CITY OF SYDNEY

17 June 2024

At the conclusion of the Resilient Communities and Economy Committee

Transport, Heritage and Planning Committee

Agenda

1. **Confirmation of Minutes**
2. **Statement of Ethical Obligations and Disclosures of Interest**
3. **Post Exhibition - A City for Walking Strategy and Action Plan - Continuing the Vision**
4. **Public Exhibition - Planning Proposal - 242-258 Young Street, Waterloo - Sydney Local Environmental Plan 2012 Amendment and Draft Design Guide**
5. **Public Exhibition - Planning Proposal - 8-24 Kippax Street, Surry Hills - Sydney Local Environmental Plan 2012 and Sydney Development Control Plan 2012 Amendments**
6. **Local Planning Panel - Appointment of Members**
7. **Fire Safety Reports**

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1. Register to speak by calling Secretariat on 9265 9702 or emailing secretariat@cityofsydney.nsw.gov.au before 10.00am on the day of the meeting.

2. Check the recommendation in the Committee report before speaking, as it may address your concerns so that you just need to indicate your support for the recommendation.

3. Note that there is a three minute time limit for each speaker (with a warning bell at two minutes) and prepare your presentation to cover your major points within that time.

4. Avoid repeating what previous speakers have said and focus on issues and information that the Committee may not already know.

5. If there is a large number of people interested in the same item as you, try to nominate three representatives to speak on your behalf and to indicate how many people they are representing.

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Committee reports are available at www.cityofsydney.nsw.gov.au

Item 1.
Confirmation of Minutes

Minutes of the following meetings of the Transport, Heritage and Planning Committee are submitted for confirmation:

Meeting of 6 May 2024

Item 2.

Statement of Ethical Obligations

In accordance with section 233A of the Local Government Act 1993, the Lord Mayor and Councillors are bound by the Oath or Affirmation of Office made at the start of the Council term to undertake their civic duties in the best interests of the people of the City of Sydney and the City of Sydney Council and to faithfully and impartially carry out the functions, powers, authorities and discretions vested in them under the Local Government Act 1993 or any other Act, to the best of their ability and judgement.

Disclosures of Interest

Pursuant to the provisions of the Local Government Act 1993, the City of Sydney Code of Meeting Practice and the City of Sydney Code of Conduct, Councillors are required to disclose and manage both pecuniary and non-pecuniary interests in any matter on the agenda for this meeting.

In both cases, the nature of the interest must be disclosed.

This includes receipt of reportable political donations over the previous four years.

Item 3.

Post Exhibition - A City for Walking Strategy and Action Plan - Continuing the Vision

File No: X092554

Summary

This report seeks Council approval of the A City for Walking: Strategy and Action Plan – Continuing the Vision ('Strategy and Action Plan').

At its meeting on 19 February 2024, Council resolved to exhibit the draft Strategy and Action Plan. It was exhibited for public comment from 21 February 2024 to 5 April 2024, with extensions granted on request. Final submissions were received in mid-April 2024. The City received a total of 430 submissions: 406 survey responses and 24 written submissions. The City also engaged People With Disability Australia to facilitate a focus group on inclusive language.

The level of engagement reflects considerable interest in walking and improving walking in our area.

A City for Walking: Strategy and Action Plan – Continuing the Vision celebrates what the City has achieved since the release of its 2015 Walking Strategy. It shows how the City's existing programs contribute to the city for walking, how the City can further improve walking in its area and targets funding for programs that accelerate the delivery of walking improvement. It outlines the City's approach, structured around a strategy and 12 actions for the next 10 years.

The Strategy and Action Plan aligns with Sustainable Sydney 2030-2050 Continuing the Vision and the Community Strategic Plan. Specifically, it facilitates Strategic Direction 5: A City for Walking, Cycling and Public Transport and outlines programs that contribute directly to the outcomes in the Community Strategic Plan.

The Strategy and Action Plan responds directly to the City's Access Strategy and Action Plan which guides the transport approach to be undertaken by the City over the coming years. Action 8 in the Access Strategy and Action Plan relates to this item.

The Strategy and Action Plan considers the whole walking experience, from physically connected infrastructure to needs such as physical and perceived safety, comfort and fun. It comprises 12 actions, including advocacy, working with partners and City-controlled actions which are a mix of capital works, behaviour change, data collection and leadership, and shows how the City will meet the walking-related targets contained in Sustainable Sydney 2030-2050 Continuing the Vision .

The Strategy and Action Plan sets out an organisation-wide approach to walking, providing the principles and framework for those managing and delivering walking programs. It also assists with decision-making, prioritisation and collaboration regarding walking projects, ensuring a comprehensive and effective strategy for enhancing the walking experience in our area.

The Strategy and Action Plan aligns with best practice and NSW government policies and approaches, including 'movement and place' and 'road user space allocation'. It was developed with input from a panel of experts in walking from across Australia.

Submissions overall showed considerable support for the City's approach and commitments to improving walking in our area, particularly to the hierarchy of walking needs, the City's program of highest priority walking improvements (Action 1), the City's advocacy to improve priority and reduce wait times at signalised intersections for people walking (Action 4) and reduce vehicle speeds (Action 3) and the City's approach to traffic calming and reducing traffic volumes (supported by all of the actions, but notably Actions 1, 2, 5 and 8).

The biggest single-issue respondents mentioned was the *interaction between people walking and people cycling*, including people riding on the footpath, interactions on shared paths and clutter created by shared bike parking on the footpath. Many comments raised that people walking need their own space sperate from other transport modes. This issue was addressed through the addition of a half-page call out box clarifying the road rules around cycling on footpaths and setting out the City's work to reduce illegal riding on footpath. Action 7 (regarding road rules) was also amended to reflect community concerns about people cycling.

The final Strategy and Action Plan was amended to clarify the City's plans in several specific areas, including clarification on the road rules related to people riding on the footpath, amendments to language use to make it clear that walking includes people using mobility aids, updating the safety section with new research supplied by Transport for NSW and clarification that updating our street design guidance (Action 8) includes reviewing the accessibility of different road crossing types. A fuller description of amendments is detailed in the Public Consultation section of this report.

Note that throughout this item and the Strategy and Action Plan, the term 'walking' refers to all people moving on the footpath. This includes people using mobility aids, people pushing prams or trolleys for deliveries, and people using unpowered scooters, skateboards or rollerblades.

Recommendation

It is resolved that:

(A) Council note the submissions and feedback received through the public exhibition period as shown at Attachment A to the subject report;

(B) Council adopt A City for Walking Strategy and Action Plan - Continuing the Vision incorporating amendments following the public exhibition process, as shown at Attachment C to the subject report; and

(C) authority be delegated to the Chief Executive Officer to make minor amendments to A City for Walking Strategy and Action Plan - Continuing the Vision in order to correct any minor drafting errors and finalise design, artwork and accessible formats for publication.

Attachments

Attachment A. Engagement Report - Draft A City for Walking Strategy and Action Plan - Continuing the Vison

Attachment B. Proposed Changes to Exhibited Draft A City for Walking Strategy and Action Plan - Continuing the Vision

Attachment C. Final A City for Walking Strategy and Action Plan - Continuing the Vision

Background

1. There have been many changes since the City of Sydney's first walking strategy was released in 2015, notably:

   (a) Physical changes, including lower speed limits throughout much of our area, pedestrianisation of many streets and lanes and the transformation of George Street.

   (b) Changes in City strategy and policy, particularly Sustainable Sydney 2030-2050 Continuing the Vision, the Community Strategic Plan – Delivering Sustainable Sydney 2030-2050, both published in 2022, and the Access Strategy and Action Plan - Continuing the Vision, published 2024.

   (c) Changes in NSW Government policy, namely the introduction of movement and place and a road user space allocation policy which recognise the roles streets play for different users and functions and provide guidance on how to best prioritise limited space among these.

2. The updated Strategy and Action Plan responds to these changes, celebrating what the City has achieved since 2015, shows how the City's existing programs contribute to the city for walking, how the City can further improve walking in its area and seeks funding for programs that accelerate the delivery of walking improvement.

3. The Strategy and Action Plan outlines the City's approach and commitments to walking, structured around a strategy and 12 actions for the next 10 years. It sets out an organisation-wide approach to walking, providing the principles and framework for those managing and delivering walking programs. It also assists with decision-making, prioritisation, and collaboration regarding walking projects, ensuring a comprehensive and effective strategy for enhancing the walking experience in our area.

4. The Strategy and Action Plan aligns with Sustainable Sydney 2030-2050 Continuing the Vision. Specifically, it facilitates Strategic Direction 5: A City for Walking, Cycling and Public Transport and outlines programs that contribute directly to the outcomes in the Community Strategic Plan.

5. Sustainable Sydney 2030-2050 Continuing the Vision contains measures and targets which will track how well we are achieving Strategic Direction 5. This strategy aims to provide greater clarity of how the first part of that direction will be achieved. As such this strategy doesn't contain any new targets or measures and instead reinforces existing measures and targets.

6. The Strategy and Action Plan responds directly to the Access Strategy and Action Plan which guides the transport approach to be undertaken by the City over the coming years. Action 8 in the Access Strategy and Action Plan relates to this item.

7. The draft Strategy and Action Plan was developed with input from a panel of experts in walking from across Australia, as well as a broad range of City of Sydney staff.

8. The Strategy and Action Plan is structured around a human-centred hierarchy of walking needs that considers the whole walking experience, from a physically connected network to needs such as safety, comfort and enjoyment.

9. The ‘Strategy’ portion of the document is structured around a hierarchy of walking needs. These walking needs are:

    (a) A city where people can walk – this strategy provides the infrastructure requirements to make walking possible.

    (b) A city where people can walk safely – this strategy looks at both road safety and personal safety for people walking.

    (c) A city where walking is comfortable – this strategy focuses on providing a high-quality public domain to improve the walking experience, including tree planting and street furniture.

    (d) A city where walking is fun – this strategy is about encouraging people to walk more or further through providing surprise and delight along a walking journey through street activity and public art.

    (e) A city that is a leader in walking – ensuring the City can use an evidence-based approach to walking planning and share our knowledge with other local governments and organisations.

10. The Action Plan comprises 12 actions, including a combination of capital works, behaviour change, data collection, leadership and advocacy planned over a 10-year timeframe. These are:

    (a) Action 1. We will implement a program of highest priority walking improvements. (This includes crossings, greening, street upgrades and public domain improvements that are already committed and funded over the next 3 years.)

    (b) Action 2. We will investigate ways of increasing our commitment to delivering walking improvements. (This action includes a list of proposed programs including doubling the rollout of pedestrian crossings, expanding the network of automated pedestrian counters and creating a dedicated funding pathway for walking improvements.)

    (c) Action 3. We will work with Transport for NSW to implement 30 and 40 km/hr speed limits.

    (d) Action 4. We will work with Transport for NSW to ensure that signal phasing prioritises people walking.

    (e) Action 5. We will implement local area traffic management (LATM) plans to reduce vehicle volumes and speed to make it safer for people walking.

    (f) Action 6. We will develop a code of practice for construction activities in public places that provides guidance on how to maintain safety, connectivity and place amenity for people walking.

    (g) Action 7. We will advocate for Transport for NSW to improve how NSW road rules relate to people walking and raise awareness of road rules as they relate to people walking (including cycling on footpaths).

    (h) Action 8. We will review the guidance in our Sydney Streets Code related to walking (including crossings, intersections, child friendly streets, lane widths and designing for people with disability).

(i) Action 9. We will work with Transport for NSW to reduce red tape and make it easier for our community to activate their streets via temporary or permanent closures, street painting and plantings.

(j) Action 10. We will promote walking as a form of exploration and curiosity through our Culture Walks, guided tours and self-guided walks.

(k) Action 11. We will continue be a leader in walking and evidence-based planning.

(l) Action 12. We will use language that highlights the human element of walking and advocate for others to do the same. For example, using "people walking" instead of "pedestrians".

Key Implications

Strategic Alignment - Sustainable Sydney 2030-2050 Continuing the Vision

11. Sustainable Sydney 2030-2050 Continuing the Vision renews the communities' vision for the sustainable development of the city to 2050. It includes 10 strategic directions to guide the future of the city, as well as 10 targets against which to measure progress. This plan is aligned with the following strategic directions and objectives:

    (a) Direction 2 - A leading environmental performer - by reducing emissions through supporting walking, the most sustainable mode of transport.

    (b) Direction 3 - Public places for all - by creating the opportunity for reallocating street space away from vehicles to people, places and planting.

    (c) Direction 5 - A city for walking, cycling and public transport - by setting out in detail the approach and actions the City will undertake to achieve the first part of the direction. This is the key focus of the Strategy and Action Plan.

    (d) Direction 6 - An equitable and inclusive city - by identifying and responding to the varied walking needs across the community.

    (e) Direction 9 - A transformed and innovative economy - by creating high-quality, walkable places that support businesses and communities.

Organisational Impact

12. The Strategy and Action Plan has insignificant organisational impact and implementation of actions will not require additional staff resourcing.

Risks

13. The Strategy and Action Plan includes actions impacted by external factors beyond the City's direct control, such as NSW Government approvals, agreement, policy and funding which require the support of external stakeholders in order to be implemented.

Social / Cultural / Community

14. In the Sydney city centre, people make almost 1.3 million trips per day, of which 92 per cent are walking trips. Within the City of Sydney local government area, almost 57 per cent of trips are by walking only (2022/23 Household Travel Survey). Every trip starts and ends with a walk, so improvements in walking benefit the whole community.

15. Thirty-seven per cent of households in our local area do not own a car (much higher than the 11 per cent across Greater Sydney), 31 per cent of residents walk to work and 27 per cent use public transport to get to work, which usually includes at least one walking trip. A high-quality walking environment, and access by walking to public transport by walking for longer trips, is critical.

16. A walkable city supports diversity and inclusion by providing the infrastructure and environment that makes walking available to everyone. This could be providing street furniture to provide opportunities for rest for those unable to walk long distances, or making streets quieter through traffic calming to improve the experience for people with sensory disability.

17. The actions proposed will result in reduced congestion, quieter, less polluted streets, calmed traffic, reduced crashes of all types, crossings, plantings, street furniture, trees, rain gardens and improved lighting. These improvements all have benefits beyond improving walking experience. These benefits include health, environmental and economic benefits.

Environmental

18. The key environmental challenge for the transport sector is net zero emissions by 2035. The City's overall approach is to reduce emissions by reducing the amount people need to travel by private motor vehicle by encouraging walking, cycling and public transport. Walking is intrinsically environmentally sustainable in terms of carbon produced, space and infrastructure required.

19. Some city centre streets carry three to four times more people walking per day than some motorways in the area. Parts of George Street, for example, had over 100,000 people walking on it per day in 2019.

Economic

20. The Strategy and Action Plan are consistent with the City's economic vision, encapsulated in Direction 9 of Sustainable Sydney 2030-2050 Continuing the Vision.

21. The overall approach to improve walking in precincts such as the city centre, Tech Central (and our university cluster) and Pyrmont is fundamental to supporting high value growth in the innovation sector, as well as directly enabling the city centre tower clusters fundamental to the Central Sydney Planning Strategy.

22. A good walking environment is important to continuing to attract businesses, workers and visitors. Increased levels of walking bring significant health benefits to the community, reducing the burden of health care costs (financial and human),

Financial Implications

23. Many of the actions can be completed without additional funding.

24. The proposed items with financial implications are all part of Action 2 and are as follows:

    (a) an additional $9 million of capital funding that has been included in the draft 2024/25 Capital Works budget and future year forward estimates over the next 10 years to double the rollout of pedestrian crossings from Year 4 to Year 10, from four per year to eight per year;

(b) for some years an operating budget to undertake specific Walking and Place Improvement Studies will be required for some specific initiatives, noting that the City would seek grant funding under available NSW Government programs at the time; and

(c) capital funding of around $120,000 to expand automated counter network from four locations to 15 (noting operational budget would be requested through normal budgeting processes for operation and maintenance of cameras once installed). The automated counter network refers to the set of cameras we have installed on smart poles that automatically count the number of pedestrians 24 hours per day. The data is publicly accessible. Note that once all 15 are installed, we would stop the twice-yearly manual counting, and operational funding currently used for the manual counting would be reallocated towards maintenance of automated counters.

25. The City will seek Council's consideration and approval for any additional funding through the normal yearly budgeting processes.

Relevant Legislation

26. The Strategy and Action Plan relates generally to allocation of transport and traffic responsibilities under the Local Government Act 1993, the Roads Act 1993 and the Road Transport Act 2013.

Options

27. The City could consider advocating for specific projects or approaches based on existing Council strategies, including Sustainable Sydney 2030-2050 Continuing the Vision, City Plan 2036 and the 2015 walking strategy. However, without the updated Strategy and Action Plan, there would be less organisation-wide understanding to assist with decision-making, prioritisation, and collaboration ensuring a comprehensive and effective strategy to improve the walking experience in our area.

Public Consultation

28. At its 19 February 2024 meeting, Council resolved to exhibit the draft Strategy and Action Plan. It was exhibited for public comment from 21 February 2024 to 5 April 2024, with several extensions granted on request. Final submissions received in mid-April 2024.

29. During the consultation period the 'Sydney Your Say' page was visited 2198 times, with 864 people downloading the draft Strategy and Action Plan.

30. The City received 406 survey responses and 23 written submissions (10 from organisations, 13 from individuals).

31. The City engaged People With Disability Australia to facilitate a focus group on inclusive language. Results are summarised in Attachment A.

32. The level of engagement reflects considerable interest in walking and improving walking in our area.

33. Attachment A provides a detailed Engagement Report.

34. Submissions overall showed considerable support for the City's approach and commitments to improving walking in our area, particularly to the hierarchy of walking needs and the approach that considers the transport needs of walking along with the experience.

35. The feedback highlighted the following key areas:

    (a) The majority of respondents are walking regularly around our area, with 68 per cent walking daily or multiple times per day.

    (b) Walking is very important to respondents (98 per cent), and walking needs to be possible, safe, comfortable and fun.

36. The biggest single-issue respondents mentioned in the open response part of the survey and in written submissions was the interaction between people walking and people cycling, including people riding on the footpath, interactions on shared paths and clutter created by shared bike parking on the footpath. Many comments raised that people walking need their own space sperate from other transport modes. We recognise this is an on-going issue, particularly with shared bike parking on the footpath, and will continue to implement the Cycling Strategy and Action Plan and to run behaviour change programs such as Share the Path which provides cyclist education training. Furthermore, we will actively work to improve understanding and awareness of road rules for people walking and people riding (Action 7) and we are working with bike share operators to a) implement 'slow zones' where people on shared e-bikes cannot ride over 10 km/hr in areas with high levels of interactions with people walking and b) create mandatory parking areas for their bikes in key areas, ideally on-street rather than on footpaths.

37. There was significant support for:

    (a) Implementing a program of highest priority walking improvements, including crossings, greening, street upgrades and public domain improvements that are already committed and funded over the next three years (Action 1).

    (b) The City's advocacy to improve priority and reduce wait times at signalised intersections for people walking, and for us to explore different signal types including pedestrian priority signals and scramble crossings (Action 4).

    (c) The City's approach to traffic calming and reducing traffic volumes including reducing non-essential traffic on local streets, improving major streets to support local businesses, reducing traffic in the city centre and reducing parking both on-street and off-street (supported by all of the actions, but notably Actions 1, 2, 5 and 8; note that the City sets maximum parking rates in new development through Sydney LEP 2012. This Strategy and Action Plan will not alter these rates).

38. There was support for the City's advocacy to reduce vehicle speeds, with support for 30 km/h on local roads and in areas of high pedestrian traffic (Action 3).

39. Many comments referenced wanting more "pedestrian streets" such as expanding the pedestrianised city centre, and support for temporary street closure programs such as Sydney Streets.

40. Many comments referenced the need to reduce footpath clutter and maintain clear paths of travel (Strategy A1).

41. Several submissions requested more pedestrian crossings, continuous footpath treatments and other crossing types (Strategy A2).

42. Many submissions provided ideas on how to reduce the time required for people to walk, including sharing their ideas to improve connectivity and linking walking with public transport. Time and distance were key needs identified (The hierarchy table has been updated to reflect this. See point 49).

43. From the open response and written submissions, there was support for all the actions, with significant support for Action 1 (program of highest priority walking improvements), 3 (advocacy around vehicle speeds), 4 (advocacy around signal priority), 5 (LATM) and 8 (reviewing the guidance in our Sydney Street Design Code). In addition, there was support for actions on road rules (Action 7), trees (and other shading; Actions 1, 2 and 8), road reallocation (Actions 1 and 2), construction impacts (Action 6), accelerating the walking delivery program (Action 2), using inclusive proactive language (Action 12), and creating more child friendly streets (Action 8).

44. There was concern that the design of some of the suggested treatment types needed to be more inclusive to people with disability, people pushing prams, older people, children and vulnerable people. This issue is part of implementation of Action 8. (The wording of Action 8 and Strategy A2 have been updated to reflect this. See point 49).

45. There was also some concern that the pedestrianisation and/or traffic calming of areas may result in a lack of mobility parking and/or drop off and pick up areas. This is noted, and out of scope of the Strategy and Action Plan. The design and parking arrangements (if any) of specific projects will go through the City's normal approval processes. The City's approach to parking is outlined in our Central Sydney On-Street Parking Policy which prioritises on-street parking for taxis, delivery and mobility purposes. Through our Inclusion (Disability) Action Plan 2021–2025 we will continue to explore and implement strategies to increase access to on-street and off-street accessible parking and drop-off points in the City of Sydney area.

46. There was some concern about footpath maintenance, including the need for footpaths and crosswalks to be maintained, particularly for accessibility. (The wording of Strategy B3 has been altered to reflect this. See point 49).

47. There was support for measures to improve walking comfort, including seating, public toilets and drinking fountains. Several respondents requested shelter/shade options at intersections. (Action 8 was updated to reflect this. See point 49)

Amendments to the Strategy and Action Plan following exhibition

48. Based on the nature of the feedback provided, the final Strategy and Action Plan required minor amendments to clarify the City's plans in several specific areas. Attachment B identifies the proposed changes to the exhibited draft, with key amendments as follows:

    (a) Amendments to language use following feedback from the focus group and the City's Inclusion team, including to the definition of 'Accessibility' used.

(b) Clarification included in 'A note on terminology' (page 4) that walking does not include motorised scooters ('e-scooters'). It does include people using motorised wheelchairs or other motorised mobility aids. This was in response to several submissions.

(c) Addition of time and distance to the diagram explaining the hierarchy of walking needs for clarity in response to additional needs section of the survey (Figure 2, page 8).

(d) Clarification included in the delays and detours section (page 11) on the impact of traffic signals to people walking.

(e) Clarification added to roles and responsibilities section (page 17) to include bus shelters and, in cases where responsibility is shared, that the City will work with the relevant NSW Government stakeholders.

(f) Minor amendment to Strategy A1 to explain the City's approach to clear walking paths in response to open response and written submissions (page 20).

(g) Clarification of our approach to improving connectivity for people walking through crossings, including our advocacy approach to signalised intersections and comments around the different types of crossings (Strategy A2; page 21). Several survey submissions and written submissions requested this clarification.

(h) Addition to Strategy A3 to highlight the strong links between walking and public transport and the need for mobility parking in expanding the 10-minute city (page 22). This was in response to survey submissions, but also to submissions from the NSW Bar Association and the Department of Education.

(i) In response to the submissions on the interactions between people riding on the footpath and people walking clarification has been provided in Strategy A1 (page 20) and a new 'explainer' box elucidating the rules related to people riding on the footpath has been added to Strategy B3 (safety; page 27).

(j) Updated Strategy B3 (safety) to include (a) new research from Transport from NSW which they included in their submission and (b) the importance of maintenance of footpaths for accessibility in response to open response submissions (page 26).

(k) Minor amendments to Strategy C1 (comfort) to align with the City's Resilience Strategy 2023-2028, specifically Action 5 Support our community to cope with increased heat and drought (page 27-28). Inclusion of the Resilience Strategy in Figure 6.

(l) Addition to Action 7 that the City will work to improve the compliance with road rules of people riding (specifically in relation to riding on footpaths).

(m) Addition to Action 8 that the review of our Sydney Street Codes will include reviewing the accessibility of different crossing types and shelter at waiting spaces.

(n) Addition of 'schools' to Tranche 2 (Appendix B) walking improvements in response to submission by Department of Education, recognising the importance of walking to and from schools (and public transport access to schools).

(o) Addition of a definition of 'Inclusion' and clarification added to our definition of 'interchange' at the request of Transport for NSW (Appendix E).

49. Several comments included location specific issues or suggestions. These comments have been retained to be reviewed during implementation phases of actions.

50. We will continue to work collaboratively and consult with specific stakeholders, including with state government agencies such as Transport for NSW, Department of Planning, Housing and Infrastructure and the Department of Education, and with key community groups.

KIM WOODBURY

Chief Operating Officer

Sebastian Smyth, Executive Manager City Access and Transport

Attachment A

Engagement Report – Draft A City for Walking Strategy and Action Plan – Continuing the Vision

CITY OF SYDNEY

Engagement Report – Draft "A City for Walking": Strategy and Action Plan – Continuing the Vision



Engagement report
June 2024

The City of Sydney acknowledges the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

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1. Executive summary

The City of Sydney (the ‘City’) developed the draft “A City for Walking”: Strategy and Action Plan – Continuing the Vision (‘Strategy and Action Plan’) updating and building on the ideas from the City’s 2015 Walking Strategy.

The update was needed for the following reasons:

- The City has achieved much of what was proposed in 2015.
- To align with new City policies, notably Sustainable Sydney 2030-2050 Continuing the Vision and the Community Strategic Plan ("SS2030-2050"), and respond to Direction 5 – A city for walking, cycling and public transport.
- To align with new NSW Government policies including movement and place and road user space allocation.

We asked the community for feedback on the draft Strategy and Action Plan.

The City exhibited the draft Strategy and Action Plan between 22 February and 5 April 2024, with extensions to the consultation period granted on request. Final submissions were received in early May 2024.

The consultation was available online via Council’s ‘Sydney Your Say’ page, with respondents able to comment via a survey or by providing a separate submission via email.

The outcomes of the consultation include:

- 406 survey responses.
- 23 email submissions, including 10 organisation submissions.

The City also engaged People With Disability Australia to facilitate a focus group on the language used in the draft Strategy and Action Plan to ensure it was inclusive.

We heard our community want a city for walking.

Overall, there was considerable support for the draft Strategy and Action Plan.

Respondents want a more walkable city, with a safer, more convenient and fun walking experience. They wanted fewer cars and more space for walking, better footpaths, greater priority at traffic lights, more crossings, less clutter and more amenities like trees, seating and public toilets.

Walking is important to our community.

They told us they wanted a holistic walking environment that integrates walking connections seamlessly with other modes of transport, infrastructure that connects destinations and provides the ability to stroll, rest and relax.

They also told us they wanted a walking environment that was easy for all people, including children, older people and people with disability. They wanted streets with more space for walking, more trees, an improved public domain and shade and shelter. They wanted less delays when walking.

We have updated the draft Strategy and Action Plan to reflect community feedback.

2. Background

2.1. A draft strategy and action plan to deliver a city for walking

The City is updating it’s 2015 Walking Strategy.

The updated Strategy and Action Plan celebrates what the City has achieved since 2015 and aligns with new City polices, namely *Sustainable Sydney 2030-2050 Continuing the Vision* and the *Community Strategic Plan* ("SS2030-2050"). It facilitates Direction 5: a city for walking, cycling and public transport.

The updated Strategy and Action Plan also responds to new NSW Government policies including movement and place and road user space allocation.

The updated Strategy and Action Plan is structured around a hierarchy of walking needs: possible, safe, comfortable, and fun. It aims to make walking safe, comfortable and inviting for everyone. It provides a framework for managing and delivering walking programs, guiding decision-making, prioritisation, and collaboration for enhancing the walking experience in our community.

The Action Plan contains 12 actions.

2.2. This engagement report

This engagement report summarises the City’s engagement activities during the public exhibition of the draft Strategy and Action Plan and provides the key findings from those activities.

All feedback captured in this report has been considered before reporting back to Council.

3. Engagement summary

3.1. From 21 February 2024 to 5 April 2024, we asked the community for feedback on our draft Walking Strategy and Action Plan.

Consultation on the draft Strategy and Action Plan provided an opportunity for stakeholders and the community to review and comment on the draft approach and actions outlined.

Consultation activities included an online survey available via our ‘Sydney Your Say’ page and email submissions.

The consultation was promoted on the Sydney Your Say newsletter and various social media channels.

The City granted two extensions to the consultation period on request, with the final submissions received in late April and early May 2024.

The City also engaged People With Disability Australia to facilitate a focus group online to undertake a targeted discussion about the language used in the draft Strategy and Action Plan to ensure it was inclusive.

3.2. Purpose of the engagement

The purpose of the engagement was to:

- Gather feedback from stakeholders and the community about the draft Strategy and Action Plan.
- Determine the level of satisfaction with the draft Strategy and Action Plan.
- Inform the development of the final draft of the Strategy and Action Plan.

The purpose of the focus group was to:

- Inform an inclusive approach to terminology used in the draft Strategy and Action Plan, including the title and how we defined 'walking' throughout the document.
- Gather feedback from participants about areas where the strategy could be more inclusive.

3.3. Outcomes from the engagement

Below is a break-down of the engagement during the consultation period:

- There were 2,198 visits to the ‘Sydney Your Say’ page during the consultation period.
- 864 people downloaded the draft Strategy and Action Plan document.
- 406 people responded to online survey consultation.

- 23 email submissions were received.
    - 13 from individuals
    - 10 from organisations:
        - Department of Education
        - Guide dogs Australia
        - Bicycle NSW
        - BIKEast
        - UTS
        - Mott Macdonald
        - NSWBA
        - ACON
        - Pyrmont Action Group
        - Transport for NSW

4. Survey findings

The following section summarises response to each of the questions asked in the online survey.

4.1. Age

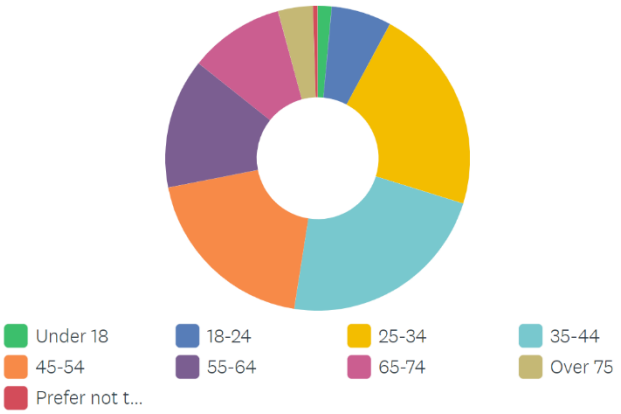
Question: Select your age bracket

The City received feedback from individuals across different age brackets, ranging from under 18 years old to over 75. 78 percent of the total responses were from individuals under the age of 55.

25-34 years old **22%**

35-44 years old **23%**

45-54 years old **20%**



4.2. Gender

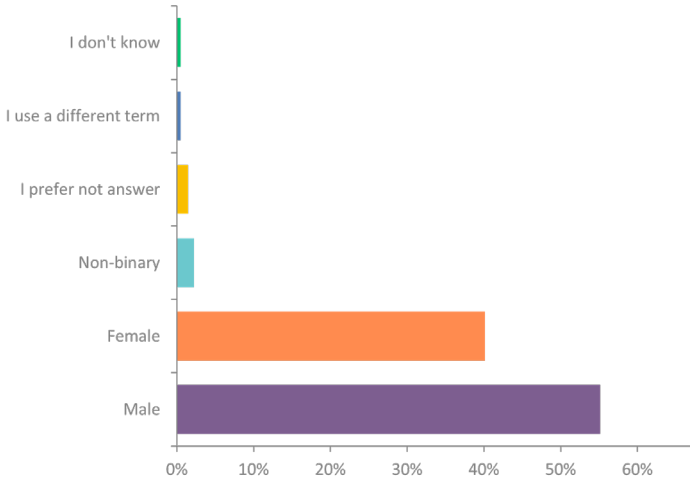
Question: How would you describe your gender?

Survey respondents reflected a diverse range of gender identities, with 2 percent identifying as non-binary, while 40 percent identified as female and 52 percent as male.

Female **40%**

Male **55%**

Non-binary **2%**



4.3. Reasons for walking

Question: What are your top reasons for walking in the City?

People walk in our city for different reasons. The main reason for respondents was to get around for everyday needs, highlighting walking as an integral part of the daily routine in their lives.

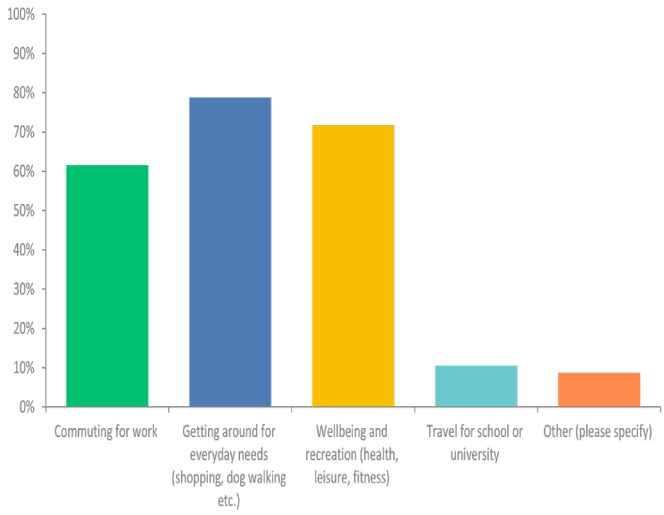
Other responses include:

- Travel for school or university
- Living in the city or being a long-time local resident
- Visiting friends and family
- Social activities and entertainment e.g. hanging out with friends, concerts, bookshops, restaurants, local gigs.
- Accessing amenities like medical care

79% Getting around for everyday needs (shopping, dog walking etc.)

72% Wellbeing and recreation (health, leisure, fitness)

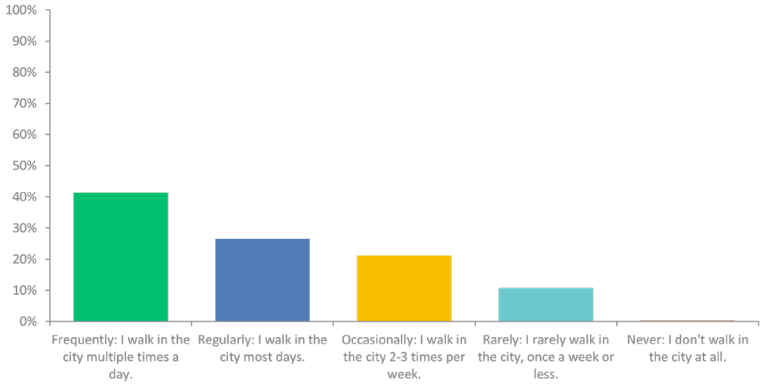
62% Commuting for work



4.4. Frequency of walking

Question: How often do you walk in the City?

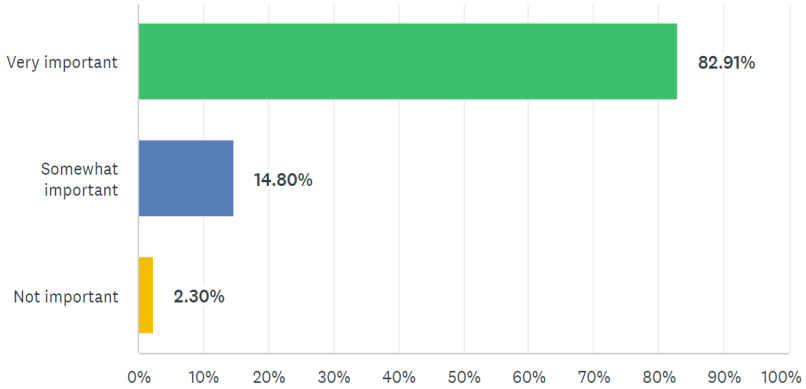
68% walk regularly in the city most days or frequently, multiple times a day.



4.5. Importance of walking

Question: How important is walking in your daily life and overall wellbeing?

98% walking is very important or somewhat important.



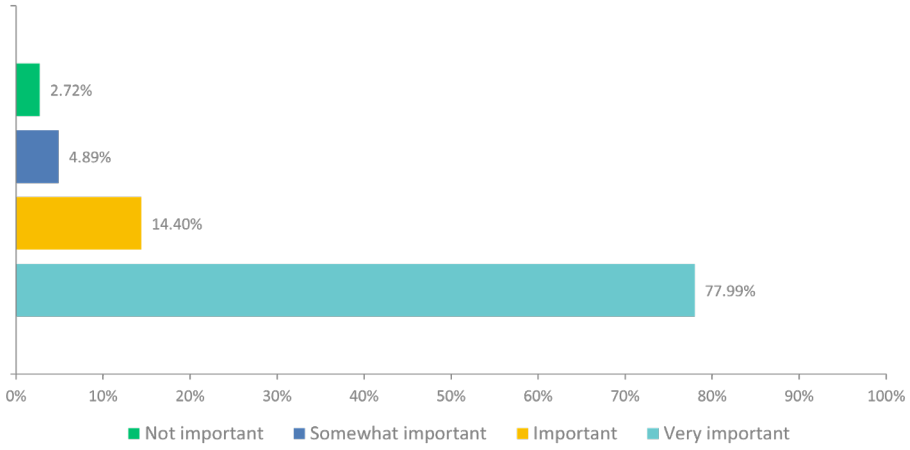
4.6. Needs that make a city for walking

Question: We have approached the Strategy through a hierarchy of walking needs. How important is each of these to you when you’re walking?

Survey respondents were asked how important the draft Strategy’s “hierarchy of walking needs” (possible, safe, comfortable, fun) was to them. Most respondents thought all 4 needs were either ‘very important’ or ‘important’. ‘Walking is safe’ was identified by most respondents (82%) as ‘very important’. Responses to each walking need are summarised below

4.6.1. Walking is possible

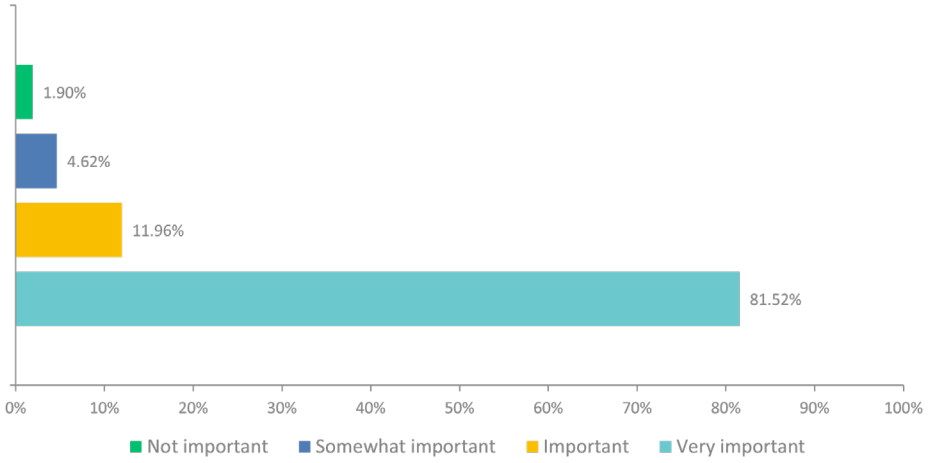
92% very important or important



4.6.2. Walking is safe

94%

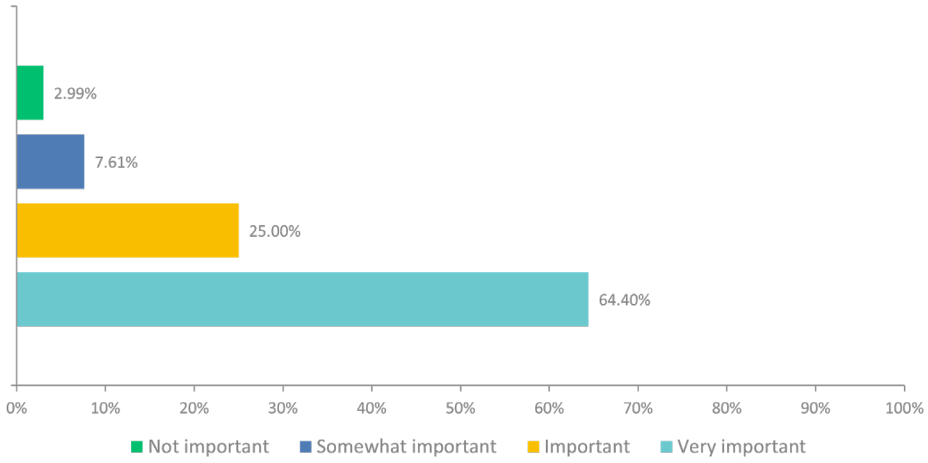
very important
or important



4.6.3. Walking is comfortable

89%

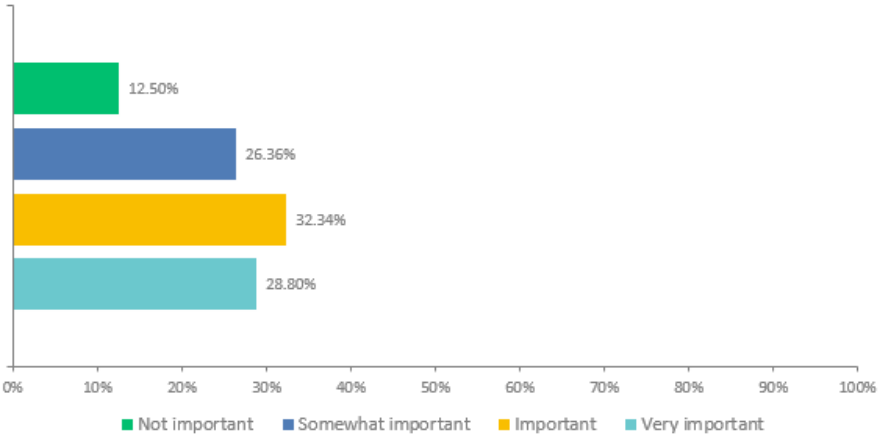
very important
or important



4.6.4. Walking is fun

61%

very important
or important



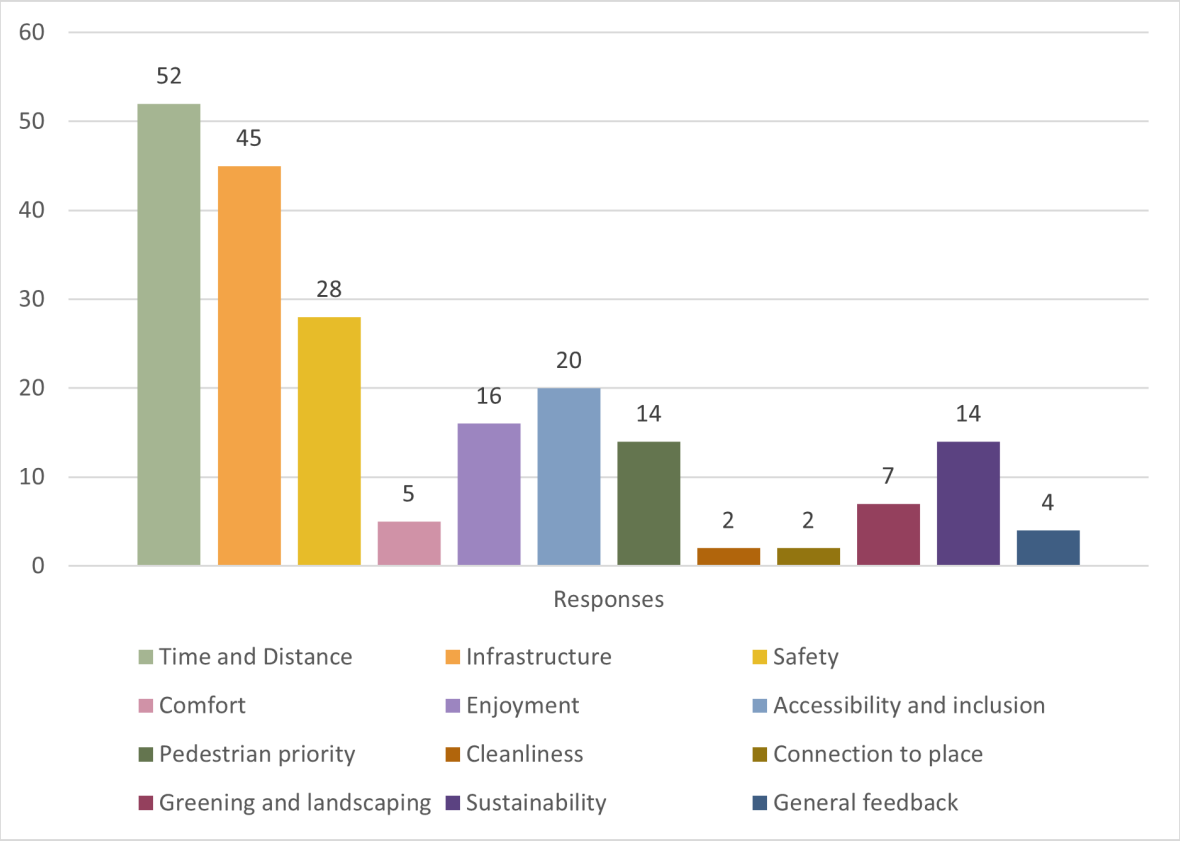
4.7. Additional feedback on walking needs

Question: Do you have any specific additions to the walking needs mentioned above?

We asked people if there are any additional walking needs that should be included in the Strategy and Action Plan. These have been themed and are shown in the below table.

Most of the responses reflected the “heirarchy of needs” outlined in the draft Strategy and Action Plan. These suggestions supported the draft. Several comments stressed the importance of time and distance. This is included in the heirarchy of needs and has now been highlighted in the heirarchy diagram in the Strategy and Action Plan following feedback.

There was significant overlap with responses to the open ended question (Question 10) which asked respondents if they had any feedback on a specific strategy or action. We have included these in our summary table (section 4.10).



52

responses about **time and distance needs**

Respondents shared ideas to improve connectivity and convenience. They suggested integrating walking with other ways to get around, such as public transport, and reducing barriers like long wait times at traffic lights to make walking faster and convenient.

They also suggested walking should connect easily to local shops, businesses and public transport with footpaths and crossings.

45

responses about **infrastructure needs**

Respondents shared infrastrucure needs for walking, suggesting more footpath space, better lighting, trees, public toilets and shelter.

They also suggested lowering vehicle speed limits and vehicle numbers.

Additionally, responses included support for more pedestrian crossings and reducing wait times traffic signal times to make walking safer and easier.

28

responses about **safety needs**

Respondents highlighted safety needs for walking in the local area.

Some suggested solutions included dedicated bike lanes, removing electric hire bike partking from the footpath and reducing the speed of food delivery bikes on footpaths.

Other responses included improved visibility, reduced obstructions such as billboards, lowering speed limits to 30km/h for people driving, traffic calming measures and traffic lights that prioritise people walking.

4.8. Approval for the Walking Strategy as a framework

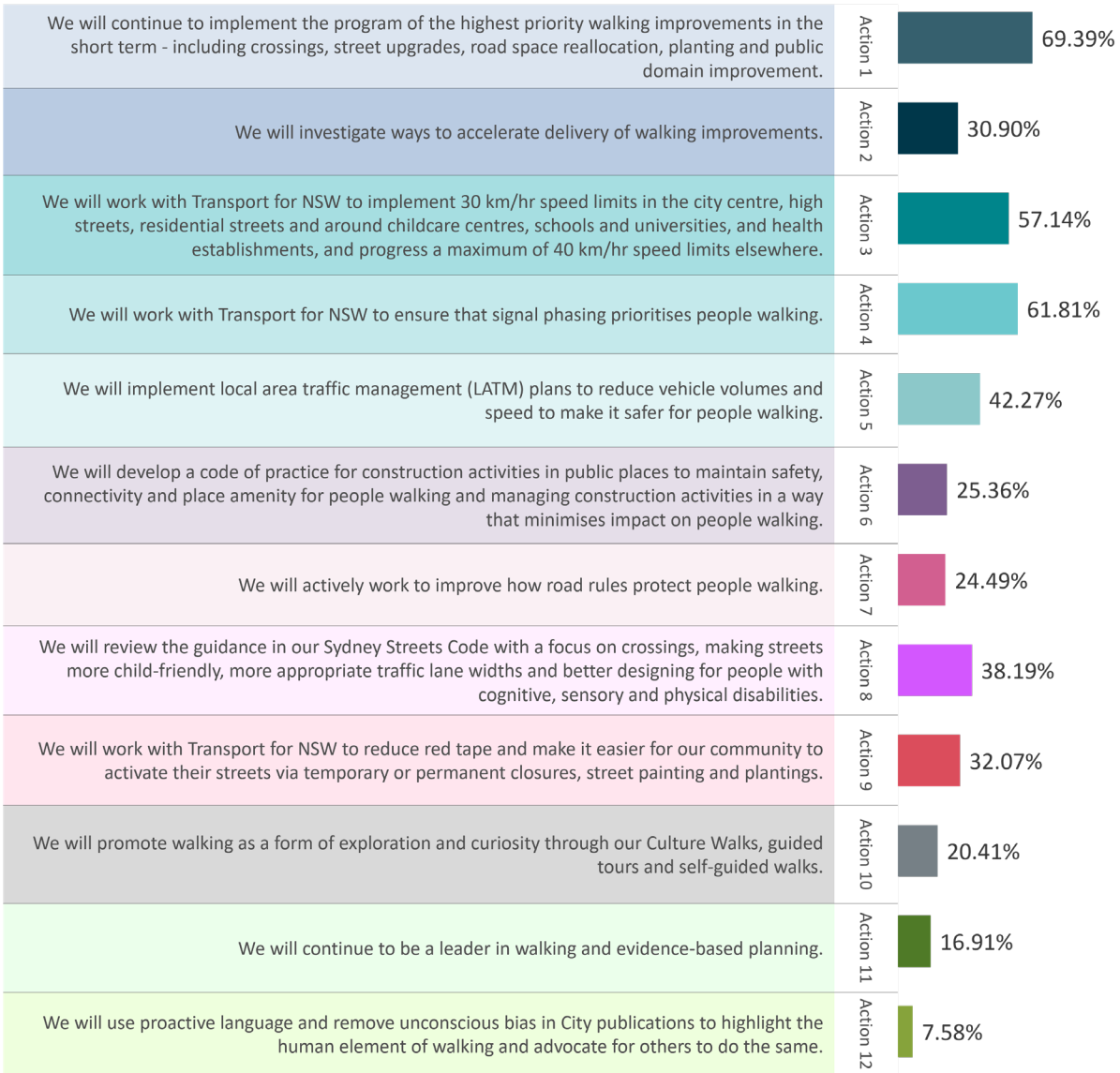
Question: Do you think the Walking Strategy and Action Plan provides the right approach to improving walking?

We asked respondents how well they thought the Walking Strategy and Action Plan provided a framework for improving walking in the city on a scale of not at all, moderately well and very well. Around 84 per cent of respondents chose ‘moderately well’ and ‘very well’.

4.9. Which actions are the most important?

Question: Select up to five walking actions in the Walking Strategy that are the most important to you.

Respondents were asked to pick up to five ‘most important actions’ out of the twelve included in the draft. Most respondents thought all 12 actions were important. Actions 1, 4, 3 and 5 ranked the most important. The feedback supports the proposed order of actions in the draft Strategy and Action Plan. Below is a summary of these responses.



4.10. Themes raised in feedback

Question: Do you have feedback on a specific strategy or action?

Question 10 was an open response, free-text question, asking respondents if they had any feedback on a specific strategy or action.

176 individual respondents provided responses to Question 10. Of these 12 were comments of general non-support, 14 were comments on specific locations and 4 comments were unrelated to the draft Strategy and Action Plan.

The following table summarises the issues raised by respondents. Many respondents raised multiple subjects in their response so the total in the ‘Number of responses’ column is greater than the number of individuals who responded.

Responses from the open response, free-text question asking respondents about additional needs that were feedback on a specific strategy or action have also been reported here.

The table also tallies and reports comments received via an individual submission (13).

Issues raised in organisational submissions are included as Appendix A.

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
1	**Interactions between people walking and people riding bicycles.** • Support for people walking and people riding having dedicated space. Comments included: • Different speed requirements (notably e-bicycles). • Negative experiences of people riding using footpaths and shared paths. • Opposition to riders not following the road rules (cycling on footpaths, speeding, going through red lights) • Delivery riders • Support for dedicated parking not on the footpath	59	Safe	*Changes made to Strategy and Action Plan.* Noted. We have made changes to the Strategy and Action Plan to reflect these concerns, notably: • Clarification on the City’s approach added to Strategy A1 and B4. • An 'explainer' box on rules related to people riding on the footpath added to Strategy B4. Addition to Action 7 that the City will advocate for the NSW Government to improve compliance of people riding on footpaths through its regulation of delivery companies and share bike operators. *The Strategy and Action Plan responds to these issues*. Several of the actions in the Strategy and Action plan respond to this issue, namely: • Action 1 outlines the need to provide more space for people walking. • Action 7 outlines that we will actively work to improve understanding, awareness, and compliance of road rules for people walking and people riding. • Through Action 3 we are advocating for reduced speed limits in our area. This will make riding on streets safer. *City initiatives already underway*. We recognise this is an on-going issue. We: • Will continue to implement our *Cycling Strategy and Action Plan.* • Will continue to run our behaviour change programs including the regular (two to four times per week) *Share the Path* program which provides onsite education about courteous shared path use and cycle training courses. • Are working with bike share operators to a) implement ‘slow zones’ where people on shared e-bikes cannot ride over 10 km/hr in areas with high levels of interactions with people walking and b) create mandatory parking areas for their bikes in Pyrmont, Ultimo, Circular Quay, Barangaroo and The Rocks, with a further nine precincts in the pipeline. • Have written to the NSW Government asking them to improve the safety for people riding, to promote safer rider behaviour and to establish a permit system for bike share companies and food delivery companies. • Have asked Transport for NSW to review their guidance and road rules which prevent the City from allowing bike parking on the road in locations where it does not pose a risk to safety. Note: We recognise that there are safety issues with people walking and people cycling sharing space, however we note that people walking on a footpath are more likely to be injured or killed by someone driving than someone cycling.
2	**Signalised intersections** • Support for automatic pedestrian phases at signalised crossings throughout the city but especially in places where there are high levels of people walking.	32	Possible	*Changes made to Strategy and Action Plan.* Noted. We have made changes to Strategy A2 to clarify the City’s advocacy approach to signalised intersections. *The Strategy and Action Plan responds to these issues*. Many comments are covered within the Strategy and Action Plan, notably:

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
	• Long wait times for people walking and the need to improve signal phases for people walking. • That different types of signalised intersections such as count down timers or scramble crossings could be implemented. • One comment that signalised intersections should be replaced with pedestrian-priority crossings.			• A key outcome of Direction 5 in the City’s strategic plan, *Sustainable Sydney 2030-50 Continuing the Vision* is that people are prioritised at key intersections, reducing wait times and improving safety. This strategy and action plan provides the framework to support this Direction. • Through Action 4, we will continue to work with Transport for NSW to ensure that signal phasing prioritises people walking, advocating for automated pedestrian phases, a maximum wait time at intersections of 45 seconds for people walking with a target of 30 seconds and for more pedestrian priority signalised. • Through Action 8, we will review the guidance in our *Sydney Streets Code* with a focus on providing guidance on location, selection and design of crossings and intersections. We will investigate the safety of signalised and unsignalised pedestrian crossings along with the community’s perception of different crossing types as part of reviewing our guidance.
3	**Calming and lowering the amount of traffic** • Reducing or diverting vehicle traffic from local streets and residential streets. • Improving major roads for walking to support local businesses. • Reducing traffic volumes in the city centre. • Reducing car parking rates for new developments • 2 comments were not supportive of reducing traffic volumes.	26	Safe	Noted. No change required in Strategy and Action Plan *The Strategy and Action Plan responds to these issues*. Many of the comments align with the actions outlined in the draft, notably: • Through Action 1, we will finish delivering the set of traffic-calming initiatives identified in the Alexandria LATM, and complete streetscape and laneway projects that are committed / under construction including Zetland Avenue west, Green Square to Ashmore Connector, Castlereagh Street, Loftus Street, and the Primrose Avenue quiet way. • Through Action 5, we will implement local area traffic management (LATM) plans to reduce vehicle volumes and speed to make it safer for people walking, focused on areas around schools and childcare centres, residential areas between state and regional roads and areas of high walking activity. • Action 8 will provide guidance on traffic lane widths. • Action 2 looks at improving walking in locations not picked up elsewhere. *City Initiatives already underway.* Outside of this Strategy and Action Plan, the City is addressing these issues: • Reducing vehicle volumes and speeds to make the city centre and local neighbourhoods safer, healthier, and quieter and transforming the avenues that lead into central Sydney to provide more space for walking are key outcomes of Direction 5 in *Sustainable Sydney 2030-2050*. • Our *Access Strategy and Action Plan* provides our approach to vehicle traffic. • We will continue to link the supply of destination parking in developments to the relative level of access by public transport and to implement, review and update the car parking policies and controls to support the transition to a net-zero carbon and energy-efficient transport system by 2030, continue promoting more efficient modes of transport including walking, cycling and public transport and manage congestion (*City Plan 2036: Local strategic planning statement* I1.9). The City sets maximum parking rates in new development through *Sydney LEP 2012*. As these are maximum rates, there is no requirement by the City for parking in new development. The maximum rates are set by land use, dwelling size, and proximity to transport and other services. For residential development, the rates are typically less than 1 per dwelling. Our *Neighbourhood Parking Policy* tries to balance the competing needs of kerbside parking and the LEP approach and places a blanket restriction on residents of newly built apartment buildings having access to on-street parking permits. This Strategy and Action Plan does not alter these rates.

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
4	**Speed of people driving.** • That local roads and areas of high pedestrian traffic should have a 30 km/h speed limit. • Small side streets and laneways should have a10 km/h speed limit. • That streets should be designed with a “design speed” of 30km/h or less. • 7 respondents did not support reducing speed limits.	24	Safe	Noted. No change required in Strategy and Action Plan. *The Strategy and Action Plan responds to these issues*. Several of the actions in the Strategy and Action Plan responds to these issues, namely: • Action 1: We will also implement three new shared zones and upgrade the streetscape in line with the City’s shared zone design palette to indicate to drivers to drive at 10 km/h. • Action 3: The City will work with Transport for NSW to implement 30 km/hr speed limits in the city centre, high streets, residential streets and around childcare centres, schools and universities, and health establishments, and progress a maximum of 40 km/hr speed limits elsewhere. • Action 8: We will review the street design guidance in our *Sydney Streets Code*. Transport for NSW only recognise 10km/h as a valid speed limit for ‘shared zones’, which can be expensive to implement. Therefore these need to be prioritised across our area based on highest need.
5	**Reduce footpath clutter** • Suggestions to reduce clutter created by shared bike and e-bike parking, advertising panels, residential rubbish bins, poles for road signs and other non-walking infrastructure and clutter in the space around bus shelters. Maintain clear walking zones (accessible path of travel).	23	Possible	*Changes made to Strategy and Action Plan* Noted. Updated Strategy A1 to explain the City’s approach to clear walking paths. *The Strategy and Action Plan responds to these issues*. Strategy A1 provides the City’s approach: • We will remove or relocate utilities such as redundant Ausgrid poles in around 50 locations to reduce footpath clutter (part of Action 1). • We will look at opportunities to consolidate or remove redundant signage (part of Action 1). • In addition to this we will look to increase space for people to walk by reallocating road space. *City initiatives already underway*. Outside of this Strategy and Action Plan, we: • Are working with bike share operators to create mandatory parking areas for their bikes in Pyrmont, Ultimo, Circular Quay, Barangaroo and The Rocks, with a further nine precincts in the pipeline. • Have asked Transport for NSW to review their guidance and road rules that are preventing the City from placing bike parking on the road in locations where it does not pose a risk to safety.
6	**Support for pedestrian-only streets and shared zones, both permanent and temporary.** Many comments referenced expanding the pedestrian area in the city centre and wanting to see more temporary street closures such as the Sydney Streets program.	18	Safe	Noted. No change required in Strategy and Action Plan. *The Strategy and Action Plan responds to these issues*. The Strategy and Action Plan responds to these issues, in particular: • Strategy B2: In the city centre, we will investigate reducing through-traffic by reallocating road space from vehicles to people or pedestrianising streets. • Action 1: We will implement a program of the highest priority walking improvements. • Action 1: We will finalise the George Street South pedestrianisation and upgrade and will undertake the permanent pedestrianisation of George Street North. • Action 9: We will work with Transport for NSW to reduce red tape and make it easier for our community to activate their streets via temporary or permanent closures, street painting and plantings.
7	**Pedestrian crossings** • Support for more pedestrian crossings throughout the city, including zebra and	15	Possible	*Changes made to Strategy and Action Plan* Noted. In response to submissions, we have altered the wording of Action 8 and Strategy A2 to include reviewing the accessibility of different crossing types and to highlight that we will review the guidance in

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
	wombat crossings, continuous footpath treatments and other crossings. • They wanted us to prioritise local streets, high streets, and small roundabouts, along with walking routes to schools. • Several submissions requested that we improve the design of crossings for people with disability.			our *Sydney Streets Code* with a focus on providing guidance on location, selection and design of crossings and intersections and reviewing how our guidance relates to designing for people with cognitive, sensory, and physical disability. *The Strategy and Action Plan responds to these issues.* Several of the actions respond to these comments, in particular: • Action 1: We will install approximately 30 continuous footpath treatments, 12 raised crossings (wombat crossings), four at-grade crossings (zebra crossings) and one pedestrian refuge crossing. We will also upgrade three new signalised pedestrian crossings and upgrade two intersections that are missing pedestrian crossings. • Action 2: We are proposing to double the rollout of both zebra and wombat crossings compared to the current plan to address these priority areas. We will seek funding for this.
8	**Accessibility** The need to provide walkable environments for everyone including people with mobility, sensory or physical disability, people pushing prams, children, older people, and vulnerable people. This includes accessible crossings.	13	Possible	*Changes made to Strategy and Action Plan.* Agreed. In response to submissions, we have altered the wording in the Strategy and Action Plan to: • Emphasise accessibility within Strategy B3, C2 and E3. • Action 8 and Strategy A2 to include reviewing the accessibility of different crossing types and to highlight that as part of reviewing our guidance in our *Sydney Streets Code* we will review how our guidance relates to designing for people with cognitive, sensory and physical disability. *The Strategy and Action Plan responds to these issues.* Several of the actions within the Strategy and Action Plan respond to these comments, in particular: • Action 1: We will install approximately 110 new kerb ramps (including replacing around 20 kerb ramps that are currently not compliant with accessibility standards). We will widen footpaths or build kerb extensions to narrow crossing distance in approximately 20 locations. • Action 8: We will review how the guidance in our *Sydney Streets Code* relates to designing for people with cognitive, sensory and physical disability. • Action 11: We will continue to undertake research on behaviour change and attitudes to walking and cycling in order to implement evidence-based planning. • Action 12: We will use proactive language and remove unconscious bias in City publications to highlight the human element of walking and advocate for others to do the same. Note: We have sought the input from key stakeholders in the development of this strategy and action plan and will continue to engage with our communities (as appropriate) on upgrades, projects, and programs.
9	**Road rules** Comments included: • That we should include people cycling and people walking in our education and advocacy on road rules • Enforcement of road rules • Clarify the road rules that prioritise people walking	11	Safe	*Changes made to Strategy and Action Plan.* Noted. We have made changes to the Strategy and Action Plan to reflect these concerns, notably: • Clarification on the road rules in Strategy B4. • An 'explainer' box on rules related to people riding on the footpath added to Strategy B4. • Addition to Action 7 to improve the compliance of people riding on footpaths. *The Strategy and Action Plan responds to these issues.* Strategy A1 and Action 7 provides the City’s approach, including that we will actively work to improve how road rules relate to people walking by increasing awareness and understanding of existing road rules related to walking, working with the NSW government to promote driver and cyclist compliance with road

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
				rules relevant to people walking, advocating for legislative reform to improve road rules related to people walking and by clarifying road rules. *City initiatives already underway.* We will continue to implement our *Share the Path* program which provides cyclist education training including on road rules.
10	**Trees** Provide more trees and greening along major walking routes	10	Comfort	*City initiatives already underway.* Supported. Through our tree planting program, we will plant at least 700 trees per year over the next 3 years, totalling 2,100 trees. This includes a minimum of 50 in-road trees in the parking lane per year, or 150 trees over the 3-year period. After 2026, a greater proportion of the trees planted will be in-road.
11	**Better footpaths** This includes fixing damaged pavers, maintaining crosswalks and upgrading signage. Increasing footpath space. Footpaths are slippery when wet.	9	Safe / Possible	*The Strategy and Action Plan responds to these issues.* Action 1, 2 and 8 respond to this. We have allocated $15 million towards upgrading and renewing our footpaths and a further $17 million for upgrading asphalt footpaths to granite pavers. This is being done in line with the *Liveable Green Network* initiative from *Sustainable Sydney 2030–2050*. *City initiatives already underway.* We encourage people to notify us of maintenance issues. Our pavers comply with the Australian Standard. We review reports of slipping with a view to ensuring that our footpaths continue to be safe.
12	**Street furniture** The need for more seating, public toilets, and drinking water fountains.	9	Comfort	*The Strategy and Action Plan responds to these issues.* We have allocated around $450,000 towards new street furniture, including seating, toilets, and water fountains and a further $400,000 for furniture upgrade and renewal (Action 1). *City initiatives already underway.* We will provide regular seating and other amenities such as public toilets and water fountains through our street furniture program. We will use the Liveable Green Network to prioritise the location of new street furniture.
13	**Weather protection** Shade and weather protection along major walking routes and particularly at intersections	8	Comfort	*Changes made to Strategy and Action Plan.* Noted. We have made changes to Action 8 to include that we will investigate further opportunities to provide shade and shelter on our streets. *The Strategy and Action Plan responds to these issues.* Several actions address these issues, namely: • Action 1. • Reducing waiting times at intersections will reduce the impact of waiting in weather (Action 4). *City initiatives already underway.* Some new buildings are required to provide awnings through the planning process.
14	**On-street parking** Responses here primarily supported the removal of on-street parking, however some comments focused on the need to have on-	8	Safe	*Changes made to Strategy and Action Plan.* Noted. We have updated Strategy A3 to include mobility parking. *City initiatives already underway.*

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
	street parking available for people with disability and deliveries.			Our approach to on-street parking is outlined in: • Our *Central Sydney On-Street Parking Policy* which prioritises on-street parking for taxis, delivery, and mobility purposes in the Central Sydney area. • Outside Central Sydney, our *Neighbourhood Parking Policy* tries to balance the competing needs of kerbside parking. • Through our *Inclusion (Disability) Action Plan 2021–2025* we will continue to explore and implement strategies to increase access to on-street and off-street accessible parking and drop-off points in our area.
15	**Vehicle access** That vehicle access needs to be maintained	7	Safe	*The Strategy and Action Plan responds to these issues.* We can reduce traffic volumes on surface streets in our local area through local area traffic management plans and low speed treatments to reduce through-traffic while still enabling local vehicle access, i.e. access for people that are going to that destination. Vehicle access for people that need to drive to be there will be maintained. *City initiatives already underway.* Our approach to balancing the needs of various forms of transport, including for people who drive, is outlined in our *Access Strategy and Action Plan*.
18	**Large SUVs** That large personal vehicles, such as large SUVs, need to be disincentivised and access limited.	6	Safe	Beyond scope of Strategy and Action Plan. No changes to document.
16	**Road pricing** The need for road pricing, including increasing tolls, increasing parking costs and/or exploring a tax on vehicles entering the city centre.	7	Safe	Beyond the scope of Strategy and Action Plan. No changes to document. *City initiatives already underway.* This issue is addressed in the City’s: • *Access Strategy and Action Plan* (Action 17). • *Electrification of Transport in the City Strategy and Action Plan* (Action 4).
19	**Road reallocation** Space needs to be taken from vehicle lanes and given to people walking (and people riding bicycles)	6	Possible	*The Strategy and Action Plan responds to these issues.* In the city centre, we can reduce through-traffic by reallocating road space from vehicles to people or pedestrianising streets.
20	**Noise and air pollution** Noise and air pollution needs to be reduced to improve walking environments. Reduce motorcycle noise.	6	Comfort	*The Strategy and Action Plan responds to these issues.* Noted. This is in line with this Strategy and Action Plan. Reducing traffic volumes also reduces noise and air pollution.
21	**Tactical urbanism and trialling infrastructure changes.** Using temporary infrastructure to test changes such as temporary pocket parks and crossings.	5	Fun	*The Strategy and Action Plan responds to these issues.* We will work with Transport for NSW to reduce red tape and make it easier for our community to activate their streets via temporary or permanent closures, street painting and plantings (Action 11).

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
22	**Community events and temporary closures.** Support for the Sydney Streets program	5	Fun	*The Strategy and Action Plan responds to these issues.* Noted. No changes to the document.
23	**Construction impacts**. Mitigating the impact of construction activities on people walking, including for people with disability. Additional comments included that: • Construction should not be able to close footpaths. • Footpaths should be repaired after construction activities have completed.	5	Possible	*The Strategy and Action Plan responds to these issues.* Noted. Action 6 addresses this issue: We will develop a code of practice for construction activities in public places that provides guidance on how to maintain safety, connectivity and place amenity for people walking. This will inform the basis of permitting and managing construction activities in a way that minimises impact on all people walking.
24	**Public transport.** Public transport extends the walking trip and public transport needs to be aligned and accessible to enable a walkable city	5	Possible	*Changes made to Strategy and Action Plan.* Agreed. Text added to Strategy A3 to emphasise that public transport expands the ten-minute city. *City initiatives already underway.* • SS2030-2050 Direction 5: A City for walking, cycling and public transport responds to this issue. • We will continue to work with Transport for NSW, and advocate to them, to improve public transport access and interchange in our area. Our advocacy actions for public transport are outlined in our *Access Strategy and Action Plan*.
25	**Off-street parking** Reduce off-street parking	4	Safe	Outside of the scope of this Strategy and Action Plan. *City initiatives already underway.* • We will continue to implement, review and update the car parking policies and controls to support the transition to a net-zero carbon and energy-efficient transport system by 2030. • The City sets maximum parking rates in new development through *Sydney LEP 2012*. As these are maximum rates, there is no requirement by the City for parking in new development. The maximum rates are determined by land use, dwelling size, and proximity to transport and other services. For residential development, the rates are typically less than 1 per dwelling.
26	**E-scooters** The use of e-scooters on the footpath and the conflict with people walking. One respondent asked that we make it easier for e-scooters. The other respondents commented on the conflict.	4	Safe	*Changes made to Strategy and Action Plan.* Clarification was added to the definition that walking does not include motorised scooters ('e-scooters'). *City initiatives already underway.* E-scooters are currently illegal on public roads and footpaths in NSW outside approved trial areas. Their use is being trialled in several locations. The City is not part of these trials but will continue to work with the NSW Government and to monitor the outcomes of trials.
28	**Child friendly streets** Create more child friendly streets. Upgrade walking routes to schools.	4	Possible	*Changes made to Strategy and Action Plan.* • ‘Schools' has been added to Action 2 (Tranche 2 walking improvements). • Working with the Department of Education has been added to the roles and responsibilities section to make it clear that we will work collaboratively as required. *The Strategy and Action Plan responds to these issues.*

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
				Several actions in the Strategy and Action Plan respond to these issues, namely: • Action 8: We will review the guidance in our *Sydney Streets Code* with a focus on providing guidance on how to create child-friendly streets. • Action 3: We will also work with Transport for NSW to implement 30 km/hr speed limits around childcare centres, schools, and universities. • Action 5: LATM plans to reduce vehicle volumes and speed to make it safer for people walking in areas around schools and childcare centres.
29	**Land use** The need to integrate land use and urban design when planning for walking to provide destinations and interest. Consider planning rules to enable the “10-minute” city. Include the developmental impact on walking level of service when approving new developments.	4	Possible / Fun	*The Strategy and Action Plan responds to these issues.* Agreed. Strategy A3 supports our planning process and our commitment to 10-min neighbourhoods. *City initiatives already underway.* Major developments often provide walking space assessments as part of development approval process.
30	**Lighting** Footpath lighting is needed to improve safety	4	Safe	*The Strategy and Action Plan responds to these issues.* Agreed. We will install new street lighting in six locations specifically to improve the walking experience (Action 1). We can look at areas with inadequate lighting as part of walking improvements (Action 2).
31	**Interest** Provide artwork, landmarks, landscaping, and other iconic features along walking routes	3	Fun	*The Strategy and Action Plan responds to these issues.* Strategy D responds to this. *City initiatives already underway.* • The City’s *Greening Sydney Strategy* ensures our streets includes landscape and urban canopy where possible. • The City’s public art policy acknowledges the vital role of art in the overall strategic planning of the city and the implementation of SS2030–2050. In many instances artwork provides landmarks and legibility along walking routes.
32	**Wayfinding** Street signs and wayfinding is needed. Include Indigenous names and stories.	3	Comfort	*The Strategy and Action Plan responds to these issues.* Action 1 responds to this. *City initiatives already underway.* We will continue the rollout of new wayfinding signage.
33	**Partnering** The City needs to work with state government agencies and large institutions to implement this plan	2	Possible	*Changes made to Strategy and Action Plan* Agreed. This is aligned with the Strategy and Action Plan. Clarification has been added to the roles and responsibilities section to highlight that we will continue to work collaboratively with NSW Government agencies including Transport for NSW and the Education, along with institutions, such as universities, within our area.
34	**Drainage** The impact of storm water on footpaths.	2	Possible	Noted. No changes to the document.

Theme #	Themes and issues	Number of responses (most to least)	Hierarchy of walking needs	City of Sydney response
35	**Gradient** It is important that footpaths are not too steep	2	Possible	Noted. No changes to the document.
36	**Parks** The use and maintenance of city parks should be addressed	2	Comfort	Noted. No changes to the document.
37	**Delivery vehicles** Access for delivery vehicles needs to be maintained	2	Safe	Noted. The City’s approach for delivery vehicles is outlined in the City’s *Access Strategy and Action Plan*.
38	**Safety from other people**	2	Safe	Noted. Providing more space, footpaths on both sides of the road, active street frontages and lighting can help increase safety.
39	**Keep left when walking**	2	Safe	Outside scope of the Strategy and Action Plan. Not changes to the document.
40	**Revitalise city laneways**	1	Fun	*The Strategy and Action Plan responds to these issues.* Action 1 responds to this. We will complete streetscape and laneway projects that are committed or already under construction including Zetland Avenue west, Green Square to Ashmore Connector, Castlereagh Street, Loftus Street, and the Primrose Avenue quiet way. *City initiatives already underway.* • The City’s *Laneways Revitalisation Program* aims to transform city centre lanes and underused spaces to improve pedestrian connectivity and the quality of the public domain. To date, a total of 25 lanes in the city centre have been upgraded, including much loved spaces such as Angel Place, Ash Street, Tank Stream Way and Penfold Lane. • This is aligned with the Laneway Commons *Sustainable Sydney 2030-2050 Transformative Project*.
41	**Banning texting while walking**	1	Safe	Outside scope of the Strategy and Action Plan. No changes to the document.
42	**Low emission zone**	1	Comfort	Out of scope of the Strategy and Action Plan. The City’s *Electrification of Transport in the City Strategy and Action Plan* and *Access Strategy and Action Plan* address this.
43	**Homeless strategy is needed to improve walking**	1	Comfort	Out of scope of the Strategy and Action Plan. This is covered in the City’s *A City for All – Homelessness Action Plan*.
44	**Connectivity across major roads and other infrastructure**	1	Possible	*The Strategy and Action Plan responds to these issues.* Agreed. Strategy A2 responds to this. We will improve connectivity for people walking by ensuring there are frequent street crossings that give people priority and that align with people’s walking routes. We will ensure that footpaths and crossings are accessible so that everyone can use them.
45	**Leadership** City staff should be frequently upskilled in walking requirements	1	Possible	*The Strategy and Action Plan responds to these issues.* Noted. As part of Action 11.

5. Focus group findings

The City engaged People With Disability Australia to facilitate a focus group to undertake a targeted discussion about language used in the draft Strategy and Action Plan on advice received from the Inclusion (Disability) Advisory Panel in June 2023.

10 participants were asked to look at the terminology used and areas for improvement to make sure that the Strategy and Action Plan was inclusive. The table below summarises the discussion of the focus group and provides a response where appropriate.

Issue	City of Sydney response
General support for strategy	Noted.
The term ‘walking’ does not capture everyone. Participants shared concerns that the term ‘walking’ may not define people who move about in different ways including wheelchair users or people with disability.	*Changes made to Strategy and Action Plan* Noted. We have amended the definition of walking used to reflect better that walking includes people who use mobility and sensory aids. The Strategy and Action Plan (Section 1) defines the term ‘walking’ to include all people moving on the footpath; people using mobility and sensory aids, including wheelchairs (motorised and manual) and walkers; people pushing prams and other carrying devices including for deliveries; and people using unpowered scooters, skateboards, and rollerblades.
Participants suggested the title ‘pedestrian strategy’ may be more inclusive	Noted. We have amended the title by putting *“A city for walking*” in italics and quotation marks to make the reference to Sustainable Sydney 2030-2050 clearer. While the title ‘pedestrian strategy’ was considered, we chose to retain the original title adding italics (“A City for Walking”: Strategy and Action Plan – Continuing the Vision) for three reasons: 1. The title is a direct quote from Direction 5 in *Sustainable Sydney 2030-2050* “A city for walking, cycling and public transport’, so the use of this title maintains a direct reference to the strategy that it responds to. 2. The City tries to use human-centred language wherever possible (e.g. ‘people walking’ rather than pedestrian, ‘people cycling’ rather than cyclist). This is Action 12 in the associated action plan. 3. This strategy is trying to speak to the whole experience of walking, while ‘pedestrian’ is typically referring to only the more physical / infrastructure-related components of walking. The term pedestrian is used in reference to specific infrastructure.

Issue	City of Sydney response
Action 6 Participants noted that consulting people with disability when implementing Action 6 is important as there are unique safety issues that can arise for people with disability due to construction impacts.	Noted. No changes to document. This is part of implementation of Action 6.
Language continuity It was suggested that a language guide should be used when developing City documents to improve continuity and clarity.	Noted. At the City of Sydney, we want our messages to be clear, inclusive, and consistent. We use a style guide to help us do this for all our communications. This guide covers emails, web content, reports, and social media posts. We have noted the feedback and look to continually update our internal guidance.
Format of strategy document Participants requested improvements to document accessibility and to provide materials in another formats including video, braille, Easy Read, or a word document.	Noted. While the City aims to provide information in equally accessible formats, some resources can only be provided efficiently as PDF files. If people require any information on the site in an alternative format such as braille, audio, large text or easy English, they can contact the City by completing our online Accessible format request form through this webpage: https://cityofsydney.jotform.com/230467034139958.

Appendix A – Organisational Submissions

The City received 10 submissions from organisations. The table following presents a summary of the issues raised in these submissions along with the City’s response.

Organisation	Topic raised	City of Sydney response
Pyrmont Action	Interaction and safety with e-scooters. • More signage needed	*Changes made to Strategy and Action Plan.* Clarification was added to the definition that walking does not include motorised scooters ('e-scooters'). *City initiatives already underway.* Noted. E-scooters are currently illegal on public roads and footpaths in NSW outside approved trial areas. Transport for NSW is overseeing e-scooter trials in several locations. City of Sydney is not part of these trials. The City will continue to work with the NSW Government on an approach to e-scooters.
	People walking need to follow the road rules	*The Strategy and Action Plan responds to these issues.* Action 7 addresses this.
	Hire bikes blocking footpaths and signage	*City initiatives already underway.* Noted. We note that this is an on-going issue and: • Are working with bike share operators to encourage them to create mandatory parking areas for their bikes in Pyrmont, Ultimo, Circular Quay, Barangaroo and The Rocks, with a further nine precincts in the pipeline. • Have written to the NSW Government asking them to establish a permit system for bike share companies. • Have asked that Transport for NSW review their guidance and road rules which prevent the City from allowing bike parking on-street in locations where it does not pose a risk to safety.
Department of Education	Considerable movement with the City of Sydney area of students travelling to / from school	Noted. Information only. No changes to document.

Organisation	Topic raised	City of Sydney response
	Consider adopting the TfNSW’s *Walking Space Guide* which recommends a minimum width of 3m for footpaths in the frontage of all schools in the city to encourage walking.	Noted. The City was involved in the development of the *Walking Space Guide* and uses it to inform required footpath widths across our area, including schools. No changes to document.
	Include an action on how to improve pedestrian priority / refuges at 4-lane roundabouts and 4-lane roads working with Transport for NSW.	Noted. This will be included in the review of the guidance in our *Sydney Streets Code* (Action 8). No changes to document.
	Provide the infrastructure required to achieve the greatest possible active travel mode share by students within the City of Sydney area. This includes: • Public transport access • Crossing (signalised and unsignalised) in areas around schools • Prioritise areas around schools in Tranche 1 (Action 1) and Tranche 2 (Action 2)	*The Strategy and Action Plan responds to these issues.* Noted. Many of the actions in the Strategy and Action Plan address these issues, specifically Actions 1, 2, 3, 4, 5 and 8. Action 1 items have already been committed. Many of these items are in the area around schools. *Changes made to Strategy and Action Plan* ‘Schools’ have been specifically mentioned in Tranche 2 in Appendix B.
Guide Dogs NSW/ACT	General support for the Strategy and Action Plan	Noted, with thanks.
	Concern about the accessibility of shared zones and other mixed transport areas and flush finish road crossings (such as continuous footpath treatments) for people with low vision or blindness. Designs must incorporate the needs of people who are blind or have low vision.	*Changes made to Strategy and Action Plan* Noted. We have: • Added text to emphasise accessibility in Strategy B3, C2 and E3. • Added wording to Action 8 and Strategy A2 to include reviewing the accessibility of different crossing types and to highlight that in our review of the guidance in our *Sydney Streets Code* we will review how our guidance relates to designing for people with cognitive, sensory and physical disability.

Organisation	Topic raised	City of Sydney response
	Need for a clear path of travel along the building line along with sufficient space be provided for people to be able to walk comfortably and safely.	*Changes made to Strategy and Action Plan* Noted. Updated Strategy A1.
	Recommends looking at the use of TGSIs.	Noted. We will review this when we review our guidance in our *Sydney Streets Code* (Action 8). No changes to document.
	Requests further consultation and to work with the City to ensure guidance developed by the City is inclusive for people who are blind or have low vision.	We will continue to engage with our community (as appropriate) on upgrades, projects, and programs. We have sought the input from key stakeholders in the development of this strategy and action plan.
Bicycle NSW	Strong support for the strategy and action plan. Compliments on the leadership and view of walking as transport and as public life	Noted, with thanks.
	Support for road space reallocation	Noted. Strategy A responds to this.
	Support the planting of trees within the carriageway	Noted. The Strategy and Action Plan responds to this.
	Support for signal phasing to support walking, particularly for default green crossings in low-traffic areas, and instant green for pedestrians and bike riders at off-peak times.	Noted. Strategy A2 responds to this.
	Support 30 km/hr speed limits in the city centre, high streets, residential streets and around childcare centres, schools, universities, and health establishments, with a maximum of 40 km/hr elsewhere.	Noted. Strategy B1 responds to this.
	Walking should be for all ages	*Changes made to Strategy and Action Plan.*

Organisation	Topic raised	City of Sydney response
		Noted. This has been emphasised.
	Supports the approach to declutter footpaths.	Noted. Strategy A1 responds to this.
	Collaborate with WalkSydney, BIKEast, Bike Sydney and Bicycle NSW	We will continue to engage with our community (as appropriate) on upgrades, projects, and programs. We have sought the input from key stakeholders, including WalkSydney, in the development of this strategy and action plan.
BIKEast	General support for the Strategy and Action Plan	Noted with thanks.
	Reduction of clutter on footpaths to consider all infrastructure types and path types.	Noted. The Strategy and Action Plan responds to this.
	Shared paths are an important part of the cycling network.	*Changes made to Strategy and Action Plan.* Noted. Our approach to shared paths has been updated in the Strategy and Action Plan.
	Support for the *Share the Path* and behaviour change programs	Noted. This is outside of the scope of the Strategy and Action Plan.
	Path surfaces – including restoration after construction – limit usability.	Noted. Action 6 responds to this.
	Collaborate with WalkSydney	We will continue to engage with our community (as appropriate) on upgrades, projects, and programs. We have sought the input from key stakeholders, including WalkSydney, in the development of this strategy and action plan.
UTS	Support for the Walking Strategy and Action Plan	Noted with thanks.
	• The amenity of the education quarter is impacted by 3 state roads (Broadway, Wattle Street and Harris Street) with differing	Noted. No changes to document.

Organisation	Topic raised	City of Sydney response
	responsibilities for the roads and public domain within their area.	
	That the 'city education quarter' be acknowledged and defined within the Strategy and Action Plan	Noted. While the City acknowledges the importance of the education cluster around UTS, the Walking Strategy and Action Plan does not define / name new precincts.
	That the City facilitate engagement and collaboration with key city education quarter stakeholders, including Transport for NSW and Placemaking NSW.	Noted, outside of the scope of this Strategy and Action Plan.
Mott MacDonald	Pedestrian comfort, shading and understanding of comfort levels (i.e. UTCI)	Noted. The Strategy and Action Plan responds to this.
	Document should include specific guidance / recommendations for pedestrian design.	Noted. No changes to document. This is a strategic document and action plan. Specific design guidance is more appropriate in the *Street Design Guide* and will be reviewed (Action 8).
	Support for decluttering	Noted. Strategy A1 responds to this.
	Remove push buttons at signals by a set time frame	Noted. Strategy A2 responds to this.
	Incentivise visiting the city centre in the evening	Noted. Out of scope of this Strategy and Action Plan. Aligns with actions being undertaken by the City.
	Add concrete measures to make nighttime walking safe.	Noted. Strategy B3 responds to this.
	More frequent street closures	Noted. Strategy D responds to this.
	Encourage bold and experimental urban design, playful interventions, and a purpose for certain walks (i.e. cultural walks)	Noted. This is supported by Action 10.

Organisation	Topic raised	City of Sydney response
	Increase community engagement and ownership/intervention.	Noted. This is supported by Action 9.
New South Wales Bar Association	The need to ensure that the Courts and Tribunals within the City of Sydney area are accessible to all (e.g. mobility parking, public transport access).	• Noted. This aligns with actions already being taken by the City, including: Through our *Inclusion (Disability) Action Plan 2021–2025* we will continue to explore and implement strategies to increase access to on-street and off-street accessible parking and drop-off points in the City of Sydney area. • We will continue to engage with Transport for NSW on the location of public transport access including bus stops.
ACON	Endorsement	Noted with thanks.
Transport for NSW	Welcomes and supports the Strategy and Action Plan. Notably the principles associated with the use of design, activations, and installations to create community and encourage people to interact with their streets. Sydney Metro supports initiatives that improve the walking environment within and surrounding Metro Station precincts and will continue to collaborate with the City on these opportunities.	Noted, with thanks.
	Footpath clutter	Noted. Strategy A1 responds to this.
	Include safety when assessing shared paths.	*Changes made to Strategy and Action Plan.* Noted. An explainer box has been added to Strategy B4.
	Bus shelters	*Changes made to Strategy and Action Plan.*

Organisation	Topic raised	City of Sydney response
		Noted. Clarification has been added to roles and responsibilities table.
	Traffic signals support a safe walkable city as they include pedestrian lanterns and countdown timers	Noted, however priority crossings (zebra or wombats) should be used in preference where appropriate, particularly on local roads, as they give a higher degree of priority to people walking. It could be argued that for the same budget, multiple zebra crossings would provide greater improvement in safety for people walking than a single, signalised crossing.
	Reference for Strategy B3 Safety	*Changes made to Strategy and Action Plan.* Supported. Reference included in Strategy and Action Plan
	Principle D2. Suggest limiting the length of barriers used in outdoor dining.	Noted. Out of scope of Strategy and Action Plan. We will feed this into our review of our *Outdoor Dining Guidelines*.
	Reference NSW Guide to Walkable Public Space (April 2022).	*Changes made to Strategy and Action Plan.* Noted. Guide now referenced in Strategy A2.
	Include case studies of projects that have successfully supported the reallocation of road space (that the City and Transport have funded/ delivered).	Noted. Case studies for document already included. No changes to document.
	Transport advocates for the application of the Movement and Place Framework when considering traffic changes. General comments and support in principle for Action 1 and collaboration for Action 3	Noted. No changes to document.
	Supports in principle: Action 3, 7, 9	Noted. No changes to document.
	Tranche 1 – include locations	Noted. Given that locations may change due to changes in priority / budget, this information is internal only. No changes to document.

Organisation	Topic raised	City of Sydney response
	Definition of interchange Sydney Metro’s definition is the area and assets that facilitate easy, safe, and intuitive customer access to and egress from the public transport network, transfer between modes by accessible paths, entry to urban centres, and an efficient customer journey. The interchange includes the station. The interchange can have multiple sites that may not be connected and includes areas that are owned by other stakeholders.	*Changes made to Strategy and Action Plan.* Noted, however it is unclear whether Metro’s definition is clarified anywhere in public documents. Amended City’s definition to note that it is specifically for use in interpreting the Walking Space Guide given that the Guide itself does not include a definition.

Attachment B

Proposed Changes to Exhibited Draft A City for Walking Strategy and Action Plan – Continuing the Vision



~~Draft~~
~~February~~ June 2024

"A City for Walking": Strategy and Action Plan – Continuing the Vision

We acknowledge the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

CITY OF SYDNEY

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1. Introduction

A note on terminology

This strategy and action plan uses the term 'walking', which includes all people moving on the footpath; people using mobility ~~devices~~ and sensory aids, including wheelchairs (motorised and manual), ~~canes,~~ walkers and the like ~~motorised scooters~~; people pushing prams and other carrying devices including for deliveries; and people using unpowered scooters, skateboards and rollerblades.[1] 'Walking' does not include people on bikes or e-scooters, although it is noted that children and youths can legally ride bikes on footpaths with their guardians.



Photo: Chris Southwood / City of Sydney

A strategy and action plan to deliver a city for walking

Our communities want a city for walking.

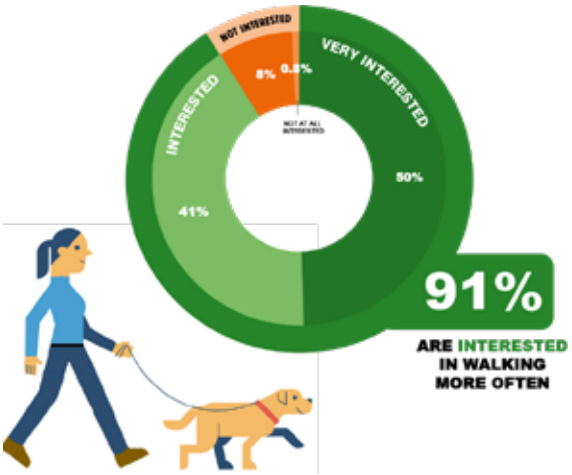
> When asked for words to describe Sydney in the future, 'safe', 'sustainable', 'green' and 'walkable' consistently came up as the most popular choices.
>
> – *Sustainable Sydney 2030–2050 Continuing the Vision* consultation

The communities of the City of Sydney have told us they want a more walkable city, with fewer or no cars in the city centre: a city where there is "space to walk, bike, stroll, jog, chat, rest, relax and enjoy life." They want streets with more trees, gardens and plants; more space for walking; and more space for children to play and for socialising. They want a city that is easy for all ages, all people and all mobility levels.

If a city like this can be provided, 91% of people in Sydney would be 'interested' in walking more, and 50% would be 'very interested' in walking more (Figure 1).

"A City for Walking": Strategy and Action Plan – Continuing the Vision (the 'Strategy and Action Plan') responds directly to the voices of our community. We need a proactive strategy and action plan to guide decision-making and make progress to becoming a more walkable city. We have already accomplished significant strides in making the City of Sydney more walkable since the introduction of our first walking strategy in 2015. But there is still much to do.

Figure 1. Sydneysiders' interest in walking more often



Source: City of Sydney.
Active Transport Survey 2021.

This strategy and action plan outlines the approach of the City of Sydney (the 'City') to become a city for walking within our local government area (the 'local area', 'area' or 'our area'). The strategy and action plan identifies the focus of our activities for our area to become more walkable in the short-term. The actions identified are either within the City of Sydney's control or ability to influence.

This document was developed with input from a panel of experts in walking across Australia to ensure that we are keeping up with current best practice.

Continuing the vision

The City of Sydney's first walking strategy was published in 2015. Since then, much has been achieved (Pop out box 1). So, it is a good time to take stock and examine how to continue to improve walking in our area. The City of Sydney's flagship strategy, *Sustainable Sydney 2030–2050 Continuing the Vision*, published in 2022 provides direction for continuing the vision. This Strategy and Action Plan takes the ideas and projects from the last walking strategy and renews them to align with *Sustainable Sydney 2030–2050 Continuing the Vision* and new policies of the NSW state government.



Photo: Chris Southwood / City of Sydney

Achievements since our last walking strategy

We have made good progress towards making our city more walkable since our 2015 walking strategy. The City typically spends over $28 million per year[2] on walking-related improvements, including footpath upgrades, new crossings, streetscape upgrades and traffic calming. Some notable achievements are below (image credits in endnotes).



We continually undertake streetscape upgrades such as Macleay Street, Potts Point, at a rate of 3 to 5 projects per year.



We have pedestrianised streets – notably George Street (pictured) and Devonshire Street.



We have improved wayfinding across the local area, including with 2,560 tactile signs and 145 pylon signs.



Speed limits have been reduced so that now over 75% of streets are 40 kilometres per hour (km/h) or under.



Over 700 trees are planted per year, including 150 in the road area.



Signal times have changed throughout the city centre from 120-second to 90-second cycles.



Successful events and programs have been held including outdoor dining, temporary dining areas, parklets and City Streets festivals.



We have increased lighting, seating and accessible public toilets.



We have added more pedestrian crossings, raised wombat crossings and continuous footpath treatments.

All of these achievements have led to significant improvements in the experience of walking. In 2007, a person walking along Park Street between College Street and Sussex Street would have spent 52% of their walking time waiting at intersections. Through working with Transport for NSW to reduce delays across the city centre, by 2020 only 20% of the same trip would be spent waiting.[3]

Walking improvements have also led to increased diversity in who uses the city centre. While the city centre was once mostly used by young adults, there has been a shift towards more diverse age groups, particularly in areas like Darling Harbour and Chinatown, where there has been more investment in public space.[4]

What is a 'city for walking'?

What is a 'city for walking'? A city for walking is easy, inviting and convenient. It is ~~a city in which all people, regardless of age or ability can walk.~~ inclusive and ~~It~~ has infrastructure and public spaces that are accessible.

A city for walking has destinations and activities to walk to: parks, shops, schools, universities and workplaces. It is safe and it feels safe. It has space to move around, and also has space and places to stay and linger, with street furniture, art and greenery that make it comfortable and inviting.

A city for walking is welcoming, where public create social connections and where people feel included. A city for walking is fun and interesting.

These elements are often referred to as 'walkability'. Many parts of Sydney have these elements and the basis for these elements, but there are areas we can improve (See *Challenges and Opportunities*).

The following sections explain some of the words and phrases used in the Strategy and Action Plan.

Walking: Walking includes all people moving on the footpath, ~~from~~ including people using mobility ~~devices~~ aids or pushing prams, ~~to people~~ using unpowered scooters, skateboards and rollerblades. Walking can be for transport (for example, walking to work or the shops) or for recreation (for example, walking the dog, sightseeing or taking a stroll in the park). People walking can easily switch to other activities, such as shopping or stopping to chat with a friend. In this sense, walking is a way of transport but it is also a form of public life, a way of moving in the community. All types of walking are important to this strategy and action plan.

Walking is so common and we do it so much as part of all our journeys that most people do not identify themselves as a 'walker' or even notice when they are walking for a period or distance. This means that walking sometimes does not get the attention it deserves. Whether people are walking for a minute or an hour, the experience is important.

Walking takes different forms. For example, ~~for people with disability or limited mobility, using~~ people who use a wheelchair, cane, walker or motorised scooter ~~may be how they get around the area~~. Accessibility, safety and inclusion needs to be carefully considered to achieve a walkable city for people with disability ~~or limited mobility~~ for people of all ages and people of diverse sexualities and genders and intersex people. Can they get to where they need to go? Do they feel safe while doing so? Do they feel part of the community and included? Cities can follow the 7 Principles of Universal Design[5] to improve access and inclusion for all people, including people with disability – resulting in streets and neighbourhoods that can be used and enjoyed by everyone.[6]

Walkability is the sum of "factors within the built environment that make it convenient, comfortable and safe to walk."[7] Walkable places are compact, dense and mixed-use environments that allow people to meet their daily needs without needing to drive.

Walkability is about creating inclusive places. Many Australians do not have a driver licence, due to age, health conditions, disability or personal choice, and many more have their licence but do not feel comfortable driving. In the City of Sydney, more than a third of households do not own a car.[8] Walkable places make sure that everyone is able to participate in society and go about their daily lives with independence and autonomy.

In particular, people using wheelchairs or mobility devices have a right to access places used by the public.[9] The City of Sydney's *Inclusive and Accessible Public Domain Policy and Guidelines*[10] set out clear minimum standards to remove access barriers and provide best practice in access for people with disability. The principles of Universal Design are also important in considering how to create places that are accessible, usable, convenient and enjoyable for all. Walkable places that are accessible and inclusive are good for everyone – not only people with disability.[11]

> "Every investment in walkability is also an investment in rollability; wheelchair users are among those who benefit most when footpaths become safer."
>
> - Jeff Speck, Walkable City Rules

Figure 2. Hierarchy of walking needs



Source: Matan (2021), adapted from Pedestrians First[12] and Alfonzo[13].

Walking needs

To create a city for walking that is inviting for everyone, some fundamental needs should be met. The hierarchy of walking needs (Figure 2) illustrates what some of these needs are, from basic infrastructure that makes it possible to walk safely to providing reasons to walk and making walking comfortable and inviting so that people *want* to walk.

All of the elements in the hierarchy work together, and all are important. Some elements will be more important to some people than others. For example, some people will find that having a park nearby increases their desire to walk; for others, a nearby train station is more important. Some people will want to walk on a concrete path that is uninterrupted and easy, while others may be happy to walk on a grassy hill. Whatever people prefer, it is important to provide the basic necessities so that walking is inviting for ~~both an 8- and 80-year-old~~ people of all ages so that we are creating a city for walking for everyone.



Photo: Katherine Griffiths / City of Sydney

Benefits of a City for Walking

The social, economic, environmental and health benefits of walkability are established and are measurable.[14] Walking is healthy and sustainable. It produces little to no carbon emissions. It improves physical and mental health. It is important for inclusion and equity. It is flexible and low cost. It provides independence and exercise. It contributes to sense of place and community and to social cohesion. It helps reduce the risk of loneliness and isolation.[15] It reduces congestion and uses less space than other transport modes.

Walkable places have been found to also have economic benefits including increased productivity, improved property values and support for local business,[16] along with the economic benefits that flow from improved health outcome. These benefits can be quantified.

- The Queensland Government estimated that a person walking 20 minutes to work and back provides $8.48 to the economy from benefits and savings related to decongestion, health, vehicle operating costs, infrastructure savings and environmental benefits.[17]
- Studies in the United Kingdom found that the cost–benefit ratio of walking (and cycling) interventions is around 13:1.[18]
- The City of Melbourne, looking at the value of walking connections in the city centre, determined that making pedestrian connectivity 10% worse in the city centre would cost its economy $2.1 billion.[19]

Moreover, the evidence showing the economic benefits of walking often does not account for the contribution to the economy from people walking in areas with shops and restaurants. A study of restaurants in Brisbane found that businesses overestimated how much people driving spent by three times while at the same time underestimating how much people walking spent.[20] In reality, people walking tend to be the biggest contributors to economic activity. A survey of businesses on Acland Street in Melbourne found that 57% of the expenditure on the street came from people who had walked to the street, with only 26% coming from people who drove there.[21]

Walkable places are also crucial in creating community and connection. Australia is experiencing a loneliness epidemic. One in four Australians are lonely,[22] and loneliness is increasing, which has a significant impact on people's physical and mental health. Loneliness is more acute among people living alone, who make up 40% of households in the City of Sydney. Walkable environments help with loneliness by

creating informal opportunities for people to connect with each other. Whether it's bumping into a neighbour or an old colleague on the street, saying hi to your barista or nodding at the person who walks the dog at the same time as you, walking helps to create networks of loose connections that collectively form communities. These casual acquaintances are important. Not only are they what tie neighbourhoods together, but research shows that those with larger networks of these 'weak ties' tend to be happier overall and experience a greater sense of belonging.[23]

Walkable environments are also a key ingredient of precincts, activity centres and innovation hubs since chance encounters help spark and spread ideas.[24] A strong focus on walking needs and creating space for interaction is critical to the success of these precincts, including Tech Central, touted by the state government as "Sydney's innovation heart".[25]

Walking in the City of Sydney

Walking now and in the future

Walking and a good walking environment is important to the City of Sydney now and in the future with the population and employment projected to grow within the local government area. The number of the people in the our area daily – residents, workers and all visitors – will grow from the current 1.2 million to 1.7 million in 2036 and to 2 million in 2050. There are likely to be up to 100,000 extra jobs in the city centre.[26]

The Sydney city centre contributes over $90 billion in economic activity annually, and the City of Sydney local government area generates $130 billion which is nearly 8% of the total national economy. The city centre has the highest concentration of top 500 companies in Australia and the largest retail centre.[27] It is, to a large degree, Australia's business brand with the headquarters of globally influential and innovative firms concentrated in the central business district (CBD). Walking and a good walking environment is very important to workers but also for continuing to attract businesses.

How we walk

– In our city centre, people make almost 1.3 million trips per day, of which 92% are walking trips.[28]

– Within our area, people are making around 3.4 walking trips a day and have an average daily walking time of 32 minutes.[29]

– In our area, 37% of our households do not own a car – much higher than the overall 11% across Greater Sydney.[30]

– A total of 31% of residents walk to work, and 27% use public transport to get to work which usually includes at least one walking trip.[31]

– Some city centre streets carry 3 to 4 times more people walking per day than some motorways in the area. Parts of George Street, for example, had over 100,000 people walking on it per day in 2019.

– How we use the city centre has changed after the COVID-19 pandemic. Tuesday to Thursday have the highest activity levels during the day,[32] reflecting the trend of working from home on Mondays and Fridays. However, in terms of spending, weekends are busier now than pre-pandemic, with weekend night-time spending up 15% compared to pre-2019.

Figure 3. Our busiest footpaths have comparable volumes of people to our motorways



Source: City of Sydney pedestrian counts (2019), TfNSW Traffic Volume Viewer (2019).

Challenges and opportunities

Geography: Sydney's geography is one of its greatest assets. Part of why people love Sydney is the beauty of the area, the hills, cliffs and harbour edges. The colours of green and blue in the land and sea are part of what makes walking enjoyable and restorative. Environments with nature – trees, grass and plants – have been shown to increase wellbeing and reduce stress and mental illness. This has been shown repeatedly in studies, both locally[33] and overseas. Having access to the ocean, lakes, fountains and other water features – easy enough in the City of Sydney – is also beneficial for health and wellbeing.

However, our geography also poses challenges. Sydney is a hilly place. Slopes and hills can be the cause of access issues, particularly for people with disability ~~limited mobility~~. They can add significant distance, real and perceived, to travel. Research with the University of New South Wales (UNSW) found that in our area, a 1% increase in the maximum gradient along a route made the walking trip feel 21 meters longer.[34] If a walkway is too steep, without offering accessible alternatives, it can be a complete barrier to some people.

Number of people: The City of Sydney is visited by over 1.2 million people per day, which will grow to 2 million by 2050. This many people cannot all be accommodated in cars as there is simply not enough space for them, which means that walking will need to play a significant role in making this growth possible. We need to take walking seriously, particularly in the city centre and places with high projected growth such as Green Square.

While almost all our streets have connected footpaths on both sides, there is room for improvement. Delays, disruptions and crowding all limit walking within our area. Transport for NSW looked at walking in strategic centres across New South Wales using mobile phone data; it found that while the Sydney CBD had the highest walkability score of all of the NSW strategic centres studied, it had about 6% less walking than would be expected given the level of connectivity. We can – and must – do better.

Delays and detours: Delays reduce the walkability of our area and add to the perceived cost of walking.

Traffic signals are a major cause of delay for people walking and can account for a large proportion of the time it takes to walk somewhere. Inconvenient intersections, particularly those with long wait times, decrease how far people are willing to walk by some 10% to 20%.[35] Research in partnership with UNSW[36] within our area found that a single turn in a path is the equivalent of adding 18 meters to a walking trip. For short walking trips, this can add considerably to the perceived distance of a trip. ~~Similarly, inconvenient intersections decrease how far people are willing to walk by some 10% to 20%.~~[36]

These inconveniences have real-world costs; the City of Melbourne found that if they reduced delays for people walking by optimising traffic signals at four locations in their city centre, the economic benefit would be approximately $6.3 million per year.[37]



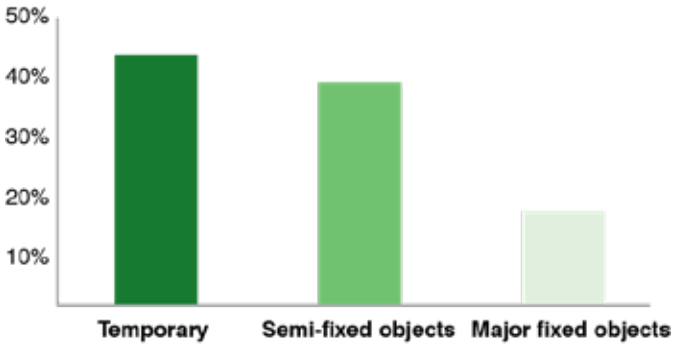
Photo: Chris Southwood / City of Sydney

Competition for space on footpaths: Footpaths are used for many other things than just space for walking. Some are beneficial to walking such as outdoor dining, lighting, trees and seating. Some are not, such as traffic signals and signs, electric boxes and electric poles. They are a mix of temporary, semi-fixed and fixed objects (see Figure 4), and have varying impacts on walking depending on the size, location and impact on site lines. How we address different the different competing uses for space depends on these factors.

Many footpaths are too congested or narrow for all the functions they need to perform. Crowding is particularly prominent at areas of waiting such as signalised intersections. Reducing wait times would help alleviate this.

Road space allocation: The allocation of space on many of our streets reflect transport planning decisions of the past, which prioritised space for vehicles over people walking. Overall, only 40% of street space in the city centre is allocated to footpaths, even though there are 5 times more people walking than driving on an average street.[38] The City of Sydney is seeking to redress this imbalance in our area through our local public domain plans and local improvement schemes to put people walking at the top of the priority list, in line with the recently adopted Transport for NSW *Road User Space Allocation Policy*. There have

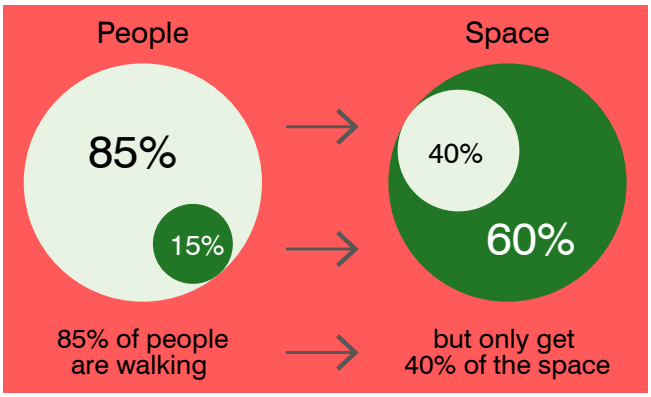
Figure 4. Temporary objects are the most common footpath obstacles



- **Temporary**: Includes bins, outdoor dining, temporary signage and parked motorbikes.
- **Semi-fixed objects**: Includes kiosks, wayfinding, bollards, street furniture and bicycle racks.
- **Major fixed objects**: Includes trees, traffic signal boxes and construction hoarding.

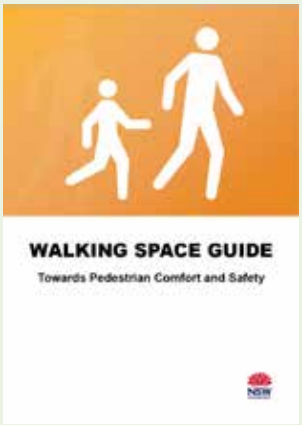
Source: Adapted from the City of Melbourne Transport Strategy.

Figure 5. Road space allocation is not fair



Source: Adapted from UNSW Walking Deep Dive[39]

been some significant changes in the balance of street space allocation throughout our area, such as in George Street, Pitt Street and Crown Street with more projects in the pipeline for Oxford Street, Loftus Street and Castlereagh Street. But more needs to be done, faster.



Explainer: Walking Space Guide

The Transport for New South Wales (TfNSW) Walking Space Guide, published in 2020, provides a set of standards and tools for planners to ensure that sufficient space is provided for people to be able to walk comfortably and safely. Clear widths are recommended based on street classification and volume of people, and traffic buffers and other allowances are to be provided in addition to this. The Guide is to be used for all footpaths on streets, but not for walking space within transport interchanges (which the City defines as the ticketed area within a station).

According to Transport for NSW's Walking Space Guide (see left), many of the footpaths in our city centre provide adequate space for the number of people walking. However, many do not, and many will not in the future. Road space reallocation will be an important part of accommodating the future growth in walking.

Traffic volumes and speed: The amount of traffic and its speed are issues for people walking throughout our area. Traffic reduces safety and amenity and contributes to noise and air pollution. How people feel in their local area is shaped to a large degree by the speed and volume of traffic.

Through-traffic (people *driving through* rather than *to* an area) is also a problem, particularly in the city centre where traffic is funnelled onto the streets instead of through the underground Cross City Tunnel. This traffic creates an unpleasant environment and makes it challenging to reallocate space to people walking.

Severance: Severance refers to physical and psychological barriers that impact on the ability for people to walk where they want to go. It can refer to roads or public transport infrastructure that are difficult to cross, large city blocks, or parks without accessible paths ~~which are hard to cross for people with limited mobility~~.

Major roads throughout our area present significant barriers to walking, particularly where the crossings are too far apart or have intersections that are missing pedestrian crossings. Some of our most important streets, including King Street in Newtown and Botany Road, have distances of 300 meters or more between crossings. This is a serious barrier for people walking and adds significant distance and time, particularly as the major roads such as these also often have more traffic travelling at higher speeds, all adding to the degree of severance.

Red tape: There are many opportunities throughout our area to add interest and encourage exploration through walking – such as the inclusion of public art, murals and water features – but these tend to be concentrated in major areas. If residents want to do a temporary activity, such as a street party or festival, the process to obtain permission can be involved and lengthy. For example, applying for a temporary road closure for a community event takes a minimum of seven weeks. This ~~dampens~~ inhibits the creativity of our community and reduces motivation to be more active.

The NSW government recently changed the law to expand what councils are able to do without state approval, including installing zebra crossings and planting trees in parking lanes. This is a step in the right direction to make it easier for councils to create liveable places and make our streets more walkable. We need to look for other ways to streamline improvements for walking.

Strategic Framework: Delivering Sustainable Sydney 2030–2050 Continuing the Vision

This Strategy and Action Plan is embedded in the *Sustainable Sydney 2030–2050 Continuing the Vision* suite of documents,[40] in order to deliver *Direction 5: A City for Walking, Cycling and Public Transport*.

Under this Direction, the *Community Strategic Plan: Delivering Sustainable Sydney 2030–2050* includes five outcomes to be achieved by 2050.[41] The Strategy and Action Plan also aims to deliver these outcomes.

Sustainable Sydney 2030–2050 Continuing the Vision – Direction 5: A City for Walking, Cycling and Public Transport

Outcome 5.3: More people walk more, because walking is the most attractive and convenient choice for short trips in the local area.

Sydney by 2050:

– People are prioritised by increasing the capacity, quality and amenity of our streets.

– The experience for people walking will be enhanced for everyone by improving safety, quality, accessibility, and comfort including for children walking in their neighbourhoods and to school.

– The City is legible and intuitive to navigate, supported by a comprehensive wayfinding system.

– People are prioritised at key intersections, reducing wait times, and improving safety.

As walking is inextricably linked with place, the Strategy and Action Plan also helps to achieve the 2050 outcomes listed under *5.1 Street space is reallocated for people, places and planting*.

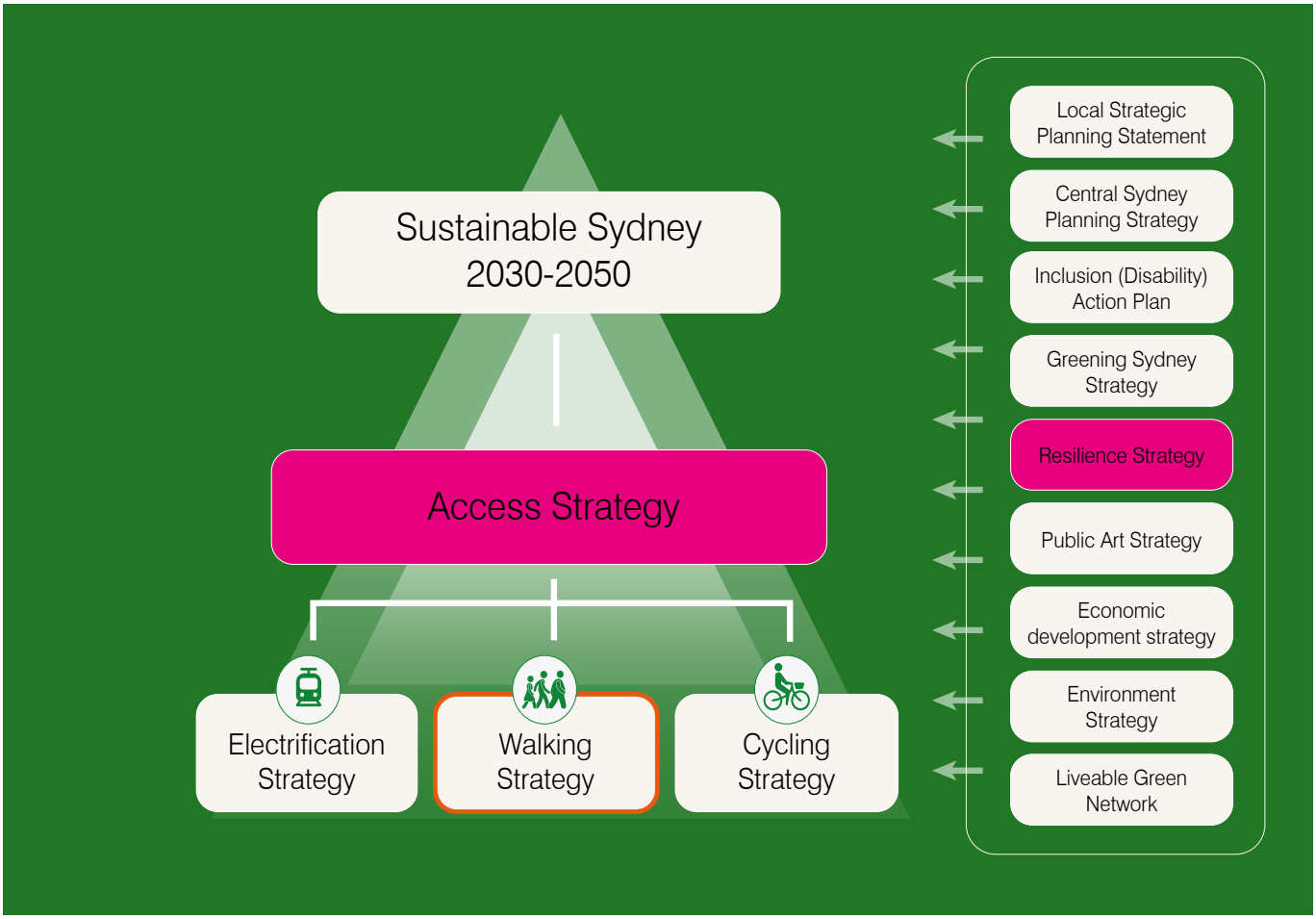
This strategy should also be read keeping in mind that our streets must meet a multitude of needs, notably loading and servicing. This is recognised in Outcome 5.1 which reads "Freight, servicing and parking will be managed to support the efficient functioning of the city while improving the amenity of city spaces". It is important that we maintain access for freight, delivery and service vehicles as road space is reallocated.

The ~~*City Access Strategy (currently in draft form),*~~ *Access strategy and action plan: continuing the vision* which covers all modes of transport across the area, contains the explicit action to develop a walking strategy. Walking improvements take various forms from lighting and kerb ramps to public art and planning controls, so there is also a strong relationship between the Strategy and Action Plan and the City of Sydney's other relevant strategies and action plans.



Sustainable Sydney 2030–2050 Continuing the Vision

Figure 6. Relationship between the Strategy and Action Plan, *Sustainable Sydney 2030–2050 Continuing the Vision*~~, City Access Strategy~~ and other strategies



Target and measures

Direction 5 in *Sustainable Sydney 2030–2050 Continuing the Vision* provides the adopted targets and measures for the Strategy and Action Plan, which are listed below. The plan does not introduce additional targets or measures but instead identifies actions and areas of focus to help achieve them. The targets are:

- **By 2050 people will use public transport, walk or cycle to travel to and from work.** This includes 9 out of 10 people working in the city centre and 2 out of 3 people working in the rest of the local area.
- **By 2030 every resident will be around a 10-minute walk** to what they need for daily life.

In addition, this Strategy and Action Plan helps to deliver the following targets which relate to other Directions within *Sustainable Sydney 2030–2050 Continuing the Vision*:

- **By 2035 we will achieve net zero emissions** in the City of Sydney local area.
- **By 2050 there will be a minimum overall green cover of 40%**, including 27% tree canopy cover.
- **By 2050 community cohesion and social interaction will have increased** … at least 75% of the local resident population feeling part of the community, agreeing most people can be trusted and believing that when needed, they can get help from their neighbourhoods.

Achievements towards these targets will be measured through the increase of walking in the local area from walking counts which measure the average growth across sample locations.



Photo: Chris Southwood / City of Sydney

Figure 7. Responsibility and control in walking projects

City has responsibility/control	City has shared responsibility/control	City does not have responsibility/control
Footpaths (and accessibility infrastructure)	Space allocation of streets	Traffic signals and phasing
Trees and planting	Traffic control signage	State roads
Parking enforcement, policy	Parking controls and enforcement	Speed limits
Lighting (most)	Access around schools	Bus stop locations
~~Street furniture (most)~~ Bus shelters	Through-site links	Telephone and electric boxes
~~Community engagement~~ Street furniture (most)	Pedestrian crossings	Utility pits/service locations
~~Personal security~~ Community engagement	Road safety	State parks
~~Wayfinding, signage~~ Personal security	Funding	Speeding enforcement
~~Public toilets, bubblers~~ Wayfinding, signage		Clearways
~~Parks~~ Public toilets, bubblers		Public transport infrastructure
Parks		
Footpath use policies (e.g. display of goods) and outdoor dining management		
Planning controls		

The City of Sydney's roles and responsibilities

Walking interventions and walking projects are often split between levels of government and between different departments and private developers. This is partly because of the diversity and breadth of walking projects, which could be a new footpath, lighting, a new park, street trees or activations such as street parties and outdoor dining, along with planning, land use and development decisions, including the location of public transport.

As a local government, we control many but not all of the elements that influence walking. Some, such as speed and street space allocation, need approval from, or collaboration with, the state government. Other elements are out of our control completely, but which we can seek to influence. Figure 7 gives examples of activities in each of these categories. It is not a complete list but is provided to improve understanding of the complex roles and responsibilities in delivering a city for walking.

Where responsibility is shared, we work collaboratively with state government agencies including Transport for NSW, Department of Planning, Housing and Infrastructure and the Department of Education. Where responsibility is outside our control, we advocate for good outcomes.

Exclusions

The Strategy and Action Plan does not cover all of the actions that the City of Sydney undertakes in regard to walking. Actions that are covered in City strategies and adopted policies that influence the Strategy and Action Plan, such as the Inclusion ~~(Accessibility)~~ (Disability) Strategy and the Inclusive and Accessible Public Domain Policy and associated guidelines, are not covered. Adopted actions relating to walking are listed in Appendix F.

2. Strategy

Introduction

This section outlines our strategy for walking in the City of Sydney. The Strategy and Action Plan is structured around the hierarchy of walking needs introduced in Figure 2. Starting from the basic infrastructure that is needed and moving through safety, comfort and experience, the strategy sets out the approach and principles that the City of Sydney will take for each walking need, as well as why the principle is important, and the actions that will be taken to achieve the approach.



Photo: Katherine Griffiths / City of Sydney

Here is a summary of the principles underpinning each element of the strategy:

Strategy	Principles
Strategy A – A city where people can walk	
A1	We will ensure that there is sufficient space for people to walk.
A2	We will improve connectivity for people walking by ensuring there are frequent street crossings that give people priority and that align with people's walking routes. We will ensure that footpaths and crossings are accessible so that everyone can use them.
A3	We will plan our city based on 10-minute neighbourhoods so that people are able to meet their daily needs easily by walking.
Strategy B – A city where people can walk safely	
B1	We will make it safer for people to walk by reducing vehicle speeds.
B2	We will reduce traffic volumes on surface streets and manage through-traffic in residential neighbourhood streets to improve both safety and experience for people walking.
B3	We will work to make all people feel safer while walking around our city.
B4	We will work to improve compliance with road rules, especially the lesser-known rules that benefit people walking.
Strategy C – A city where walking is comfortable	
C1	We will make our streets and public spaces comfortable and inviting by ensuring that they are green and cool.
C2	We will make sure that there are frequent opportunities for people to stop and rest, use the toilet or have a drink of water.
C3	We will make our city more pleasant to walk in by reducing noise and air pollution from traffic.
Strategy D – A city where walking is fun	
D1	We will make all streets interesting to walk along by ensuring that built form has active, permeable frontages that invite engagement and curiosity.
D2	We will use design, activations and installations to create neighbourhood-based community and encourage people to interact with their streets.
D3	We will make it easier for the community to use their streets how they want to.
Strategy E – A city that is a leader in walking	
E1	We will lead the way in evidence-based planning for walking.
E2	We will continue to lead the way by sharing knowledge, skills, lessons learnt and data with other local governments and organisations.
E3	We ensure that how we talk about walking reflects the diversity and differing needs of people walking.
E4	We will encourage more walking through targeted behaviour-change programs and campaigns, and encourage people to tell us what would make walking better for them.

Strategy A
A city where people can walk

Principle

A1 We will ensure that there is sufficient space for people to walk.

Approach

We will ensure that all footpaths and shared zones have a continuous accessible path of travel free from obstructions.

Wherever possible, we will increase the space available for people walking by:

- Decluttering footpaths by working with relevant stakeholders to determine more appropriate locations for their infrastructure or how more space could be provided for people walking at that location.
- Reallocating road space from vehicles to people.

Space for people walking and infrastructure that supports walking – such as benches, bins, bubblers and trees – will be the primary considerations on a footpath. Footpaths that have surplus space for people walking can then be considered for additional infrastructure and uses, such as outdoor dining and bicycle parking, including share bike parking. **Where the footpath is not wide enough, these other uses should be placed within the carriageway.**

~~Delivery of new shared paths will follow the same principle. Our preference is always for separated cycleways or quiet on-road cycling wherever possible to improve the experience for both people walking and cycling. However, in some locations this is not possible and shared paths are necessary. We will aim to only allow cycling on a footpath where the expected walking volumes and widths mean comfort can be maintained for people walking (noting that this of course includes people using wheelchairs).~~

We recognise that there is growing concern around people cycling on footpaths. See the explainer box on page 27 for the City's approach to this issue.

Construction activities may require temporary closure or impacts to footpath widths but we will make every effort to ensure that direct, accessible and safe walking paths are maintained. We will develop guidance on planning construction activities to minimise the impacts on people walking.

Case study: George Street

The pedestrianisation of George Street is an example of the City and NSW governments working together to improve public space and walking outcomes. Where George Street was once a heavily congested, unpleasant street it is now the pedestrian spine of the city, providing space for people to enjoy. The initial project was so successful that it was extended south to Central station and a trial of a further closure between Hunter and Bridge Street started in late 2022.





Justification

We know that the first step to being a city for walking is to make it possible for people to walk. We will provide space and infrastructure that enables people to walk. This starts with making sure footpaths are continuous and connected, accessible and wide enough for the number of people who use them. This is particularly important in the city centre, where there are more than 1.3 million trips made daily, most of them walking trips.[42] We will address the problem of space by assessing people's current and future needs, addressing footpath clutter and actively reclaiming space for people.

Many footpaths in Sydney are crowded and uncomfortable for walking. Some level of crowding is good for a sense of activity and security, but on many footpaths, particularly at intersections, the crowding means that it is hard – and sometimes unsafe – to wait. Currently, footpaths have a lot of uses to fulfill but little space to do them. Reallocating street space is the main way we can create more space on footpaths for people walking.

Principle

A2 We will improve connectivity for people walking by ensuring there are frequent street crossings that give people priority and that align with people's walking routes. We will ensure that footpaths and crossings are accessible so that everyone can use them.

Approach

We will ~~do this~~ provide more crossings through our own ~~programs (for example, installing zebra crossings and continuous footpath treatments on local roads) and advocating for improving pedestrian priority at signals with a maximum wait time of 45 seconds and a target of 30 seconds.~~ delivery programs and create local guidance on the design and location of crossings to support this.

We will advocate for ~~more pedestrian crossings on state-controlled roads and pedestrian priority signals where the default setting is a green light for people walking (see explainer).~~ improving pedestrian priority at signals including:

~~We will create local guidance that support rolling out safer crossings in more locations with more certainty and at a lower cost.~~

- a maximum wait time of 45 seconds and a target of 30 second at all signals
- more crossings on state-controlled roads
- more pedestrian priority signals where the default setting is a green light for people walking (see explainer)
- automatic phasing so that people don't need to 'request' to cross by pushing a button
- ensuring that 15% or less of walking journeys is spent waiting at traffic lights as per best practice[43].

All crossings will have kerb ramps and will provide a continuous, accessible path for people using wheelchairs or mobility devices.

Justification

Walking is typically most enjoyable when it is uninterrupted. For a public space to be walkable, for the comfort of pedestrians it is important that people can cross streets regularly, easily and safely; however, streets often prioritise vehicular traffic and movement.[44]

Waiting at signals to cross can make up a significant proportion of time on a walking trip and can make major roads feel like both a physical and psychological barrier to walking. For someone walking along Park Street between College Street and Sussex Street, in 2007, 52% of their walking time would be spent waiting at lights. We have been working with Transport for NSW to reduce delays across the city centre and by 2020, only 20%[45] of the same trip was spent waiting. However, there is still much more to do – particularly across major roads.

Research has shown that 30 seconds is the longest people are willing to wait at traffic lights before getting impatient,[46] so getting this right also improves the safety of people walking by reducing the incentive for them to cross against the lights.

We also need frequent crossing opportunities so people don't need to walk far out of their way to cross the street. Some of our major roads such as King Street in Newtown and Botany Road have gaps of 300 metres and more between crossings; this could add up to 5 minutes to a walk.

Beyond signalised crossings, there are other ways to indicate that people have the right of way when crossing a street. Zebra crossings and the raised equivalent, wombat crossings, clearly give priority to people walking when they are crossing the street. Continuous footpath treatments, where the surface treatment of the footpath continues across a side street, are another way of reinforcing priority for people walking along a main street where they already legally have the right of way.

Explainer: Different types of crossings

There are different ways of giving people priority when crossing the road.



Continuous footpath treatments involve creating a visually distinct and continuous pathway for people walking that extends across the side road or driveway without interruptions. The treatment often includes raised pavement and different paving materials to indicate that people walking have right of way.



Pedestrian priority traffic lights are traffic lights where the default is a green light for people walking and cycling, until vehicles trigger the detector. The Rainbow Crossing at the corner of Bourke Street and Campbell Street (pictured) is a well-loved example.



Zebra crossings are pedestrian crossings marked with white stripes where drivers have to give way to people walking.



Wombat crossings are zebra crossings that are raised to increase visibility for approaching drivers and slow down traffic.

Principle

A3 We plan our city based on 10-minute neighbourhoods so that people are able to meet their daily needs easily by walking.

Approach

We do this through a planning framework that provides opportunities for local businesses and services close to where people live.

As people also need to travel beyond this range, we will provide mobility parking and advocate for public transport that meets these needs.

Justification

For walking to be a viable transport option we need sufficiently dense, mixed-use environments where daily needs are within easy walking distance. The need for a missing grocery item has motivated many walks to the store, as has the need to get a house-bound child to the playground. However, these require a city planned so that people have the option of doing these things on foot, through local centre and mixed-use zoning and creating fine-grain, human-scale development.

Through-site links – publicly accessible walkways through the middle of a privately owned site – and the creation of new streets in large developments are ways to increase the ability to walk. Both decrease the distance that people need to walk by providing alternatives to walking around very long blocks. When we masterplan urban renewal precincts or major development sites, we may require new streets or links in our development control plan, so people can move more easily and quickly.

Case study: Pitt Street

The Pitt Street cycleway and street upgrade between King Street and Reiby Place was made permanent in 2022. The project upgraded the public domain and reallocated traffic lanes to both walking and cycling space, narrowing the street to one traffic lane. The project has calmed traffic and made the street more pleasant to walk along, as well as enabled people to cross informally along its length.



Photo: Abril Felman / City of Sydney

Explainer: Countdown timers

Countdown timers, such as the ones installed at Martin Place, display the number of seconds people crossing the street have until the red walking signal displays. These popular crossings allow people to decide about whether there is time left for them to cross. They can be particularly helpful for people who may be less mobile or have hearing impairments. There are 18 countdown timers in the City and we continue to advocate for more.



Photo: Chris Southwood / City of Sydney

Strategy B
A city where people can walk safely

Principle

B1 We will make it safer for people to walk by reducing vehicle speeds.

Approach

We will work to reduce vehicle speeds by:

- Advocating for and working with Transport for NSW to implement speed limits of 30 km/h in the city centre, high streets, residential streets and around childcare centres, schools, universities and health establishments. We will work towards a maximum of 40 km/h on all other streets within our local area. None of our residential streets should have a speed limit of 50 km/h.
- Creating streets so that people driving slow down by narrowing roadways, planting trees and installing raised crossings and other traffic calming measures and ensure we have design standards consistent with these outcomes. The provision in the Sydney Development Control Plan that applies to traffic speed is 40 km/h on collector streets, 30 km/h on local streets and 10 km/h on laneways.[47]



Photo: Chris Southwood / City of Sydney

Figure 8. Serious injuries and fatalities in City of Sydney, 2017–2021



Justification

Safety is paramount to a walking city. People need to be able to move around safely in order to walk. People walking are particularly vulnerable to conflicts with people driving, particularly when crossing the road.

Reducing vehicle speeds is the single most effective way of improving the walking environment, and lowering vehicle speeds reduces both the severity and number of crashes. At an impact speed of 40 km/h, pedestrians have a 40% risk of death. This falls to about a 10% risk of death if the impact speed is 30 km/h.[48] Equally important is that lower vehicle speeds reduce the chance of collision because they allow more time for all road users to react.

Of all the crashes that occurred across our area in the last five years, people walking accounted for twice as many serious injuries and deaths as people driving. In the city centre where there are the most people walking, the statistics were even worse – over 24% of crashes involved people walking, of which 74% were crashes that resulted in serious injury.[49]

Case study: 30 km/h in Manly

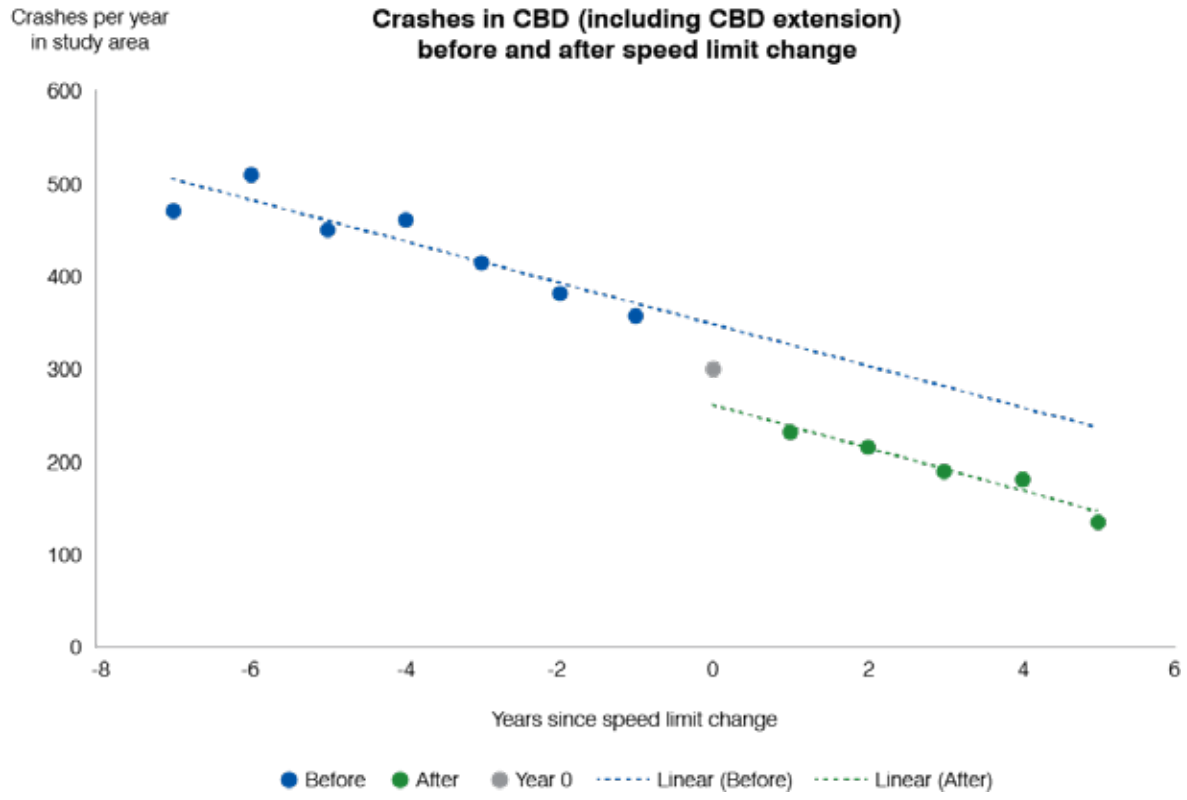
In partnership with Transport for NSW, the Northern Beaches Council reduced the speed limit in the town centre and along the waterfront to 30 km/h in 2020.



Member for Manly James Griffin said that the new speed limits will allow more people to enjoy the streets of Manly and move around safely. The City of Sydney is keen to work with Transport for NSW to implement the new speed limit in suitable areas once the trial has concluded.

The City of Sydney has been progressively reducing speed limits across our area which has resulted in a significant change in the number of crashes, despite the growing numbers of people walking. We want all our local streets to have a maximum speed limit of 40 km/h.

Figure 9. City centre crashes before and after speed limit change from 50 km/h to 40 km/h



Principle

B2 We will reduce traffic volumes on surface streets and manage through-traffic in residential neighbourhood streets to improve both safety and the experience for people walking.

Approach

We will reduce traffic volumes on surface streets in our local area through local area traffic management plans and low speed treatments to reduce through-traffic while still enabling local vehicle access, i.e. access for people that are going to that destination. In the city centre, we can reduce through-traffic by reallocating road space from vehicles to people or pedestrianising streets (*Can I walk?*). Government investment in public transport, especially the Sydney Metro, is also making it easier to get around without a car.

The City of Sydney also has ambitious limits on parking spaces, discouraging vehicles from parking in the centre in the future.

We will create and/or review local area traffic management plans to avoid and reduce through-traffic on local residential streets.

Justification

Reducing traffic volume in local streets or places of high walking activity improves safety, simply by reducing the risk for people walking. Less traffic means less opportunity for cars to hit people. The stakes are high in the city centre because over 1.2 million people visit our local area every day. Higher traffic volumes expose all these people to a higher risk of injury or death.

Traffic reduction on local streets is equally important. In Australia, parents are very concerned about traffic safety and it is one of the main reasons[50] for the decline in children walking to school from 75% to 25% over 40 years[51]. Local streets should be quiet and safe for children to walk and play. This is just not possible with a high volume of traffic. Less busy streets also make it easier for people with ~~a range of disabilities to walk, for example, those with~~ sensory, physical and cognitive ~~disabilities~~ disability.

Reducing traffic volume also benefits other walking needs. For example, less traffic means streets form less of a barrier for people to cross (*A city where people can walk*) and has better health outcomes due to reduced noise and air pollution (*A city where people can walk comfortably*). Traffic volume even has impacts on connection and social cohesion; one study found that in areas with 2,000 vehicles per day residents were more likely to have 3 times more friends as compared to an area with 16,000 vehicles per day (*A city where walking is fun*).[52]

Case study: Traffic calming in Green Square

Our traffic calming plans manage and calm traffic on local roads, to improve safety, walking, cycling and public transport access for local residents. This intersection upgrade in Green Square has slowed average traffic speeds to below 40 km/h and made more space for people walking.



Photos: Sydney Civil

Principle

B3 We will work to make all people feel safer while walking around our city.

Approach

We will keep our area clean, well-lit and well-maintained, in order to make our streets accessible to all and ensure that people feel safer in their environment. We will also work with community partners to understand and address issues of harassment and intolerance that make certain groups feel unsafe on our streets.

We will engage and gather data from the community on how design and activation can improve perceptions of safety in public space, and examine how gender-inclusive process and design can support more walking journeys and participation in public life in the city including after dark.

Justification

Beyond the safety of roads, people also need to feel safe in order to want to walk. If they felt safer in public spaces, people would be more likely to walk, catch public transport and go out during the day and after dark[53]. The perception of streets or public spaces as being safe ~~is very important to encourage walking, particularly for older people, women, children, and people with disability or limited mobility.~~ can differ across age, ability, cultural background and identity. For example,over ~~Over~~ 90% of women feel unsafe walking in Sydney at night, and 30% during the day.[54] For the women surveyed, inadequate lighting was the number one reason for feeling unsafe. Maintenance and cleanliness also add to the feeling of safety.

Some ~~groups~~ people, such as ~~LGBTIQA+ people~~ people of diverse sexualities and genders and intersex people, and some multicultural communities, can feel unsafe in certain spaces because of the behaviour and attitudes of others. It is important that the City work with these groups to understand the issues and develop strategies to address them, for example through the existing Hate Crime Awareness Campaign on which the City collaborates with the NSW government.

Principle

B4 We will work to improve compliance with road rules, especially the lesser-known rules that benefit people walking.

Approach

We will actively raise awareness and work with Police and the NSW Government through the Local Government Road Safety Program to promote compliance of lesser-known road rules that prioritise the needs of people walking. We will increase clarity for all road users by not permitting things which create confusion over who has right of way, for example lights and audible sirens at driveways.

Justification

Road safety also involves making sure drivers follow the road rules. There are some rules that drivers are often not aware of that, if followed, would make it easier and safer for people to walk. For example, drivers must give way to pedestrians when turning or driving into or out of driveways. However, in many locations, sirens have been installed which cause confusion, make people walking uncomfortable and perpetuate the attitude that "people need to get out of the way of cars".

Other road rules that prioritise people walking which we will raise awareness of and advocate for their enforcement include:

- People walking have the same priority as cars in shared zones
- Cars must not stop or park in driveways if doing so blocks the footpath
- ~~Cars must not stop.~~ People aged 16 or over must not cycle on footpaths unless supervising children under 16.

Studies show that compliance with road rules relates to the perception of the chance of being caught and the severity of the penalty. Presently, the chance of being caught when road rules are not obeyed is very low. This aspect of compliance needs to be addressed to promote safe driver behaviour.

Explainer: People riding on the footpath

With the increase in demand for rapid, low-cost food delivery and popularity of using share bikes, people riding on the footpath is a growing problem in the City of Sydney. Riding a bicycle on the footpath is only legal for children under 16 and those accompanying them, or people with special dispensation. The City recognises that making deliveries and travelling by bike are sustainable and low-cost transport options and we are working to improve all riders' awareness of their obligations to ride legally and safely, especially near people walking.



Photo: Adam Hollingworth / City of Sydney

Shared paths, marked with a blue line and signage, are shared between people walking and people riding. In both cases, people riding must always give way to people walking. Our preference is always for separated cycleways or quiet on-road cycling wherever possible to improve the experience and safety for both people walking and cycling. However, in some locations this is not possible and shared paths are necessary. We will aim to only allow shared paths where the expected walking volumes and path widths mean safety and comfort can be maintained for people walking.

While we do not have the power to make or enforce road rules governing bikes on footpaths, we advocate strongly to the state government to appropriately regulate share bike operators and delivery companies to reduce riding and clutter on footpaths. We also run programs to encourage people to respectfully share space on shared paths and engage with food delivery services to educate riders on the road rules and available cycle infrastructure.

It is noted that in the 5 years between 2018 and 2022 there were 8 crashes resulting in serious injuries to a person walking caused by a person cycling in our area, however over the same period there were 108 caused by people driving as well as 10 fatalities*. As such, our primary focus remains on reducing vehicle volumes and speeds to keep people safe

*City of Sydney analysis of NSW crash data (2018–2022).

Strategy C
A city where walking is comfortable

Principle

C1 We will make our streets and public spaces comfortable and inviting by ensuring that they are green and cool.

Approach

We will do this by delivering the major projects in *Sustainable Sydney 2030–2050* – such as our Green Avenue projects – and by progressing the actions set out in the supporting *Greening Sydney Strategy* and *Urban Forest Strategy* to ensure greening is distributed equitably across the local area. Wherever possible, we will prioritise the reallocation of road space to allow the planting of large trees within the carriageway to improve walking space on narrow footpaths, calm traffic, and shade and cool our streets.

Justification

Heatwaves are Australia's deadliest natural hazard. They now arrive earlier, are hotter and last longer. Urban temperature extremes can present us with life-or-death situations. The 2011 heatwave killed 96 people and hospitalised almost 600, while the 2009 heatwave during the Black Saturday bushfires killed 374 people in Melbourne alone.[55] The health impacts of heat are also an equity issue.~~; the impacts are not felt equally: the elderly and those from a lower socio-economic background are at the most risk of dying from heat exposure.~~ In our local area there are a number of priority communities who are at greater risk from heatwaves: people experiencing homelessness, renters (including people in social housing), the elderly, babies and young children and people with disability. These groups are at greater risk due to pre-existing health conditions or because their living conditions don't provide adequate shelter



Photo: Mark Metcalfe / City of Sydney

from heat. People from these groups may also be on a low income and therefore have less options to escape from the heat. The City's streets and public spaces, when well-shaded, provide a free and inclusive place to stay cool.[56]

Planting more street trees is one of the most important things we can do to make it possible for people to walk comfortably on hot days. Canopy trees significantly reduce daytime air temperatures through a combination of shade and evapotranspiration, the combined processes by which water moves from the earth's surface into the atmosphere. Individual trees can make a valuable difference to air temperatures and the more the better: above 40% canopy cover increases the cooling effect sharply.[57]

Trees also have other benefits for walking needs. They make it safer (*A city where people can walk safely*) by calming traffic and reducing vehicle speeds.[58] Without the sense of enclosure that trees provide, streets feel wider, and this sends the message to people driving that they can drive faster.

We also know there are significant benefits for health and wellbeing when people walk on green streets, particularly when the canopy cover is over 30%. At this level, Australian research has shown that greening can reduce the odds of becoming lonely by a quarter (*A city where walking is fun*).[59]

A study of how people chose their walking route showed that people often valued green views over directness. In fact, green views make the walk feel shorter than it is; the study found a 1% increase in greening reduced perceived distance by 0.3 metres.[60] This is in part because green streets make people feel connected to their environment and the people around them. Shade also protects people from dangerous UV light which causes skin cancer.

Case study: the City's wayfinding program

The City's wayfinding program has delivered clear and consistent wayfinding information including signage, clear mapping graphics, and web-based information to encourage people to walk more, and confidently find their way around the city.

The wayfinding system includes a network of tactile street signs at every signalised pedestrian crossing throughout our area, making it safer and easier for people of all abilities to navigate our streets.



Photo: Paul Patterson / City of Sydney

Principle

C2 We will make sure that there are frequent opportunities for people to stop and rest, use the toilet or have a drink of water.

Approach

We will provide regular seating and other amenities such as public toilets and water fountains through our street furniture program. We will use the Liveable Green Network to prioritise the location of new street furniture (see Appendix E).

Justification

Regular opportunities to stop and rest are essential for some people to be able to use streets on foot because they find walking for longer distances a challenge. According to the



Photo: Abril Felman / City of Sydney

2021 Census, about 5,800 people, or close to 3% have a severe or profound disability that affects their ability to communicate, get around and care for themselves.[61] There are also many people with disability who visit and work in the City of Sydney. Seating is therefore essential for creating environments that are inclusive, as well as being important for making streets comfortable places to spend time for ~~everyone, regardless of ability~~ all people, inclusive of people with a disability, all ages and genders.

Older people can also be significantly impacted by a lack of seating. A British study, Standing Up for Sitting Down, noted that a lack of seating in public spaces limits the ability of older people to engage in public life and makes even simple chores like shopping stressful.[62] We want to create an inclusive and accessible city for everyone, and seating is a fundamental part of the puzzle.

In a similar vein, accessible public toilets are very important for small children, pregnant women, older people and people with some health conditions or disability to feel comfortable and confident while out and about. A lack of facilities can shape where people go or even how much food or water they take in, a phenomenon sometimes referred to as a 'loo leash'.[63]

~~Regardless of mobility level,~~ Accessible and inclusive street furniture and seating make walking more comfortable and pleasant for all people. The Healthy Streets framework, a human-centred approach to embedding public health in transport, public health and the public realm, out opportunities to stop and rest as 1 of the 10 pillars of creating streets that work for people. To get a top score on this indicator, seating should be provided at least every 50 metres.[64]

Principle

C3 We will make our city more pleasant to walk in by reducing noise and air pollution from traffic.

Approach

The most effective way to reduce air and noise pollution from traffic is to reduce the volume of traffic on streets. We will do this by making it easier for people to move around without a vehicle, specifically by:

- Supporting car share programs
- Advocating for better public transport
- Building a safe, separated bike network
- Managing traffic in local areas (see Principle B2)

In addition, through our *Electrification of Transport in the City Strategy and Action Plan*, we are encouraging the transition to electric vehicles which have less pollution and create less noise.[65] Actions from the Electrification Strategy are found in Appendix F.

Justification

Noise and pollution from road traffic impacts on our health and wellbeing in many ways. It also makes streets stressful for people living and working on them as well as people walking on them. People walking are exposed to noise and fumes from people driving, particularly on major roads and when waiting to cross.

Reducing the noise from road traffic creates an environment in which people are willing to spend time and interact. We can reduce noise and air pollution by reducing traffic volume (*A city where people can walk safely*) as well as by transitioning to electric vehicles.

Strategy D
A city where walking is fun

Principle

D1 We will make streets interesting to walk along through good building design and interesting uses in appropriate locations.

Approach

We use planning controls to create interest in the street, either through building and landscape design or the visible uses of a building. This includes identifying where the buildings and the uses within the buildings can contribute to the activity in the street and providing design guidance for making buildings that are interesting to look at. Where we can't avoid blank facades or where we have old or historical buildings that can't be changed, we can use public art and plantings to make our streets more enjoyable.

Justification

Beyond making sure the city's physical characteristics are safe and comfortable, we can encourage walking by making it fun and interesting. This is important for creating a sense of fascination, vibrancy and community as well as attracting visitors, businesses and residents.

Streets and public places need to be comfortable, inviting and interesting for people to want to walk.[66] The more inviting and interesting the street, the longer people are willing to walk. In our local area, a place of interest along a route reduces the perceived distance of the route by three metres, meaning that people who are enjoying their walking experience believe the walk is shorter.

Case study: Laneways Revitalisation Program

Laneways can be vibrant, walkable spaces that invite exploration. The Laneways Revitalisation Program aims to transform city centre lanes and underused spaces to improve pedestrian connectivity and the quality of the public domain. These upgrades have helped local businesses and led to a revitalised small bar and dining culture, with over 90 small bars now operating in our area.

To date, a total of 25 lanes in the city centre have been upgraded, including much loved spaces such as Angel Place, Ash Street, Tank Stream Way and Penfold Lane.



Photo: Tyrone Branigan / City of Sydney



Photo: Katherine Griffiths / City of Sydney

Unique buildings, small shops and businesses and buildings that open directly onto the street all help people to engage with their environment while blank facades and long, unbroken blocks do not.

An interesting and activated ground floor also contributes to perceptions of safety by putting more 'eyes on the street' (*A city where people can walk safely*). Shops and businesses create a network of people who casually observe one another and can raise the alarm if anything happens. In a survey of 6,000 women about their experience of city streets, 'nobody around' and 'isolate/unsurveyed' were both in the top 10 factors that contributed to feeling unsafe.[67] This also impacts children; if caregivers feel unsafe while using streets, they are less likely to let children move independently or to venture out with them.[68] Shops and buildings that open directly onto the street help create bustle and life, which make people feel safe.

Principle

D2 We will use design, activations and installations to create neighbourhood-based community and encourage people to interact with their streets.

Approach

We will encourage walking by introducing opportunities for play in the design of our footpaths and streets. The focus is on playful design that encourages imagination and spontaneous interaction with our environment; this is separate from and in addition to our program of formal play spaces for children and youth.

Case study: Alfresco dining program

During the pandemic, we launched a free, fast-tracked application process for outdoor dining permits. This made it easier for restaurants, cafes and bars to reallocate parking space for outdoor dining. So far, more than 400 permits have been granted across inner Sydney, creating vibrant places that encourage walking and public life and supporting local artists. Feedback from our community and businesses has been overwhelmingly positive.



Photo: Mark Metcalfe / City of Sydney

In the same way, events and temporary activations also make for enjoyable walking. We will continue our existing programs – such as Chairs in Squares, Sydney Streets, greening laneways, and outdoor dining – as well as look for other ways to attract people to spend time in the public realm and explore our city. We aim to create unexpected moments, giving people a sense of discovery as they walk our streets.

We will use public art to add surprise and delight but also to tell the story of our First Nations people. We will work in partnership to complete *Yananurala*, the nine-kilometre public art walk that highlights Aboriginal history and culture at places along the Sydney harbour foreshore.

Justification

Design should enable and encourage access by our residents, workers and visitors across all ages and interests. We want people to enjoy spending time in our City and we have heard from our community that events, activations and public art programs play an important role in this.

Part of the reason that these elements make walking around fun is a sense of exploration and novelty. When you don't know what you'll find around the corner, you're tempted to keep

wandering to find out. Tracy Emin's artwork, the *Distance of Your Heart*, which features 60 delicate handmade bronze sculptures of birds hidden between Bridge Street and Macquarie Street, is a great example of this. Like a treasure hunt comprised of scattered elements, the installation encourages exploration and curiosity – a new way of looking at a familiar place.

Elements of fun also create opportunities for casual encounters with others and help to build a sense of community. Neighbourhood street closures, interactive artworks, places to sit and community events such as painting murals are all important ways to help people feel connected to their communities.

Playful design that encourages interaction is particularly important for children and adolescents. Play is essential for children's wellbeing and happiness, which the United Nations recognises through the Right to Play, enshrined in the 1989 Rights of the Child convention. Opportunities for playful engagement with their environment help build physical, emotional and social resilience.[69]

Principle

D3 We will make it easier for the community to use their streets how they want to.

Approach

We will empower the community to be innovative in how they use their street by simplifying the process for our residents to obtain approval for street murals, planting and temporary road closures.

Justification

Personalisation is an important part of facilitating connection. People feel more connected to places that they have the ability to change.[70] Making it easier for the community to hold the sort of events they want to and make changes to their streets helps to bring people together and develop a sense of community in local neighbourhoods, which is an important part of making walking fun and enjoyable and embedding it into everyday life.

Strategy **E**
A city that is a leader in walking

Principle

E1 We will lead the way in evidence-based planning for walking.

Approach

We are committed to the principles of open data and will continue to collect and publish data on walking in the local area.

We will continue to investigate ways of improving our knowledge of walking and use our data and evidence to inform the selection and design of projects and undertake evaluation to measure whether they have had the intended impact.

We will continue to respect people's right to privacy. We will never collect walking data in a way that records personal or identifiable information.

Case study: Tracking changing attitudes

We have begun a program of longitudinal studies to understand shifting attitudes to walking and cycling projects over time. Often residents often express opposition during the planning stages of cycleways but become increasingly supportive once the projects are completed. By conducting comprehensive studies that track attitudes over time, we gain valuable insights into the factors driving this shift in public opinion and use it to help shape future projects. We are currently conducting such a study on the planned Oxford Street cycleway.



Photo: Katherine Griffiths / City of Sydney



Photo: Chris Southwood / City of Sydney

Justification

It is often said that you can't improve what you don't measure. This is particularly true of walking – it is such an underappreciated, ubiquitous part of daily life that if we don't measure it, it goes unseen. We need to know how many people are walking, at what times of the day and what factors affect their experience of walking so that we can tailor our streets for better walking.

Using data to inform planning decisions is called evidence-based planning. This approach helps us make better decisions and to learn from experience. The City of Sydney has a limited budget and the more we make decisions informed by evidence, the more effective we will be in using our finite resources to do more of what works and less of what doesn't.

Principle

E2 We will continue to lead the way by sharing knowledge, skills, lessons learned and data with other local governments and organisations.

Approach

We can learn from others by developing deep and extensive networks with professionals working to improve walkability. We will continue working with other councils and organisations through both formal and informal channels to make it easier for others to make positive changes for walking. We will also work with academics and research institutions to contribute to the overall body of expertise.

Justification

Given its location and intense level of development, the City of Sydney often experiences challenges relating to people walking (and access and transport more broadly). This means that we have the experiences and resources to share with other Councils and have embedded this sharing in our mission.

Principle

E3 We will ensure that how we talk about walking reflects the diversity and differing needs of people walking.

Approach

We will use inclusive, human-centred language in all our communications.

Justification

Streets are for ~~everybody, regardless of ability, age or gender~~ all people, inclusive of people with a disability and of all ages and genders. When we talk about walking, we are including all people moving on footpaths – those on foot, using mobility aids such as wheelchairs, mobility scooters and walking frames, as well as those with prams, rollerblades, unpowered scooters and skateboards. This is a diverse set of people with differing needs and preferences when it comes to interacting with our city's streets, and we need to acknowledge this in the language we use.

Principle

E4 We will encourage more walking through targeted behaviour-change programs and campaigns and encourage people to tell us what would make walking better for them.

Approach

We will develop and implement a range of behaviour-change programs to encourage the community to walk more. In particular, we will develop measures to encourage school students to walk to and from school by working in partnership with schools and parent committees.

We will also encourage people to tell the City of Sydney and Transport for NSW about the particular barriers to walking they face.

Justification

Sometimes, particular groups of people have specific needs when it comes to walking that require a thoughtful and targeted approach to removing barriers. Walking to school is a good example. While 40 years ago, 75% of kids walked to school, today only 25% do.[71] Not only is infrastructure required to make sure children can safely make the trip, but there is also an educational component of teaching kids about how to use crossings and signals, how to check for traffic and how to be alert in a road environment. Parents may also need support, information and tools to feel comfortable letting their child walk to school.

Walking is often an overlooked mode of transport, and while we hear a lot from people using other modes about the challenges they face (traffic, late buses, connectivity of cycleways), we hear very little about the barriers to people walking. This may be because walking is so common that people don't often identify themselves as 'walkers'. But we need to know~~ing~~ more about the specific problems that walkers face, for example, intersections with long delays, so that we can target our efforts to create the most ~~and most~~ effective behaviour change.



Photo: Anna Kucera / City of Sydney

3. Action Plan

Action	
1	**We will implement a program of the highest priority walking improvements**. These are actions that have already been committed in the next three years and will include programs and projects related to crossings, street upgrades, road space reallocation, planting and public domain improvements focused on key walking routes. See Appendix A for Tranche 1 walking improvements.
2	We will **investigate ways of increasing our commitment to delivering walking improvements**. See Appendix B for proposals for new or accelerated walking-related programs.
3	We will work with Transport for NSW to **implement 30 km/hr speed limits** in the city centre, high streets, residential streets and around childcare centres, schools and universities, and health establishments, and progress a maximum of 40 km/hr speed limits elsewhere.
4	We will work with Transport for NSW to **ensure that signal phasing prioritises people walking**. The City will advocate for: • Automated pedestrian phases • A maximum wait time at intersections of 45 seconds for people walking with a target of 30 seconds • More pedestrian priority signalised intersections (like Bourke Street at Taylor Square)
5	We will **implement local area traffic management (LATM) plans** to reduce vehicle volumes and speed to make it safer for people walking. We will focus these LATM plans on: • Areas around schools and childcare centres • Residential areas between state and regional roads • Areas of high walking activity
6	We will **develop a code of practice for construction activities in public places** that provides guidance on how to maintain safety, connectivity and place amenity for people walking. This will inform the basis of permitting and managing construction activities in a way that minimises impact on people walking.
7	We will actively work to **improve how road rules relate to people walking** by: • Raising awareness and **understanding** of existing road rules related to walking • Advocate for the NSW government to improve **compliance** with road rules by people driving and cycling, particularly by regulating share bike operators and bike delivery companies ~~Working with the NSW government to promote driver and cyclist compliance compliance by people driving and cycling with road rules relevant to people walking~~ • Continue and increase education about courteous, safe and legal bicycle riding to improve the safety and comfort of walking • Advocating for **legislative reform** to improve road rules related to people walking • **Clarifying the right of way** for people walking across driveways by banning any devices that falsely imply vehicle priority (flashing lights, audible sirens) and encouraging the removal of existing devices (through compliance action where applicable). Any safety issues at the interface of a driveway and a footpath are to be resolved by warning drivers of their responsibility to drive safely around people, for example, by using speed bumps.

Action	
8	We will **review the guidance in our Sydney Streets Code** with a focus on: • Providing guidance on location, selection and design of **crossings and intersections,** including reviewing accessibility of different crossing types, and shelter at waiting spaces • Providing guidance on how to create **child-friendly streets**. This could be done via adopting existing guidance developed by a third party as an addendum to the Street Design Guide • Defining **traffic lane width standards** applicable to our local area that support space re-allocation and safe speeds • Reviewing how our guidance relates to **designing for people with cognitive, sensory and physical ~~disabilities~~ disability** – for example, including charging stations for mobility devices in the standard set of street furniture the City uses We will also develop local design standards related to walking (for example, speed management, tree planting near traffic and tactical urbanism) where State or national standards result in suboptimal walking outcomes.
9	We will work with Transport for NSW to **reduce red tape** and make it easier for our community to activate their streets via temporary or permanent closures, street painting and plantings.
10	We will **promote walking as a form of exploration** and curiosity through our Culture Walks, guided tours and self-guided walks.
11	We will continue to **be a leader in walking and evidence-based planning** by: • Increasing our network of permanent pedestrian counters • Investigating new forms of people movement data • Sharing knowledge and expertise with other councils, cities, agencies and the community • Undertaking research on behaviour change and attitudes to walking and cycling
12	We will **use proactive language and remove unconscious bias** in City publications to highlight the human element of walking and advocate for others to do the same.

4. Appendices

Appendix A – Tranche 1 Walking Improvements

This appendix sets out the highest-priority walking-related programs and projects that the City will deliver over the next three years (July 2023 – June 2026). These projects and programs are continuing the vision set out in the last walking strategy and now form part of the City's business-as-usual approach to improving walking. They all have committed funding and delivery pathways and will be subject to consultation and approval.

Programs

Road closures and shared zones

We will close four streets to traffic and upgrade them with full landscaping. We will also implement three new shared zones and upgrade the streetscape in line with the City's shared zone design palette to indicate to drivers to drive at 10 km/h.

Crossings

We will install approximately 30 continuous footpath treatments, 12 raised crossings (wombat crossings), four at-grade crossings (zebra crossings) and one pedestrian refuge crossing. We will also upgrade three new signalised pedestrian crossings and upgrade two intersections that are missing pedestrian crossings.

Kerb ramps

We will install approximately 110 new kerb ramps. This includes replacing around 20 kerb ramps that are currently not compliant with accessibility standards.

Footpath widening

We will widen footpaths or build kerb extensions to narrow crossing distance in approximately 20 locations.

Footpath renewal

We have allocated $15 million towards upgrading and renewing our footpaths and a further $17 million for upgrading asphalt footpaths to granite pavers. This is being done in line with the Liveable Green Network initiative from *Sustainable Sydney 2030–2050 Continuing the Vision*.

Clutter

We will remove or relocate utilities such as redundant Ausgrid poles in approximately 50 locations to reduce footpath clutter. In addition to this, we will look at opportunities to consolidate or remove redundant signage.

Pedestrian safety improvements

We have committed to three programs delivering pedestrian safety improvements to specific problem areas.

Tree planting

Through our tree planting program, we will plant at least 700 trees per year over the next 3 years, totalling 2,100 trees. This includes a minimum of 50 in-road trees in the parking lane per year, or 150 trees over the 3-year period. After 2026, a greater proportion of the trees planted will be in-road.

Furniture

We have allocated around $450,000 towards new street furniture, including seating, toilets and water fountains and a further $400,000 for furniture upgrade and renewal.

Raised intersections

We will convert one roundabout to a raised crossing to calm traffic and improve amenity for people walking.

Lighting

We will install new street lighting in six locations specifically to improve the walking experience.

Projects

We will deliver the Crown Street streetscape upgrade and public domain works.

We will finalise the George Street South pedestrianisation and upgrade.

We will undertake the permanent pedestrianisation of George Street North.

We will continue the rollout of new wayfinding signage ($200,000 allocated).

We will finish delivering the set of traffic-calming initiatives identified in the Alexandria Local Access Traffic Management Plan.

We will complete streetscape and laneway projects that are committed or already under construction including Zetland Avenue west, Green Square to Ashmore Connector, Castlereagh Street, Loftus Street and the Primrose Avenue quiet way.

We will continue to facilitate the delivery of developer-delivered works to support development growth, in particular in the urban renewal precincts of Green Square and Ashmore.

Appendix B – Tranche 2 Walking Improvements

This appendix sets out ways in which the City could increase the commitment to walking improvements over the next 10 years, either through accelerating existing programs or creating new programs.

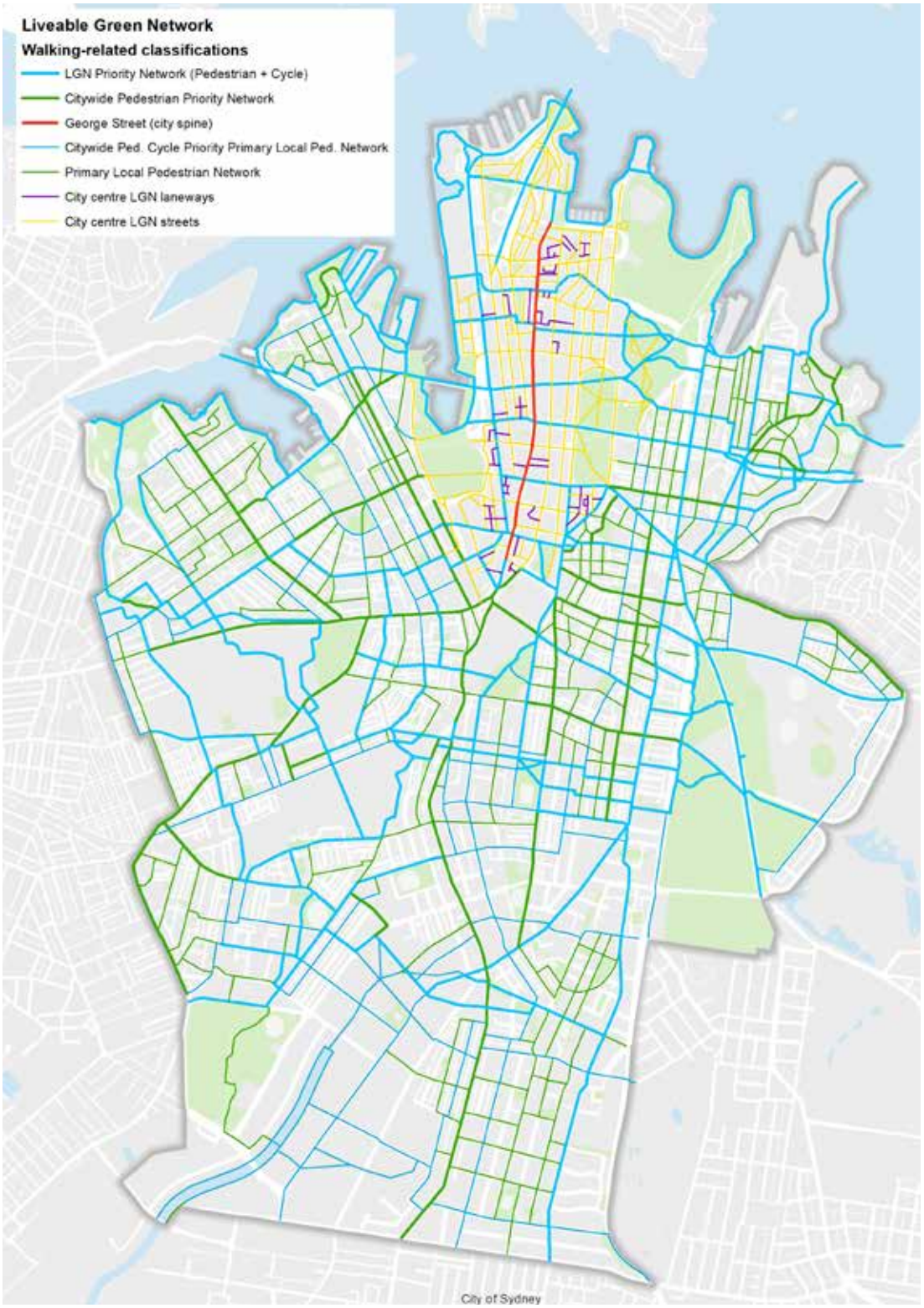
Items in this appendix will require approval of additional funding. Each program is listed below along with the additional resources required for its implementation.

Programs	Resources required
Crossings Following the recent delegation of power to Council regarding installing crossings on local streets, the City has identified additional priority locations for installing pedestrian crossings. We propose to double the rollout of both zebra and wombat crossings compared to the current plan (Appendix A – Tranche 1 Walking Improvements) to address these priority areas.	Existing program funded. Seeking additional funding for acceleration.
Walking and Place We will continue to undertake Walking and Place studies of precincts that have particular walking significance and are not picked up through other processes (such as schools). We will undertake three studies per year. We will continue to seek grant funding from Transport for NSW and others to fund the delivery of these projects.	Seeking NSW Government funding.
Walking counter automation We will increase the network of automated pedestrian counters from 4 locations to 15 with a view to ultimately replace the current twice yearly manual counts.	Capital funding required.

Appendix C – Liveable Green Network

All of our streets and footpaths support walking. Developed in 2011, our Liveable Green Network (Figure 10) shows streets that have been identified for different purposes. This classification helps us to prioritise some types of projects, particularly greening, street furniture and footpath maintenance along key walking routes. The Liveable Green Network aims to create a pedestrian and cycling network that connects people with the city and village centres as well as major transport and entertainment hubs, cultural precincts, parks and open spaces.

Figure 10. Liveable Green Network



Appendix D – Strategic alignment of actions

The actions from this strategy support the outcome statements of Direction 5 in *Sustainable Sydney 2030–2050 Continuing the Vision* - A city for walking, cycling and public transport

5.1 Street space is reallocated for people, places and planting

Actions	The City is shaded and cooler, quieter and calmer, air cleaner and more space available for people to use the streets	Vehicle speeds and volumes are reduced, making the city centre and local neighbourhoods safer, healthier and quieter	Avenues that lead into Central Sydney have been transformed to be greener, with more space for walking and cycling
1. Implement tranche of highest priority improvements	●	●	●
2. Increase our commitment to walking improvements	●	●	●
3. Work towards 30 km/h		●	
4. Prioritise people walking at signals			
5. Implement local area traffic management plans	●	●	
6. Develop a code of practice for construction activities		●	
7. Improve how road rules relate to people walking			
8. Review guidance related to walking in Sydney Streets Code	●		
9. Reduce red tape	●		
10. Promote walking as a form of exploration			
11. Continue to be a leader in walking			
12. Use proactive and human-centric language around walking			

Note:Many actions also support outcomes under other Directions in *Sustainable Sydney 2030–2050*

The actions from this strategy support the outcome statements of Direction 5 in *Sustainable Sydney 2030–2050 Continuing the Vision* - A city for walking, cycling and public transport

5.3 More people walk more, because walking is the most attractive and convenient choice for short trips

Actions	People are prioritised by increasing the capacity, quality and amenity of our streets	The experience of people walking will be enhanced for everyone by improving safety, quality, accessibility and comfort, including for children	The city is legible and intuitive to navigate, supported by a comprehensive wayfinding scheme	People are prioritised at key intersections, reducing wait times, and improving safety
1. Implement tranche of highest priority improvements	●	●		●
2. Increase our commitment to walking improvements	●	●		●
3. Work towards 30 km/h		●		●
4. Prioritise people walking at signals		●		●
5. Implement local area traffic management plans		●		●
6. Develop a code of practice for construction activities		●	●	●
7. Improve how road rules relate to people walking	●	●		●
8. Review guidance related to walking in Sydney Streets Code	●	●		●
9. Reduce red tape		●		
10. Promote walking as a form of exploration		●	●	
11. Continue to be a leader in walking		●		
12. Use proactive and human-centric language around walking		●		

Note: Many actions also support outcomes under other Directions in *Sustainable Sydney 2030–2050*

Appendix E – Key terms

Key term	Definition
Accessibility	~~The ability for everyone, regardless of mobility, age, where they live and disability or special mobility needs to be able to easily use the transport system, including walking infrastructure.~~ Accessibility in this context refers to physically being able to access a place. This includes walking infrastructure that is usable and easily understood by everyone who interacts with it.
Active frontage	Ground floors with windows and doors onto the street which create interest and activity.
Active transport	Transport that is 'human powered' such as walking and cycling. This includes electric bikes and scooters.
Amenity	Something that makes your surroundings pleasant and agreeable.
Clear width	The width on a footpath available for walking that is unobstructed by obstacles.
Continuous footpath treatment	Where the surface treatment of the footpath continues across a side street. It is a way of reinforcing priority for people walking along a main street where they legally already have the right of way.
Cycle time (signals)	The time taken by a traffic light to go through all its phases. Longer cycle times mean people walking have to wait longer to cross.
Development control plan (DCP)	Detailed planning and design guidelines by the local government to support the planning controls. DCPs are a key feature of the NSW planning system.
Inclusion	Using the Australian Government's definition, inclusion is when everyone in a group is involved and respected. Diversity is celebrated and things can be changed to suit the needs and preferences of the individual.
Interchange	~~The~~ When using the Walking Space Guide, the City interprets 'interchange' as referring to the ticketed area within the gate line of a station. The City's public footpaths should never be considered as interchanges for the purposes of assessing walking space.
Kerb ramp	Otherwise known as a kerb cut, dropped kerb or pram ramp, this is a ramp graded down from the top of the footpath to the surface of the street. They provide access for people using wheelchairs, pushing prams or ~~with limited mobility pushing~~ delivery trolleys..
Local Strategic Planning Statement (LSPS)	A document that the NSW government requires all local governments to develop that sets out the 20-year vision for land use and how growth will be managed in the future.
Local traffic	Vehicles that either originate or stop in the area in question. The opposite of through-traffic.
Parklet	A kerbside parking space that has been repurposed into a public space 'pocket' to provide seating, greenery and other amenities.

Key term	Definition
Planning controls	The set of regulations that control development in terms of density, height, external design, open space provisions and maximum parking provision, among other things.
Road space allocation	How the space between buildings is allocated between uses, particularly footpath space and road space. Often, the allocation of space does not reflect the number of people using each part, in which case the reallocation of road space is needed.
Severance	Physical and psychological barriers that impact on the ability for people to walk where they want to go. It can include roads or public transport infrastructure that are difficult to cross, large blocks, or parks without accessible paths which are hard to cross for people with ~~limited mobility~~ disability.
Shared path	A path shared by people walking and cycling.
Shared zone	A road shared by people walking, cycling and driving. The maximum speed limit is 10 km/h. Shared zones must have different surfaces to normal roads to help people identify them.
Street furniture	All furniture in the public domain, including seating, bins, drinking fountains and toilets.
Through-traffic	Vehicles which are passing through an area without originating or stopping there.
Through-site links	Publicly accessible connections through sites on private land.
Walkability	The sum of "factors within the built environment that make it convenient, comfortable and safe to walk."[72]
Walking	People moving about on the footpath, including those using mobility aids (for example, wheelchairs, electric wheelchairs, mobility scooters and prams among other devices). It does not include people using a bicycle.
Wombat crossing	A raised zebra crossing that gives people walking priority to cross.
Zebra crossing	A pedestrian crossing marked by white parallel stripes.
10-minute neighbourhood	A concept by which cities are planned so that people are able to meet their daily needs within a 10-minute walk.

Appendix F – Actions related to walking in other strategies and plans

Improving walking in our city requires a multifaceted approach that touches on many aspects of what we do at the City from planting trees to planning approvals. Many of these aspects already have adopted strategies and policies with actions that relate, directly or indirectly, to walking. Rather than replicate these actions in the Walking Strategy and Action Plan here, a selection of actions related to walking in other plans is listed below.

Plan	Reference	Action
Sustainable Sydney 2030–2050 Continuing the Vision	**Transformative project**	Three linked city squares: Three city squares will be linked by the new pedestrian boulevard on George Street to provide more space for public life in the heart of our city.
Sustainable Sydney 2030–2050 Continuing the Vision	**Transformative project**	The green city • Green avenues: Transforming Broadway, Oxford Street and Park Street by reallocating road space to people, businesses and planting. • The laneway commons: The laneway commons reimagines our neighbourhood service lanes as soft, permeable, green commons that better serve community needs. The initiative transforms land that is now used for private vehicle access and waste collection.
Sustainable Sydney 2030–2050 Continuing the Vision	**Transformative project**	City space improvement program • Lunch Club: This program reimagines our city centre road space with temporary lunchtime closures with simple elements (fixed and fleeting) – the first step towards more permanent change. • Roads to spaces: This program could convert more roads into spaces for people to walk, linger and enjoy.

Plan	Reference	Action
~~City~~ **Access Strategy**	**Action 5**	Plan Sydney Metro precincts to improve the public domain and increase space for people. It will result in modifications to streets including: • Footpath widening – localised in places of high activity such as busy intersections and crossing points • Footpath widening – along whole blocks or streets to encourage more street activation and economic activity • Adding street trees and appropriate street furniture.
~~City~~ **Access Strategy**	**Action 8**	A city for walking. We will update the Walking Strategy and Action Plan as appropriate. We will deliver priority programs of localised interventions to make walking safer, easier and more convenient. This builds on the City's Walking Strategy and Action Plan and will include: • Increased crossing opportunities • Space for walking and public life • Lighting • Increased number of trees and planting • Reduced vehicle speeds and reduced through-traffic along main streets and in local neighbourhoods • Reduced waiting times for people walking at traffic signals.
~~City~~ **Access Strategy**	**Action 13**	Reducing the impacts of buses in the city centre. The City will advocate to the NSW Government to reduce the number of bus layovers in the city centre. This street space can then be reallocated to uses such as outdoor dining, plantings or footpath widening.
Local Strategic Planning Statement (LSPS)	**I1.1**	Continue to encourage walking and cycling in the city by implementing the City's walking, cycling and Liveable Green Network strategies, and applying the NSW Government's Movement and Place framework.
Local Strategic Planning Statement (LSPS)	**I1.2**	Work with the NSW Government to plan for the transition of streets to 'people first' places, applying the NSW Government's Movement and Place framework so streets are healthier, quieter, cleaner and greener with increased footpath capacity throughout the city.
Local Strategic Planning Statement (LSPS)	**I1.9**	Continue to implement, review and update the car parking policies and controls to support the transition to a net-zero carbon and energy-efficient transport system by 2030, continue promoting more efficient modes of transport including walking, cycling and public transport and manage congestion. This includes working with the NSW Government to review and update the Central Sydney Parking Space Levy.

Plan	Reference	Action
Local Strategic Planning Statement (LSPS)	**I1.10**	Work with landowners, institutions and government to increase public walking, cycling and transport connections across the city and district, including infrastructure, busy roads, railway lands, institutional lands and golf courses and the like.
Local Strategic Planning Statement (LSPS)	**L1.1**	Provide public and publicly accessible spaces that are inclusive, good quality, accessible and activated for diverse people and communities and contribute to the social life of the city.
Local Strategic Planning Statement (LSPS)	**L1.3**	Improve the accessibility of the public domain for people of all ages and abilities – with a focus on children and young people, older people, and people with disability – including through the delivery and improvement of inclusive and accessible public spaces, amenities and facilities.
Local Strategic Planning Statement (LSPS)	**L2.1**	Plan for local communities to be able to access daily needs and essential services, including fresh food and health and personal services, within walking distance by providing an appropriate mix of uses, including local retail, services, infrastructure and recreation, in local and neighbourhood centres and mixed-use zones supported by adequate floor space on the ground floor (and adjacent floors where appropriate).
Local Strategic Planning Statement (LSPS)	**L2.2**	Undertake a review of active frontage and built form controls to connect and create a network of activity in appropriate places.
Local Strategic Planning Statement (LSPS)	**L2.3**	Work with others to create and maintain a continuous publicly accessible harbour foreshore edge that is wide enough to support a range of recreational activities, except in areas required for productive working harbour functions.
Local Strategic Planning Statement (LSPS)	**L2.4**	Plan and deliver walkable local streets or shared zones with wider footpaths, gardens, street trees, pedestrian priority at crossings and safe traffic speeds.
Greening Sydney Strategy	**Action 1**	Achieve the green and canopy cover targets The minimum overall green target for the city is 40%, including an overall canopy target of 27%. This is based on the provision of greening and canopy cover being shared between all our streets, our parks and all property. To achieve the target, we will ensure that across their portfolio: • streets provide 39% green cover with a minimum 34% canopy cover • parks provide 86% green cover with a minimum of 46% canopy cover • property areas provide 28% green cover with a minimum of 20% canopy cover. Importantly, each portfolio needs to provide their share, as there is limited capacity for others to make up any difference. It is vital that ... everyone works together to provide the targets.

Plan	Reference	Action
Urban Forest Strategy	**Action 4**	Achieving the canopy cover targets will take a sustained and coordinated effort, with all owners and managers of land in our area required to play their part to provide new tree canopy. To ensure our canopy targets are achieved, we will: • identify streets where tree planting and providing canopy cover should be prioritised over other uses of public space, such as on-street car parking and other street space that is underused. Develop a program to prioritise planting based on need and opportunity • continue to identify opportunities for new and replacement tree planting in streets and parks and deliver best-practice tree planting and establishment programs. Ensure trees are planted in the best locations to optimise canopy cover • ensure the mature size of trees planted in streets and parks is the most appropriate for the space available. Park planting plans will be developed and the street tree master plan will be comprehensively reviewed to ensure tree species selection is optimised • improve soil and tree pit growing conditions in streets to ensure the trees planted thrive to mature size
Inclusion (Disability) Action Plan	**Direction 2**	The creation of more liveable communities for people with disability. Streets, parks, footpaths and open spaces in the City of Sydney area are accessible. The design, maintenance and management of infrastructure and places enables people with disability to travel through the City with dignity and independence.
Inclusion (Disability) Action Plan	**Action 4**	Continue to improve the accessibility of streets, footpaths, parks and open places through renewal programs, upgrades and new capital
Electrification of transport in the city strategy and action plan	**Action 1**	Work with the NSW Government to reduce vehicle kilometres travelled (VKT) by all vehicle fleets by creating a city for walking, cycling and public transport to reduce transport-related emissions.
Resilience Strategy 2023-2028	**Action 5**	Support our community to cope with increased heat and drought

5. Endnotes

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Attachment C

Final A City for Walking Strategy and Action Plan – Continuing the Vision



June 2024

"A City for Walking": Strategy and Action Plan – Continuing the Vision

We acknowledge the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

CITY OF SYDNEY

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1. Introduction

A note on terminology

This strategy and action plan uses the term 'walking', which includes all people moving on the footpath; people using mobility and sensory aids, including wheelchairs (motorised and manual), walkers and the like; people pushing prams and other carrying devices including for deliveries; and people using unpowered scooters, skateboards and rollerblades.[1] 'Walking' does not include people on bikes or e-scooters, although it is noted that children and youths can legally ride bikes on footpaths with their guardians.



Photo: Chris Southwood / City of Sydney

A strategy and action plan to deliver a city for walking

Our communities want a city for walking.

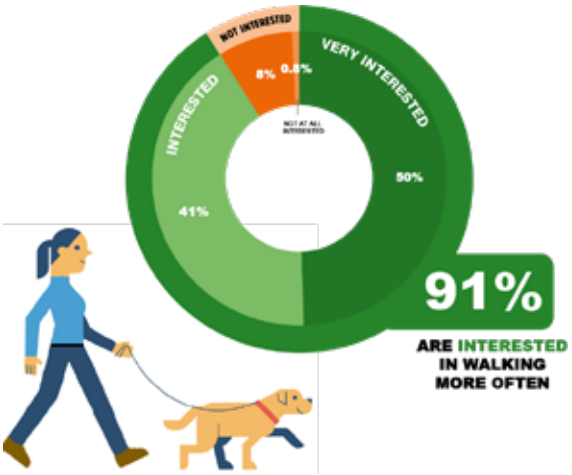
> When asked for words to describe Sydney in the future, 'safe', 'sustainable', 'green' and 'walkable' consistently came up as the most popular choices.
>
> – *Sustainable Sydney 2030–2050 Continuing the Vision* consultation

The communities of the City of Sydney have told us they want a more walkable city, with fewer or no cars in the city centre: a city where there is "space to walk, bike, stroll, jog, chat, rest, relax and enjoy life." They want streets with more trees, gardens and plants; more space for walking; and more space for children to play and for socialising. They want a city that is easy for all ages, all people and all mobility levels.

If a city like this can be provided, 91% of people in Sydney would be 'interested' in walking more, and 50% would be 'very interested' in walking more (Figure 1).

"A City for Walking": Strategy and Action Plan – Continuing the Vision (the 'Strategy and Action Plan') responds directly to the voices of our community. We need a proactive strategy and action plan to guide decision-making and make progress to becoming a more walkable city. We have already accomplished significant strides in making the City of Sydney more walkable since the introduction of our first walking strategy in 2015. But there is still much to do.

Figure 1. Sydneysiders' interest in walking more often



Source: City of Sydney.
Active Transport Survey 2021.

This strategy and action plan outlines the approach of the City of Sydney (the 'City') to become a city for walking within our local government area (the 'local area', 'area' or 'our area'). The strategy and action plan identifies the focus of our activities for our area to become more walkable in the short-term. The actions identified are either within the City of Sydney's control or ability to influence.

This document was developed with input from a panel of experts in walking across Australia to ensure that we are keeping up with current best practice.

Continuing the vision

The City of Sydney's first walking strategy was published in 2015. Since then, much has been achieved (Pop out box 1). So, it is a good time to take stock and examine how to continue to improve walking in our area. The City of Sydney's flagship strategy, *Sustainable Sydney 2030–2050 Continuing the Vision*, published in 2022 provides direction for continuing the vision. This Strategy and Action Plan takes the ideas and projects from the last walking strategy and renews them to align with *Sustainable Sydney 2030–2050 Continuing the Vision* and new policies of the NSW state government.



Photo: Chris Southwood / City of Sydney

Achievements since our last walking strategy

We have made good progress towards making our city more walkable since our 2015 walking strategy. The City typically spends over $28 million per year[2] on walking-related improvements, including footpath upgrades, new crossings, streetscape upgrades and traffic calming. Some notable achievements are below (image credits in endnotes).



We continually undertake streetscape upgrades such as Macleay Street, Potts Point, at a rate of 3 to 5 projects per year.



We have pedestrianised streets – notably George Street (pictured) and Devonshire Street.



We have improved wayfinding across the local area, including with 2,560 tactile signs and 145 pylon signs.



Speed limits have been reduced so that now over 75% of streets are 40 kilometres per hour (km/h) or under.



Over 700 trees are planted per year, including 150 in the road area.



Signal times have changed throughout the city centre from 120-second to 90-second cycles.



Successful events and programs have been held including outdoor dining, temporary dining areas, parklets and City Streets festivals.



We have increased lighting, seating and accessible public toilets.



We have added more pedestrian crossings, raised wombat crossings and continuous footpath treatments.

All of these achievements have led to significant improvements in the experience of walking. In 2007, a person walking along Park Street between College Street and Sussex Street would have spent 52% of their walking time waiting at intersections. Through working with Transport for NSW to reduce delays across the city centre, by 2020 only 20% of the same trip would be spent waiting.[3]

Walking improvements have also led to increased diversity in who uses the city centre. While the city centre was once mostly used by young adults, there has been a shift towards more diverse age groups, particularly in areas like Darling Harbour and Chinatown, where there has been more investment in public space.[4]

What is a 'city for walking'?

What is a 'city for walking'? A city for walking is easy, inviting and convenient. It is inclusive and has infrastructure and public spaces that are accessible.

A city for walking has destinations and activities to walk to: parks, shops, schools, universities and workplaces. It is safe and it feels safe. It has space to move around, and also has space and places to stay and linger, with street furniture, art and greenery that make it comfortable and inviting.

A city for walking is welcoming, where public create social connections and where people feel included. A city for walking is fun and interesting.

These elements are often referred to as 'walkability'. Many parts of Sydney have these elements and the basis for these elements, but there are areas we can improve (See *Challenges and Opportunities*).

The following sections explain some of the words and phrases used in the Strategy and Action Plan.

Walking: Walking includes all people moving on the footpath, including people using mobility aids or pushing prams, using unpowered scooters, skateboards and rollerblades. Walking can be for transport (for example, walking to work or the shops) or for recreation (for example, walking the dog, sightseeing or taking a stroll in the park). People walking can easily switch to other activities, such as shopping or stopping to chat with a friend. In this sense, walking is a way of transport but it is also a form of public life, a way of moving in the community. All types of walking are important to this strategy and action plan.

Walking is so common and we do it so much as part of all our journeys that most people do not identify themselves as a 'walker' or even notice when they are walking for a period or distance. This means that walking sometimes does not get the attention it deserves. Whether people are walking for a minute or an hour, the experience is important.

Walking takes different forms. For example, people who use a wheelchair, cane, walker or motorised scooter. Accessibility, safety and inclusion needs to be carefully considered to achieve a walkable city for people with disability for people of all ages and people of diverse sexualities and genders and intersex people. Can they get to where they need to go? Do they feel safe while doing so? Do they feel part of the community and included? Cities can follow the 7 Principles of Universal Design[5] to improve access and inclusion for all people, including people with disability – resulting in streets and neighbourhoods that can be used and enjoyed by everyone.[6]

Walkability is the sum of "factors within the built environment that make it convenient, comfortable and safe to walk."[7] Walkable places are compact, dense and mixed-use environments that allow people to meet their daily needs without needing to drive.

Walkability is about creating inclusive places. Many Australians do not have a driver licence, due to age, health conditions, disability or personal choice, and many more have their licence but do not feel comfortable driving. In the City of Sydney, more than a third of households do not own a car.[8] Walkable places make sure that everyone is able to participate in society and go about their daily lives with independence and autonomy.

In particular, people using wheelchairs or mobility devices have a right to access places used by the public.[9] The City of Sydney's *Inclusive and Accessible Public Domain Policy and Guidelines*[10] set out clear minimum standards to remove access barriers and provide best practice in access for people with disability. The principles of Universal Design are also important in considering how to create places that are accessible, usable, convenient and enjoyable for all. Walkable places that are accessible and inclusive are good for everyone – not only people with disability.[11]

Walking needs

To create a city for walking that is inviting for everyone, some fundamental needs should be met. The hierarchy of walking needs (Figure 2) illustrates what some of these needs are, from basic infrastructure that makes it possible to walk safely to providing reasons to walk and making walking comfortable and inviting so that people *want* to walk.

Figure 2. Hierarchy of walking needs



Source: Matan (2021), adapted from Pedestrians First[12] and Alfonzo[13].

"Every investment in walkability is also an investment in rollability; wheelchair users are among those who benefit most when footpaths become safer."

- Jeff Speck, Walkable City Rules

All of the elements in the hierarchy work together, and all are important. Some elements will be more important to some people than others. For example, some people will find that having a park nearby increases their desire to walk; for others, a nearby train station is more important. Some people will want to walk on a concrete path that is uninterrupted and easy, while others may be happy to walk on a grassy hill. Whatever people prefer, it is important to provide the basic necessities so that walking is inviting for people of all ages so that we are creating a city for walking for everyone.



Photo: Katherine Griffiths / City of Sydney

Benefits of a City for Walking

The social, economic, environmental and health benefits of walkability are established and are measurable.[14] Walking is healthy and sustainable. It produces little to no carbon emissions. It improves physical and mental health. It is important for inclusion and equity. It is flexible and low cost. It provides independence and exercise. It contributes to sense of place and community and to social cohesion. It helps reduce the risk of loneliness and isolation.[15] It reduces congestion and uses less space than other transport modes.

Walkable places have been found to also have economic benefits including increased productivity, improved property values and support for local business,[16] along with the economic benefits that flow from improved health outcome. These benefits can be quantified.

- The Queensland Government estimated that a person walking 20 minutes to work and back provides $8.48 to the economy from benefits and savings related to decongestion, health, vehicle operating costs, infrastructure savings and environmental benefits.[17]
- Studies in the United Kingdom found that the cost–benefit ratio of walking (and cycling) interventions is around 13:1.[18]
- The City of Melbourne, looking at the value of walking connections in the city centre, determined that making pedestrian connectivity 10% worse in the city centre would cost its economy $2.1 billion.[19]

Moreover, the evidence showing the economic benefits of walking often does not account for the contribution to the economy from people walking in areas with shops and restaurants. A study of restaurants in Brisbane found that businesses overestimated how much people driving spent by three times while at the same time underestimating how much people walking spent.[20] In reality, people walking tend to be the biggest contributors to economic activity. A survey of businesses on Acland Street in Melbourne found that 57% of the expenditure on the street came from people who had walked to the street, with only 26% coming from people who drove there.[21]

Walkable places are also crucial in creating community and connection. Australia is experiencing a loneliness epidemic. One in four Australians are lonely,[22] and loneliness is increasing, which has a significant impact on people's physical and mental health. Loneliness is more acute among people living alone, who make up 40% of households in the City of Sydney. Walkable environments help with loneliness by

creating informal opportunities for people to connect with each other. Whether it's bumping into a neighbour or an old colleague on the street, saying hi to your barista or nodding at the person who walks the dog at the same time as you, walking helps to create networks of loose connections that collectively form communities. These casual acquaintances are important. Not only are they what tie neighbourhoods together, but research shows that those with larger networks of these 'weak ties' tend to be happier overall and experience a greater sense of belonging.[23]

Walkable environments are also a key ingredient of precincts, activity centres and innovation hubs since chance encounters help spark and spread ideas.[24] A strong focus on walking needs and creating space for interaction is critical to the success of these precincts, including Tech Central, touted by the state government as "Sydney's innovation heart".[25]

Walking in the City of Sydney

Walking now and in the future

Walking and a good walking environment is important to the City of Sydney now and in the future with the population and employment projected to grow within the local government area. The number of the people in the our area daily – residents, workers and all visitors – will grow from the current 1.2 million to 1.7 million in 2036 and to 2 million in 2050. There are likely to be up to 100,000 extra jobs in the city centre.[26]

The Sydney city centre contributes over $90 billion in economic activity annually, and the City of Sydney local government area generates $130 billion which is nearly 8% of the total national economy. The city centre has the highest concentration of top 500 companies in Australia and the largest retail centre.[27] It is, to a large degree, Australia's business brand with the headquarters of globally influential and innovative firms concentrated in the central business district (CBD). Walking and a good walking environment is very important to workers but also for continuing to attract businesses.

How we walk

– In our city centre, people make almost 1.3 million trips per day, of which 92% are walking trips.[28]

– Within our area, people are making around 3.4 walking trips a day and have an average daily walking time of 32 minutes.[29]

– In our area, 37% of our households do not own a car – much higher than the overall 11% across Greater Sydney.[30]

– A total of 31% of residents walk to work, and 27% use public transport to get to work which usually includes at least one walking trip.[31]

– Some city centre streets carry 3 to 4 times more people walking per day than some motorways in the area. Parts of George Street, for example, had over 100,000 people walking on it per day in 2019.

– How we use the city centre has changed after the COVID-19 pandemic. Tuesday to Thursday have the highest activity levels during the day,[32] reflecting the trend of working from home on Mondays and Fridays. However, in terms of spending, weekends are busier now than pre-pandemic, with weekend night-time spending up 15% compared to pre-2019.

Challenges and opportunities

Geography: Sydney's geography is one of its greatest assets. Part of why people love Sydney is the beauty of the area, the hills, cliffs and harbour edges. The colours of green and blue in the land and sea are part of what makes walking enjoyable and restorative. Environments with nature – trees, grass and plants – have been shown to increase wellbeing and reduce stress and mental illness. This has been shown repeatedly in studies, both locally[33] and overseas. Having access to the ocean, lakes, fountains and other water features – easy enough in the City of Sydney – is also beneficial for health and wellbeing.

However, our geography also poses challenges. Sydney is a hilly place. Slopes and hills can be the cause of access issues, particularly for people with disability. They can add significant distance, real and perceived, to travel. Research with the University of New South Wales (UNSW) found that in our area, a 1% increase in the maximum gradient

Figure 3. Our busiest footpaths have comparable volumes of people to our motorways



Source: City of Sydney pedestrian counts (2019), TfNSW Traffic Volume Viewer (2019).

along a route made the walking trip feel 21 meters longer.[34] If a walkway is too steep, without offering accessible alternatives, it can be a complete barrier to some people.

Number of people: The City of Sydney is visited by over 1.2 million people per day, which will grow to 2 million by 2050. This many people cannot all be accommodated in cars as there is simply not enough space for them, which means that walking will need to play a significant role in making this growth possible. We need to take walking seriously, particularly in the city centre and places with high projected growth such as Green Square.

While almost all our streets have connected footpaths on both sides, there is room for improvement. Delays, disruptions and crowding all limit walking within our area. Transport for NSW looked at walking in strategic centres across New South Wales using mobile phone data; it found that while the Sydney CBD had the highest walkability score of all of the NSW strategic centres studied, it had about 6% less walking than would be expected given the level of connectivity. We can – and must – do better.

Delays and detours: Delays reduce the walkability of our area and add to the perceived cost of walking.

Traffic signals are a major cause of delay for people walking and can account for a large proportion of the time it takes to walk somewhere. Inconvenient intersections, particularly those with long wait times, decrease how far people are willing to walk by some 10% to 20%.[35] Research in partnership with UNSW[36] within our area found that a single turn in a path is the equivalent of adding 18 meters to a walking trip. For short walking trips, this can add considerably to the perceived distance of a trip.

These inconveniences have real-world costs; the City of Melbourne found that if they reduced delays for people walking by optimising traffic signals at four locations in their city centre, the economic benefit would be approximately $6.3 million per year.[37]

Competition for space on footpaths: Footpaths are used for many other things than just space for walking. Some are beneficial to walking such as outdoor dining, lighting, trees and seating. Some are not, such as traffic signals and signs, electric boxes and electric poles. They are a mix of temporary, semi-fixed and fixed objects (see Figure 4), and have varying impacts on walking depending on the size, location and impact on site lines. How we address different the different competing uses for space depends on these factors.

Many footpaths are too congested or narrow for all the functions they need to perform. Crowding is particularly prominent at areas of waiting such as signalised intersections. Reducing wait times would help alleviate this.

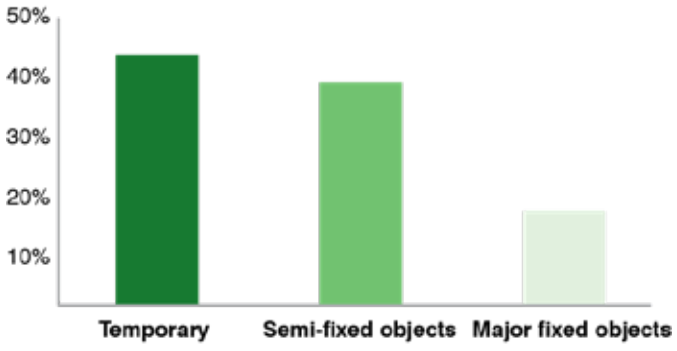


Photo: Chris Southwood / City of Sydney

Road space allocation: The allocation of space on many of our streets reflect transport planning decisions of the past, which prioritised space for vehicles over people walking. Overall, only 40% of street space in the city centre is allocated to footpaths, even though there are 5 times more people walking than driving on an average street.[38] The City of Sydney is seeking to redress this imbalance in our area through our local public domain plans and local improvement schemes to put people walking at the top of the priority list, in line with the recently adopted Transport for NSW *Road User Space Allocation Policy*. There have been some significant changes in the balance of street space allocation throughout our area, such as in George Street, Pitt Street and Crown Street with more projects in the pipeline for Oxford Street, Loftus Street and Castlereagh Street. But more needs to be done, faster.

According to Transport for NSW's Walking Space Guide (see left), many of the footpaths in our city centre provide adequate space for the number of people walking. However, many do not, and many will not in the future. Road space reallocation will be an important part of accommodating the future growth in walking.

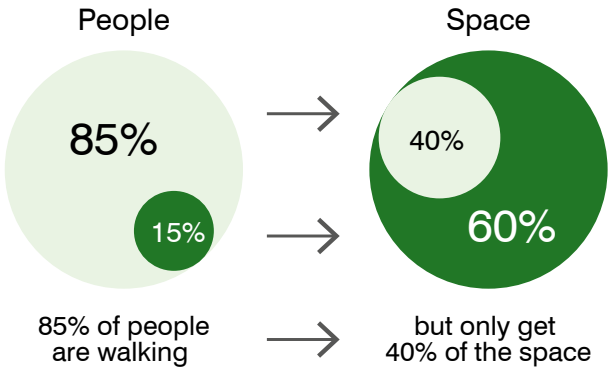
Figure 4. Temporary objects are the most common footpath obstacles



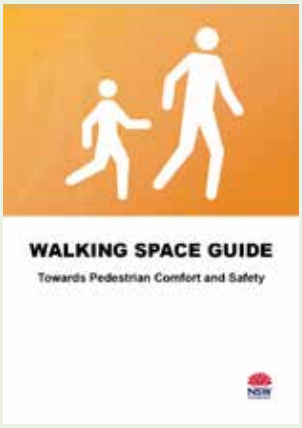
- **Temporary**: Includes bins, outdoor dining, temporary signage and parked motorbikes.
- **Semi-fixed objects**: Includes kiosks, wayfinding, bollards, street furniture and bicycle racks.
- **Major fixed objects**: Includes trees, traffic signal boxes and construction hoarding.

Source: Adapted from the City of Melbourne Transport Strategy.

Figure 5. Road space allocation is not fair



Source: Adapted from UNSW Walking Deep Dive[39]



Explainer: Walking Space Guide

The Transport for New South Wales (TfNSW) Walking Space Guide, published in 2020, provides a set of standards and tools for planners to ensure that sufficient space is provided for people to be able to walk comfortably and safely. Clear widths are recommended based on street classification and volume of people, and traffic buffers and other allowances are to be provided in addition to this. The Guide is to be used for all footpaths on streets, but not for walking space within transport interchanges (which the City defines as the ticketed area within a station).

Traffic volumes and speed: The amount of traffic and its speed are issues for people walking throughout our area. Traffic reduces safety and amenity and contributes to noise and air pollution. How people feel in their local area is shaped to a large degree by the speed and volume of traffic.

Through-traffic (people *driving through* rather than *to* an area) is also a problem, particularly in the city centre where traffic is funnelled onto the streets instead of through the underground Cross City Tunnel. This traffic creates an unpleasant environment and makes it challenging to reallocate space to people walking.

Severance: Severance refers to physical and psychological barriers that impact on the ability for people to walk where they want to go. It can refer to roads or public transport infrastructure that are difficult to cross, large city blocks, or parks without accessible paths.

Major roads throughout our area present significant barriers to walking, particularly where the crossings are too far apart or have intersections that are missing pedestrian crossings. Some of our most important streets, including King Street in Newtown and Botany Road, have distances of 300 meters or more between crossings. This is a serious barrier for people walking and adds significant distance and time, particularly as the major roads such as these also often have more traffic travelling at higher speeds, all adding to the degree of severance.

Red tape: There are many opportunities throughout our area to add interest and encourage exploration through walking – such as the inclusion of public art, murals and water features – but these tend to be concentrated in major areas. If residents want to do a temporary activity, such as a street party or festival, the process to obtain permission can be involved and lengthy. For example, applying for a temporary road closure for a community event takes a minimum of seven weeks. This inhibits the creativity of our community and reduces motivation to be more active.

The NSW government recently changed the law to expand what councils are able to do without state approval, including installing zebra crossings and planting trees in parking lanes. This is a step in the right direction to make it easier for councils to create liveable places and make our streets more walkable. We need to look for other ways to streamline improvements for walking.

Strategic Framework: Delivering Sustainable Sydney 2030–2050 Continuing the Vision

This Strategy and Action Plan is embedded in the *Sustainable Sydney 2030–2050 Continuing the Vision* suite of documents,[40] in order to deliver *Direction 5: A City for Walking, Cycling and Public Transport*.

Under this Direction, the *Community Strategic Plan: Delivering Sustainable Sydney 2030–2050* includes five outcomes to be achieved by 2050.[41] The Strategy and Action Plan also aims to deliver these outcomes.

Sustainable Sydney 2030–2050 Continuing the Vision – Direction 5: A City for Walking, Cycling and Public Transport

Outcome 5.3: More people walk more, because walking is the most attractive and convenient choice for short trips in the local area.

Sydney by 2050:

– People are prioritised by increasing the capacity, quality and amenity of our streets.

– The experience for people walking will be enhanced for everyone by improving safety, quality, accessibility, and comfort including for children walking in their neighbourhoods and to school.

– The City is legible and intuitive to navigate, supported by a comprehensive wayfinding system.

– People are prioritised at key intersections, reducing wait times, and improving safety.

As walking is inextricably linked with place, the Strategy and Action Plan also helps to achieve the 2050 outcomes listed under *5.1 Street space is reallocated for people, places and planting*.

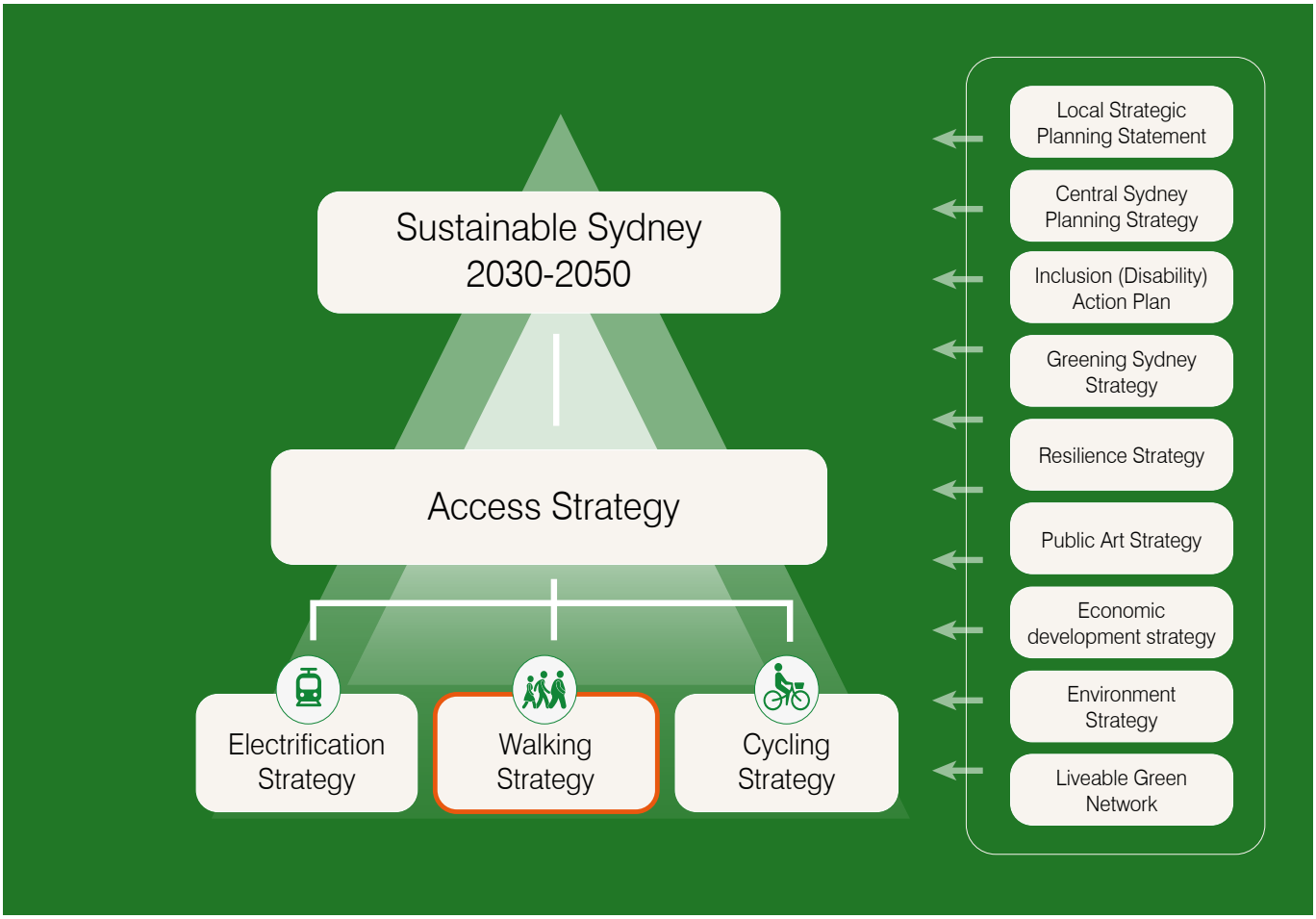
This strategy should also be read keeping in mind that our streets must meet a multitude of needs, notably loading and servicing. This is recognised in Outcome 5.1 which reads "Freight, servicing and parking will be managed to support the efficient functioning of the city while improving the amenity of city spaces". It is important that we maintain access for freight, delivery and service vehicles as road space is reallocated.

The *Access strategy and action plan: continuing the vision* which covers all modes of transport across the area, contains the explicit action to develop a walking strategy. Walking improvements take various forms from lighting and kerb ramps to public art and planning controls, so there is also a strong relationship between the Strategy and Action Plan and the City of Sydney's other relevant strategies and action plans.



Sustainable Sydney 2030–2050 Continuing the Vision

Figure 6. Relationship between the Strategy and Action Plan, *Sustainable Sydney 2030–2050 Continuing the Vision* and other strategies



Target and measures

Direction 5 in *Sustainable Sydney 2030–2050 Continuing the Vision* provides the adopted targets and measures for the Strategy and Action Plan, which are listed below. The plan does not introduce additional targets or measures but instead identifies actions and areas of focus to help achieve them. The targets are:

- **By 2050 people will use public transport, walk or cycle to travel to and from work.** This includes 9 out of 10 people working in the city centre and 2 out of 3 people working in the rest of the local area.
- **By 2030 every resident will be around a 10-minute walk** to what they need for daily life.

In addition, this Strategy and Action Plan helps to deliver the following targets which relate to other Directions within *Sustainable Sydney 2030–2050 Continuing the Vision*:

- **By 2035 we will achieve net zero emissions** in the City of Sydney local area.
- **By 2050 there will be a minimum overall green cover of 40%**, including 27% tree canopy cover.
- **By 2050 community cohesion and social interaction will have increased** … at least 75% of the local resident population feeling part of the community, agreeing most people can be trusted and believing that when needed, they can get help from their neighbourhoods.

Achievements towards these targets will be measured through the increase of walking in the local area from walking counts which measure the average growth across sample locations.



Photo: Chris Southwood / City of Sydney

Figure 7. Responsibility and control in walking projects

City has responsibility/control	City has shared responsibility/control	City does not have responsibility/control
Footpaths (and accessibility infrastructure)	Space allocation of streets	Traffic signals and phasing
Trees and planting	Traffic control signage	State roads
Parking enforcement, policy	Parking controls and enforcement	Speed limits
Lighting (most)	Access around schools	Bus stop locations
Bus shelters	Through-site links	Telephone and electric boxes
Street furniture (most)	Pedestrian crossings	Utility pits/service locations
Community engagement	Road safety	State parks
Personal security	Funding	Speeding enforcement
Wayfinding, signage		Clearways
Public toilets, bubblers		Public transport infrastructure
Parks		
Footpath use policies (e.g. display of goods) and outdoor dining management		
Planning controls		

The City of Sydney's roles and responsibilities

Walking interventions and walking projects are often split between levels of government and between different departments and private developers. This is partly because of the diversity and breadth of walking projects, which could be a new footpath, lighting, a new park, street trees or activations such as street parties and outdoor dining, along with planning, land use and development decisions, including the location of public transport.

As a local government, we control many but not all of the elements that influence walking. Some, such as speed and street space allocation, need approval from, or collaboration with, the state government. Other elements are out of our control completely, but which we can seek to influence. Figure 7 gives examples of activities in each of these categories. It is not a complete list but is provided to improve understanding of the complex roles and responsibilities in delivering a city for walking.

Where responsibility is shared, we work collaboratively with state government agencies including Transport for NSW, Department of Planning, Housing and Infrastructure and the Department of Education. Where responsibility is outside our control, we advocate for good outcomes.

Exclusions

The Strategy and Action Plan does not cover all of the actions that the City of Sydney undertakes in regard to walking. Actions that are covered in City strategies and adopted policies that influence the Strategy and Action Plan, such as the Inclusion (Disability) Strategy and the Inclusive and Accessible Public Domain Policy and associated guidelines, are not covered. Adopted actions relating to walking are listed in Appendix F.

2. Strategy

Introduction

This section outlines our strategy for walking in the City of Sydney. The Strategy and Action Plan is structured around the hierarchy of walking needs introduced in Figure 2. Starting from the basic infrastructure that is needed and moving through safety, comfort and experience, the strategy sets out the approach and principles that the City of Sydney will take for each walking need, as well as why the principle is important, and the actions that will be taken to achieve the approach.



Photo: Katherine Griffiths / City of Sydney

Here is a summary of the principles underpinning each element of the strategy:

Strategy	Principles
Strategy A – A city where people can walk	
A1	We will ensure that there is sufficient space for people to walk.
A2	We will improve connectivity for people walking by ensuring there are frequent street crossings that give people priority and that align with people's walking routes. We will ensure that footpaths and crossings are accessible so that everyone can use them.
A3	We will plan our city based on 10-minute neighbourhoods so that people are able to meet their daily needs easily by walking.
Strategy B – A city where people can walk safely	
B1	We will make it safer for people to walk by reducing vehicle speeds.
B2	We will reduce traffic volumes on surface streets and manage through-traffic in residential neighbourhood streets to improve both safety and experience for people walking.
B3	We will work to make all people feel safer while walking around our city.
B4	We will work to improve compliance with road rules, especially the lesser-known rules that benefit people walking.
Strategy C – A city where walking is comfortable	
C1	We will make our streets and public spaces comfortable and inviting by ensuring that they are green and cool.
C2	We will make sure that there are frequent opportunities for people to stop and rest, use the toilet or have a drink of water.
C3	We will make our city more pleasant to walk in by reducing noise and air pollution from traffic.
Strategy D – A city where walking is fun	
D1	We will make all streets interesting to walk along by ensuring that built form has active, permeable frontages that invite engagement and curiosity.
D2	We will use design, activations and installations to create neighbourhood-based community and encourage people to interact with their streets.
D3	We will make it easier for the community to use their streets how they want to.
Strategy E – A city that is a leader in walking	
E1	We will lead the way in evidence-based planning for walking.
E2	We will continue to lead the way by sharing knowledge, skills, lessons learnt and data with other local governments and organisations.
E3	We ensure that how we talk about walking reflects the diversity and differing needs of people walking.
E4	We will encourage more walking through targeted behaviour-change programs and campaigns, and encourage people to tell us what would make walking better for them.

Strategy A
A city where people can walk

Principle

A1 We will ensure that there is sufficient space for people to walk.

Approach

We will ensure that all footpaths and shared zones have a continuous accessible path of travel free from obstructions.

Wherever possible, we will increase the space available for people walking by:

- Decluttering footpaths by working with relevant stakeholders to determine more appropriate locations for their infrastructure or how more space could be provided for people walking at that location.
- Reallocating road space from vehicles to people.

Space for people walking and infrastructure that supports walking – such as benches, bins, bubblers and trees – will be the primary considerations on a footpath. Footpaths that have surplus space for people walking can then be considered for additional infrastructure and uses, such as outdoor dining and bicycle parking, including share bike parking. **Where the footpath is not wide enough, these other uses should be placed within the carriageway.**

We recognise that there is growing concern around people cycling on footpaths. See the explainer box on page 27 for the City's approach to this issue.

Construction activities may require temporary closure or impacts to footpath widths but we will make every effort to ensure that direct, accessible and safe walking paths are maintained. We will develop guidance on planning construction activities to minimise the impacts on people walking.

Justification

We know that the first step to being a city for walking is to make it possible for people to walk. We will provide space and infrastructure that enables people to walk. This starts with making sure footpaths are continuous and connected, accessible and wide enough for the number of people who use them. This is particularly important in the city centre, where there are more than 1.3 million trips made daily, most of them walking trips.[42] We will address the problem of space by assessing people's current and future needs, addressing footpath clutter and actively reclaiming space for people.

Many footpaths in Sydney are crowded and uncomfortable for walking. Some level of crowding is good for a sense of activity and security, but on many footpaths, particularly at intersections, the crowding means that it is hard – and sometimes unsafe – to wait. Currently, footpaths have a lot of uses to fulfill but little space to do them. Reallocating street space is the main way we can create more space on footpaths for people walking.

Case study: George Street

The pedestrianisation of George Street is an example of the City and NSW governments working together to improve public space and walking outcomes. Where George Street was once a heavily congested, unpleasant street it is now the pedestrian spine of the city, providing space for people to enjoy. The initial project was so successful that it was extended south to Central station and a trial of a further closure between Hunter and Bridge Street started in late 2022.





Principle

A2 We will improve connectivity for people walking by ensuring there are frequent street crossings that give people priority and that align with people's walking routes. We will ensure that footpaths and crossings are accessible so that everyone can use them.

Approach

We will provide more crossings through our own delivery programs and create local guidance on the design and location of crossings to support this.

We will advocate for improving pedestrian priority at signals including:

- a maximum wait time of 45 seconds and a target of 30 second at all signals
- more crossings on state-controlled roads
- more pedestrian priority signals where the default setting is a green light for people walking (see explainer)
- automatic phasing so that people don't need to 'request' to cross by pushing a button
- ensuring that 15% or less of walking journeys is spent waiting at traffic lights as per best practice[43].

All crossings will have kerb ramps and will provide a continuous, accessible path for people using wheelchairs or mobility devices.

Justification

Walking is typically most enjoyable when it is uninterrupted. For a public space to be walkable, for the comfort of pedestrians it is important that people can cross streets regularly, easily and safely; however, streets often prioritise vehicular traffic and movement.[44]

Waiting at signals to cross can make up a significant proportion of time on a walking trip and can make major roads feel like both a physical and psychological barrier to walking. For someone walking along Park Street between College Street and Sussex Street, in 2007, 52% of their walking time would be spent waiting at lights. We have been working with Transport for NSW to reduce delays across the city centre and by 2020, only 20%[45] of the same trip was spent waiting. However, there is still much more to do – particularly across major roads.

Research has shown that 30 seconds is the longest people are willing to wait at traffic lights before getting impatient,[46] so getting this right also improves the safety of people walking by reducing the incentive for them to cross against the lights.

Explainer: Different types of crossings

There are different ways of giving people priority when crossing the road.



Continuous footpath treatments involve creating a visually distinct and continuous pathway for people walking that extends across the side road or driveway without interruptions. The treatment often includes raised pavement and different paving materials to indicate that people walking have right of way.



Pedestrian priority traffic lights are traffic lights where the default is a green light for people walking and cycling, until vehicles trigger the detector. The Rainbow Crossing at the corner of Bourke Street and Campbell Street (pictured) is a well-loved example.



Zebra crossings are pedestrian crossings marked with white stripes where drivers have to give way to people walking.



Wombat crossings are zebra crossings that are raised to increase visibility for approaching drivers and slow down traffic.

We also need frequent crossing opportunities so people don't need to walk far out of their way to cross the street. Some of our major roads such as King Street in Newtown and Botany Road have gaps of 300 metres and more between crossings; this could add up to 5 minutes to a walk.

Beyond signalised crossings, there are other ways to indicate that people have the right of way when crossing a street. Zebra crossings and the raised equivalent, wombat crossings, clearly give priority to people walking when they are crossing the street. Continuous footpath treatments, where the surface treatment of the footpath continues across a side street, are another way of reinforcing priority for people walking along a main street where they already legally have the right of way.

Principle

A3 We plan our city based on 10-minute neighbourhoods so that people are able to meet their daily needs easily by walking.

Approach

We do this through a planning framework that provides opportunities for local businesses and services close to where people live.

As people also need to travel beyond this range, we will provide mobility parking and advocate for public transport that meets these needs.

Justification

For walking to be a viable transport option we need sufficiently dense, mixed-use environments where daily needs are within easy walking distance. The need for a missing grocery item has motivated many walks to the store, as has the need to get a house-bound child to the playground. However, these require a city planned so that people have the option of doing these things on foot, through local centre and mixed-use zoning and creating fine-grain, human-scale development.

Case study: Pitt Street

The Pitt Street cycleway and street upgrade between King Street and Reiby Place was made permanent in 2022. The project upgraded the public domain and reallocated traffic lanes to both walking and cycling space, narrowing the street to one traffic lane. The project has calmed traffic and made the street more pleasant to walk along, as well as enabled people to cross informally along its length.



Photo: Abril Felman / City of Sydney

Through-site links – publicly accessible walkways through the middle of a privately owned site – and the creation of new streets in large developments are ways to increase the ability to walk. Both decrease the distance that people need to walk by providing alternatives to walking around very long blocks. When we masterplan urban renewal precincts or major development sites, we may require new streets or links in our development control plan, so people can move more easily and quickly.

Explainer: Countdown timers

Countdown timers, such as the ones installed at Martin Place, display the number of seconds people crossing the street have until the red walking signal displays. These popular crossings allow people to decide about whether there is time left for them to cross. They can be particularly helpful for people who may be less mobile or have hearing impairments. There are 18 countdown timers in the City and we continue to advocate for more.



Photo: Chris Southwood / City of Sydney

Strategy B
A city where people can walk safely



Photo: Chris Southwood / City of Sydney

Principle

B1 We will make it safer for people to walk by reducing vehicle speeds.

Approach

We will work to reduce vehicle speeds by:

- Advocating for and working with Transport for NSW to implement speed limits of 30 km/h in the city centre, high streets, residential streets and around childcare centres, schools, universities and health establishments. We will work towards a maximum of 40 km/h on all other streets within our local area. None of our residential streets should have a speed limit of 50 km/h.
- Creating streets so that people driving slow down by narrowing roadways, planting trees and installing raised crossings and other traffic calming measures and ensure we have design standards consistent with these outcomes. The provision in the Sydney Development Control Plan that applies to traffic speed is 40 km/h on collector streets, 30 km/h on local streets and 10 km/h on laneways.[47]

Figure 8. Serious injuries and fatalities in City of Sydney, 2017–2021



Justification

Safety is paramount to a walking city. People need to be able to move around safely in order to walk. People walking are particularly vulnerable to conflicts with people driving, particularly when crossing the road.

Reducing vehicle speeds is the single most effective way of improving the walking environment, and lowering vehicle speeds reduces both the severity and number of crashes. At an impact speed of 40 km/h, pedestrians have a 40% risk of death. This falls to about a 10% risk of death if the impact speed is 30 km/h.[48] Equally important is that lower vehicle speeds reduce the chance of collision because they allow more time for all road users to react.

Of all the crashes that occurred across our area in the last five years, people walking accounted for twice as many serious injuries and deaths as people driving. In the city centre where there are the most people walking, the statistics were even worse – over 24% of crashes involved people walking, of which 74% were crashes that resulted in serious injury.[49]

Case study: 30 km/h in Manly

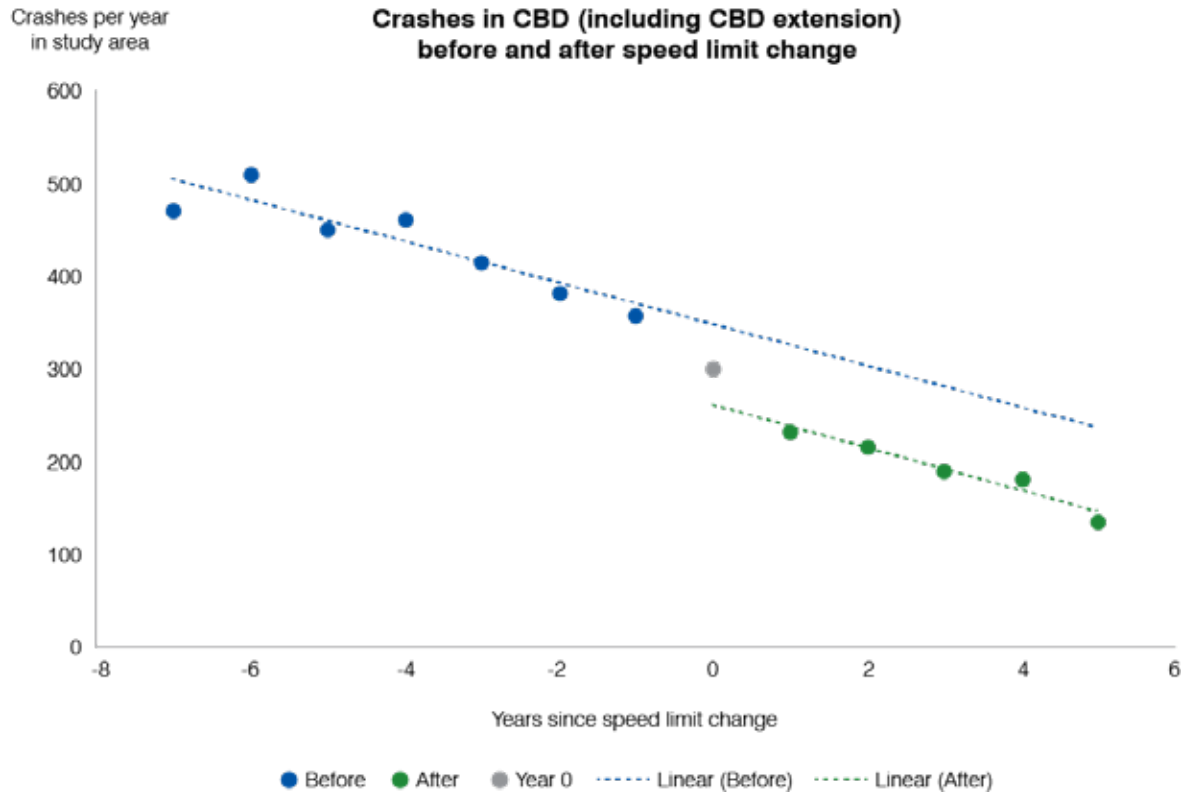


In partnership with Transport for NSW, the Northern Beaches Council reduced the speed limit in the town centre and along the waterfront to 30 km/h in 2020.

Member for Manly James Griffin said that the new speed limits will allow more people to enjoy the streets of Manly and move around safely. The City of Sydney is keen to work with Transport for NSW to implement the new speed limit in suitable areas once the trial has concluded.

The City of Sydney has been progressively reducing speed limits across our area which has resulted in a significant change in the number of crashes, despite the growing numbers of people walking. We want all our local streets to have a maximum speed limit of 40 km/h.

Figure 9. City centre crashes before and after speed limit change from 50 km/h to 40 km/h



Principle

B2 We will reduce traffic volumes on surface streets and manage through-traffic in residential neighbourhood streets to improve both safety and the experience for people walking.

Approach

We will reduce traffic volumes on surface streets in our local area through local area traffic management plans and low speed treatments to reduce through-traffic while still enabling local vehicle access, i.e. access for people that are going to that destination. In the city centre, we can reduce through-traffic by reallocating road space from vehicles to people or pedestrianising streets (*Can I walk?*). Government investment in public transport, especially the Sydney Metro, is also making it easier to get around without a car.

The City of Sydney also has ambitious limits on parking spaces, discouraging vehicles from parking in the centre in the future.

We will create and/or review local area traffic management plans to avoid and reduce through-traffic on local residential streets.

Justification

Reducing traffic volume in local streets or places of high walking activity improves safety, simply by reducing the risk for people walking. Less traffic means less opportunity for cars to hit people. The stakes are high in the city centre because over 1.2 million people visit our local area every day. Higher traffic volumes expose all these people to a higher risk of injury or death.

Traffic reduction on local streets is equally important. In Australia, parents are very concerned about traffic safety and it is one of the main reasons[50] for the decline in children walking to school from 75% to 25% over 40 years[51]. Local streets should be quiet and safe for children to walk and play. This is just not possible with a high volume of traffic. Less busy streets also make it easier for people with sensory, physical and cognitive disability.

Reducing traffic volume also benefits other walking needs. For example, less traffic means streets form less of a barrier for people to cross (*A city where people can walk*) and has better health outcomes due to reduced noise and air pollution (*A city where people can walk comfortably*). Traffic volume even has impacts on connection and social cohesion; one study found that in areas with 2,000 vehicles per day residents were more likely to have 3 times more friends as compared to an area with 16,000 vehicles per day (*A city where walking is fun*).[52]

Case study: Traffic calming in Green Square

Our traffic calming plans manage and calm traffic on local roads, to improve safety, walking, cycling and public transport access for local residents. This intersection upgrade in Green Square has slowed average traffic speeds to below 40 km/h and made more space for people walking.





Principle

B3 We will work to make all people feel safer while walking around our city.

Approach

We will keep our area clean, well-lit and well-maintained, in order to make our streets accessible to all and ensure that people feel safer in their environment. We will also work with community partners to understand and address issues of harassment and intolerance that make certain groups feel unsafe on our streets.

We will engage and gather data from the community on how design and activation can improve perceptions of safety in public space, and examine how gender-inclusive process and design can support more walking journeys and participation in public life in the city including after dark.

Justification

Beyond the safety of roads, people also need to feel safe in order to want to walk. If they felt safer in public spaces, people would be more likely to walk, catch public transport and go out during the day and after dark53. The perception of streets or public spaces as being safe can differ across age, ability, cultural background and identity. For example, over 90% of women feel unsafe walking in Sydney at night, and 30% during the day.[54] For the women surveyed, inadequate lighting was the number one reason for feeling unsafe. Maintenance and cleanliness also add to the feeling of safety.

Some people, such as people of diverse sexualities and genders and intersex people, and some multicultural communities, can feel unsafe in certain spaces because of the behaviour and attitudes of others. It is important that the City work with these groups to understand the issues and develop strategies to address them, for example through the existing Hate Crime Awareness Campaign on which the City collaborates with the NSW government.

*City of Sydney analysis of NSW crash data (2018–2022).

Explainer: People riding on the footpath



With the increase in demand for rapid, low-cost food delivery and popularity of using share bikes, people riding on the footpath is a growing problem in the City of Sydney. Riding a bicycle on the footpath is only legal for children under 16 and those accompanying them, or people with special dispensation. The City recognises that making deliveries and travelling by bike are sustainable and low-cost transport options and we are working to improve all riders' awareness of their obligations to ride legally and safely, especially near people walking.

Shared paths, marked with a blue line and signage, are shared between people walking and people riding. In both cases, people riding must always give way to people walking. Our preference is always for separated cycleways or quiet on-road cycling wherever possible to improve the experience and safety for both people walking and cycling. However, in some locations this is not possible and shared paths are necessary. We will aim to only allow shared paths where the expected walking volumes and path widths mean safety and comfort can be maintained for people walking.

While we do not have the power to make or enforce road rules governing bikes on footpaths, we advocate strongly to the state government to appropriately regulate share bike operators and delivery companies to reduce riding and clutter on footpaths. We also run programs to encourage people to respectfully share space on shared paths and engage with food delivery services to educate riders on the road rules and available cycle infrastructure.

It is noted that in the 5 years between 2018 and 2022 there were 8 crashes resulting in serious injuries to a person walking caused by a person cycling in our area, however over the same period there were 108 caused by people driving as well as 10 fatalities*. As such, our primary focus remains on reducing vehicle volumes and speeds to keep people safe

Principle

B4 We will work to improve compliance with road rules, especially the lesser-known rules that benefit people walking.

Approach

We will actively raise awareness and work with Police and the NSW Government through the Local Government Road Safety Program to promote compliance of lesser-known Clarifying the right of way that prioritise the needs of people walking. We will increase clarity for all road users by not permitting things which create confusion over who has right of way, for example lights and audible sirens at driveways.

Justification

Road safety also involves making sure drivers follow the road rules. There are some rules that drivers are often not aware of that, if followed, would make it easier and safer for people to walk. For example, drivers must give way to pedestrians when turning or driving into or out of driveways. However, in many locations, sirens have been installed which cause confusion, make people walking uncomfortable and perpetuate the attitude that "people need to get out of the way of cars".

Other road rules that prioritise people walking which we will raise awareness of and advocate for their enforcement include:

- People walking have the same priority as cars in shared zones
- Cars must not stop or park in driveways if doing so blocks the footpath
- People aged 16 or over must not cycle on footpaths unless supervising children under 16.

Studies show that compliance with road rules relates to the perception of the chance of being caught and the severity of the penalty. Presently, the chance of being caught when road rules are not obeyed is very low. This aspect of compliance needs to be addressed to promote safe driver behaviour.

Strategy C
A city where walking is comfortable

Principle

C1 We will make our streets and public spaces comfortable and inviting by ensuring that they are green and cool.

Approach

We will do this by delivering the major projects in *Sustainable Sydney 2030–2050* – such as our Green Avenue projects – and by progressing the actions set out in the supporting *Greening Sydney Strategy* and *Urban Forest Strategy* to ensure greening is distributed equitably across the local area. Wherever possible, we will prioritise the reallocation of road space to allow the planting of large trees within the carriageway to improve walking space on narrow footpaths, calm traffic, and shade and cool our streets.

Justification

Heatwaves are Australia's deadliest natural hazard. They now arrive earlier, are hotter and last longer. Urban temperature extremes can present us with life-or-death situations. The 2011 heatwave killed 96 people and hospitalised almost 600, while the 2009 heatwave during the Black Saturday bushfires killed 374 people in Melbourne alone.[55] The health impacts of heat are also an equity issue. In our local area there are a number of priority communities who are at greater risk from heatwaves: people experiencing homelessness, renters (including people in social housing), the elderly, babies and young children and people with disability. These groups are at greater risk due to pre-existing health conditions or because their living conditions don't provide adequate shelter from heat. People from these groups may also be on a low income and therefore have less options to escape from the heat. The City's streets and public spaces, when well-shaded, provide a free and inclusive place to stay cool.[56]

Planting more street trees is one of the most important things we can do to make it possible for people to walk comfortably on hot days. Canopy trees significantly reduce daytime air temperatures through a combination of shade and evapotranspiration, the combined processes by



Photo: Mark Metcalfe / City of Sydney

which water moves from the earth's surface into the atmosphere. Individual trees can make a valuable difference to air temperatures and the more the better: above 40% canopy cover increases the cooling effect sharply.[57]

Trees also have other benefits for walking needs. They make it safer (*A city where people can walk safely*) by calming traffic and reducing vehicle speeds.[58] Without the sense of enclosure that trees provide, streets feel wider, and this sends the message to people driving that they can drive faster.

We also know there are significant benefits for health and wellbeing when people walk on green streets, particularly when the canopy cover is over 30%. At this level, Australian research has shown that greening can reduce the odds of becoming lonely by a quarter (*A city where walking is fun*).[59]

A study of how people chose their walking route showed that people often valued green views over directness. In fact, green views make the walk feel shorter than it is; the study found a 1% increase in greening reduced perceived distance by 0.3 metres.[60] This is in part because green streets make people feel connected to their environment and the people around them. Shade also protects people from dangerous UV light which causes skin cancer.

Case study: the City's wayfinding program

The City's wayfinding program has delivered clear and consistent wayfinding information including signage, clear mapping graphics, and web-based information to encourage people to walk more, and confidently find their way around the city.

The wayfinding system includes a network of tactile street signs at every signalised pedestrian crossing throughout our area, making it safer and easier for people of all abilities to navigate our streets.



Photo: Paul Patterson / City of Sydney

Principle

C2 We will make sure that there are frequent opportunities for people to stop and rest, use the toilet or have a drink of water.

Approach

We will provide regular seating and other amenities such as public toilets and water fountains through our street furniture program. We will use the Liveable Green Network to prioritise the location of new street furniture (see Appendix E).

Justification

Regular opportunities to stop and rest are essential for some people to be able to use streets on foot because they find walking for



Photo: Abril Felman / City of Sydney

longer distances a challenge. According to the 2021 Census, about 5,800 people, or close to 3% have a severe or profound disability that affects their ability to communicate, get around and care for themselves.[61] There are also many people with disability who visit and work in the City of Sydney. Seating is therefore essential for creating environments that are inclusive, as well as being important for making streets comfortable places to spend time for all people, inclusive of people with a disability, all ages and genders.

Older people can also be significantly impacted by a lack of seating. A British study, Standing Up for Sitting Down, noted that a lack of seating in public spaces limits the ability of older people to engage in public life and makes even simple chores like shopping stressful.[62] We want to create an inclusive and accessible city for everyone, and seating is a fundamental part of the puzzle.

In a similar vein, accessible public toilets are very important for small children, pregnant women, older people and people with some health conditions or disability to feel comfortable and confident while out and about. A lack of facilities can shape where people go or even how much food or water they take in, a phenomenon sometimes referred to as a 'loo leash'.[63]

Accessible and inclusive street furniture and seating make walking more comfortable and pleasant for all people. The Healthy Streets framework, a human-centred approach to embedding public health in transport, public health and the public realm, out opportunities to stop and rest as 1 of the 10 pillars of creating streets that work for people. To get a top score on this indicator, seating should be provided at least every 50 metres.[64]

Principle

C3 We will make our city more pleasant to walk in by reducing noise and air pollution from traffic.

Approach

The most effective way to reduce air and noise pollution from traffic is to reduce the volume of traffic on streets. We will do this by making it easier for people to move around without a vehicle, specifically by:

- Supporting car share programs
- Advocating for better public transport
- Building a safe, separated bike network
- Managing traffic in local areas (see Principle B2)

In addition, through our *Electrification of Transport in the City Strategy and Action Plan*, we are encouraging the transition to electric vehicles which have less pollution and create less noise.[65] Actions from the Electrification Strategy are found in Appendix F.

Justification

Noise and pollution from road traffic impacts on our health and wellbeing in many ways. It also makes streets stressful for people living and working on them as well as people walking on them. People walking are exposed to noise and fumes from people driving, particularly on major roads and when waiting to cross.

Reducing the noise from road traffic creates an environment in which people are willing to spend time and interact. We can reduce noise and air pollution by reducing traffic volume (*A city where people can walk safely*) as well as by transitioning to electric vehicles.

Strategy D
A city where walking is fun

Principle

D1 We will make streets interesting to walk along through good building design and interesting uses in appropriate locations.

Approach

We use planning controls to create interest in the street, either through building and landscape design or the visible uses of a building. This includes identifying where the buildings and the uses within the buildings can contribute to the activity in the street and providing design guidance for making buildings that are interesting to look at. Where we can't avoid blank facades or where we have old or historical buildings that can't be changed, we can use public art and plantings to make our streets more enjoyable.

Justification

Beyond making sure the city's physical characteristics are safe and comfortable, we can encourage walking by making it fun and interesting. This is important for creating a sense of fascination, vibrancy and community as well as attracting visitors, businesses and residents.

Streets and public places need to be comfortable, inviting and interesting for people to want to walk.[66] The more inviting and interesting the street, the longer people are willing to walk. In our local area, a place of interest along a route reduces the perceived distance of the route by three metres, meaning that people who are enjoying their walking experience believe the walk is shorter.

Case study: Laneways Revitalisation Program

Laneways can be vibrant, walkable spaces that invite exploration. The Laneways Revitalisation Program aims to transform city centre lanes and underused spaces to improve pedestrian connectivity and the quality of the public domain. These upgrades have helped local businesses and led to a revitalised small bar and dining culture, with over 90 small bars now operating in our area.

To date, a total of 25 lanes in the city centre have been upgraded, including much loved spaces such as Angel Place, Ash Street, Tank Stream Way and Penfold Lane.



Photo: Tyrone Branigan / City of Sydney



Photo: Katherine Griffiths / City of Sydney

Unique buildings, small shops and businesses and buildings that open directly onto the street all help people to engage with their environment while blank facades and long, unbroken blocks do not.

An interesting and activated ground floor also contributes to perceptions of safety by putting more 'eyes on the street' (*A city where people can walk safely*). Shops and businesses create a network of people who casually observe one another and can raise the alarm if anything happens. In a survey of 6,000 women about their experience of city streets, 'nobody around' and 'isolate/unsurveyed' were both in the top 10 factors that contributed to feeling unsafe.[67] This also impacts children; if caregivers feel unsafe while using streets, they are less likely to let children move independently or to venture out with them.[68] Shops and buildings that open directly onto the street help create bustle and life, which make people feel safe.

Principle

D2 We will use design, activations and installations to create neighbourhood-based community and encourage people to interact with their streets.

Approach

We will encourage walking by introducing opportunities for play in the design of our footpaths and streets. The focus is on playful design that encourages imagination and spontaneous interaction with our environment; this is separate from and in addition to our program of formal play spaces for children and youth.

In the same way, events and temporary activations also make for enjoyable walking. We will continue our existing programs – such as Chairs in Squares, Sydney Streets, greening laneways, and outdoor dining – as well as look for other ways to attract people to spend time in the public realm and explore our city. We aim to create unexpected moments, giving people a sense of discovery as they walk our streets.

We will use public art to add surprise and delight but also to tell the story of our First Nations people. We will work in partnership to complete *Yananurala*, the nine-kilometre public art walk that highlights Aboriginal history and culture at places along the Sydney harbour foreshore.

Case study: Alfresco dining program

During the pandemic, we launched a free, fast-tracked application process for outdoor dining permits. This made it easier for restaurants, cafes and bars to reallocate parking space for outdoor dining. So far, more than 400 permits have been granted across inner Sydney, creating vibrant places that encourage walking and public life and supporting local artists. Feedback from our community and businesses has been overwhelmingly positive.



Photo: Mark Metcalfe / City of Sydney

Justification

Design should enable and encourage access by our residents, workers and visitors across all ages and interests. We want people to enjoy spending time in our City and we have heard from our community that events, activations and public art programs play an important role in this.

Part of the reason that these elements make walking around fun is a sense of exploration and novelty. When you don't know what you'll find around the corner, you're tempted to keep wandering to find out. Tracy Emin's artwork, the *Distance of Your Heart*, which features 60 delicate handmade bronze sculptures of birds hidden

between Bridge Street and Macquarie Street, is a great example of this. Like a treasure hunt comprised of scattered elements, the installation encourages exploration and curiosity – a new way of looking at a familiar place.

Elements of fun also create opportunities for casual encounters with others and help to build a sense of community. Neighbourhood street closures, interactive artworks, places to sit and community events such as painting murals are all important ways to help people feel connected to their communities.

Playful design that encourages interaction is particularly important for children and adolescents. Play is essential for children's wellbeing and happiness, which the United Nations recognises through the Right to Play, enshrined in the 1989 Rights of the Child convention. Opportunities for playful engagement with their environment help build physical, emotional and social resilience.[69]

Principle

D3 We will make it easier for the community to use their streets how they want to.

Approach

We will empower the community to be innovative in how they use their street by simplifying the process for our residents to obtain approval for street murals, planting and temporary road closures.

Justification

Personalisation is an important part of facilitating connection. People feel more connected to places that they have the ability to change.[70] Making it easier for the community to hold the sort of events they want to and make changes to their streets helps to bring people together and develop a sense of community in local neighbourhoods, which is an important part of making walking fun and enjoyable and embedding it into everyday life.

Strategy E
A city that is a leader in walking

Principle

E1 We will lead the way in evidence-based planning for walking.

Approach

We are committed to the principles of open data and will continue to collect and publish data on walking in the local area.

We will continue to investigate ways of improving our knowledge of walking and use our data and evidence to inform the selection and design of projects and undertake evaluation to measure whether they have had the intended impact.

We will continue to respect people's right to privacy. We will never collect walking data in a way that records personal or identifiable information.

Case study: Tracking changing attitudes

We have begun a program of longitudinal studies to understand shifting attitudes to walking and cycling projects over time. Often residents often express opposition during the planning stages of cycleways but become increasingly supportive once the projects are completed. By conducting comprehensive studies that track attitudes over time, we gain valuable insights into the factors driving this shift in public opinion and use it to help shape future projects. We are currently conducting such a study on the planned Oxford Street cycleway.



Photo: Katherine Griffiths / City of Sydney



Photo: Chris Southwood / City of Sydney

Justification

It is often said that you can't improve what you don't measure. This is particularly true of walking – it is such an underappreciated, ubiquitous part of daily life that if we don't measure it, it goes unseen. We need to know how many people are walking, at what times of the day and what factors affect their experience of walking so that we can tailor our streets for better walking.

Using data to inform planning decisions is called evidence-based planning. This approach helps us make better decisions and to learn from experience. The City of Sydney has a limited budget and the more we make decisions informed by evidence, the more effective we will be in using our finite resources to do more of what works and less of what doesn't.

Principle

E2 We will continue to lead the way by sharing knowledge, skills, lessons learned and data with other local governments and organisations.

Approach

We can learn from others by developing deep and extensive networks with professionals working to improve walkability. We will continue working with other councils and organisations through both formal and informal channels to make it easier for others to make positive changes for walking. We will also work with academics and research institutions to contribute to the overall body of expertise.

Justification

Given its location and intense level of development, the City of Sydney often experiences challenges relating to people walking (and access and transport more broadly). This means that we have the experiences and resources to share with other Councils and have embedded this sharing in our mission.

Principle

E3 We will ensure that how we talk about walking reflects the diversity and differing needs of people walking.

Approach

We will use inclusive, human-centred language in all our communications.

Justification

Streets are for all people, inclusive of people with a disability and of all ages and genders. When we talk about walking, we are including all people moving on footpaths – those on foot, using mobility aids such as wheelchairs, mobility scooters and walking frames, as well as those with prams, rollerblades, unpowered scooters and skateboards. This is a diverse set of people with differing needs and preferences when it comes to interacting with our city's streets, and we need to acknowledge this in the language we use.

Principle

E4 We will encourage more walking through targeted behaviour-change programs and campaigns and encourage people to tell us what would make walking better for them.

Approach

We will develop and implement a range of behaviour-change programs to encourage the community to walk more. In particular, we will develop measures to encourage school students to walk to and from school by working in partnership with schools and parent committees.

We will also encourage people to tell the City of Sydney and Transport for NSW about the particular barriers to walking they face.

Justification

Sometimes, particular groups of people have specific needs when it comes to walking that require a thoughtful and targeted approach to removing barriers. Walking to school is a good example. While 40 years ago, 75% of kids walked to school, today only 25% do.[71] Not only is infrastructure required to make sure children can safely make the trip, but there is also an educational component of teaching kids about how to use crossings and signals, how to check for traffic and how to be alert in a road environment. Parents may also need support, information and tools to feel comfortable letting their child walk to school.

Walking is often an overlooked mode of transport, and while we hear a lot from people using other modes about the challenges they face (traffic, late buses, connectivity of cycleways), we hear very little about the barriers to people walking. This may be because walking is so common that people don't often identify themselves as 'walkers'. But we need to know more about the specific problems that walkers face, for example, intersections with long delays, so that we can target our efforts to create the most effective behaviour change.



Photo: Anna Kucera / City of Sydney

3. Action Plan

Action	
1	**We will implement a program of the highest priority walking improvements**. These are actions that have already been committed in the next three years and will include programs and projects related to crossings, street upgrades, road space reallocation, planting and public domain improvements focused on key walking routes. See Appendix A for Tranche 1 walking improvements.
2	We will **investigate ways of increasing our commitment to delivering walking improvements**. See Appendix B for proposals for new or accelerated walking-related programs.
3	We will work with Transport for NSW to **implement 30 km/hr speed limits** in the city centre, high streets, residential streets and around childcare centres, schools and universities, and health establishments, and progress a maximum of 40 km/hr speed limits elsewhere.
4	We will work with Transport for NSW to **ensure that signal phasing prioritises people walking**. The City will advocate for: • Automated pedestrian phases • A maximum wait time at intersections of 45 seconds for people walking with a target of 30 seconds • More pedestrian priority signalised intersections (like Bourke Street at Taylor Square)
5	We will **implement local area traffic management (LATM) plans** to reduce vehicle volumes and speed to make it safer for people walking. We will focus these LATM plans on: • Areas around schools and childcare centres • Residential areas between state and regional roads • Areas of high walking activity
6	We will **develop a code of practice for construction activities in public places** that provides guidance on how to maintain safety, connectivity and place amenity for people walking. This will inform the basis of permitting and managing construction activities in a way that minimises impact on people walking.
7	We will actively work to **improve how road rules relate to people walking** by: • Raising awareness and **understanding** of existing road rules related to walking • Advocate for the NSW government to improve **compliance** with road rules by people driving and cycling, particularly by regulating share bike operators and bike delivery companies • Continue and increase education about courteous, safe and legal bicycle riding to improve the safety and comfort of walking • Advocating for **legislative reform** to improve road rules related to people walking • **Clarifying the right of way** for people walking across driveways by banning any devices that falsely imply vehicle priority (flashing lights, audible sirens) and encouraging the removal of existing devices (through compliance action where applicable). Any safety issues at the interface of a driveway and a footpath are to be resolved by warning drivers of their responsibility to drive safely around people, for example, by using speed bumps.

Action	
8	We will **review the guidance in our Sydney Streets Code** with a focus on: • Providing guidance on location, selection and design of **crossings and intersections,** including reviewing accessibility of different crossing types, and shelter at waiting spaces • Providing guidance on how to create **child-friendly streets**. This could be done via adopting existing guidance developed by a third party as an addendum to the Street Design Guide • Defining **traffic lane width standards** applicable to our local area that support space re-allocation and safe speeds • Reviewing how our guidance relates to **designing for people with cognitive, sensory and physical disability** – for example, including charging stations for mobility devices in the standard set of street furniture the City uses We will also develop local design standards related to walking (for example, speed management, tree planting near traffic and tactical urbanism) where State or national standards result in suboptimal walking outcomes.
9	We will work with Transport for NSW to **reduce red tape** and make it easier for our community to activate their streets via temporary or permanent closures, street painting and plantings.
10	We will **promote walking as a form of exploration** and curiosity through our Culture Walks, guided tours and self-guided walks.
11	We will continue to **be a leader in walking and evidence-based planning** by: • Increasing our network of permanent pedestrian counters • Investigating new forms of people movement data • Sharing knowledge and expertise with other councils, cities, agencies and the community • Undertaking research on behaviour change and attitudes to walking and cycling
12	We will **use proactive language and remove unconscious bias** in City publications to highlight the human element of walking and advocate for others to do the same.

4. Appendices

Appendix A – Tranche 1 Walking Improvements

This appendix sets out the highest-priority walking-related programs and projects that the City will deliver over the next three years (July 2023 – June 2026). These projects and programs are continuing the vision set out in the last walking strategy and now form part of the City's business-as-usual approach to improving walking. They all have committed funding and delivery pathways and will be subject to consultation and approval.

Programs

Road closures and shared zones

We will close four streets to traffic and upgrade them with full landscaping. We will also implement three new shared zones and upgrade the streetscape in line with the City's shared zone design palette to indicate to drivers to drive at 10 km/h.

Crossings

We will install approximately 30 continuous footpath treatments, 12 raised crossings (wombat crossings), four at-grade crossings (zebra crossings) and one pedestrian refuge crossing. We will also upgrade three new signalised pedestrian crossings and upgrade two intersections that are missing pedestrian crossings.

Kerb ramps

We will install approximately 110 new kerb ramps. This includes replacing around 20 kerb ramps that are currently not compliant with accessibility standards.

Footpath widening

We will widen footpaths or build kerb extensions to narrow crossing distance in approximately 20 locations.

Footpath renewal

We have allocated $15 million towards upgrading and renewing our footpaths and a further $17 million for upgrading asphalt footpaths to granite pavers. This is being done in line with the Liveable Green Network initiative from *Sustainable Sydney 2030–2050 Continuing the Vision*.

Clutter

We will remove or relocate utilities such as redundant Ausgrid poles in approximately 50 locations to reduce footpath clutter. In addition to this, we will look at opportunities to consolidate or remove redundant signage.

Pedestrian safety improvements

We have committed to three programs delivering pedestrian safety improvements to specific problem areas.

Tree planting

Through our tree planting program, we will plant at least 700 trees per year over the next 3 years, totalling 2,100 trees. This includes a minimum of 50 in-road trees in the parking lane per year, or 150 trees over the 3-year period. After 2026, a greater proportion of the trees planted will be in-road.

Furniture

We have allocated around $450,000 towards new street furniture, including seating, toilets and water fountains and a further $400,000 for furniture upgrade and renewal.

Raised intersections

We will convert one roundabout to a raised crossing to calm traffic and improve amenity for people walking.

Lighting

We will install new street lighting in six locations specifically to improve the walking experience.

Projects

We will deliver the Crown Street streetscape upgrade and public domain works.

We will finalise the George Street South pedestrianisation and upgrade.

We will undertake the permanent pedestrianisation of George Street North.

We will continue the rollout of new wayfinding signage ($200,000 allocated).

We will finish delivering the set of traffic-calming initiatives identified in the Alexandria Local Access Traffic Management Plan.

We will complete streetscape and laneway projects that are committed or already under construction including Zetland Avenue west, Green Square to Ashmore Connector, Castlereagh Street, Loftus Street and the Primrose Avenue quiet way.

We will continue to facilitate the delivery of developer-delivered works to support development growth, in particular in the urban renewal precincts of Green Square and Ashmore.

Appendix B – Tranche 2 Walking Improvements

This appendix sets out ways in which the City could increase the commitment to walking improvements over the next 10 years, either through accelerating existing programs or creating new programs.

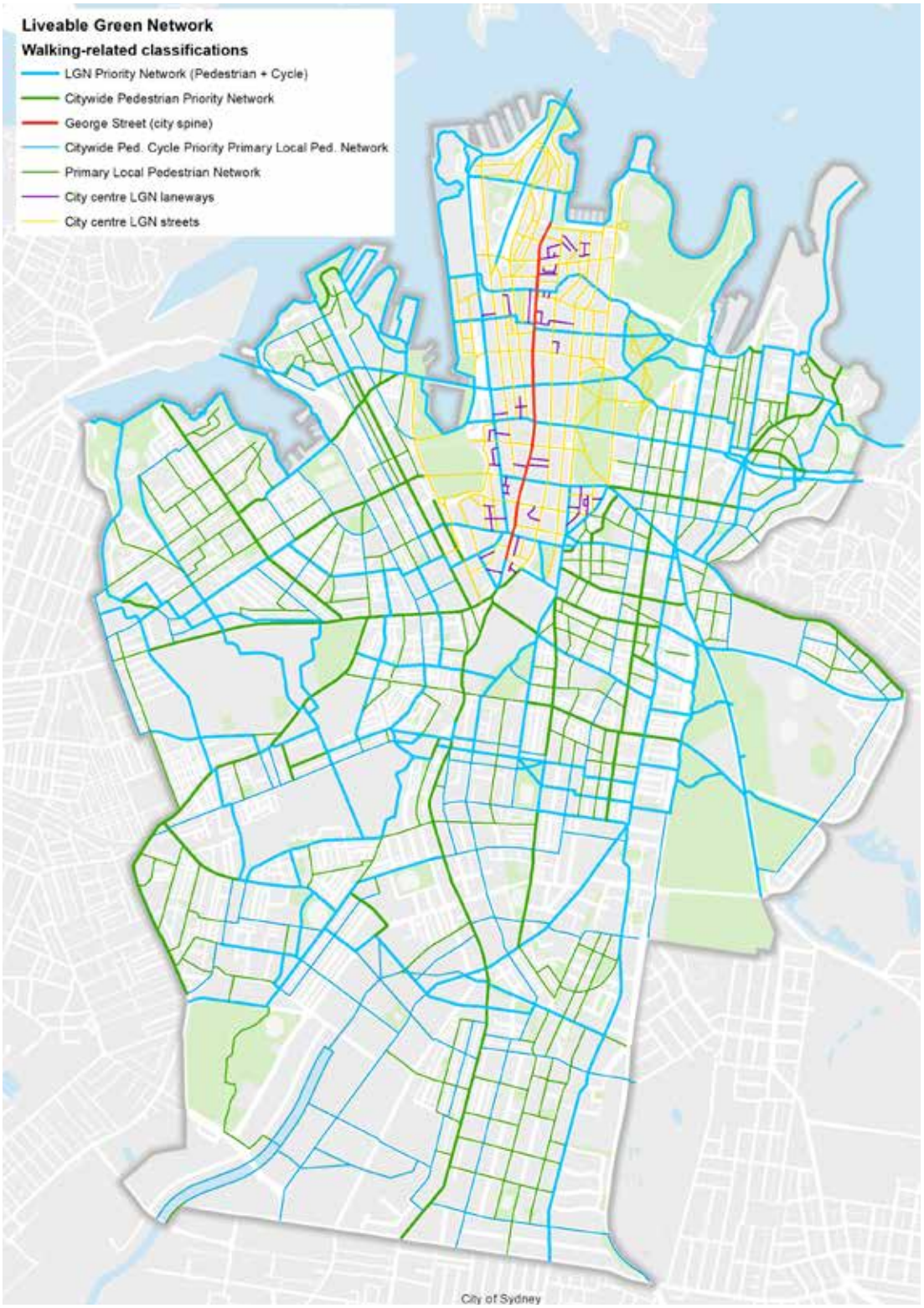
Items in this appendix will require approval of additional funding. Each program is listed below along with the additional resources required for its implementation.

Programs	Resources required
Crossings Following the recent delegation of power to Council regarding installing crossings on local streets, the City has identified additional priority locations for installing pedestrian crossings. We propose to double the rollout of both zebra and wombat crossings compared to the current plan (Appendix A – Tranche 1 Walking Improvements) to address these priority areas.	Existing program funded. Seeking additional funding for acceleration.
Walking and Place We will continue to undertake Walking and Place studies of precincts that have particular walking significance and are not picked up through other processes (such as schools). We will undertake three studies per year. We will continue to seek grant funding from Transport for NSW and others to fund the delivery of these projects.	Seeking NSW Government funding.
Walking counter automation We will increase the network of automated pedestrian counters from 4 locations to 15 with a view to ultimately replace the current twice yearly manual counts.	Capital funding required.

Appendix C – Liveable Green Network

All of our streets and footpaths support walking. Developed in 2011, our Liveable Green Network (Figure 10) shows streets that have been identified for different purposes. This classification helps us to prioritise some types of projects, particularly greening, street furniture and footpath maintenance along key walking routes. The Liveable Green Network aims to create a pedestrian and cycling network that connects people with the city and village centres as well as major transport and entertainment hubs, cultural precincts, parks and open spaces.

Figure 10. Liveable Green Network



Appendix D – Strategic alignment of actions

The actions from this strategy support the outcome statements of Direction 5 in *Sustainable Sydney 2030–2050 Continuing the Vision* - A city for walking, cycling and public transport

5.1 Street space is reallocated for people, places and planting

Actions	The City is shaded and cooler, quieter and calmer, air cleaner and more space available for people to use the streets	Vehicle speeds and volumes are reduced, making the city centre and local neighbourhoods safer, healthier and quieter	Avenues that lead into Central Sydney have been transformed to be greener, with more space for walking and cycling
1. Implement tranche of highest priority improvements	●	●	●
2. Increase our commitment to walking improvements	●	●	●
3. Work towards 30 km/h		●	
4. Prioritise people walking at signals			
5. Implement local area traffic management plans	●	●	
6. Develop a code of practice for construction activities		●	
7. Improve how road rules relate to people walking			
8. Review guidance related to walking in Sydney Streets Code	●		
9. Reduce red tape	●		
10. Promote walking as a form of exploration			
11. Continue to be a leader in walking			
12. Use proactive and human-centric language around walking			

Note:Many actions also support outcomes under other Directions in *Sustainable Sydney 2030–2050*

The actions from this strategy support the outcome statements of Direction 5 in *Sustainable Sydney 2030–2050 Continuing the Vision* - A city for walking, cycling and public transport

5.3 More people walk more, because walking is the most attractive and convenient choice for short trips

Actions	People are prioritised by increasing the capacity, quality and amenity of our streets	The experience of people walking will be enhanced for everyone by improving safety, quality, accessibility and comfort, including for children	The city is legible and intuitive to navigate, supported by a comprehensive wayfinding scheme	People are prioritised at key intersections, reducing wait times, and improving safety
1. Implement tranche of highest priority improvements	●	●		●
2. Increase our commitment to walking improvements	●	●		●
3. Work towards 30 km/h		●		●
4. Prioritise people walking at signals		●		●
5. Implement local area traffic management plans		●		●
6. Develop a code of practice for construction activities		●	●	●
7. Improve how road rules relate to people walking	●	●		●
8. Review guidance related to walking in Sydney Streets Code	●	●		●
9. Reduce red tape		●		
10. Promote walking as a form of exploration		●	●	
11. Continue to be a leader in walking		●		
12. Use proactive and human-centric language around walking		●		

Note: Many actions also support outcomes under other Directions in *Sustainable Sydney 2030–2050*

Appendix E – Key terms

Key term	Definition
Accessibility	Accessibility in this context refers to physically being able to access a place. This includes walking infrastructure that is usable and easily understood by everyone who interacts with it.
Active frontage	Ground floors with windows and doors onto the street which create interest and activity.
Active transport	Transport that is 'human powered' such as walking and cycling. This includes electric bikes and scooters.
Amenity	Something that makes your surroundings pleasant and agreeable.
Clear width	The width on a footpath available for walking that is unobstructed by obstacles.
Continuous footpath treatment	Where the surface treatment of the footpath continues across a side street. It is a way of reinforcing priority for people walking along a main street where they legally already have the right of way.
Cycle time (signals)	The time taken by a traffic light to go through all its phases. Longer cycle times mean people walking have to wait longer to cross.
Development control plan (DCP)	Detailed planning and design guidelines by the local government to support the planning controls. DCPs are a key feature of the NSW planning system.
Inclusion	Using the Australian Government's definition, inclusion is when everyone in a group is involved and respected. Diversity is celebrated and things can be changed to suit the needs and preferences of the individual.
Interchange	When using the Walking Space Guide, the City interprets 'interchange' as referring to the ticketed area within the gate line of a station. The City's public footpaths should never be considered as interchanges for the purposes of assessing walking space.
Kerb ramp	Otherwise known as a kerb cut, dropped kerb or pram ramp, this is a ramp graded down from the top of the footpath to the surface of the street. They provide access for people using wheelchairs, pushing prams or delivery trolleys.
Local Strategic Planning Statement (LSPS)	A document that the NSW government requires all local governments to develop that sets out the 20-year vision for land use and how growth will be managed in the future.
Local traffic	Vehicles that either originate or stop in the area in question. The opposite of through-traffic.
Parklet	A kerbside parking space that has been repurposed into a public space 'pocket' to provide seating, greenery and other amenities.
Planning controls	The set of regulations that control development in terms of density, height, external design, open space provisions and maximum parking provision, among other things.

Key term	Definition
Road space allocation	How the space between buildings is allocated between uses, particularly footpath space and road space. Often, the allocation of space does not reflect the number of people using each part, in which case the reallocation of road space is needed.
Severance	Physical and psychological barriers that impact on the ability for people to walk where they want to go. It can include roads or public transport infrastructure that are difficult to cross, large blocks, or parks without accessible paths which are hard to cross for people with disability.
Shared path	A path shared by people walking and cycling.
Shared zone	A road shared by people walking, cycling and driving. The maximum speed limit is 10 km/h. Shared zones must have different surfaces to normal roads to help people identify them.
Street furniture	All furniture in the public domain, including seating, bins, drinking fountains and toilets.
Through-traffic	Vehicles which are passing through an area without originating or stopping there.
Through-site links	Publicly accessible connections through sites on private land.
Walkability	The sum of "factors within the built environment that make it convenient, comfortable and safe to walk."[72]
Walking	People moving about on the footpath, including those using mobility aids (for example, wheelchairs, electric wheelchairs, mobility scooters and prams among other devices). It does not include people using a bicycle.
Wombat crossing	A raised zebra crossing that gives people walking priority to cross.
Zebra crossing	A pedestrian crossing marked by white parallel stripes.
10-minute neighbourhood	A concept by which cities are planned so that people are able to meet their daily needs within a 10-minute walk.

Appendix F – Actions related to walking in other strategies and plans

Improving walking in our city requires a multifaceted approach that touches on many aspects of what we do at the City from planting trees to planning approvals. Many of these aspects already have adopted strategies and policies with actions that relate, directly or indirectly, to walking. Rather than replicate these actions in the Walking Strategy and Action Plan here, a selection of actions related to walking in other plans is listed below.

Plan	Reference	Action
Sustainable Sydney 2030–2050 Continuing the Vision	**Transformative project**	Three linked city squares: Three city squares will be linked by the new pedestrian boulevard on George Street to provide more space for public life in the heart of our city.
Sustainable Sydney 2030–2050 Continuing the Vision	**Transformative project**	The green city • Green avenues: Transforming Broadway, Oxford Street and Park Street by reallocating road space to people, businesses and planting. • The laneway commons: The laneway commons reimagines our neighbourhood service lanes as soft, permeable, green commons that better serve community needs. The initiative transforms land that is now used for private vehicle access and waste collection.
Sustainable Sydney 2030–2050 Continuing the Vision	**Transformative project**	City space improvement program • Lunch Club: This program reimagines our city centre road space with temporary lunchtime closures with simple elements (fixed and fleeting) – the first step towards more permanent change. • Roads to spaces: This program could convert more roads into spaces for people to walk, linger and enjoy.

Plan	Reference	Action
Access Strategy	**Action 5**	Plan Sydney Metro precincts to improve the public domain and increase space for people. It will result in modifications to streets including: • Footpath widening – localised in places of high activity such as busy intersections and crossing points • Footpath widening – along whole blocks or streets to encourage more street activation and economic activity • Adding street trees and appropriate street furniture.
Access Strategy	**Action 8**	A city for walking. We will update the Walking Strategy and Action Plan as appropriate. We will deliver priority programs of localised interventions to make walking safer, easier and more convenient. This builds on the City's Walking Strategy and Action Plan and will include: • Increased crossing opportunities • Space for walking and public life • Lighting • Increased number of trees and planting • Reduced vehicle speeds and reduced through-traffic along main streets and in local neighbourhoods • Reduced waiting times for people walking at traffic signals.
Access Strategy	**Action 13**	Reducing the impacts of buses in the city centre. The City will advocate to the NSW Government to reduce the number of bus layovers in the city centre. This street space can then be reallocated to uses such as outdoor dining, plantings or footpath widening.
Local Strategic Planning Statement (LSPS)	**I1.1**	Continue to encourage walking and cycling in the city by implementing the City's walking, cycling and Liveable Green Network strategies, and applying the NSW Government's Movement and Place framework.
Local Strategic Planning Statement (LSPS)	**I1.2**	Work with the NSW Government to plan for the transition of streets to 'people first' places, applying the NSW Government's Movement and Place framework so streets are healthier, quieter, cleaner and greener with increased footpath capacity throughout the city.
Local Strategic Planning Statement (LSPS)	**I1.9**	Continue to implement, review and update the car parking policies and controls to support the transition to a net-zero carbon and energy-efficient transport system by 2030, continue promoting more efficient modes of transport including walking, cycling and public transport and manage congestion. This includes working with the NSW Government to review and update the Central Sydney Parking Space Levy.

Plan	Reference	Action
Local Strategic Planning Statement (LSPS)	**I1.10**	Work with landowners, institutions and government to increase public walking, cycling and transport connections across the city and district, including infrastructure, busy roads, railway lands, institutional lands and golf courses and the like.
Local Strategic Planning Statement (LSPS)	**L1.1**	Provide public and publicly accessible spaces that are inclusive, good quality, accessible and activated for diverse people and communities and contribute to the social life of the city.
Local Strategic Planning Statement (LSPS)	**L1.3**	Improve the accessibility of the public domain for people of all ages and abilities – with a focus on children and young people, older people, and people with disability – including through the delivery and improvement of inclusive and accessible public spaces, amenities and facilities.
Local Strategic Planning Statement (LSPS)	**L2.1**	Plan for local communities to be able to access daily needs and essential services, including fresh food and health and personal services, within walking distance by providing an appropriate mix of uses, including local retail, services, infrastructure and recreation, in local and neighbourhood centres and mixed-use zones supported by adequate floor space on the ground floor (and adjacent floors where appropriate).
Local Strategic Planning Statement (LSPS)	**L2.2**	Undertake a review of active frontage and built form controls to connect and create a network of activity in appropriate places.
Local Strategic Planning Statement (LSPS)	**L2.3**	Work with others to create and maintain a continuous publicly accessible harbour foreshore edge that is wide enough to support a range of recreational activities, except in areas required for productive working harbour functions.
Local Strategic Planning Statement (LSPS)	**L2.4**	Plan and deliver walkable local streets or shared zones with wider footpaths, gardens, street trees, pedestrian priority at crossings and safe traffic speeds.
Greening Sydney Strategy	**Action 1**	Achieve the green and canopy cover targets The minimum overall green target for the city is 40%, including an overall canopy target of 27%. This is based on the provision of greening and canopy cover being shared between all our streets, our parks and all property. To achieve the target, we will ensure that across their portfolio: • streets provide 39% green cover with a minimum 34% canopy cover • parks provide 86% green cover with a minimum of 46% canopy cover • property areas provide 28% green cover with a minimum of 20% canopy cover. Importantly, each portfolio needs to provide their share, as there is limited capacity for others to make up any difference. It is vital that ... everyone works together to provide the targets.

Plan	Reference	Action
Urban Forest Strategy	**Action 4**	Achieving the canopy cover targets will take a sustained and coordinated effort, with all owners and managers of land in our area required to play their part to provide new tree canopy. To ensure our canopy targets are achieved, we will: • identify streets where tree planting and providing canopy cover should be prioritised over other uses of public space, such as on-street car parking and other street space that is underused. Develop a program to prioritise planting based on need and opportunity • continue to identify opportunities for new and replacement tree planting in streets and parks and deliver best-practice tree planting and establishment programs. Ensure trees are planted in the best locations to optimise canopy cover • ensure the mature size of trees planted in streets and parks is the most appropriate for the space available. Park planting plans will be developed and the street tree master plan will be comprehensively reviewed to ensure tree species selection is optimised • improve soil and tree pit growing conditions in streets to ensure the trees planted thrive to mature size
Inclusion (Disability) Action Plan	**Direction 2**	The creation of more liveable communities for people with disability. Streets, parks, footpaths and open spaces in the City of Sydney area are accessible. The design, maintenance and management of infrastructure and places enables people with disability to travel through the City with dignity and independence.
Inclusion (Disability) Action Plan	**Action 4**	Continue to improve the accessibility of streets, footpaths, parks and open places through renewal programs, upgrades and new capital
Electrification of transport in the city strategy and action plan	**Action 1**	Work with the NSW Government to reduce vehicle kilometres travelled (VKT) by all vehicle fleets by creating a city for walking, cycling and public transport to reduce transport-related emissions.
Resilience Strategy 2023-2028	**Action 5**	Support our community to cope with increased heat and drought

5. Endnotes

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Item 4.

Public Exhibition - Planning Proposal - 242-258 Young Street, Waterloo - Sydney Local Environmental Plan 2012 Amendment and Draft Design Guide

File No: X093892

Summary

The Green Square urban renewal area is Australia's largest urban renewal area and features the Green Square Town Centre at its heart. The urban renewal area is forecast to grow at an annual rate of 4.4 per cent, to about 63,000 people in 2036. This will include a significant increase in the school aged population.

Planning Proposal - 242-258 Young Street, Waterloo (the planning proposal) has been prepared at the request of Sustainable Development Group Ltd (the proponent). The planning proposal is to facilitate the redevelopment of 242-258 Young Street, Waterloo (the site) for a six-storey building comprising a K-12 independent school and an integrated film school (that is already located on the site).

The proposed changes to building height and floor space ratio controls for the site will enable development that has a good contextual fit with adjacent development. The planning proposal will deliver essential social infrastructure to support the population growth. It will contribute to the availability of school places and increase the diversity of schools in the area. Increasing the provision of infrastructure that is aligned with population growth is a key strategic priority across City and State strategies.

The proponent has submitted a public benefit offer to enter into a planning agreement to deliver two new pedestrian crossings on Young and Powell Streets. This is in additional to any required contributions under the City of Sydney Contributions Plan 2015. The public benefit offer will facilitate the delivery of an improved pedestrian environment on Hunter and Young Street.

This report recommends approval of the planning proposal for submission to the Department of Planning, Housing and Infrastructure seeking a Gateway Determination, followed by public exhibition. It also recommends that a draft Design Guide is endorsed for exhibition, and a draft planning agreement be prepared based on the public benefit offer. It is expected that all documents are exhibited concurrently.

Recommendation

It is resolved that:

(A) Council approve Planning Proposal - 242-258 Young Street, Waterloo, as shown at Attachment A to the subject report, to be submitted to the Minister for Planning and Public Spaces with a request for Gateway Determination;

(B) Council approve Planning Proposal - 242-258 Young Street, Waterloo, as shown at Attachment A to the subject report, for public authority consultation and public exhibition in accordance with any conditions imposed under the Gateway Determination;

(C) Council seek authority from the Minister for Planning and Public Spaces to exercise the delegation of all the functions under section 3.36 of the Environmental Planning and Assessment Act 1979 to make the local environmental plan and to put into effect Planning Proposal - 242-258 Young Street, Waterloo;

(D) Council approve the draft Design Guide 242-258 Young Street, Waterloo, as shown at Attachment B to the subject report, for public exhibition concurrent with the Planning Proposal;

(E) authority be delegated to the Chief Executive Officer to make any variations to Planning Proposal - 242-258 Young Street, Waterloo, to correct any drafting errors or to ensure consistency with the Gateway Determination;

(F) authority be delegated to the Chief Executive Officer to make any variations to the draft Design Guide 242-258 Young Street, Waterloo, to correct any drafting errors or ensure it is consistent with the Planning Proposal following the Gateway Determination; and

(G) Council note the Chief Executive Officer will prepare a draft planning agreement in accordance with the letter of offer dated 2 May 2024, shown at Attachment C to the subject report, and the requirements of the Environmental Planning and Assessment Act 1979, to be exhibited in accordance with the Act.

Attachments

Attachment A. Planning Proposal - 242-258 Young Street and appendices

Attachment B. Draft Design Guide - 242-258 Young Street, Waterloo

Attachment C. Planning Agreement - Public Benefit Offer - 242-258 Young Street, Waterloo - dated 2 May 2024

Background

1. A planning proposal request has been lodged for a site in Waterloo, within the Green Square urban renewal area. The site is located at 242-258 Young Street, Waterloo, and has street frontages to Young and Hunter Streets, and Powell Street, as shown in Figure 1.

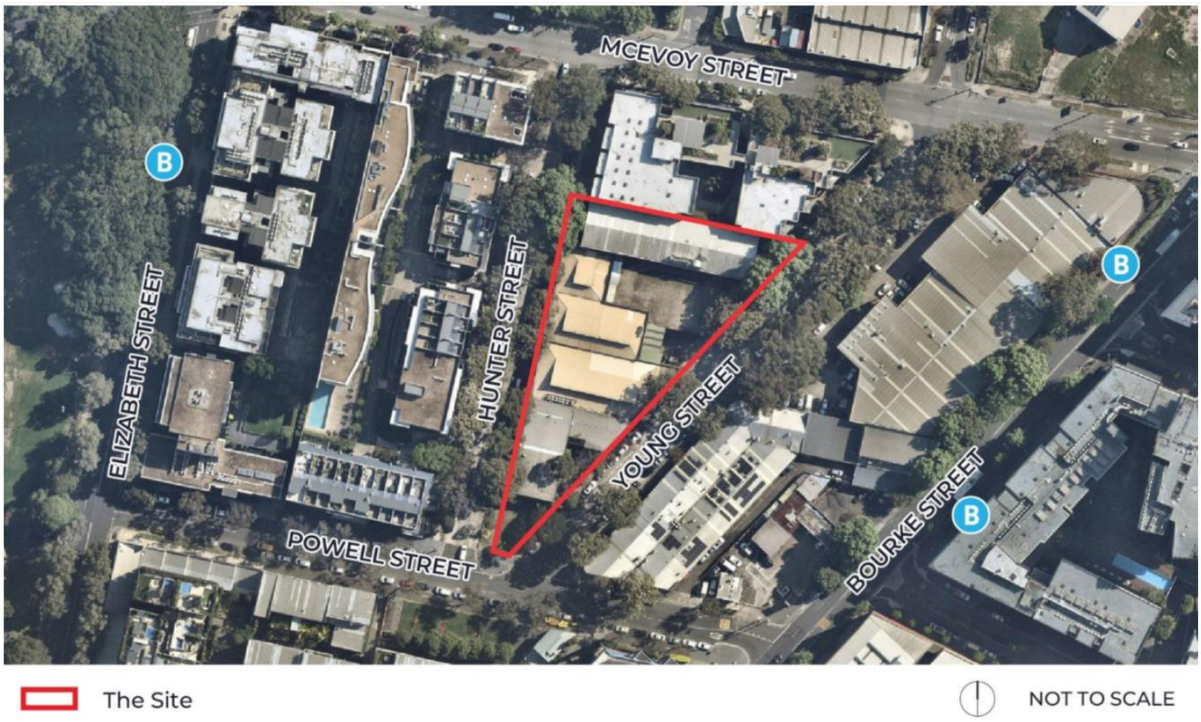


Figure 1: Land affected by this planning proposal

2. The two lots comprising the site have a total area of 4,611 square metres. Existing development on the site consists of a one to two storey masonry commercial building and a two-storey building currently in use for a film school.

3. Further details of the site and existing planning controls can be found in Section 1 and Section 2 of the Planning Proposal. Images of the site with the affected buildings is shown at Figure 2 and Figure 3.



Figure 2: 242-258 Young Street, viewed from the south-west along Hunter Street, showing masonry building of 1-2 storeys

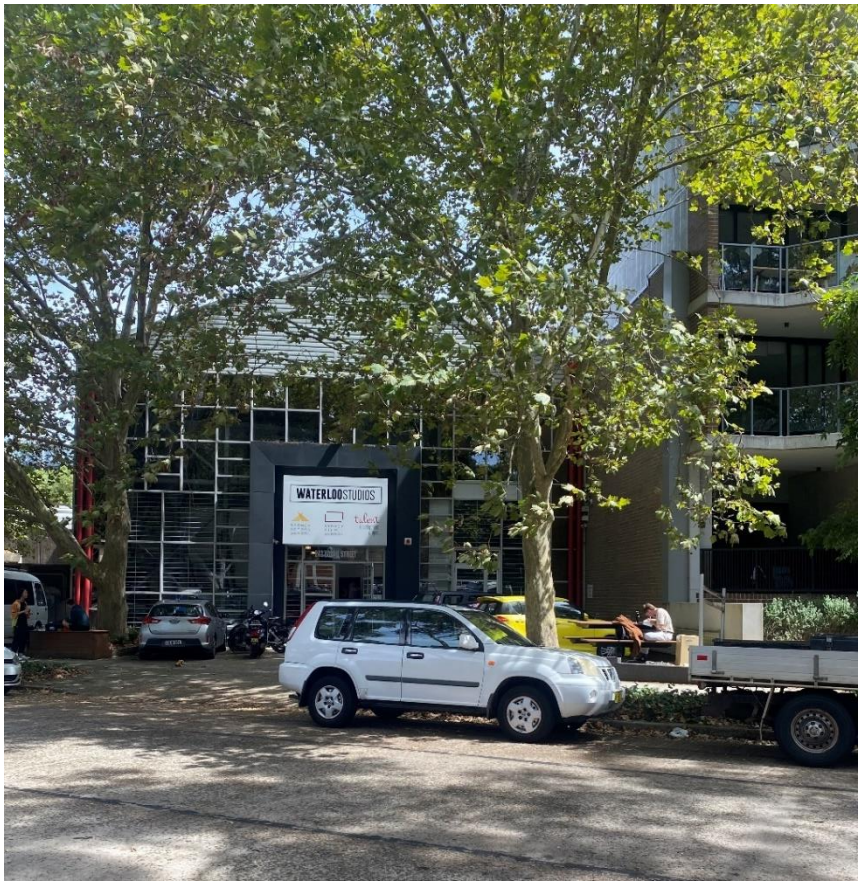


Figure 3: Sydney Film School at 242 Young Street, viewed from the east

4. Following comprehensive pre-lodgement advice, the applicant, Sustainable Development Group Ltd, represented by Ethos Urban, lodged a request to prepare a planning proposal in February 2024.

Key Implications

The proponent has requested increased height and floor space controls to enable a new school, and maintain the existing film school

5. The proponent has requested a planning proposal be prepared to facilitate the redevelopment of the site to include a six-storey non-residential building up to a maximum height of 25 metres comprising:

   (a) a six storey non-residential building up to a maximum height of 25 metres;

   (b) approximately 10,609 square metres of floor space for an independent primary and secondary school, to support 800 students; and

   (c) approximately 2,935 square metres of floor space with ground floor cafe to retain the existing film school within the new development.

6. Images prepared by the proponent of the indicative development scheme are at Figures 4, 5 and 6.



Figure 4: Artistic representation of indicative building envelope - Young Street perspective



Figure 5: Artistic representation of indicative building envelope - Hunter Street perspective



Figure 6: Artistic representation of indicative design - Powell Street perspective

The City has prepared a planning proposal to increase the height and floor space for a combined primary and secondary school and film school

7. The planning proposal details the proposed amendments to the Sydney Local Environmental Plan 2012 (Sydney LEP 2012) by inserting new site-specific provisions.

8. The provisions are to:

   (a) permit a maximum building height of 25 metres, an increase from the current control of 15 metres;

   (b) increase the maximum floor space ratio (FSR) control from a maximum of 2.2:1, inclusive of mapped FSR, community infrastructure floor space and design excellence floor space, to 2.94:1; and

   (c) require the consent authority to be satisfied that the resulting building would be used primarily for the purpose of an educational establishment.

9. Further explanation of the provisions can be found in Section 4 of the Planning Proposal.

The Design Guide will make sure the development fits within the area, protects amenity and tree canopy, provides deep soil and improves access and activation

10. The draft Design Guide - 242-258 Young Street Waterloo (draft Design Guide) is at Attachment B and provides further guidance for development facilitated by this planning proposal. The key provisions in the draft Design Guide include:

   (a) a maximum building envelope including setbacks, street wall heights and maximum height in storeys (as shown at Figure 7);

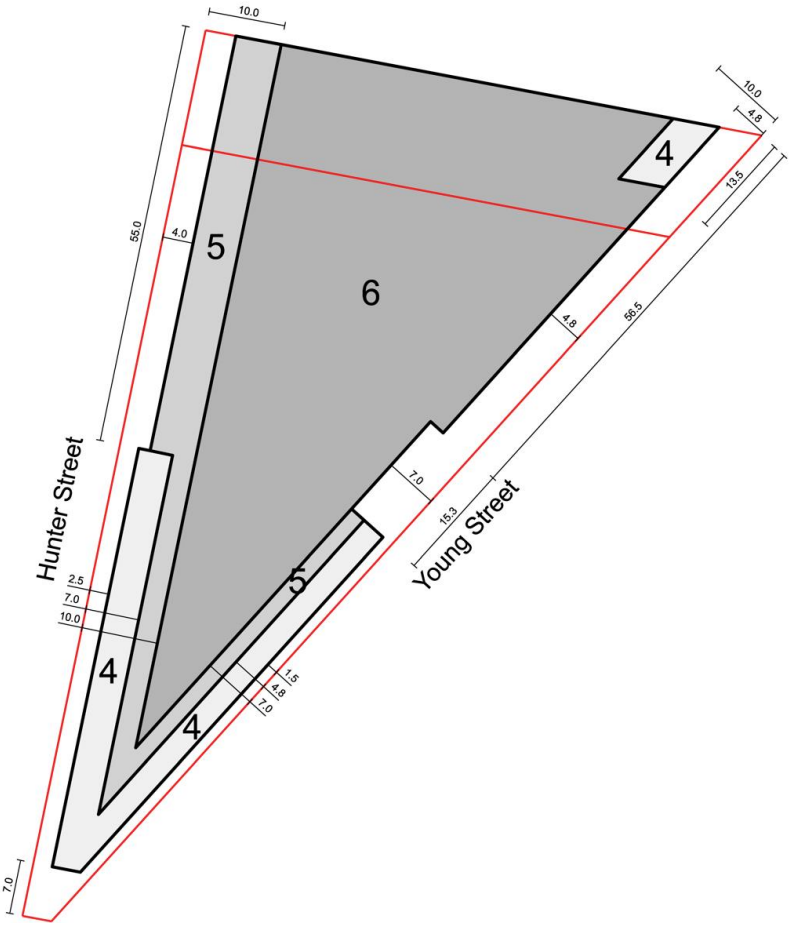


Figure 7: Maximum building envelope

(b) footpath widening setbacks to be dedicated to Council along the majority of the site's boundaries to increase footpath widths from approximately two metres to between 3.5 metres along Young Street and 4.5 metres along Hunter Street;

(c) detailed controls to manage the retention of trees on and surrounding the site, including pruning;

(d) landscaped area setbacks to be provided along Hunter and Young Streets with the aim of achieving two areas of deep soil landscaping;

(e) requirements to provide landscape setbacks to screen boundary walls from public view;

(f) requirements for servicing, access, parking and active transport and

(g) a design excellence strategy.

The proposal is a good contextual fit and has site-specific merit

11. The proposed building envelope has been designed to minimise overshadowing to adjacent residential buildings and surrounding sites. It effectively mitigates overshadowing impacts on both the future Woolworths site and the open space south of Powell Street. Specifically, it ensures that during the mid-winter solstice, 70 per cent of the apartments maintain at least two hours of solar access, while more than 85 per cent of the open space area receives a minimum of four hours of sunlight. Figure 8 illustrates the sole overshadowing impact on existing residential development at 9 Hunter Street Waterloo: three apartment balconies experience partial overshadowing between 9 am and 10 am during the mid-winter solstice.

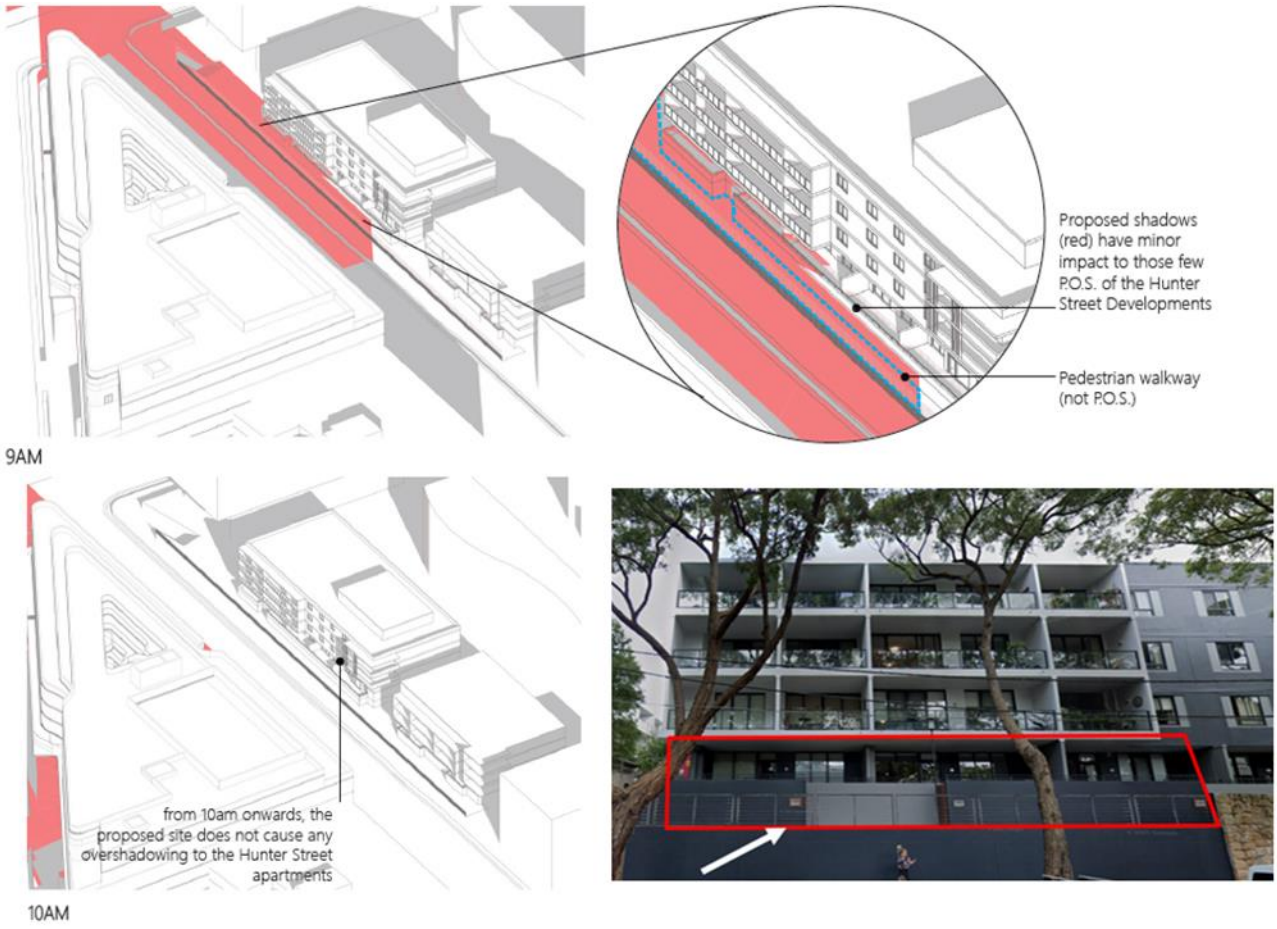


Figure 8: Overshadowing impacts - mid-winter solstice - 9 Hunter Street Waterloo Source: Plus Architecture Urban Design Report.

12. The six storey proposal with five and four storey elements is consistent in height with surrounding development as shown in Figure 9. The height at 923-935 Bourke Street Waterloo across Young Street to the west is seven storeys while the height at 7-11 Hunter Street opposite to the east is four to five storeys.

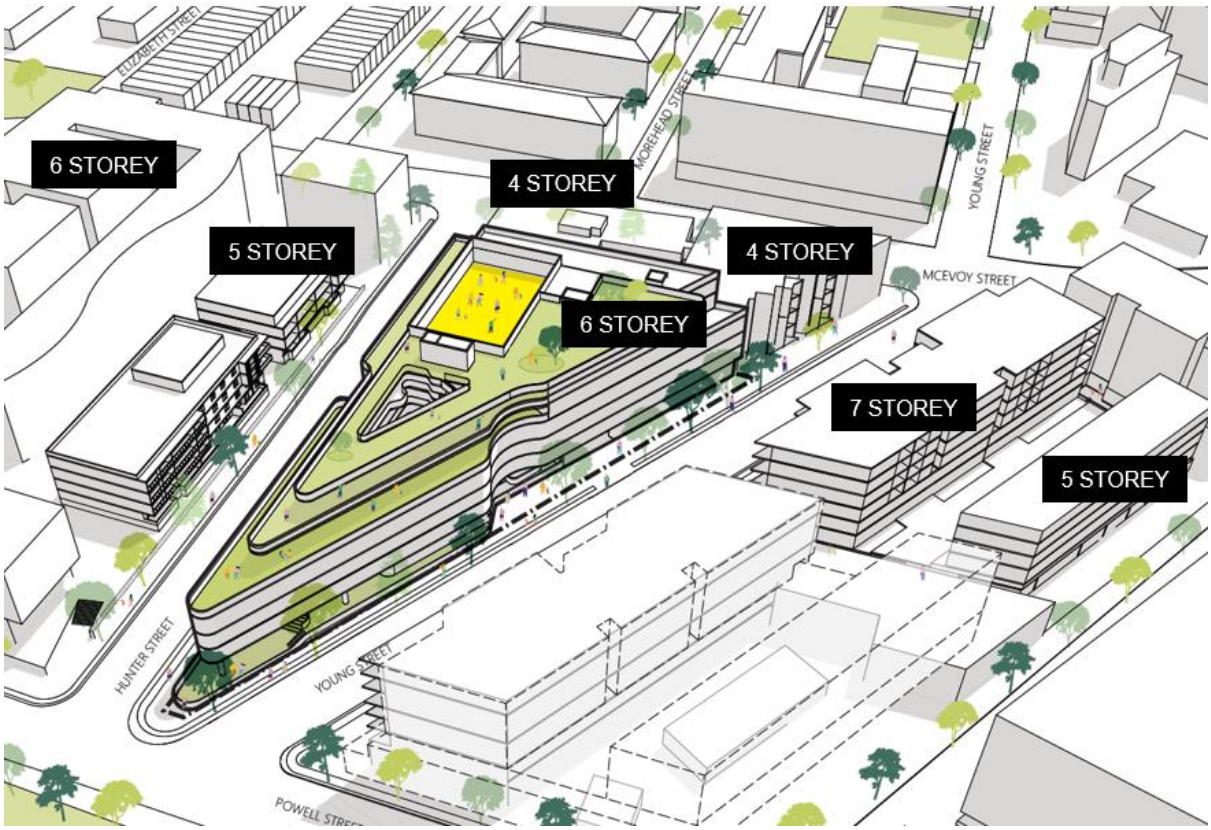


Figure 9: Contextual fit. Source: Plus Architecture Urban Design Report.

13. The proposed building envelope has been designed, through setbacks to manage the impact on trees within the and surrounding the site. Of the 33 trees identified on and surrounding the site, eight trees of a low retention value are proposed for removal which are all within the building footprint. Trees of high and medium retention value are retained.

14. The impact of students, staff and visitors moving to and from the site will be managed through a designated drop off and pick up area on Young Street, which can accommodate approximately 6-8 cars. A school bus zone is proposed on Hunter Street for pick-up and drop-off on from Monday-Friday between 8:00am to 9:00am and from 3:00pm to 4:00pm. The separation of parking and the Bus Zones reduces the traffic impacts on any one street.

15. Given the site constraints, playing fields will not be provided on-site. However the proponent has proposed to use Turruwul Park, Rosebery to meet its sporting field requirements. These are the closest sporting fields in the area having capacity within the City's bookings system to support this future use. This requires a 10-15 minute bus ride to move children between the school and the park. Where sporting fields closer to the school become available new arrangements could come into place.

16. The Traffic and Transport Report accompanying the planning proposal indicates that these impacts arising from the proposal are acceptable, particularly given the highly accessible location of the school. The report was updated in response to comments from City's Traffic and Transport team as well as Transport for NSW who have requested refinements to the technical study to regarding intersection analysis, end of trip facilities and mapping of pedestrian and bike networks. Transport for NSW will have an opportunity to review this report during the public exhibition.

17. Further information on the urban design, environmental, social and economic impacts of the planning proposal can be found in Section 5.4 of the planning proposal.

A Voluntary Planning Agreement will deliver an enhanced pedestrian environment

18. The proponent has offered to enter into a Voluntary Planning Agreement (VPA) with Council to deliver public benefits as part of this planning proposal. The Environmental Planning and Assessment Act 1979 (the Act) allows the proponent to enter into a legally binding Voluntary Planning Agreement with Council. Voluntary Planning Agreements are voluntary and must be freely entered into by the public authority and a proponent. They are also publicly exhibited and held on a publicly accessible register.

19. The letter of offer from the proponent at Attachment C to this report outlines the public benefits. The benefit will be the construction of two pedestrian crossings on Young and Powell Streets on Council land free of cost to Council.

20. This Voluntary Planning Agreement will not offset local infrastructure contributions required under a contributions plan (section 7.11 of the Act), and housing and productivity contributions (division 7.1, subdivision 4 of the Act).

21. The Voluntary Planning Agreement will be prepared and publicly exhibited with the planning proposal.

The planning proposal will facilitate wider benefits in the area

22. The planning proposal, draft Design Guide and Voluntary Planning Agreement will facilitate the redevelopment of the subject site with the following key benefits:

    (a) provision of a new independent K-12 school with capacity for approximately 800 students will introduce further diversity into the educational offer in the Green Square area;

    (b) supporting the retention of creative industry floor space in the City of Sydney through the incorporation of the existing film school into the new development; and

    (c) delivery of two new pedestrian crossings, improved pedestrian accessibility and safety in the area.

The planning proposal is consistent with City's strategic vision

23. The City's Local Strategic Planning Statement, City Plan 2036, sets out the 20-year vision for land use planning in the city and the planning priorities and actions needed to achieve the vision.

24. Two of the key priorities are to align development and growth with supporting infrastructure and supporting community wellbeing with social infrastructure. The Green Square-Mascot urban renewal area, which includes Waterloo, is expected to support a significant population increase into the future. It is forecast to grow at an annual rate of 4.4 per cent, to approximately 63,000 people in 2036. School-aged children will also increase by 77 per cent by 2031 within a 2km radius of the site. The proposal will deliver further diversity in the education infrastructure available in Green Square to support this population growth.

25. Sustainable Sydney 2030-2050 Continuing the Vision renews the community's vision for the sustainable development of the city to 2050. It includes 10 strategic directions for the future of the city, as well as 10 targets against which to measure progress. This planning proposal is aligned with the following strategic directions and objectives.

    (a) Direction 4 - Design excellence and sustainable development - the proposed built form will demonstrate design excellence and architectural interest through a high quality, comfortable, safe and inclusive development for students and the wider community. The design will also integrate the retention of tree and canopy structures on and off-site. The proposal aims to deliver 5-star green star design aspiration, 4-star NABERS rating for schools and will outperform regulatory sustainability standards including NCC Section J - Energy Efficiency and State Environmental Planning Policy (Sustainable Buildings) 2022.

    (b) Direction 8 - A thriving cultural and creative life -the proposal includes the redevelopment of the existing film school which will support the cultural and creative life of the City.

26. Further information regarding the alignment of the Planning Proposal with the strategic planning framework can be found in Section 5.3 of the Planning Proposal.

Relevant Legislation

27. Environmental Planning and Assessment Act 1979 (Act).

28. Environmental Planning and Assessment Regulation 2021.

Critical Dates / Time Frames

29. Should Council endorse the attached planning proposal for public exhibition, it will be forwarded to the Department of Planning, Housing and Infrastructure in accordance with section 3.34 of the Act for Gateway Determination.

30. The Gateway Determination will provide the required date for the completion of the Local Environmental Plan amendment. Following public exhibition, the outcomes will be reported back to Council.

Public Consultation

31. The public exhibition process for this planning proposal will be determined by the Department of Planning, Housing and Infrastructure. It is expected the public exhibition of the planning proposal, draft Design Guide and notification of the planning agreement will run concurrently. The consultation will be in accordance with:

    (a) the Gateway Determination issued by the Department of Planning, Housing and Infrastructure under section 3.34 of the Act;

    (b) the Environmental Planning and Assessment Regulation 2021;

    (c) in relation to the Voluntary Planning Agreement, Section 7.5(2) of the Act; and

    (d) the City of Sydney's Community Engagement Strategy and Participation Plan.

32. It is likely that the public exhibition for the planning proposal would be a minimum of 20 working days.

33. The planning proposal, draft Design Guide and draft Voluntary Planning Agreement will be publicly exhibited on the City of Sydney website in accordance with the Environmental Planning and Assessment Regulation 2021.

GRAHAM JAHN AM

Director City Planning, Development and Transport

Gibran Khouri, Specialist Planner

Kristina Argiropoulos, Cadet Planner

Attachment A

Planning Proposal – 242-258 Young Street, Waterloo

CITY OF SYDNEY

Planning Proposal – 242-258 Young Street, Waterloo



The City of Sydney acknowledges the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

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1. Background

1.1. Introduction

The City of Sydney (the City) has prepared this Planning Proposal: 242-258 Young Street Waterloo (this planning proposal) in response to a request from the proponent, Sustainable Development Group Ltd (SDG), to prepare a planning proposal for the site.

This planning proposal is to enable development on the site for:

- an independent primary and secondary school for 800 students in a 10,609sqm building, including associated auditorium and outdoor space;
- a film school of 2,935sqm; and
- a cafe.

This planning proposal will amend the Sydney Local Environmental Plan 2012 (Sydney LEP) to increase maximum height of building on the site to 25m and increase the maximum FSR that can be achieved on the site to 2.94:1, but only where the development is for a school.

A draft Design Guide: 242-258 Young Street Waterloo (draft Design Guide) is proposed in conjunction with this planning proposal. The Design Guide provides detailed provisions for the development of the site. This includes provisions relating to built form, setbacks, public domain including footpath widening and deep soil, tree retention, green infrastructure, flooding, parking and waste. The City intends to publicly exhibit the draft Design Guide with this planning proposal.

The landowner has made a public benefit offer to enter into a planning agreement with Council. The offer includes a commitment to deliver new pedestrian crossings on Young Street and Powell Street as well as construction of public domain improvements to meet RMS standards for pedestrian crossings. The City will work with the land owner to prepare a draft planning agreement so it can be publicly exhibited with the planning proposal.

This planning proposal has been prepared in accordance with the *Local Environmental Plan Making Guideline,* published by the Department of Planning and Environment in August 2023.

1.2. Site identification

The site comprises 244-258 Young Street, Waterloo owned by Charvic Pty Ltd and 242 Young Street Waterloo owned by International Screen Academy Property Pty Ltd. The legal description of the site is Lot A DP 161650 and Lot B DP 161650 (244-258 Young Street) and Lot 1 DP 84655 (242 Young Street) and as shown in below in Figure 1.



Figure 1. Site identification: 242-258 Young Street, Waterloo outlined in red line. Source Ethos Urban

1.3. Site location

The site is located in the suburb of Waterloo. It is within the Green Square urban renewal area, approximately 4km south-east of Sydney Central Business District. Green Square Train Station and Green Square Town Centre (Town Centre) are south of the site, approximately 900m and 800m respectively. The Waterloo Metro Station is 1.2km north-west of the site.

The site context is shown below in Figure 2.



Figure 2. Site Context. Source Ethos Urban Source: Plus Architecture Urban Design Report

The site is 300m east of Waterloo Oval and 900m east of Waterloo Park. The Waterloo Estate (South) is to the north-west of the site and is proposed to deliver 2ha of new open space with 950m walking distance. Moore Park is 850m north-east of the site, it is proposed to repurpose 20ha of the existing golf course to provide additional public open space.

1.4. Green Square urban renewal area

The Green Square urban renewal area is a high-density urban renewal area in the City's south. As of 2016, the population of the renewal area and City South was forecast to grow by an additional 44,452 persons, at an annual rate of 4.4 per cent, to about 63,000 people in 2036 when the urban renewal area is expected to be built out. The population estimate for Green Square as of 30 June 2021 is 34,253.

The Town Centre, together with Mascot, is identified as a strategic centre in the Greater Sydney Region Plan: A Metropolis of Three Cities and the Eastern City District Plan. Green Square Library, Joynton Avenue Creative Centre, Perry Park Recreation Centre and Gunyama Park Aquatic and Recreation Centre are among the recently delivered community facilities.

1.5. Surrounding context

The area surrounding the site is in transition and is characterised by a variety uses that includes residential, mixed use, and urban services.

To the east of the site, on the other side of Young Street, are one to two storey light industrial and retail showroom premises, within older brick and masonry buildings. The site, 923-935 Bourke Street Waterloo, is subject to a recently finalised planning proposal which is planned for a five to seven storey mixed-use development with full-line supermarket and retail. It also includes a through-site link.

Immediately to the north of the site, is a four storey residential building. Further north of the site is the Danks Street South urban renewal precinct, set within the former Sydney Water site which is surrounded by former light industrial parcels to the north and north- west, which are planned for between four to seven storey mid-rise buildings and 12-23 storey towers.

To the south of the site, on Powell Street are one to eight storey buildings ranging from commercial, retail and multi-residential premises. To the west of the site along Hunter Street are four storey residential buildings.

1.6. Site accessibility

The site has a high level of accessibility. Green Square Train Station provides connections to Central station, Sydney CBD and the wider regional rail network. The Waterloo Metro station is 1.2km from the site and will provide a fast train connection to the City every four minutes. Local and express bus services connect the site to the broader region, including services to Redfern station. The frequent peak services include:

- 320 that runs from between St Leonards and Green Square Town Centre via North Sydney, Crows Nest and Sydney CBD (every 10-15 minutes);
- 304 that runs north-south between Epsom Road Zetland and Circular Quay via the CBD, Surry Hills, Waterloo and Gadigal Avenue in Zetland (every 5-15 minutes); and
- 343 that runs from Kingsford to Rosebery via Gardeners Road and then in a north-south alignment to Circular Quay via Rosebery, Zetland, Waterloo, Redfern and Surry Hills (every 3-5 minutes).

The site is connected to a pedestrian walking environment that includes footpaths on both sides of all surrounding streets. Controlled pedestrian crossings are provided on all legs at the following signalised intersections:

- Bourke Street with Danks Street;
- Bourke Street with Potter Street;
- Bourke Street with Lachlan Street; and
- Bourke Street with McEvoy Street.

The site is connected to an extensive cycleway network through Powell Street, linking to Bourke Street which provides an off-road shared path, providing a connection through to the Sydney CBD.

The site is connected by a network of state and regional roads, which includes McEvoy Street, Bourke Street, Lachlan Street, and Elizabeth Street. The site is also serviced by a local street network, having a direct frontage to Young Street and Hunter Streets.

1.7. Site characteristics

The site is comprised of two lots with an area of 4,611sqm. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography generally falls in an east to west direction across the width of the site. Street views of site and surrounding area are shown below in Figure 3. Existing development on the site consists of two buildings. There is a one to two storey masonry building and a two-storey building currently used for the film school.



From intersection with Powell Street, view looking north-east on Hunter Street along frontage of site.



View looking north-west on Young Street along frontage of site taken from eastern side of Young Street.



View looking east on Hunter Street along frontage of site.



View looking south on Young Street along frontage of site.



View looking east on Hunter Street along frontage of site.



View looking west on Young Street along frontage of site.

Figure 3. Street views of 242-258 Young Street site and surrounding area.

2. Existing planning controls

The Sydney Local Environmental Plan (LEP) 2012 contains zoning and development standards for the site as shown in table 1 below.

2.1. Sydney Local Environmental Plan 2012

LEP Clause	Provision
Land use zones (clause 2.1)	The site is zoned MU1 Mixed Use zone (see Figure 4). All development is permitted with consent under the MU1 Mixed Use Zone, except *Extractive industries; Heavy industrial storage establishments; Heavy industries; Pond-based aquaculture*, that are prohibited.
Height of buildings (clause 4.3)	The maximum height of buildings for the site is 15m (see Figure 5).
Floor space ratio (clause 4.4)	The maximum mapped (base) FSR for the site is 1.5:1 (see Figure 6).
Community infrastructure floor space at Green Square (clause 6.14)	Development may be eligible for community infrastructure floor space (in addition to floor space available under clause 4.4) where community infrastructure is provided as part of the development. The site is identified in Area 6 on Floor Space Ratio Map (0.5:1 FSR).
Design excellence (clause 6.21)	Development may be eligible for 10% additional building height or FSR where design excellence is demonstrated.
Heritage conservation (clause 5.10)	The site is not identified as a heritage item and is not within a heritage conservation area (see Figure 7). A search of the NSW State Heritage Register did not identify any further heritage items on the site, or on any adjacent land.
Flood planning (clause 5.21)	Flood planning provisions require the consent authority to be satisfied with the following prior to granting development consent: (a) is compatible with the flood function and behaviour on the land, and (b) will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other

LEP Clause	Provision
	development or properties, and (c) will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and (d) incorporates appropriate measures to manage risk to life in the event of a flood, and (e) will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.
Car parking - Office and business premises (clause 7.6)	The site is identified as land in Category F on the Public Transport Accessibility Level Map. This requires maximum parking rate of one space per 75sqm for office or business premises.
Car parking - Retail premises (clause 7.7)	The site is identified as land in Category F on the Public Transport Accessibility Map. This requires a maximum parking rate of 1 space for each 50sqm of gross floor area (GFA) used for the purpose of retail.
Acid Sulfate Soils (clause 7.14)	The site is identified Class 5 for acid sulfate soils.
Affordable housing contribution (clause 7.13)	The site is subject to an affordable housing contribution requirement of 3% for any residential development and 1% for any non-residential development
Development requiring or authorising preparation of a development control plan (clause 7.20)	The proposed development is State Significant Development. A Design Guide has been prepared in lieu of a Development Control Plan.

Table 1. Current provisions in Sydney LEP 2012

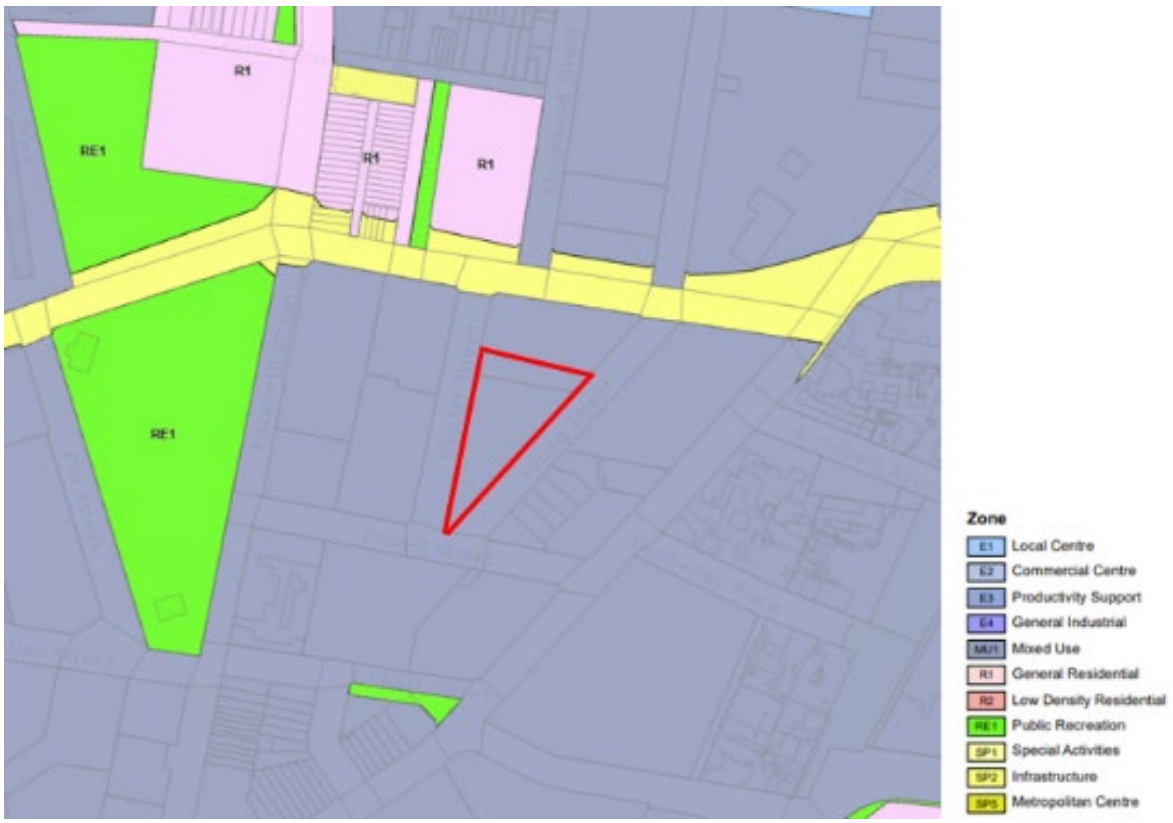


Figure 4. Land Zoning Map Sydney LEP 2012



Figure 5. Building Height Map Sydney LEP 2012

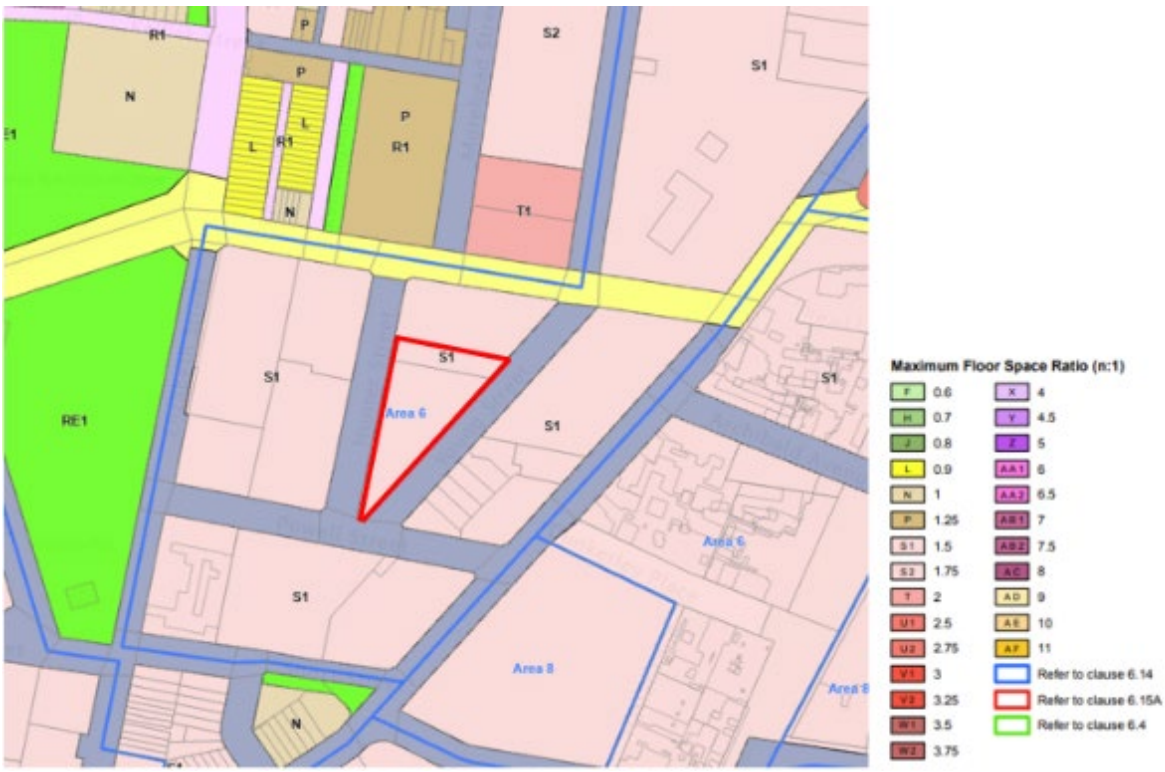


Figure 6. Floor Space Ratio Map Sydney LEP 2012

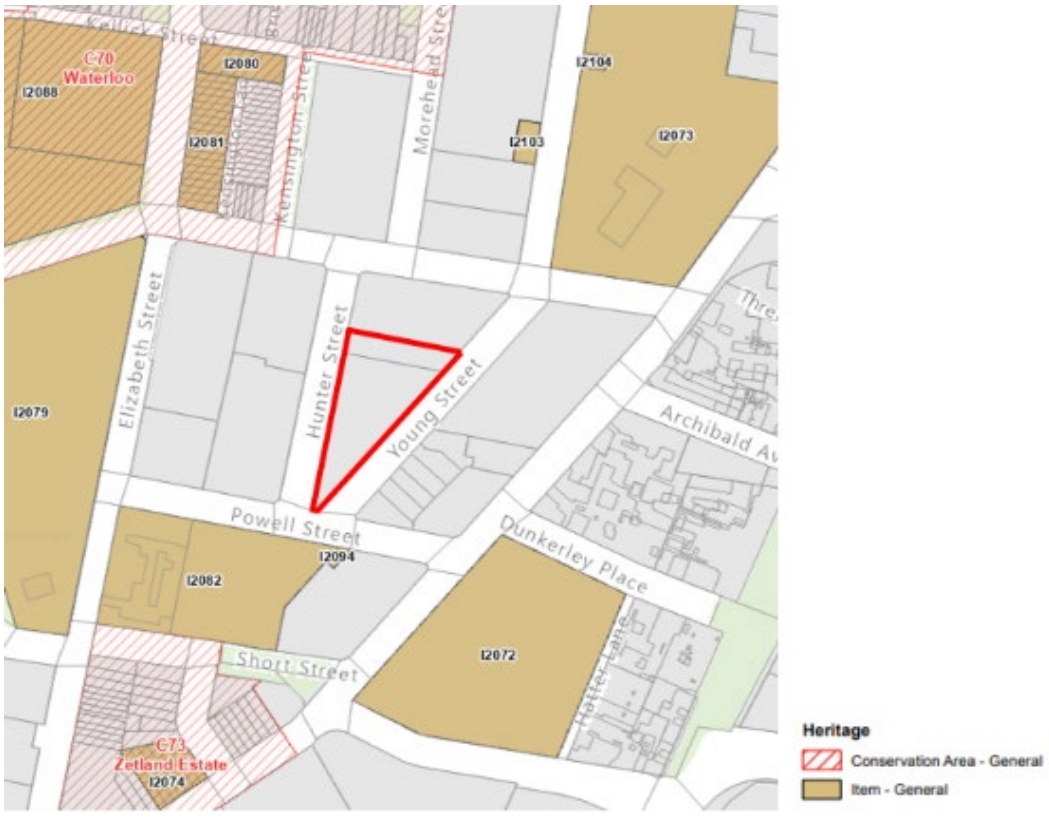


Figure 7. Heritage Map Sydney LEP 2012

3. Objectives and intended outcomes

3.1. Objectives

The objectives of this planning proposal are to:

- facilitate the delivery of a school in an area of high population growth;
- ensure development responds to the surrounding development;
- ensure footpaths and roads are safe for students and other pedestrians; and
- ensure mature street trees are protected in the case of any development.

3.2. Intended outcomes

The intended outcome of this planning proposal is to enable the redevelopment of 242-258 Young Street, Waterloo for:

- a building comprising a K-12 independent vertical school and separate film school with a maximum FSR of 2.94:1 and maximum height of 25 metres;
- maintained and expanded local employment opportunities in a location with good access to public transport and housing;
- improved environment for pedestrians along Young and Hunter Streets through footpath widenings;
- development that responds appropriately to the surrounding built form context;
- tree protection where the site is redeveloped; and
- high sustainability performance standards for the future development.

A planning agreement will be exhibited to secure delivery of two new pedestrian crossings across Young Street and Powell Street as well as construction of public domain improvements to meet RMS standards for pedestrian crossings.

4. Explanation of provisions

4.1. Proposed amendments to Sydney LEP 2012

To achieve the objectives and intended outcomes, this planning proposal seeks to amend the Sydney Local Environmental Plan 2012 by inserting a new site-specific clause under Division 5 Site Specific Provisions to:

- limit the use of the clause to development which is primarily for an educational establishment (being a school);
- in addition to FSR that can be achieved under Clause 4.4 (mapped FSR), Clause 6.14 (community infrastructure floor space) and Clause 6.21 (design excellence), allow an additional 0.74:1 FSR in the written clause, but only where it is primarily for an educational establishment (being a school). For clarity, design excellence (clause 6.21 of the Sydney LEP 2012) is not to be calculated on the additional FSR;
- require that any development on the site demonstrating design excellence in accordance with clause 6.21 of the Sydney LEP 2012 is only eligible for additional FSR, and not additional height;
- permit a maximum building height of 25m;
- remove the requirement for a development control plan to be prepared for the site, which is currently required by clause 7.20 of Sydney LEP 2012;
- allow for the maximum building height to be exceeded to allow for shade structures, rooftop nets, balustrade, fence or low-level boundary treatments and lift overruns to facilitate the use of any rooftop open space; and
- require development under this clause to have considered the Design Guide.

4.1.1. Floor space ratio assumptions

The above changes to the Sydney LEP will facilitate the development of a school that can achieve a total FSR of 2.94:1. At the time of drafting, the total FSR comprises:

- the mapped FSR of 1.5:1;
- the community infrastructure FSR of 0.5:1 under clause 6.14;
- design excellence FSR of up to 0.2:1 under clause 6.21D;
- the site specific additional FSR of 0.74:1 where the floor space is used for an educational establishment (being a school).

Counted floor space and voids

The proponent's indicative reference scheme shows circulation spaces that are connected to a void. This floor space is counted as GFA as the void is sealed from above with a roof. If this void was to be open to the sky, the circulation space would not be counted as GFA. It is the intention of this planning proposal to facilitate a built form shown in the indicative scheme. How the internal void spaces are counted (or not) in GFA calculation cannot be known until a development application is lodged. However, in the instance where those internal circulation spaces are not counted as GFA, it is noted the entirety of the GFA achievable under the above clause may not be reached. This is noted in the draft Design Guide.

Design excellence floor space

At 25m the proposed development will require a design excellence competition process under clause 6.21. This planning proposal makes no change to this requirement, other than to require that the site is only eligible for additional FSR, and not additional height under clause 6.21.

Notwithstanding, the City is awaiting a gateway determination for *Planning Proposal - Sydney Local Environmental Plans – Policy and Housekeeping Amendments 2023* (Policy and Housekeeping planning proposal). It intends to reduce the number of circumstances where a competitive design process is required under clause 6.21, notably lifting the threshold from 25m to 35m height for land outside Central Sydney. It also removed the 'opt-in' option for developers to undertake a design excellence process.

If the Policy and Housekeeping planning proposal changes to clause 6.21 of the Sydney LEP come into effect prior to any development application being lodged for the proposed development, a design excellence competition process under clause 6.21 of the Sydney LEP would no longer be required and could no longer be opted into. This would therefore impact the maximum FSR that could be achieved on the site under this planning proposal to 2.74:1.

Following public exhibition of this planning proposal, when a gateway determination is likely to have been issued for the Policy and Housekeeping planning proposal, the City will consider any requirements of the gateway as they relate to clause 6.1, and any submissions made by the public. These considerations may give rise to a different approach to FSR to ensure the maximum FSR required for the proposed development can be achieved.

4.2. Site-Specific Design Guide

To ensure future development is consistent with the objectives and intended outcomes of this planning proposal, site-specific provisions will be drafted to ensure a high-quality built form. The proposed development will have a Capital Investment Value greater than $20 million and is classified as State Significant Development and the City's Development Control Plans will not apply. As a result, the City has prepared a Site-Specific draft Design Guide. Consideration of the design guide in the assessment process is required by this planning proposal.

The draft Design Guide will be publicly exhibited with this planning proposal.

5. Justification

This planning proposal and the accompanying draft Design Guide for the site are informed by the City's assessment of the request for a planning proposal and supporting documentation submitted by the landowner.

This section provides a justification of the site specific and strategic merit of this planning proposal and has been prepared in accordance with the Department's Local Environmental Plan Making Guideline. It assesses the proposed amendments holistically and its alignment with the Greater Sydney Region Plan and Eastern City District Planas well as the City Plan 2036: Local Strategic Planning Statement and Sustainable Sydney 2030-2050.

5.1. Indicative reference scheme

The proponent has prepared an indicative reference scheme for the site. The purpose of the reference scheme is to test, at the concept level, that a development can be provided within the proposed controls while achieving the requirements of other existing planning controls and the NSW School Infrastructure Education Facilities Standards and Guidelines (EFSG). The reference scheme is only one iteration of the built form that may be facilitated by the proposed planning controls.

The planning proposal does not imply approval of the indicative reference scheme, which provides only concept level information. The development of the site will be subject to a development application.

The urban design analysis and the reference scheme, prepared by Plus Architecture and appended to this report, provides detailed analysis of the planning framework, site context and proposed built form, including the physical, technical, and topographical factors for the site's redevelopment.

The concept vision for the site and its future redevelopment is for a high-quality development that provides further diversity in the available education infrastructure in a highly accessible location to support the surrounding population.

The scheme includes a 10,608 sqm school to accommodate 800 students and a 2,395sqm film school and ground floor café to the north of the site. The film school and café are commercial businesses independent of the operation of the school. However, there may be opportunities for the film school to support learning outcomes for the K-12 school.

The proposed development includes 4,975sqm of on-site open space for school use, resulting in approximately 6.2sqm per student. This is delivered across the following levels:

- Ground floor: 753sqm;
- Level one: 154sqm;
- Level two: 154sqm;
- Level three: 154sqm;
- Level four: 1,259sqm;
- Level five: 1281sqm (including a 757sqm basketball court); and
- Level six: 1,221sqm.

Access

Access to the single level of basement carparking is proposed from Young Street.

The pick-up/drop-off zone for the school is on Young Street and the bus zone is located on Hunter Street. This is to manage traffic on Young Street, which will also be used to access the Woolworths supermarket development at 923 Bourke Street, Waterloo.

Trees

The proposed building envelope has setbacks to the east and west façade to reduce the length of the street wall and to create a recessive articulation zone. This allows for the retention of most mature canopy cover. Of the 33 trees identified on and surrounding the site in the Arboricultural Impact Assessment, all but 8 of the trees are proposed for retention. This is discussed further in Section 5.5.

Upper-level setbacks

The building envelope is setback on the upper three levels to mitigate visual impact and allow solar access to neighbouring developments and open space.

Use

The ground floor of the school features a foyer that is accessible from both Hunter and Young Street. The foyer is also connected to the 462-seat auditorium on Hunter Street (see Figure 8: Indicative ground floor plan).

The existing film school at (242 Young Street) will be 2,935sqm and will be upgraded and reinstated as part of the school. The lobby is located on Young Street.

The indicative reference scheme for the site is shown at Figures 8-20.

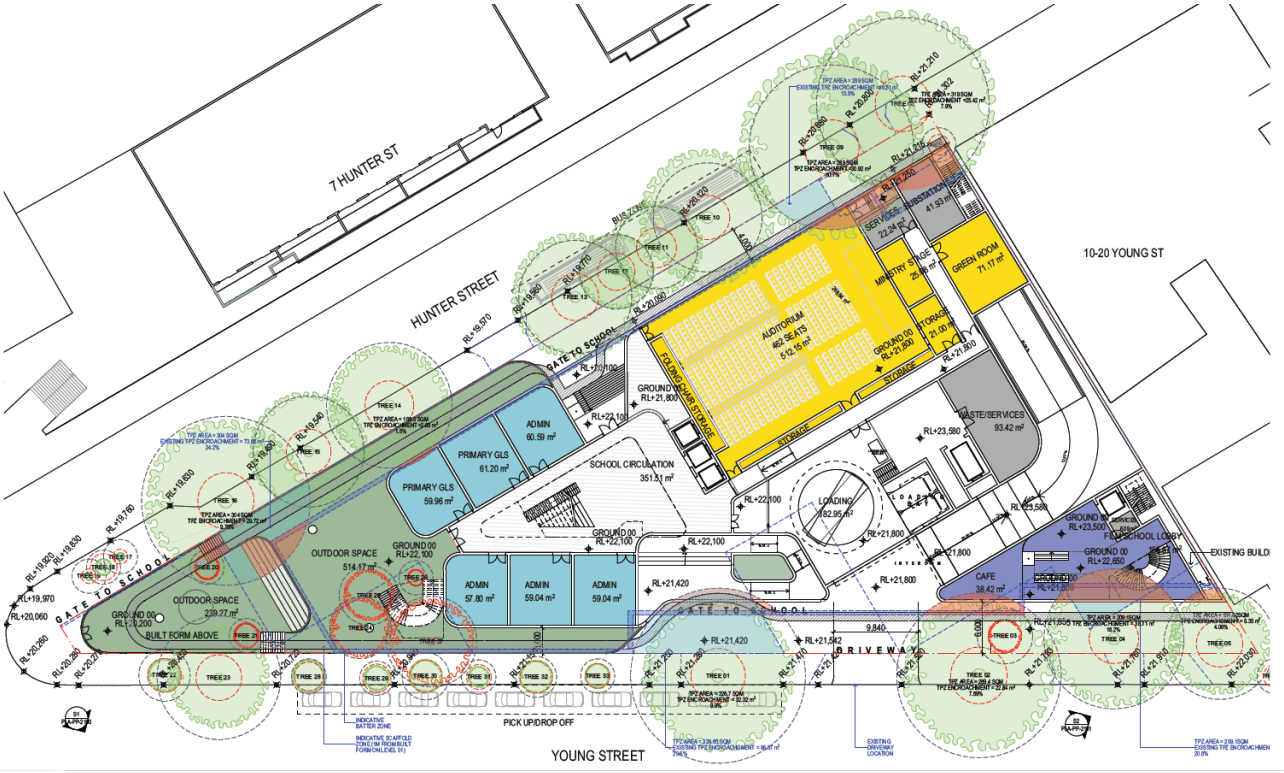


Figure 8. Indicative ground floor plan. Source: Plus Architecture Urban Design Report

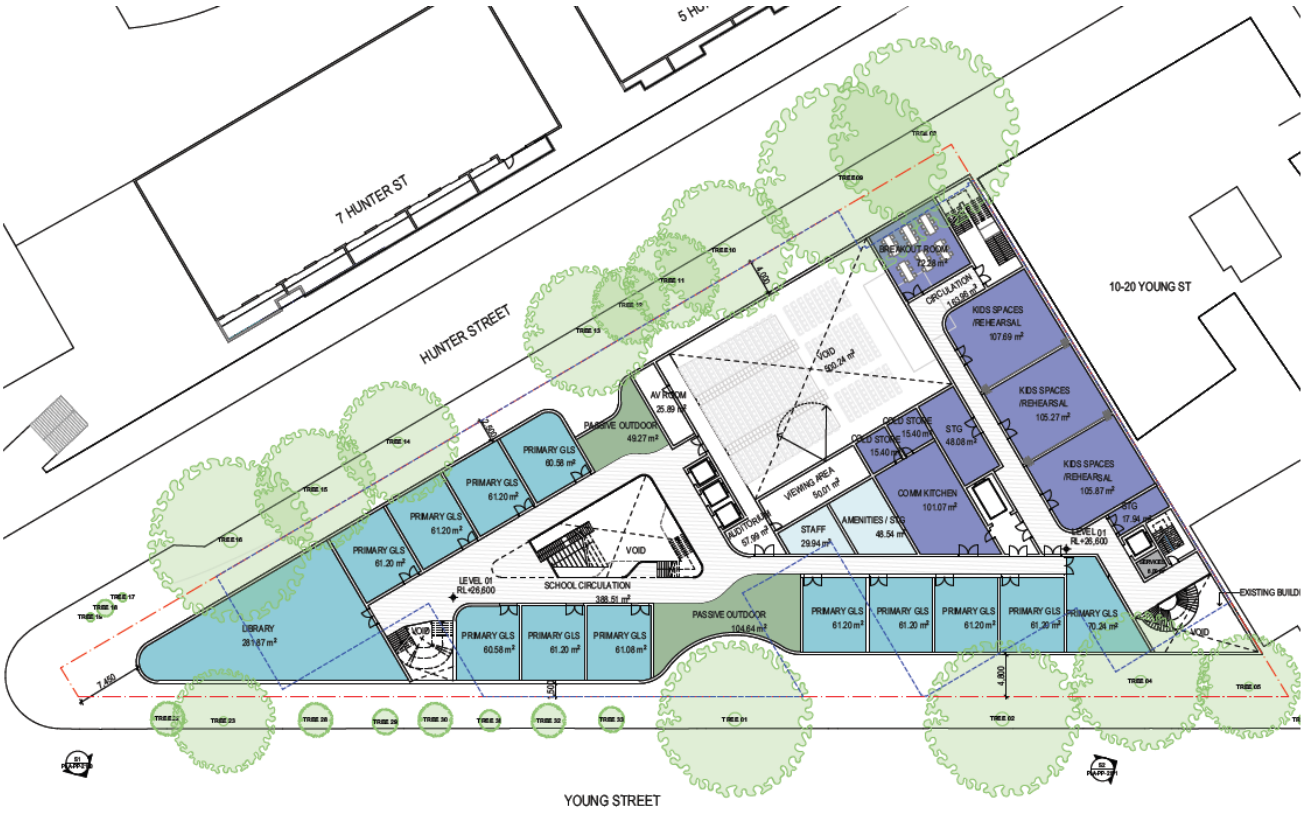


Figure 9. Indicative typical floor plan. Source: Plus Architecture Urban Design Report



Figure 10. Indicative floor plan level 4. Source: Plus Architecture Urban Design Report

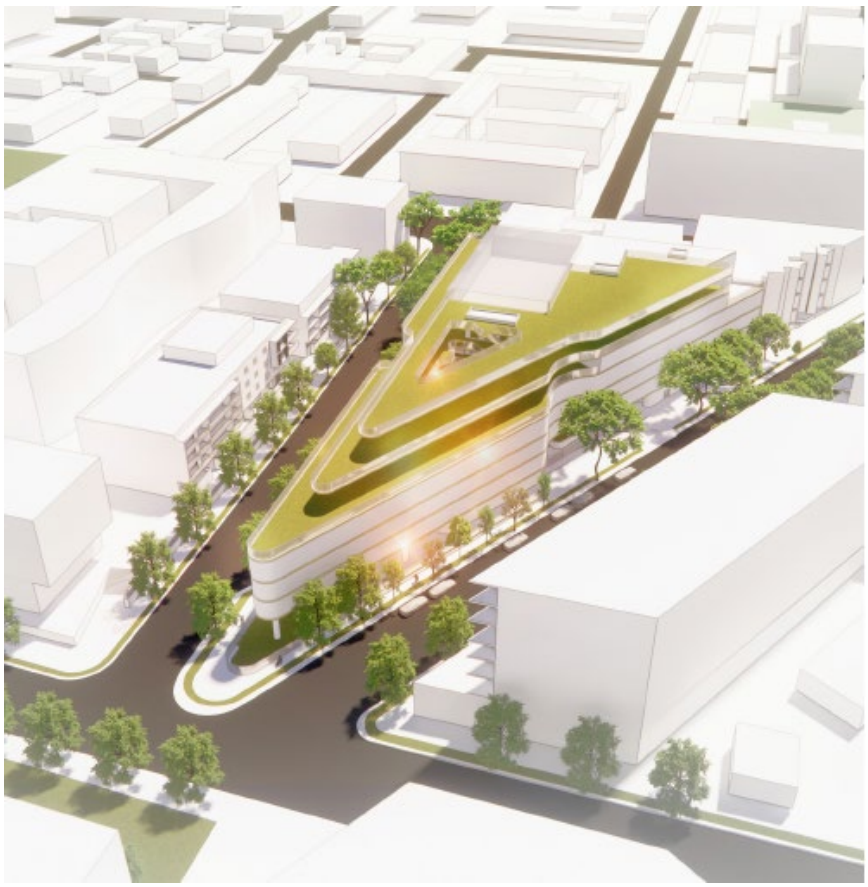


Figure 11. Indicative building envelope. Source Plus Architecture Landscape Plans

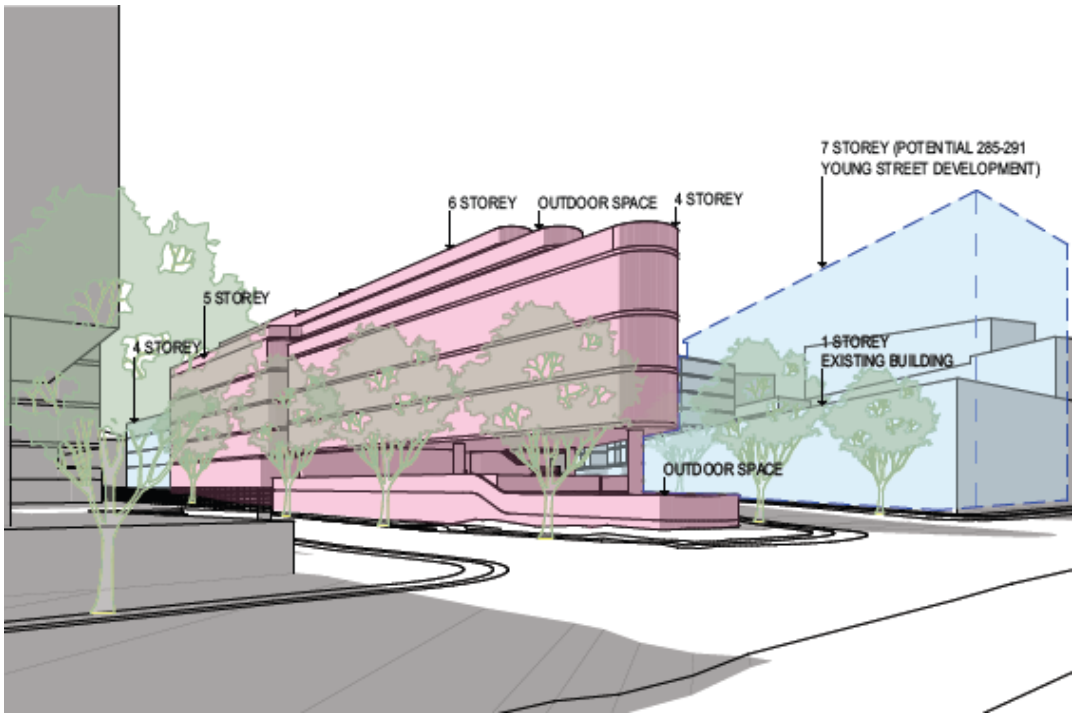


Figure 12. Indicative development concept – view looking north from Hunter Street. Source: Plus Architecture Urban Design Report

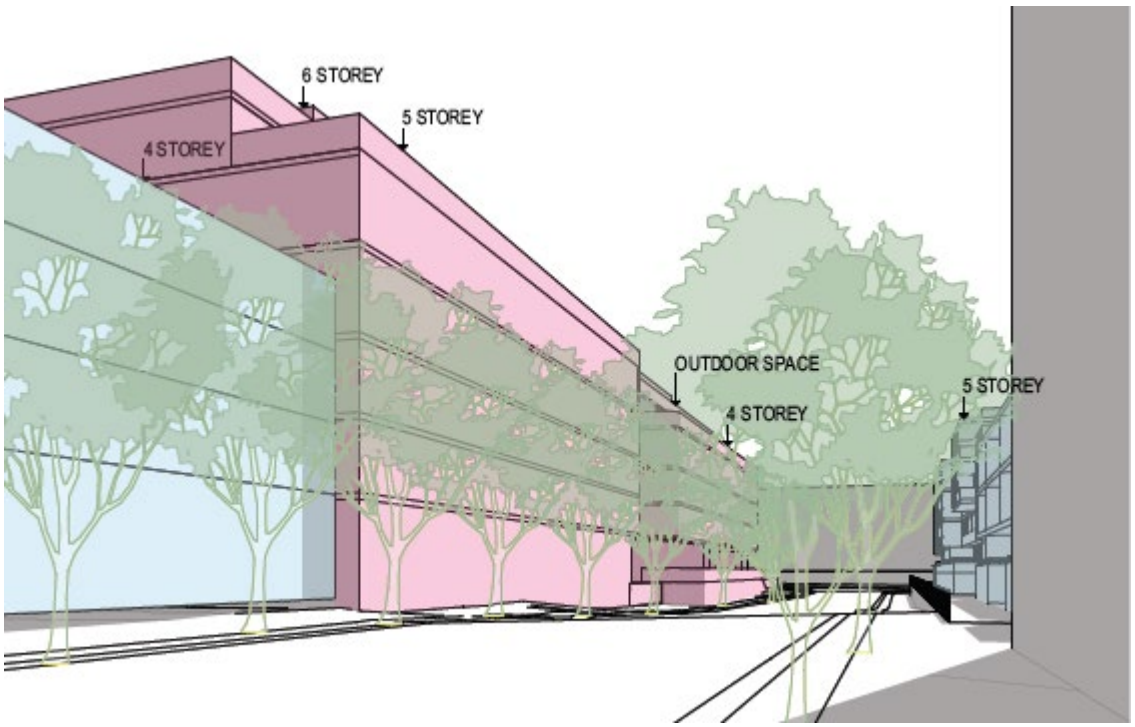


Figure 13. Indicative development concept – view looking south from Hunter Street. Source: Plus Architecture Urban Design Report

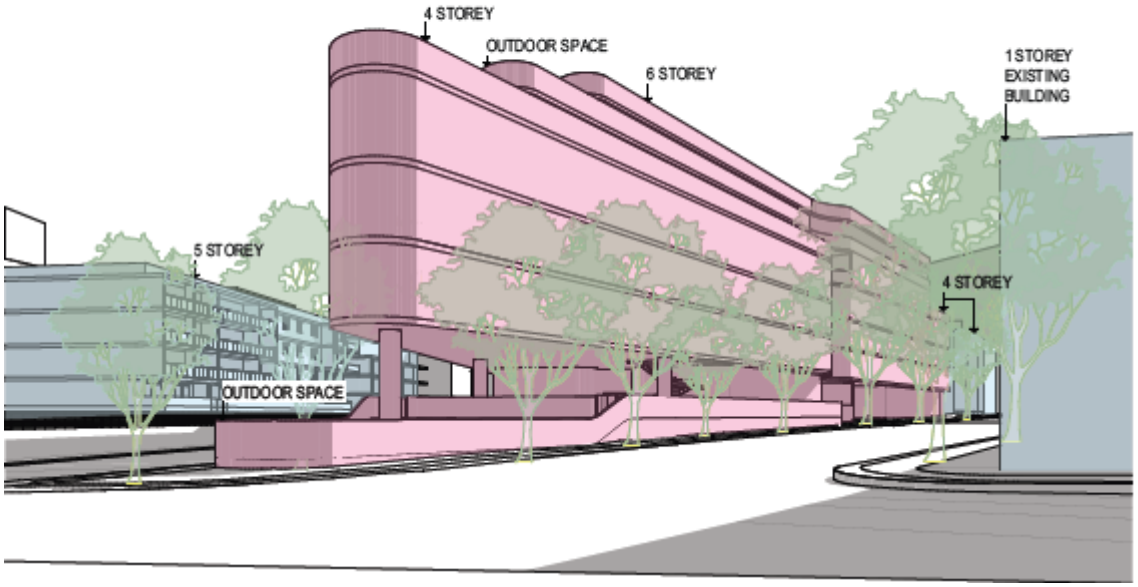


Figure 14. Indicative development concept – view looking north from Young Street. Source: Plus Architecture Urban Design Report

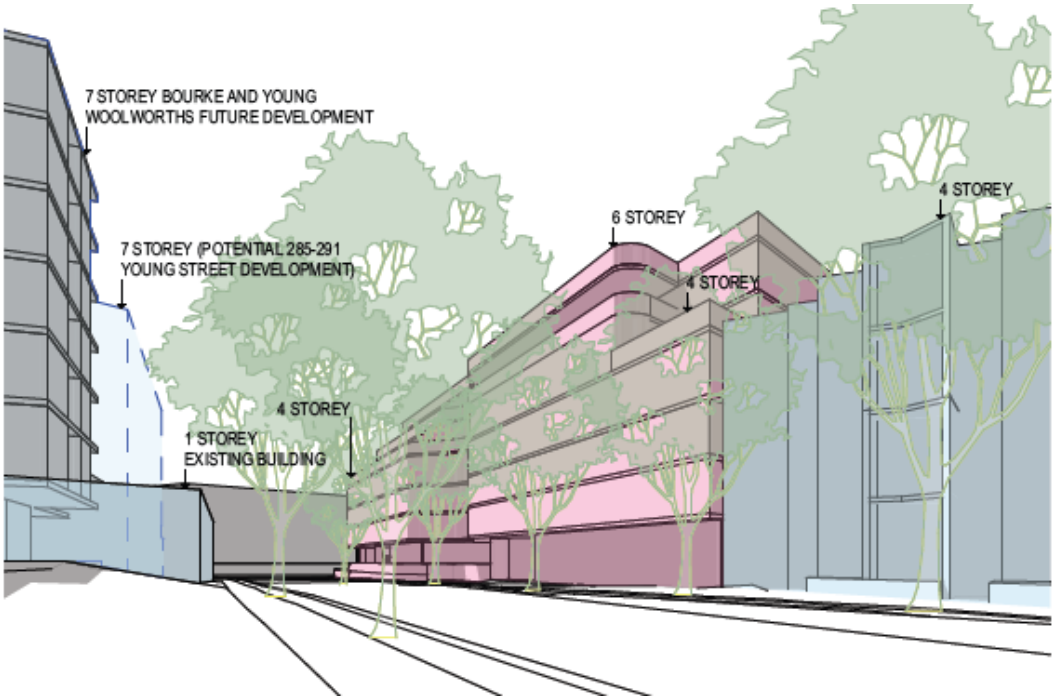


Figure 15. Indicative development concept – view looking south from Young Street Source: Plus Architecture Urban Design Report

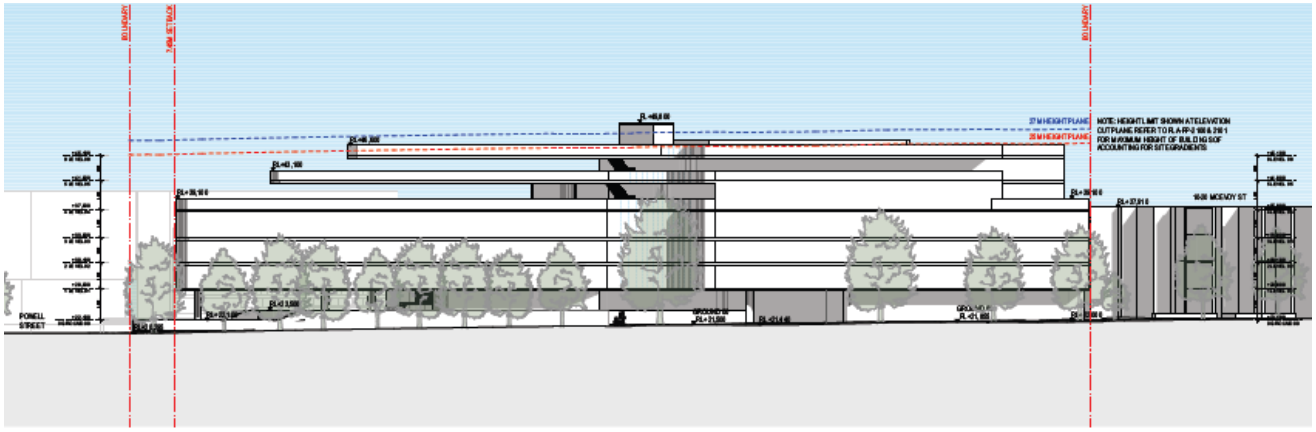


Figure 16. Young Street elevation. Source: Plus Architecture Urban Design Report

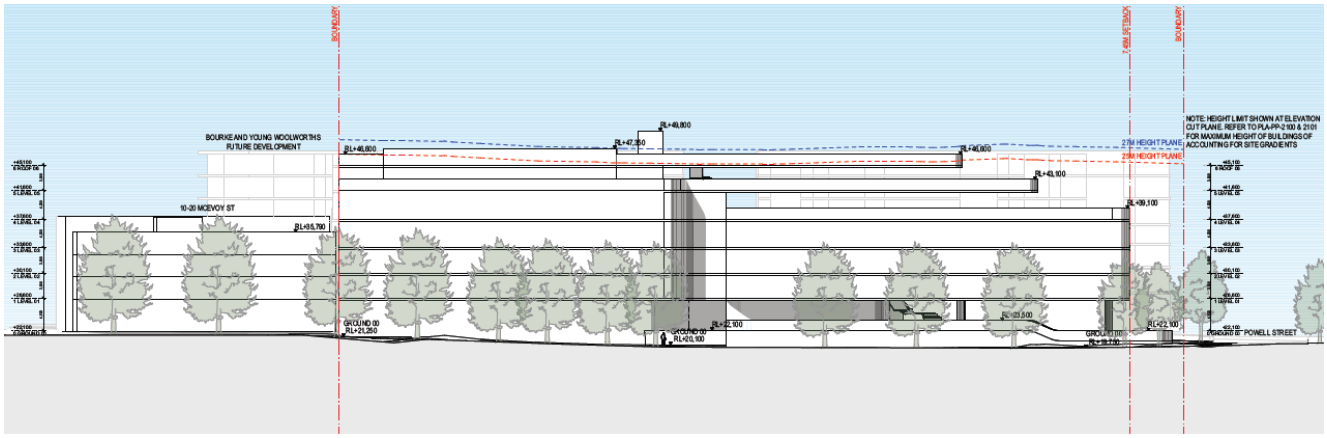


Figure 17. Hunter Street elevation. Source: Plus Architecture Urban Design Report

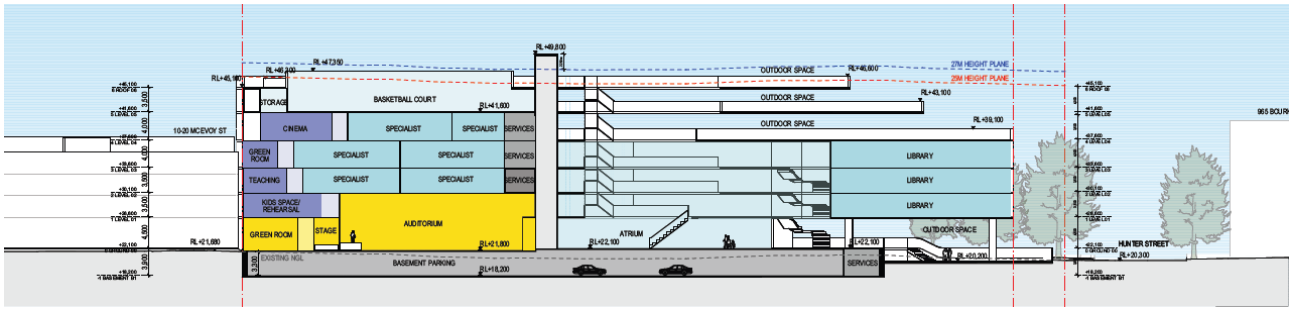


Figure 18. North-south cross section of indicative building envelope. Source: Plus Architecture Urban Design Report

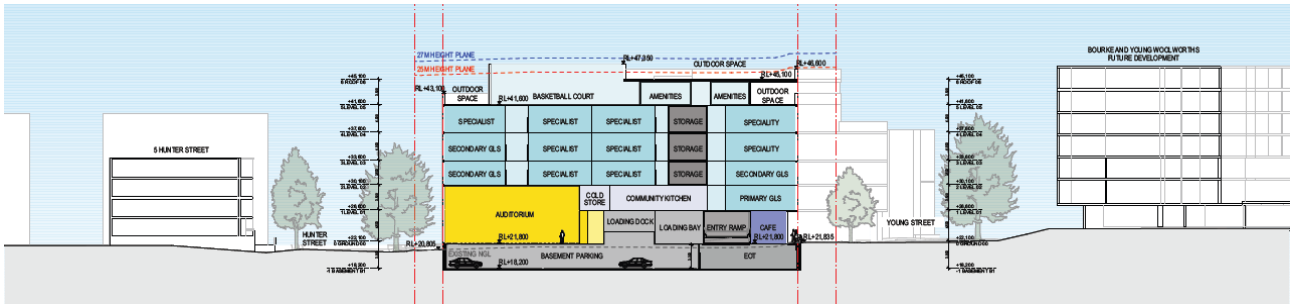


Figure 19. West-east cross section of indicative building envelope. Source: Plus Architecture Urban Design Report

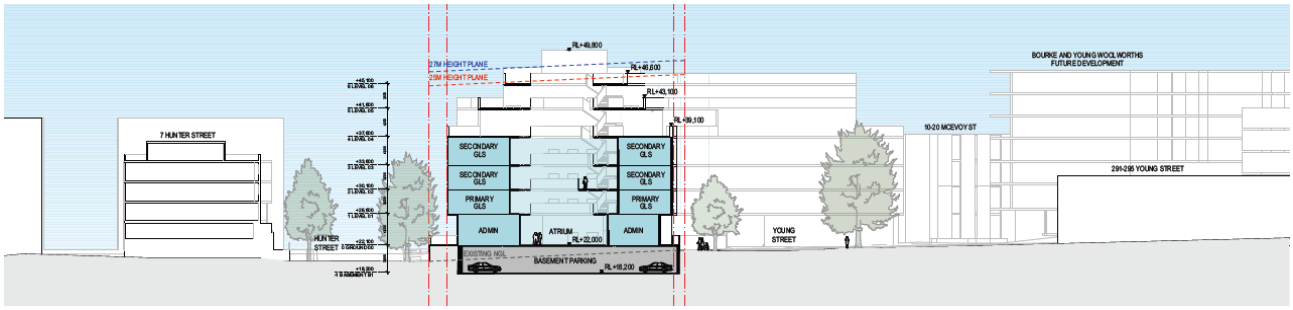


Figure 20. West-east cross section of indicative building envelope. Source: Plus Architecture Urban Design Report

5.2. Development outcomes

The planning proposal and the accompanying draft Design Guide seeks to facilitate a new school on the site, incorporating the existing film school.

The indicative reference scheme, provided by the landowner and tested in the urban design study attached to this planning proposal, shows a development outcome on the site that includes a total of 13,544sqm GFA incorporating within the same development:

- 10,608sqm for a school;
- 2,935sqm for a film school; and
- ground floor café in the film school part of the development.

The new vertical school consists of:

- 45 General Learning Spaces (GLS) and 13 specialist classrooms;
- a multi-purpose hall / auditorium;
- a library;
- a canteen;

- administration, lobby and circulation spaces; and
- 4,978sqm of outdoor recreation space.

The development is serviced by a basement including 55 car parking spaces and end of trip facilities.

The key proposed planning controls in the Sydney LEP and the draft Design Guide to facilitate the development are:

- building heights of up to six storeys or 25m;
- FSR of up to 2.94:1;
- parking controls that allow for one space for every two staff members;
- setbacks to support deep soil landscaping;
- setbacks to allow for widened footpaths along Hunter Street and Young Street; and
- the required retention of nine high value, 13 medium value and three low value trees.

5.3. Need for the planning proposal

Is the planning proposal a result of an endorsed LSPS, strategic study or report?

This planning proposal is not the result of any endorsed LSPS, strategic study or report.

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

A planning proposal is the only way to facilitate the proposed development outcomes, as they specifically related to matters that are best address by local environmental plan controls.

5.4. Relationship to the strategic planning framework

Will the planning proposal give effect to the objectives and actions of the applicable regional or district plan or strategy (including any exhibited draft plans or strategies)?

This planning proposal is consistent with the relevant objectives and actions of the applicable regional or sub-regional strategy as summarised below.

A Metropolis of Three Cities - Greater Sydney Region Plan

- *Objective 9: Greater Sydney celebrates the arts and supports creative industries innovation* - The proposal will tertiary film school will provide more opportunities for creative industries to collaborate with education institutions and support local opportunities for artistic, cultural and creative expression.
- *Objective 12: Great places that bring people together* - The planning proposal will deliver high-quality social infrastructure that will be a focal point for social interaction and connections for school-age populations and families in the catchment area.
- *Objective 14: A Metropolis of Three Cities – integrated land use and transport creates walkable and 30-minute city* - The new school will provide a local option for residents which will does not require travel to centres outside of the immediate catchment, ultimately contributing to a reduction in private car trips, as well as the time and distance travelled.
- *Objective 33: A low-carbon city contributes to net-zero emissions by 2050 and mitigates climate change* - The project's goal is to achieve a minimum 4 Star NABERS Energy Commitment Agreement for schools and attain at least a 5 Star Green Star – Education v1 rating upon certification. Additionally, it seeks to minimise energy consumption through passive strategies and utilise renewable resources as necessary.

Eastern City District Plan

This planning proposal is consistent with the following planning priorities of the District Plan.

- *Priority E1: Planning for a city supported by infrastructure* – The proposal supports the alignment of population growth with infrastructure through the provision of primary, secondary and tertiary education facilities. The site is also supported by proximity to public transport infrastructure, including Waterloo metro.
- *Priority E3: Providing services and social infrastructure to meet people's changing needs* – The proposal will deliver social infrastructure which will cater to the daily needs of the local community in an area that is growing rapidly, particularly the school aged population group and reduce existing enrolment pressures on surrounding schools.
- *Priority E4: Fostering healthy, creative, culturally rich and socially connected communities* – The film will provide a creative enterprise that will support opportunities for creative expression school and cultural vibrancy. The proposal will also reduce the need for car-based trips to access the school.
- *Priority E11: Growing investment, business opportunities and jobs in strategic centres* - This planning proposal will deliver employment opportunities in the Green Square – Waterloo strategic centre through the school and café and retention of the existing the film school.
- *Priority E19: Reducing carbon emissions and managing energy, water and waste efficiency* - This planning proposal enables a future built form that supports a sustainable design with high efficiencies for water, energy and waste and to reduce carbon emissions.

Is the planning proposal consistent with council's local strategy or other local strategic plans?

Yes. This planning proposal is consistent with relevant local strategies and plans as summarised below.

Sustainable Sydney 2030-2050

The planning proposal supports following Sustainable Sydney strategic directions:

- *D4: Design excellence and sustainable development* - The draft Design Guide accompanying this planning proposal includes provisions for the future development to reduce greenhouse gas emissions through improved energy efficiency and low carbon energy in line with the City's 2026 targets for net zero emissions. The proposed development aims to deliver 5-star green star design aspiration and 4-star NABERS rating for schools with the inclusion of renewable resources where required. The proposal will meet and outperform regulatory sustainability standards including NCC Section J – Energy Efficiency and State Environmental Planning Policy (Sustainable Buildings) 2022.

  The built form will also be designed to operate with high environmental performance standards for water, energy and waste which include efficient stormwater management design for on-site retention and reuse. It will also optimise passive heating and cooling.

  The built form will demonstrate design excellence and architectural interest by creating a high quality, comfortable, safe and inclusive built environment for students and the wider area. The design will also integrate the retention of tree and canopy structures both on and surrounding the site adding to the attractiveness and amenity of the bult form.
- *D8: A thriving cultural and creative life* - The proposal includes the redevelopment of the existing film school which will support the cultural and creative life of the City.

City Plan 2036: Local Strategic Planning Statement

This planning proposal gives effect to the following priorities of City Plan 2036:

Infrastructure

- *I1: Movement for walkable neighbourhoods and a connected city* - The proposed development is strategically located in close proximity to public transport including the Waterloo Metro Station, Green Square Station and bus services. The site is highly connected and supports

opportunities for walking and cycling. The site is also located across from a recently rezoned site, proposing a mixed-use residential development at 923-935 Bourke Street that will deliver a through site link and footpath widening connecting the site to the Bourke Street shared path. The proposal will provide two pedestrian crossings on Young and Powell Streets. The pedestrian crossing on Young Street will connect the site to the through site link on Bourke Street which will support active transport uses and the prioritisation of pedestrian movements to the site.

- *I2: Align development and growth with supporting infrastructure* - The proposed development responds to the significant growth in the school-age population in the Waterloo area. This is explained further in section 5.5 of this planning proposal.

Liveability

- *L1: A creative and social connected city* - The school will become a community hub for social connection for families and individuals in the catchment area. The redevelopment of the film school will provide creative tertiary education opportunities for the wider community. It is the only existing artistic/performance space within a walkable 400m catchment of the site.

Sustainability

- *S2: Creating better buildings and places to reduce emissions and water and use water efficiently* - The proposed planning controls ensure high sustainability targets for the future redevelopment site. The built form will include measure that reduce carbon emissions through passive design and manage energy and water.

Is the planning proposal consistent with applicable State Environmental Planning Policies?

This planning proposal is consistent with all applicable State Environmental Planning Policies (SEPPs), as summarised in Table 2

Table 2: Consistency with State Environmental Planning Policies

State Environmental Planning Policy	Comment
SEPP (Biodiversity and Conservation) 2021	Consistent
SEPP (Exempt and Complying Development Codes) 2008	Consistent
SEPP (Housing) 2021	Consistent
SEPP (Industry and Employment) 2021	Consistent
SEPP (Planning Systems) 2021	Consistent
SEPP (Precincts–Central River City) 2021	Not applicable
SEPP (Precincts–Eastern Harbour City) 2021	Consistent
SEPP (Precincts–Regional) 2021	Not applicable
SEPP (Precincts–Western Parkland City) 2021	Not applicable
SEPP (Primary Production) 2021	Not applicable

State Environmental Planning Policy	Comment
SEPP (Resilience and Hazards) 2021	Consistent. A Detailed Site Investigation was prepared by EI Australia in 2018 which found that widespread contamination was not present, and the site could be remediated to a suitable standard for the proposed development which was mixed-use residential. The report recommended that a Hazardous Materials Survey and an Additional Site Investigation be conducted, and a Remedial Action Plan is prepared prior to commencement of works. This can be satisfied at the DA stage.
SEPP (Resources and Energy) 2021	Consistent
SEPP (Sustainable Buildings) 2022	Consistent
SEPP (Transport and Infrastructure) 2021	Consistent

Is the planning proposal consistent with applicable Ministerial Directions (section 9.1 Directions) or key government priority?

This planning proposal is consistent with all Ministerial Directions issued under section 9.1 of the Environmental Planning and Assessment Act 1979, as summarised in Table 3.

Table 3: Consistency with Ministerial Directions

Ministerial Direction	Comment
Focus area 1: Planning Systems	
1.1 Implementation of Regional Plans	Consistent. This proposal supports the Region Plan, as discussed in detail under Question 3 (above).
1.2 Development of Aboriginal Land Council land	Not applicable
1.3 Approval and Referral Requirements	Consistent. This planning proposal does not include concurrence, consultation or referral provisions or identify any developments as designated development.
1.4 Site Specific Provisions	Inconsistent. The objective of this direction is to discourage unnecessarily restrictive site specific planning controls. This direction applies when a relevant planning authority prepares a planning proposal that will allow a particular development to be carried out. This planning proposal is inconsistent with this Direction as it proposes site specific controls to

Ministerial Direction	Comment
	allow a particular development to be carried out. Division 5 of the LEP contains site-specific provisions for various sites across the City. This planning proposal introduces site-specific controls into the LEP to ensure the development is used for a vertical school and film school. In this instance, the inconsistency is acceptable because it is of minor significance and is the only way to achieve the intended outcomes of this planning proposal.
1.4A Exclusion of Development Standards from Variation	Consistent. This planning proposal does not propose to exclude a development standard from variation under clause 4.6
Focus area 1: Planning Systems – Place-based	
1.5 Parramatta Road Corridor Urban Transformation Strategy	Not applicable
1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan	Not applicable
1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable
1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan	Not applicable
1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor	Not applicable
1.10 Implementation of the Western Sydney Aerotropolis Plan	Not applicable
1.11 Implementation of Bayside West Precincts 2036 Plan	Not applicable
1.12 Implementation of Planning Principles for the Cooks Cove Precinct	Not applicable
1.13 Implementation of St Leonards and Crows Nest 2036 Plan	Not applicable
1.14 Implementation of Greater Macarthur 2040	Not applicable

Ministerial Direction	Comment
1.15 Implementation of the Pyrmont Peninsula Place Strategy	Not applicable
1.16 North West Rail Link Corridor Strategy	Not applicable
1.17 Implementation of the Bays West Place Strategy	Not applicable
1.18 Implementation of the Macquarie Park Innovation Precinct	Not applicable
1.19 Implementation of the Westmead Place Strategy	Not applicable
1.20 Implementation of the Camelia-Rosehill Place Strategy	Not applicable
1.21 Implementation of the South West Growth Structure Plan	Not applicable
1.22 Implementation of the Cherrybrook Station Place Strategy	Not applicable
Focus area 2: Design and Place	No directions in place.
Focus area 3: Biodiversity and Conservation	
3.1 Conservation Zones	Consistent. The planning proposal will not adversely impact the conservation of environmentally sensitive areas.
3.2 Heritage Conservation	Consistent. The planning proposal will not adversely impact the ongoing conservation of heritage items.
3.3 Sydney Drinking Water Catchments	Not applicable
3.4 Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs	Not applicable
3.5 Recreation Vehicle Areas	Consistent. The site is not being development for the purpose of a recreation vehicle area.
3.6 Strategic Conservation Planning	Not applicable
3.7 Public Bushland	Consistent. The proposal does not adversely impact the protection of bushland in urban areas.
3.8 Willandra Lakes Region	Not applicable

Ministerial Direction	Comment
3.9 Sydney Harbour Foreshores and Waterways Area	Not applicable
3.10 Water Catchment Protection	Not applicable
Focus area 4: Resilience and Hazards	
4.1 Flooding	Consistent. While this planning proposal contains provisions that apply to flood planning areas which result in an increase in the development density of the land, it is consistent with the Direction as it does not: • rezone land; • permit development in floodway areas; • permit development for residential accommodation in high hazard areas; • permit a significant increase in the development. The increase in the development density is minor (approximately 15 to 20 per cent increase in GFA); • permit development for the purpose of uses identified in 3e of the Direction; • permit development without consent; • result in significantly increased government spending on emergency management, flood mitigation, emergency response measures; or • permit hazardous industries, storage establishments or materials on the site. The planning proposal is in accordance with the Alexandra Canal Floodplain Risk Management Study and Plan, adopted by the City in accordance with the principles and guidelines of the Floodplain Development Manual 2005. The Plan identifies the site as being part of the Sheas Creek Sub-Catchment. Some flood modification measures identified in the Plan have already been acted upon by the City as part of infrastructure improvements through the development of the Green Square Urban Renewal Area. The operational management plan supporting this planning proposal proposes shelter in place provisions in the event of flash flooding. Shelter in place procedures will be refined and improved as part of any future development application

Ministerial Direction	Comment
	process. It ensures that during a flood event, there can be safe occupation while the flood risk subsides.
4.2 Coastal Management	Consistent. 242-258 Young Street Waterloo is not on land within the coastal zone. In relation to the proposed change to clause 7.9, this applies to areas within the coastal zone however this change does not rezone land nor does it enable increased development or more intense land-use. It is consistent with all relevant Acts, manuals, guidelines and plans identified in Ministerial Direction 4.2.
4.3 Planning for Bushfire Protection	Not applicable.
4.4 Remediation of Contaminated Land	A Detailed Site Investigation was prepared for a mixed-use residential development concept in 2018 which found that the site could be remediated to a suitable standard for the proposed development and that there was no widespread contamination at the site. Detailed contamination assessment of the site will be further undertaken at the development application stage in accordance with the City's contamination management policy.
4.5 Acid Sulfate Soils	Consistent. The site is mapped as Class 5 Acid Sulfate Soils in the City of Sydney sheet map, which means acid sulfate soils are not typically found.
4.6 Mine Subsidence and Unstable Land	Not applicable
Focus area 5: Transport and Infrastructure	
5.1 Integrating Land Use and Transport	Consistent. The objectives of this Direction are to improve accessibility, increase transport options, reduce travel demand and dependence on cars, support public transport, and provide for efficient movement of freight. The planning proposal will enable development of social infrastructure and jobs in a location well served by public and active transport infrastructure. This supports the efficient and viable operation of public transport services,

Ministerial Direction	Comment
	reduce dependence on cars and trip generation by car.
5.2 Reserving Land for Public Purposes	Consistent. The planning proposal does not relate to the reservation of land for public purposes.
5.3 Development Near Regulated Airports and Defence Airfields	Consistent. The direction applies to this planning proposal as the proposal "will create, alter or remove a zone or provision relating to land in the vicinity of a license aerodrome." The planning proposal seeks to increase the permissible building height as identified in the Height of Building Map. The land subject to this planning proposal is affected by the Obstacle Limitation Surface (OLS). However, no proposed increase in height in this planning proposal (or any other proposed control) will allow development to exceed the OLS airspace level of 60m. The following requirement of this direction are relevant to this planning proposal: In the preparation of a planning proposal that sets controls for the development of land in the vicinity of a licensed aerodrome, the relevant planning authority must: (a) consult with the Department of the Commonwealth responsible for aerodromes and the lessee of the aerodrome, (b) take into consideration the Obstacle Limitation Surface (OLS) as defined by that Department of the Commonwealth, for land affected by the OLS: (c) prepare appropriate development standards, such as height, and (d) allow as permissible with consent development types that are compatible with the operation of an aerodrome. The planning proposal is consistent with the above and any further consultation with relevant authorities will be undertaken later in the planning proposal process.
5.4 Shooting Ranges	Not applicable
Focus area 6: Housing	
6.1 Residential Zones	Not applicable
6.2 Caravan Parks and Manufactured Home Estates	Consistent. The site is not being developed for a caravan park or manufactured home estate.

Ministerial Direction	Comment
Focus area 7: Industry and Employment	
7.1 Employment Zones	Consistent. The planning proposal will retain the existing MU1 zoning.
7.2 Reduction in non-hosted short-term rental accommodation period	Not applicable
7.3 Commercial and Retail Development along the Pacific Highway, North Coast	Not applicable
Focus area 8: Resources and Energy	
8.1 Mining, Petroleum Production and Extractive Industries	Not applicable
Focus area 9: Primary Production	
9.1 Rural Zones	Not applicable
9.2 Rural Lands	Not applicable
9.3 Oyster Aquaculture	Not applicable
9.4 Farmland of State and Regional Significance on the NSW Far North Coast	Not applicable

Table 2. Consistency with Section 9.1 Ministerial Directions

5.5. Environmental, social and economic impact

Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected because of the proposal?

The planning proposal and the accompanying specialist technical studies do not identify or assess any critical habitat or threatened species, populations or ecological communities, or their habitats on this site. As a result, it is highly unlikely that there would be any adverse impact on a critical habitat or threatened species, population or ecological community to take place as a result of this proposal.

Mature vegetation within the site is not listed as critical habitat or threatened. The indicative reference scheme for the proposed development intends to retain a significant part of existing tree and canopy structure.

Are there any other likely environmental effects of the planning proposal and how are they proposed to be managed?

A range of technical studies were submitted in support of this planning proposal and are appended to this report, including:

- Attachment A – Urban Design Report – Plus Architecture

- Attachment B – Architectural Drawings – Plus Architecture
- Attachment C - Draft Site-Specific Design Guide – Ethos Urban
- Attachment D – Engagement Summary Report – Ethos Urban
- Attachment E – Landscape Concept Plan - Turf Design
- Attachment F – Survey Plan - MBM
- Attachment G – Traffic and Transport Report – JMT
- Attachment H – Social Infrastructure Review – Ethos Urban
- Attachment I – Operational Management Plan – Amina Consulting
- Attachment J – Site Specific Flood Study – WMA Water
- Attachment K – Acoustic Report – ADP
- Attachment L – Arboriculture Impact Assessment – Aborsaw
- Attachment M – Public Art Statement – Amanda Sharrad Consulting
- Attachment N – Detailed Site Investigation – EI Australia
- Attachment O – Geotechnical Assessment Report – Alliance Geotech
- Attachment P – Sustainability Strategy – JN Engineering
- Attachment Q – Landowners Consent – Charvic
- Attachment R – Landowners Consent – ISAP
- Attachment S – Response to City of Sydney Tree Officer Comments – Aborsaw
- Attachment T – CIV Report – MBM
- Attachment U – Acid Sulfate Soils Assessment – Alliance Geotech

Need for a school

A Social Infrastructure Review has been prepared by Ethos Urban on behalf of the proponent and is attached to this Planning Proposal planning proposal (Attachment H).

The Review found the school will introduce further diversity for schooling options into an area of high population growth.

Floor Space Ratio

The current maximum FSR that can be achieved on the site under the Sydney LEP 2012 is 2.2:1. This includes:

- a mapped FSR of 1.5:1;
- an additional 0.5:1 where community infrastructure floor space is provided; and
- up to an additional 10% of FSR (or height) where the building demonstrates design excellence (a total of 0.2:1 on this site).

This planning proposal facilitates an additional 0.74:1 of floor space, resulting in a total of 2.94:1 that can be achieved on the site, excluding design excellence.

An Urban Design Report, prepared by Plus Architecture, is attached to this planning proposal at Attachment A. The Report demonstrates that the proposed density is consistent with the surrounding area and will not result in significant adverse impacts. The mixed-use building to the immediate east of the site at 923-935 Bourke Street, Waterloo has an FSR of 2.7:1. Adjacent to the site, to the immediate north at 10-20 McEvoy Street is a 4-storey residential building which has an FSR of 2.1:1.

The additional FSR is supported because the school will assist in addressing the current gap in primary and high schools in the catchment area. The site is also in a highly accessible location,

close to public transport and to current and planned high density residential development with an expected growth in school-aged populations.

Maximum Building Height

The planning proposal introduces a 25m building height control within the site-specific provision, which allows for 6 storeys. The draft Design Guide provides more detailed requirements for upper-level setbacks and articulation.

The scheme proposes a five-storey podium height to the north along Hunter Street, which transitions to 4 storeys to the south. This scale is suitable to the existing development along Hunter Street which is 4-5 storeys.

Along Young Street, a four-storey podium height with 2 storeys setback above for a total of 6 storeys is proposed. The podium height aligns with the 4 storey residential building directly north. The upper 2 levels are setback from the podium to reduce visual appearance from street level. The building height is an appropriate contextual fit to 923-935 Bourke Street which is a 7 storey mixed-use residential building.

The proposed heights allow a natural transition in height and massing of the development to adjoining sites, the existing residential apartments along Young Street and the mixed-use developments along Bourke Street, as well as responding to the surrounding area, where building heights are up to 40m within the Danks Street South precinct and up to 68.5m within the Lachlan precinct. In addition, the retention of tree canopy will reduce the impacts of the proposal on the surrounding building and maintain amenity.

Given the roof will be used as a play area for school students, the site specific provision also accommodates for shade structures, rooftop nets, balustrade, fence or low-level boundary treatments and lift overruns. This inclusion is essential for the development to be able to deliver an educational establishment on the site.

Open space

The reference scheme is subject to the NSW Department of Education's Facilities Standards and Guidelines that required a minimum of 10sqm of open space per student. However, the guideline allows vertical schools to employ innovative methods to compensate for a shortage of on-site open space.

The proponent has proposed to use Turruwul Park, Rosebery to meet its sporting field requirements. These are the closest sporting fields in the area having capacity within the City's bookings system to support this future use. This requires a 10-15 minute bus ride to move children between the school and the park.

Where sporting fields closer to the school become available new arrangements could come into place.

Sustainability

The sustainable design objectives for the proposed development are informed by a Sustainability Strategy Report prepared by JN Engineering.

The draft Design Guide accompanying this Planning Proposal requires that the educational premises achieves a minimum 4 Star NABERS Energy Commitment Agreement for schools and achieve a minimum 5 Star Green Star – Education v1 rating at certification.

Flooding

The City's Alexandra Canal Catchment Floodplain Risk Management Plan shows that the site is significantly flood-affected. The site is affected by overland flow from Euston Street (north) that flows in a southerly direction along Hunter Street and Young Street. The main flood risk is on Hunter Street due to ponding at the sag point.

A Specific Flood Study, prepared on behalf of the proponent by WMAwater and attached to this planning proposal as Attachment J, finds that the building envelope is appropriate and complies

with all flooding levels as per the City's Interim Floodplain Management Policy. The proposed development would also not have an adverse impact on flood levels for surrounding properties and would not change the flood hazard on surrounding roads. The Study also noted that in a probable maximum flood (PMF) event the upper levels of the building can serve as a flood refuge. Any future flood emergency management and evacuation will require a detailed investigation and flood management plan to be put in place given the flash-flooding nature of the site.

The draft Design Guide, accompanying this planning proposal includes detailed provisions to ensure sufficient flood risk management measures are in place, to be addressed at the development application stage, in particular strategies to minimise risk to human life and damage to property caused by flood events. At this stage, the proponent has prepared an operational management plan which foreshadows the shelter in place arrangements that would be further developed at development application stage.

Heritage

No change is proposed to current heritage provisions in the Sydney LEP 2012. The site is not identified as a heritage item and is not located in a heritage conservation area.

There are local listed heritage items to the north of the site in the Danks Street South precinct, including:

- Item 12073 Former Sydney Water pumping station and valve house including interiors and associated underground pipework (903–921 Bourke Street);
- Item 12103 Commercial building part of "Federation Business Centre" (222 Young Street) including interior; and
- Item 21204 Electrical substation including interior (241 Young Street).

Directly to the south of the site are the following locally listed heritage items:

- Item 12082 Former Chubb Pty Ltd including interior (830–838 Elizabeth Street):
- Item 12094 Electrical substation including interior (2A Powell Street); and
- Item 2072 Federation warehouse with art deco additions (866–882 Bourke Street).

Further south is the Zetland Estate heritage conservation area (C73). Further north is the Zetland heritage conservation area (C70).

There are no state listed heritage items in the vicinity.

The review of the heritage items mentioned above confirms the proposed changes to the planning controls does not impact these nearby heritage items.

Overshadowing

The built form of the proposed development minimises overshadowing impacts to surrounding residential development and publicly accessible private open space to the south of the site.

Figure 21 below demonstrates that the built form will not restrict future development from achieving two hours of solar access to 70 per cent of the apartments during the mid-winter solstice, with no additional overshadowing impacts until 2pm. This includes the Woolworths development and non-residential uses to the south-east of the site. Overshadowing is illustrated where the building envelope of the school site visually overlaps with the lower levels of buildings across the road.

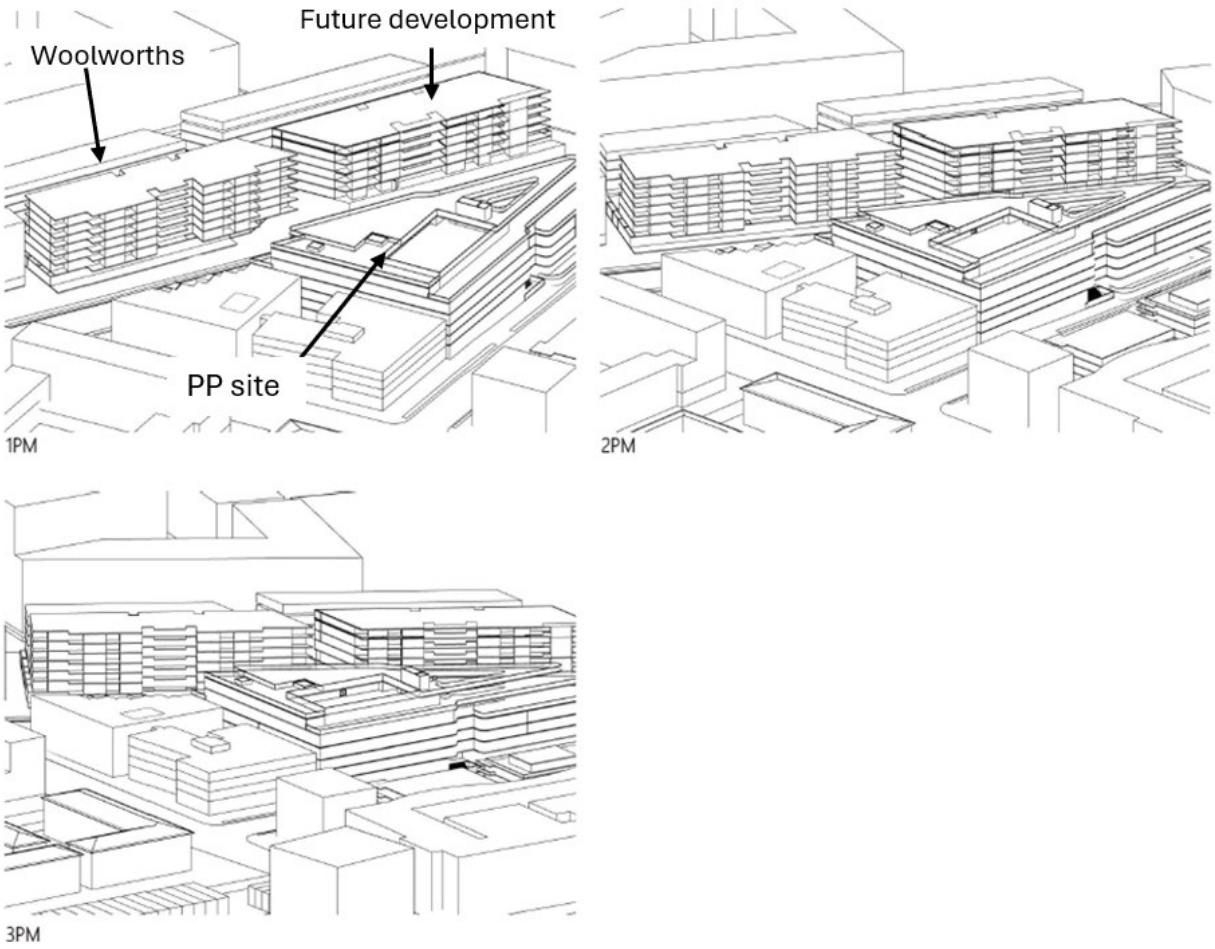
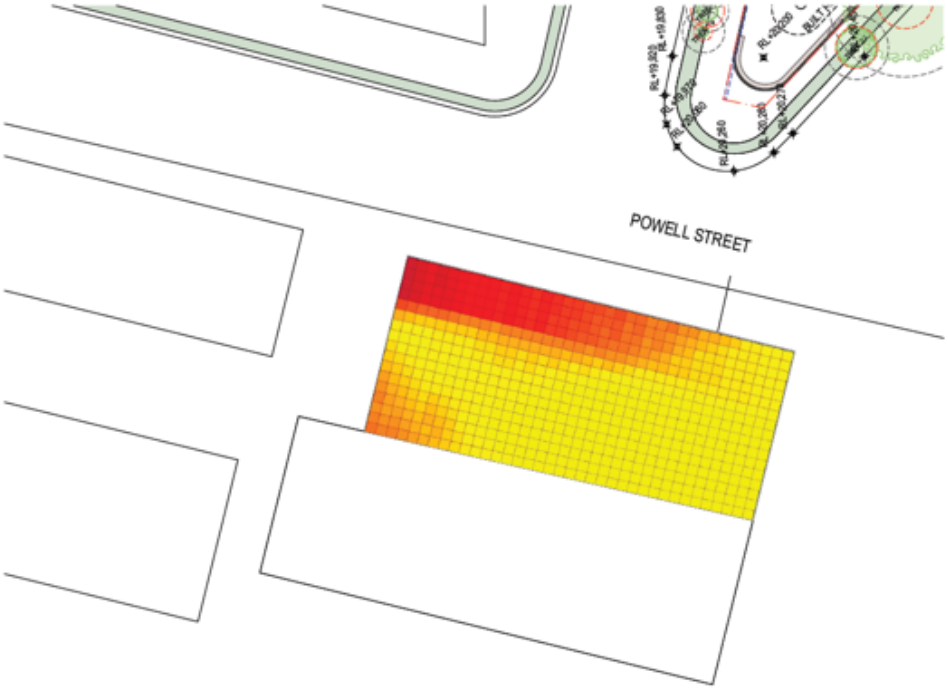


Figure 21. Overshadowing impact Young Street (sun eye view). Source: Plus Architecture Urban Design Report

Figure 22 demonstrates that the open space to the south of the site will achieve a minimum of four hours of solar access to more than 85% of its area from 9am to 3pm on the mid-winter solstice. This complies with the City's requirement for open space in the Sydney Development Control Plan 2012.



SITE AREA (SQM)	≥ 3 HRS	≥ 4 HRS	≥ 5 HRS	6 HRS
629.26	604.9	545.5	462.1	232.5
	96.1%	86.7%	73.4%	36.9%

Figure 22. Solar study of southern open space. Source: Ethos Urban Planning Justification Report

The proposed development results in minor overshadowing during the mid-winter solstice before 10am to parts of three residential apartment balconies located at 9 Hunter Street Waterloo. These balconies are identified in Figure 23. The figure demonstrates how the overshadowing impact is minimal, From 10am onwards, the proposal does not cause any overshadowing to the Hunter Street apartments.

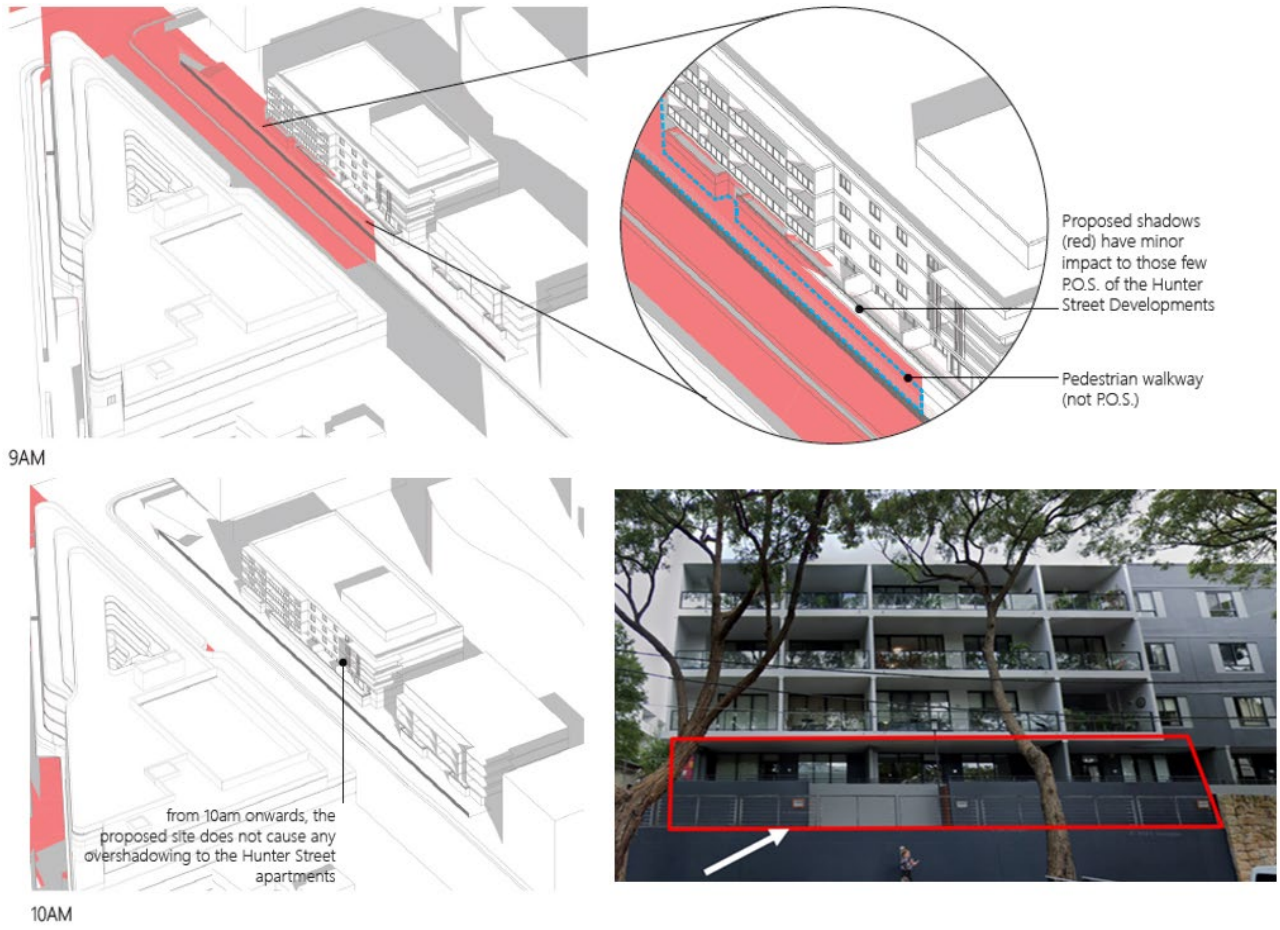


Figure 23. Balconies affected by overshadowing – Hunter Street Source: Plus Architecture Urban Design Report

Noise

This planning proposal is supported by an Acoustic Report prepared by ADP Consulting, appended at Attachment K.

The assessment report identifies relevant noise emissions criteria applicable to the development and nearby sensitive noise receivers. The assessment concludes that there are no site conditions, statutory or otherwise that would prevent the development from complying with the relevant noise criteria. It also suggests acoustic treatments for the mitigation of acoustic impact to all nearest noise sensitive receivers.

Long-term unattended and attended noise monitoring will be conducted at the DA stage to ensure compliance with internal noise level criteria.

Trees protection

The proposed built form ensures the future development retains a substantial portion of the tree and canopy structure that currently occupy both the perimeter of the site and the street verge.

The Design Guide identifies the street trees surrounding the site, as well as trees on the site that must be protected in developing the site. There are currently 33 trees on the site and surrounding area. A survey of the trees on the site is shown below in Figure 23. The trees are classified as:

- 9 High Retention Value Trees
- 13 Medium Retention Value Trees
- 11 Low Retention Value Trees

The proposal is seeking to remove 8 trees that are classified as low retention value and are all within the proposed building footprint. 25 trees are identified to be protected. These include all high value and medium value trees.

The proposal is supported by an Arboriculture Impact Assessment, prepared by Aborsaw (Attachment L). The assessment notes that the tree protection zones that are encroached by the proposed building envelope are all smaller than the existing encroachment. It concludes that the viability of the trees to be retained will not be impacted if protection measures are adhered to.

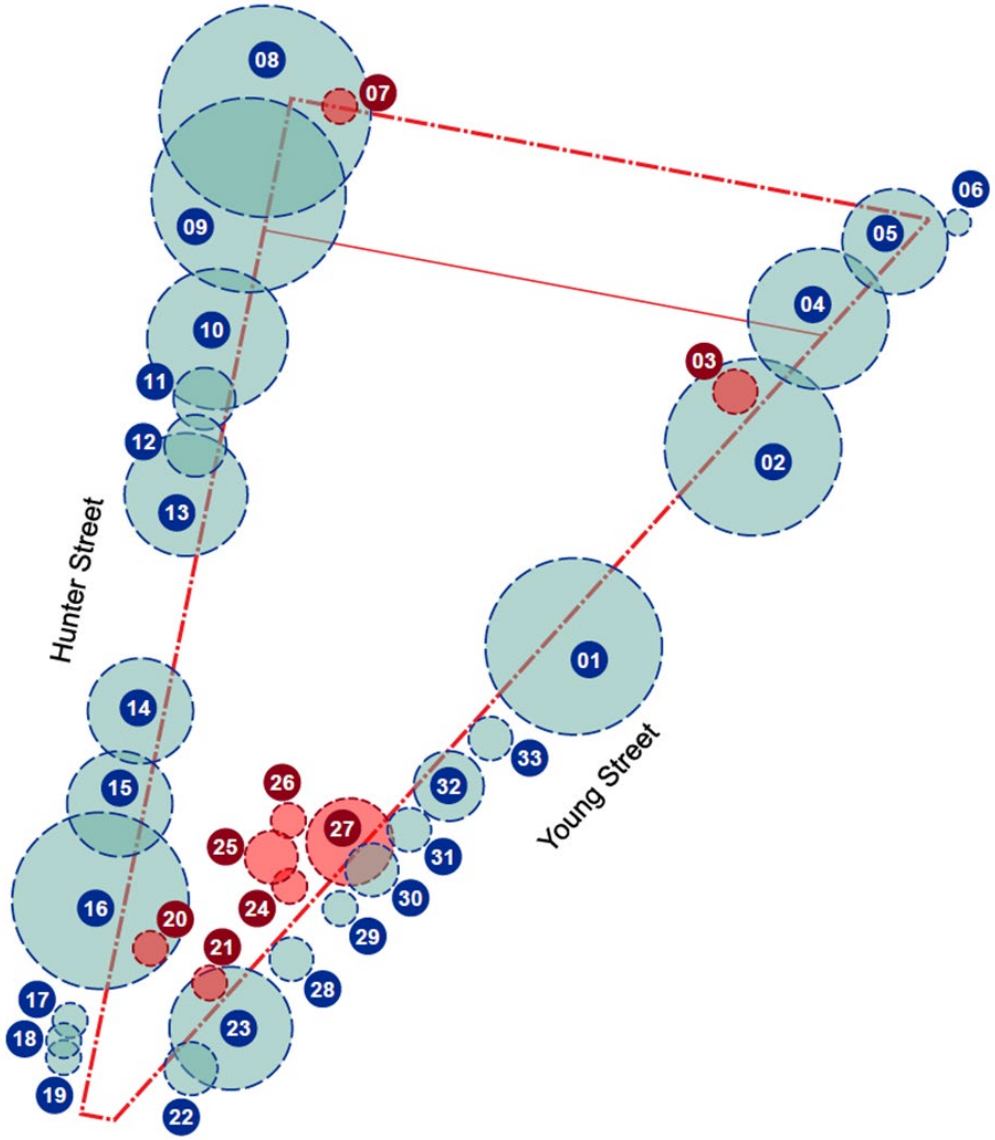


Figure 24. Tree removal/retention map. Source: City of Sydney

The Draft Design Guide requires retention of trees shown in blue in Figure 23 and corresponding setbacks at basement, ground and all upper levels, to ensure that adequate space is provided for existing tree roots and tree canopies. These setbacks are all carefully considered and supported by the Arboriculture Impact Assessment, to ensure that the trees proposed for retention will have minimal pruning because of the development.

The Draft Design Guide ensures that any future development application will need detailed justification to demonstrate that the development will not compromise the ongoing health and viability of the trees identified for retention.

Footpath widening

The Draft Design Guide accompanying this planning proposal requires a footpath widening setback of between 2m and 2.5m along Hunter Street and 1.5m along Young Street. Currently the footpaths are approximately 2m wide with an additional 2m currently landscaped area. By increasing the existing footpath widths from 2m to between 3.5m and 4.5m will allow safe circulation space outside the school entries and to allow other members of the public to safely use the footpaths.

Public transport

As noted in Section 1 of this planning proposal, the site is currently well serviced by public transport, allowing students and workers easy access to the development.

The draft letter of offer received by the proponent includes two pedestrian crossings across Young Street and Powell Streets. This allows for safe pedestrian access to the future Woolworths site, surrounding bus stops, Waterloo Metro Station and Green Square Station.

The pedestrian crossing across Young Street will allow students to safely access bus stops on Bourke Street. The pedestrian crossing proposed across Powell Street, provides students with a safer, more pleasant route to Green Square Station avoiding Bourke Street, via Short Street Reserve as well as providing a direct and safe pedestrian route to Waterloo Oval. It also allows for a safer route to Waterloo Metro Station, via existing signalised pedestrian crossings and quieter street environments.

Traffic and transport

An updated Traffic and Transport Report prepared by JMT Consulting, appended to this planning proposal, provides a traffic assessment of the proposed development resulting from this planning proposal and impacts to the adjacent roads. The assessment indicates that the traffic and transport impacts arising from the proposal are considered acceptable.

The design guide accompanying this planning proposal limits car parking to 1 space per 2 staff members, which is estimated to be 55 spaces and consistent with the reference scheme. This limit is appropiate given the proximity to public transport, the surrounding high density area and the parking rates in recently approved for schools in the LGA (e.g. Green Square Public School with no parking ranging to 1 space for every 2 staff members at Ultimo Pyrmont Public School). It will help manage traffic impacts and discourage car use to access the site from the surrounding area and from outside the catchment.

School drop-off sessions will begin between 8:00am and 8:30am, while pick up will be at 3:00pm to 3:30pm, this will be staggered across primary and secondary school students. Traffic generating modelling determines that the school may generate 90-100 car trips to the site in the morning peak hour between 8:00-9:00am and 10-15 vehicles in the afternoon peak hour between 5:00-6:00pm. The modelling assumes that no additional traffic will be generated from the film school as it is a ‘like for like’ replacement.

The traffic modelling indicates that the proposal is not anticipated to result in unacceptable traffic impacts on the surrounding road network. It also demonstrates that the kerbside area will have sufficient capacity to accommodate all pick up and drop offs.

This modelling has taken into consideration traffic movements associated with the future Woolworths development (923-935 Bourke Street) with peak usage times with the proposal and the Woolworths site not overlapping.

A designated drop off and pick up area for students accommodating 6-8 cars at any time is proposed on Young Street. A school Bus Zone is proposed on Hunter Street for pick-up and drop-off on from Monday-Friday between 8:00am to 9:00am and from 3:00pm to 4:00pm. The separation of parking and the Bus Zones reduces the traffic impacts on any one street. Drop off and bus zones are indicative only in will be resolved further at the development application stage.

The Design Guide includes provisions which require development to:

- assess and address potential impacts on surrounding movement systems through a Transport Impact Study;
- provide a comprehensive analysis of parking and access arrangements with a Parking and Access Report;
- develop and distribute a strategy for access to transport facilities for students, employees, and visitors through a Transport Access Guide;
- detail construction vehicle routes, access, parking arrangements, and mitigation measures for traffic impacts in a Construction Management Plan;
- limit parking to 1 space per 2 staff; and
- provide end-of-trip facilities at a rate of 10% for students and staff, with secure, weather-protected spaces for Bicycle Parking Facilities.

Has the planning proposal adequately addressed any social and economic effects?

A detailed discussion of the social and economic effects of this planning proposal is provided in section 5 of this planning proposal.

Future development will have positive social and economic impacts. It will provide new employment opportunities in the school and café and retain existing employment in the film school through redevelopment. It will also introduce greater diversity in education infrastructure for 800 students in an area of high population growth.

5.6. State and Commonwealth interests

Is there adequate public infrastructure for the planning proposal?

The site is located 800m from Green Square railway station which provides connection to Central Station, Sydney CBD and the wider regional rail network and light rail network. The Waterloo Metro Station is 1.2km from the site and provides high-speed connection to Sydney CBD. The Metro Station will also deliver 2 hectares of public open space. The site is well serviced by buses and connects to a cycleway network.

The site is already serviced by the full range of public utilities and infrastructure, including electricity, telecommunications, water, sewer and stormwater.

There is adequate public infrastructure to support this planning proposal.

What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

To be determined in further consultation with public authorities following Gateway determination.

6. Mapping

This planning proposal does not include any amendments to maps.

7. Community consultation

This planning proposal is to be exhibited in accordance with the gateway determination once issued by the Department of Planning, Housing and Infrastructure.

It is anticipated the gateway determination will require public exhibition for a period of not less than 20 working days.

The public consultation will be undertaken in accordance with the City's Community Participation Plan and the principles in the City's Community Engagement Strategy.

Notification of the public exhibition will be via the City of Sydney website.

Exhibition material will be made available on the City of Sydney website and at Town Hall House at 456 Kent Street, Sydney.

Consultation with relevant NSW agencies, authorities and other relevant organisations will be undertaken in accordance with the gateway determination.

8. Project timeline

The anticipated timeline for completion of this planning proposal as follows:

Stage	Timeframe
Commencement / gateway determination	June - August 2024
Government agency consultation	September – October 2024
Public exhibition	September – October 2024
Review of issues raised in submissions	October - November 2024
Post-exhibition reporting	November 2024
LEP drafting	November – January 2024
LEP made	March 2025
LEP notification	March 2025

CITY OF SYDNEY

Attachment A1

Proponent Planning Proposal Justification Report

Planning Proposal Justification Report

Amendments to Sydney Local Environmental Plan 2012

242 – 258 Young Street, Waterloo

Ethos Urban

Prepared by Ethos Urban

9 February 2024 | 2210804



'Gura Bulga'
Liz Belanjee Cameron

'Gura Bulga' – translates to Warm Green Country. Representing New South Wales.



'Dagura Buumarri'
Liz Belanjee Cameron

'Dagura Buumarri' – translates to Cold Brown Country. Representing Victoria.



'Gadalung Djarri'
Liz Belanjee Cameron

'Gadalung Djarri' – translates to Hot Red Country. Representing Queensland.

Ethos Urban acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We pay our respects to their Elders past, present and emerging.

In supporting the Uluru Statement from the Heart, we walk with Aboriginal and Torres Strait Islander people in a movement of the Australian people for a better future.

Contact:	Ben Craig Director	BCraig@ethosurban.com +61 416 917 365

This document has been prepared by:		**This document has been reviewed by:**	
Matthew Thrum	18 January 2024		
Kimberley Bautista	18 January 2024	Allison De Marco	18 January 2024

Version No.	Date of issue	Prepared by	Approved by
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3.0 (FINAL)	09/02/2024	MT	ADM

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B.	**Architectural Drawings**	*Plus Architecture*
C.	**Draft Site-Specific Design Guide**	*Ethos Urban*
D.	**Engagement Summary Report**	*Ethos Urban*
E.	**Landscape Concept Plan**	*Turf Design*
F.	**Survey Plan**	*MBM*
G.	**Traffic and Transport Report**	*JMT*
H.	**Social Impact Report**	*Ethos Urban*
I.	**Operational Management Plan**	*Amina Consulting*
J.	**Site Specific Flood Study**	*WMA Water*
K.	**Acoustic Report**	*ADP*
L.	**Arboriculture Impact Assessment**	*Aborsaw*
M.	**Public Art Statement**	*Amanda Sharrad Consulting*

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N.	**Detailed Site investigation**	*EI Australia*
O.	**Geotechnical Assessment Report**	*Alliance Geotech*
P.	**Sustainability Strategy**	*JN Engineering*
Q.	**Landowners Consent**	*Charvic*
R.	**Landowners Consent**	*ISAP*
S.	**Response to City of Sydney Tree Officer Comments**	*Aborsaw*
T.	**CIV Report**	*MBM*
U.	**Acid Sulfate Soils Assessment**	*Alliance Geotech*

Executive Summary

Ethos Urban has prepared this Planning Proposal on behalf of Sustainable Development Group Ltd (SDG).

The Planning Proposal is intended to support the delivery of a new K-12 independent school – comprising 280 primary school students and 520 secondary school students. The proposal will include a multi-purpose hall and community space. The proposal will additionally reaccommodate the existing film school (Sydney Film School) within contemporary high-quality facilities.

This Planning Proposal seeks Council's support for a site-specific amendment to reflect an increase in height from 15m to 25m and an increase in FSR to 2.94:1.

The indicative reference scheme totals some 13,543m^2 of Gross Floor Area (GFA). Basement carparking is accommodated for a total of 60 cars, together with 4,978m^2 of outdoor recreational space provided at ground level.

This Report is accompanied by, and should be read alongside, the draft Site-Specific Design Guide.

From a strategic context, the City of Sydney LGA is currently undergoing significant growth, with increased population and housing driving demand for increased infrastructure, including schools. The site sits within the Green Square and City South Village, which is forecasted for significant population growth, with the village projected to account for over 40% of new dwellings in the City of Sydney going forward.

This Planning Proposal responds to the above and is justified for the following reasons:

- **Provides necessary Social Infrastructure to support local growth:** Significant growth is projected in the school aged population (5-17) to 2031 in the Waterloo area – representing a 76% increase from 2021 (3811) to 2031 (6701). The Planning Proposal is accompanied by technical reports, including Social Infrastructure Review, which highlight that a review of the population catchment of the site shows that there is significant population growth projected for school age children. The Planning Proposal responds to an identified demand for schools in this area – providing schooling capacity to accommodate the future population growth within the City of Sydney Local Government Area (LGA) and relieving enrolment pressures from surrounding high schools exceeding student capacity.
- **Responds to an existing deficiency in school place supply and choice:** Currently, there are significantly fewer independent school places in the Waterloo area compared to comparable catchments. There is a gap in existing or planned independent schools in the area, with a projected rate of 9 private school places per 100 school aged children in the Waterloo catchment area in 2031. For comparison, 114 private school places per 100 school aged children are available in the North Sydney region. The Planning Proposal will support diversity of educational choice.
- **Comprehensive and holistic redevelopment for long-term benefit**: The two existing landowners have a long-term interest in the site, and local community. Sustainable Development Group Ltd (SDG) are expert in facilitating the delivery of sustainable social infrastructure schemes rooted in their local communities. SDG have worked to support the two existing long-term landowners in realising their vision for the site while capitalising on the benefits of redeveloping both sites comprehensively. The existing landowners have elected to pursue a long-term ownership strategy – in lieu of a shot-term highest and best use site land disposal strategy.
- **Delivery of a contemporary Education Hub with co-location and all-through school benefits**: Co-location of the independent K-12 school, and Sydney Film School will create a unique education hub and opportunities. The K-12 school, and film school would both benefit from co-location. There would be potential for the school to benefit from the media focus of the film school – which is currently not offered anywhere else at high school level. The K-12 education model will also allow students to complete their primary and secondary education pathway on the same site, minimising disruption to regular routines.
- **Sustainable location:** The site at 242-258 Young Street, Waterloo is well-suited for a school – the site is close to public transport, including 750m to both Green Square Station and Waterloo Metro Station. The layout and character of the site is well suited to support a school – including two frontages with each street having specific characteristics that would support a school. The Planning Proposal would positively redress the extent of current inactive blank frontages – leading to potentially improved perceptions of safety associated with activation of the site associated with the school design.
- **Good quality design:** The Planning Proposal seeks to deliver a high-quality flexible learning and teaching environments in a contemporary purpose-built space. It is noted that the NSW Department of Education (DoE) promotes flexible learning spaces to support personalised teaching and learning. Creating student-

centred learning environments can have positive impacts on social and emotional wellbeing, inclusivity, and physical comfort of students.

- **Timely delivery to support growth:** Sustainable Development Group Ltd are expert in facilitating the delivery of sustainable social infrastructure schemes rooted in their local communities. Subject to planning, the school could be operational by the start of the 2028 or 2029 school year.

To this end, SDG's concept for the site is focused on delivering a high quality and ecologically sustainable development, to drive significant positive outcomes within South Sydney. The development will provide a significant new piece of social and educational infrastructure, delivering a new school with permanent teaching space to accommodate 800 students. The provision of new educational facilities will support and strengthen the availability of educational facilities in the region.

Accordingly, considering the proposal and the overall strategic nature of the site and justification provided in addressing planning issues, the Planning Proposal is considered to have sufficient strategic merit to support the proposed educational facility. This Planning Proposal also demonstrates that the proposed land uses, and density sought can be appropriately accommodated on the site in an attractive urban form maximises activity, improves social and economic outcomes and enhances vibrancy, whilst minimising amenity impacts of surrounding residential receivers. This supports the site-specific merit of the Planning Proposal.

For these reasons, we recommend supporting this Planning Proposal for Gateway Determination.

1.0 Introduction

1.1 Overview

Ethos Urban has prepared this Planning Proposal on behalf of Sustainable Development Group Ltd (SDG).

The Planning Proposal is intended to support the delivery of a new K-12 independent school – comprising 280 primary school students and 520 secondary school students. The proposal will include a multi-purpose hall and community space. The proposal will additionally reaccommodate the existing film school (Sydney Film School) within contemporary high-quality facilities.

This Planning Proposal seeks Council's support for a site-specific amendment to reflect an increase in height from 15m to 25m and an increase in FSR to 2.94:1.

The indicative reference scheme totals some 13,543m^2 of Gross Floor Area (GFA). Basement carparking is accommodated for a total of 60 cars, together with 4,978m^2 of outdoor recreational space provided at ground level.

This Report is accompanied by, and should be read alongside, the draft Site-Specific Design Guide.

This Planning Proposal responds to the above and is justified for the following reasons:

- **Provides necessary Social Infrastructure to support local growth:** Significant growth is projected in the school aged population (5-17) to 2031 in the Waterloo area – representing a 76% increase from 2021 (3811) to 2031 (6701). The Planning Proposal is accompanied by technical reports, including Social Infrastructure Review, which highlight that a review of the population catchment of the site shows that there is significant population growth projected for school age children. The Planning Proposal responds to an identified demand for schools in this area – providing schooling capacity to accommodate the future population growth within the City of Sydney Local Government Area (LGA) and relieving enrolment pressures from surrounding high schools exceeding student capacity.
- **Responds to an existing deficiency in school place supply and choice:** Currently, there are significantly fewer independent school places in the Waterloo area compared to comparable catchments. There is a gap in existing or planned independent schools in the area, with a projected rate of 9 private school places per 100 school aged children in the Waterloo catchment area in 2031. For comparison, 114 private school places per 100 school aged children are available in the North Sydney region. The Planning Proposal will support diversity of educational choice.
- **Comprehensive and holistic redevelopment for long-term benefit**: The two existing landowners have a long-term interest in the site, and local community. Sustainable Development Group Ltd (SDG) are expert in facilitating the delivery of sustainable social infrastructure schemes rooted in their local communities. SDG have worked to support the two existing long-term landowners in realising their vision for the site while capitalising on the benefits of redeveloping both sites comprehensively. The existing landowners have elected to pursue a long-term ownership strategy – in lieu of a shot-term highest and best use site land disposal strategy.
- **Delivery of a contemporary Education Hub with co-location and all-through school benefits**: Co-location of the independent K-12 school, and Sydney Film School will create a unique education hub and opportunities. The K-12 school, and film school would both benefit from co-location. There would be potential for the school to benefit from the media focus of the film school – which is currently not offered anywhere else at high school level. The K-12 education model will also allow students to complete their primary and secondary education pathway on the same site, minimising disruption to regular routines.
- **Sustainable location:** The site at 242-258 Young Street, Waterloo is well-suited for a school – the site is close to public transport, including 750m to both Green Square Station and Waterloo Metro Station. The layout and character of the site is well suited to support a school – including two frontages with each street having specific characteristics that would support a school. The Planning Proposal would positively redress the extent of current inactive blank frontages – leading to potentially improved perceptions of safety associated with activation of the site associated with the school design.
- **Good quality design:** The Planning Proposal seeks to deliver a high-quality flexible learning and teaching environments in a contemporary purpose-built space. It is noted that the NSW Department of Education (DoE) promotes flexible learning spaces to support personalised teaching and learning. Creating student-centred learning environments can have positive impacts on social and emotional wellbeing, inclusivity, and physical comfort of students.

- **Timely delivery to support growth:** Sustainable Development Group Ltd are expert in facilitating the delivery of sustainable social infrastructure schemes rooted in their local communities. Subject to planning, the school could be operational by the start of the 2028 or 2029 school year.

An artist impression sketch of the indicative built form character which could be delivered by the proposed controls is provided in **Figure 1** below.



Figure 1 Artist impression of the indicative development

Source: Plus Architecture

To achieve the strategic vision and indicative redevelopment concept presented, this Planning Proposal seeks the following site-specific amendments to the Sydney LEP 2012 to reflect an increase in height from 15m to 25m; and reflect an increase in FSR to 2.94:1.

This Report is accompanied by, and should be read alongside, the draft Site-Specific Design Guide. The Guide addresses address key design and development outcomes, including site-specific provisions related to the future built form, access, vegetation, design excellence, community facilities and sustainability. Importantly, the future built form has been specifically designed to accommodate the provision of teaching spaces that meets the special design requirements for the proposed uses.

It is noted that, with a Capital Investment Value more than $20 million, future development for the purposes of a school would constitute State Significant Development. The Council would therefore prepare a Design Guide, in lieu of a Development Control Plan. A draft Site-Specific Design Guide has been prepared incorporating suggested site-specific controls that would apply to the site.

As required by Section 3.33 of the Environmental Planning & Assessment Act 1979 (EP&A Act), and in reference to the Local Environmental Plan Making Guideline, this planning proposal report includes:

- a statement of the objectives or intended outcomes of the proposed instrument;
- an explanation of the provisions that are to be included in the proposed instrument;
- the justification for those objectives, outcomes and provisions and the process for their implementation (including whether the proposed instrument will comply with relevant directions under Section 9.1 of the EP&A Act);
- maps containing sufficient detail to indicate the substantive effect of the proposed amendments; and
- details of community consultation.

This Planning Proposal describes the underlying need for a new school, the site and surrounds, the proposed amendments to the Sydney LEP 2012 and provides a strategic planning and environmental assessment of the proposed amendments to the site's planning provisions in relation to floor space ratio and building height controls.

The report should be read in conjunction with the Urban Design Report prepared by Plus Architecture and specialist consultant reports appended to this proposal. The full Project Team is presented at **Section 1.2**.

1.2 Project Team

This Planning Proposal is a collaboration which has been informed by the following specialist firms:

Urban Design and Architecture

Town Planning
Social Assessment and Strategy
Community Engagement

Traffic and Transport

Sustainability
Services and Utilities

Landscape Architecture

Geotechnical and Acid Sulfate Soils

Flooding

Amina Consulting

Acoustics

Arboriculture

Operational management

Public Art

Quantity Surveyor

2.0 Pre-Lodgement Consultation

The Proposal has been subject to pre-submission discussions and review by the City of Sydney on three separate occasions (being 30 November 2022, 27 June 2023 and 6 December 2023). Across these meetings, the following matters were discussed:

- **Principle** – any planning proposal request must establish the strategic merit of the proposal. Establish whether there is sufficient local infrastructure to support demands generated by the proposal. In particular, understanding how, when and how often students will access facilities in the City of Sydney and surrounding LGAs, in particular sporting fields.
- **Open space** – the suitability of on-site space should be best practice for schools – and sufficient to support student population.
- **Height** – An initial building height (of 32.5m) was questioned – with comment noting that the immediate area, includes the 7 storeys Woolworths mixed use proposal opposite on Young Street.
- **Built Form** – Any changes to the building height control for the site must ensure that in the event of redevelopment, that residential parcels can achieve at least 70% solar access in accordance with the Apartment Design Guide.
- **Landscaping and tree retention** – the proposal should include provision for landscaping, including deep soil and street trees. There are a substantial number of trees surrounding the site. A detailed assessment is required of how the existing tree canopy may be retained as part of the future redevelopment of the site.
- **Traffic and Transport** – A detailed assessment of traffic and transport impacts of the proposed development is required. The traffic scenarios to be modelled are to include a base (current), a future base (background growth) and a future base plus the proposed development.

The City of Sydney Design Advisory Panel (DAP) also provided a number of recommendations to be implemented as part of the Proposal.

These recommendations have been considered by the project team and have generally been implemented into the Proposal where feasible.

Any deviation from the recommendations is suitably justified, as shown in **Table 1** below. The Design Report (**Appendix A**) provides a detailed response to each of the comments and associated design changes raised by during the DAP session.

Table 1 Response to comments

Summary of Comments Received	Proposal Response
Principle	
Any planning proposal request must establish the strategic merit of the proposal. Establish whether there is sufficient local infrastructure to support demands generated by the proposal. In particular, understanding how, when and how often students will access facilities in the City of Sydney and surrounding LGAs, in particular sporting fields.	As described in **Section 7.5**, Ethos Urban were commissioned to undertake research to demonstrate the need for schools in the area and to provide analysis regarding the relevant social infrastructure that the school may provide or require use of. The site is in the inner Sydney suburb of Waterloo. The site is only a 10-minute walk to Green Square which the City of Sydney anticipates will accommodate 63,000 people, 21,000 new homes, and around 21,000 jobs. The site is also well connected to the CBD: 20-minutes by bike, 18-minutes by car, or 25-minutes by bus. Despite this expected growth and connectivity, the proponent has identified a significant lack of planned school infrastructure in the area, particularly secondary schools. The Social Infrastructure Report prepared demonstrates the need for schools in the area and provides analysis regarding the relevant social infrastructure. It includes: analysis of the population and demographic characteristics of the school catchment area, focusing on forecasted growth of school age children; a review of existing and planned schools in the catchment area (both primary and secondary schools); a review of the available relevant social infrastructure in the surrounding area including passive open space (includes play space), indoor and outdoor recreation space and artistic and performance spaces.; a review the open space needs for the proposed school development; analysis of case study research into provision of open space for inner-city vertical school developments; and opportunities to support the

Summary of Comments Received	Proposal Response
	needs of the school users while balancing the needs of the local community for social infrastructure. The report concludes that the proposal for a vertical school at the site 242-258 Young Street, Waterloo responds to an identified demand for schools in this area. A review of the population catchment of the site shows that there is significant population growth projected for school age children. There is also a gap in existing or planned private schools in the area, with a projected rate of 9 private school places per 100 school aged children in the Waterloo catchment area in 2031, compared to 114 places per 100 school aged children in the North Sydney region (Appendix A). From a review of other vertical schools across NSW and interstate, it was found that rarely are these schools able to achieve the NSW Department of Education's open space guideline of 10m^2 per pupil. The average open space per student (of the examples where information was available) was 5.65m^2, ranging from 4.4m^2 to 7.2m^2 per student. The proposed provision of 6.2m^2 per student of open space for the proposed school is above the average identified through the case studies. The case studies also show that a combination of innovative solutions to open space provision, alongside shared use arrangements with local government or other landowners can be successful in meeting the recreational needs of students.
Height	
An initial building height (of 32.5m) was questioned – with comment noting that the immediate area, includes the 7 storeys Woolworths mixed use proposal opposite on Young Street.	The height, bulk and scale of the Concept Envelope has been considered within the Design Report at **Appendix A**. The Concept Envelope has been subject to significant amendment since originally presented to the City of Sydney – including a substantial reduction in proposed maximum height. The proposed building form is proposed to be 25m, except for lift overrun, balustrades and fencing to support use of open spaces at rooftop. The proposed height sympathetically relates to the Woolworths mixed use proposal opposite on Young Street.
Any changes to the building height control for the site must ensure that in the event of redevelopment, that residential parcels can achieve at least 70% solar access in accordance with the Apartment Design Guide.	As noted above, the height, bulk and scale of the Concept Envelope has been considered within the Design Report at **Appendix A**. The concept scheme has been evolved and developed in parallel with rigorous testing to understand and minimise impacts in respect of solar access on surrounding residential development – and identified open space to the south of the site on Powell Street (Mondrian scheme). The testing is summarised at **Section 7.2** of this report. In summary, in respect of: the Woolworths development on Young Street, the proposed design ensures that there is no impact to that site achieving 2 hours of solar access to 70% of the apartments during winter. Similarly, if the site at 285-291 Young Street is redeveloped as a residential building, it will achieve 2 hours of solar access to 70% of the apartments during winter. the existing development at Hunter Street the proposed built form minimises additional overshadowing to the balconies of these residential blocks during the winter solstice. The publicly accessible private open space opposite the site to the south has been given focus on account of the wider pool of potential visitors. By stepping back the building to minimise overshadowing, solar testing was able to demonstrate that the open space achieves a minimum of 4

Summary of Comments Received	Proposal Response
	hours of solar access to more than 85% of its area from 9am to 3pm on the winter solstice. This is substantially in exceedance of the 4-hour requirement of 50%.
Landscaping and tree retention	
The proposal should include provision for landscaping, including deep soil and street trees. There are a substantial number of trees surrounding the site. A detailed assessment is required of how the existing tree canopy may be retained as part of the future redevelopment of the site. It is likely that additional building setbacks would be needed to limit the impacts of the development and to protect the tree canopy. A similar approach was undertaken for the Woolworths proposal, which included a detailed lidar survey of the site's tree canopy structure and measures for the retention the canopy. It is expected that if a similar approach was adopted, it would further limit the development and the total gross floor area that may be achieved on the site.	A detailed assessment of tree impacts has been undertaken in **Section 7.6** and at **Appendix L**. A landscape plans are also included at **Appendix E**.
Traffic and Transport	
A detailed assessment of traffic and transport impacts of the proposed development is required. The assessment should include intersection modelling, similar in scope for the Woolworths proposal. The traffic scenarios to be modelled are to include a base (current), a future base (background growth) and a future base plus the proposed development.	A Transport Assessment has been prepared by JMT Consulting and is summarised at **Section 7.3**. The assessment includes details of traffic modelling outputs, car parking and access arrangements for the proposal. Several mitigation measures have been recommended – which are considered appropriate for the proposed development. A summary of the assessment and proposed mitigation measures are set out at Section 7.

The Proposal has been subject to review by the DAP on 13 August 2023. These recommendations have been considered by the project team and have generally been implemented into the Proposal where feasible. The Design Report (**Appendix A**) provides a detailed response to each of the comments and associated design changes raised by during the DAP sessions.

3.0 The Site

3.1 Site location and context

The site is situated on the traditional land of the Gadigal people of the Eora nation.

The site is located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA), approximately 4km south-east of the Sydney CBD. The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. Located within the Green Square Urban Renewal Area, which is considered a major growth centre within the South Sydney Region.

The site's locational context is shown at **Figure 2**.

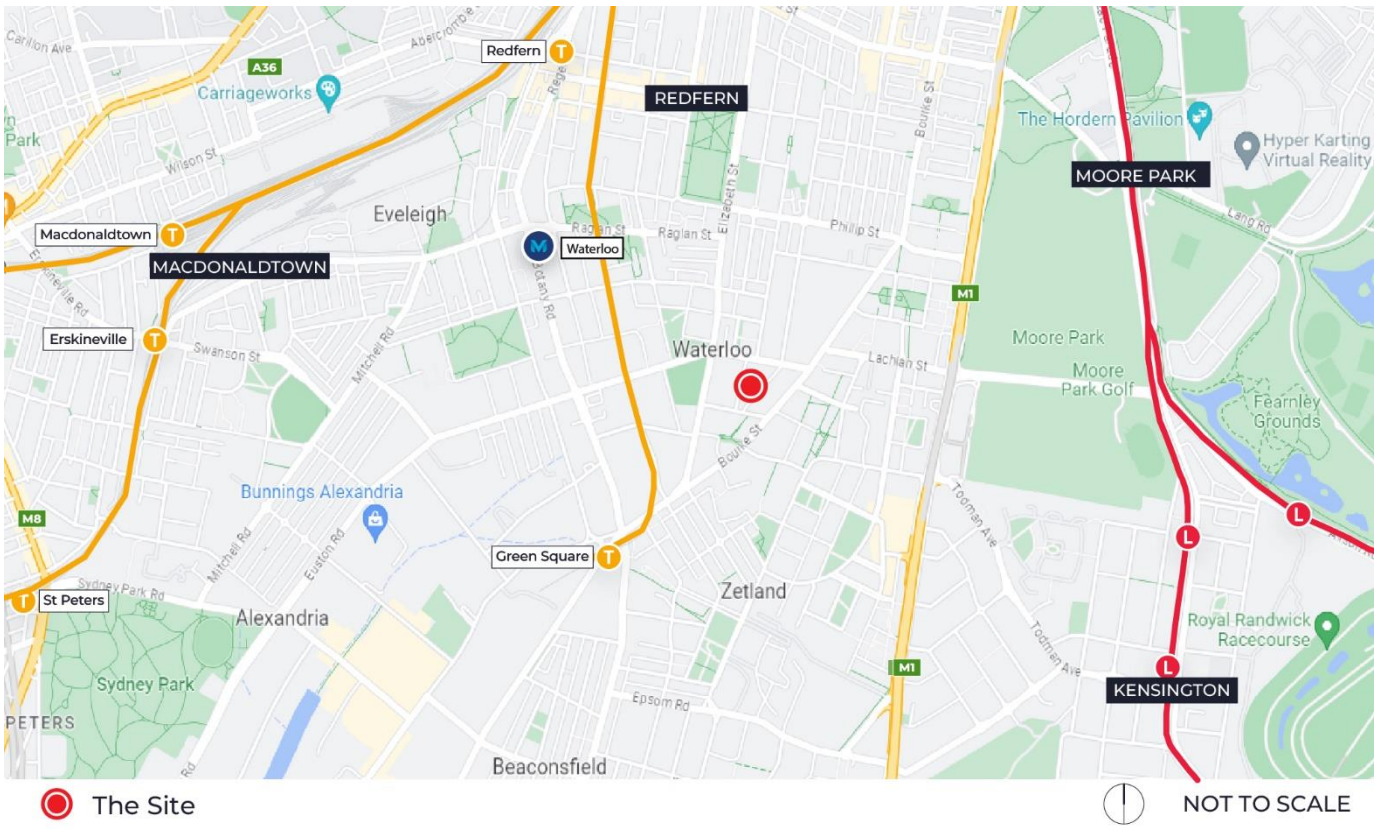


Figure 2 Locational context map

Source: Nearmaps + Ethos Urban

The site is approximately 900m walk from Green Square Station and 1km from the future Waterloo Metro Station which is scheduled to be completed in 2024 as part of the Sydney Metro Project. The site is also well serviced by several frequent local and express bus routes.

3.2 Site description

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m^2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction (confirm via survey). A Survey Plan is provided at **Appendix F** prepared by Registered Surveyor Pty Ltd and a site aerial is provide at **Figure 3**.

The site and is currently occupied by 2 storey office and film school. The southern tip of the site is a grass lawn area.

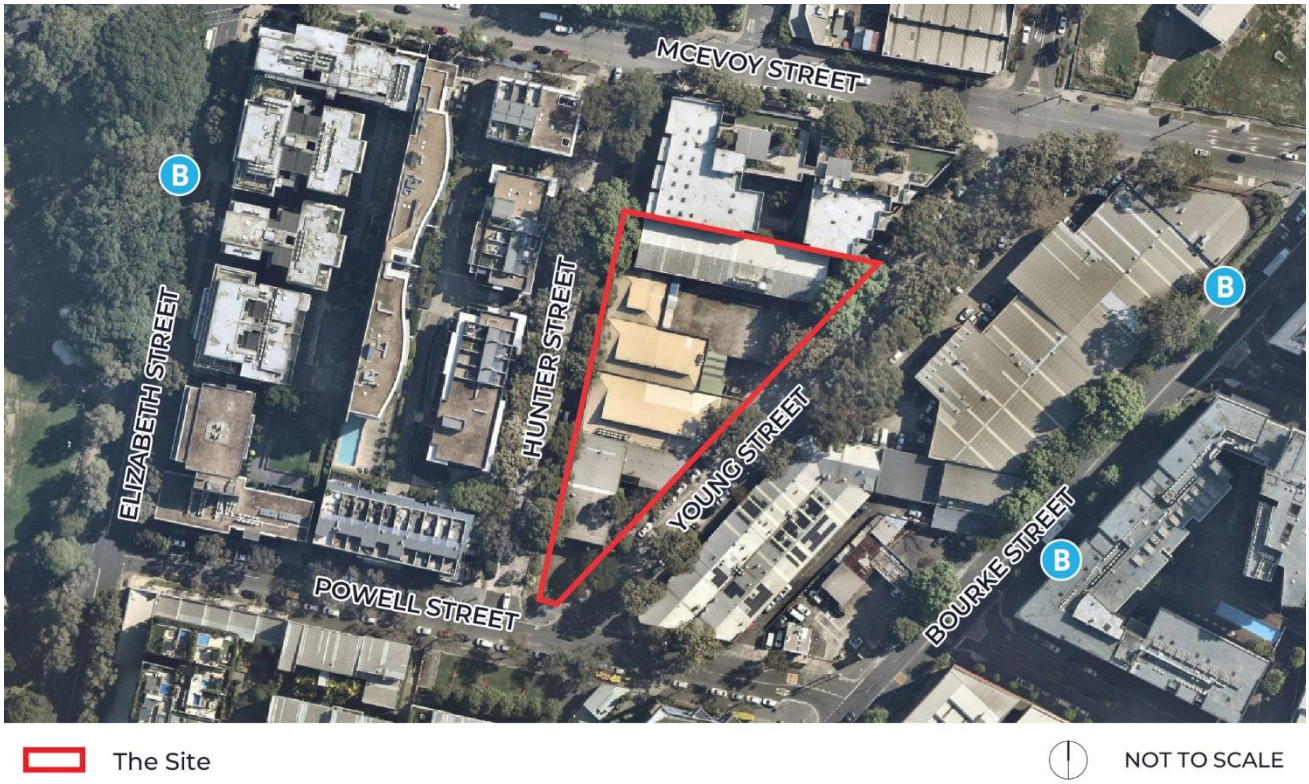


Figure 3 Aerial Map

Source: Nearmaps + Ethos Urban

3.3 Surrounding development

North of the site is a residential complex located at 10-20 McEvoy Street (**Figure 4**). This development comprises 79 apartments and is approximately four storeys in height. The street contains well established vegetation and tree canopy. Further North extends Morehead Street, which is characterised on the east side by mixed residential housing, including terraces, apartments, and the west, which is defined by large commercial and industrial properties (**Figure 5**).

The Eastern boundary of the site follows Young Street, which is primarily of small retail stores (**Figure 6**), except for a car dealership located at 267 Young Street (**Figure 7**). The street contains well established vegetation and tree canopy. Further East commences more mixed use development with higher buildings located along the Bourke Street spine. Two primary bus stops are situated within a five minute walk along this street, which includes routes 320 and 393 in both directions.

The site is situated with a small frontage along Powell Street on the southern boundary. Powell Street has a small green space, café and additional mixed-use residential development, ranging from five storeys to seven (**Figure 8**). This includes the 'Mondrian' development at 2-4 Powell Street, featuring a broad block layout with an internal courtyard and pool (**Figure 10** and **Figure 11**). The solar access of these existing amenities has been considered in detailed in **Section 7.2**. Further South the density of development softens towards more detached housing and smaller commercial premises.

Hunter Street is situated West of the site and is characterised by large mixed use residential developments ranging from four to six storeys in height (**Figure 9**). The street has a well-established vegetation and tree canopy. Further west is Waterloo Oval and Fernside Skatepark, a 920m^2 full street-style skate plaza, which runs along Elizabeth Street which includes a bus stop servicing the 343 route.



Figure 4 10-20 McEvoy Street Residential Complex facing South



Figure 5 Corner of Morehead Street and McEvoy facing North



Figure 6 Young Street Retail Stores facing North-East



Figure 7 267 Young Street facing North-East



Figure 8 Powell Street facing South



Figure 9 Hunter Street facing West



Figure 10 Powell Street facing South



Figure 11 2-4 Powell Street internal courtyard and pool (isolated from Powell Street)

Source: Ethos Urban

3.3.1 Future surrounding development

Woolworths Waterloo

The City of Sydney is in the process of finalising an amendment to the Sydney LEP that will enable a mixed-use development at 923–935 Bourke Street that includes residential, commercial and retail uses, with a below ground Woolworths Supermarket (refer to **Figure 12**). The development seeks to serve as a neighbourhood centre for the surrounding locality, and is directly opposite the subject site. It is expected to progress to a competitive design competition and development application in 2024.



Figure 12 Woolworths Waterloo Reference Scheme

Source: City of Sydney

Danks Street South Precinct

The Danks Street South Precinct is a significant site located in the Green Square Urban Renewal Area to the north of the site fronting Bourke Street and McEvoy Street. It was designated for mixed-use residential development in the early 2000s and has been the subject of extensive planning since that time. The precinct is expected to house up to 2500 future residents and be well-utilized by existing local communities.

The Danks Street South Precinct Development Control Plan, Urban Design Study, and Planning Proposal were approved by Council in December 2018. The development controls allow for mixed residential uses and include new streets, pedestrian and cycle-only through-site links, a public central park, a plaza with heritage buildings, and a neighbourhood pocket park. Two heritage buildings at the centre of the site, the Waterloo Pumping Station and Valve House, will be retained.



Figure 13 Danks Street South Precinct Proposed Development

Source: Dahua

3.4 Existing planning framework

3.4.1 Sydney Local Environmental Plan 2012

The Sydney LEP 2012 is the principal environmental planning instrument applying to the site. The existing key planning controls that apply under the LEP are outlined in **Table 2** below.

Table 2 Current Sydney LEP 2012 provisions

Clause	Provision / Standard
2.1 Land use zone	MU1 Mixed Use zone: *Permitted with consent: Amusement centres; Boarding houses; Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Entertainment facilities; Function centres; Information and education facilities; Light industries; Local distribution premises; Medical centres; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Shop top housing; Tank-based aquaculture; Tourist and visitor accommodation; Vehicle repair stations; Any other development not specified in exempt or prohibited provisions.* *Prohibited: Extractive industries; Heavy industrial storage establishments; Heavy industries; Pond-based aquaculture*
4.3 Building height	The maximum height of buildings within the site is 15m. *As set out at **Section 3.4.2** below, it is noted that the Council's Transport, Heritage and Planning Committee resolved on 4 December 2023 to approve amendments to Part 5 of the LEP – to support rooftop structure/s that exceed the maximum building heights in areas outside Central Sydney.*
4.4 Floor Space Ratio	The maximum base floor space ratio that applies to the site is 1.5:1. It is noted additional FSR is available through Clauses 6.14 and 6.21.
5.21 Flood Planning	Various detailed flood planning provisions which require the consent authority to be satisfied prior to granting development consent.
6.14 Community Infrastructure floor space at Green Square	Development that results in additional floor space, may be permitted with consent if the development includes certain Green Square community infrastructure provisions, to the satisfaction of consent authority. Mapped Area 6—0.5:1.
6.21 Design Excellence	Development consent must not be granted to development unless the consent authority considers that the development exhibits design excellence. This provision applies to developments: with a height greater than 25m, which have an investment value of greater than $100m, or requires the preparation of a site specific DCP (Clause 7.20). Development demonstrating design excellence may have up to 10% additional floorspace (including FSR mapped and community infrastructure floorspace). *As set out at **Section 3.4.2** below, It is noted that the Council's Transport, Heritage and Planning Committee resolved on 4 December 2023 to approve amendments to Clause 6.21D of the LEP – to raise the threshold for requiring a competitive design process on land outside of Central Sydney from 25 metres to 35 metres.*
7.6 Car Parking – Office premises and business premises	The site is identified as land in Category D (Land Use Integration Map). The proposal will exceed 1.5:1 FSR and accordingly the maximum number of car parking spaces is determined based on a formula as discussed in **Section 7.3**.
7.9 Other land uses	Information and education facilities - The maximum number of car parking spaces for information and education facilities is 1 space or every 200m^2 of GFA of the building used for information or educational facility uses.
7.14 Acid Sulfate Soils	Class 5
7.20 Development requiring or authorising preparation of a development control plan	With a Capital Investment Value more than $20 million, future development for the purposes of a school would constitute State Significant Development. The Council would therefore prepare a Design Guide, in lieu of a Development Control Plan. A draft Site-Specific Design Guide has been prepared incorporating site-specific controls that would apply to the site.

Clause	Provision / Standard
	*It is further noted, as set out at **Section 3.4.2** below that the Council's Transport, Heritage and Planning Committee res,olved on 4 December 2023 to approve amendments to Clause 7.20 of the LEP – to raise the threshold for preparation of a site-specific DCP to 35m – for land outside of Central Sydney.*
.23 Large retail development outside of Green Square Town Centre	The site is identified as land with restricted retail development with a maximum gross floor area of 1,000m^2.

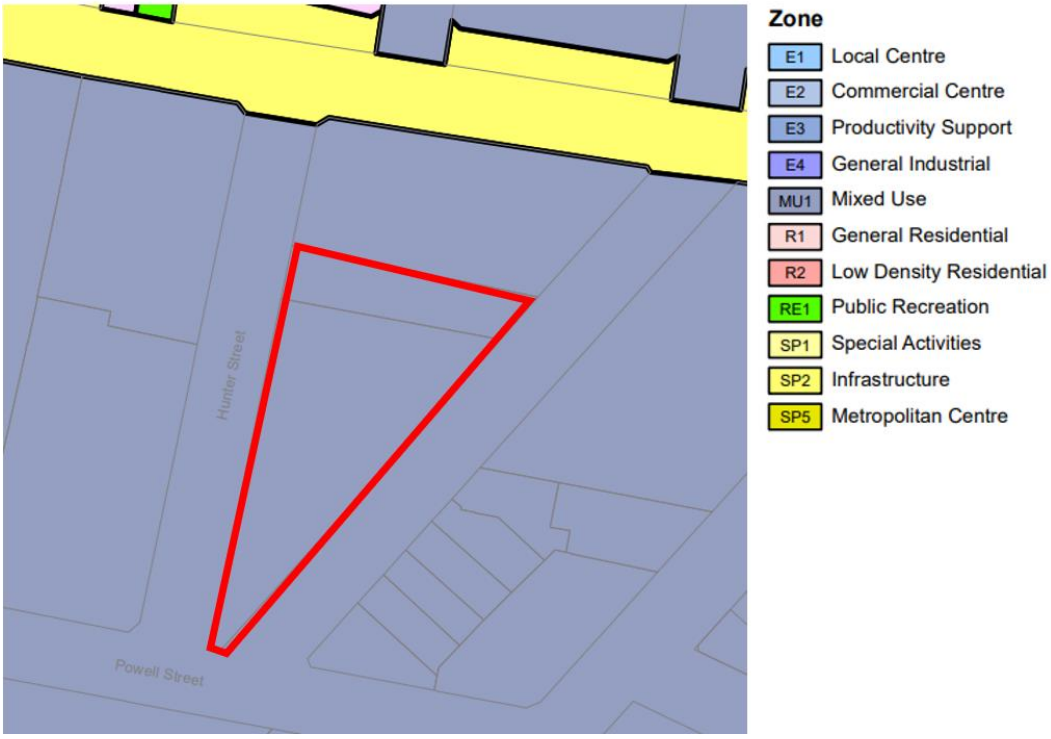


Figure 14 Land use zoning map (site identified in red outline)

Source: Sydney LEP 2012

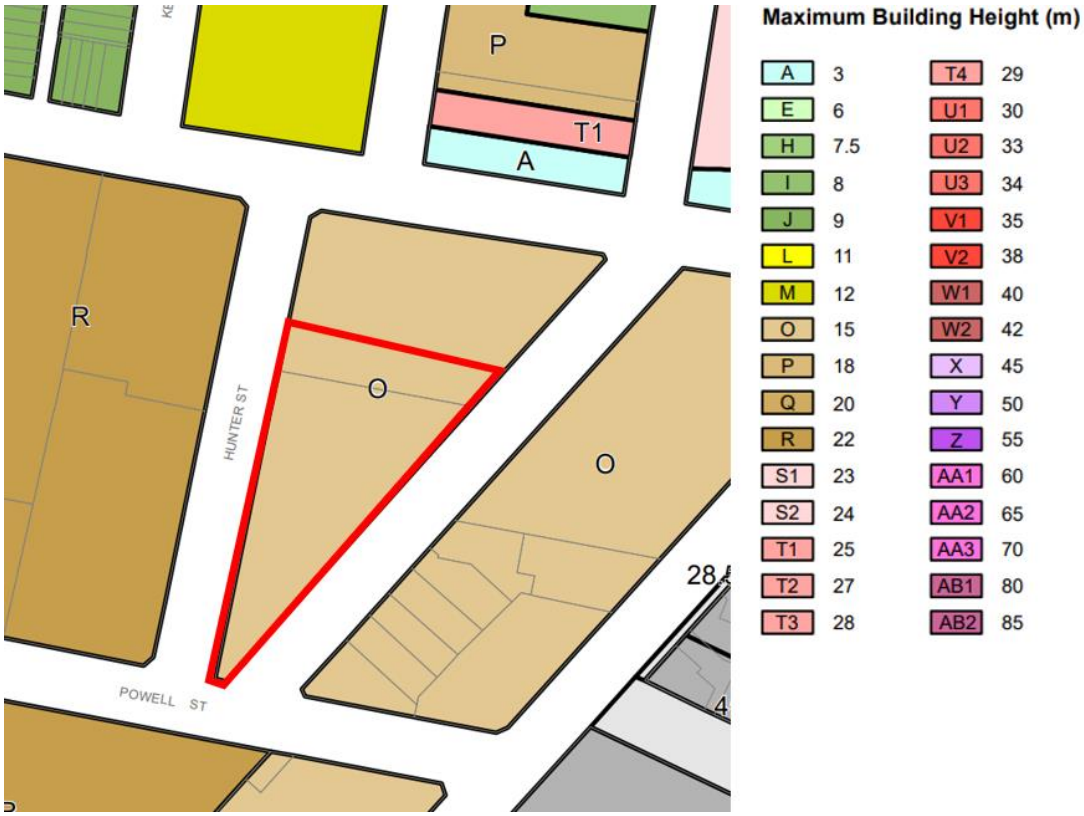


Figure 15 Height of Buildings (site identified in red outline)

Source: Sydney LEP 2012

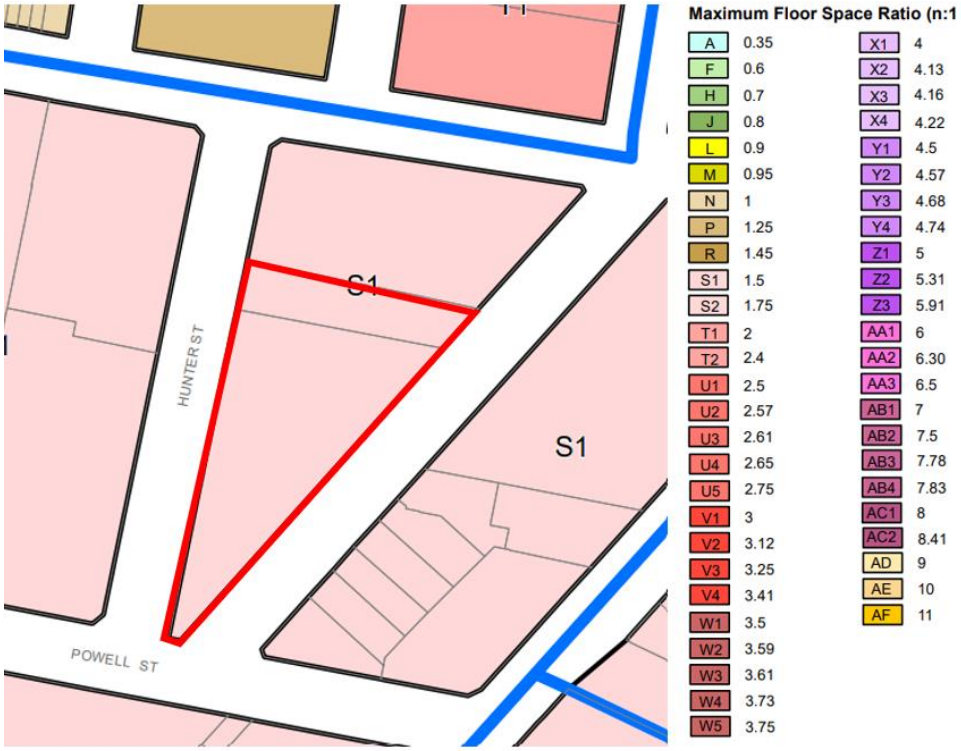


Figure 16 Floor Space Ratio (site identified in red outline)

Source: Sydney LEP 2012

3.4.2 Planning Proposal – Sydney Local Environmental Plans – Policy and Housekeeping Amendments 2023 (Transport, Heritage and Planning Committee - 4 December 2023)

At its meeting on 4 December 2023 the Council's Transport, Heritage and Planning Committee considered updates to the Council's land use planning framework – including proposed changes to the Sydney Local Environmental Plan 2012, the Green Square Town Centre Sydney Local Environmental Plans, Sydney Development Control Plan 2012, and to the City's Competitive Design Policy.

The Planning Proposal includes an extensive suite of amendments – but, of specific relevance to this Planning Proposal the amendments update the Council's Competitive Design Policy, with interlinked LEP amendments – streamlining the process for design competitions; and seek to clarify when rooftop structures exceeding the maximum building heights in areas outside Central Sydney are allowed.

The suite of amendments were considered by the Transport, Heritage and Planning Committee which resolved (in summary) to variously: approve the Planning Proposal Policy and Housekeeping Amendments (LEP) (and forward to the Department of Planning, Housing and Infrastructure with request for gateway determination), approve the draft Sydney Development Control Plan 2012 - Policy and Housekeeping Amendments 2023 (subject to insertions), approve updates to City of Sydney Competitive Design Policy (and other guidance document amendments) and delegate authority to the Chief Executive Officer to make any necessary minor amendments.

As noted, the following key LEP Amendments are of specific relevance in the consideration of this Planning Proposal:

Amendment 9 – Design excellence processes and site-specific development control plans

- LEP Amendment 9 seeks to raise the threshold for requiring a competitive design process on land outside of Central Sydney from 25 metres to 35 metres (Cl. 6.21D). Likewise, the threshold for the requirement to prepare a site-specific DCP is also proposed to be increased to 35m (Cl. 7.20) for land

outside Central Sydney. The amendments aim to streamline the development approval process by reducing the number of competitive design processes and development control plans (concept development applications).

LEP Amendment 3 – Allowing structures associated with green roofs to exceed building height limits

- LEP Amendment 3 seeks to address the current lack of allowance for rooftop structure/s that exceed the maximum building heights in areas outside Central Sydney (new Cl at Part 5) – subject to these structures supporting the social use of the roof and other requirements. The proposed new clause will allow the Council to approve structures required to access and promote rooftop gardens and rooftop open space, and ancillary structures to these, that are higher than the LEP height of building controls as long as certain criteria are met to limit the extent, use and impact of the structure.

It is anticipated that the amendments will progress through gateway determination to public exhibition in the first quarter of 2024, with finalisation following in October.

3.4.3 Sydney Development Control Plan 2012

The Sydney DCP 2012 provides additional detailed design guidance which builds upon the provisions of the Sydney LEP 2012. The site is located within Green Square as identified in the Sydney DCP, meaning it is subject to built form controls relating to street frontage heights, setbacks, building bulk, facades and sun access planes. Relevant key considerations are identified in Table 3 below.

Table 3 Current key Sydney DCP 2012 controls

Provision	Planning Control
Section 5.2: Green Square	
5.2.3 Community Infrastructure	Maximum GFA under Clause 6.14 of Sydney LEP 2012 to be achieved where a development provides specific infrastructure including roads, public domain, drainage and stormwater infrastructure works, to the satisfaction of the consent authority.
5.2.7.1 Water channels and setbacks	A 3m landscape setback, measures from the existing site boundary shall be provided along the eastern site boundary fronting Young Street, free of structures and encroachments.
5.2.7.3 Floor risk management	Development applications for land within the flood liable portions of the Green Square development area require the submission of a flood study.
5.2.9 Building Design	Align buildings to the street to define the public and private domain with direct access to private open space as appropriate. Multiple entries are to be provided along the street frontage and along through-site links. Vehicular entries must be separated from common lobby entries.

Provision	Planning Control
5.2.10 Setbacks	Land dedication is required for mapped community infrastructure, including setbacks. Mapped setbacks include a 3m landscape setback along the Hunter Street, Young Street and Powell Street frontages.
Section 2: Locality Statements	
2.5.11 Waterloo Park Locality	The site is located within the Waterloo Park locality. The character of Waterloo Park is to be primarily low to medium scale mixed use development.
Section 3: General Provisions	
3.1.5 Public Art	Conceptual public art strategy considerations to guide the future design excellence provisions and detailed design of the site. Refer to **Appendix M**.
3.6 Ecologically Sustainable Development	Ecologically Sustainable Development (ESD) provisions as relevant to new developments. Refer to conceptual ESD considerations presented at **Section 7.10** of this report.
3.11 Transport and parking	Car parking, accessible parking, bicycle parking and motor cycle parking is provided in accordance with relevant provisions under the Sydney LEP 2012 and Sydney DCP 2012. Refer to **Section 7.3** for further consideration.
Section 4: Residential Flat, Non-residential and mixed use	
4.2.1 Building height	The maximum number of storeys mapped for the site is 4 storeys.
4.2.2.1 Setbacks	Rear setbacks and alignment should be consistent with adjoining buildings and in areas were corner buildings are typically built to the street boundary on one or more frontages, new development on a corner may be built to the street boundary.
4.2.3.1 Solar access	New development must not create any additional overshadowing onto a neighbouring dwelling where that dwelling currently receives less than 2 hours of direct sunlight to habitable room windows and 50% of the private open space between 9am and 3pm on 21 June.
4.2.3.6 Deep soil	The minimum amount of deep soil is to be 10% of the site area, with a minimum dimension of 10m.

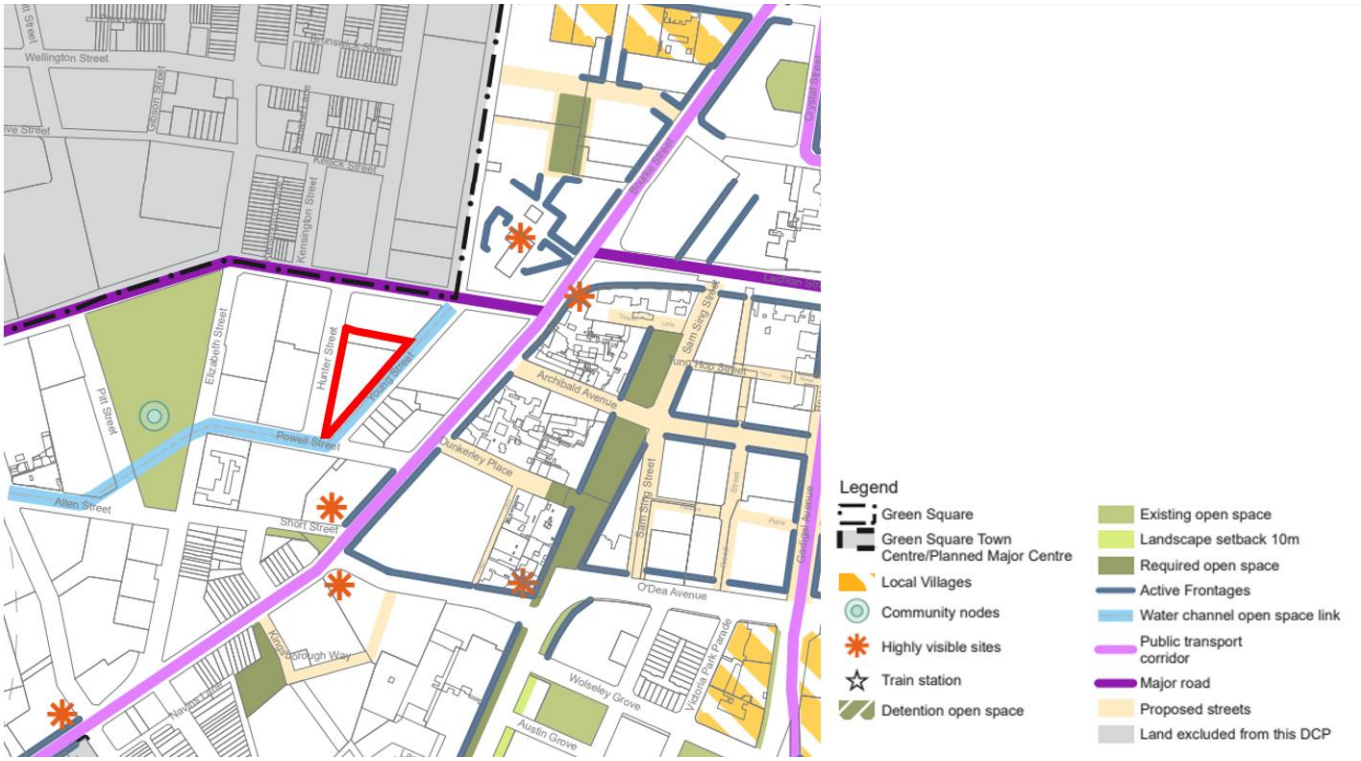


Figure 17 Extract of the Green Square DCP Structure

Source: city of Sydney DCP 2012

4.0 Development concept

4.1 Site opportunities and considerations

In undertaking a review of the site's development potential, the following key opportunities and consideration have informed the exploration of design opportunities for the site:



Large amalgamated site



Support the City of Sydney as in important location for primary, secondary and tertiary educational infrastructure



Provide infrastructure that meets the needs of residents and workers



Direct connection to public transport



Environmental constraints – tree canopy and flooding

4.2 Indicative reference design

Plus Architecture have developed an indicative reference design to act as a test scheme for the proposed planning envelope, demonstrating a proof of concept for the site to support the proposed amendments to the Sydney LEP 2012 and Sydney DCP 2012. The indicative reference design has been carefully designed within the site and is a result of thoughtful analysis of the surrounding locality and the desired future character of the area. The reference design consists of:

- A new 6 storey vertical school consisting of:
  - 45 General Learning Spaces (GLS) and 13 specialist classrooms
  - A multi-purpose hall / auditorium
  - A library
  - A canteen
  - Administration, lobby and circulation spaces
  - An active green roof
  - A basement including 60 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m^2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
  - 10,608m^2 education floor area
  - 2,935m^2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m^2.

4.3 Numerical summary

Table 4 provides a summary of the indicative concept scheme's key numerical components.

Table 4 Numerical summary of indicative reference scheme

Component	Indicative Development concept
Site Area	4,611m^2
Gross Floor Area	13,543m^2
Floor Space Breakdown	Vertical school: 10,608m^2 Commercial (film school): 2,935m^2
Floor Space Ratio	2.94:1
Maximum Height	25m (excluding roof balustrades, netting and lift overrun)
Outdoor areas	4,978m^2
Car Parking Spaces	60
Loading/ servicing	Single consolidated loading dock which can accommodate a Medium Rigid Vehicle (MRV).

4.4 Building envelope

The proposed building is 6 storeys in height, complementing the seven-storey scale of the Woolworths Waterloo proposal. To mitigate visual impact, the upper levels of the building are substantively set back from the podium. The setbacks to the upper levels also allow solar access to neighbouring developments, as well as the small outdoor space to the south of the site. Fronting Hunter Street, the scheme features a 5 storey podium height to the north, which transitions to 4 storeys towards the south. The 4-5 storey scale appropriately ties in with the 4-5 storey scale of existing buildings along Hunter Street. Similarly, along Young Street, the scheme proposes a 4 storey podium. The podium height is aligned in scale with the 4 storey building to the north. A distinctive recessed condition characterises the ground floor. Elevations and 3D views of the proposed envelope are shown in **Figure 18** to **Figure 23**.

The height of the building envelope reaches a maximum of 25m, excluding some elements of netting and balustrading on the roof that is contained within a 27m height plane. Further, the lift overrun required to access the roof area minorly encroaches on the 27m height line (RL +49,800) but is not visible from the street.

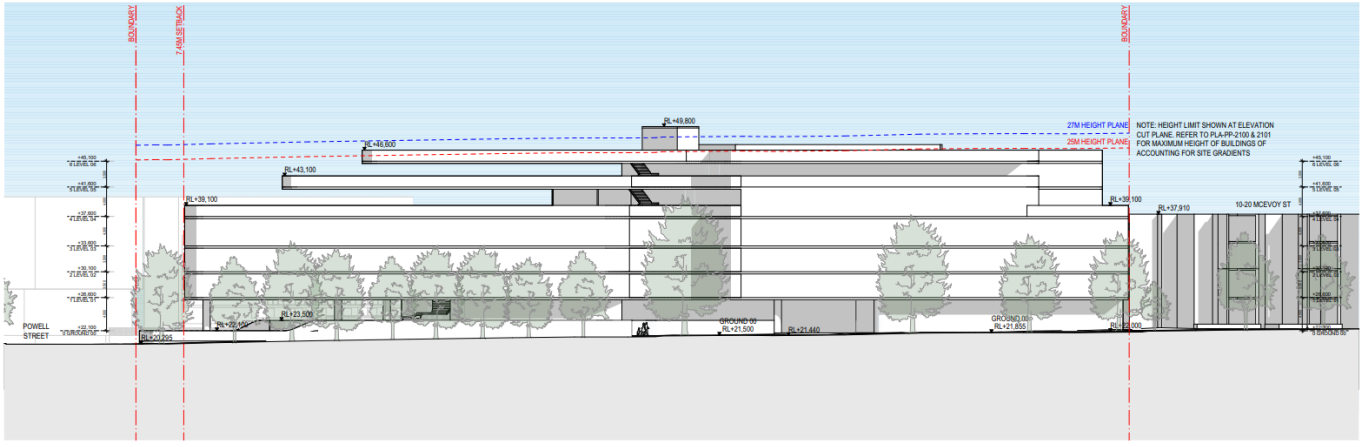


Figure 18 Young Street Elevation

Source: Plus Architecture

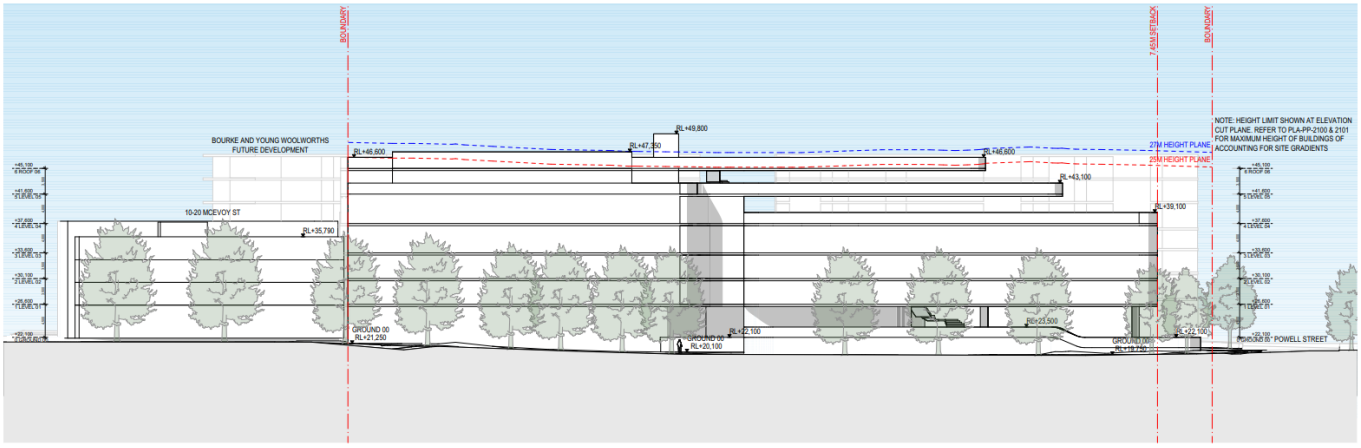


Figure 19 Hunter Street Elevation

Source: Plus Architecture

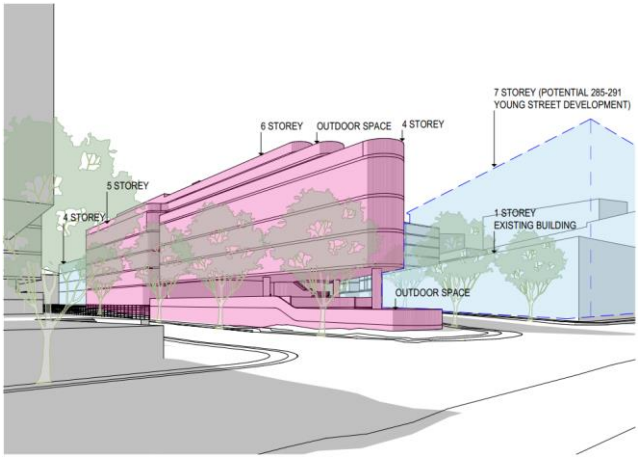


Figure 20 View from Hunter Street (south)

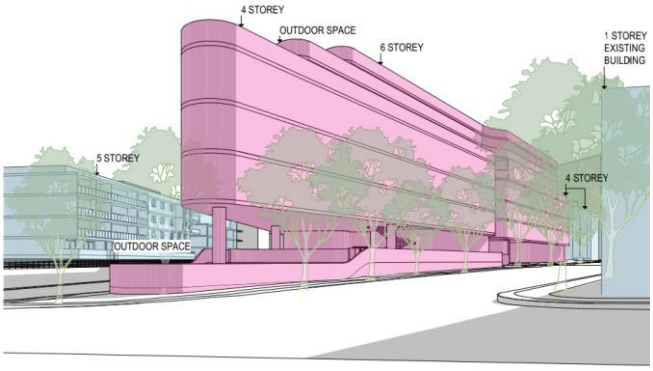


Figure 21 View from Young Street (south)

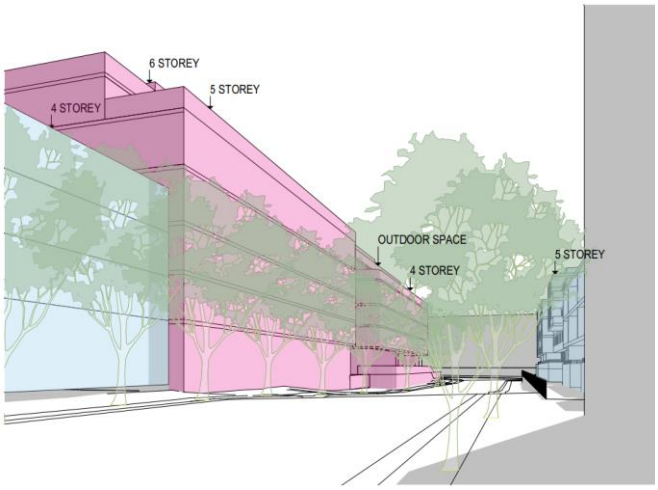


Figure 22 View from Hunter Street (north)

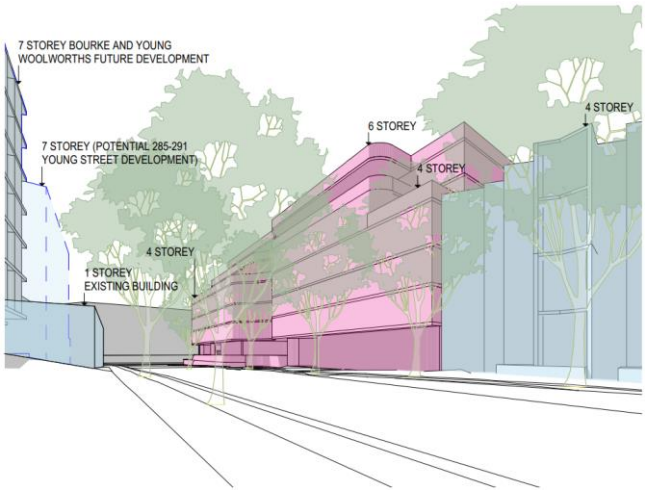


Figure 23 View from Young Street (north)

Source: Plus Architecture

4.5 Ground plane

The ground plane of the school features a spacious main foyer that is easily accessible from both Hunter and Young Street. The ground floor layout plan is shown at **Figure 24**. The foyer serves as a gateway to the auditorium, which is located on Hunter Street. The auditorium is a versatile space that can be made available to the community on weekends and for a range of purposes by the school on weekdays. The film school lobby is located on Young Street and includes a café, contributing to the future mixed-use character of Young Street. Ground floor loading and basement access are located off Young Street to minimize disruption to the residential character of Hunter Street. The school's pick-up/drop-off zones are located on Young Street, while the bus zones are located on Hunter Street. This separation of transport modes reduces the traffic load on any one street.

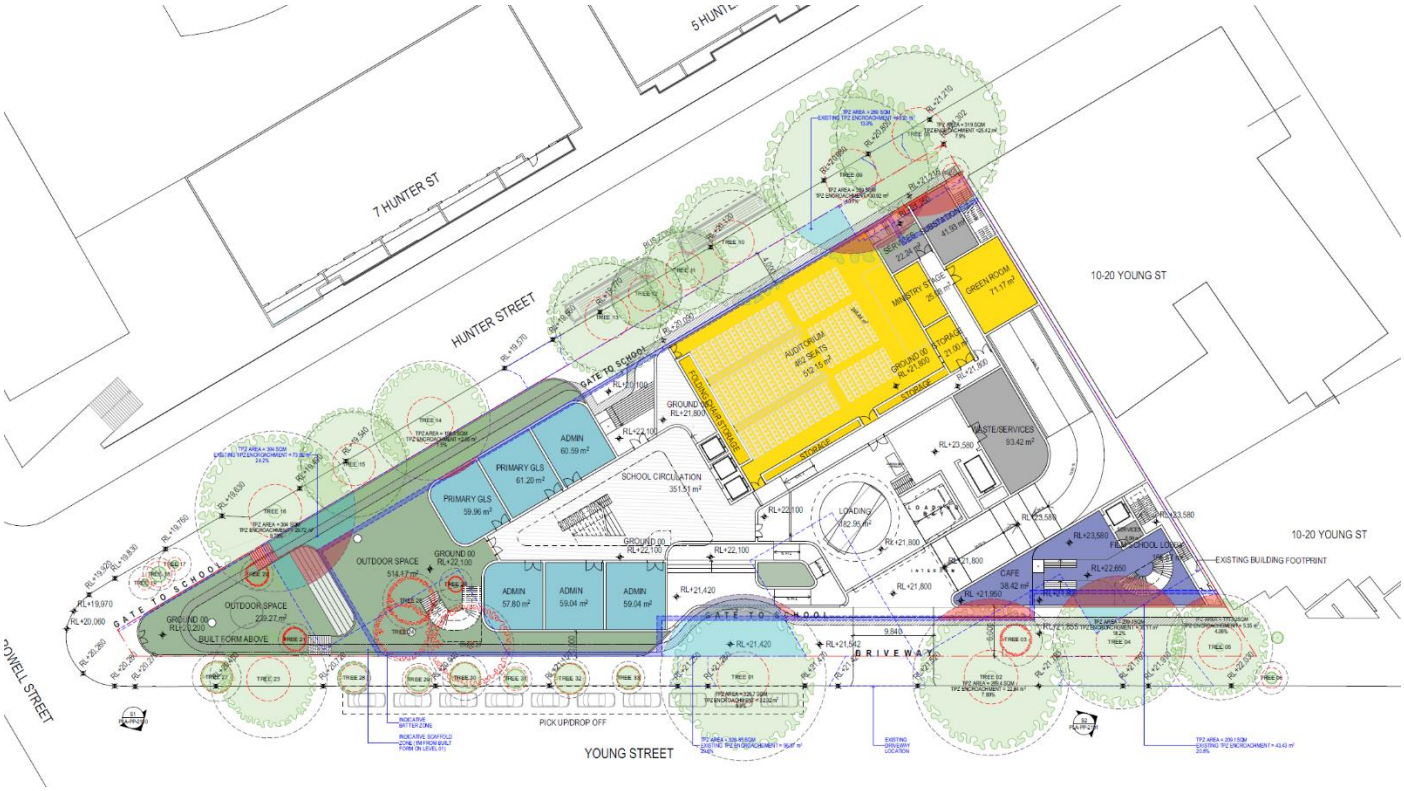


Figure 24 Ground floor plan

Source: Plus Architecture

4.6 Basement, servicing and vehicular access

A layout plan of the basement is shown in **Figure 25**. Vehicular access to the basement is via Young Street. Shared between the school and film school, access to the building is provided to the film school lift core, school lift core, and the goods lift. The basement is protected to the PMF flood level, as described in **Section 7.8**. Likewise, the basement extent has been developed with appropriate arboricultural inputs, as described in **Section 7.6**. The basement includes:

- 60 car parking spaces, utilised by the school and film school on weekdays, and by users of the auditorium and other spaces on weekends.
- Bicycle parking and end of trip facilities
- Services and waste facilities

The reference scheme includes an on-site loading lock located on the ground floor. The loading dock can accommodate an 8.8m long MRV. A 10m diameter turntable is provided to facilitate the forward entry and exit of all loading vehicles. All loading and unloading is to occur on-site and off-street.

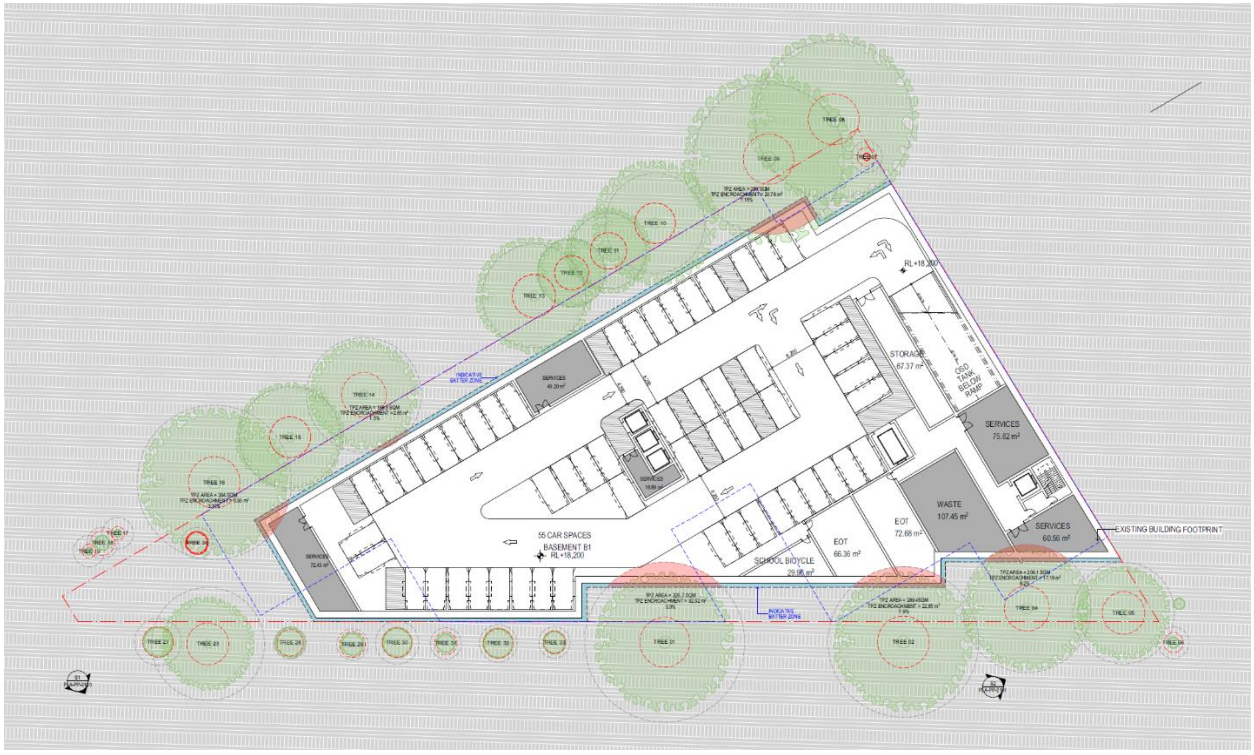


Figure 25 Basement plan

Source: Plus Architecture

4.7 Primary and secondary school

The majority of the site and the proposed building is oriented around the vertical school. The learning spaces are dual oriented around a central atrium and building core. Specifically, the school includes:

- **Ground floor:** Includes 2 primary school GLS, 4 admin spaces, open space for student use and a 462-seat auditorium with green room. See also **Section 7.4**.
- **Level 1:** Includes a feature atrium in the middle for the school, flanked by 12 primary school GLS and the first floor of the library. The upper level of the auditorium is also easily accessed off the main circulation space, including a separate viewing area.
- **Level 2:** Includes 15 secondary school GLS alongside 4 specialist classrooms. The level also includes an amenities and staff room and the second floor of the library.
- **Level 3:** Includes 15 secondary school GLS alongside 4 specialist classrooms. The level also includes the third floor of the library.
- **Level 4:** At this level the built form begins to step back, creating a large open space for use by students. The level also include 3 secondary school GLS and 5 specialist classrooms
- **Level 5:** This level also sees a further setting back of the built form, creating an expansive open space. It also includes a canteen. Change rooms and amenities, and an outdoor basketball court.
- **Level 6:** This level is the roof of the proposal, featuring open space to the south, and service spaces to the north.

4.8 Film school

To the north of the site sits spaces for the film school, which is accessed off a separate film school core. These spaces are shared with the community on the weekends. The film school consists of:

- **Ground floor:** Includes a café and lobby area for the film school. See also **Section 7.4**.
- **Level 1:** Includes 3 kids rehearsal spaces, a breakout room and a communal kitchen.
- **Level 2:** Includes 3 teaching spaces, an admin room and an equipment hire space.
- **Level 3:** Includes a carpentry space, green room, flats storage a prop room and a black box theatre.
- **Level 4:** Includes a cinema space and sound stage.
- **Level 5:** Includes audio, grading and animation spaces as well as two editing labs.

4.9 Landscaping concept

The proposal for the landscaping concept has been provided by Turf Design Studio and attached in **Appendix E**. The design concept has been formulated to align closely to the following seven principles:

- Biophilic: Engaging with biophilic principles to promote health & wellbeing.
- Resilient: Design and materials that will endure extreme weather events and suitably robust for the school context.
- Adaptable: Future-proofing spaces by maximising flexibility for multiple uses.
- Playful: Integrating moments of play and delight into the everyday experience.
- Inclusive: An environment that does not discriminate and maximises opportunities for social interaction.
- Outdoor Learning: A diversity of outdoor 'rooms' as an extension of indoor learning facilities.
- Connected: With Country and the local community.

Each level is allocated as a specific zone, with associated purposes as indicated in **Figure 26** to **Figure 30** below. A proposed 8 out of 17 trees located on the site are proposed to be removed.

The Ground Level (**Figure 26**) is a designated primary play area, consisting of an adaptive space primarily centred on interaction and play.

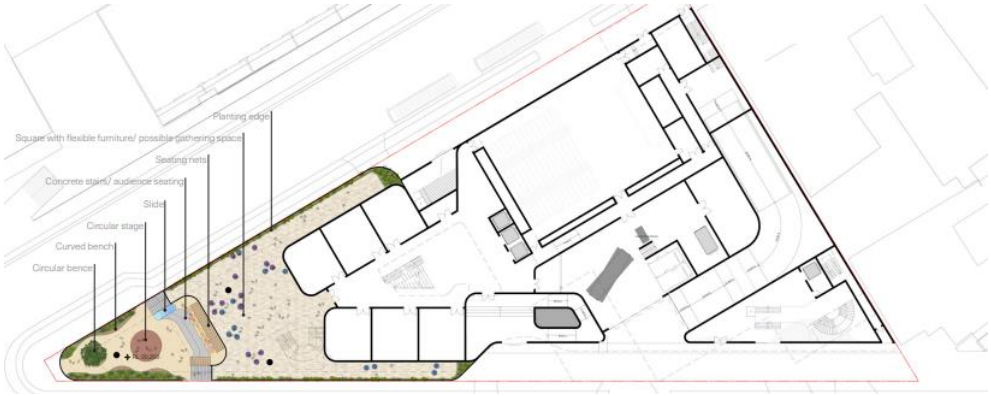


Figure 26 Ground Level Landscape Plan

Source: Turf Design Studio

Levels 1 to 3 (**Figure 27**) will consist of secondary play zones, outdoor leaning areas, adaptive spaces, and seating.



Figure 27 Levels 1 through 3 Landscape Plan

Source: Turf Design Studio

Level 4 (**Figure 28**) focuses on secondary play gathering spaces that include event space, outdoor learning, and seating.

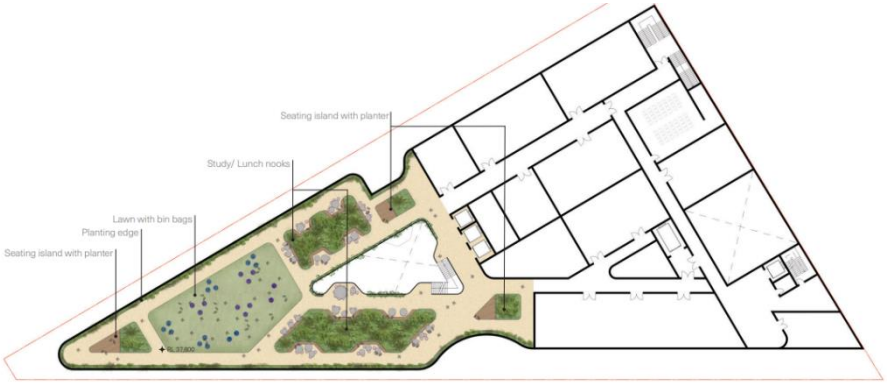


Figure 28 Levels 1 through 3 Landscape Plan

Source: Turf Design Studio

Level 5 (**Figure 29**) encompasses an outdoor gym, running track, basketball court, which all function as flexible active use spaces.



Figure 29 Level 5 Landscape Plan

Source: Turf Design Studio

Lastly, Level 6 (**Figure 30**) will include multiple rooftop learning spaces, including food production and kitchen gardens, canopy cover, sport area, seating area with view, open lawn and study nook. Additionally, the atrium will be a focal point that is complimented by planting for a calming and easily maintained edge.



Figure 30 Level 6 (Rooftop) Landscape Plan

Source: Turf Design Studio

4.10 Public Art Plan

A preliminary public art plan has been created by Public Art Curator Amanda Sharrad and is attached to **Appendix M**. The plan outlines the vision principles and structure for the implementation of public art, including a contextual analysis and initial opportunities within the proposed development. Principles for this plan have been written in accordance with the relevant planning principals identified in City of Sydney public art and urban planning policies and guidelines such as the *City of Sydney City Art Public Art Strategy*, *Public Art Policy*, *Guidelines for Public Art in Private developments*, *Green Square Public Art Strategy*, *Guidelines for Acquisitions and Deaccessions* and *Sustainable 2030*.

Illustrated to **Figure 31**, the public domain within the pink overlay is indicated as an opportunity for public art as it would be owned and maintained by the developer. Furthermore, these spaces near the entrances to the proposed school provide a transitional space to announce the school and create a destination focus. Alternatively, the boundaries outlined in blue identify areas of art integration to create a chance for a public artwork that is highly integrated within the fencing material.

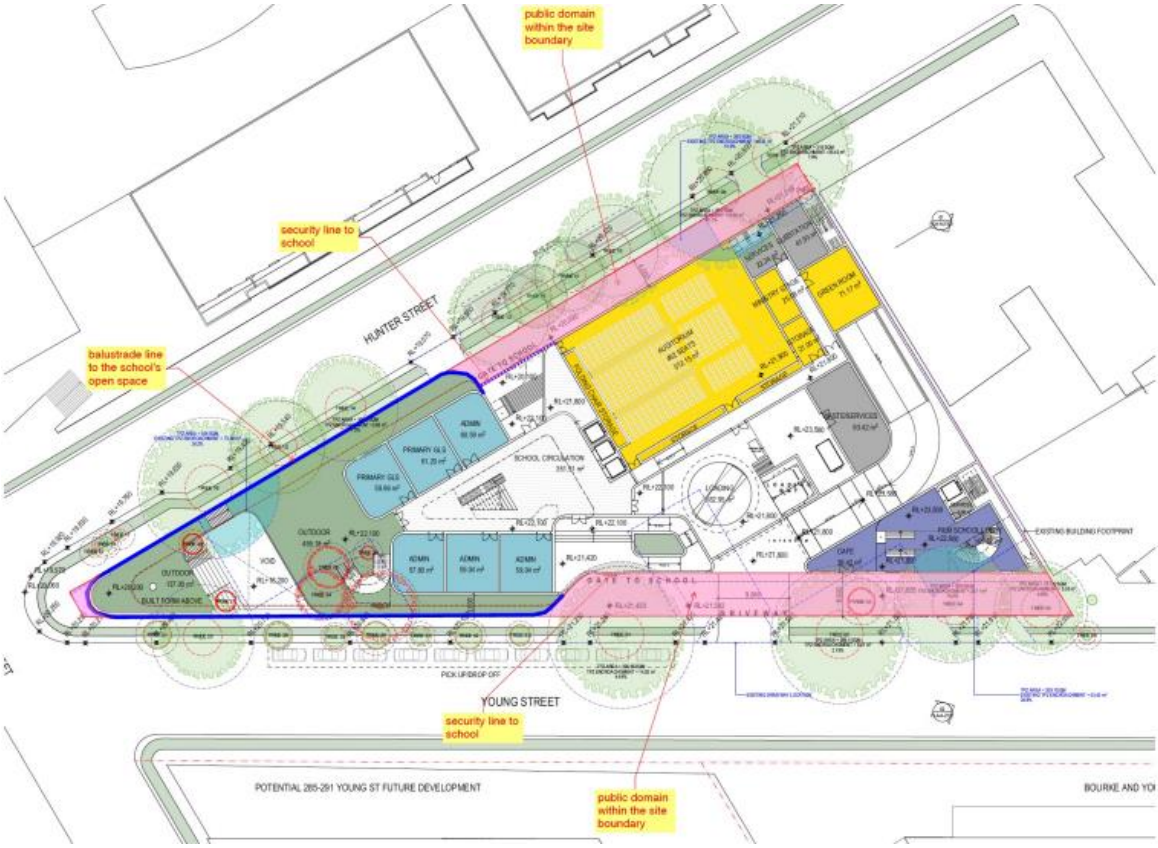


Figure 31 Public Art Opportunities

Source: Preliminary Public Art Plan

The following are recommended at the marked locations on the plan illustrated in **Figure 32**:

1. Sculptural artworks amongst landscaping/sculptural seating/shade structures/water/cultural planting.
2. A tall vertical sculptural landmark artwork.
3. Highly integrated artworks in the soffit of the architectural fabric or a sculptural / lighting artwork suspended from the soffit.
4. Highly integrated artwork in the boundary fence.

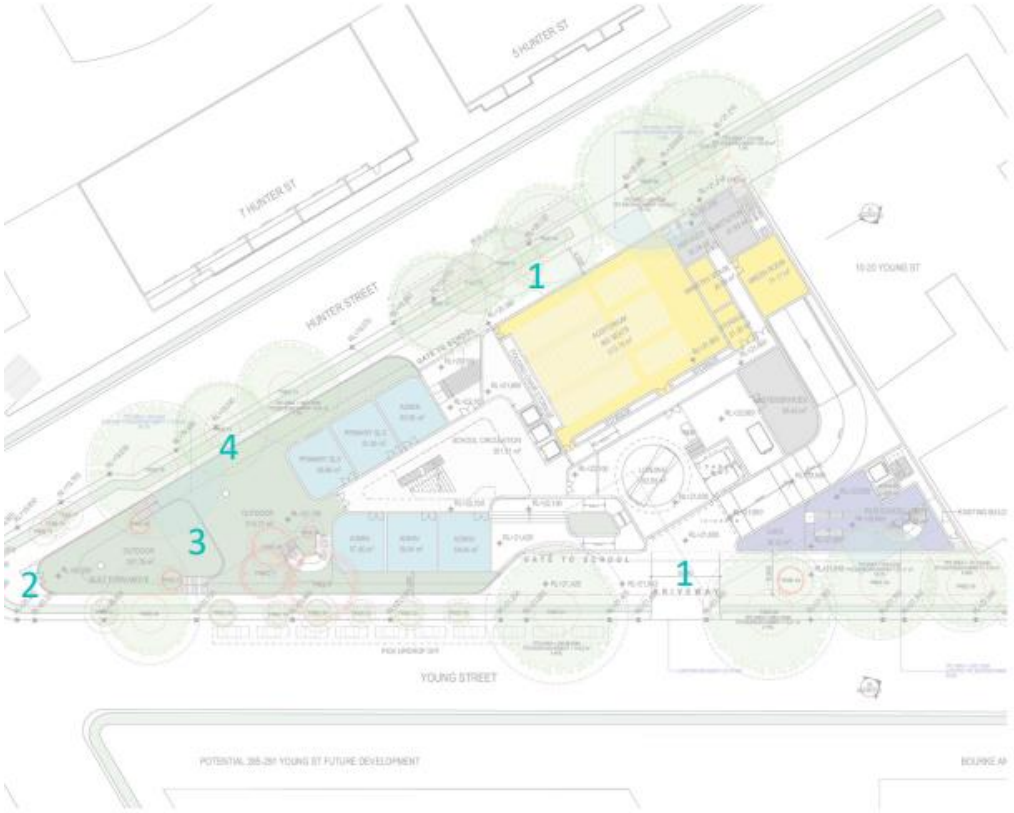


Figure 32 Public Art Opportunity Sites

Source: Preliminary Public Art Plan

5.0 Planning proposal

This planning proposal report has been prepared in accordance with Section 3.33 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and the 'Local Environmental Plan Making Guideline' prepared by the NSW Department of Planning and Environment, which requires the following matters to be addressed:

- The objectives and intended outcomes of the amendment to the LEP;
- Explanation of provisions;
- Justification, including:
  - relationship to strategic planning frameworks;
  - environmental, social and economic impact;
  - State and Commonwealth interests;
- Maps;
- Project timeframe; and
- Community consultation.

The following section outlines the objectives and intended outcomes of this rezoning request and an explanation of provisions in order to achieve those outcomes, including relevant mapping. The justification and evaluation of impacts is set out in Section 6.0 and 7.0 of this report.

5.1 Objectives and intended outcomes

The primary objective of the Planning Proposal is to establish appropriate planning provisions to support the development of a future educational establishment that will support the surrounding area. The intent is facilitate the future renewal and intent of the site to create an integrated education asset to respond to a growing population in the vicinity of the site. Supporting objectives of this outcome include:

- **Educational infrastructure**: Deliver an integrated primary, secondary and tertiary education facility to meet the needs of families and individuals in the Waterloo / Green Square / Zetland as the population continues to grow and change.
- **Job retention and creation**: Maintain and expand the employment opportunities afforded through the existing film school, and introduce new jobs close to housing for primary and secondary educators.
- **Community**: Foster a sense of community through school activities and other community functions on weekends.
- **Tree canopy:** Ensure that existing mature canopy vegetation within the site and street frontage are prioritised for retention in any redevelopment, facilitating the continuation of a strong urban canopy to enhance amenity.
- **Built form**: Deliver high quality architectural built form that reflects and builds on the existing and future character of the area, while responding to the unique demands of an educational establishment in an urban context.

5.2 Explanation of provisions

5.2.1 Amendments to Sydney LEP 2012

Amendments to the Sydney LEP 2012 are sought under this Planning Proposal, as detailed in **Table 5**. These have been approached in accordance with the changes already proposed and being progressed under the LEP amendment detailed in **Section 3.4.2**.

Table 5 Summary of Proposed Amendments to the Sydney LEP 2012

Control	Clause / Map	Existing	Proposed
Site-specific controls	6.XX	N/A	The following site-specific allowances are proposed: • Additional height and floorspace provision in relation to development of the kind described in **Section 4.0** • Non-residential development not subject to a competitive design competition • development consent may be granted to certain building elements exceeding the height limit • clarification of community and design excellence floorspace provision • Removes the requirement for the preparation of a site-specific development control plan and replaces it with a subclause giving effect to a site-specific design guide. This site-specific clause is discussed further in the section below.

Site specific controls

The Planning Proposal seeks to amend the Sydney LEP 2012 to insert a control relating to consistency with a design guide prepared for the site (refer to **Section 5.2.2**).

6.XX 242-258 Young Street, Waterloo

(1) This clause applies to the following land in Waterloo—
- *a) Lot 1, DP 84655,*
- *b) Lots A and B, DP 161650.*

(2) Despite Clause 4.3, the maximum height for a building is 25m.

(3) Despite Clause 4.4, the maximum floor space ratio for a building on the land to which this clause applies is 2.94:1, which includes any additional floor space for which the building is eligible under clauses 6.12, 6.13 and 6.14.

(4) Despite subclause (2), development consent may be granted to a building that exceeds the height limits set by this Plan if the consent authority is satisfied that any exceedance relates only to rooftop nets, balustrade, fence or low-level boundary treatments and lift overruns to facilitate the use of any rooftop open space.

(5) Development consent must not be granted under this clause unless the consent authority—
- *a) is satisfied the building will not be used for the purposes of—*
  - *i. residential accommodation, or*
  - *ii. serviced apartments.*

(6) Development consent must not be granted under this clause unless the consent authority—

a) *has considered the* Design Guide—242-258 Young Street, Waterloo*, published by the Department in [DATE].*

(7) *Clauses 6.21D(1)(a)(ii) and 6.21D(1)(c) do not apply to development to which this clause applies.*

(8) *A building on land to which this clause applies is not eligible for additional floor space under clause 6.21D(3)(b).*

(9) *Clause 7.20 does not apply to apply to development that is not used for a residential purpose on the land to which this clause applies.*

5.2.2 Proposed Design Guide framework

It is noted that, with a Capital Investment Value more than $20 million, future development for the purposes of a school would constitute State Significant Development. The Council would therefore prepare a Design Guide, in lieu of a Development Control Plan. A draft Site-Specific Design Guide has been prepared incorporating suggested site-specific controls that would apply to the site.

A draft site-specific Design Guide has been prepared to accompany this Planning Proposal. This Report is accompanied by, and should be read alongside, the draft Site-Specific Design Guide.

The Guide has been prepared to provide greater certainty of the built form and design outcomes presented in the indicative reference scheme.

The draft Design Guide contains site-specific provisions relating to key principles listed below, which have been embellished in conjunction with input from Council during the initial assessment of the Planning Proposal. It addresses address key design and development outcomes, including site-specific provisions related to the future built form, access, vegetation, design excellence and sustainability.

- **Section 1** sets out the land to which the Design Guide applies, administrative matters and the relationship to other elements of the planning framework that apply to the site.
- **Section 2** contains the Vision and Principles for the site, which have informed the planning framework (including the design guide and relevant provisions of the Sydney LEP 2012), including:
  - *Vision for the site* – setting out a vision for a vibrant, creative and contemporary teaching environment focused on providing innovative learning spaces and high-quality classrooms supported by multifunctional flexible spaces, including diverse open spaces.
  - *Principles*
    - Delivery of a high quality contemporary educational hub that provides innovative opportunities to teach, learn, meet and collaborate.
    - A diverse, activated, and attractive place of learning that is well integrated to the surrounding urban context and supports the wider community.
    - A Built form that positive contributes to the public domain, positively contributing to surrounding streetscapes and achieving high amenity and urban character of the surrounding locality.
    - Development responds appropriately to the environmental context, designed to mitigate against flood risks and responding to the existing urban tree canopy cover through thoughtful building design.
    - Building is to be of high environmental performance, integrated sustainable practices and Water Sensitive Urban Design (WSUD) infrastructure where practical.
    - Land uses are compatible and well-integrated that are also complementary to the existing film school.
- **Section 3** contains the specific design guidance for development applications for the site in respect of:
  - *Built form*
  - *School and design*
  - *Landscaping and ecology*
  - *Environmentally sustainable development*
  - *Public Area*
  - *Sustainable transport*
  - *Parking, access and circulation*
  - *Noise and vibration*

5.3 Community consultation

With reference to the relevant considerations set out within the NSW Department of Planning & Environment's Local Environmental Plan Making Guideline, it is noted that:

- The LEP making process does not require formal community consultation prior to a proponent submitting a rezoning request to council.
- The most appropriate time for community consultation for planning proposals is after a Gateway determination is issued and all relevant studies and reports have been completed. This ensures the community has clear and evidence-based information available to help them make informed comments on the proposal.

Nonetheless, the following engagement activities were undertaken during the pre-lodgement phase for the Planning Proposal:

- **Letterbox Delivery** – A community notification letter was distributed to residents, and businesses via letterbox drop on 29 November 2023 to inform the community about the Planning Proposal and invite them to register for a community webinar and complete an online survey. Approximately 4,840 properties were reached, including 196 businesses.
- **Community Webinar** – A 1.5-hour community webinar was hosted for community members to learn about the Planning Proposal, meet the project team, provide feedback, and ask questions. The webinar was held 6pm, Tuesday 12 December 2023 with 36 registrations and 22 attendees.
- **Community Survey** – A short online survey was held to provide community members with opportunity to provide feedback to inform the Planning Proposal, and for the project team to learn more about the local community, including opportunities and potential impacts. The survey was open from 29 November 2023 and closed 11.59pm Thursday 14 December 2023. The survey covered: the perceived need for a new school and benefits of the proposal, potential concerns or impacts related to the proposal and any other feedback. There were a total of 146 responses.

Of the feedback received, respondents highlighted the following benefits, concerns and commentary as listed in **Table 6**.

Table 6 Consultation Feedback

Feedback	Comment
Benefits	• Respondents felt that a new primary school and secondary school option were needed in Waterloo. • There was interest in potential community use of school facilities amongst respondents. • The community supports the inclusion of the Sydney Film school on the site. • The proposal will result in increased vibrancy of the area and new opportunities for community connection through the school.
Concerns	• Parking impacts to local residents, including loss of on-street parking. • Traffic impacts from pick-up and dropoff, and increasing existing congestion on McEvoy, Hunter and Powell Street. • Construction impacts, including noise, traffic and construction delays, and cumulative construction impacts with reference to the nearby Woolworths development.
Other Commentary	• Some community members indicated they wanted an affordable school option (i.e. government run). • It is important to maximise green space in the design, to provide appropriate outdoor space for sporting activities and socialising, as well as for enhanced visual amenity in the area. • Consider upgrades to public transport to reduce additional traffic generation, with specific reference to local bus networks

A full overview of the engagement activities and findings is provided at **Appendix D**.

Further, formal public consultation will take place in accordance with Sections 3.34 and 3.35 of the EP&A Act at a later date. Any future DA for the site would also be exhibited in accordance with Council requirements, at which point the public and any authorities would have the opportunity to make further comment on the proposal.

5.4 Project timeline

Table 7 provides the project timeline anticipated for the subject planning proposal which is predicated on the nature and scale of the Planning Proposal.

Table 7 Anticipated Project Timeline

Action	Timeframe
Stage 1 – Pre-lodgement	Complete
Lodgement	January 2024
Stage 2 – Planning Proposal	May 2024
Stage 3 – Gateway Determination	June 2024
Stage 4 – Post-Gateway	August 2024
Stage 5 – Public exhibition & Assessment	December 2024
Stage 6 – Finalisation	February 2025

6.0 Justification of strategic and site-specific merit

6.1 Strategic merit

6.1.1 Section A – need for the Planning Proposal

Q1. Is the Planning Proposal a result of an endorsed local strategic planning statement, strategic study or report?

Yes. This planning proposal responds to the vision and outcomes of the City of Sydney Local Strategic Planning Statement, as discussed at **Section 6.1.2**.

Q2. Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes. To achieve the realisation of a new K-12 independent school and film school to serve the surrounding area, the development standards under the Sydney LEP 2012 must be amended to facilitate the renewal of the site in a manner that will achieve the objectives and intended outcomes. In preparing this Planning Proposal, three options were considered to facilitate the intended outcomes. These are listed and discussed below:

- Option 1: Do nothing; and
- Option 2: Redevelop the site under the existing planning controls.
- Option 3: Submit a Planning Proposal to amend the Sydney LEP 2012;

Option 1 – Do nothing

The site will remain as an existing light industrial premises, which is ageing and is no longer fit for purpose. Over time the site will be at odds within the surrounding character which is evolving into a dense mixed-use precinct. Doing nothing is not considered an appropriate outcome for the site.

Option 2 – Redevelop the site under the existing planning controls

If required to redevelop under the existing controls it is likely that the proponent would be forced to redevelop it for its highest and best use as residential. Redeveloping the site under existing planning controls for the purposes of a school would functionally result in a school that is not able to adequately accommodate the desired range and quantum of space to serve the needs of the future educational establishment. Further, it would be a major limiting factor in reducing the overall capacity of the school; a critical factor in an area with a growing and densifying population and one that lacks a secondary school within a 2km radius. Redevelopment of the site under current controls would represent a missed opportunity that underdelivers on educational infrastructure for the area.

Option 3 – Submit a Planning Proposal to amend the SLEP 2012

Option 3 comprises submitting a Planning Proposal to facilitate redevelopment of the site in accordance with the provisions presented in this report and the accompanying reference scheme. This scheme maximises open space per student whilst providing an appropriate amount and diversity of spaces for use by the school. Further it enables the retention of the tertiary film school on the site, offering a consolidated education hub for the surrounding area. This option is preferred as it represents the best combined outcome for the applicant, the Council and the existing and future residents of the area in terms of meeting social and infrastructure needs.

6.1.2 Section B – relationship to the strategic planning framework

Q3. Will the Planning Proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

Greater Sydney Region Plan – A Metropolis of Three Cities

The Greater Sydney Region Plan (GSRP) is the overarching strategy for growing and shaping the Greater Sydney Area. It sets a 40-year vision (to 2056) and establishes a 20-year plan to manage growth and change for Greater Sydney in the context of social, economic and environmental matters. The plan was adopted in March 2018 and seeks to reposition Sydney as a metropolis of three cities – the western parkland city, central river city, and the eastern harbour city, the latter of which captures Waterloo. The Plan provides 10 high level policy directions supported by 40 objectives that inform the District Plans, Local Plans and Planning Proposals which follow in the planning hierarchy. The plan identifies Waterloo as adjoining the Harbour CBD, immediately proximate to the strategic centre of Green Square, and within the Eastern Economic Corridor.

The proposal is consistent with the strategic direction for the eastern harbour city, providing education capacity in close proximity to housing and public transport. The proposal will take enrolment pressure of existing schools in the area and ensure that a high-quality educational facility is provided for the future population of the school catchment. The proposal is also consistent with the other, wider goals contained within the Plan, including:

- The creation of temporary job opportunities in manufacturing, construction and construction management, and on-going jobs in teaching and administration for the wider Sydney LGA.
- Delivering additional educational infrastructure for the catchment that will take enrolment pressure off the existing schools in the region.
- Ensuring that the wider Green Square/Zetland/Waterloo urban renewal area's population growth is supported by infrastructure.

The proposal is consistent with the following directions under the Plan, which govern growth and development in Sydney (refer to **Table 8**).

Table 8 Consistency with GSRP directions

Direction (modify as needed)	Consistency of the proposal with the Direction
A city supported by infrastructure	The proposal benefits from existing and future public transport infrastructure, especially the forthcoming Sydney Metro service from the nearby Waterloo station. This will provide high speed connections to the CBD, and on to Chatswood, Macquarie Park and the Hills, as well as to Bankstown in 2025. The site in its existing configuration is serviced by key utilities.
A city for the people	The proposed development achieves this vision through delivering improved quality of life through co-locating schools, transport, and recreational facilities in a walkable mixed-use neighbourhood, in keeping with 30-minute city principles. The proposal seeks to facilitate active transport and to foster a community based around the school and its facilities.
Housing the city	The proposal constitutes key supporting infrastructure for existing and forthcoming housing growth in the surrounding area. The site currently reflects employment uses and is proximate to ample residential development.
A well-connected city	The proposal delivers a new school within proximity of Waterloo Metro Station, Green Square train station and is adjacent to numerous bus services. Further, the nearby Bourke Street shared path connects to a substantive active transport network across the City of Sydney and the eastern suburbs. The site is located within strategic location with immediate access to housing and employment, as well as access to other major destinations and hubs within 30 minutes by public transport.
Jobs and skills for the city	The proposed school represents a net increase of jobs generated by the site. Further, employment related to the existing film school will be retained as part of the redevelopment
A city in its landscape	A total of 33 trees are located upon and adjacent to the site. The proposal retains the majority of these existing trees, except for 7 low value trees, which are required to be removed to accommodate the building envelope. However, new landscaping is proposed as discussed at **Section 4.9**, which will further contribute to the landscape character of the Waterloo area.

Direction (modify as needed)	Consistency of the proposal with the Direction
An efficient city	Energy consumption on the site will be minimised through design and performance management, in keeping with the requirements of the Sustainable Buildings SEPP. This includes a 5 star green star design aspiration and targeting 4 star NABERS rating for schools.
A resilient city	The proposal has implemented a number of design initiatives to minimise exposure to natural hazards by ensuring that future development is not affected by flooding. The environmental initiatives implemented throughout the development will contribute to enhanced environmental outcomes and seek to mitigate impacts related to climate change.

Eastern District Plan

The Eastern City District Plan underpins the Greater Sydney Region Plan and sets the 20-year vision for the District through 'Planning Priorities' that are linked to the Region Plan. Key priorities of the District Plan which this planning proposal would give effect to are elaborated in **Table 9**.

Table 9 Consistency with the Eastern City District Plan directions and objectives

Directions and Objectives	Comment
Direction 1 – A city supported by infrastructure	
Priority E1 – Planning for a city supported by infrastructure	As mentioned, the proposal benefits from existing and future public transport infrastructure, especially the forthcoming Sydney Metro service from the nearby Waterloo station. This will provide high speed connections to the CBD, and on to Chatswood, Macquarie Park and the Hills, as well as to Bankstown in 2025. The site in its existing configuration is serviced by key utilities. The proposal contributes to the alignment of infrastructure with growth by providing primary, secondary and tertiary educational infrastructure amongst strong pedestrian and cycle networks connecting Waterloo and the broader CBD as well as forthcoming housing growth.
Direction 2 – A collaborative city	
Priority E2 – Working through collaboration	The delivery of a consolidated education asset in this location will create opportunities to involve the community and encourage collaboration between students of the school and film school. These opportunities will be more fully explored at the DA stage.
Direction 3 – A city for people	
Priority E3 – Providing services and social infrastructure to meet people's changing needs	The future built form will provide and maintain primary, secondary and tertiary educational infrastructure to cater for the growing population in the vicinity of the site. There is a notable lack of secondary schools in the surrounding area.
Priority E4 – Fostering healthy, creative, culturally rich and socially connected communities	The proposed development contributes towards healthy, creative, culturally rich and socially connected communities by co-locating schools, transport, and recreational facilities in a walkable mixed-use neighbourhood, in keeping with 30-minute city principles. The proposal seeks to facilitate active transport and to foster a community based around the school and its facilities.
Direction 5 – A city of great places	
Priority E6 – Creating and renewing great places and local centres, and respecting the District's heritage.	The provision of new educational infrastructure will add to the diverse range of uses that make Waterloo and the surrounding area an attractive place to live, work and visit. When viewed in the context of substantial future development, the proposal will represent a harmonious contribution to a thriving urban environment.
Direction 6 – A well connected city	
Priority E10 – Delivering integrated land use and transport planning and a 30 minute city	As noted above, the proposal delivers a new school within proximity of Waterloo Metro Station, Green Square train station and close to numerous bus services. Further, the nearby Bourke Street shared path connects to a substantial active transport network across the City of Sydney and the eastern suburbs. The site is located within strategic

Directions and Objectives	Comment
	location with immediate access to housing and employment, as well as access to other major destinations and hubs within 30 minutes by public transport.
Direction 7 – Jobs and skills for the city	
Priority E11 – Growing investment, business opportunities and jobs in strategic centres	The proposed school represents a net increase of jobs generated by the site within the strategic renewal area of Green Square / Waterloo / Zetland. Further, employment related to the existing film school will be retained as part of the redevelopment.
Direction 9 – An efficient city	
Priority E19 – Reducing carbon emissions and managing energy, water and waste efficiency	The future built form presents an opportunity to deliver a sustainable building that recognises the importance of environmental preservation, occupants' health, safety and wellbeing, as well as in terms of greenhouse gases emissions reduction. The future development will also support transport demand initiatives by seeking to incentivise and facilitate walking and cycling opportunities to achieve the NSW Government's goal of net zero emissions by 2050.

Q4. Is the Planning Proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GCC, or another endorsed local strategy or strategic plan?

City Plan 2036 – City of Sydney Local Strategic Planning Statement

The Planning Proposal aims to give effect to several planning priorities and actions within the City of Sydney Local Strategic Planning Statement (LSPS). Council's LSPS (known as City Plan 2036) represents Council's 20-year vision and strategy for the LGA's future direction and contains directions about infrastructure, liveability, productivity and sustainability. The LSPS draws from the Greater Sydney Commission's Greater Sydney Regional Plan and Eastern City District Plan and implements the planning priorities identified from these larger strategic documents at a local level.

Table 10 Consistency with the LSPS

Planning Priority	Consistency/Comment
Infrastructure	
I1 – Movement for walkable neighbourhoods and a connected city	The site's strategic location within proximity of Waterloo Metro Station, Green Square train station and close to numerous bus services creates ideal conditions for walkability and a connected city. The nearby Bourke Street shared path connects to a substantial active transport network across the City of Sydney and the eastern suburbs, creating compelling cycling options for those living within the catchment. Cycling is enhanced through provision of end-of-trip facilities within the proposal to enhancement the viability and attractiveness of this mode to access the site. This will contribute to encouraging more active and healthy lifestyles.
I2 – Align development and growth with supporting infrastructure	The subject proposal constitutes an important contribution to educational infrastructure in the Green Square / Waterloo / Zetland area that has been, and will continue to be, the subject of substantial housing growth.
I3 – Supporting community wellbeing with social infrastructure	The auditorium and other spaces within the school can also be made available for community use and events in addition to the natural role of a school as a hub of community wellbeing and activities.
Liveability	
L1 – A creative and socially connected city	The Green Square / Waterloo / Zetland area is home to many diverse communities. Schools, particularly in dense communities, can serve as social hubs for families raising children in the catchment area. An ability to share spaces with the community on weekends will further enhance this capacity. Additionally, the proposal includes the upgrading and reinstating of a tertiary film school – a creative study opportunity for local residents and people from across Sydney.
L2 – Creating great places	The delivery of new educational infrastructure will contribute to the dense diversity of uses that make Waterloo and the adjacent area great places to be. Read in the context of substantial future development, the vertical form of the school will appropriately reflect the energic density of the neighbourhood.
Sustainability	
S2 – Creating better buildings and places to reduce emissions and waste and use water efficiency	The future built form presents an opportunity to deliver an sustainable building that recognises the importance of environmental preservation, occupants' health, safety and wellbeing, as well as in terms of greenhouse gases emissions reduction. The future development will also support transport demand initiatives by seeking to incentivise and facilitate walking and cycling opportunities to achieve the NSW Government's goal of net zero emissions by 2050. Waste minimisation and reduction strategies are to be further developed at the DA stage.

Sustainable Sydney 2030-2050

Sustainable Sydney 2030 is Council's long term vision for a more sustainable, equitable and resilient city. The plan builds on three key themes of Green, Global and Connected as well as 10 strategic directions to guide the future of the City. The achievement of a number of strategic directions are supported by this Planning Proposal as outlined in **Table 11**.

Table 11 Sustainable Sydney 2030-2050 strategic directions

Strategic direction	Consistency/ comment
A leading environmental performer	The proposal seeks to minimise greenhouse gas emissions through improved energy efficiency and low carbon energy production for net zero emissions. Natural lighting and natural ventilation will be utilised effectively throughout the development. In addition to thermal comfort, energy and water efficiency, the proposed building design will provide sustainable and efficient operation to the occupants. The future built form will encourage walking and active transportation to prevent unnecessary or lengthy private car trips.
Design excellence and sustainable development	The proposal has been designed to maximise the amenity of students in a sustainable manner. This has been done in accordance with best practice case studies and criteria listed under the Transport and Infrastructure SEPP, discussed later in this section.
A city for walking, cycling and public transport	The nearby Bourke Street shared path connects to a substantial active transport network across the City of Sydney and the eastern suburbs, creating compelling cycling options for those living within the catchment. Cycling is enhanced through provision of end-of-trip facilities within the proposal to enhancement the viability and attractiveness of this mode to access the site. This will contribute to encouraging more active and healthy lifestyles.
An equitable and inclusive city	Access to education for people of all backgrounds is critical infrastructure, particularly in dense urban environments. Schools in densely populated areas serve as social hubs for families raising children in the catchment area. The proposal to share spaces with the community on weekends will further enhance this capacity.
A thriving cultural and creative life	The proposal includes the upgrading and reinstating of a tertiary film school, which will provide a creative study opportunity for local residents and people from across Sydney.

Q5. Is the planning proposal consistent with any other applicable State and regional studies or strategies?

Better Placed

The objectives and design principles of Better Placed have been considered and responded to in the proposed design. The document seeks to promote good design and capture our collective aspiration and expectations for the places where we work, live and play. Better Placed includes seven objectives for good design, which have been considered in the preparation of the reference scheme as follows:

- **Objective 1 – Better Fit – contextual, local and of its place**

  The proposed development responds to the surrounding mixed-use context and its location within Waterloo. The evolution of the site enhances the character of the local area which is undergoing change. The proposed school use is consistent with the vision for the surrounding area.
- **Objective 2 – Better Performance – sustainable, adaptable and durable**

  The proponent has ensured that principles of ESD have been incorporated into the proposal, ensuring effective and environmentally responsive design initiatives. The target goals for the proposed development include:
  - 5 star green star design aspiration
  - 4 star NABERS rating for schools.

- **Objective 3. Better for Community – inclusive, connected and diverse**

  Through detailed design, the proposal will ensure compliance with all accessibility standards to create inclusive and accessible spaces. The site is easily accessed by pedestrians from the adjoining streets.
- **Objective 4. Better for People – safe, comfortable and liveable**

  The proposed development will include secured learning areas and amenities and will optimise visual links between the school and the streetscape. The proposal significantly enhances passive surveillance to public and private area over the existing blank façade condition.
- **Objective 5 – Better Working – functional, efficient and fit for purpose**

  The proposed development optimises design and amenity around the needs of a K-12 school and film school. For the former, this has been done with regard to the Design Guide for Schools, as outlined in **Section XX**.
- **Objective 6 – Better Value – creating and adding value**

  The proposed development represents a valuable contribution to the locality as a renewed and significantly enhanced education space. It replaces legacy uses that, over time, have become less appropriate and necessary for the locality, and responds to emerging demand brought on by significant urban renewal in the surrounding area.
- **Objective 7 – Better Look and Feel – engaging, inviting and attractive**

  The design principles that have informed the proposal as illustrated in the Design Report prepared by Plus Architecture and included at **Appendix A**.

Q6. Is the Planning Proposal consistent with applicable State Environment Planning Policies?

The State Environmental Planning Policies directly applicable to the Planning Proposal are identified in **Table 12**

Table 12 Consistency with State Environmental Planning Policies

SEPP	Consistent			Comment
	Yes	No	N/A	
State Environmental Planning Policy (Biodiversity and Conservation) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008			-	Not relevant to the proposed LEP amendment. May apply to future development on the site.
State Environmental Planning Policy (Housing) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Industry and Employment) 2021			-	Not relevant to the proposed LEP amendment. May apply to future development on the site.
State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Planning Systems) 2021			-	Not relevant to the proposed LEP amendment. Future development for the purposes of a school with a capital investment value in excess of $20 million will constitute SSD.
State Environmental Planning Policy (Precincts—Central River City) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Precincts—Eastern Harbour City) 2021			-	Not relevant to the proposed LEP amendment.

SEPP	Consistent			Comment
	Yes	No	N/A	
State Environmental Planning Policy (Precincts—Regional) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Precincts—Western Parkland City) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Primary Production) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Resilience and Hazards) 2021	✓			*State Environmental Planning Policy (Resilience and Hazards) 2021* (R&H SEPP) seeks to ensure that contaminated land is remediated prior to development, to reduce health hazards or potential harm resulting from contamination. As per the R&H SEPP, it is required that when considering rezoning land, remediation works meet certain standards. The site has been occupied by a variety of commercial buildings for an extended period of time. The requirements of the R&H SEPP will be addressed accordingly during the detailed DA process. Contamination is addressed further in **Section 7.9**.
State Environmental Planning Policy (Resources and Energy) 2021			-	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Sustainable Buildings) 2022	✓			Through the detailed design process, the proposal is able to comply with the requirements for the quantification and minimisation of embodied and operational carbon emissions.
State Environmental Planning Policy (Transport and Infrastructure) 2021	✓			Whilst not immediately relevant to the proposed LEP amendment, Chapter 3 of the Transport and Infrastructure SEPP sets out additional controls and requirements for schools. As such, this will be of key relevance to any future development application. A preliminary assessment against these controls has been included below.

State Environmental Planning Policy (Transport and Infrastructure) 2021 – Design quality principles in schools

Table 13 Design quality principles in schools

Principle	Comment
Principle 1—context, built form and landscape *Schools should be designed to respond to and enhance the positive qualities of their setting, landscape and heritage, including Aboriginal cultural heritage. The design and spatial organisation of buildings and the spaces between them should be informed by site conditions such as topography, orientation and climate.* *Landscape should be integrated into the design of school developments to enhance on-site amenity, contribute to the streetscape and mitigate negative impacts on neighbouring sites.* *School buildings and their grounds on land that is identified in or under a local environmental plan as a scenic protection area should be designed to recognise and protect the special visual qualities and natural environment of the area, and located and designed to minimise the development's visual impact on those qualities and that natural environment.*	The indicative built form has been deliberately designed to respond to the site condition as is discussed in **Section 7.1** and in **Appendix A**. The landscaped areas of the school have been given equal attention through the Landscape Concept Design attached at **Appendix E** and discussed further in **Section 4.9**.
Principle 2—sustainable, efficient and durable *Good design combines positive environmental, social and economic outcomes. Schools and school buildings should be designed to minimise the consumption of energy, water and natural resources and reduce waste and encourage recycling.* *Schools should be designed to be durable, resilient and adaptable, enabling them to evolve over time to meet future requirements.*	The proposal seeks to minimise greenhouse gas emissions through improved energy efficiency and low carbon energy production for net zero emissions. Natural lighting and natural ventilation will be utilised effectively throughout the development. In addition to thermal comfort, energy and water efficiency, the proposed building design will provide sustainable and efficient operation to the occupants. The future built form will encourage walking and active transportation to prevent unnecessary or lengthy private car trips. These initiatives are fully explored in **Section 7.10** and in the ESD report at **Appendix P**.
Principle 3—accessible and inclusive *School buildings and their grounds should provide good wayfinding and be welcoming, accessible and inclusive to people with differing needs and capabilities.*	This will be fully developed through detailed design, though has already been considered conceptually throughout the preparation of the reference scheme.
Principle 4—health and safety *Good school development optimises health, safety and security within its boundaries and the surrounding public domain, and balances this with the need to create a welcoming and accessible environment.*	Whilst these matters will be fully resolved through the detailed design of the school, these principles have been considered in the concept design at **Appendix B** and Operational Management Plan and **Appendix L**.
Principle 5—amenity *Schools should provide pleasant and engaging spaces that are accessible for a wide range of educational, informal and community activities, while also considering the amenity of adjacent development and the local neighbourhood.* *Schools located near busy roads or near rail corridors should incorporate appropriate noise mitigation measures to ensure a high level of amenity for occupants.* *Schools should include appropriate, efficient, stage and age appropriate indoor and outdoor learning and play spaces, access to sunlight, natural ventilation, outlook, visual and acoustic privacy, storage and service areas.*	Providing adequate play spaces that balance student needs with the amenity of the surrounding neighbourhood has been a central focus through the development of the concept design. These factors are assessed in **Section 7.0**.
Principle 6—whole of life, flexible and adaptive *School design should consider future needs and take a whole-of-life-cycle approach underpinned by site wide*	The concept design includes a variety of flexible spaces including general learning areas, specialist classrooms and a multi-purpose auditorium. The function of these spaces is

Principle	Comment
strategic and spatial planning. Good design for schools should deliver high environmental performance, ease of adaptation and maximise multi-use facilities.	considered in the Urban Design Report and Operational Management Plan in **Appendix A** and **L** respectively.
Principle 7—aesthetics *School buildings and their landscape setting should be aesthetically pleasing by achieving a built form that has good proportions and a balanced composition of elements. Schools should respond to positive elements from the site and surrounding neighbourhood and have a positive impact on the quality and character of a neighbourhood.* *The built form should respond to the existing or desired future context, particularly, positive elements from the site and surrounding neighbourhood, and have a positive impact on the quality and sense of identity of the neighbourhood.*	As above, the indicative built form has been deliberately sculpted in response to the existing and future built form context that surrounds the site. This context and the amelioration of amenity impacts is discussed in **Section 7.2**.

Q7. Is the Planning Proposal consistent with the applicable Ministerial Directions (Section 9.1 Directions) or key government priority?

The proposal's consistency with applicable Section 9.1 Directions is assessed in **Table 14**.

Table 14 Assessment of Section 9.1 Directions

Ministerial Direction	Consistent			Comment
	Yes	No	N/A	
Focus area 1: Planning Systems				
1.1 Implementation of Regional Plans	✓			The Planning Proposal is consistent with the Greater Sydney Region Plan and Eastern City District Plan as discussed at **Section 6.1.2**.
1.2 Development of Aboriginal Land Council land			-	Not applicable.
1.3 Approval and Referral Requirements	✓			This direction aims to ensure that LEP provisions encourage the efficient and appropriate assessment of development. The relevant requirements of this direction have been considered in the preparation of this Planning Proposal.
1.4 Site Specific Provisions	✓			A particular development scenario is envisaged for the site. The proposed provisions will allow for the envisaged development to be carried out on the site. However, the proposal will not create unnecessarily restrictive or complicated planning controls.
1.4A Exclusion of Development Standards from Variation			-	Not applicable.
Focus area 1: Planning Systems – Place-based				
1.5 Parramatta Road Corridor Urban Transformation Strategy			-	Not applicable.
1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan			-	Not applicable.
1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan			-	Not applicable.
1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan			-	Not applicable.
1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor			-	Not applicable.
1.10 Implementation of Western Sydney Aerotropolis Plan			-	Not applicable.
1.11 Implementation of Bayside West Precincts 2036 Plan			-	Not applicable.
1.12 Implementation of Planning Principles for the Cooks Cove Precinct			-	Not applicable.
1.13 Implementation of St Leonards and Crows Nest 2036 Plan			-	Not applicable.

Ministerial Direction	Consistent			Comment
	Yes	No	N/A	
1.14 Implementation of Greater Macarthur 2040			-	Not applicable.
1.15 Implementation of the Pyrmont Peninsula Place Strategy			-	Not applicable.
1.16 North West Rail Link Corridor Strategy			-	Not applicable.
1.17 Implementation of the Bays West Place Strategy			-	Not applicable.
1.18 Implementation of the Macquarie Park Innovation Precinct			-	Not applicable.
1.19 Implementation of the Westmead Place Strategy			-	Not applicable.
1.20 Implementation of the Camellia-Rosehill Place Strategy			-	Not applicable.
1.21 Implementation of South West Growth Area Structure Plan			-	Not applicable.
1.22 Implementation of the Cherrybrook Station Place Strategy			-	Not applicable.
Focus area 2: Design and Place				
Focus area 3: Biodiversity and Conservation				
3.1 Conservation Zones			-	Not applicable.
3.2 Heritage Conservation			-	Not applicable.
3.3 Sydney Drinking Water Catchments			-	Not applicable.
3.4 Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs			-	Not applicable.
3.5 Recreation Vehicle Areas			-	Not applicable.
3.6 Strategic Conservation Planning			-	Not applicable.
3.7 Public Bushland			-	Not applicable.
3.8 Willandra Lakes Region			-	Not applicable.
3.9 Sydney Harbour Foreshores and Waterways Area			-	Not applicable.
3.10 Water Catchment Protection			-	Not applicable.
Focus area 4: Resilience and Hazards				
4.1 Flooding	✓			The proposal is consistent with the relevant flood related policies, manuals, guidelines, or studies applicable to the site. Further, it does not seek to rezone land within a flood planning area that is zoned recreation, rural, special purposes, or conservation. A flood report has been prepared in accordance with the principles of the Floodplain Development Manual 2005 and consistent with the planning authorities'

Ministerial Direction	Consistent			Comment
	Yes	No	N/A	
				requirements, described in **Section 7.8** and attached at **Appendix J**.
4.2 Coastal Management			-	Not applicable.
4.3 Planning for Bushfire Protection			-	Not applicable.
4.4 Remediation of Contaminated Land	✓			A Detailed Site Investigation has been prepared which identifies past remediation and potential future remediation requirements to be incorporated at the development application stage. Refer to **Section 7.9**.
4.5 Acid Sulfate Soils	✓			Refer **Section 7.11**.
4.6 Mine Subsidence and Unstable Land			-	Not applicable.
Focus area 5: Transport and Infrastructure				
5.1 Integrating Land Use and Transport	✓			The Planning Proposal is consistent with the relevant guidelines as it: • Creates new education and employment opportunities within proximity of high capacity transport connections • Capitalises on investment in Waterloo Metro Station and the City of Sydney active transport network
5.2 Reserving Land for Public Purposes			-	Not applicable.
5.3 Development Near Regulated Airports and Defence Airfields			-	Not applicable.
5.4 Shooting Ranges			-	Not applicable.
Focus area 6: Housing				
6.1 Residential Zones			-	Not applicable.
6.2 Caravan Parks and Manufactured Home Estates			-	Not applicable.
Focus area 7: Industry and Employment				
7.1 Business and Industrial Zones	✓			Proposal is consistent and permissible within the existing MU1 Mixed Use zoning which is to be retained.
7.2 Reduction in non-hosted short-term rental accommodation period			-	Not applicable.
7.3 Commercial and Retail Development along the Pacific Highway, North Coast			-	Not applicable.
Focus area 8: Resources and Energy				
8.1 Mining, Petroleum Production and Extractive Industries			-	Not applicable.
Focus area 9: Primary Production				
9.1 Rural Zones			-	Not applicable.
9.2 Rural Lands			-	Not applicable.
9.3 Oyster Aquaculture			-	Not applicable.

Ministerial Direction	Consistent			Comment
	Yes	No	N/A	
9.4 Farmland of State and Regional Significance on the NSW Far North Coast			-	Not applicable.

6.2 Site-specific merit

6.2.1 Section C – environmental, social and economic impact

Q8. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No. The Planning Proposal's accompanying specialist studies have not identified any impact on critical habitat or threatened species, populations or ecological communities or their habitats, given the site's urban location. Mature vegetation within the site is not listed as critical habitat or threatened.

Q9. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

A detailed assessment of the environmental effects as a result of this proposal is identified in **Section 7.0**. Relevant management measures are identified where appropriate and, on this basis, no unacceptable impacts are likely to result from this rezoning request or future development on the site.

Q10. Has the planning proposal adequately addressed any social and economic effects?

Yes. The economic and social impacts arising from rezoning request have been fully identified and addressed in this report and by the specialist reports assessed in **Section 7.0**. The planning proposal will contribute to a number of positive social and economic effects, including:

- Creation of new jobs on the site
- Provision of new primary, secondary and tertiary education facilities for the surrounding area
- Facilitating community uses on weekends and outside of school hours.

6.2.2 Section D – Infrastructure (Local, State and Commonwealth)

Q11. Is there adequate public infrastructure for the planning proposal?

The subject site is located in an existing legacy urban area and is well served by the full range of public utilities including electricity, telecommunications, water, sewer and stormwater. The proposal capitalises on its location close to major retail and residential density and its proximity to existing and planned major transport nodes.

6.2.3 Section E – State and Commonwealth Interests

Q12. What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

The proponent and the project team have consulted extensively with the City of Sydney Council primarily in formulating and refining this Planning Proposal. This has been summarised in **Section 0**.

Where necessary, further consultation with relevant authorities will be undertaken as required in accordance with the Gateway Determination. State and Commonwealth authorities will have the opportunity to provide comment on the planning proposal as part of its formal exhibition.

7.0 Environmental Assessment

7.1 Built form and urban design

The subject site is within a highly urban area undergoing significant urban renewal. This factor was an important consideration when determining and designing for an appropriate scale for the site. The site is bounded by several existing residential flat buildings between 4 and 5 storeys, which served to establish a baseline for the scale of the development. Equally important, however, is the future scale anticipated in the locality. The Woolworths Waterloo proposal (refer to **Section 3.3.1**) achieves a 27m or 7 storey height opposite the site to the east. More dramatically, the Dank Street South Precinct includes buildings of up to 20 storeys. This context is represented in **Figure 33**. In response to these diverse factors, an appropriate building envelope was shaped from within a 27m height plane.

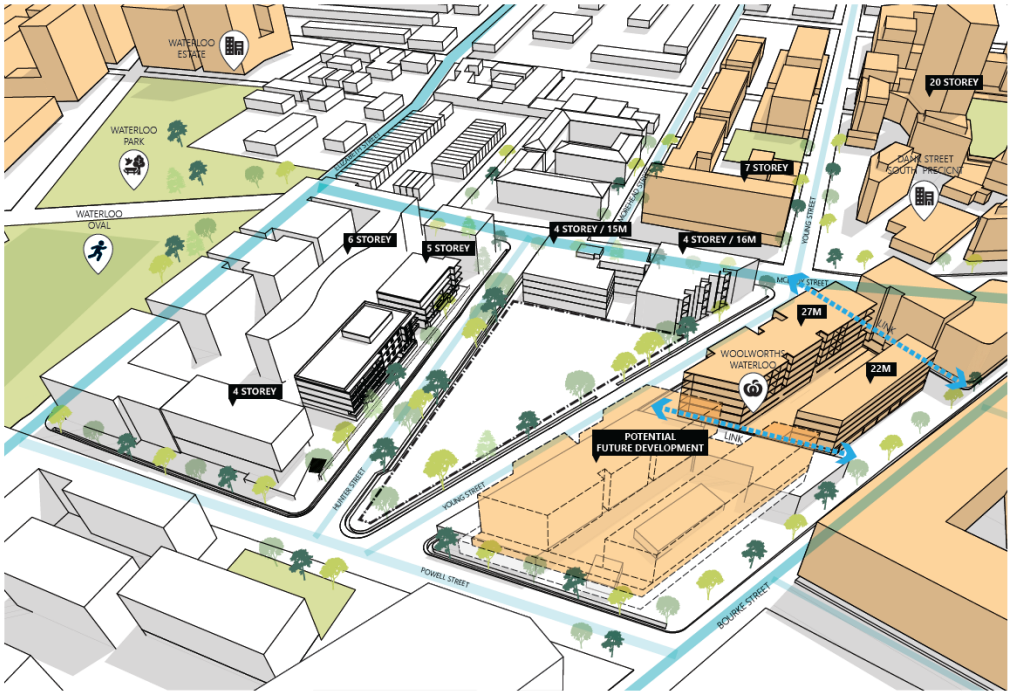


Figure 33 Surrounding built form context

Source: Plus Architecture

To appropriately scale the expression of the development to the existing residential buildings nearby, a podium expression of 4 storeys was adopted. These levels are expressed differently to the upper storeys. Further, setbacks at the northern extent of the building envelope were adopted to match the existing built form. These design moves are shown in **Figure 34**. Together, these successfully embed the proposal within the built form context and render it of its place in terms of scale.

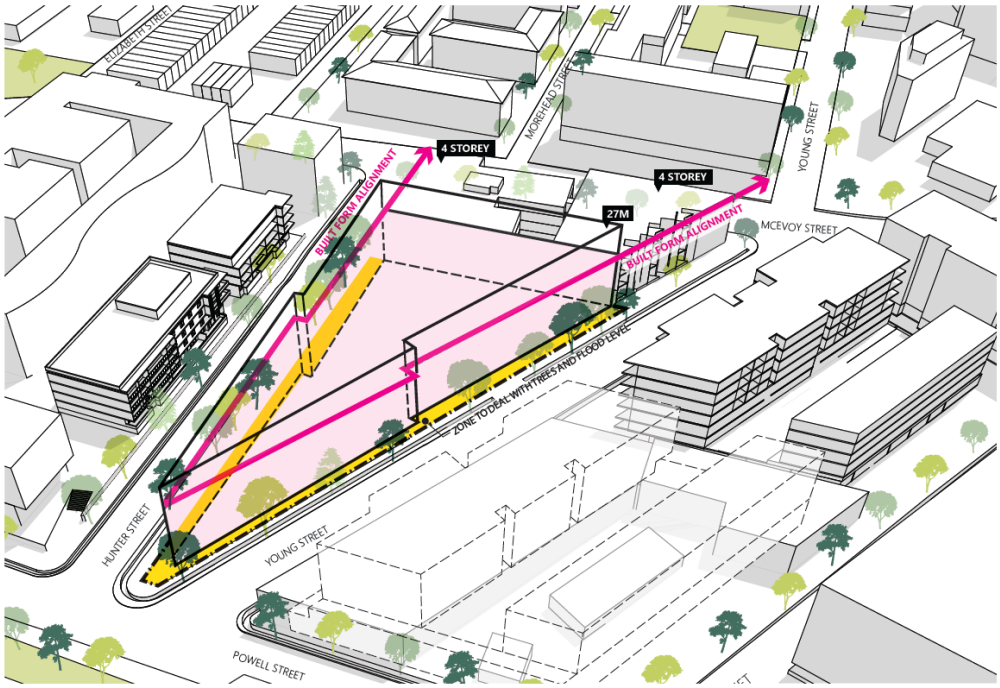


Figure 34 Setback and podium response diagram

Source: Plus Architecture

From these basic elements, the building envelope was further refined to respond to local conditions. Key articulations were introduced to create a more sympathetic built form to the context and to break up the perceived bulk of the structure. Indents to the east and west facade reduce the length of the street wall and enhance the human scale at the street. Additionally, the ground level is setback 1.5m to offer relief to the street and add a recessive articulation zone. These additions represent a more dynamic and responsive reflection of the existing and future character, and ameliorate potential negative outcomes for the streetscape. This is shown in **Figure 35**.

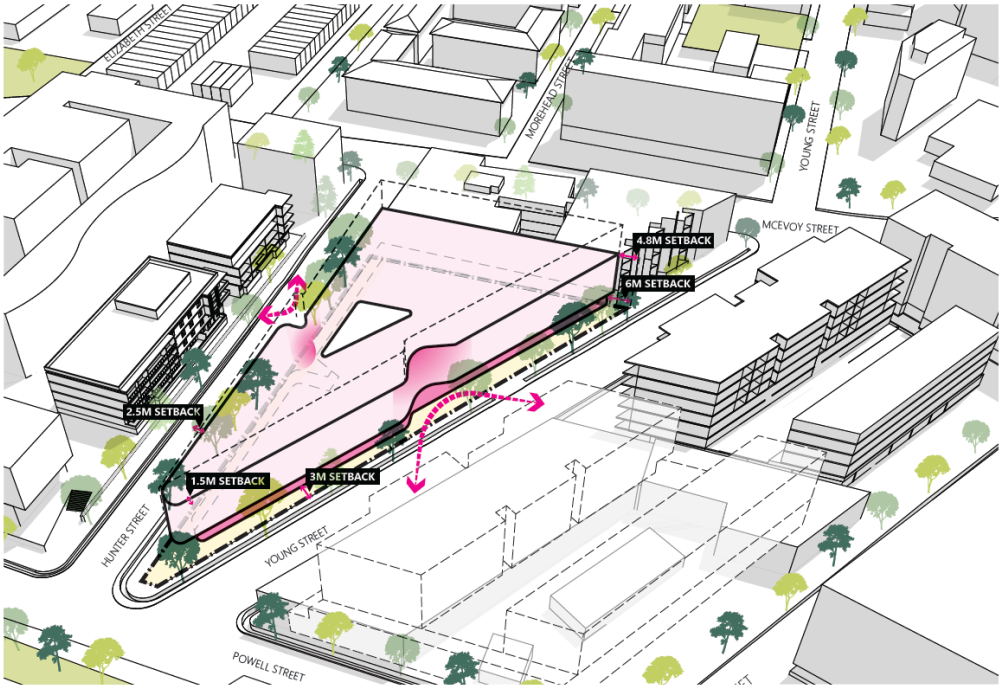


Figure 35 Envelope articulation diagram

Source: Plus Architecture

7.2 Environmental Amenity

7.2.1 Solar access and overshadowing

The future Woolworths development on Young Street features residential apartments. The proposed design ensures that there is no impact to that site achieving 2 hours of solar access to 70% of the apartments during winter. Similarly, if the site at 285-291 Young Street is redeveloped as a residential building, it will achieve 2 hours of solar access to 70% of the apartments during winter. An except of the solar analysis completed is shown at **Figure 36** and included in full in **Appendix B**.

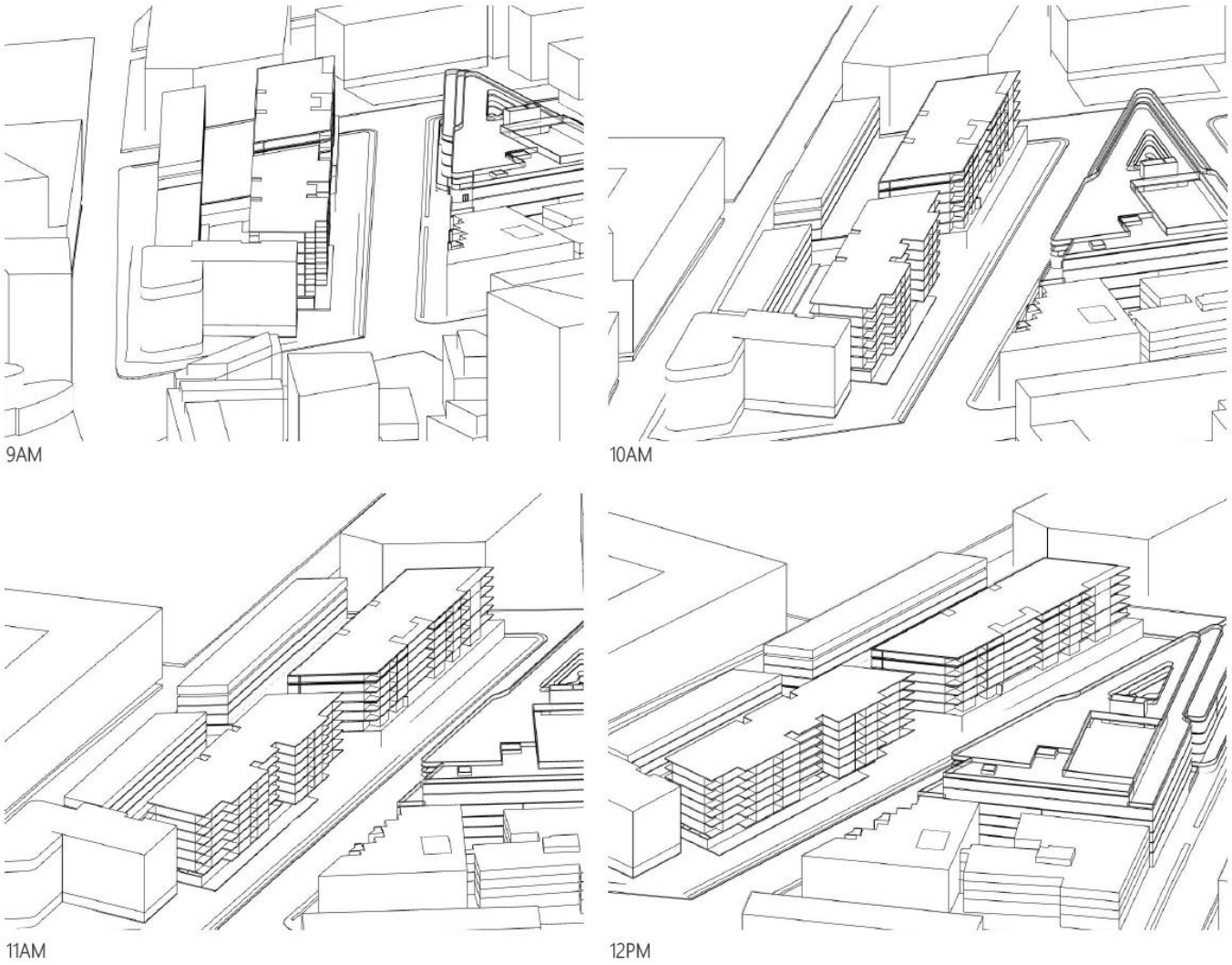


Figure 36 Young Street future development sun eye diagrams

Source: Plus Architecture

The existing developments along Hunter Street are residential apartment blocks. The proposed built form minimises additional overshadowing to the balconies of these residential blocks during the winter solstice. This is demonstrated in the additional shadow diagrams presented at **Figure 37**.

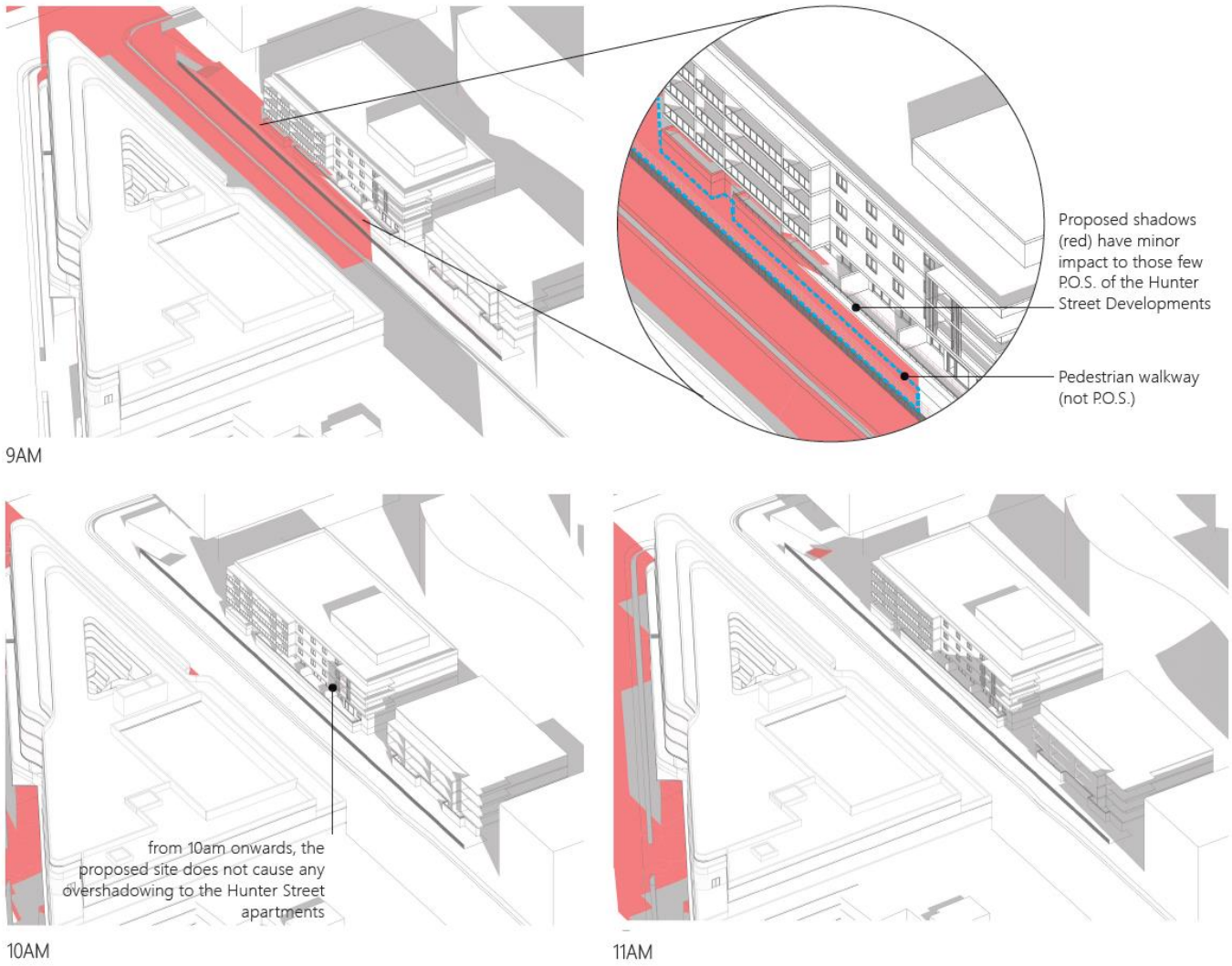


Figure 37 Hunter Street Apartments solar study

Source: Plus Archiotecture

Southern open space

Opposite the site to the south there is a small area of publicly accessible private open space. This has been given focus on account of the wider pool of potential visitors. By stepping back the building to minimise overshadowing, solar testing was able to demonstrate that the open space achieves a minimum of 4 hours of solar access to more than 85% of its area from 9am to 3pm on the winter solstice. This is substantially in exceedance of the 4 hour requirement of 50%. The combined results of the analysis completed is presented in **Figure 38**.

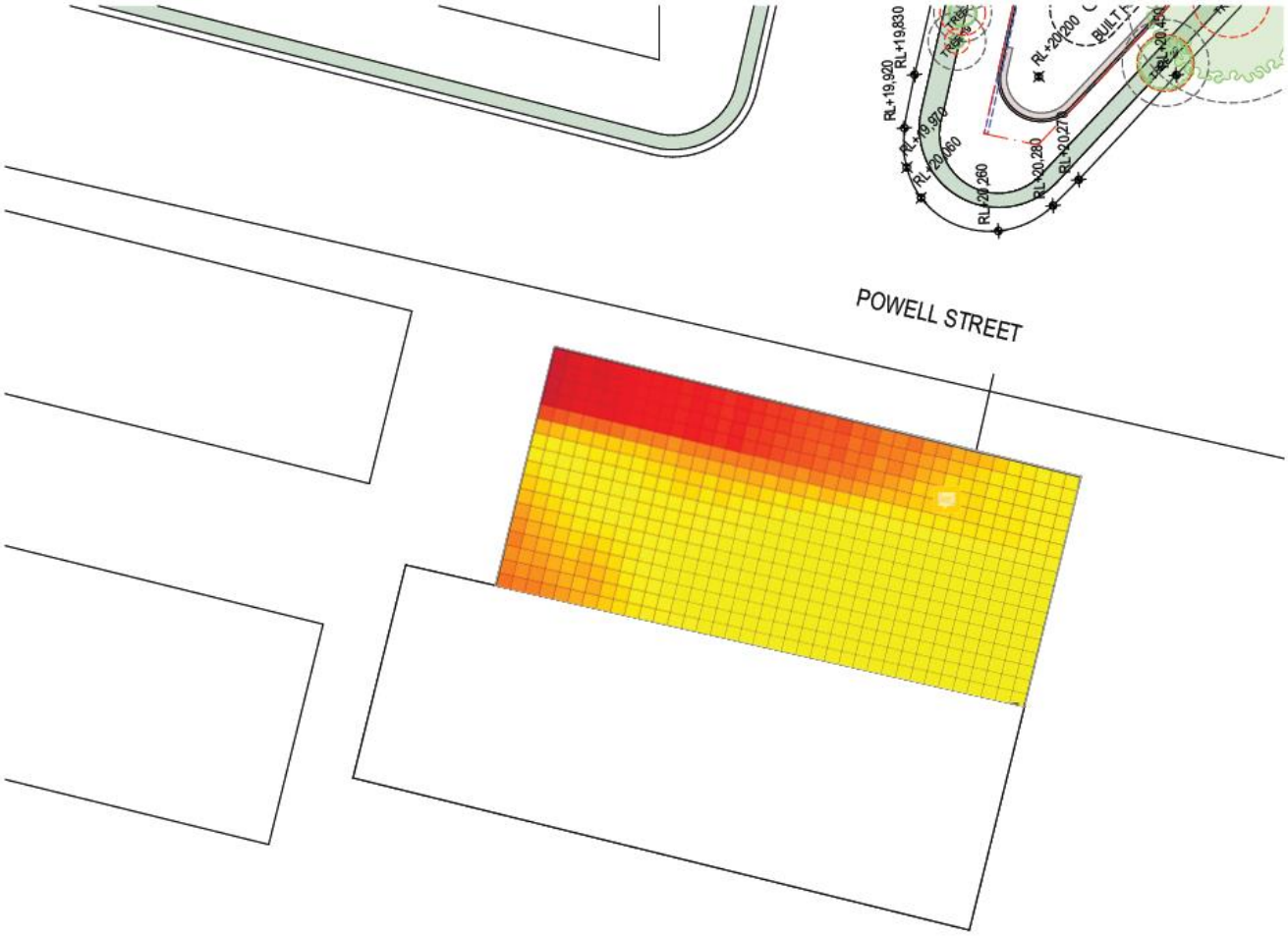


Figure 38 Consolidated solar study of southern open space

Source: Plus Architecture

7.3 Transport and Accessibility

A Transport Assessment has been prepared by JMT Consulting and is included at **Appendix G**. The assessment includes details of traffic modelling outputs, car parking and access arrangements for the proposal. JMT Consulting have also recommended a number of mitigation measures which are considered appropriate for the proposed development. A summary of the assessment and proposed mitigation measures are provided below.

7.3.1 Proposed Access Arrangements

The below describes the proposed traffic and pedestrian access arrangements for the proposal.

Vehicle access routes

The on-site car parking area accessed by Young Street (**Figure 39**). The proposal reduces the number of driveways on the site from six to one – providing a significantly improved environment for pedestrians and facilitating the introduction of additional on-street car parking spaces. The main driveway access point will be primarily for senior staff and service vehicles, with guardians utilising the designated drop off and pick up area for students along Young Street near the site. In addition, this area may only accommodate approximately 6 – 8 cars at any time. The bus drop off and pick up zone is located on Hunter Street fronting the site.

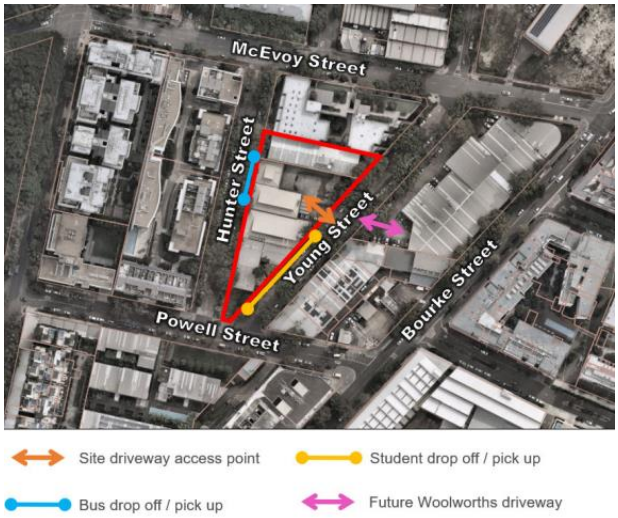


Figure 39 Proposed site access

Source: JMT Consulting

Pedestrian access

Pedestrians will be able to access the school through the main entrances on both Young and Hunter Street. The surrounding street network provides a variety of existing pedestrian crossing points at signalised intersections. Students arriving to the site from the west, north and east are generally well serviced by these crossing points with additional connectivity proposed as part of a through site link at 923-935 Bourke Street (**Figure 40**).



Figure 40 Existing and potential future pedestrian connections

Source: JMT Consulting

Pick-up and drop-off arrangement

School drop-off sessions will begin between 8 am and 8.30am, while pick will be at 3:00pm to 3.30pm in a staggered manner for primary and secondary age groups. Travel demand and vehicle trips for these periods have been calculated based on a best practice approach, which examined traffic survey outcomes from Inner Sydney High School, Sydney Secondary College, and Bourke Street Public School. The forecasted traffic movements are described in **Table 15**.

Table 15 Forecast traffic movements

				Students arriving / leaving in peak hour		Cars in peak hour	
Year Group	Car mode share	Student numbers	Car occupancy (students per car)	AM peak hour*	PM peak hour**	AM peak hour*	PM peak hour**
Year K-6	35%	250	93	75%	10%	41	5
Year 7-12	20%	550		75%	10%	52	7
			Total			**93**	**12**

Source: JMT Consulting
* AM road network peak hour 8am-9am
** PM road network peak hour 5pm – 6pm

An assessment has been conducted to assess the effectiveness of the proposed drop off / pick up area on Young Street to accommodate future demands. The current layout provides for approximately 6 vehicle drop off / pick up bays. A preliminary capacity assessment has been conducted to confirm the suitability of this provision, with relevant assumptions in **Table 16** below.

Table 16 Preliminary capacity assessment of drop off area

Consideration	Quantum
Number of vehicle arrivals in AM peak hour	93
% of arrivals within a 10 minute period	35%
Number of cars within a 10 minute period	33
Typical dwell time	60 seconds
Pick up / Drop off spaces required	4

Source: JMT Consulting

This preliminary assessment demonstrates that there will be sufficient capacity to accommodate all pick up and drop off within the identified kerbside area. A further assessment of the drop off and pick up zone will be provided as part of a detailed Development Application for the site.

7.3.2 Parking and Loading

On-street parking changes

The proposed development will provide additional on-street parking to Young Street and Hunter Street as a result of the proposed development reducing the number of driveways from six to one. For the purposes of the drop off/pick up zone on Young Street, parking will be reserved for the use of this zone on during allocated periods, whilst all other exclude times allowing for parking as is. Additionally, the bus zone indicated to be located on Hunter Street will also be reserved for the use of buses during allocated school hours, resulting in temporary changes to parking provision. This, however, is acceptable under the following considerations:

- The project will create opportunities for additional on-street parking along both Young Street and Hunter Street through the removal of existing driveway crossovers;
- The drop off / pick up zone and bus zones would only be in place for certain periods of the day, and outside of school hours and on weekends the general public will continue to be able to utilise these areas for on-street car parking; and
- The existing on-street parking is untimed and typically utilised by workers of the existing building. The on-street parking is not subject to any resident parking scheme or time restrictions relied upon by visitors to the area.

On-site car parking

As prescribed under the SLEP 2012, the purposes of educational facilities allow for the following car parking provision:

1 space for every 200 square metres of the gross floor area of the building used for those purposes

Furthermore, for the purposes of commercial component (film school), the proposed development would include a control of 1 space per 75m^2 maximum for the film school. In total, the guidance on the maximum number of car parking permitted under the SLEP 2012 is 231 spaces. The 60 basement car parking spaces proposed as part of the reference scheme are significantly below this quantity and meet the objectives of reducing car dependency and supporting the use of sustainable forms of transport to the site. The final car parking requirements and provision for the site will be determined at the development application stage of the project.

Loading and servicing

Service vehicles will be able to access an on-site loading dock via Young Street, with all trucks entering and exiting the site in a forward direction. The on-site loading dock is capable of accommodating a Medium Rigid Vehicle (MRV) which is suitable to accommodate the needs of the site based on the development yields

associated with the reference scheme. The detailed design of the loading dock will be carried out at the development application stage of the project.

Bicycle parking and end of trip facilities

Bicycle parking and end of trip facilities will be provided as part of any future development application for the site. As indicated from the architectural plans in **Appendix B**, these facilities have been located in the basement of the building as indicated in **Figure 41**.



Figure 41 Bicycle parking and end of trip facilities

Source: JMT Consulting

7.4 Operational Plan

The proposed school will cater for approximately 905 students and staff, comprising of 280 primary students, 520 secondary students and 105 staff members. Hours of operation will be 7:30am to 5:30pm, Monday through to Friday. An Operational Plan of Management for the school has been prepared and is provided at **Appendix L**. A breakdown of the schools operations is provided below.

7.4.1 Management of open space areas within the school

A total of 4978m^2 of open space is provided in the proposed development, resulting in approximately 6.2m^2 per student. This allocation will be managed and monitored by delineating the infrastructure and students into three categories, Primary (Years K to 6), Middle (Years 7 to 10), and Senior (Years 11 to 12). In addition to active supervision, passive surveillance through line of sight from administrative offices will provide added management as well as swipe cards and CCTV camera monitoring systems, which will control access for students, staff, contractors, and visitors.

7.4.2 Measures to compensate for the shortage of on-site open space

The proposed development does not meet the minimum requirements of 10m^2 of open space per student. However, as outlined by the *NSW School Infrastructure Education Facilities Standards and Guidelines* (EFSG), which allows vertical schools to employ innovative methods to reduce the lack of open space, the school will be designed with multipurpose spaces which can adaptively cater to changing needs, events or volumes of students. Alternatively, where greater open space is required, the school will utilise Turruwul Park (**Figure 42**) which is located within 10-minute bus trip. Additionally, the school will utilise the two hectares of open space that will be constructed into two playing fields as part of the Waterloo metro station in the proposed Main Park, which is a 10-minute walk from the school (**Figure 42**).



Figure 42 Proximity to Open Space

Source: Nearmap and Ethos Urban

7.4.3 Logistics of safely transporting students to and from the school

Transportation for the purpose of excursions will be specified either by walking, public transport or both. The three school aged groups (primary, middle and senior) will adhere to the Excursions Policy which will be developed to follow the *NSW Government Road Safety Education Program*. Transportation if the form of walking will adhere to the guidelines for students to and from school, which will ensure such measures including route, pedestrian education and safety, adequate assembly provision, numbers monitoring, and risks assessments are all undertaken.

Transportation via any form of public transportation, including bus, train, and metro, will adhere to the relevant legislation, guidelines, and school's Excursions Policy. Following the school's Excursion Policy, buses will be loaded and unloaded on Hunter Street, while the nearest train station is a 10-minute walk to Green Square Station at O'Riordan Street and Botany Road. The nearest Metro station is also a 10-minute walk to Waterloo Station at Cope Street and Botany Road.

7.4.4 Clarification of usage of the undercroft area at the ground level

The undercroft area is a multipurpose area that will be used as a student-holding area during drop-off and pick-up for guardians. Primary and secondary schools will have staggered start and end times to ease drop off and pickup volume on the surround road network per the following schedule:

- Primary school drop-off session will start at 8.30am whilst pick will be at 3:00pm.
- Secondary school drop-off session will start at 8.00am whilst pick up will be at 3.30pm.

The undercroft area will be actively supervised and monitored during these periods.

7.4.5 Operational transport management including details of pick up and drop off

Provisions to manage and mitigate the impact of traffic generation during bus and vehicle pick up and drop off have been incorporated. This includes provisions such as:

- Providing safe pedestrian movements of students, staff, parents and visitors from the community and train and Metro stations.
- Limiting delivery of school supplies and materials between 9.30am and 2.30pm on school days.
- Limiting basement parking to executive staff members.
- Excluding students from driving to and from school.
- Distribution of Opal cars to encourage public transportation usage.

Bus drop-off and pick up will occur on Hunter Street, while the vehicle drop off will occur on Young Street (**Figure 43 and Figure 44**). The school Bus Zone will be established on Hunter Street for pick-up and drop-off times from 8:00 am to 9:00 am and from 3:00 pm to 4:00 pm.



Figure 43 Vehicle drop off and pick up

Source: Ethos Urban

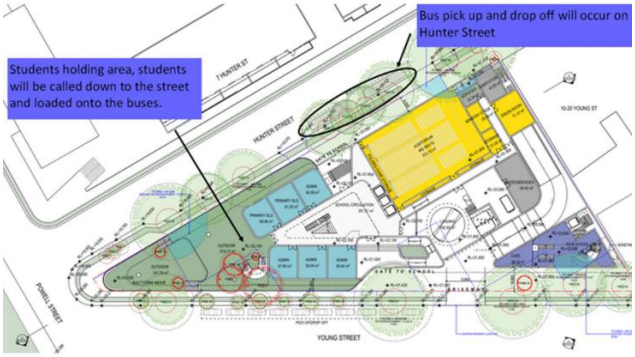


Figure 44 Bus drop off and pick up

Source: Ethos Urban

Refer to **Appendix G** for detailed information on all provisions regarding school drop off and pickup in addition to forecast modelling by JMT Consulting.

7.4.6 Preliminary details of evacuation plan

The identification and management of risks have been planned and outlined in the event of emergencies. This has been formulated in accordance with the *Work Health and Safety Regulation 2017 under an Emergency Management Plan* (EMP). The designated EMP will include:

- Preparedness, prevention, response and recovery strategies.
- Agreed staff emergency management roles and responsibilities.
- A site-specific risk assessment.

Emergency response procedures are also included in the case of an emergency, in which the school will activate one or a combination of the following five core emergency procedures:

- On-site evacuation (relocation) such as a fire, gas leak, or other hazards (**Figure 45**).
- Off-site evacuation in the event of a bomb threat, fire, spill, and flood (**Figure 47**).
- Lock-down in cases such as hazardous smoke, severe weather events or sensitive police operations.
- Lock-out in the event of a gas leak.
- Shelter-in-place during severe weather events or intruder threats (**Figure 46**).

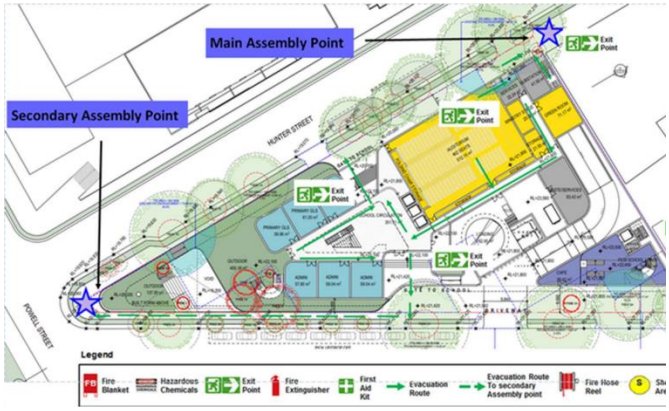


Figure 45 On-site evacuation Assembly Points

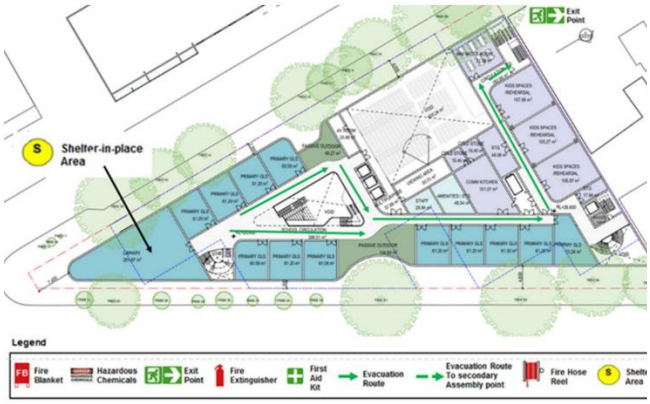


Figure 46 Shelter in Place Points (Levels 1-3)

Source: Ethos Urban



Figure 47 Off-site evacuation Assembly Points

Source: Nearmap and Ethos Urban

7.4.7 Flood emergency response plan

Annual Exceedance Probability (AEP) is considered acceptable for risk levels associated with a 20%, 5 % and 1% AEP flood event. In most cases, the school can be evacuated to an off-site emergency evacuation point, with the exception of 1% and Possible Maximum Flood (PMF). The primary refuge/emergency assembly points for floods on the school campus are depicted in **Figure 48**.

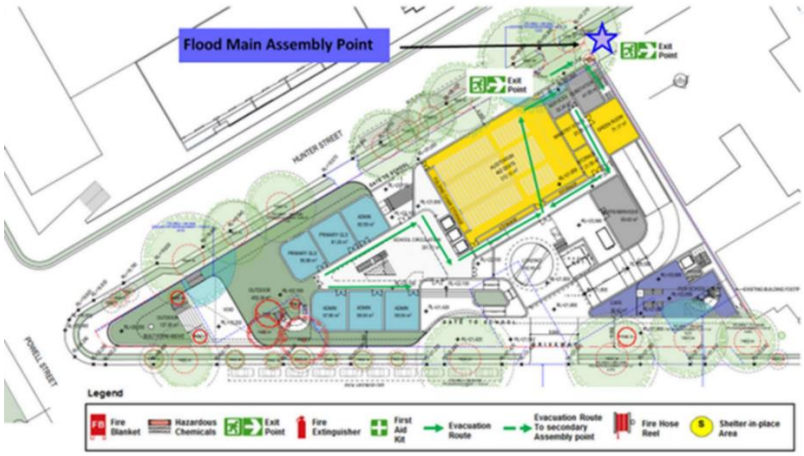


Figure 48 Refuge/Emergency Assembly Points For Flood Events

Source: Ethos Urban

The school is capable of complying with the *Education and Care Services National Law Act 2010*, Education and Care Services National Regulations and the National Quality Framework standards and that assessment of compliance will be undertaken at the SSDA stage.

7.5 Social Infrastructure

Ethos Urban were commissioned to undertake research to demonstrate the need for schools in the area and to provide analysis regarding the relevant social infrastructure that the school may provide or require use of.

The site is in the inner Sydney suburb of Waterloo. The site is only a 10-minute walk to Green Square which the City of Sydney anticipates will accommodate 63,000 people, 21,000 new homes, and around 21,000 jobs. The site is also well connected to the CBD: 20-minutes by bike, 18-minutes by car, or 25-minutes by bus.

Despite this expected growth and connectivity, the proponent has identified a significant lack of planned school infrastructure in the area, particularly secondary schools.

The Social Infrastructure Report prepared demonstrates the need for schools in the area and provides analysis regarding the relevant social infrastructure. It includes: analysis of the population and demographic characteristics of the school catchment area, focusing on forecasted growth of school age children; a review of existing and planned schools in the catchment area (both primary and secondary schools); a review of the available relevant social infrastructure in the surrounding area including passive open space (includes play space), indoor and outdoor recreation space and artistic and performance spaces.; a review the open space needs for the proposed school development; analysis of case study research into provision of open space for inner-city vertical school developments; and opportunities to support the needs of the school users while balancing the needs of the local community for social infrastructure.

The report concludes that the proposal for a vertical school at the site 242-258 Young Street, Waterloo responds to an identified demand for schools in this area. A review of the population catchment of the site shows that there is significant population growth projected for school age children. There is also a gap in existing or planned private schools in the area, with a projected rate of 9 private school places per 100 school aged children in the Waterloo catchment area in 2031, compared to 114 places per 100 school aged children in the North Sydney region.

From a review of other vertical schools across NSW and interstate, it was found that rarely are these schools able to achieve the NSW Department of Education's open space guideline of 10m^2 per pupil. The average open space per student (of the examples where information was available) was 5.65m^2, ranging from 4.4m^2 to 7.2m^2 per student. The proposed provision of 6.2m^2 per student of open space for the proposed school is above the average identified through the case studies.

The case studies also show that a combination of innovative solutions to open space provision, alongside shared use arrangements with local government or other landowners can be successful in meeting the recreational needs of students.

7.6 Arboriculture

An Arboricultural Impact Assessment (AIA) has been prepared by Arborsaw and is provided at **Appendix M**. The report provides a detailed inspection, assessment and analysis of impacts on existing tree species within and surrounding the Proposal Site. Additionally, a letter of response to correspondence received from Council officers is included at **Appendix S**.

7.6.1 Methodology

The following documents and guidelines have been adopted to guide the arboricultural impact assessment:

- Australian Standard 4970: 2009 *Protection of trees on development site* – Tree Protection Zone and Structural Root Zone.
- IACA Significance of a Tree, Assessment Rating System (STARS) (IACA 2010) – retention value method.
- City of Sydney Street Tree Master Plan, Part D Technical Guidelines (2015) – street tree protection.

Refer to **Appendix M** for further details on specific methodology and criteria of above documents and guidelines.

7.6.2 Existing Environment

The site inspection undertaken by Arborsaw on 23 June 2022 have assessed 33 trees, comprising of:

- Nine (9) High (A) Retention Value Trees – high landscape significance, of good condition and have long life expectancies of 40+ years.
- 13 Medium (B) Retention Value Trees – fair or better health and structure and have life expectancies of 15+ years.
- Ten (10) Low (C) Retention Value Trees – considered constraints on development due to reduced health or condition, short life expectations, ow landscape significance, or are easily replaceable due to small size.

- One (1) (R) Remove Tree.

A plan indicating the location of assessed trees is provided in **Figure 49**.

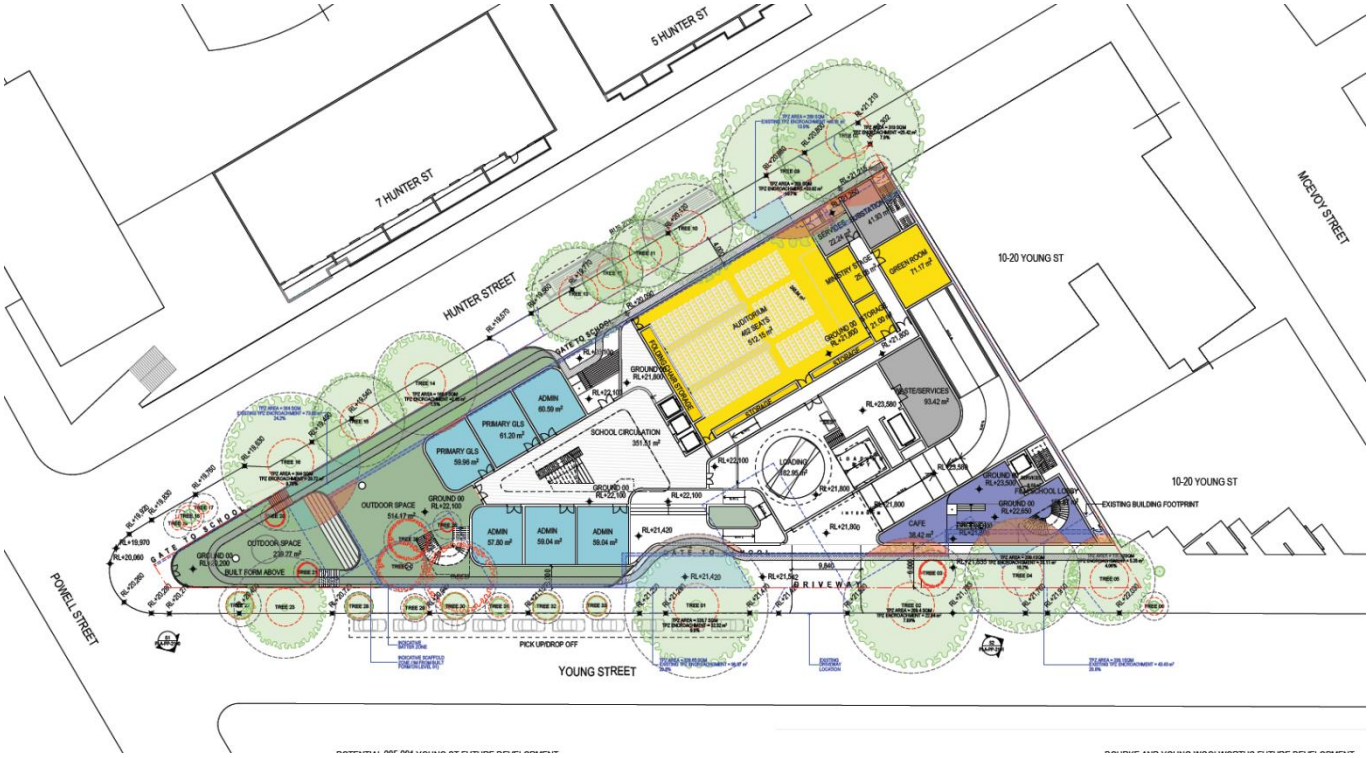


Figure 49 Building Envelope and Existing Tree Overlay

Source: Arborsaw

7.6.3 Arboricultural Impact

Tree Removal

The construction of the proposed development layout would result in the removal of seven (7) trees (7, 20, 21, 24, 25, 26, 27) as part of development facilitation. All seven (7) trees subject to removal are trees of Low Retention Value and within the proposed development footprint. These trees will not warrant further design and layout change for tree incorporation due to their Low Retention Value.

Tree Retention

The proposal includes the retention of 25 trees (1, 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 28, 29, 30, 31, 32, 33).

The on-site trees (5 and 6) are able to be retained due to the reduced building envelope as part of the Proposal.

The other 23 trees are located on Council land surrounding the site, which will be subject to the protection from works under the *City of Sydney Street Tree Master Plan, Part D Technical Guidelines*. The guideline provides advice pertaining to staff training and induction, trunk protection, trenching and excavation near trees, pruning, kerb removal adjacent to trees, tree protection signage, stockpiling and storage of materials, and damage to trees to be retained, as part of protection measures from proposed development impact for existing street trees.

Canopy Pruning

Canopy pruning is proposed on several trees to accommodate the building envelope. Canopy pruning will provide space for 1m wide scaffolding with minimal clearance to permit the scaffold only. Once removed, the 1m gap for the scaffold will provide an appropriate gap between branches and the new building. Pruning for scaffold will be minimised as far as practical, and the scaffolding will be designed to avoid branches and tying back branches. Where pruning is unavoidable it must will be in accordance with AS 4373.

A plan illustrating tree management measures is provided in **Figure 50**.



Figure 50 Tree Management Plan

Source: Arborsaw

7.7 Noise and vibration

A Noise Impact Assessment (NIA) has been prepared by ADP Consulting and provided at **Appendix L**. The report provides a preliminary environmental noise impact assessment which identifies relevant noise emissions criteria by the Proposal during both the construction and operational stages.

7.7.1 Noise Sensitive Receivers

The nearest or most affected point of each receiver zone, as related to potential noise intrusion, from the Site are listed in **Table 17** and illustrated in **Figure 51**.



Figure 51 Noise Sensitive Receivers

Source: ADP Consulting

Table 17 Noise Sensitive Receivers

Receiver	Address	Receiver Description
R1	10-20 McEvoy Street	An existing 4-story mixed-use development attached to the north of the Site.
R2	Hunter Street	An existing 4-storey mixed-use development to the west.
R3	3 Hunter Street	A 7-storey residential apartment development on top of a podium.
R4	11 Hunter Street	A 5-storey mixed-use development to the south-west.
R5	Opposite Powell Street	Single-storey commercial receivers to the south-west.

Receiver	Address	Receiver Description
R6	834-836 Elizabeth Street	A 5-storey residential apartment building on top of a podium, located to the south-west of the site.
R7	4 Powell Street	Existing 4-storey residential apartment buildings to the south.
R8	2-24 Powell Street	A 7-storey mixed-use development to the south.
R9	Opposite Powell Street	A passive recreation park to the south.
R10	Opposite Powell Street	A commercial receiver (café) to the south.
R11	Opposite Powell Street	A 5-storey commercial receiver to the south-east.
R12	Opposite Young Street	Existing single-storey commercial tenancies to the east.
R13	923-935 Bourke Street	Existing commercial tenancies to the east. *The site has a planning proposal approved for changes to enable a mixed-use development on the site that includes residential, commercial and retail uses, with a below ground supermarket.
R14	xx Bourke Street	A multi-level mixed-use development, approximately 150m east of the Site.
R15	Opposite McEvoy Street	Proposed new mixed=use development to the north of the site.
R16	Danks Street	Danks Street South residential masterplan proposal, including multiple residential buildings, retail, open space, and a central building of 20 levels.

Source: ADP Consulting

7.7.2 Noise Monitoring

Long-term unattended and attended noise monitoring will be conducted at the DA stage to evaluate the acoustic environment around the Proposal.

7.7.3 Noise Assessment Methodology and Criteria

The following documents and guidelines have been adopted to guide acoustics assessment:

- Draft Operational management plan dated 9 November 2023, Revision 1 and prepared by Bruce Litchfield – Amina Project Management.
- General Floor Plans with job number 20621 provided by Plus Architecture.
- Council of the City of Sydney Development Control Plan (DCP) 2012.
- Association of Australasian Acoustical Consultants' (AAAC) Guideline for Educational Facilities, version 2.0, dated September 2018 (GEF).
- Education Facilities Standards & Guidelines – NSW Department of Education.
- AS/NZS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors (AS/NZS 2107).
- NSW EPA's Noise Policy for Industry, dated October 2017 (NPfI).
- Department of Environment & Climate Change NSW - Interim Construction Noise Guideline.

Noise criteria of the above documents and guidelines are detailed in **Appendix L**.

7.7.4 Noise Intrusion Assessment

The compliance with internal noise level criteria for the Proposal will be ensured with long-term unattended noise logging and attended noise measurements. Treatment recommendations will be provided at DA stage to the following elements:

- Minimum glazing requirements.
- External wall construction.
- Roof/ceiling construction.

7.7.5 Noise Emission Assessment

The Draft Operational Management Plan prepared by Amina Project Management identifies the following information for the operation of the proposed development:

- The total capacity of the proposed educational development will be 800 students.
- The hours of operation will be between 7:30am to 5:30pm.
- Bus drop-off and pick up will occur on Hunter Street.
- Vehicle drop off/ pick up will occur on Young Street.
- All drop off/ pick up will be conducted during day-time period (7am – 6pm).

A detailed noise emission assessment will be conducted at the DA stage to ensure the Proposal's compliance with the identified noise emission criteria.

7.7.6 Typical Acoustic Treatments

ADP Consulting provides a list of typical acoustic treatments for the mitigation of acoustic impact at all nearest noise sensitive receivers. The typical acoustic treatments are outlined in **Table 18**.

Table 18 Typical Acoustic Treatments

Noise Type	Acoustic Treatment
Mechanical Noise	• Selection of quieter units with the capability of reduced duty and noise output if required. • Installation of acoustic barriers or acoustic louvres.
Outdoor Areas	• Management of number of students allowed outdoors at any one time. • Maximum allowable noise level from reinforced sound systems. • Barriers (if required). • Absorptive materials on areas such as walls and under soffits.
Café	• Maximum number of people allowed outdoors (if outdoor sitting is proposed). • Hours of operation. • Maximum allowable noise level from reinforced sound systems.
Specialist Areas, Carpentry Room, Rehearsal Rooms	• Allowable hours of operation. • Quieter equipment where possible. • Treatment of room envelope to ensure a high transmission loss value of all elements where noise can escape from. • Highly acoustic absorptive materials on room surfaces.
Traffic Noise, Drop-Offs/Pick-Ups, Loading Dock	• Management of peak 1-hour movements. • Barriers, if required.
Basketball Court	A Basketball Court is proposed to be located on Level 05 of the proposed development (RL +41,100). The basketball court is proposed to have walls around its perimeter, and open roof. A detailed noise emission assessment should be undertaken at DA Stage. Potential noise issues are associated with noise breaking from the open rooftop to the upper levels of the proposed 20-level mixed-use development to the north. Typical acoustic treatments and management controls for the basketball court include: • Management of maximum capacity and hours of operation. • Treatment of Basketball Court floor. • Wall construction recommendations for the walls surrounding the court.

Noise Type	Acoustic Treatment
	• If required, construction of awnings or roof with skylights.
Construction	As part of the DA Stage, a Construction Noise & Vibration Management Plan (CNVMP) will most likely be required. Noise emissions will be assessed for each proposed construction stage based on the proposed equipment used in each stage and duration and a management report will be prepared in accordance with the NSW Interim Construction Noise Guideline. The CNVMP will: • Identify sensitive land uses with the potential to be affected by noise from the construction. • Predict noise emissions from equipment associated with each stage of construction based on the proposed hours of construction. • Determine noise management levels at all receivers based on the long-term noise monitoring (described in Section 2). • Determine ground-born noise criteria for each receiver located in the proximity of the construction site. • Predict noise levels at all receivers and predict if there will be any exceedances. • Recommend best practice approach principles and specific noise control measures to be used during the demolition / construction period to ensure that the noise objectives are achieved where feasible and reasonably practicable, including timetabling of proposed activities. • Recommend community action initiatives such as prior notification for particularly noisy activities and the provision of a contact telephone number for people affected by demolition / construction noise to ask questions or complain. • Outline an action plan detailing how complaints, if received, will be dealt with. • Determine if vibration monitoring will be needed at specific areas to ensure vibration criteria are met during construction and prevent structural damage of other buildings.

Source: ADP Consulting

7.7.7 Conclusion

A preliminary noise impact assessment has been undertaken for the Proposal. Overall, ADP Consulting believes there are no site conditions, statutory or other requirements that would preclude this development from complying with noise criteria defined in the NIA.

7.8 Stormwater and flooding

A Flood Assessment has been conducted by wma water and is attached to **Appendix J**. The site is identified as being prone to flooding and is subject to flood-related development controls under the City of Sydney LEP, DCP, and Interim Floodplain Management Policy. The site is subject to 'mainstream' flooding and is classified as a 'school' under the Flood Planning Level (FPL). The proposed floor levels meet the City of Sydney's Interim Floodplain Management, which encompasses school floor levels being 0.5 m above the 1% AEP flood level and basement car parking being protected to the PMF level. **Figure 52** to **Figure 55** illustrates the flood likelihood from 20% to 1% AEP Event in addition to a PMF. As such as the proposed development has been assessed against the requirements and found to not have an adverse impact on flood levels for surrounding properties and would not change the flood hazard on the surrounding roads up to and including the 1% AEP event.

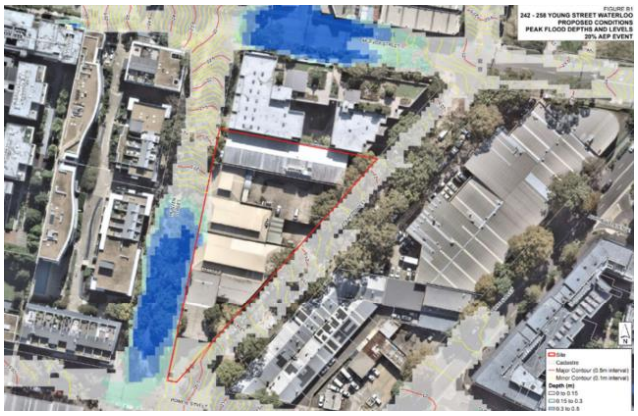


Figure 52 20% AEP Event

Source: WMA Water

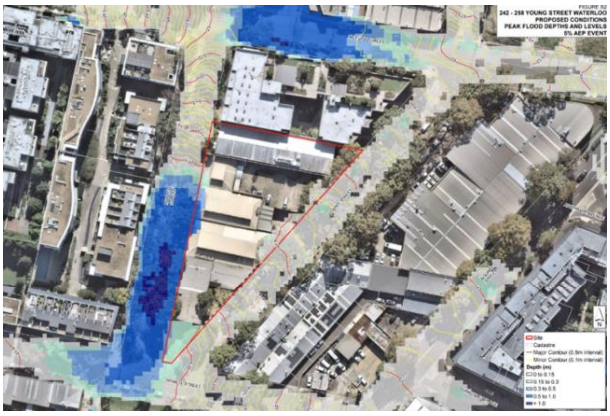


Figure 53 5% AEP Event

Source: WMA Water

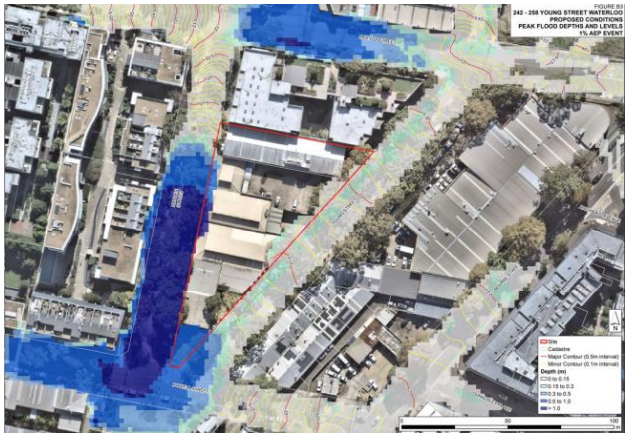


Figure 54 1% AEP Event

Source: WMA Water

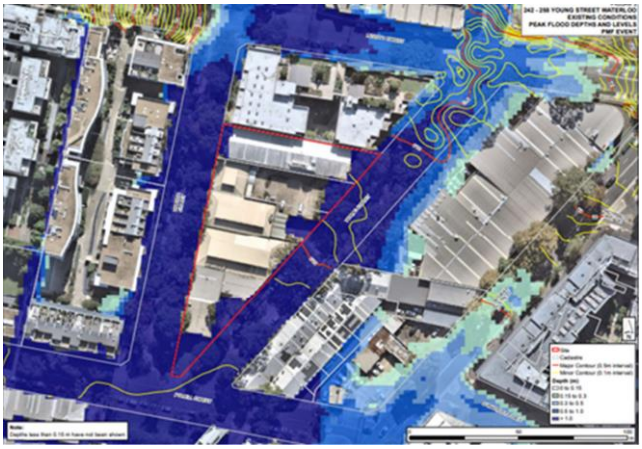


Figure 55 PMF Event

Source: WMA Water

In addition, the Flood Emergency Plan for the school's flood emergency response is provided in **Appendix I** and **Section 7.4.7**. These outline the necessary measures for responding to floods that may occur in this area within two hours. Given the likelihood of the site being inaccessible during a PMF event, the first, second and third floors' libraries will become the primary refuge/ shelter in place.

7.9 Contamination

This application is supported by a Detailed Site Investigation (DSI) completed as part of a past (now defunct) development concept in 2018. It is attached at **Appendix N**. Further reporting will be prepared as appropriate at the DA stage. The DSI included the following findings:

- The site was free of statutory notices issued by the EPA/DECC
- SafeWork NSW records confirming the historical presence of USTs at the site
- Groundwater was encountered during monitoring at depths ranging from 2.60 to 3.29 metres
- Soil samples identified the following contaminants in select locations:
  - Nickel
  - Zinc
  - Carcinogenic PSHs, F2 and F3
  - Copper
  - Lead
- Groundwater samples also recorded copper and zinc concentrations above the adopted investigation levels

In light of the above findings, the report concludes and recommends that:

- Widespread contamination is not present at the site
- The site can be remediated to a standard suitable for the proposed development

- A Hazardous Materials Survey (HMS) of current site structures is conducted prior to demolition
- An Additional Site Investigation (ASI) should be conducted to close remaining data gaps
- A Remedial Action Plan (RAP) should be prepared prior to the commencement of works

These recommendations are able to be satisfied at the DA stage.

7.10 Sustainability

The proposal seeks to prioritise ecologically sustainable design principles throughout the project. Accordingly, an ESD report has been prepared to detail the ESD provisions for the development and is made available at **Appendix P**. The proposed measures demonstrate a commitment to environmental sustainability.

The development will achieve sustainability targets through an integrated and staged approach that minimizes energy consumption via passive measures, optimizes consumption through energy efficiency, and uses renewable resources where required. The development will meet and outperform the following regulatory sustainability requirements:

- NCC Section J – Energy Efficiency
- State Environmental Planning Policy (Sustainable Buildings) 2022.

The project is also targeting the following through detailed design:

- Green Star Buildings Tool – Green Building Council of Australian. 5 Star Design Aspiration.
- NABERS – 4 Star NABERS tool for Schools (to be released in 2024)

A full list of proposed measures are included at **Appendix P**.

7.11 Geotechnical and Acid Sulfate Soils

A Geotechnical Assessment has been conducted by Alliance geotechnical & environmental solutions and is attached at **Appendix O**. Additionally, an Acid Sulfate Soils Assessment is made available at **Appendix U**. A previous investigation was carried out on the site in 2018 by EI Australia, including the drilling of 10 boreholes across the site (see **Figure 56**) Further to this Alliance undertook additional testing at four nominated locations based on access constraints (see **Figure 56**).

The findings noted that bedrock was generally encountered at 7-8m depth below ground level and comprises Hawkesbury Sandstone. The encountered bedrock was predominantly highly weathered, very low strength sandstone, overlying moderately weathered, low to medium strength sandstone. It is recommended that the peak particle velocity during the demolition, excavation, and construction should be limited to 5mm/s (AS2187.2 - 1993 Appendix J) which is expected to be achieved provided that low impact rock-breaking equipment is used.

Based on the proposed architectural plans, the walls of the basement level are set at the property boundaries. Given the proximity of the site boundaries to the adjacent building and roads, Alliance have recommended that the excavation be supported by a permanent shoring wall. Batter slopes are not considered, given the site constrains along with temporary shoring options.

Furthermore, it is recommended to construct the piles using Continuous Flight Auger (CFA) techniques, due to the presences of groundwater and sandy soils. Notably, should the shoring piles be used to support elements of the structure above, then the pile socket would be extended to provide sufficient pile capacity. The permanent retaining wall should be designed in accordance with AS 4678 Earth Retaining Structures. Where some lateral movement is acceptable, an 'active' lateral earth pressure coefficient (K_a). is recommended.

Regarding foundation parameters, it is recommended that all foundations are founded on the same stratum to minimise the risk of differential settlement. It is also recommended that if shallow footing are design for Class III sandstone, then spoon testing should be undertaken on 1/3 of the footings to ensure allowable seams and defect spacing is achieved.

Alliance have also provided recommendations for basement construction and dewatering, due to the water level depth existing below the ground levels by 2.60m to 3.29m. As such it is anticipated that the rate of groundwater inflow will be relatively high. As a result, it is recommended that the basement be tanked, and the basement slab and walls be designed for a groundwater level of RL 18.1. Alliance have also recommended that additional rising head or slug testing be carried out to assess the hydraulic conductivity of the marine sands or better inform the tanked basement design.



Figure 56 Borehole locations

Source: Alliance Geotechnical

8.0 Conclusion

Ethos Urban has prepared this Planning Proposal on behalf of Sustainable Development Group Ltd (SDG).

The Planning Proposal is intended to support the delivery of a new K-12 independent school – comprising 280 primary school students and 520 secondary school students. The proposal will include a multi-purpose hall and community space. The proposal will additionally reaccommodate the existing film school (Sydney Film School) within contemporary high-quality facilities.

A planning proposal is justified for the following reasons:

- The proposal is **consistent with the objects of the EP&A Act**, in that it promotes the orderly and economic use and development of land;
- The proposal is **consistent with the strategic planning framework for the site**;
- The proposal is **consistent with the applicable SEPPs and Ministerial Directions**.

The development concept which the planning proposal aims to:

- **Provide necessary Social Infrastructure to support local growth:** Significant growth is projected in the school aged population (5-17) to 2031 in the Waterloo area – representing a 76% increase from 2021 (3811) to 2031 (6701). The Planning Proposal is accompanied by technical reports, including Social Infrastructure Review, which highlight that a review of the population catchment of the site shows that there is significant population growth projected for school age children. The Planning Proposal responds to an identified demand for schools in this area – providing schooling capacity to accommodate the future population growth within the City of Sydney Local Government Area (LGA) and relieving enrolment pressures from surrounding high schools exceeding student capacity.
- **Respond to an existing deficiency in school place supply and choice:** Currently, there are significantly fewer independent school places in the Waterloo area compared to comparable catchments. There is a gap in existing or planned independent schools in the area, with a projected rate of 9 private school places per 100 school aged children in the Waterloo catchment area in 2031. For comparison, 114 private school places per 100 school aged children are available in the North Sydney region. The Planning Proposal will support diversity of educational choice.
- **Deliver comprehensive and holistic redevelopment for long-term benefit**: The two existing landowners have a long-term interest in the site, and local community. Sustainable Development Group Ltd (SDG) are expert in facilitating the delivery of sustainable social infrastructure schemes rooted in their local communities. SDG have worked to support the two existing long-term landowners in realising their vision for the site while capitalising on the benefits of redeveloping both sites comprehensively. The existing landowners have elected to pursue a long-term ownership strategy – in lieu of a shot-term highest and best use site land disposal strategy.
- **Deliver a contemporary Education Hub with co-location and all-through school benefits**: Co-location of the independent K-12 school, and Sydney Film School will create a unique education hub and opportunities. The K-12 school, and film school would both benefit from co-location. There would be potential for the school to benefit from the media focus of the film school – which is currently not offered anywhere else at high school level. The K-12 education model will also allow students to complete their primary and secondary education pathway on the same site, minimising disruption to regular routines.
- **Capitalise on a sustainable location:** The site at 242-258 Young Street, Waterloo is well-suited for a school – the site is close to public transport, including 750m to both Green Square Station and Waterloo Metro Station. The layout and character of the site is well suited to support a school – including two frontages with each street having specific characteristics that would support a school. The Planning Proposal would positively redress the extent of current inactive blank frontages – leading to potentially improved perceptions of safety associated with activation of the site associated with the school design.
- **Support good quality design:** The Planning Proposal seeks to deliver a high-quality flexible learning and teaching environments in a contemporary purpose-built space. It is noted that the NSW Department of Education (DoE) promotes flexible learning spaces to support personalised teaching and learning. Creating student-centred learning environments can have positive impacts on social and emotional wellbeing, inclusivity, and physical comfort of students.
- **Ensure timely delivery to support growth:** Sustainable Development Group Ltd are expert in facilitating the delivery of sustainable social infrastructure schemes rooted in their local communities. Subject to planning, the school could be operational by the start of the 2028 or 2029 school year.

To this end, SDG's concept for the site is focused on delivering a high quality and ecologically sustainable development, to drive significant positive outcomes within South Sydney. The development will provide a significant new piece of social and educational infrastructure, delivering a new school with permanent teaching space to accommodate 800 students. The provision of new educational facilities will support and strengthen the availability of educational facilities in the region.

Accordingly, considering the proposal and the overall strategic nature of the site and justification provided in addressing planning issues, the Planning Proposal is considered to have sufficient strategic merit to support the proposed educational facility. This Planning Proposal also demonstrates that the proposed land uses, and density sought can be appropriately accommodated on the site in an attractive urban form maximises activity, improves social and economic outcomes and enhances vibrancy, whilst minimising amenity impacts of surrounding residential receivers. This supports the site-specific merit of the Planning Proposal.

In light of the above, we would have no hesitation in recommending that a planning proposal be prepared, endorsed and proceed through to gateway assessment and public exhibition.

Attachment A2-1

Urban Design Report

242-258 YOUNG STREET WATERLOO

URBAN DESIGN REPORT
REVISION A

15.01.2023

140

SDG plus architecture

CONTENTS

This Urban Design Report is submitted to the Council of the City of Sydney (Council) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- *an increased maximum Floor Space Ratio (FSR)*
- *an increased maximum Building Height*

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture.

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- DEVELOPMENT SCHEDULE



ACKNOWLEDGEMENT OF COUNTRY

We acknowledge Country, the Cultural Landscape that we are working upon, and we acknowledge the custodianship of its people and the privilege and responsibility to Connect with Country.

We acknowledge the Gadigal people, and their ongoing connection to culture, lands and waters and their valuable contribution to the community. We recognise and acknowledge the surrounding clans to the North, South, East and West whilst honouring and celebrating their Elders past, present and emerging.

We are part of the system of Country, our actions must always be Country positive. Being connected to Country transcends language and culture - a connected system of action, emotion, and experience.

EXECUTIVE SUMMARY

Despite the strong population growth forecast for the Waterloo-Green Square Corridor, there is a significant lack of planned school infrastructure to provide for the educational needs of children. No new high schools are currently in planning within a 2km radius of the target site, in the heart of Waterloo.

New schooling facilities are needed to cater to the educational needs of local students, with demand expected to double in this period.

The proposal envisions a mixed-use infill building that is primarily a Kindergarden to Year 12 School, with spaces for the current film school on-site, which can be shared with the community. The aim for the development is to provide much needed educational infrastructure to the Waterloo area, as well as provide great urban activation to its surrounds. The proposal also envisions a community aspect through its flexible auditorium on ground floor, which can be used by the school and the shared community.

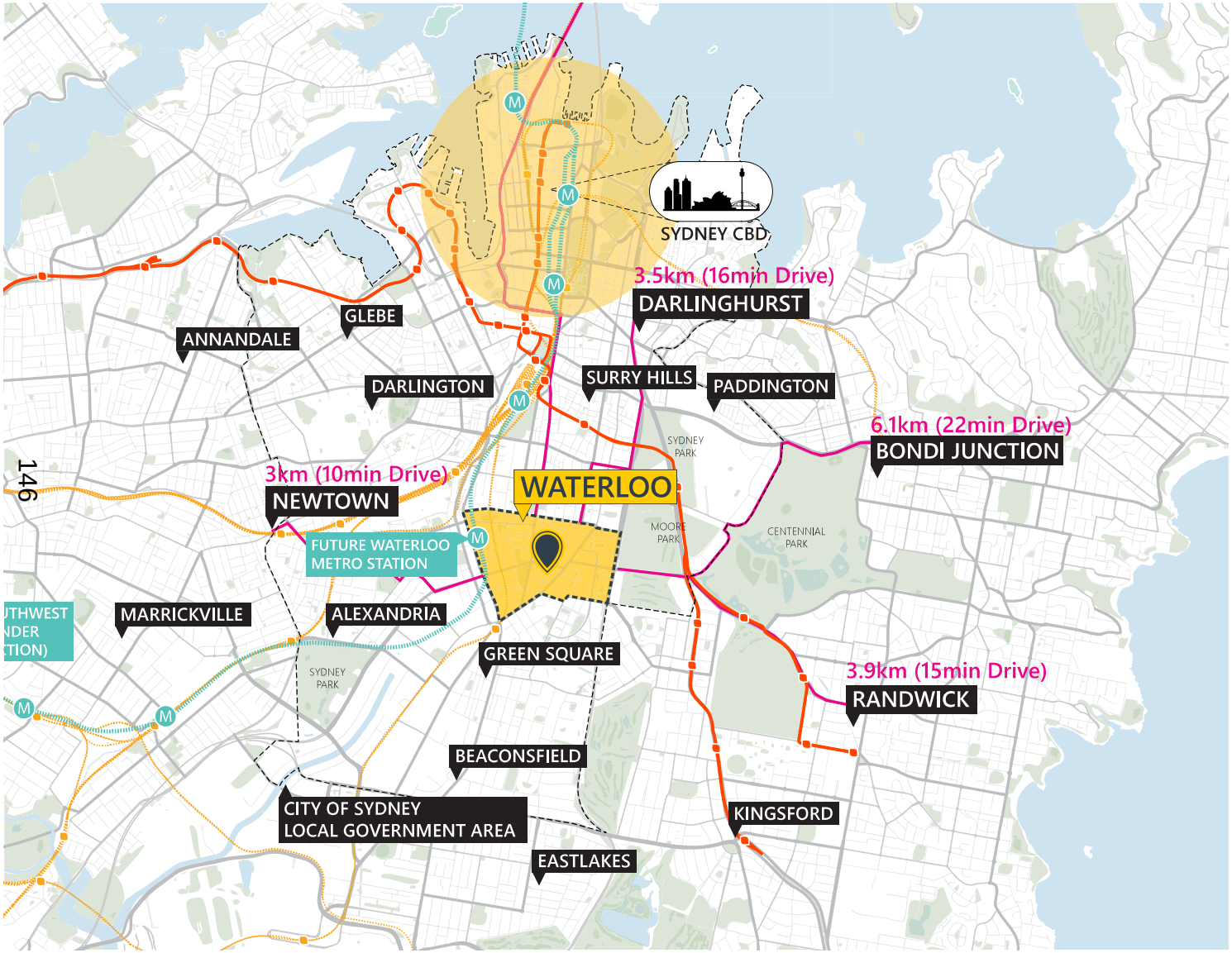
DESIGN ADVISORY PANEL (DAP) - RESPONSE TO COMMENTS

The Panel was presented with a pre-planning proposal request for the subject site on the 13/08/2023. The proposal was for a private Anglican secondary school of about 1,000 students and a separate film school for 120 students (the film school is currently accommodated on the site). The comments from the panel are noted below.
Since then, the scheme has responded in the following ways:

COMMENTS (13/08/2023)	RESPONSE
1. There are key strategic and built form issues identified by the City, including but not limited to:	Since the DAP meeting, the scheme has been amended to almost double the on-site open space per student. Access to additional open space off-site has also been considered, as detailed in the 'Social Infrastructure Review' prepared by Ethos Urban.
1A. Access to open space	It is currently proposed that students will have access to Turruwul Park, which is a 7 minute drive from the school. This park includes a soccer field, two tennis courts, a tennis wall, and cricket facilities. Council has confirmed the space has availability Monday to Friday 8:00am-5:00pm. Additionally, the future Waterloo Main Park provides two hectares of open space and include two playing fields. It is approximately 800m walk from the proposed school site and provides another option for potential shared use. If this could be achieved this option would be the preferred option given its proximity to the site.
1B. Noise	Since the DAP meeting, an acoustic consultant has been engaged. Their report generally outlines any acoustic requirements / implications that are present on the site, as well as providing a guideline of how they can be mitigated or responded to. These findings will be taken into consideration by the design team during design development.
1C. Traffic and transport, which includes safe movement of children and the cumulative impacts on Young Street from the school and Woolworths.	The transport impact assessment supporting the Planning Proposal responds to the comments provided by the Design Advisory Panel by: • Considering the various pedestrian routes available from public transport nodes to and from the site, including future through-site connections proposed by the adjacent Woolworths site • Developing a Green Travel Plan to support travel to/from the site via sustainable forms of transport and to minimise the traffic related impacts of the proposal • Undertaking traffic modelling which considers the cumulative impacts of the proposal along with development in the surrounding area including the Wooworths site
2. Due to flooding constraints and setback requirements the City is not convinced the proposal will yield useable or fit-for purpose floorplates. **3.** Squeezing two schools on the site, is perhaps impacting the feasibility of both.	Since the DAP meeting, a school operations consultant has been engaged to validate key internal areas of the school. In conjunction with this, the student population has been reduced from 1,000 students to 800 students. The school internal area has also been increased, whilst the film school internal area has been decreased, whilst ensuring functionality of both uses on the site.

01
SITE AND CONTEXT

REGIONAL CONTEXT



Waterloo is located in the City of Sydney local government area. Waterloo, considered an inner-city suburb, sits south of Sydney CBD and can be easily accessed from there by car, bus, or by train from Green Square Station. By 2024, the site will also be easily accessed by the future Waterloo Metro Station.

Waterloo is also within ~20min driving distance from the Eastern suburbs, inner-south suburbs and inner-west suburbs, with bus and train offering public transport. Overall, Waterloo features great proximity to several key precincts in Sydney.

17 MIN WALK TO FUTURE WATERLOO METRO STATION

11 MIN WALK TO GREEN SQUARE STATION

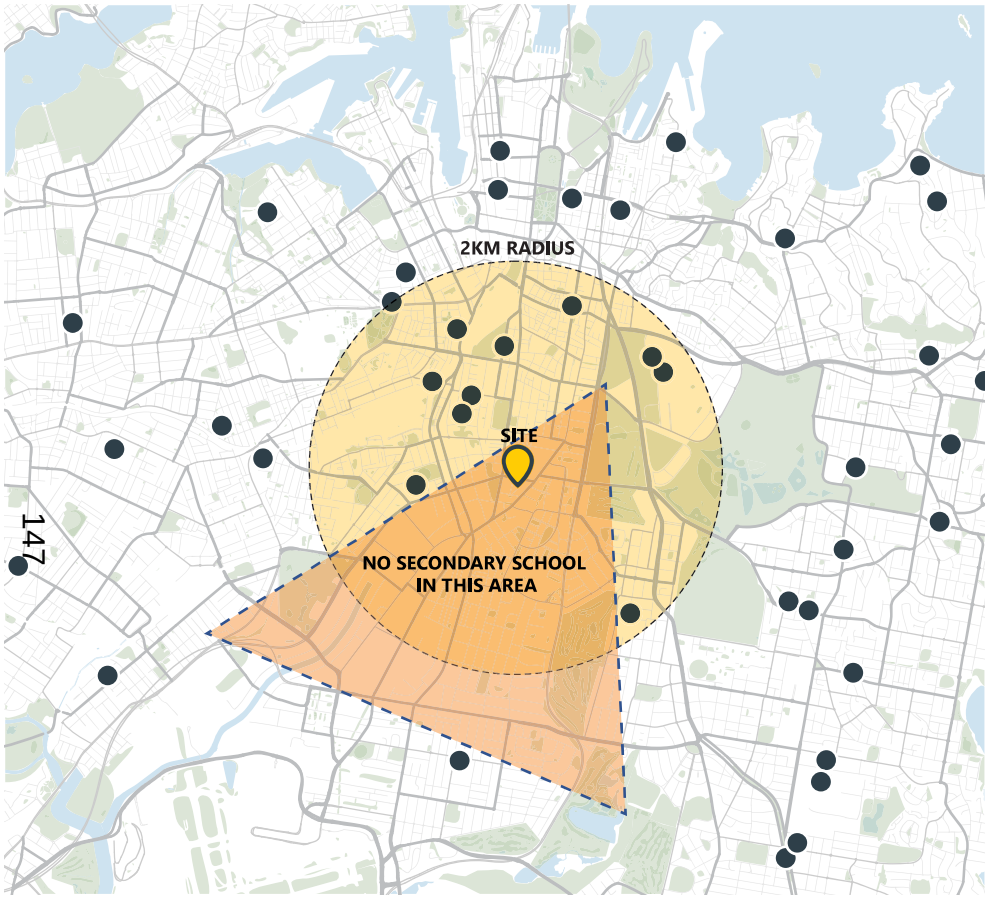
20 MIN RIDE TO SYDNEY CBD

18 MIN DRIVE TO SYDNEY CBD

25 MIN BUS RIDE TO SYDNEY CBD

SCHOOL CATCHMENT OPPORTUNITY

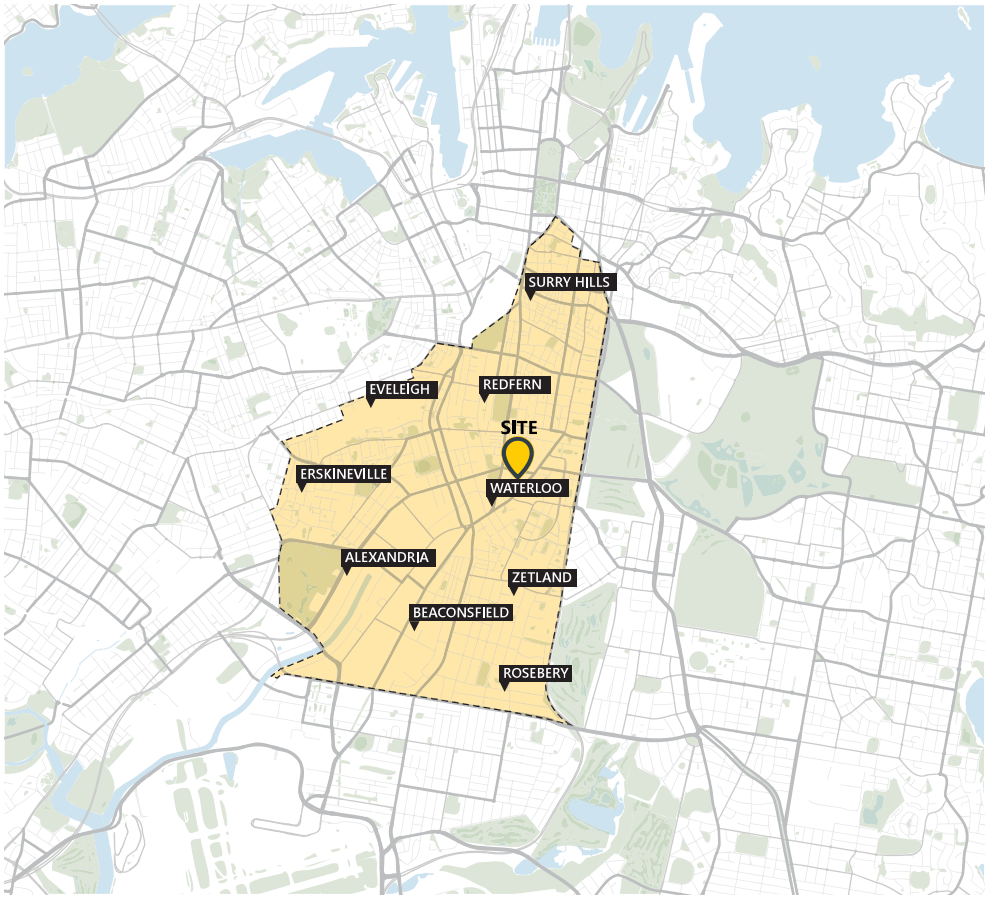
SHORTAGE OF SECONDARY SCHOOLS IN THE SOUTH SYDNEY REGION



The circle shows the distribution of secondary schools within a 2km radius to the Site. It clearly demonstrates that there is a significant shortage of secondary schools around the Waterloo/Green Square district which will be further magnified given the area is forecast to be one of the highest density per square km in the world by 2036.

● Secondary School

POTENTIAL CATCHMENT AREA



The potential catchment zone for the school is shown in the above map. This zone will cover an approximate current population of **90,000 people**, with a population forecast to grow to **114,000 people in 2031 (+26%.)**

▭ Potential Catchment area

02

URBAN CONTEXT ANALYSIS

FUTURE PROJECTIONS OF THE AREA



+50,000 RESIDENTS (2041)
(REDFERN / WATERLOO / GREEN SQUARE)
https://forecast.id.com.au/sydney/about-forecast-areas?WebID=140
https://forecast.id.com.au/sydney/about-forecast-areas?WebID=2010



21,000 + NEW JOBS
(GREEN SQUARE)
https://www.urbanagendaplatform.org/best-practice/i-green-square-rich-industrial-past-vibrant-sustainable-and-connected-community



FUTURE WATERLOO METRO STATION (2024)



+30,000 NEW DWELLINGS (2030)
(GREEN SQUARE, BEACONSFIELD, ZETLAND, ALEXANDRIA, ROSEBERY, WATERLOO)
https://www.cityofsydney.nsw.gov.au/green-square



+40 NEW PARKS IN GREEN SQUARE TOWN CENTRE
https://news.cityofsydney.nsw.gov.au/articles/green-square-new-park-drying-green-residents

SITE PLAN - THE FUTURE OF WATERLOO



Waterloo Area Redevelopment:

The Waterloo area is currently undergoing substantial redevelopment. These areas include key strategic precincts, such as Danks Street South, Lachlan Precinct, Waterloo Estate, and others.

Directly interfacing with the site are:

- the future Woolworths Waterloo development
- Lachlans Precinct
- Dank Street South Precinct

These future redevelopments generally have a focus on mixed use, providing retail, commercial, and residential dwelling, and will greatly reshape the context of the site.

Infrastructure and Connectivity:

Key road networks like Bourke, Elizabeth, Botany and S Dowling Streets connects suburbs in a north-south direction, while McEvoy, Dacey Avenue, and Euston Road facilitate east-west connectivity, linking the inner west to the Eastern Suburbs. Essential public transport nodes include Green Square Station and the ongoing construction of the Waterloo Metro, both within a 1km radius or a 15-minute walk, with additional bus routes along Elizabeth and Bourke Streets connecting the area to surrounding locales.

FUTURE PRECINCTS - DANK STREET SOUTH



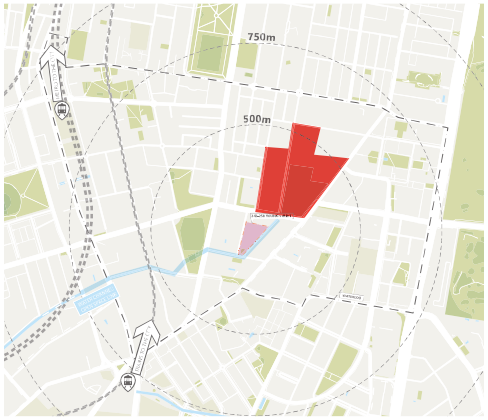


Dank Street South:

- 6 apartment buildings by Bates Smart, Richard and Spence, MHNDU, and Fieldwork
- 376 apartments total
- 5% of units to be affordable
- 15% of units to be adaptable
- retail spaces proposed







FUTURE PRECINCTS - WATERLOO METRO QUARTER & WATERLOO ESTATE





Waterloo Metro Quarter:

- 220 new homes, including 70 social housing dwellings and 24 affordable homes;
- 35,000 square metres of offices and shops;
- 2,600 square metres of public space, including pedestrian links from Raglan Street and Botany Road through to Cope Street Plaza;
- Community facilities; and Parking for 155 vehicles.
- New Metro Station

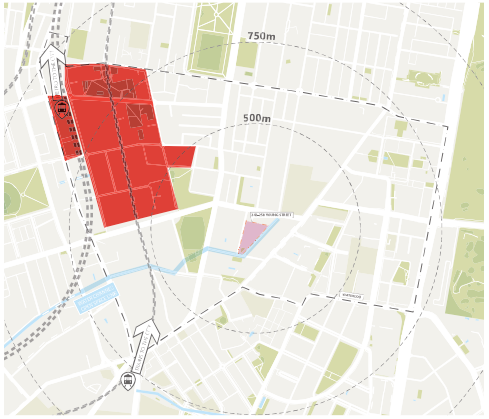
Waterloo Estate:

- 3,000 new homes, including ~1,500 new social and affordable properties
- ~50% social and affordable housing









FUTURE PRECINCTS - WOOLWORTHS WATERLOO



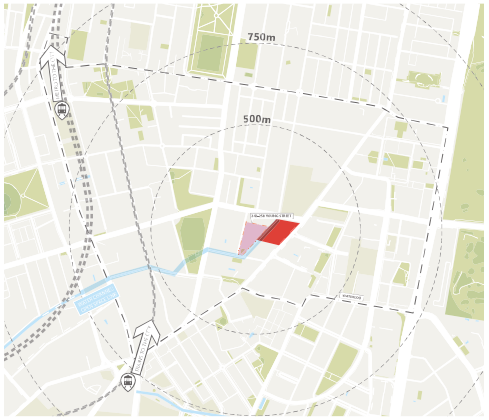


Woolworths Waterloo:

- 121 apartments proposed
- 2,025 sqm commercial area proposed
- 3,200 sqm 5 Star Green Star rated full line Woolworths supermarket proposed
- 1,670 sqm retail area proposed







FUTURE PRECINCTS - LACHLAN PRECINCT



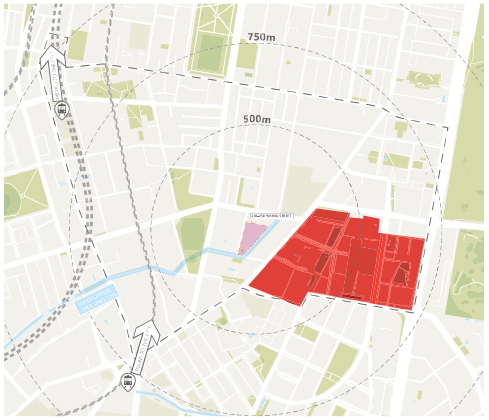






Lachlan Precinct:

- The plan arranges multi-residential development into smaller lots, aligning them with street networks and open areas.
- Varied building heights and footprints are introduced to promote diversity in the overall context and streetscape relationship.
- The masterplan ensures fair access by evenly situating open spaces and pocket parks throughout the development.



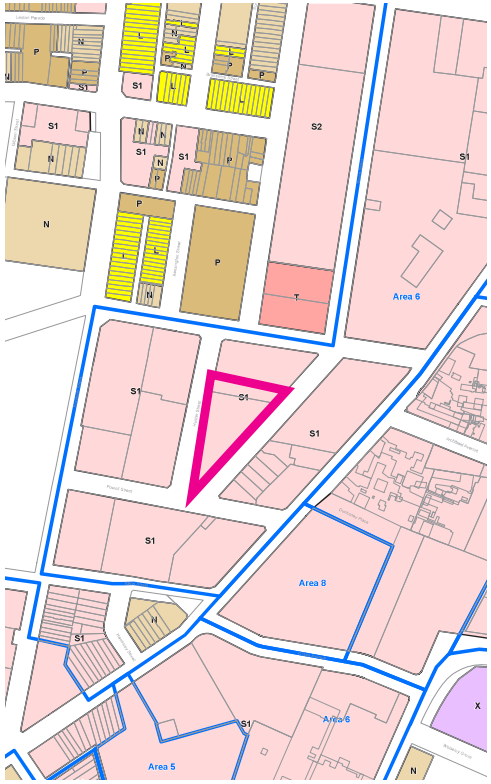
03
SITE ANALYSIS

CURRENT LEP MAP CONTROLS

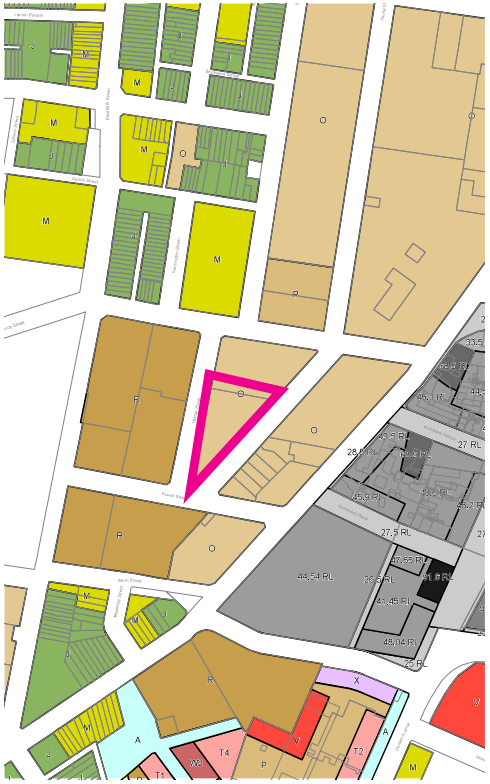
ZONE - MU1 (Mixed Use)



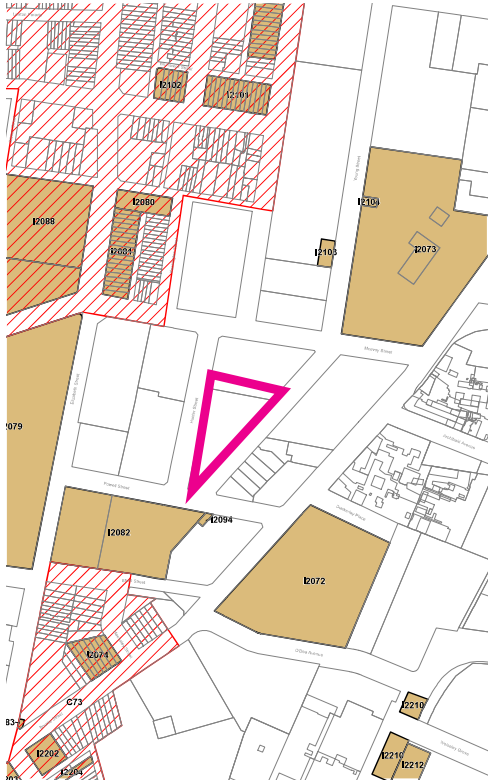
FSR - 1.5:1



HEIGHT - 15m

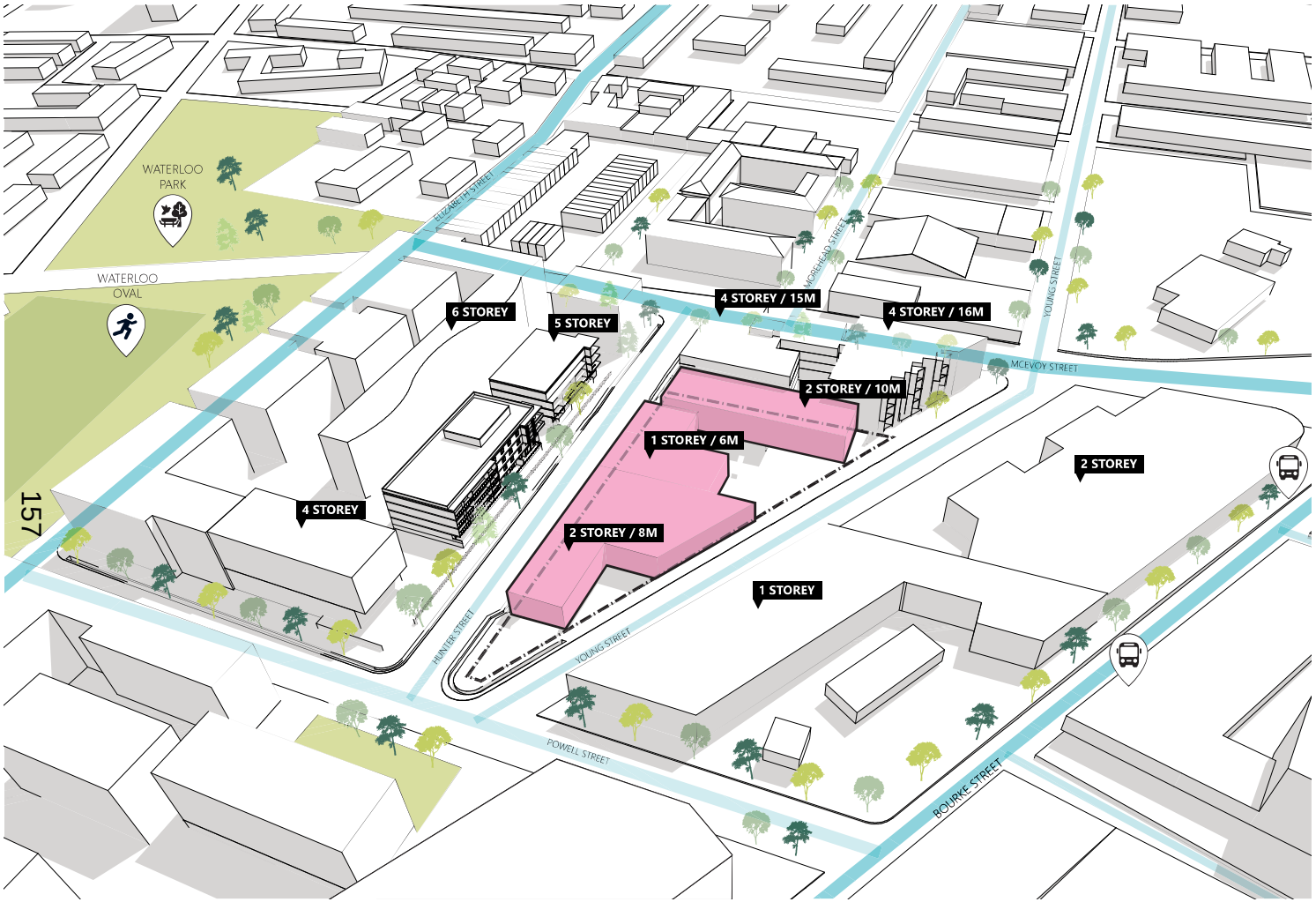


HERITAGE -NONE



SITE ANALYSIS

EXISTING CONTEXT - SCALE





FILM SCHOOL

YOUNG STREET



POWELL STREET

WATERLOO OVAL

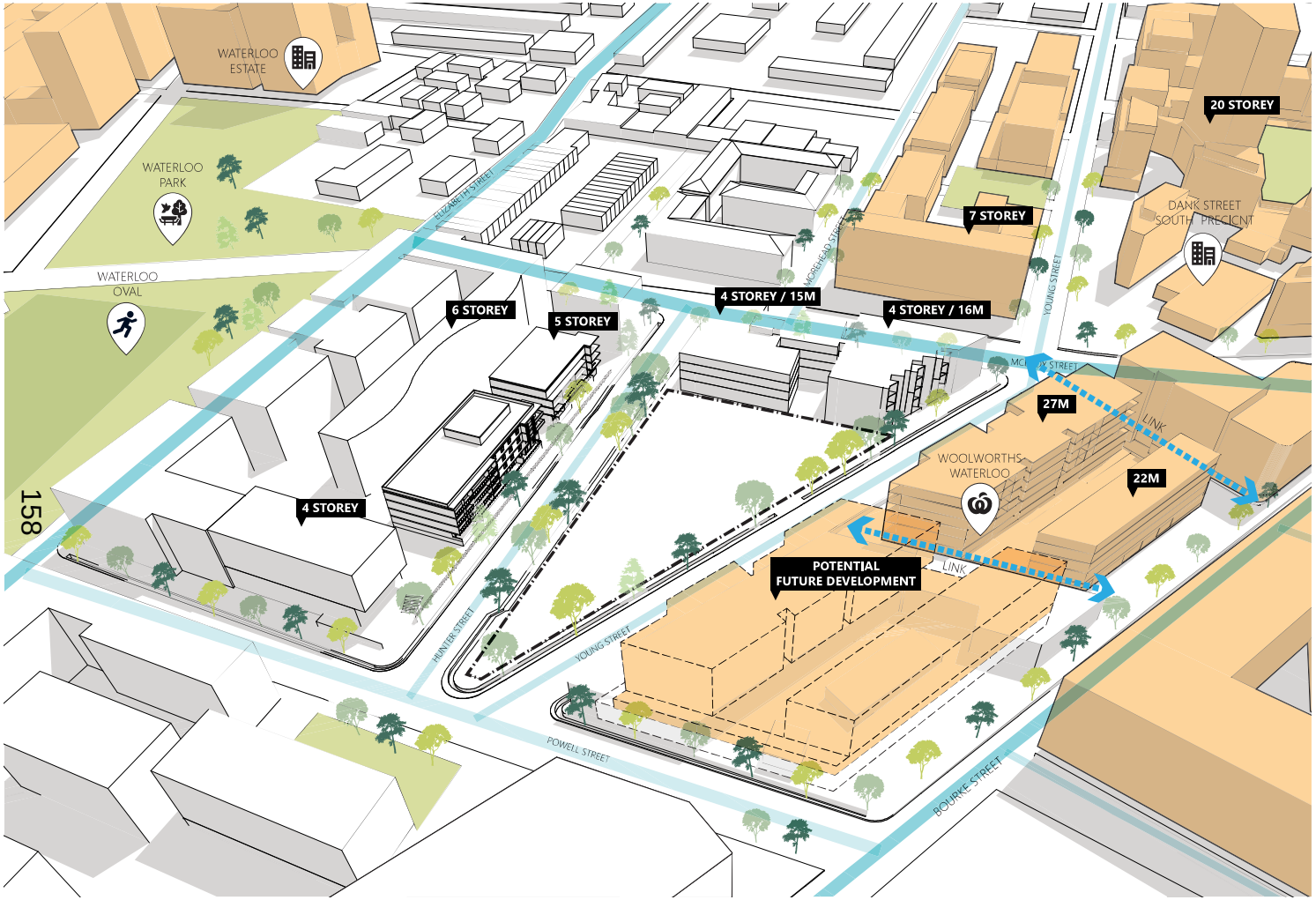


MCEVOY STREET

HUNTER STREET

SITE ANALYSIS

FUTURE CONTEXT - SCALE





DANK STREET SOUTH

LACHLAN PRECINCT



WATERLOO ESTATE

WOOLWORTHS WATERLOO



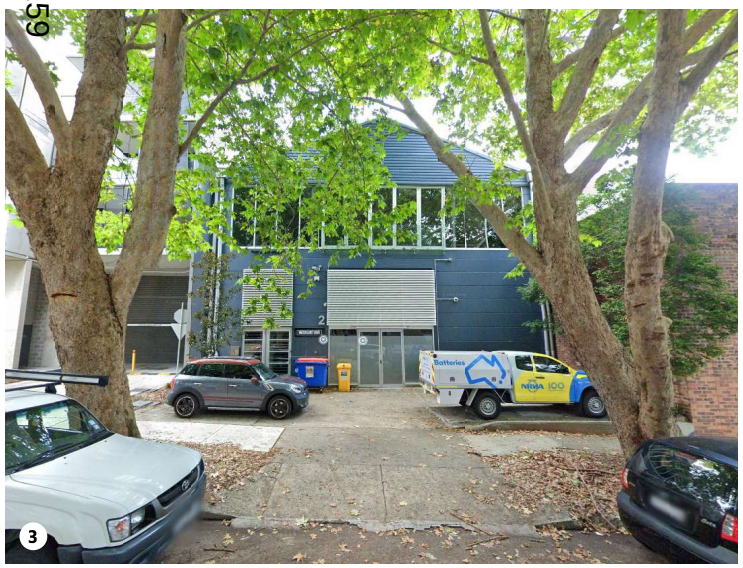
WATERLOO METRO QUARTER

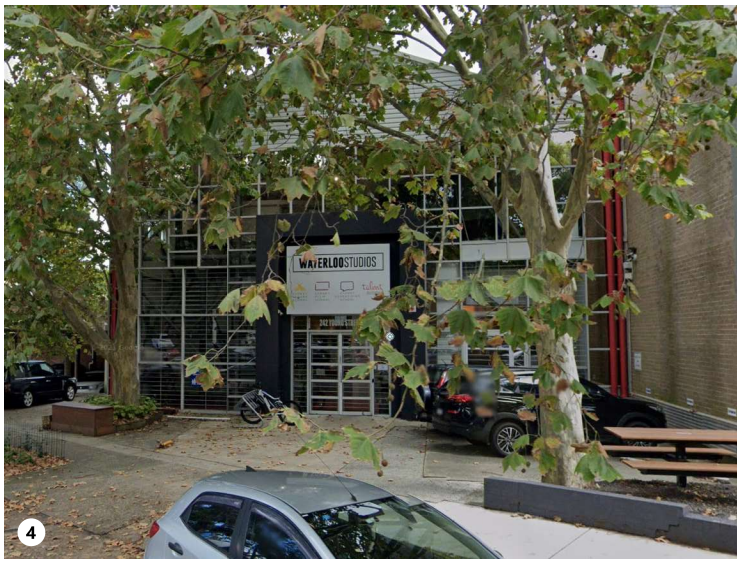
FUTURE WATERLOO METRO STATION

EXISTING SITE CONDITIONS - BUILDINGS



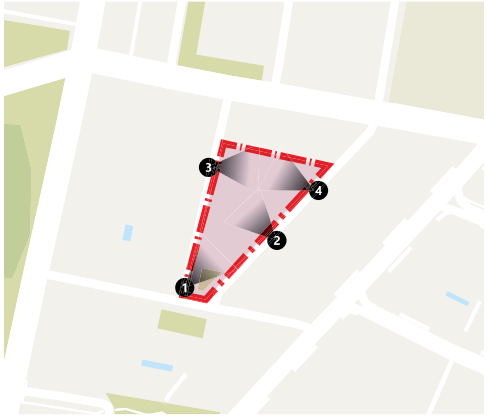






Existing Buildings:

- The site consists of two buildings, a masonry commercial building of one to two storeys, and a two storey pitched building, which is housing the current Film school.
- There is a green space to the southern corner of the site.
- The site features multiple driveway access points, as shown in images 2, 3, and 4.
- The site features significant street trees which contribute to the character to the area.



EXISTING SITE CONDITIONS - YOUNG STREET





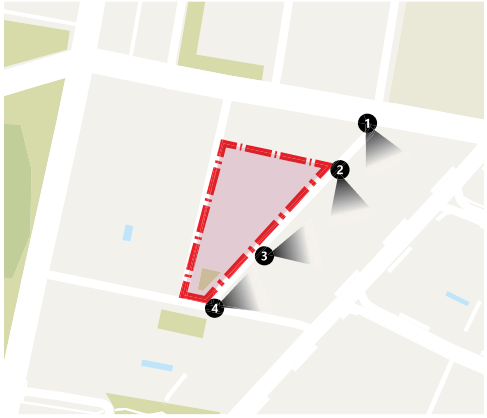




160

Young Street:

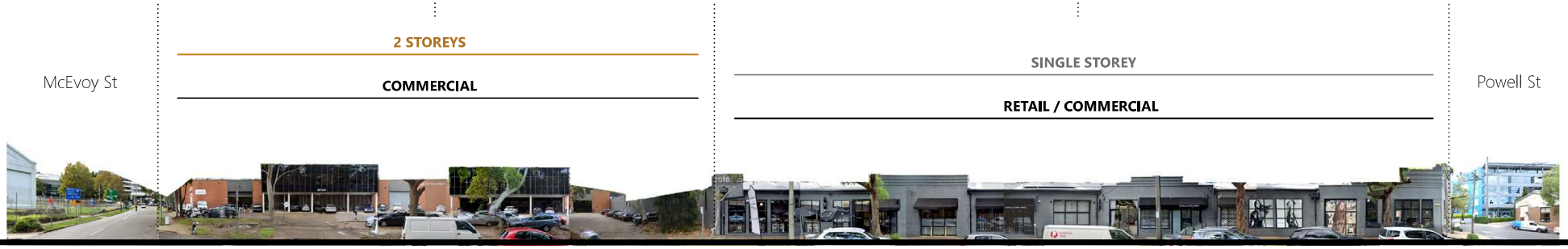
- On the eastern side of the site, Young Street features single-story commercial / retail buildings.
- An approved planning proposal on 923-935 Bourke Street stipulates a new Woolworths, retail, and multi-residential uses. This development will provide great amenity to its context as well as characterising the area as a future neighbourhood centre.



EXISTING SITE CONDITIONS - YOUNG STREET ELEVATIONS

At the northern end of the street, a commercial building specializing in vehicle sales is situated, distinguished by a greater setback compared to the adjacent structures.

The second segment along the street pertains to retail establishments, featuring single-story shops that provide diverse services to the community.



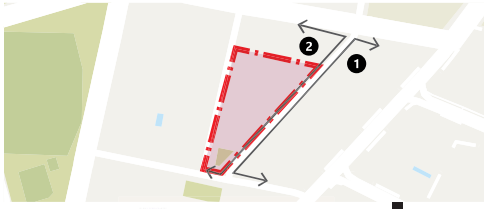
1. EAST ELEVATION

The site is characterised by a one to two storey masonry building, characterised by blank solid walls and minimal openings. There is also a green space to the south, and a two storey building, housing the current Film School.

Similar to Hunter Street, the four-story building is noted for sharing materiality with the site's perimeter walls. Additionally, the building introduces a sequence of angular designs in the balconies of its residential units.



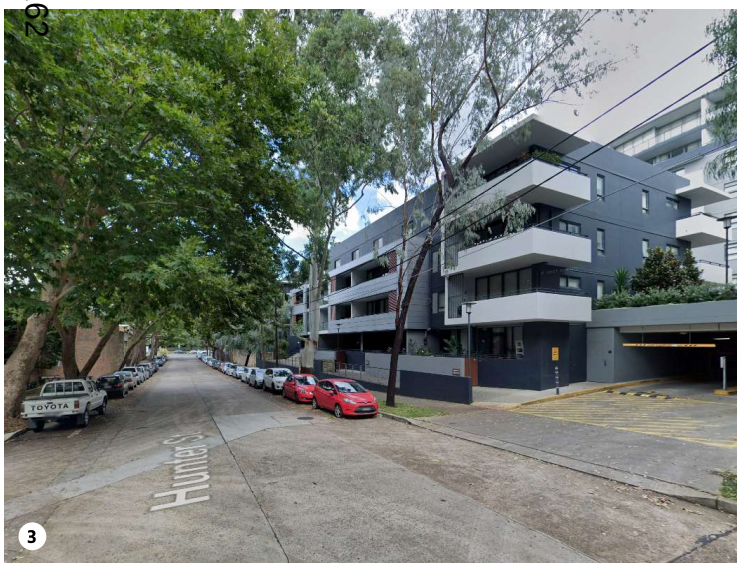
2. WEST ELEVATION



EXISTING SITE CONDITIONS - HUNTER STREET



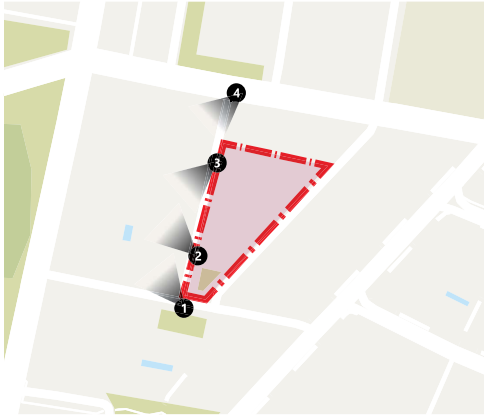






Hunter Street:

- Hunter Street is located on the western side of the site and comprises a series of four-story residential buildings, which are raised on a high base with parking underneath.
- The balconies of these buildings are oriented towards the street, where a row of trees is evenly situated on both sides.



EXISTING SITE CONDITIONS - HUNTER STREET ELEVATIONS

The street, spanning its length, is characterized by four storey residential buildings that share a consistent morphology and height. Additionally, these buildings provide access to resident parking facilities.

The corner building boasts a significantly more spacious commercial/retail ground level in terms of height, resulting in an overall greater height compared to the other buildings along the same street, creating an urban marker at the corner.



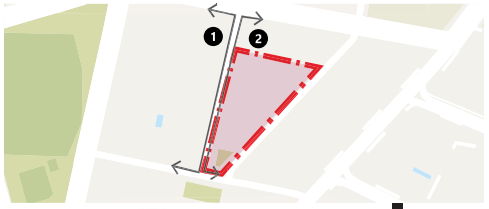
1. WEST ELEVATION

At one end of the block, a residential building is positioned with a greater setback compared to the other buildings along the same street.

The site is characterised by a one to two storey masonry building, characterised by blank solid walls and minimal openings. There is also a green space to the south, and a two storey building, housing the current Film School.



2. EAST ELEVATION



EXISTING SITE CONDITIONS- POWELL STREET



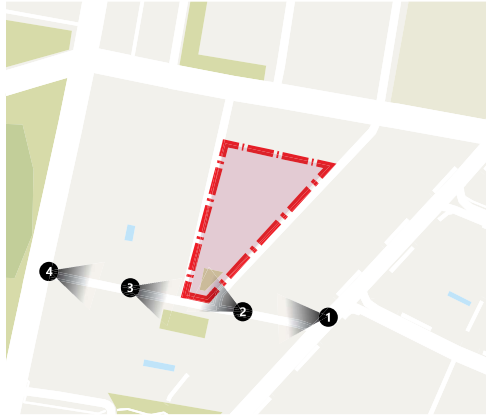






Powel Street:

- Powell Street, situated to the south of the site, acts as a linkage between Bourke Street and Elizabeth Street, both bustling thoroughfares with significant public transportation connectivity.
- Functioning as a quieter street, Powell Street provides a southern vantage point of the site.
- Along Powell Street, a variety of buildings, ranging from one to eight stories, exhibit diverse materials and architectural styles. There uses range from commercial / retail / multi-residential.
- There is a green open space directly across from the subject site, as shown in View 03



Attachment A2-2

Urban Design Report

04
DESIGN THINKING

DESIGN THINKING

DESIGN DRIVERS - CONTRIBUTING TO FUTURE MIXED USE PRECINCT

The project seeks to achieve a mixed use building dedicated to social and educational infrastructure, that will be of great benefit to the future mixed use precinct being established in nearby areas. The school will be the primary user, with additional spaces provided for the tertiary film school. The shared community will be able to use parts of these spaces which will be delineated in an operational management plan.



SCHOOL



TERTIARY FILM SCHOOL



COMMUNITY



SHARED SPACE

DESIGN DRIVERS - OVERALL PRINCIPLES



WELCOMING TO COMMUNITY



FLEXIBLE USE AND INNOVATIVE LEARNING SPACES

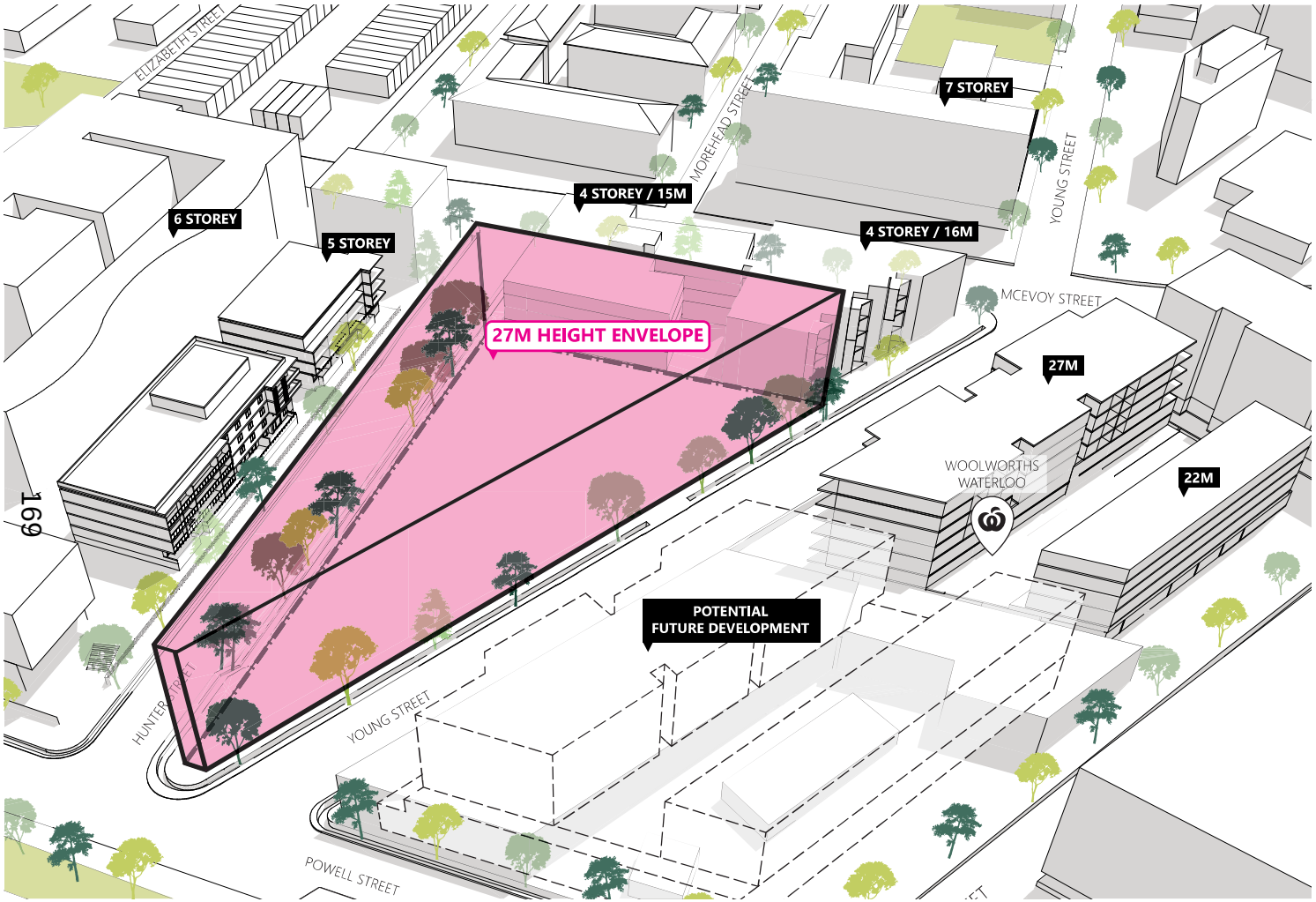


DYNAMIC OUTDOOR SPACES



SUSTAINABILITY

DESIGN DIAGRAMS - ENVELOPE



The proposal brings a massing form to 27m from natural ground levels, within the footprint of the site.



WOOLWORTHS WATERLOO



10-20 MCEVOY STREET

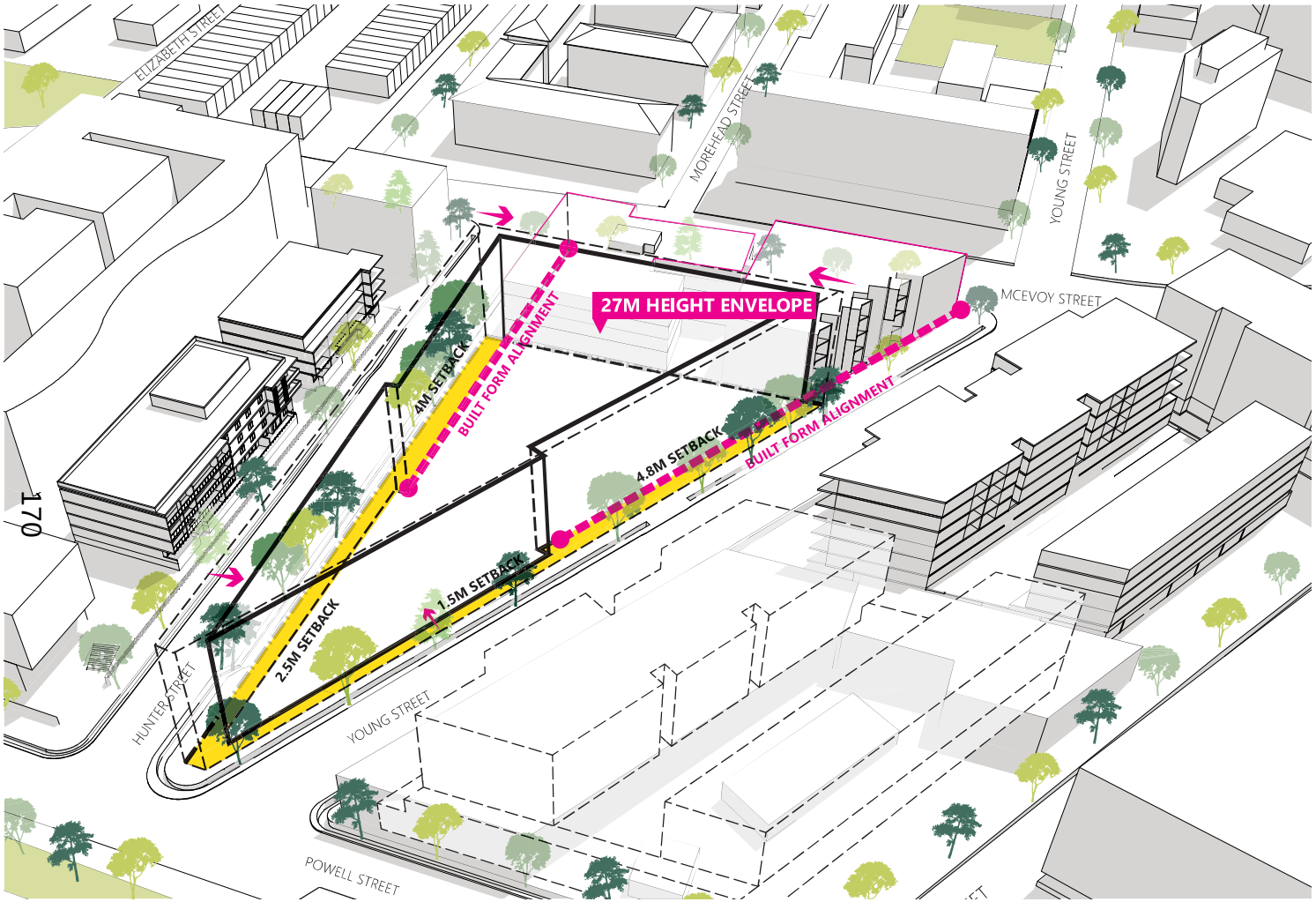


9 HUNTER STREET



5 HUNTER STREET

DESIGN DIAGRAMS - SETBACKS TO ALIGN WITH NEIGHBOURS



Setbacks are applied to offer relief to the street, and to tie in with the alignments of the existing buildings to the north.



WOOLWORTHS WATERLOO



10-20 MCEVOY STREET

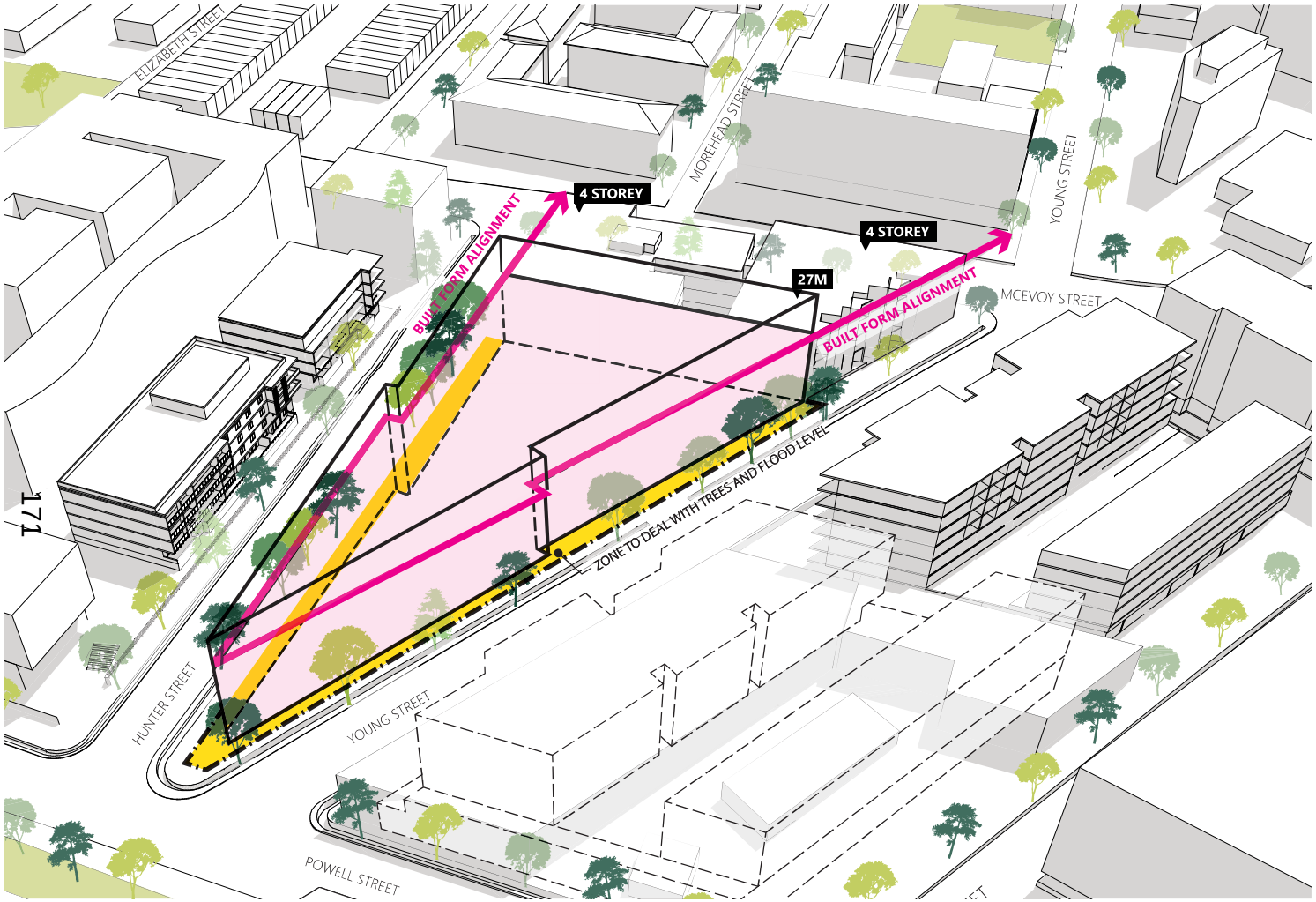


9 HUNTER STREET



5 HUNTER STREET

DESIGN DIAGRAMS - PODIUM VS UPPER LEVEL EXPRESSION



The proposal seeks a podium expression of 4 storeys that ties into the scale of its surrounds. These levels will be expressed differently to the upper storeys.



WOOLWORTHS WATERLOO



10-20 MCEVOY STREET

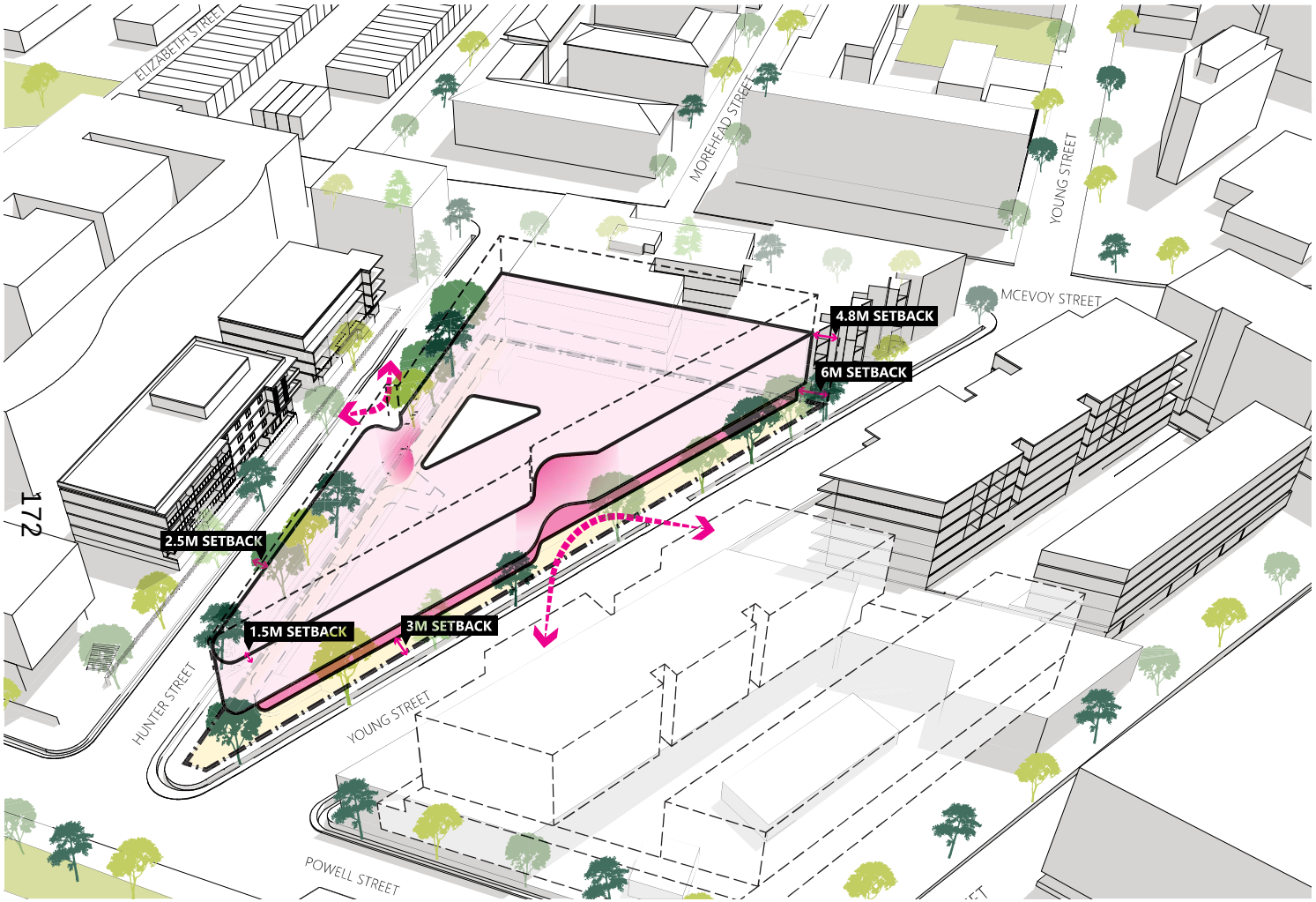


9 HUNTER STREET



5 HUNTER STREET

DESIGN DIAGRAMS - PODIUM ARTICULATION



Key articulations are introduced to create a more sympathetic built form to the context. Indents to the east and west facade reduce the length of the street wall. The ground level is further setback to offer relief to the street and add a recessive articulation zone.



WOOLWORTHS WATERLOO

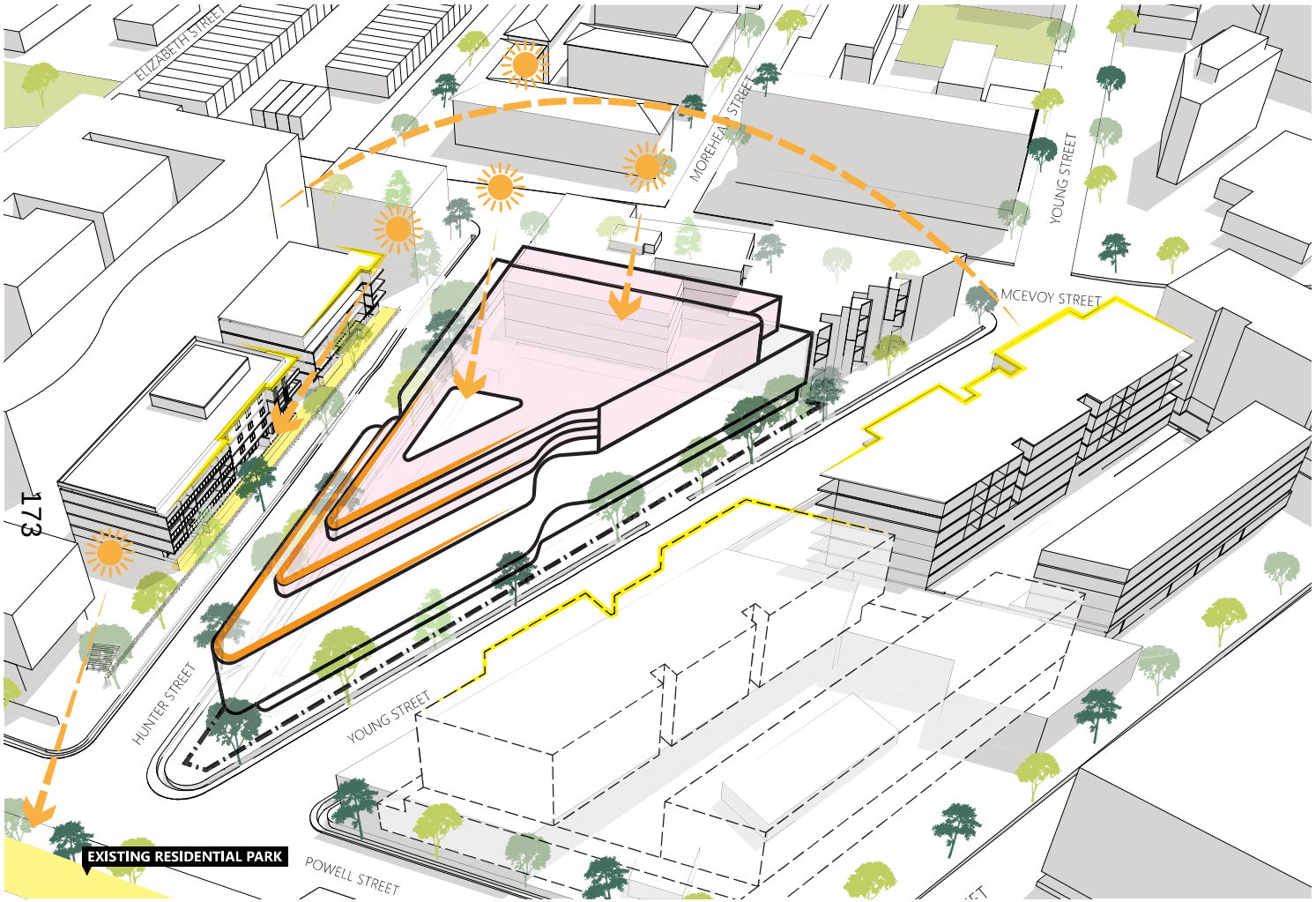
10-20 MCEVOY STREET



9 HUNTER STREET

5 HUNTER STREET

DESIGN DIAGRAMS - UPPER LEVEL ARTICULATION AND SOLAR



The upper levels are generally dedicated to majority of the open space for the school. Introduction of setbacks allow solar access to the existing buildings to Hunter Street, future developments to Young Street, and the pocket park to the south.



WOOLWORTHS WATERLOO



10-20 MCEVOY STREET

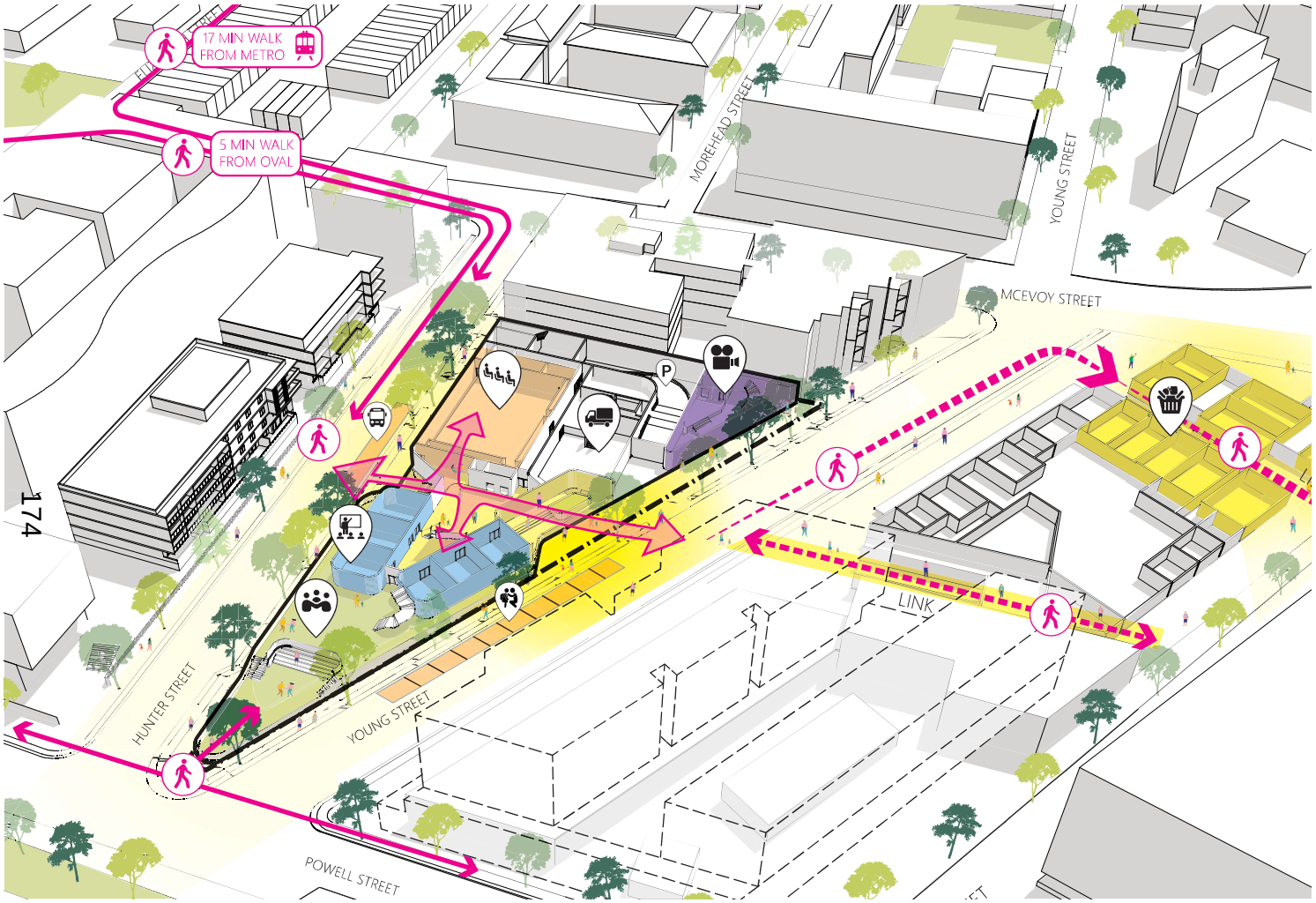


9 HUNTER STREET



5 HUNTER STREET

DESIGN DIAGRAMS - GROUND PLANE



The ground plane features a main foyer space for the school, which is easily accessed from both Hunter and Young Street. This creates a east-west through site link for the school users, easily connects to the future link on the Woolworths site and to the future metro. The school foyer also links to the auditorium, located on Hunter Street. It can be used by the shared community on the weekends. To the south of the site sits admin, classroom and open space for the school.

The film school lobby is located on Young Street, adding to the future mixed use nature of Young. Ground floor loading and basement access are located off Young Street, to minimise disruption to the residential character of Hunter Street. To reduce overload of traffic on one street, pick-up/drop-off zones for the school is located on Young Street, whilst the bus zones are located on Hunter Street.



ACTIVE ENTRANCE



MAIN FOYER

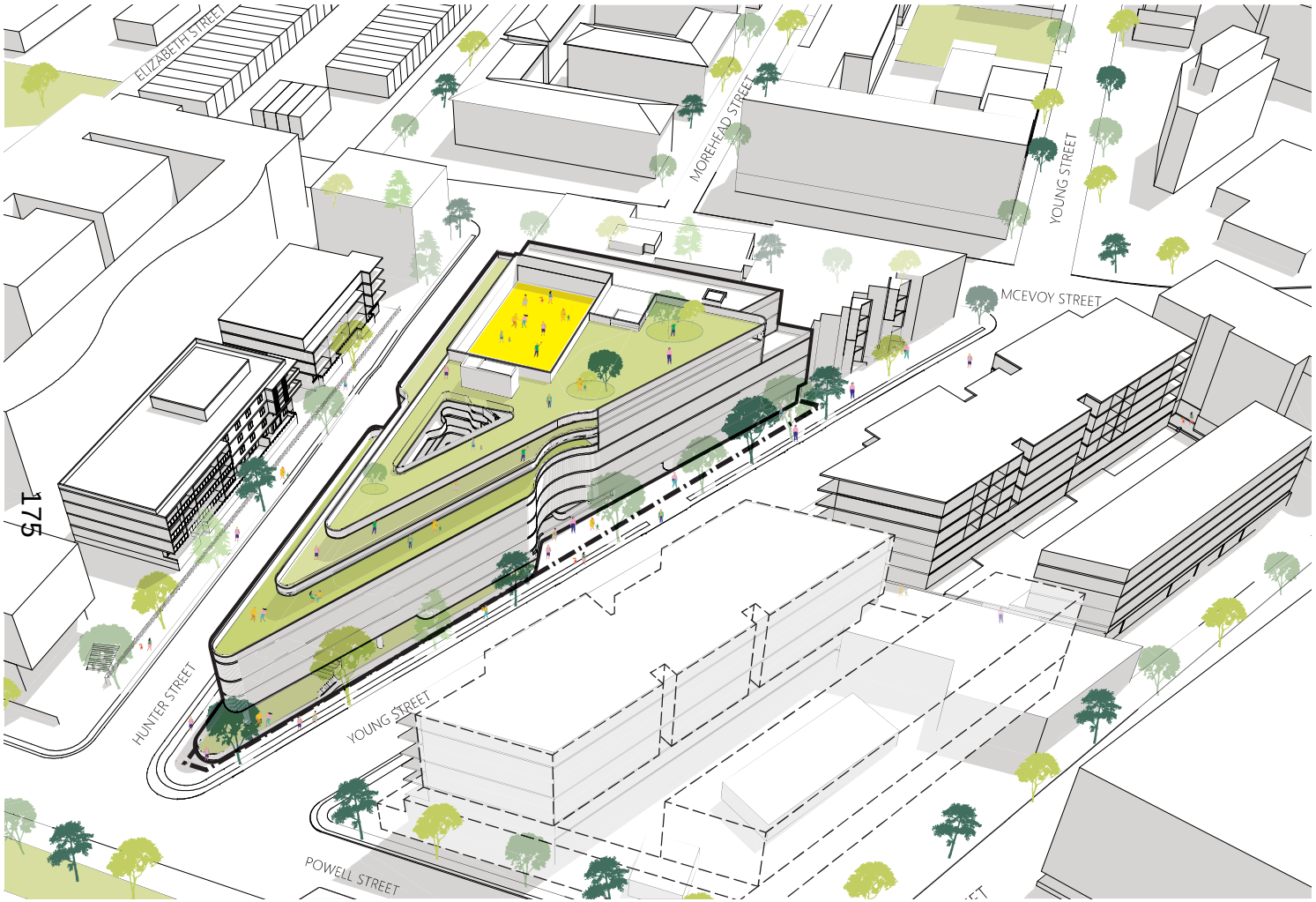


AUDITORIUM



OPEN SPACE

DESIGN DIAGRAMS - OVERVIEW



DEV SUMMARY

Height	27m Height Limit
Total GFA	13,544sqm (including school circulation)
Total FSR	2.94:1 (including school circulation)
Cars	55 cars

SCHOOL

GFA	10,609sqm (incl. school circulation)
STUDENTS	~800
GLSs	45
OUTDOOR	4,975sqm (6.2sqm per student)

FILM SCHOOL

GFA	2,935sqm
STUDENTS	~120
OUTDOOR	59sqm

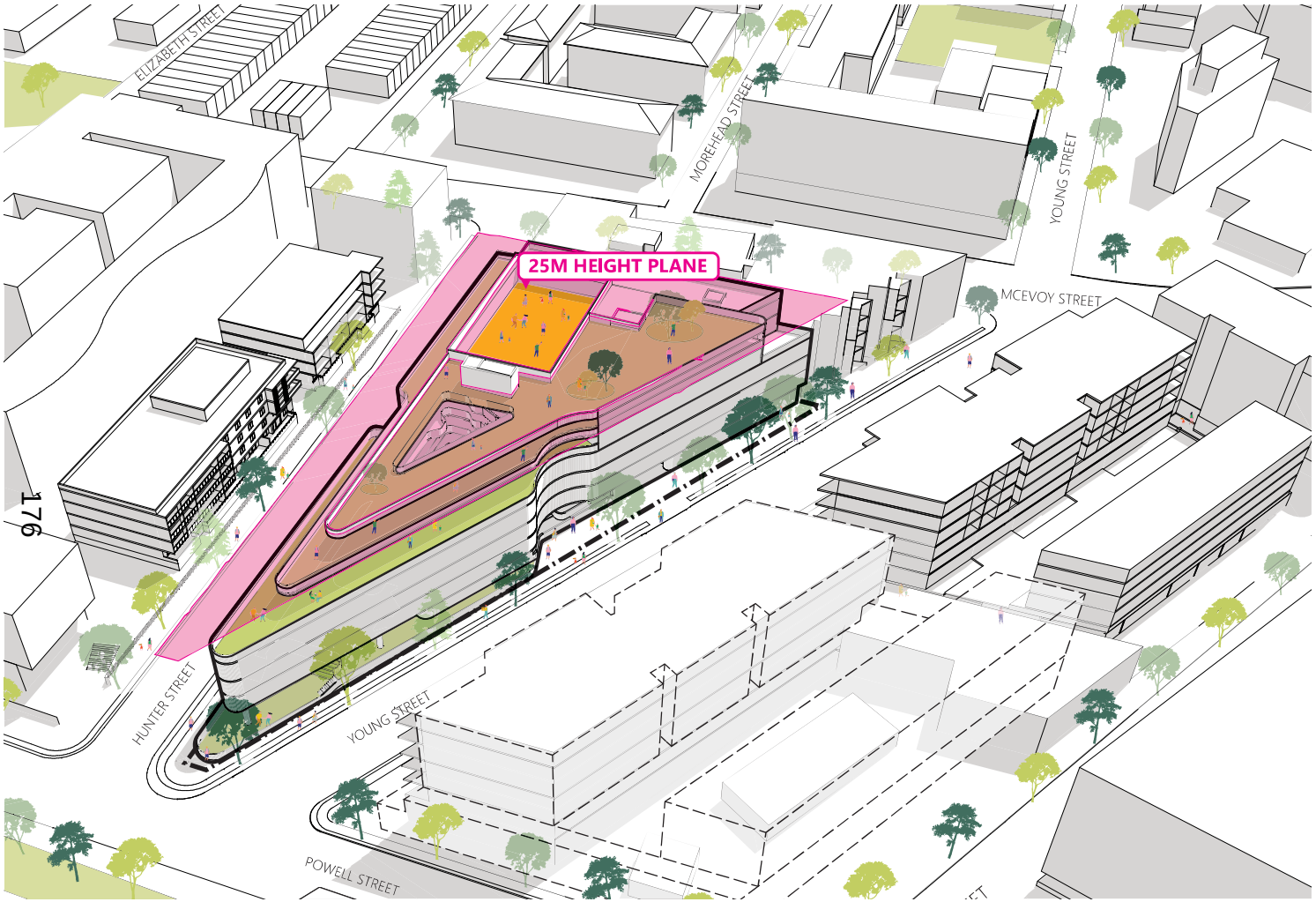


SCHOOL STUDY SPACES



VERTICAL CIRCULATION

DESIGN DIAGRAMS - HEIGHT PLANE 25M



The current design seeks to fit the built form (sans the rooftop netting and balustrading from the outdoor area) into a height of 25m. To accomodate accessibility to level 6, the school core lift will go through the 25m height plane.



ROOFTOP GARDEN



OUTDOOR SEATING

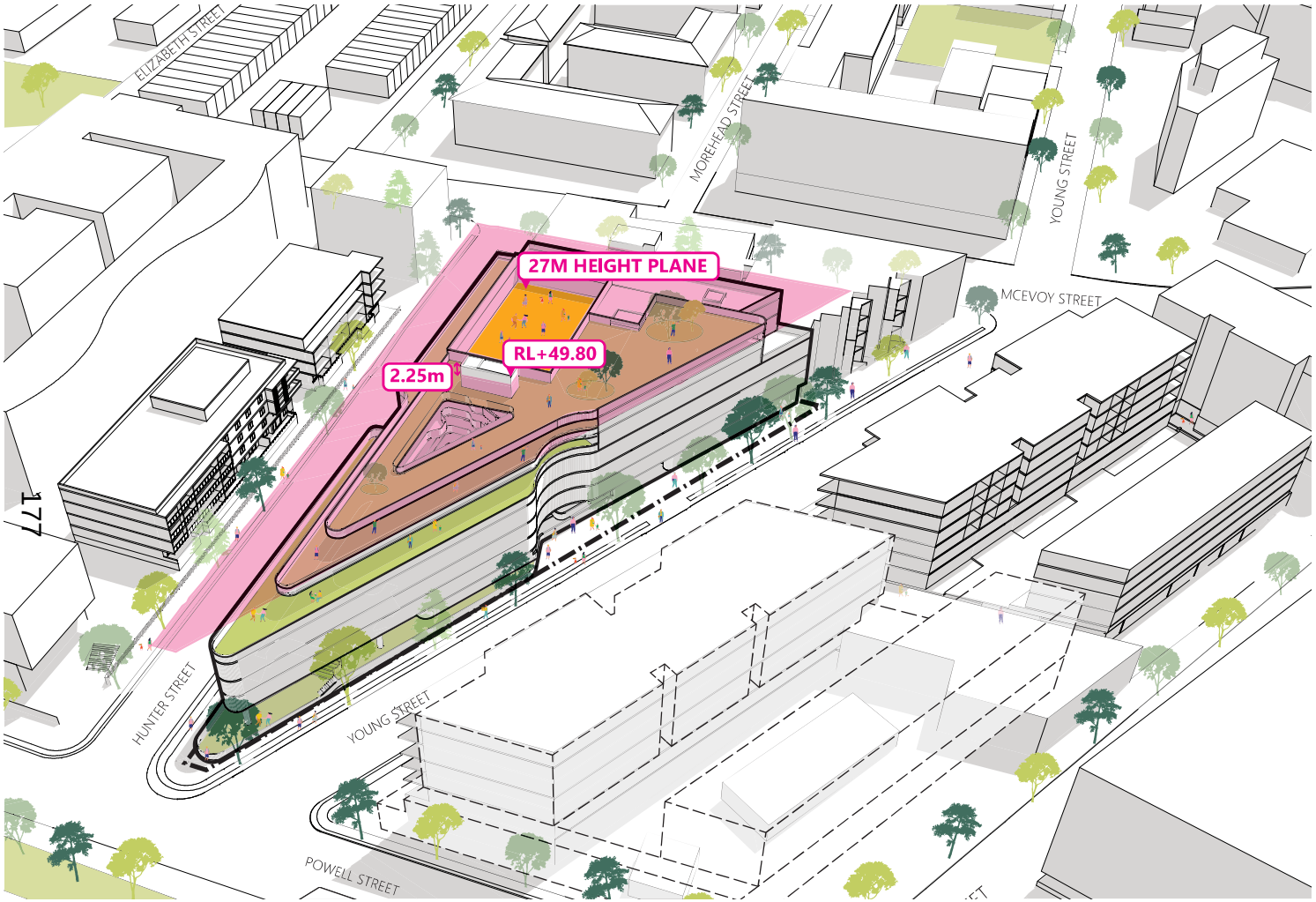


SPORT AREA



PLAY AREA

DESIGN DIAGRAMS - HEIGHT PLANE 27M



The netting and balustrading will sit slightly higher than the 25m, with intent that is sits within the 27m height line. The school core lift will have minor enroachment, with the overrun on RL+49.800 and 2.25m maximum exceedance from the 27m height plane.



ROOFTOP GARDEN



OUTDOOR SEATING



SPORT AREA



PLAY AREA

PERSPECTIVE - OVERVIEW



PERSPECTIVE- STREET VIEW



PERSPECTIVE- STREET VIEW



Attachment A2-3

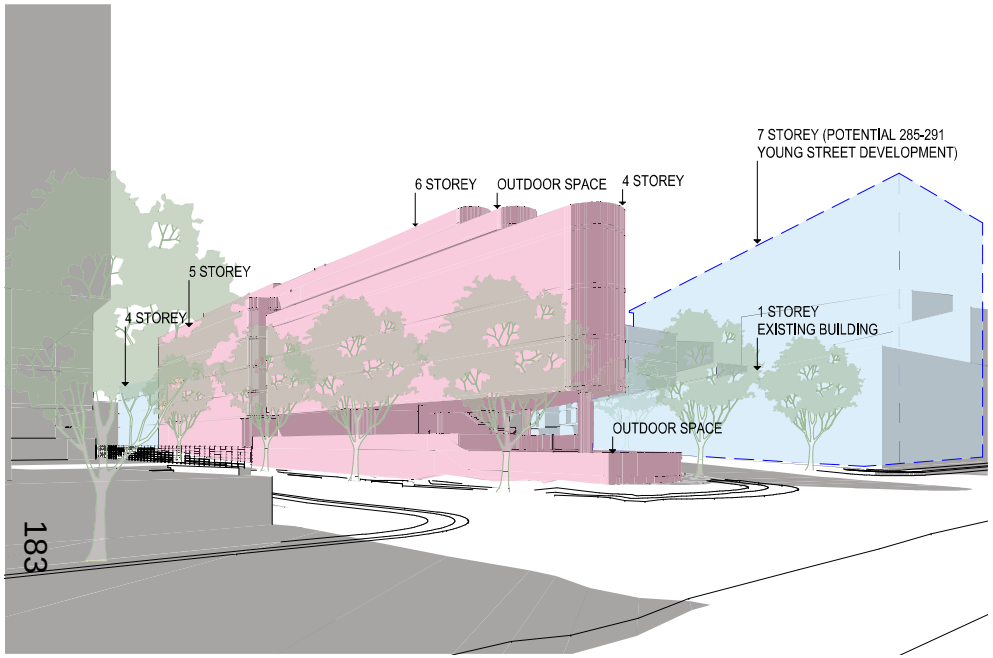
Urban Design Report

05
REFERENCE SCHEME

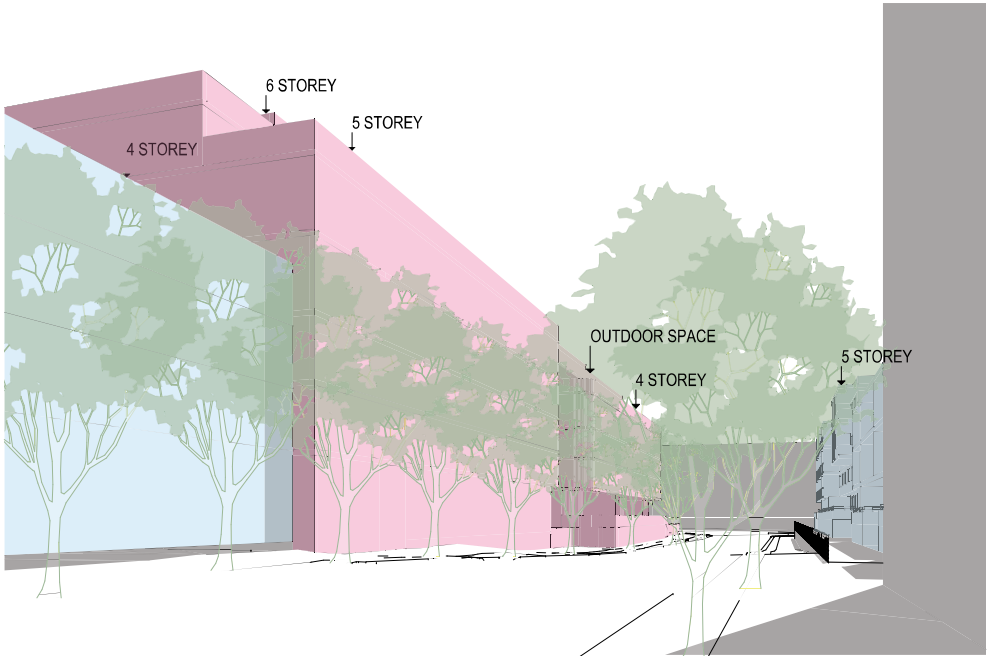
REFERENCE SCHEME

ENVELOPE DIAGRAMS (VIEW ANALYSIS) - HUNTER STREET

01 - VIEW FROM HUNTER STREET (SOUTH)



02 - VIEW FROM HUNTER STREET (NORTH)

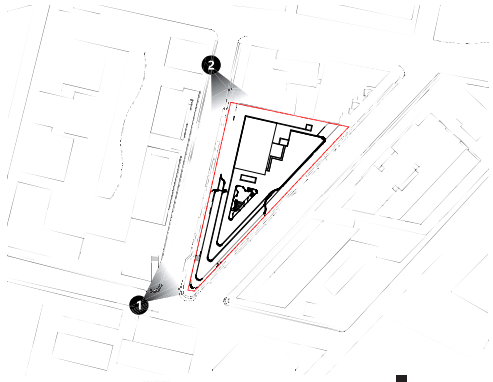


VIEW ANALYSIS ALONG HUNTER STREET:

- Along Hunter Street, the scheme proposes a 5 storey podium height to the north, which transitions to 4 storeys towards the south. The 4-5 storey scale appropriately ties in with the 4-5 storey scale of existing buildings along Hunter Street.
- The proposal reaches 6 storeys, with the upper levels set back from the podium to reduce visual appearance of the building. The lift overrun on level 6 has minor enroachment on the 27m height line, but is is not visible from the street, as illustrated in these street views.
- Retention of existing mature street trees buffers views towards the built form.
- The ground floor is recessively expressed to create a lightness and relief to the base of the building. Erosion of the ground floor at the corner of Young Street and Hunter Street also softens the building's interface at the intersection, whilst allowing the building to present as a key urban marker, as shown in View 01.

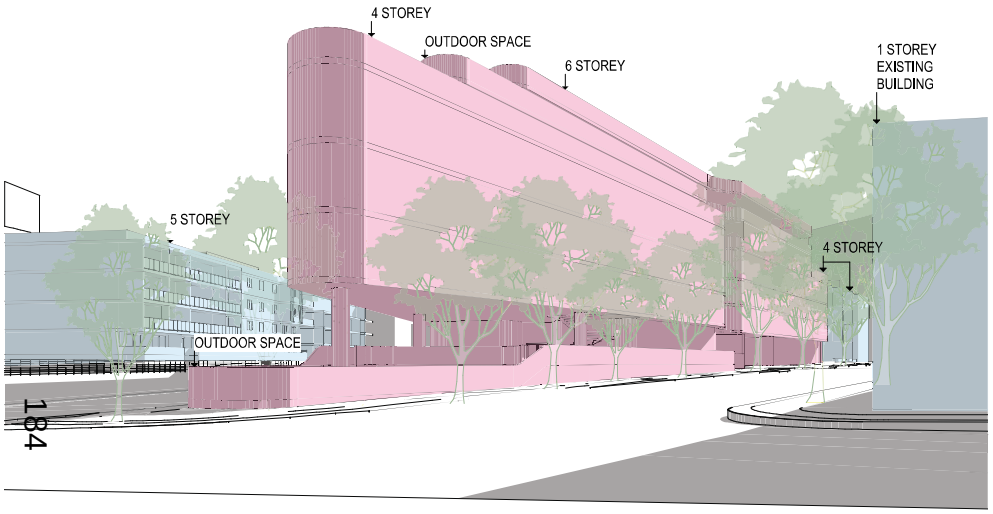
Reference Sheme

Context Buildings



ENVELOPE DIAGRAMS (VIEW ANALYSIS) - YOUNG STREET

03 - VIEW FROM YOUNG STREET (SOUTH)



04 - VIEW FROM YOUNG STREET (NORTH)

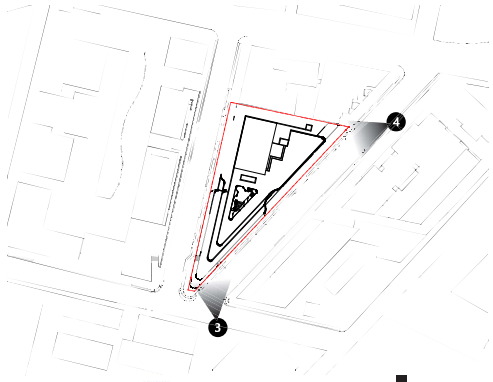


VIEW ANALYSIS ALONG YOUNG STREET:

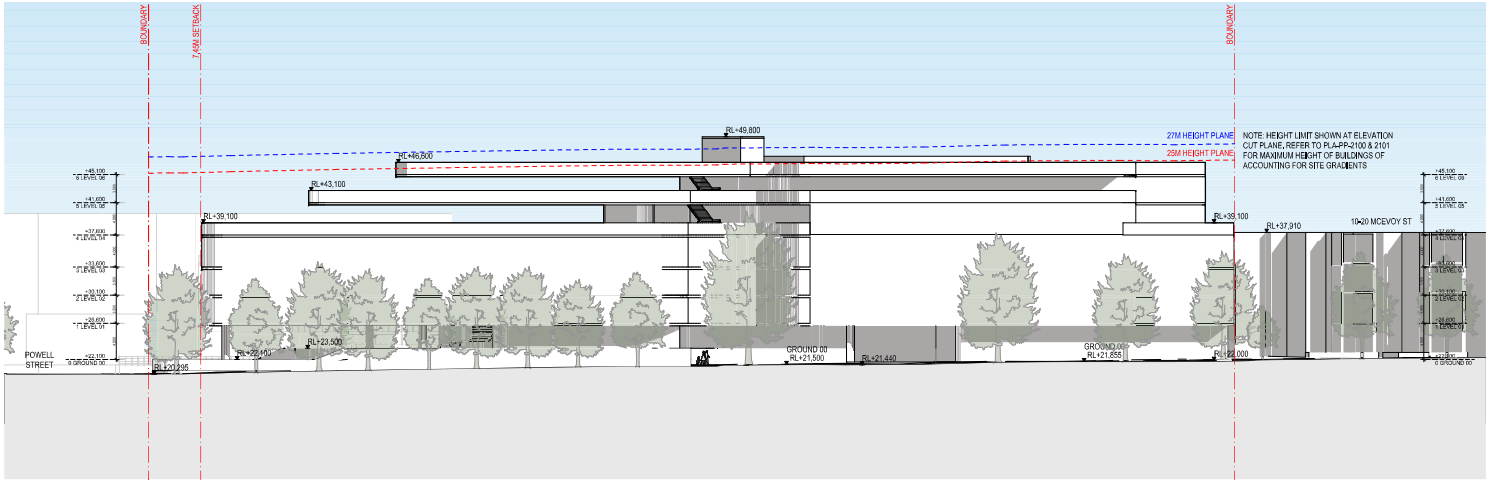
- Along Young Street, the scheme proposes a 4 storey podium, with additional levels above to 6 storeys, which are generally setback from the podium line. The podium height neatly ties in with the 4 storey building to the north, as shown in view 04.
- The proposal reaches 6 storeys, with the upper levels set back from the podium to reduce visual appearance of the building. The lift overrun on level 6 has minor enroachment on the 27m height line, but is is not visible from the street, as illustrated in these street views.
- Overall, the scheme relates to the scale of the approved planning proposal Bourke and Young Woolworths, which sits at 27m and reaches 7 storeys. This approved building will be a defining character of the street wall height, and the reference scheme is consistent with this future scale. This is evident in view 04.
- Retention of existing mature street trees buffers views towards the built form.
- The ground floor is recessively expressed to create a lightness and relief to the base of the building. Erosion of the ground floor at the corner of Young Street and Hunter Street also softens the building's interface at the intersection, whilst allowing the building to present as a key urban marker, as shown in View 03.

Reference Sheme

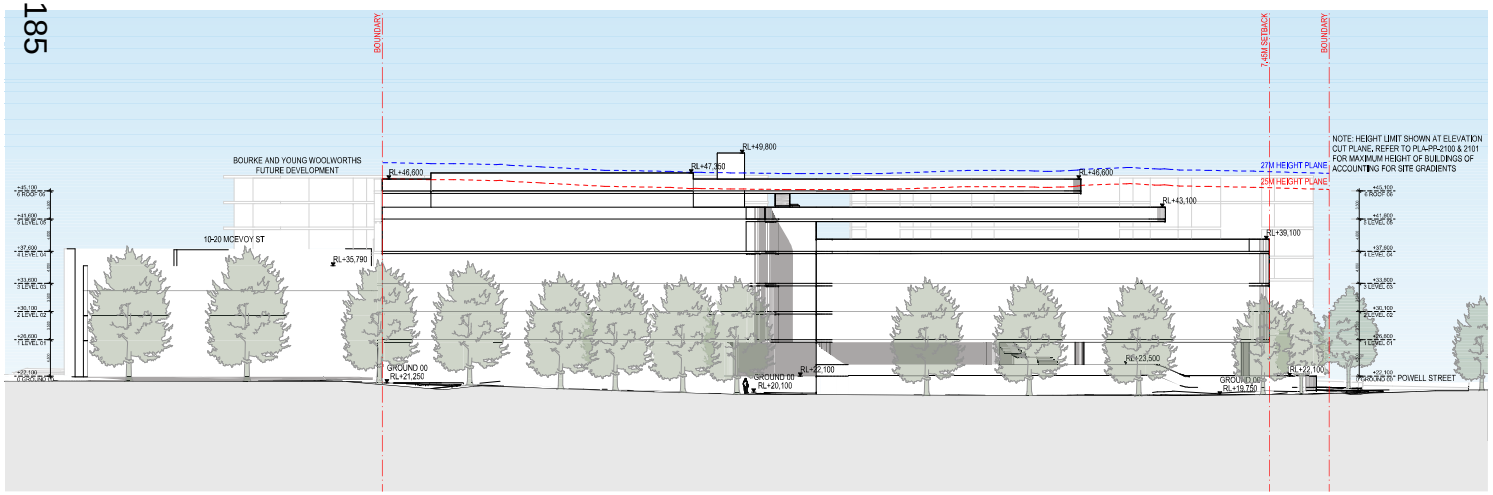
Context Buildings



ELEVATIONS



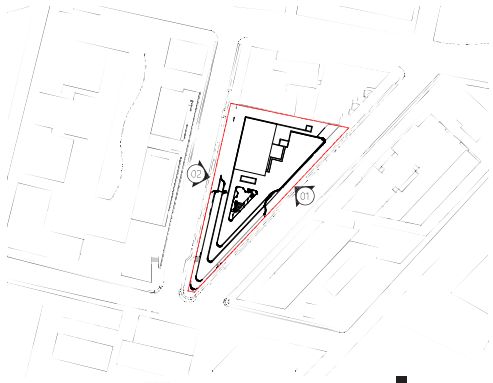
01 YOUNG STREET ELEVATION



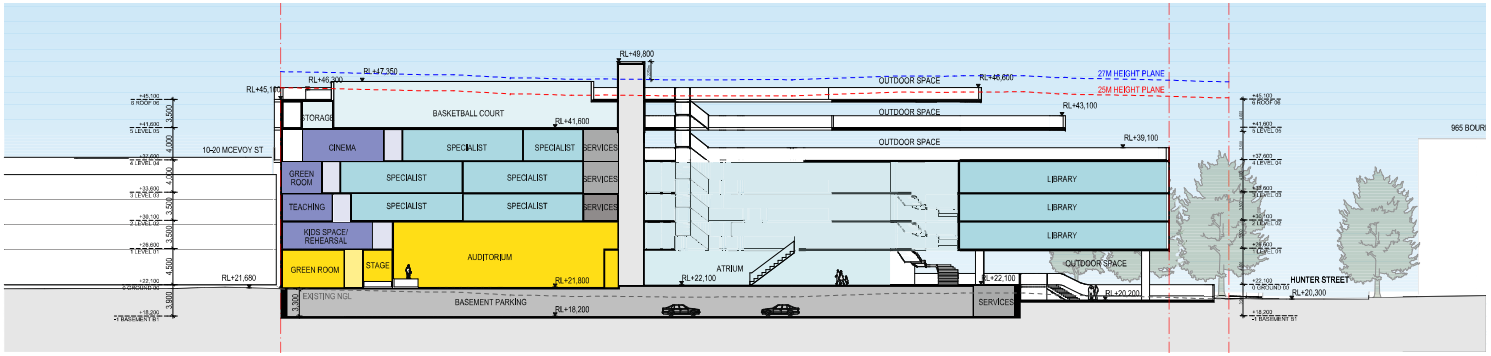
02 HUNTER STREET ELEVATION

The scheme proposes the following storey heights:

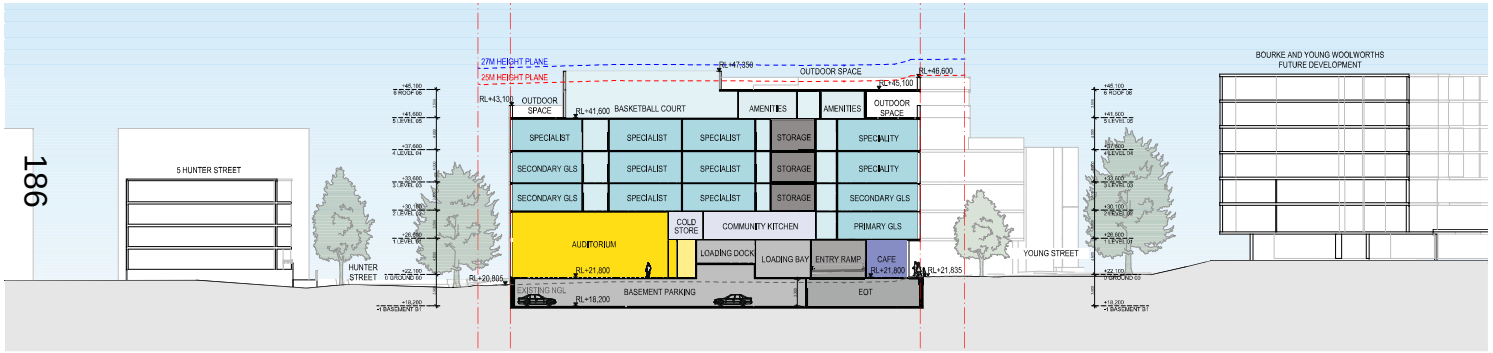
- Along Hunter Street, the scheme proposes a 5 storey podium height to the north, which transitions to 4 storeys towards the south. The 4-5 storey scale appropriately ties in with the 4-5 storey scale of existing buildings along Hunter Street.
- Along Young Street, the scheme proposes a 4 storey podium, with additional levels above to 6 storeys, which are setback from the podium line. The podium height neatly ties in with the 4 storey building to the north, as shown in view 04.
- The proposal reaches 6 storeys, with the upper levels set back from the podium to reduce visual appearance of the building. The lift overrun on level 6 have minor enroachment on the 27m height line, but is is not visible from the street. The building presents as a 6 storey scale to the street interfaces, and also ties in with the 7 storey scale of the future Bourke and Young Woolworths Development, as shown in view 01 and 02. The setbacks to the upper levels also allows solar access to the neighbouring existing and future developments, as well as the park to the south.
- The ground floor is recessively expressed.



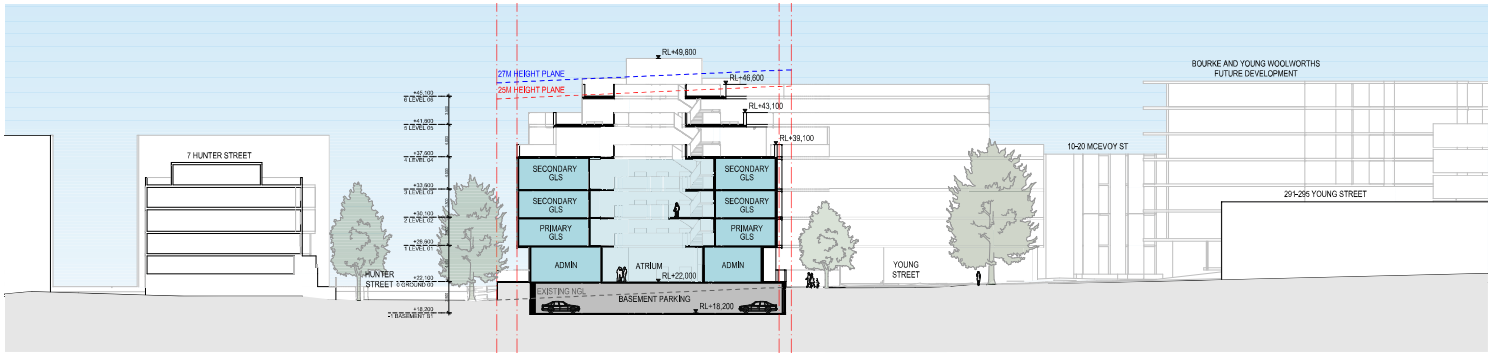
SECTIONS



SECTION 01



SECTION 02

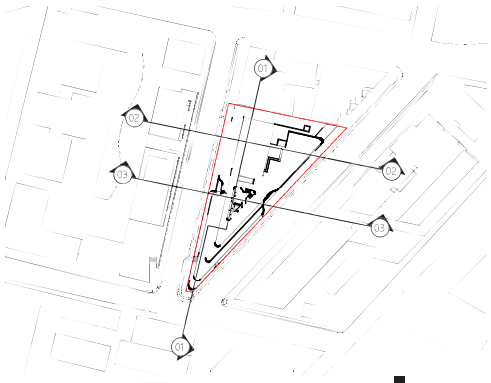


SECTION 03

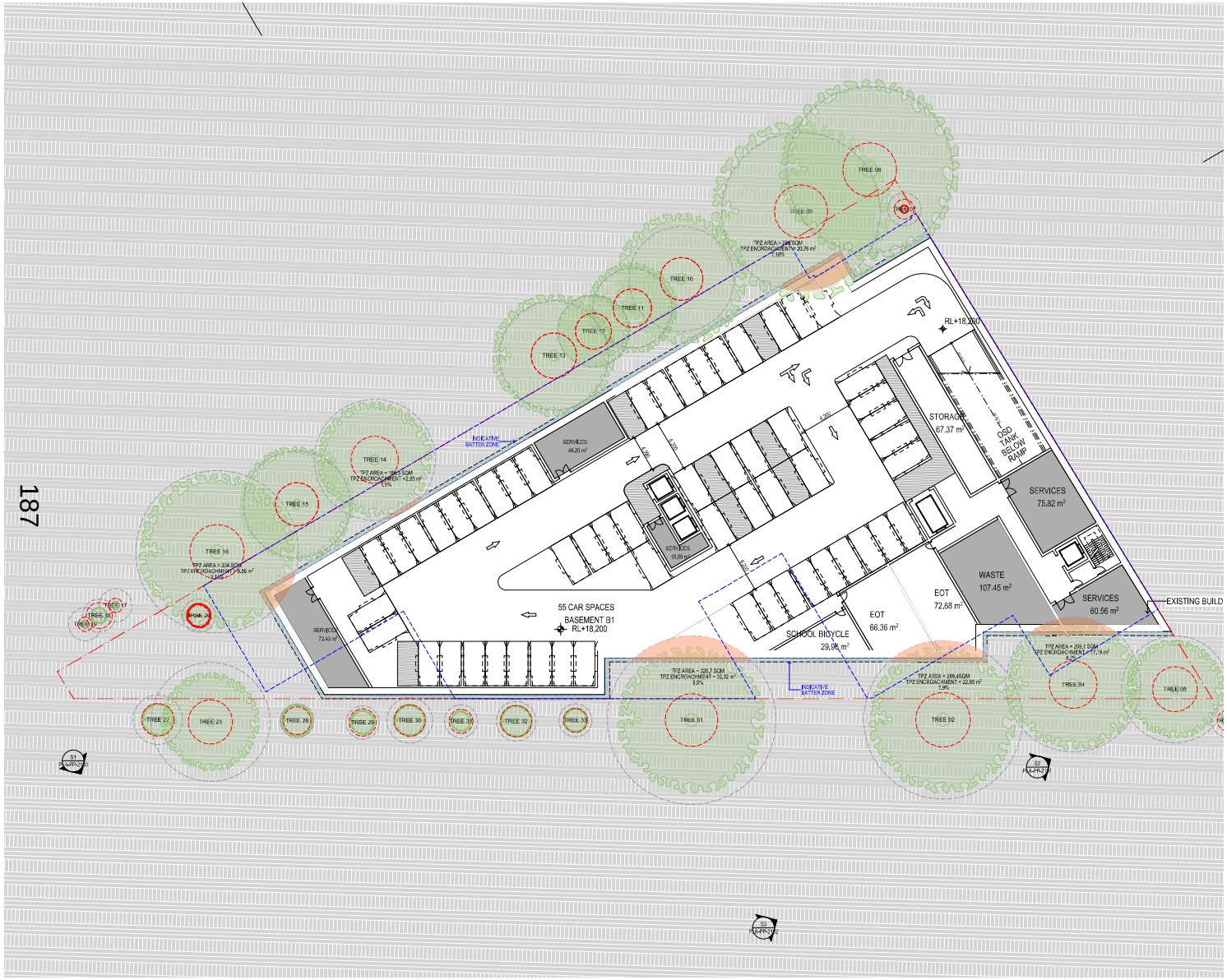
The scheme is primarily composed of spaces for the K-12 school which spans from ground to level 05 , which is vertically accessed by the school lift core or the feature circulation void. The void connects to terraced open space for the school on levels 04, 05, and 06.

The film school similarly spans ground to level 05, and is accessed via its own lift core and its feature atrium. The double height school auditorium is located on ground, but can also be accessed from level 01. This space is intended to be shared with the community, who will have access to it after school hours, or during the weekend.

All users of the site have access to the basement carpark, which spans one level.



PLANS - BASEMENT



The basement features vehicular access from ground. It is also connected to the film school lift core, school lift core, and the goods lift. The basement is also protected to the PMF flood level, and the footprint is shaped to mitigate impacts to tree TPZs.

The basement incorporates 55 cars, which will be used by the school and film school on weekdays, and by the shared community during times they are using the auditorium. The basement also features end of trip facilities, waste holding rooms, and bicycle parking.



BICYCLE PARKING



END OF TRIP



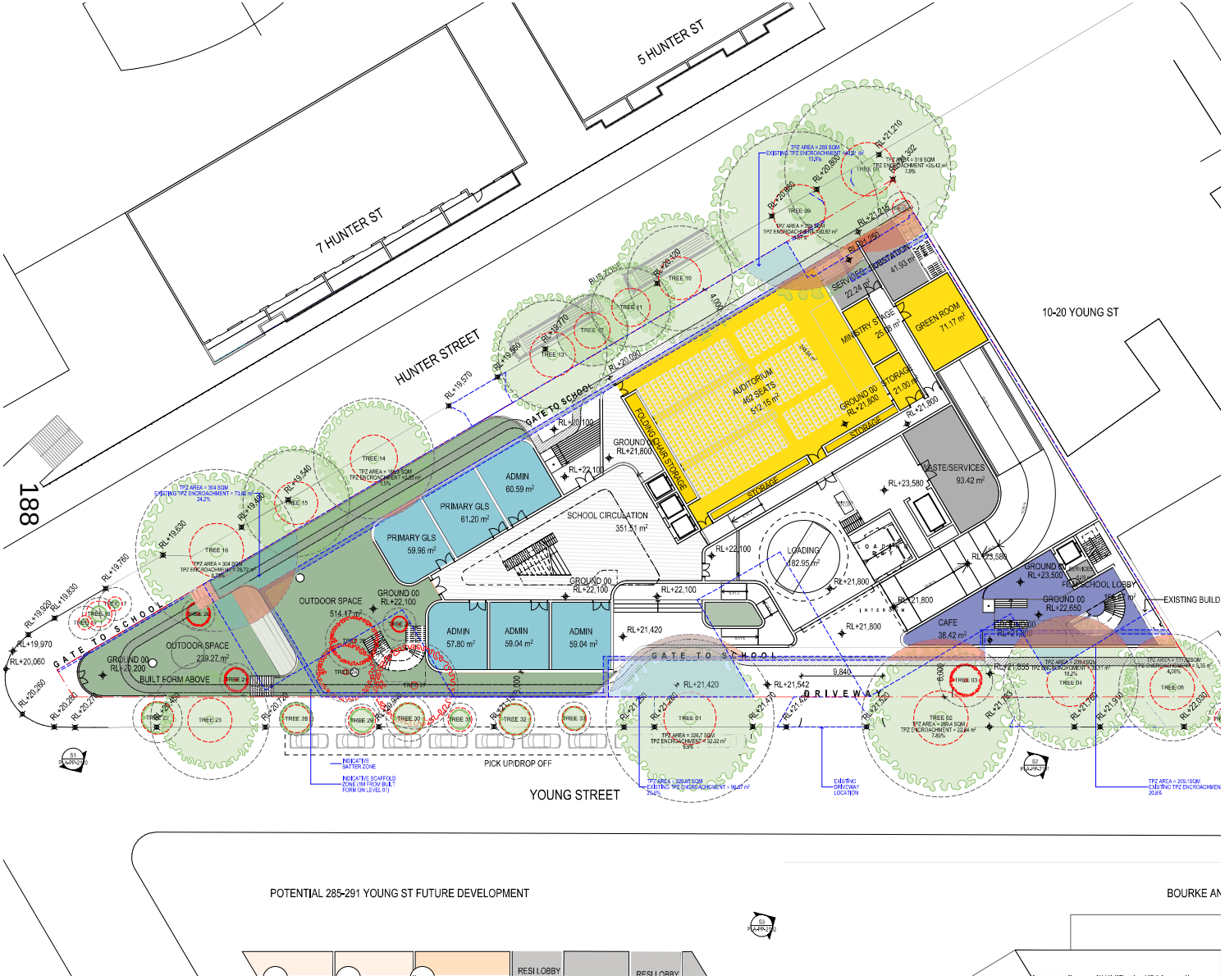
ELECTRIC CHARGING STATION



LOBBY

REFERENCE SCHEME

PLANS - GROUND



The ground plane features a main foyer space for the school, which is easily accessed from both Hunter and Young Street. This school foyer links to the auditorium, which is located on Hunter Street. This auditorium can be used by the community on the weekends. To the south of the site sits admin and classroom spaces for the school, as well as ground floor open space.

The film school lobby is located on Young Street, adding to the future mixed use nature of Young. Ground floor loading as well as basement access is located off Young Street, to minimise disruption to the residential character of Hunter Street. Pick-up/drop-off zones for the school is located on Young Street, whilst the bus zones are located on Hunter Street. Splitting up these transport modes reduces overload of traffic on one street.



AUDITORIUM



MAIN FOYER

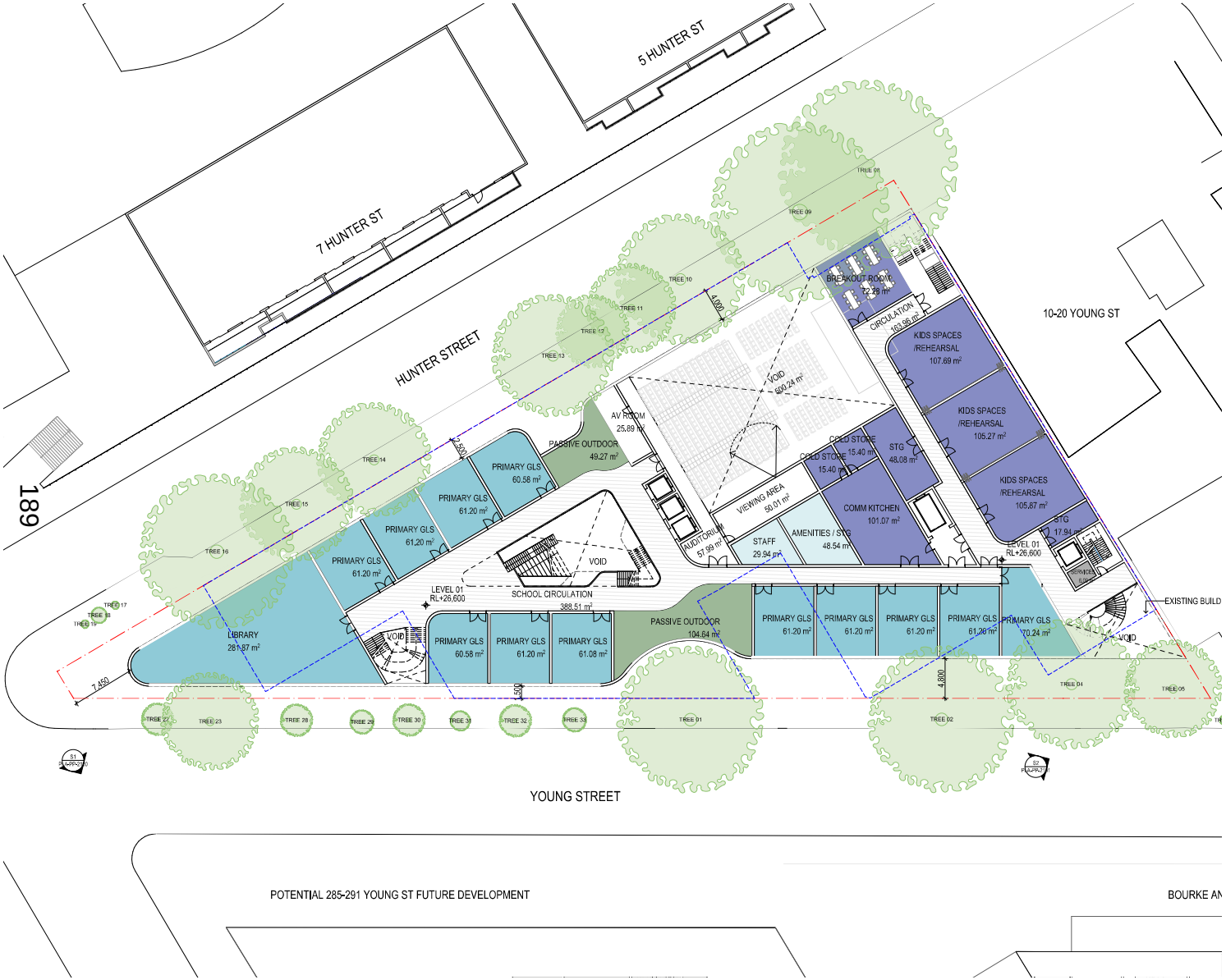


OUTDOOR SPACE



PLAY AREA

PLANS - LEVEL 01



Level 01 features a feature atrium in the middle for the school, which is flanked by primary classrooms, the school lift core and the library. The upper level of the auditorium is also easily accessed off the main circulation space. The auditorium features a separate viewing area on this level.

Passive open space is provided on the east and west of the building, and becomes opportunities for learning as well as breakout.

To the north of the site sits spaces for the film school, which is easily accessed off the film school core. These spaces are shared with the community on the weekends.



ATRIUM CIRCULATION



LIBRARY

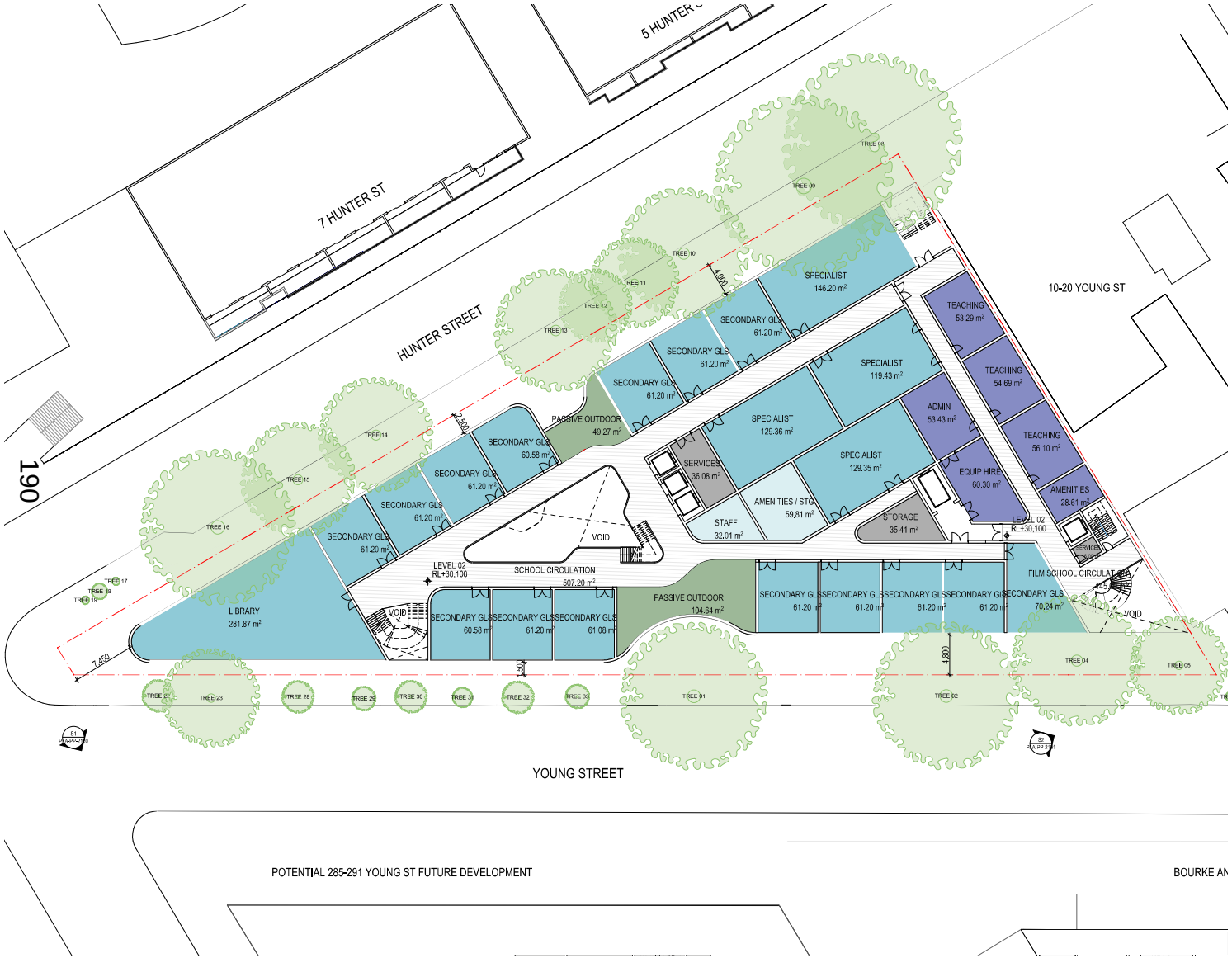


CLASSROOM



PASSIVE OPEN SPACE

PLANS - LEVEL 02



Level 02 features a feature atrium in the middle for the school, which is flanked by secondary classrooms, specialist rooms, the school lift core and the library.

Passive open space is provided on the east and west of the building, and becomes opportunities for learning as well as breakout.

To the north of the site sits spaces for the film school, which is easily accessed off the film school core.



SPECIALIST ROOM



CLASSROOM

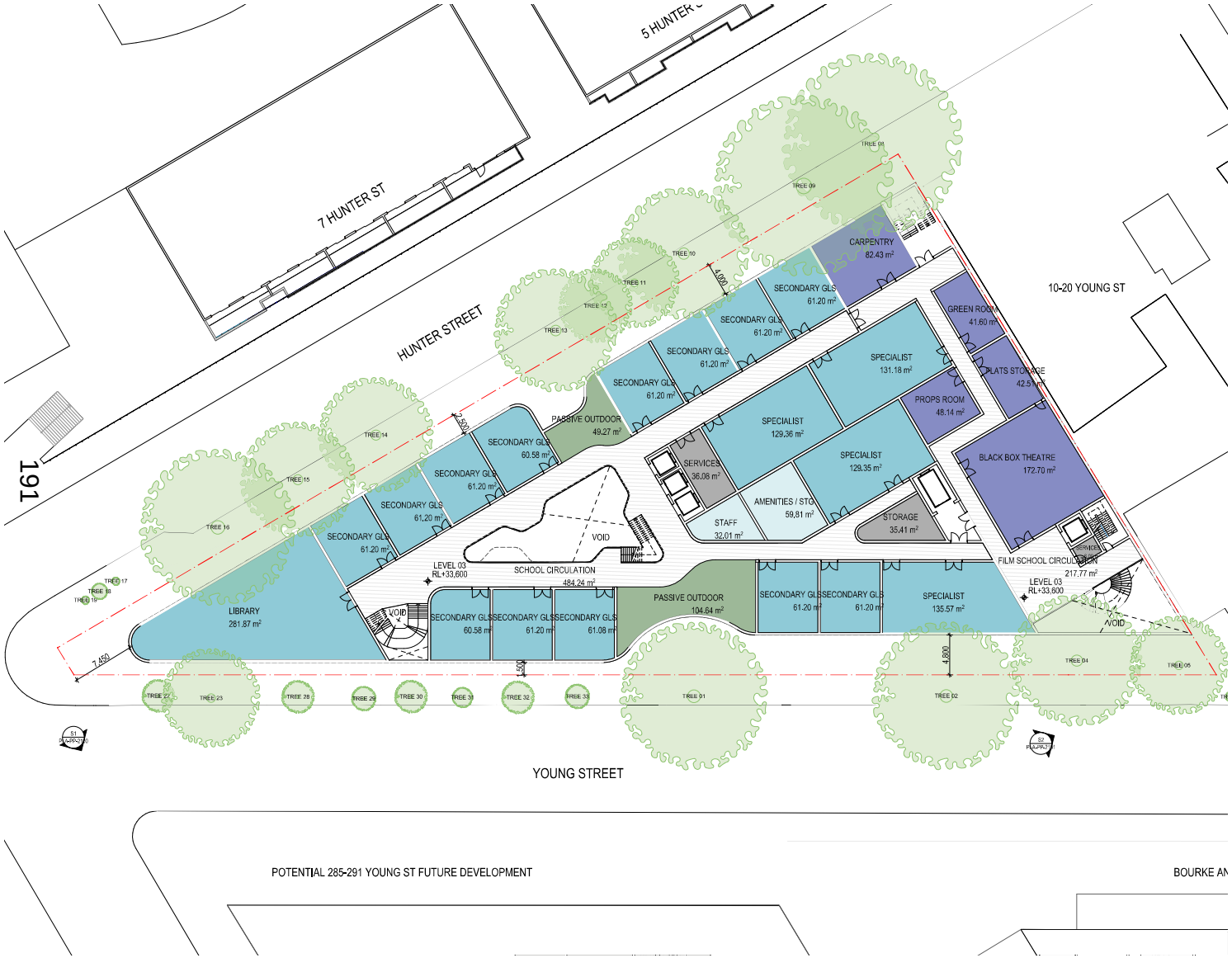


ATRIUM CIRCULATION



BREAKOUT SPACE

PLANS - LEVEL 03



Level 03 features a feature atrium in the middle for the school, which is flanked by secondary classrooms, specialist rooms, the school lift core and the library.

Passive open space is provided on the east and west of the building, and becomes opportunities for learning as well as breakout.

To the north of the site sits spaces for the film school, which is easily accessed off the film school core.



SPECIALIST ROOM



CLASSROOM

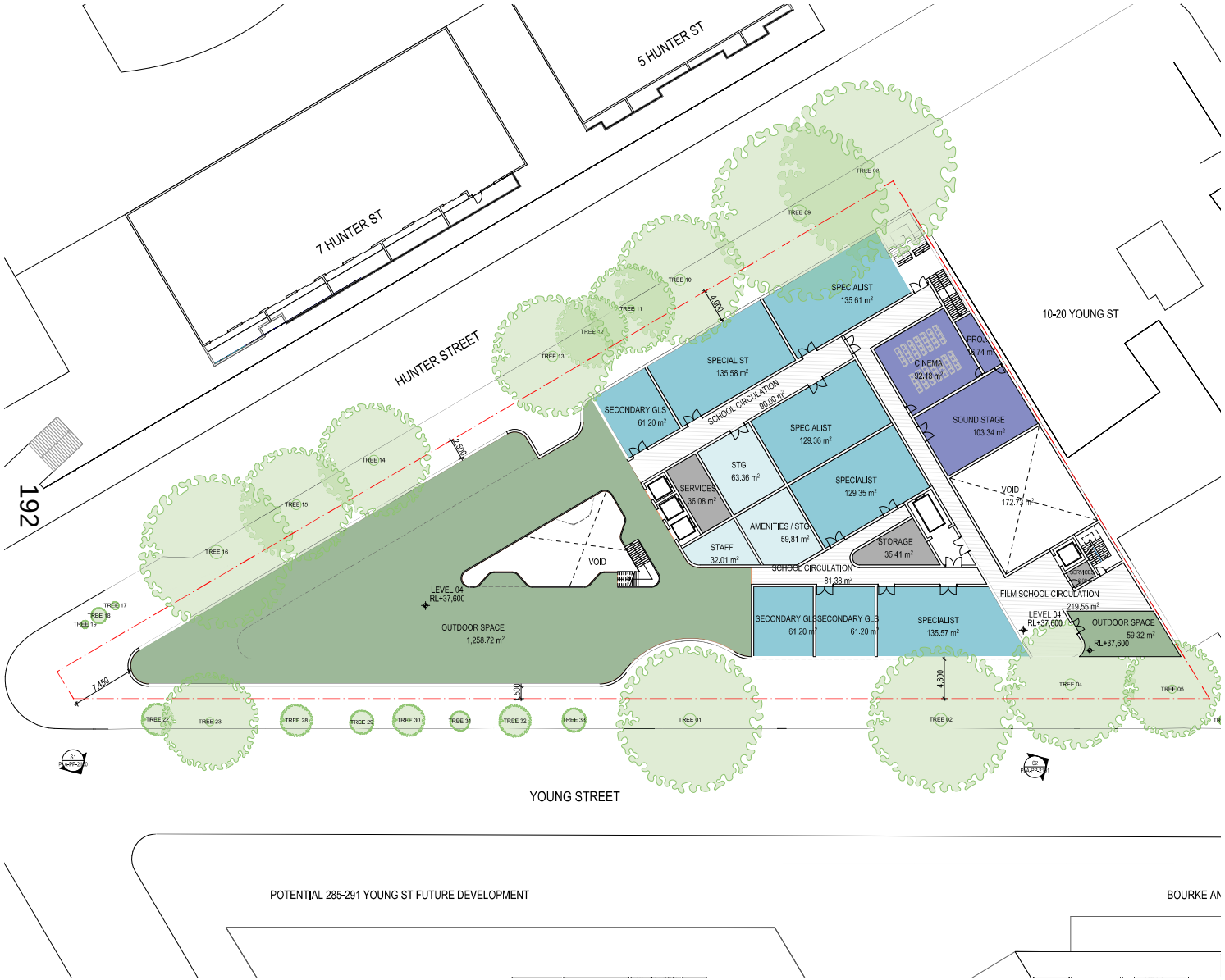


BLACK BOX THEATRE



BREAKOUT SPACE

PLANS - LEVEL 04



Level 04 sees the built form stepping back from the south, giving way to expansive open space for the school. To the north are the remaining specialist rooms and classrooms.

To the north of the site sits spaces for the film school, which is easily accessed off the film school core.



STUDIO



SPECIALIST ROOM

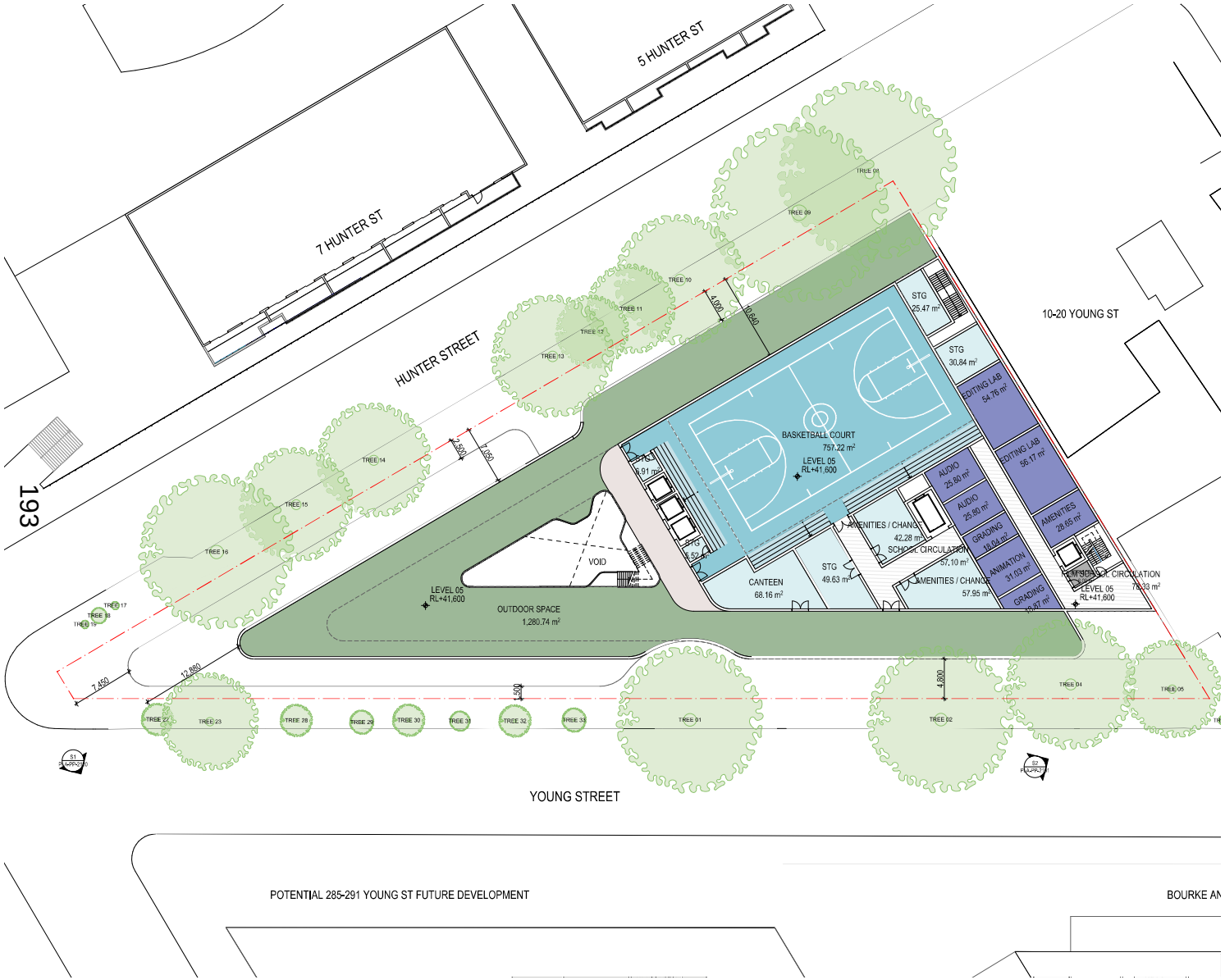


OUTDOOR SPACE



OUTDOOR LEARNING

PLANS - LEVEL 05



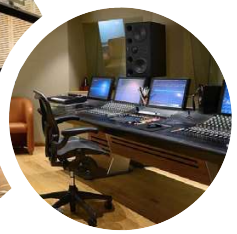
Level 05 sees the built form stepping back from the south, east and west, giving way to expansive open space for the school. This also allows appropriate solar access for the existing and future context around the site.

To the north west sits an open basketball court, which is setback from the building line to reduce acoustic and visual impacts to the street. There is additional spaces such as amenties, canteen and storage.

To the north of the site sits spaces for the film school, which is easily accessed off the film school core.



BASKETBALL COURT



AUDIO ROOM

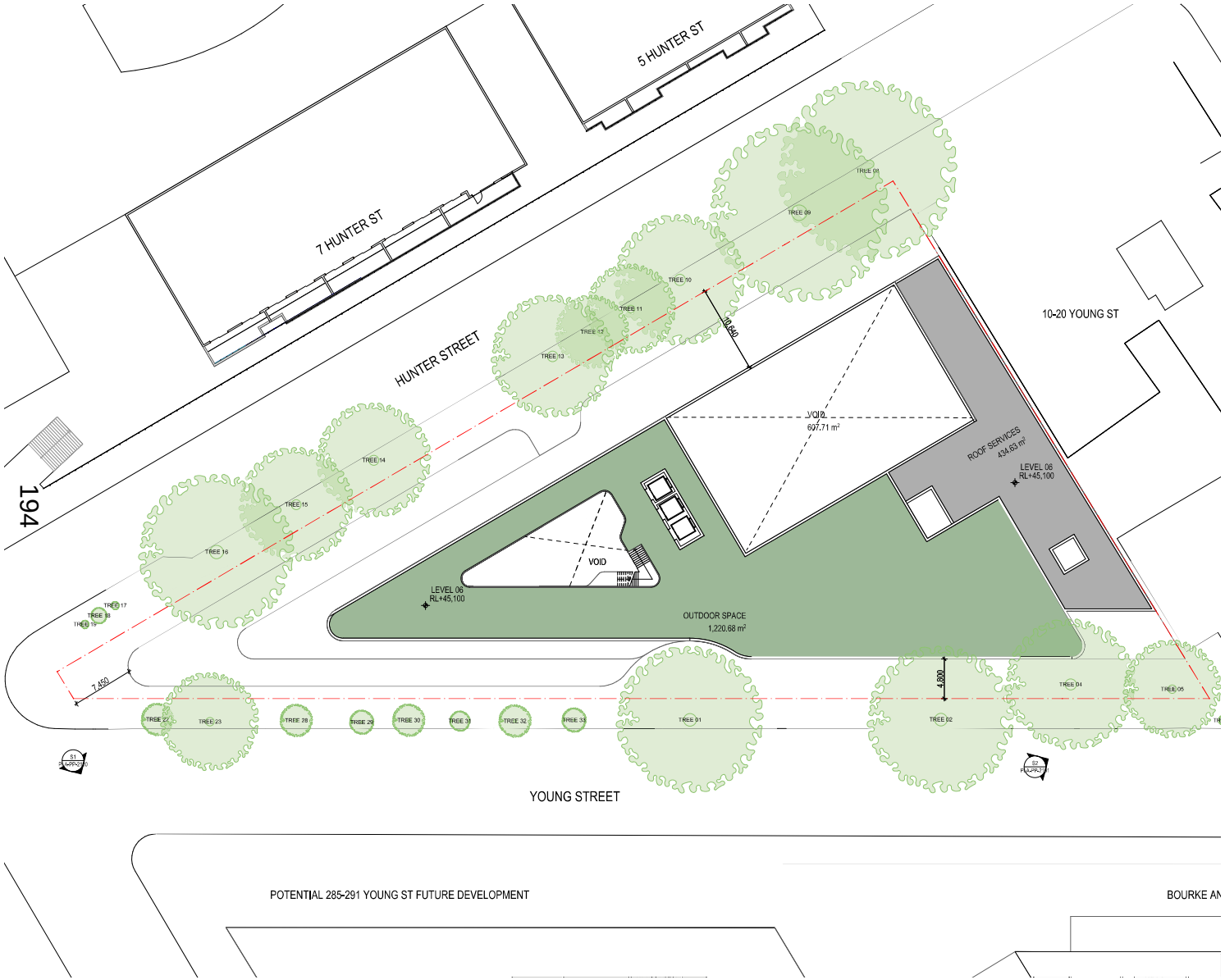


OUTDOOR LEARNING



ADAPTIVE SPACE

PLANS - LEVEL 06



Level 06 is the roof of the proposal, featuring open space to the south, and service spaces to the north. The void to the atrium provides great solar access to the levels below. The rooftop open space also receives great solar access and provides amenity for the students.



ROOFTOP GARDEN



CANOPY COVER



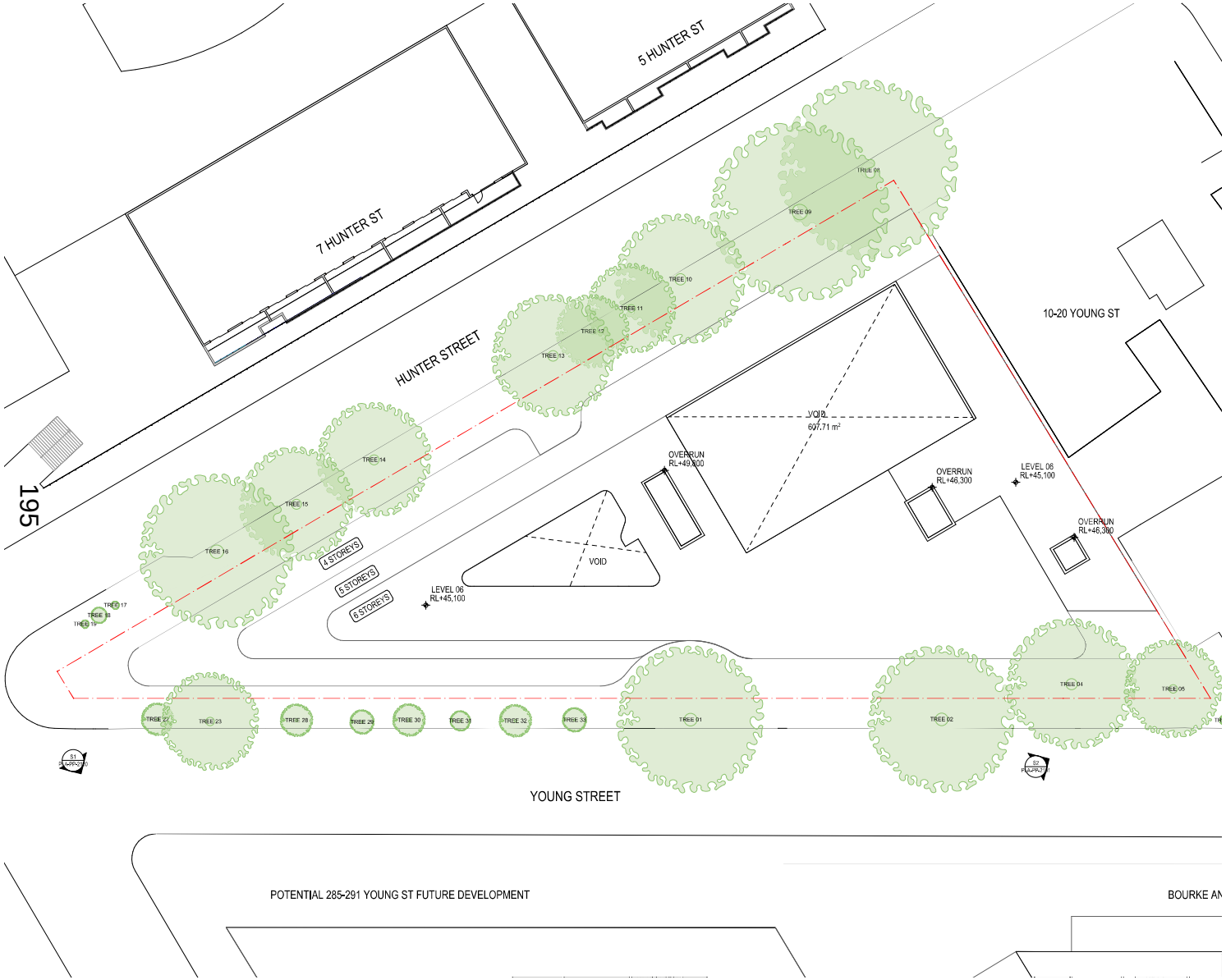
ROOF TERRACE



ROOFTOP SPORT

REFERENCE SCHEME

PLANS - ROOF PLAN



The lift overrun that sits at RL+49.800 has minor enroachment on the 27m height plane. However, it is not visible on street level.



ROOFTOP GARDEN



CANOPY COVER



ROOF TERRACE



ROOFTOP SPORT

Attachment A2-4

Urban Design Report

06

PROGRAMMATIC OPERATIONS

VERTICAL SCHOOL PRECEDENTS - COMPARISON

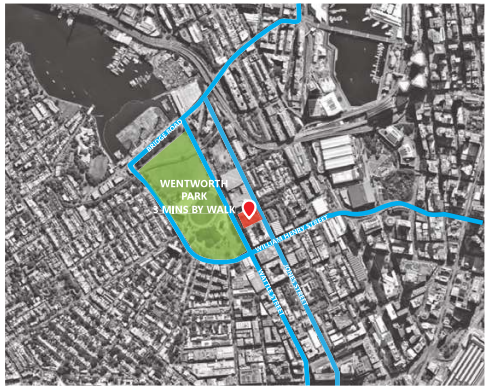


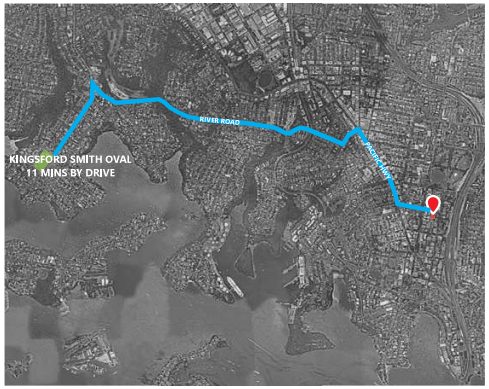














INNER SYDNEY HIGH SCHOOL

Y7 - Y12

~ 1200 STUDENTS

~5240 SQM OUTOOR (4.4 SQM/ STUDENT)

1 MIN WALK TO PRINCE ALFRED PARK

ULTIMO PUBLIC SCHOOL

K-Y6

~ 900 STUDENTS

~4500 SQM OUTOOR (5 SQM/ STUDENT)

3 MIN WALK TO WENTWORTH PARK

REDDAM HOUSE NORTH SYDNEY CAMPUS

K-Y12

~ 1550 STUDENTS

~3410 SQM OUTOOR (2.2 SQM/ STUDENT)

11 MIN WALK TO KINGSFORD SMITH OVAL

PROPOSED REFERENCE SCHEME

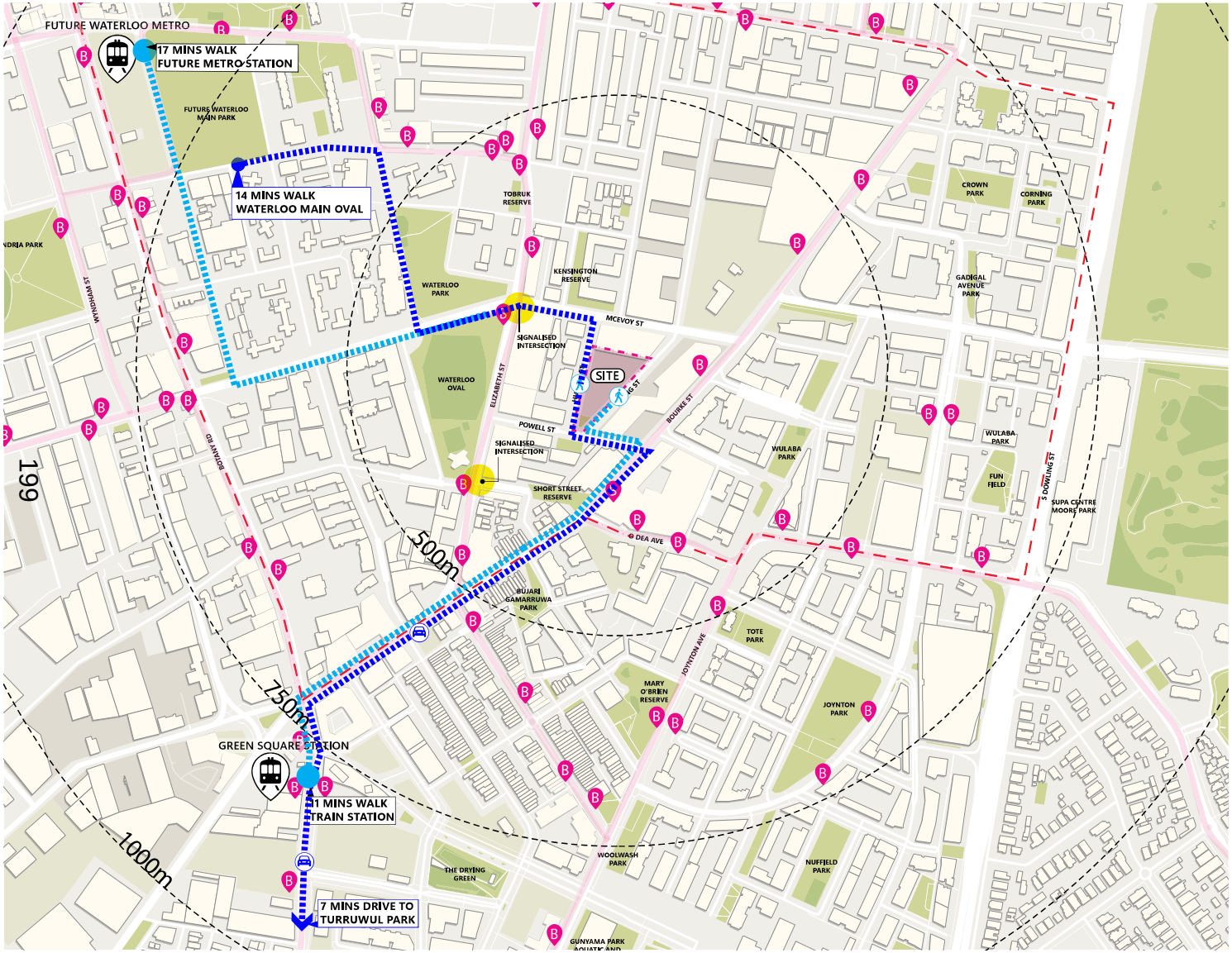
K-Y12

~ 800 STUDENTS

~4975 SQM OUTOOR (6.2 SQM/ STUDENT)

7 MIN DRIVE TO TURRUWUL PARK
14 MIN WALK TO FUTURE WATERLOO MAIN PARK

CONNECTIVITY TO LOCAL FACILITIES AND TRANSPORT



The school currently achieves 6.2sqm on-site open space per student. Regarding access to open space off-site, it is currently proposed that students will have access to Turruwul Park, which is a 7 minute drive from the school. This park includes a soccer field, two tennis courts, a tennis wall, and cricket facilities. Council has confirmed the space has availability Monday to Friday 8:00am-5:00pm.

Additionally, the future Waterloo Main Park provides two hectares of open space and include two playing fields. It is approximately 800m walk from the proposed school site and provides another option for potential shared use. If this could be achieved this option would be the preferred option given its proximity to the site.

Regarding connectivity to transport, the school is also well connected to Green Square (11min walk) as well as the future Waterloo Metro Station (17min walk).



FUTURE WATERLOO MAIN PARK



TURRUWUL PARK

PROGRAMMATIC OPERATIONS

SCHOOL SPACES BREAKDOWN

YEAR	STUDENTS	GLS	SPECIALIST	LIBRARY	SCHOOL GFA	OUTDOOR
K	40	2				
1	40	2				
2	40	2				
3	40	2	0			
4	40	2				
5	40	2				
6	40	2		870 SQM	870 SQM	8,000 SQM
7	90					
8	90					
9	90	31	13			
10	90					
11	80					
12	80					
TOTAL REQ.* **AS PER SCHOOL OPERATION'S CONSULTANT'S ADVICE*	800	45	13	870 SQM	9,694 SQM	8,000 SQM (10 SQM PER STUDENT)
TOTAL PROV.		45	13	846 SQM	10,609 SQM	4,975 SQM (6.2 SQM PER STUDENT)

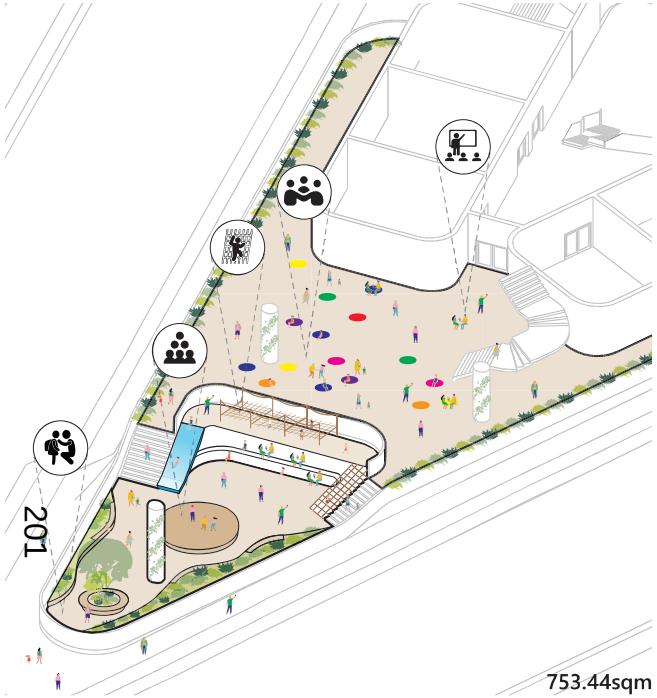
The reference scheme has been tailored to reflect the required spaces needed for a school of 800 students. The following table summarises the required spaces as well as what has been provided in the reference scheme.

200

PROGRAMMATIC OPERATIONS

VARIETY OF OPEN SPACES

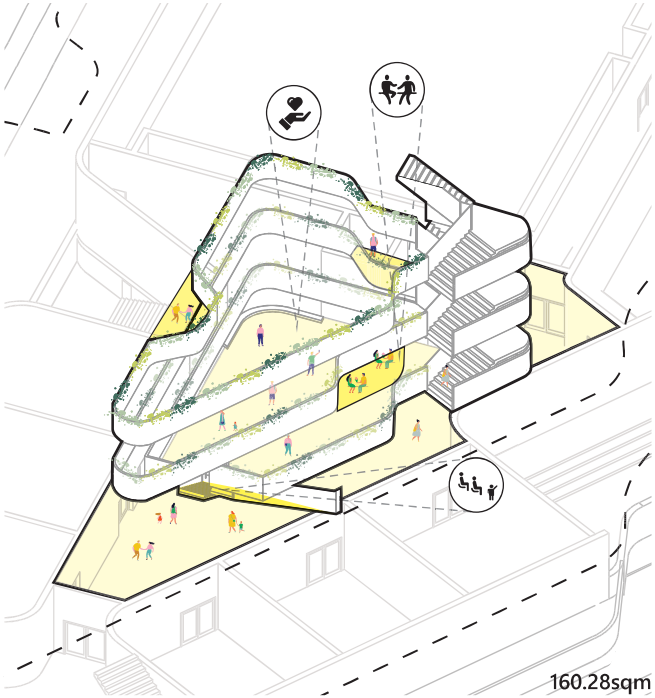
OPEN SPACE ON GROUND





PRIMARY PLAY
ADAPTIVE SPACE
CONNECTION WITH COMMUNITY

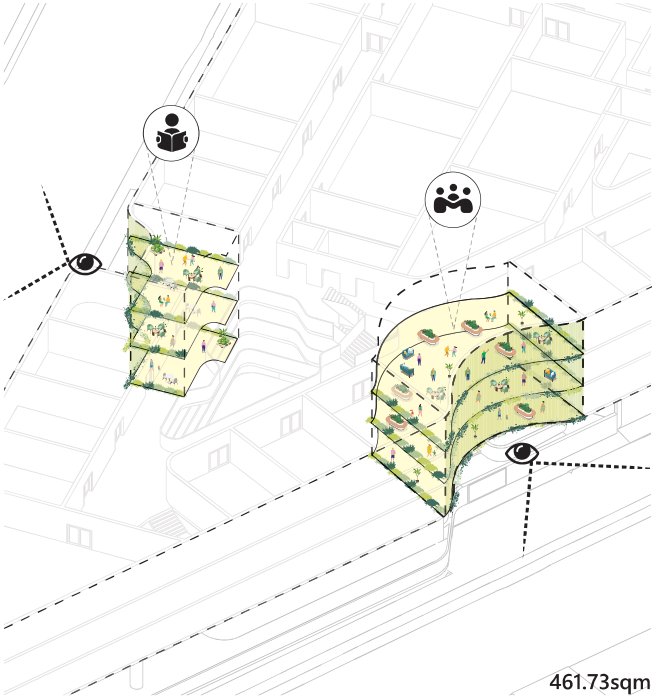
SCHOOL ATRIUM





LEARNING AREA
COMMUNAL SPACE
BREAKOUT AREA

PASSIVE LEARNING SPACES

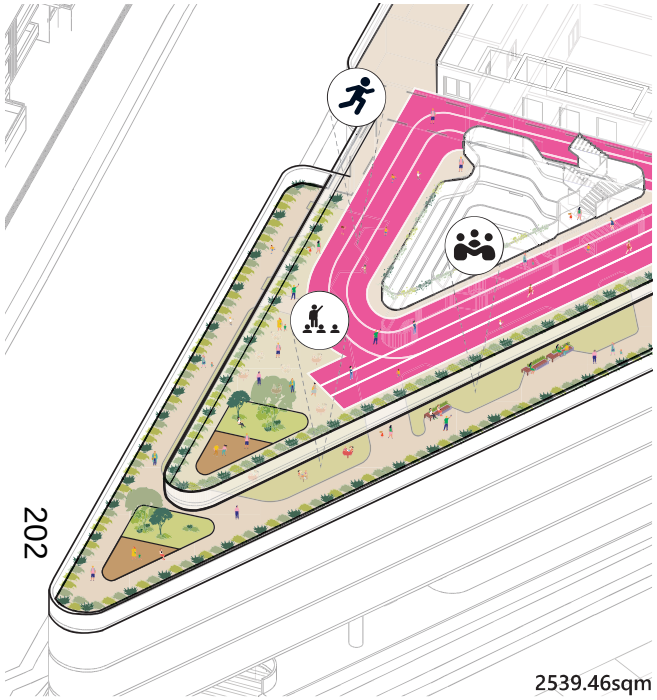




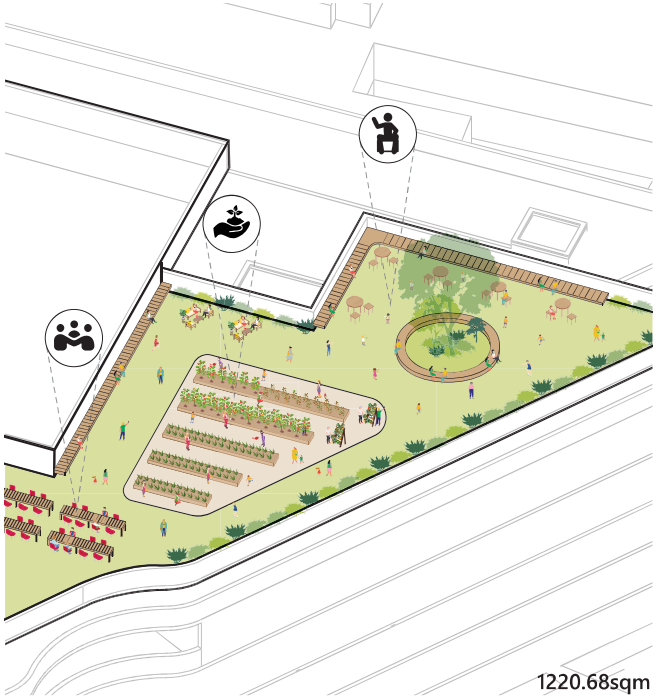
SECONDARY PLAY ZONE
OUTDOOR LEARNING
ADAPTIVE SACE

VARIETY OF OPEN SPACES

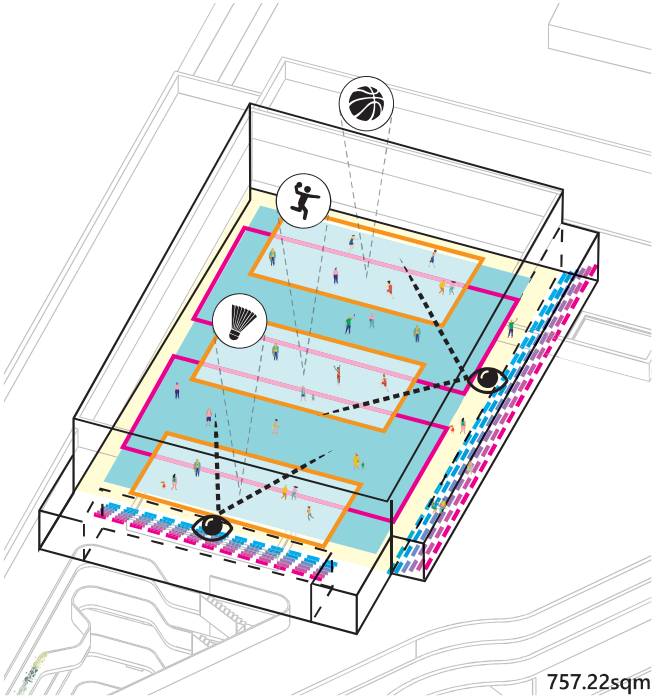
LEVEL 4-5 OPEN SPACE



ROOFTOP OPEN SPACE



ROOFTOP BASKETBALL COURT





OUTDOOR LEARNING
OUTDOOR GYM
CONNECTION WITH ENVIRONMENT

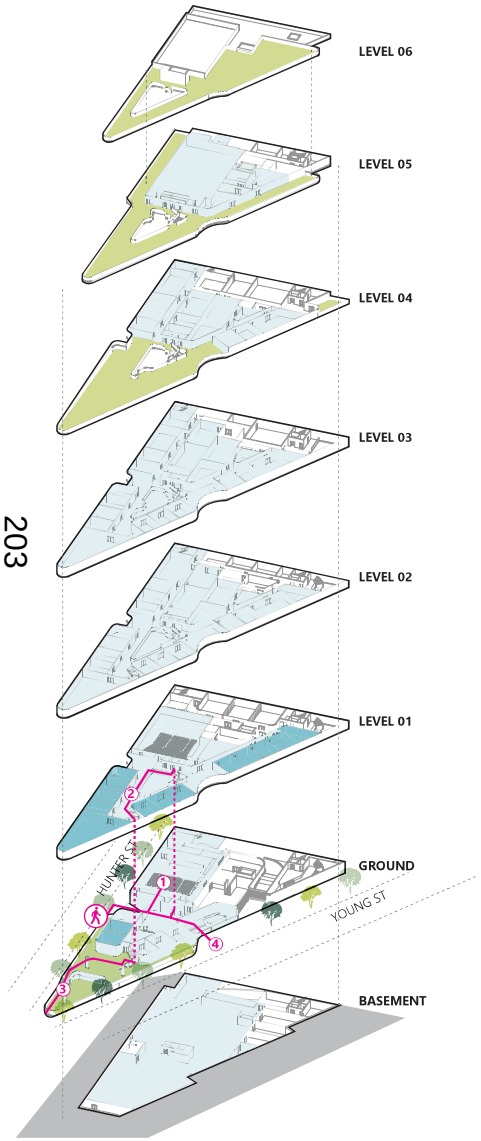


FOOD PRODUCTION
OUTDOOR LEARNING
COMMUNAL SPACE



SPORT AREA
HOSTING EVENTS
ADAPTIVE SACE

MIXED USE - MODES



SCHOOL - PRIMARY

Weekday

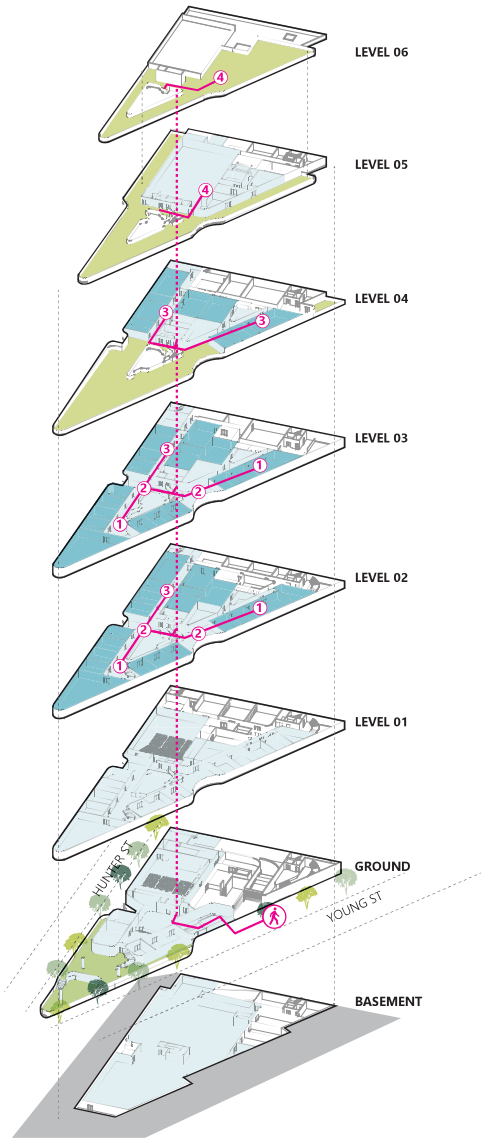


1. In the morning, students go to the auditorium for morning assembly.

2. They then proceed to their classrooms where they engage in various subjects such as english, and mathematics.

3 In the afternoon, students move to the amphitheatre (open space on ground) for science class for collaborative learning.

4. At the end of the day, students wait at the pick-up zone on ground for pick up from their parents.



SCHOOL - SECONDARY

Weekday



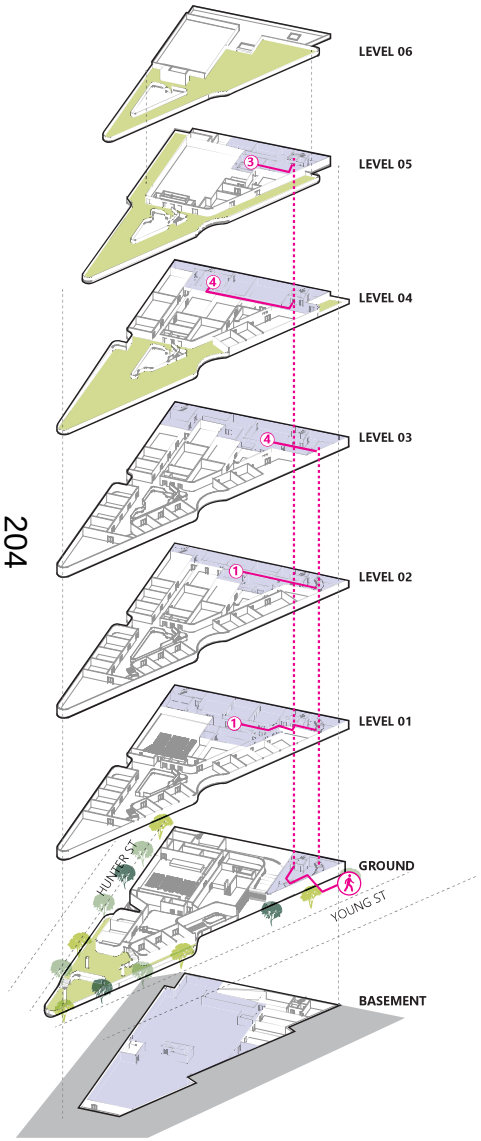
1. In the morning, students move to their classrooms after morning assembly for academic lessons.

2. During recess/lunch time, students go to the passive outdoor space or breakout space to hang out.

3. For creative/technolgoies class, students move to the specialist classrooms for design, woordworking, computer lessons.

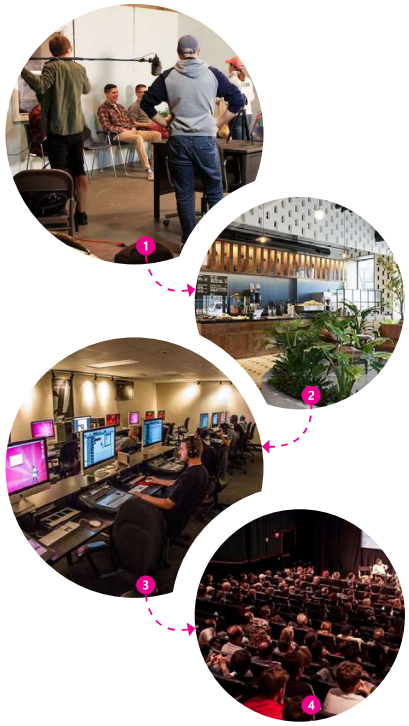
4. During 'free period' for the senior students, some go to the sports court to play games. Others tend to the food production garden.

MIXED USE - MODES



FILM SCHOOL

Weekday, weekend

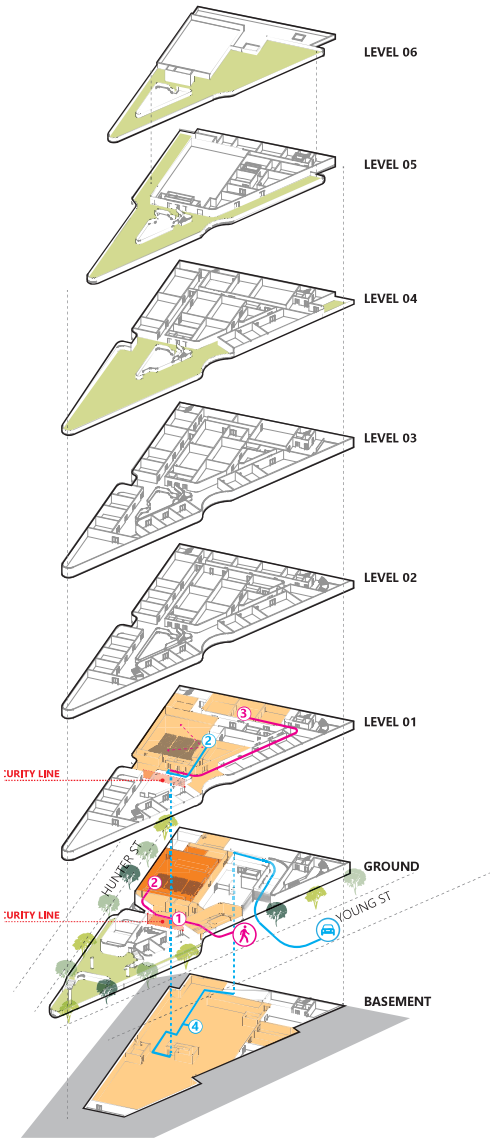


1. Students start their day by attending lectures/workshops.

2. In the afternoon, students head to the cafe on ground for lunch.

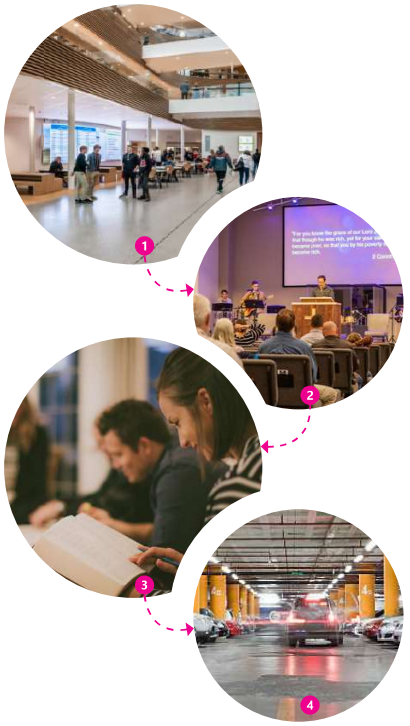
3. In preparation for the film screening, students go to the sound and editing lab for final adjustments.

4. Students and guests attend the screening in the cinema to watch and enjoy the final film.



COMMUNITY / SHARED USE

Before & after school hours, weekends



1. In the morning, people gather in the foyer space before going into the auditorium for the community gathering.

2. During the gathering, people intently listen to the various guest speakers.

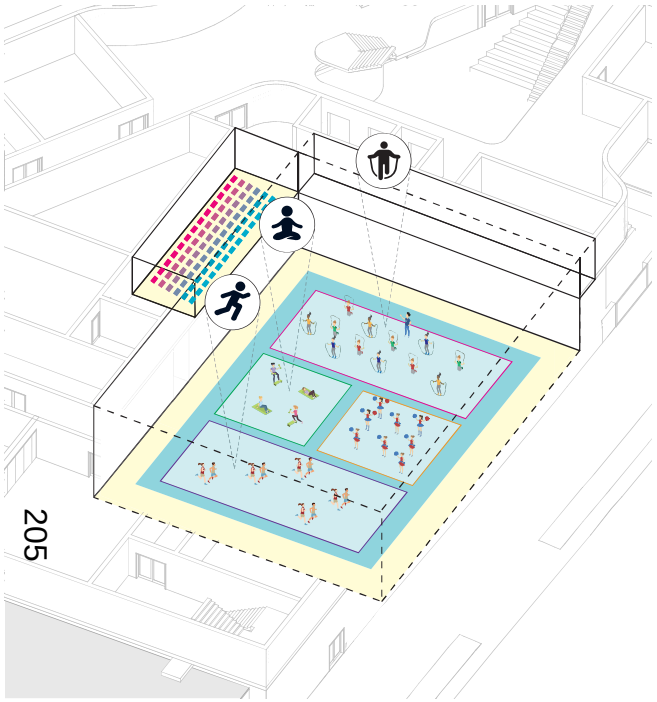
3. After the various guest presentations, some people head to the flexible rooms on level 01 to have further community discussions.

4. People go back to the basement to pick up their car and drive to their next activity/ destination.

PROGRAMMATIC OPERATIONS

AUDITORIUM MODES

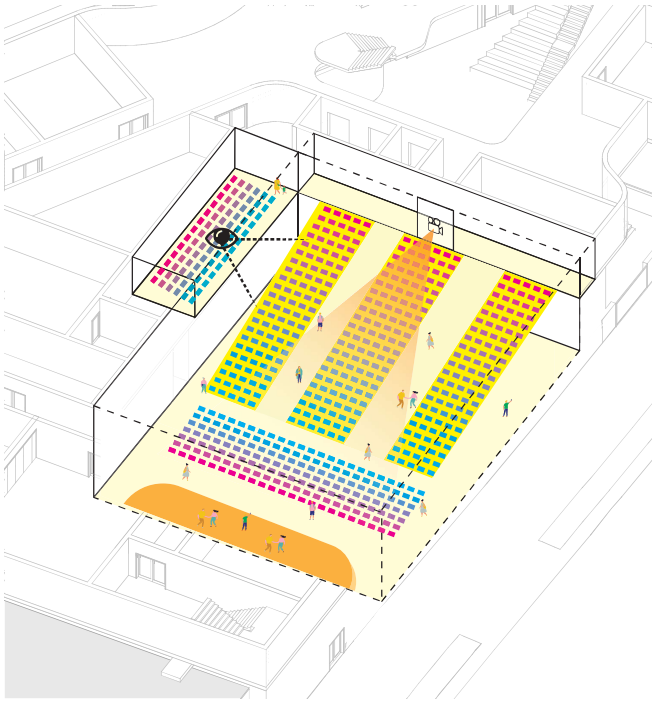
SPORT MODE





SCHOOL EXERCISE PROGRAM
COMMUNITY SPORT COMPETITION
WEEKEND YOGA CLASS
REGULAR SCHOOL HIRE

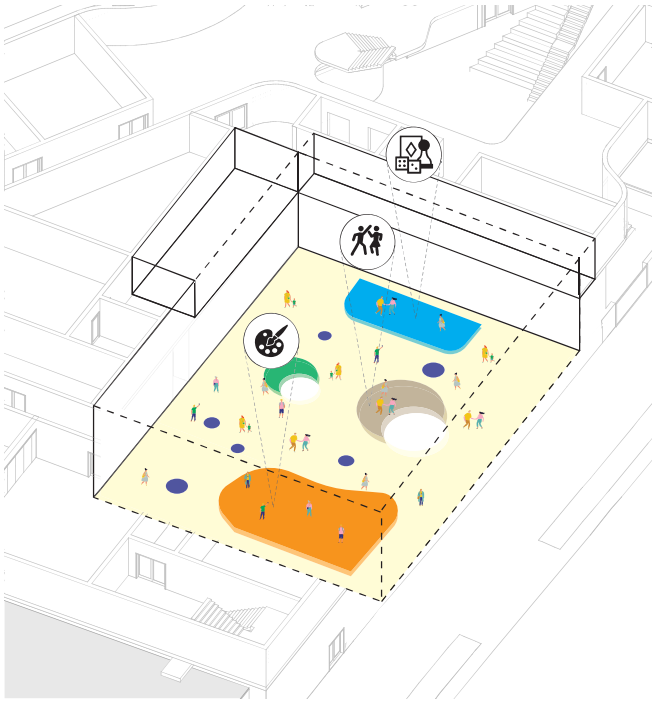
SEATING MODE





PERFORMANCE AND PLAYS
SCHOOL ASSEMBLY
COMMUNITY GATHERING
GUEST SPEAKER

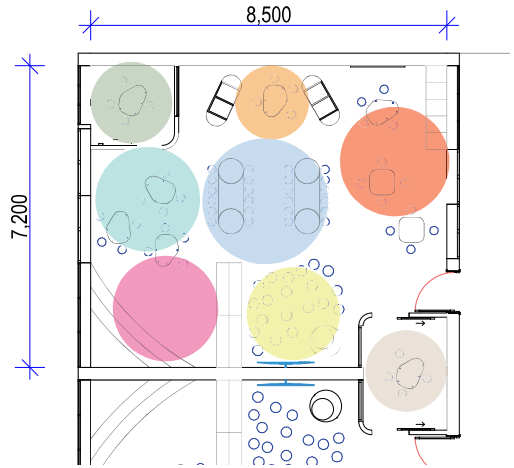
FLAT MODE

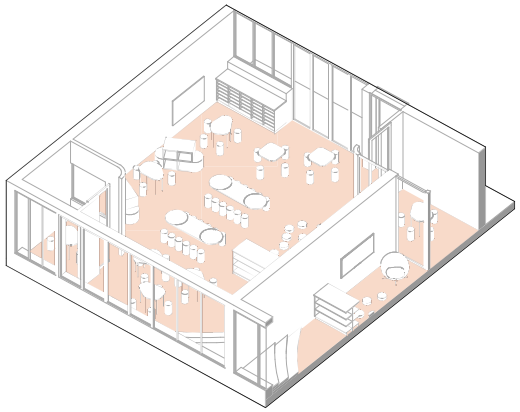




SCHOOL ART EXHIBITION
WEEKEND LOCAL MARKET
SCHOOL DISCO
FASHION HALL

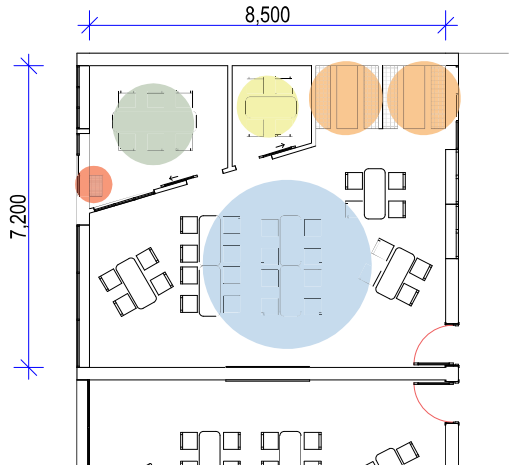
FLEXIBLE CLASSROOM MODULES

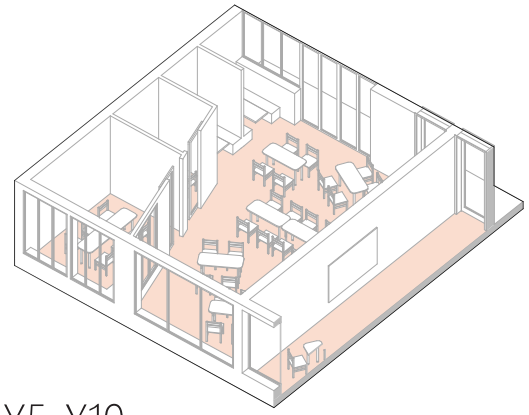




K-Y4

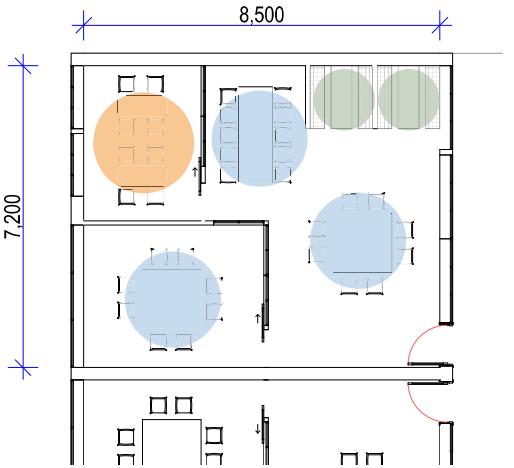
- **SHARED READING HUB**
  1 x WALL MOUNTED LCD
  1 x MODULAR BOOK SHELF
- **CENTRALISE LEARNING SPACE**
  24 x SEATS
  2 x LONG TABLE
  1 x MOBILE WHITE BOARD
- **MATHS WALL**
  1 x MATHS WALL
  30 x TRAY STORAGE
- **READERS HUB**
  PLATFORM SEATINGS
  1 x MODULAR BOOK SHELF
- **WRITER SPACE**
  12 x SEATS
  3 x TABLE
- **ACCELERATED INTERVENTION**
  1 x TEACHING STATION
- **READERS HUB**
  TECH HUB STORAGE
  1 x TABLE
- **SHARED BREAKOUT ROOM**
  5 x SEATS

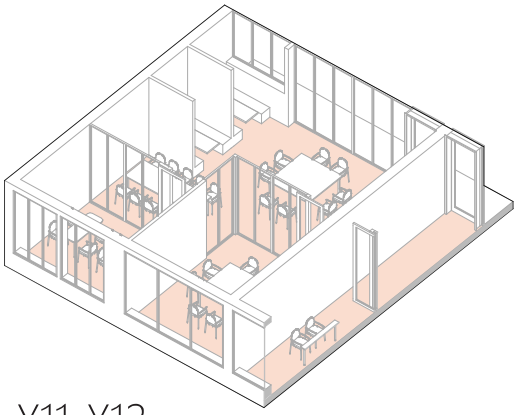




Y5-Y10

- **BREAK OUT ROOM**
  1 x TABLE
  4 x CHAIRS
- **CENTRALISE LEARNING SPACE**
  24 x SEATS
  6 x LONG TABLE
  1 x WALL MOUNTED WHITE BOARD
- **PEER REVIEW OBSERVATION**
- **COLLABORATION BOOTH**
  4 x STUDENT PER BOOTH WITH LCD





Y11-Y12

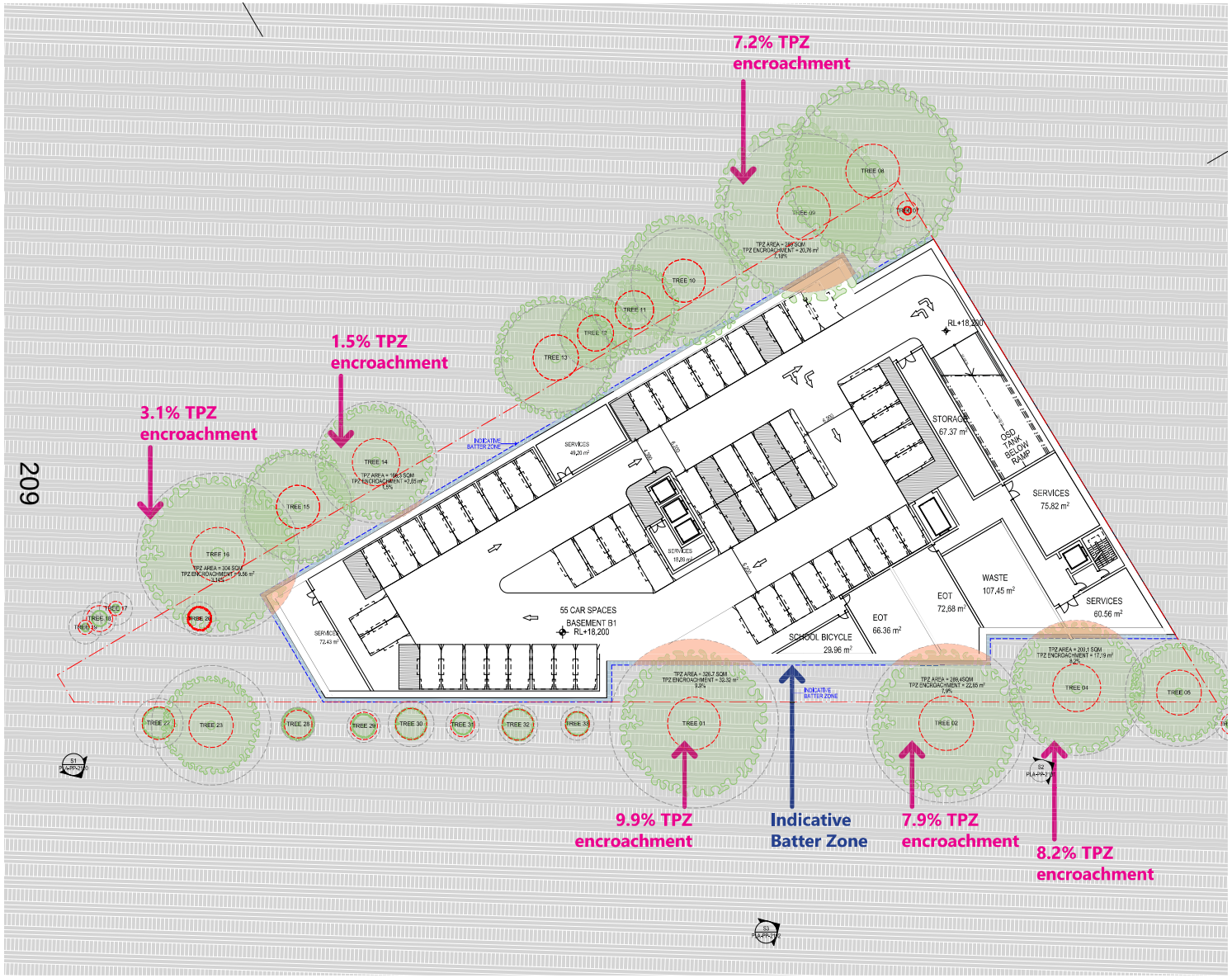
- **COLLABORATION BOOTH**
  4 x STUDENT PER BOOTH WITH LCD
- **ELECTIVE LEARNING SPACE**
  26 x SEATS
  3 x LARGE TABLE
- **PEER REVIEW OBSERVATION**
- **WITHDRAWL**
  4 x STUDENT PER TABLE
  2 x TABLE

Attachment A2-5

Urban Design Report

07
APPENDIX

TREES STRATEGY - BASEMENT



There are several street trees surrounding the site with a mix of reduced quality and high value.

Following an arborist report and further development on the plans, the current proposal achieves the following:

General

- There is no SRZ encroachment
- All street trees maintained, except the ones identified as Retention Value R or C, which are trees recommended to be removed, or of reduced quality.

B01

- All TPZ encroachments in basement are less than 10%. The TPZ encroachments also factor in an indicative batter zone.

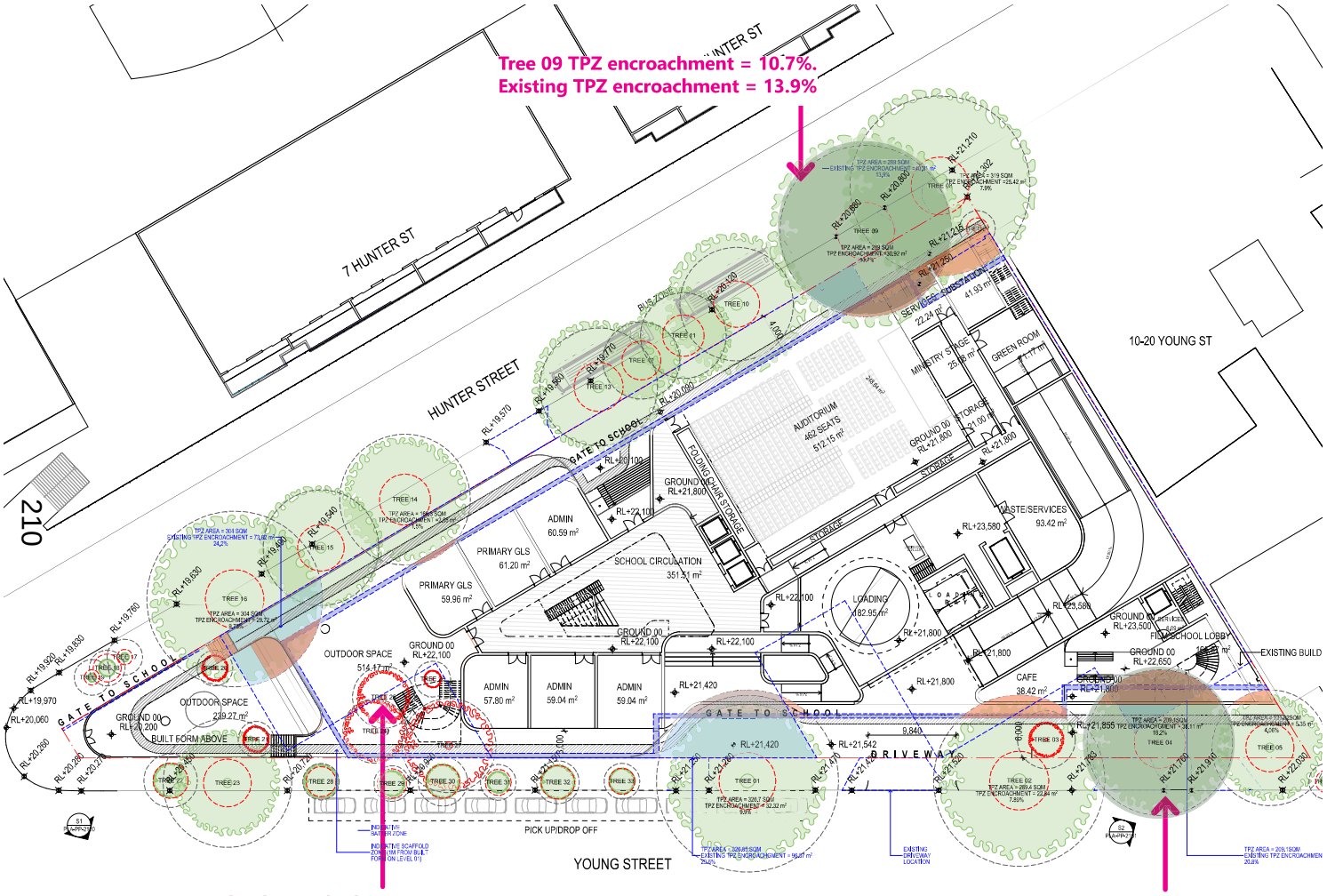
Ground

- Two trees have a TPZ encroachment higher than 10%, however, in each case, the existing built form had an even greater TPZ encroachment. Note: TPZ encroachments also factor in the indicative batter zone from basement.

Upper Levels

- Several tree canopies are encroached on the upper levels. 3D views comparing the massing and the 3d point cloud have been prepared

TREES STRATEGY - GROUND



There are several street trees surrounding the site with a mix of reduced quality and high value.

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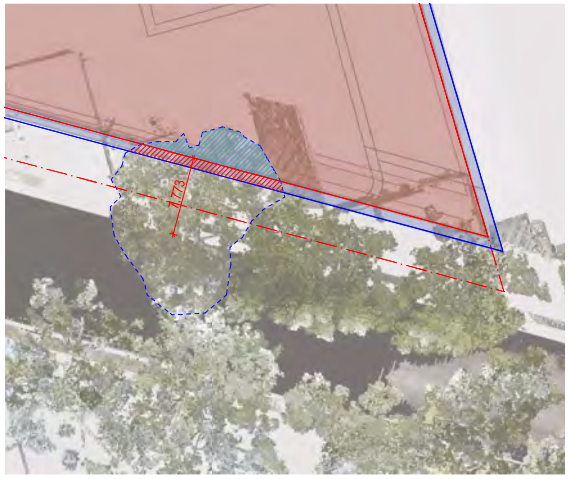
Retained Tree - TPZ encroachment <10%

Retained Tree - TPZ encrochament >10% (minor)

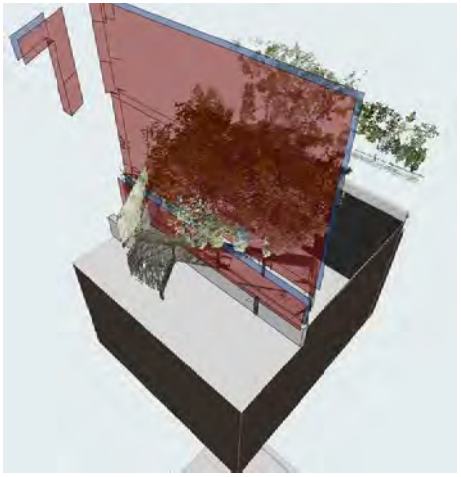
Tree to be demolished (Retention Value R or C)

APPENDIX

TREES STRATEGY - CANOPIES



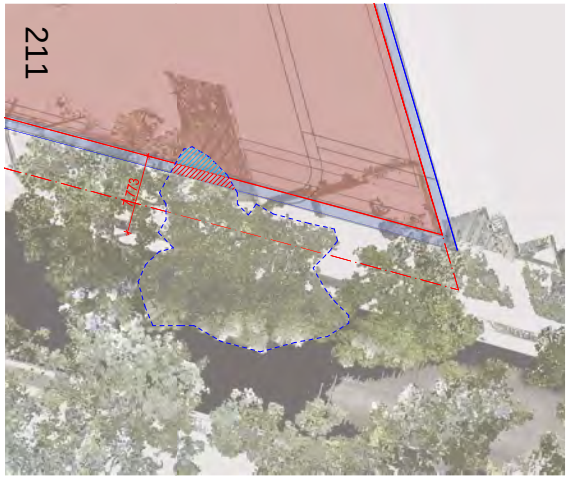
TREE 02 - PLAN



TREE 02 - 3D VIEW



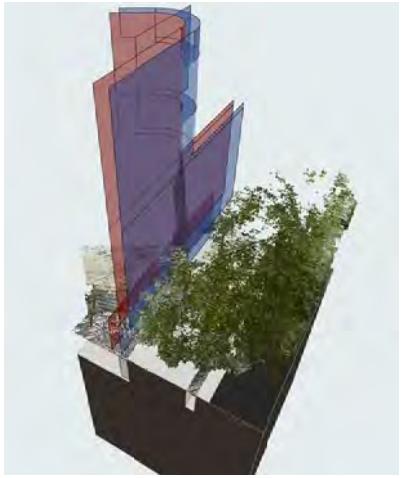
TREE 02 - 3D VIEW



TREE 04 - PLAN



TREE 04 - 3D VIEW



TREE 04 - 3D VIEW

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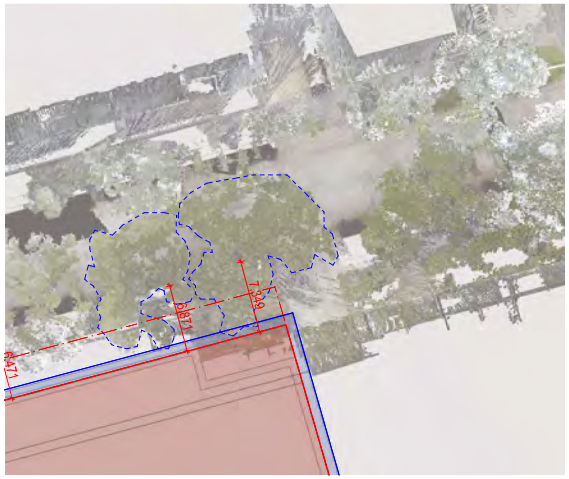
Tree Canopy (as derived from Point Cloud)

Proposed Built Form

Scaffolding

APPENDIX

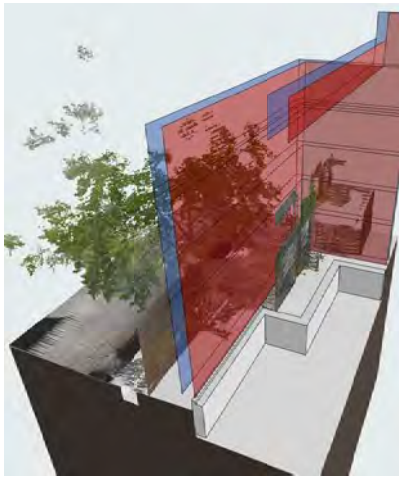
TREES STRATEGY - CANOPIES



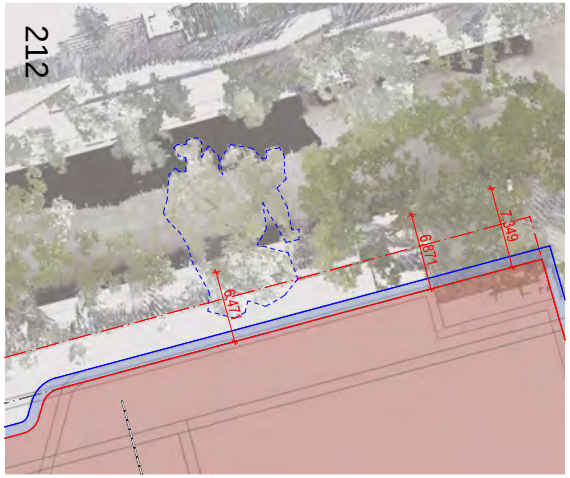
TREE 08+09 - PLAN



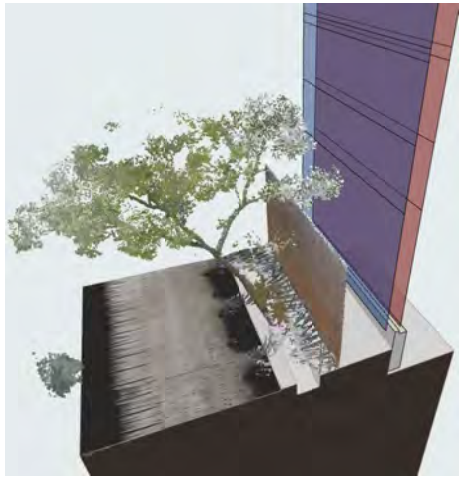
TREE 08+09 - 3D VIEW



TREE 08+09 - 3D VIEW



TREE 10 - PLAN



TREE 10 - 3D VIEW



TREE 10 - 3D VIEW

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Ground

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Upper Levels

- Several tree canopies are encroached on the upper levels. 3D views comparing the massing and the 3d point cloud have been prepared

Tree Canopy (as derived from Point Cloud)

Proposed Built Form

Scaffolding

APPENDIX

TREES STRATEGY - CANOPIES



TREE 14 - PLAN



TREE 14 - 3D VIEW



TREE 14 - 3D VIEW



TREE 15 - PLAN



TREE 15 - 3D VIEW



TREE 15 - 3D VIEW

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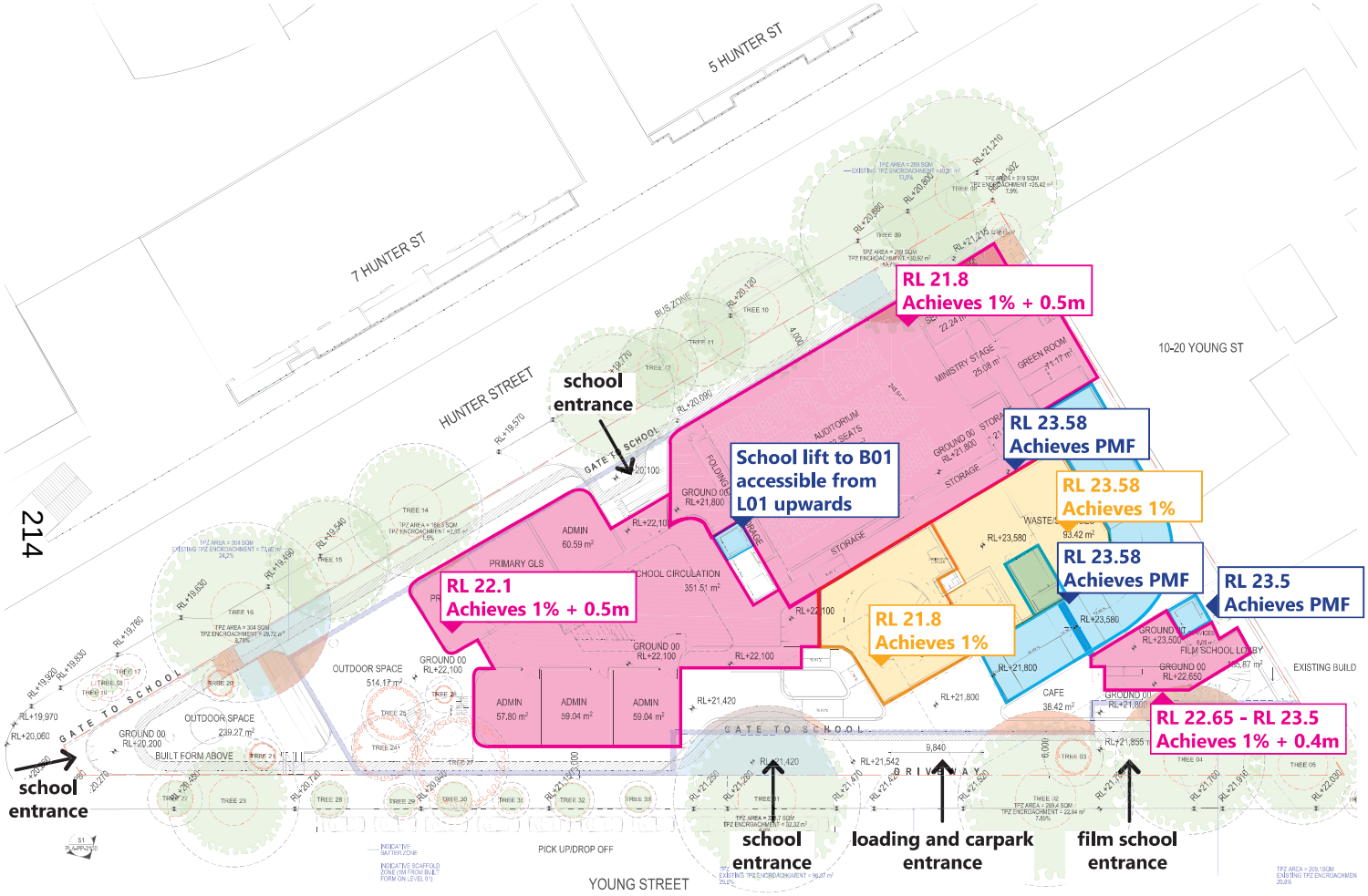
Tree Canopy (as derived from Point Cloud)

Proposed Built Form

Scaffolding

APPENDIX

FLOODING STRATEGY



Non habitable (minimum 1% AEP)

Habitatble (minimum 1% AEP + 0.4 / 0.5m)

Basement penetration (minimum PMF)

The proposed site has flooding issues on both Hunter Street and Young Street. Following a flooding assessment, the level on the ground have been amended to achieve the following:

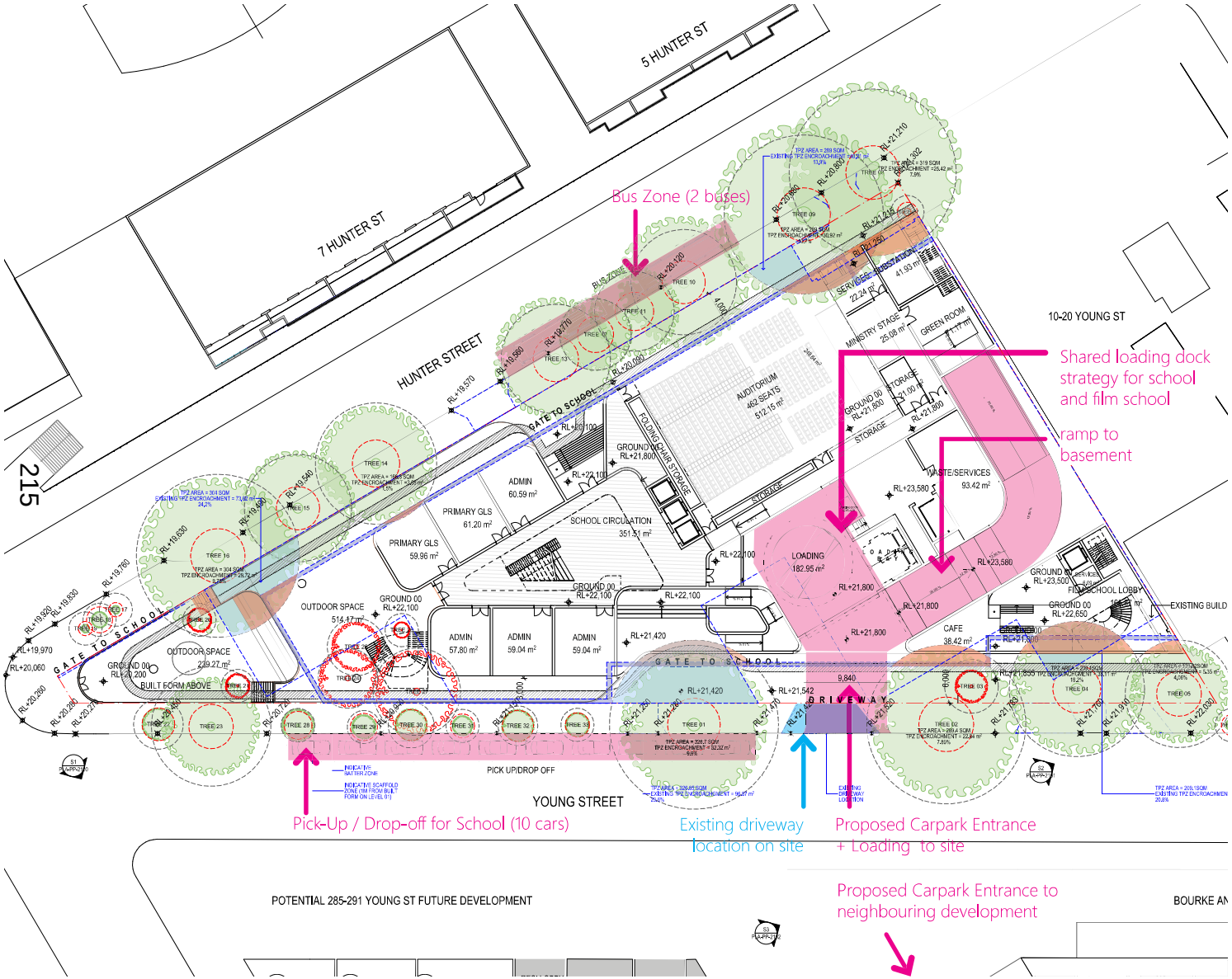
- All basement penetrations (ramps, stairs, lifts) are at the PMF level
- Most ground floor habitable areas are at 1% AEP + freeboard (0.4m or 0.5m depending on circumstance) except for some areas near entrances

School Lift Core Arrangement

to ensure openings below RL 23.5 do not flood the basement



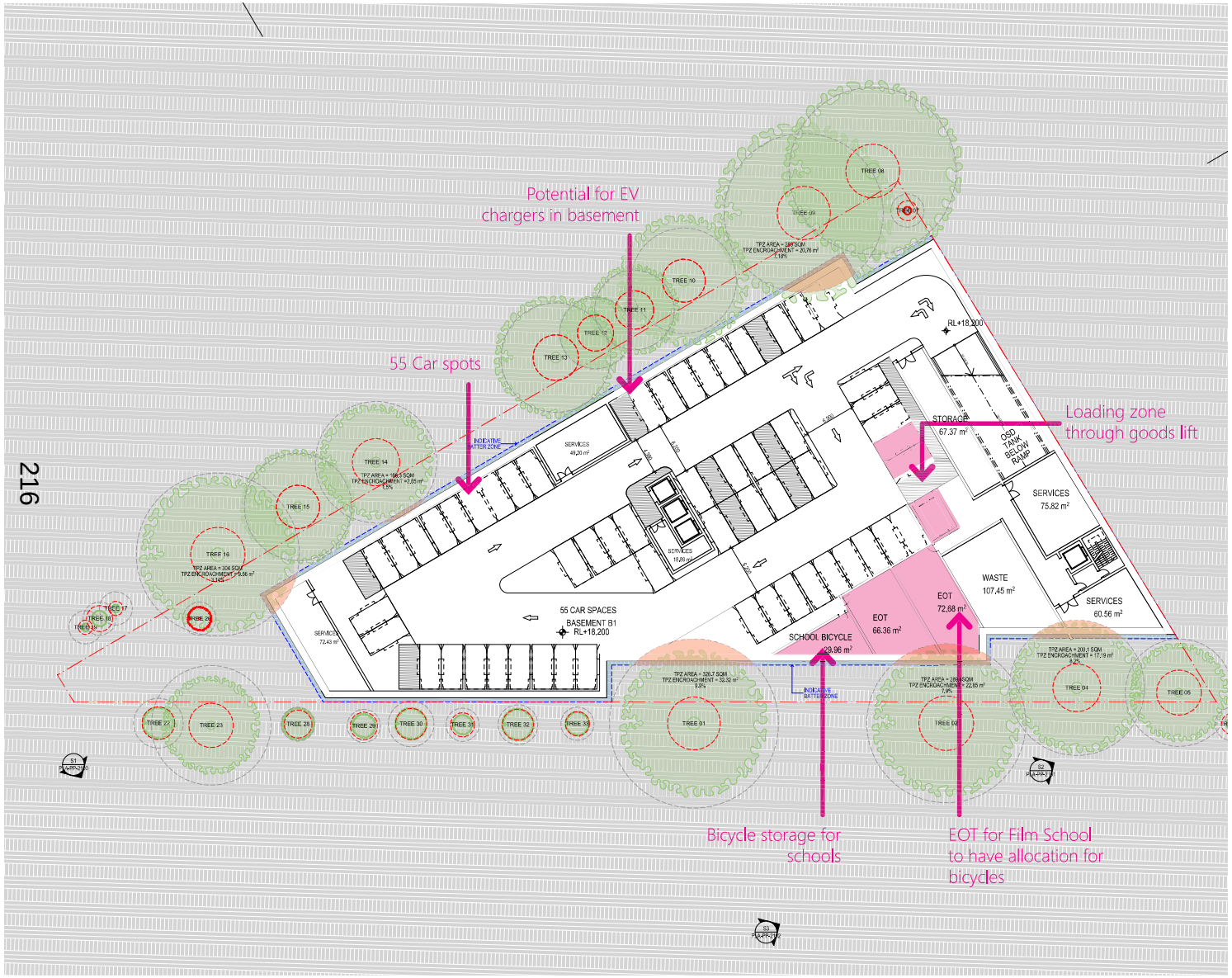
TRAFFIC STRATEGY - GROUND



- The proposed carpark entrance and loading dock entrance is off Young Street, which is located at an existing driveway to the site.
- Loading dock is used by the school and the film school during the weekdays, and by the shared community on the weekend.
- The proposed pick-up/drop-off zone for the school sits along Young Street. These locations are to reduce impacts to Hunter Street.
- A bus zone for the school is located on Hunter Street.

APPENDIX

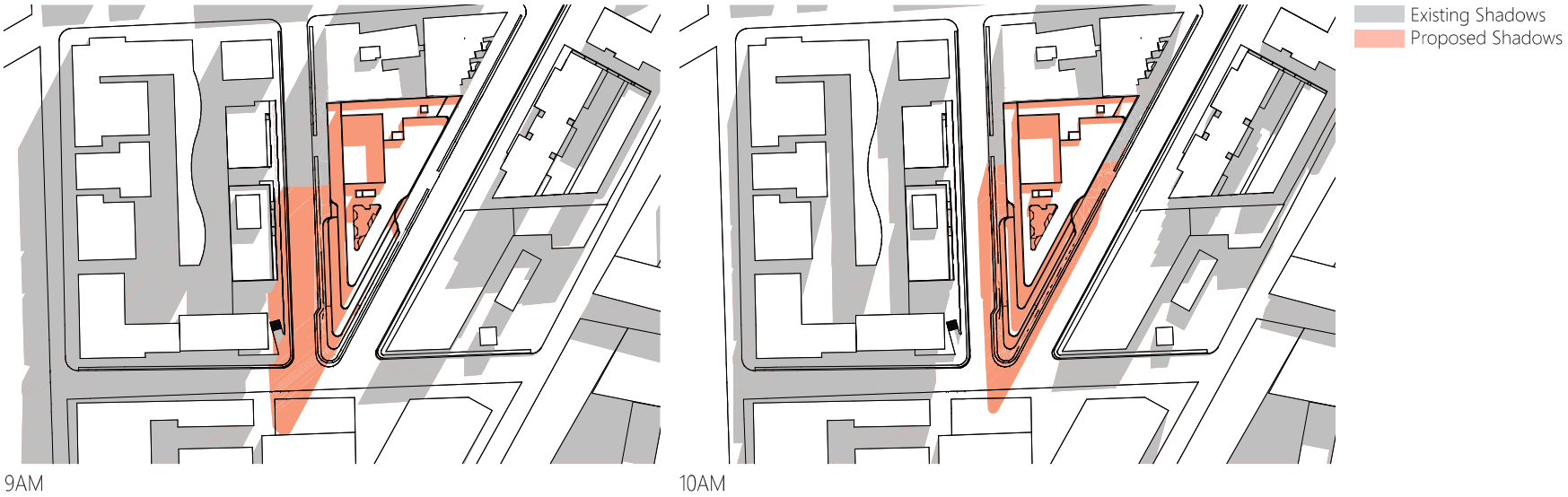
TRAFFIC STRATEGY - LOWER GROUND



- The basement holds 55 car spots, which will be used by the school and film school during the weekdays, and the shared community during the weekend.
- The basement car park will have the potential for EV chargers
- EOT for the film school will have the option for bicycles
- Bicycle parking for the school will also be stored in the basement

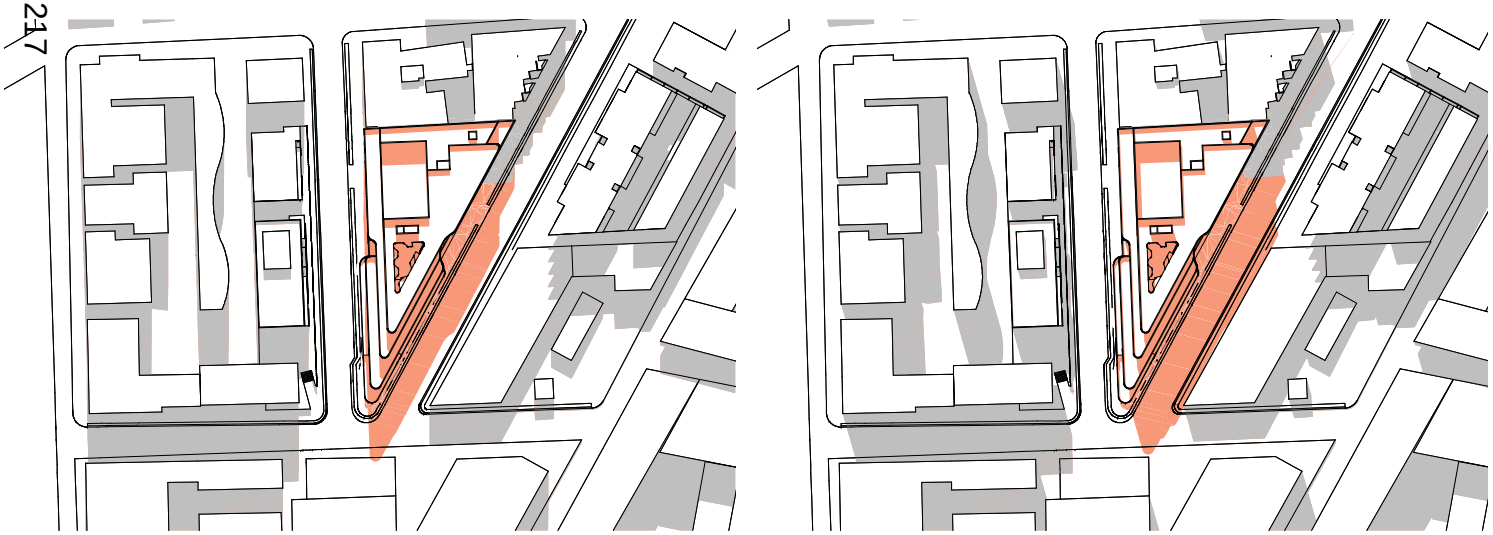
APPENDIX

SHADOW DIAGRAMS (WINTER SOLSTICE)



9AM

10AM

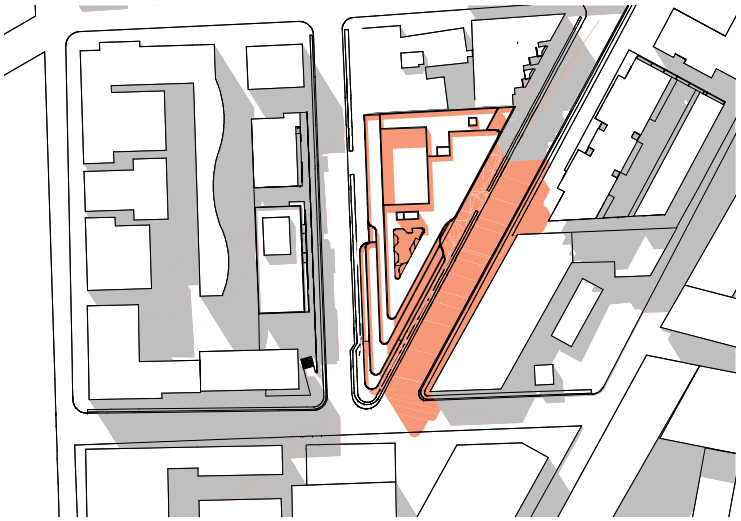


11AM

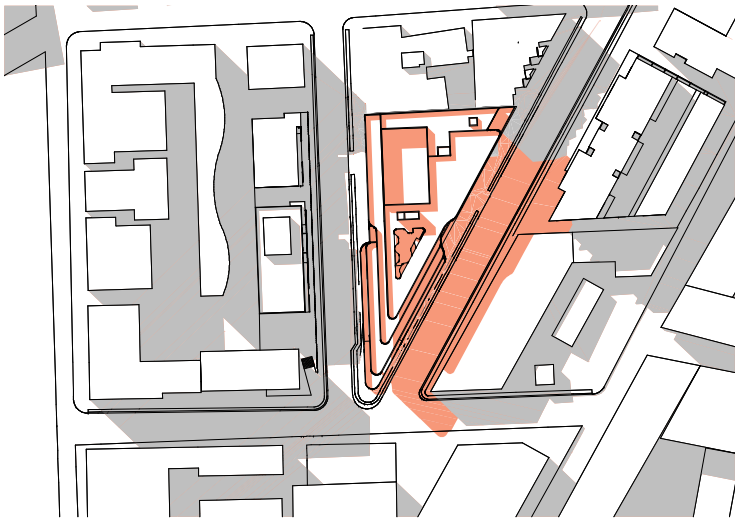
12PM

APPENDIX

SHADOW DIAGRAMS (WINTER SOLSTICE)

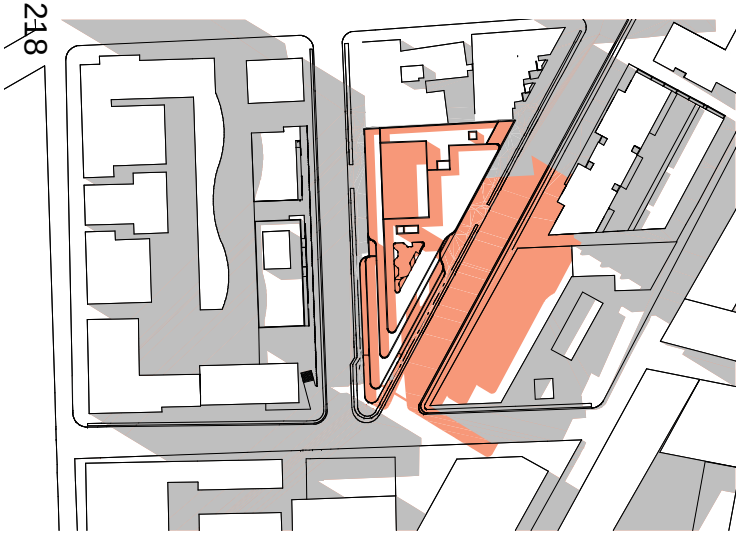


1PM



2PM

Existing Shadows
Proposed Shadows

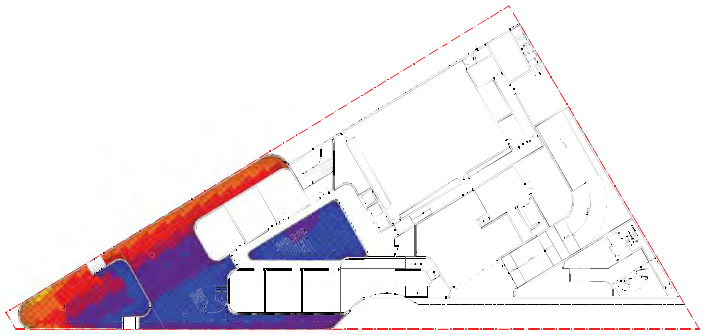


3PM

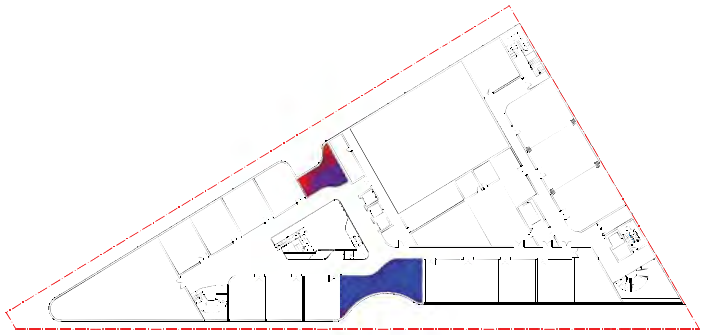
APPENDIX

OPEN SPACE SOLAR STUDY (WINTER SOLSTICE)

These diagrams illustrates the amount of time the school open space receives direct sunlight during winter solstice (9am-3pm).



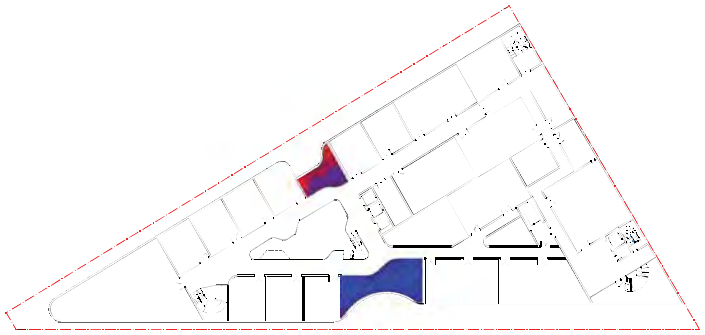
GROUND 00



LEVEL 01



LEVEL 02



LEVEL 03

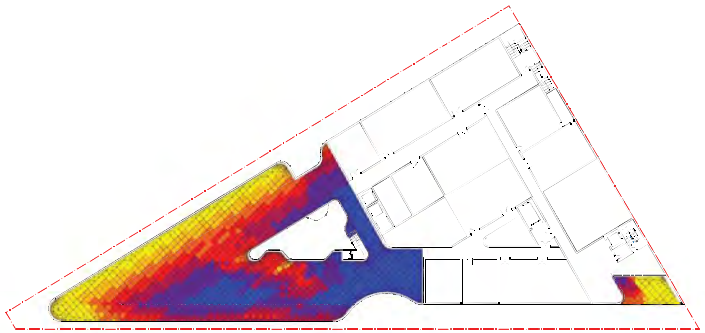


Note:
This is an indicative solar study taken on winter solstice between 9am to 3pm. Data is indicative only and is subject to being verified by an expert consultant.

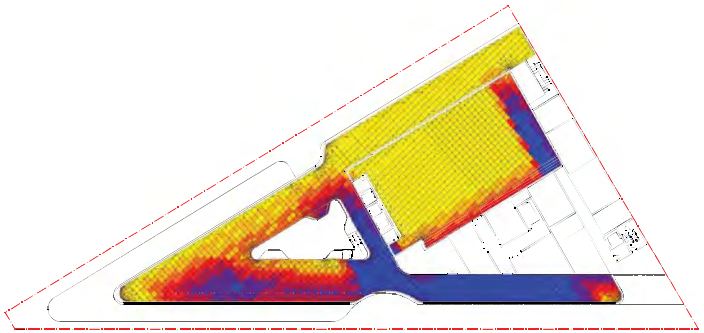
APPENDIX

OPEN SPACE SOLAR STUDY (WINTER SOLSTICE)

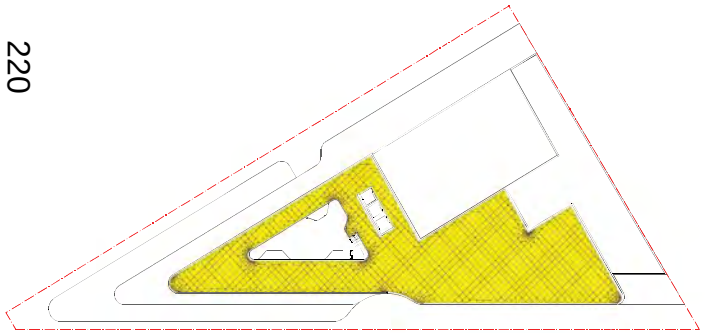
These diagrams illustrates the amount of time the school open space receives direct sunlight during winter solstice (9am-3pm).



LEVEL 04



LEVEL 05



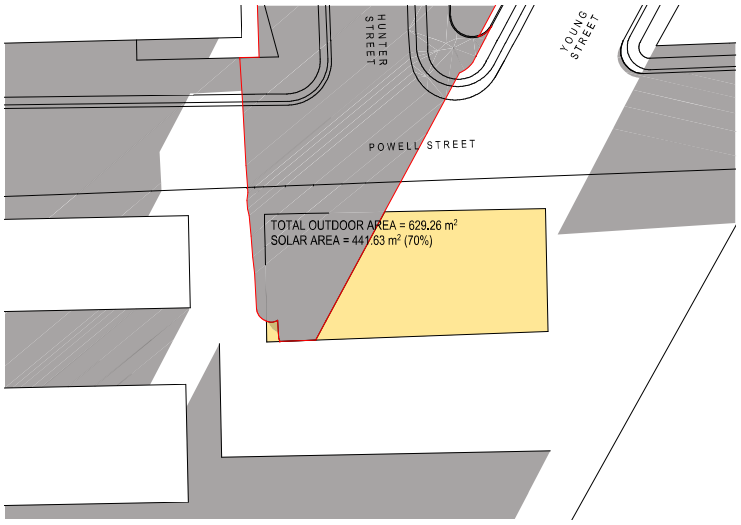
LEVEL 06



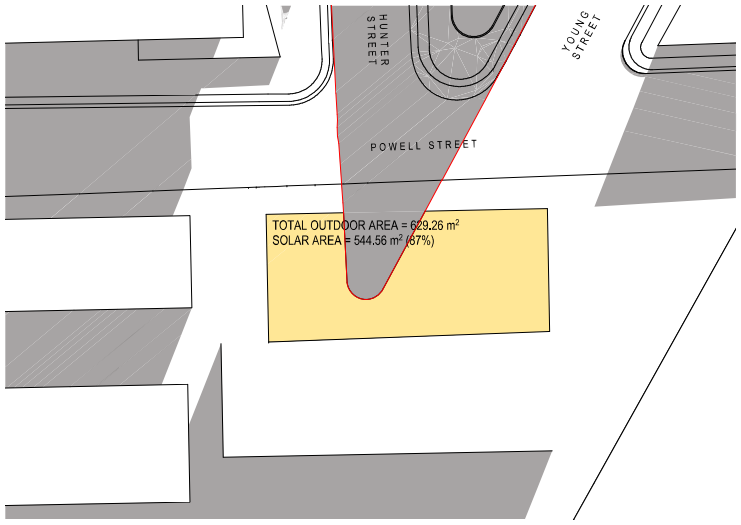
Note:
This is an indicative solar study taken on winter solstice between 9am to 3pm. Data is indicative only and is subject to being verified by an expert consultant.

APPENDIX

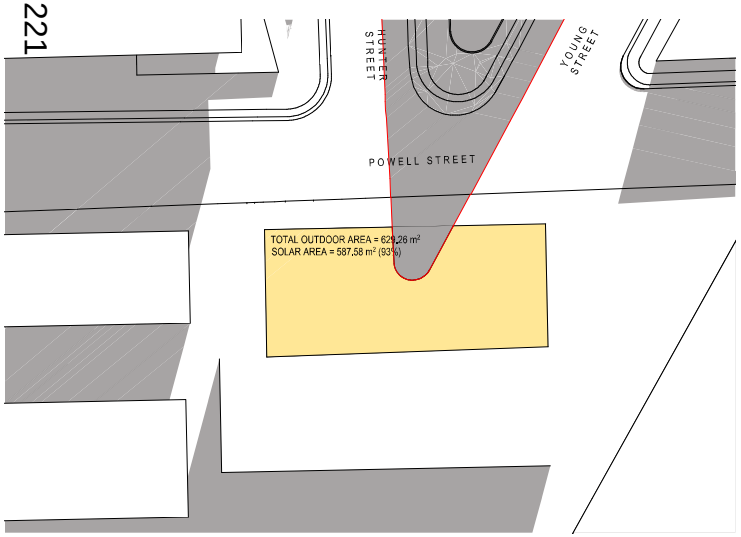
SOLAR ACCESS TO EXISTING NEIGHBOURING OUTDOOR AREA



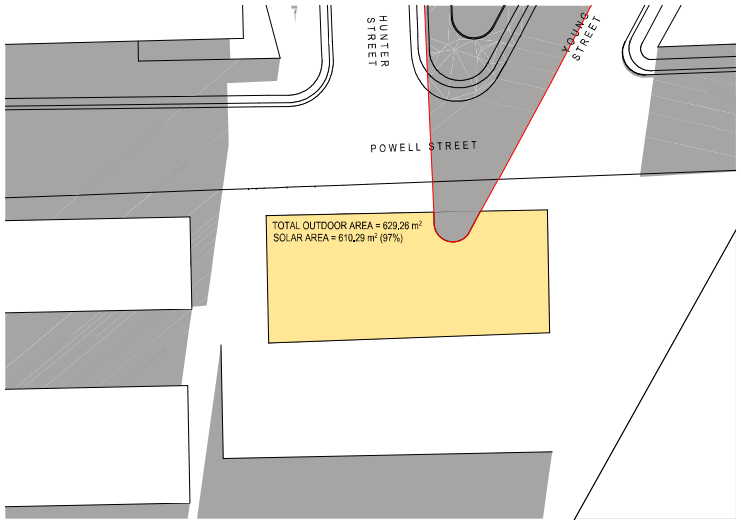
9AM



9:30AM



10AM



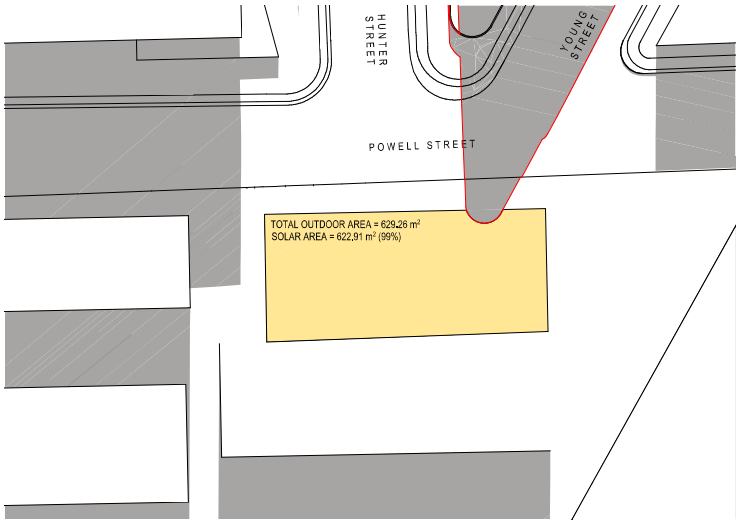
10:30AM

The neighbouring outdoor area to the south achieves the minimum 4 hours of solar access to more than 85% of its area from 9am to 3pm (winter solstice).

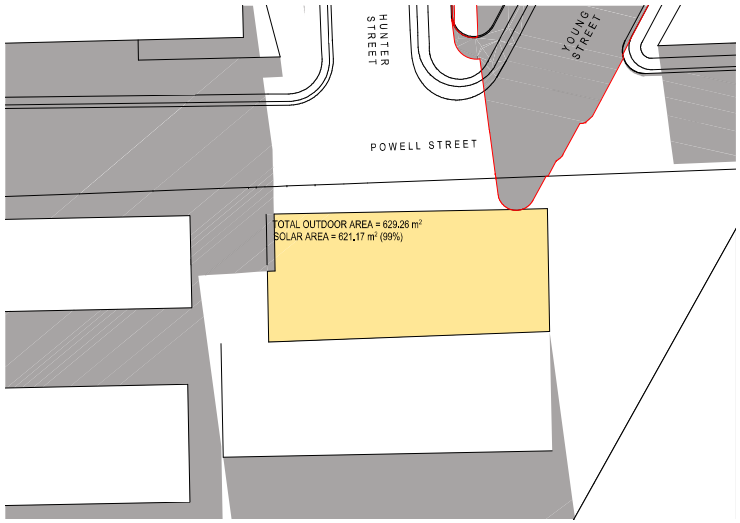
Existing Shadows
Proposed Shadows
Solar Access in Neighbouring Outdoor Area

APPENDIX

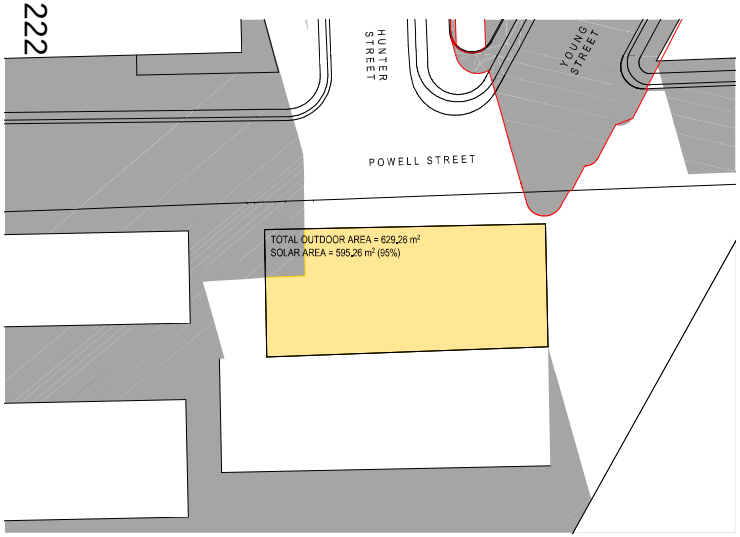
SOLAR ACCESS TO EXISTING NEIGHBOURING OUTDOOR AREA



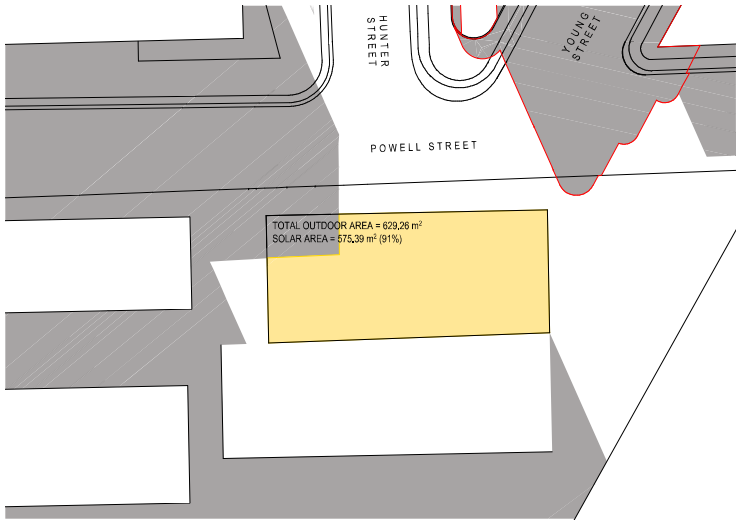
11AM



11:30AM



12PM



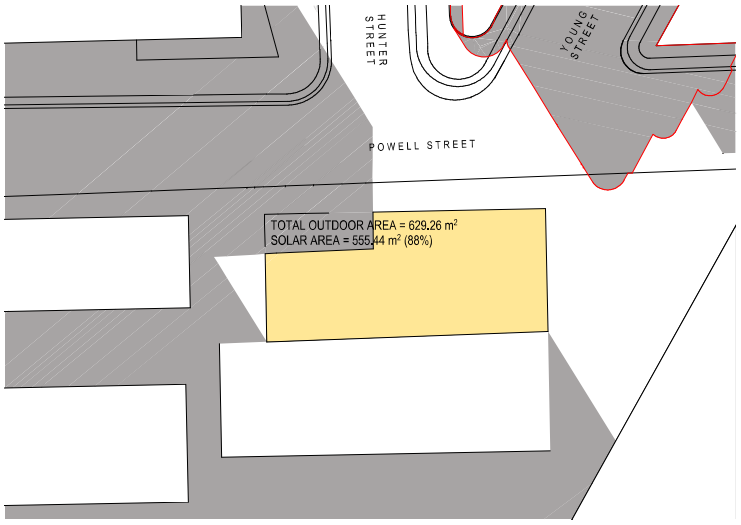
12:30PM

The neighbouring outdoor area to the south achieves the minimum 4 hours of solar access to more than 85% of its area from 9am to 3pm (winter solstice).

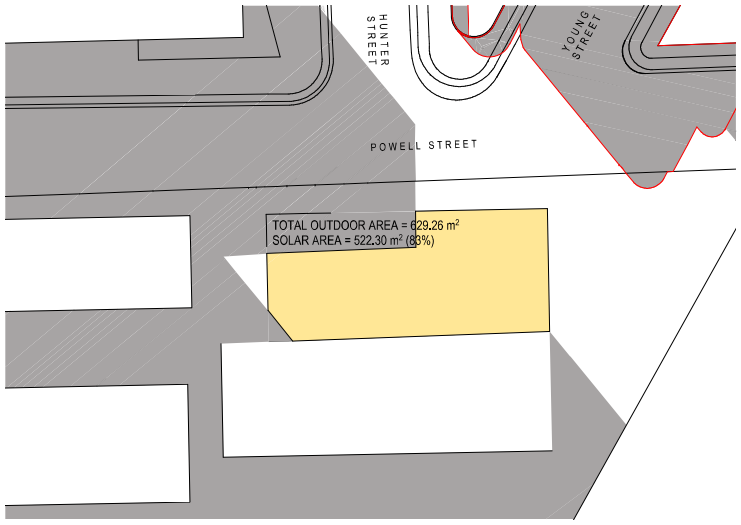
Existing Shadows
Proposed Shadows
Solar Access in Neighbouring Outdoor Area

APPENDIX

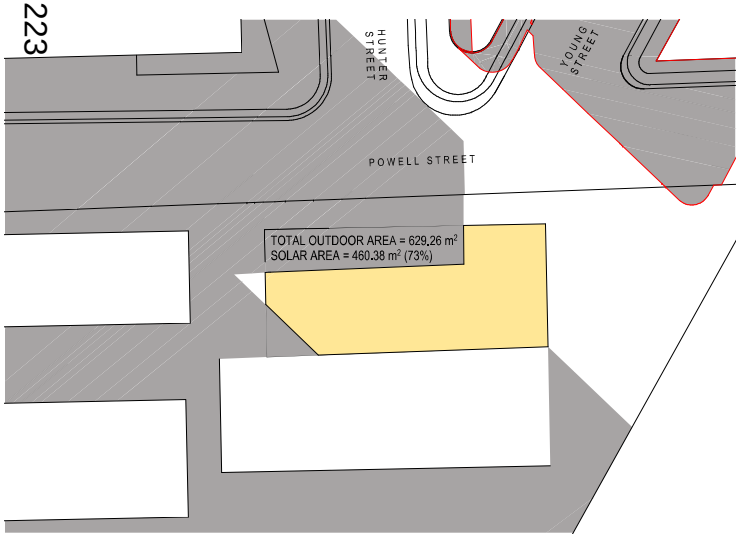
SOLAR ACCESS TO EXISTING NEIGHBOURING OUTDOOR AREA



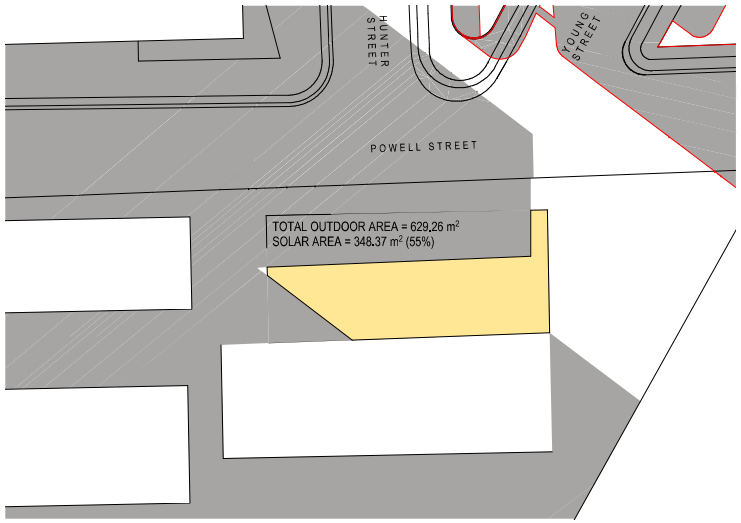
1PM



1:30PM



2PM



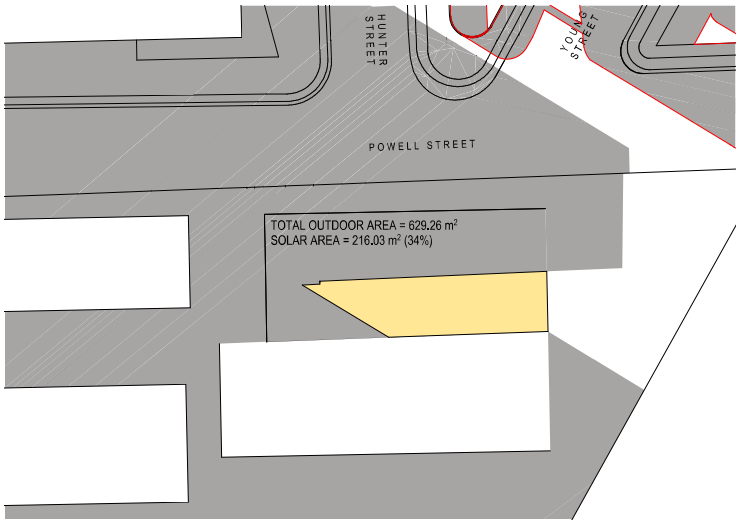
2:30PM

The neighbouring outdoor area to the south achieves the minimum 4 hours of solar access to more than 85% of its area from 9am to 3pm (winter solstice).

Existing Shadows
Proposed Shadows
Solar Access in Neighbouring Outdoor Area

APPENDIX

SOLAR ACCESS TO EXISTING NEIGHBOURING OUTDOOR AREA



3PM

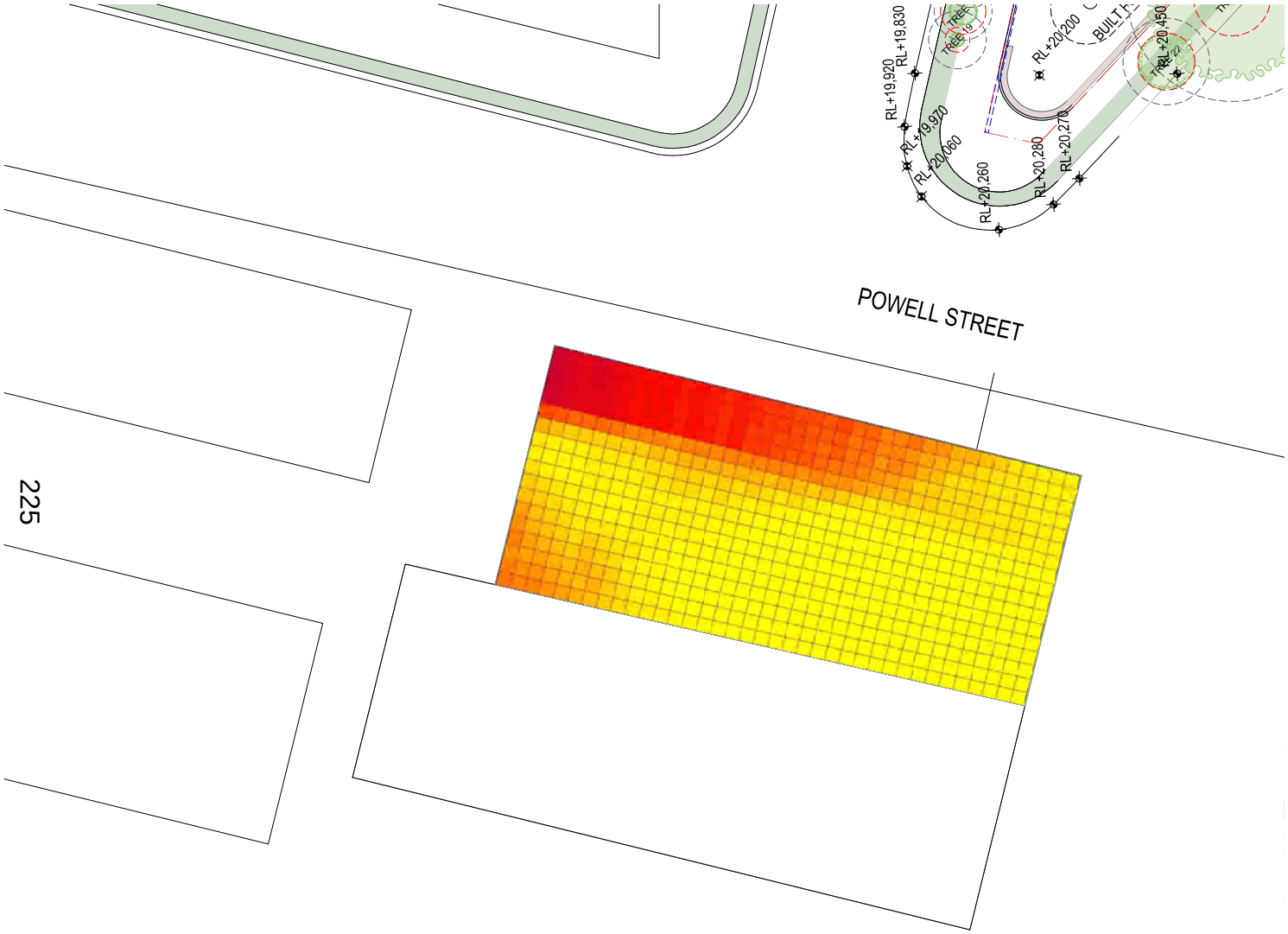
224

The neighbouring outdoor area to the south achieves the minimum 4 hours of solar access to more than 85% of its area from 9am to 3pm (winter solstice).

Existing Shadows
Proposed Shadows
Solar Access in Neighbouring Outdoor Area

APPENDIX

SOLAR ACCESS TO EXISTING NEIGHBOURING PARK



City of Sydney has sought a solar insolation analysis that demonstrates 4 hours of sunlight can be provided continuously over 50% of the park to the south of Powell Street.

The Solar Study demonstrates that 4 hours of sunlight is achieved to 86.7% of the park on June 21 between 9am-3pm, when sunlight is measured at 10-minute intervals. These intervals have been calculated to be exposed to sunlight throughout the interval.

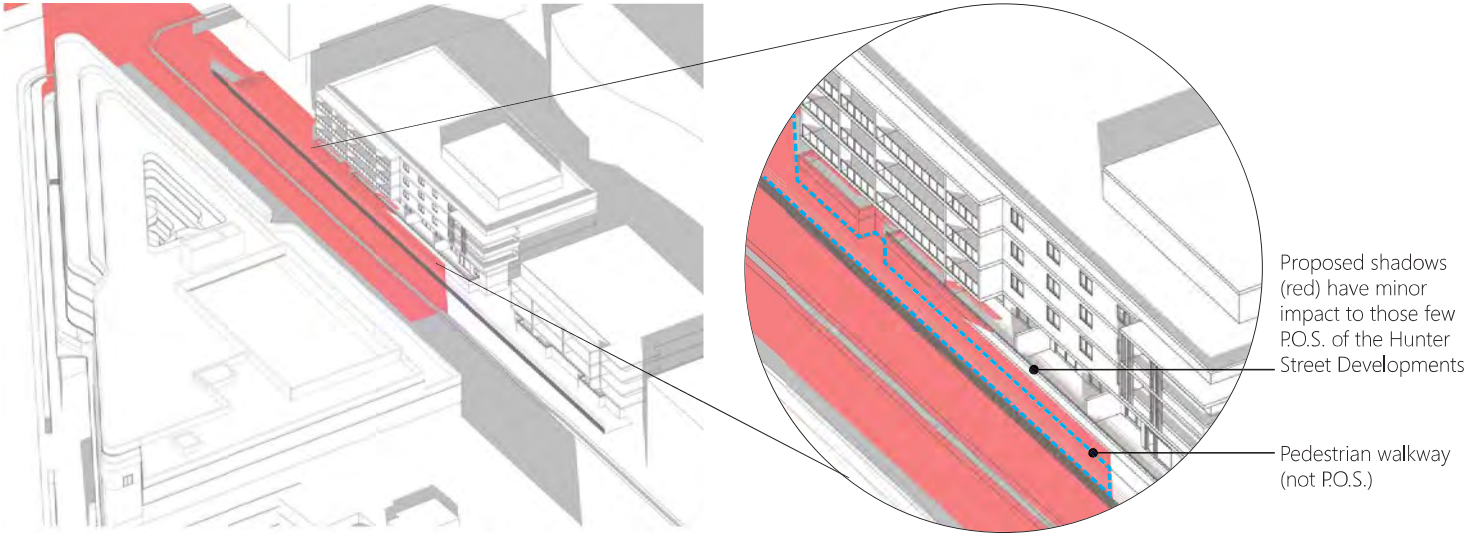
SITE AREA (SQM)	> 3 HRS	> 4 HRS	> 5 HRS	6 HRS
629.26	604.9	545.5	462.1	232.5
	96.1%	86.7%	73.4%	36.9%

Note:
This solar study is taken on winter solstice between 9am to 3pm at a 10 minute interval.

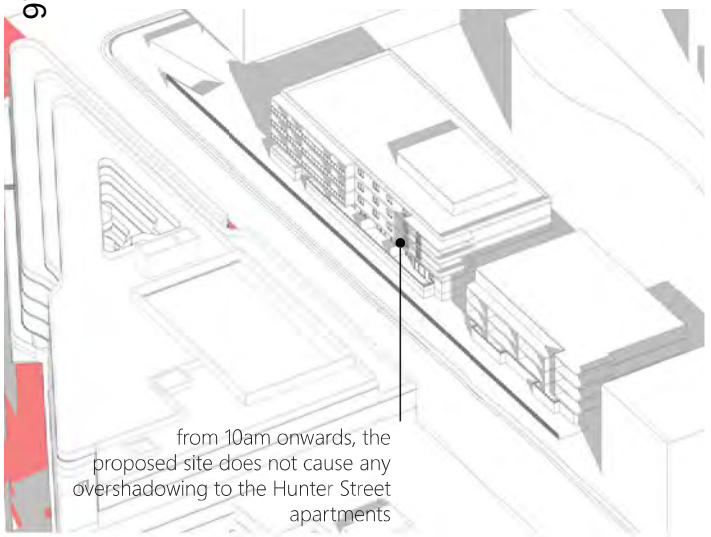
4 Hour Requirement: **50%**
4 Hour Achieved: **86.7%**

APPENDIX

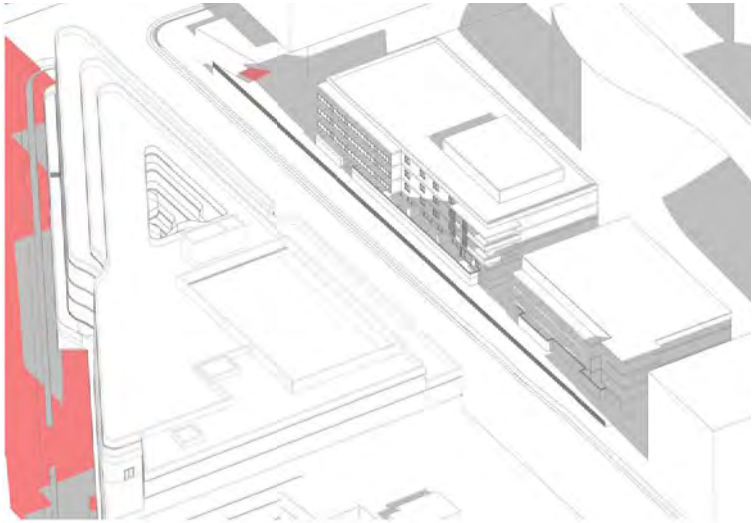
EXISTING HUNTER STREET APARTMENTS - SOLAR ACCESS



9AM



10AM



11AM

The existing developments along Hunter Street are residential apartment blocks. The proposed built form does not cause any additional overshadowing to the apartment living rooms during winter solstice from 9am to 3pm. There is minor overshadowing to three balconies, which only occurs at 9am.

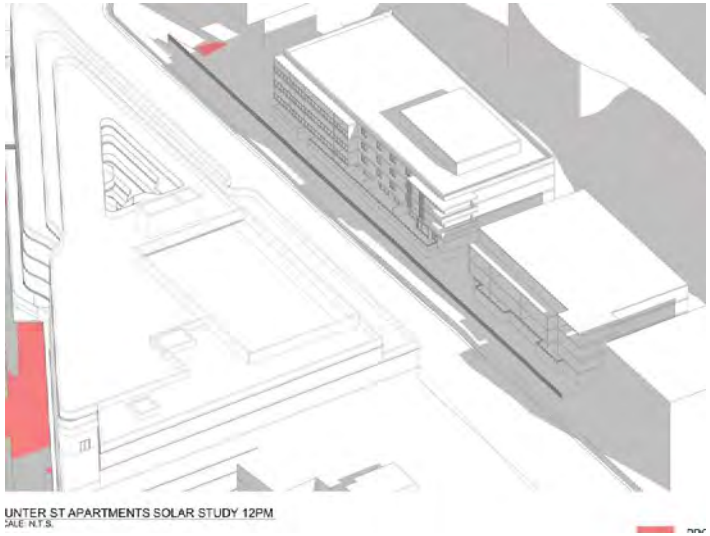
Existing Shadows
Proposed Shadows



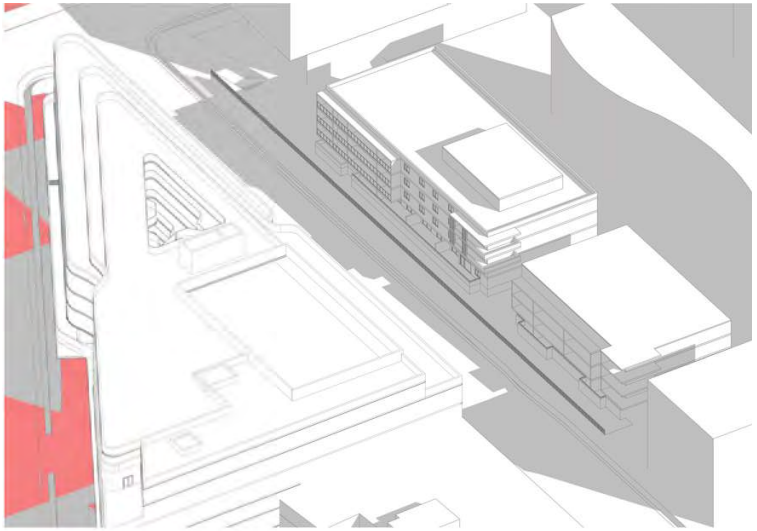
HUNTER STREET APARTMENTS

APPENDIX

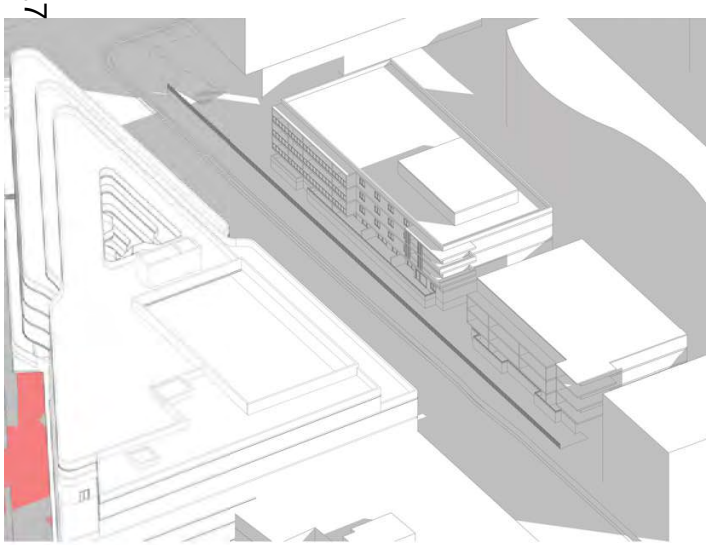
EXISTING HUNTER STREET APARTMENTS - SOLAR ACCESS



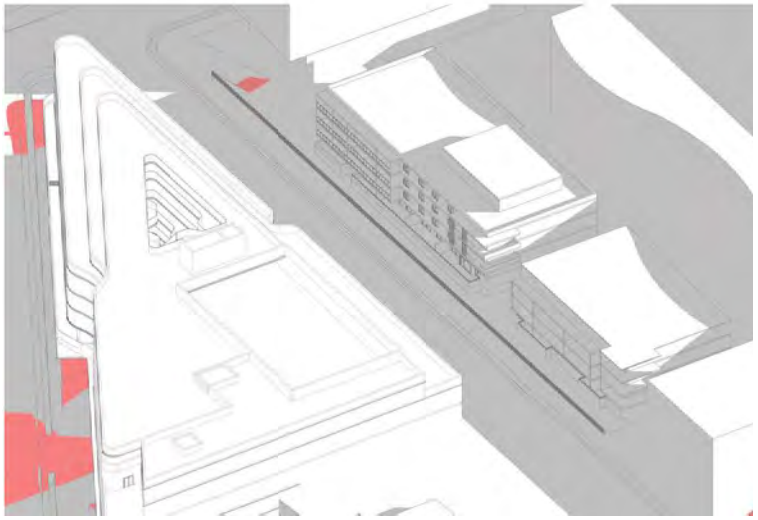
12PM



1PM



2PM



3PM

The existing developments along Hunter Street are residential apartment blocks. The proposed built form does not cause any additional overshadowing to the apartment living rooms during winter solstice from 9am to 3pm. There is minor overshadowing to three balconies, which only occurs at 9am.

Existing Shadows
Proposed Shadows

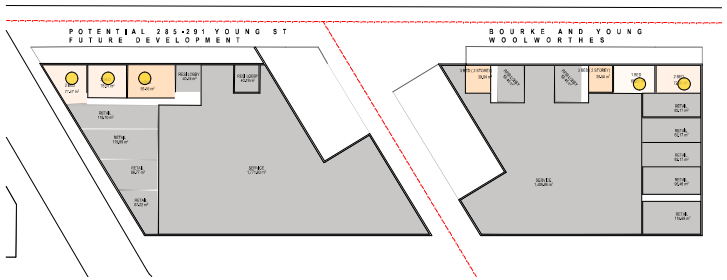
Pedestrian walkway (not P.O.S.)
Balconies and living space
Private open space



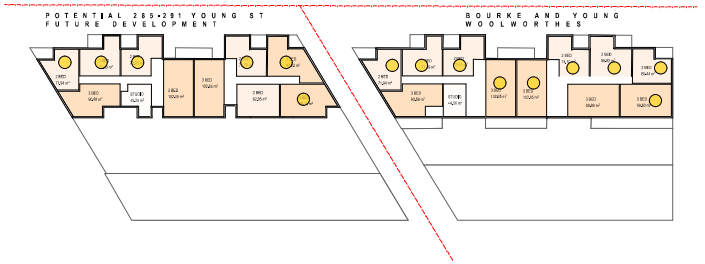
HUNTER STREET APARTMENTS

APPENDIX

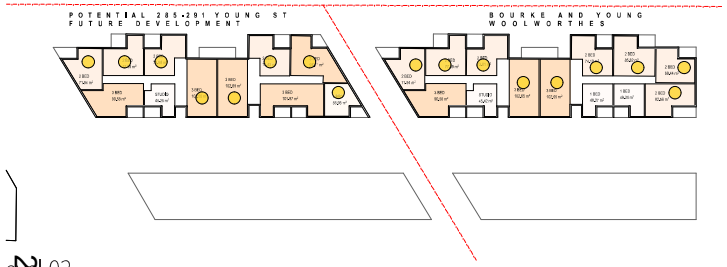
FUTURE YOUNG STREET DEVELOPMENT - SOLAR ACCESS PLANS



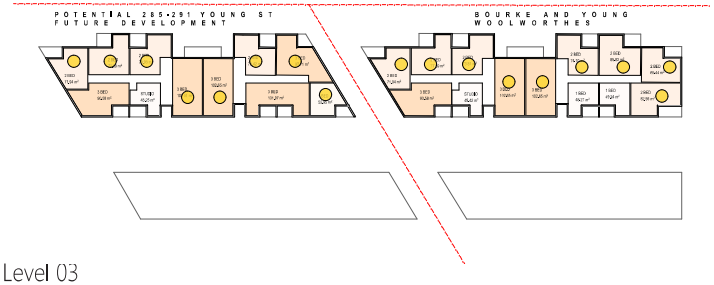
Ground



Level 01



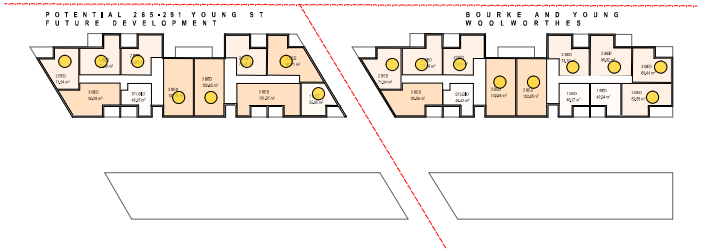
Level 02



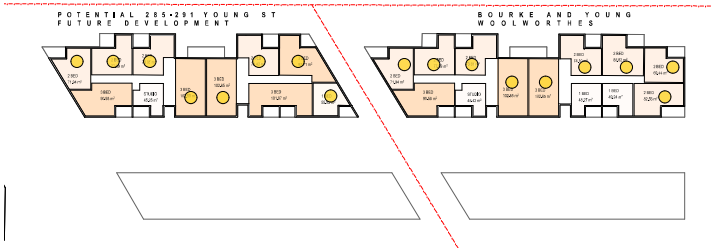
Level 03



Level 04



Level 05



Level 06

City of Sydney has asked that any changes to the building height control for the site must ensure that in the event of redevelopment, the future Bourke and Young Street Development as well as any potential residential development on 285-291 Young Street can achieve at least 70% solar access to the apartments in accordance with the Apartment Design Guide.

This Study analyses any solar impact from the Concept Reference Scheme to those sites. Through this study, both of these sites are able to achieve 71% solar access to their apartments during Winter Solstice.

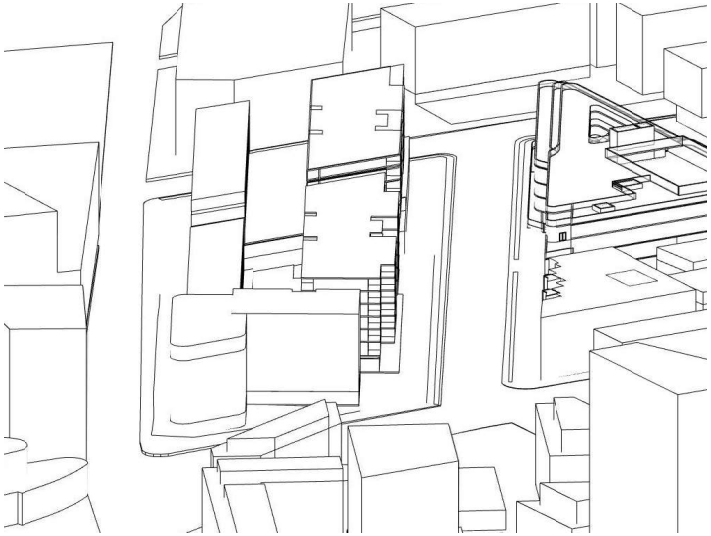
BOURKE AND YOUNG WOOLWORTH SOLAR COUNT			
STORY	NO. OF APT	2H SOLAR ACCESS	
LEVEL 06	13	9	69%
LEVEL 05	13	9	69%
LEVEL 04	13	9	69%
LEVEL 03	13	9	69%
LEVEL 02	13	9	69%
LEVEL 01	12	9	75%
LEVEL GL	2	2	100%
	79	56	71%

YOUNG ST FUTURE BLDG SOLAR COUNT			
STORY	NO. OF APT	2H SOLAR ACCESS	
LEVEL 06	11	8	73%
LEVEL 05	11	8	73%
LEVEL 04	11	8	73%
LEVEL 03	11	8	73%
LEVEL 02	11	8	73%
LEVEL 01	11	6	55%
LEVEL GL	3	3	100%
	69	49	71%

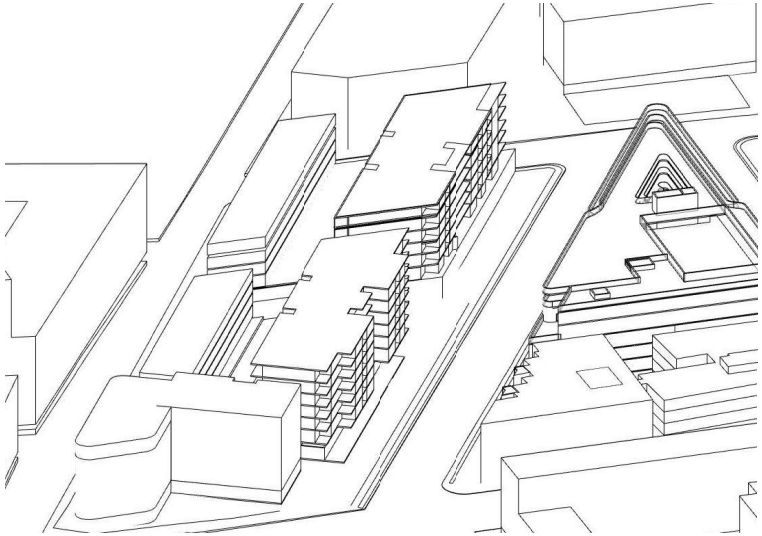
Apartment achieving 2 hours solar access during winter solstice

APPENDIX

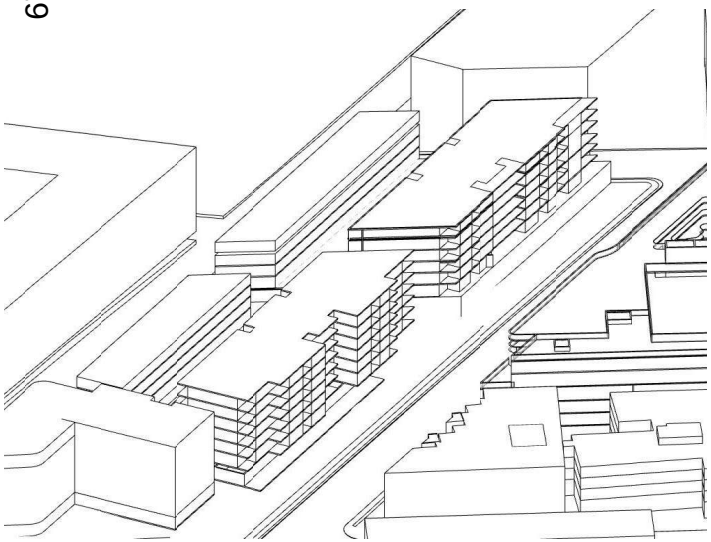
FUTURE YOUNG ST DEVELOPMENT - SUN EYE VIEWS



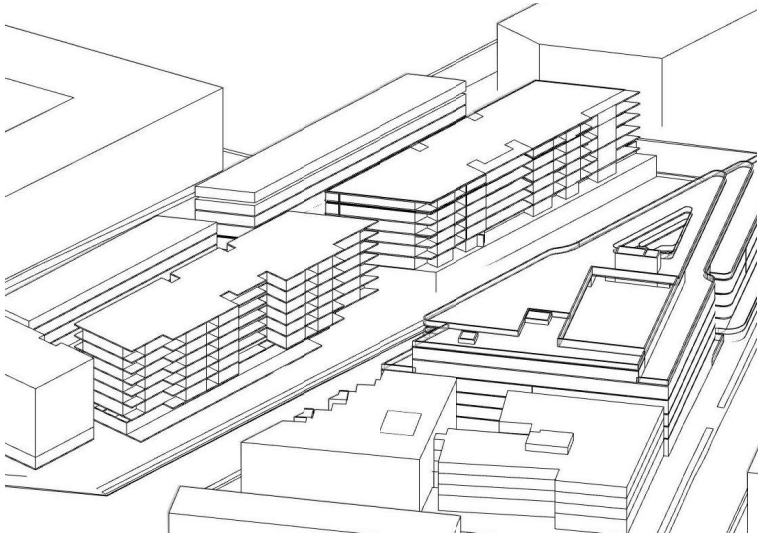
9AM



10AM



11AM



12PM

City of Sydney has asked that any changes to the building height control for the site must ensure that in the event of redevelopment, the future Bourke and Young Street Development as well as any potential residential development on 285-291 Young Street can achieve at least 70% solar access to the apartments in accordance with the Apartment Design Guide.

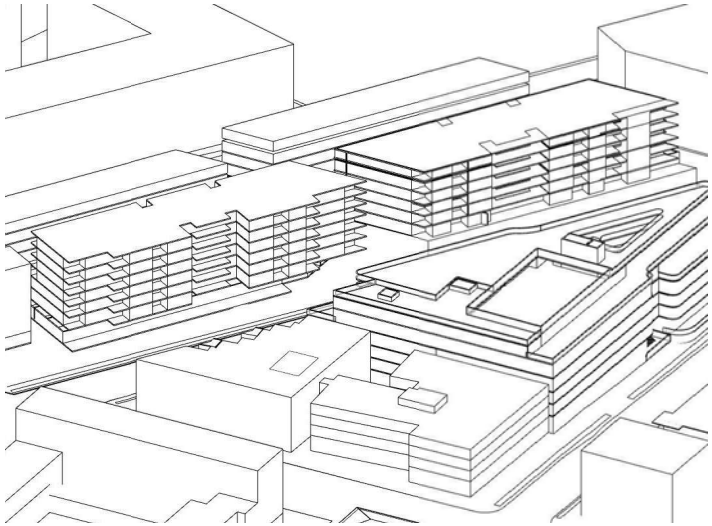
This Study analyses any solar impact from the Concept Reference Scheme to those sites. Through this study, both of these sites are able to achieve 71% solar access to their apartments during Winter Solstice.

BOURKE AND YOUNG WOOLWORTH SOLAR COUNT			
STORY	**NO. OF APT**	**2H SOLAR ACCESS**	
LEVEL 06	13	9	69%
LEVEL 05	13	9	69%
LEVEL 04	13	9	69%
LEVEL 03	13	9	69%
LEVEL 02	13	9	69%
LEVEL 01	12	9	75%
LEVEL GL	2	2	100%
	79	56	71%

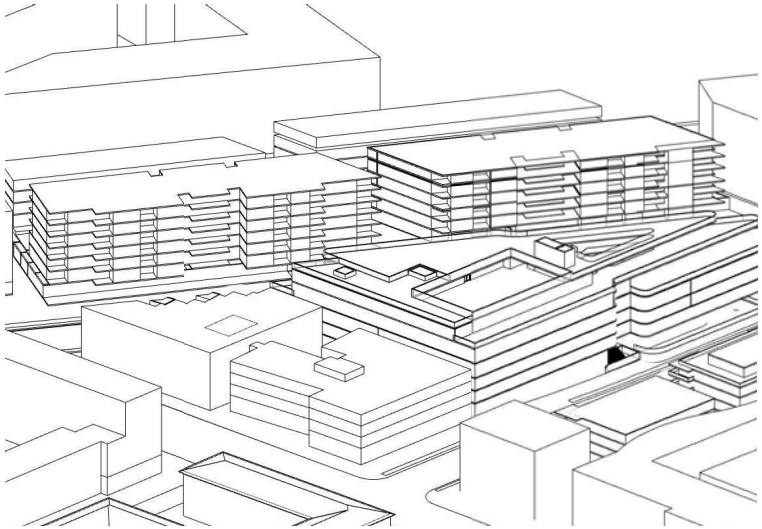
YOUNG ST FUTURE BLDG SOLAR COUNT			
STORY	**NO. OF APT**	**2H SOLAR ACCESS**	
LEVEL 06	11	8	73%
LEVEL 05	11	8	73%
LEVEL 04	11	8	73%
LEVEL 03	11	8	73%
LEVEL 02	11	8	73%
LEVEL 01	11	6	55%
LEVEL GL	3	3	100%
	69	49	71%

APPENDIX

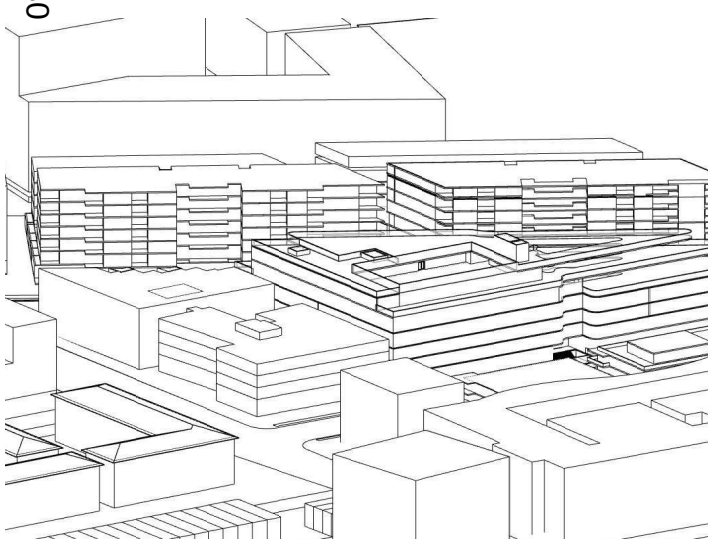
FUTURE YOUNG STREET DEVELOPMENT - SUN EYE VIEWS



1PM



2PM



3PM

The future Woolworths development on Young Street features residential apartments. The proposed design ensures that there is no impact to that site achieving 2 hours of solar access to 70% of the apartments during winter.

Similarly, if the site at 285-291 Young Street is redeveloped as a residential building, it will achieve 2 hours of solar access to 70% of the apartments during winter.

BOURKE AND YOUNG WOOLWORTH SOLAR COUNT			
STORY	**NO. OF APT**	**2H SOLAR ACCESS**	
LEVEL 06	13	9	69%
LEVEL 05	13	9	69%
LEVEL 04	13	9	69%
LEVEL 03	13	9	69%
LEVEL 02	13	9	69%
LEVEL 01	12	9	75%
LEVEL GL	2	2	100%
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YOUNG ST FUTURE BLDG SOLAR COUNT			
STORY	**NO. OF APT**	**2H SOLAR ACCESS**	
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LEVEL 05	11	8	73%
LEVEL 04	11	8	73%
LEVEL 03	11	8	73%
LEVEL 02	11	8	73%
LEVEL 01	11	6	55%
LEVEL GL	3	3	100%
	69	49	71%

SITE OPTIONS SUMMARY

OPTION 01
AS SHOWN IN COUNCIL MEETING 30/11/22



Height	32.5m
Levels	8 storeys
Basement	1 storey
Total GFA	17,159sqm (includ. circulation)
Total FSR	3.8:1 (includ. circulation)
School Open Space	1,857 sqm
	2.3sqm/student

OPTION 02
AS SHOWN IN COUNCIL MEETING 27/06/23



Height	27m
Levels	6 storeys
Basement	1 storey
Total GFA	13,919sqm (includ. circulation)
Total FSR	3.02:1 (includ. circulation)
School Open Space	3,494sqm
	3.16sqm/student

Key Changes
- floors and height reduced
- GFA reduced
- school open space increased
- commercial program removed

OPTION 03
AS SHOWN IN COUNCIL MEETING 05/12/23



Height	27m
Levels	6 storeys
Basement	1 storey
Total GFA	13,544sqm (includ. circulation)
Total FSR	2.94:1 (includ. circulation)
School Open Space	4,975sqm
	6.2sqm/student

Key Changes
- GFA reduced to increase school open space
- film school area reduced, school area increased

OPTION 04
CURRENT REFERENCE SCHEME



Height	27m (w. minor enroachment)
Levels	6 storeys
Basement	1 storey
Total GFA	13,544sqm (includ. circulation)
Total FSR	2.94:1 (includ. circulation)
School Open Space	4,975sqm
	6.2sqm/student

Key Changes
- Lift access to Level 06 added as per discussions in Council Meeting (05/12/2023)
- Basement footprint reduced to mitigate TPZ encroachment from indicative batter zones

APPENDIX

SCHEDULE

LEVEL	G.F.A (m2) EXC SCHOOL. CIRCULATION	G.F.A (m2) INCLUD. CIRCULATION	CARS Provided
L6			
L5	1433.89	1490.99	
L4	1562.55	1733.93	
L3	2469.39	2953.70	
L2	2468.95	2976.15	
L1	2118.20	2506.71	
G	1387.91	1739.42	
B1	142.64	142.64	55.00
TOTAL	11440.89	13543.54	55.00

SITE AREA	4611 m^2
FSR ALLOWED (+0.5 BONUS)	2.0 :1
GFA ALLOWABLE	9222 m^2

GFA PROPOSED (EXCL. SCHOOL CIRCULATION)	11440.89 m^2
FSR PROPOSED (EXCL. CIRCULATION)	2.48 :1

GFA PROPOSED (INCL. SCHOOL CIRCULATION)	13543.54 m^2
FSR PROPOSED (INCL. SCHOOL CIRCULATION)	2.94 :1

EDUCATION

	TOTAL SCHOOL G.F.A. (m2) INCLUDING CORRIDOR	GLS/CLASS ROOM	PRIMARY GLS NO.	SECONDARY GLS NO.	SPECIALIST	SPECIALIST NO.	ADMIN/ STAFF	AMENITIES	CANTEEN	AUDITORIUM	BASKETBALL COURT	LIBRARY	CIRCULATION SPACE	SCHOOL OUTDOOR SPACE (ACTIVE)	SCHOOL OUTDOOR SPACE (PASSIVE)
		NLA (m2)	NO.	NO.	NLA (m2)	NO.	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	(m2)	(m2)
6	232													1220.68	
5	230.73							100.23			757.22		57.10	1280.74	
4	1287.56	185.76		3.00	665.47	5.00	32.01	59.81					171.38	1258.72	
3	2323.00	794.24		13.00	525.46	4.00	32.01	59.81				281.87	484.31		153.91
2	2491.38	925.68		15.00	524.34	4.00	32.01	59.81				281.87	507.20		153.91
1	1697.87	742.08	12.00				29.94	48.54		108.00		281.87	388.51		153.91
G	1535.35	121.16	2.00				297.67			512.15			351.51	753.44	
B1	142.64														
	10608.53	2768.92	14.00	31.00	1715.27	13.00	423.64	328.20	0.00	620.15	757.22	845.61	1960.01	4513.58	461.73
		TARGET GLS	14	31	TARGET SPECIALIST	13						870SQM TARGET		TOTAL OUTDOOR	4975.31
														TOTAL OUTDOOR PER STUDENT	6.2
															10/STUDENT REQ.

FILM SCHOOL

	TOTAL G.F.A. (m2)	AMENITIES	CAFE	FILM SCHOOL CORRIDOR / LOBBY	FILM SCHOOL	FILM SCHOOL OUTDOOR SPACE	BREAKOUT ROOM	REHEARSAL/ KIDS SPACES	COMMERCIAL KITCHEN	STORAGE
		NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)
L6										
L5	360.26	28.65		78.33	230.38					
L4	446.37			219.55	212.26	59.32				
L3	630.70			217.77	387.38					
L2	484.77	28.61		145.69	277.81					
L1	808.84			163.96			72.28	318.83	131.87	66.02
G	204.07		38.42	165.87						
B1										
	2935.01	57.26	38.42	991.17	1107.83	59.32	72.28	318.83	131.87	66.02

YEAR	GLS	SPECIALIST	NO. STUDENT
K	2	0	40
1	2		40
2	2		40
3	2		40
4	2		40
5	2		40
6	2		40
7	31	13	90
8			90
9			90
10			90
11			80
12			80
TOTAL	45	13	800

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NOMINATED ARCHITECT (NSW)

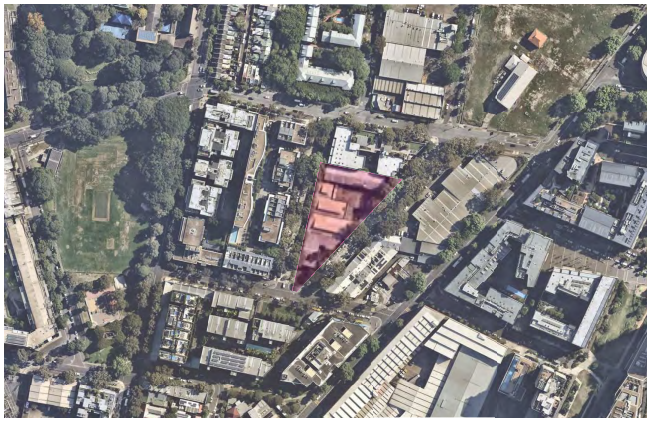
Amit Julka 10002
Rido Pin 11286

Attachment A3-1

Architectural Drawings

PLANNING PROPOSAL - CONCEPT REFERENCE SCHEME

242-258 YOUNG STREET WATERLOO



This Concept Reference Scheme Architectural Set as prepared by Plus Architecture is submitted to the Council of the City of Sydney (Council) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

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PLANNING PROPOSAL

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SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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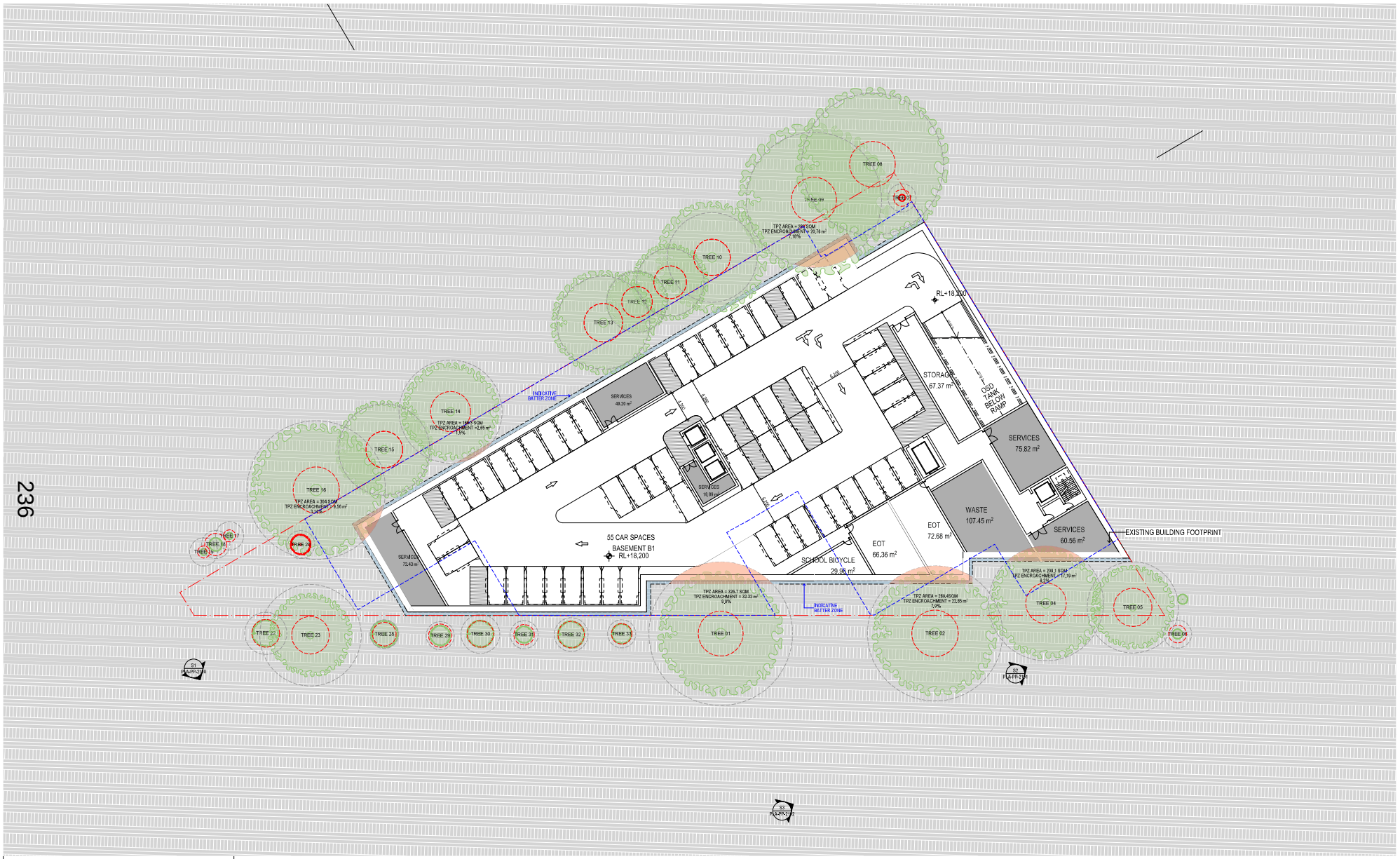
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242-258 Young Street Waterloo Sydney NSW	COVER SHEET

SCALE		
DATE	PLOT DATE	
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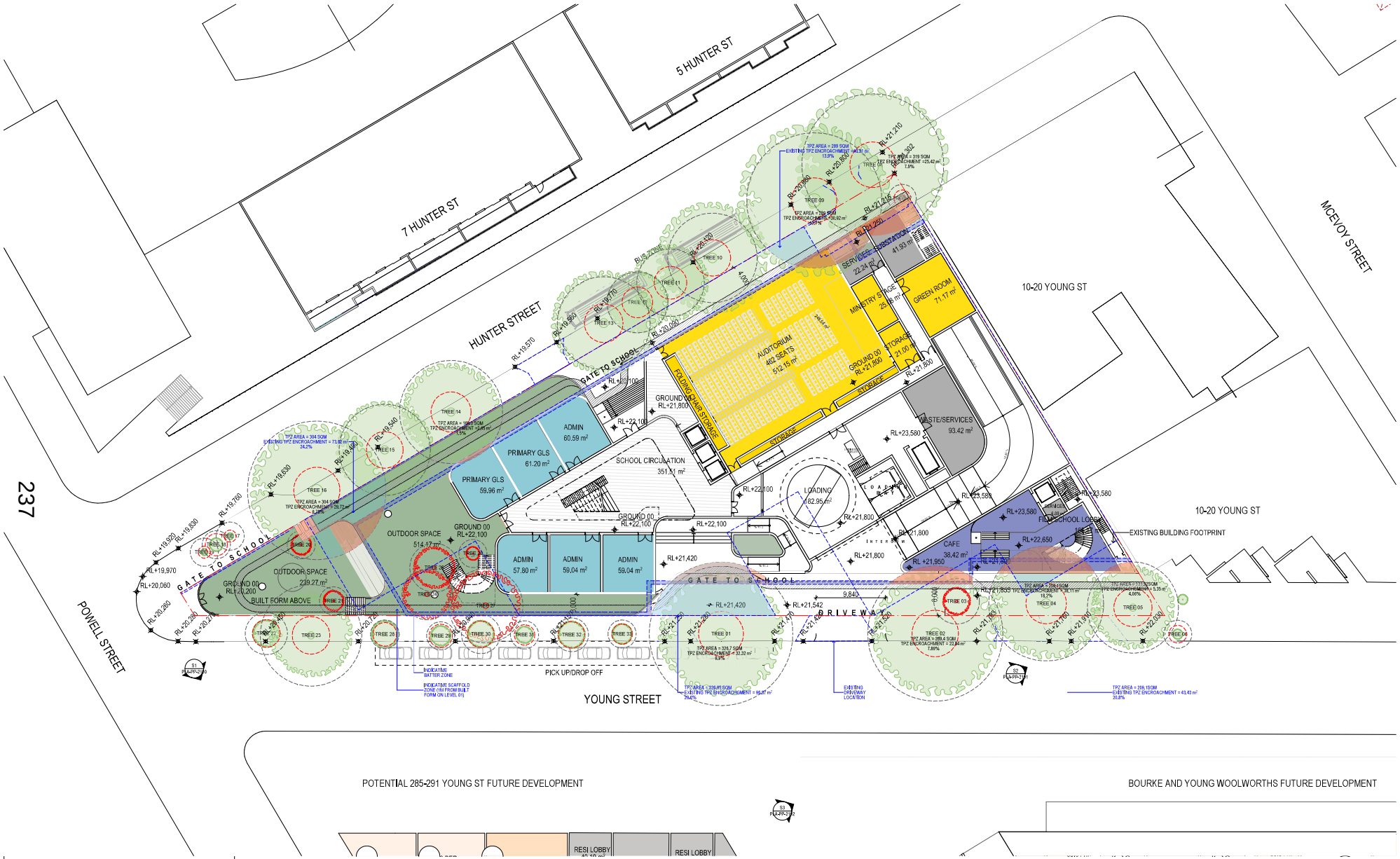
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	GENERAL FLOOR PLAN - BASEMENT 01

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DATE	PLOT DATE	
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JOB NO.	DRAWING NO.	REVISION
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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
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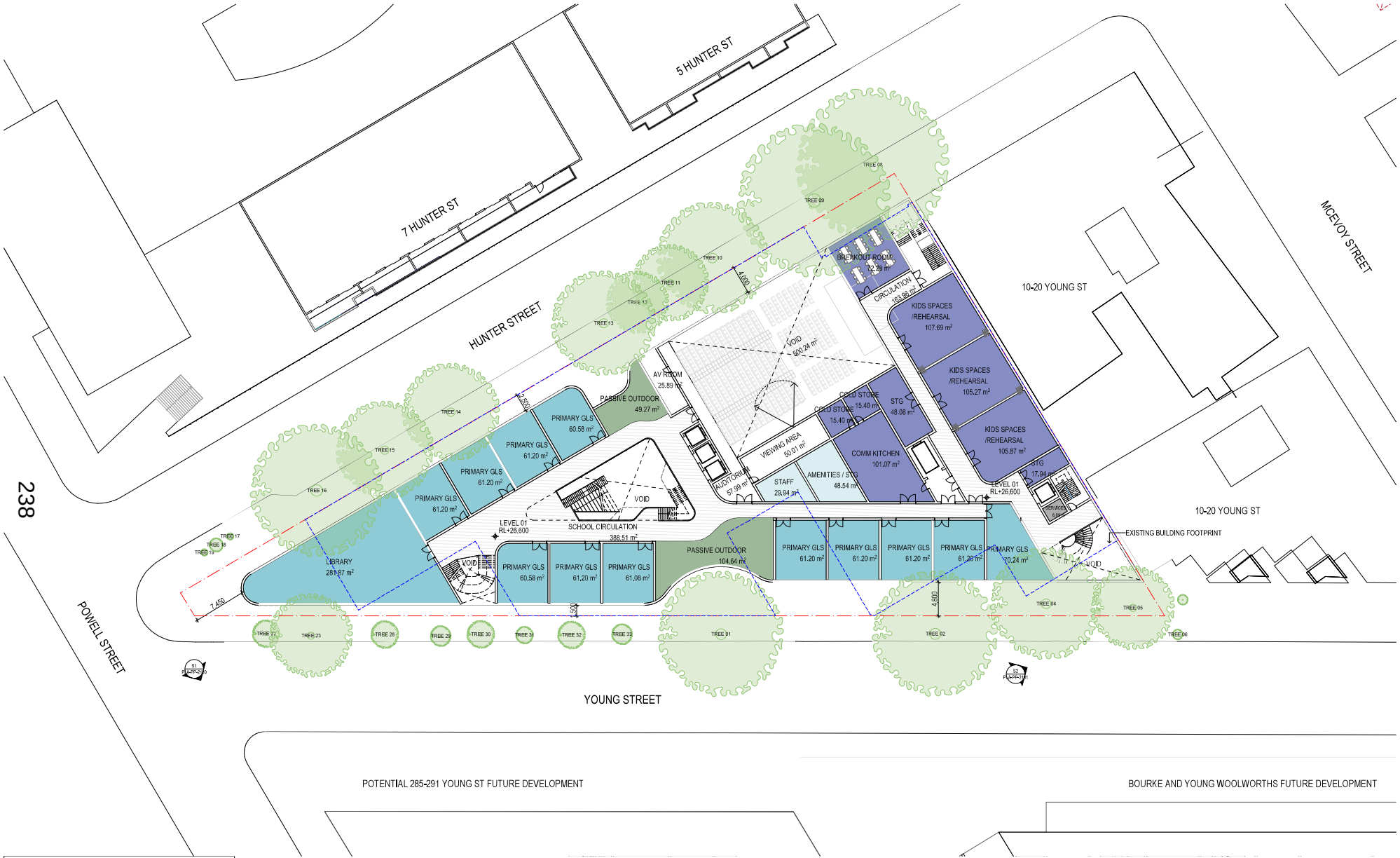
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PROJECT	242-258 Young Street Waterloo Sydney NSW
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FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990

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FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9660

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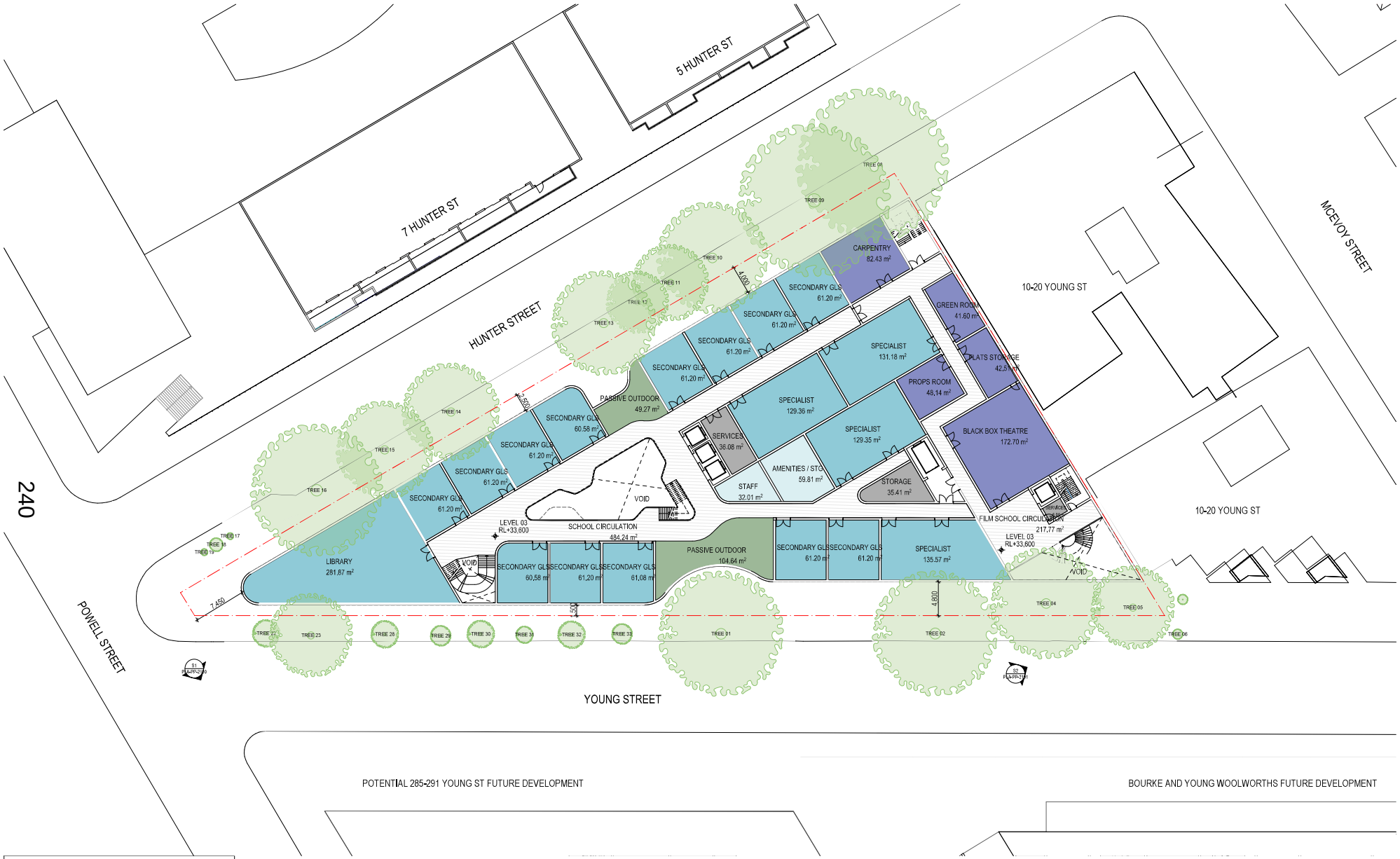
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PROJECT	242-258 Young Street Waterloo Sydney NSW
DRAWING TITLE	GENERAL FLOOR PLAN - LEVEL 02

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FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9660

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	GENERAL FLOOR PLAN - LEVEL 03

SCALE		
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DATE	PLOT DATE	
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JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-1003	A



PLANNING PROPOSAL

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FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990

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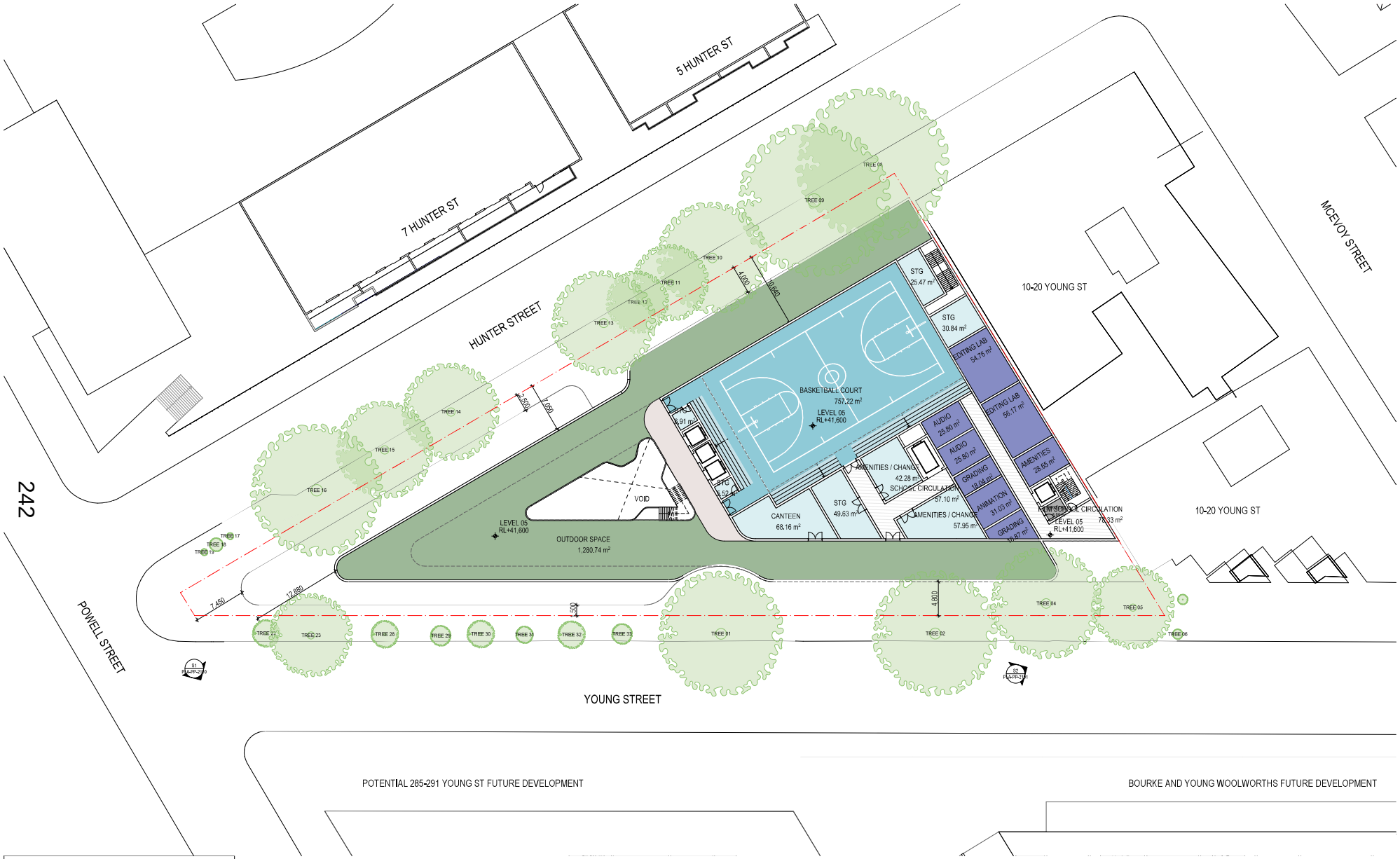
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Plus Architecture Pty. Ltd. ACN 605568303
Nominated Architect (NSW): Amit Julka 10402 Rule Pin 11286

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DRAWING TITLE	GENERAL FLOOR PLAN - LEVEL 04

SCALE	1:250 @A1
DATE	15/01/2024
PLOT DATE	17/01/2024
DRAWN	IC
CHECKED	GH
JOB NO.	20621
DRAWING NO.	PLA-PP-1004
REVISION	A



PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS		
PLANNER	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	JMT CONSULTING	T 0415 563 177
ARBORIST	ARBORSAW	T 2413 842 183
FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

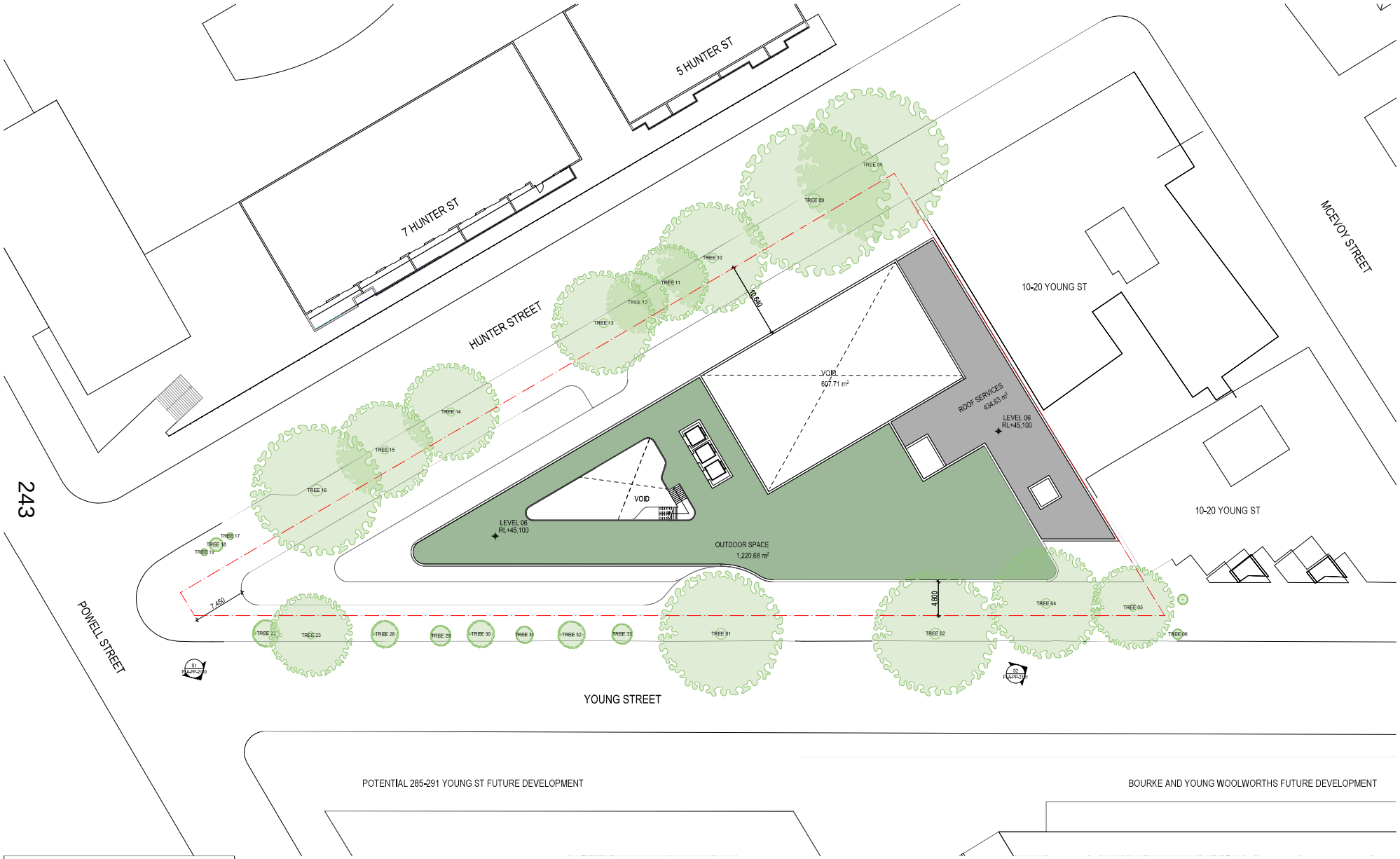
Level 4, 222 Clarence Street
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ACN 605568303
Nominated Architect (NSW):
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Rule Pte 11286

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PROJECT	242-258 Young Street Waterloo Sydney NSW
DRAWING TITLE	GENERAL FLOOR PLAN - LEVEL 05

SCALE	1:250 @A1		
DATE	15/01/2024	PLOT DATE	17/01/2024
DRAWN	IC	CHECKED	GH
JOB NO.	20621	DRAWING NO.	PLA-PP-1005
		REVISION	A



PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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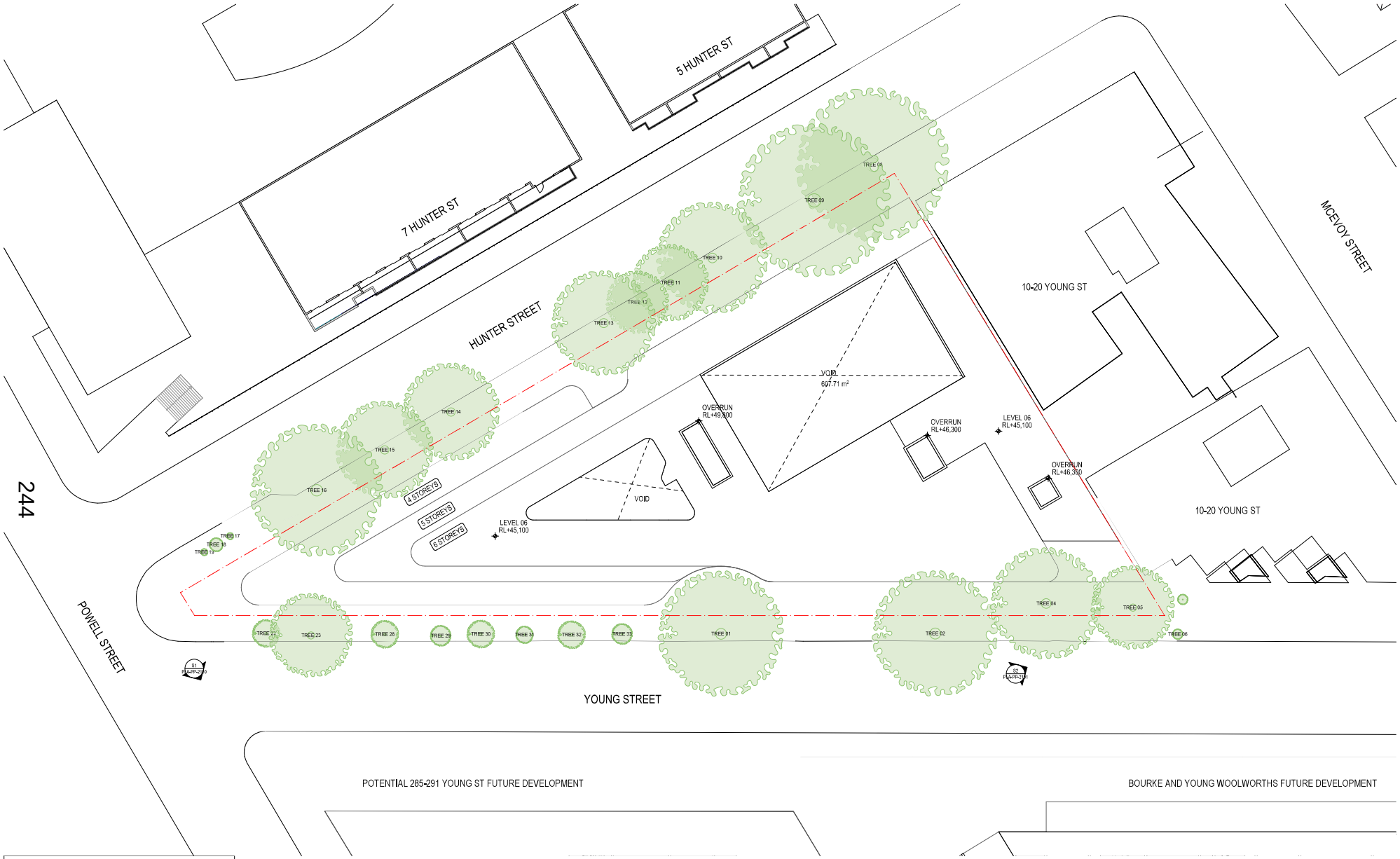
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Plus Architecture Pty. Ltd.
ACN 605560303
Nominated Architect (NSW):
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Robo Pte 11286

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PROJECT	242-258 Young Street Waterloo Sydney NSW
DRAWING TITLE	GENERAL FLOOR PLAN - LEVEL 06

SCALE	1:250 @A1
DATE	15/01/2024
PLOT DATE	17/01/2024
DRAWN	IC
CHECKED	GH
JOB NO.	20621
DRAWING NO.	PLA-PP-1006
REVISION	A



PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS		
PLANNER	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	JMT CONSULTING	T 0415 563 177
ARBORIST	ARBORSAW	T 2413 842 183
FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

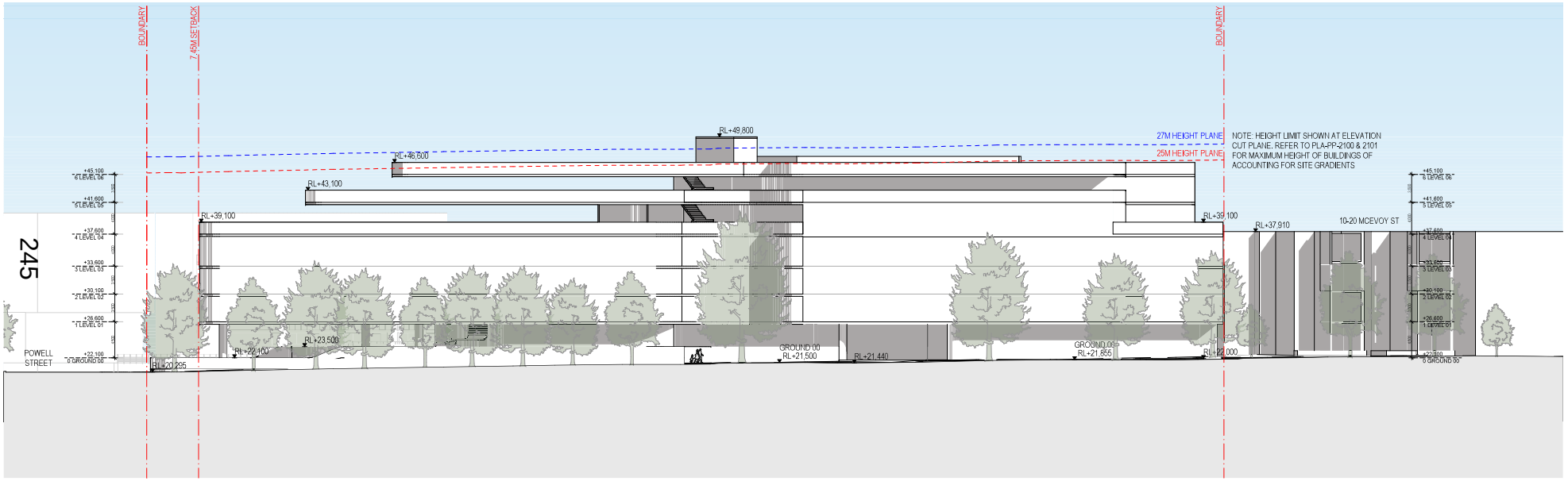
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	GENERAL FLOOR PLAN - ROOF PLAN

SCALE		
1:250 @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-1007	A



E1 - YOUNG STREET ELEVATION
SCALE: 1:250@A1

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
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FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9660

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Nominated Architect (NSW):
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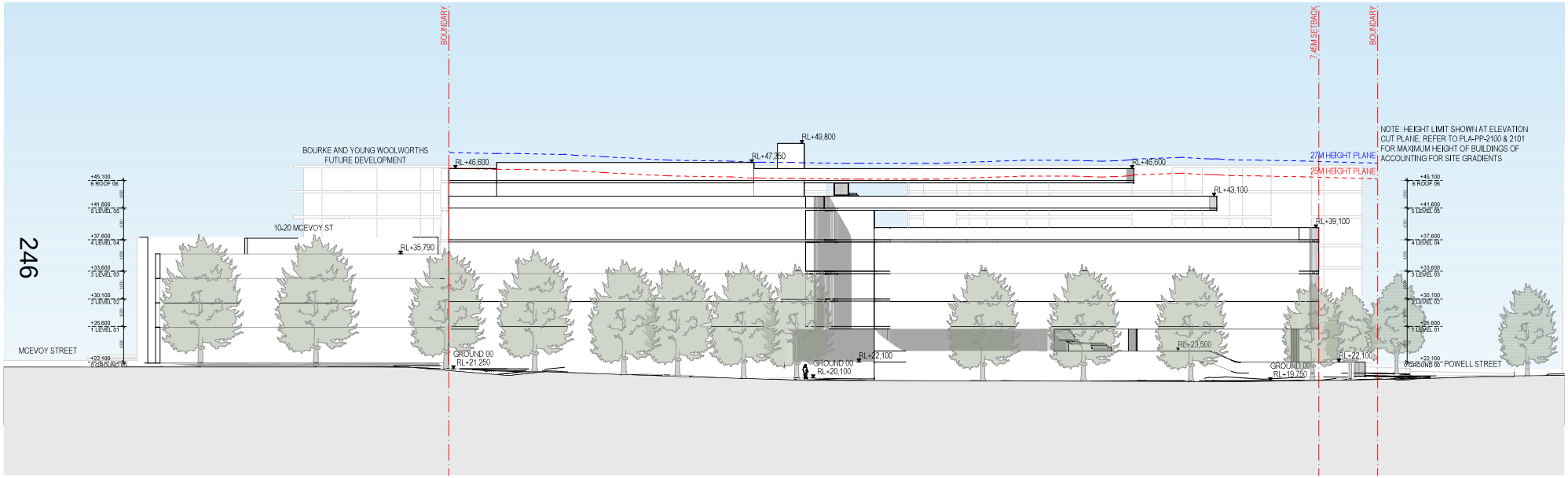
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	ELEVATIONS - SHEET 01

SCALE	
1:250 @A1	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2000	A



E2 - HUNTER STREET ELEVATION
SCALE: 1:250@A1

PLANNING PROPOSAL

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DATE	REVISION	BY	CHK	NO.

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PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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ACN 605560303
Nominated Architect (NSW):
Amir Jajbo 10602
Reba Pie 11286

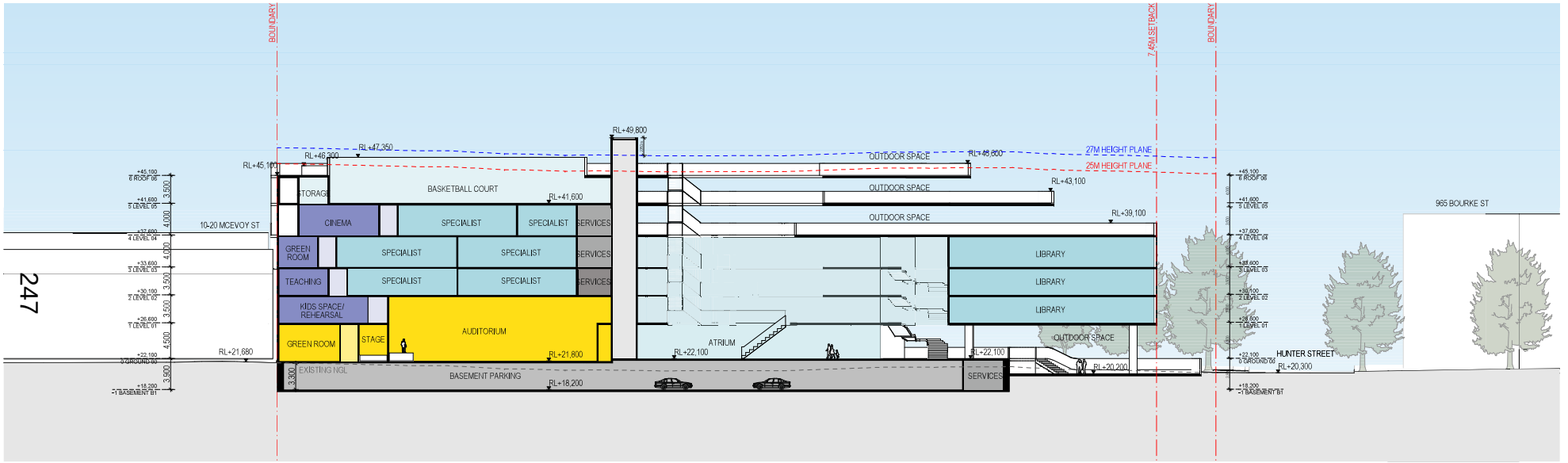
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	ELEVATIONS - SHEET 02

SCALE	
1:250 @A1	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2001	A



S1 - SECTION AA
SCALE: 1:250@A1

PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

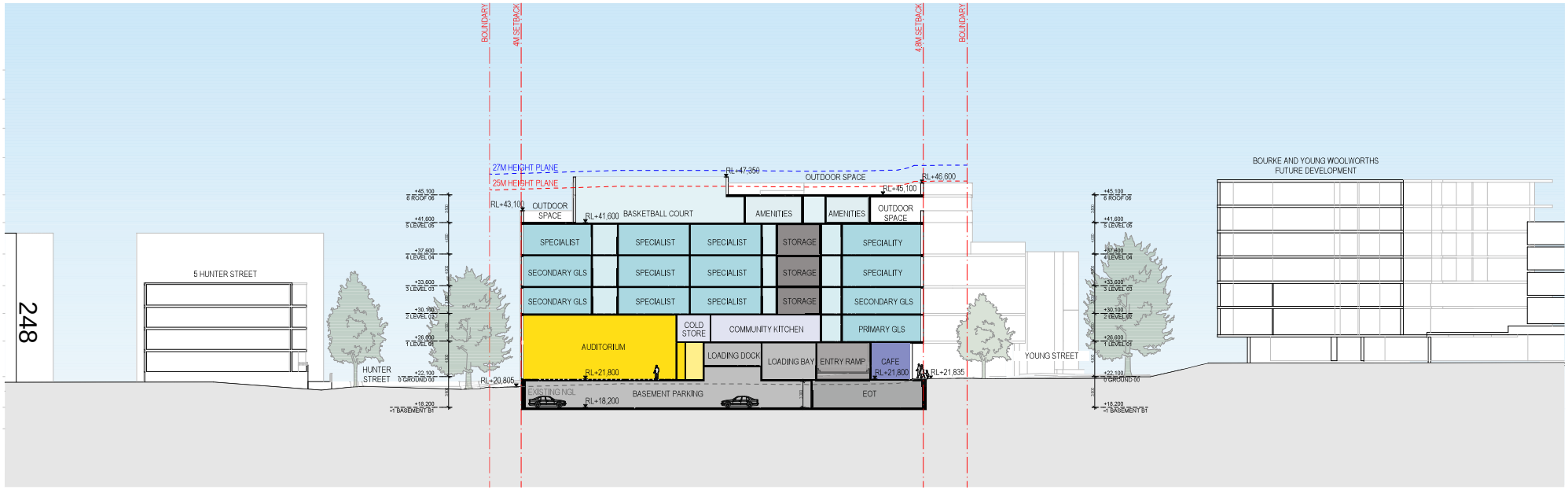
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Plus Architecture Pty. Ltd.
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	SECTIONS - SHEET 01

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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2100	A



S2 - SECTION BB
SCALE: 1:250@A1

PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

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CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

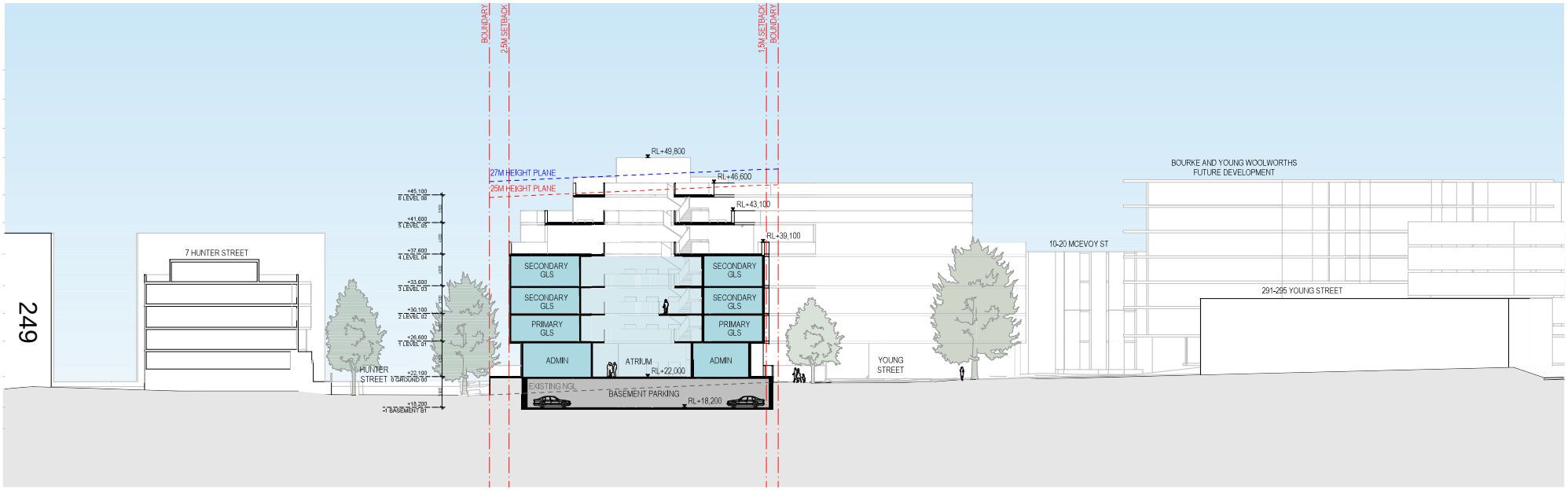
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	SECTIONS - SHEET 02

SCALE		
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2101	A



S3 - SECTION CC
SCALE: 1:250@A1

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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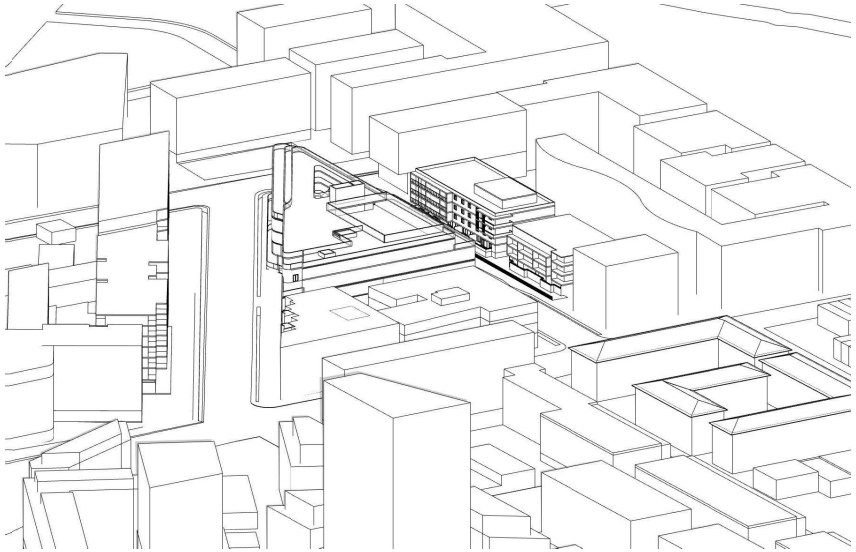
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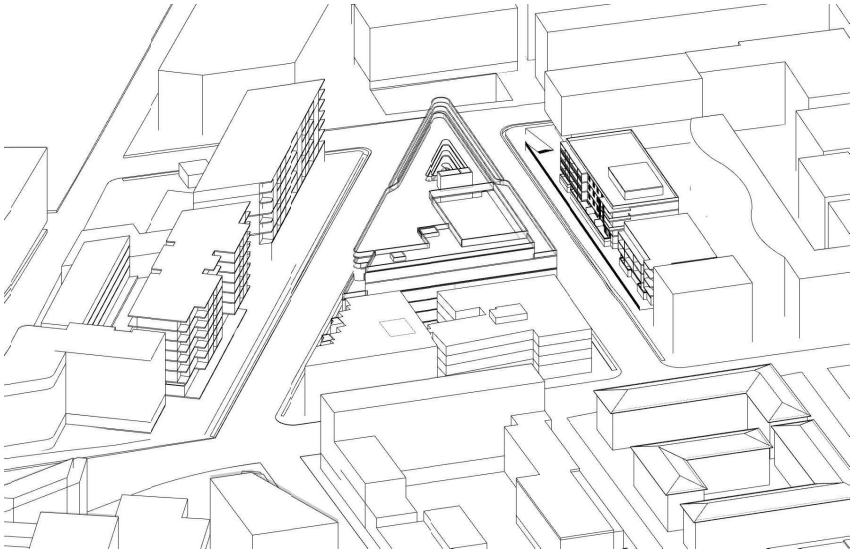
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	SECTIONS - SHEET 03

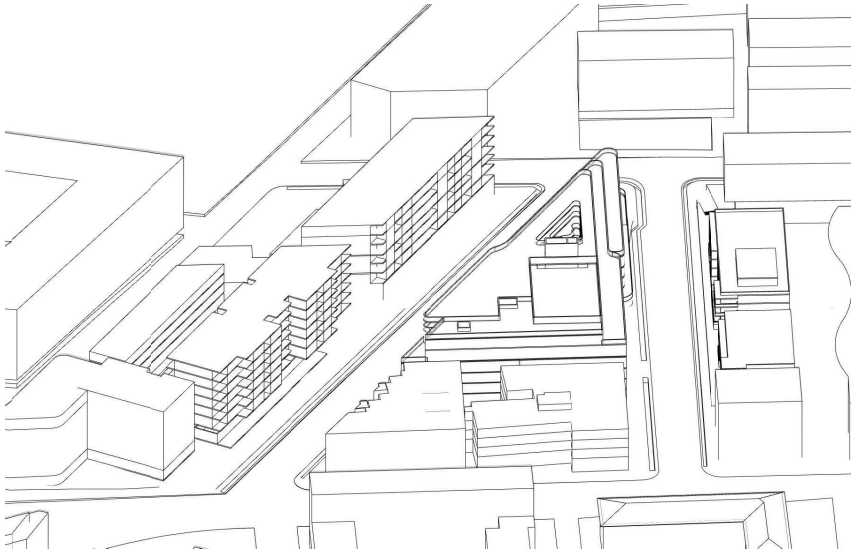
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IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2102	A



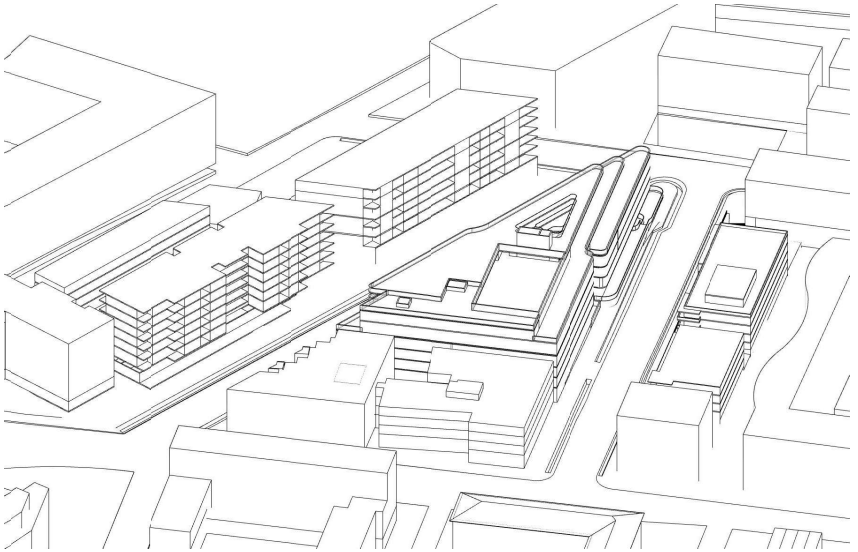
- SUN EYE VIEW - 9AM
SCALE: N.T.S.



- SUN EYE VIEW - 10AM
SCALE: N.T.S.



- SUN EYE VIEW - 11AM
SCALE: N.T.S.



- SUN EYE VIEW - 12PM
SCALE: N.T.S.

250

PLANNING PROPOSAL

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DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

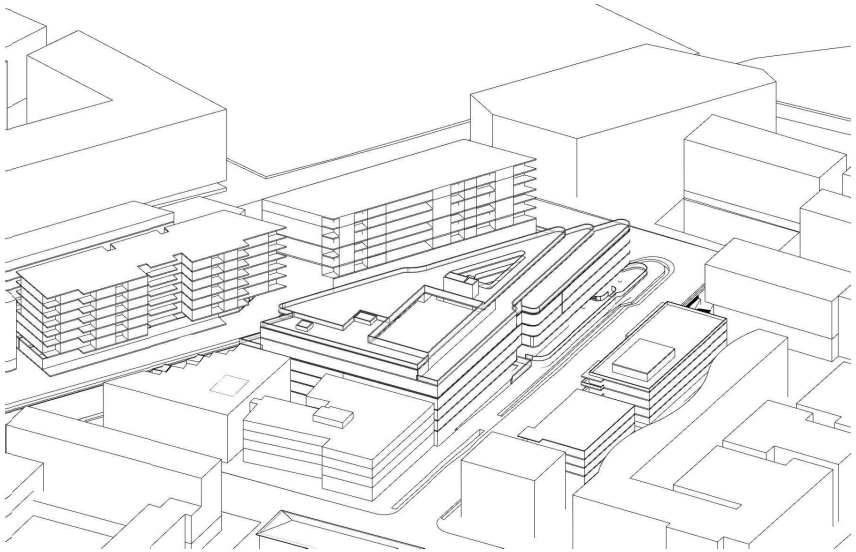
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Plus Architecture Pty. Ltd.
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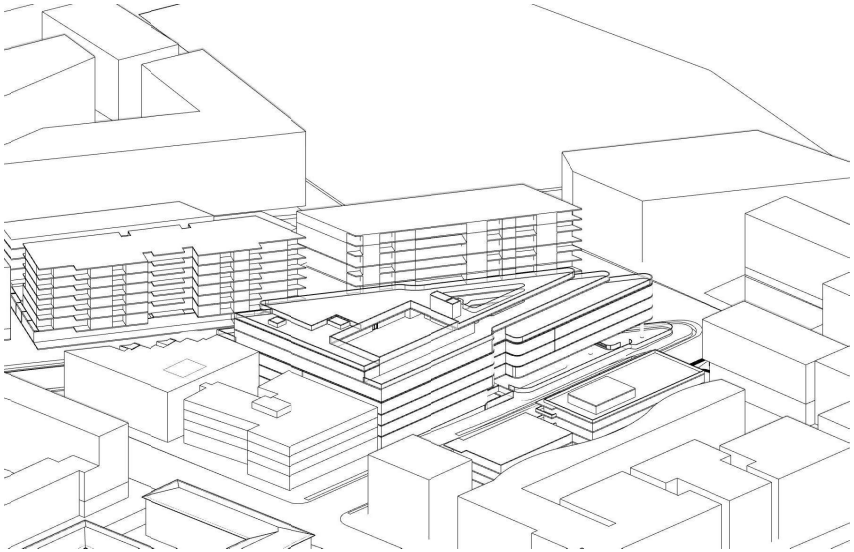
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	SUN EYE VIEWS (WINTER SOLSTICE) - SHEET 01

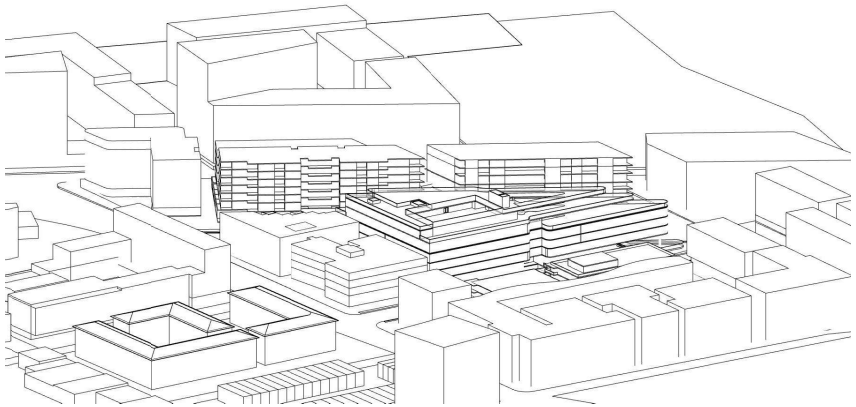
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2200	A



SUN EYE VIEW - 1PM
SCALE: N.T.S.



SUN EYE VIEW - 2PM
SCALE: N.T.S.



SUN EYE VIEW - 3PM
SCALE: N.T.S.

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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Nominated Architect (NSW):
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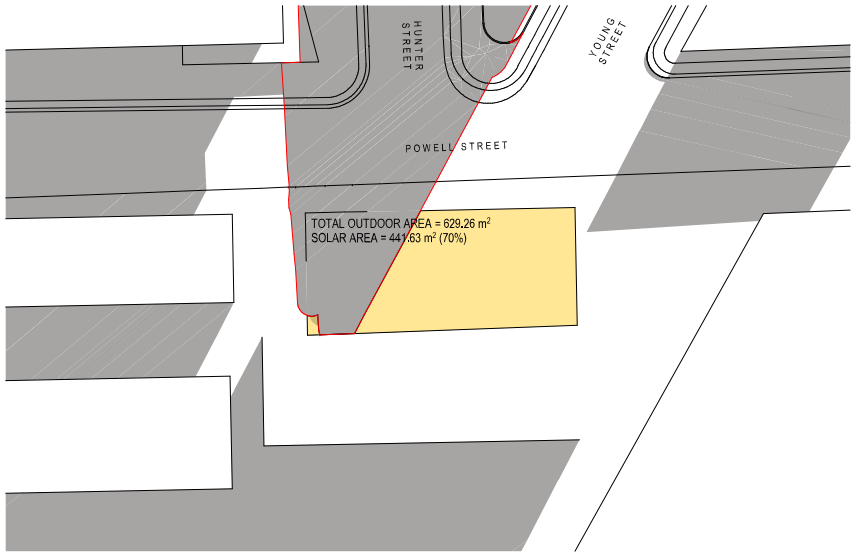
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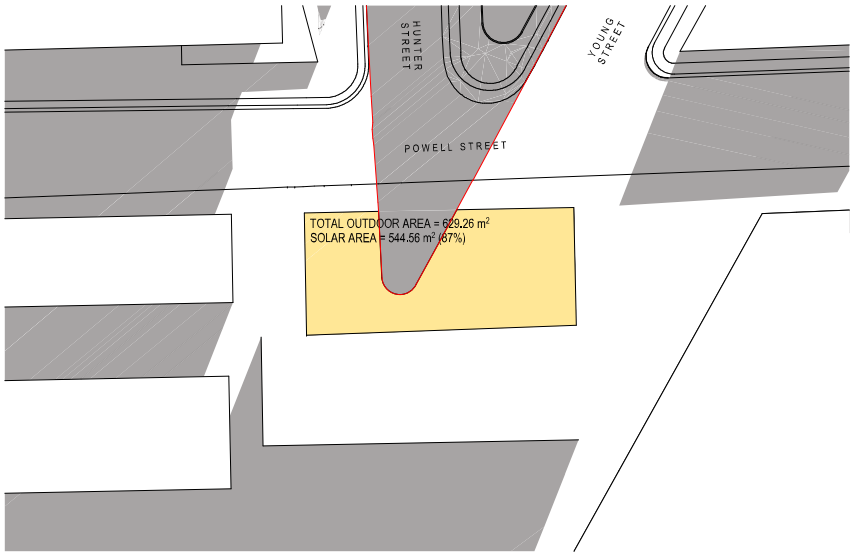
PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	SUN EYE VIEWS (WINTER SOLSTICE) - SHEET 02

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15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	

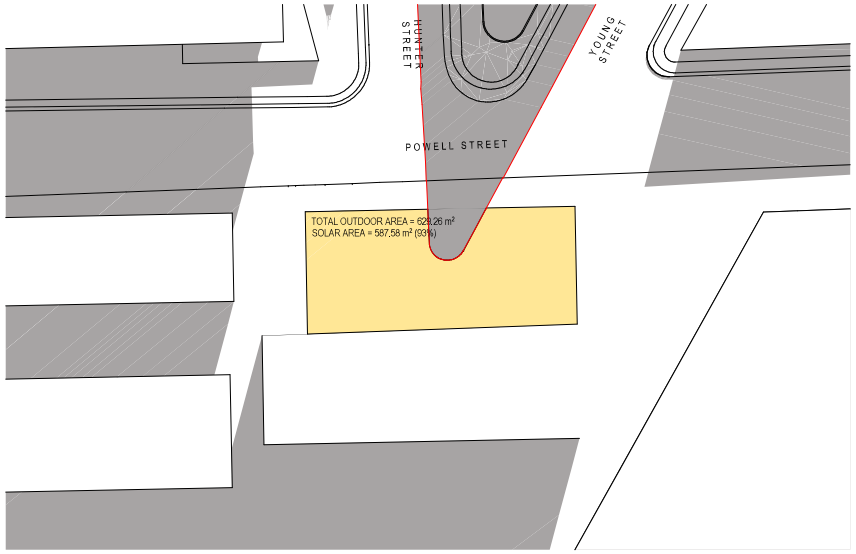
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2201	A



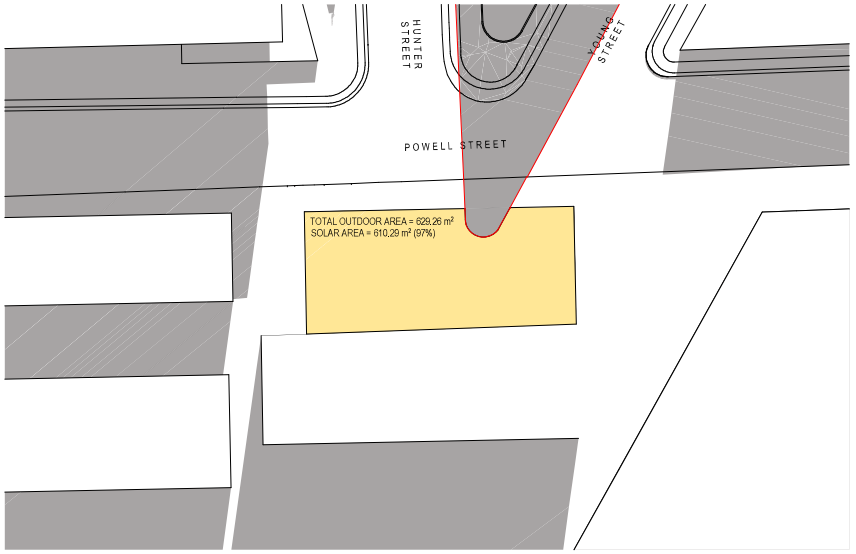
NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 9AM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 9.30AM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 10AM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 10:30AM
SCALE: 1:350@A1

SOLAR OUTDOOR AREA
PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

Level 4, 222 Clarence Street
Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amit Julka 10602
Rida Pte 11286

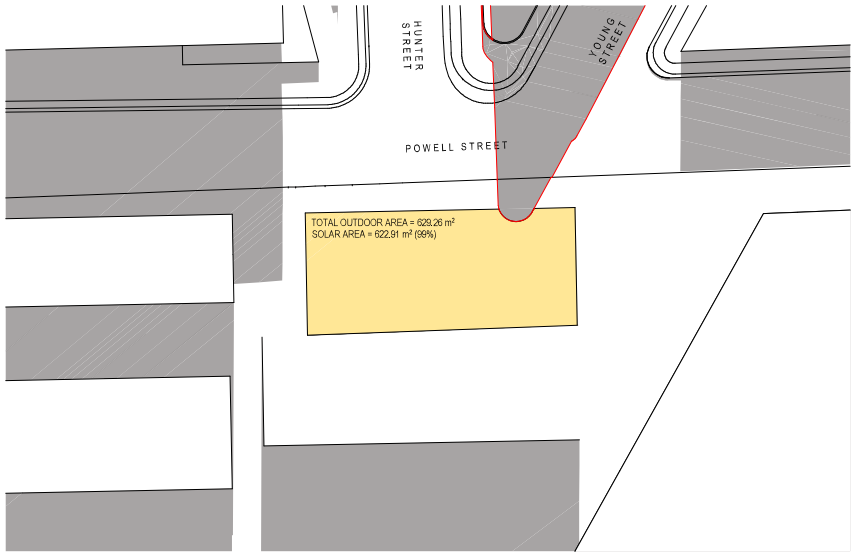
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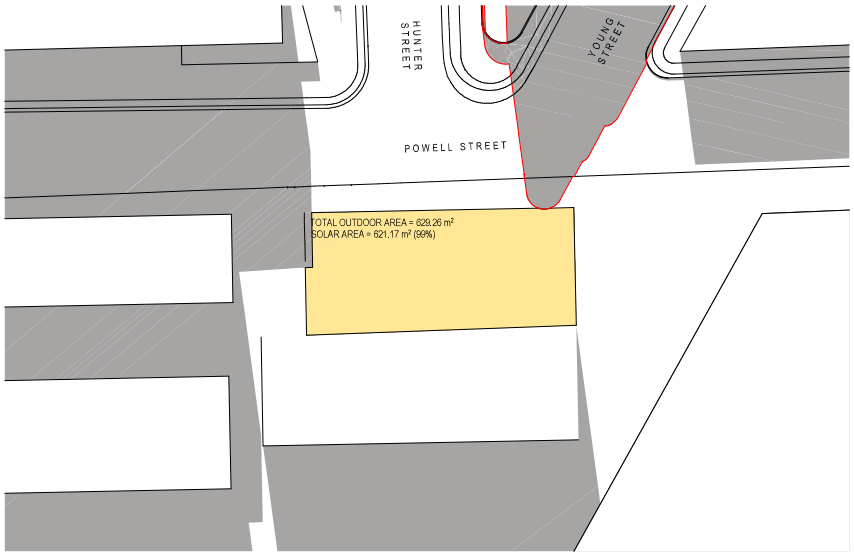
PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
NEIGHBOURING OUTDOOR AREA SOLAR STUDY (WINTER SOLSTICE) - SHEET 01

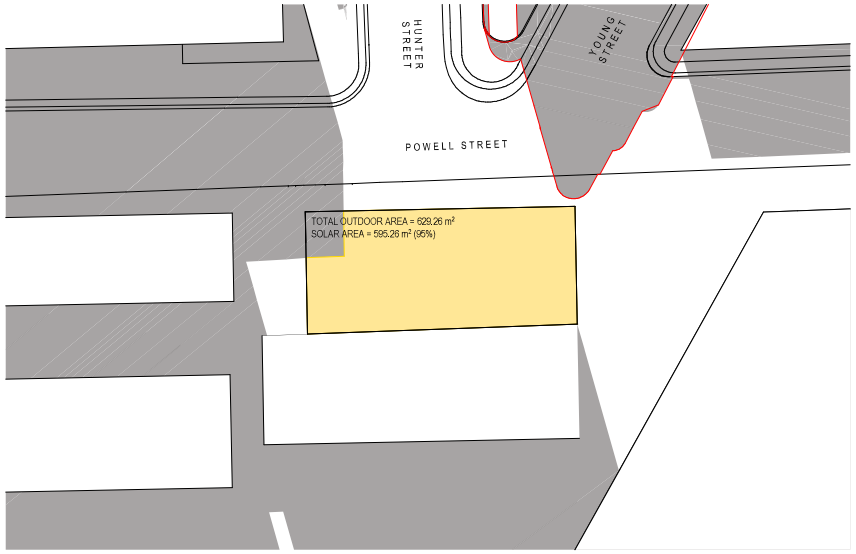
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DATE	15/01/2024
PLOT DATE	17/01/2024
DRAWN	IC
CHECKED	GH
JOB NO.	20621
DRAWING NO.	PLA-PP-2300
REVISION	A



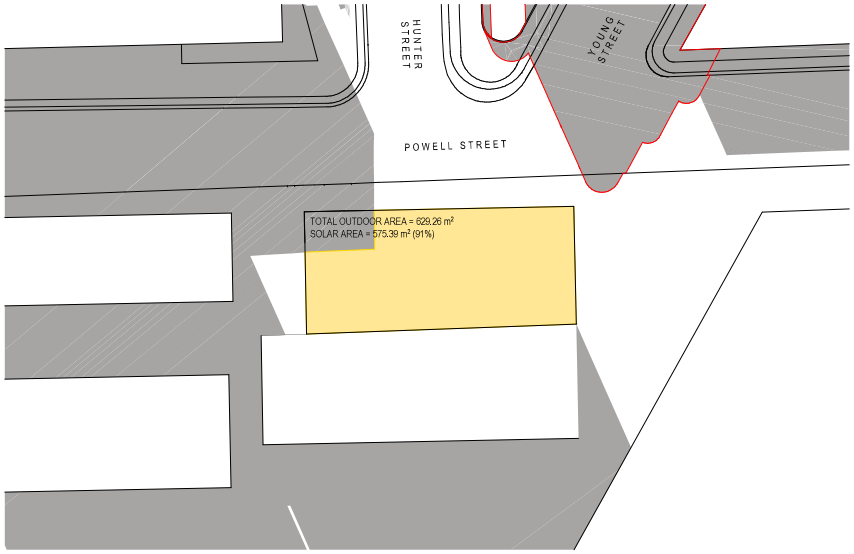
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SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 11:30AM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 12PM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 12:30PM
SCALE: 1:350@A1

SOLAR OUTDOOR AREA
PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	ETHOS URBAN	T (02) 9956 6962	
TRAFFIC	JMT CONSULTING	T 0415 563 177	
ARBORIST	ARBORSAW	T 2413 642 183	
FLOODING	WMA WATER	T (02) 9299 2855	
SCHOOL OPERATIONS	AMINA	T 02 9541 9628	
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990	

SDG

Level 4, 222 Clarence Street
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Plus Architecture Pty. Ltd.
ACN 605560303
Nominated Architect (NSW):
Amir Jafar-Tehrani
Reg No 11299

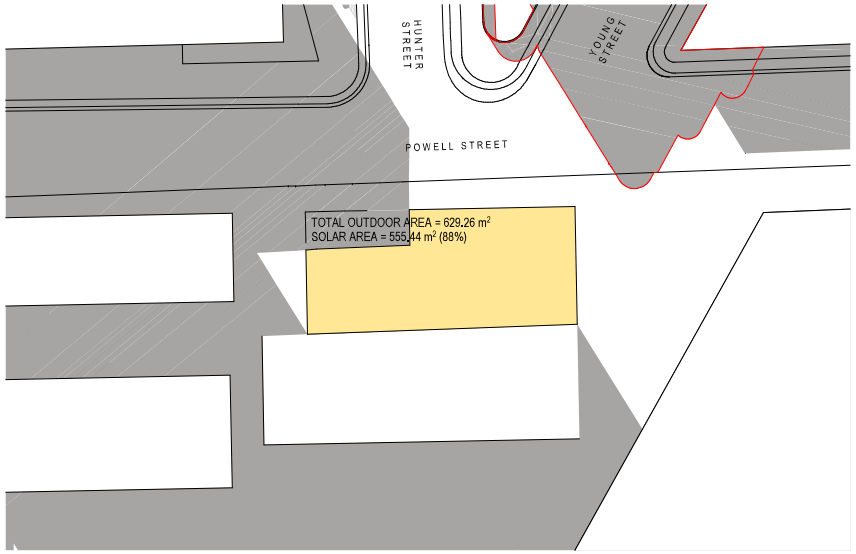
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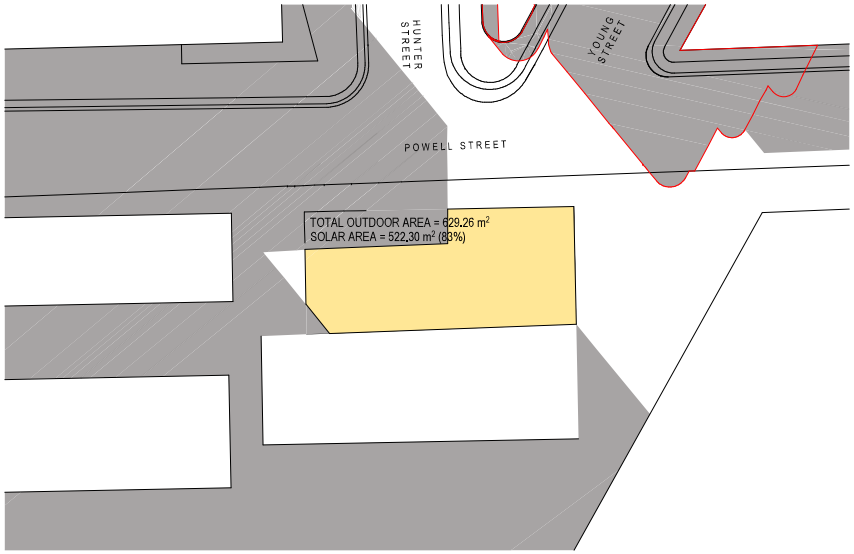
PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	NEIGHBOURING OUTDOOR AREA SOLAR STUDY (WINTER SOLSTICE) - SHEET 02

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DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

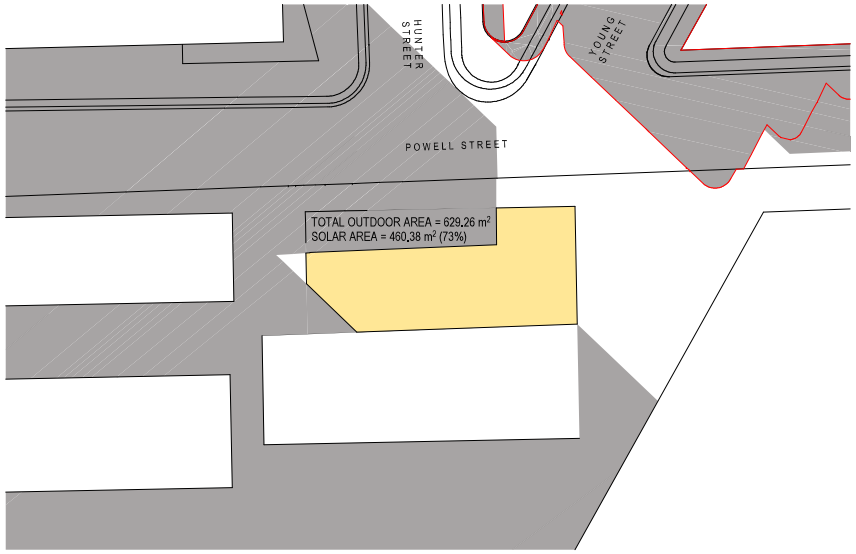
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2301	A



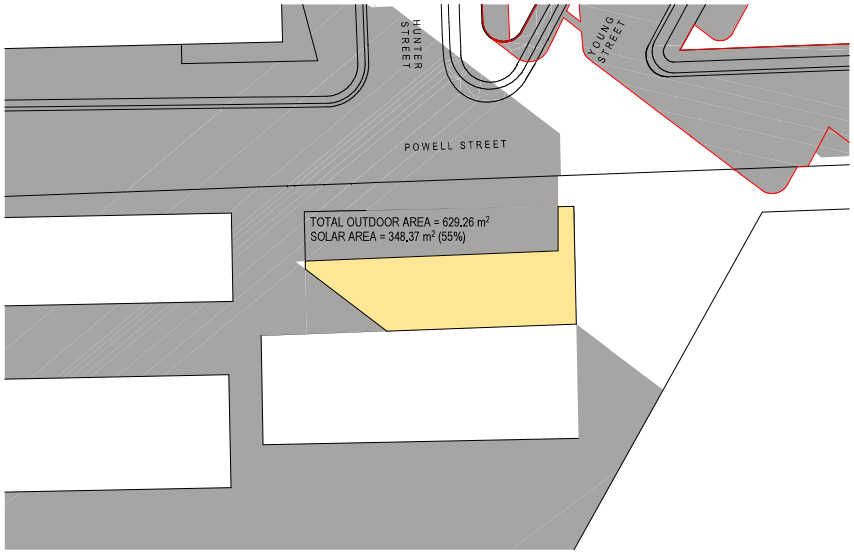
NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 1PM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 1:30PM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 2PM
SCALE: 1:350@A1



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 2:30PM
SCALE: 1:350@A1

SOLAR OUTDOOR AREA
PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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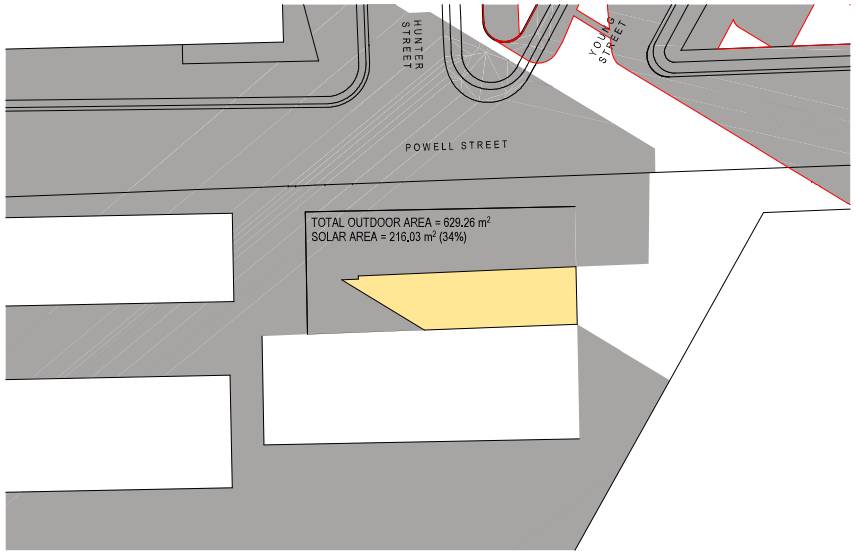
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Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amir Jajoo 10602
Abbe Pin 11286

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	NEIGHBOURING OUTDOOR AREA SOLAR STUDY (WINTER SOLSTICE) - SHEET 03

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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2302	A



NEIGHBOURING OUTDOOR AREA SOLAR STUDY - 3PM
SCALE: 1:350@A1

SOLAR OUTDOOR AREA
PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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PLANNER	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	JMT CONSULTING	T 0415 563 177
ARBORIST	ARBORSAW	T 2413 842 183
FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990

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Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amir Jajbo 10602
Rabe Pte 11286

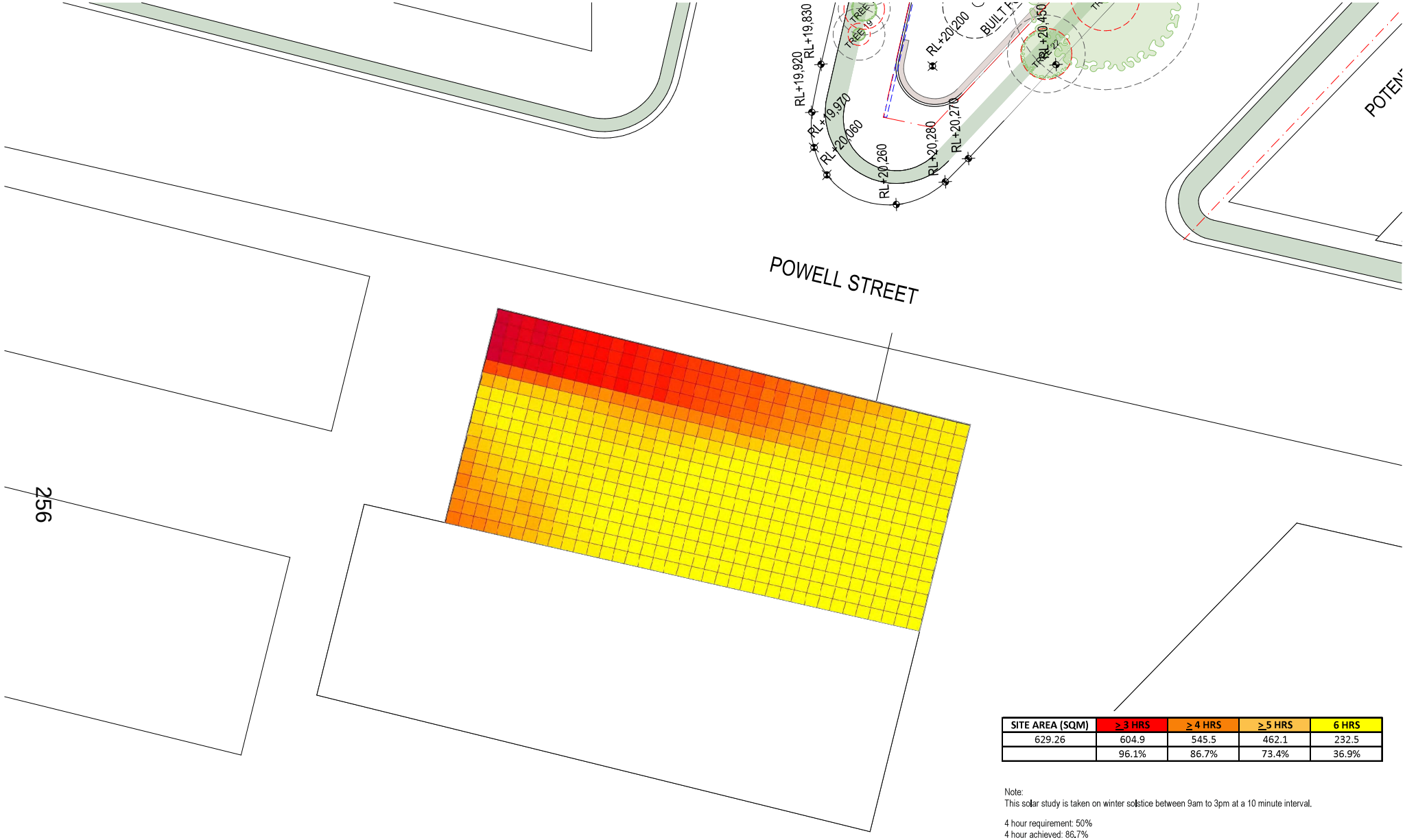
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PROJECT
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DRAWING TITLE
NEIGHBOURING OUTDOOR AREA SOLAR STUDY (WINTER SOLSTICE) - SHEET 04

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DATE: 15/01/2024	PLOT DATE: 17/01/2024
DRAWN: IC	CHECKED: GH
JOB NO.: 20621	DRAWING NO.: PLA-PP-2303
	REVISION: A



SITE AREA (SQM)	≥3 HRS	≥4 HRS	≥5 HRS	6 HRS
629.26	604.9	545.5	462.1	232.5
	96.1%	86.7%	73.4%	36.9%

Note:
This solar study is taken on winter solstice between 9am to 3pm at a 10 minute interval.

4 hour requirement: 50%
4 hour achieved: 86.7%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
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ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

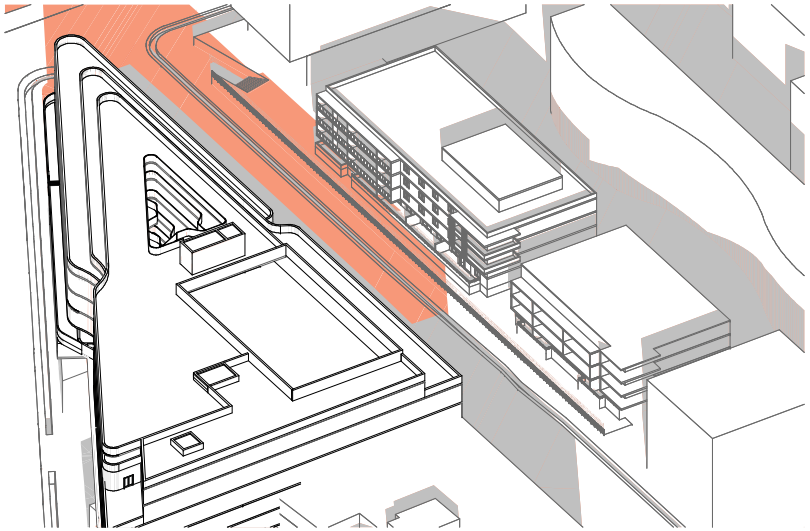
Level 4, 222 Clarence Street
Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amir Jajbo 10602
Reta Pte 11289

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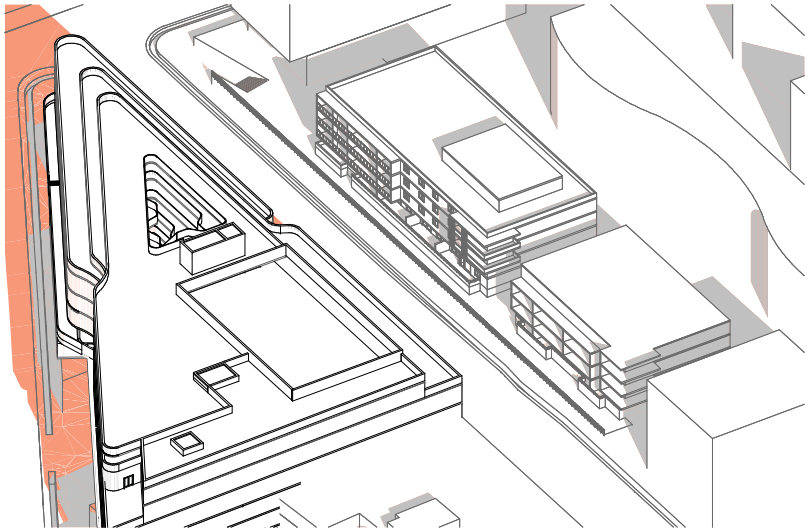
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	NEIGHBOURING OUTDOOR AREA SOLAR STUDY (WINTER SOLSTICE) - SHEET 05

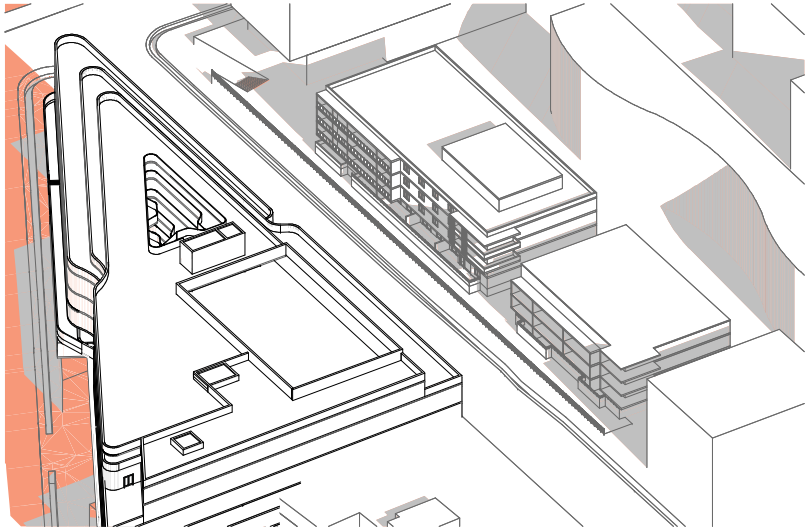
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DRAWN	CHECKED	
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JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2304	A



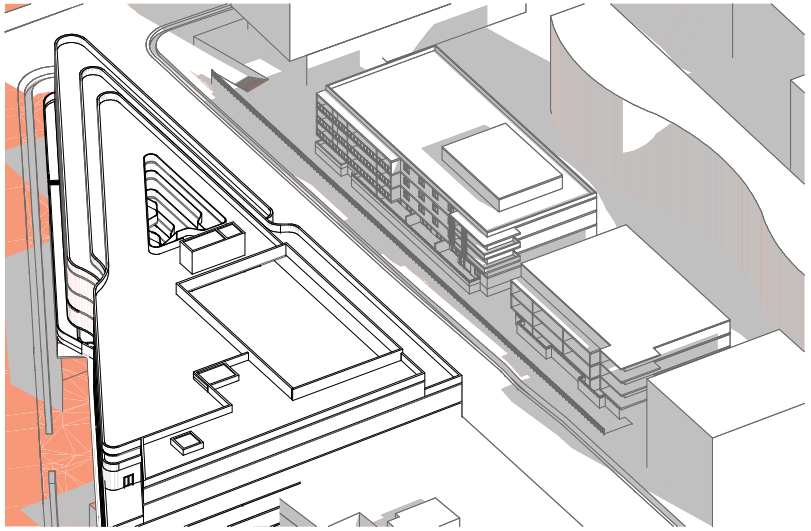
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SCALE: N.T.S.



HUNTER ST APARTMENTS SOLAR STUDY 10AM
SCALE: N.T.S.



HUNTER ST APARTMENTS SOLAR STUDY 11AM
SCALE: N.T.S.



HUNTER ST APARTMENTS SOLAR STUDY 12PM
SCALE: N.T.S.

PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

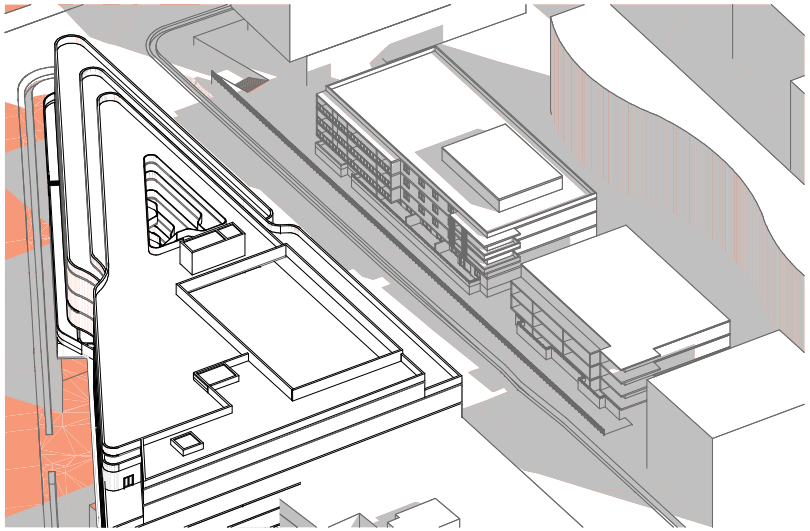
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Nominated Architect (NSW):
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Rule Pin 11286

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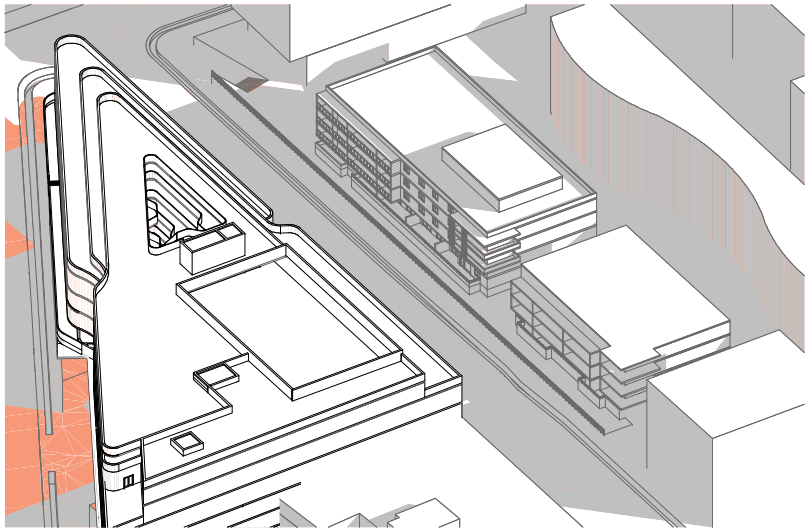
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	HUNTER ST APARTMENTS SOLAR STUDY (WINTER SOLSTICE) - SHEET 01

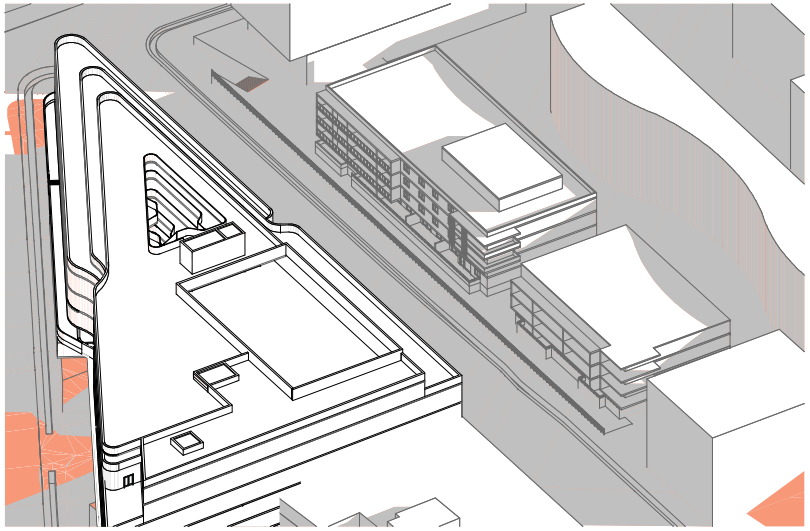
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DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2400	A



HUNTER ST APARTMENTS SOLAR STUDY 1PM
SCALE: N.T.S.



HUNTER ST APARTMENTS SOLAR 2PM
SCALE: N.T.S.



HUNTER ST APARTMENTS SOLAR STUDY 3PM
SCALE: N.T.S.

PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

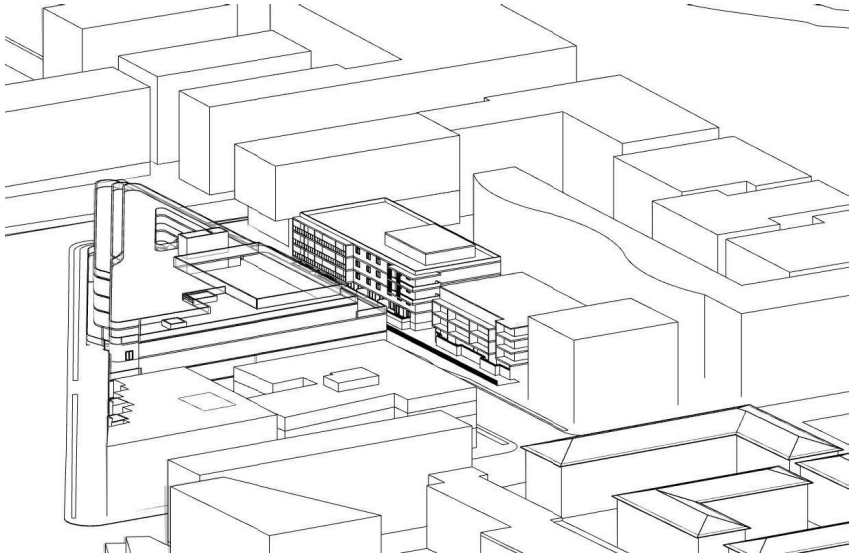
Level 4, 222 Clarence Street
Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605560303
Nominated Architect (NSW):
Amit Julka 10602
Rule No 11286

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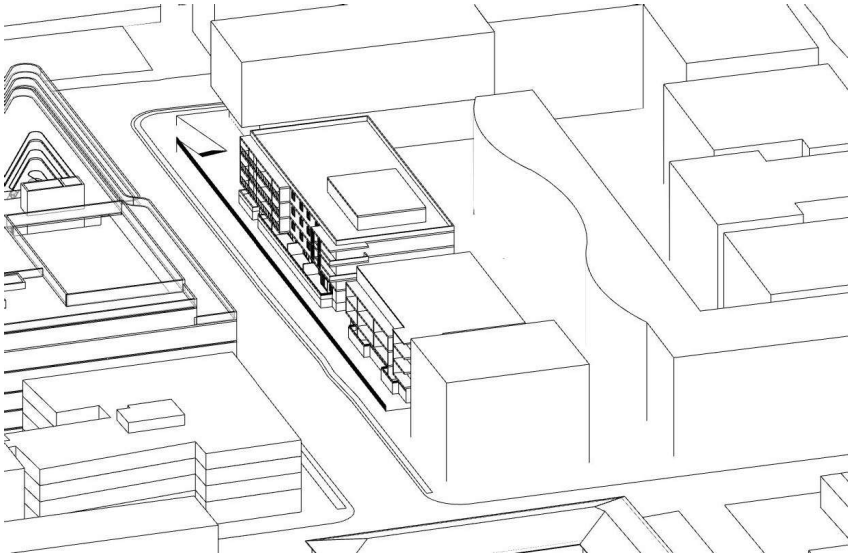
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	HUNTER ST APARTMENTS SOLAR STUDY (WINTER SOLSTICE) - SHEET 02

SCALE		
NTS @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2401	A



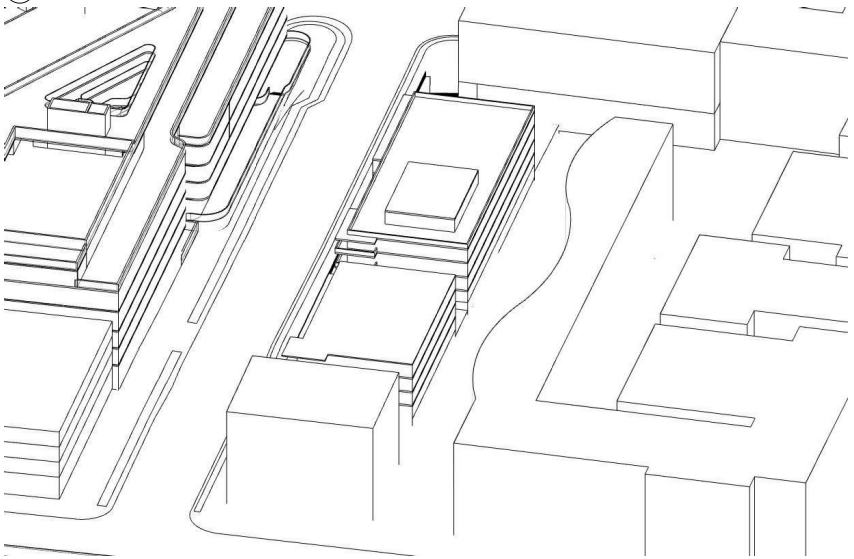
HUNTER ST APARTMENTS SUN EYE - 9AM
SCALE: N.T.S.



HUNTER ST APARTMENTS SUN EYE - 10AM
SCALE: N.T.S.



HUNTER ST APARTMENTS SUN EYE - 11AM
SCALE: N.T.S.



HUNTER ST APARTMENTS SUN EYE -12PM
SCALE: N.T.S.

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

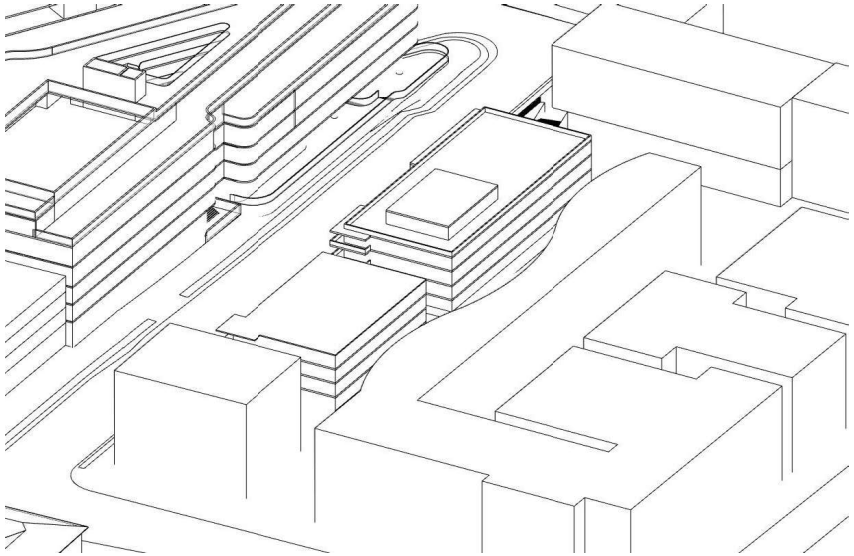
Level 4, 222 Clarence Street
Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605560303
Nominated Architect (NSW):
Amir Jajbo 11602
Reg No 11286

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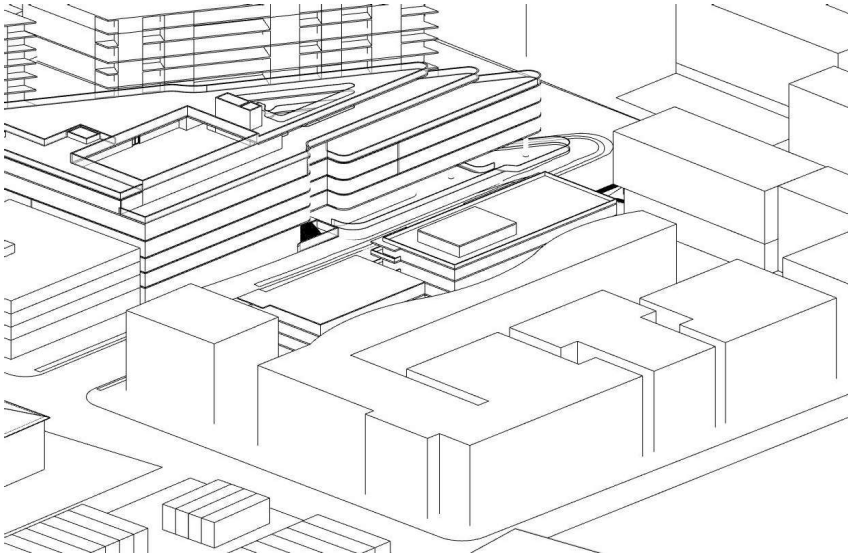
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	HUNTER ST SUN EYE VIEWS (WINTER SOLSTICE) - SHEET 01

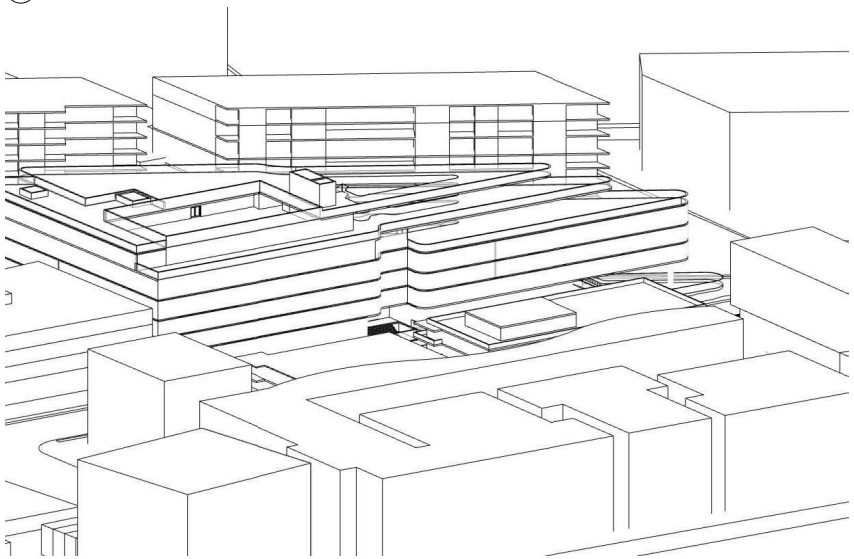
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2402	A



HUNTER ST APARTMENTS SUN EYE- 1PM
SCALE: N.T.S.



HUNTER ST APARTMENTS SUN EYE - 2PM
SCALE: N.T.S.



HUNTER ST APARTMENTS SUN EYE - 3PM
SCALE: N.T.S.

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

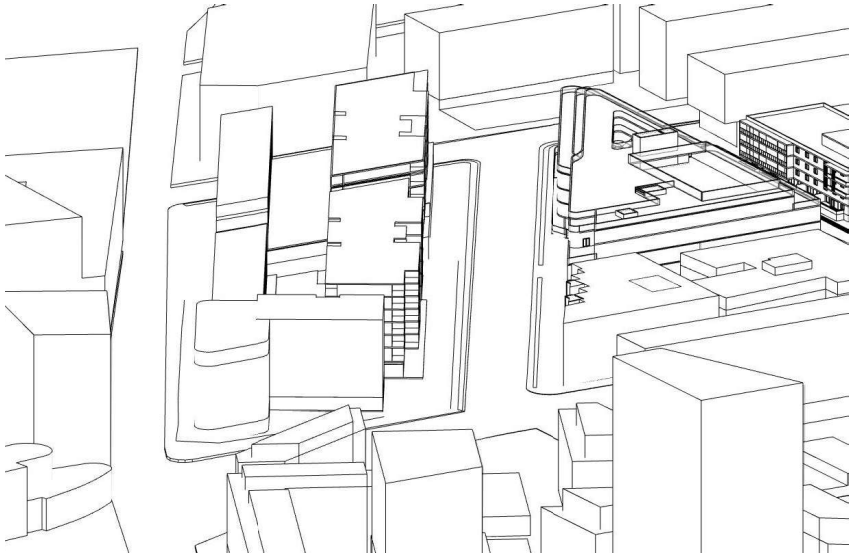
Level 4, 222 Clarence Street
Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amir Jajoo 10602
Rule Pin 11286

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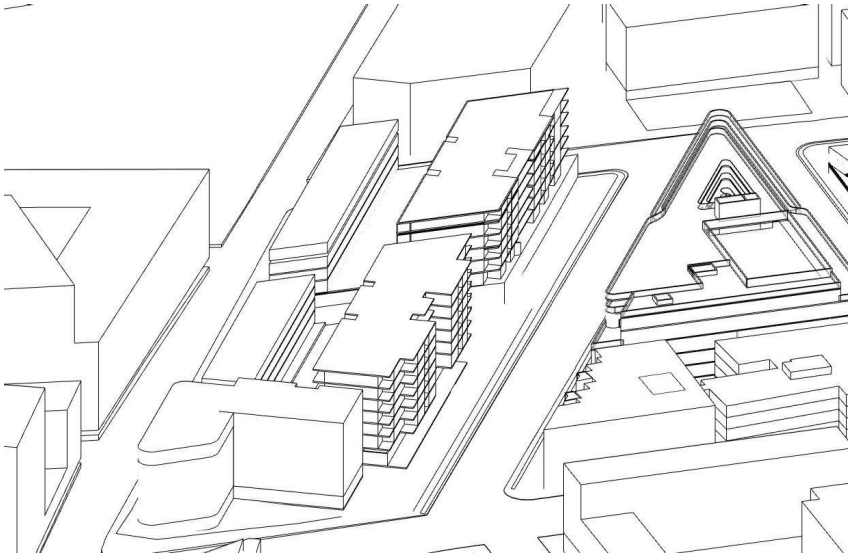
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	HUNTER ST SUN EYE VIEWS (WINTER SOLSTICE) - SHEET 02

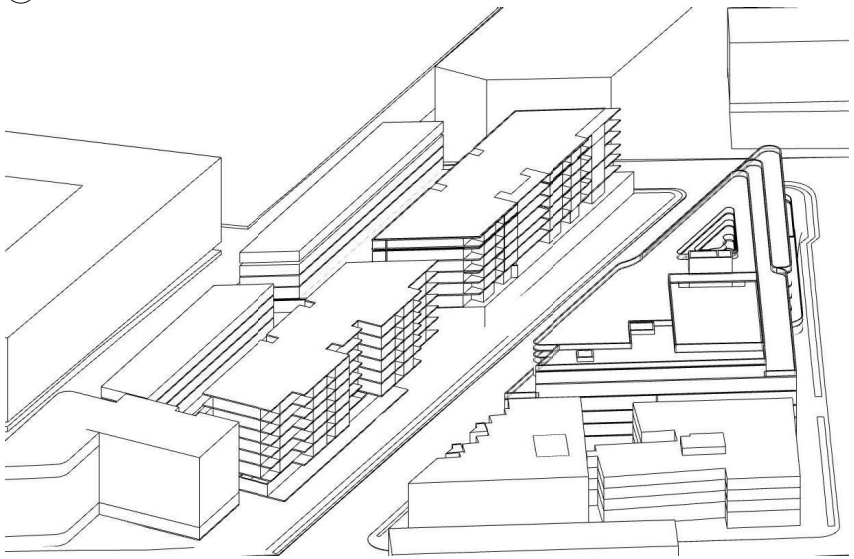
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DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2403	A



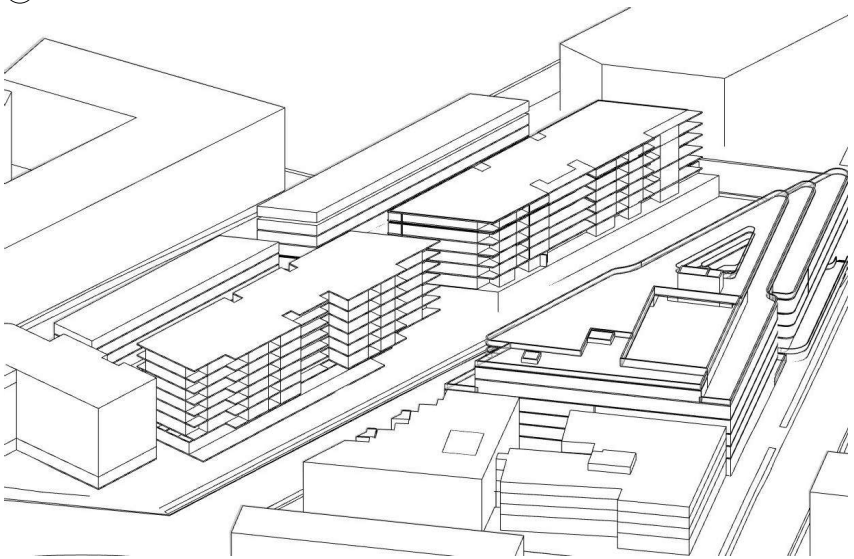
- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 9AM
SCALE: N.T.S.



- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 10AM
SCALE: N.T.S.



- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 11AM
SCALE: N.T.S.



- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 12PM
SCALE: N.T.S.

PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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SDG

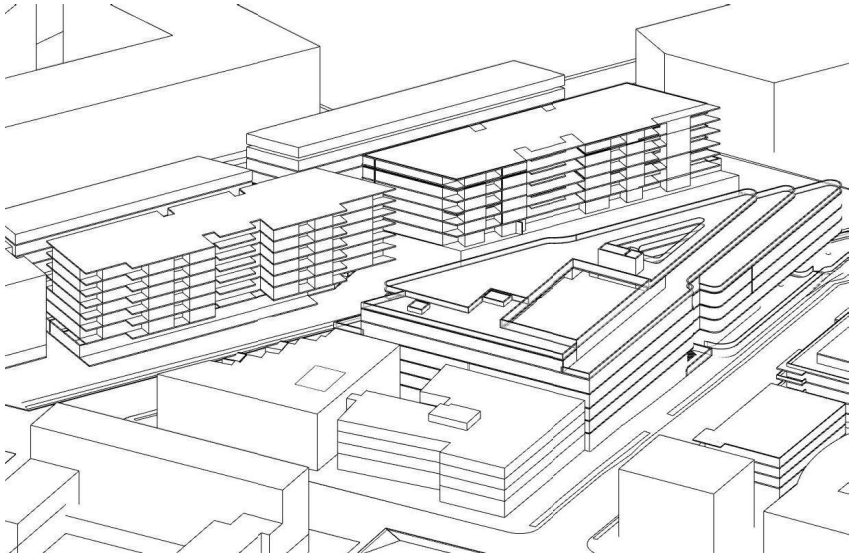
Level 4, 222 Clarence Street
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Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amit Juba 10602
Rule Pin 11286

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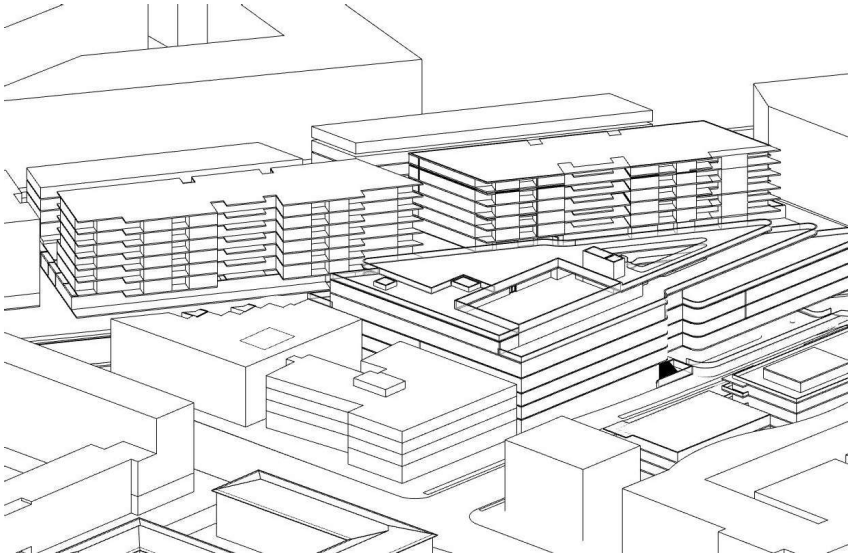
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	YOUNG ST FUTURE DEVELOPMENTS SUN EYE VIEWS (WINTER SOLSTICE) - SHEET 01

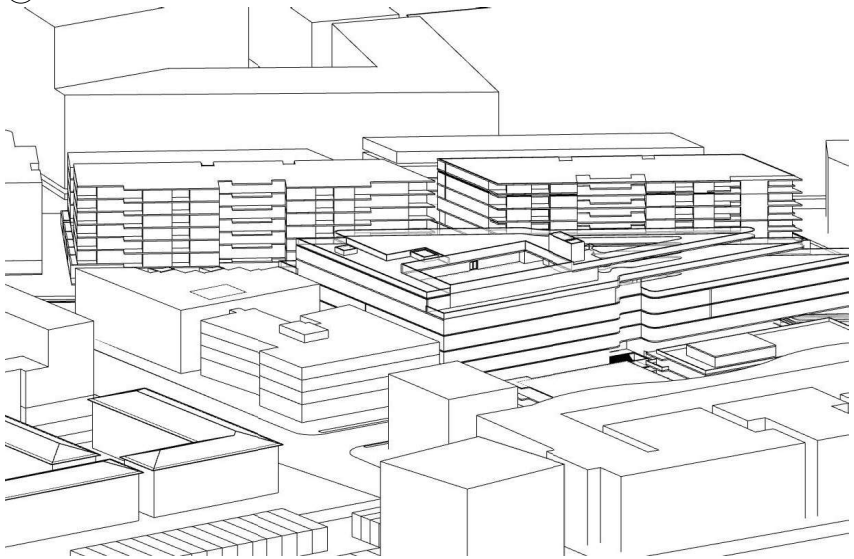
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2500	A



- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 1PM
SCALE: N.T.S.



- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 2PM
SCALE: N.T.S.



- YOUNG ST FUTURE DEVELOPMENT SUN EYE - 3PM
SCALE: N.T.S.

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

SDG

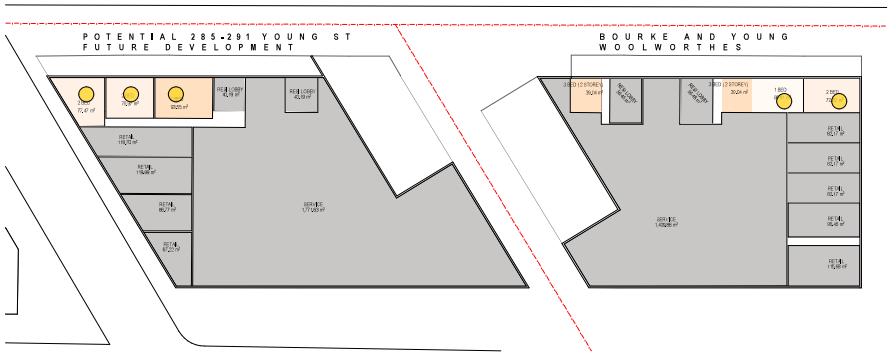
Level 4, 222 Clarence Street
Sydney, NSW 2000 Australia
Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amir Jajoo 10602
Reg No 11286

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Christchurch Auckland
Telephone +61 2 8823 7000
Instagram @plusarchitecture
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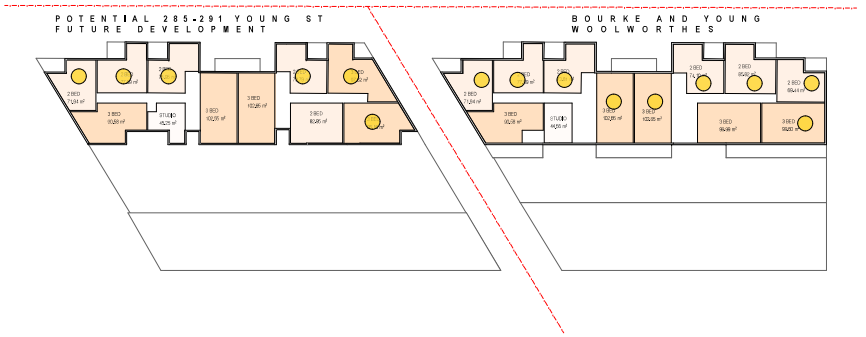
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	YOUNG ST FUTURE DEVELOPMENTS SUN EYE VIEWS (WINTER SOLSTICE) - SHEET 02

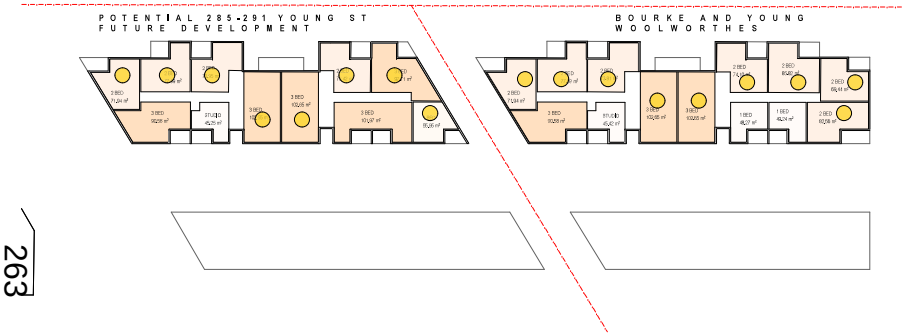
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2501	A



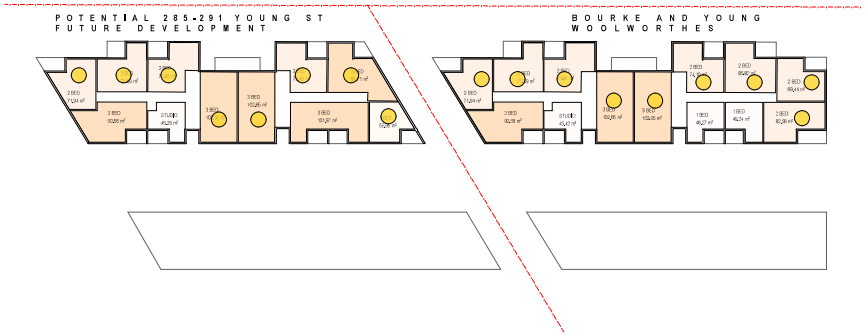
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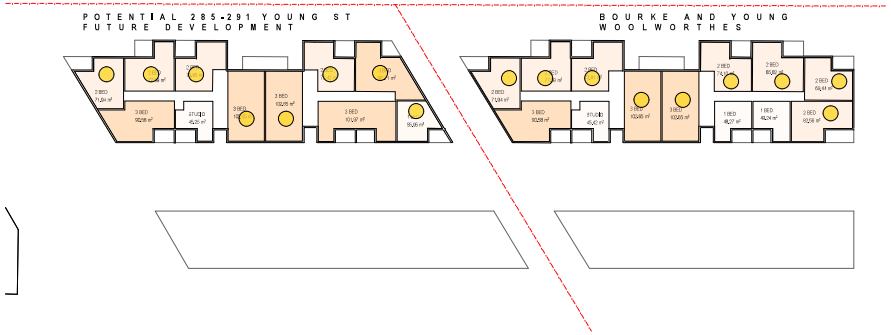
1. LEVEL 01
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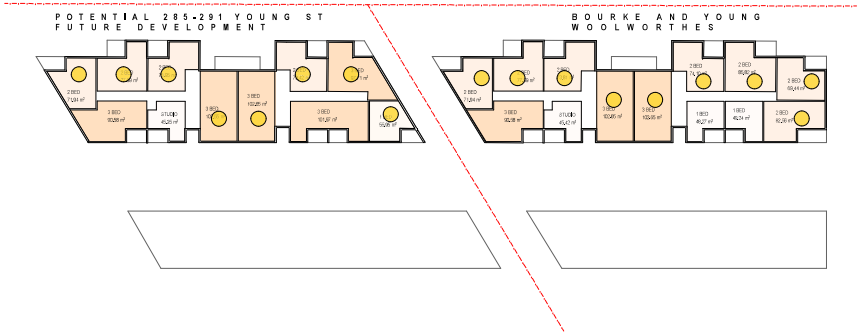
2. LEVEL 02
SCALE: 1:500@A1



3. LEVEL 03
SCALE: 1:500@A1



4. LEVEL 04
SCALE: 1:500@A1



5. LEVEL 05
SCALE: 1:500@A1

2 HOURS OF SUNLIGHT DURING WINTER SOLSTICE

263

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

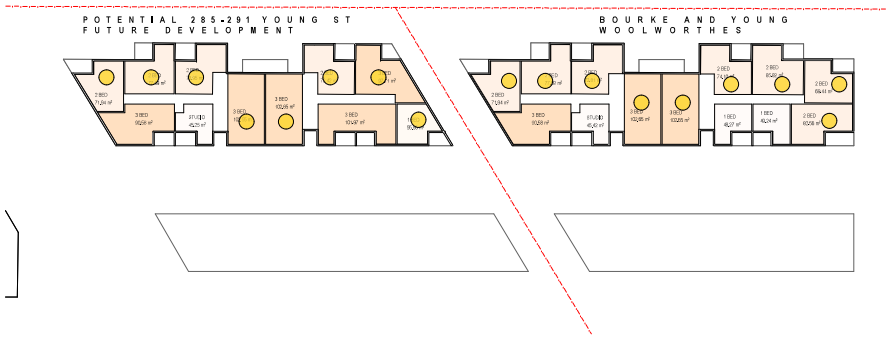
Level 4, 222 Clarence Street
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Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
Amit Julka 10602
Rule Pte 11289

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	YOUNG ST FUTURE DEVELOPMENTS SOLAR AMENITY PLANS - SHEET 01

SCALE		
1:500 @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2502	A



6 LEVEL 06
SCALE: 1:500@A1

BOURKE AND YOUNG WOOLWORTH SOLAR COUNT			
STORY	NO. OF APT	2H SOLAR ACCESS	
LEVEL 06	13	9	69%
LEVEL 05	13	9	69%
LEVEL 04	13	9	69%
LEVEL 03	13	9	69%
LEVEL 02	13	9	69%
LEVEL 01	12	9	75%
LEVEL GL	2	2	100%
	79	56	71%

YOUNG ST FUTURE BLDG SOLAR COUNT			
STORY	NO. OF APT	2H SOLAR ACCESS	
LEVEL 06	11	8	73%
LEVEL 05	11	8	73%
LEVEL 04	11	8	73%
LEVEL 03	11	8	73%
LEVEL 02	11	8	73%
LEVEL 01	11	6	55%
LEVEL GL	3	3	100%
	69	49	71%

2 HOURS OF SUNLIGHT DURING WINTER SOLSTICE

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 8299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

SDG

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Plus Architecture Pty. Ltd.
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Nominated Architect (NSW):
Amir Jajbo 10602
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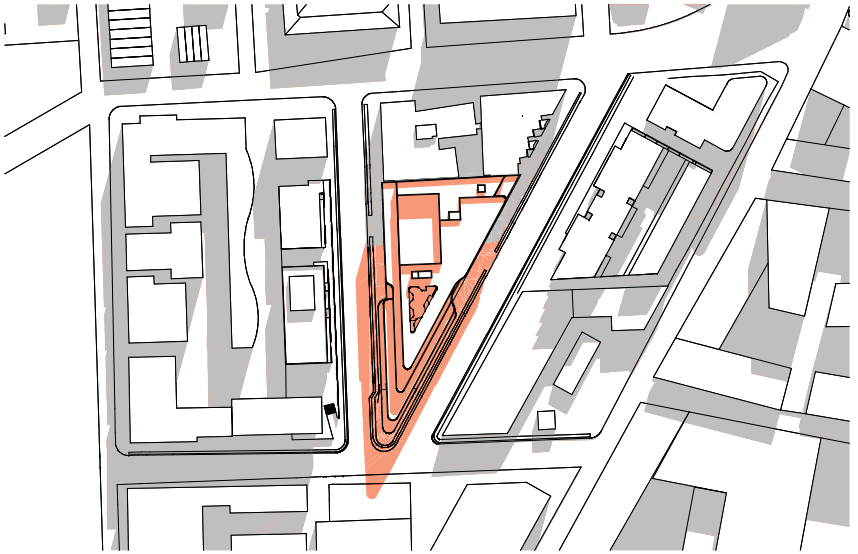
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	YOUNG ST FUTURE DEVELOPMENTS SOLAR AMENITY PLANS - SHEET 02

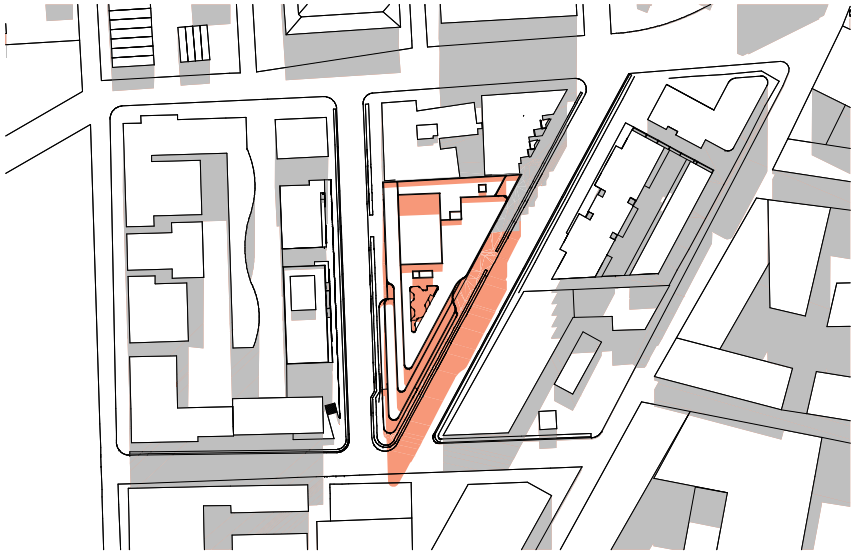
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
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JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2503	A



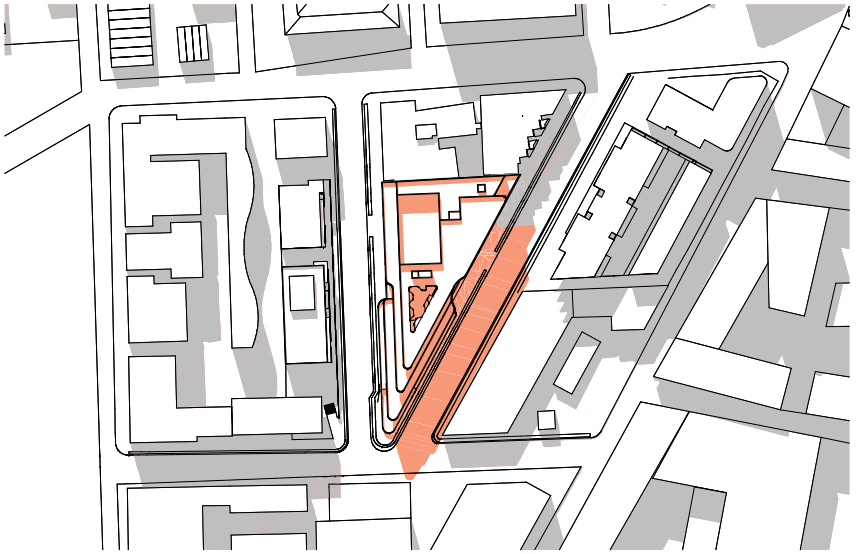
SHADOW DIAGRAM - 9AM
SCALE: N.T.S.



SHADOW DIAGRAM - 10AM
SCALE: N.T.S.



SHADOW DIAGRAM - 11AM
SCALE: N.T.S.



SHADOW DIAGRAM - 12PM
SCALE: N.T.S.

PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

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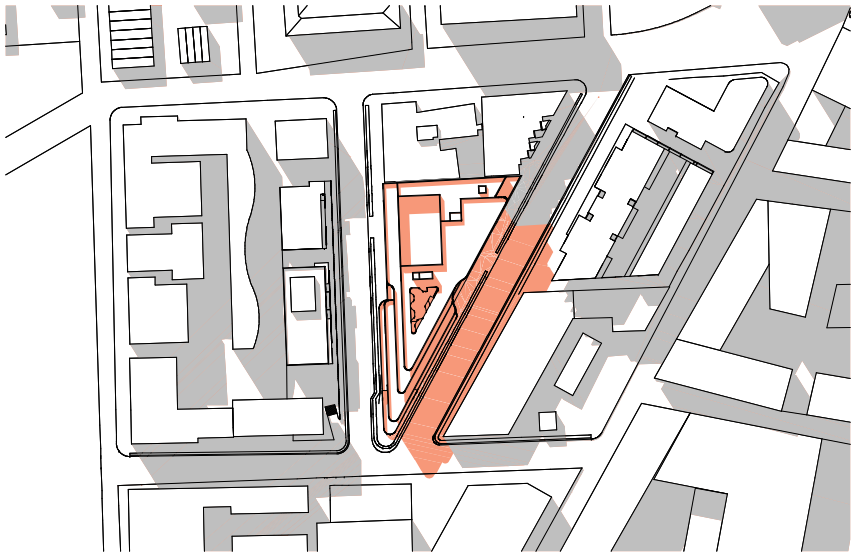
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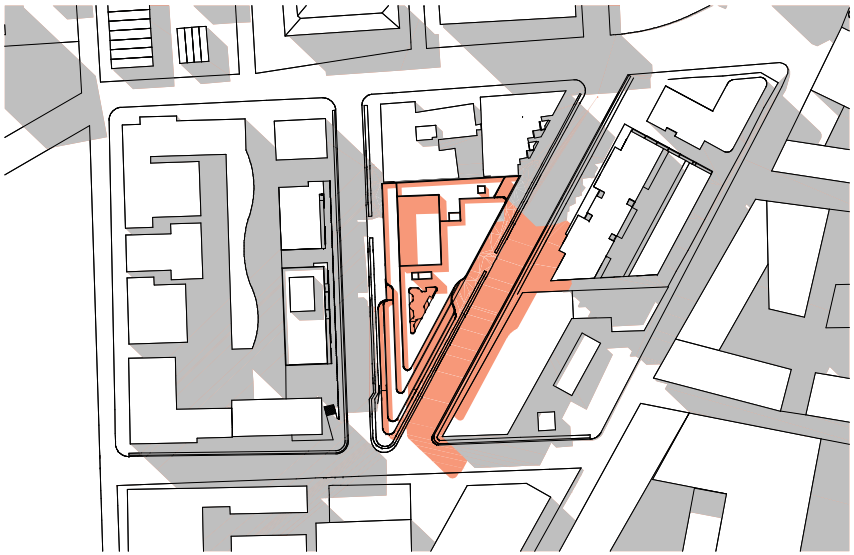
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PROJECT	242-258 Young Street Waterloo Sydney NSW
DRAWING TITLE	SHADOW DIAGRAMS (WINTER SOLSTICE) - SHEET 01

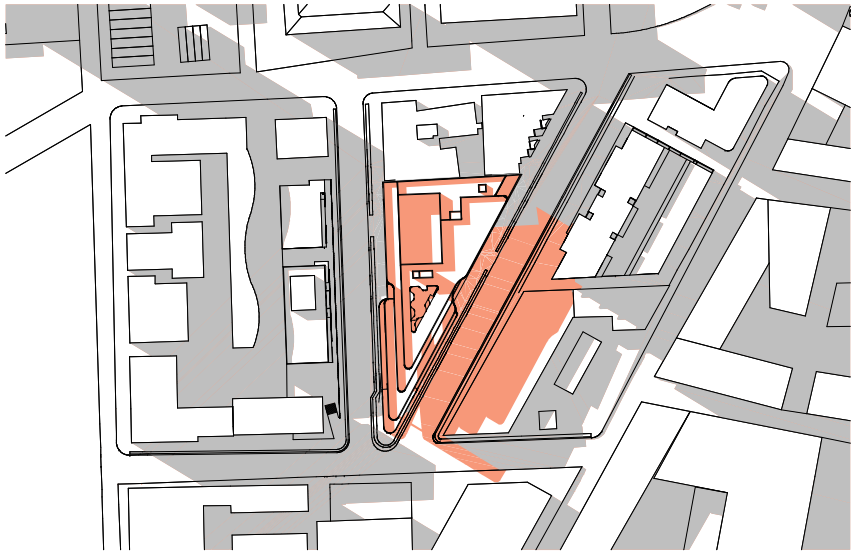
SCALE NTS @A1		
DATE 15/01/2024	PLOT DATE 17/01/2024	
DRAWN IC	CHECKED GH	
JOB NO. 20621	DRAWING NO. PLA-PP-2600	REVISION A



- SHADOW DIAGRAM - 1PM
SCALE: N.T.S.



- SHADOW DIAGRAM - 2PM
SCALE: N.T.S.



- SHADOW DIAGRAM - 3PM
SCALE: N.T.S.

PROPOSED SHADOWS
EXISTING SHADOWS

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS		
PLANNER	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	JMT CONSULTING	T 0415 563 177
ARBORIST	ARBORSAW	T 2413 842 183
FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9660

SDG

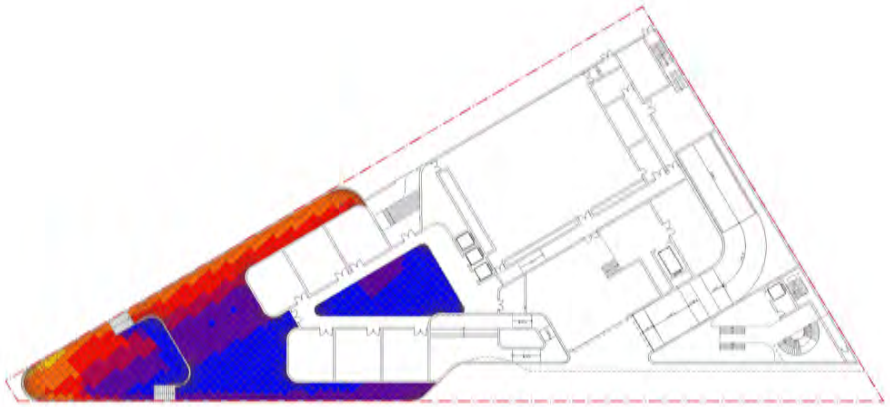
Level 4, 222 Clarence Street
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Plus Architecture Pty. Ltd.
ACN 605560303
Nominated Architect (NSW):
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Rabe Pte 11286

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	SHADOW DIAGRAMS (WINTER SOLSTICE) - SHEET 02

SCALE		
NTS @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2601	A



0. GROUND 00 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1



1. LEVEL 01 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1



2. LEVEL 02 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1



3. LEVEL 03 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1

hours
0 1 2 3 4 5 6

Note:
This is an indicative solar study taken on winter solstice between 9am to 3pm.
Data is indicative only and is subject to being verified by an expert consultant.

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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Plus Architecture Pty. Ltd.
ACN 605568303
Nominated Architect (NSW):
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Reg No 11286

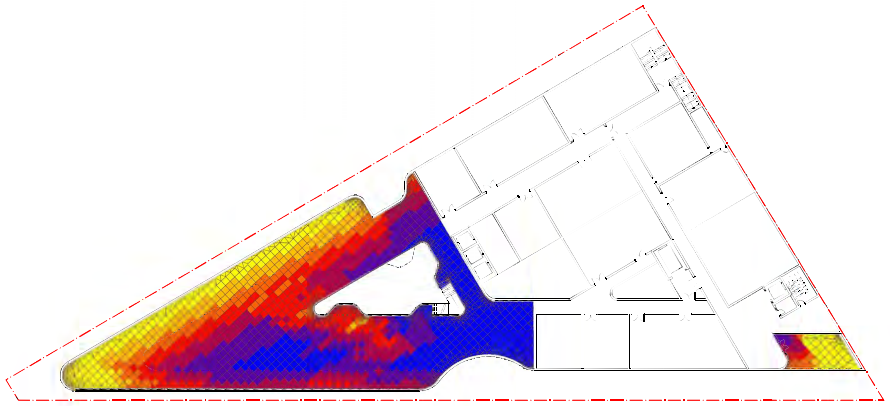
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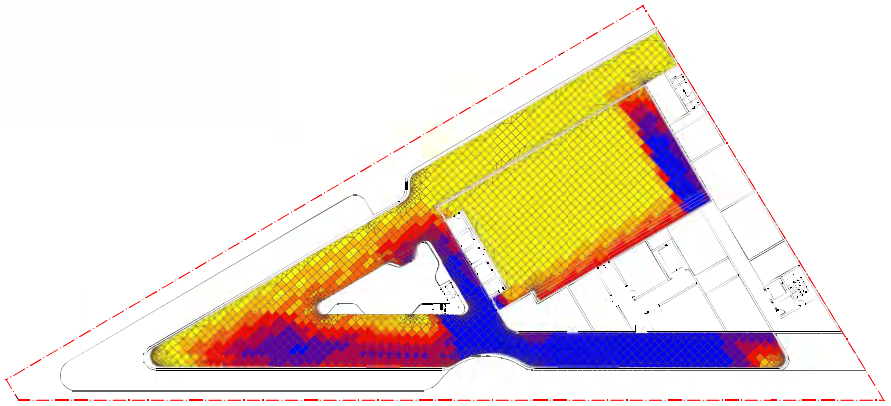
PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	OPEN SPACE SOLAR STUDY (WINTER SOLSTICE) - SHEET 01

SCALE		
1:400 @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	

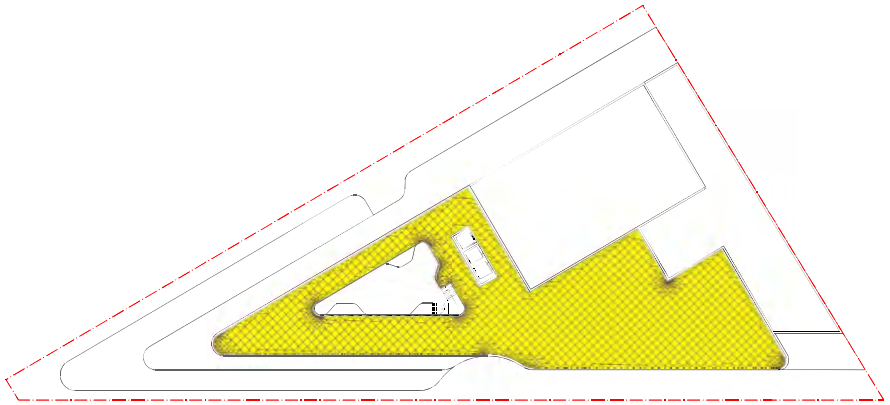
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2700	A



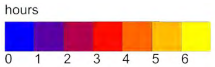
4. LEVEL 04 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1



5. LEVEL 05 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1



6. LEVEL 02 OPEN SPACE SOLAR ACCESS
SCALE: 1:400@A1



Note:
This is an indicative solar study taken on winter solstice between 9am to 3pm.
Data is indicative only and is subject to being verified by an expert consultant.

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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Nominated Architect (NSW):
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Rule Pin 11286

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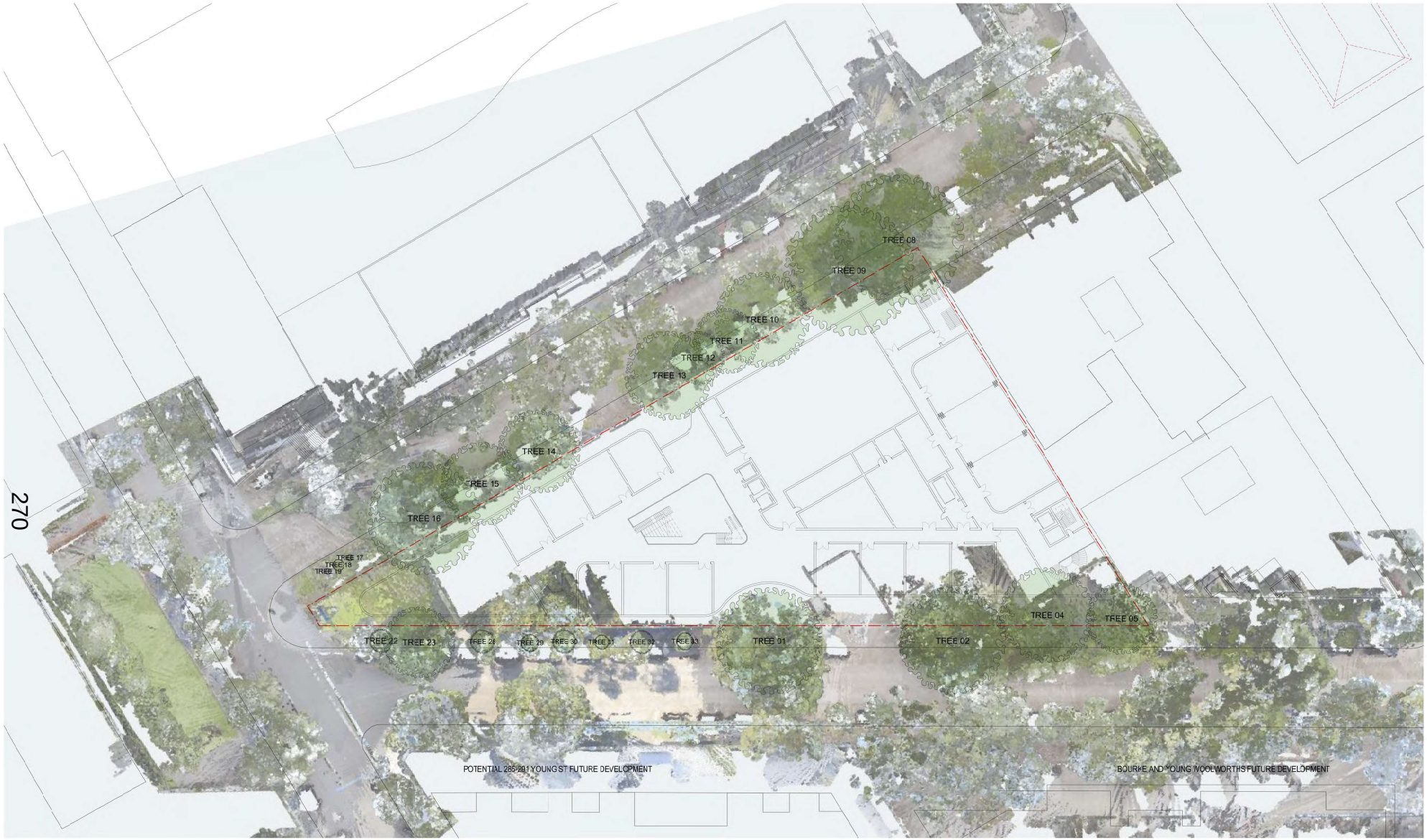
PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	OPEN SPACE SOLAR STUDY (WINTER SOLSTICE) - SHEET 02

SCALE		
1:400 @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-2701	A

Attachment A3-2

Architectural Drawings



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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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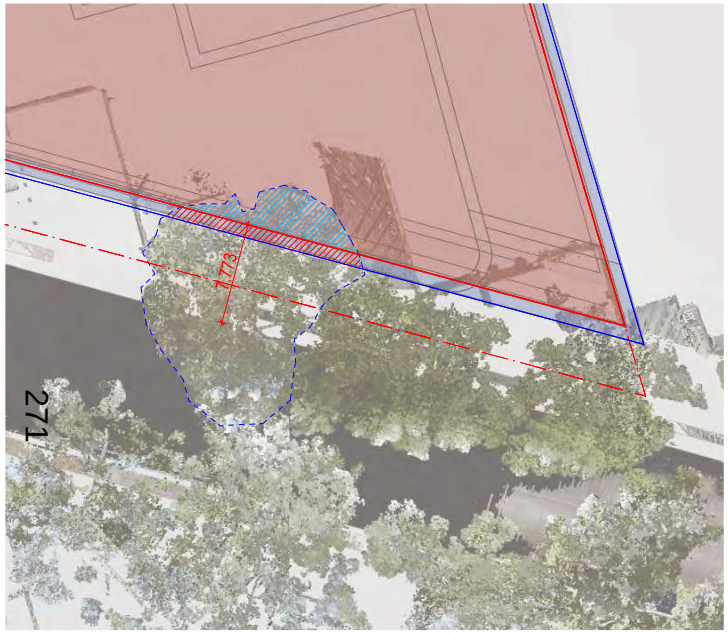
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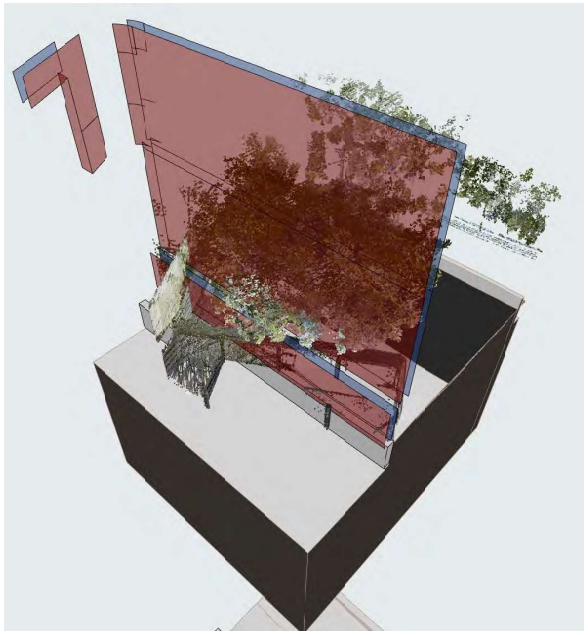
PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	TREE CANOPIES OVERVIEW

SCALE		
NTS		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3000	A



TREE 02 VIEW 01
SCALE: N.T.S.



TREE 02 VIEW 01
SCALE: N.T.S.



TREE 02 VIEW 03
SCALE: N.T.S.

TREE 02

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: 13.7%

TO BUILT FORM WITH SCAFFOLDING: 20.9%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	WMA WATER	T (02) 9299 2855	
SCHOOL OPERATIONS	AMINA	T 02 9541 9628	
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990	

SDG

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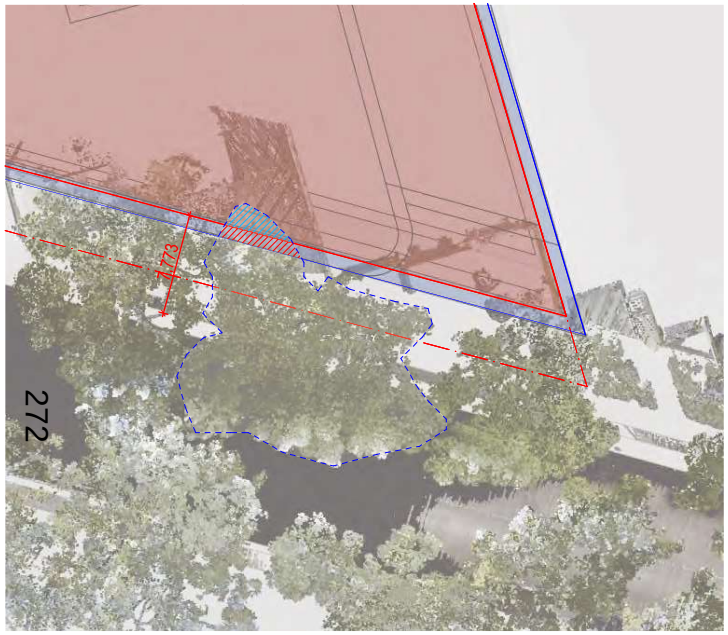
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242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
TREE CANOPY NO.2

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

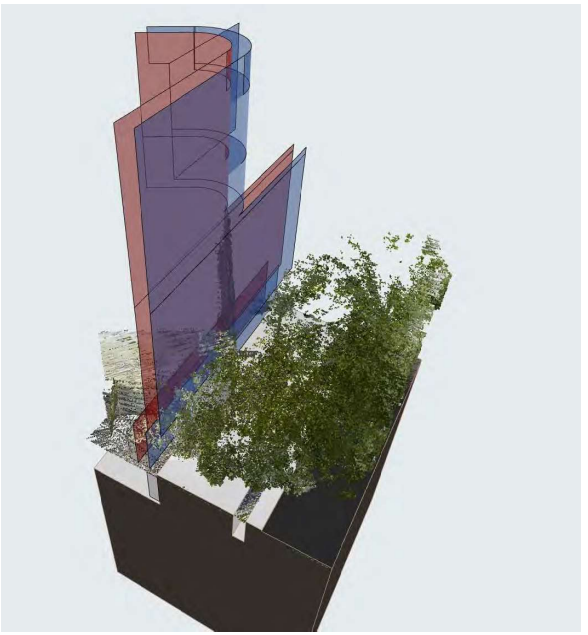
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3001	A



TREE 04 VIEW 01
SCALE: N.T.S.



TREE 04 VIEW 02
SCALE: N.T.S.



TREE 04 VIEW 03
SCALE: N.T.S.

TREE 04

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: 2.7%

TO BUILT FORM WITH SCAFFOLDING: 5.1%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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ARBORIST	☐	ARBORSAW	T 2413 642 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

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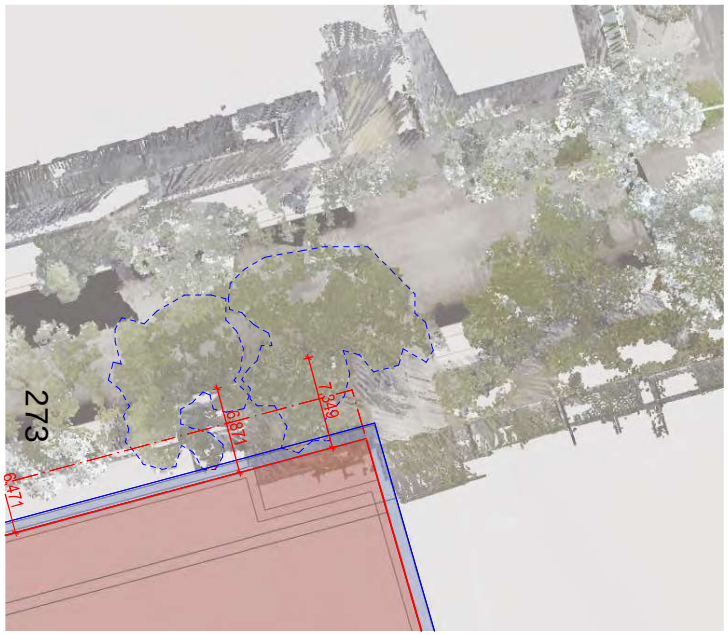
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PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
TREE CANOPY NO.4

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3002	A



TREE 08 AND 09 VIEW 01
SCALE: N.T.S.



TREE 08 AND 09 VIEW 02
SCALE: N.T.S.



TREE 08 AND 09 VIEW 03
SCALE: N.T.S.

TREE 08 AND 09

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING (TREE 08)

TO BUILT FORM: NIL

TO BUILT FORM WITH SCAFFOLDING: 0.16%

CANOPY PRUNING (TREE 09)

TO BUILT FORM: NIL

TO BUILT FORM WITH SCAFFOLDING: 0.83%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	TREE CANOPY NO.8 AND 9

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3003	A



TREE 10 VIEW 01
SCALE: N.T.S.



TREE 10 VIEW 02
SCALE: N.T.S.



TREE 10 VIEW 03
SCALE: N.T.S.

TREE 10

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: NIL

TO BUILT FORM WITH SCAFFOLDING: NIL

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS		
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FLOODING	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	AMINA	T 02 9541 9628
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990

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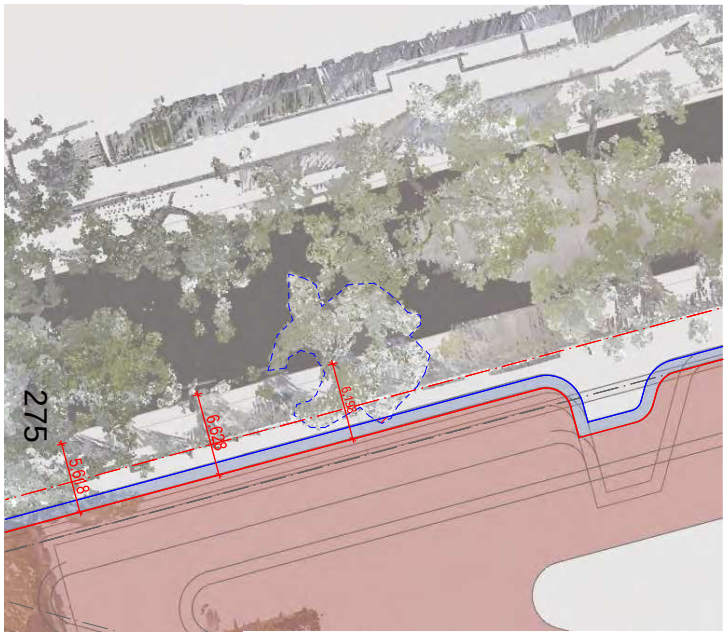
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PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
TREE CANOPY NO.10

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3004	A



TREE 14 VIEW 01
SCALE: N.T.S.



TREE 14 VIEW 02
SCALE: N.T.S.



TREE 14 VIEW 03
SCALE: N.T.S.

TREE 14

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: NIL

TO BUILT FORM WITH SCAFFOLDING: 0.33%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
TRAFFIC	☐	JMT CONSULTING	T 0415 563 177
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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
TREE CANOPY NO.14

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

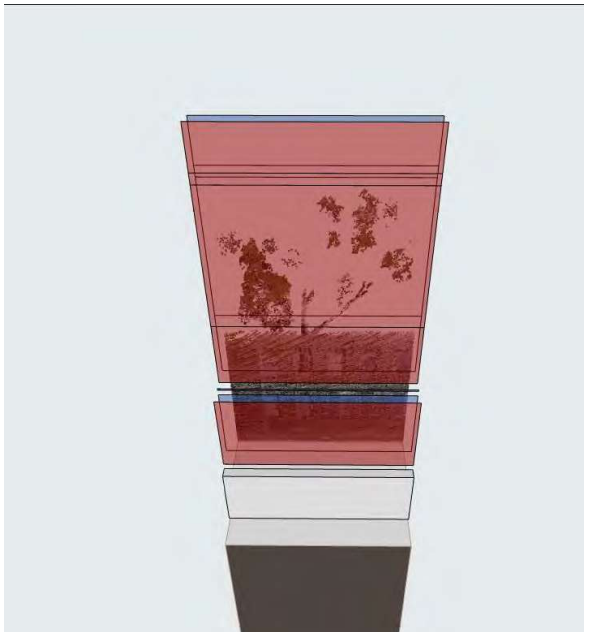
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3005	A



TREE 15 VIEW 01
SCALE: N.T.S.



TREE 15 VIEW 02
SCALE: N.T.S.



TREE 15 VIEW 03
SCALE: N.T.S.

TREE 15

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: NIL

TO BUILT FORM WITH SCAFFOLDING: NIL

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

CONSULTANTS			
PLANNER	☐	ETHOS URBAN	T (02) 9956 6962
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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	TREE CANOPY NO.15

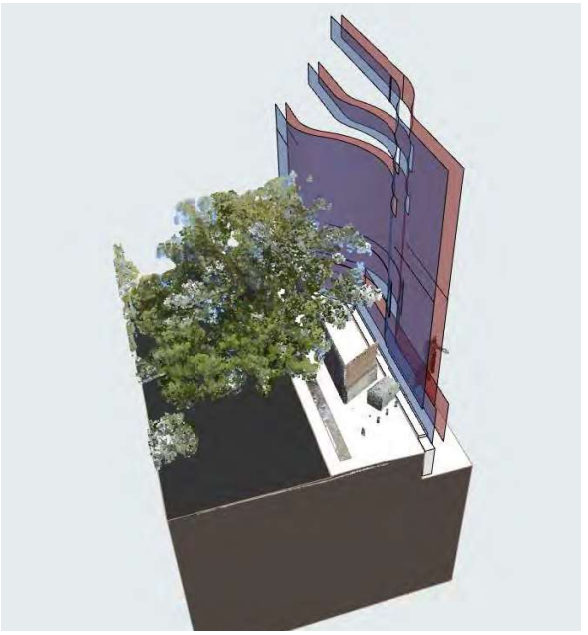
SCALE		
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DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3006	A



TREE 01 VIEW 01
SCALE: N.T.S.



TREE 01 VIEW 02
SCALE: N.T.S.



TREE 01 VIEW 03
SCALE: N.T.S.

TREE 01

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: NIL

TO BUILT FORM WITH SCAFFOLDING: NIL

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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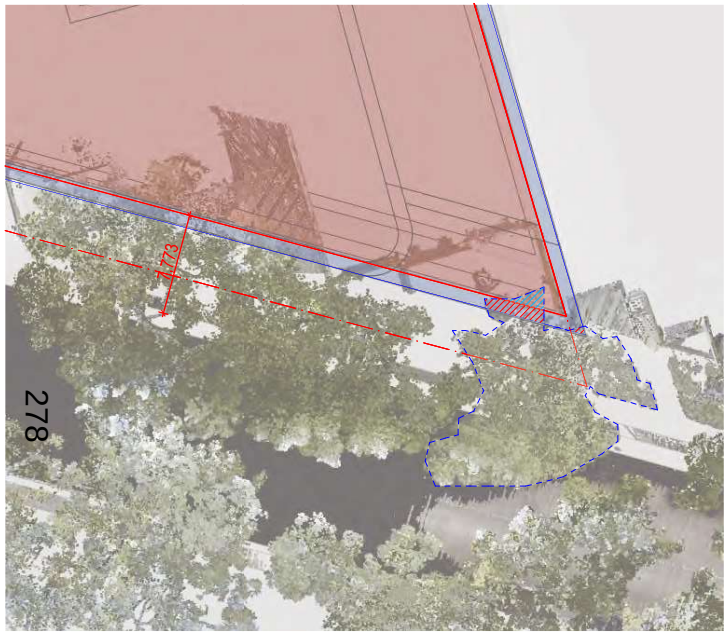
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PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
TREE CANOPY NO.1

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3007	A



TREE 05 VIEW 01
SCALE: N.T.S.



TREE 05 VIEW 02
SCALE: N.T.S.



TREE 05 VIEW 03
SCALE: N.T.S.

TREE 05

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: 1.6%

TO BUILT FORM WITH SCAFFOLDING: 4.8%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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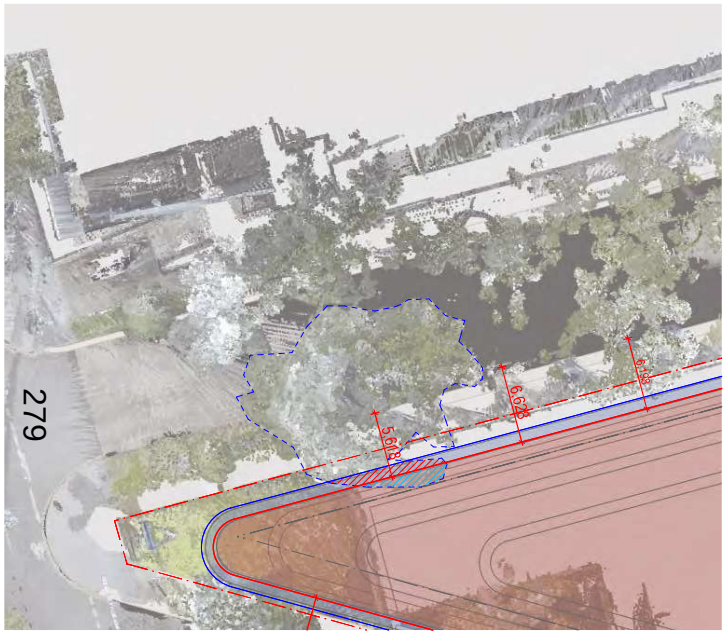
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DRAWING TITLE
TREE CANOPY NO.5

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3008	A



TREE 16 VIEW 01
SCALE: N.T.S.



TREE 16 VIEW 02
SCALE: N.T.S.



TREE 16 VIEW 03
SCALE: N.T.S.

TREE 16

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: 3.3%

TO BUILT FORM WITH SCAFFOLDING: 6.8%

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DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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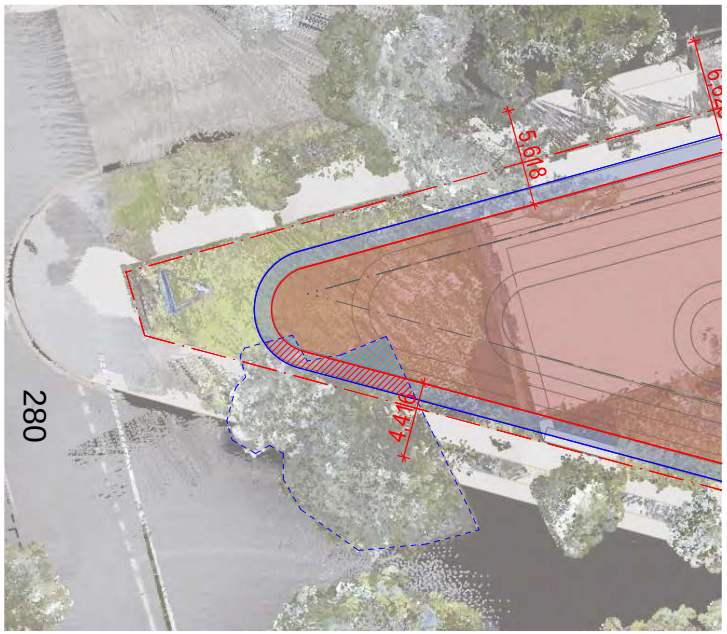
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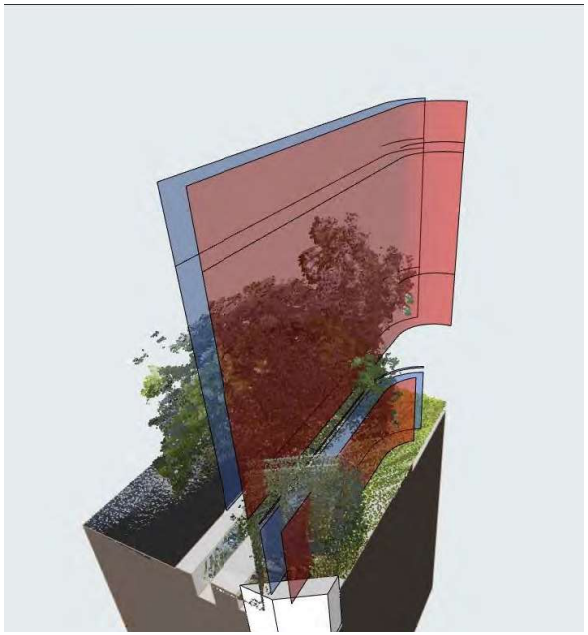
DRAWING TITLE
TREE CANOPY NO.16

SCALE	
NTS	
DATE	PLOT DATE
15/01/2024	17/01/2024
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IC	GH

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-3009	A



TREE 23 VIEW 01
SCALE: N.T.S.



TREE 23 VIEW 02
SCALE: N.T.S.



TREE 23 VIEW 03
SCALE: N.T.S.

TREE 23

BUILDING ENVELOPE

SCAFFOLDING

CANOPY PRUNING

TO BUILT FORM: 4.5%

TO BUILT FORM WITH SCAFFOLDING: 11.9%

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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Nominated Architect (NSW):
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Robe Pin 11286

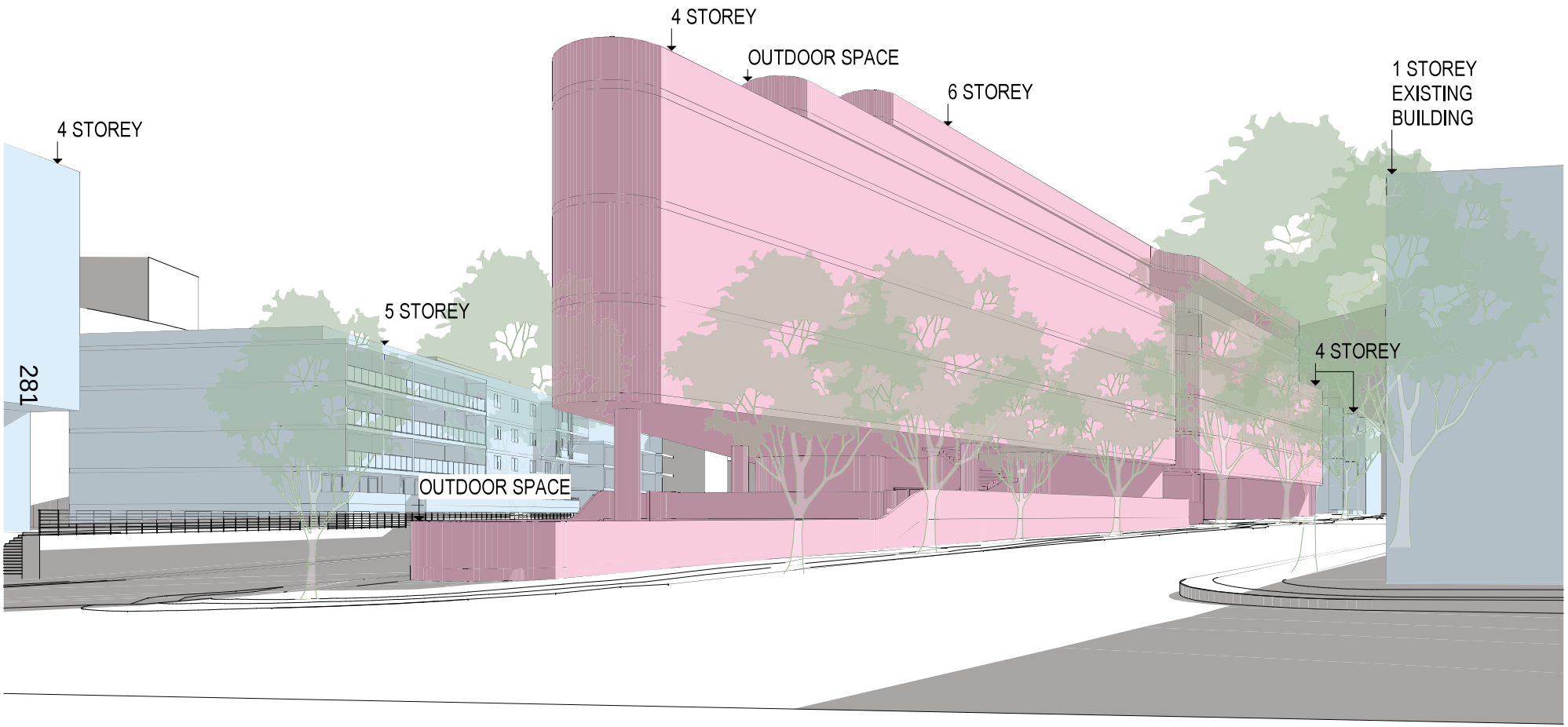
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	TREE CANOPY NO.23

SCALE	
NTS	
DATE	PLOT DATE
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IC	GH

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20621	PLA-PP-3010	A



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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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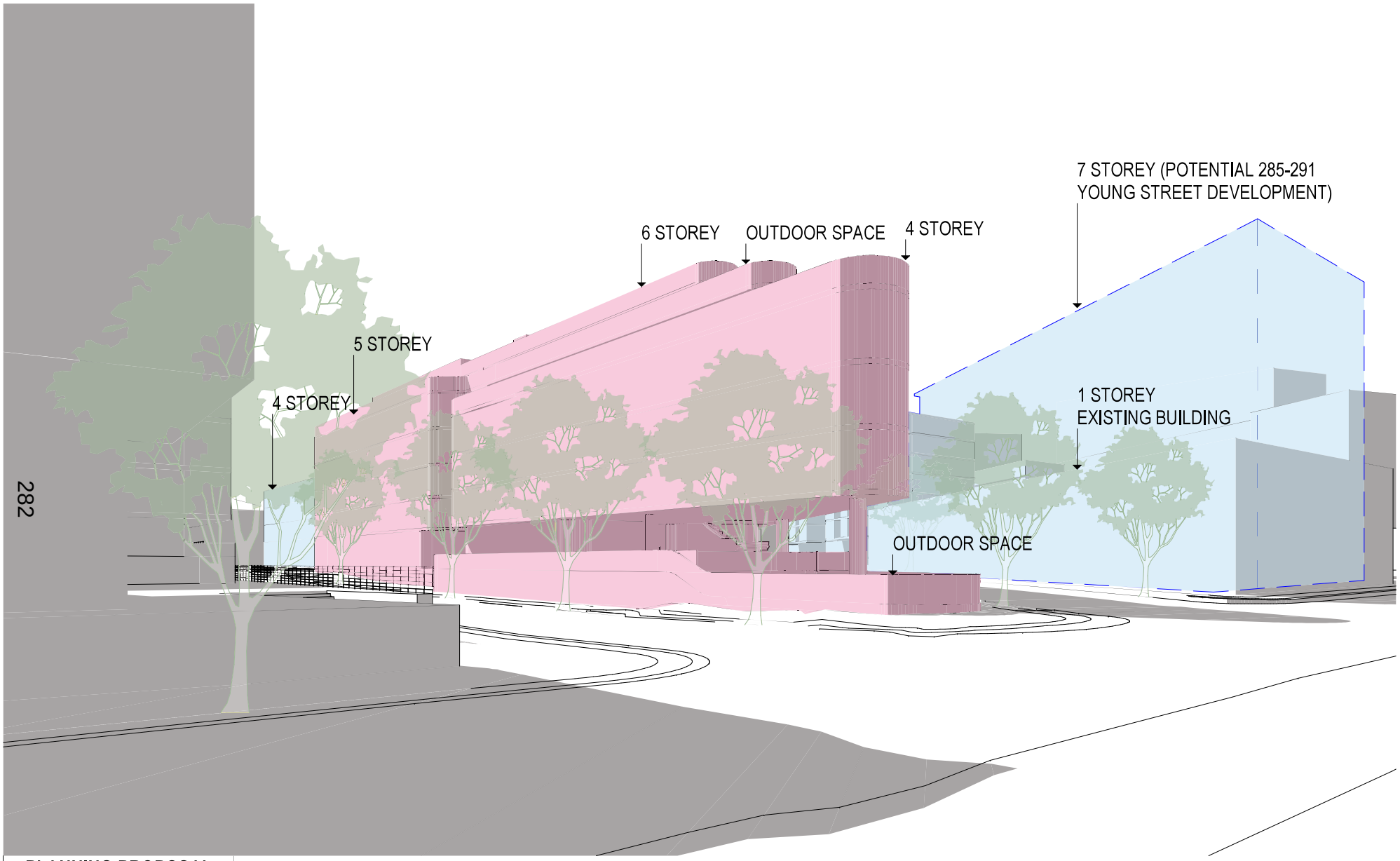
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	ENVELOPE DIAGRAM - POWELL & YOUNG ST

SCALE		
NTS @A1		
DATE	PLOT DATE	
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JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-4000	A



PLANNING PROPOSAL

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FLOODING	☐	WMA WATER	T (02) 9299 2855
SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 9394 9990

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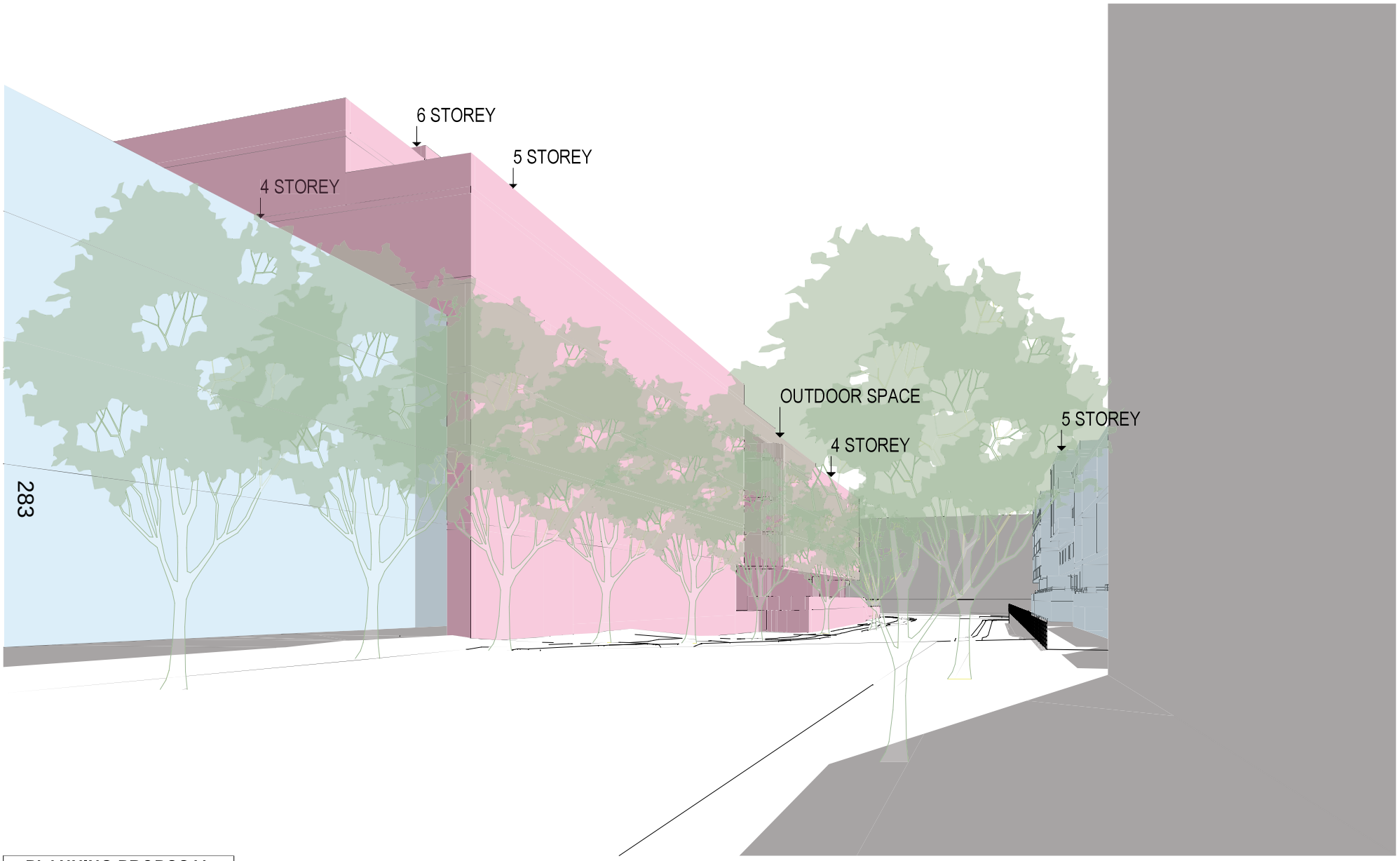
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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	ENVELOPE DIAGRAM - POWELL & HUNTER ST

SCALE		
NTS @A1		
DATE	PLOT DATE	
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JOB NO.	DRAWING NO.	REVISION
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PLANNING PROPOSAL

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SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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PROJECT	DRAWING TITLE
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SCALE		
NTS @A1		
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PLANNING PROPOSAL

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SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	ENVELOPE DIAGRAM - YOUNG ST

SCALE		
NTS @A1		
DATE	PLOT DATE	
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IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-4003	A



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PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
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DATE	REVISION	BY	CHK	NO.

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	PERSPECTIVES - SHEET 02

SCALE		
NTS @A1		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
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IC	GH	

JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-5001	A



287

PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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SCHOOL OPERATIONS	☐	AMINA	T 02 9541 9628
LANDSCAPE	☐	TURF DESIGN STUDIO	T (02) 8394 9990

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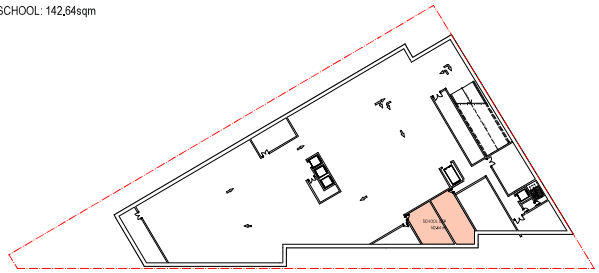
PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
PERSPECTIVES - SHEET 03

SCALE	
NTS @A1	
DATE	PLOT DATE
15/01/2024	17/01/2024
DRAWN	CHECKED
IC	GH

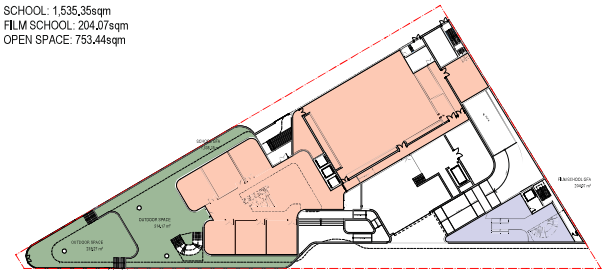
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-5002	A

SCHOOL: 142.64sqm



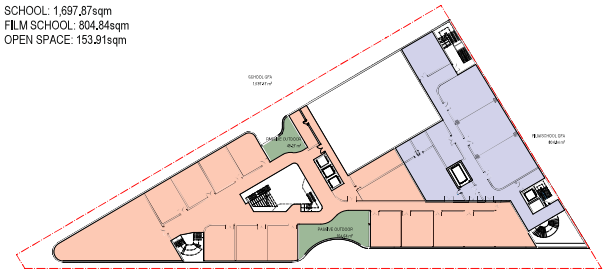
AREA - BASEMENT B1
SCALE: 1:600@A1

SCHOOL: 1,535.35sqm
FILM SCHOOL: 204.07sqm
OPEN SPACE: 753.44sqm



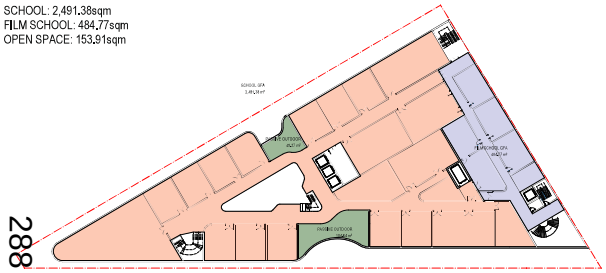
AREA - GROUND 00
SCALE: 1:600@A1

SCHOOL: 1,697.87sqm
FILM SCHOOL: 804.84sqm
OPEN SPACE: 153.91sqm



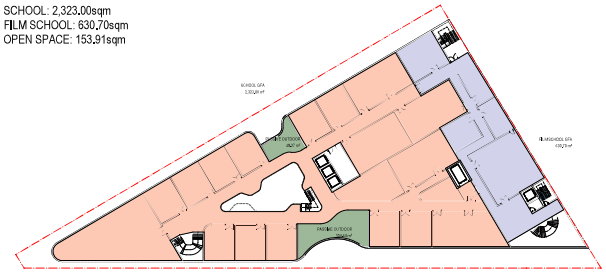
AREA - LEVEL 01
SCALE: 1:600@A1

SCHOOL: 2,491.38sqm
FILM SCHOOL: 484.77sqm
OPEN SPACE: 153.91sqm



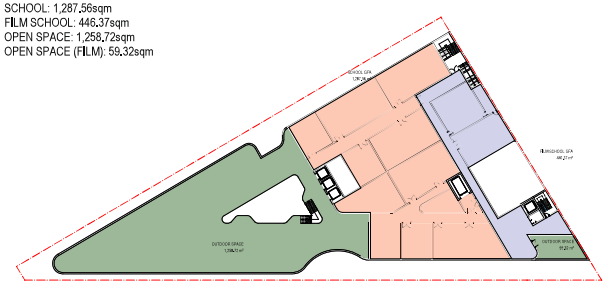
AREA - LEVEL 02
SCALE: 1:600@A1

SCHOOL: 2,323.00sqm
FILM SCHOOL: 630.70sqm
OPEN SPACE: 153.91sqm



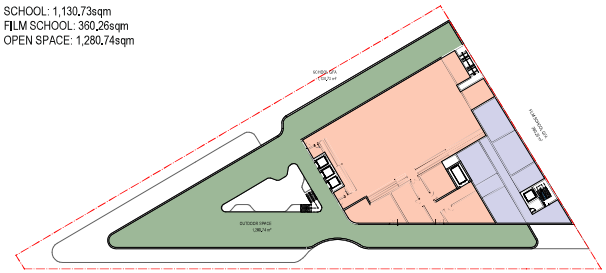
AREA - LEVEL 03
SCALE: 1:600@A1

SCHOOL: 1,287.56sqm
FILM SCHOOL: 446.37sqm
OPEN SPACE: 1,258.72sqm
OPEN SPACE (FILM): 59.32sqm



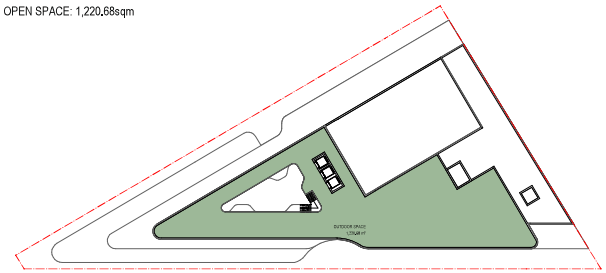
AREA - LEVEL 04
SCALE: 1:600@A1

SCHOOL: 1,130.73sqm
FILM SCHOOL: 360.26sqm
OPEN SPACE: 1,280.74sqm



AREA - LEVEL 05
SCALE: 1:600@A1

OPEN SPACE: 1,220.68sqm



AREA - LEVEL 06
SCALE: 1:600@A1

OPEN SPACE AREA
SCHOOL GFA
FILM SCHOOL GFA

PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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FLOODING	WMA WATER	T (02) 9299 2855	
SCHOOL OPERATIONS	AMINA	T 02 9541 9628	
LANDSCAPE	TURF DESIGN STUDIO	T (02) 8394 9990	

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PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
AREA DIAGRAMS

SCALE: 1:600 @A1	
DATE: 15/01/2024	PLOT DATE: 17/01/2024
DRAWN: IC	CHECKED: GH
JOB NO.: 20621	DRAWING NO.: PLA-PP-6000
	REVISION: A

LEVEL	G.F.A (m2) EXC SCHOOL CIRCULATION	G.F.A (m2) INCLUD. CIRCULATION
L6		
L5	1433.89	1490.99
L4	1562.55	1733.93
L3	2469.39	2953.70
L2	2468.95	2976.15
L1	2118.20	2506.71
G	1387.81	1739.42
B1	142.64	142.64
TOTAL	11440.89	13543.54

CARS Provided
55.00
55.00

EDUCATION

	TOTAL SCHOOL G.F.A. (m2) INCLUDING CORRIDOR	GLS/CLASS ROOM	PRIMARY GLS NO.	SECONDARY GLS NO.	SPECIALIST	SPECIALIST NO.	ADMIN/ STAFF	AMENITIES	CANTEEN	AUDITORIUM	BASKETBALL COURT	LIBRARY	CIRCULATION SPACE	SCHOOL OUTDOOR SPACE (ACTIVE)	SCHOOL OUTDOOR SPACE (PASSIVE)
		NLA (m2)	NO.	NO.	NLA (m2)	NO.	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	(m2)	(m2)
L6														1220.68	
L5	1130.73							100.23			757.22		57.10	1280.74	
L4	1287.56	185.76		3.00	665.47	5.00	32.01	59.81					171.38	1258.72	
L3	2323.00	794.24		13.00	525.46	4.00	32.01	59.81				281.87	484.31		153.91
L2	2491.38	925.68		15.00	524.34	4.00	32.01	59.81				281.87	507.20		153.91
L1	1697.87	742.08	12.00				29.94	48.54		108.00		281.87	388.51		153.91
G	1535.25	121.16	2.00				297.67			512.15			351.51	753.44	
B1	142.64														
TOTAL	10608.53	2768.92	14.00	31.00	1715.27	13.00	423.64	328.20	0.00	620.15	757.22	845.61	1960.01	4513.58	461.73
		TARGET GLS	14	31	TARGET SPECIALIST	13						870SQM TARGET		TOTAL OUTDOOR	4975.31
														TOTAL OUTDOOR PER STUDENT	6.2
															10/STUDENT REQ.

FILM SCHOOL

	TOTAL G.F.A. (m2)	AMENITIES	CAFE	FILM SCHOOL CORRIDOR / LOBBY	FILM SCHOOL	FILM SCHOOL OUTDOOR SPACE	BREAKOUT ROOM	REHEARSAL/ KIDS SPACES	COMMERCIAL KITCHEN	STORAGE
		NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)
L6										
L5	360.26	28.65		78.33	230.38					
L4	446.37			219.55	212.26	59.32				
L3	630.70			217.77	387.38					
L2	484.77	28.61		145.69	277.81					
L1	809.84			163.96			72.28	318.83	131.87	66.02
G	204.07		38.42	165.67						
B1										
	2935.01	57.26	38.42	991.17	1107.83	59.32	72.28	318.83	131.87	66.02

SITE AREA	4611 m^2
FSR ALLOWED (+0.5 BONUS)	2.0 :1
GFA ALLOWABLE	9222 m^2

GFA PROPOSED (EXCL. SCHOOL CIRCULATION)	11440.89 m^2
FSR PROPOSED (EXCL. CIRCULATION)	2.48 :1

GFA PROPOSED (INCL. SCHOOL CIRCULATION)	13543.54 m^2
FSR PROPOSED (INCL. SCHOOL CIRCULATION)	2.94 :1

YEAR	GLS	SPECIALIST	NO. STUDENT
K	2		40
1	2		40
2	2		40
3	2	0	40
4	2		40
5	2		40
6	2		40
7			90
8			90
9	31	13	90
10			90
11			80
12			80
TOTAL	45	13	800

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PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	DEVELOPMENT SCHEDULE

SCALE		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-7000	A

	EXISTING CONDITIONS							
	EXISTING OFFICE					EXISTING FILM SCHOOL		
	TOTAL G.F.A. (m2)	OFFICE NLA (m2)	WARE-HOUSE NLA (m2)	CARS PROVIDED		TOTAL G.F.A. (m2)	FILM SCHOOL NLA (m2)	CARS PROVIDED
L6								
L5								
L4								
L3								
L2								
L1	630	630		24		781.33	781.33	
G	2417	600	1817	13		807.94	807.94	6
B1								
TOTAL	**3047**	**1230**	**1817**	**37**		**1589.27**	**1589.27**	**6**

	PROPOSED SCHEME			
	EDUCATION & FILM SCHOOL			
	TOTAL G.F.A. (m2) INCLD. CIRCULATION	EDUCATION NLA (m2)	FILM SCHOOL NLA (m2)	CARS PROVIDED
	1490.99	1130.73	360.26	
	1733.93	1287.56	446.37	
	2953.70	2323.00	630.70	
	2976.15	2491.38	484.77	
	2506.71	1697.87	808.84	
	1739.42	1535.35	204.07	
	142.64	142.64		55
	13543.54	**10608.53**	**2935.01**	**55**

	TOTAL GFA	CARS PROVIDED
EXISTING CONDITIONS	**4636.27 m2**	**43**
PROPOSED SCHEME	**13543.54 m2**	**55**

NOTE: REFER TO QUANTITY SURVEYOR'S REPORT FOR VALUE OF CAPITAL WORKS

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PLANNING PROPOSAL

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15/01/2024	PLANNING PROPOSAL	IC	GH	A

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PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	**DEVELOPMENT OUTCOME**

SCALE		
DATE	PLOT DATE	
15/01/2024	17/01/2024	
DRAWN	CHECKED	
IC	GH	

JOB NO.	DRAWING NO.	REVISION
20621	**PLA-PP-7001**	**A**

Attachment A4

Draft Site Specific Design Guide

Ethos Urban

242-258 Young Street, Waterloo

DRAFT

Site Specific Design Guide

January 2024

Version 1.0

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1.3 Relationship to Other Plans and Planning Instruments 3
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2.1 Vision for the site 4
2.2 Principles 4
3.0 Design Guidelines 5
3.1 Built form 5
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3.3 Landscaping and ecology 7
3.4 Environmentally sustainable development 8
3.5 Public Art 8
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3.7 Parking, access and circulation 9
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Figure 3 Building heights and setbacks 5
Figure 4 Indicative section locations plan 6
Figure 5 Section 1 6
Figure 6 Section 2 6

1.0 Introduction

1.1 Land to which this Guide applies

The Guideline applies to land at 242- 258 Young Street, Waterloo (the site), as outlined in red in **Figure 1: Land Application Map**, being Lot 1 in DP84655 and Lots A and B in DP 161650.

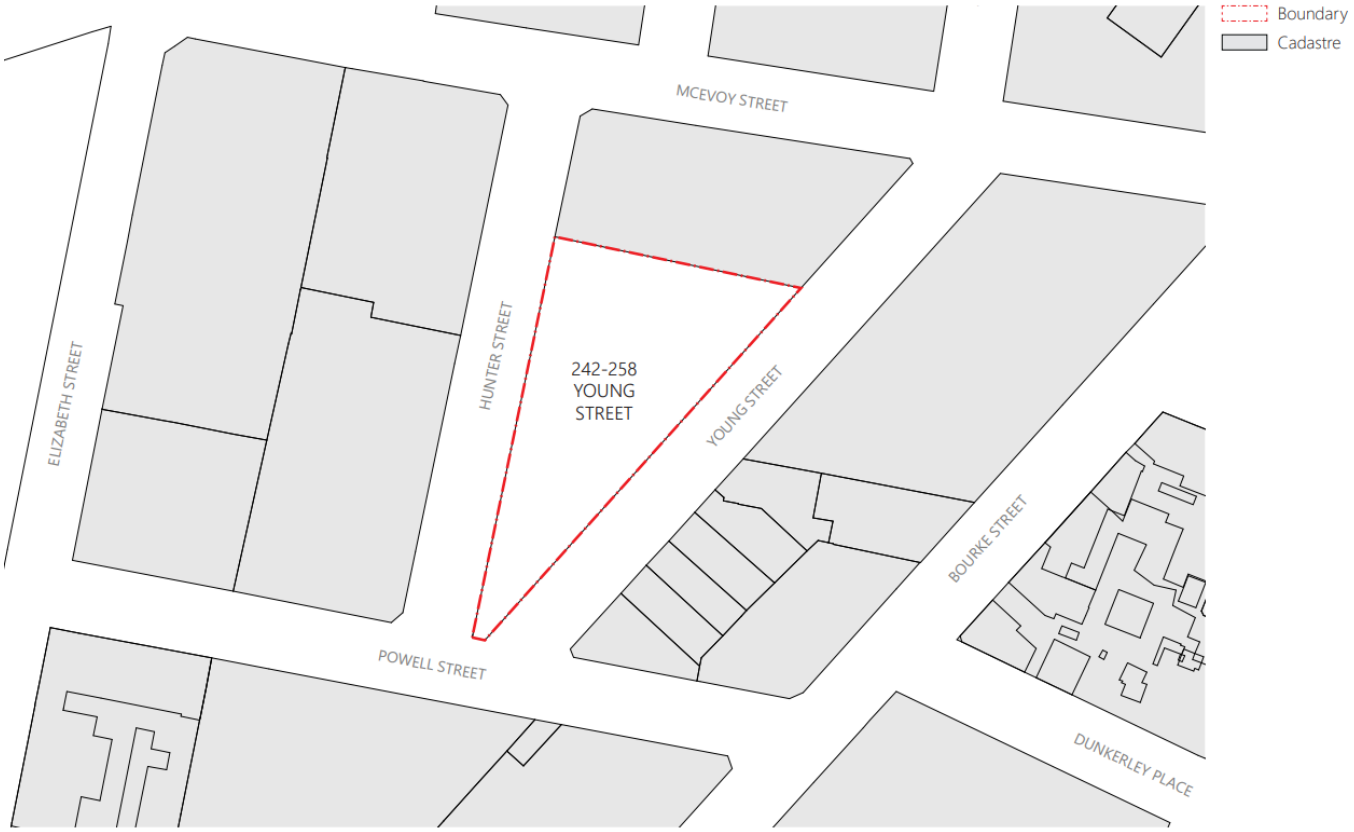


Figure 1 Land Application Map

1.2 Purpose and Application of this Guide

The purpose of this Site-Specific Design Guide is to support implementation of the Sydney Local Environmental Plan (LEP) 2012 as it applies to 242-258 Young Street, Waterloo, by providing more detailed provisions to guide development.

It is given effect by reference in Division 5 Site specific provisions of the LEP 2012. This Design Guide replaces the provisions of the Sydney Development Control Plan 2012 in so far as they apply to the site. The sections of this Design Guide inform the preparation, assessment and determination of Development Applications as follows:

- **Section 1** sets out the land to which the Design Guide applies, administrative matters and the relationship to other elements of the planning framework that apply to the site.
- **Section 2** contains the Vision and Principles for the site, which have informed the planning framework (including the design guide and relevant provisions of the Sydney LEP 2012).
- **Section 3** contains the specific design guidance for development applications for the site.

1.3 Relationship to Other Plans and Planning Instruments

The Design Guide is subordinate to the Sydney LEP 2012 and other environmental planning instruments that apply to the site. Where a provision in the Design Guide conflicts with or is more onerous than a provision in the Sydney LEP 2012 or a State Environmental Planning Policy (SEPP), the Sydney LEP 2012 or the relevant SEPP prevails to the extent of the inconsistency.

2.0 Vision and Principles

2.1 Vision for the site

The site will be a connected educational hub, being an important and key form of social infrastructure for the wider Waterloo community. The new school will be a vibrant, creative and contemporary teaching environment focused on providing innovative learning spaces and high-quality classrooms that are supported by multifunctional flexible spaces, including diverse open spaces.

The redevelopment of the site will reflect high quality design that is durable, resilient and adaptable to ensure it can evolve over time to meet the evolving needs of a modern education.

The renewal of the site will positively contribute to the surrounding urban fabric, establishing an important civic role and purpose for the local community – by providing critical social infrastructure to support the significant population growth projected for school age children in the area.

2.2 Principles

The principles of this Design Guide are to ensure:

- Delivery of a high quality contemporary educational hub that provides innovative opportunities to teach, learn, meet and collaborate.
- A diverse, activated, and attractive place of learning that is well integrated to the surrounding urban context and supports the wider community.
- A form and external appearance that positively contributes to the public domain, including surrounding streetscapes – and which enhances the amenity and urban character of the surrounding locality.
- Development that responds appropriately to the environmental context, designed to mitigate against flood risks and responding to the existing urban tree canopy cover through thoughtful building design.
- Building is to be of high environmental performance, integrated sustainable practices and Water Sensitive Urban Design (WSUD) infrastructure where practical.
- Land uses are compatible and well-integrated that are also complementary to the existing film school.

Provisions

1. Layout of the development is to be generally in accordance with **Figure 2: Urban Strategy Plan**.



Figure 2 Urban strategy plan

3.0 Design Guidelines

3.1 Built form

Objectives

(a) To ensure development is of an appropriate bulk and scale for its location.

(b) To ensure the development responds to the site's surrounding context.

(c) To define building envelopes that provide sufficient flexibility for different designs to be explored and for development to achieve design excellence.

(d) To minimise overshadowing of surrounding residential development and open spaces.

Provisions

(1) Building setbacks are to be consistent with **Figure 3: Building Heights and Setbacks, Figure 5: Section 1 and Figure 6: Section 2**, specifically incorporating:

  (a) A 3m landscape setback to be provided along Young Street, Hunter Street and Powell Street.

(2) Building massing is to be consistent with the building envelopes outlined in **Figure 3: Building Heights and setbacks plan**.

(3) Basement carparking is to be generally located directly below buildings to maximise the extent of deep soil tree retention zones.

(4) All plant and other mechanical equipment must not result in unacceptable adverse amenity impacts and be appropriately screened.



Figure 3 Building heights and setbacks

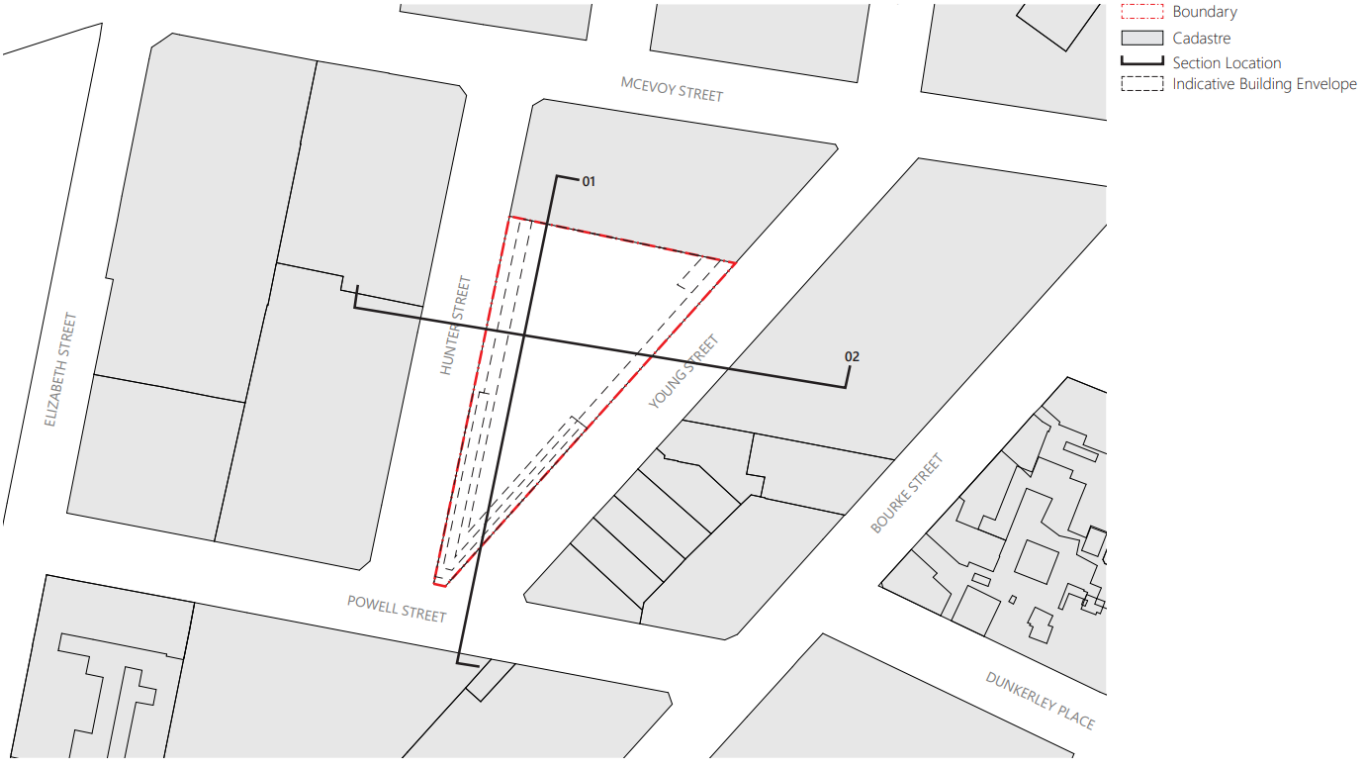


Figure 4 Indicative section locations plan

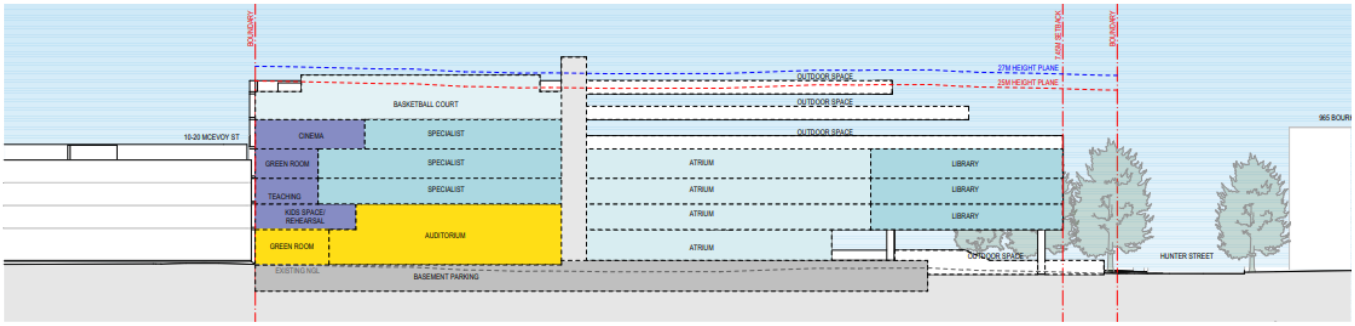


Figure 5 Section 1

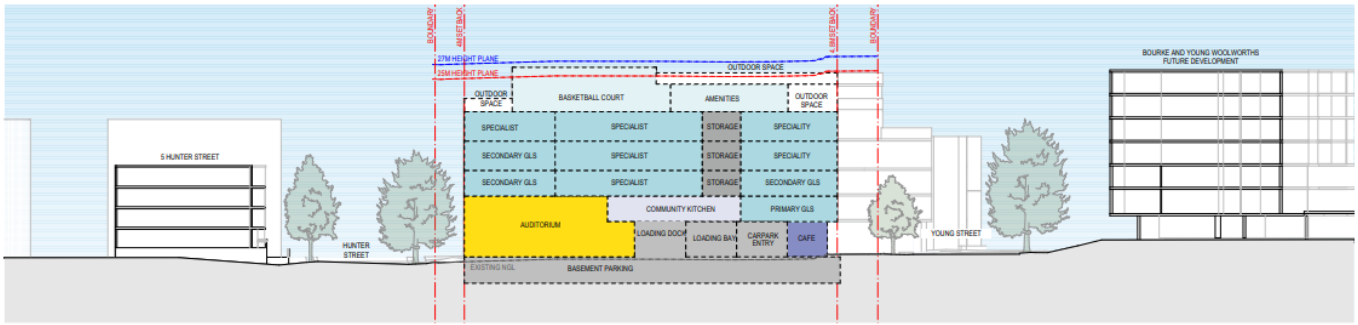


Figure 6 Section 2

3.2 School and design

Objectives

(a) The design and spatial organisation of the school is to respond to the site's environmental conditions, including topography, flooding constraints, orientation and climate.

(b) Development should reflect sustainable, resilient and efficient design that enables the future school to be adaptable overtime to meet future needs.

(c) The design of the building must provide an inclusive environment that maximises opportunities for social interaction.

Provisions

(1) The design of the school must optimise health, safety and security within the site boundaries and the public domain.

(2) A variety of open spaces that can support passive recreation and activities should be provided vertically up the building.

(3) The school must include a mix of engaging, flexible and multi-purpose spaces that can support various play activities whilst also considering the amenity of adjacent sites.

(4) The school design should complement and seamlessly integrate with the existing film school on the site.

3.3 Landscaping and ecology

Objectives

(a) Ensure high quality landscaping that enhances the development and provides opportunities for deep soil and tree canopy cover.

(b) Incorporate biophilic principles to promote health and wellbeing across the building design.

Provisions

(1) The deep soil tree zones as identified in '**Figure 2: Urban Strategy Plan**' are to prioritise tree retention where practical and be provided with suitable retention measures as defined by an arboriculture impact assessment.

(2) Any development application is to provide the following details:

  (a) The level of pruning necessary for existing trees.

  (b) Appropriate management measures will be put in place to protect existing trees from damage during building work.

(3) Ground floor landscaping and design of the communal outdoor space is to be high quality and incorporate indigenous tree species of varying typologies and scales, where practical.

(4) rooftop outdoor space is to be provided and is to be designed to:

  (a) Be easily accessible to staff and students; and

  (b) Be of high-quality design and maximise safe and secure activities

(5) Building materiality must be resilient and suitability robust for the school context.

(6) Landscaped areas are to form opportunities for outdoor learning and form a natural extension to the indoor learning spaces.

3.4 Environmentally sustainable development

Objectives

(a) Minimise energy and water use, waster generation, and urban heat effects.

(b) Maximise on-site renewable energy generation, water re-use and waste recycling.

(c) Ensure the efficient use of resources in building design, construction and operation.

(d) Ensure that development is resilient against the effects of climate change.

Provisions

(1) Development is to be designed and constructed to reduce the need for active heating and cooling by incorporating passive design measures including design, location and appropriate use of thermal mass and external shading, including vegetation.

3.5 Public Art

Objectives

(a) Ensure public art is: Inspiring and socially engaged, creates works that are exceptional, distinctive and identifiable to enhance a sense of place and place identity, reflects upon the diverse stories in the community of the past, present and anticipated future audiences, is integrated into the fabric of the site, exhibits artistic excellence and is innovative, unique and contemporary.

Provisions

(1) Ensure the respectful engagement of First Nations artists and cultural knowledge by following Indigenous Cultural and Intellectual Property protocols.

(2) Public Art is to be provided in accordance with the City of Sydney Guidelines for Public Art in Private Development and the Public Art Policy.

(3) Development is to incorporate high quality public art in publicly accessible locations.

(4) Where appropriate, public art should reference the history of the site, or area, recognise and respond to former and existing uses including by traditional custodians of the land and cultural practices.

3.6 Sustainable transport

(a) Encourage alternatives to private motor vehicle use and support sustainable transport, such as public transport, walking or cycling.

Provisions

(1) Provide end of trip and bicycle parking facilities on-site that are weather protected and secure for students, staff, visitors and other users. Facilities are not to be located on public realm.

3.7 Parking, access and circulation

Objectives

(a) To ensure vehicle access and basement layouts maximise pedestrian safety and create a high-quality ground level relationship with the building and public domain.

Provisions

(1) Vehicular access and basement parking are to be provided in accordance with **Figure 2: Urban Strategy Plan**, specifically:

  (a) Basement car park access is to be provided off Young Street.

(2) A ground level vehicle pick-up and drop-off zone is to be provided along Young Street and is to be designed to minimise impacts on the local road network.

(3) A ground level bus pick-up and drop-off zone is to be provided along Hunter Street.

(4) The vehicular driveway and crossover are to be clearly visible and include active safety measures.

(5) A Traffic Management Plan is to accompany any future Development Application and must include an assessment of potential traffic and safety measures.

3.8 Noise and vibration

Objectives

(a) To provide appropriate interface and mitigation of noise, to ensure high amenity is preserved for neighbouring properties.

Provisions

(2) A Construction Noise and Vibration Management Plan is to accompany any future Development Application and should:

  (a) Identify sensitive land uses with the potential to be affected by construction and operational noise and predict associated noise levels.

  (b) Predict noise emissions from equipment associated with each stage of construction, based on the proposed hours of construction.

  (c) Determine noise management levels at all receivers based on the long-term noise monitoring.

  (d) Provide best practice approach principles and specific noise control measures to be use during demolition, construction and operation to ensure noise objectives are achieved where feasible and reasonably practical.

(3) The school is to be designed with appropriate noise mitigation measures to ensure good amenity for neighbouring properties.

Attachment A5

Engagement Summary Report

Memo

Company Name:	Sustainable Development Group
To:	Richard Huynh
From	Kate McClure, Joseph Wey
CC:	Ross Hornsey, Allison DeMarco
Date:	19 December 2023
Re:	Pre-submission community engagement findings
Project Name:	242-258 Young Street, Waterloo
Project No:	2210804

Engagement overview

The following table provides an overview of the engagement activities undertaken during the pre-lodgement engagement phase for the Planning Proposal at 242-258 Young Street, Waterloo.

Table 1 Engagement activities

Engagement activity	Details	Reach
Letterbox delivery (map in appendix)	A community notification letter was distributed to residents, and businesses via letterbox drop on 29 November 2023 to inform the community about the Planning Proposal and invite them to register for a community webinar and complete an online survey.	Approximately 4,840 properties reached[1], including 196 businesses.
Community webinar	A 1.5-hour community webinar was hosted for community members to learn about the Planning Proposal, meet the project team, provide feedback, and ask questions. The webinar was held 6pm, Tuesday 12 December 2023.	36 registrations and 22 attendees
Community survey	A short online survey was held to provide community members with opportunity to provide feedback to inform the Planning Proposal, and for the project team to learn more about the local community, including opportunities and potential impacts. The survey was open from 29 November 2023 and closed 11.59pm Thursday 14 December 2023. The survey covered: • Perceived need for a new school and benefits of the proposal. • Potential concerns or impacts related to the proposal. • Any other feedback.	146 total responses

[1] Note: Delivery attempted but refused at the apartment building at 832 Elizabeth Street, Waterloo.

1.1.2 Enquiry channels

A public email address (consultation@ethosurban.com) and phone number (1800 870 549) were provided to local residents and businesses via the letter, for the opportunity to ask questions and provide feedback about the Planning Proposal.

As of 18 December 2023, **seven enquiries were received** via the 1800 phone number and email address to provide feedback. This feedback has been included in **Table 2**.

Key findings

Feedback received during the initial stakeholder outreach during the Planning Proposal is described in the table below. This feedback will be included considered as plans for the proposal progress and inform the Engagement Strategy for the future State Significant Development Application process.

Early feedback key takeaways

Benefits

- Respondents felt that a new primary school and secondary school option were needed in Waterloo.
- There was interest in potential community use of school facilities amongst respondents.
- The community supports the inclusion of the Sydney Film school on the site.
- The proposal will result in increased vibrancy of the area and new opportunities for community connection through the school.

Concerns

- Parking impacts to local residents, including loss of on-street parking
- Traffic impacts from pick-up and drop-off, and increasing existing congestion on McEvoy, Hunter and Powell Street
- Construction impacts, including noise, traffic and construction delays, and cumulative construction impacts with reference to the nearby Woolworths development

Other commentary

- Some community members indicated they wanted an affordable school option (i.e. government run)
- It is important to maximise green space in the design, to provide appropriate outdoor space for sporting activities and socialising, as well as for enhanced visual amenity in the area
- Consider upgrades to public transport to reduce additional traffic generation, with specific reference to local bus networks

Table 2 Feedback summary

Theme	Feedback summary
Project need	• Support for the project, noting a need for additional school options in the local area, increased vibrancy in Waterloo, and potential opportunities for future collaborations with community organisations. • Interest in student capacity.
Concept design	• Respondents generally supported the overall concept design.
School preference	• Most survey respondents (65%) indicated either strong support or support for a new school at the project site, and 29% of respondents indicated either strong opposition or opposition. • Most survey respondents (70%) indicated there is not enough school options in Waterloo, with 61% of respondents indicating both new primary school and secondary school options are needed.
Site location	• Mixed feedback on the proposed site location, with support for the location noting changing demographics of the area (increasing young families) and concerns about the proposed location noting the need for large green open space for sport and social activities for students, as well as impacts to residential amenity. • Suggestion that a new site be selected on a major arterial road.
Height, bulk, and scale	• Less than half of survey respondents (40%) indicated they are very concerned or concerned about the proposed building height. • Support for building height notes the existing higher density development in Waterloo. • Concerns about building height relate to perceived needs for learning, including a need for adequate green space, and impacts to the local character of Waterloo.

Theme	Feedback summary
	• Queries about the existing approved height limit for the site and height of existing buildings and how the proposal would fit in.
Proposed outdoor space	• Suggestion to relocate the proposed outdoor space to front Young Street.
Traffic and parking impacts	• Most survey respondents (70%) indicated they are very concerned or concerned about parking impacts, including loss of on-street parking. • Most survey respondents (62%) indicated they are very concerned or concerned about traffic impacts, including traffic congestion on Powell, McEvoy and Hunter Street. • Concerns were raised about traffic management considerations for the proposal, including the cumulative impacts with the Woolworths development. • Suggestions to reduce parking and traffic impacts included ensuring adequate onsite parking for staff and visitors and installing new traffic lights at McEvoy/Hunter Street McEvoy/Young Street intersections; and at Powell/Elizabeth Street and Powell/Bourke Street intersections.
Vehicular and pedestrian movements, site access and connectivity	• Information sought about the proposed site entrances, pedestrian flow/movement throughout the school precinct, any proposed cycleway networks and traffic calming measures, e.g., pedestrian crossings. • Some respondents identified the Mondrian Green Square apartment walkway should be considered as part of the traffic assessment, to understand impacts. • Suggestion to change direction of proposed traffic flow from Powell Street so that it flows from Burke Street to McEvoy Street. • Concern about increased pedestrian activity in the area, including concern that Hunter Street is too narrow to cope with increased activity and access to private property on Hunter and Powell streets. • Concern about lack of appropriate pick-up/drop-off zones for parents.
Public transport	• Interest in bus operations, with reference to the use of / impacts to Hunter Street. • Commentary that the existing public transport needs improvements to service the proposed school, with specific reference to upgrading the local bus stop networks.
Residential amenity impacts	• Concern the proposal will impact the existing peaceful environment of the immediate area surrounding the site.
Overshadowing	• Concern about overshadowing of residential apartments on Hunter Street.
Noise impacts (operational)	• Less than half of survey respondents (40%) indicated they are very concerned or concerned about increased noise before, after, or during school hours. • Noise concerns raised include afterhours activities, noise generated from the rooftop, and the proposed external green space. • Interest in how the design will mitigate noise impacts generated by the external green space.
School operator	• Information sought about the potential school operator i.e. government, independent. • Concern about a lack of detail on the proposed organisation and who will manage the school.
Landscaping and biodiversity	• Commentary noting the importance of maximising green space in the proposed design. • Concern about any removal of existing trees on the site, particularly on Young and Hunter Street.
Community facilities	• Most survey respondents (72%) indicated there could be either strong interest or interest in potential community use of the proposed school facilities outside school hours. • Just under half of survey respondents (48%) indicated they are very unconcerned or unconcerned about the potential for increased vibrancy in the area. • Support for community facilities or community-run programs accessible after-hours, with support for religious and arts/cultural activities. • Commentary noting a lack of cinemas in the area, with suggestion to incorporate a publicly accessible cinema/auditorium in the design.
Construction impacts	• Most survey respondents (54%) indicated they are very concerned or concerned about construction impacts, including noise, traffic and duration / delays, and reference to cumulative construction impacts regarding the nearby Woolworths development

Theme	Feedback summary
Project timeline	• Interest in the project timeline, with reference to anticipated commencement of construction works and duration of construction.
Planning process and consultation	• Interest in the planning process and timeline for project completion. • Interest in further consultation opportunities, with reference to traffic management and consultation undertaken to date with Schools Infrastructure NSW.

Next steps

A summary of the initial engagement findings will be included in the Planning Proposal for submission to City of Sydney. Findings will also be considered by the project team as plans progress, and to inform the Engagement Strategy for the future State Significant Development Application for the site.

Appendix A Community notification letter

A.1 Community notification – 29 November 2023

Ethos Urban

29 November 2023

Our ref: 2210804

Dear neighbour,

RE: 242-258 Young Street, Waterloo – Proposal for a new school development

We are writing on behalf of the landowners at 242-258 Young Street, Waterloo, to inform you about a proposal for a new school development.

A planning proposal to City of Sydney is being prepared that is proposing the development of a new independent school, as well as accommodating the relocation of an existing film school on the site, including classrooms, open spaces, sports, creative arts, and multi-purpose hall.

The proposal brings a great opportunity to provide a high-quality educational facility for primary and secondary students, in an area that is growing quickly but lacks the school infrastructure to support the growth. The Sydney Film School, currently on site, will also be integrated in the proposed development.

Please see map and image overleaf.

Project details

The proposed school is planned to include:

- Accommodation for 280 primary school students, 520 secondary school students, and the Sydney Film School.
- 6-storey vertical school, to provide high quality school facilities including open space in an inner-city neighbourhood.

Have your say

We invite you to find out more about the project and share your feedback.

Join our online information session
6pm, Tuesday 12 December
Online via Zoom
Scan the QR code to register, registrations are essential.

Complete a short survey to provide feedback
Survey closes 11:59pm, Thursday 14 December
Scan the QR code to complete the survey.

If you have any questions or difficulty accessing the links via the above QR codes, please contact us via email consultation@ethosurban.com or call 1800 870 549.

We look forward to hearing from you.

Yours sincerely,

Ross Hornsey
Director, Engagement

Ethos Urban Pty Ltd
W. ethosurban.com

Level 4, 180 George Street,
Sydney NSW 2000
Gadigal Land

Level 8, 30 Collins Street,
Melbourne VIC 3000
Wurundjeri Woi Wurrung Land

Level 4, 215 Adelaide Street,
Brisbane QLD 4000
Turrbal, Jagera and Yugara Land



Figure 1 The project site - 242-258 Young Street, Waterloo



Figure 2 Proposed aerial view

Ethos Urban Pty Ltd
W. ethosurban.com

Level 4, 180 George Street,
Sydney NSW 2000
Gadigal Land

Level 8, 30 Collins Street,
Melbourne VIC 3000
Wurundjeri Woi Wurrung Land

Level 4, 215 Adelaide Street,
Brisbane QLD 4000
Turrbal, Jagera and Yugara Land

Appendix B Community survey

A.2 Community survey – 29 November 2023 – 14 December 2023

242-258 Young Street, Waterloo

Community Survey

A planning proposal to City of Sydney is being prepared that is proposing the development of a new independent school, as well as accommodating the relocation of an existing film school on the site.

Waterloo is growing quickly but lacks the school infrastructure to support this growth. The proposed school would provide a new schooling option within walking distance, and accommodate 280 primary school students, 520 secondary school students, and the Sydney Film School, in a new 6-storey building. The school will include classrooms, open spaces, and a multi-purpose hall.

Complete this community survey to provide your feedback on the proposal. This feedback will be considered as plans progress, and to inform future community engagement.

1. What is your relationship to Waterloo?

- ◯ I live in Waterloo
- ◯ I work in Waterloo
- ◯ I regularly visit Waterloo
- ◯ Other (please specify)

2. Do you think there are enough school options in Waterloo?

- ◯ A new primary school option is needed
- ◯ A new secondary school option is needed
- ◯ New primary school and secondary school options are needed
- ◯ Neither, there is already enough local school options

3. To what extent would you support a new school at 242-258 Young Street, Waterloo?

Strongly support	Support	Neutral	Oppose	Strongly oppose
◯	◯	◯	◯	◯

4. To what degree do you think there could be interest in potential community use of the proposed school facilities outside school hours (for example, sports facilities, multipurpose hall, auditorium spaces)?

Strong interest	Some interest	Neutral	Not much interest	No interest
◯	◯	◯	◯	◯

5. To what extent do you agree with the following potential benefits from the proposal?

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
A new local primary school option	○	○	○	○	○
A new local secondary school option	○	○	○	○	○
A new home for the Sydney Film School	○	○	○	○	○
Increased vibrancy in the area	○	○	○	○	○
Opportunities for community connection through the school	○	○	○	○	○

Other (please specify)

6. To what extent would you be concerned about the following potential impacts?

	Very concerned	Concerned	Neutral	Unconcerned	Very unconcerned
Building height	○	○	○	○	○
Construction impacts (e.g., noise, dust, traffic)	○	○	○	○	○
Traffic impacts (school drop off and pick up)	○	○	○	○	○
Increased vibrancy in the area	○	○	○	○	○
Increased noise before, after, or during school hours	○	○	○	○	○
Parking impacts	○	○	○	○	○

Other (please specify)

7. Do you have any other comments about the proposal?

8. If you would like to join our register for email updates, please provide your name and email address.

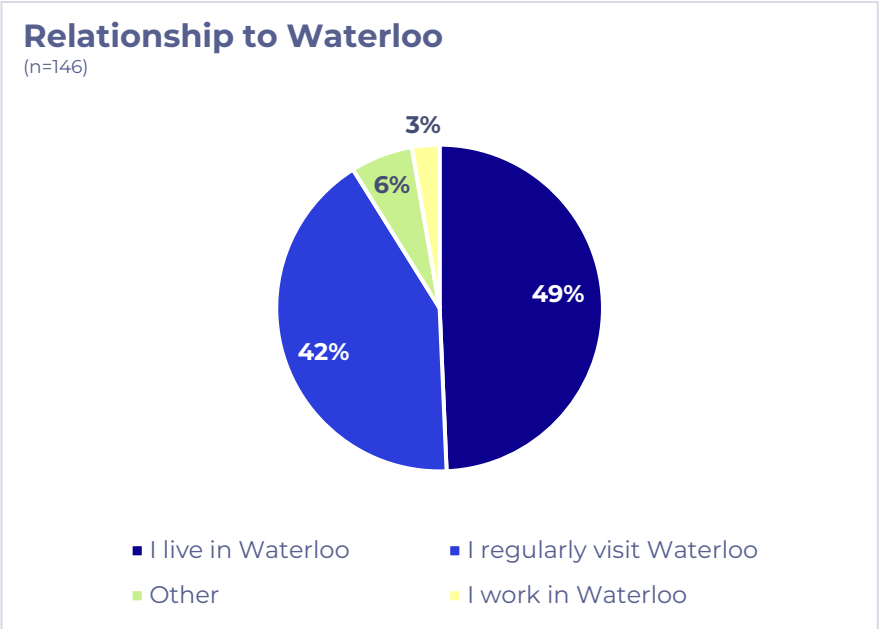
Name

Email Address

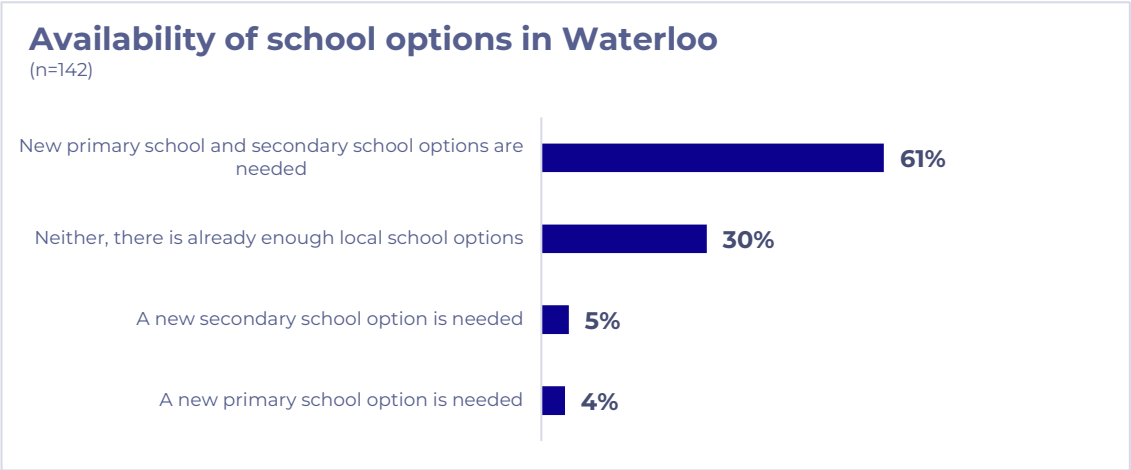
Thank you for providing your feedback.

A.3 Community survey results

Question 1



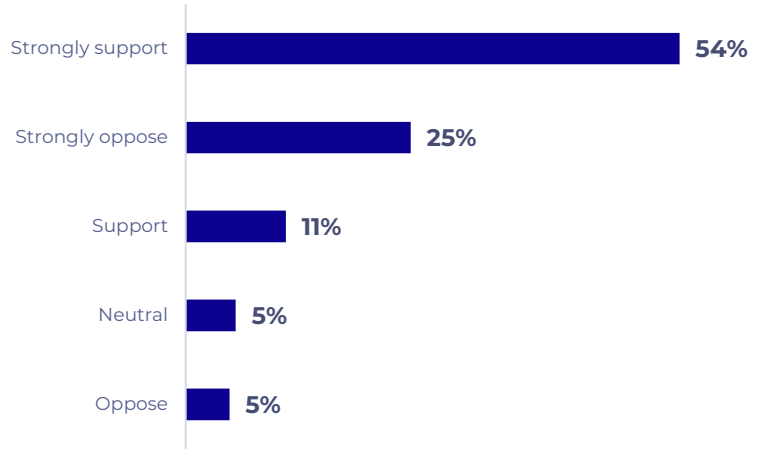
Question 2



Question 3

Extent of support for a new school at 242-258 Young Street, Waterloo

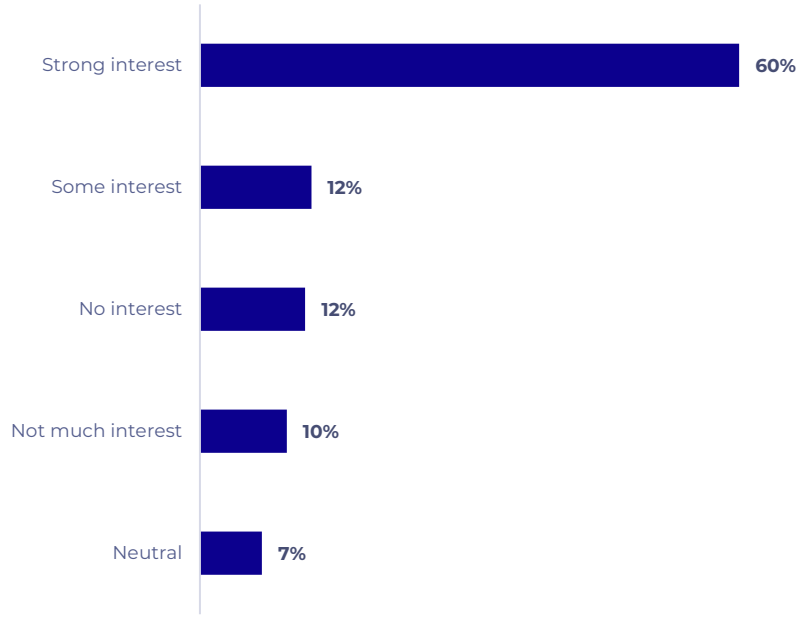
(n=146)



Question 4

Interest in potential community use of the proposed school facilities outside school hours

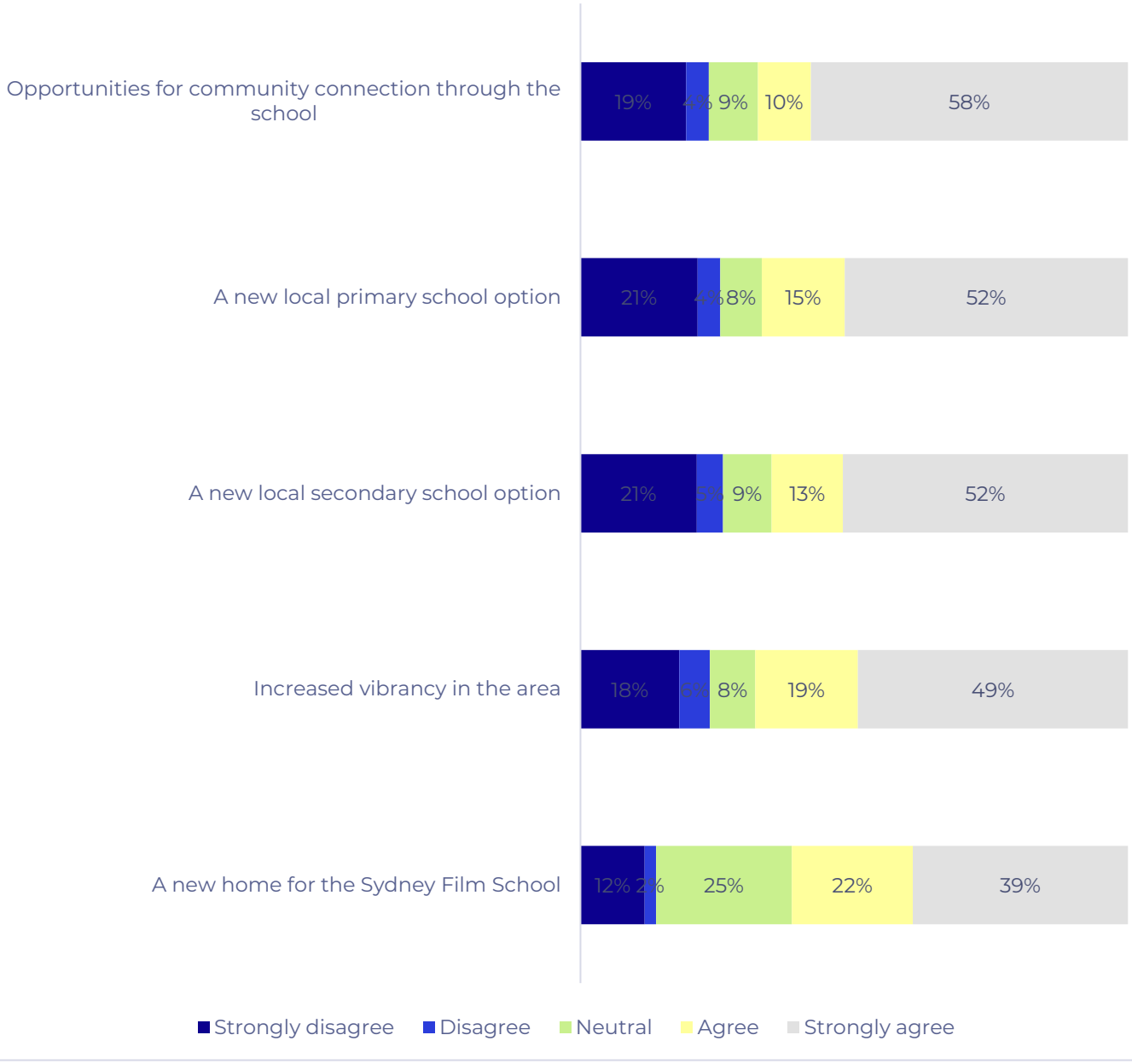
(n=146)



Question 5

Extent of agreement with the following potential benefits from the proposal

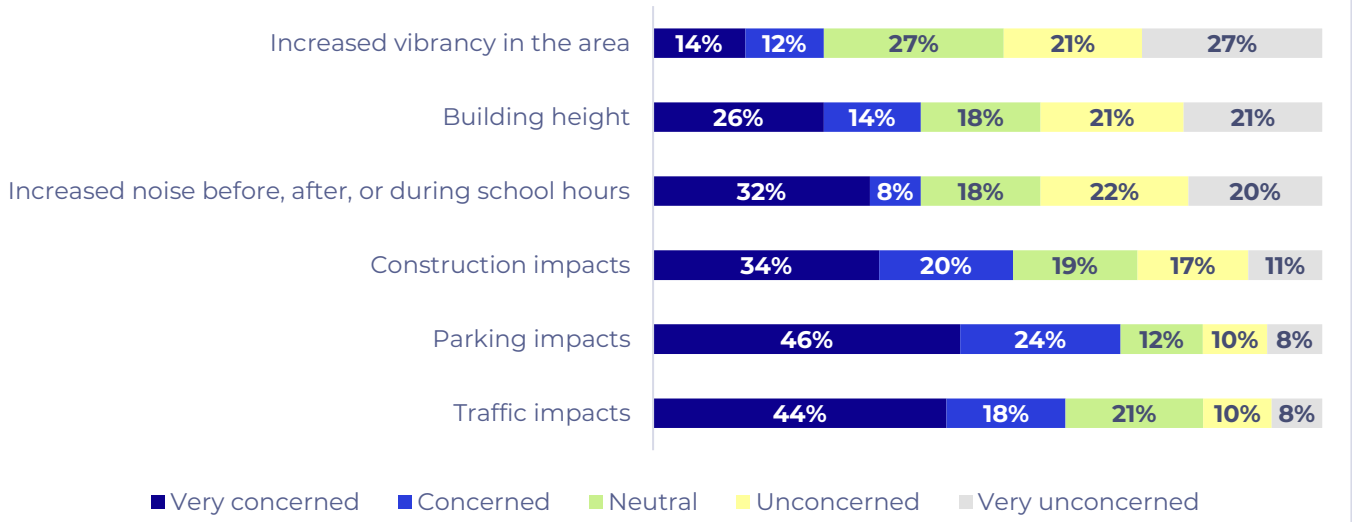
(n=146)



Question 6

Extent of concern about potential impacts

(n=146)



Attachment A6

Landscape Concept Plans

242-258 Young Street Waterloo

PLANNING PROPOSAL I LANDSCAPE

January 2024

315

PREPARED FOR

SDG
Sustainable Development Group Ltd.

PREPARED BY

turf

ARCHITECT

plus architecture

LANDSCAPE ARCHITECT

turf

Turf Design Studio
35 Wellington Street
Chippendale NSW
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Public domain & Landscape Strategic Planning policy 5
Site Context 9
Principles 10
Key Spaces 11
Tree Management Plan 18
Planting & Material Palette 19

DOCUMENT NAME		242-258 Young Street, Waterloo Planning Proposal - Landscape	
DATE	**REV**	**DRAWN BY**	**CHECKED BY**
18.12.2023	B	Cynthia Wang/ Jonne van Bunningen	Matt Coggan
24.01.2024	C	Cynthia Wang/ Jonne van Bunningen	Matt Coggan

Acknowledgments

We acknowledge Illpah Country by Gadigal people, the Cultural Landscape that we are working upon, We acknowledge the custodianship of its people and the privilege and responsibility to Connect with Country.



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Introduction

Overview

This Landscape Planning Proposal is submitted to the Council of the City of Sydney (Council) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

• an increased maximum Floor Space Ratio (FSR)
• an increased maximum Building Height.

Proposal

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

a) A new 6 storey vertical school consisting of:

- 45 GLS, 13 specialist / classrooms
- A multi-purpose hall / auditorium
- An auditorium
- A library
- A canteen
- Administration, lobby and circulation spaces
- An active green roof
- A basement including 60 car parking spaces and end-of-trip facilities

b) The incorporation of the existing film school within the new vertical school building

c) A total of approximately 13,543m2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:

- 10,608m2 education floor area
- 2,935m 2 commercial (film school) floor area

d) Outdoor spaces totalling approximately 4,978m2 .

The Site

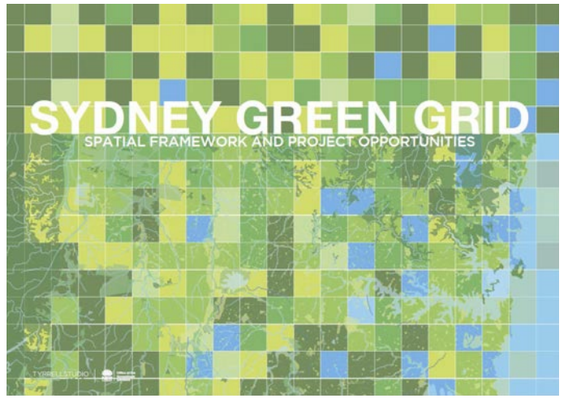
The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.



Source: Nearmap + Ethos Urban

Public domain & Landscape Strategic Planning policy



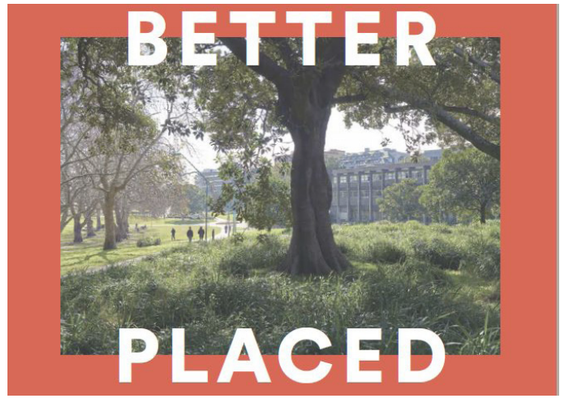
State | Sydney Green Grid - Central District 2023 (GANSW)

Increase access to open space (P118)	• Providing opportunities and improved access to public open space through spatial strategies which define the site's landscape.
Create new high quality public realm (P121)	• Improve connections through major roads and barriers, enhancing access to public green space. • Creating new public spaces which benefit larger scale infrastructure projects. • Revitalise and create high quality public spaces which foster gathering and connection.



State | Greener Places (GANSW)

Integration (P32)	• Delivering enhanced quality of life in communities through the integration of green with urban infrastructure.
Connectivity (P34)	• Green Space which optimises and maximises wellbeing and sustainable development • Delivering access between place, highlighting landscapes which provide urban cooling.
Multi Functionality (P36)	• Focus on high quality and performing green spaces which are multi-functional. • Promoting access to open space, strengthening identity and image of place



State | Better Placed (GANSW)

Better Fit (P39)	• A space that relates to Waterloo's local and contextual location with communal aspirations and local character.
Better for Community (40)	• Seek to grow economic and social status • Incorporating diverse use e.g. hotels, commercial and retail • Allows the public to move freely and sustainably throughout spaces.
Better for People (P41)	• Focus on safety (CPTED), comfort and basic uses of public spaces. • Creating spaces that are valuable parts of the environment and local community.



State | Everyone can play (NSW Government)

Inclusive play process (P21)	• Creating play spaces that people of all ages and abilities can access and enjoy, through designing alongside inclusion needs. • Evaluating and continually reviewing to measure design success. • Incorporating the six-step inclusive play process into planning design and management of inclusive play spaces.
Connecting with Place (P53)	• Provide a sense of identity through creating and connecting Waterloo's community social,cultural and environmental aspects. • Recognising the importance of Country in public open space, celebrating the 'Sharing of Country' and rich culture with everyone. • Celebrate and engage with natural elements such as smells, sounds and organic textures.
Designing inclusive nature play spaces (P67)	• Integrating variety of play spaces, engaging with nature • Considering a diverse range of materials, levels and native planting.



Local | City of Sydney greening strategy 2021

Ambition (P36)	• Increasing green and canopy cover for heat prevention and community health to 30-40%
Canopy Coverage (P37)	• Increase canopy cover for Street from 25% in 2019 to 34% in 2050 • Increase canopy cover for parks from 31% in 2019 to 46% in 2050 • Increase canopy cover for Property from 12% in 2019 to 20% in 2050
Green Coverage (P37)	• Increase green cover for Street from 25% in 2019 to 34% in 2050 • Increase green cover for parks from 31% in 2019 to 46% in 2050 • Increase green cover for Property from 12% in 2019 to 20% in 2050.



Local | Street design code

Main Themes	• Connectivity and accessibility • Promote walking and cycling • Quality public domain and place making • Environmental sustainability • Urban canopy and greening
Canopy Coverage (P23)	• Increase canopy cover from the current 18.1% coverage to 22% in 2030 and 27% in 2050
Urban Renewal Areas (P80)	• Many former industrial areas are being transformed into medium to high density residential and mixed use neighborhoods. These areas include new streets that present the opportunity to be exemplars in streetscape design and sustainability. • The area will provide a network of new streets which will achieve a highly permeable street pattern that integrates pedestrian, cycle and vehicular movements, WSUD, and flood management.



Local | City of Sydney Street tree master Plan

Street tree selection	• Young Street prescribed tree species: Tallowwood - Eucalyptus microcorys • Adapting to future climate and recognising street tree selection which can adapt to warmer conditions and frequent heat waves.
Diversity, biodiversity and habitat	• Increase diversity through shelter,food sources and nesting opportunities • Native species implementation to be the driver biodiversity
Indigenous Knowledge	• Collaboration between indigenous ecologists to incorporate locally indigenous tree species to Sydney • Reintroduce locally indigenous tree species to heighten the cultural significance of the site • Acknowledging Gadigal of the Eora Nation as the Traditional Custodians of Waterloo and complex cultural land management practices.

1.2 City of Sydney Street Tree Master Plan I Map

Existing tree species surrounding the site



Buckinghamia celsissima

MCevoy Street / Powell Street/ Bourke Street



Corymbia gummifera habit

Powell Street



Eucalyptus microcorys

Hunter Street / Young Street/ MCevoy Street



Loshostemon confertus

MCevoy Street / Bourke Street



Melicope elleryana

Hunter Street / Young Street



Plantanus Acerifolia

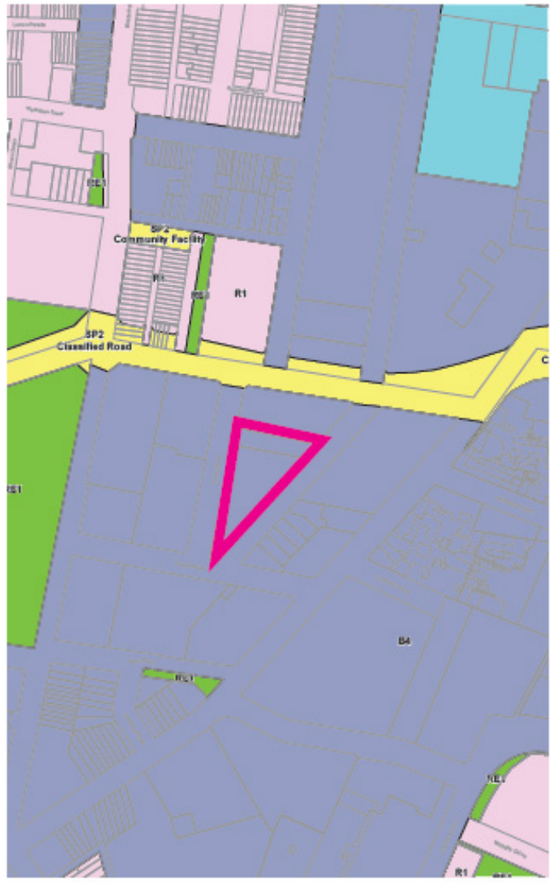
Bourke Street



Source: City of Sydney

1.3 Public domain & Landscape Strategic Planning policy I Local

ZONE - MU1



Land Zoning Map

Legend

MU1	Mixed Use
R1	General Residential
RE1	Public Recreation
SP2	Infrastructure
E1	Local Centre

FSR - 1.5:1

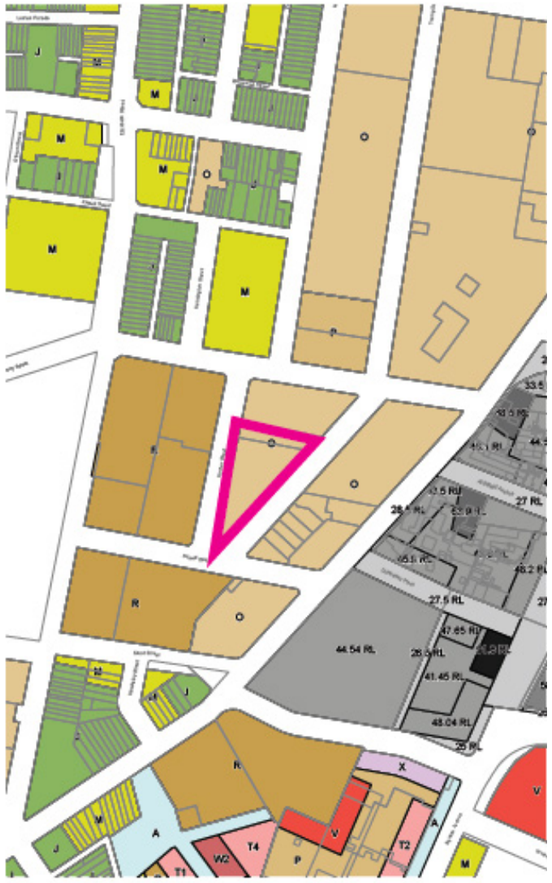


Floor Space Ratio

Legend

L	0.9
P	1.25
S1	1.5
T1	2
X1	4

HEIGHT - 15m

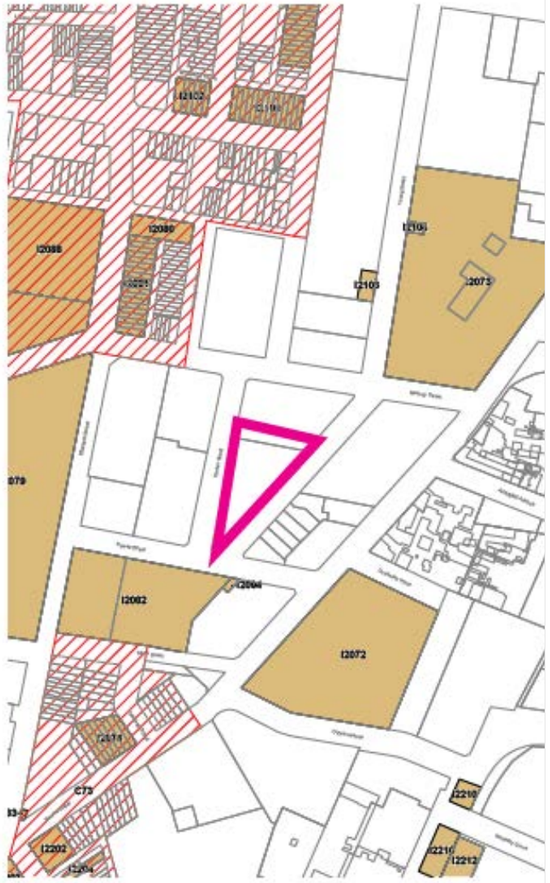


Maximum Building Height (m)

Legend

A	3	R	22
J	9	T4	29
M	12	V1	38
O	15	X	45

HERITAGE -NONE



Heritage Map

Legend

- Conservation Area
- Item - General

Cadastre

- Cadastre 4/10/2022 © City of Sydney

Site Context

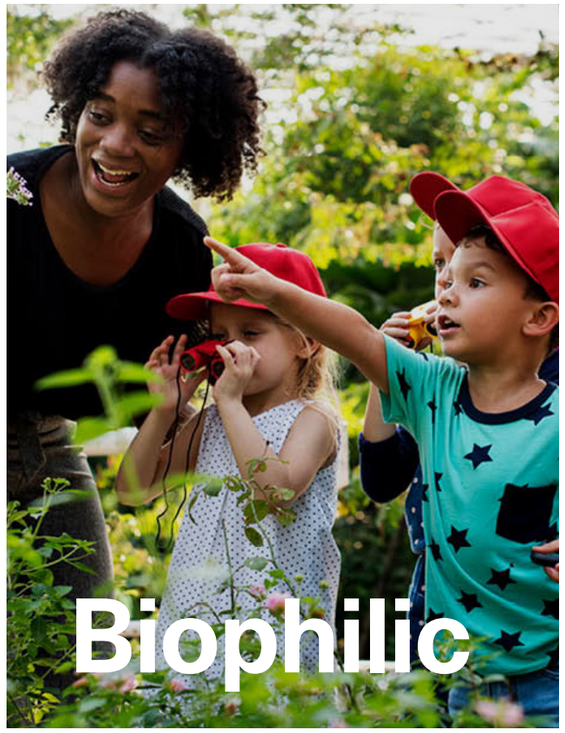


MAP LEGEND

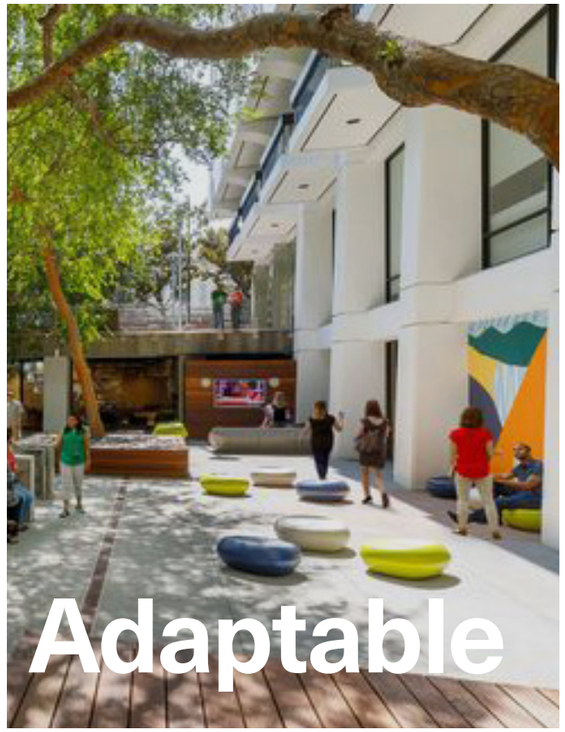
- Study area
- Passive Green space
- Active Green space
- Sports field
- Swimming pool / Aquatic Center
- River
- School
- Train
- Metro
- Line

Principles

- Biophilic I Engaging with biophilic principles to promote health & wellbeing
- Resilient I Design and materials that will endure extreme weather events and suitably robust for the school context
- Adaptable I Future-proofing spaces by maximising flexibility for multiple uses
- Playful I Integrating moments of play and delight into the everyday experience
- Inclusive I An environment that does not discriminate and maximises opportunities for social interaction
- Outdoor Learning I A diversity of outdoor ‘rooms’ as an extension of indoor learning facilities
- Connected I With Country and the local community



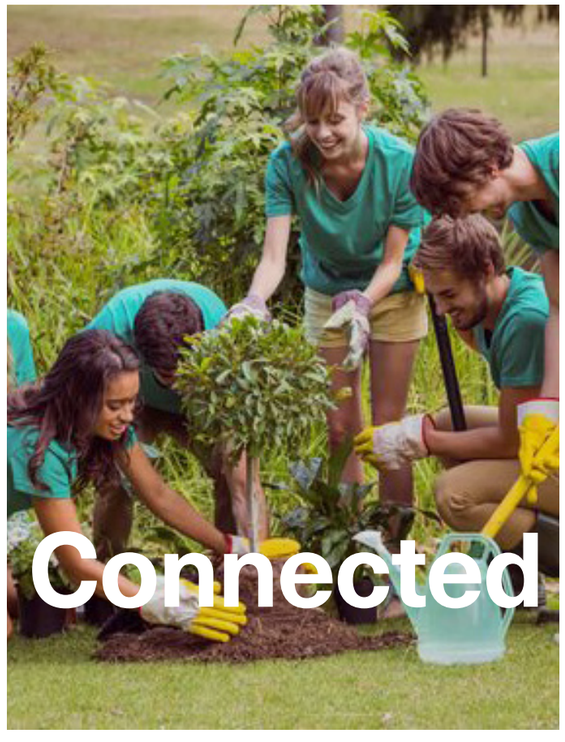












Key Spaces



*Note: Formal and informal play opportunities are incorporated throughout all levels. Play additionally can be used as a learning strategy to enhance the spatial experience and utilization across all open space.

ROOFTOP LEARNING

+ Food production
+ Forest area
+ Seating
+ Sports

OUTDOOR GYM

+ Secondary Play
+ Resilient materials
+ Adaptive space
+ Outdoor gym

SECONDARY PLAY AND GATHERING

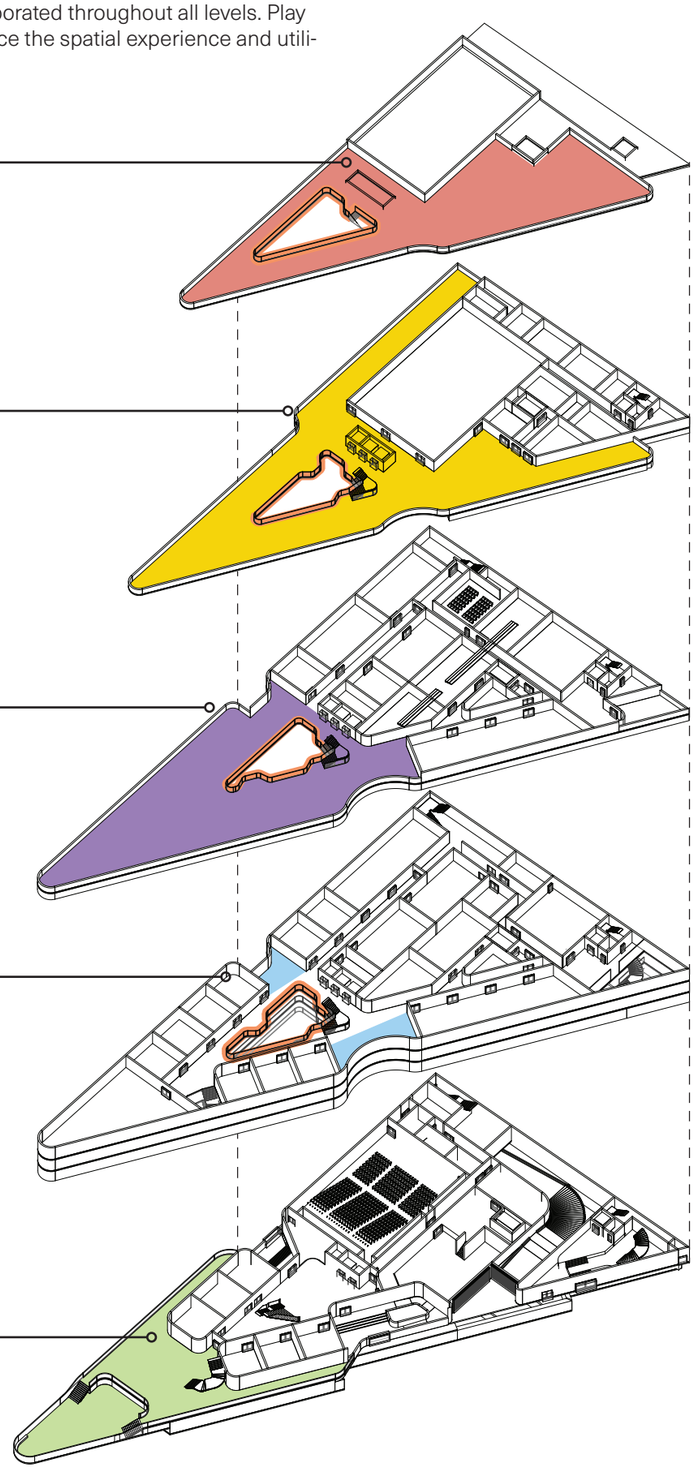
+ Secondary Play
+ Resilient materials
+ Adaptive space
+ Outdoor learning

PASSIVE OUTDOOR ZONE

+ Passive outdoor space
+ Adaptive space
+ Flexible seatings

PRIMARY PLAY

+ Primary Play zone
+ Connection with the community



GROUND LEVEL | Primary Play

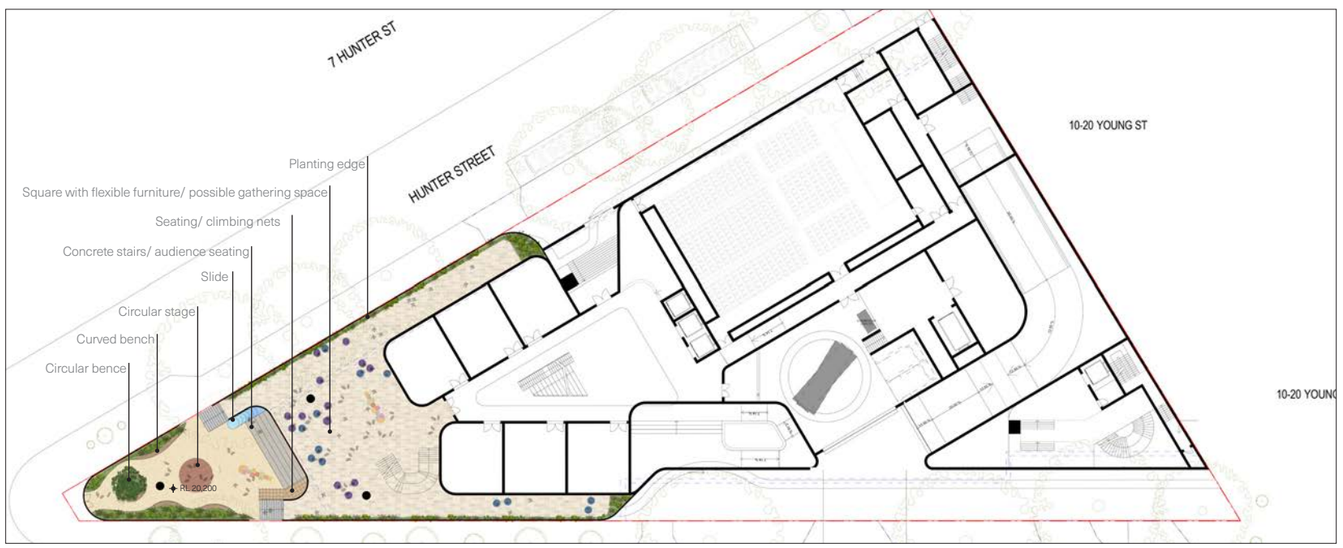
- Primary play
- Adaptive space
- Resilient materials
- Connection with community













LEVEL 1 - 3 | Passive Outdoor Zone

- Secondary play zone
- Outdoor learning
- Adaptive space
- Seating area













LEVEL 4 | Secondary Play and Gathering

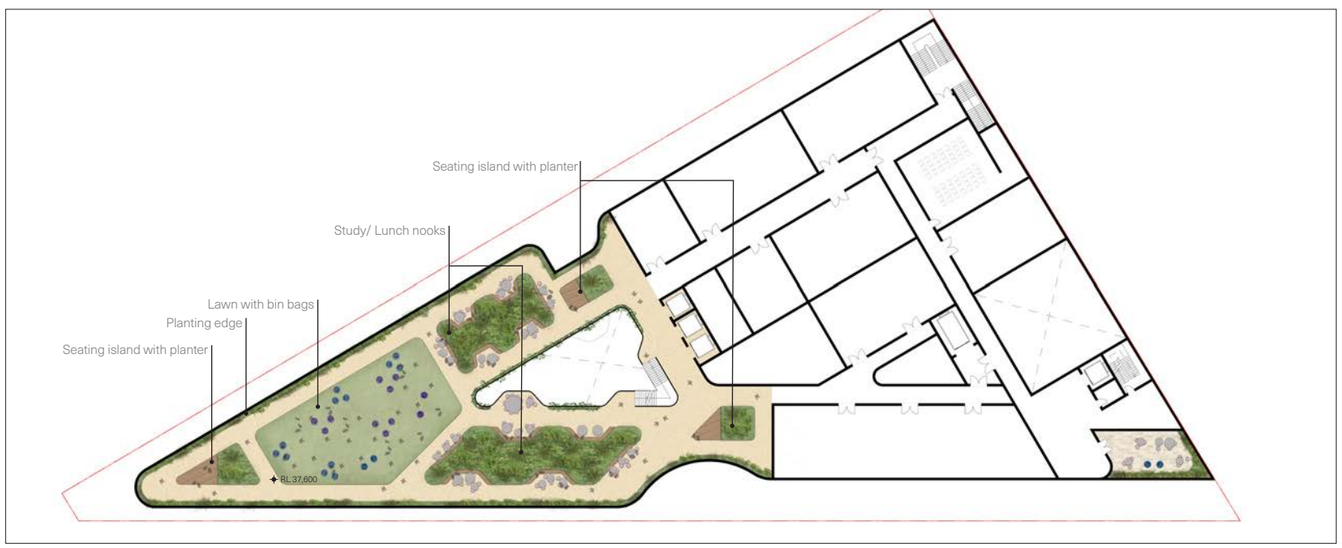
- Hosting events
- Outdoor learning
- Adaptive space
- Seating area
- Connection with environment
- Resilient materials

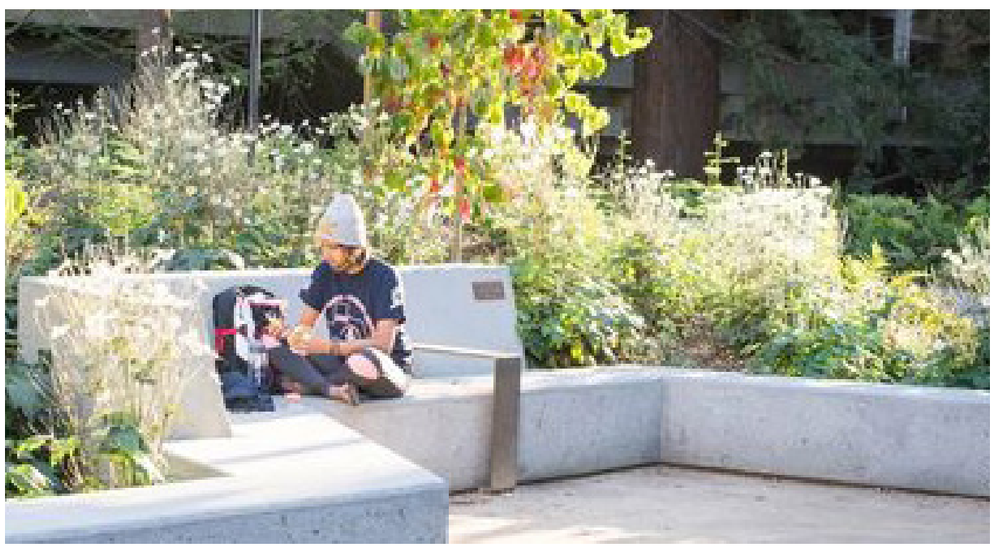












LEVEL 5 | Outdoor Gym

- Flexibale active use
- Running track
- Basketball Court

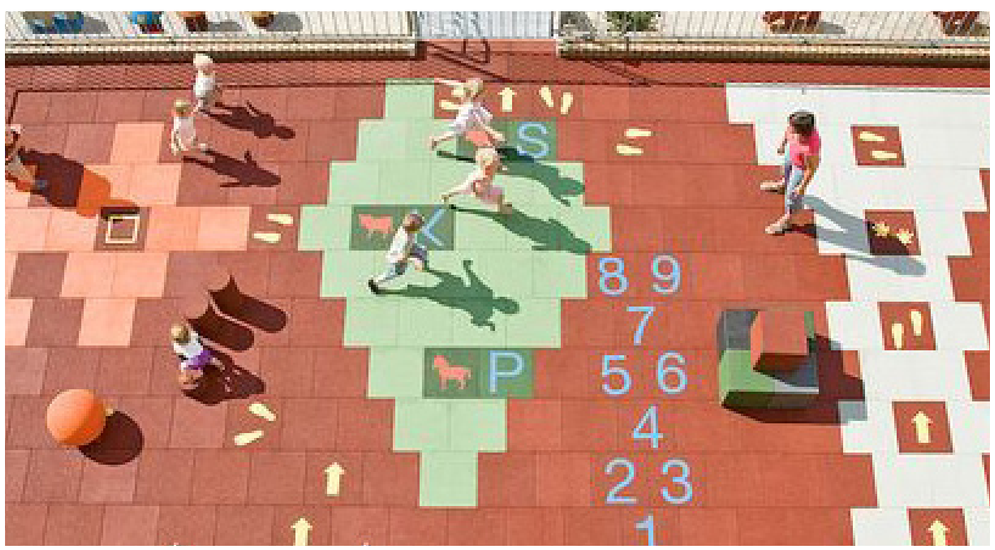












LEVEL 6 | Rooftop Learning

- Food production
- Kitchen gardens
- Canopy cover
- Sport area
- Seating area with view
- Open lawn
- Study nook







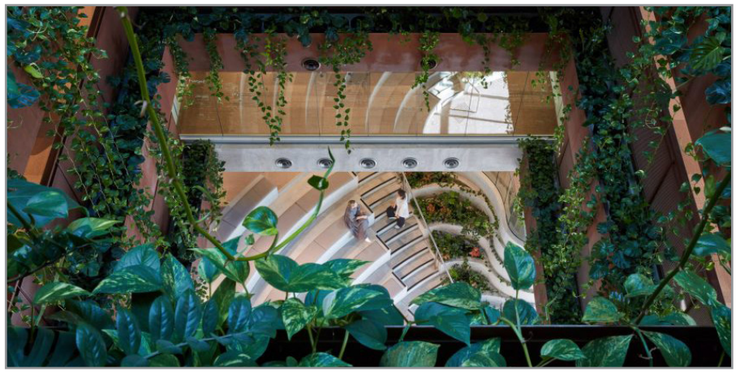


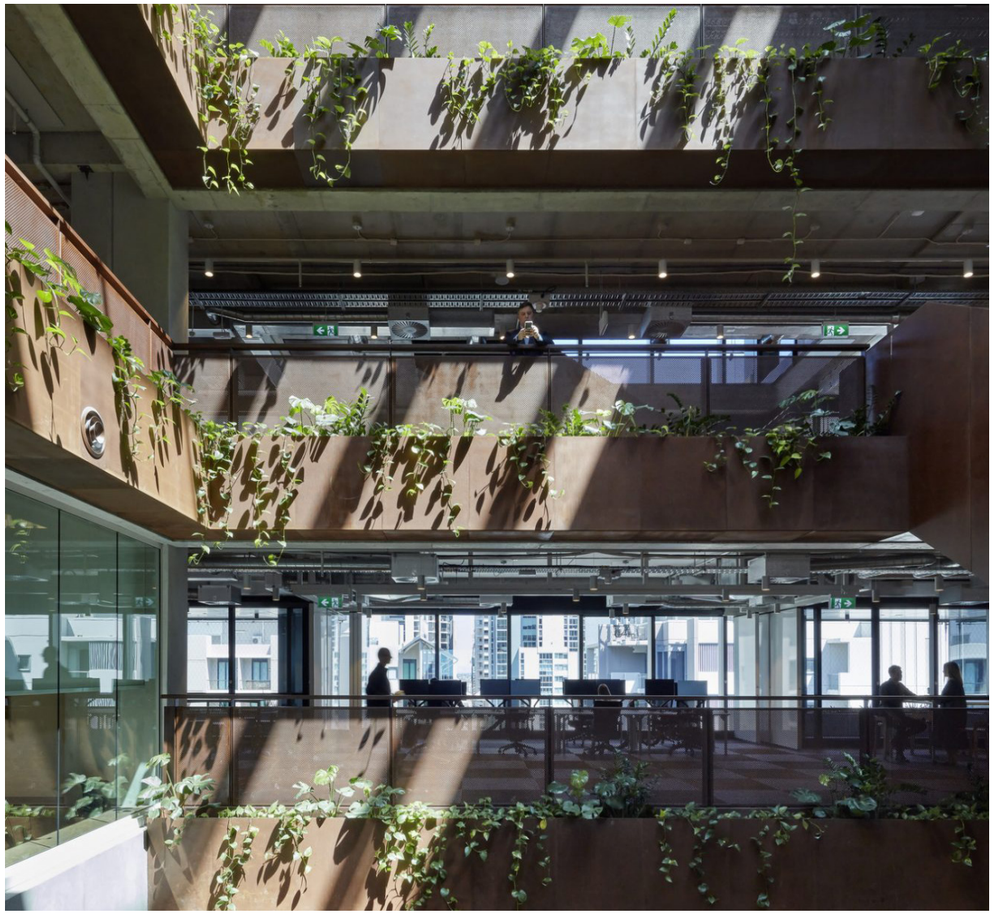




Key Spaces I Atrium

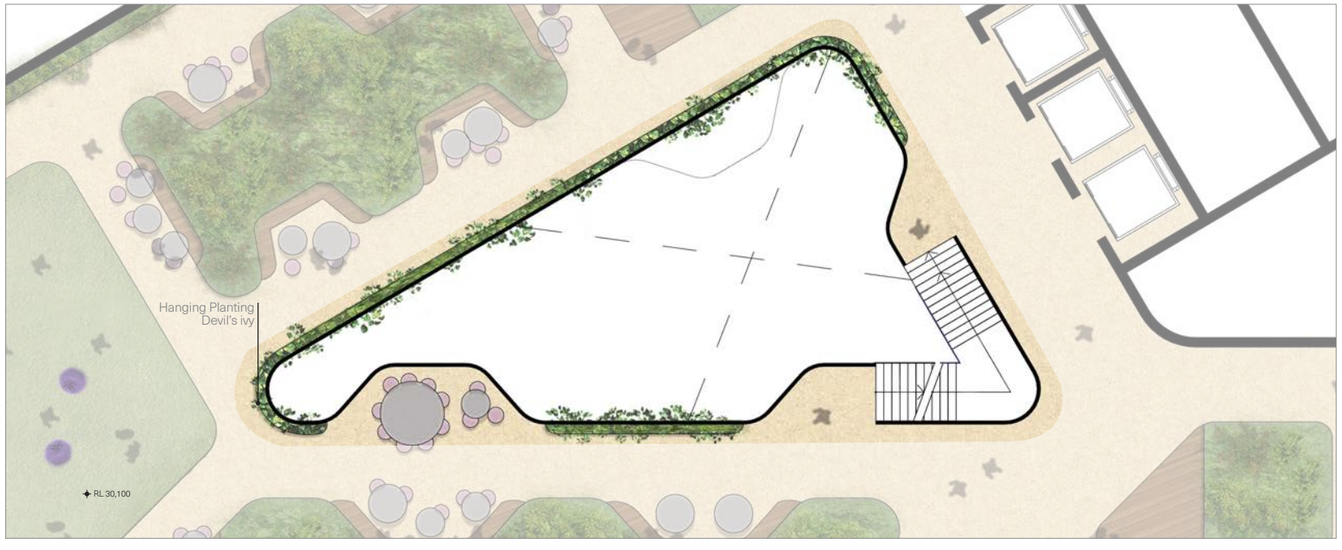
- Flexible edge
- Easy maintenance
- Hanging planting
- Interactive
- Calming











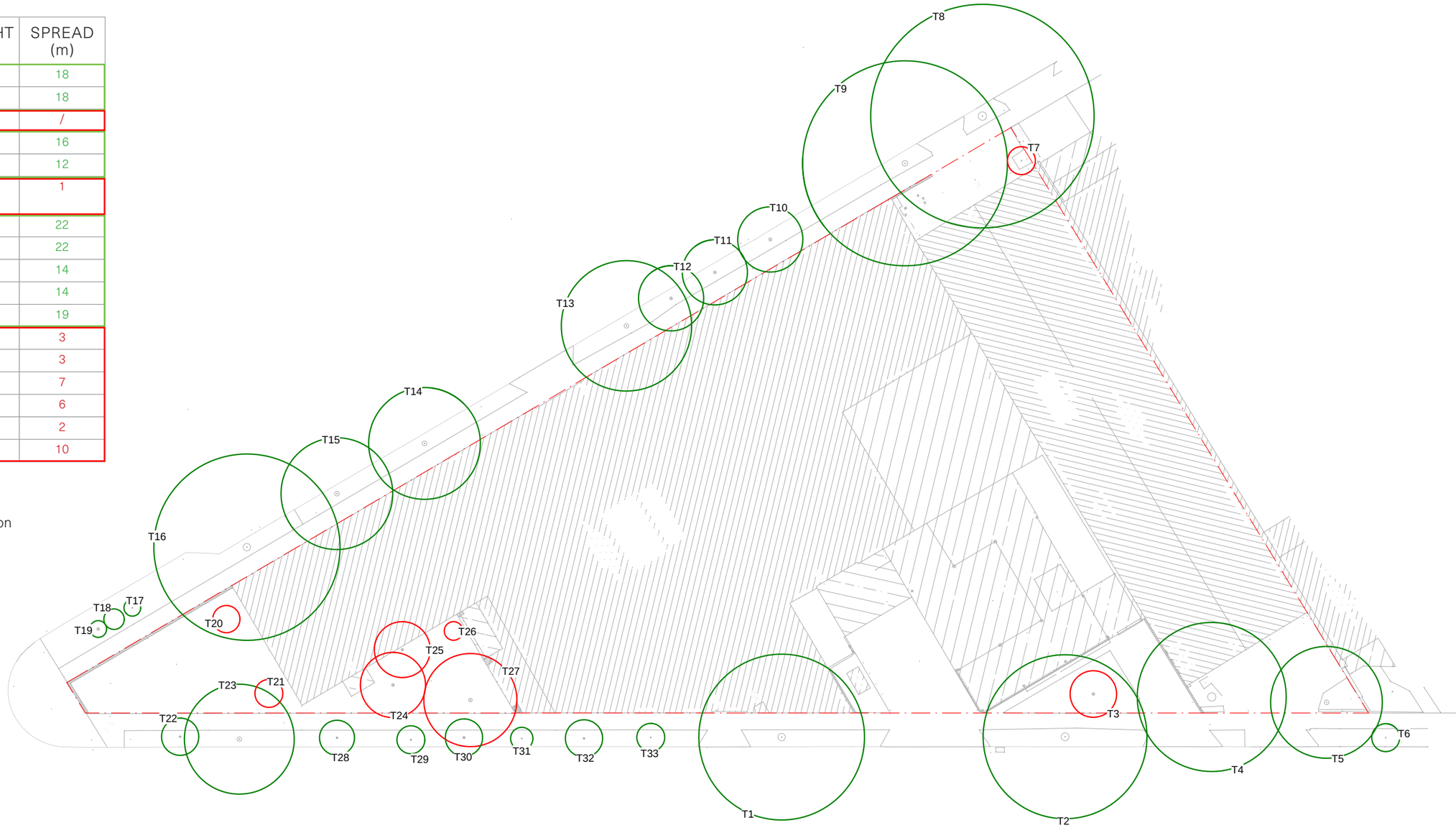


Tree Management Plan

NO.	Botanical Name	HEIGHT (m)	SPREAD (m)
1	Eucalyptus microcorys	19	18
2	Eucalyptus microcorys	17	18
3	Unknown sp.	/	/
4	Platanus x hybrida	20	16
5	Platanus x hybrida	19	12
7	Magnolia grandiflora ‘Little Gem’	6	1
8	Platanus x hybrida	20	22
9	Platanus x hybrida	20	22
14	Eucalyptus botryoides	17	14
15	Eucalyptus botryoides	17	14
16	Eucalyptus microcorys	21	19
20	Celtis occidentalis	5	3
21	Celtis occidentalis	5	3
24	Ulmus glabra ‘Lutescens’	7	7
25	Eucalyptus botryoides	12	6
26	Unknown sp.	6	2
27	Ulmus glabra ‘Lutescens’	8	10

Legend

- Existing Significant Tree for Retention
- Exisitng Tree Removed
- Tree Retained
- Tree Removed



Refer to 2023 Arboricultural Impact Assessment (Sustainable Development Group Ltd) for further detail.

Planting & Materials Palette


Buckinghamia celsissima


Corymbia gummifera habit


Eucalyptus microcorys


Loshostemon confertus


Melicope elleryana


Plantanus Acerifolia


Cymbopogon ambiguus


Lomandra longifolia


Prostanthera incisa


Enchylaena tomentosa


Prostanthera rotundifolia


Asplenium nidus


Asplenium australasicum


Dicksonia antarctica


Westringia fruticosa


Lomandra longifolia


Goodenia ovata


Grevillea buxifolia


Circular nook seating with planting


Sandstone seating in circular gathering space


Loose cafe furniture with shade umbrellas


Vertical climbers


Loose cafe furniture


Indoor planting and timber seat

SYDNEY
35 Wellington St
Chippendale NSW
2008
P 02 9527 3380
ABN: 77 097 739 663

TURFDESIGN.COM

Attachment A7

Survey Plan

M.G.A. NORTH
TRUE NORTH

LOT 1
DP 748007

No.10-20
FOUR STOREY
BRICK & RENDERED BUILDING
(FLAT ROOF)

NOT SURVEYED (INACCESSIBLE)

100° 37' 40" 23.47 SEPARATE WALLS

100° 43' 40" 50.165 SEPARATE WALLS

No.242
TWO STOREY
RENDERED & CLAD BUILDING
(METAL ROOF)

LOT 1
DP 84655
AREA 1053 m²
BY SURVEY

100° 41' 00" 64.6

STATION 9003
NAIL IN CONC
E 334 322.969m
N 6 247 358.990m
RL 21.665m

STATION 9002
NAIL IN CONC
E 334 253.154m
N 6 247 355.414m
RL 20.160m

STREET

HUNTER

STREET

YOUNG

STREET

SEE SHEET 2

LOTS A & B
DP 161650
AREA 3502 m²
BY SURVEY

No.244-258
ONE & TWO STOREY
BRICK OFFICES & WAREHOUSE
(METAL ROOF)

SEE DIAGRAM 1

HUNTER

STREET

STREET

YOUNG ST

YOUNG

STREET

STATION 9001
NAIL IN CONC
E 334 236.044m
N 6 247 271.155m
RL 20.016m

POWELL STREET

SEE SHEET 3
FOR WALL TO
BOUNDARY
DIAGRAMS 2-10

EASEMENTS :-
(A) EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 3.36 WIDE (DP1136961)
(B) RIGHT OF CARRIAGEWAY 6.8 WIDE (DP1136961)
(C) EASEMENT FOR SUPPORT VARIABLE WIDTH (DP638902)
(D) EASEMENT FOR MAINTENANCE OF GUTTER VARIABLE WIDTH (DP638902)
(E) EASEMENT FOR SUPPORT 0.3, 0.32 & VARIABLE WIDTH (DP644174)
(F) EASEMENT FOR MAINTENANCE OF GUTTER & FLASHING 0.3, 0.32 & VARIABLE WIDTH (DP644174)

0 4m 8m 12m 16m 20m
SCALE 1:200

IMPORTANT NOTES:-

- THIS PLAN IS PREPARED FOR THE CLIENT NAMED HEREON FROM A COMBINATION OF FIELD SURVEY AND EXISTING RECORDS FOR THE PURPOSES OUTLINED IN THE JOB SCOPE AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
- A BOUNDARY SURVEY HAS BEEN MADE. IF ANY CONSTRUCTION IS INTENDED IN THE PROXIMITY OF THE BOUNDARIES IT IS RECOMMENDED TO MARK OUT THE RELEVANT BOUNDARIES.
- BEARINGS RELATE TO MGA NORTH BY SCIMS (GDA2020).
- DISTANCES RELATE TO DISTANCE BY SURVEY, FOR TITLE DIMENSIONS PLEASE REFER TO DEPOSITED PLAN 161650.
- TREE SPREADS & TRUNK DIAMETERS SHOWN ARE DIAGRAMMATIC ONLY AND TREE HEIGHTS ARE ESTIMATED. IF ANY OF THESE ELEMENTS ARE CRITICAL TO DESIGN (IN PARTICULAR DRIPLINES) MORE SPECIFIC DETAILS SHOULD BE REQUESTED FOR ACCURATE LOCATION. TREES & VEGETATION NOT AFFECTING THE BUILDING ENVELOPE AREA OR ACCESS PATH HAS NOT BEEN LOCATED.
- VISIBLE SURFACE PITS ONLY SHOWN. THE EXISTENCE AND POSITION OF UNDERGROUND SERVICES HAS NOT BEEN INVESTIGATED.
- A CURRENT SERVICES SEARCH, INCLUDING ALL 'DIAL BEFORE YOU DIG' SERVICES PLANS, AND SITE CHECKING OF ALL EXISTING SERVICES WILL BE NECESSARY PRIOR TO COMMENCING ANY WORK.
- PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.
- THIS NOTE IS AN INTEGRAL PART OF THIS PLAN INCLUDING SUBSEQUENT SHEETS.

CO-ORDINATE SYSTEM:-

DRAWING UNITS IN CAD ARE IN MILLIMETRES

THE FOLLOWING SHIFT NEEDS TO BE APPLIED TO BRING THE CO-ORDINATES OF THE CAD DRAWING MODEL TO MGA (GDA2020) ZONE 56:
+334 000 000mm EASTING
+6 247 000 000mm NORTHING

LEVEL DATUM IS AUSTRALIAN HEIGHT DATUM

DIMENSIONS ARE SHOWN IN METRES

LOTS A & B
DP 161650
AREA 3502 m²
BY SURVEY

No.244-258
ONE & TWO STOREY
BRICK OFFICES & WAREHOUSE
(METAL ROOF)

SEE DIAGRAM 7

SEE DIAGRAM 6

SEE DIAGRAM 3

SEE DIAGRAM 4

SEE DIAGRAM 5

STREET

HUNTER

STREET

YOUNG

STREET

POWELL STREET

DIAGRAM 1

0 2m 4m 6m 8m 10m
LENGTHS ARE IN METRES. SCALE 1:100

M.G.A. CO-ORDINATES OF BOUNDARY CORNERS

No.	EASTING	NORTHING
1	334,257.428	6,247,371.214
2	334,320.908	6,247,359.239
3	334,249.429	6,247,270.248
4	334,236.667	6,247,270.961
5	334,332.875	6,247,372.471
6	334,260.518	6,247,386.137
7	334,283.586	6,247,381.809

ABBREVIATIONS:

B	- SILL (BOT. WINDOWS)	PP	- POWER POLE
BM	- BENCHMARK	PPT	- PARAPET
EL	- ELECTRICAL POLE	R	- ROOF LINE
FF	- FIRST FLOOR	RL	- REDUCED LEVEL
FL	- FLOOR LEVEL	RR	- ROOF RIDGE
G	- GAS VALVE	S	- SEWER CONNECTION
GF	- GROUND FLOOR	SF	- SECOND FLOOR
GM	- GAS METER	SL	- SURFACE LEVEL
GU	- GUTTER RL	SV	- STOP VALVE
H	- HYDRANT	SVP	- SEWER VENT PIPE
IL	- INVERT LEVEL	T	- LINTEL (TOP WINDOWS)
KO	- KERB OUTLET	TW	- TOP OF WALL
LP	- LIGHT POLE	VC	- VEHICLE CROSSING
MB	- MAIL BOX	WT	- WATER TAP
PC	- PRAM CROSSING	WM	- WATER METER

01	ADDITIONAL LOT ADDED	08/07/2022
00	ORIGINAL ISSUE	04/07/2022

NOTE:-
UNDERGROUND SERVICES WHERE LOCATED FROM SURFACE FEATURES ONLY.

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REGISTERED SURVEYOR

NOTES:-
A BOUNDARY SURVEY HAS BEEN MADE.

ISNSW THE INSTITUTION OF SURVEYORS NSW CELEBRATING 125 YEARS

REGISTERED SURVEYOR PTY LTD
ACN 658 811 011 ABN 46 658 811 011
www.registeredsurveyor.com.au
Timothy John Sigley M.I.S., BSpSc (Hons) Surv.
Registered Surveyor BOSSI No. 5000954 - Grad
L14 ALFRED ST N, North Sydney NSW 2060
P.O. Box 1118, North Sydney NSW 2059
tim@registeredsurveyor.com.au | 0499 905 401

LARKI
DETAIL SURVEY OF
LOTS A & B IN DP 161650 & LOT 1 IN DP 84655
No.242-258 YOUNG ST
WATERLOO NSW 2017
L.G.A.: COUNCIL OF THE CITY OF SYDNEY

www.dialbeforeyoudig.com.au DIAL1100 BEFORE YOU DIG

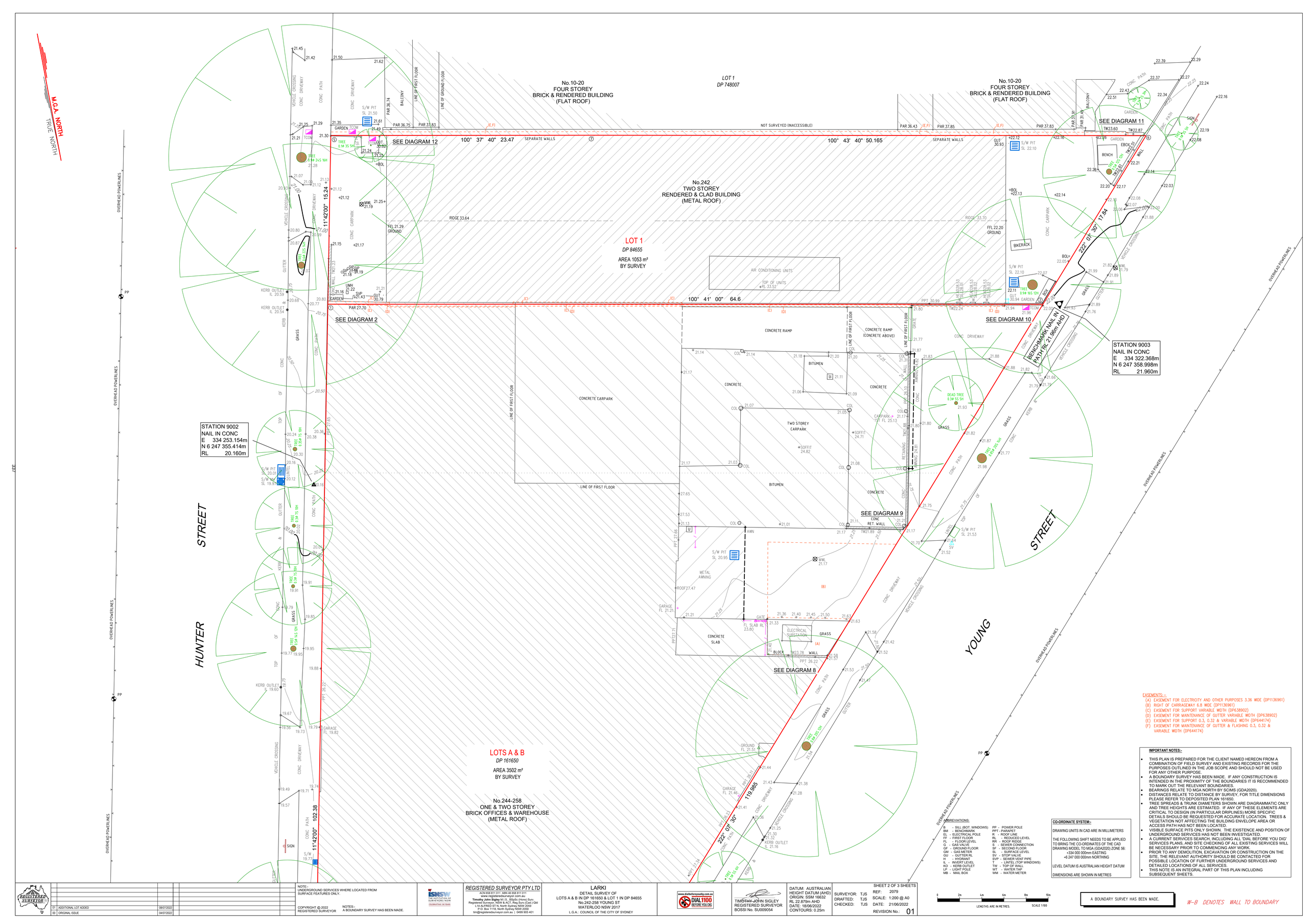
TIMOTHY JOHN SIGLEY
REGISTERED SURVEYOR
BOSSI No. SU0009054

DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
ORIGIN: SSM 16632
RL 22.879m AHD
DATE: 18/06/2022
CONTOURS: 0.25m

SHEET 1 OF 3 SHEETS
SURVEYOR: TJS
DRAFTED: TJS
CHECKED: TJS
REF: 2079
SCALE: 1:200 @ A0
DATE: 21/06/2022
REVISION No.: 01

A BOUNDARY SURVEY HAS BEEN MADE.

W-B DENOTES WALL TO BOUNDARY



EASEMENTS:-
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- (C) EASEMENT FOR SUPPORT VARIABLE WIDTH (DP638902)
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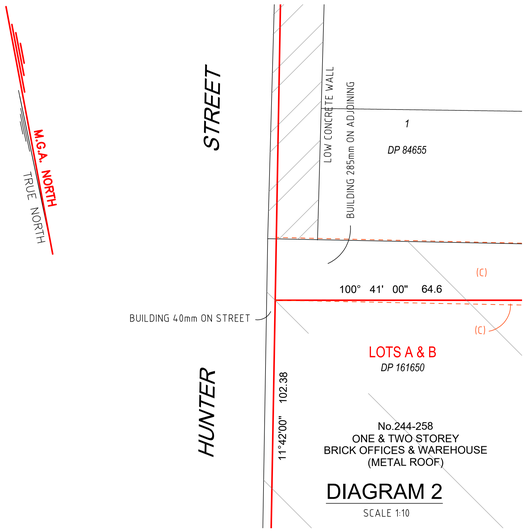


DIAGRAM 2
SCALE 1:10

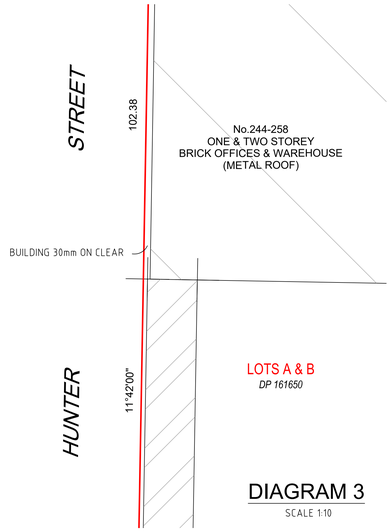


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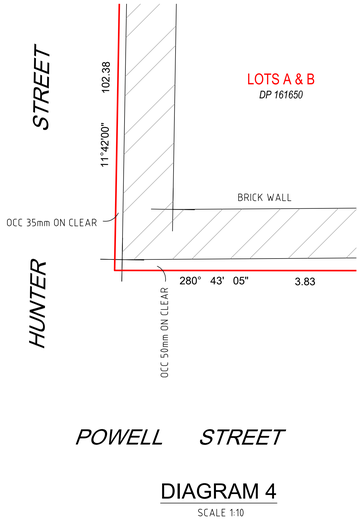


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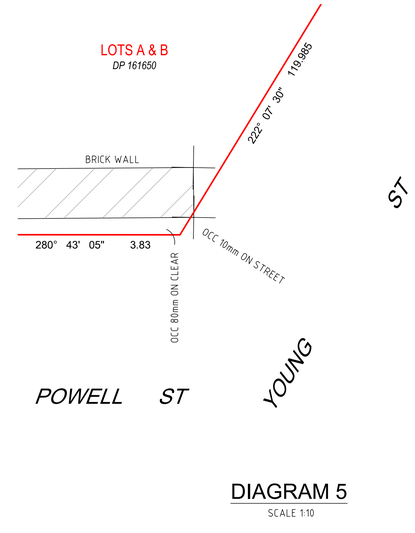


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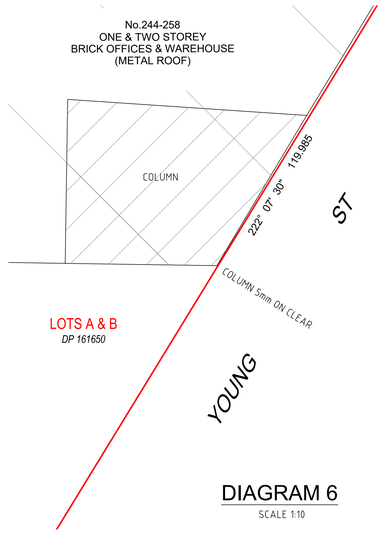


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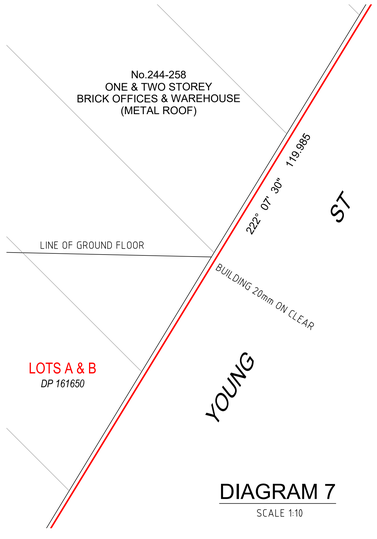


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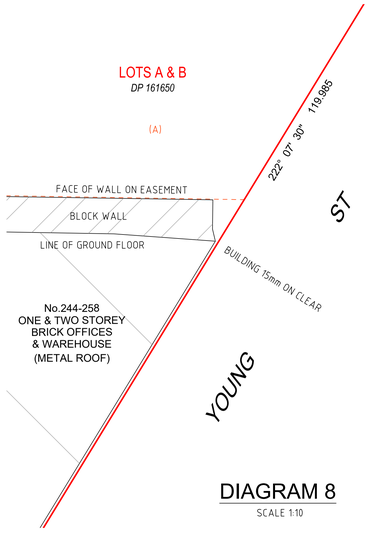


DIAGRAM 8
SCALE 1:10

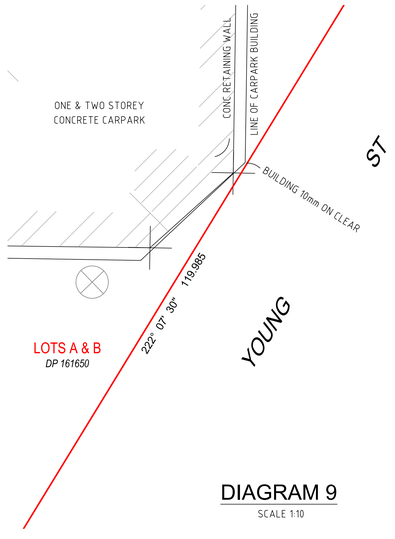


DIAGRAM 9
SCALE 1:10

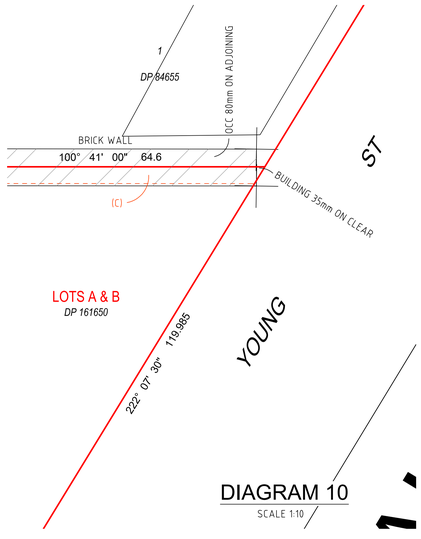


DIAGRAM 10
SCALE 1:10

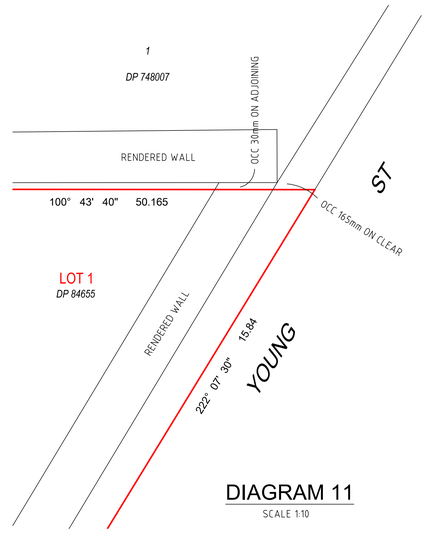


DIAGRAM 11
SCALE 1:10

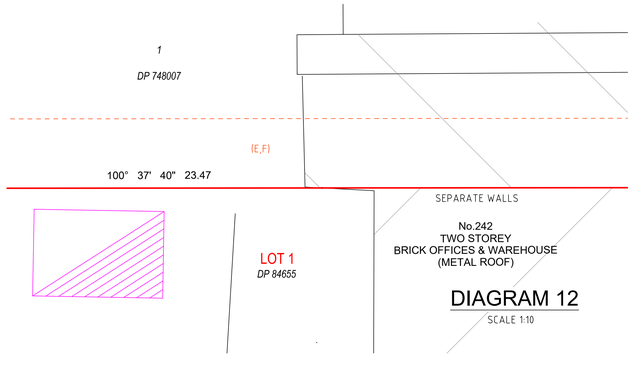


DIAGRAM 12
SCALE 1:10

CO-ORDINATE SYSTEM:-

DRAWING UNITS IN CAD ARE IN MILLIMETRES

THE FOLLOWING SHIFT NEEDS TO BE APPLIED TO BRING THE CO-ORDINATES OF THE CAD DRAWING MODEL TO MGA (GDA2020) ZONE 56:
+334 000 000mm EASTING
+6 247 000 000mm NORTHING

LEVEL DATUM IS AUSTRALIAN HEIGHT DATUM

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- (C) EASEMENT FOR SUPPORT VARIABLE WIDTH (DP638902)
- (D) EASEMENT FOR MAINTENANCE OF GUTTER VARIABLE WIDTH (DP638902)
- (E) EASEMENT FOR SUPPORT 0.3, 0.32 & VARIABLE WIDTH (DP644174)
- (F) EASEMENT FOR MAINTENANCE OF GUTTER & FLASHING 0.3, 0.32 & VARIABLE WIDTH (DP644174)

WALL TO BOUNDARY DIAGRAMS 2-10

0 0.2m 0.4m 0.6m 0.8m 1m
LENGTHS ARE IN METRES. SCALE 1:10

IMPORTANT NOTES:-

- THIS PLAN IS PREPARED FOR THE CLIENT NAMED HEREON FROM A COMBINATION OF FIELD SURVEY AND EXISTING RECORDS FOR THE PURPOSES OUTLINED IN THE JOB SCOPE AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
- A BOUNDARY SURVEY HAS BEEN MADE. IF ANY CONSTRUCTION IS INTENDED IN THE PROXIMITY OF THE BOUNDARIES IT IS RECOMMENDED TO MARK OUT THE RELEVANT BOUNDARIES.
- BEARINGS RELATE TO MGA NORTH BY SCIMS (GDA2020).
- DISTANCES RELATE TO DISTANCE BY SURVEY, FOR TITLE DIMENSIONS PLEASE REFER TO DEPOSITED PLAN 161650.
- TREE SPREADS & TRUNK DIAMETERS SHOWN ARE DIAGRAMMATIC ONLY AND TREE HEIGHTS ARE ESTIMATED. IF ANY OF THESE ELEMENTS ARE CRITICAL TO DESIGN (IN PARTICULAR DRIPLINES) MORE SPECIFIC DETAILS SHOULD BE REQUESTED FOR ACCURATE LOCATION. TREES & VEGETATION NOT AFFECTING THE BUILDING ENVELOPE AREA OR ACCESS PATH HAS NOT BEEN LOCATED.
- VISIBLE SURFACE PITS ONLY SHOWN. THE EXISTENCE AND POSITION OF UNDERGROUND SERVICES HAS NOT BEEN INVESTIGATED.
- A CURRENT SERVICES SEARCH, INCLUDING ALL 'DIAL BEFORE YOU DIG' SERVICES PLANS, AND SITE CHECKING OF ALL EXISTING SERVICES WILL BE NECESSARY PRIOR TO COMMENCING ANY WORK.
- PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR POSSIBLE LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.
- THIS NOTE IS AN INTEGRAL PART OF THIS PLAN INCLUDING SUBSEQUENT SHEETS.

ABBREVIATIONS:

B	- SILL (BOT. WINDOWS)	PP	- POWER POLE
BM	- BENCHMARK	PPT	- PARAPET
EL	- ELECTRICAL POLE	R	- ROOF LINE
FF	- FIRST FLOOR	RL	- REDUCED LEVEL
FL	- FLOOR LEVEL	RR	- ROOF RIDGE
GF	- GROUND	SC	- SEWER CONNECTION
GFF	- GROUND FLOOR	SF	- SECOND FLOOR
GM	- GAS METER	SL	- SURFACE LEVEL
GU	- GUTTER BS	SV	- STOP VALVE
H	- HYDRANT	SVP	- SEWER VENT PIPE
IL	- INVERT LEVEL	T	- LINTEL (TOP WINDOWS)
KO	- KERB OUTLET	TW	- TOP OF WALL
LP	- LIGHT POLE	VC	- VEHICLE CROSSING
MB	- MAIL BOX	WT	- WATER TAP
PC	- PRAM CROSSING	WM	- WATER METER

01	ADDITIONAL LOT ADDED	08/07/2022	
00	ORIGINAL ISSUE	04/07/2022	

REGISTERED SURVEYOR

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REGISTERED SURVEYOR

NOTE:-
UNDERGROUND SERVICES WHERE LOCATED FROM SURFACE FEATURES ONLY.

NOTES:-
A BOUNDARY SURVEY HAS BEEN MADE.

REGISTERED SURVEYOR PTY LTD
ACN 608 811 011 ABN 49 608 811 011
Suite 2, 37-39 Brisbane Street, Penrith 2750
Timothy John Sigley M.I.S., BSpSc (Hons) Surv.
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LARKI
DETAIL SURVEY OF
LOTS A & B IN DP 161650 & LOT 1 IN DP 84655
No.242-258 YOUNG ST
WATERLOO NSW 2017
L.G.A.: COUNCIL OF THE CITY OF SYDNEY

www.dialbeforeyoudig.com.au DIAL1100 BEFORE YOU DIG

TIMOTHY JOHN SIGLEY
REGISTERED SURVEYOR
BOSSI No. SU009054

DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
ORIGIN: SSM 16632
RL 22.879m AHD
DATE: 18/06/2022
CONTOURS: 0.25m

SURVEYOR: TJS
DRAFTED: TJS
CHECKED: TJS

SHEET 3 OF 3 SHEETS
REF: 2079
SCALE: 1:200 @ A0
DATE: 21/06/2022
REVISION No.: 01

A BOUNDARY SURVEY HAS BEEN MADE.

W–B DENOTES WALL TO BOUNDARY

Attachment A8

Traffic and Transport Report

JMT CONSULTING



242 – 258 Young Street, Waterloo

Transport Assessment

Prepared for: **Sustainable Development Group**

28 May 2024

340

PROJECT INFORMATION

Project Name:	242 – 258 Young Street, Waterloo
Client:	Sustainable Development Group
Project Number:	2252
Prepared By:	JMT Consulting

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1 Introduction

1.1 Background

This transport impact assessment is submitted to the Council of the City of Sydney (**Council**) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
  - 45 GLS, 13 specialist / classrooms
  - A multi-purpose hall / auditorium
  - A library
  - A canteen
  - Administration, lobby and circulation spaces
  - An active green roof
  - A basement including 55 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m^2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
  - 10,608m^2 education floor area
  - 2,935m^2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m^2.

1.2 Site location

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.

The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.

An aerial photo of the site is shown at Figure 1



Figure 1 Site location and local context

Source: Ethos Urban

1.3 Report purpose

This report has been prepared to summarise the traffic and transport implications of the Planning Proposal. Specifically the assessment considers the following items:

- Existing transport conditions, including:
    - Surrounding road network
    - Vehicle site access
    - Car parking
    - Loading and servicing arrangements
    - Public transport provision
- Proposed site access arrangements
- Proposed vehicle loading and servicing arrangements
- Proposed parking rates to be adopted as part of a future development application for the site
- Additional traffic movements resulting from the Planning Proposal and impacts to the adjacent road network
- Public transport, walking and cycling measures

2 Existing Transport Conditions

2.1 Surrounding road network

To manage the extensive network of roads for which councils are responsible under the Roads Act 1993, Transport for NSW (TfNSW) in partnership with local government established an administrative framework of *State, Regional,* and *Local Road* categories. State Roads are managed and financed by TfNSW and Regional and Local Roads are managed and financed by councils.

Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. Due to their network significance TfNSW provides financial assistance to councils for the management of their Regional Roads. Key State and Regional roads which provide access to the site are illustrated in Figure 2 below, which demonstrates the site is very well connected to the surrounding road network.

The site is primarily serviced by the State Roads including McEvoy Street, Bourke Street and Lachlan Street, as well as Regional Roads such as Bourke Street and Elizabeth Street. The site is also serviced by local roads managed by Council including direct frontage to Young Street and Hunter Street.



Figure 2 Existing road network

2.2 Existing site access points

As illustrated in Figure 3 there are six existing points of vehicular access to the site – four driveways on Young Street and two driveways on Hunter Street. These driveways vary between 4m and 9m in width and impact the pedestrian environment in the vicinity of the site. The driveways also limit the ability to provide on-street car parking adjacent to the site.

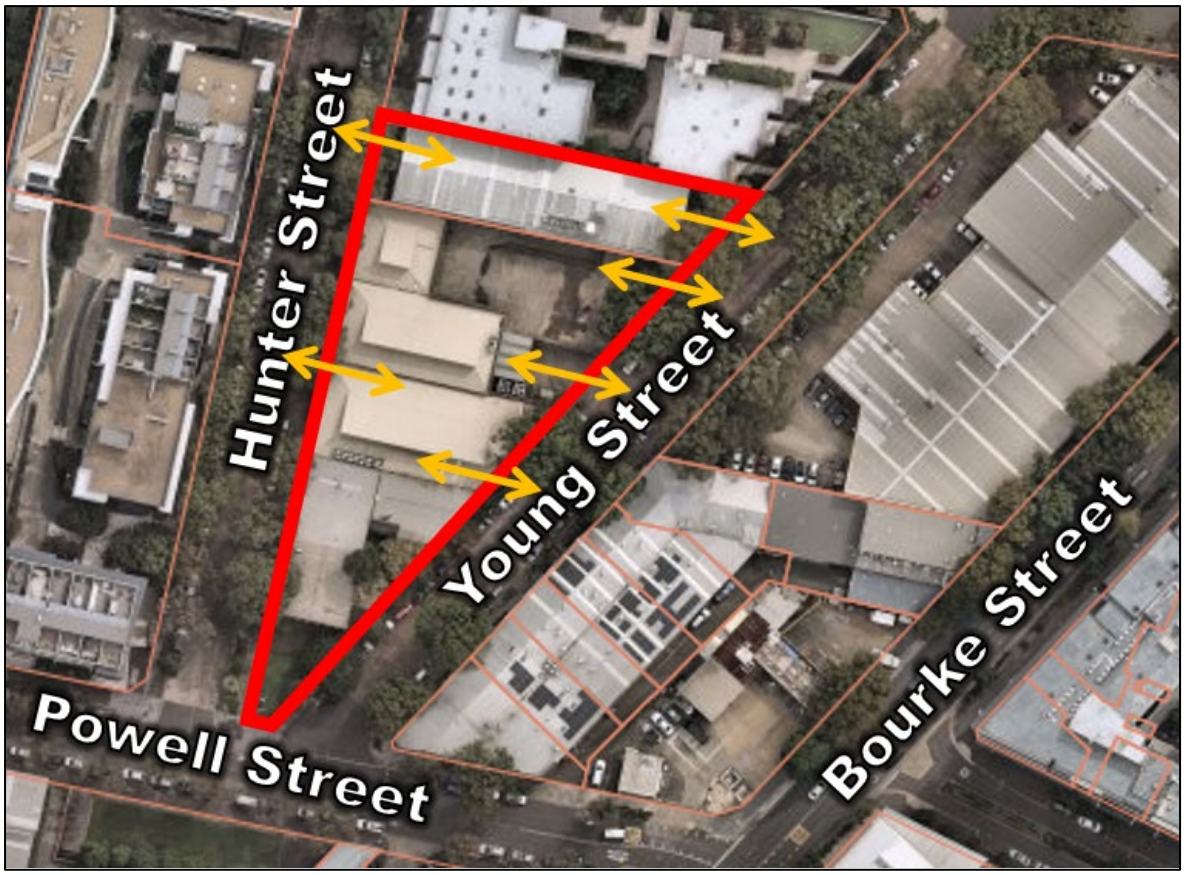


Figure 3 Existing vehicular site access points

2.3 Public transport

The site has access to a number of nearby public transport network as illustrated in Figure 4 below.



Figure 4 Public transport access

Green Square railway station located approximately 800m from the site. Green Square is serviced by the T8 (Airport and South) line which provides direct access to the Sydney CBD, Sydney Airport, Revesby and Glenfield, Campbelltown and Macarthur. Between 6am and 10pm on weekdays train services operate every 5 to 7 minutes in each direction, with frequencies increasing to every 15 minutes outside of this time period.

A number of bus services also operate from the bus stops located along the streets within the site immediate vicinity. The closest bus stop is located immediately adjacent to the site on Bourke Street which is served by frequent bus services. A summary of these bus services is provided in Table 1 below.

Table 1 Existing bus routes

Route Number	Route Description	Weekday Frequency	
		Peak	Off-peak
301	Eastgardens to Redfern via Mascot	30 minutes	30 minutes
302	Eastgardens to Redfern via Kingsford	No service	1 hour
303	Sans Souci to Redfern via Mascot	15-30 minutes	30 minutes- 1 hour
304	Rosebery to City Circular Quay via Zetland	5-15 minutes	15 minutes
306	Redfern to Mascot Station	10 minutes	20 minutes
343	Kingsford to Chatswood	3-5 minutes	10 minutes

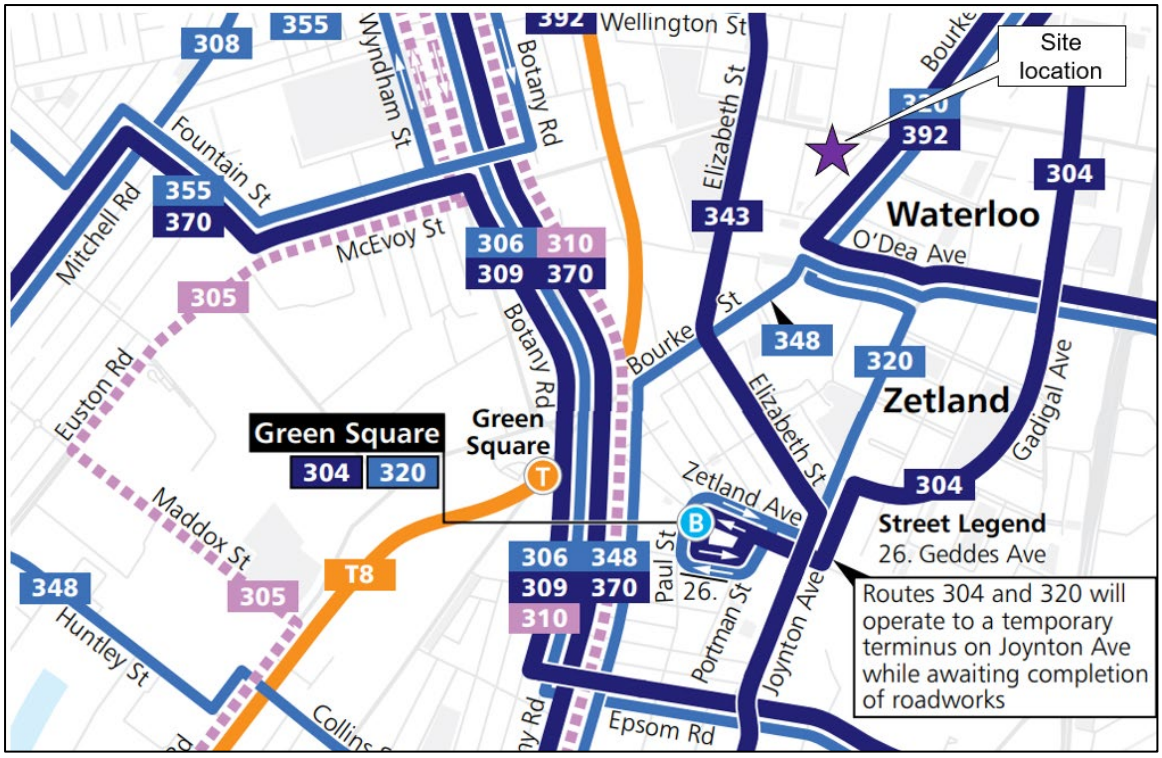


Figure 5 Nearby bus routes

Sydney Metro is a major public transport infrastructure project currently in the construction phase within proximity of the subject site. The Sydney Metro City and Southwest metro line (currently under construction) will connect to the recently opened Sydney Metro Northwest line at Chatswood station and provide significantly improved connectivity from the southwest and Sydney CBD to Chatswood and the northwest.

Waterloo Metro Station is one of the new stations of Sydney Metro City & Southwest line. It is bounded by Botany Road and Cope Street, Raglan Street and Wellington Street. This new station will be located approximately 1km west of the subject site which is within viable walking distance for residents, visitors and staff to mass transit.

The expansion of the Sydney Metro network will further improve public transport accessibility to the site.

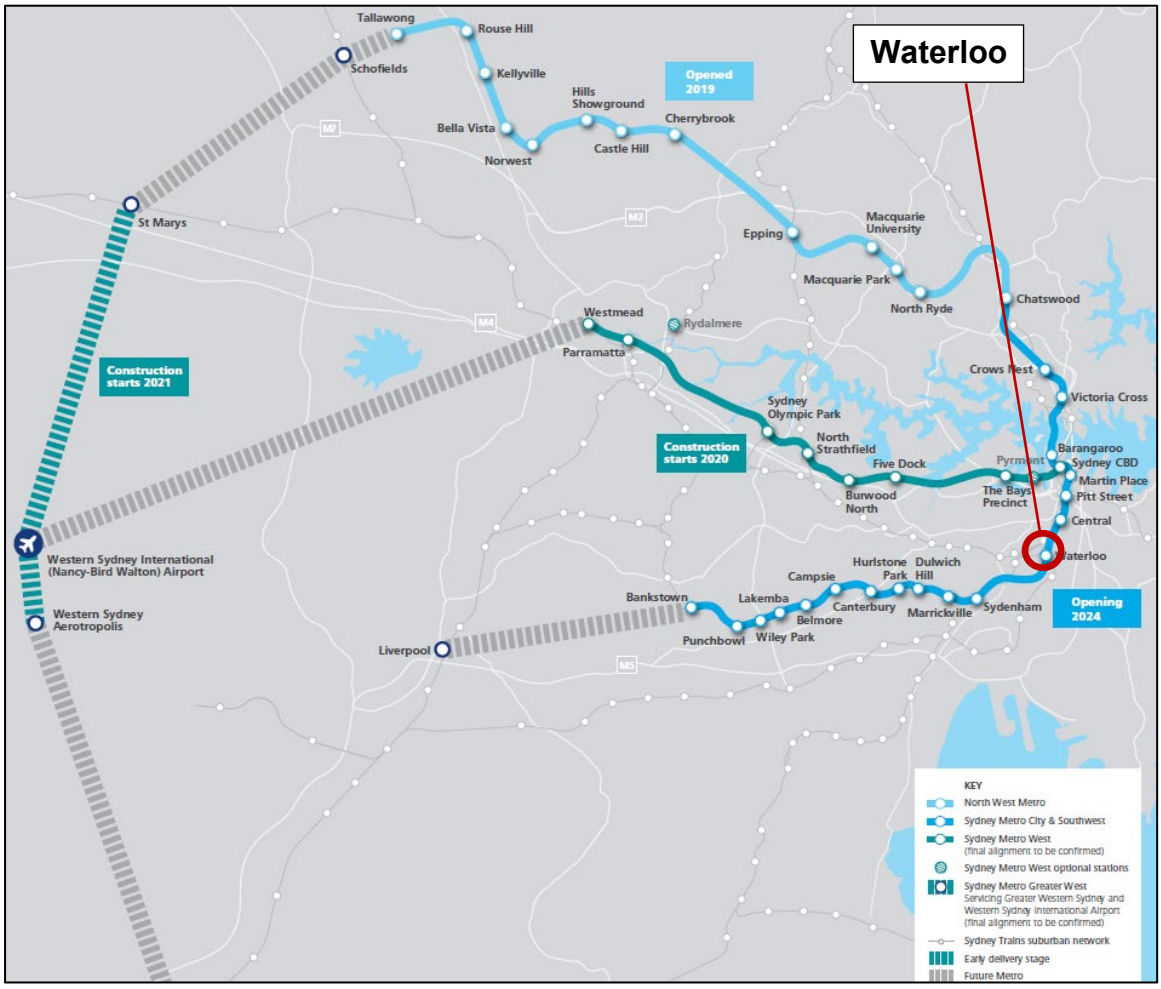


Figure 6 Sydney Metro network

Source: Transport for NSW

2.4 Public transport accessibility

A key indicator of the level of public transport accessibility a site contains is the number of locations accessible within a 30 minute public transport catchment. A key objective of the Greater Sydney Commission's Greater Sydney Region Plan is to deliver a 30-minute city where jobs, services and quality public transport spaces are in easy reach of residences.

As illustrated in Figure 6 a number of key employment centres across Sydney can be reached within 30 minutes public transport travel time of the site, including Central / Redfern, Sydney CBD, North Sydney CBD, Burwood, Mascot and Kogarah. The highly accessible nature of the site will facilitate the use of public transport by future users of the site.

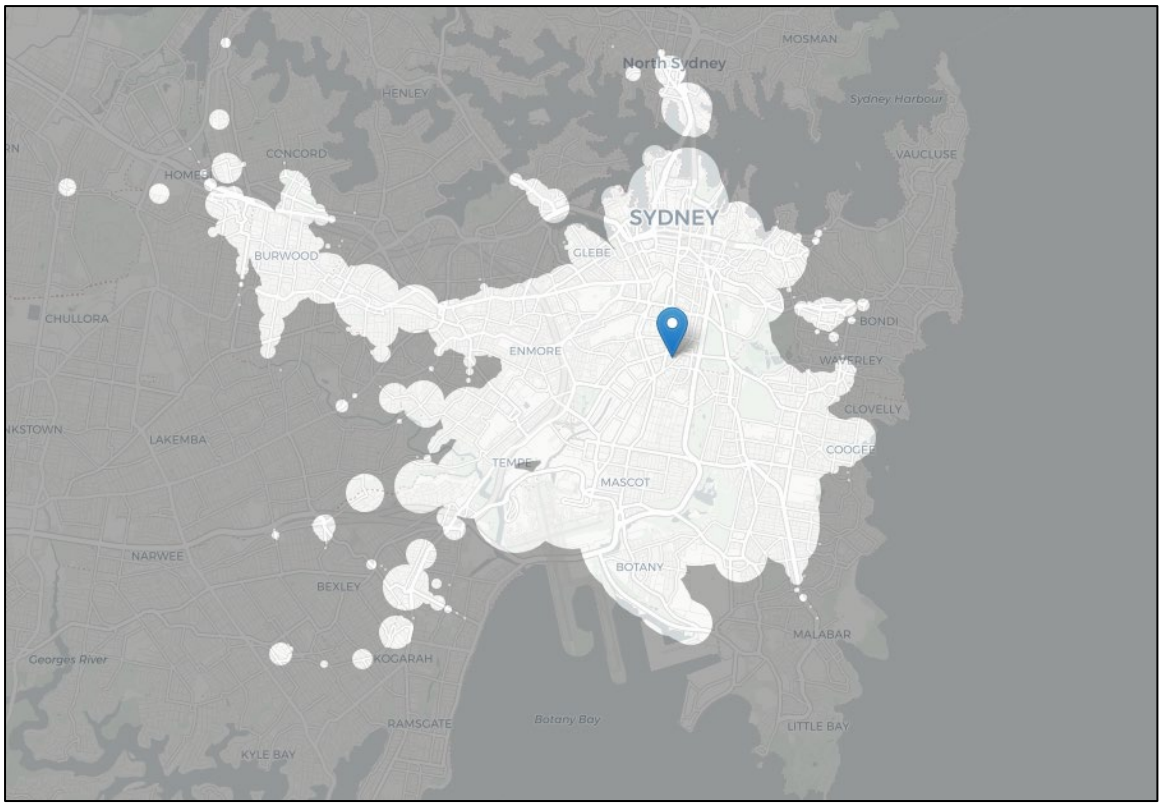


Figure 7 30 minute public transport catchment from site

Source: https://www.mapnificent.net/sydney

2.5 Pedestrian and cycling network

The pedestrian environment in the vicinity of the site is strong, with pedestrian footpaths are provided on both sides of all surrounding streets. Controlled pedestrian crossings are provided on all legs at the following signalised intersections:

- Bourke Street with Danks Street
- Bourke Street with Potter Street
- Bourke Street with Lachlan Street, and
- Bourke Street with McEvoy Street.

An extensive cycleway network is available in the immediate vicinity of the site as shown in Figure 7. An off-road shared path is provided along Bourke Street near the site (see Figure 8). In addition, an off-road separated cycleway is also provided along Bourke Street north of Phillip Street, which provides a high quality cycleway connection through to the Sydney CBD. A similar facility is also provided along George Street to the west of the site.

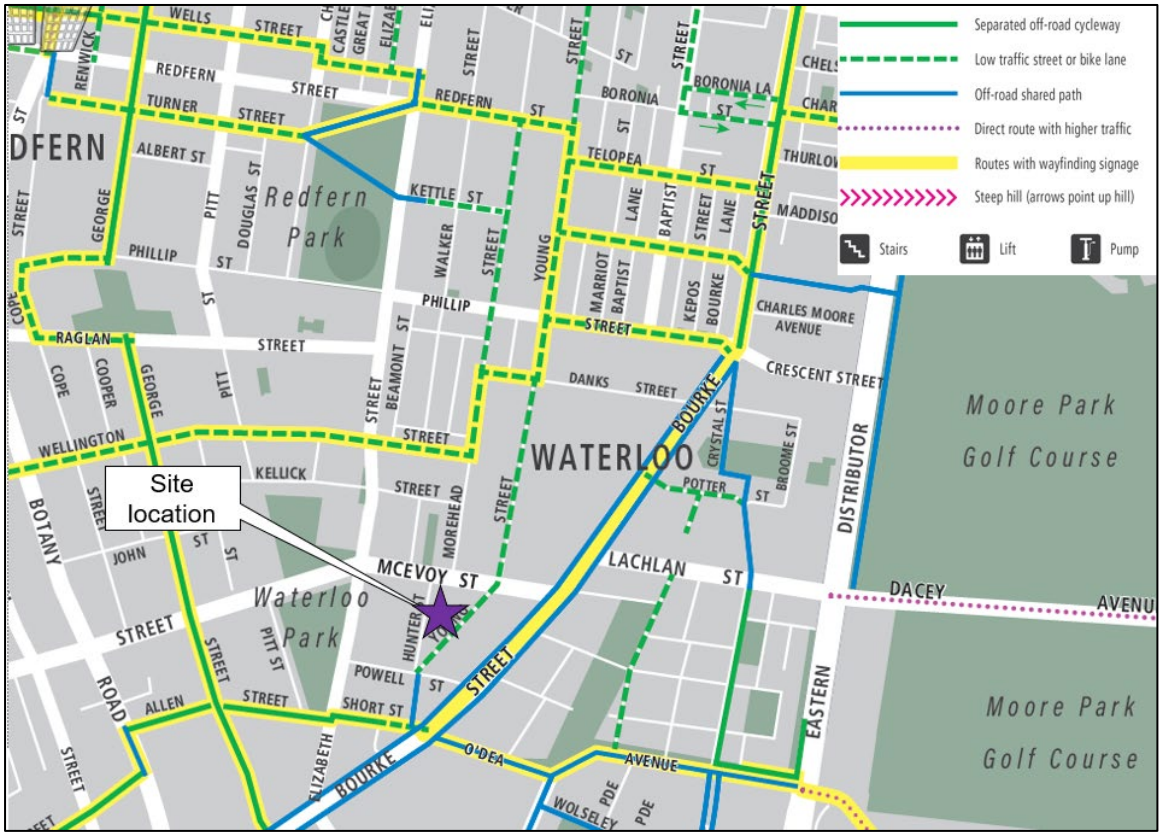


Figure 8 Existing cycling network



Figure 9 Bourke Road shared pathway (view south of Powell Street)

3 Transport and Access Strategy

3.1 Site access strategy

The reference scheme developed for the purposes of the Planning Proposal envisages the following access arrangements as indicated in Figure 9.

- Access to an on-site car parking area via Young Street which will provide access for cars and service vehicles.
- A drop off and pick up area for students along Young Street fronting the site, with this area located away from the future Woolworths driveway on the other side of Young Street. Indicatively this area may accommodate approximately 6 – 8 cars at any one time. The drop off / pick up area has been located away from the future Woolworths driveway so that vehicles using this zone will not conflict with drivers entering/exiting the Woolworths car park.
- A bus drop off and pick up zone on Hunter Street fronting the site.

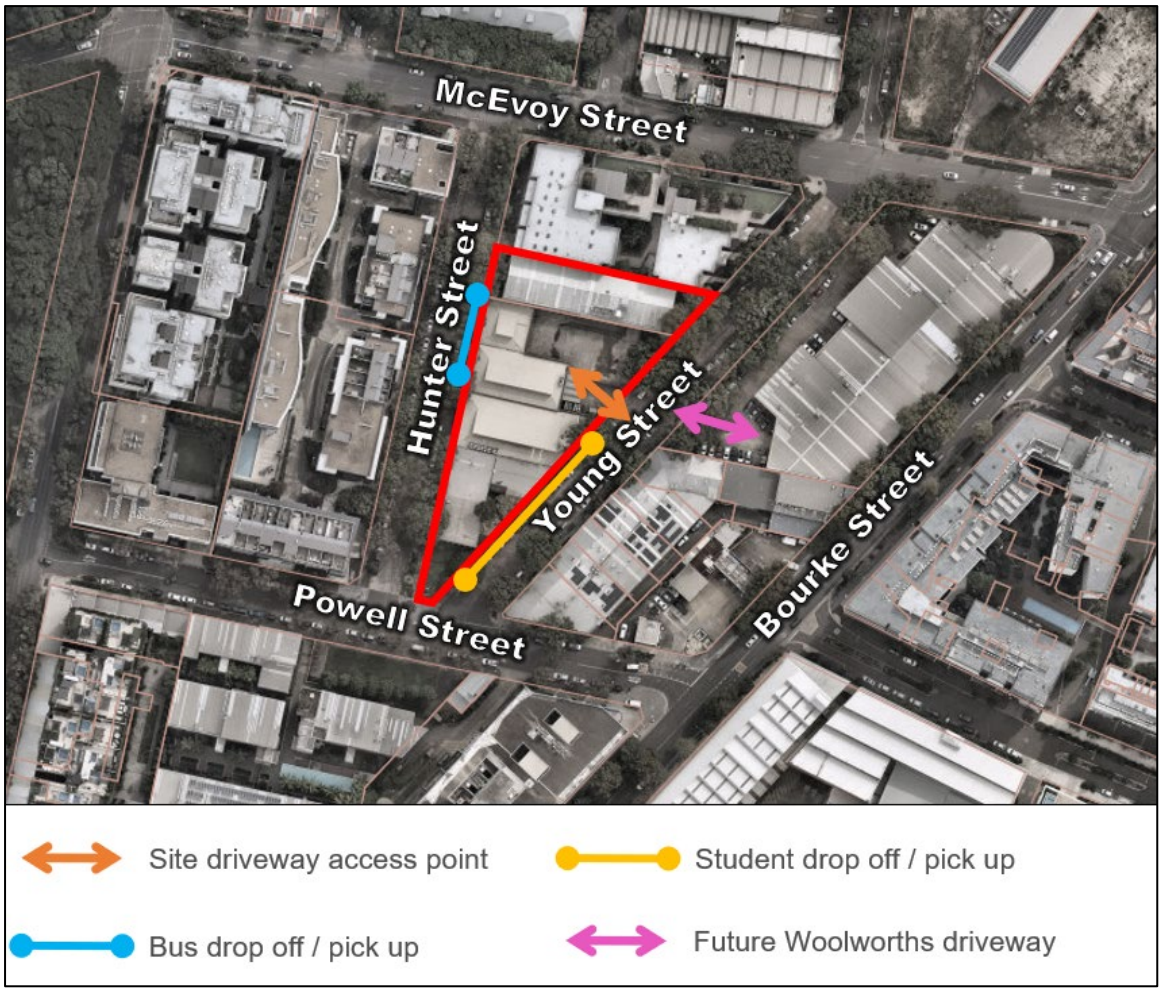


Figure 10 Proposed site access

As previously noted in Section 2.2 of this document the site currently contains six vehicular points of access across Young Street and Hunter Street – impacting the pedestrian and on-street parking environment. The proposal reduces the number of driveways fronting the site from six down to one – providing for a significantly improved environment for pedestrians and facilitating the introduction of additional on-street car parking spaces.

The site access driveway on Young Street will allow for the simultaneous entry and exit of a B85 and B99 vehicle as indicated in Figure 10 below. The reference design has located the proposed driveway in a location consistent with that in place for the current site.

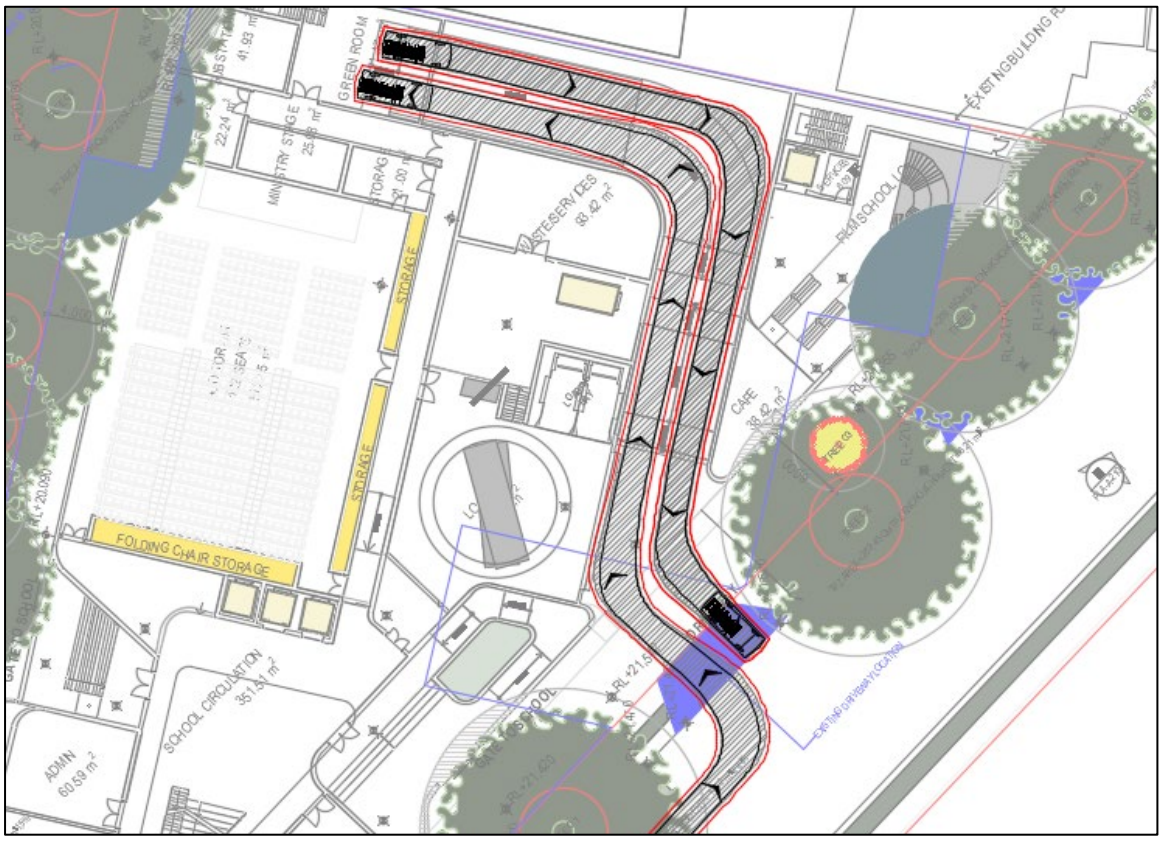


Figure 11 Vehicle swept paths – Young Street access point

3.2 Pedestrian connections

As indicated in Figure 11 the site benefits from a number of existing pedestrian crossing points at signalised intersections. Students arriving to the site from the west, north and east are generally well serviced by these crossing points.

With the improved permeability to be provided via the future Woolworths development at 923-935 Bourke Street, including new through site links, a new pedestrian crossing of Young Street would be delivered by the project across Young Street. This crossing point will generally align with the through-site link to be delivered by Woolworths. An additional pedestrian crossing will be delivered by the project across Powell Street at Young Street to support pedestrian movements from the south.

Subject to a future DA for the site, there will be the potential for footpath widening on Young Street and Hunter Street adjacent to the site. This footpath widening will provide additional space for pedestrians to move and store – particularly relevant to support safe and efficient drop off / pick up activity and travel by school bus.



Figure 12 Existing and potential future pedestrian connections

3.3 Bicycle parking

Bicycle parking and end of trip facilities will be provided as part of any future Development Application for the site. The reference scheme prepared for the Planning Proposal has located these facilities in the basement of the building as indicated in Figure 12.

Access for cyclists in the reference scheme to the end of trip area is via the passenger lifts accessed either off on Young Street or Hunter Street. As part future design development, and prior to the lodgement of the DA, opportunities to improve access for cyclists will be considered including potentially via the introduction of a dedicated bike ramp (or similar) accessed at ground level.

The final bicycle parking requirements and access arrangements for end of trip areas (including access from the street network) will be confirmed at the Development Application (DA) stage of the project.



Figure 13 Bicycle parking and end of trip facilities

3.4 Sustainable transport measures

Sustainable transport measures involve the application of policies, objectives and targets to positively influence travel behaviour through the uptake of sustainable transport modes – public transport, walking and cycling. Sustainable transport measures have proven effective in limiting car based travel and reducing traffic congestion to facilitate new development opportunities in urban areas.

Transport for NSW has recently created a Travel Choices team to help develop travel action plans for businesses. As part of this program, the framework proposes to assess travel demand management is a series of four 'R's as shown in Figure 13:

- Remode (consideration of travel via alternative modes)
- Retime (consideration of travel at alternative times)
- Reroute (using less congested routes to travel to a destination)
- Reduce (minimise the amount of travel required)

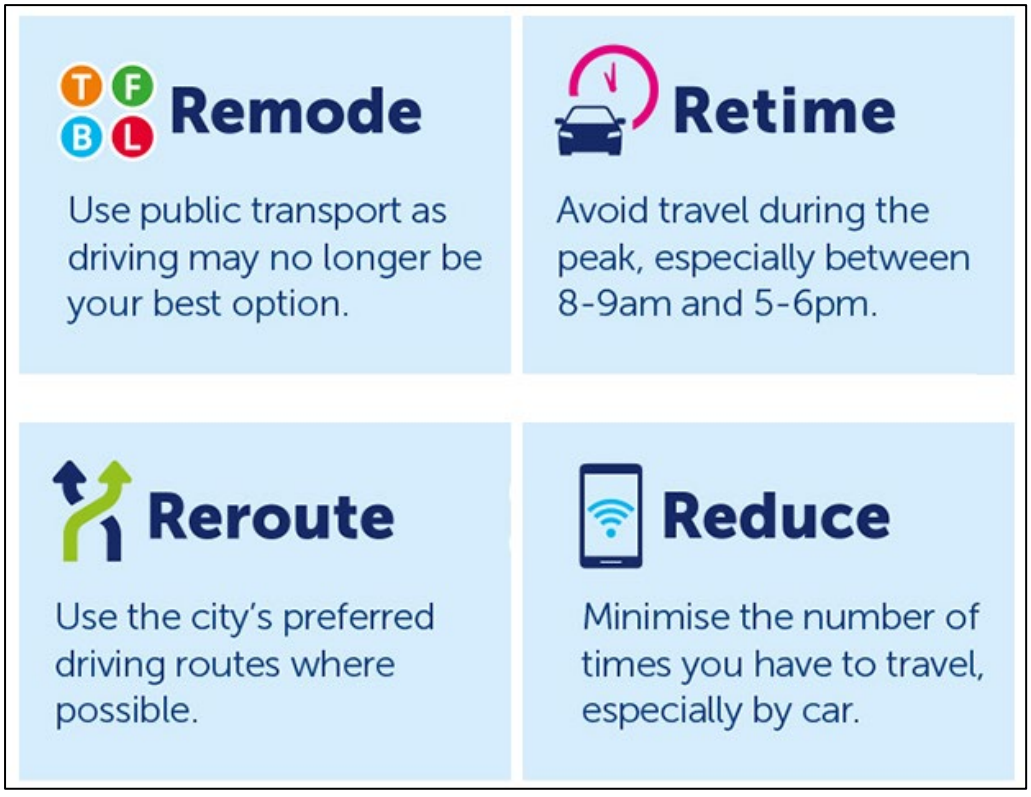


Figure 14 The four components of travel demand management

The following opportunities to reduce private vehicle travel and promote the use of sustainable transport modes to the future school have been identified at this preliminary stage of the project. These measures, along with others that align with the principles of sustainable travel, will be explored in further detail with the future operator of the school as the project develops.

- Appointment of a school travel coordinator to manage school travel activities and review the effectiveness of the implemented measures
- Preparation of a transport access guide (TAG) to be displayed on the school's website capturing sustainable ways to travel to school. The TAG would also be provided to all students when they first start at the school.
- Cycle Provisional Training–both for staff and students, and potentially parents covering the local area.
- Guided cycle/pedestrians groups "Cycle Trains / Walking School Bus"– adults guides a convoy of pupils on a safe route
- Bike check up–sponsored or subsidised bicycle maintenance offered to students
- Targeted educational program–for parents and students to encourage use of alternative transport modes as well as the health benefits
- Encouragement and rewards program – based on how frequently students walk / bike to school
- Student involvement – e.g. students prepare 'healthy travel to school' logo as part of their class room activities or steps per day challenges
- Encouragement of car pooling by staff
- Staggered start and finish times for different year groups so as to distribute travel demand across a longer period of time and reduce the extent of congestion experienced at pick up and drop off times.

3.5 Loading dock

The reference scheme includes an on-site loading dock which can accommodate a Medium Rigid Vehicle (MRV) which is 8.8m in length. This loading provision is considered suitable to accommodate the needs of the site based on the development yields associated with the reference scheme.

The loading dock is located on the ground floor with a 10m diameter turntable provided to facilitate the entry and exit of vehicles from the site in a forwards direction. All loading / unloading is to occur on-site and not in public streets. The loading dock has been designed in accordance with the requirements outlined in the relevant Australian Standard (AS2890.2, 2018). The detailed design of the loading dock will be carried out at the Development Application stage of the project.

As indicated in Figure 14 below heavy vehicles (including MRVs) have the ability to safely enter and exit the loading dock in a forwards direction without impacting the opposing travel lane on Young Street.

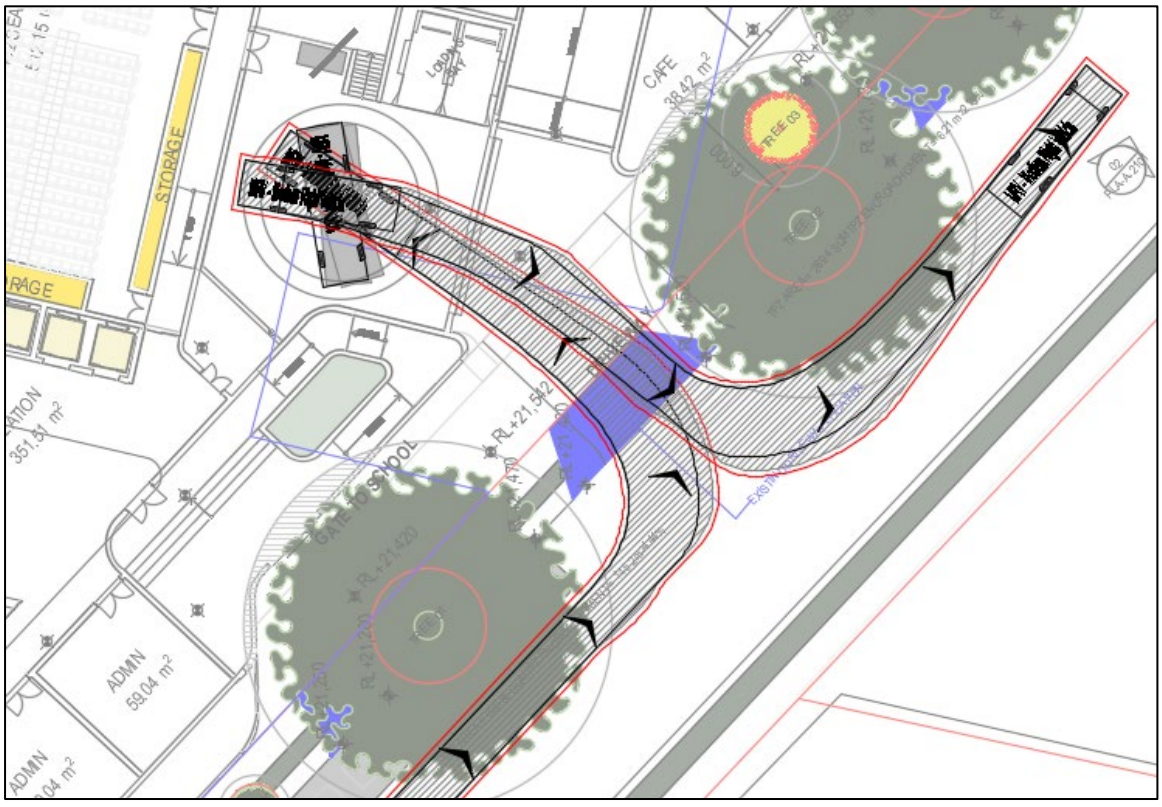


Figure 15 Swept path analysis – loading dock

3.6 On-street car parking impacts

The reduction of the number of driveways fronting the site from six down to one will facilitate the introduction of additional on-street car parking – both along Hunter Street and Young Street. This will provide a positive outcome for users of the surrounding area.

The reference scheme prepared for the Planning Proposal envisages a student drop off / pick up zone on Young Street and bus zone on Hunter Street. During school drop off and pick up (indicatively 8am-9am and 2.30pm-3.30pm) the on-street parking along Young Street would be reserved for this specific purpose. Similarly during school hours a bus zone would be in place adjacent to the site on Hunter Street – temporarily impacting some existing on-street parking spaces.

The impacts of this temporary change of parking restrictions is considered acceptable given the following:

- The project will create opportunities for additional on-street parking along both Young Street and Hunter Street through the removal of existing driveway crossovers;
- The drop off / pick up zone and bus zones would only be in place for certain periods of the day, and outside of school hours and on weekends the general public will continue to be able to utilise these areas for on-street car parking; and
- The existing on-street parking is untimed and typically utilised by workers of the existing building. The on-street parking is not subject to any resident parking scheme or time restrictions relied upon by visitors to the area.

3.7 On-site car parking provision

The reference scheme includes a basement car parking area with approximately 55 car parking spaces. It should be noted that the reference scheme is conceptual in nature and further investigations will need to be undertaken at subsequent stages to confirm the final parking number and layout. The final car parking requirements and provision for the site will be confirmed at the Development Application (DA) stage of the project.

Maximum car parking allowances for the various use of the site are summarised in following sections of this document:

3.7.1 Commercial car parking

For buildings on land in Category F[1], with the commercial component having a floor space ratio of no more than 1.5:1, the Sydney LEP specifies a maximum car parking rate of 1 space per 75m^2. Based on the 2,935m^2 of commercial GFA provided in the reference scheme up to 39 car parking spaces could be delivered on the site.

3.7.2 School car parking

The City of Sydney LEP does not provide a car parking rate for educational establishments and therefore a merits based parking assessment should be undertaken. The 55 car parking spaces proposed as part of the reference scheme is considered suitable and meets the objectives of reducing car dependency and supporting the use of sustainable forms of transport to the site.

3.8 Car park design

As part of the reference scheme developed for the Planning Proposal a basement car park has been designed to facilitate the future development. The car park and associated elements such as car parking space dimensions, circulation aisles and ramp would be designed in accordance with the relevant Australian Standard for car parking facilities, namely AS2890.1: 2004 and AS2890.6:2009.

Car parking spaces have been designed to comply with a Class 2 car park facility as specified in the Australian Standard (generally medium turnover long term parking) with minimum 2.5m wide spaces and aisle widths of 5.8m minimum. The detailed design of the car park will be carried out at the Development Application stage of the project.

[1] Based on Public Transport Accessibility Level Map

3.9 Off-site student travel to open space

Given the project is at a very early stage only preliminary investigations have been undertaken in relation to potential open space areas for use of the student population. Turruwul Park in Rosebery has been identified as suitable and has availability Monday to Friday 8:00am-5:00pm. As indicated in Figure 15 travel time to Turruwul Park from the site is between 5 and 14 minutes in the afternoon peak hour. Typically students will travel to/from the open space areas in the middle the day when traffic volumes are lower compared to the commuter peak hours which will facilitate shorter travel times.

Further detailed planning around travel to/from open space areas will be undertaken in subsequent stages of the project.

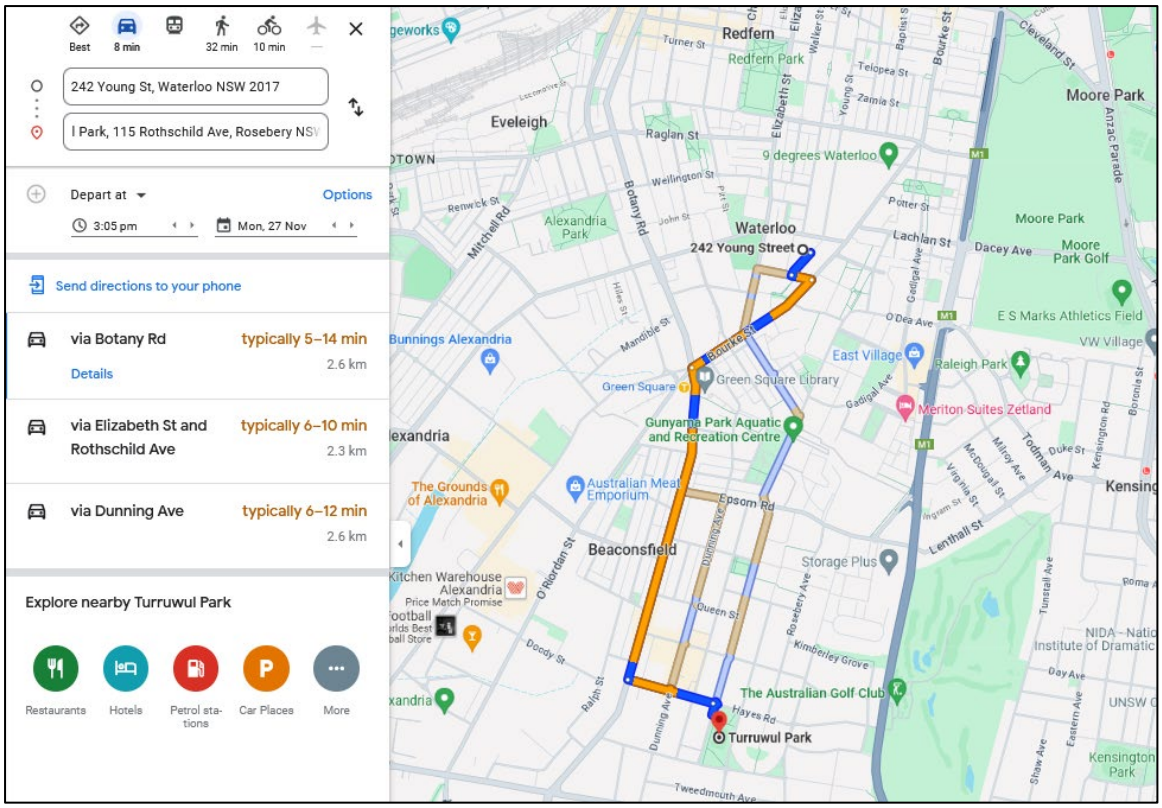


Figure 16 Typical route and travel time to off-site open space

Source: Google maps

4 Traffic Assessment

4.1 Baseline traffic assumptions

To inform the traffic assessment undertaken for the Planning Proposal reference is made to the detailed traffic modelling undertaken for the adjacent Woolworths Planning Proposal (PP-2021-6962) at 923 – 935 Bourke Street, Waterloo. The modelling undertaken for this proposal considered:

- Existing performance of intersections surrounding the site, including:
  - Bourke Street / Lachlan Street
  - Bourke Street / McEvoy Street
  - Bourke Street / Powell Street
  - Powell Street / Young Street
  - McEvoy Street / Young Street
- Traffic performance with the Woolworths proposal in place

The traffic modelling undertaken for the Woolworths development was subject to detailed discussions with both TfNSW and Council and ultimately deemed to be satisfactory to determine the impacts of the proposal. Given the proximity of the Woolworths development to the subject site and the same key intersections that would be impacted it is appropriate to use the modelling for the Woolworths project as an appropriate baseline to understand the traffic impacts of the proposal for the site at 242-258 Young Street.

4.2 Travel demand and vehicle trips

This section contains details about the school's expected traffic demand. In determining projected mode shares for a new site it is industry best practice to review existing travel behaviours of users in similar developments. The assumptions were developed based on this best practice approach which considered traffic survey outcomes from Inner Sydney High School, Sydney Secondary College & Bourke Street Public School.

The traffic generation from the school has been calculated based on the following assumptions:

- Up to 800 students at the school, comprising of 250 students in the primary school and 550 students in the senior school.
- 75% of students arrive during the morning road network peak hour (8am – 9am) based on surveys of other schools, taking into consideration factors such as absenteeism, out of school hours care and other factors.
- 10% of students depart during the afternoon road network peak hour (5pm – 6pm)
- Mode share for student drop off / pick up:

- 35% for the primary school which is slightly above the surveyed rate for Bourke Street public school as well as consistent with the rate observed at Meadowbank Education Campus (primary school component)
- 20% for the high school, greater than the 15% observed at Sydney Secondary College and adopted for Inner Sydney High School

The above mode share assumptions should be considered in the context of the highly accessible nature of the site located adjacent to high density residential developments within Waterloo and Green Square, as well as the imminent opening of the Waterloo metro station.

- Every vehicle arriving to the site counts as two 'trips' – with one inbound trip and one outbound trip.
- Average of 1.6 students per car which is the standard vehicle occupancy rate used by Schools Infrastructure when preparing transport assessments for new schools.

Based on these assumptions the traffic generation potential from the school can be summarised in Figure 11. This indicates that the school may generate in the order of 90 to 100 car trips to the site in the morning peak hour, with only 10-15 vehicles in the afternoon peak hour.

Table 2 Forecast traffic movements

Year Group	Car mode share	Student numbers	Car occupancy (students per car)	Students arriving / leaving in peak hour		Cars in peak hour	
				AM peak hour*	PM peak hour**	AM peak hour*	PM peak hour**
Year K-6	35%	250	93	75%	10%	41	5
Year 7-12	20%	550		75%	10%	52	7
Total						**93**	**12**

* AM road network peak hour 8am-9am

** PM road network peak hour 5pm – 6pm

As the film school use of the site provides for a 'like for like' replacement it has been assumed no additional traffic would be generated from this use relative to existing conditions.

4.3 Traffic distribution

The forecast arrival and departure directions for cars accessing the site are shown in Figure 16 (arrival directions) and Figure 17 (departure directions). This traffic distribution is generally consistent with the assumptions adopted for the

neighbouring Woolworths site, however takes into consideration the likely direction of travel to access or leave drop off / pick up zone on the western kerb of Young Street.



Figure 17 Arrival directions to site

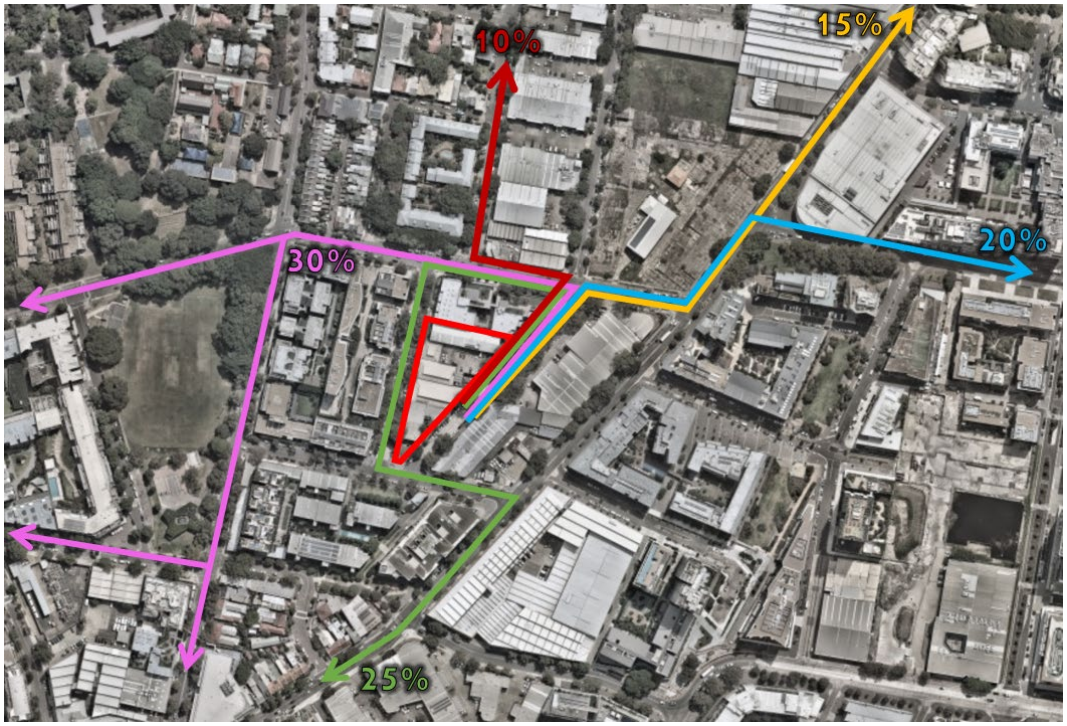


Figure 18 Departure directions from site

4.4 Traffic modelling

The traffic modelling undertaken to support the proposal has been conducted using the TfNSW approved 'SIDRA Network' modelling package. SIDRA Network, unlike SIDRA Intersection, considers the operation of intersections in a coordinated manner including downstream and upstream queuing effects. SIDRA Network also has the ability to consider the interaction of traffic signal phasing / timing at adjoining intersections.

A key benefit of using SIDRA Network, as is now commonly recommended by TfNSW, is that any vehicle queues arising at a site are considered in the model and will impact the operation of the adjacent intersections. As can be seen in the figure below, the traffic modelling has considered the operation of key intersections close to the site in a linked manner.

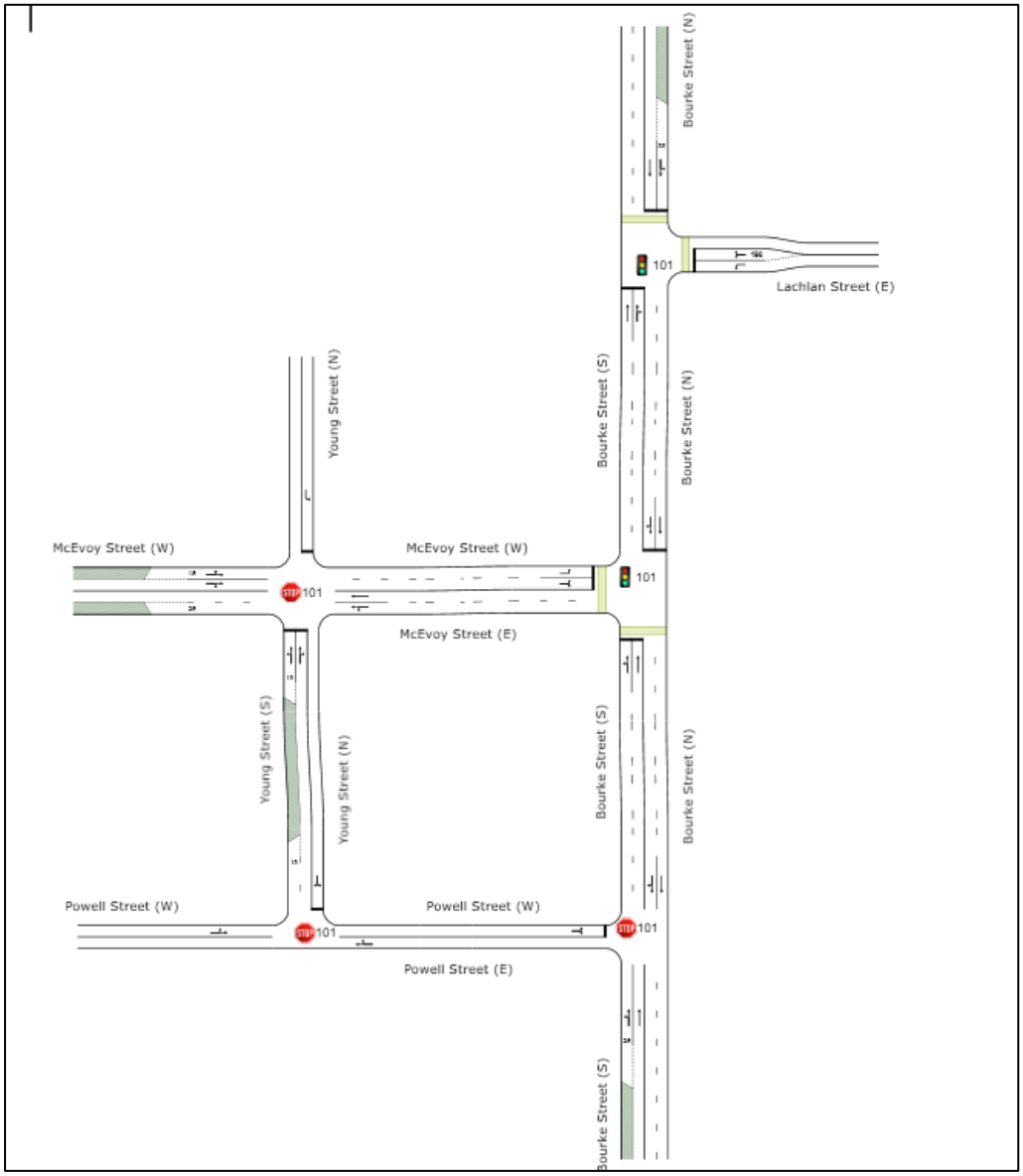


Figure 19 SIDRA network layout

The traffic modelling metric used to analyse the performance of the intersections is intersection Level of Service (LOS). Level of Service is a measure that uses the average delay experienced by vehicles to categorically assign each approach and movement with a qualitative ordinal grade (A through F, with A being the best and F being the worst). RMS Traffic Modelling Guidelines indicate the average delay relating to each grade, this is outlined in Table 3. In typical urban environments it is typical for intersections to operate at Level of Service D or E and still remain within acceptable performance levels.

Table 3 Level of service grades / description

Level of service grade	Average delay (seconds)	Description
A	Less than 14	Good operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity. At signals, incidents will cause excessive delays. Roundabouts require other control mode
F	Greater than 71	Unsatisfactory with excessive queuing

The modelling results indicate that the proposal is not anticipated to significantly impact the surrounding road network. Intersection level of service remains unchanged for all sites when compared to the 'future base' scenario which considers both background traffic growth as well as traffic associated with the future Woolworths development. The modelling indicates that all intersections would operate at Level of Service D or below which is acceptable in urban environments. The modelling also demonstrates that intersections will generally perform at Level of Service consistent with that currently experienced.

It is also worthwhile noting that a number of vehicle trips associated with morning drop offs would typically be 'pass by' trips – this is vehicles already on the road network. This concept of linked trips is noted in the *RMS Guide to Traffic Generating Developments* and would involve parents dropping off their children on the way to work or other activities. No allowance for pass by trips has been made in the traffic modelling and therefore the outputs reflect a conservative scenario where all vehicles travelling to the site are 'new' trips on the network.

It should also be recognised that the adjoining Woolworths development will generate the majority of it's traffic after 5pm on weekdays and on weekends – outside of the operating times of the school. Therefore the busiest traffic usage times of the respective sites will not overlap – therefore minimising the impacts on the surrounding road network.

The results of the traffic modelling are illustrated in Figure 19 (AM peak hour), and Figure 20 (PM peak hour). Detailed traffic modelling outputs are provided in Appendix A of this document.

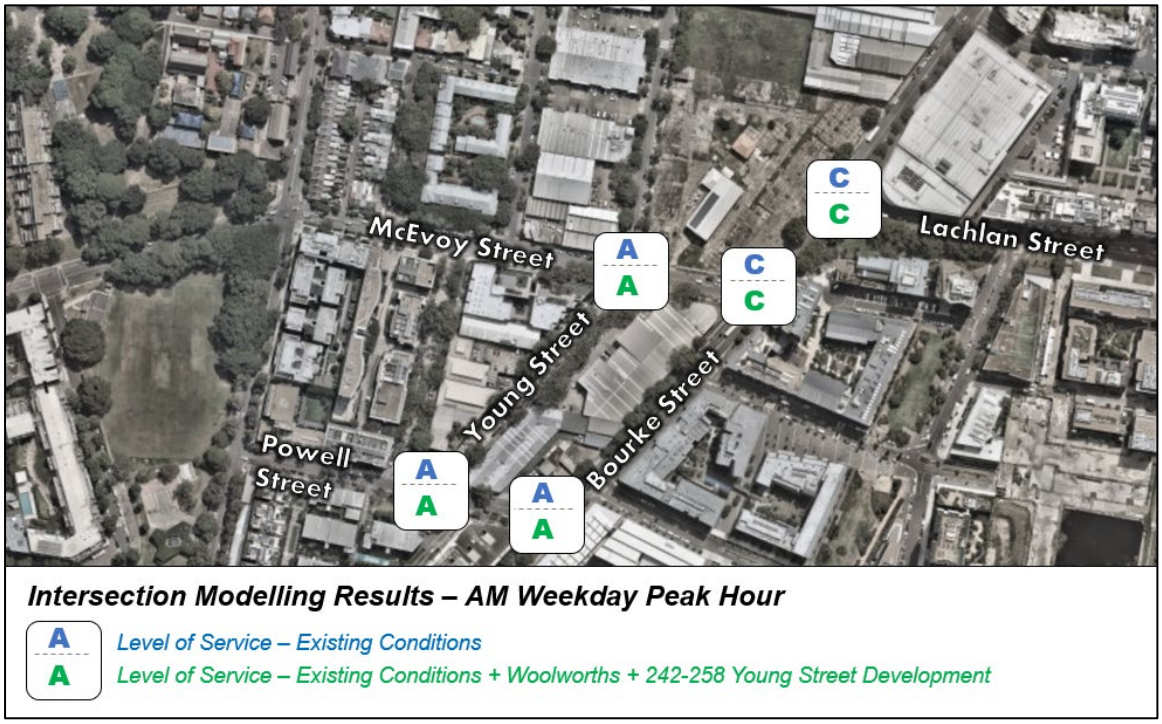


Figure 20 Intersection modelling results – AM peak weekday hour

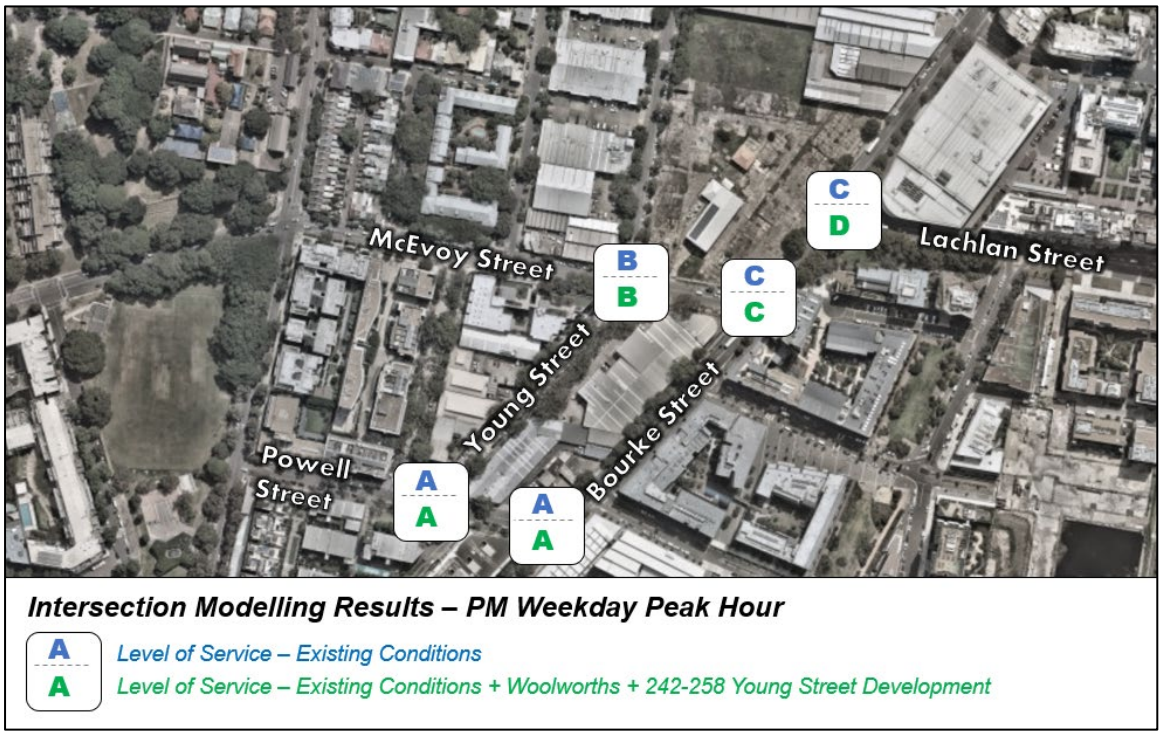


Figure 21 Intersection modelling results – PM weekday peak hour

In response to TfNSW comments regarding traffic and road safety impacts an analysis has been undertaken to understand expected queue lengths on McEvoy Street at Bourke Street. The typical queue lengths during the AM and PM peak hours are 74m and 65m respectively which is less than the distance to the adjacent intersection at Young Street as noted in Figure 21. It should also be noted that the project would generate relatively low right turn demands from Young Street into McEvoy Street of approximately 30 vehicles in the AM peak hour and 5 vehicles in the PM peak hour.

The SIDRA Network traffic modelling has considered any upstream and downstream queueing implications and confirmed that the Young Street / McEvoy Street can continue to operate in a safe manner with the proposal. Delays for vehicles turning right from Young Street into McEvoy Street are 30 seconds or less (Level of Service C) which is an acceptable level of performance. Should vehicle queueing extend on McEvoy Street from the Bourke Street traffic lights past Young Street, vehicles wanting to turn right out of Young Street would be temporarily delayed and be required to wait for the queue to clear before entering McEvoy Street.



Figure 22 Forecast queue lengths on McEvoy Street at Bourke Street

4.5 Drop off / pick up capacity

An assessment has been undertaken to consider the suitability of the proposed drop off / pick up area on Young Street to accommodate future demands. The current layout makes provision for approximately 6 vehicle drop off / pick up bays. A preliminary capacity assessment has been undertaken to confirm the suitability of this provision, with relevant assumptions noted in Table 4 below.

Table 4 Preliminary capacity assessment of drop off area

Consideration	Quantum
Number of vehicle arrivals in AM peak hour	93
% of arrivals within a 10 minute period	35%
Number of cars within a 10 minute period	33
Typical dwell time	60 seconds
Pick up / Drop off spaces required	4

This preliminary assessment demonstrates there will be adequate capacity to accommodate all pick up and drop off within the identified kerbside area, even taking a worst case scenario whereby no informal drop off and pick up occurs on surrounding streets. This assessment of the drop off and pick up zone will be finalised as part of the detailed Development Application for the site.

In response to road safety concerns raised by TfNSW in relation to drivers arriving to the site via McEvoy Street and turning right into Young Street, the future operator of the school will actively communicate with parents and carers with regards to safe routes of travel to and from the site. This will include advice for drivers arriving via McEvoy Street to turn right into Pitt Street or George Street rather than relying on Young Street – this will remove any requirement for drivers to undertake u-turns to access the drop off area on Young Street.

5 Summary

This transport assessment report has been undertaken by JMT Consulting to support a Planning Proposal for the site at 242-258 Young Street, Waterloo. Key findings of the transport assessment are as follows:

- Vehicle access to the site would be via a single driveway from Young Street which will accommodate both cars and service vehicles. This would result in a reduction in the number of driveways fronting the site from six down to one – providing for a significantly improved environment for pedestrians and facilitating the introduction of additional on-street car parking spaces.
- The reference scheme makes provision for student drop off and pick up via a kerbside zone on the western side of Young Street, located away from the future Woolworths driveway on the eastern side of Young Street.
- Service vehicle access to an on-site loading dock is to be provided via Young Street, with all trucks entering and exiting the site in a forwards direction.
- Car parking for all uses will be delivered in accordance with the parking rates outlined in the Sydney LEP, with the final number of spaces to be determined at the Development Application stage of the project. The reference scheme includes approximately 55 parking spaces which is below the maximum stipulated in Council's controls.
- Traffic modelling undertaken indicates that the proposal is not anticipated to result in unacceptable traffic impacts on the surrounding road network – with all intersections performing at an acceptable level of service.
- Sustainable transport measures have been suggested to improve the mode share of public transport and active transport. These items should be considered further at subsequent stages of the project.

In the above context, the traffic and transport impacts arising from the proposal are considered acceptable.

Appendix A: Traffic Modelling Outputs

MOVEMENT SUMMARY

Site: 101 [Bourke / Powell (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	51	2.1	51	2.1	0.140	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	57.9
2	T1	479	4.4	479	4.4	0.140	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.0
Approach		529	4.2	529	4.2	0.140	0.6	NA	0.0	0.0	0.00	0.06	0.00	58.9
North: Bourke Street (N)														
8	T1	655	3.5	655	3.5	0.194	0.3	LOS A	0.2	1.3	0.07	0.03	0.07	59.0
9	R2	36	2.9	36	2.9	0.194	8.9	LOS A	0.2	1.3	0.16	0.07	0.16	53.3
Approach		691	3.5	691	3.5	0.194	0.8	NA	0.2	1.3	0.08	0.03	0.08	58.9
West: Powell Street (W)														
10	L2	15	0.0	15	0.0	0.080	8.7	LOS A	0.1	0.8	0.49	0.94	0.49	19.7
12	R2	28	0.0	28	0.0	0.080	14.4	LOS A	0.1	0.8	0.49	0.94	0.49	43.5
Approach		43	0.0	43	0.0	0.080	12.5	LOS A	0.1	0.8	0.49	0.94	0.49	39.9
All Vehicles		1263	3.7	1263	3.7	0.194	1.1	NA	0.2	1.3	0.06	0.07	0.06	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

Lachlan / Bourke
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
2	T1	509	9.3	509	9.3	0.544	20.6	LOS B	8.6	65.0	0.79	0.70	0.79	37.6
3	R2	311	7.8	311	7.8	* 0.809	62.2	LOS E	8.7	65.0	1.00	0.88	1.08	18.8
Approach		820	8.7	820	8.7	0.809	36.4	LOS C	8.7	65.0	0.87	0.77	0.90	28.1
East: Lachlan Street (E)														
4	L2	618	6.0	618	6.0	0.796	33.8	LOS C	12.6	92.6	0.85	0.89	0.95	25.8
6	R2	116	3.6	116	3.6	* 0.796	49.5	LOS D	9.6	69.8	0.97	0.92	1.13	31.0
Approach		734	5.6	734	5.6	0.796	36.3	LOS C	12.6	92.6	0.87	0.90	0.98	27.2
North: Bourke Street (N)														
7	L2	34	6.3	34	6.3	* 0.803	61.2	LOS E	5.1	38.4	1.00	0.96	1.28	29.1
8	T1	262	8.8	262	8.8	0.803	53.9	LOS D	5.5	41.4	0.99	0.96	1.27	21.7
Approach		296	8.5	296	8.5	0.803	54.7	LOS D	5.5	41.4	0.99	0.96	1.27	22.8
All Vehicles		1849	7.5	1849	7.5	0.809	39.3	LOS C	12.6	92.6	0.89	0.85	0.99	26.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Lachlan Street (E)											
P2	Full	62	49.3	LOS E	0.2	0.2	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	56	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		118	49.3	LOS E	0.2	0.2	0.95	0.95	77.2	33.5	0.43

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Bourke (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	32	3.3	32	3.3	* 0.749	45.4	LOS D	7.8	59.3	0.95	0.89	1.05	14.8
2	T1	462	10.0	462	10.0	0.749	38.9	LOS C	7.9	60.3	0.94	0.89	1.05	15.2
Approach		494	9.6	494	9.6	0.749	39.3	LOS C	7.9	60.3	0.94	0.89	1.05	15.2
North: Bourke Street (N)														
8	T1	533	7.7	533	7.7	0.410	11.7	LOS A	8.7	65.0	0.70	0.62	0.70	17.6
9	R2	347	5.5	347	5.5	* 0.737	57.6	LOS E	8.9	65.0	1.00	0.87	1.02	4.6
Approach		880	6.8	880	6.8	0.737	29.8	LOS C	8.9	65.0	0.82	0.72	0.82	8.4
West: McEvoy Street (W)														
10	L2	358	7.1	358	7.1	0.750	36.0	LOS C	9.5	70.2	0.88	0.88	0.96	9.3
12	R2	157	7.4	157	7.4	* 0.750	56.6	LOS E	6.4	47.6	1.00	0.88	1.13	6.3
Approach		515	7.2	515	7.2	0.750	42.3	LOS C	9.5	70.2	0.91	0.88	1.01	8.1
All Vehicles		1888	7.6	1888	7.6	0.750	35.7	LOS C	9.5	70.2	0.88	0.81	0.93	10.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bourke Street (S)											
P1	Full	81	49.3	LOS E	0.2	0.2	0.95	0.95	78.7	35.2	0.45
West: McEvoy Street (W)											
P4	Full	46	49.3	LOS E	0.1	0.1	0.95	0.95	78.6	35.2	0.45
All Pedestrians		127	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Young (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Young Street (S)														
1	L2	19	0.0	19	0.0	0.018	9.1	LOS A	0.0	0.2	0.24	0.86	0.24	48.8
3	R2	4	0.0	4	0.0	0.018	21.6	LOS B	0.0	0.2	0.75	0.96	0.75	23.3
Approach		23	0.0	23	0.0	0.018	11.4	LOS A	0.0	0.2	0.33	0.87	0.33	45.7
East: McEvoy Street (E)														
4	L2	5	0.0	5	0.0	0.077	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
5	T1	372	4.2	372	4.2	0.121	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		377	4.2	377	4.2	0.121	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Young Street (N)														
7	L2	77	2.7	77	2.7	0.091	9.1	LOS A	0.1	0.8	0.31	0.89	0.31	47.2
Approach		77	2.7	77	2.7	0.091	9.1	LOS A	0.1	0.8	0.31	0.89	0.31	47.2
West: McEvoy Street (W)														
10	L2	56	1.9	56	1.9	0.144	5.6	LOS A	0.0	0.0	0.00	0.14	0.00	57.0
11	T1	443	6.2	443	6.2	0.144	0.1	LOS A	0.0	0.3	0.02	0.07	0.02	58.6
12	R2	7	14.3	7	14.3	0.144	7.5	LOS A	0.0	0.3	0.04	0.02	0.04	59.4
Approach		506	5.8	506	5.8	0.144	0.8	NA	0.0	0.3	0.02	0.07	0.02	58.3
All Vehicles		983	4.8	983	4.8	0.144	1.5	NA	0.1	0.8	0.04	0.13	0.04	57.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Powell / Young (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

Powell / Young
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Powell Street (E)														
5	T1	57	1.9	57	1.9	0.048	0.1	LOS A	0.1	0.5	0.10	0.20	0.10	56.7
6	R2	29	7.1	29	7.1	0.048	5.3	LOS A	0.1	0.5	0.10	0.20	0.10	43.6
Approach		86	3.7	86	3.7	0.048	1.9	NA	0.1	0.5	0.10	0.20	0.10	55.4
North: Young Street (N)														
7	L2	15	7.1	15	7.1	0.032	8.4	LOS A	0.0	0.3	0.11	0.94	0.11	36.9
9	R2	21	5.0	21	5.0	0.032	8.6	LOS A	0.0	0.3	0.11	0.94	0.11	48.4
Approach		36	5.9	36	5.9	0.032	8.5	LOS A	0.0	0.3	0.11	0.94	0.11	45.9
West: Powell Street (W)														
10	L2	31	6.9	31	6.9	0.032	5.7	LOS A	0.0	0.0	0.00	0.30	0.00	55.0
11	T1	28	0.0	28	0.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	55.0
Approach		59	3.6	59	3.6	0.032	2.9	NA	0.0	0.0	0.00	0.30	0.00	55.0
All Vehicles		181	4.1	181	4.1	0.048	3.5	NA	0.1	0.5	0.07	0.38	0.07	52.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: AM Existing + Woolies + School)]

Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

Lachlan / Bourke
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
2	T1	527	9.0	527	9.0	0.552	19.8	LOS B	8.6	65.0	0.78	0.70	0.78	38.2
3	R2	329	7.3	329	7.3	* 0.856	64.3	LOS E	8.7	65.0	1.00	0.90	1.12	18.4
Approach		857	8.4	857	8.4	0.856	36.9	LOS C	8.7	65.0	0.86	0.78	0.91	27.8
East: Lachlan Street (E)														
4	L2	637	5.8	637	5.8	0.833	39.5	LOS C	14.7	107.6	0.88	0.93	1.05	23.6
6	R2	116	3.6	116	3.6	* 0.833	54.1	LOS D	10.3	75.0	0.99	0.95	1.21	29.8
Approach		753	5.5	753	5.5	0.833	41.7	LOS C	14.7	107.6	0.90	0.93	1.07	25.1
North: Bourke Street (N)														
7	L2	34	6.3	34	6.3	* 0.838	63.5	LOS E	5.5	41.3	1.00	1.00	1.35	28.5
8	T1	276	8.4	276	8.4	0.838	56.6	LOS E	5.9	44.5	0.99	1.00	1.34	21.0
Approach		309	8.2	309	8.2	0.838	57.4	LOS E	5.9	44.5	0.99	1.00	1.34	22.1
All Vehicles		1919	7.2	1919	7.2	0.856	42.1	LOS C	14.7	107.6	0.90	0.87	1.04	25.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Lachlan Street (E)											
P2	Full	62	49.3	LOS E	0.2	0.2	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	56	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		118	49.3	LOS E	0.2	0.2	0.95	0.95	77.2	33.5	0.43

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Bourke (Site Folder: AM Existing + Woolies + School)]

Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	32	3.3	32	3.3	* 0.774	48.0	LOS D	8.2	61.7	0.96	0.92	1.10	14.1
2	T1	465	10.0	465	10.0	0.774	41.5	LOS C	8.3	63.1	0.96	0.92	1.10	14.4
Approach		497	9.5	497	9.5	0.774	42.0	LOS C	8.3	63.1	0.96	0.92	1.10	14.4
North: Bourke Street (N)														
8	T1	564	7.3	564	7.3	0.444	13.1	LOS A	8.7	65.0	0.72	0.65	0.72	16.3
9	R2	353	5.4	353	5.4	* 0.775	59.5	LOS E	8.9	65.0	1.00	0.88	1.04	4.5
Approach		917	6.5	917	6.5	0.775	30.9	LOS C	8.9	65.0	0.83	0.74	0.85	8.2
West: McEvoy Street (W)														
10	L2	385	6.6	385	6.6	0.767	37.2	LOS C	10.1	74.7	0.89	0.89	0.98	9.1
12	R2	163	7.1	163	7.1	* 0.767	56.0	LOS D	7.1	52.5	1.00	0.90	1.14	6.4
Approach		548	6.7	548	6.7	0.767	42.8	LOS D	10.1	74.7	0.92	0.89	1.03	8.1
All Vehicles		1962	7.3	1962	7.3	0.775	37.1	LOS C	10.1	74.7	0.89	0.83	0.96	10.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bourke Street (S)											
P1	Full	81	49.3	LOS E	0.2	0.2	0.95	0.95	78.7	35.2	0.45
West: McEvoy Street (W)											
P4	Full	46	49.3	LOS E	0.1	0.1	0.95	0.95	78.6	35.2	0.45
All Pedestrians		127	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Young (Site Folder: AM Existing + Woolies + School)]

Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Young Street (S)														
1	L2	89	0.0	89	0.0	0.084	9.2	LOS A	0.2	1.1	0.25	0.87	0.25	48.8
3	R2	39	0.0	39	0.0	0.171	23.0	LOS B	0.2	1.7	0.78	1.00	0.78	22.4
Approach		128	0.0	128	0.0	0.171	13.4	LOS A	0.2	1.7	0.41	0.91	0.41	43.0
East: McEvoy Street (E)														
4	L2	11	0.0	11	0.0	0.079	5.5	LOS A	0.0	0.0	0.00	0.04	0.00	56.4
5	T1	372	4.2	372	4.2	0.123	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		382	4.1	382	4.1	0.123	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.7
North: Young Street (N)														
7	L2	77	2.7	77	2.7	0.094	9.1	LOS A	0.1	0.8	0.30	0.89	0.30	47.2
Approach		77	2.7	77	2.7	0.094	9.1	LOS A	0.1	0.8	0.30	0.89	0.30	47.2
West: McEvoy Street (W)														
10	L2	56	1.9	56	1.9	0.147	5.6	LOS A	0.0	0.0	0.00	0.14	0.00	57.0
11	T1	443	6.2	443	6.2	0.147	0.1	LOS A	0.0	0.3	0.02	0.07	0.02	58.6
12	R2	7	14.3	7	14.3	0.147	7.6	LOS A	0.0	0.3	0.03	0.02	0.03	59.4
Approach		506	5.8	506	5.8	0.147	0.8	NA	0.0	0.3	0.02	0.07	0.02	58.3
All Vehicles		1094	4.3	1094	4.3	0.171	2.7	NA	0.2	1.7	0.08	0.21	0.08	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Bourke / Powell (Site Folder: AM Existing + Woolies + School)]

Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	78	1.4	78	1.4	0.147	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	57.0
2	T1	476	4.4	476	4.4	0.147	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	58.7
Approach		554	4.0	554	4.0	0.147	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.4
North: Bourke Street (N)														
8	T1	655	3.5	655	3.5	0.215	0.6	LOS A	0.3	2.4	0.11	0.06	0.11	58.4
9	R2	69	1.5	69	1.5	0.215	9.0	LOS A	0.3	2.4	0.30	0.16	0.30	48.2
Approach		724	3.3	724	3.3	0.215	1.4	NA	0.3	2.4	0.13	0.07	0.13	58.0
West: Powell Street (W)														
10	L2	21	0.0	21	0.0	0.165	8.7	LOS A	0.2	1.6	0.55	0.95	0.55	18.6
12	R2	60	0.0	60	0.0	0.165	15.3	LOS B	0.2	1.6	0.55	0.95	0.55	42.7
Approach		81	0.0	81	0.0	0.165	13.6	LOS A	0.2	1.6	0.55	0.95	0.55	40.0
All Vehicles		1359	3.4	1359	3.4	0.215	1.9	NA	0.3	2.4	0.10	0.13	0.10	56.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Powell / Young (Site Folder: AM Existing + Woolies + School)]

Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

Powell / Young
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Powell Street (E)														
5	T1	57	1.9	57	1.9	0.087	0.3	LOS A	0.2	1.2	0.20	0.35	0.20	54.1
6	R2	92	2.3	92	2.3	0.087	5.4	LOS A	0.2	1.2	0.20	0.35	0.20	35.2
Approach		148	2.1	148	2.1	0.087	3.4	NA	0.2	1.2	0.20	0.35	0.20	48.9
North: Young Street (N)														
7	L2	28	3.7	28	3.7	0.049	8.3	LOS A	0.1	0.5	0.10	0.95	0.10	36.6
9	R2	26	4.0	26	4.0	0.049	8.9	LOS A	0.1	0.5	0.10	0.95	0.10	48.2
Approach		55	3.8	55	3.8	0.049	8.6	LOS A	0.1	0.5	0.10	0.95	0.10	44.7
West: Powell Street (W)														
10	L2	68	3.1	68	3.1	0.052	5.7	LOS A	0.0	0.0	0.00	0.41	0.00	53.3
11	T1	28	0.0	28	0.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.41	0.00	53.3
Approach		97	2.2	97	2.2	0.052	4.1	NA	0.0	0.0	0.00	0.41	0.00	53.3
All Vehicles		300	2.5	300	2.5	0.087	4.6	NA	0.2	1.2	0.12	0.48	0.12	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Bourke (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	43	2.4	43	2.4	* 0.779	50.5	LOS D	9.3	68.3	0.98	0.93	1.11	13.5
2	T1	456	6.2	456	6.2	0.779	45.1	LOS D	9.3	68.3	0.98	0.93	1.12	13.6
Approach		499	5.9	499	5.9	0.779	45.6	LOS D	9.3	68.3	0.98	0.93	1.12	13.5
North: Bourke Street (N)														
8	T1	519	6.9	519	6.9	0.408	9.8	LOS A	8.8	65.0	0.58	0.52	0.58	20.0
9	R2	443	1.0	443	1.0	* 0.777	53.2	LOS D	9.2	65.0	1.00	0.89	1.03	5.0
Approach		962	4.2	962	4.2	0.777	29.8	LOS C	9.2	65.0	0.78	0.69	0.79	8.4
West: McEvoy Street (W)														
10	L2	379	0.6	379	0.6	0.534	22.2	LOS B	7.9	55.4	0.68	0.79	0.68	13.8
12	R2	260	0.8	260	0.8	* 0.774	55.6	LOS D	8.7	61.4	1.00	0.89	1.12	6.4
Approach		639	0.7	639	0.7	0.774	35.8	LOS C	8.7	61.4	0.81	0.83	0.86	9.4
All Vehicles		2100	3.5	2100	3.5	0.779	35.4	LOS C	9.3	68.3	0.83	0.79	0.89	10.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bourke Street (S)											
P1	Full	69	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
West: McEvoy Street (W)											
P4	Full	52	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		121	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

Lachlan / Bourke
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
2	T1	416	4.8	416	4.8	0.372	15.9	LOS B	8.9	65.0	0.72	0.63	0.72	41.1
3	R2	388	1.9	388	1.9	* 0.833	60.3	LOS E	9.1	65.0	1.00	0.90	1.08	19.3
Approach		804	3.4	804	3.4	0.833	37.3	LOS C	9.1	65.0	0.85	0.76	0.89	27.4
East: Lachlan Street (E)														
4	L2	576	1.8	576	1.8	0.812	38.3	LOS C	13.3	94.9	0.88	0.91	1.02	24.0
6	R2	97	1.1	97	1.1	* 0.812	55.7	LOS D	8.2	58.4	1.00	0.94	1.21	29.4
Approach		673	1.7	673	1.7	0.812	40.8	LOS C	13.3	94.9	0.90	0.92	1.05	25.2
North: Bourke Street (N)														
7	L2	56	0.0	56	0.0	* 0.837	61.1	LOS E	7.3	53.9	1.00	1.01	1.29	29.1
8	T1	353	8.4	353	8.4	0.837	54.3	LOS D	7.9	59.1	1.00	1.01	1.29	21.5
Approach		408	7.2	408	7.2	0.837	55.3	LOS D	7.9	59.1	1.00	1.01	1.29	22.9
All Vehicles		1885	3.6	1885	3.6	0.837	42.5	LOS C	13.3	94.9	0.90	0.87	1.04	25.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Lachlan Street (E)											
P2	Full	87	49.3	LOS E	0.3	0.3	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	16	49.2	LOS E	0.0	0.0	0.95	0.95	78.5	35.2	0.45
All Pedestrians		103	49.3	LOS E	0.3	0.3	0.95	0.95	76.3	32.4	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Young (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Young Street (S)														
1	L2	22	0.0	22	0.0	0.022	9.4	LOS A	0.0	0.3	0.28	0.85	0.28	48.7
2	T1	1	0.0	1	0.0	0.067	25.0	LOS B	0.1	0.6	0.83	1.00	0.83	35.9
3	R2	9	0.0	9	0.0	0.067	29.0	LOS C	0.1	0.6	0.83	1.00	0.83	19.3
Approach		33	0.0	33	0.0	0.067	15.6	LOS B	0.1	0.6	0.45	0.90	0.45	41.3
East: McEvoy Street (E)														
4	L2	7	0.0	7	0.0	0.098	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.0
5	T1	477	1.1	477	1.1	0.153	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		484	1.1	484	1.1	0.153	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Young Street (N)														
7	L2	76	0.0	76	0.0	0.084	9.4	LOS A	0.1	0.9	0.37	0.89	0.37	46.8
Approach		76	0.0	76	0.0	0.084	9.4	LOS A	0.1	0.9	0.37	0.89	0.37	46.8
West: McEvoy Street (W)														
10	L2	71	0.0	71	0.0	0.174	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	57.2
11	T1	554	0.8	554	0.8	0.174	0.1	LOS A	0.1	0.7	0.04	0.08	0.04	58.2
12	R2	17	0.0	17	0.0	0.174	7.7	LOS A	0.1	0.7	0.08	0.03	0.08	58.7
Approach		641	0.7	641	0.7	0.174	0.9	NA	0.1	0.7	0.04	0.08	0.04	58.1
All Vehicles		1234	0.8	1234	0.8	0.174	1.6	NA	0.1	0.9	0.05	0.12	0.05	57.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Bourke / Powell (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	63	1.7	63	1.7	0.136	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	57.3
2	T1	452	4.4	452	4.4	0.136	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.8
Approach		515	4.1	515	4.1	0.136	0.7	NA	0.0	0.0	0.00	0.07	0.00	58.6
North: Bourke Street (N)														
8	T1	724	3.8	724	3.8	0.224	0.4	LOS A	0.3	2.0	0.09	0.04	0.09	58.7
9	R2	55	5.8	55	5.8	0.224	9.0	LOS A	0.3	2.0	0.22	0.10	0.22	51.1
Approach		779	3.9	779	3.9	0.224	1.0	NA	0.3	2.0	0.10	0.05	0.10	58.5
West: Powell Street (W)														
10	L2	19	0.0	19	0.0	0.126	8.6	LOS A	0.2	1.2	0.51	0.94	0.51	18.8
12	R2	43	0.0	43	0.0	0.126	15.5	LOS B	0.2	1.2	0.51	0.94	0.51	42.7
Approach		62	0.0	62	0.0	0.126	13.4	LOS A	0.2	1.2	0.51	0.94	0.51	39.5
All Vehicles		1356	3.8	1356	3.8	0.224	1.5	NA	0.3	2.0	0.08	0.10	0.08	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Powell / Young (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

Powell / Young
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Powell Street (E)														
5	T1	76	1.4	76	1.4	0.065	0.1	LOS A	0.1	0.7	0.13	0.20	0.13	56.4
6	R2	41	5.1	41	5.1	0.065	5.3	LOS A	0.1	0.7	0.13	0.20	0.13	42.7
Approach		117	2.7	117	2.7	0.065	2.0	NA	0.1	0.7	0.13	0.20	0.13	55.0
North: Young Street (N)														
7	L2	22	0.0	22	0.0	0.049	8.2	LOS A	0.1	0.5	0.14	0.93	0.14	36.8
9	R2	33	0.0	33	0.0	0.049	8.6	LOS A	0.1	0.5	0.14	0.93	0.14	48.5
Approach		55	0.0	55	0.0	0.049	8.4	LOS A	0.1	0.5	0.14	0.93	0.14	46.1
West: Powell Street (W)														
10	L2	39	5.4	39	5.4	0.042	5.7	LOS A	0.0	0.0	0.00	0.29	0.00	55.2
11	T1	40	0.0	40	0.0	0.042	0.0	LOS A	0.0	0.0	0.00	0.29	0.00	55.2
Approach		79	2.7	79	2.7	0.042	2.8	NA	0.0	0.0	0.00	0.29	0.00	55.2
All Vehicles		251	2.1	251	2.1	0.065	3.6	NA	0.1	0.7	0.09	0.39	0.09	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: PM Existing + Woolies + School)]

Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

Lachlan / Bourke
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
2	T1	421	4.8	421	4.8	0.377	16.4	LOS B	8.9	65.0	0.74	0.65	0.74	40.7
3	R2	400	1.8	400	1.8	* 0.857	61.7	LOS E	9.1	65.0	1.00	0.91	1.10	19.0
Approach		821	3.3	821	3.3	0.857	38.5	LOS C	9.1	65.0	0.86	0.78	0.91	27.0
East: Lachlan Street (E)														
4	L2	587	1.8	587	1.8	0.826	40.3	LOS C	14.1	100.3	0.90	0.93	1.05	23.3
6	R2	97	1.1	97	1.1	* 0.826	57.1	LOS E	8.5	60.5	1.00	0.95	1.23	29.0
Approach		684	1.7	684	1.7	0.826	42.6	LOS D	14.1	100.3	0.91	0.93	1.08	24.6
North: Bourke Street (N)														
7	L2	56	0.0	56	0.0	* 0.856	63.4	LOS E	7.7	56.5	1.00	1.03	1.34	28.5
8	T1	362	8.1	362	8.1	0.856	56.9	LOS E	8.3	62.1	1.00	1.04	1.33	20.9
Approach		418	7.1	418	7.1	0.856	57.7	LOS E	8.3	62.1	1.00	1.04	1.33	22.2
All Vehicles		1923	3.6	1923	3.6	0.857	44.1	LOS D	14.1	100.3	0.91	0.89	1.06	24.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Lachlan Street (E)											
P2	Full	87	49.3	LOS E	0.3	0.3	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	16	49.2	LOS E	0.0	0.0	0.95	0.95	78.5	35.2	0.45
All Pedestrians		103	49.3	LOS E	0.3	0.3	0.95	0.95	76.3	32.4	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Bourke (Site Folder: PM Existing + Woolies + School)]

Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	43	2.4	43	2.4	* 0.806	53.0	LOS D	9.4	69.0	0.99	0.96	1.16	12.9
2	T1	456	6.2	456	6.2	0.806	47.6	LOS D	9.4	69.0	0.99	0.97	1.18	13.0
Approach		499	5.9	499	5.9	0.806	48.1	LOS D	9.4	69.0	0.99	0.97	1.18	13.0
North: Bourke Street (N)														
8	T1	519	6.9	519	6.9	0.402	9.4	LOS A	8.8	65.0	0.58	0.52	0.58	20.5
9	R2	477	0.9	477	0.9	* 0.812	54.0	LOS D	9.2	65.0	1.00	0.90	1.05	4.9
Approach		996	4.0	996	4.0	0.812	30.7	LOS C	9.2	65.0	0.78	0.70	0.80	8.2
West: McEvoy Street (W)														
10	L2	394	0.5	394	0.5	0.593	23.1	LOS B	8.6	60.6	0.71	0.80	0.71	13.4
12	R2	262	0.8	262	0.8	* 0.822	59.1	LOS E	9.2	64.5	1.00	0.92	1.19	6.1
Approach		656	0.6	656	0.6	0.822	37.5	LOS C	9.2	64.5	0.83	0.85	0.91	9.0
All Vehicles		2151	3.4	2151	3.4	0.822	36.8	LOS C	9.4	69.0	0.84	0.81	0.92	10.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Bourke Street (S)											
P1	Full	69	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
West: McEvoy Street (W)											
P4	Full	52	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		121	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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MOVEMENT SUMMARY

Site: 101 [McEvoy / Young (Site Folder: PM Existing + Woolies + School)]

Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Young Street (S)														
1	L2	43	0.0	43	0.0	0.041	9.4	LOS A	0.1	0.5	0.26	0.86	0.26	48.8
3	R2	18	0.0	18	0.0	0.126	30.6	LOS C	0.2	1.1	0.84	1.00	0.84	18.4
Approach		61	0.0	61	0.0	0.126	15.6	LOS B	0.2	1.1	0.43	0.90	0.43	41.3
East: McEvoy Street (E)														
4	L2	41	0.0	41	0.0	0.105	5.5	LOS A	0.0	0.0	0.00	0.12	0.00	51.0
5	T1	477	1.1	477	1.1	0.164	0.2	LOS A	0.0	0.0	0.00	0.04	0.00	59.3
Approach		518	1.0	518	1.0	0.164	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.2
North: Young Street (N)														
7	L2	76	0.0	76	0.0	0.085	9.6	LOS A	0.1	0.9	0.38	0.89	0.38	46.8
Approach		76	0.0	76	0.0	0.085	9.6	LOS A	0.1	0.9	0.38	0.89	0.38	46.8
West: McEvoy Street (W)														
10	L2	71	0.0	71	0.0	0.183	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	57.3
11	T1	554	0.8	554	0.8	0.183	0.2	LOS A	0.2	1.1	0.06	0.09	0.06	57.9
12	R2	26	0.0	26	0.0	0.183	7.9	LOS A	0.2	1.1	0.13	0.05	0.13	58.0
Approach		651	0.6	651	0.6	0.183	1.1	NA	0.2	1.1	0.06	0.09	0.06	57.8
All Vehicles		1305	0.7	1305	0.7	0.183	2.1	NA	0.2	1.1	0.07	0.16	0.07	56.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\JMT Consulting\Projects\2252 - Young Street High School\Internal\Traffic Modelling\Young Street High School Traffic Model_May24.sip9

MOVEMENT SUMMARY

Site: 101 [Bourke / Powell (Site Folder: PM Existing + Woolies + School)]

Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Bourke Street (S)														
1	L2	83	1.3	83	1.3	0.140	5.6	LOS A	0.0	0.0	0.00	0.19	0.00	56.6
2	T1	443	4.5	443	4.5	0.140	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.5
Approach		526	4.0	526	4.0	0.140	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.2
North: Bourke Street (N)														
8	T1	718	3.8	718	3.8	0.225	0.5	LOS A	0.3	2.2	0.10	0.05	0.10	58.6
9	R2	59	5.4	59	5.4	0.225	9.1	LOS A	0.3	2.2	0.24	0.12	0.24	50.4
Approach		777	3.9	777	3.9	0.225	1.1	NA	0.3	2.2	0.11	0.05	0.11	58.4
West: Powell Street (W)														
10	L2	22	0.0	22	0.0	0.168	8.5	LOS A	0.2	1.6	0.53	0.95	0.53	18.4
12	R2	59	0.0	59	0.0	0.168	15.7	LOS B	0.2	1.6	0.53	0.95	0.53	42.5
Approach		81	0.0	81	0.0	0.168	13.8	LOS A	0.2	1.6	0.53	0.95	0.53	39.6
All Vehicles		1384	3.7	1384	3.7	0.225	1.8	NA	0.3	2.2	0.09	0.12	0.09	57.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 101 [Powell / Young (Site Folder: PM Existing + Woolies + School)]

Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

Powell / Young
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Powell Street (E)														
5	T1	76	1.4	76	1.4	0.081	0.2	LOS A	0.1	1.0	0.17	0.27	0.17	55.3
6	R2	66	3.2	66	3.2	0.081	5.4	LOS A	0.1	1.0	0.17	0.27	0.17	38.8
Approach		142	2.2	142	2.2	0.081	2.6	NA	0.1	1.0	0.17	0.27	0.17	52.6
North: Young Street (N)														
7	L2	47	0.0	47	0.0	0.074	8.2	LOS A	0.1	0.8	0.12	0.93	0.12	36.7
9	R2	38	0.0	38	0.0	0.074	8.8	LOS A	0.1	0.8	0.12	0.93	0.12	48.5
Approach		85	0.0	85	0.0	0.074	8.4	LOS A	0.1	0.8	0.12	0.93	0.12	44.6
West: Powell Street (W)														
10	L2	56	3.8	56	3.8	0.051	5.7	LOS A	0.0	0.0	0.00	0.34	0.00	54.4
11	T1	40	0.0	40	0.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	54.4
Approach		96	2.2	96	2.2	0.051	3.3	NA	0.0	0.0	0.00	0.34	0.00	54.4
All Vehicles		323	1.6	323	1.6	0.081	4.4	NA	0.1	1.0	0.11	0.46	0.11	50.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Attachment A9

Social Infrastructure Review

Social Infrastructure Review

242-258 Young Street, Waterloo

Submitted to Sustainable Development Group

Ethos Urban

Prepared by Ethos Urban

6 December 2023 | 2210804



'Gura Bulga'

Liz Belanjee Cameron

'Gura Bulga' – translates to Warm Green Country.
Representing New South Wales.

Ethos Urban acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We pay our respects to their Elders past, present and emerging.

In supporting the Uluru Statement from the Heart, we walk with Aboriginal and Torres Strait Islander people in a movement of the Australian people for a better future.

Contact:	Erin Henshaw-Hill Associate Director, Social Strategy	ehenshawhill@ethosurban.com (02) 9956 6962

This document has been prepared by:		**This document has been reviewed by:**	
Kate McClure, Jayden Price	6 December 2023	Erin Henshaw-Hill	6 December 2023

Version No.	**Date of issue**	**Prepared by**	**Approved by**
1.0 (DRAFT)	01/12/2023	KM	EHH
2.0 (FINAL)	06/12/2023	KM	EHH

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Appendix A 7

1.0 Introduction

On behalf of the landowners of 242-258 Young Street, Waterloo, Sustainable Development Group (SDG) is leading a planning proposal for a new school development on the site. As part of this proposal, Ethos Urban was commissioned to undertake research to understand the need for schools in the area and to provide analysis regarding the relevant social infrastructure that the school may provide or require use of.

1.1 Project overview

SDG seeks to deliver a high-quality educational facility for primary and secondary school students at the site 242-258 Young Street, Waterloo, as well as accommodating the relocation of the existing Sydney Film School on the site.

The development is planned to include:

- Accommodation for 280 primary school students and 520 secondary school students.
- A dedicated, permanent home for the Sydney Film School (approx. 120 students).
- A 6-storey building with a gross floor area (GFA) of 13,919m^2, including an open space ratio of 7.4m^2 per pupil.
- School facilities including classrooms, indoor and outdoor sports facilities, creative arts facilities, a multi-purpose hall and auditorium, and tiered passive open space across the top three storeys.



Figure 1 Proposed development scheme

Source: Plus Architecture

1.1.1 Site context

The site is in the inner Sydney suburb of Waterloo (see Figure 2). The site is only a 10-minute walk to Green Square which the City of Sydney anticipates will accommodate 63,000 people, 21,000 new homes, and around 21,000 jobs. The site is also well connected to the CBD: 20-minutes by bike, 18-minutes by car, or 25-minutes by bus. Despite this expected growth and connectivity, the proponent has identified a significant lack of planned school infrastructure in the area, particularly secondary schools.

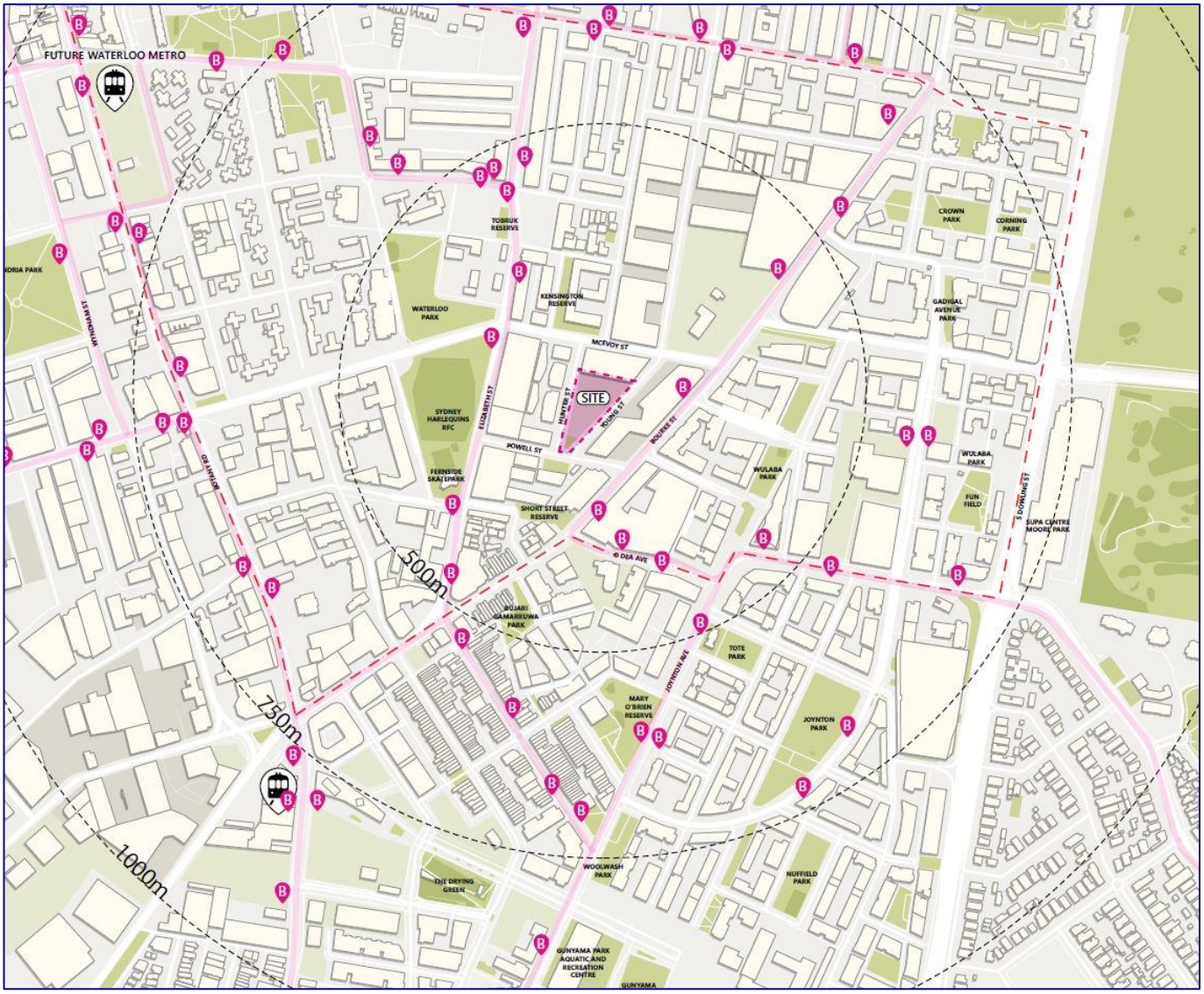


Figure 2 Subject site - 242-258 Young Street, Waterloo

Source: Plus Architecture

1.2 Purpose of this study and approach

The purpose of this study is to understand the need for schools in the area and to provide analysis regarding the relevant social infrastructure that the school may provide or require use of. It includes:

- a review of the policy environment and social issues and trends
- analysis of the population and demographic characteristics of the school catchment area, focusing on forecasted growth of school age children
- a review of existing and planned schools in the catchment area (both primary and secondary schools)
- a review of the available relevant social infrastructure in the surrounding area including passive open space (includes play space), indoor and outdoor recreation space and artistic and performance spaces.
- a review the open space needs for the proposed school development
- analysis of case study research into provision of open space for inner-city vertical school developments.
- opportunities to support the needs of the school users while balancing the needs of the local community for social infrastructure.

Our methodology has involved the following steps:



Social Context Review

- Policy and plans, to understand requirements and directions.
- Demographics, to consider growth in the school age population.
- Existing social infrastructure, to understand existing relevant gaps
- Review of community aspirations and perceptions from relevant desktop sources.

Stakeholder Engagement

- Meeting with the City of Sydney's Outdoor Events and Sportsfield Coordinator to discuss potential accommodation options.

Case Studies Review

- Understand how other vertical schools have addressed open space and social infrastructure provision.
- Identify where available, the open space to student ratios achieved.
- Identify shared use agreements with local governments or other landowners.

1.2.1 Limitations

Qualitative data collection (interviews with existing infrastructure providers) is currently outside the scope of the review. Therefore, we are unable to comment on the practical performance of the reviewed approaches or provide details on the operations of the schools.

2.0 Social context

2.1 Policy environment

The relevant social policy context has been reviewed, including the NSW Education Department *Standard Facilities and Guidelines*, and other strategic policy drivers at State and local government levels. Documents reviewed include:

- City Plan Local Strategic Planning Statement, City of Sydney, 2020
- Community Strategic Plan: Delivering Sustainable Sydney 2030-2050, City of Sydney, 2022
- A Metropolis of Three Cities: Greater Sydney Region Plan, Greater Cities Commission, 2018
- Inclusive Education for students with disability, NSW Department of Education, 2022
- Educational Facilities Standards and Guidelines, NSW Department of Education

Below provides a summary of the relevant policy themes drawn from the key State and local government policy documents noted above.

- A goal in the City of Sydney's Community Strategic Plan (CSP) is for "a city that is optimistic about future opportunities in education, jobs, innovation, and the economy" (pg. 27).
- A Metropolis of Three Cities identifies that all residents within Greater Sydney will live within 30 minutes of their education facilities (pg. 6).
- City of Sydney's CSP identifies the need for collaborative approaches to ensure education is provided and appropriately sequenced to support the city and its communities (pg. 65).
- As identified in the City of Sydney's CSP, there is a need to "support the people who live, work in, and visit the city with adequate infrastructure, facilities, and services at the right time and in the right locations, including education" (pg. 63).
- City of Sydney's CSP states education facilities should be co-located with industry, talent, infrastructure, and investment (pg. 105).
- The NSW Department of Education's Our Plan for NSW Public Education identifies a commitment that "every student learns, grows, and belongs in an equitable and outstanding education system" (pg. 5).

The NSW Government's Education Facilities Standards and Guidelines provides a design framework and standardised approach for the delivery of education facilities in line with relevant policies, regulations, and best practice. Particularly relevant to this report is Design Guideline 10.03, outlined below. This provides the context for considering how other similar schools have achieved open space requirements at constrained sites.

DG 10.03 Open Play Space Requirements

Open play space must be provided for students to access during recess, lunch breaks and for outdoor learning. Open play pace can be comprised of;

- Paved and grassed areas
- Rooftops and terraces
- Covered outdoor areas

The designated open play space must be easily monitored and managed by school staff.

Where a joint use agreement can be negotiated with a local council or landowner, then required play space can be located off-site, providing the facilities are;

- In close proximity to the school
- Easily accessible
- Safe and secure.

The area per student must meet the requirements below (new school on a brownfield site):

Designs must aim to achieve a minimum of 10m^2 per student. Where this figure is not achievable, the proposed m^2 per student of the completed project must not be less than the existing m^2 per student currently on the site.

Source: NSW Department of Education Educational Facilities Standards and Guidelines

The NSW Government's Education Facilities Standards and Guidelines (and Design Framework: Master Planning for schools -Jan 2023) provides provision for innovative design solutions in dense urban areas, noting that *'while it is preferable to maintain building heights of up to 4 storeys with open space provided at grade…innovative solutions for school design in dense urban areas may be appropriate. School designs that demonstrate building*

heights above 4 storeys...may explore open space within levels of the building, on rooftops, under the building, and/or shared with the community.

2.2 Social issues and trends

2.2.1 Delivering high rise schools in high density context

Limited space combined with rapid population growth within highly urbanised contexts has resulted in an increased demand for high-density and high-rise schools in Sydney's metropolitan areas[1].

While increasingly popular, high-rise schools can also experience a range of different challenges compared to traditional schools. One key challenge is that smaller land parcels mean less space for formal and informal outdoor play and recreation.

2.2.2 Innovation in school design

The constrained environments of vertical schools have led to design innovations to help meet open play space requirements, such as rooftop playgrounds and sports courts (Homebush West Public School, South Melbourne Primary School), terraced green spaces (Ultimo Public School) and netted balconies (Inner Sydney High School).

2.2.3 Integrating schools with the surrounding community

High rise schools, such as independent St Andrews Cathedral School, or public Inner Sydney High School and Arthur Phillip Public School also represent a shift from schools as 'gated communities' to places that are integrated with the surrounding community, through the shared use of community and school facilities[2].

Agreements between schools and local governments or other landowners can facilitate a reciprocal arrangement of benefit to both school students and the local community. For example, Ultimo Public School offers a full-sized basketball court for hire and its outdoor learning area can be used for weekend markets, while its students enjoy the use of Wentworth Park.

The following neighbourhood characteristics for the success of shared facility use:

- A safe pedestrian connection for students to access nearby public park space.
- Location of the school within the neighbourhood, and the convenience of access to its facilities offered for hire outside school hours (e.g., other options available and how easily these can be accessed).
- How conducive the land use mix of the surrounding area is to pedestrian activity (e.g., active street frontages)
- Volume and speed of traffic and the presence of car parks should be considered.



Figure 3 Ultimo Public School
Source: Arch Daily

[1] Vertical schools on the rise in Australian cities | ArchitectureAU
[2] Vertical Schools as Community Hubs | SpringerLink

2.3 Demographic profile

The following section provides a summary of relevant demographic and population data prepared by GapMaps. The subject catchment area incorporates a 2km radius of the site.

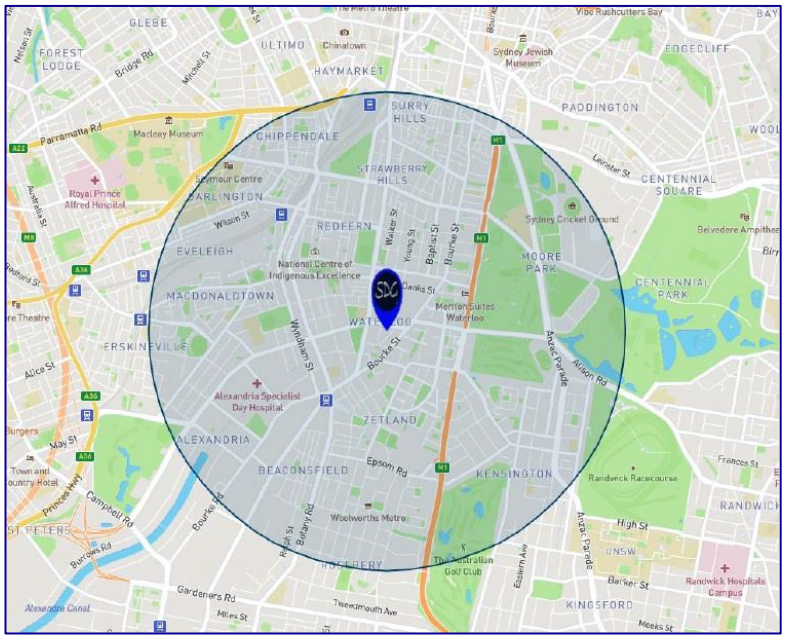


Figure 4 2km radius of 242-258 Young Street, Waterloo

Source: GapMaps

The data provided by GapMaps indicates demand for schools in this area, with significant population growth projected for school age children (77% growth by 2031).

Key findings

A summary of key population and demographic characteristics relevant to this study have been provided below:

- Catchment area population in 2021 was 94,773 and is projected to **increase by 24%** to 117,644 in 2031.
- The number of school age children in the catchment area was projected to **grow by 77%** to 2031.
- Household income in the Waterloo catchment is comparable to the draw catchments for independent schools in other areas of Sydney.
- The catchment has a high proportion of residents born outside Australia (49%), notably from Northeast Asia, Southeast Asia[3], and the UK. Migrant communities tend to place value on results-focused education for their children.

Table 1 Projected population of school age children in the catchment (2021-2031)

Age group	2021	2031	% Growth
Pre-school (Aged 0-5)	4319	7429	72%
Primary school (Aged 6-11)	2433	3963	63%
High school (Aged 12-17)	1645	3244	97%
All school (Aged 6-17)	4078	7207	77%
Pre-school (Aged 0-5)	4319	7429	72%

Source: GapMaps

[3] Northeast Asis includes: China, Mongolia, Japan, and the Koreas; Southeast Asia includes: Myanmar, Cambodia, Thailand, Vietnam, Indonesia, Malaysia, the Philippines and Singapore

Table 2 Catchment area household income (2021)

	Average household income	Households with income >$3,000 per week	Households with income >$4,000 per week
Waterloo catchment	$122,920	33%	21%
Greater Sydney	$109,794	25%	15%

Source: GapMaps

Table 3 Catchment area place of birth (2021)

	% Born in Australia	% Born outside Australia (top 3 countries)		
		UK	NE Asia	SE Asia
Waterloo catchment	49%	7.8%	14.5%	7.8%
New South Wales	72%	4%	5%	4.5%

Source: GapMaps

2.4 Existing schools

The spatial distribution of existing schools has been analysed, both from the perspective of schools currently located in the area surrounding the site, and a benchmark analysis of private school[4] places within the Waterloo catchment compared to draw catchments for independent schools in other areas of Sydney.

Key findings

- There is a gap of secondary schools and private primary school options in the area to the south and east of the site, including the Waterloo / Green Square area.
- There are fewer private school places per capita in the Waterloo catchment area compared to other private school draw catchments in Sydney.

2.4.1 Schools in the surrounding area

Within two kilometres of the proposed school site, there are 12 schools, including 7 public and 5 private schools (see Figure 5). Almost half of these offer a specialised education service:

- Yudi Gunyi School is a specialist public school for students aged 10-17 experiencing behavioural challenges.
- Redfern Jarjum College is a Jesuit primary school for Aboriginal and Torres Strait Islander children who are not participating in mainstream schools.
- Central Sydney Intensive English High School provides support and preparation for newly arrived students from non-English speaking backgrounds to transition to mainstream high schools.
- SEDA College NSW provides vocational high school education program rather than an ATAR pathway.
- Sydney Distance Education Primary School provides education for students who cannot attend their local school, including those whose families are travelling in Australia or overseas.
- There is a significant gap of secondary schools and private primary school options in the area to the south and east of the site in the Waterloo / Green Square area, as shown in Figure 5.

2.4.2 Independent school places benchmarking

Benchmarking indicates there are forecast to be 9 private school places per 100 school aged children in the Waterloo catchment area in 2031, compared to 114 places per 100 school aged children in the North Sydney region (Appendix A)[5]. Currently there are no new independent schools planned for the Waterloo area.

[4] Private schools comprises both independent and Catholic schools.
[5] Data provided by GapMaps. For Sustainable Development Group

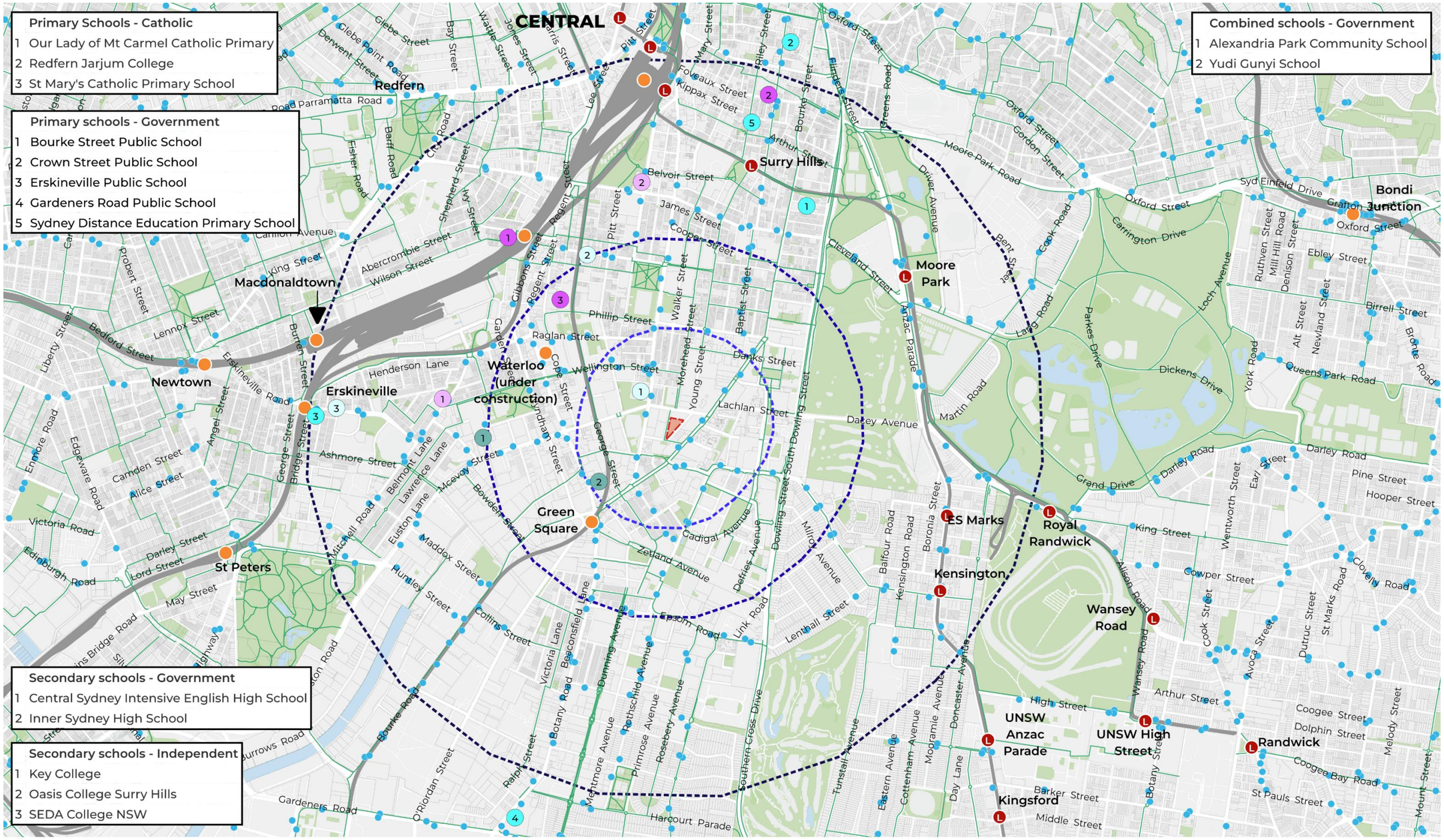


Figure 5 Surrounding schools

Source: Ethos Urban

2.5 Existing social infrastructure

Social infrastructure typologies relevant to school environments were reviewed, considering both planned provision within the proposal and within the existing community.

Key findings

- Further explore whether there is opportunity for Waterloo Park to be used for additional passive open space for students, considering its proximity to the school site.
- Turruwal Park presents an option for structured or formal sports and recreation activities, during school hours. Shared use of this space should be further explored with City of Sydney, with consideration for viable transport options.
- Main Park presents an option for structured or formal sports and recreation activities, as well as passive recreation, during school hours. Shared use of this space should be further explored with the responsible authority. Transport options may also need to be considered.
- Further explore the opportunity for community shared use of artistic and performance / multipurpose facilities outside of school hours.

2.5.1 Passive open space

Passive open space is important for schools in contributing to the learning, health and wellbeing, and social connection for students. Access to open space is well established as an essential aspect of a school environment, both for primary and secondary schools.

The proposal provides an open space ratio of 6.2m^2 per student, including covered and uncovered spaces across the top three levels. The surrounding area is well serviced by open spaces within a walkable 400m catchment of the site (see Figure 6). The following provides a summary of these:

- There are eight parks within a walkable catchment to the site.
- The closest open spaces to the site are Kensington Reserve and Short Street Reserve, however they are small and have minimal facilities such as bench seating and bins.
- Waterloo Park is the largest nearby reserve. It is co-located with Waterloo Oval providing a total area of 2.88ha. It includes a playground, basketball half court, exercise equipment (Waterloo Park), skate park, dog off-leash area, and public toilets (Waterloo Oval). Student access to the park from the site would be via Young Street and McEvoy Street with a signalised crossing at Elizabeth Street. The distance is 150m or an approximately 6-minute walk.
- Waterloo Park and Waterloo Oval are bisected by McEvoy Street, with signalised crossings at either end of the park (Elizabeth Street and Pitt Street).

Other nearby open spaces include:

- Bujari Gamarruwa Park which includes green open space with bench seating
- Mary O'Brien Reserve which includes BBQ facilities, playground, water play area.
- The Rope Walk Park which includes green open space, playground.
- Tobruk Reserve which includes a small green space and bench seating.
- Tote Park which includes green open space, playground, public toilets.

Given the proximity and amenity of Waterloo Park, it's ability to support informal recreation time, for example at lunch breaks, for secondary students should be further explored.

2.5.2 Indoor and outdoor recreation facilities

Indoor and outdoor recreation facilities provide for structured, more formal sports and recreational activities such as competition sports and physical education classes. These spaces support a core aspect of education.

The proposal includes some indoor and outdoor recreation facilities onsite, including a multipurpose hall with sports court. However, the site is not large enough to accommodate a sports field and an alternative option is required. There are 7 indoor and outdoor recreation facilities within one kilometre of the site (see Figure 8).

These include:

- Gunyama Park Aquatic and Recreation Centre which includes swimming pools, fitness centre, outdoor synthetic sports field

- Alexandria Park which includes multipurpose sports field, tennis court, multipurpose court, playground
- Redfern Park which includes basketball courts, skate plaza, playground
- Waterloo Oval (as noted above, connected to Waterloo Park) which includes a sportsfield, exercise equipment, playground, basketball half-court, and skate park.

Consultation with the City of Sydney identified that the sportsfields at these facilities are currently operating at capacity. Waterloo Oval would be the preferred option given its proximity to the site, however, consultation with the City of Sydney has indicated that this oval is already a highly utilised space and is fully booked 4-6pm each weekday, including by community clubs and other schools. There may be one 90-minute slot per week available.

The future Main Park, part of the Waterloo Metro Station project, will provide two hectares of open space and include two playing fields. It is approximately 800m walk from the proposed school site and provides another option for potential shared use.

Council staff also suggested that Turruwal Park, which is located approximately 7 minutes' drive south of the site, could be an option to explore for shared use by the proposed school, provided transport options to the park are viable. Turruwal Park provides a soccer field, two tennis courts, a tennis wall, and cricket facilities and has availability Monday to Friday 8:00am-5:00pm. It is fully booked weeknights from 5:00pm and weekends. One other school uses the park but does not have a regular booking of the space.

2.5.3 Artistic and performance spaces

Artistic and performance spaces help provide facilities for Creative and Performing Arts (CAPA) subjects such as music and drama, as well as extracurricular activities. CAPA promotes creativity, learning, and social connection.

The proposal includes a multipurpose hall, auditorium, rehearsal rooms, music, and art spaces.

The only existing artistic / performance spaces within a walkable 400m catchment of the site are those currently located on the site. The site currently includes Waterloo Studios (242 Young Street), which provides space for Sydney Actors School, Sydney Film School, and Sydney Advertising School. While Sydney Film School will be incorporated in the development, the other two school will be relocated.

Other nearby facilities include the Governors Centre, a drama theatre near Sydney Boys and Sydney Girls schools, and nearby Redfern and Central stations, such as Belvoir Street Theatre.

There is an opportunity to explore shared use arrangements with the City of Sydney for the school's creative arts facilities, rehearsal rooms, multi-purpose hall and auditorium. These facilities could provide creative and performance spaces for community use outside of school hours (after hours, weekends and school holidays). We understand from previous discussions with the City of Sydney that space for creative uses is an emerging need in this area.

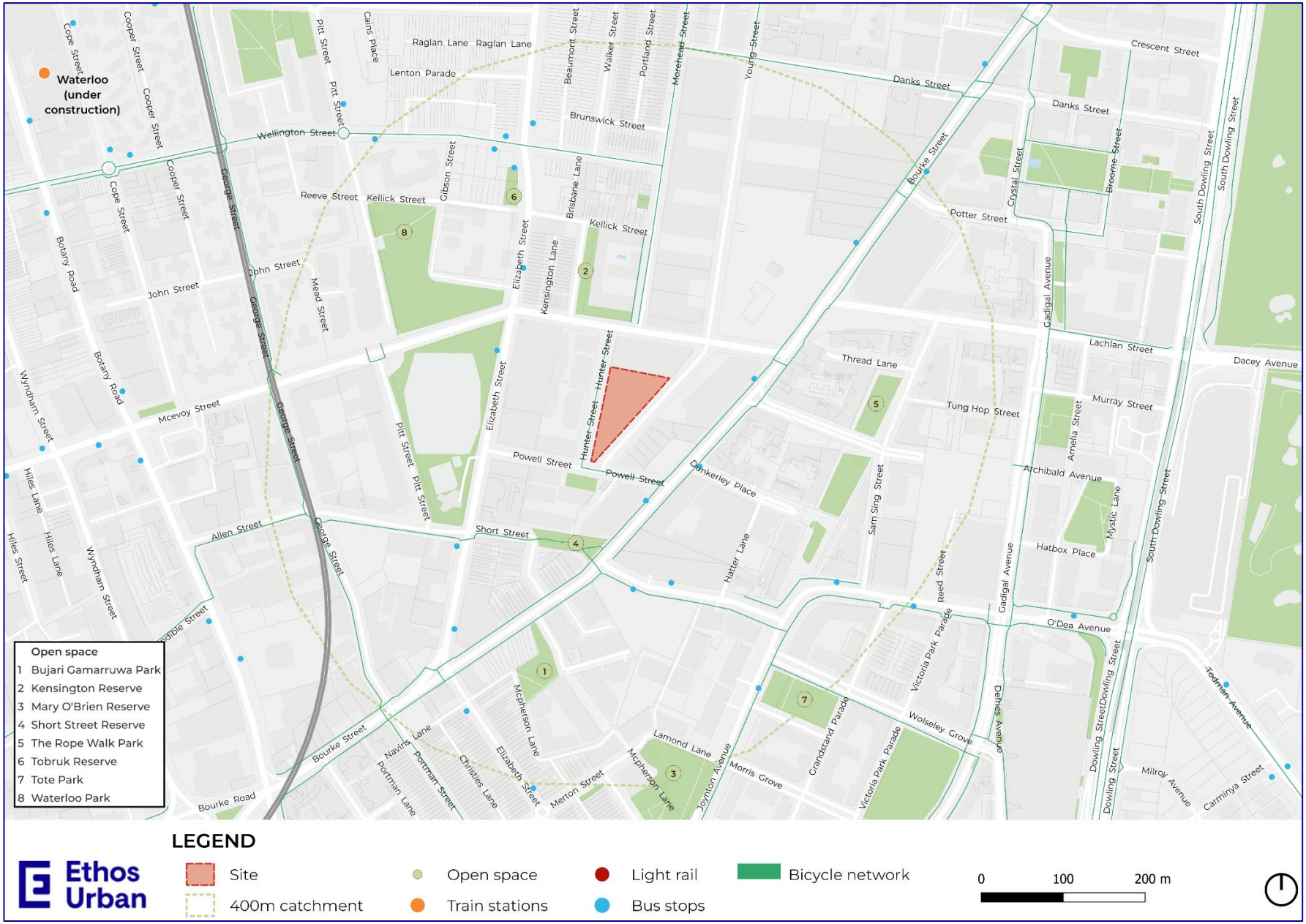


Figure 6 Social infrastructure map – open space

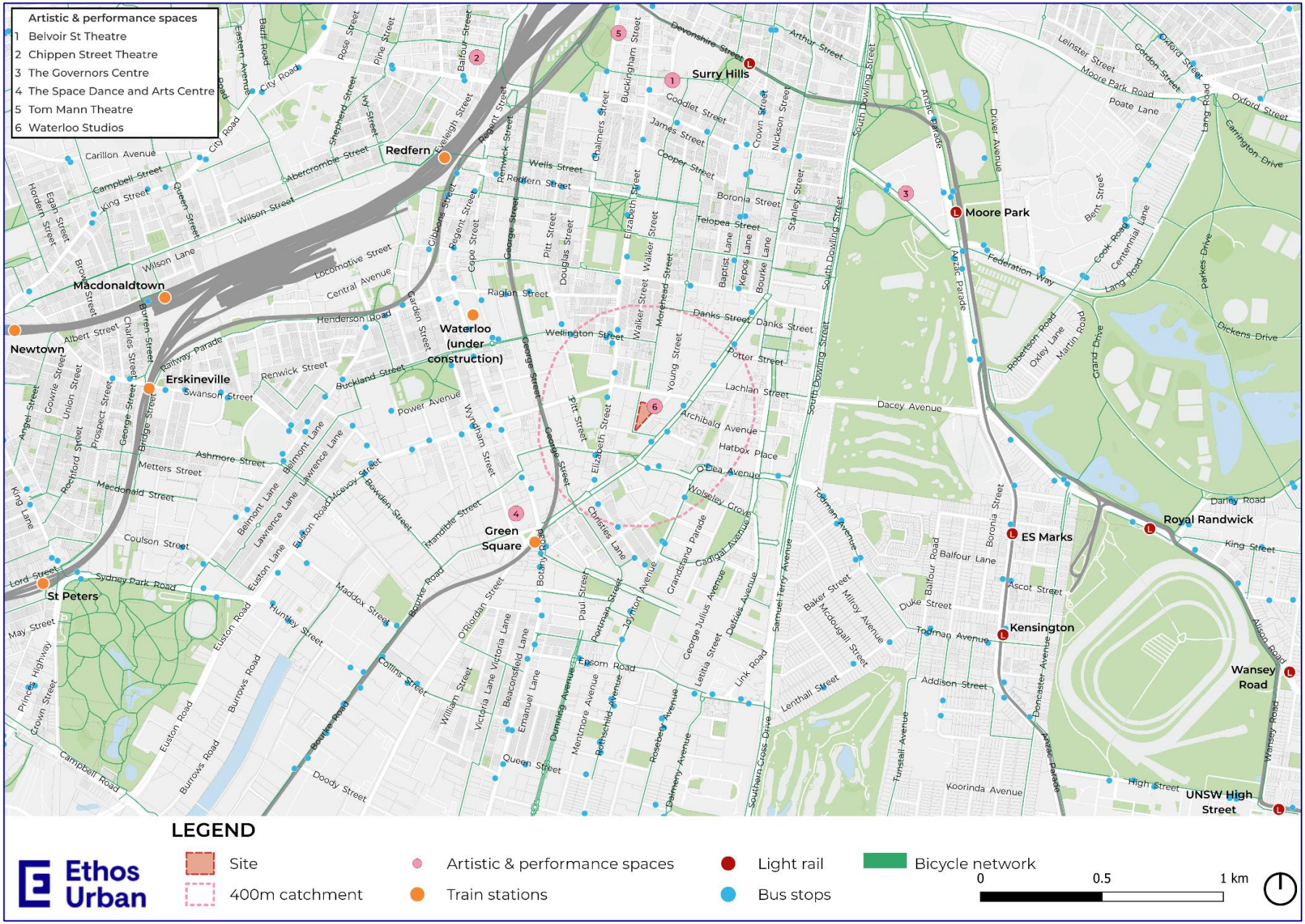


Figure 7 Social infrastructure map – artistic & performance spaces



Figure 8 Social infrastructure map – indoor & outdoor recreation spaces

3.0 Case studies

Nine vertical schools, including examples of public and private primary and secondary schools, in NSW and interstate, were reviewed to understand the range of approaches to open space provision. Table 3 provides an overview of each case study, showing details of the school, approach to open space provision, open space ratio per student and details of shared use arrangements.

Key findings

- Innovative approaches to open space provision are derived from design solutions that maximise passive open space, play areas, multipurpose halls, and sports facilities, within the vertical school development.
- Open space provision can be enhanced through shared use agreements with local governments, where there is appropriate and available open space close to the school site.
- Vertical schools do not always achieve the open space guideline of 10m^2 per pupil.

In summary, each vertical school considered in this research appears to adopt one or more of the following:

- Screened balconies, terraces, rooftop open spaces (all examples)
- Ground-level open space within the school site, where possible (Arthur Phillip High School)
- Shared outdoor open space, such as Council parks, a closed road, or with an adjacent school (Inner Sydney High School, Arthur Phillip High School, Homebush West Public School, Prahran High School).

In the case studies reviewed, where schools have a shared use agreement to access public open space, the open space is adjacent to the school site.

The average open space per student (of the examples where information was available) was 4.78m2, ranging from 2.56m2 to 7.2m2 per student. The proposed provision of 6.2m2 per student of open space for the proposed school is above the average of all of the identified through the case studies, with the exception of one. The proposed provision of 6.2m2 per student of open space is above the average provision of the case studies considered.

Key management and operational approaches relevant to this study include staggered student break times (e.g., the proposed Reddam House North Sydney campus) and staggered start and finish times (planned for Inner Sydney High School once it reaches capacity). The Draft Operational Management Plan for the proposal recommends timetabling open space use into primary (K-6), middle (7-10) and senior secondary (11-12) year level segments[6].

[6] Draft Operational Management Plan prepared by Amina Project Management (November 2023)

Table 4 Summary of case studies

	Year	Storeys	Capacity	Levels	On site open space	Open space ratio	Shared use
Inner Sydney High School NSW	2021	14	1,200	7-12	• Open games court at the podium level. • Screened balconies on the upper levels. • Indoor and outdoor recreation spaces provided.	4.4m^2 per student	• Agreement with City of Sydney[7] to use Prince Alfred Park, 10am to 2pm. • Community has access to indoor sports, performance spaces, outside school hours.
Ultimo Public School NSW	2020	3	800	K-6	• Roof top play areas (~4,000m^2) • Makes use of site slope to create five different levels / terraces with outdoor spaces between classrooms. • Includes 3 distinct areas: flat space, 'green oasis', quiet sheltered area. • Games court • Indoor and outdoor recreation spaces provided.	5m^2 per student	• Facilities can be hired by the public. • Uses adjacent Wentworth Park[8].
Homebush West Public School NSW	2019	3	900	K-6	• Rooftop play and educational area (1,600m^2) • Two sports courts • Indoor and outdoor recreation spaces provided.	6m^2 per student	• Facilities can be hired by the public. • Agreement with Strathfield Council to close part of Exeter Road to be used as a play area.
Arthur Phillip High School NSW	2020	17	2,000	7-12	• At ground level, 4x external sports courts, amphitheatre (with covered space) and outdoor space for markets. • Breezeways / screened facades (screened outdoor space providing vertical circulation around each of the homebases).	7.2m^2 per student	• Shares communal outdoor space with adjacent primary school.

[7] 20-year license agreement with City of Sydney
[8] Vertical Schools as Community Hubs | SpringerLink

	Year	Storeys	Capacity	Levels	On site open space	Open space ratio	Shared use
					• Indoor and outdoor recreation spaces provided.		
St Andrew's Cathedral School NSW	1976	8	1,450	K-12	• Multipurpose Health Centre and BBC Auditorium. • Rooftop playground that doubles as a social space and host of the annual Christmas markets.	Data unavailable	• Uses Sydney Square for opening school event. • Sydney Town Hall used for annual Showcase concerts and Evening of Celebration and Prize-giving. • Parade Theatre at NIDA used for musical theatre productions. • City Recital Hall and Concourse Theatre used for musical performances.
Reddam House North Sydney Campus	2023 – Approved SSDA	6	1,550	K-12	• Ground floor: lightweight sculptural play structure for Junior School. Nature play garden with artificial play surface, sandpit, and elevated deck. • Level 2 and 3: lightweight sculptural vertical play structure with integrated slide. • Level 6: seating and outdoor learning nooks with integrated charging points. • Level 7: seating and outdoor learning nooks with integrated charging points. • Sports hall and auditorium Basement 2. • Use of on-site open space and sports hall will be staggered between year groups.	Junior School: 3.55m2 per student Senior School: 2.56m2 per student	• Concept Proposal provides a summary of indicative open space and recreational facility use by the school in Lane Cove Council on an as-needed basis. Lane Cove confirmed willingness and agreement will be created at later stage.
Prahran High School VIC	2019	5	650	7-12	• Rooftop recreation area includes courts and protective netting.	Data unavailable	• Lane space that can be activated for play during school hours.

	Year	Storeys	Capacity	Levels	On site open space	Open space ratio	Shared use
South Melbourne Primary School VIC	2018	6	570	K-6	• Play area on level 5 and outdoor sports courts. • Indoor and outdoor recreation spaces.	Data unavailable	
Haileybury City Campus VIC	2016	12	750	K-12	• 1,500m^2 of outdoor green space across three terraces. • Indoor running track and sports complex. • Indoor and outdoor recreation spaces.	Data unavailable	• Shared use of 'Inside Out' recreation area on Batman Street that includes a multipurpose sports court, seating, and changerooms. • Shared use of Flagstaff Gardens.

4.0 Conclusion

4.1 Summary

High rise schools are becoming increasingly popular as a result of rapid population growth combined with limited land parcels within highly urbanised context. However, these schools face the challenge of providing space for formal and informal recreation for students. This has led to innovative design solutions such as rooftop playgrounds and sports courts as well as shared use arrangements with local governments or other landowners.

The proposal for a vertical school at the site 242-258 Young Street, Waterloo responds to an identified demand for schools in this area. A review of the population catchment of the site shows that there is significant population growth projected for school age children. There is also a gap in existing or planned private schools in the area, with a projected rate of 9 private school places per 100 school aged children in the Waterloo catchment area in 2031, compared to 114 places per 100 school aged children in the North Sydney region (Appendix A).

From a review of other vertical schools across NSW and interstate, it was found that rarely are these schools able to achieve the NSW Department of Education's open space guideline of 10m2 per pupil. The average open space per student (of the examples where information was available) was 5.65m2, ranging from 4.4m2 to 7.2m2 per student. The proposed provision of 6.2m2 per student of open space for the proposed school is above the average identified through the case studies.

The case studies also show that a combination of innovative solutions to open space provision, alongside shared use arrangements with local government or other landowners can be successful in meeting the recreational needs of students.

4.2 Opportunities

In addition to the onsite provision proposed for this development, the following opportunities have also been identified to help meet the recreation needs of the students:

- A review of available open space in the surrounding area shows there may be an opportunity for Waterloo Park to be used for additional passive open space for secondary school students, if a shared use agreement can be negotiated with the City of Sydney.
- Discussions with the City of Sydney have identified the possibility of developing a shared use arrangement with the proposed school for Turruwal Park. This park is located approximately 7 minutes' drive south of the site and includes a soccer field, two tennis courts, a tennis wall, and cricket facilities. Council has confirmed the space has availability Monday to Friday 8:00am-5:00pm. Since this space is not within walking distance, the operator would need to confirm the viability of providing transport to and from this park. However, it is not unreasonable or rare for students in dense urban areas to use transport to access various facilities, particularly for sporting purposes.
- The future Main Park, part of the Waterloo Metro Station project, will provide two hectares of open space and include two playing fields. It is approximately 800m walk from the proposed school site and provides another option for potential shared use. If this could be achieved this option would be the preferred option given its proximity to the site.
- There is an opportunity for community shared use outside of school hours of the proposed school's hall for artistic and performance / multipurpose space.
- The Draft Operational Management Plan for the proposal recommends timetabling open space use into primary (K-6), middle (7-10) and senior secondary (11-12) year level segments[9].

4.3 Recommendations for next steps

The recommended next steps include:

- Progress discussions in respect of Turruwal Park with the City of Sydney around potential shared use arrangements for formal / structured sports activities.
- Consult further with the City of Sydney around potential shared use arrangements for the future Main Park.

[9] Draft Operational Management Plan prepared by Amina Project Management (November 2023)

- Consult further with City of Sydney regarding opportunities for community use of spaces, especially creative spaces, auditorium outside of school hours and identify design requirements that would be needed to support this use.
- Implement recommendations outlined in the Operational Management Plan that support maximising access to open space for students, such as staggering school breaks (primary / middle / secondary).

Appendix A

Table 5 Private school places comparison

Region	TOTAL Private Schools			
	Schools (#)	Enrolment (#)	enrolment/ 100 school aged (2021)	enrolment/ 100 school aged (2031)
Waterloo draw	6	588	15	9
Sutherland Shire draw	8	3107	24	22
Lower N Beaches draw	9	5113	37	38
Inner South draw	12	4734	47	39
Central East Suburbs draw	17	9228	91	84
North Sydney draw	9	11535	130	114

Source: Prepared by GapMaps for Sustainable Development Group

Waterloo draw Central	6x SA2s: Surry Hills, Redfern, Erskineville-Alexandria, Waterloo, Zetland, Rosebery-Beaconsfield. Pop = 89.9k
Suburbs draw Inner South draw	Randwick South, Coogee-Clovelly, South Coogee . Pop = 90.8k 5x SA2s: Arncliffe-Bardwell Valley, Monterey-Brighton le Sands-Kyeemagh, Bexley North, Bexley South, Rockdale. Pop = 89.4k
Sutherland Shire draw	6x SA2s: Sylvania-Taren Point, Gymea- Grays Point, Miranda-Yowie Bay, Caringbah, Caringbah South, Woolooware-Burraneer. Pop = 89.8k
North Sydney draw	6x SA2s: Cremorne-Cammeray, Neutral Bay-Kirribilli, North Sydney-Lavender Bay, Crows Nest-Waverton, Greenwich-Riverview, St Leonards-Naremburn. Pop = 91.3k
Lower Northern Beaches draw	5x SA2s: Dee Why South-North Curl Curl, Freshwater-Brookvale, Manly Vale- Allambie Heights, Manly-Fairlight, Balbaowlah-Clontarf-Seaforth. Pop = 91.7k

Attachment A10

Operational Management Plan

242-258 Young Street Planning Proposal

- **Project Name:** 242-258 Young Street, Waterloo
- **Project Description:** Amendments to the *Sydney Local Environmental Plan 2012* and the Sydney Development Control Plan 2012

Operational management plan for proposed School redevelopment at 242-258 Young Street, Waterloo

Introduction

This operational management plan is submitted to the Council of the City of Sydney (Council) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
  - 46 GLS, 13 specialist/classrooms
  - A multi-purpose hall/auditorium
  - A library
  - A canteen
  - Administration, lobby and circulation spaces
  - An active green roof
  - A basement including 60 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
  - 10,608m2 education floor area
  - 2,935m2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m2.

Site location and context

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m^2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.

The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.

An aerial photo of the site is shown at Figure 1

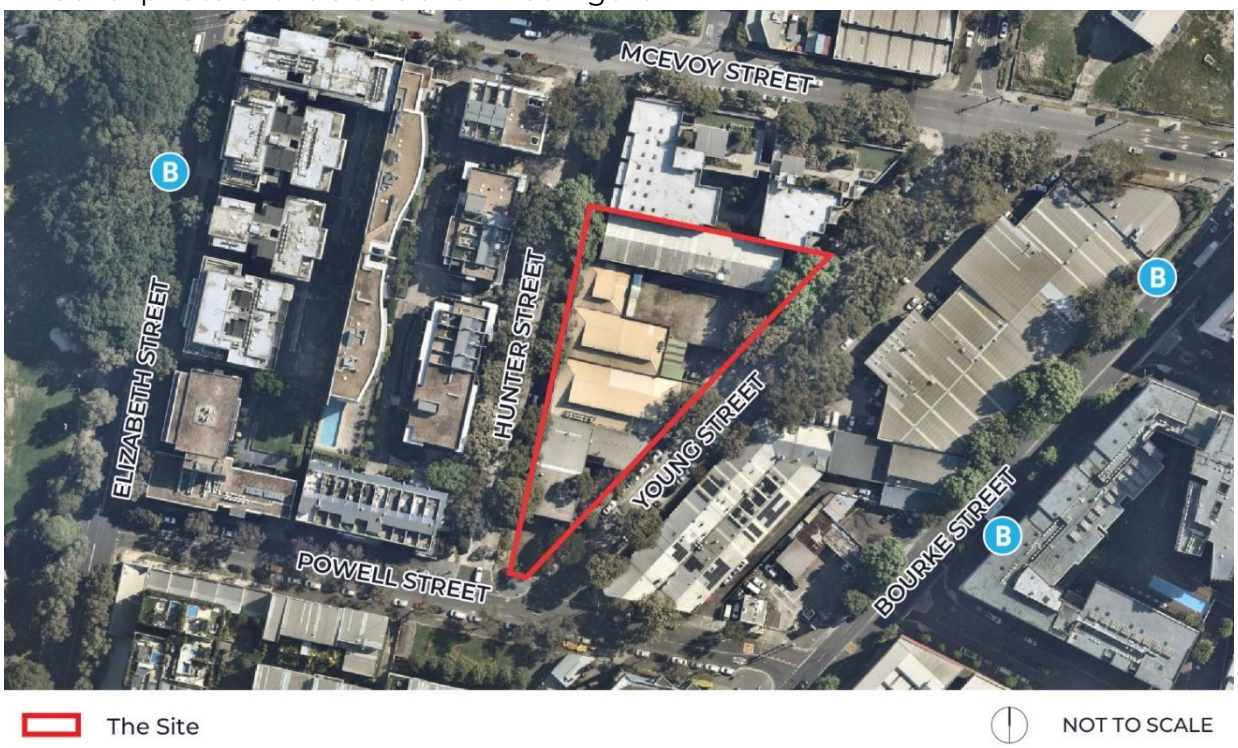


Figure 1 Aerial Map

Source: Nearmap + Ethos Urban

OPERATIONAL MANAGEMENT PLAN

Table of Contents for Operational Management Plan

Background

1 Management of open space areas within the school

2 Measures to compensate for the shortage of on-site open space

3 Logistics of safely transporting students to and from the school

4 Clarification of usage of the undercroft area at the ground level

5 Operational transport management including details of pick up and drop off

6 Preliminary details of evacuation plan

7 Flood emergency response plan

Background

This paper addresses the operational management plan section of the Planning Proposal Lodgement Checklist provided by the City of Sydney.

Operational management plan

To ensure a comprehensive evaluation of the proposed development, an operational management plan for the new school is to be prepared. It is to include, but is not limited to:

- Management of open space areas within the school including monitoring mechanisms.
- Measures to compensate for the shortage of on-site open space including details of off-site playing fields and park facilities that are likely to be utilised.
- Logistics of safely transporting students to and from the off-site open space locations.
- Clarification of usage of the undercroft area at the ground level and how it would be separated from the movements during school start and finish times.
- Operational transport management including details of pick up and drop off management measures.
- Preliminary details of evacuation in case of an emergency considering the pedestrian flows around the site.
- A flood emergency response plan detailing shelter-in-place.

School

Our proposed school is guided by three core values: collaboration, innovation and compassion. Our mission is to provide a caring environment where we nurture every child's academic, physical, emotional, social, and spiritual development. We complement our strong well-being programs with academic rigour to equip all students with the necessary skills, learning dispositions, and intellectual character traits to navigate their school years confidently, the workforce, and life in general.

The school is capable of complying with the Education and Care Services National Law Act 2010, Education and Care Services National Regulations and the National Quality Framework standards and that assessment of compliance will be undertaken at the SSDA stage.

ENROLMENTS	Primary 280 and Secondary 520 = 800 Students
STAFF	105
TOTAL STAFF AND STUDENTS	905
OPERATIONAL HOURS	7.30 am to 5.30 pm.



Sketch of School from Plus Architecture

1 Management of open space areas within the school, including monitoring mechanisms.

The management and monitoring of the school's school infrastructure can be provided by active and passive supervision within the campus of enclosed and open spaces. The floor plans show 4976 sq meters of open space, which is 6.2 sq meters of Outdoor/Open Space per student.

The proposed school aims to introduce innovative outdoor and open space designs and efficient management strategies.

Optimal management is achieved by delineating the infrastructure and students into Primary (Years K to 6), Middle (Years 7 to 10), and Senior (Years 11 to 12).

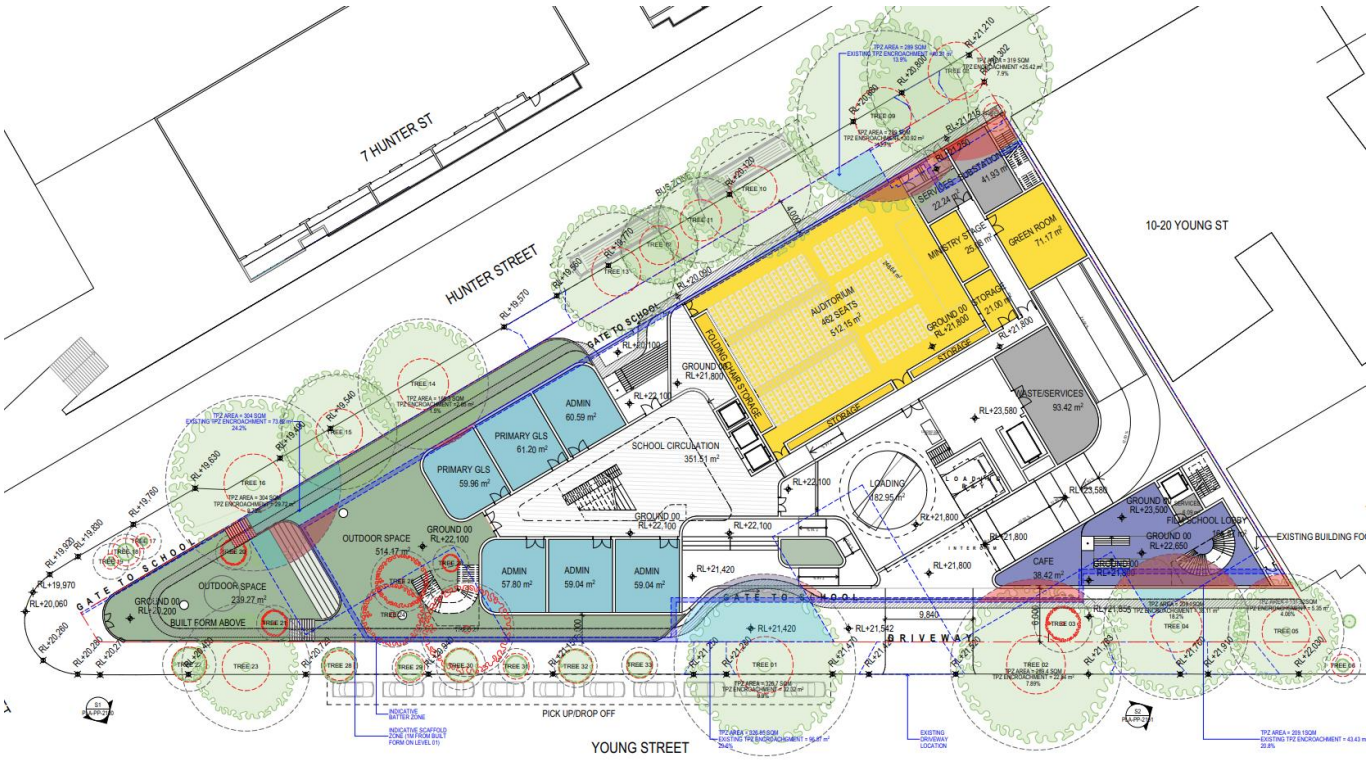
For this school, passive and active play spaces are designated for Primary, Middle, and Senior students to meet their relaxation, social, and movement needs. This facilitates staff supervision of these areas during the school day.

Adjacent student amenities and passive open space are located to be within the line of sight of administration offices and staff areas for passive supervision.

Surveillance throughout the school will be provided by a swipe card and CCTV camera monitoring system, which will control access for students, staff, contractors, and visitors.

Site Map

Ground floor has 754 sqm of Open Space for all School to be used as a student-holding area and gathering space **Figure 2.**



Floor plan from Plus Architecture

First Floor has 154 sqm of Passive Open Space for Primary School use **Figure 3.**



Floor plan from Plus Architecture

Second Floor has 154 sqm of Passive Open Space for Middle School use **Figure 4**.



Floor plan from Plus Architecture

Third Floor has 154 sqm of Passive Open Space for Senior School use **Figure 5.**



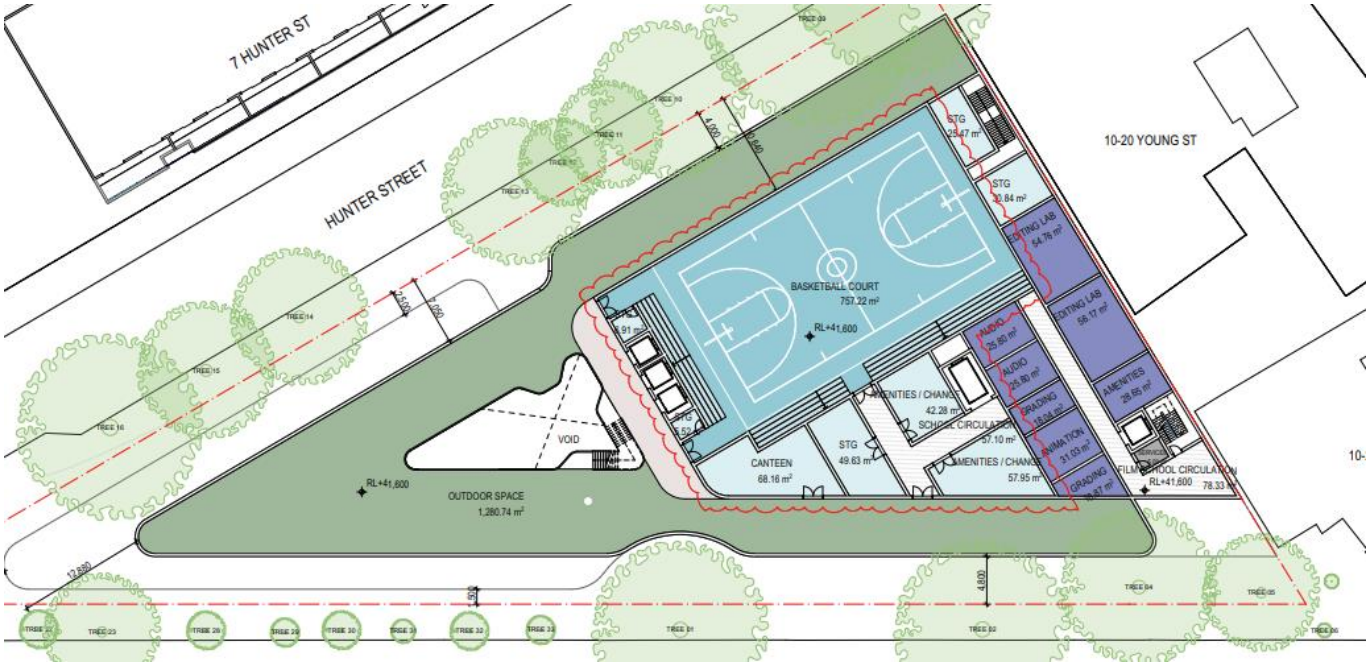
Floor plan from Plus Architecture

Fourth Floor has 1259 sqm of Active Open Space for Primary School use **Figure 6**.



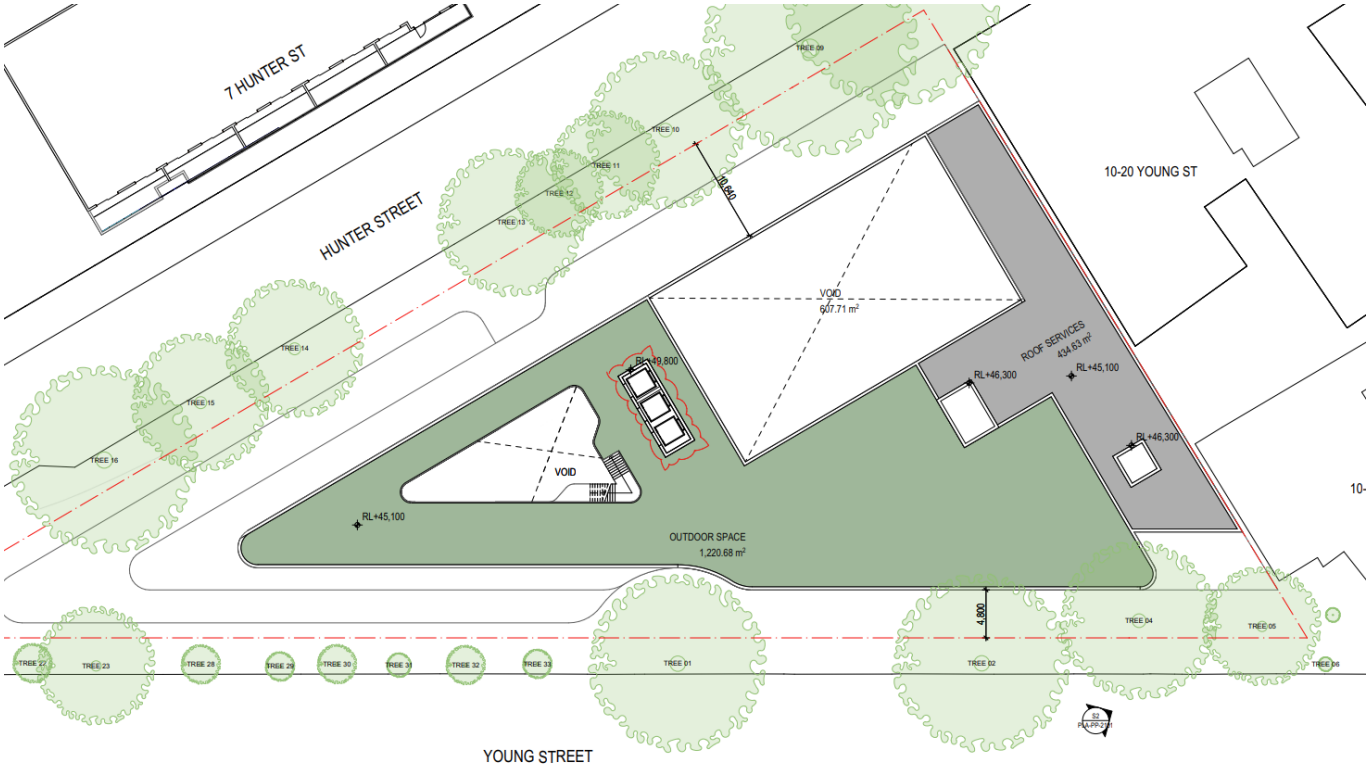
Floor plan from Plus Architecture

Fifth Floor has 1281 sqm of Active Open Space for middle school. The Basketball Court is a timetable space for Primary, Middle and Senior School use **Figure 7**.



Floor plan from Plus Architecture

Sixth floor has 1221 sqm of Active Open Space for secondary School use **Figure 8**.



Floor plan from Plus Architecture

The following table sets out the school infrastructure by type of space and supervision

Table 1.

Space	General Learning Areas	Specialties Learning Areas	Internal Travel Space	Passage Lifts	Student Amenities	Staff & Admin Areas
Basement 01				Passive supervision, CCTV and swipe card		
Ground Floor 00	Primary Timetable space with swipe card		Primary Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision with swipe card
Level 01	Primary Timetable space with swipe card		Primary Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision with swipe card
Level 02	Middle Timetable space with swipe card	Middle Timetable space with swipe card	Middle Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision with swipe card
Level 03	Middle/Senior Timetable space with swipe card	Middle/Senior Timetable space with swipe card	Middle/Senior Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision with swipe card
Level 04	Senior Timetable space with swipe card	Senior Timetable space with swipe card	Middle / Senior Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card	Passive supervision with swipe card
Level 05			Middle / Senior Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card		
Level 06			Senior Passive supervision, CCTV and swipe card	Passive supervision, CCTV and swipe card		
Notes	Primary School years k to 6					
	Middle School years 7 to 10					
	Senior School years 11 to 12					
1	Outdoor space/ open space will have designated usage times for Junior, Middle and Senior Schools.					
2	CCTV monitoring in all student areas with swipe card access control on all doors					
3	Outdoor space / open spaces will always be actively supervision by teaching staff					
4	Passive outdoor space will always be actively supervision by teaching staff					
5	Timetable space will always be actively supervision by teaching staff					

The following table sets out the school infrastructure by type of space and supervision.

Table 2

Space	Multi-Purpose Hall	Basketball Court	Outdoor Space/ Open Space	Passive Outdoor Space/ Open Space	External Travel	Carpark and store rooms
Basement 01					CCTV and swipe card	CCTV and swipe card
Ground Floor 00	Timetable space, CCTV and swipe card		Active supervision, CCTV and swipe card		Passive supervision, CCTV and swipe card	
Level 01				Primary Passive will have active supervision and CCTV		
Level 02				Middle Passive will have active supervision and CCTV		
Level 03				Middle/Senior Passive will have active supervision and CCTV		
Level 04			Junior Active supervision, CCTV and swipe card		CCTV and swipe card	
Level 05		Timetable Space Active supervision, CCTV and swipe card	Middle Active supervision, CCTV and swipe card		CCTV and swipe card	
Level 06			Senior Active supervision, CCTV and swipe card		CCTV and swipe card	
Notes	Primary School years K to 6 Middle School years 7 to 10 Senior School years 11 to 12					
1	Outdoor space/ open space will have designated usage times for Junior, Middle and Senior Schools.					
2	CCTV monitoring in all student areas with swipe card access control on all doors					
3	Outdoor space / open spaces will always be actively supervision by teaching staff					
4	Passive outdoor space will always be actively supervision by teaching staff					
5	Timetable space will always be actively supervision by teaching staff					

Education Facilities Standards and Guidelines (EFSG)

It is not possible for a vertical school located in a dense urban area to meet the minimum requirement of 10 square metres of open space per student. However, under the NSW School Infrastructure Education Facilities Standards and Guidelines (EFSG), open space may be delivered innovatively in such schools. The proposed school will innovate in relation to design and multi-purpose management of student open spaces.

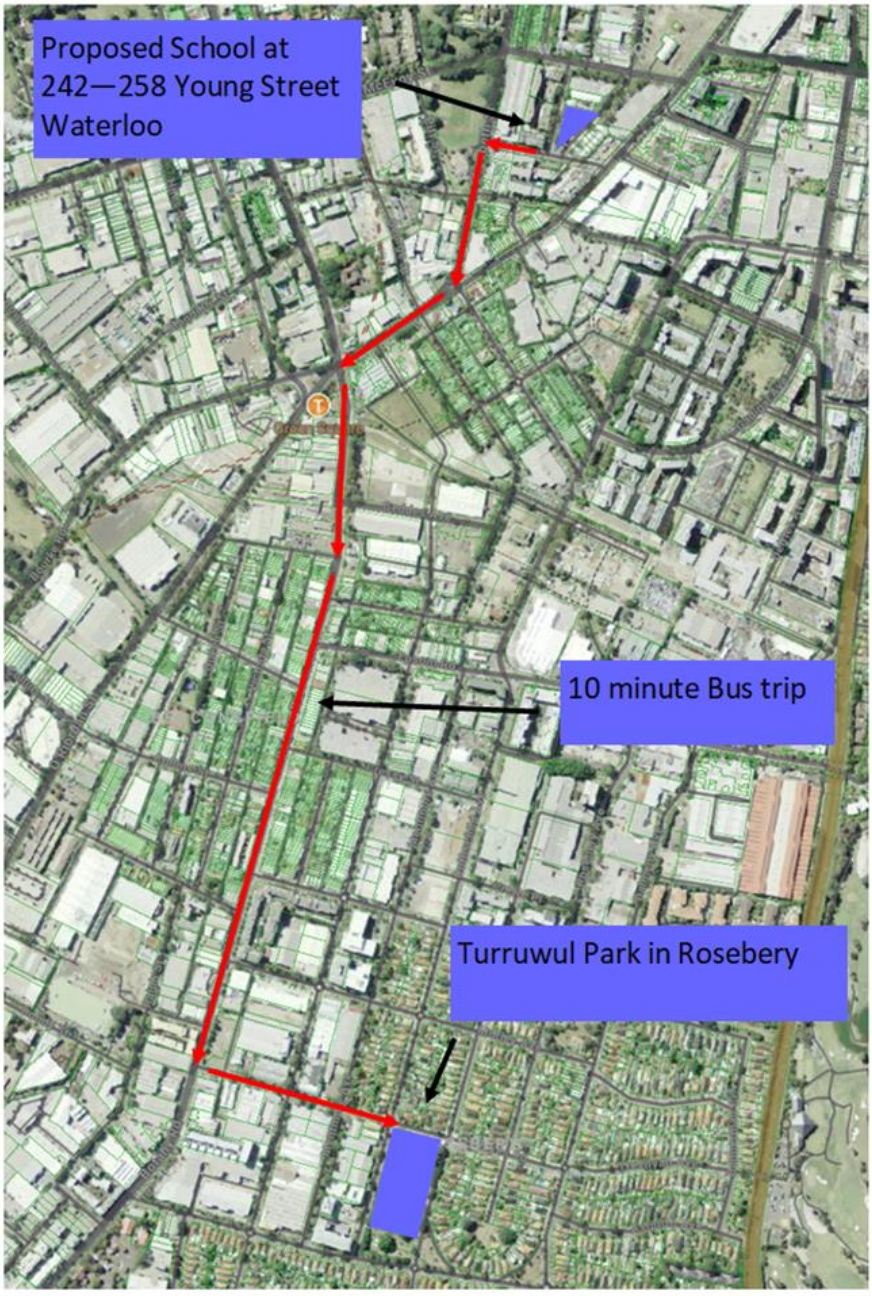
2 Measures to compensate for the shortage of on-site open space, including details of off-site playing fields and park facilities that are likely to be utilised.

The proposal is to use Turruwul Park at 115 Rothschild Ave, Rosebery for a 3.2 kilometre 10-minute bus trip for the school's playing fields.

The SDG has been in talks with the City of Sydney regarding the use of Turruwul Park's playing fields during school hours and terms. The proposed plan is to transport students to and from the playing fields by bus. The students will be divided into three schools: Primary (Years K-6), Middle (Years 7-10), and Senior (Years 11-12), based on the availability of the fields.

Area Map

Turruwul Park Roseberry **Figure 9.**



Source: Nearmap

Site Map

Turruwul Park Roseberry **Figure 10.**



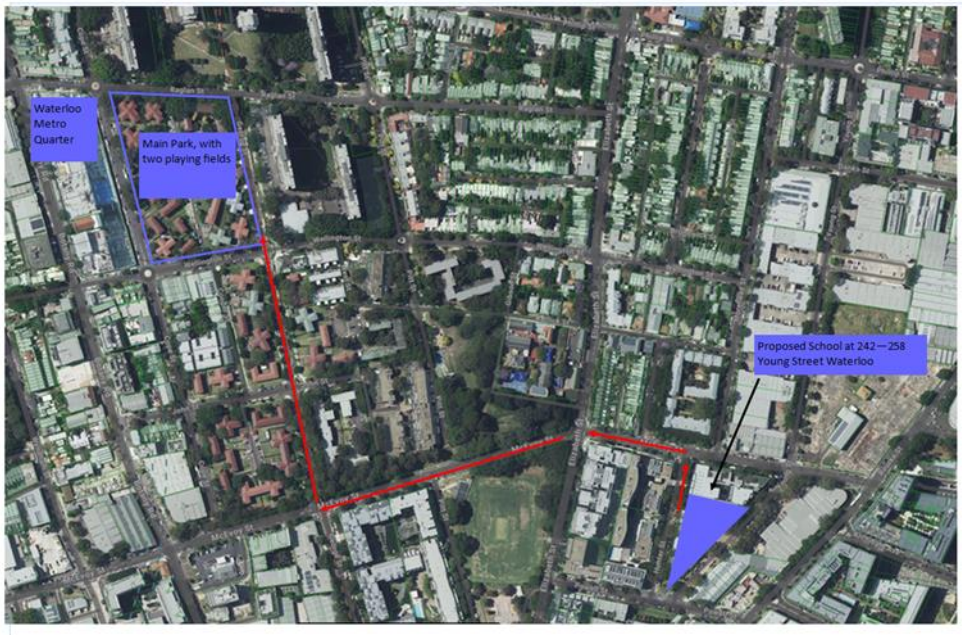
Source: Nearmap

Alternative

As an alternative, two hectares of open space will be developed into two playing fields as part of the Waterloo metro station in the proposed Main Park, which is a 10-minute walk from the school.

Area Map

Main Park at Waterloo Metro Station **Figure 11.**



Source: Nearmap

Site Map

Main Park at Waterloo Metro Station **Figure 12**.



Source Department of Planning and Environment

3 Logistics of safely transporting students to and from the off-site open space locations

Students' movements to and from the school will be arranged as excursions, and the majority will be by bus. Walking and public transport will be used for excursions by different year groups.

Students will be divided into three schools: Primary (Years K-6), Middle (Years 7-10), and Senior (Years 11-12), organised by year groups. *Following Kid Safe Australia's excursion guidelines and the NSW Government Road Safety Education Program, the school will move students to off-site locations.*

Excursions

The school is required to always adhere to its Excursions Policy which will developed to follow the NSW Government Road Safety Education Program. The school recognises It is crucial that students are not transported in staff members' personal vehicles. It will prohibit using staff personal vehicles to transport students during excursions.

When transporting students using public transportation, staff will be responsible for ensuring their safety and well-being throughout the journey. Staff supervising excursions will have a list of student names and parent/carer contact details for all students travelling. Staff will have hard copies of this document during excursions. Students always remain under staff supervision.

Walking

Walking movements outside the school campus will always adhere to the school's Excursions Policy.

The school will follow NSW Government Road Safety Education Program guidelines for walking primary students to and from school. This will:

- Ensure that the safest route is taken.
- Keep students together as a group and walk in line on footpaths.
- Ensure staff remain vigilant so that no student runs ahead or lags too far behind the group.
- Ensure students cross roads at crossings or lights where available and obey road rules.
- Ensure students undertake extreme care crossing all roads.
- Require that If the students are under 10 years of age they hold hands.
- Require a "head count" to be conducted on a regular basis.
- Require that students are assisted in getting on and off the mode of transport.
- Require that the ground floor has an assembly space with a capacity for 120 students in one area.
- Require that a risk assessment is done for all travel plans.

Area Map

The two maps below show the pedestrian Access to the proposed school **Figure 13**.



Source JMT Consulting

Bus

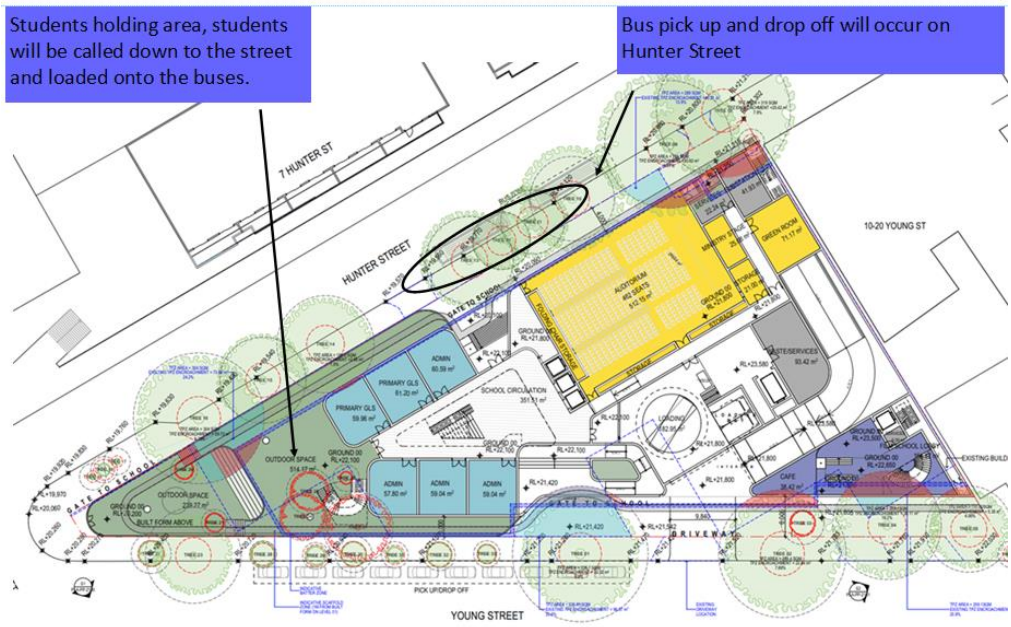
Buses will be loaded and unloaded on Hunter Street following the school's excursions policy.

According to the Passenger Transport Act of 1990, every bus that provides transportation for students must comply with its regulations.

All buses must comply with child restraint laws and ensure passengers under 7 are properly restrained in an approved seat.

Site map

This site map shows the location of the bus drop-off and pick-up points **Figure 14.**



Floor plan from Plus Architecture

Train and metro

Train and metro transport will always adhere to the school's Excursions Policy.

The nearest train station is 800 meters or a 10-minute walk to Green Square Station at O'Riordan Street and Botany Road.

The nearest Metro station is 800 meters or a 10-minute walk to Waterloo Station at Cope Street and Botany Road.

Area Map

This map shows the locations of the Train and Proposed Metro Stations. **Figure 15.**



Source JMT Consulting

4 Clarification of usage of the undercroft area at the ground level and how it would be separated from the movements during school start and finish times.

This area will serve multiple purposes throughout the school day. Its primary function will be as a passive outdoor/open space, while during drop-off and pick-up times the space will also serve as a student-holding area. At other times, it will become a common gathering space for staff and students.

Primary and secondary schools will have staggered start and end times to ease drop-off and pickup volume.

Drop off

The primary school drop-off session will start at 8.30 am

The secondary school drop-off session will start at 8.00 am

Pickup

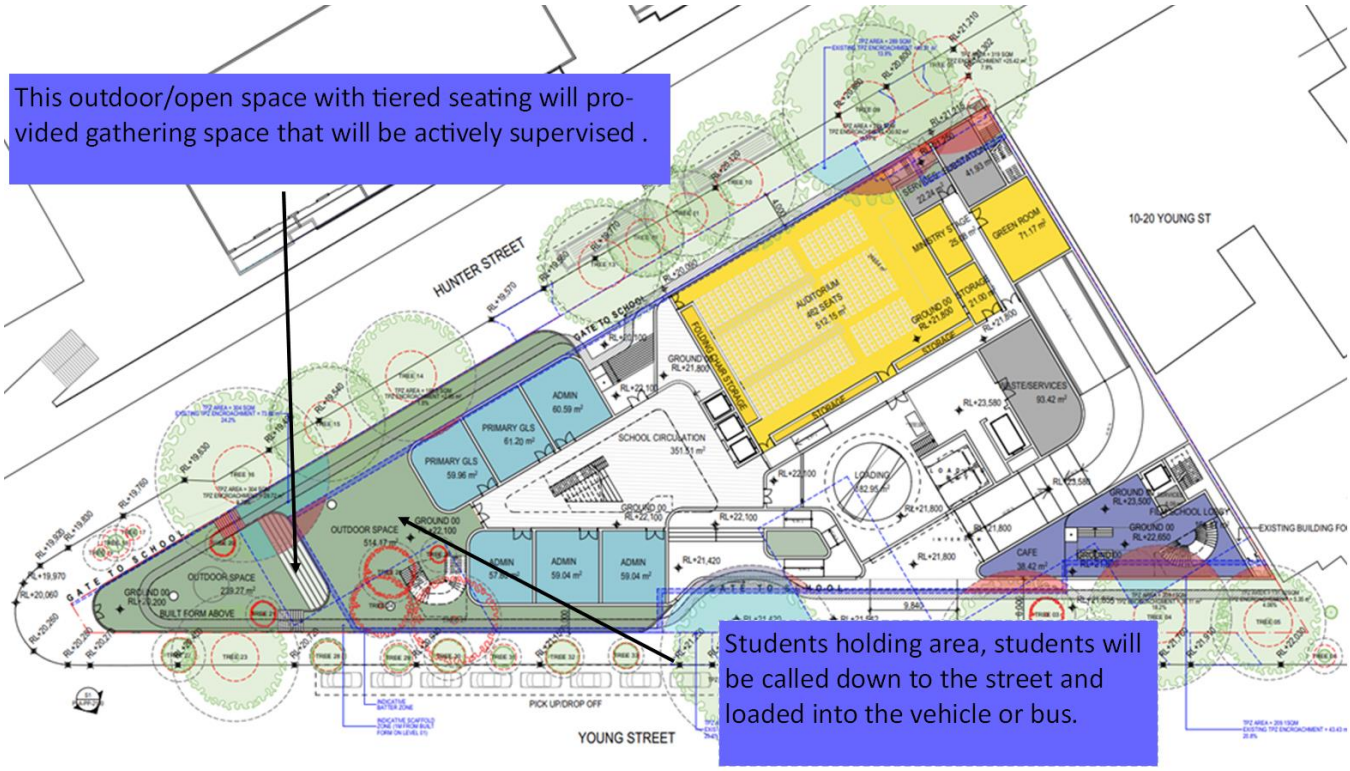
Primary Students will be picked up at 3:00 pm

Secondary Students will be picked up at 3.30 pm

As a gathering space, it must be actively supervised and monitored.

Site plan

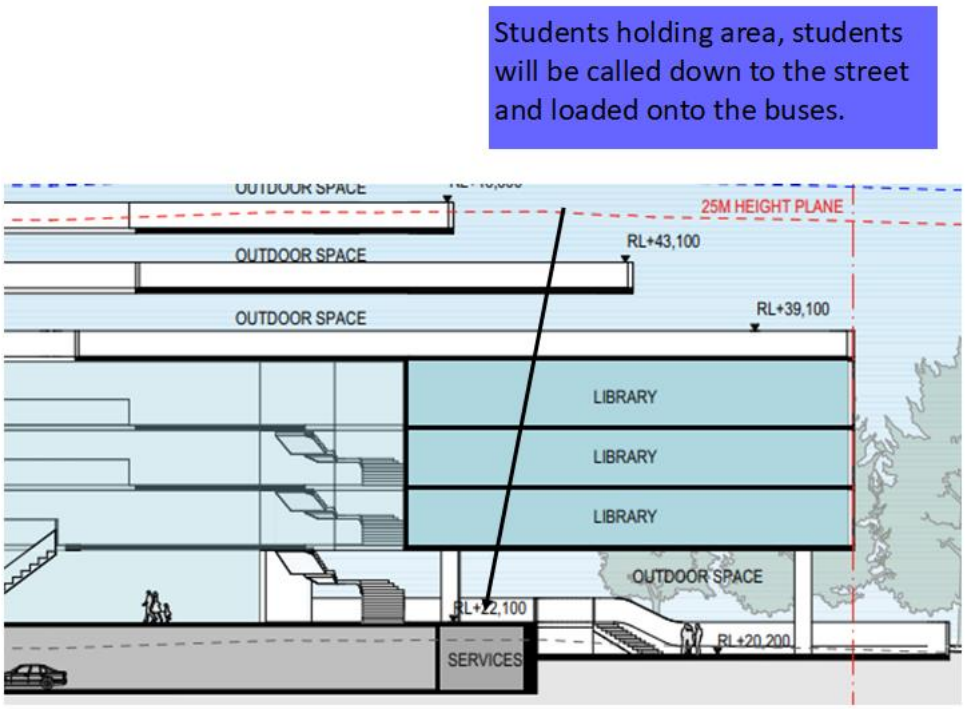
Open space on the ground floor **Figure 16.**



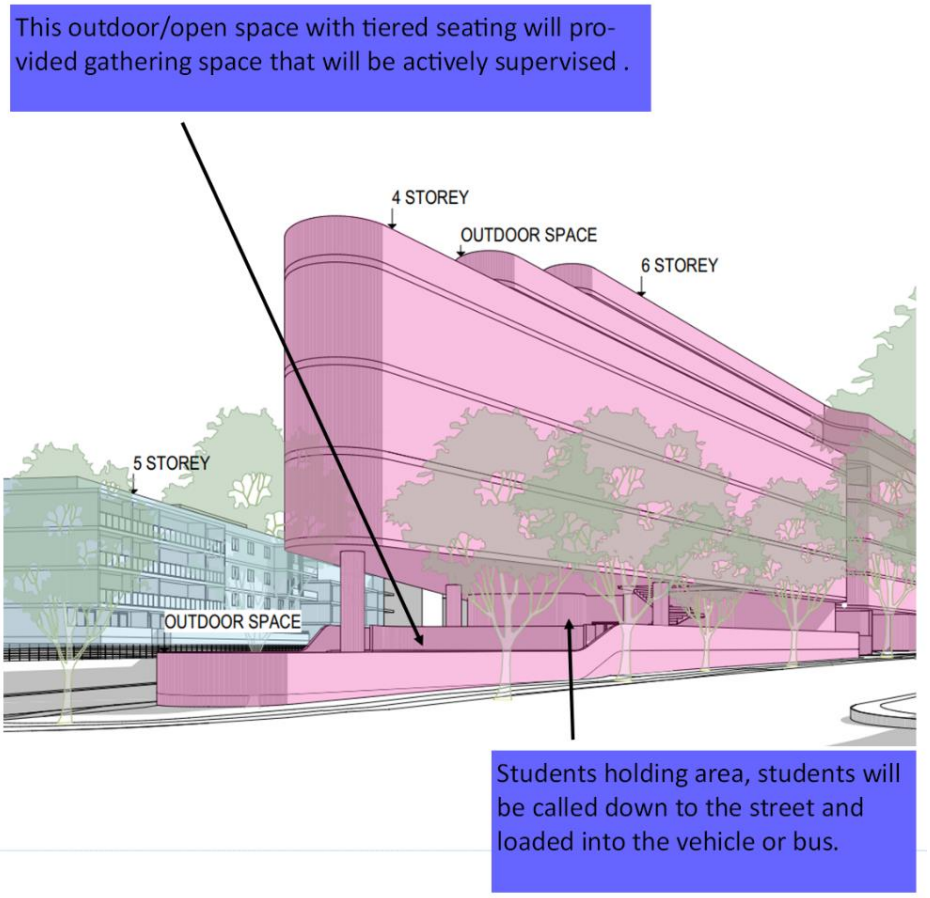
Floor plan from Plus Architecture

Site Section

Open space in the basement and ground floor **Figure 17.**



Section from Plus Architecture



Sketch from Plus Architecture

5 Operational transport management, including details of pick-up and drop-off management measures

The school recognises the importance of sound arrangements for student, staff, parent and visitor movements and has identified appropriate measures to manage:

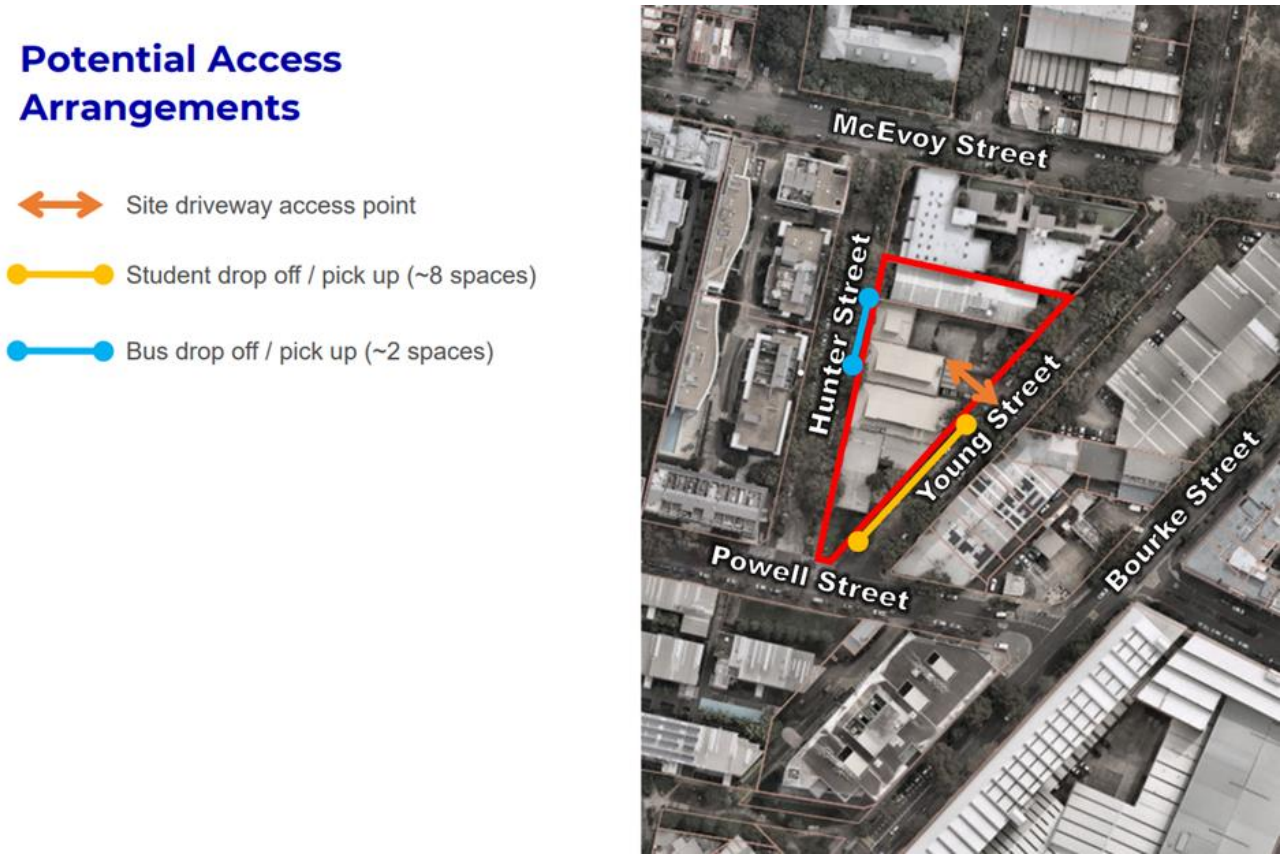
- Bus and vehicle pick up and drop off
- Safe pedestrian movements of students, staff, parents and visitors from the community and train and Metro stations
- Delivery of school supplies and materials between 9.30 am and 2.30 pm on school days

It will minimise the volume of vehicle movements in and around the school by setting the following conditions:

- Only executive staff members will be permitted to park their vehicles in the basement car park.
- Staff will not be permitted to park their vehicles in the basement car park. Staff will be provided with Opal cards for transportation to and from school to encourage the use of public transport.
- Year 11 and 12 Students will not be permitted to drive vehicles to and from school.

Area map.

The area map below shows the potential transport arrangements for the school **Figure 18.**



Source JMT Consulting

Students drop off and pick up – buses and vehicles.

The school principal, deputy principal and senior staff will be rostered for traffic duty each school day. Bus drop-off and pick up will occur on Hunter Street, while the vehicle drop off will occur on Young Street. During set drop off and pick up times the basement car park will be closed to vehicle movements.

Drop off

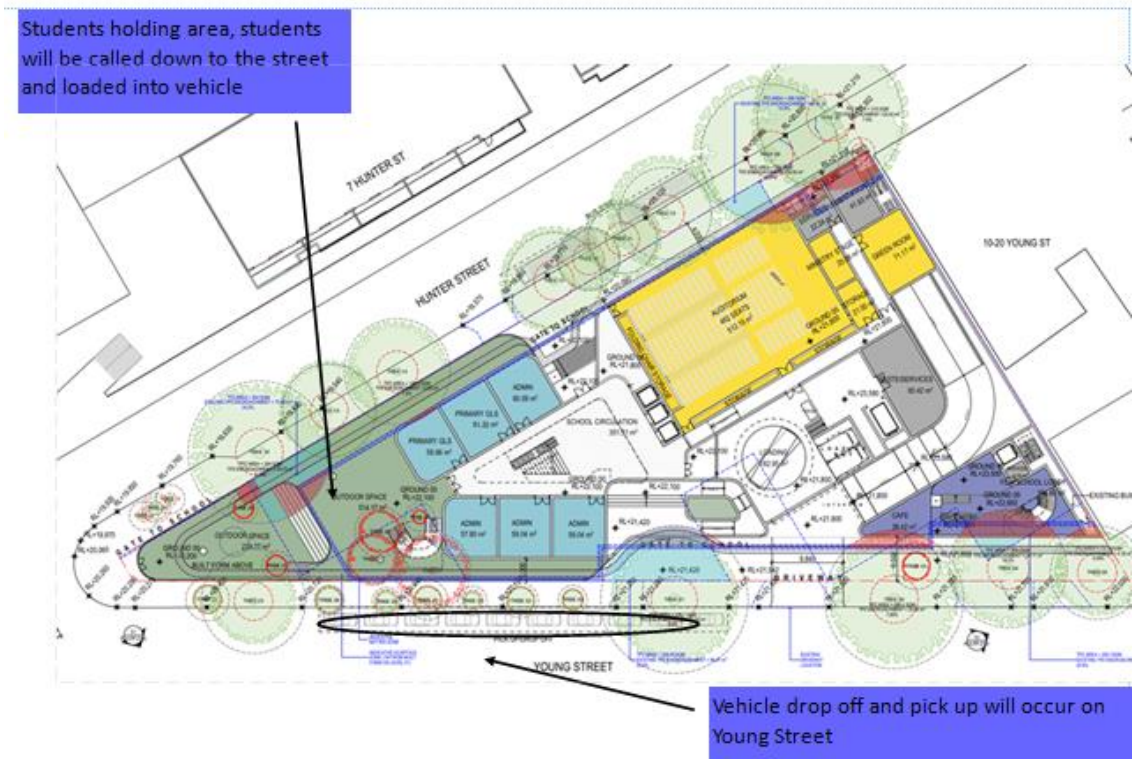
- All secondary and primary students will be admitted through the main entrance on Young Street, including families with older siblings. Staff will supervise the unloading of students from cars.
- Similarly, secondary and primary students be collected from the main entrance on Young Street. Staff will always supervise the loading of students into cars.
- Primary Students with older siblings may arrive at 8.00 am (not before)
- Secondary Students may arrive at 7.30 am (not before)
- The primary school drop-off session starts at 8.30 am
- The secondary school drop-off session will start at 8.00 am.

Pick up

- All secondary and primary students will be collected from the main entrance on Young Street. Staff will always supervise the loading of students into cars. Students will load into vehicles by year group and be held within the ground floor of the school until the designated loading time.
- Primary Students will be picked up at 3:00 pm (not before)
- Secondary Students will be picked up at 3.30 pm (not before)
- On approaching the Kiss and Drop area in Young Street each vehicle will display the student name/s and year group/s, staff members will call out the students' name/s, then the student/s will travel down from the holding area on the ground floor of the school and be loaded into the vehicle. The location of the student holding area depends on the number of students being picked up by vehicles.

Site Plan

This site map shows vehicle pickup and drop-off on Young Street **Figure 19.**



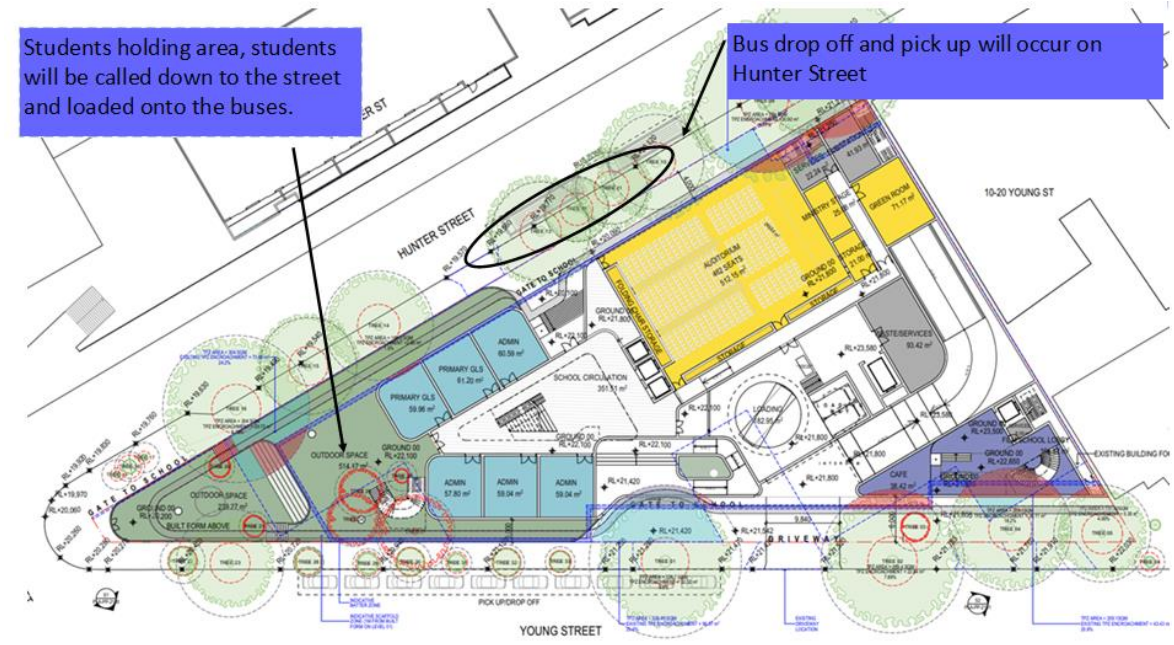
Floor plan from Plus Architecture

Buse drop off and pick up

The school Bus Zone will be established on Hunter Street for pick-up and drop-off times from 8:00 am to 9:00 am and from 3:00 pm to 4:00 pm.

Site plan

This site map shows the bus pick up and drop off in Hunter Street **Figure 20.**



Floor plan from Plus Architecture

Area transport overview map

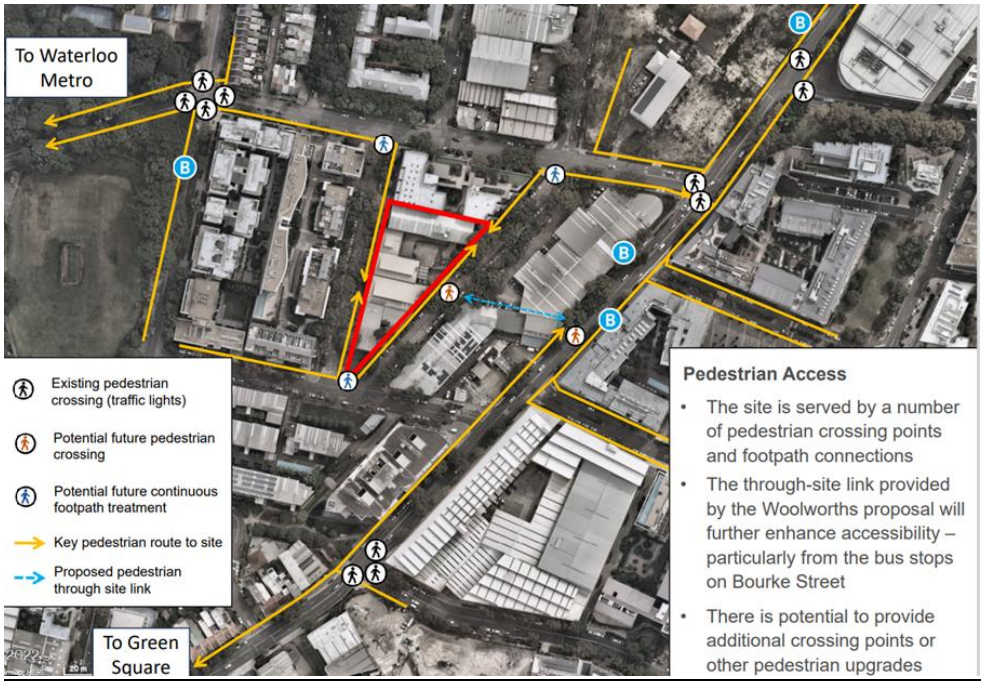
The transport overview map displays train, bus, and metro options for reaching the school **Figure 21.**



Source JMT Consulting

Area travel map

The pedestrian access map displays staff, student, and visitor routes to and from the school **Figure 22.**



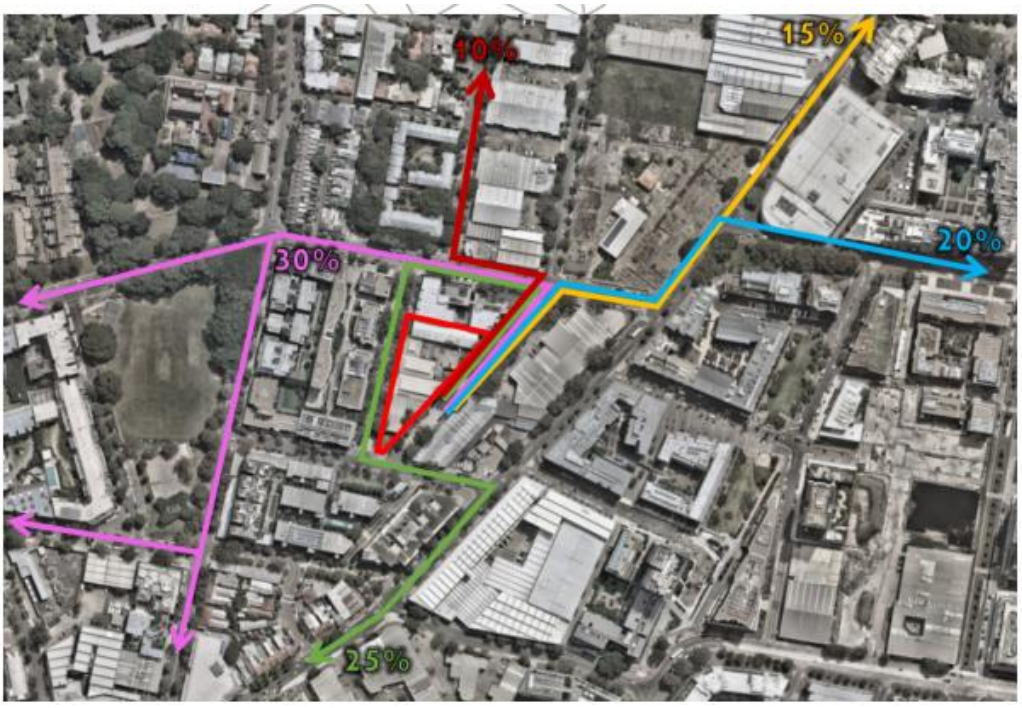
Traffic distribution forecast by Source JMT Consulting

The forecast arrival and departure directions for cars accessing the site are shown below (arrival directions figure 23) and below (departure directions Figure 24). This traffic distribution is generally consistent with the assumptions adopted for the neighbouring Woolworths site. However, takes into consideration the likely direction of travel to access or leave the drop off / pick up zone on the western kerb of Young Street.

Arrival directions by forecast JMT Consulting **Figure 23.**



Departing directions by forecast JMT Consulting **Figure 24.**



Source JMT Consulting

6 Preliminary details of evacuation in case of an emergency, considering the pedestrian flows around the site.

PRELIMINARY EVACUATION – EMERGENCY MANAGEMENT PLAN (EMP)

Schools are required to provide a safe environment for staff, students and visitors. This includes identifying and managing risks and planning for emergencies. Under Regulation 43 of the Work Health and Safety Regulation 2017, a workplace must have an Emergency Management Plan (EMP).

The school EMP will include:

- Preparedness, prevention, response and recovery strategies
- Agreed staff emergency management roles and responsibilities
- A site-specific risk assessment.

In compliance with Australian Standard 3745-2010, the school's EMP should be developed collaboratively. Therefore the EMP will be developed in consultation with school educators and staff to respond to the following events (Response Events):

- Building fire
- Asbestos
- Flood
- Heat (extreme)
- Industrial /Factory fire
- Mental Stress
- Missing Student and or Staff
- Intruder
- Bomb/substance threat
- Severe weather event
- Smoke
- Snakes
- Earthquake

EMERGENCY RESPONSE PROCEDURES

During an emergency, the school will activate one or a combination of the following five core emergency procedures:

- on-site evacuation (relocation)
- off-site evacuation
- lock-down
- lock-out
- shelter-in-place

On–Site Evacuation may be necessary if it is unsafe to stay inside the building due to a fire, gas leak, or other threats. Lockout procedure is often combined with this to prevent access to high-risk areas.

Off-Site Evacuation may be necessary If it is unsafe to remain on site and involves evacuation to a designated off-site point. This includes emergencies like bomb threats, fires, spills, and floods. It may also be necessary in response events outside the school premises.

Lockdown may be used if it is safest for everyone to remain indoors. Emergency situations may include hazardous smoke emissions, severe weather events or sensitive police operations.

Lockout may be necessary for immediate danger, for example in the event of a gas leak. Off-site evacuation procedures may also be used for these circumstances.

Shelter-in-place may be used as a protective action for external hazards like severe weather events or intruder threats. It may be a central assembly point before evacuation or a last resort. The location may vary depending on the hazard. If it poses a threat to children, immediate evacuation is necessary.

COMMUNICATION AND CONSULTATION

Communication and consultation with all relevant internal and external authorities (namely, police, fire brigade, State Emergency Service, Rural Fire Service, ambulance) will take place during all stages of the risk management process. Similarly there will be communication and consultation between the principal and other executive staff, staff, parents, care givers and families in relation to risk management.

EMERGENCY RESPONSE DRILLS SCHEDULE

Emergency response drills once every term will ensure the procedures are practical and that staff with responsibilities during an emergency have the knowledge to carry out their role.

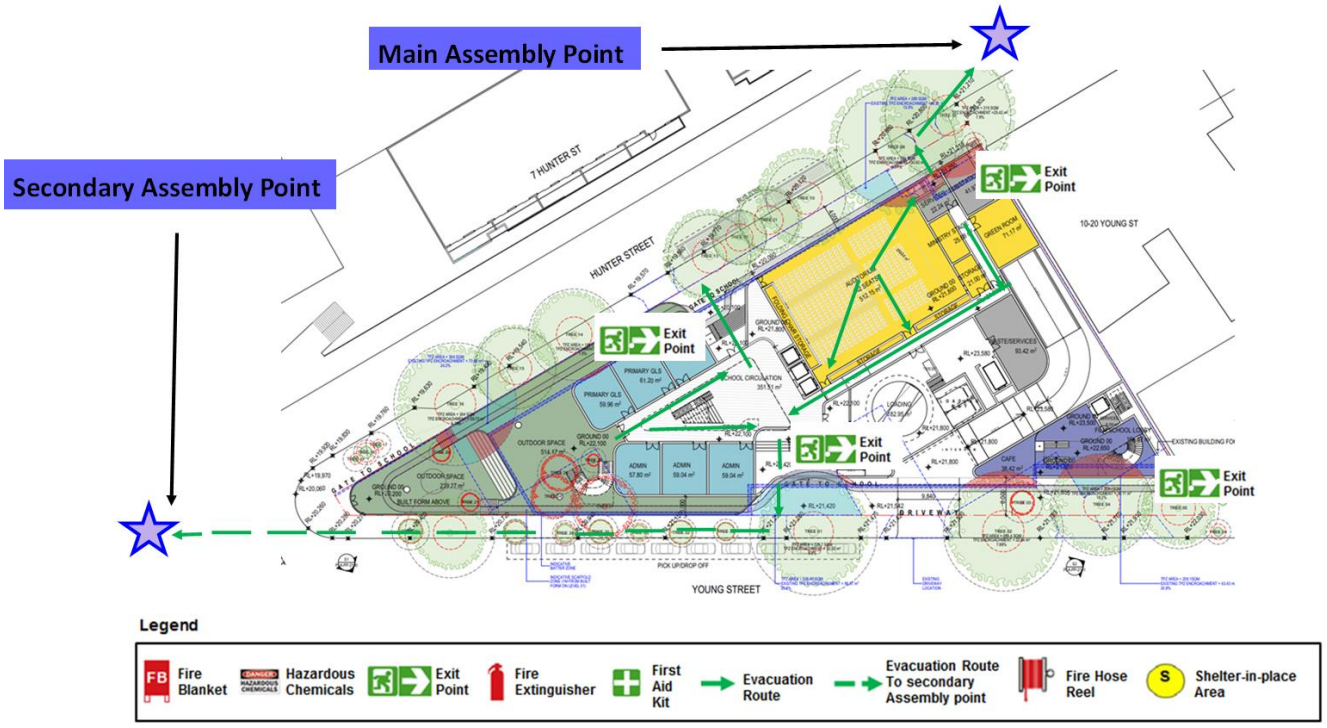
EMERGENCY KIT

A kit will kept in a designated, easily accessible place.

SITE MAP

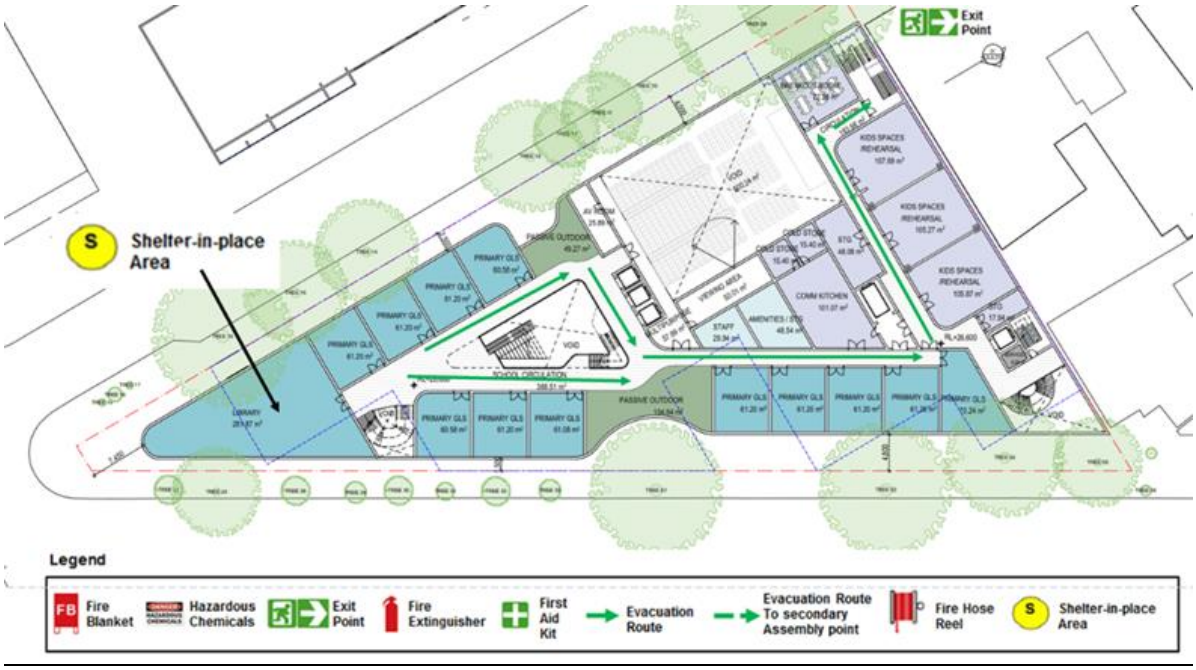
The floor plans below display the primary and secondary refuge/emergency assembly points, as well as the shelter-in-place location on the school campus.

Ground Floor **Figure 25.**



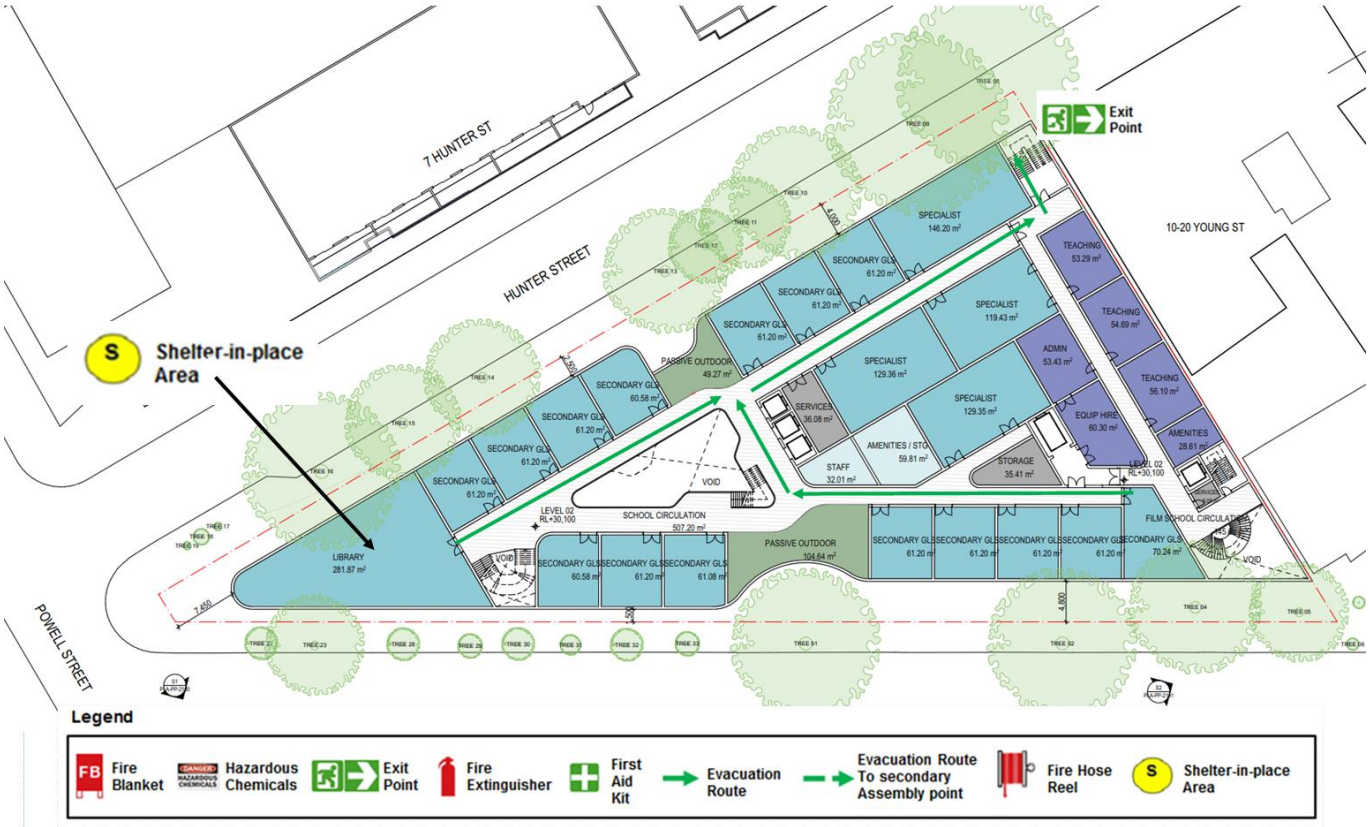
Floor plan from Plus Architecture

First Floor **Figure 26.**



Floor plan from Plus Architecture

Second Floor **Figure 27.**



Floor plan from Plus Architecture

Third Floor **Figure 28.**



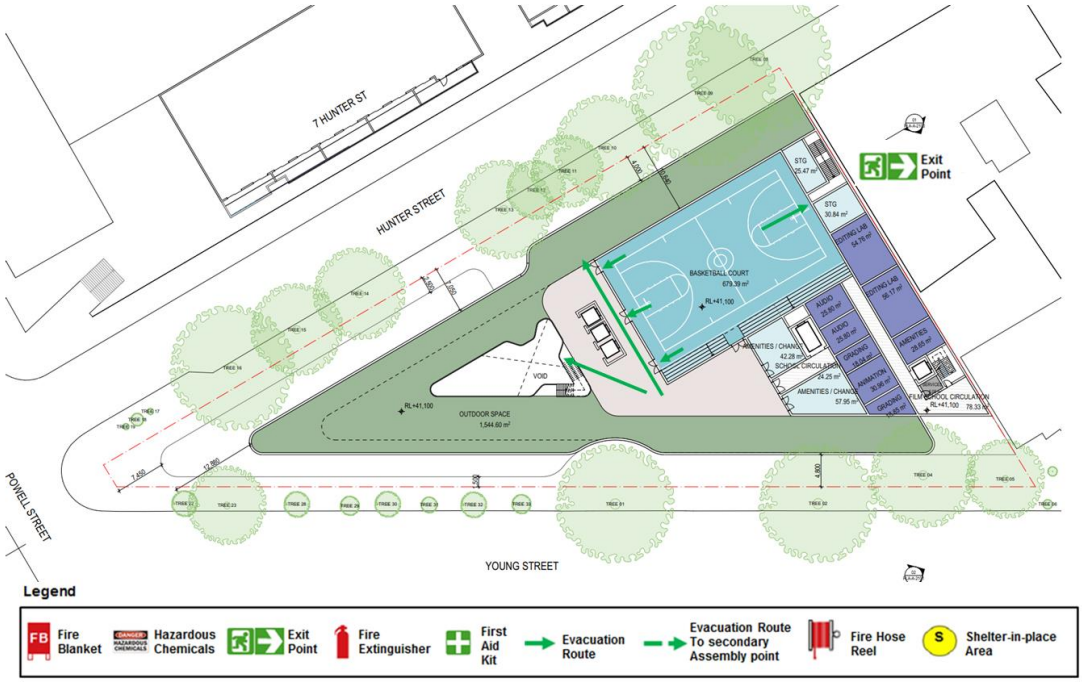
Floor plan from Plus Architecture

Fourth Floor **Figure 29.**



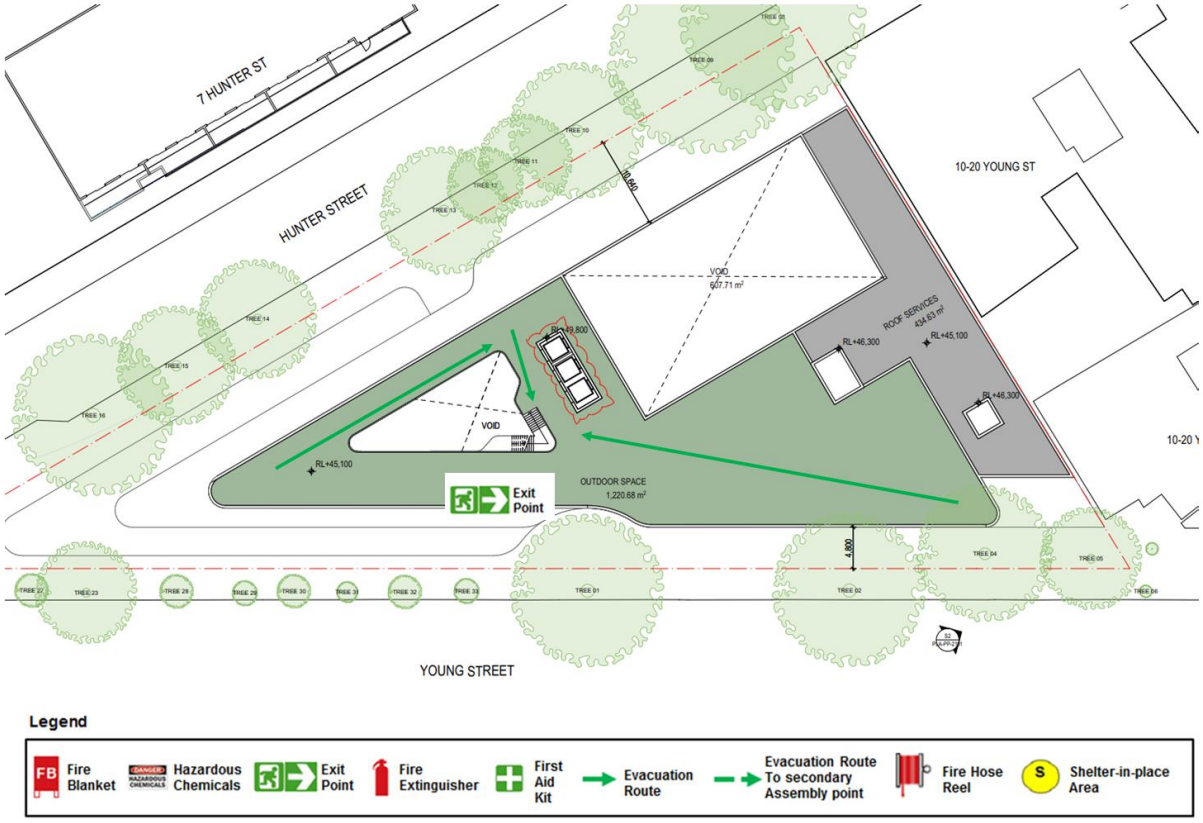
Floor plan from Plus Architecture

Fifth Floor **Figure 30.**



Floor plan from Plus Architecture

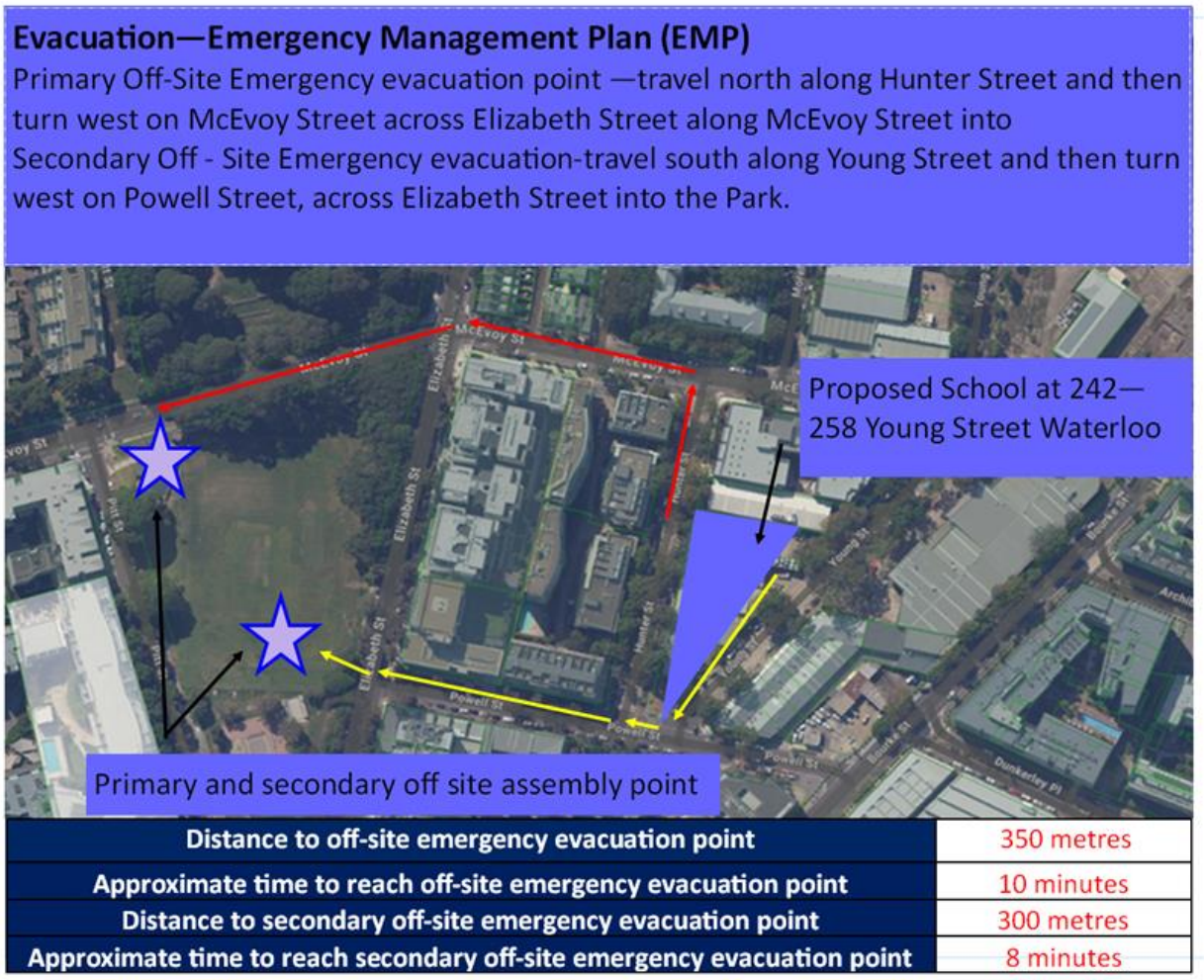
Sixth Floor **Figure 31.**



Floor plan from Plus Architecture

AREA MAP

The below area map shows the location of the school and its off-site evacuation points **Figure 32.**



Flood events evacuation routes are different to all other events (see page 37 / figure 41)

7 Flood Emergency Response Plan - detailing shelter-in-place procedures is required.

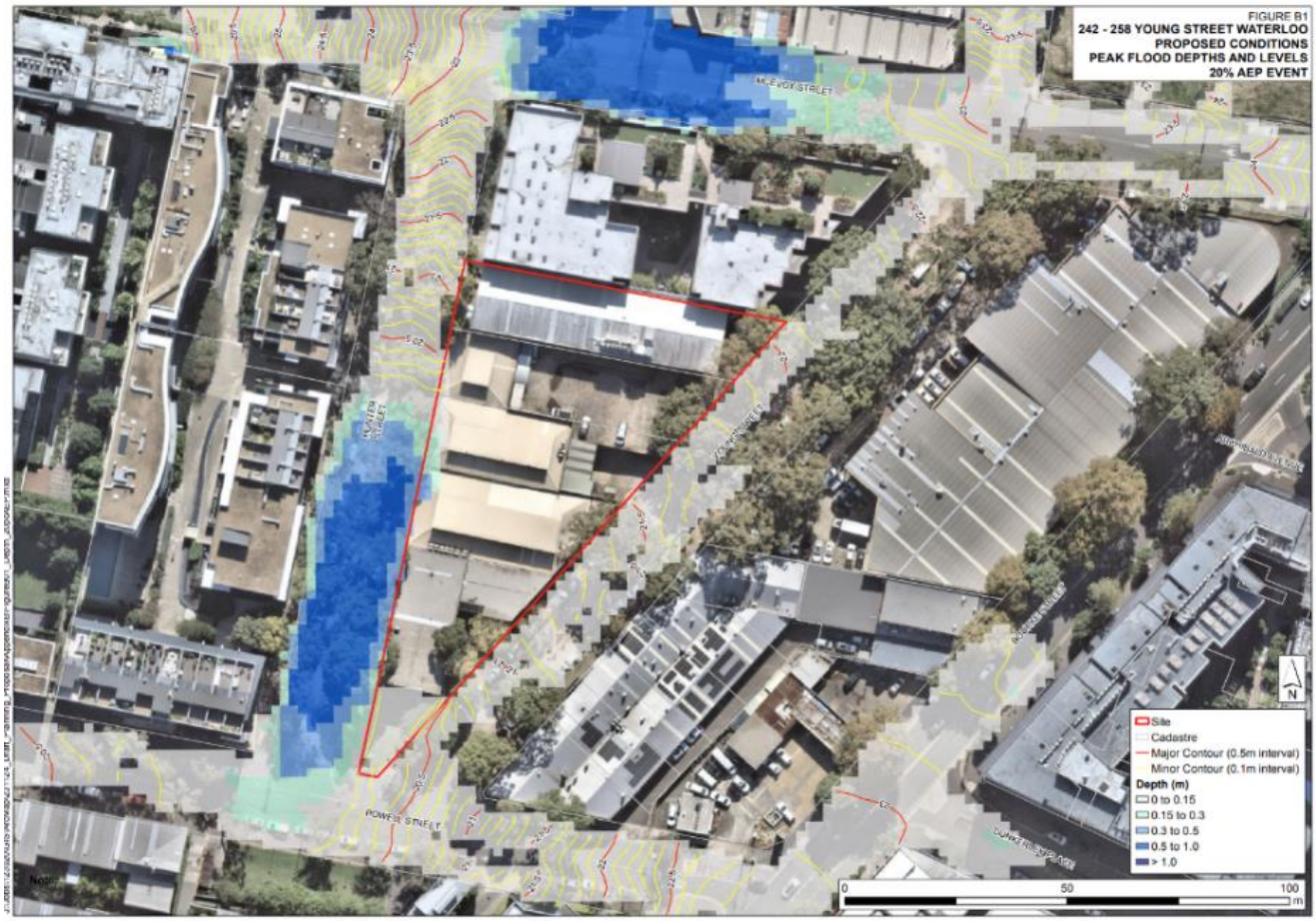
FLOOD EMERGENCY PLAN

The school's flood emergency response plan outlines its procedures for responding to floods that may occur in this location within two hours.

20% AEP Event

Flood likelihood is measured by Annual Exceedance Probability (AEP). A 20% AEP flood has a 20 in 100 chance of occurring in any given year. The school can be evacuated to an off-site emergency evacuation point during a 20% AEP flood event as the considered risk is acceptable.

20% AEP flood **Figure 33.**

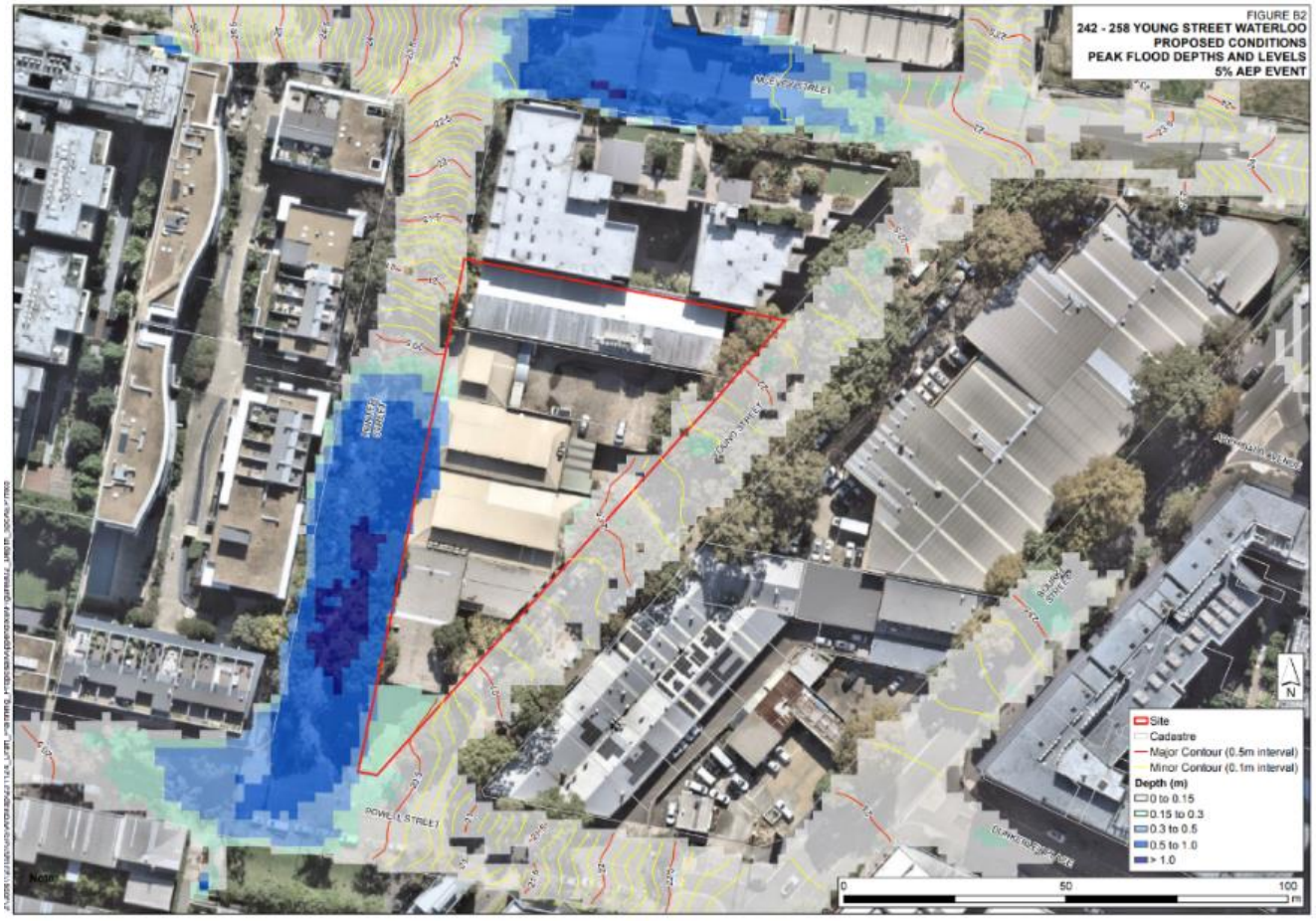


Source from WMA Water

5% AEP Event

Flood likelihood is measured by Annual Exceedance Probability (AEP). A 5% AEP flood has a 5 in 100 chance of occurring in any given year. The school can be evacuated to an off-site emergency evacuation point during a 5% AEP flood event as the considered risk is acceptable.

5% AEP flood **Figure 34.**

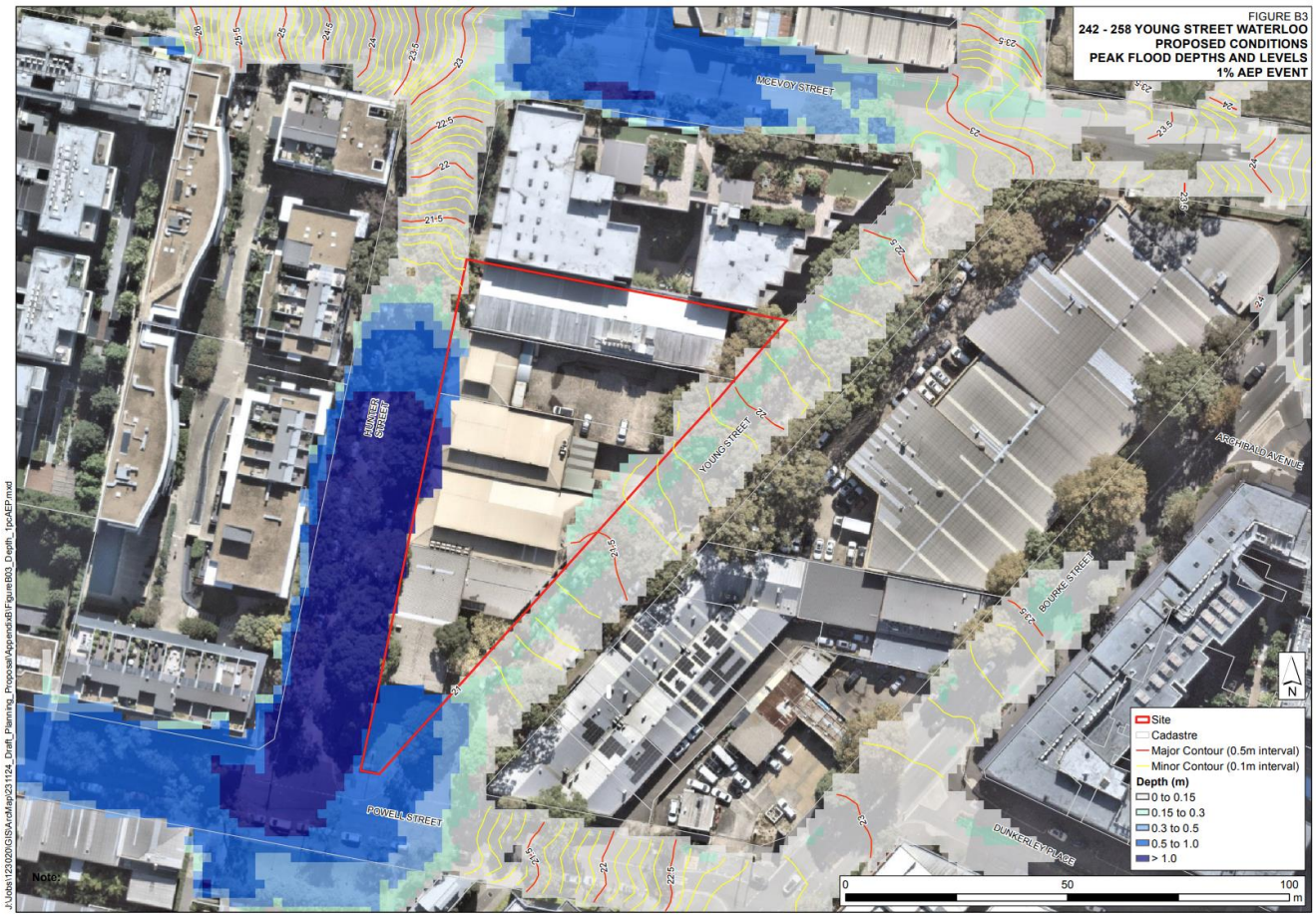


Source from WMA Water

1% AEP Event

Flood likelihood is measured by Annual Exceedance Probability (AEP). A 1% AEP flood has a 1 in 100 chance of occurring in any given year. It is imperative that everyone 'Shelters-In-Place' inside the school until the floodwaters have subsided and it is safe to evacuate. The school can be evacuated to an off-site emergency evacuation point during a 1% AEP flood event as the considered risk is acceptable.

1% AEP flood **Figure 35.**

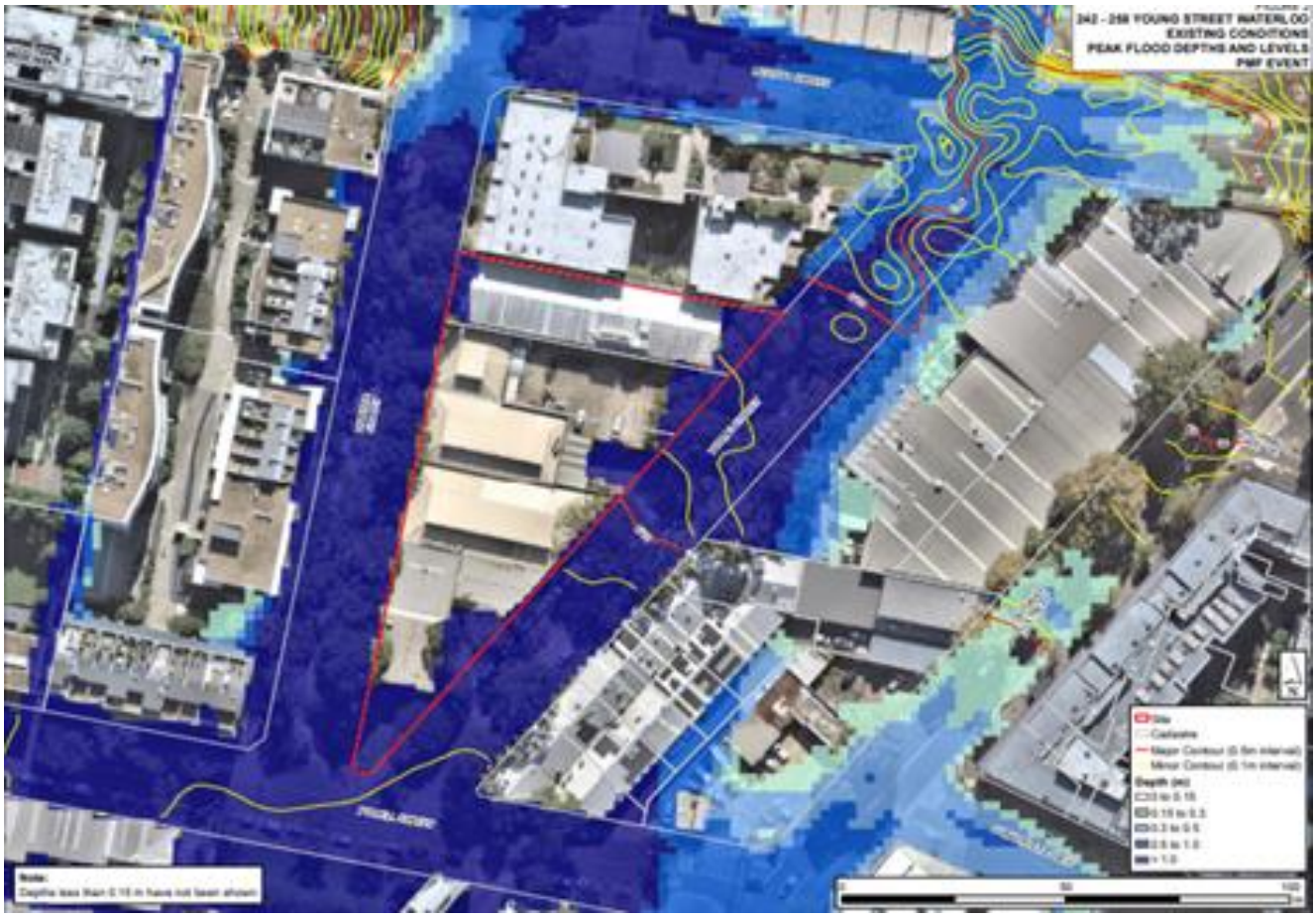


Source from WMA Water

PMF EVENT

If a Possible Maximum Flood (PMF) occurs, the school will be isolated for approximately two to four hours as McEvoy Street, Hunter Street, Powell Street, and Young Street surrounding the school will be flooded. This presents a level five hazard, making it unsafe for people and vehicles to evacuate from the school as there will be no safe way to do so. Additionally, there will be no effective flood access. It is imperative that everyone 'Shelters-In-Place' inside the school until the floodwaters have subsided and it is safe to evacuate to an off-site emergency evacuation.

PMF flood **Figure 36.**



Source from WMA Water

FLOOD EMERGENCY RESPONSE PLAN

This emergency response plan outlines a 'shelter-in-place' strategy that will be put into action until it is considered safe for the school to be evacuated. The school principal will initiate the flood management plan in response to flood warnings received from the Bureau of Meteorology (BOM) and other local sources of information.

FLOOD PRIMARY REFUGE/ EMERGENCY ASSEMBLY POINT

In a flood emergency, the first, second and third floors' libraries are the primary refuge/ shelter in place. Once everyone is accounted for, students, staff, visitors and contractors will remain in these locations as part of the 'shelter-in-place' strategy until it is safe to leave via the main assembly point on Hunter Street.

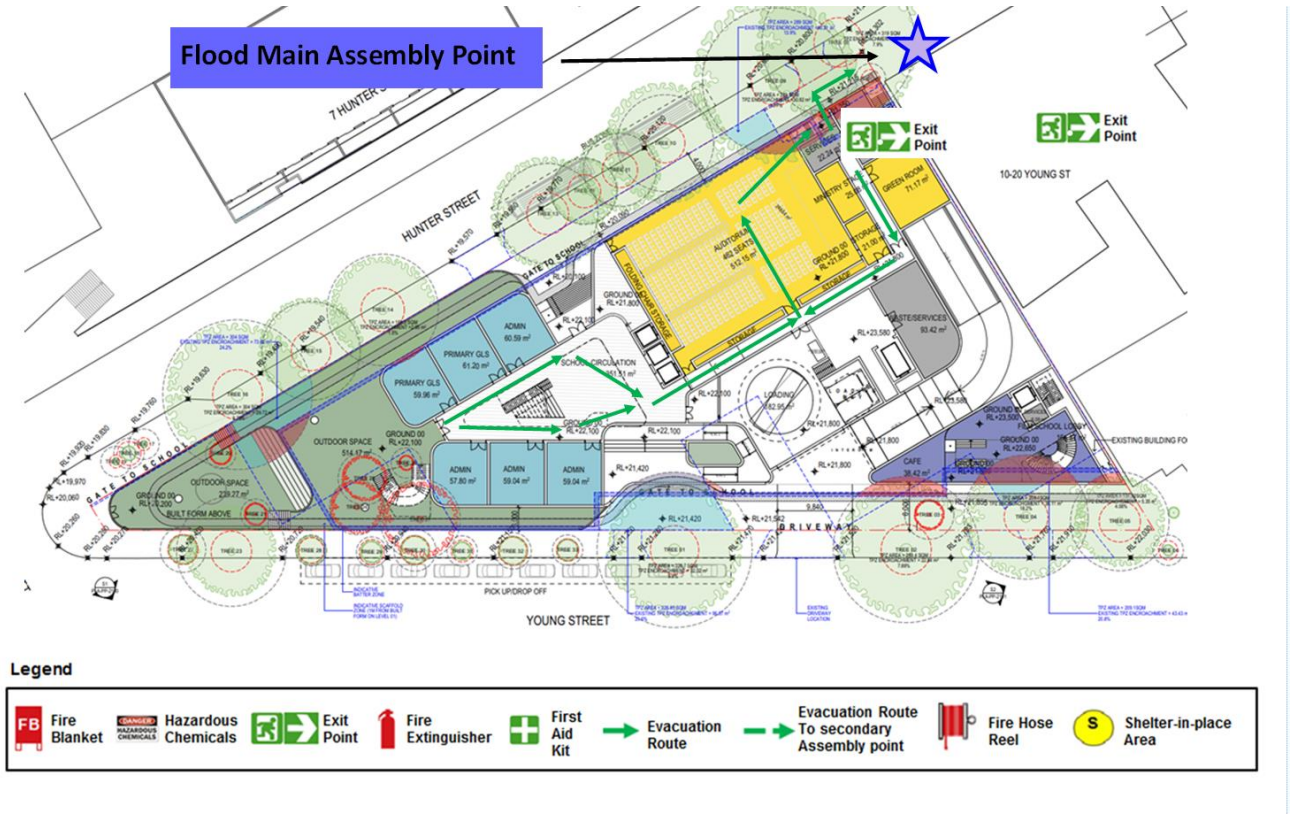
EMERGENCY EVACUATION POINT

For a safe evacuation of the school premises, everyone, including students, staff, visitors and contractors, must head north along Hunter Street and then turn west on McEvoy Street. The park on the corner of Elizabeth Street and McEvoy Street is designated as the off-site emergency evacuation point for flooding events. This is where the school will coordinate with first responders and student pick-up points.

SITE MAP

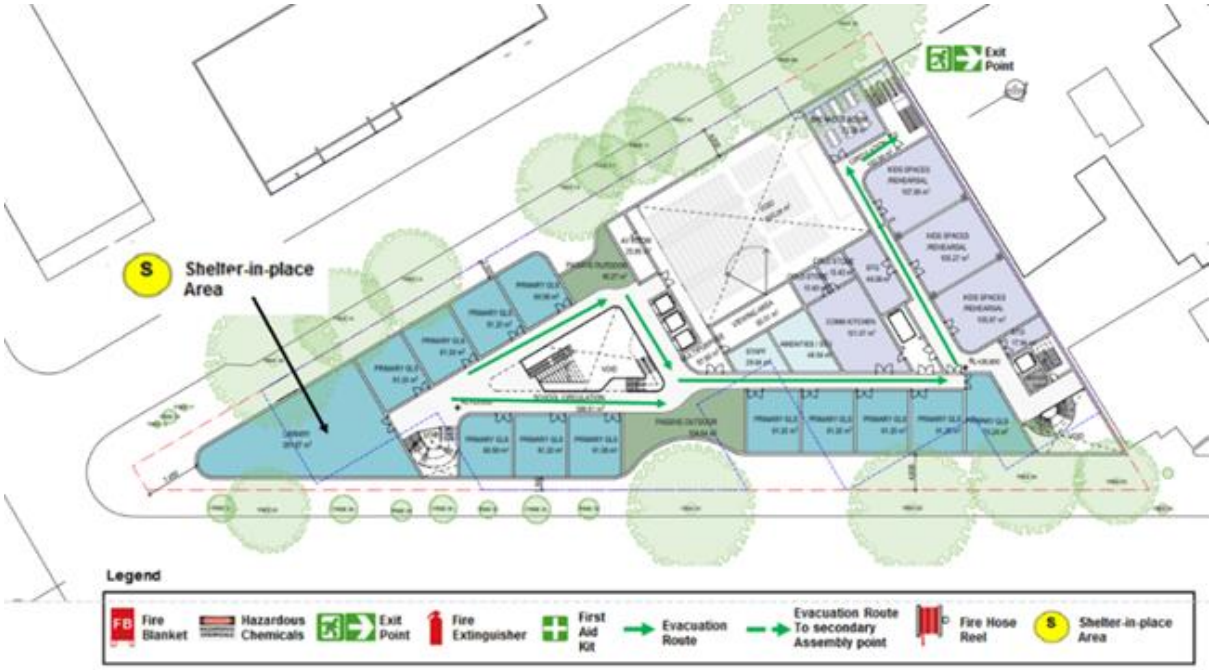
The floor plans below display the primary refuge/emergency assembly points for flood events only, as well as the shelter-in-place location on the school campus.

Ground Floor **Figure 37.**



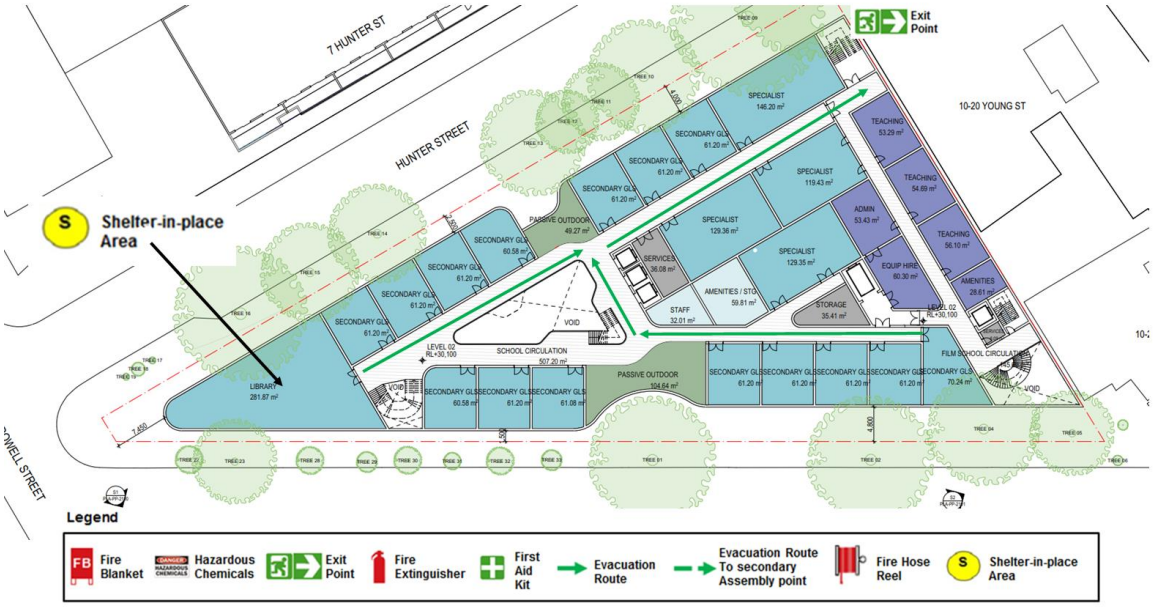
Floor plan from Plus Architecture

First Floor **Figure 38.**



Floor plan from Plus Architecture

Second Floor **Figure 39.**



Floor plan from Plus Architecture

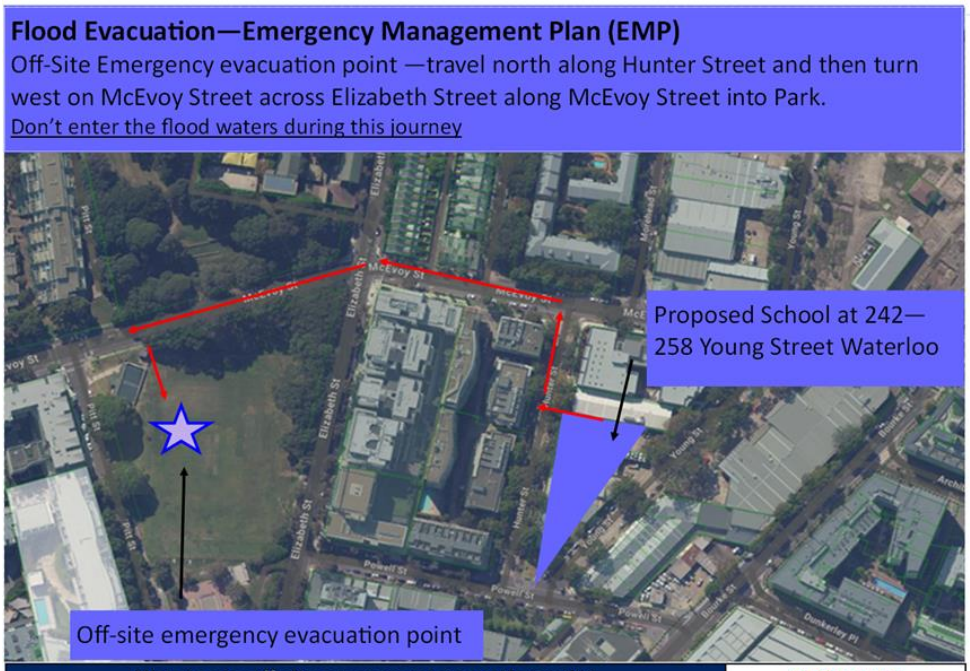
Third Floor **Figure 40.**



Floor plan from Plus Architecture

AREA MAP

The area map below shows the location of the school and its flood off-site emergency evacuation point **Figure 41.**



Source: Nearmap

FLOOD EMERGENCY RESPONSE PLAN SCHOOL PERSONNEL

The table below outlines the responsibilities of school personnel during a flood emergency event **Table 3**

Staff	Location	Responsibilities
Chief Flood Warden – Principal	**At School**	**On-Site Organise flood management drills for school and staff not less than yearly.** **Register duty phone for Early Warning Network and Dipstick (if recommended to be installed).** **Decide if evacuation is required (only in an emergency).** **Decide when it is safe for on-site persons to leave after a flood event.** **Liaise with emergency services when they attend the site.**
First Aid Officer Deputy Principals Teachers	**At School**	**Prepare and maintain a Flood Emergency Kit.** **Assist in coordinating the movement of limited mobility persons to the assembly points during such times.** **Manage Individual Health Care Plans for students.**
Deputy Chief Flood Warden Deputy Principals	**At School**	**On-Site assist the First Aid Officer where required or fill those responsibilities if that appointee is unavailable.** **Receive text notifications from the Early Warning Network and Dipstick (if recommended to be installed).**
Flood Warden Teachers	**At School**	**Assist the Deputy Chief Flood Warden where required or fill those responsibilities if that appointee is not available.** **Receive text notifications from the Early Warning Network and Dipstick (if recommended to be installed)**
Flood Warden **Teachers**	**At School**	**Maintain calm in students, other staff, visitors, and contractors.** **Know who the flood-relevant appointees are for advice.**
Flood Warden **Teachers**	**At School shelter-in-place points on the First, Second and Third-floor libraries.**	**Assemble students, other staff, visitors, and contractors at the Primary refuge/shelter-in-place points**
Flood Warden **Teachers**	**Flood main assembly point on Hunter Street**	**Move the students, other staff, visitors and contractors by travelling north along Hunter Street to McEvoy Street, along** **Mc Evoy Street across Elizabeth Street and then along McEvoy Street to the off- site emergency evacuation point /pick-up point.**

FLOOD EVACUATION WARNINGS

Below is a list of flood evacuation warnings that may occur during weather events that have the potential to cause flooding near the school. The Bureau of Meteorology (BOM) maintains rainfall gauge stations in Sydney. They provide information to assist in flood warning systems.

The BOM issues five warnings through various methods.

- Television
- Radio
- Websites
  - http://www.bom.gov.au/
  - http://www.bom.gov.au/nsw/warnings/
- In addition to this, the SES may issue warnings in the form of:
- Bulletins
- Evacuation Warnings or Evacuation Order
- Hazzard near me mobile phone app

WARNING TYPES

Severe Weather Warning

The BOM issues warnings for severe or dangerous weather that is not limited to severe thunderstorms, tropical cyclones, or bushfires. These warnings are given when there is severe weather in an area, or it is expected to develop or move into an area.

Severe Thunderstorm Warning

The Bureau of Meteorology issues warnings to alert communities of the potential threat of severe thunderstorms.

Flood Alert/Watch/Advice

If there is an expected flood-producing rainfall, a flood alert, watch, or advice will be issued to provide an early warning of possible flooding.

Generalised Flood Warning

A generalised flood warning will be issued if expected flooding occurs in a particular area. As per the "Service Level Specification for Flood Forecasting and Warning Services for New South Wales - Version 2.0" (Bureau of Meteorology, 2013), there will be a three-hour warning time from the issuance of the warning to the peak flood level. This is the most probable warning type that will be used for the subject site in the event of an evacuation.

Minor/Moderate Flood Warning

Additional information may be considered to issue a more specific flood warning. It is expected that three hours of warning time will be given from the moment the warning is issued until the flood reaches its highest level. Monitoring of the real-time water level data of rivers and harbours is available on the Bureau of Meteorology website. This information is available at http://www.bom.gov.au/nsw/flood/.

All warnings will be issued through the website, radio and television.

Radio frequencies

ABC Sydney (702AM, 92.9FM, 206.352MHz digital), Triple J (105.7FM), 2DayFM

(104.1FM), Triple M (104.9FM), Nova (96.9FM), KIIS (106.5FM), 2GB (873AM), 2UE (954AM).

All public and commercial television stations should broadcast warnings.

SES Flood Bulletins

The SES may issue a bulletin with flood information and recommended actions.

Evacuation Warning

The SES or Police may issue an evacuation warning, which provides advance notice to prepare for evacuation.

Evacuation Order

The SES will issue an evacuation order if evacuation is necessary. If an evacuation is ordered, it must be carried out. The evacuation order will be broadcasted through various channels such as radio/TV, door knock, automated telephone message or SMS.

Equipment.

Early Warning Network Automated Text and Email Service

The property can sign up for automatic alerts through the Early Warning Network (www.ewn.com.au). These alerts will filter the BOM warnings mentioned above and send notifications via text or email to the Chief Flood Warden or property owners.

On-Site Emergency Tone

The PA system will have an uninterrupted power supply and will be configured to sound an emergency tone, which means that all visitors, staff, and students should gather in the designated assembly points, namely the Ground Floor Multi-Purpose Hall and the First Floor Library, under the guidance of the staff and flood wardens. The emergency tone will be tested during every drill or once a term. In the event of an emergency, if the tone is not operational, an air horn and a handheld loudspeaker are available in the Flood Emergency Kit.

Dipstick Flood Alert System

The Dipstick Flood Alert System by Tuftec (http://tuftec.com.au) acts as a failsafe to notify stakeholders on-site, should no flood warnings be issued by the Bureau or SES. This device is designed to sense when water reaches a predetermined level and send a text alert, along with the rate of rise, to nominated parties, including the Council and all Flood Wardens.



Dipstick Flood Alert System **Figure 42.**

Flood Depth Gauge

This is a manual system where the flood depth is shown on a depth gauge and markings can be made to determine flood severity, such as a 100-year or 50-year event.

Rain Gauge

Both electronic and manual systems will be installed in open spaces to record rainfall at the school.

For any questions or comments, please contact Bruce Litchfield on 0448 820 587.

Attachment A11

Site Specific Flood Study

FLOOD ASSESSMENT FOR PLANNING PROPOSAL FOR 242-258 YOUNG STREET WATERLOO

FINAL REPORT



wma water

JANUARY 2024

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FLOOD ASSESSMENT FOR PLANNING PROPOSAL FOR 242-258 YOUNG STREET WATERLOO

FINAL REPORT

JANUARY 2024

Project Flood Assessment for Planning Proposal for 242-258 Young Street Waterloo	**Project Number** 123020
Client Sustainable Development Group	**Client's Representative** Richard Huynh
Authors Michael Reeves	**Verified By** Michael Reeves
Date 18 January 2024	**Status** Final Report

Revision	Description	Distribution	Date
1	Draft Report	Sustainable Development Group	Nov 2023
2	Final Report	Sustainable Development Group	Dec 2023
3	Final Report (updated plans)	Sustainable Development Group	Jan 2023

FLOOD ASSESSMENT FOR PLANNING PROPOSAL FOR 242-258 YOUNG STREET WATERLOO FINAL REPORT

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Appendix B

Figure B1: Proposed Conditions Flood Depth and Level – 20% AEP Event
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Appendix C

Figure C1: Proposed Conditions Change in Peak Flood Level – 20% AEP Event
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1. INTRODUCTION

1.1 Background

This flood assessment report is submitted to the Council of the City of Sydney (Council) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
    - 45 GLS, 13 specialist / classrooms
    - A multi-purpose hall / auditorium
    - A library
    - A canteen
    - Administration, lobby and circulation spaces
    - An active green roof
    - A basement including 60 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543 m^2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
    - 10,608 m^2 education floor area
    - 2,935 m^2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978 m^2.

1.2 Site Location and Context

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4 km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611 m^2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118 m along Hunter Street, 137 m along Young Street and 4.3 m along Powell Street. The topography of the site generally falls in an east to west direction.

The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.

An aerial photo of the site is shown in Diagram 1.



Diagram 1: Site location (*Source: Nearmap + Ethos Urban*)

1.3 Catchment Description

The site is within the Alexandra Canal catchment, for which WMAwater completed the *Alexandra Canal Catchment Flood Study Model Update – ARR2019 Hydrology* for City of Sydney (Reference 1). This report documents a site-specific flood assessment using information from the catchment-wide study, for the purposes of this planning proposal.

There is a catchment area of approximately 200 ha that drains to the streets surrounding the site (noting that not all of the catchment directly drains to the site due to a number of sag points that store water, the complex underground stormwater network and diversion of flow paths along different streets in different events). There are two trunk drains that run under Hunter Street and Young Street past the site. The main drain is under Young Street and consists of a 3000 mm (W) x 1800 mm (H) box culvert. At Powell Street (the apex of the site), the trunk drain continues west along Powell Street. There are also twin 600 mm diameter pipes under Hunter Street. A single 600 mm diameter pipe continues west from Hunter Street and joins the main box culvert on Powell Street. The trunk drain discharges into an open channel on the downstream side of Wyndham Street. This open channel combines with the Sheas Creek open channel which then discharges into the upstream end of Alexandra Canal.

In general, overland flow from Euston Road (to the north of the site) flows along Hunter Street and Young Street in a southerly direction. Water can also pond on Euston Road at a sag point between Hunter Street and Young Street. There is a substantial sag point on Hunter Street adjacent to the site. This receives flow from Hunter Street and also Young Street as it rounds the apex of the site via Powell Street. The sag point can only drain via the 600 mm diameter pipe, or when the flood

depth is large enough to overtop the crest level at the western end of Powell Street. Overflow can then continue down Elizabeth Street as it flows toward Alexandra Canal. The depth of ponding on Hunter Street would need to be approximately 1.5 m in order to activate the overflow to Elizabeth Street.

The study area topography and stormwater network can be seen in Figure 1. Photos around the site can be seen in Photo 1, Photo 2 and Photo 3.



Photo 1: Hunter Street looking south, with the site on the left and the sag point toward the end of the street. *Source: Google Street View, dated March 2021.*



Photo 2: Young Street looking south, with the site on the right. *Source: Google Street View, dated March 2021.*



Photo 3: Powell Street looking west, with the apex of the site on the right, and sag point overflow point located at the end of the road. *Source: Google Street View, dated March 2021.*

The site is considered to be flood prone and hence flood-related development controls apply to the site.

2. AVAILABLE FLOOD INFORMATION

2.1 Source of Flood Information

Flood information used in this assessment is based on the Alexandra Canal Catchment Flood Study Model Update – ARR2019 Hydrology (Reference 1). This is the most up-to-date flood modelling available for the Alexandra Canal catchment which covers the site. Further details regarding the flood modelling can be found in Reference 1.

2.2 Existing Flood Behaviour

The site is subject to overland flooding from both Hunter Street and Young Street. The overland flows are typically shallow (less than 0.2 m deep) up to and including the 1% AEP event. These flows, however, are deep enough to overtop the gutter and affect the site. The main flood risk for the site, however, is due to ponding at the sag point on Hunter Street adjacent to the site. When this ponding is deep enough, it affects a large portion of the site fronting Hunter Street and even extends across Powell Street and up Young Street. In the PMF event, flood water 1 m to 4 m deep surrounds the site, due to both ponding at the sag point but also significant catchment flows from McEvoy Street. A summary of the peak flood depths and levels at the Hunter Street sag point from the Reference 1 flood model can be found in Table 1, along with flows crossing McEvoy Street toward the site.

Table 1: Peak flood levels and depths at the Hunter Street sag point and peak flows crossing McEvoy Street towards the site

Event	Peak Flood Level[1] (mAHD)	Peak Flood Depth[2] (m)	Peak Flow[3] (m^3/s)
50% AEP	19.88	0.53	0.48
20% AEP	20.15	0.8	0.84
10% AEP	20.32	0.97	1.35
5% AEP	20.51	1.16	1.79
2% AEP	20.68	1.33	2.01
1% AEP	21.05	1.7	3.16
0.5% AEP	21.36	2.01	5.11
0.2% AEP	21.63	2.28	8.58
PMF	23.36	4.01	81.3

1. Sourced from Reference 1 modelling at the Hunter Street sag point
2. Calculated flood depth based on the surveyed surface level of the Hunter Street sag pit
3. Peak overland flows crossing McEvoy Street towards the site

3. PROPOSED DEVELOPMENT

The proposed development consists of multi-storey school building. The proposed building contains basement carparking accessed via Young Street and a loading dock. The ground level of the building can be accessed via both Hunter Street and Young Street and contains administration offices and a large auditorium. There are outdoor play spaces at the apex of the site. The facilities such as the auditorium will have a dual function and be used by community groups on the weekend. At the north-east corner of the building there is a film school and café. The proposed building comprises most of the site, although this is consistent with the existing use

of the site, where the industrial and commercial buildings comprise the majority of the site. The proposed ground floor plan is shown in the attachment.

4. FLOOD-RELATED DEVELOPMENT CONTROLS

The site is identified as being flood prone under Clause 7A(1) and Clause 7A(2) of Schedule 4 of the *Environmental Planning and Assessment Regulation 2000*, and is subject to flood-related development controls. Relevant flood considerations include:

a) Flood planning levels for the site are to be determined in accordance with the *Sydney Local Environment Plan* (Reference 2) and *Sydney Development Control Plan 2012* (Reference 3), and based on flood modelling results from previous catchment-wide flood investigations (discussed above); and
b) The development will also need to comply flood-related development controls specified in the *City of Sydney Interim Floodplain Management Policy* (Reference 4).

City of Sydney's *Interim Floodplain Management Policy* (Reference 4) documents the requirements for the management of flood risk for all new developments within the local government area (LGA). City of Sydney has a responsibility to manage floodplains and ensure that any:

- New development will not experience undue flood risk; and
- Existing development will not be adversely affected through increased damage or hazard as a result of any new development.

The Flood Planning Level (FPL) requirements specify the minimum floor levels required for buildings and depends on the type of flooding experienced on the site and type of development. The site is subject to 'mainstream' flooding and can be classified as a 'school'. The FPLs applicable to the site are specified in Table 2.

Table 2: Flood Planning Levels (from City of Sydney Interim Floodplain Management Policy)

Development	Type of Flooding	Requirement	Comment
Schools	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood level + 0.5m	This is considered applicable to all school facilities within the building.
Business	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood level	Applies to the café within the building. Also considered applicable to any general 'lobby' type areas outside of the school facilities.
Below-ground car park	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m or the PMF (whichever is the higher)	This applies to all possible ingress points to the car park such as vehicle entrances and exits, ventilation ducts, windows, light wells, lift shaft openings, risers and stairwells. It is noted that the PMF level dictates the FPL at the site for below-ground

Development	Type of Flooding	Requirement	Comment
			car parks as it is higher than the 1% AEP + 0.5 m.
Above ground enclosed car park	Mainstream or local drainage flooding	1% AEP flood level	Considered applicable for the loading dock.

As outlined in Table 2, there a number of FPLs applicable to the site and a different FPL may apply for each entry depending on the adjacent flood behaviour and use. An assessment of the proposed development is provided in the following sections.

5. FLOOD IMPACT ASSESSMENT

5.1 Existing Flood Model

Flood modelling used for this assessment was taken from the 'Alexandra Canal Catchment – Flood Study Model Update ARR2019 Hydrology' (Reference 1). The 'Ultimate Development' scenario simulated the current day conditions at the time of model development (2019) in addition to approved major developments (precincts and stormwater upgrades) within the catchment. Further details about the flood model can be found in Reference 1.

WMAwater has undertaken some additional modelling within the Alexandra Canal catchment for City of Sydney since this study was finalised. The modelling undertaken for major stormwater upgrades does not affect flood levels at the site and hence the '2019 Ultimate Development' scenario is considered applicable for the site. The study also utilised the latest guidelines – Australian Rainfall and Runoff (ARR) 2019 (Reference 5).

The flood study (Reference 1) undertook a critical duration analysis across the entire catchment and found the 30 minute and 60 minute storms represented flood behaviour across the catchment. The same storms were adopted for this assessment and no changes were made to the hydrologic (DRAINS) modelling. Updates were made to the hydraulic model (TUFLOW), which are described in the following sections.

5.2 Updated Flood Model

The existing flood model was updated with the following features to represent current conditions:

- Inclusion of the latest LiDAR topography from NSW Spatial Services. The LiDAR was captured in May 2020 and better represents the terrain on the roads surrounding the site. Several large trees line McEvoy Street, Hunter Street and Young Street, such that the LiDAR data does not represent the road, gutter and nature strip accurately in several areas. The most recent LiDAR better represents key features such as the gutters, as shown in Diagram 2. The extent of the terrain update is limited to the crest s of McEvoy Street, Hunter Street, Young Street and Powell Street, where the two LiDAR datasets are in good agreement. The gutters were also enforced in the model with breaklines based on

the 2020 LiDAR data, or detailed topographic survey (where available).



Photo 4: At the corner of McEvoy Street and Young Street, looking south-west. *Source: Google Street View, dated May 2022.*

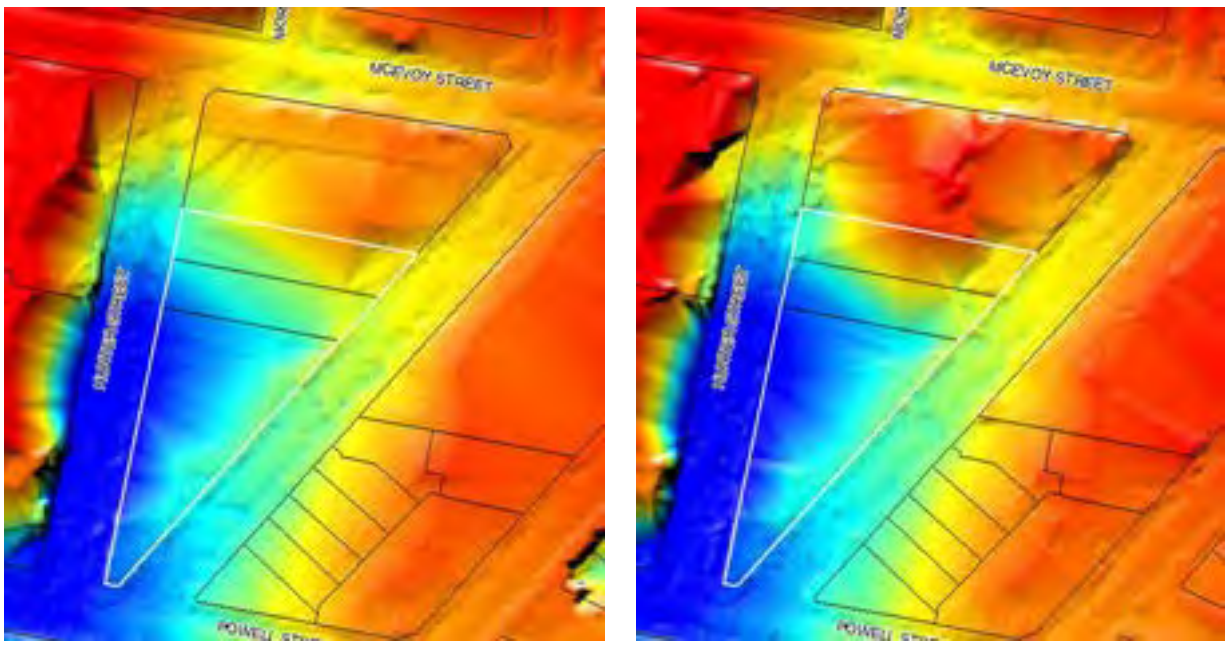


Diagram 2: Comparison of Flood Study LiDAR data (left) and latest 2020 LiDAR data (right)

- Adjustment of the building footprint on the site and inclusion of an undercroft parking area that would be subject to flooding (Photo 5). The parking area terrain was included based on detailed survey of the site.



Photo 5: Undercroft area existing on the site that would be subject to inundation in flood events. *Source: Google Street View, dated March 2021.*

- Minor modification to buildings on McEvoy Street. A small gap exists in the model between the buildings that allows water to enter (Diagram 3). This gap does not exist in reality and was removed from the modelling.

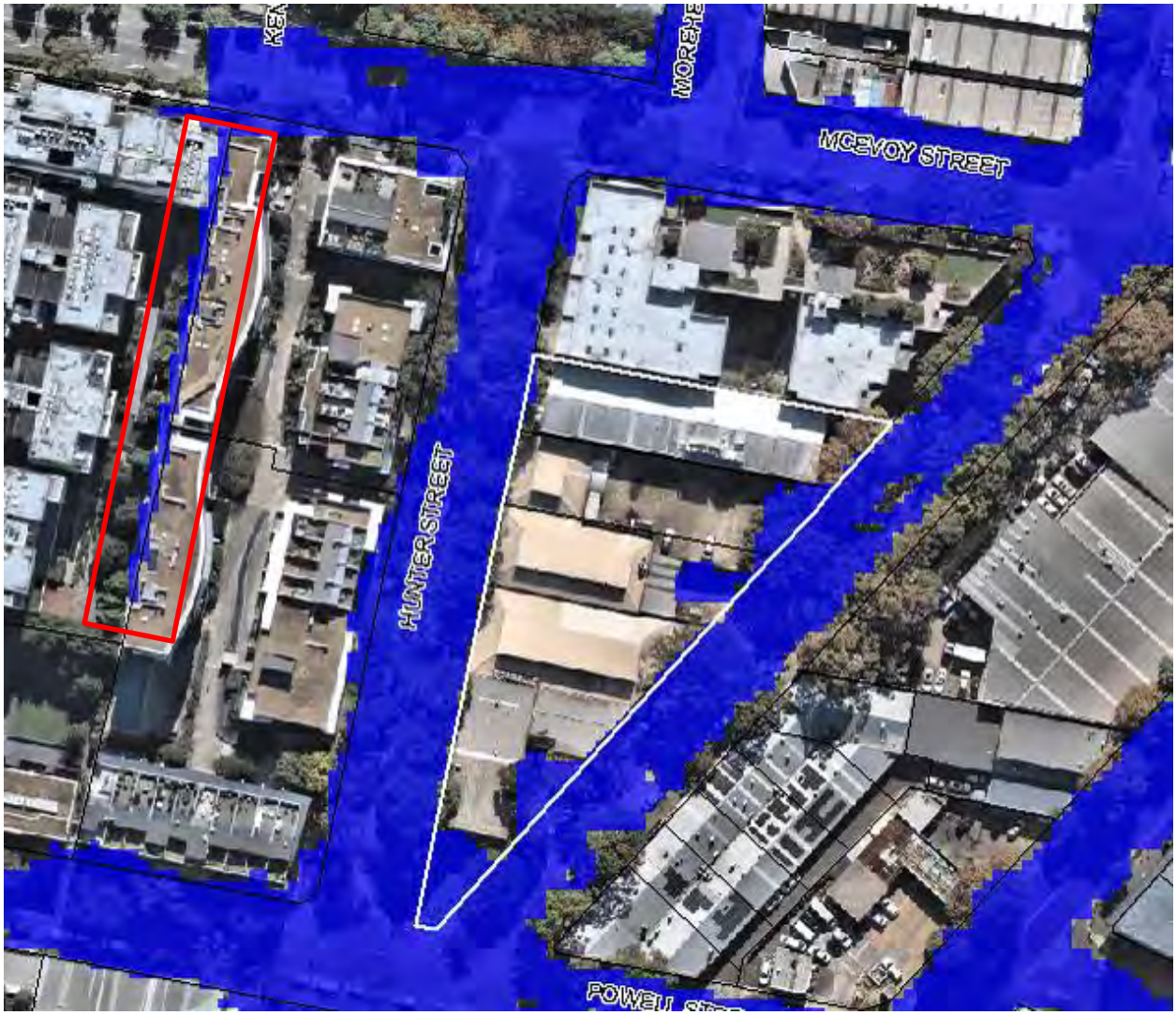


Diagram 3: Flood Study model results showing inundation between buildings on McEvoy Street

The updated model was run for the '2019 Ultimate Development' scenario for the 20% AEP, 5% AEP, 1% AEP and PMF events.

These updates resulted in a change in 1% AEP peak flood levels as follows:

- Increase of 0.03 m on McEvoy Street
- Increase of 0.01 m at the Hunter Street sag point
- Generally reductions in overland flow depths on Young Street, in the range of 0.03 m to 0.08 m

These changes are typically within the accuracy of the flood levels quoted for the purpose of setting floor levels. The overall flood behaviour, as described in Section 2.2, is consistent with the updated model.

The existing conditions flood behaviour with the updated model is shown in the following maps in Appendix A:

- Peak flood depth and level contours in Figure A1 to Figure A4 for the 20% AEP, 5% AEP, 1% AEP and PMF events, respectively;
- Peak velocity in Figure A5 to Figure A8 for the 20% AEP, 5% AEP, 1% AEP and PMF

events, respectively; and

- Hydraulic hazard in Figure A9 to Figure A12 for the 20% AEP, 5% AEP, 1% AEP and PMF events, respectively.

Peak flood depths on Hunter Street and Powell Street remain shallow (less than 0.2 m deep) where overland flow is present adjacent to the site up to and including the 1% AEP event. Ponding occurs at the Hunter Street sag point, however, where ponding in the 1% AEP event affects a portion of Hunter Street adjacent to the site as well as Powell Street. In the PMF event, the Hunter Street sag point causes deep water adjacent to much of the site (in the range of 1.5 m to 4 m deep) in addition to significant overland flows from McEvoy Street.

Peak velocities in the 1% AEP event can exceed 2 m/s on Hunter Street towards the sag point and are typically between 1 m/s and 1.5 m/s along Young Street. Lower peak velocities in the order of 0.5 m/s are evident at the Hunter Street sag point. In the PMF event, velocities are approximately 3 m/s to 4 m/s on Young Street and up to 3.5 m/s on Hunter Street, again with lower peak velocities at the sag point (less than 0.5 m/s).

Australian Rainfall and Runoff (ARR) 2019 (Reference 5) provides information relating to categorisation of flood hazard. A summary of this categorisation is provided in Diagram 4.

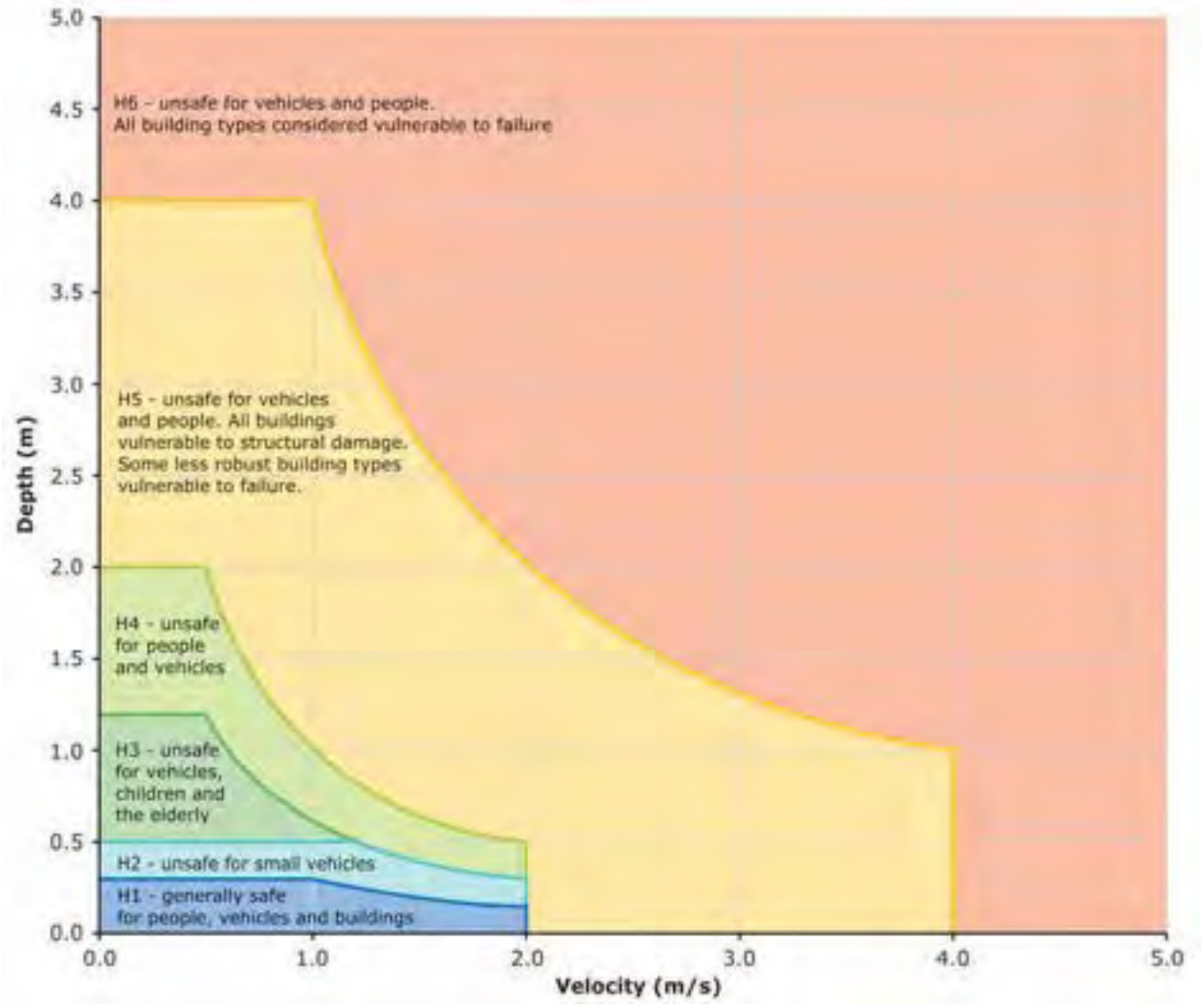


Diagram 4: General flood hazard vulnerability curves (Source: Reference 5)

The flood hazard at the Hunter Street sag point and McEvoy Street sag point is H3 in the 20% AEP and 5% AEP flood events. The remaining areas are subject to H1 hazard. In the 1% AEP event, the McEvoy Street sag point remains H3, but the Hunter Street sag point reaches H4. High velocities in the gutter along Hunter Street upstream of the sag point also trigger H5 hazard. Young Street is still subject to only H1 hazard. In the PMF event, there is H6 hazard along the centre of Young Street and continuing onto Powell Street to the west. The site itself is subject to H5 hazard along each of its open boundaries.

5.3 Flood Impact with Proposed Development

The proposed development was included in the flood model with the following elements:

- Inclusion of the proposed building footprint for the ground level as a solid obstruction, maintaining a consistent representation with buildings in the Flood Study model.
- Inclusion of the proposed outdoor space at the apex of the site, at an elevation of 20.2 mAHD.

Currently, it has been assumed that ground levels within the small area between the building/outdoor space and the boundary will remain as per existing conditions. Although there may be some landscaping in this small area, it will still need to interface with the road reserve and hence levels should remain fairly similar.

The model was run for the same events as outlined in Section 5.2. The proposed conditions flood behaviour is shown in the following maps in Appendix B:

- Peak flood depth and level contours in Figure B1 to Figure B4 for the 20% AEP, 5% AEP, 1% AEP and PMF events, respectively;
- Peak velocity in Figure B5 to Figure B8 for the 20% AEP, 5% AEP, 1% AEP and PMF events, respectively; and
- Hydraulic hazard in Figure B9 to Figure B12 for the 20% AEP, 5% AEP, 1% AEP and PMF events, respectively.

The proposed conditions flood behaviour remains very similar to the existing conditions. Most notably, the proposed driveway is not inundated in events up to the 1% AEP event, with the proposed culvert conveying the 1% AEP flow under the driveway. The carpark also remains flood free in the 1% AEP event.

The results for the proposed conditions were compared with the existing conditions to understand any changes to the flood behaviour that may arise as a result of the development. The change in peak flood level is shown in Appendix C in Figure C1 to Figure C3 for the 20% AEP, 5% AEP and 1% AEP events, respectively.

Changes in flood level of more than 0.01 m have been mapped, as changes less than this are considered to be within the precision of the numerical model and data (Reference 6). The results indicate that for the 20% AEP event, there are negligible changes in peak flood level outside of the site. In the 5% AEP event, there is a reduction in flood level at the Hunter Street sag point of

0.05 m and negligible changes elsewhere. In the 1% AEP event, there is a reduction of approximately 0.02 m at the Hunter Street sag point. On Young Street, there is a change in the flood level profile down the street, due to the change in the building footprint. The areas of flow path widening and narrowing change with the proposed building footprint that result in a localised area where the flood level increases by up to 0.02 m. A flood level profile along Young Street is shown in Diagram 5 that demonstrates this small localised increase (around chainage 110 m). This impact due to a slight change in the flow regime is considered to be acceptable.

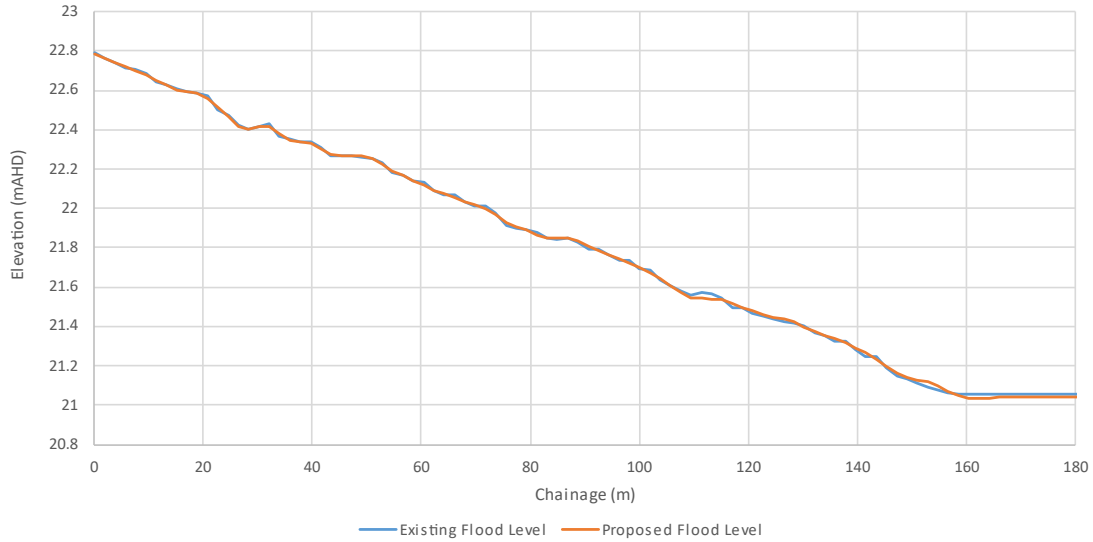


Diagram 5: Flood level profile for the 1% AEP existing and proposed conditions along Young Street

6. PROPOSED FLOOR LEVELS

The proposed floor levels have been designed to accommodate the flooding around the site. A summary of the proposed finished floor level (FFL) and FPL for all entry points around the site is provided in Table 3. The location of each entry point is shown in Figure 4.

It is noted that there are lifts in the main lobby of the school. Only two of these are accessible from the ground floor, and these lifts only go to upper levels. The third lift, which goes to the basement, is only accessible from upper levels. Hence these lifts protect the basement from inundation up to and including the PMF. All entry points comply with the required FPL.

Table 3: Floor level compliance with flood planning levels

ID[1]	Entry	Requirement	Applicable Flood Level[2]	FPL[2]	FFL[2]	Comment
1	Fire Stairs	N/A	N/A	N/A	N/A	No requirement. Fire stairs only to upper levels and need to interface with surrounding ground levels.
2	Auditorium	1% AEP + 0.5 m	21.15	21.65	21.80	Complies. Entry is at 21.25, but rises to 21.8. Also provides access to storage areas.
3	Main School Entrance (Hunter St)	1% AEP + 0.5 m	21.05	21.55	22.10	Complies. Elevated entry to main school foyer and administration offices.
4	Entry from outdoor space	1% AEP + 0.5 m	21.20	21.70	22.10	Complies. Based on nearest flood level on Young Street. Upper level of outdoor space also at 22.1.
5	Outdoor space (lower level)	N/A	N/A	N/A	20.20	No requirement for outdoor space. At a lower level to provide activation with street. Protected from inundation from Hunter Street sag point up to and including the 20% AEP event if shallow overland flows from Young Street are prevented from entering the space.
6	Main School Entrance (Young St)	1% AEP + 0.5 m	21.60	22.10	22.10	Complies. Elevated entry to main school foyer and administration offices.
7	Café	1% AEP	21.95	21.95	21.95	Complies. Based on commercial floor level requirement.
8	Film School Entry	N/A	N/A	N/A	21.80	Complies. This is only proposed to be an entry point to the film school that interfaces with the surrounding ground, with no proposed functional use. Once inside the building, the floor rises to 22.65 for the main lobby area (point 10 below).
9	Basement stairs	PMF	23.58	23.58	23.58	Complies. Basement entry protected to the maximum PMF level on Young Street.

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ID[1]	Entry	Requirement	Applicable Flood Level[2]	FPL[2]	FFL[2]	Comment
10	Film School Lobby	1% AEP	21.95	21.95	22.65	Complies. Based on commercial/non-habitable floor level requirement.
11	Basement lift	PMF	23.58	23.58	23.58	Complies. Basement entry protected to the maximum PMF level on Young Street.
12	Loading dock	1% AEP	21.80	21.80	21.80	Complies. Loading dock at the 1% AEP flood level on Young Street.
13	Basement vehicle entrance	PMF	23.58	23.58	23.58	Complies. Crest level of the basement entry is protected to the maximum PMF level on Young Street.
14	Basement service lift	PMF	23.58	23.58	23.58	Complies. Basement entry protected to the maximum PMF level on Young Street.

1. Locations shown in Figure 4
2. Elevation in mAHD

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7. FLOOD EMERGENCY MANAGEMENT AND EVACUATION

The City of Sydney *Interim Floodplain Management Policy* does not contain explicit flood-related development controls for evacuation or active flood emergency management plans for individual sites. There is a requirement under the performance criteria that proposed development should not increase risk to human life, and there should be adequate consideration of flood access, evacuation and flood readiness.

The flood risk at the site is from urban overland flow along roadways, when rainfall exceeds the capacity of the local stormwater network. Flooding will generally occur quite quickly in response to very heavy rain. Generally, the most effective way to mitigate flood risk to human life in this environment is to ensure that buildings are built to withstand flood forces to enable people to remain indoors during the intense storm events, and to discourage people from attempting to drive or walk through floodwaters. This is best achieved by effective design of the building to ensure it remains flood free without requiring active measures such as the deployment of barriers or flood gates, so that people can remain on site until flooding has subsided. Since flooding around the site will be of short duration, the risks arising from isolation during flooding are low.

Discussion is provided below about emergency management and evacuation considerations for the site.

7.1 Existing Flood Warnings and Response

7.1.1 Bureau of Meteorology flood warning

The Bureau of Meteorology issues quantitative flood warnings for specified forecast locations including expected flood class (major, moderate, minor) and timing of flooding. The Bureau does not cover quantitative flash-flood warnings, defined as rain-to-flood times of less than six hours. The area around the site is subject to flash-flooding and, as such, The Bureau does not issue quantitative warnings for this catchment.

7.1.2 Bureau of Meteorology severe weather warnings

The Bureau of Meteorology issues severe weather warnings whenever severe weather is occurring in an area or expected to develop or move into an area. This includes very heavy rain that may lead to flash flooding. The warnings describe the area under threat and the expected hazards. Warnings are issued with varying lead-times, depending on the weather situation, and can be from one hour to 24 hours or more. The Bureau also issues severe thunderstorm warnings that include thunderstorms producing heavy rainfall which may cause flash flooding.

These warnings are provided for a broad region (for example, the Sydney Metropolitan Area) and do not contain advice at the suburb level.

7.1.3 SES warnings and response

The SES is the legislated Combat Agency for floods and is responsible for the control of flood operations. This includes the coordination of other agencies and organisations for flood management tasks. The SES Local Controller is responsible for dealing with floods as detailed in the State Flood Plan.

Given the flash flood nature of the catchment and the lack of warning time for flooding, the SES is unlikely to mobilise volunteers in the vicinity of the site in anticipation of flooding. The SES will generally only respond to specific calls for assistance in flash flood areas.

7.2 Assessment of Emergency Management Requirements for the Site

It will not be possible in real time during a flood to understand what the peak of the flood will be for this site. This is because:

- the time between the rainfall occurring and flooding occurring is short (generally less than an hour, and possibly as short as 15 minutes for local flash flooding in the road reserves);
- the location of the most intense rainfall bursts for flood-producing storms in small catchments such as this cannot be predicted accurately ahead of time; and
- as a result of the above, there are no formal flood warning systems in place for the catchment (discussed in above Sections).

There will likely be very little warning of flooding, apart from very heavy local rainfall. General warnings about severe storms will be available for the Sydney Metropolitan region provided by the Bureau of Meteorology (BoM) but these will not provide specific information for this site. The operators of the site will not have statutory authority to detain people on-site in the event of flooding. However, by designing the buildings in such a way that they remain safe during flash flooding, people will be encouraged to remain inside until the flood risk in the streets subsides.

7.2.1 Flood Hazard on Site

The peak flood depths on the site are provided in Table 4.

Table 4: Summary of peak flood depths on site

Event	Peak Flood Depth (m)				
	Open space (lower level)	**Ground Floor of School**	**Auditorium**	**Café / Loading Dock**	**Level 1**
Floor level (mAHD)	*20.2*	*22.1*	*21.8*	*21.8 – 21.95*	*26.5*
50% AEP	0.0	0.0	0.0	0.0	0.0
20% AEP	0.0	0.0	0.0	0.0	0.0
10% AEP	0.1	0.0	0.0	0.0	0.0
5% AEP	0.3	0.0	0.0	0.0	0.0
2% AEP	0.5	0.0	0.0	0.0	0.0

Event	Peak Flood Depth (m)				
	Open space (lower level)	Ground Floor of School	Auditorium	Café / Loading Dock	Level 1
1% AEP	0.9	0.0	0.0	0.0	0.0
0.5% AEP	1.2	0.0	0.0	<0.1	0.0
0.2% AEP	1.4	0.0	0.0	<0.1	0.0
PMF	3.2	1.5	1.8	1.8	0.0

The lower level open space at the apex of the site is subject to inundation from the Hunter Street sag point in the 10% AEP event to a depth of 0.1 m. This increases to 0.9 m in the 1% AEP event and 3.2 m in the PMF event. This is the most hazardous area within the site, being only slightly better than the Hunter Street sag point itself. This is, however, open space with access to the ground floor. The ground floor and auditorium will remain flood free in events up to and including the 0.2% AEP event. In the PMF event, however, the ground floor will be inundated by approximately 1.5 m of water and the auditorium by 1.8 m of water. The café and loading dock area fronting Young Street are protected up to the 1% AEP event. In the 0.5% and 0.2% AEP events, shallow overland flows from Young Street can be expected to enter these areas, with depths less than 0.1 m. Again, in the PMF event, flood depths at these areas could reach 1.8 m. The first level (and higher levels) of the proposed building will remain flood free in all events up to and including the PMF event. The basement will also remain flood free up to and including the PMF event.

While the building will remain safe up to and including the 0.2% AEP event, the ground floor will experience hazardous inundation in the PMF event.

7.2.2 Site Access

Due to the location of the site, there are floodwaters on both Hunter Street and Young Street in all events simulated. In the 20% AEP event, the floodwaters at each of the entrances remains H1 and is considered safe for all vehicles and people. The Hunter Street sag point and McEvoy Street sag points reach H3 hazard, which would restrict access routes to and from the site, however, alternative routes are available.

In the 5% and 1% AEP events, the main school entrance on Hunter Street would be subject to H3 hazard due to ponding at the sag point, and unlikely to be accessible as it is unsafe for vehicles, children and the elderly. However, the hazard on Young Street remains H1 and would be accessible, as too would be the northern entrances on Hunter Street (from the auditorium and fire stairs) that are located away from the sag point. In the 1% AEP event the hazard at the Hunter Street sag point reaches H4.

In the PMF event, access to the site would be completely cut off, with the hazard on Young Street and Hunter Street being H5.

7.2.3 Rate of Rise

The site is subject to flash flooding, and as such there will be very little warning of flooding, apart from very heavy local rainfall. Not only will there be effectively no warning time, but there will be no way of accurately predicting the duration of flooding or the extent of flooding. For example, it will not be known how high the ponding at the Hunter Street sag will get to in an intense storm event.

The rate of rise of floodwater at the site can be extremely quick. From the adopted 30 minute and 60 minute critical duration storms, the rate of rise of floodwater at the Hunter Street sag point was analysed, with the results shown in Diagram 6. The rate of rise of the 1% AEP 30 minute storm event may be as quick as 7 cm per minute, with the peak flood level being reached in just 37 minutes. It can be seen that the 1% AEP 60 minute storm actually produces a higher flood level, but with a longer response time. The rate of rise for the 60 minute storm can be up to 4 cm per minute, with the peak flood level being reached in 85 minutes. This demonstrates the variable nature of storm events and the response of flash flooding. At the time of the storm, there would be no way of predicting what the water level hydrograph at the Hunter Street sag point would look like. For storms up to the 0.2% AEP, however, the building ground floor will remain flood free.

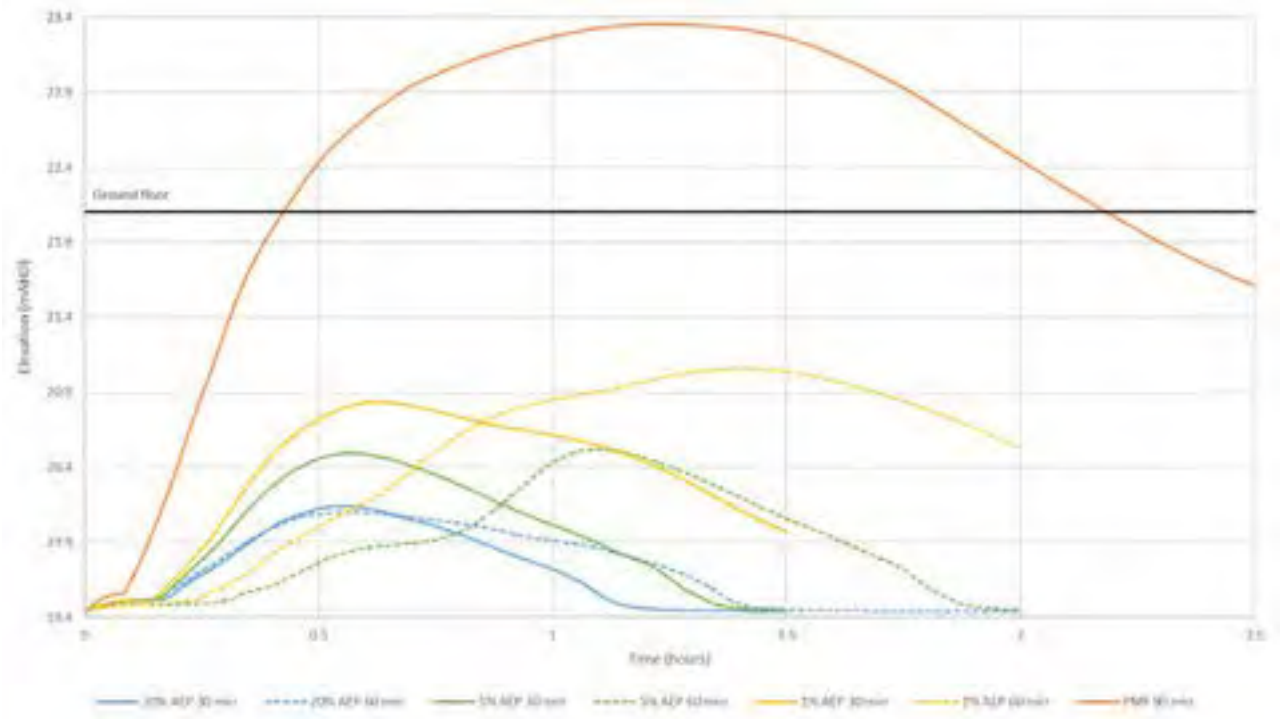


Diagram 6: Rate of rise of floodwater at the Hunter Street sag point

It is in an extreme storm event that the ground floor (of the main school building) would be inundated and this is the primary concern for the site. In the 90 minute probable maximum precipitation (PMP) storm event that produces the critical PMF at the site. This storm event can cause a rate of rise at the Hunter Street sag point of up to 15 cm per minute. The ground floor of the building would be reached in just 25 minutes from the onset of the storm. It would only take a further 8 minutes to reach 0.5 m deep above the ground floor, or 23 minutes to reach 1 m deep above the ground floor. This is a rapid rate of rise that requires a fast response. It is recognised

that the storm could be of a shorter duration (for example 30 minutes or 60 minutes), which could result in a faster rate of rise but lower peak flood level.

7.2.4 Flood Response Options

There are two flood response options available for the site:

1. Evacuation of the building to an off-site location
2. 'Shelter in place' within the building by undertaking 'vertical evacuation'

Evacuation of the building to an off-site location requires consideration of the following:

- A trigger level to initiate evacuation. This may consider factors such as rainfall depths, rainfall rates, rate of rise of floodwater or level of floodwaters.
- Evacuation location. It is understood that the muster point for the evacuation of the building in the event of an emergency is Waterloo Oval, located approximately 250 m from the site (see Figure 1). The oval is flood-free in all events.
- Evacuation route. The route to Waterloo Oval should be from the Hunter Street entry point north along the footpath to McEvoy Street, and then west to the corner of McEvoy Street and Elizabeth Street where the oval is located. The sag points on Hunter Street and McEvoy Street should be avoided. It is recognised that this route may be subject to shallow overland flows that will need to be traversed to reach the oval, depending on the magnitude of the event and the progression of flooding at the time of evacuation.
- Time to evacuate. Evacuation of a building requires a coordinated effort that takes time to action. Consideration would also need to be given to the nature of the building use as a school facility, where evacuation may take longer with the coordination of students. The trigger level should be selected to provide enough time to evacuate the entire site before flooding becomes hazardous. Evacuation of the building should be completed before the ground level of the building is inundated, and before the route becomes hazardous.
- Given the flash-flooding nature of the site, evacuation would likely take place while there is heavy rainfall and low visibility. This adds further hazards to the evacuation process.

'Shelter-in-place' within the building through 'vertical evacuation' requires consideration of the following:

- A trigger level to initiate evacuation. This may consider factors such as rainfall depths, rainfall rates, rate of rise of floodwater or level of floodwaters.
- Refuge space required for evacuation to upper levels. The upper levels of the building should contain the space and resources required to support all occupants of the building for the duration of the flood (potentially several hours).
- Evacuation route. Evacuation of the ground floor via stairs is the most reliable route, given the potential for power outages during extreme flood events or the inundation of lift shafts. The evacuation route should also consider people with accessibility issues.
- Safety of the building. The building should be designed such that it will withstand the forces of floodwater and buoyancy so that the building will remain safe during the event of a flood if it is to be used as a flood refuge.

7.3 Flood Management Plan

It is recommended that a Flood Management Plan be prepared for the site. The plan should include the following:

- Site information
- Flood behaviour
- Actions prior to a flood (preparation)
- Actions during a flood (response)
- Actions following a flood (recovery)

The plan in particular should be clear about the response for the site, since it is subject to flash flooding and inundation can occur with very little warning. Allocation of responsibilities should also be clear so that a response can be actioned as soon as it is required. The Flood Management Plan can be developed as part of a wider Emergency Management Plan, which is a legal requirement under the Education and Care Services National Regulations.

8. CONCLUSION

The flood modelling developed for the Alexandra Canal Catchment Flood Study Model Update – ARR2019 Hydrology (Reference 1) was utilised to inform the flood assessment of the proposed development at 242-258 Young Street, Waterloo. For the purpose of the planning proposal for the site, this flood assessment found that:

- The proposed floor levels meet the City of Sydney's Interim Floodplain Management Policy (Reference 4). This includes school floor levels being 0.5 m above the 1% AEP flood level and basement car parking being protected to the PMF level.
- The proposed building would not have an adverse impact on flood levels for surrounding properties and would not change the flood hazard on the surrounding roads up to and including the 1% AEP event.
- Flood emergency management and evacuation is a key consideration for the site. The upper levels of the building can serve as a flood refuge, providing protection for occupants during the PMF event. Evacuation to Waterloo Oval is also possible if triggered early to avoid potential flood hazards during evacuation. Either response would require a detailed investigation and flood management plan to be put in place given the flash-flooding nature of the site.

9. REFERENCES

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Alexandra Canal Catchment Flood Study Model Update – ARR2019 Hydrology
Prepared for City of Sydney, September 2020

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Local Environment Plan
2012

3. City of Sydney
Development Control Plan
2012

4. City of Sydney
Interim Floodplain Management Policy
May 2014

5. Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors)
Australian Rainfall and Runoff – A Guide to Flood Estimation
Commonwealth of Australia (Geoscience Australia), 2019

6. Engineers Australia
Australian Rainfall and Runoff Revision Project 15:
Two Dimensional Modelling Urban and Rural Floodplains
Department of Climate Change and Energy Efficiency, 2012

ATTACHMENTS

Attachment: Proposed ground floor plan (Plus Architecture, 15/1/2024)

FIGURES

Figure 1: Study Area
Figure 2: Existing Conditions TUFLOW Model Updates
Figure 3: Proposed Conditions TUFLOW Model Updates
Figure 4: Proposed Entry Point Locations



Attachment

492

5 HUNTER ST

7 HUNTER ST

HUNTER STREET

MCEVOY STREET

10-20 YOUNG ST

POWELL STREET

YOUNG STREET

BUS ZONE

4.000

GATE TO SCHOOL

GATE TO SCHOOL

DRIVEWAY

INTERCOM

LOADING BAY

SERVICES 6.09 m²

FILM SCHOOL LOBBY 165.87 m²

EXISTING BUILDING FOOTPRINT

AUDITORIUM 462 SEATS 512.15 m²

FOLDING CHAIR STORAGE

STORAGE

STORAGE 21.00 m²

MINISTRY STAGE 25.06 m²

GREEN ROOM 71.17 m²

SERVICES 22.24 m²

SUBSTATION 41.93 m²

GROUND 00 RL+21,800

GROUND 00 RL+22,100

GROUND 00 RL+20,200

GROUND 00 RL+21,800

ADMIN 60.59 m²

PRIMARY GLS 61.20 m²

PRIMARY GLS 59.96 m²

SCHOOL CIRCULATION 351.51 m²

OUTDOOR SPACE 514.17 m²

OUTDOOR SPACE 239.27 m²

BUILT FORM ABOVE

ADMIN 57.80 m²

ADMIN 59.04 m²

ADMIN 59.04 m²

LOADING 182.95 m²

WASTE/SERVICES 93.42 m²

CAFE 38.42 m²

RESI LOBBY

RESI LOBBY

TREE 01

TREE 02

TREE 03

TREE 04

TREE 05

TREE 06

TREE 07

TREE 08

TREE 09

TREE 10

TREE 11

TREE 12

TREE 13

TREE 14

TREE 15

TREE 16

TREE 17

TREE 18

TREE 19

TREE 20

TREE 21

TREE 22

TREE 23

TREE 24

TREE 25

TREE 26

TREE 27

TREE 28

TREE 29

TREE 30

TREE 31

TREE 32

TREE 33

TPZ AREA = 326.7 SQM
TPZ ENCROACHMENT = 32.32 m²
9.9%

TPZ AREA = 289 SQM
EXISTING TPZ ENCROACHMENT =40.31 m²
13.9%

TPZ AREA = 289 SQM
TPZ ENCROACHMENT =30.92 m²
10.7 %

TPZ AREA = 319 SQM
TPZ ENCROACHMENT =25.42 m²
7.9%

TPZ AREA = 304 SQM
EXISTING TPZ ENCROACHMENT = 73.82 m²
24.2%

TPZ AREA = 304 SQM
TPZ ENCROACHMENT = 29.72 m²
9.78%

TPZ AREA = 168.3 SQM
TPZ ENCROACHMENT =2.65 m²
1.5%

TPZ AREA = 289.4 SQM
TPZ ENCROACHMENT = 22.84 m²
7.89%

TPZ AREA = 209.1SQM
TPZ ENCROACHMENT = 38.11 m²
18.2%

TPZ AREA = 131.9SQM
TPZ ENCROACHMENT = 5.35 m²
4.06%

TPZ AREA = 326.85 SQM
EXISTING TPZ ENCROACHMENT = 96.87 m²
29.6%

TPZ AREA = 209.1SQM
EXISTING TPZ ENCROACHMENT = 43.43 m²
20.8%

INDICATIVE BATTER ZONE

INDICATIVE SCAFFOLD ZONE (1M FROM BUILT FORM ON LEVEL 01)

EXISTING DRIVEWAY LOCATION

PICK UP/DROP OFF

S1 PLA-PP-2100

S2 PLA-PP-2101

S3 PLA-PP-2102

POTENTIAL 285-291 YOUNG ST FUTURE DEVELOPMENT

BOURKE AND YOUNG WOOLWORTHS FUTURE DEVELOPMENT

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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The Builder/Contractor shall verify job dimensions prior to any work commencing. Figured dimensions shall take precedence over scaled work.

PROJECT
242-258 Young Street Waterloo Sydney NSW

DRAWING TITLE
GENERAL FLOOR PLAN - GROUND 00

SCALE		
1:250 @A1		
DATE	PLOT DATE	
15/01/2024	**17/01/2024**	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	**PLA-PP-1000**	**A**



Figures

FIGURE 1
242 - 258 YOUNG STREET WATERLOO
STUDY AREA

WEST STREET
REEVE STREET
KELLICK STREET
GIBSON STREET
WELLINGTON STREET
BRISBANE LANE
KELLICK STREET
MOREHEAD STREET
CRYSTAL ST
POTTER STREET
PITT STREET
JOHN STREET
MEAD STREET
KENSINGTON LANE
KENSINGTON STREET
KENSINGTON MEWS
LACHLAN STREET
MCEVOY STREET
THREAD LANE
Waterloo Oval
HUNTER STREET
YOUNG STREET
TUNG HOP STREET
GADIGAL AVENUE
BRUCE STREET
THE ROPE WALK
SAM SING STREET
ARCHIBALD AVENUE
REED STREET
POWELL STREET
DUNKERLEY PLACE
HATBOX PLACE
HATTER LANE
ALLEN STREET
SHORT STREET
GEORGE STREET
HAWKSLEY STREET
BOURKE STREET
O'DEA AVENUE
ELIZABETH STREET
KINGSBOROUGH WAY
JOYNTON AVENUE
WOLSELEY GROVE
'DSTAND PARADE
A PARK PARADE

N

Site
Cadastre

0 100 200
m

494

Note:

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FIGURE 2
242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
TUFLOW MODEL UPDATES

YOUNG STREET
MCEVOY STREET
HUNTER STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Updated gutter breakline
Updated undercover parking
Updated building outline
Updated LiDAR Elevation (mAHD)
High : 24
Low : 19

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\Figure02_Existing_Model.mxd

FIGURE 3
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
TUFLOW MODEL UPDATES



Note:

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FIGURE 4
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
ENTRY POINTS / FLOORS

1
2
3
4
5
6
7
8
9
10
11
12
13
14

MOREHEAD STREET
MCEVOY STREET
HUNTER STREET
YOUNG STREET
POWELL STREET
ARCHIBALD AVENUE
BOURKE STREET
DUNKERLEY PLACE

N

Site
Cadastre
Proposed Entry Points / Floors

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\Figure04_Entry_Points.mxd

Appendix A Existing Conditions Flood Maps

Figure A1: Existing Conditions Flood Depth and Level – 20% AEP Event
Figure A2: Existing Conditions Flood Depth and Level – 5% AEP Event
Figure A3: Existing Conditions Flood Depth and Level – 1% AEP Event
Figure A4: Existing Conditions Flood Depth and Level – PMF Event
Figure A5: Existing Conditions Velocity – 20% AEP Event
Figure A6: Existing Conditions Velocity – 5% AEP Event
Figure A7: Existing Conditions Velocity – 1% AEP Event
Figure A8: Existing Conditions Velocity – PMF Event
Figure A9: Existing Conditions Hydraulic Hazard – 20% AEP Event
Figure A10: Existing Conditions Hydraulic Hazard – 5% AEP Event
Figure A11: Existing Conditions Hydraulic Hazard – 1% AEP Event
Figure A12: Existing Conditions Hydraulic Hazard – PMF Event



FIGURE A1

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
20% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA01_Depth_20pcAEP.mxd

FIGURE A2

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
5% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

N

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA02_Depth_5pcAEP.mxd

FIGURE A3

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
1% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA03_Depth_1pcAEP.mxd

FIGURE A4

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
PMF EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE
502

26
25.5
25
24.5
24
23.5
24.5
24
24
24.5
24
23.5
23.5
23.5
23.5
24
24

N

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

0 50 100
m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA04_Depth_PMF.mxd

FIGURE A5

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK VELOCITY
20% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site
Cadastre
Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA05_Velocity_20pcAEP.mxd

FIGURE A6
242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK VELOCITY
5% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100
m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA06_Velocity_5pcAEP.mxd

FIGURE A7

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK VELOCITY
1% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site
Cadastre
Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA07_Velocity_pcAEP.mxd

506

FIGURE A8

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
PEAK VELOCITY
PMF EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site
Cadastre
Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA08_Velocity_PMF.mxd

FIGURE A9

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
HYDRAULIC HAZARD
20% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site

Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA09_Hazard_20pcAEP.mxd 5/07

FIGURE A10

242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
HYDRAULIC HAZARD
5% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site

Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA10_Hazard_5pcAEP.mxd

FIGURE A11
242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
HYDRAULIC HAZARD
1% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA11_Hazard_1pcAEP.mxd

FIGURE A12
242 - 258 YOUNG STREET WATERLOO
EXISTING CONDITIONS
HYDRAULIC HAZARD
PMF EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixA\FigureA12_Hazard_PMF.mxd

Appendix B Proposed Conditions Flood Maps

Figure B1: Proposed Conditions Flood Depth and Level – 20% AEP Event
Figure B2: Proposed Conditions Flood Depth and Level – 5% AEP Event
Figure B3: Proposed Conditions Flood Depth and Level – 1% AEP Event
Figure B4: Proposed Conditions Flood Depth and Level – PMF Event
Figure B5: Proposed Conditions Velocity – 20% AEP Event
Figure B6: Proposed Conditions Velocity – 5% AEP Event
Figure B7: Proposed Conditions Velocity – 1% AEP Event
Figure B8: Proposed Conditions Velocity – PMF Event
Figure B9: Proposed Conditions Hydraulic Hazard – 20% AEP Event
Figure B10: Proposed Conditions Hydraulic Hazard – 5% AEP Event
Figure B11: Proposed Conditions Hydraulic Hazard – 1% AEP Event
Figure B12: Proposed Conditions Hydraulic Hazard – PMF Event



FIGURE B1
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
20% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)
Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB01_Depth_20pcAEP.mxd

512

FIGURE B2

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
5% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

0 50 100 m

Note:

513

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB02_Depth_5pcAEP.mxd

FIGURE B3

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
1% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

N

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB03_Depth_1pcAEP.mxd

FIGURE B4

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK FLOOD DEPTHS AND LEVELS
PMF EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

Site
Cadastre
Major Contour (0.5m interval)
Minor Contour (0.1m interval)

Depth (m)
0 to 0.15
0.15 to 0.3
0.3 to 0.5
0.5 to 1.0
> 1.0

N

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB04_Depth_PMF.mxd

FIGURE B5
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK VELOCITY
20% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB05_Velocity_20pcAEP.mxd

FIGURE B6

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK VELOCITY
5% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site
Cadastre

Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB06_Velocity_5pcAEP.mxd

517

FIGURE B7

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK VELOCITY
1% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB07_Velocity_1pcAEP.mxd
518

FIGURE B8

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
PEAK VELOCITY
PMF EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site
Cadastre

Peak Velocity (m/s)
< 0.25
0.25 - 0.5
0.5 - 1.0
1.0 - 1.5
1.5 - 2.0
> 2.0

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB08_Velocity_PMF.mxd

519

FIGURE A9

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
HYDRAULIC HAZARD
20% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site

Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB09_Hazard_20pcAEP.mxd 520

FIGURE B10
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
HYDRAULIC HAZARD
5% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB10_Hazard_5pcAEP.mxd

FIGURE B11
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
HYDRAULIC HAZARD
1% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

522

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB11_Hazard_1pcAEP.mxd

FIGURE B12
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
HYDRAULIC HAZARD
PMF EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre

Hydraulic Hazard

- H1 - Generally safe for people, vehicles and buildings
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for people and vehicles
- H5 - Unsafe for vehicles and people. All buildings vulnerable to structural damage. Some less robust building types vulnerable to failure.
- H6 - Unsafe for vehicles and people. All building types considered vulnerable to failure.

0 50 100 m

Note:

523

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixB\FigureB12_Hazard_PMF.mxd

Appendix C Flood Impact Maps

Figure C1: Proposed Conditions Change in Peak Flood Level – 20% AEP Event
Figure C2: Proposed Conditions Change in Peak Flood Level – 5% AEP Event
Figure C3: Proposed Conditions Change in Peak Flood Level – 1% AEP Event



FIGURE C1
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
CHANGE IN PEAK FLOOD LEVEL
20% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Change in Peak Flood Level (m)
< -0.2
-0.2 to -0.1
-0.1 to -0.05
-0.05 to -0.01
-0.01 to 0.01
0.01 to 0.05
0.05 to 0.1
0.1 to 0.2
> 0.2
No Longer Flooded
Newly Flooded

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\Appendix C\FigureC01_Impact_20pcAEP.mxd
525

FIGURE C2

242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
CHANGE IN PEAK FLOOD LEVEL
5% AEP EVENT

MCEVOY STREET

HUNTER STREET

YOUNG STREET

ARCHIBALD AVENUE

BOURKE STREET

POWELL STREET

DUNKERLEY PLACE

N

Site
Cadastre

Change in Peak Flood Level (m)

- < -0.2
- -0.2 to -0.1
- -0.1 to -0.05
- -0.05 to -0.01
- -0.01 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.2
- > 0.2
- No Longer Flooded
- Newly Flooded

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_ProposalAppendixC\FigureC02_Impact_5pcAEP.mxd

FIGURE C3
242 - 258 YOUNG STREET WATERLOO
PROPOSED CONDITIONS
CHANGE IN PEAK FLOOD LEVEL
1% AEP EVENT

MCEVOY STREET
HUNTER STREET
YOUNG STREET
ARCHIBALD AVENUE
BOURKE STREET
POWELL STREET
DUNKERLEY PLACE

N

Site
Cadastre
Change in Peak Flood Level (m)
< -0.2
-0.2 to -0.1
-0.1 to -0.05
-0.05 to -0.01
-0.01 to 0.01
0.01 to 0.05
0.05 to 0.1
0.1 to 0.2
> 0.2
No Longer Flooded
Newly Flooded

0 50 100 m

Note:

J:\Jobs\123020\GIS\ArcMap\231124_Draft_Planning_Proposal\AppendixC\FigureC03_Impact_1pcAEP.mxd

Attachment A12

Acoustic Report

242-258 Young Street, Waterloo

School Redevelopment – Environmental Noise Impact Assessment Brief for Planning Proposal

Prepared for: Sustainable Development Group (SDG)

Project No: SYD2464
Date: 18 December 2023
Revision: 04



Project:	242-258 Young Street, Waterloo
Location:	242-258 Young Street Waterloo NSW 2017
Prepared by:	ADP Consulting Pty Ltd Level 6, 33 Erskine Street Sydney NSW 2000
Project No:	SYD2464
Revision:	04
Date:	18 December 2023

Rev	Date	Comment	Author	Signature	Technical Review	Signature	Authorisa-tion & QA	Signature
01	28/11/23	DRAFT – Issue for comments	EC	Eleni Chrysafis				
02	11/12/23	Issue	EC	Eleni Chrysafis	AG	Ann-Katrin Glanzner	EC	Eleni Chrysafis
03	15/12/23	Issue	EC	Eleni Chrysafis	AG	Ann-Katrin Glanzner	EC	Eleni Chrysafis
04	18/12/23	Issue	EC	Eleni Chrysafis	AG	Ann-Katrin Glanzner	EC	Eleni Chrysafis

Project Team	
Client / Principal	Sustainable Development Group (SDG)
Architect	Sustainable Development Group (SDG)
Urban Planning	Ethos Urban

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1. Introduction

This acoustic report is submitted to the Council of the City of Sydney (Council) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR), and
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
  - 45 GLS, 13 specialist / classrooms.
  - A multi-purpose hall / auditorium.
  - A library.
  - A canteen.
  - Administration, lobby, and circulation spaces.
  - An active green roof.
  - A basement including 60 car parking spaces and end-of-trip facilities.
- The incorporation of the existing film school within the new vertical school building.
- A total of approximately 13,543m^2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
  - 10,608m^2 education floor area
  - 2,935m^2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m^2.

1.1 Document purpose

ADP Consulting has been retained by Sustainable Development Group (SDG) to provide a preliminary environmental noise impact assessment for a proposed Educational Facility and Film School redevelopment located at 248-258 Young Street, Waterloo in support of a planning proposal.

This report presents acoustic objectives for the proposed development regarding:

- Potential noise impacts to the proposed development.
- Noise associated with the operation of the proposed development, which possesses the risk of affecting the amenity of the surrounding receivers.

1.2 Referenced drawings, codes and standards

The following drawings, conditions guidelines, standards, regulatory requirements, and other project-specific information has been referenced in preparing this report:

- Draft Operational management plan dated 9 November 2023, Revision 1 and prepared by Bruce Litchfield – Amina Project Management.
- General Floor Plans with job number 20621 provided by Plus Architecture.
- Council of the City of Sydney Development Control Plan (DCP) 2012.
- Association of Australasian Acoustical Consultants' (AAAC) Guideline for Educational Facilities, version 2.0, dated September 2018 (GEF).
- Education Facilities Standards & Guidelines – NSW Department of Education.
- AS/NZS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors (AS/NZS 2107).
- NSW EPA's Noise Policy for Industry, dated October 2017 (NPfI).
- Department of Environment & Climate Change NSW - Interim Construction Noise Guideline.

1.3 Project Summary

The proposed mixed-use development will be located at 248-258 Young Street, Waterloo and will be comprised of an educational primary and secondary facility and a Film School.

The proposed educational development will spread over (6) levels including the following areas:

- A carpark with 52 parking spots.
- Outdoor play areas on Basement Level 1, Ground Floor and Levels 4 to 6.
- Primary Student Classrooms from Ground Floor to Level 2.
- Secondary School Classrooms from Level 2 to Level 4.
- A multi-purpose Hall with 462 seats from Ground to Level 1.
- Administration rooms on Ground Floor and Level 2.
- Loading Bay on Ground Floor.
- Libraries from Level 1 to 3.
- Passive outdoor areas on Levels 1 to 3.
- Specialist Teaching rooms on Levels 2 to 4.
- A Basketball Court from Level 5 to 6.
- Other amenities across all levels, such as kitchen, storage areas and staff rooms.

The proposed Film School development will also cover (6) levels, and will comprise the following areas:

- Film School Lobby and Café on Ground Floor Level.
- Kids Spaces/ Rehearsal and Breakout Room on Level 1.
- Teaching rooms, Admin, Amenities and Equipment Hire on Level 2.
- Black Box Theatre, props room, green room, storage, and Carpentry Workshop on Level 3.
- Film School circulation, outdoors space, Cinema and Sound Stage on Level 4.
- Audio and editing studios, labs and other amenities on Level 5.

1.4 Site Location and Context

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m^2 and is triangular in shape, bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.

The siteis currently occupied by a 2-storey office building and film school. The southern tip of the site is a grass lawn area. The demolition of the existing buildings on site is proposed.

The subject development site lies on a Mixed-use (MU1) Zone, based on the NSW Planning web Portal Spatial Viewer. The site is bounded by the following noise sources:

- Approximately 45m to the north by McEvoy Street, a road that carries high volumes of traffic flow, and is specified in NSW SEPP Map number 12D as a road that carries an Annual Average Daily Traffic volume of more than 20,000 vehicles.
- Directly to the east by Young Street, a road that carries medium to low volumes of traffic flow.
- Directly to the south by Powell Street, a road that carries medium to low volumes of traffic flow.
- Directly to the west by Hunter Street, a road that carries medium to low volumes of traffic flow.

Noise impacts to the proposed development from the above noise sources should be assessed to ensure the amenity of the future occupants.

Our site analysis has noted the following nearest most affected noise sensitive receivers to the proposed development:

- Receiver 1 (R1) – An existing 4-storey mixed-use development attached to the north, at 10-20 McEvoy Street.
- Receiver 2 (R2) – An existing 4-storey mixed-use development to the west, opposite Hunter Street.
- Receiver 3 (R3) – A 7-storey residential apartment development on top of a podium, located at 3 Hunter Street.
- Receiver 4 (R4) – A 5-storey mixed-use development to the south-west, located at 11 Hunter Street.
- Receiver 5 (R5) – Single-storey commercial receivers to the south-west, opposite Powell Street.
- Receiver 6 (R6) – A 5-storey residential apartment building on top of a podium, located to the south-west of the site, opposite Powell Street, at 834-836 Elizabeth Street.
- Receiver 7 (R7) – Existing 4-storey residential apartment buildings to the south, opposite Powell Street, at 4 Powell Street.
- Receiver 8 (R8) – an existing 7-storey mixed-use development to the south, opposite Powell Street, at 2-24 Powell Street.
- Receiver 9 (R9) – A passive recreation park area to the south, opposite Powell Street.
- Receiver 10 (R10) – A commercial receiver (Café) to the south, opposite Powell Street.
- Receiver 11 (R11) – A 5-storey commercial receiver to the south-east, opposite Powell Street.
- Receiver 12 (R12) – Existing single-storey commercial tenancies to the east, opposite Young Street.

- Receiver 13 (R13) – Existing commercial tenancies to the east, opposite Young Street, at 923-935 Bourke Street, Waterloo. Based on information provided to ADP Consulting, the site has a planning proposal approved for changes to enable a mixed-use development on the site that includes residential, commercial, and retail uses, with a below ground supermarket.
- Receiver 14 (R14) – A multi-level mixed-use development, approximately 150m to the east of the project site.
- Receivers 15 & 16 (R15 & R16) – Based on information provided to ADP Consulting, new mixed-use development is proposed to the north of the site, opposite McEvoy Street. The Danks Street South residential masterplan proposal includes multiple residential buildings, retail, open space, and a central building of 20 levels.

Refer to Figure 1 for an aerial photo of the project site and nearest noise sensitive receivers.

Figure 1 Aerial photo of project site and nearest noise sensitive receivers (resourced from SIX Maps)



2. Acoustic Environment

The acoustic environment around the subject development site and surrounding receivers is dominated by urban hum, industrial source noise, and road traffic noise with continuous traffic flows during peak periods. Background noise has not been measured at this stage. The average background noise is expected to be raised in the near future from the operation of the proposed future Woolworths and neighbourhood centre development.

Long-term noise monitoring and attending measurements will be conducted at DA Stage to evaluate the acoustic environment around the proposed development. Monitored noise levels will be utilised as a basis to setup noise emission criteria at all nearest noise sensitive receivers and to evaluate noise impacts to the proposed development.

3. Noise Intrusion Criteria

3.1 City of Sydney Development Control Plan (DCP) 2012

Section 4.2.5.3 of City of Sydney Council DCP provides the following controls regarding development near busy roads.

4.2.5.3 Development on busy roads and active frontages

The following provisions apply to, sensitive uses on sites that are to have an active frontage as shown on the Active frontages map, or sites with a frontage to a busy road that carries more than 20,000 vehicles a day. Sensitive uses include:

- buildings for residential use (including mixed use buildings);
- places of public worship;
- hospitals; and
- educational establishments or childcare centres

Noise and air quality mitigation measures are required for new developments along road corridors carrying more than 20,000 Annual Average Daily Traffic. A copy of the 'Traffic volume maps on noise assessment for buildings on land adjacent to busy roads' can be accessed on the Roads and Maritime Services website www.rta.nsw.gov.au. These provisions also provide a design solution to achieve acceptable amenity for residential uses that may be affected by noise from busy roads and active uses. Applicants proposing development on busy roads should also refer to **State Environment Planning Policy (Infrastructure) 2007** and the **NSW Government's Development near Rail Corridors and Busy Roads – Interim Guidelines** which includes design guidelines and requirements to manage the impacts from road and rail noise and vibration.

3.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

Clause 2.119 of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP), specifies indoor noise level requirements for non-road developments that are for residential use. The following are stated:

(1) This section applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of TfNSW) and that the consent authority considers is likely to be adversely affected by road noise or vibration—

(a) residential accommodation,
(b) a place of public worship,
(c) a hospital,
(d) an educational establishment or centre-based childcare facility.

3.3 Development Near Rail Corridors and Busy Roads – Interim Guideline

Section 3.6 of the Development Near Rail Corridors and Busy Roads – Interim Guideline provides Airborne Noise and Ground Borne Noise criteria for residential and non-residential buildings. These are presented below.

3.3.1 Airborne noise

Table 1 Noise criteria – Interim Guideline

Type of occupancy	Recommended Max Level, dBA
Educational Institutions	40

The Interim Guideline does not provide criteria for commercial development.

3.3.2 Ground borne noise

In addition to the above, Section 3.6.2 of the NSW Department of Planning's Development Near Rail Corridors and Busy Road – Interim Guideline' outlines the following with regards to the assessment of ground-borne noise.

> **3.6.2 Ground borne noise**
>
> *"Where buildings are constructed over or adjacent to land over tunnels, ground-borne noise may be present without the normal masking effect of airborne noise. In such cases, residential buildings should be designed so that the 95th percentile of train pass-bys complies with a ground-borne L_{Amax} noise limit of 40dBA (daytime) or 35dBA (night-time) measured using the "slow" response time setting on a sound level meter".*

The table below presents a summary of the ground-borne noise criteria for the proposed development.

Table 2 Ground-borne noise criteria

Type of Occupancy	Structure Borne Noise Criteria Noise Level, dB(A)$L_{Max, slow}$
Educational	40
Commercial	40

3.4 Australian/ New Zealand Standard AS/NZS 2107:2016 – Recommended Design Sound Levels and Reverberation Times for Building Interiors

Australian/ New Zealand Standard AS/NZS 2107:2016 recommends the following internal noise levels within habitable spaces based on their use. The table below presents the noise levels for the proposed development.

Table 3 Internal design sound pressure levels acoustic criteria AS/NZS 2107:2016

Space/ Activity	**Design Sound Level, ($L_{Aeq, t}$) dB(A) range**
Teaching spaces	< 45
Music practice rooms	40 – 45
Admin offices	35 – 40
Open Plan teaching spaces – Primary	35 – 45
Open Plan teaching spaces - Secondary	35 – 45
Music Studios	30 – 35
Office areas	40 – 45
Staff common rooms	40 – 45
Sports hall	< 50
Libraries – reading areas	40 – 45
Cinemas	30 – 35
Engineering workshops – Teaching	< 45
Engineering – non-teaching	< 60
Film or television studios	25 – 30
Music recording studios	20 - 25
Sound stage	20 – 25
Voice over booth	25 – 30
Toilets, change, showers	< 55

3.5 Fire mode noise conditions

Some building systems only operate in fire mode and during periodic testing, so they do not add to background noise under typical conditions. According to AS/NZS 1668.1:2015, these systems are subject to noise limits relating not to occupant comfort but rather to occupant distress and the intelligibility of emergency commands. Hence, the 65 dB(A) limit supports the audibility of fire alarms (min. 75 dB(A) at bed heads as per AS1670.1).

Table 4 Fire mode maximum internal sound pressure levels, dB(A)

Area type	Maximum SPL, L_{Aeq}, dB(A)
Occupied Area	65
Fire-isolated exit (e.g. fire stair)	80

3.6 Internal vibration requirements

Vibration is the oscillation of an object, structure, or surface at frequencies typically below 20 Hz, which is inaudible but instead can be "felt". **Structure-borne sound** means oscillation at frequencies higher than 20Hz, resulting in audible noise, which is transmitted through rigid building elements and radiated by surfaces.

Human response to building vibration is a complex phenomenon. There is great variability in the vibration tolerance of humans, and as a result, human comfort criteria cannot robustly be defined and quantified. Acceptable values of human exposure to vibration depend on human activity and the character of the vibration, and they are further influenced by individual attitudes, expectations, and perceptibility.

Limits for vibration of the building structure potentially affecting human comfort have been derived from AS 2670.2 and BS 6472, both of which are referenced and discussed practically in the AVTG. These standards propose maximum vibration levels in terms of baseline curves and multiplication factors. For the purpose of minimising the disturbing perceptibility of vibration within the occupied areas of this development, Table 5 specifies appropriate limits for floor vibration in a simplified form.

Table 5 Vibration limits

Type of occupancy	Time	Continuous vibration limits: r.m.s. acceleration (m/s^2) Preferred / maximum	Impulsive vibration limits: r.m.s. acceleration (m/s^2) Preferred / maximum	Intermittent vibration limits: Vibration Dose Value VDV ($m/s^{1.75}$) Preferred / maximum
Offices / teaching spaces	Day or night	0.020 / 0.040	0.640 / 1.280	0.40 / 0.80

3.7 Department of Environment, Climate Change and Water NSW - Road Noise Policy (RNP), 2011

NSW Road Noise Policy provides criteria for land use developments with the potential to create additional traffic on public streets. Noise levels generated by traffic associated with the proposed development should not exceed the noise levels set out in the table below.

Table 6 Criteria for traffic noise generated by new development

Road type	Time of day	Permissible noise generation
Sub-arterial roads	Day (7:00am - 10:00pm)	60 dB(A) $_{Leq(15h)}$ (external)
	Night (10:00pm - 7:00am)	55 B(A) $_{Leq(9h)}$ (external)

4. Noise Emission Criteria

4.1 City of Sydney Council Development Control Plan (DCP) 2012

City of Sydney Council does not include specific criteria for noise emissions from Educational or Commercial development.

4.2 NSW Noise Policy for Industry (NPfI)

Noise Policy for Industry provides a method of calculating noise trigger levels which are not to be exceeded at the boundary of any residential noise sensitive receiver. These are derived by choosing the most stringent of the Amenity and Intrusiveness criteria (refer to Table 7). Amenity noise levels are presented in Table 2.2 of the NPfI and Intrusiveness noise levels are calculated by monitoring noise levels at the boundaries of the most affected receivers over a one week period and adding 5dB.

Residential receivers are considered as urban receivers.

Table 7 Noise emission criteria – Residential receivers

Noise Source	**Time of operation**	**Recommended amenity (urban residential receivers), dB $L_{Aeq,\ 15min}$**	**Intrusiveness criteria, $L_{Aeq,15min}$** (Background+5dB)	**Project trigger levels, $L_{Aeq,\ 15min}$ (urban receivers)**
Operation of proposed development	Day (7am to 6pm)	58	(TBD)*	(TBD)**
	Evening (6pm to 10pm)	48	(TBD)*	(TBD)**
	Night (10pm to 7am)	43	(TBD)*	(TBD)**

*Long-term noise monitoring is required to determine the project intrusiveness criteria.

**Project trigger levels are the project noise emission criteria. Project trigger levels are the lowest levels between the recommended amenity $L_{Aeq,15min}$ and the intrusiveness criteria $L_{Aeq,15min}$.

NPfI also provides amenity noise levels for noise sensitive receivers other than residential.

Table 8 Amenity noise levels for noise sensitive receivers other than residential

Noise Source	**Receiver**	**Time of operation**	**Recommended Amenity**
Operation of proposed development	Passive recreation receivers	When in use	50
	Commercial receivers	When in use	65

Noise trigger levels will be calculated at DA Stage based on the long-term noise monitoring which will be conducted at the site as described in Section 2.

4.3 Department of Environment, Climate Change and Water NSW - Road Noise Policy (RNP), 2011

NSW Road Noise Policy provides criteria for land use developments with the potential to create additional traffic on public streets. Noise levels generated by traffic associated with the proposed development should not exceed the noise levels set out in the table below.

Table 9 Criteria for traffic noise generated by new development

Road type	Type of project/ land use	Time of day	Permissible noise generation
Sub-arterial	Existing residences affected by additional traffic generated by land use developments	Day (7:00am - 10:00pm)	60 dB(A) $_{Leq(15h)\ (external)}$
		Night (10:00pm - 7:00am)	55 dB(A) $_{Leq(9h)\ (external)}$

If existing noise levels exceed those in the table above, Section 3.4 of the Road Noise Policy is applicable, which requires noise impacts are reduced through feasible and reasonable measures. However, in determining what is feasible/reasonable, the Policy notes that an increase of less than 2dB(A) is a minor impact and would be barely perceptible.

Typically for a raise of 3dB, the current traffic on the surrounding roads will have to be doubled. A detailed noise emission assessment from vehicles associated with the proposed development driving on public streets, will be conducted at DA Stage, once the traffic report is available.

5. Next Steps

5.1 Noise Intrusion Assessment

Noise impacts to the proposed development will be assessed based on the long-term noise logging and attended noise measurements as described in Section 2 to ensure compliance with internal noise level criteria as presented in Section 3. Treatment recommendations will be provided at DA stage to the following elements:

- Minimum Glazing requirements.
- External wall construction.
- Roof/ ceiling construction.

Architectural plans and proposed construction materials will be reviewed in preparing this.

5.2 Noise Emission Assessment

A detailed noise emission assessment will be conducted at DA Stage to ensure compliance with the noise emission criteria as presented in Section 4.

Noise emissions that will be assessed are associated with the operation of the proposed development.

- Vehicular movements associated with the use of the development.
- Passenger vehicle and bus drop off/ pick-ups.
- Children using outdoor active and passive areas.
- Children using indoor areas.
- Noise from activities in the Basketball court.
- Noise emissions from special events.
- Noise emissions from specialised areas, such as the carpentry room.

We believe that noise emission criteria can be satisfied by incorporating appropriate acoustic treatments and management controls.

5.2.1 Operation Information

The Draft Operational Management Plan prepared by Amina Project Management provide the following information regarding the operation of the proposed development.

- The total capacity of the proposed educational development will be 800 students.
- The hours of operation will be between 7:30am to 5:30pm.
- Bus drop-off and pick up will occur on Hunter Street.
- Vehicle drop off/ pick up will occur on Young Street.
- All drop off/ pick up will be conducted during day-time period (7am – 6pm).
- There are currently no information regarding:
  - Maximum number of students allowed in passive and active outdoor areas at the same time.
  - If special events are proposed to take place in the school.
  - Proposed activities that will take place in the Multi-purpose Hall.

- If formal recess and lunches will take place in the outdoor areas.
- Information regarding the maximum capacity and hours of operation of the Film School.
- If any loudspeakers are proposed to be installed outdoors.
- Other areas proposed to use sound reinforcement system.
- Proposed hours of operation of the Café.
- A traffic report is currently not available.
- Mechanical plans are not available at this stage.

5.2.2 Assessment – Items

Based on the above information, the following will be assessed at DA Stage:

Basement Level 01

> Outdoor play area.

Ground Floor Level

> Outdoor play areas.
> Multipurpose Hall.
> Loading dock, driveway and drop off/ pickups on Hunter Street and Young Street.
> Café.

Level 1

> Breakout room.
> Rehearsal rooms.
> Passive outdoor areas.

Level 2

> Specialist areas.
> Passive outdoor areas.

Level 3

> Passive outdoor areas.
> Black Box Theatre.
> Carpentry room.
> Specialist areas.

Level 4

> Outdoor space.
> Canteen.
> Specialist areas.
> Sound Stage.
> Cinema.

Level 5

> Outdoor space.
> Basketball Court.

Level 6

- Outdoor space.
- Mechanical equipment on roof.

All levels

- Noise breaking from all classrooms.

5.2.3 Information required for Noise Emission Assessment

Information required for a detailed noise emission assessment is listed below.

Outdoor areas, Multi-purpose Hall, Break-out room, Café, teaching rooms, Basketball Court, Theatre

- Noise emissions will be calculated at all nearest noise sensitive receivers based on the maximum number of children using these spaces at any one-time, maximum capacities, proposed activities and hours of operation.

Loading dock, driveway, drop off and pick up, raise of traffic on public roads

- Noise emissions will be calculated at all nearest noise sensitive receivers based on the information provided in the traffic report.

Mechanical equipment

- Noise emissions will be calculated at all nearest noise sensitive receivers after reviewing the mechanical drawings and proposed mechanical plant selections.

Specialist areas, Carpentry room

- Noise emissions will be calculated at all nearest noise sensitive receivers based on the proposed activities, hours of operation and equipment acoustic data.

5.2.4 Typical acoustic treatments

Noise emissions will be calculated at all nearest noise sensitive receivers based on the information described in Section 5.2.3.

Typical acoustic treatments include:

- Mechanical noise
  - Selection of quieter units with the capability of reduced duty and noise output if required.
  - Installation of acoustic barriers or acoustic louvres.
- Outdoor areas
  - Management of number of students allowed outdoors at any one time.
  - Maximum allowable noise level from reinforced sound systems.
  - Barriers (if required).
  - Absorptive materials on areas such as walls and under soffits.
- Café
  - Maximum number of people allowed outdoors (if outdoor sitting is proposed).
  - Hours of operation.
  - Maximum allowable noise level from reinforced sound systems.
- Specialist areas, carpentry room, rehearsal rooms
  - Allowable hours of operation.

  - Quieter equipment where possible.
  - Treatment of room envelope to ensure a high transmission loss value of all elements where noise can escape from.
  - Highly acoustic absorptive materials on room surfaces.
- Traffic noise, drop-offs/ pick-ups, loading dock
  - Management of peak 1-hour movements.
  - Barriers, if required.
- Basketball Court

  A Basketball Court is proposed to be located on Level 05 of the proposed development (RL +41,100).

  The basketball court is proposed to have walls around its perimeter, and open roof. A detailed noise emission assessment should be undertaken at DA Stage. Potential noise issues are associated with noise breaking from the open rooftop to the upper levels of the proposed 20-level mixed-use development to the north. Typical acoustic treatments and management controls for the basketball court include:
  - Management of maximum capacity and hours of operation.
  - Treatment of Basketball Court floor.
  - Wall construction recommendations for the walls surrounding the court.
  - If required, construction of awnings or roof with skylights.

5.3 Other Acoustic Considerations

5.3.1 Pedestrian traffic noise

The Council has requested a noise emission assessment from pedestrian traffic. We believe that any pedestrian traffic will be masked by the existing vehicular traffic noise, therefore, we do not expect pedestrian noise to adversely affect the amenity of the surrounding receivers. In addition to this, current vehicular and pedestrian traffic is expected to be raised in the future as part of the proposed Woolworths and neighbourhood centre development. A detailed pedestrian traffic noise assessment will be conducted as part of the DA report.

5.3.2 Construction Noise

As part of the DA Stage, a Construction Noise & Vibration Management Plan (CNVMP) will most likely be required. Noise emissions will be assessed for each proposed construction stage based on the proposed equipment used in each stage and duration and a management report will be prepared in accordance with the NSW Interim Construction Noise Guideline.

In the CNVMP we will:

- Identify sensitive land uses with the potential to be affected by noise from the construction.
- Predict noise emissions from equipment associated with each stage of construction based on the proposed hours of construction.
- Determine noise management levels at all receivers based on the long-term noise monitoring (described in Section 2).
- Determine ground-born noise criteria for each receiver located in the proximity of the construction site.
- Predict noise levels at all receivers and predict if there will be any exceedances.

- Recommend best practice approach principles and specific noise control measures to be used during the demolition / construction period to ensure that the noise objectives are achieved where feasible and reasonably practicable, including timetabling of proposed activities.
- Recommend community action initiatives such as prior notification for particularly noisy activities and the provision of a contact telephone number for people affected by demolition / construction noise to ask questions or complain.
- Outline an action plan detailing how complaints, if received, will be dealt with.
- Determine if vibration monitoring will be needed at specific areas to ensure vibration criteria are met during construction and prevent structural damage of other buildings.

6. Summary

A preliminary environmental noise impact assessment for a proposed educational facility and Film School redevelopment located at 248-258 Young Street, Waterloo in support of a planning proposal has been completed.

This report presents acoustic objectives for the proposed development in regard to potential noise impacts to the proposed development and noise associated with the operation of the proposed development which possesses the risk of affecting the amenity of the surrounding receivers.

A site analysis and nearest noise sensitive receivers was presented in Section 3. Noise intrusion criteria were provided in Section 3 as well as noise emission criteria in Section 4. Next steps for conducting a noise assessment suitable for the Development Application stage were described in Section 5.

ADP Consulting believe there are no site conditions, statutory or other requirements that would preclude this development from complying with the criteria defined in this report.

The design criteria and acoustic treatment concepts in this report demonstrate the pathways by which these shall be addressed by ADP Consulting and the project team through further analysis, recommendations, and coordination as the design progresses.

Appendix A
Glossary of acoustic terms

Air-borne sound

The sound emitted directly from a source into the surrounding air, such as speech, television or music.

Ambient sound

Of an environment: the all-encompassing sound associated with that environment, being a composite of sounds from many sources, near and far. This is normally taken to be the L_{Aeq} value.

Background noise level

The average of the lowest levels of the noise levels measured in an affected area in the absence of noise from occupants and from unwanted external ambient noise sources. Usually the L_{A90} value represents the background noise level.

dB(A)

Unit of acoustic measurement weighted to approximate the sensitivity of human hearing to sound frequency.

Decibel scale

The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. Therefore, a 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. It is generally accepted that a 10 dB increase in the sound pressure level corresponds to a perceived doubling in loudness.

Examples of decibel levels of common sounds are as follows:

- 0 dB(A) Threshold of human hearing
- 30 dB(A) A quiet country park
- 40 dB(A) Whisper in a library
- 50 dB(A) Open office space
- 70 dB(A) Inside a car on a freeway
- 80 dB(A) Outboard motor
- 90 dB(A) Heavy truck pass-by
- 100 dB(A) Jackhammer / Subway train
- 110 dB(A) Rock Concert
- 115 dB(A) Limit of sound permitted in industry
- 120 dB(A) 747 take off at 250 metres

Frequency

The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high-pitched sound and a low frequency to a low-pitched sound.

L_{90}, L_{10}, etc

A statistical measurement giving the sound pressure level which is exceeded for the given percentile of a measurement period (i.e. L_{90} is the level which is exceeded for 90 percent of a measurement period). L_{90} is commonly referred to as a basis for measuring the background sound level.

$L_{Aeq,T}$

The equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound.

L_{Amax}

The maximum sound pressure level measured over the measurement period.

L_{Amin}

The minimum sound pressure level measured over the measurement period.

Day

Referred to as the period between 7am and 6pm for Monday to Saturday and 8am to 6pm for Sundays and Public Holidays.

Evening

Referred to as the period between 6pm and 10pm for Monday to Sunday and Public Holidays.

Night

Referred to as the period between 10pm and 7am for Monday to Saturday and 10pm to 8am for Sundays and Public Holidays.

Assessment background level (ABL)

The overall background noise level on each day, evening and night periods for each day of the noise monitoring.

Rating background level (RBL)

The overall background level on each day, evening and night periods for the entire length of noise monitoring.

Reverberation

The persistence, after emission by the source has stopped, of a sound field in an enclosure.

Sound isolation

A reference to the degree of acoustical separation between two spaces. Sound isolation may refer to sound transmission loss of a partition or to noise reduction from any unwanted noise source. The term 'sound isolation' does not specify any grade or performance quality and requires the units to be specified for any contractual condition.

Sound pressure level, L_p, dB of a sound

A measurement obtained directly obtained using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the R.M.S. sound pressure to the reference sound pressure of 20 micro Pascal

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Attachment A13

Arboricultural Impact Assessment

Arboricultural Impact Assessment

242 – 258 Young Street Waterloo



Prepared by Alex Austin
For
Sustainable Development Group Ltd
January 2024

Alex Austin
AQF level 8 Consulting Arborist.
PO Box 84, Avalon Beach 2017
Email: arborsaw@gmail.com

1 Summary

Alex Austin, an AQF level 8 Arborist, was commissioned by Sustainable Development Group Ltd to complete an Arboricultural Impact Assessment (AIA) of the trees that could be impacted by the proposed planning proposal located at 242 – 258 Young Street Waterloo.

The site inspection was completed on the 23rd June 2022, where 32 trees were inspected by Marc Fisher, an AQF Level 5 Arborist. The tree population was reinspected by Alex Austin An AQF Level 8 Arborist on 2nd November 2023 to ascertain impacts of the final proposed building envelope. This report has been collated by Alex Austin and prepared in accordance with Australian Standard 4970: 2009 *Protection of trees on development sites*. The complete tree and impact data can found be in the table located in the Appendix.

The subject site is located centrally within Waterloo and bounded by Young Street to the east, Hunter to the West and Powell Street to the south. The existing commercial brick and commercial buildings are built to the site edge and have minimal setback from council trees and the canopies overhang the site.

The 32 assessed trees are comprised of;

- Nine (9) High (A) Retention Value Tree.
- 13 Medium (B) Retention Value Trees
- Ten (10) Low (C)Retention Value Trees

Council Street trees adjacent to the site include trees numbered 1, 2, 6, 8-19, 22, 23, 28-33. The remainder of the trees are located on the site. Large Council owned trees exist along the footpath (outside of site boundary) of Young and Hunter streets.

The proposed planning proposal and future development of the site includes the proposed demolition of all existing buildings, tree removals and construction of a new building of Six (6) storey's with basement carparking. If the current proposed construction layout is to proceed, then Seven (7) Low Retention Value site trees numbered 7, 20 (Exempt size), 21(Exempt size), 24, 25, 26 & 27 are proposed for removal in order to facilitate the layout. The layout and setbacks have been adjusted serval times in design to minimise the quantity of tree removal.

The 25 trees on City of Sydney land can be retained if the tree protection measures in the report are adhered to. The proposed works have been designed to minimise impacts to these 25 trees and include a reduced building envelope resulting in smaller TPZ encroachments from the existing footprint for all trees, 3D modelling to identify and minimise canopy pruning, temporary scaffold on ground protection matts and the adoption of the tree protection measures using the details within the City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015). No impact to the viability of the tree to be retained is anticipated if the protection measures and specific pruning specifications are applied as per the guidance in this report.

To ensure the 25 trees nominated for retention remain viable during and post construction, tree protection measures including the engagement of a project arborist, tree protection fencing, tree protection signage, trunk protection, ground protection, sensitive demolition and excavation techniques, project arborist supervised pruning, a restriction of activities within Tree Protection Zones (TPZ's) and compliance reporting, must be incorporated into the project.

A Tree Impact Plan has been prepared and can be located in the Appendix.

This document must be used in its entirety and further questions are to be directed to:

Alex Austin



AQF Level 8 Arborist

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3 Document Details

Version Number	Date	Description
001	06/11/2023	Draft
002	09/11/2023	Updated Summary
003	15/1/2024	Updated Text, GF + Basement Plans

4 Background

The site inspection was completed on the 23rd June 2022, where 32 trees were inspected by Marc Fisher, an AQF Level 5 Arborist. The tree population was reinspected by Alex Austin An AQF Level 8 Arborist on 2nd November 2023 to ascertain impacts of the final proposed building envelope. .This report has been collated by Alex Austin and prepared in accordance with Australian Standard 4970: 2009 *Protection of trees on development sites*. The complete tree and impact data can found be in the table located in the Appendix.

Tree assessment and recommendations in this report are based on the condition of the trees at the time of inspection. As the trees continue to age and decline, further assessment, particularly from a hazard management perspective may be necessary. Site conditions and weather events may also change the condition of the trees from the time of inspection.

4.1 Reviewed Documents

The following documents were assessed as part of this report;

- ANNEXURE A - Project Brief for Redevelopment of 242 – 258 Young Street Waterloo, Prepared by: Sustainable Development Group June 2022
- Ground floor plan, from 20621 Presentation by SDG Dated 25.10.2023)
- Tree Canopy plans and 3D Canopy Modelling by Plus Architects, dated 1/08/2023
- General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 1/08/2023
- Sydney Development Control Plan 2012 Section 3 – General Provisions
- General Floor Plan – Basement 1, by Plus Architects, drawing number PLA-PP-10B1 dated 1/08/2023
- General Floor Plan – Ground floor, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024

5 Methodology

5.1 Aims and Objectives

- Determine the Retention Value and required area for each tree to be protected and remain viable during and post construction.
- Identify and reduce potential conflicts between subject trees and site development by providing accurate information on the area required for tree retention and methods/techniques suitable for tree protection during construction.
- Encroachments to the TPZs are to be minimized prior to construction.
- Works within the defined Tree Protection Zone shall utilize special measures to avoid or minimize adverse impacts on trees.
- Provide information on restricted activities within the area nominated for tree protection, as well as suitable construction methods to be adopted during construction.

- The trees to be retained must be protected from all other demolition, excavation, and construction activities.

5.2 Tree Health and Condition

The inspection of the trees was made from the ground and involved inspection of the external features only. No invasive, diagnostic or laboratory testing was carried out.

Tree height and canopy spread were estimated and trunk diameter (DBH) and Diameter at Root Crown (DRC), have been measured with a diameter tape where applicable.

Data including species, age class, health, structure, landscape significance, defect and life expectancy were recorded. Tree species were identified using available seed and fruit during the site inspection.

All photographs were taken at the time of the site inspection by the inspecting arborist. Photographs have been altered for brightness and/or cropped only.

5.3 Tree Protection Zone and Structural Root Zone

The Tree Protection Zone method has been derived from the Australian Standard 4970–2009: *Protection of trees on development sites*.

The Tree Protection Zone (TPZ) is defined as a specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown. It is the area required to provide for the viability of a tree to be retained where it is potentially subject to damage by development.

The radius of the TPZ is calculated for each tree by multiplying its Diameter at Breast Height (DBH) by 12

$$TPZ\ radius = DBH \times 12$$

The trunk diameter method has been used in this report to determine the TPZ. This area provides a general guide where the roots are likely to be located.

The Structural Root Zone (SRZ) is the area around the base of a tree required for the tree's stability in the ground. The woody root growth and soil cohesion in this area are necessary to hold the tree upright. The SRZ is nominally circular with the trunk at its centre and is expressed by its radius in metres.

$$SRZ\ radius = (Drc \times 50)^{0.42} \times 0.64$$

5.4 Root Loss

In line with section 3.3.2 of AS 4970:2009, a 10% incursion to a TPZ is considered a minor encroachment. Any more than 10% is considered a major incursion and special measures should be taken to minimise impact on the retained trees and the Arborist must demonstrate that the tree will remain viable post construction.

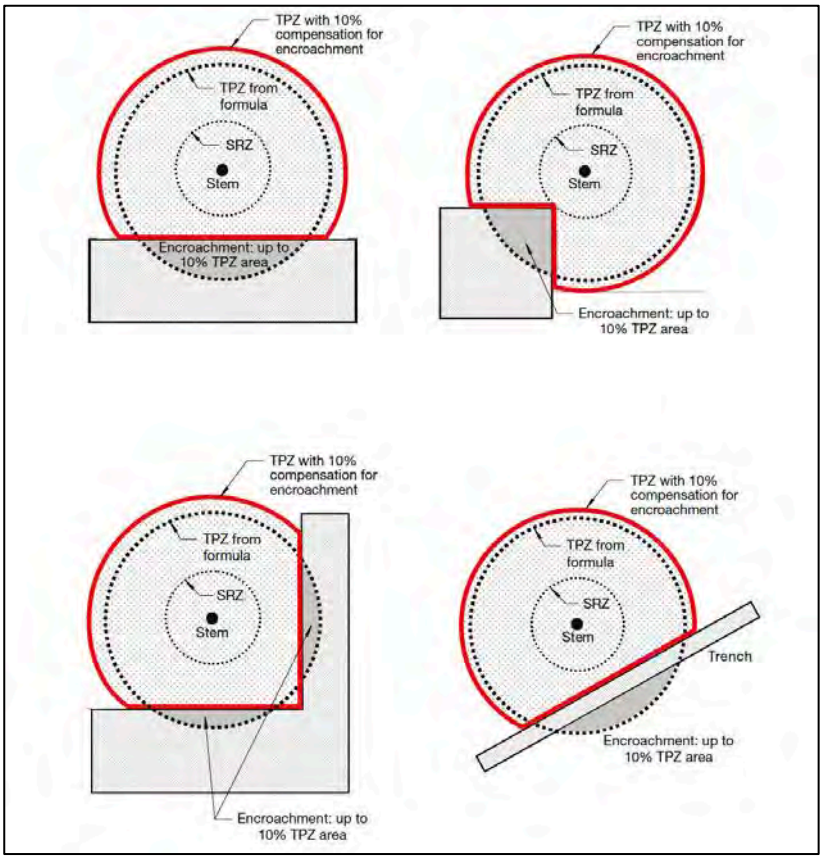


Figure 1: Example acceptable 10% minor encroachments. (Source: AS 4970:2007)

5.5 Retention Value

The retention value method used is IACA Significance of a Tree, Assessment Rating System (STARS) (IACA 2010)©. See appendix for detailed description of the method . retention value method used is a simplified rating system consisting of 4 categories as a summary of the survey's cascading process. The retention value considers the trees health and structure, age class, defects, life expectancy and significance in the landscape.

- Priority for Retention (High - A - Green) -These trees are considered important for retention and should be retained and protected. Design modification or re-location of building/s should be considered to accommodate the setbacks as prescribed by the Australian Standard AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone. Considerable efforts should be made to retain these trees.
- Consider for Retention (Medium – B (Blue)These trees may be retained and protected. These are considered less critical; however their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted. Reasonable efforts should be made to retain these trees.
- Consider for Removal (Low- C –Grey) These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.
- Priority for Removal (Remove – R- Red). -These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

6 Legislation.

6.1 Land Zoning

The site is zoned B4 Mixed Use under the Sydney Local Environmental Plan 2012 in the City of Sydney Local Government Area.

6.2 Biodiversity and Conservation SEPP

The subject trees are protected by the State Environmental Planning Policy (Biodiversity and Conservation SEPP) 2021. Trees proposed for removal or pruning, are covered by the SEPP unless they are considered an imminent danger to life and property (By a AQF Level 5 or above Arborist) and require a permit to be issued by Council.

6.3 Suburb Map

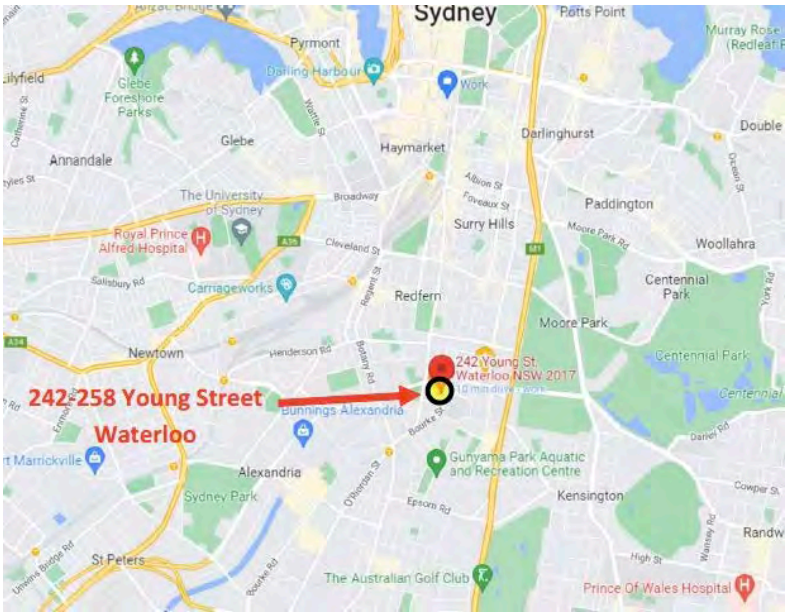


Figure 2: Map of Suburb showing site location (Source: Google 2023)

6.4 Aerial Image



Figure 3: Aerial image of the site showing boundaries. (Source: Sixmaps 2023).

6.5 Site conditions

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m^2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.





Figures 4 & 5: The typical appearance of the Young Street Frontage. (Source: Austin 2nd November 2023)




Figures 6 & 7: The typical appearance of the Young Street Frontage. (Source: Austin 2nd November 2023)




Figures 8 & 9: The typical appearance of the Hunter Street Frontage. (Source: Austin 2nd November 2023)

7 Tree Survey

The site inspection was completed on the 23rd June 2022, where 33 trees were inspected by Marc Fisher, an AQF Level 5 Arborist.

The 33 assessed trees are comprised of;

- Nine (9) High (A) Retention Value Tree.
- 13 Medium (B) Retention Value Trees
- Ten (10) Low (C)Retention Value Trees
- One (1) (R) Remove Tree

7.1 Tree Ownership

Trees numbered 1, 2, 6, 8-19, 22, 23, 28-33 are council owned trees located on the council verge surrounding the site. The remaining trees are located within the site.

7.2 Aerial Image with Tree Locations

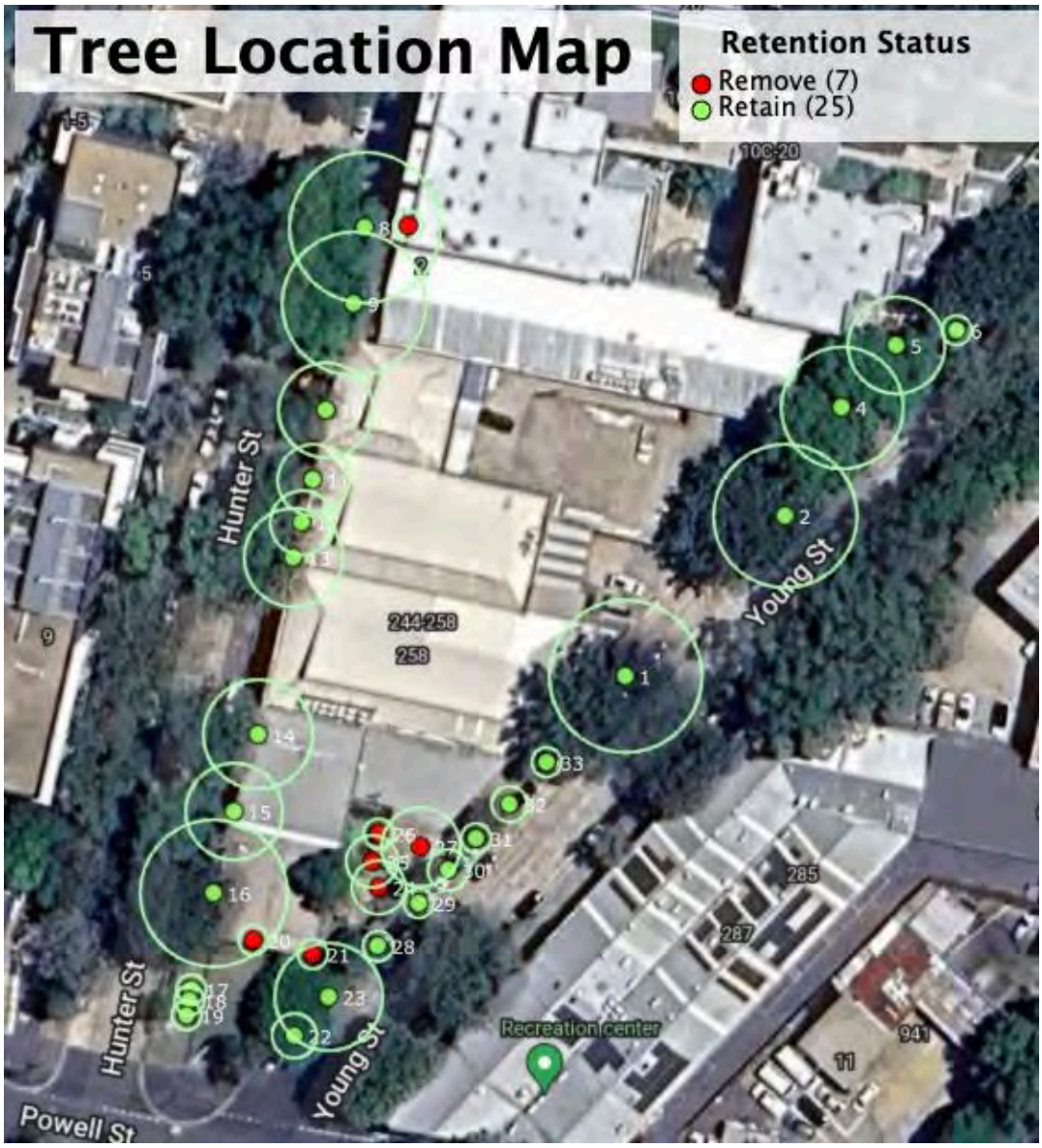


Figure 10: Aerial Image of the whole site showing tree locations. (Source: Arborsaw Tree Plotter 2022)

7.3 Nine (9) High (A) Retention Value trees

Nine (9)Trees numbered 1, 2, 4, 5, 8, 9, 14, 15 & 16 hold High Retention Value were identified in the Tree Survey. Trees in this category have high landscape significance, long life expectancies and considerable efforts should be made to incorporate these trees within the proposed development. Key examples include;

7.3.1 6.2.1 Trees 1, 2 & 16 *Eucalyptus microcorys* (Tallow Woods) Council Trees

Trees 1, 2 & 16 *Eucalyptus microcorys* (Tallow Woods) are council trees with High retention value and with High landscape significance. The trees are in good condition and have long life expectancies of 40+ years. The trees have around 10 m TPZs and 3.2m SRZs. The trees have an estimated 7m site overhang at 10m height. Considerable efforts should be made to incorporate these trees within the project.



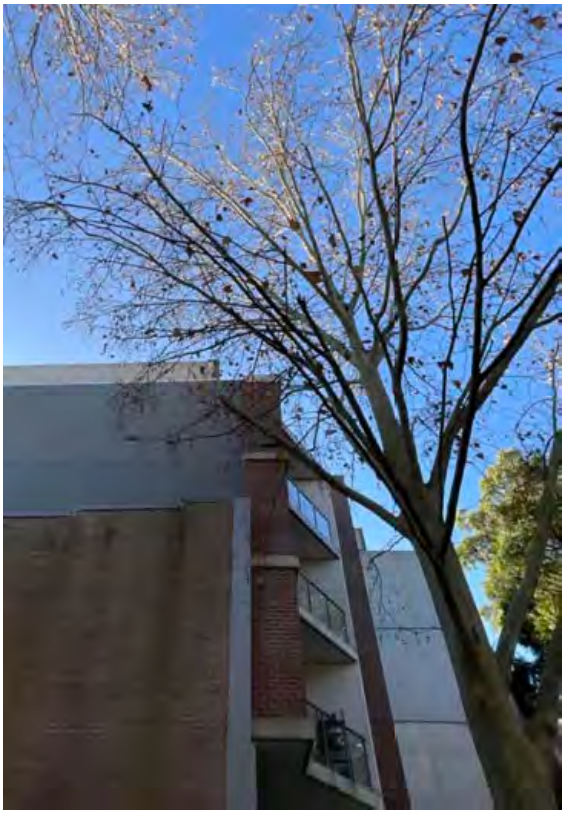
Figures 11 & 12: Tree 1 (Left) and Tree 16 (Right) in the landscape. (Source: Fisher 23rd June 2022).

7.3.2 Trees 4 & 5 *Platanus x hybrida* (London Planes)

Trees 4 & 5 *Platanus x hybrida* (London Planes) are site trees on the Young Street frontage. The trees have High retention value and landscape significance . The trees are in good condition and have long life expectancies of 40+ years. The trees have large TPZ's. Considerable efforts should be made to incorporate these trees within the project



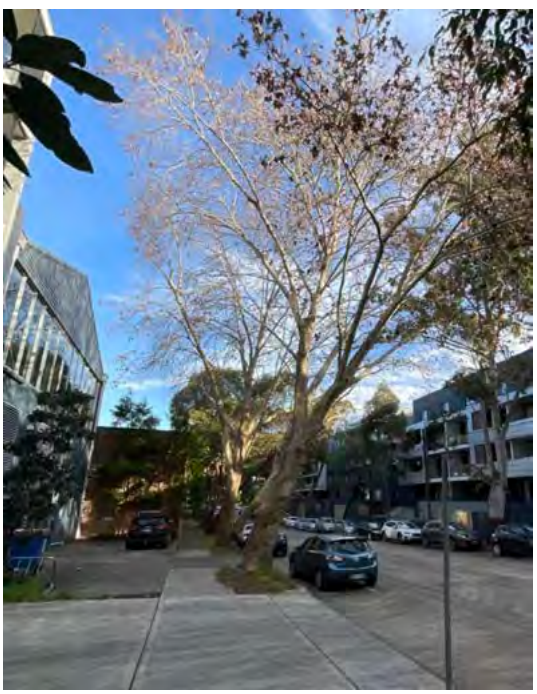

Figures 13 & 14: Tree 4's growing location (Left) and Tree 4 in the landscape. (Right). (Source: Fisher 23rd June 2022)

Figures 15 & 16: Tree 5 in the landscape (Left) and the upper crown proximity to the building can be observed. (Right). (Source: Fisher 23rd June 2022).

7.3.3 Trees 8 & 9 *Platanus x hybrida* (London Planes)

Trees 8 & 9 *Platanus x hybrida* (London Planes) are council trees on the Hunter Street frontage. The trees have High retention value and landscape significance. The trees are in good condition and have long life expectancies of 40+ years. The trees have large TPZ's. The trees have considerable canopy overhanging the site. Considerable efforts should be made to incorporate these trees within the project





Figures 17 & 18: Trees 8 & 9 can be observed. (Source: Fisher 23rd June 2022)

7.3.4 *Eucalyptus botryoides* (Southern Mahogany)

Trees 14 & 15 *Eucalyptus botryoides* (Southern Mahogany) are council trees located on the Hunter Street frontage. The trees carry High landscape significance. Both trees have only minor defects including Mechanical damage to root(s) and wounds.



Figure 19: Trees 14 & 15 can be observed in the landscape. (Source: Fisher 23rd June 2022)

7.4 13 Medium Retention Value trees

13 Trees numbered 8, 16, 17, 19, 20, 21, 22, 23, 26, 27, 33, 34 & 41were assessed to hold Medium Retention Value status. Trees in this category generally posses fair or better health and structure and have life expectancies greater than 15 years. Reasonable attempts should be made to retain the trees through the project as they have the ability to be continuing components of the landscape. Examples include;

7.4.1 Tree 6, 18, 28, 31 & 33 *Eucalyptus microcorys* (Tallow Woods)

Trees numbered 6, 18, 28, 31 & 33 are *Eucalyptus microcorys* (Tallow Wood) are relativity new established plantings with a long life expectancy of 40+ years.





Figures 20 & 21: Tree 6 (Left) and Tree 18 (Right) in the landscape. (Source: Fisher 23rd June 2023).

7.4.2 Trees 10 - 13 *Eucalyptus botryoides* (Southern Mahogany)

Trees 10 - 13 *Eucalyptus botryoides* (Southern Mahogany)are council trees located on the Hunter Street frontage. The trees have minor defects and have medium life expectancies of 15-40 years.





Figures 22 & 23: Trees 10 -13 can be observed in the landscape. (Source: Fisher 23rd June 2022).

7.5 Ten (10) Low Retention Value trees

Ten (10) Trees numbered 7, 17, 19, 20, 21, 24, 25, 26, 27 & 29 form the Low category. Trees in this category should not be considered a constraint on development as they have reduced health or condition, or have short life expectancies or have low landscape significance or are easily replaceable due to their small size.

Examples include;

7.5.1 Tree 24 *Ulmus glabra 'Lutescens'* (Golden Scotch Elm)

Tree 24 *Ulmus glabra 'Lutescens'* (Golden Scotch Elm) is site tree on the Young Street Frontage. Major Observations included; Cavity, Co-dominant stems, Deadwood > 30mm, Hanger(s) and Wound(s). The tree has a short life expectancy of 5-15 years and is recommended; for Remove deadwood > 30mm, Remove hanging limb(s).



Figure 24: Tree 24 in the landscape. (Source: Fisher 23rd June 2022)

7.5.2 Tree 29 *Eucalyptus scoparia* (Wallangarra White Gum)

Tree 29 *Eucalyptus scoparia* (Wallangarra White Gum) is a council tree on the Young Street frontage. Major Observations included; Deadwood < 30mm, Dieback, Mechanical damage, Wound response growth, Wound(s). The tree has a short life expectancy of 5- 15 years.



Figure 25: Tree 29 in the landscape. (Source: Fisher 23rd June 2022)

7.5.3 Consider Removals

Trees numbered 20, 21 & 25 are listed for consider removal and hold a Low Retention Value.

Trees 20 & 21- *Celtis occidentalis* (North American Hackberry) - inappropriate location. Exempt size (<10m height).

Tree 25- *Eucalyptus botryoides* (Southern Mahogany) - Insufficient room for mature establishment.



Figures 26 & 27: Tree 20 (Left) and Tree 21 (Right) self sown adjacent to the existing building. (Source: Fisher 23rd June 2022).



Figures 28 & 29: Tree 25 in the landscape (Left) and its very close proximity to the existing wall (Right). (Source: Fisher 23rd June 2022).

8 Planning Proposal.

8.1 Proposed Development

The proposed amendments to the to the Sydney Local Environmental Plan (Sydney LEP) 2012 are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of: 45 GLS, 13 specialist / classrooms, A multi-purpose hall / auditorium, A library, A canteen, Administration, lobby and circulation spaces, An active green roof, A basement including 55 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately: 10,608m2 education floor area, 2,935m2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m

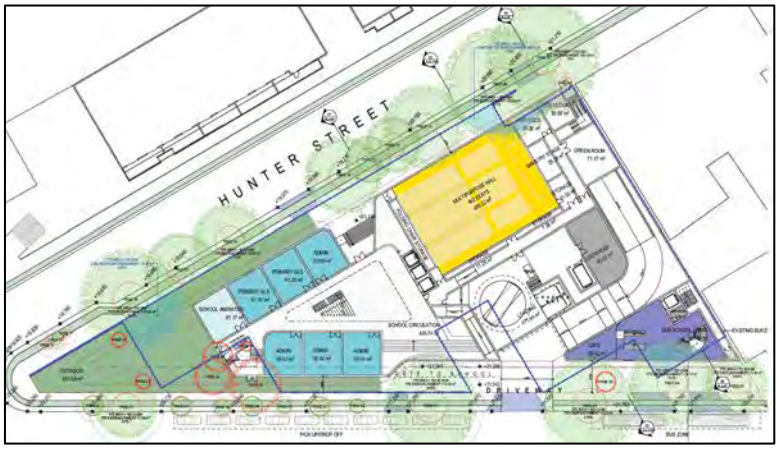


Figure 30: The proposed ground level development plan for the site. (Source Ground floor plan, from 20621 Presentation by SDG Dated 25.10.2023).



Figure 31: The proposed basement development plan for the site. (Source Basement plan, from 20621 Presentation by SDG Dated 25.10.2023).

9 Impact from Planning Proposal

9.1 Seven (7) Tree Removals

If the current proposed construction layout is to proceed, then Seven (7) site trees numbered 7, 20, 21, 24, 25, 26 & 27 are proposed for removal in order to facilitate the layout. The layout and setbacks have been adjusted serval times in design to minimise the quantity of tree removal.

All Seven (7) trees for removal are small site owned trees of Low Retention Value. Trees proposed for removal are all within the proposed footprint and their Low Retention Value status do not warrant further design change to incorporate these trees into the layout.

Trees 20, 21 & 26 are *Celtis sp* of exempt size (<10m Height).

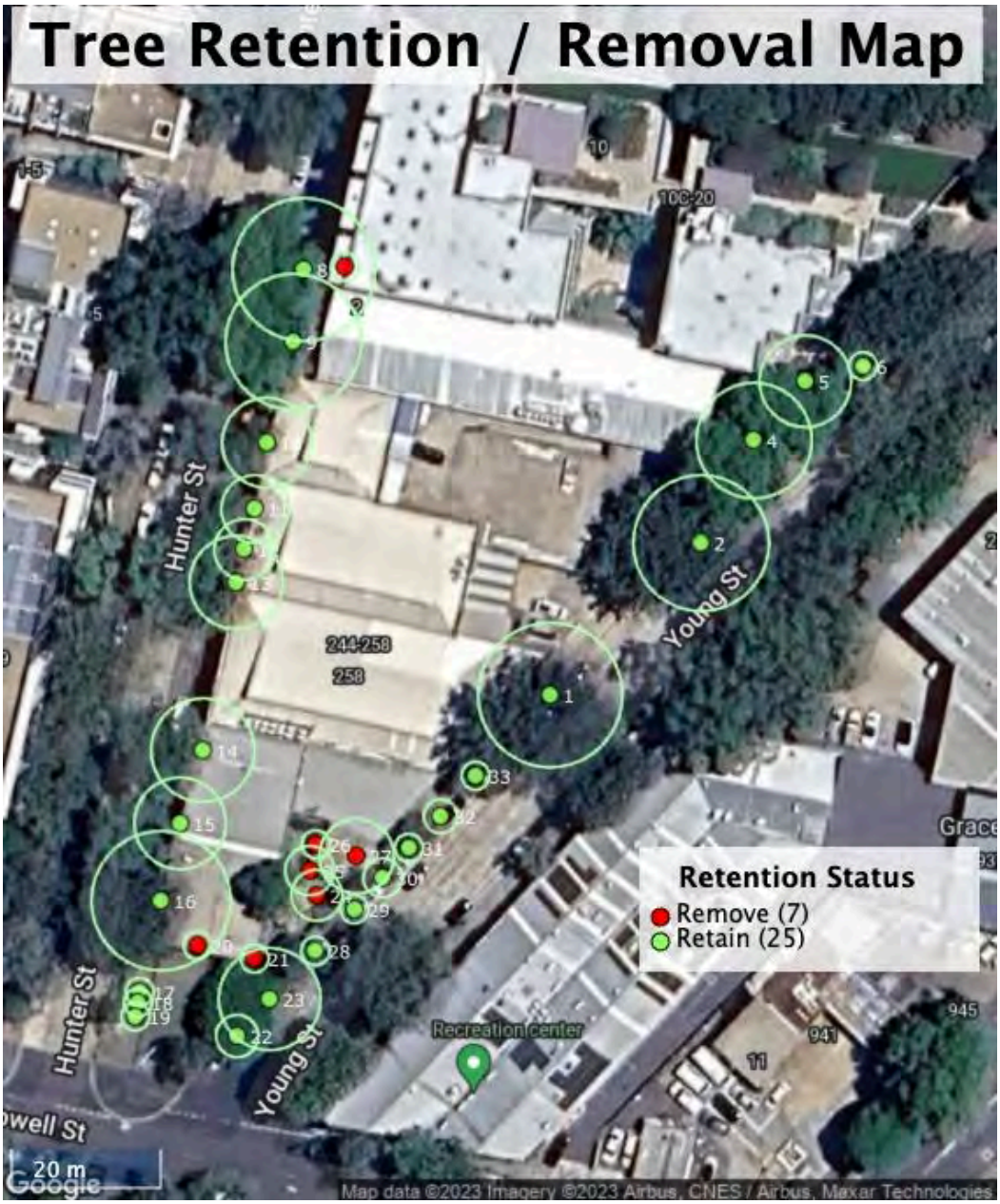


Figure 32: The proposed Tree retention and Removal Map (Source: Tree Plotter 2023).

9.2 25 Trees for Retention

25 trees numbered 1, 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 22, 23, 28, 29, 30, 31, 32 & 33 will be retained. No impact to the viability of these trees is anticipated if the protection measures are applied as per the guidance in this report.

Trees 4 & 5 are on the Client site and the remainder of the trees are on the Council land surrounding the site.

The proposed new layout has a reduced foot print to that of the existing building,. The proposed building is Six (6) levels high and also has a basement carpark. Certain trees will require supervision of the demolition of the existing as well as minor canopy pruning to facilitate the new building envelopes.

Complete TPZ impact data is seen in the Data Spreadsheet and Plan.

Canopy pruning requirements are detailed below and further detail is provided in the data spreadsheet.

9.2.1 Demolition of Existing Building

The existing building is located within the TPZ and SRZ of numerous trees. This demolition must be completed with arborist supervision and retain all roots >40mm diameter.

9.2.2 Reduced Building Envelope

The TPZ areas that are encroached by the new building envelope are all smaller than the existing encroachment. All trees have a proposed <10 % minor encroachment except for Tree 4 with 18.2%, and Tree 9 with 10.7%. Building layout has been adjusted several times to minimise impacts to trees and to ensure the proposed envelope is smaller than the existing.

The existing building is a multistorey brick struck un a concrete slab and footing. The existing construction is expected to be restricting root growth and resulting in unfavourable growing conditions for tree growth. No evidence of building damage from roots penetrating beneath the building was observed.

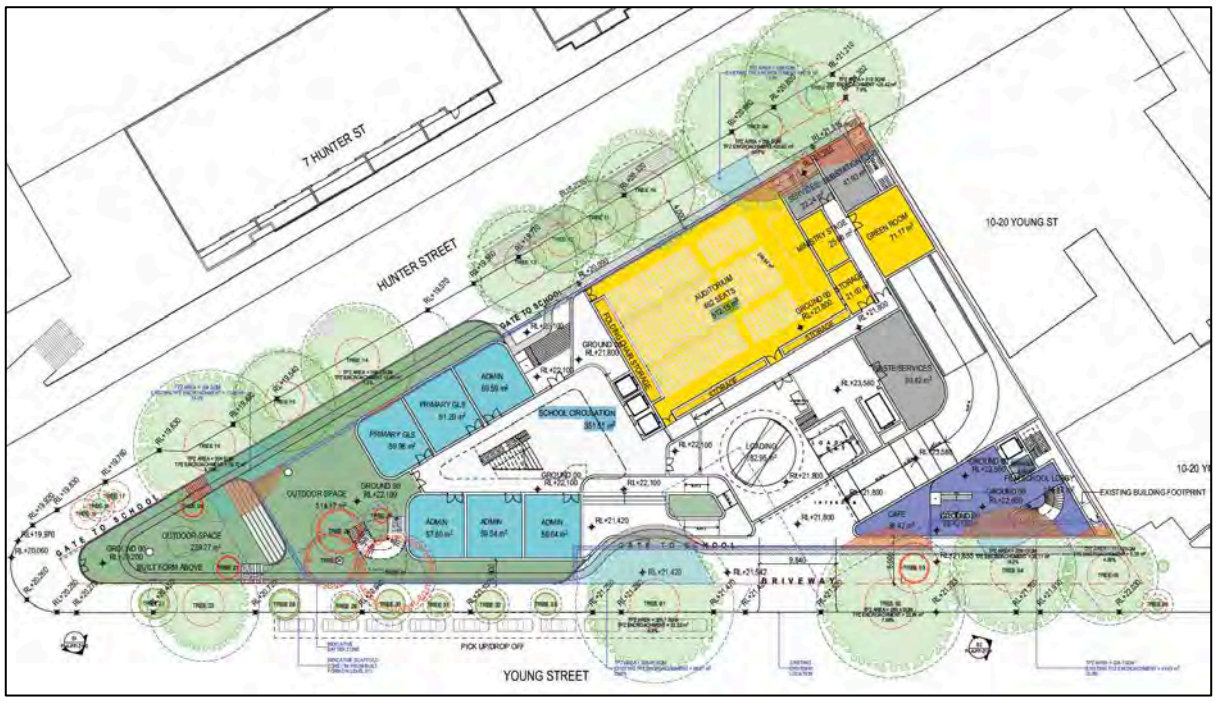


Figure 33: The floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 21/12/2024). See appendix for larger plans.

9.2.3 Temporary Scaffold.

Temporary scaffold 1m wide will be required to facilitate the building works. The scaffold must be placed on ground protection matts as to not damage roots or compact the ground.

The ground below the scaffolding must be protected by boarding (e.g. scaffold board or plywood sheeting) as shown in the figure 94 in section 11. Where access is required, a board walk or other surface material should be installed to minimize soil compaction. Boarding should be placed over a layer of mulch and impervious sheeting to prevent soil contamination. The boarding should be left in place until the scaffolding is removed.

The ground below the temporary scaffold is not expected to be negatively impacted and is not considered as a TPZ encroachment.

9.2.4 Canopy Pruning

Canopy pruning is proposed on several trees to accommodate the building envelope from level 1 up. This includes a 4.8m boundary setback on Young Street. A 1m clearance from the building is required to incorporate the scaffold.

Canopy pruning to provide space for the scaffold will be completed with minimal clearance to permit the scaffold only. Once remove the 1m gap for the scaffold will provide the appropriate 1m gap from the new building.

Pruning for scaffold will be minimized. The scaffolding must be designed to avoid branches or tying back branches. Where pruning is unavoidable it must be in accordance with AS 4373. The proposed pruning is detailed below in images, 3D modelling and descriptions below and it is also detailed in the spreadsheet located in the appendix.

9.2.5 Street Tree Protection

As works are planned near the City of Sydney Street trees in vicinity to the site, the street trees will be protected from the works using the details within the City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015), These guidelines have details pertaining to the protection of existing street trees during construction. These management measures will be required for street trees in proximity to the proposed works.

The technical guidelines provide advice pertaining to; Staff Training and Induction, Trunk Protection, Trenching and Excavation Near Trees, Pruning, Kerb Removal Adjacent To Trees, Signs - Tree Protection, Stockpiling and Storage of Materials & Damage to Trees to be Retained

10 Specific Site Trees

10.1 Tree 1 *Eucalyptus microcorys* (Tallow Wood)

Tree 1 *Eucalyptus microcorys* (Tallow Wood) is a Council tree with High retention value and with High landscape significance.

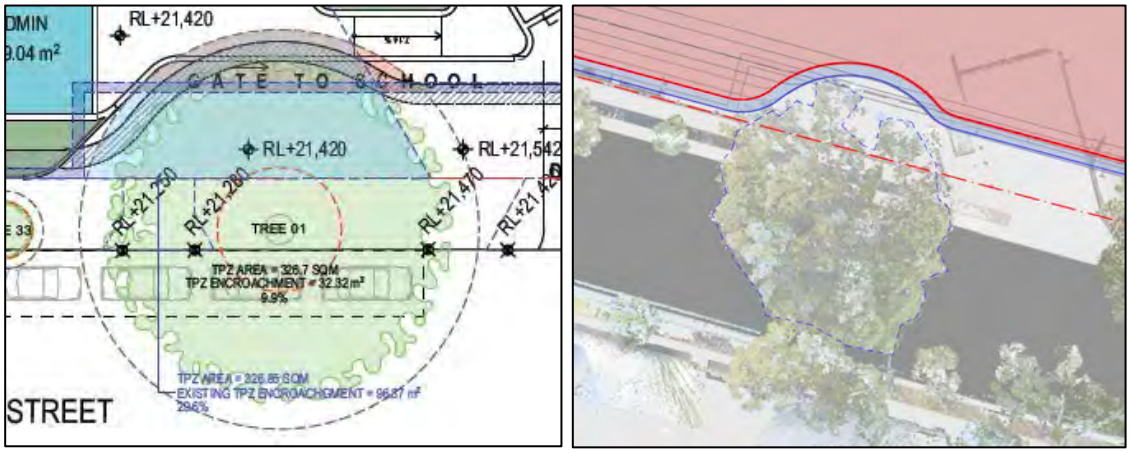
The exiting building envelope is in the SRZ. Demolition is required in the TPZ and SRZ.

The proposed building envelope proposes a minor 9.9% TPZ encroachment.

Canopy branch reduction pruning of 5 x 80mm diameter branches will provide a 3m spread reduction on the proposed building side. The proposed pruning is estimated at 5% canopy volume.



Figures 34 & 35: The proximity of Tree 1 to the existing building edge. (Source: Austin 2nd November 2023).



Figures 36 & 37: The ground floor plan depicting the existing building in the blue hatched line (partially hidden behind red hatch in this image) with the proposed building TPZ encroachments shown in pink, batter in blue and (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/12024). See appendix for larger plans & Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figures 38 & 39: The proposed minor pruning requirements to accommodate the proposed building façade.. (Source: Austin 2nd November 2023).

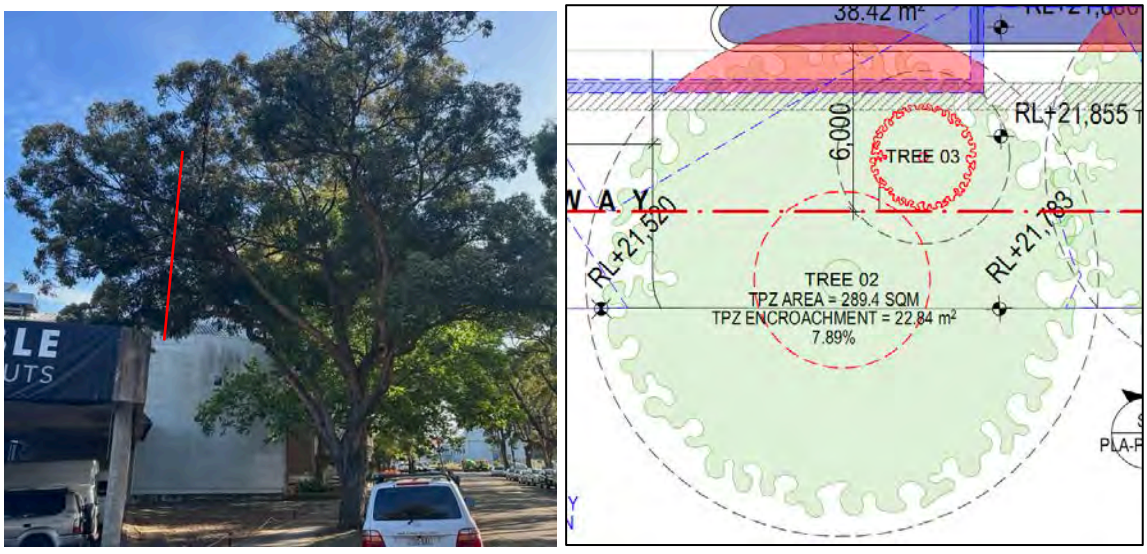
10.2 Tree 2 *Eucalyptus microcorys* (Tallow Wood)

Tree 2 *Eucalyptus microcorys* (Tallow Wood) is a Council tree with High retention value and with High landscape significance.

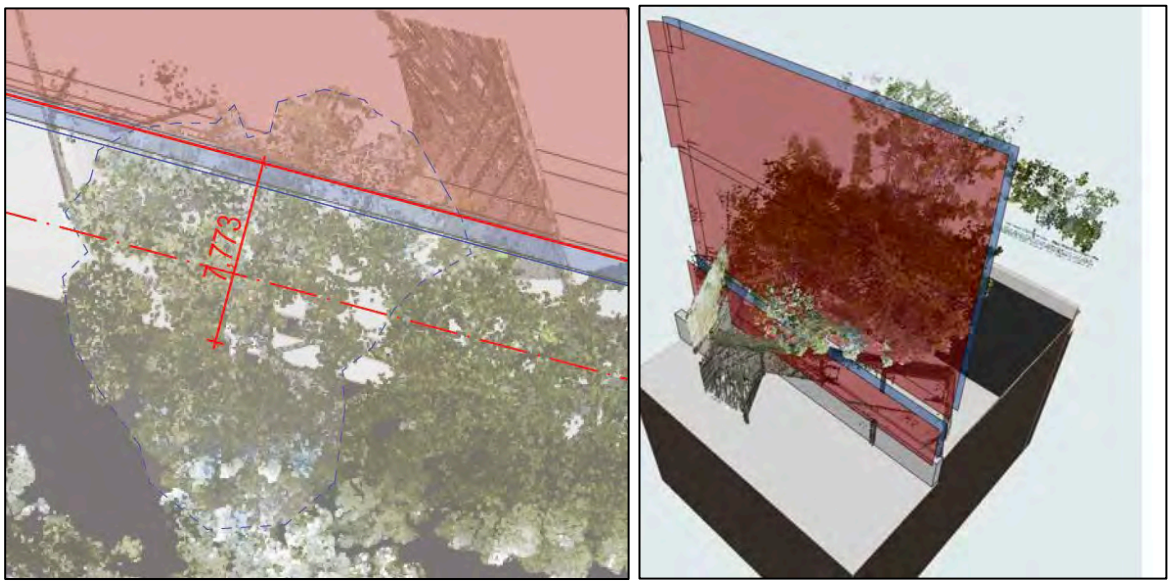
The exiting building envelope is in the TRZ. Demolition is required in the TPZ.

The proposed building envelope proposes a minor 7.89% TPZ encroachment.

Canopy branch reduction pruning of Pruning reduce 14 x 60 - 80mm diameter and 1 lower 100mm branch will provide 5m spread reduction. Plenty of pruning points are available. The proposed pruning is estimated at 15% canopy volume.



Figures 40 & 41: The proximity of Tree 2 to the existing building edge with an approximate pruning setback in red (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP - 1000 dated 15/1/2024). See appendix for larger plans.



Figures 42 & 43: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figures 44 & 45: The proposed pruning requirements to accommodate the proposed building façade next to Tree 2. (Source: Austin 2nd November 2023).

10.3 Tree 4 *Platanus x hybrida* (London Plane)

Tree 4 *Platanus x hybrida* (London Plane) is a site tree with High retention value and with High landscape significance.

The exiting building envelope is in the SRZ. Demolition is required in the TPZ and SRZ.

The existing envelope takes up 20.8% of the TPZ.

The proposed building envelope proposes a major 18.2% TPZ encroachment.

Canopy branch reduction pruning of 1x low branch at 3m of 120mm diameter back to collar. Upper canopy proposes 6 x 60 - 80mm branch reductions gives 3m canopy spread reduction. Numerous pruning points are available. The proposed pruning is estimated at 10% canopy volume.



Figures 46 & 47: The proximity of Tree 4 to the existing building edge (Left) and the slab and drain between the trunk and the building(Right). (Source: Austin 2nd November 2023)

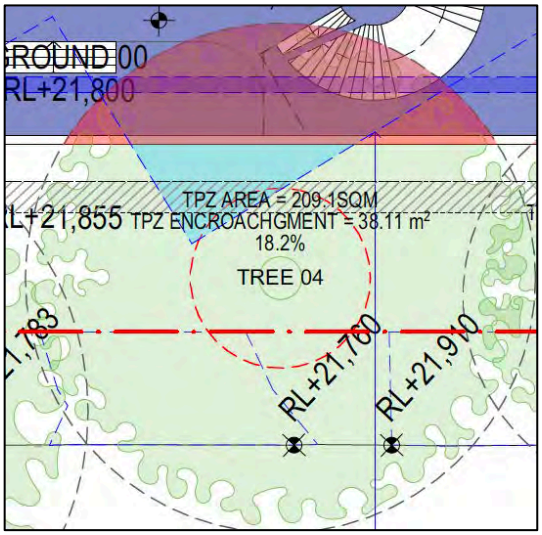
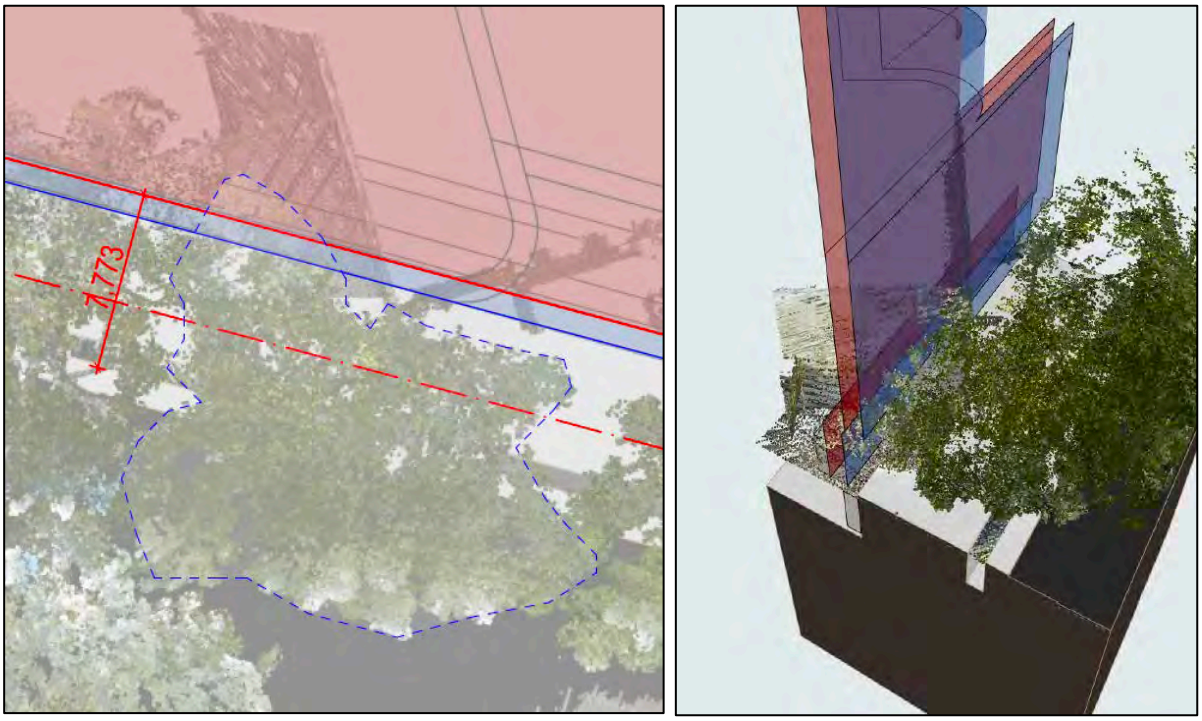


Figure 48: The floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024). See appendix for larger plans



Figures 49 & 50: The 3d modelled Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figures 51 & 52: The proposed pruning requirements to accommodate the proposed building façade. (Source: Austin 2nd November 2023).

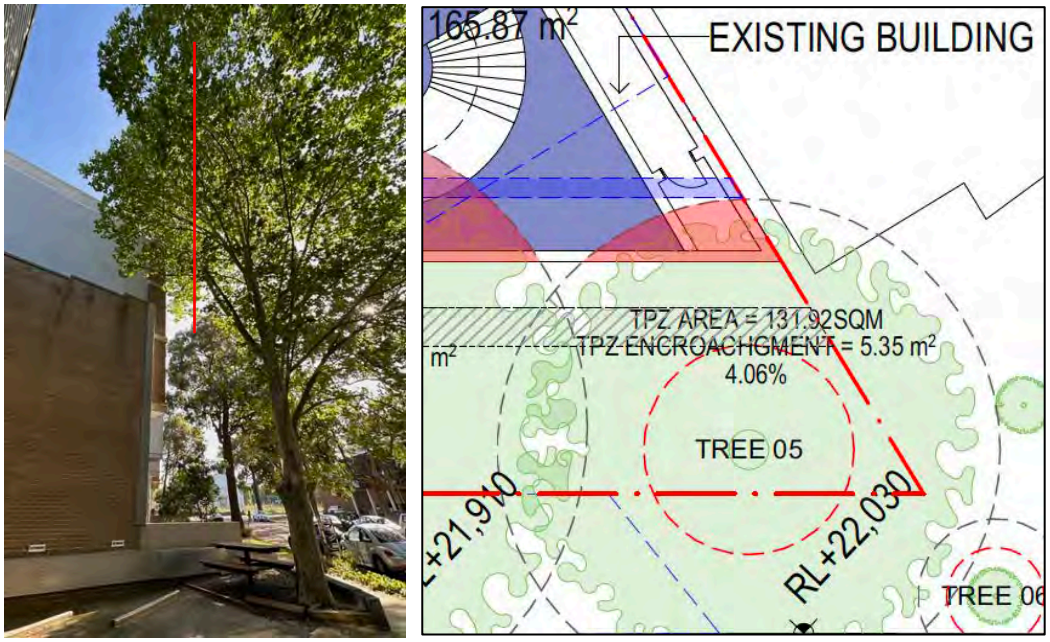
10.4 Tree 5 *Platanus x hybrida* (London Plane)

Tree 5 *Platanus x hybrida* (London Plane) is a site tree with High retention value and with High landscape significance.

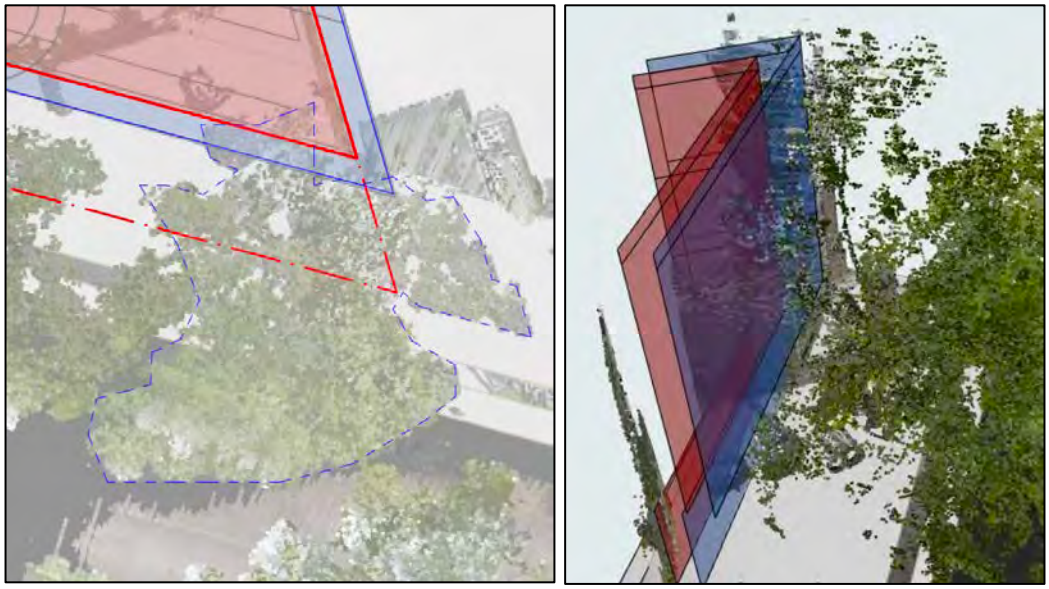
The exiting building envelope is in the TPZ. Demolition of the slab is required in the SRZ and TPZ.

The proposed building envelope proposes a minor 4.06% TPZ encroachment.

Canopy branch reduction pruning of 10 x 60 - 80mm branch reductions + clear neighbours building to 1m. The proposed pruning provides 4m canopy spread reduction. Numerous pruning points are available. The proposed pruning is estimated at 15% canopy volume.



Figures 53 & 54: The proximity of Tree 5 to the existing building edge with an approximate pruning setback in red (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP - 1000 dated 15/1/2024). See appendix for larger plans.



Figures 55 & 56: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figures 57 & 58: The proposed pruning requirements to accommodate the proposed building façade next to Tree 5. (Source: Austin 2nd November 2023).

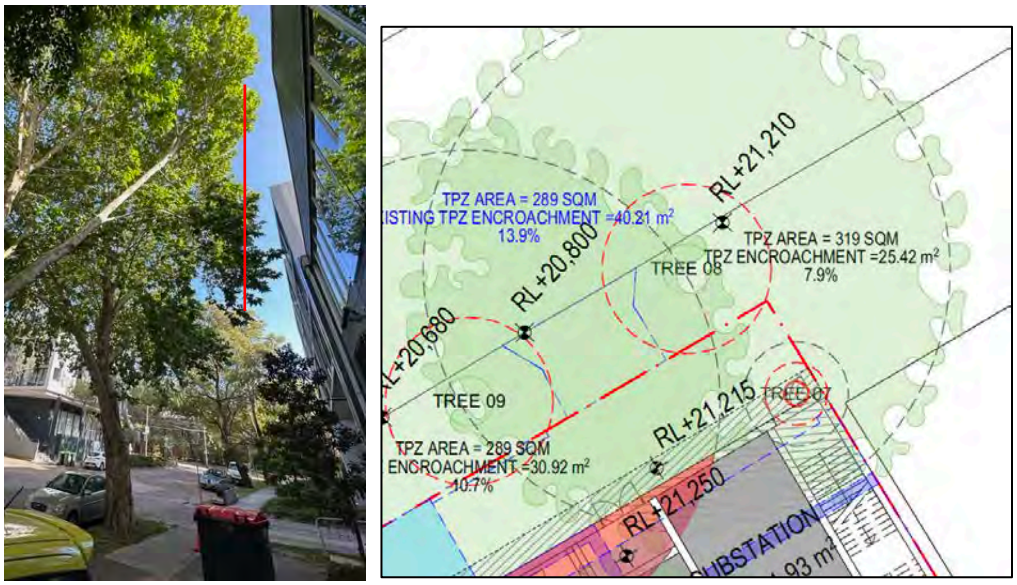
10.5 Tree 8 *Platanus x hybrida* (London Plane)

Tree 8 *Platanus x hybrida* (London Plane) is a Council tree with High retention value and with High landscape significance.

The exiting building envelope is in the TPZ. Demolition of the slab is required in the SRZ and TPZ.

The proposed building envelope proposes a minor 7.9 % TPZ encroachment.

Canopy branch reduction pruning of 6 x 50mm branches. The proposed pruning provides 2m canopy spread reduction. Numerous pruning points are available. The proposed pruning is estimated at <5% canopy volume.



Figures 59 & 60: The proximity of Tree 8 to the existing building edge with an approximate pruning setback in red (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP - 1000 dated 15/1/2024). See appendix for larger plans.



Figures 61 & 62: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figure 63: The proposed pruning requirements to accommodate the proposed building façade next to Tree 8. (Source: Austin 2nd November 2023).

10.6 Tree 9 *Platanus x hybrida* (London Plane)

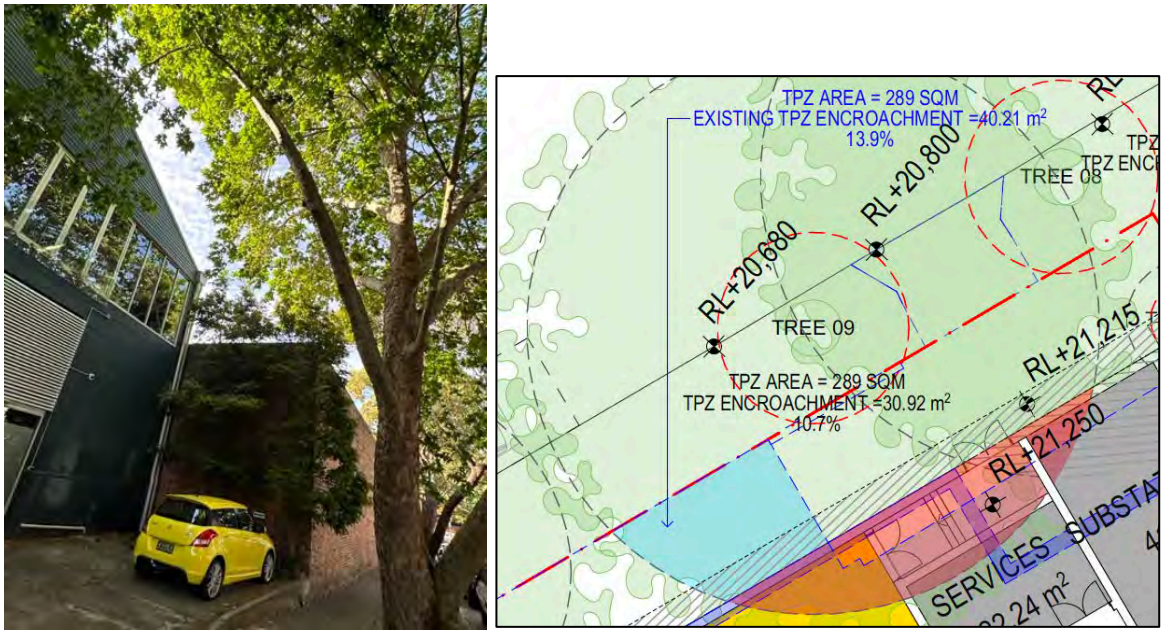
Tree 9 *Platanus x hybrida* (London Plane) is a Council tree with High retention value and with High landscape significance.

The exiting building envelope is in the TPZ. Demolition of the slab is required in the SRZ and TPZ.

The existing building envelope has a 13.9% TPZ encroachment.

The proposed building envelope proposes a 10.7 % TPZ encroachment.

Canopy branch reduction pruning Major - 1x 300mm - elongated extends to proposed building will provide 4m additional clearance. This branch has inadequate pruning points and should be removed to the collar. Additionally, Five(5) x 60 - 80mm branch reductions provide 3m additional clearance. Numerous pruning points are available. The proposed pruning provides 3m canopy spread reduction in total. The proposed pruning is estimated at 15% canopy volume.



Figures 64 & 65: The proximity of Tree 9 to the existing building edge (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024). See appendix for larger plans



Figures 66 & 67: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figures 68 & 69: The proposed pruning requirements to accommodate the proposed building façade next to Tree 9. (Source: Austin 2nd November 2023)

10.7 Tree 10 *Eucalyptus botryoides* (Southern Mahogany)

Tree 10 *Eucalyptus botryoides* (Southern Mahogany) is a Council tree with Medium retention value and landscape significance.

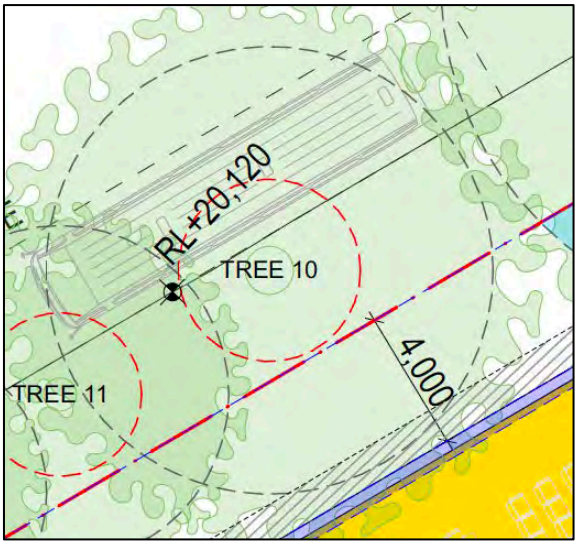
The exiting building envelope is in the TPZ. Demolition of the slab is required in the SRZ and TPZ.

The existing building envelope has a Major TPZ encroachment.

The proposed building envelope proposes a 0 % TPZ encroachment.

No pruning is required due to the proposed set back.





Figures 70 & 71: The proximity of Tree 10 to the existing building edge (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024) See appendix for larger plans.



Figures 72 & 73: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)

10.8 Tree 14 *Eucalyptus microcorys* (Tallow Wood)

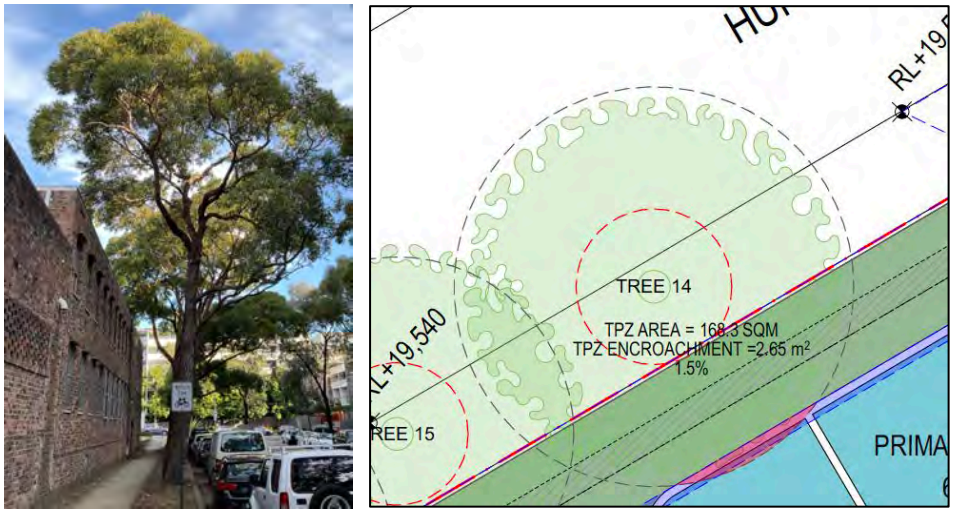
Tree 14 *Eucalyptus microcorys* (Tallow Wood) is a Council tree with Medium retention value and landscape significance.

The exiting building envelope is in the TPZ. Demolition of the slab is required in the SRZ and TPZ.

The existing building envelope has a Major TPZ encroachment.

The proposed building envelope proposes a minor 1.5 % TPZ encroachment.

Canopy branch reduction pruning of Four (40) x 50mm diameter branches will provide 2m canopy reduction and improved branch direction for future building façade. The proposed pruning is estimated at <5% canopy volume.



Figures 74 & 75: The proximity of Tree 14 tto the existing building edge (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024) See appendix for larger plans.



Figures 76 & 77: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Left) (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023) and The proposed pruning requirements to accommodate the proposed building façade next to Tree 14. (Source: Austin 2nd November 2023).

10.9 Trees 13 & 15

Tree 13 *Eucalyptus microcorys* (Tallow Wood) is a Council tree with Medium retention value and landscape significance.

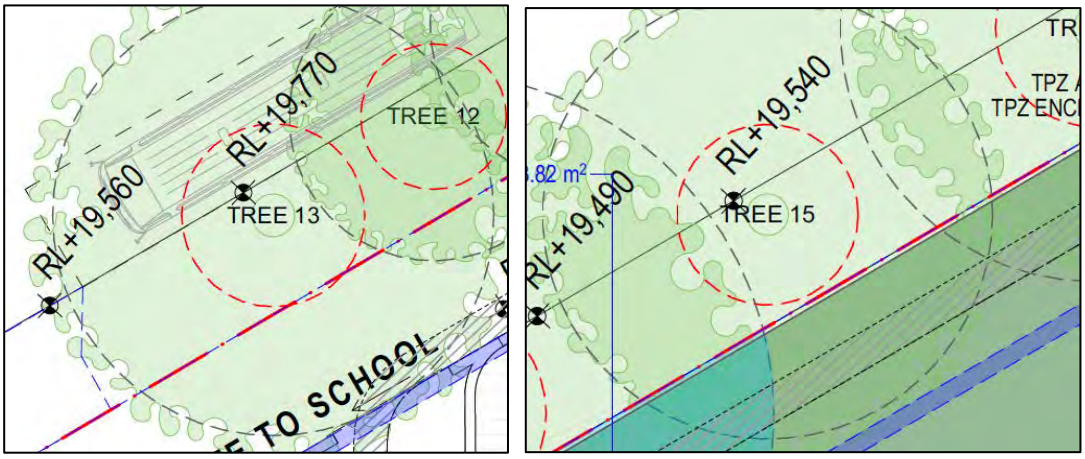
Tree 15 *Eucalyptus botryoides* (Southern Mahogany) is a Council tree with Medium retention value and landscape significance

The exiting building envelope is in the TPZs. Demolition of the slab is required in the SRZs and TPZs.

The existing building envelope has a Major TPZ encroachment for both trees

The proposed building envelope proposes a 0 % TPZ encroachment.

Canopy branch reduction pruning of Four (40) x 50mm diameter branches gives 2m clearance, improved branch direction for future building façade. The proposed pruning is estimated at <5% canopy volume.



Figures 78 & 79: The floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch to Tree 13 (Left) and Tree 15 (Right). (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024) See appendix for larger plans

10.10 Tree 16 *Eucalyptus microcorys* (Tallow Wood)

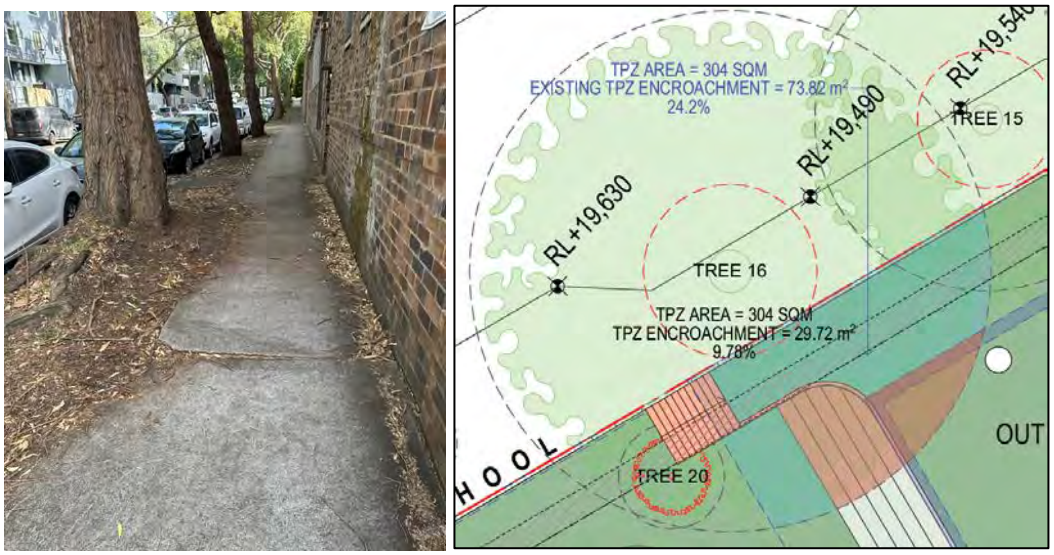
Tree 16 *Eucalyptus microcorys* (Tallow Wood) is a Council tree with High retention value and landscape significance.

The exiting building envelope is in the TPZ. Demolition of the slab is required in the SRZ and TPZ.

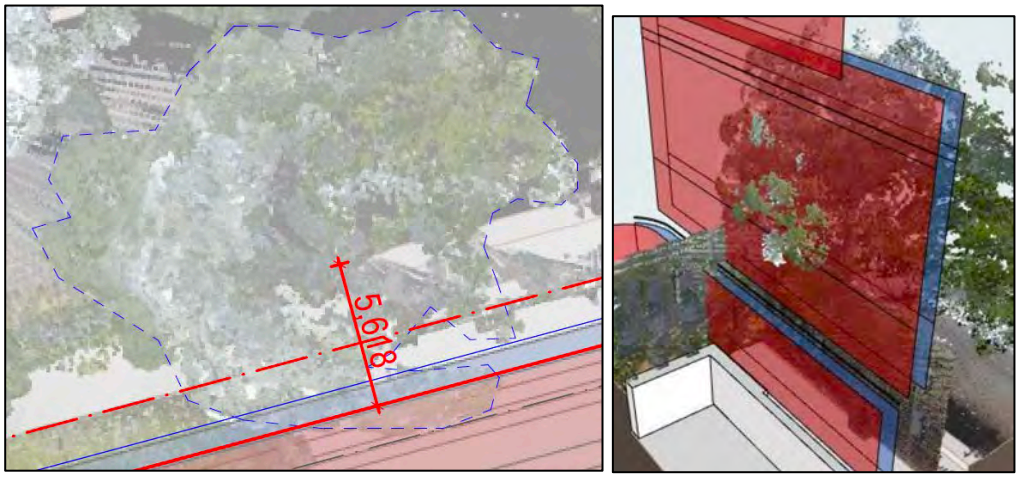
The existing building envelope has a Major 24.2% TPZ encroachment.

The proposed building envelope and outdoor staircases propose a minor 9.78 % TPZ encroachment.

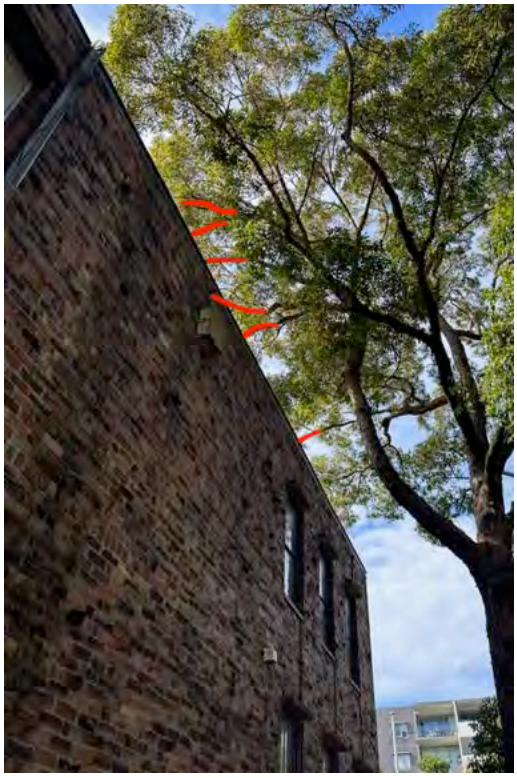
Canopy branch reduction pruning of Five (5) x 50mm diameter and One (1)x 100mm diameter branches would give 4m canopy spread reduction. Plenty of pruning points are available to minimize cuts. The proposed pruning is estimated at 10% canopy volume.



Figures 80 & 81: The proximity of Tree 16 to the existing building edge depicting the lifted paving (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line with the proposed building TPZ encroachments shown in pink, batter in blue and scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024). See appendix for larger plans.



Figures 82 & 83: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)




Figures 84 & 85: The proposed pruning requirements to accommodate the proposed building façade next to Tree 16. (Source: Austin 2nd November 2023).

10.11 23 *Ficus sp.* (Fig)

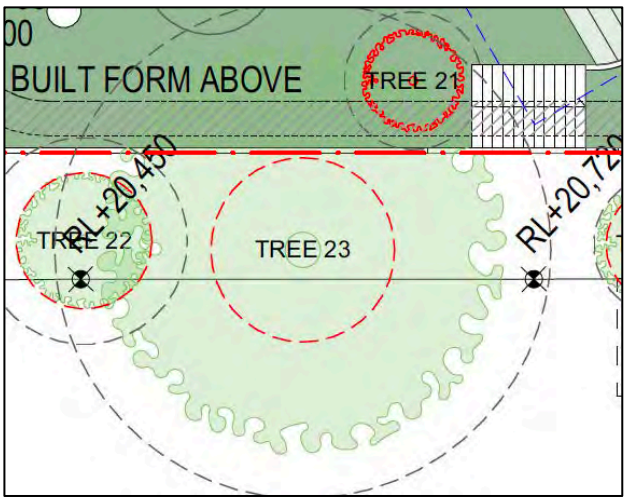
Tree 23 *Ficus sp.* (Fig) is a Council tree with Medium retention value and landscape significance.

Excavation is required in TPZ.

The proposed building envelope proposes a 4.7 % TPZ encroachment.

The 1m wide temporary scaffold results in a total 10.2% TPZ encroachment.

Canopy branch reduction pruning of Ten (10) 50mm diameter branch reduction of 2m. This would provide 42m canopy spread reduction from the proposed building façade. Plenty of pruning points are available to minimize cuts. The proposed pruning is estimated at 10% canopy volume.

Figures 86 & 87: The proximity of Tree 23 to the existing building edge depicting the lifted paving (Left - Source: Austin 2nd November 2023) and the floor plan depicting the existing building in the blue hatched line scaffold from level 1 and above shown in hatch (Source: General Floor Plan, by Plus Architects, drawing number PLA-PP -1000 dated 15/1/2024). See appendix for larger plans



Figures 88 & 89: The Tree canopy impact of the proposed building in Pink and 1m wide scaffold in Blue. (Source: Tree Canopy Modelling by Plus Architects dated 1/08/2023)



Figures 90 & 91: The proposed pruning requirements to accommodate the proposed building façade next to Tree 16. (Source: Austin 2nd November 2023).

10.12 Remaining Trees

Eleven (11) Council Trees numbered 6, 17, 18, 19, 22, 28, 29, 30, 31, 32 & 33 are located adjacent to the site but have no direct impacts from the proposal. These Eleven (11) Council Trees must be protected from construction activities such as goods movements by applying the details within the City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015).

11 Measures to minimise impacts to retained trees.

25 Trees can be retained if the tree protection measures in the report are adhered to. In order to minimise the impact to the tree nominated for retention, the following measures must be incorporated into the works.

11.1 Project Arborist

An official "Project Arborist" should be commissioned to oversee the tree protection, any works within the TPZ's and complete compliance certification. The Project Arborist should have minimum five (5) years industry experience in the field of arboriculture.

11.2 Seven (7) Tree Removals

Seven (7) site trees numbered 7, 20, 21, 24, 25, 26 & 27 are proposed for removal and should be removed at the beginning of the project (STCA). The trees nominated for retention must not be damaged during the tree removal works.

11.2.1 Standard of Works

To ensure a high standard of works is achieved, all proposed arboricultural works must be completed by a suitably qualified and experienced Arborist(s) of a minimum AQF Level 3 in accordance with the principles of the Australian Standard *4373-2007 Pruning of Amenity Trees.*

11.3 Tree Protection Fencing

Protective fencing is to be installed as close as practicable from the trunk to the TPZ distances listed in the Tree Data table. Existing site features such as boundary fences will influence the extent of the TPZ fencing. The project arborist is to determine the suitability and extent of the tree protection fencing to be used.

Tree protection fencing must remain intact throughout all proposed construction works and must only be dismantled after the works are complete. The temporary dismantling of tree protection fencing must only be done with the authorisation of the project arborist and/or the responsible authority.

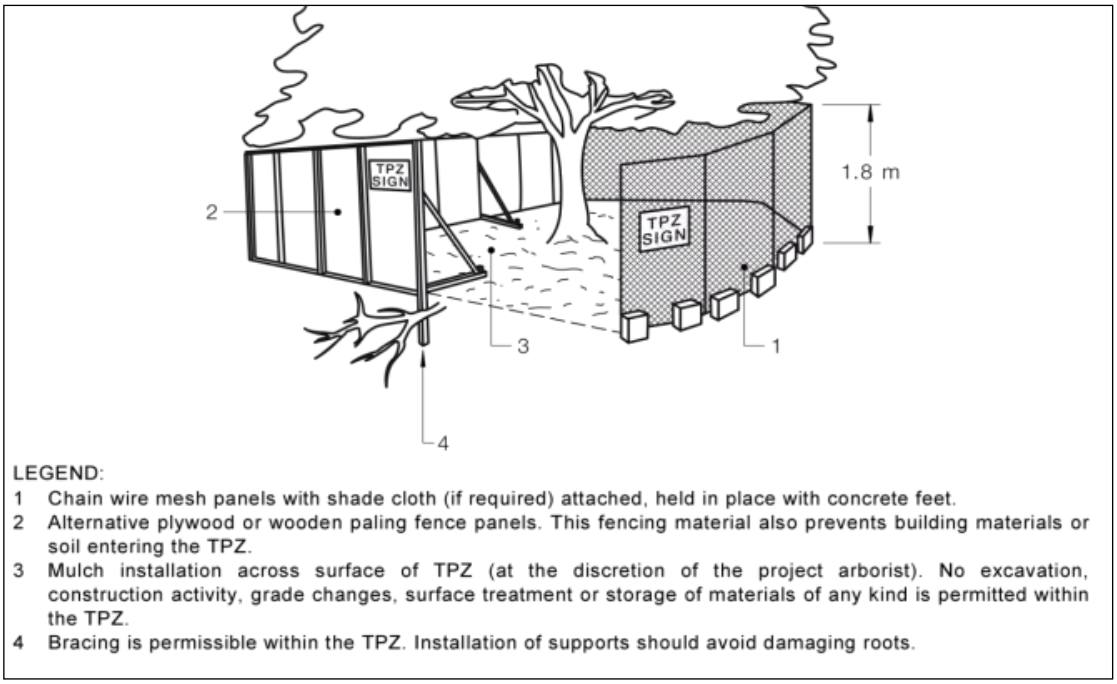


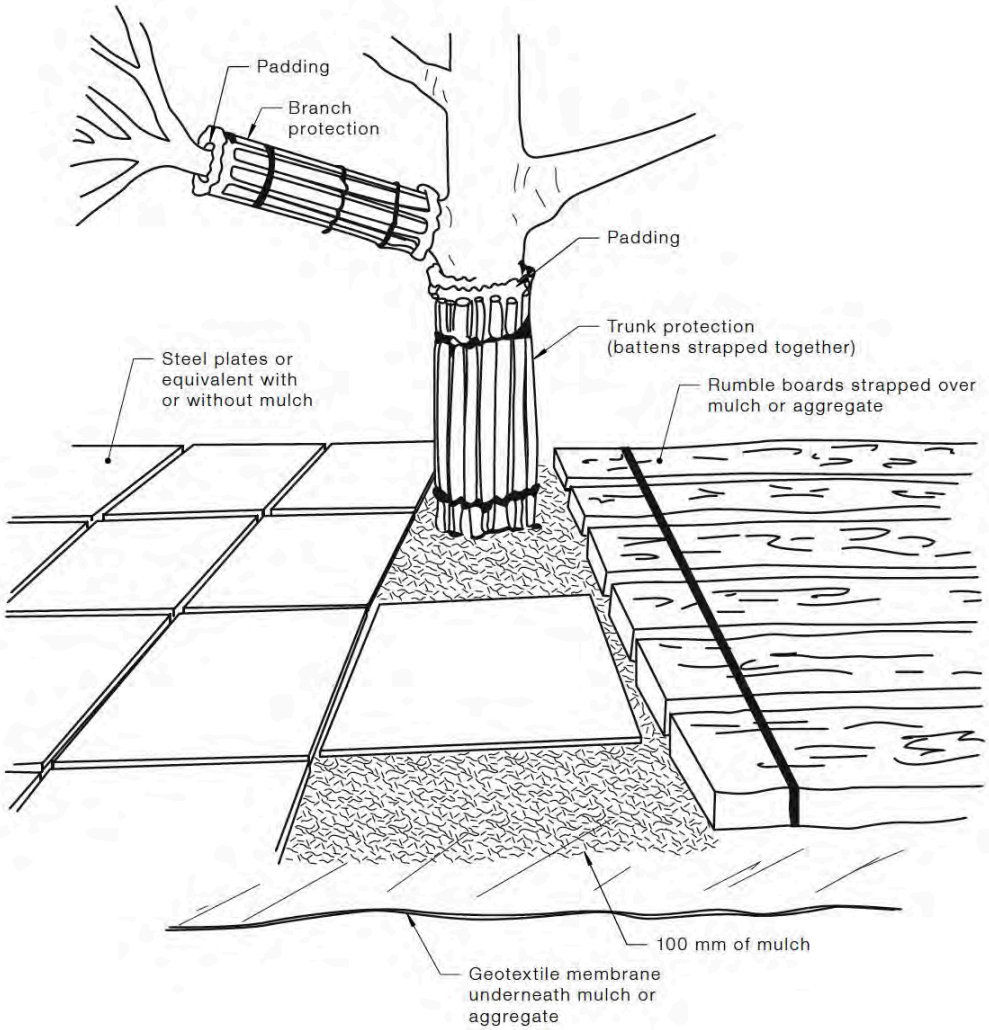
Figure 92: TPZ fencing specification. (Source: AS 4970:2007).

11.4 Trunk and Branch Protection

Trunk and Branch Protection requires the wrapping of trunks and branches with padding then at the addition of boards to be strapped (Not Nailed) to the tree using galvanised strapping tape.

11.5 Ground Protection

Rumble boards are to be installed on the ground wherever access to the site is planned outside existing driveways. Rumble boards must be installed on aggregate or mulch above a geotextile base. The rumble boards must be of suitable thickness to prevent compaction to the ground.



NOTES:

1 For trunk and branch protection use boards and padding that will prevent damage to bark. Boards are to be strapped to trees, not nailed or screwed.

2 Rumble boards should be of a suitable thickness to prevent soil compaction and root damage.

Figure 93: Trunk and branch warping as well as rumble board specifications. (Source: AS 4970:2007).

11.6 Existing Driveways

The existing driveways are suitable to use as access for demolition and site works. The existing driveway must be left in situ until the new driveways are ready to be poured.

11.7 Temporary Scaffold.

Temporary scaffold 1m wide will be required to facilitate the building works. The scaffold must be placed on ground protection matts as to not damage roots or compact the ground. Scaffold construction will be combined with canopy pruning and trunk/branch wrapping.

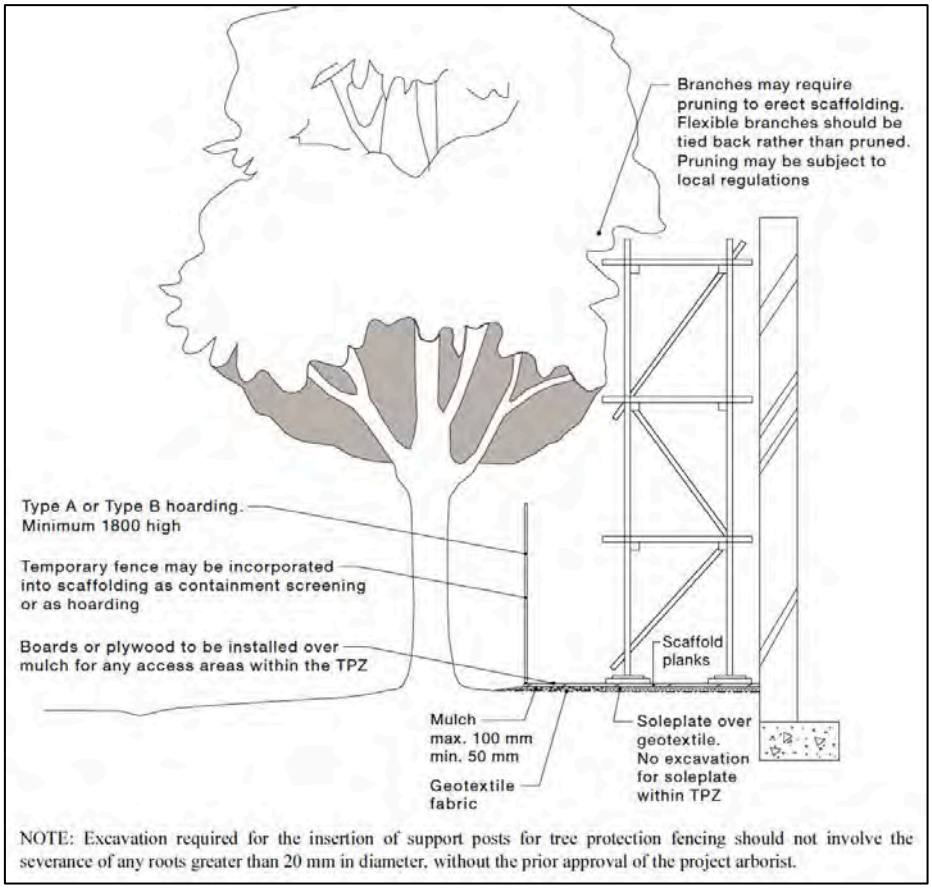


Figure 94: Scaffold within the TPZ specification. (Source: AS 4970:2007)

11.8 Tree Protection Signage

The tree protection signage below should be installed at 10m intervals along the Tree Protection Fences.



Figure 95: TPZ signage specification. (Source: Austin 2023).

11.9 Canopy Pruning

All proposed clearance pruning must be in line with the detail provides in this report be approved by the Council, be supervised by the project Arborist, be completed by a suitably qualified and experienced Arborist(s) of a minimum AQF Level 3 in accordance with the principles of the Australian Standard *4373-2007 Pruning of Amenity Trees.*

11.10 Works within TPZ's

All works within the TPZs must be completed by techniques that do not damage tree roots. Excavation works should be undertaken using techniques that are sensitive to tree roots to avoid unnecessary damage. Such techniques include:

- Excavation/demolition by hand
- Excavation/demolition by machine with Arborist supervision
- Excavation using a high-pressure water jet and vacuum truck
- Excavation using an air spade with vacuum truck

Machine excavation is prohibited within the remaining TPZ areas of retained trees unless undertaken at the direct consent from the project arborist and/or the responsible authority.

11.11 Activities Restricted within the TPZ

- Machine excavation without Arborist supervision
- Demolition by machine without Arborist supervision
- Excavation for silt fencing
- Storage
- Preparation of chemicals, including preparation of cement products
- Dumping of waste
- Wash down and cleaning of equipment
- Placement of fill
- Soil level changes
- Temporary or permanent installation of services, utilities, or signs
- Physical damage to the tree
- Parking or driving of vehicles/machinery.

11.12 Compliance Inspections & Reports

Inspections should be conducted by the Project Arborist at key points during the construction to ensure that protection measures are being adhered to during construction stages and any decline in tree health or additional remediation measures can be identified.

Tree inspections and compliance reporting by the project arborist is required at the following points;:

1. Following the tree removal works and the installation of the tree protection including, tree protection fencing, trunk protection, mulch and ground protection matts.
2. During any demolition or excavation within TPZ's of the Trees to be retained.
3. To supervise the proposed pruning schedule on trees to be retained.
4. Following the installation of the ground protection and scaffold in the TPZ's
5. During any other works within TPZ's of trees to be retained unless specific methodologies are developed and approved by the project arborist.
6. Every month during the works to ensure compliance

7. At the practical completion of the project

Following each inspection, the project arborist shall prepare a brief compliance report detailing the condition of the trees. These reports should contain photographic evidence where required to demonstrate that the protection measures are in place as specified.

Any Non-Compliance Statements shall be submitted to the Project Manager (as well as the clients' nominated representative) if tree protection conditions have been breached. Reports should contain clear remedial action specifications to minimise any adverse impact on any subject tree.

12 Conclusion

This Arboricultural Impact Assessment has provided a detailed analysis of the trees that could be affected by development on the subject site. The requirements for Tree Preservation Zones are in line with AS 4970:2009 *Protection of tree on development sites.* The viability of the trees nominated for retention is not anticipated to be impacted if the protection measures are applied as per the guidance in this report.

13 References

Australian Standard 4970: 2009 *Protection of trees on development sites.*

British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations.*

14 Industry Qualifications

- AQF Level 5 & 8 Consulting Arborist.
- ISA Certified Arborist # AU-0348A
- Tree Risk Assessment Qualification (TRAQ) (Exp Oct 2028)
- Advanced Quantified Tree Risk Assessment Registered User # 3692
- Masters of Environmental Law

15 Appendices

15.1 Significance of a Tree Assessment Rating System (IACA 2010)©

The landscape significance of a tree is an essential criterion for establishing the importance that a particular tree may have on a site. However, rating the significance of a tree becomes subjective and difficult to ascertain in a consistent and repetitive fashion due to assessor bias. It is therefore necessary to have a rating system utilising structured qualitative criteria to assist in determining the retention value for a tree.

This rating system will assist in the planning processes for proposed works, above and below ground where trees are to be retained on or adjacent a development site. The system uses a scale of *High*, *Medium* and *Low* significance in the landscape. Once the landscape significance and *Useful Life Expectancy* of an individual tree has been defined, the retention value can be determined.

Tree Significance - Assessment Criteria

1. High Significance in landscape.

- The tree is in good condition and good vigour;
- The tree has a form typical for the species;
- The tree is a remnant or is a planted locally indigenous specimen and/or is rare or uncommon in the local area or of botanical interest or of substantial age;
- The tree is listed as a Heritage Item, Threatened Species or part of an Endangered ecological community or listed on Councils significant Tree Register;
- The tree is visually prominent and visible from a considerable distance when viewed from most directions within the landscape due to its size and scale and makes a positive contribution to the local amenity;
- The tree supports social and cultural sentiments or spiritual associations, reflected by the broader population or community group or has commemorative values;
- The tree's growth is unrestricted by above and below ground influences, supporting its ability to reach dimensions typical for the taxa *in situ* - tree is appropriate to the site conditions.

2. Medium Significance in landscape.

- The tree is in fair-good condition and good or low vigour;
- The tree has form typical or atypical of the species;
- The tree is a planted locally indigenous or a common species with its taxa commonly planted in the local area;
- The tree is visible from surrounding properties, although not visually prominent as partially obstructed by other vegetation or buildings when viewed from the street;
- The tree provides a fair contribution to the visual character and amenity of the local area;
- The tree's growth is moderately restricted by above or below ground influences, reducing its ability to reach dimensions typical for the taxa *in situ*.

3. Low Significance in landscape.

- The tree is in fair-poor condition and good or low vigour;
- The tree has form atypical of the species;
- The tree is not visible or is partly visible from surrounding properties as obstructed by other vegetation or buildings;
- The tree provides a minor contribution or has a negative impact on the visual character and amenity of the local area;
- The tree is a young specimen which may or may not have reached dimension to be protected by local Tree Preservation orders or similar protection mechanisms

and can easily be replaced with a suitable specimen;
- The tree's growth is severely restricted by above or below ground influences, unlikely to reach dimensions typical for the taxa *in situ* - tree is inappropriate to the site conditions;
- The tree is listed as exempt under the provisions of the local Council Tree Preservation Order or similar protection mechanisms;
- The tree has a wound or defect that has potential to become structurally unsound.

Environmental Pest / Noxious Weed Species:

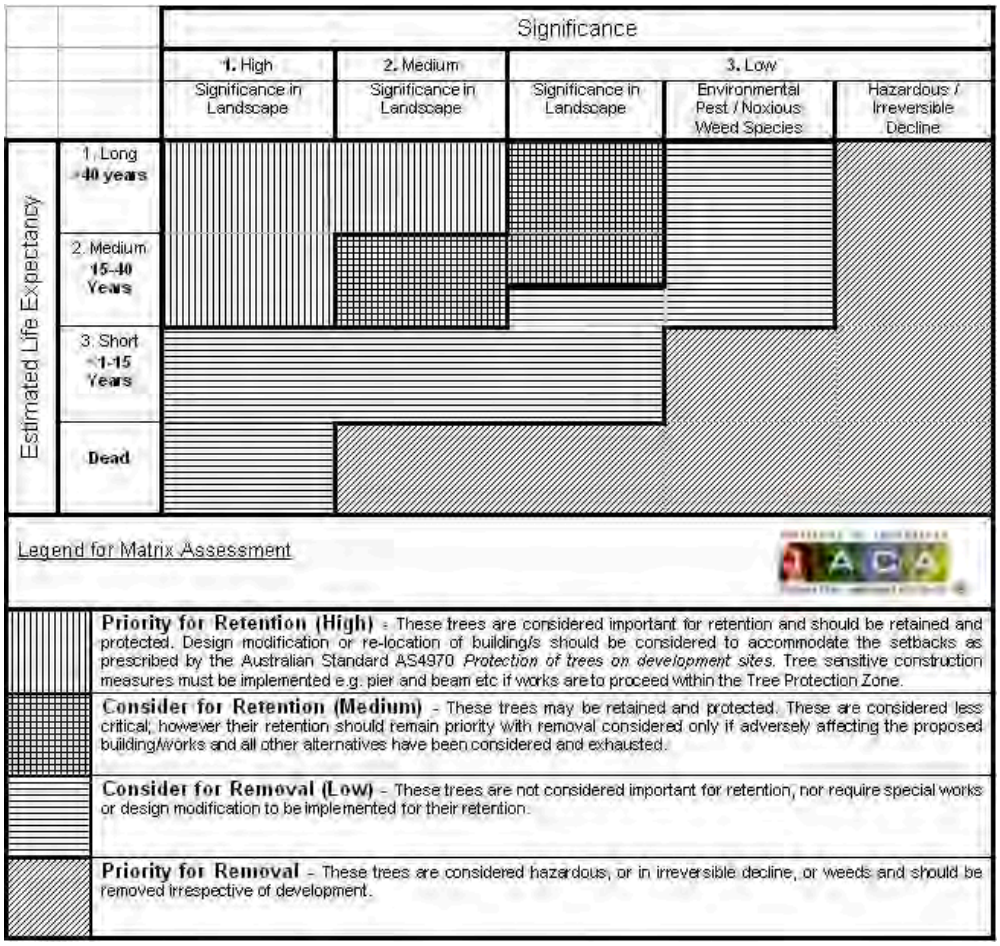
- The tree is an Environmental Pest Species due to its invasiveness or poisonous/ allergenic properties;
- The tree is a declared noxious weed by legislation.

Hazardous/Irreversible Decline:

- The tree is structurally unsound and/or unstable and is considered potentially dangerous;
- The tree is dead, or is in irreversible decline, or has the potential to fail or collapse in full or part in the immediate to short term.

The tree is to have a minimum of three (3) criteria in a category to be classified in that group. Note: The assessment criteria are for individual trees only, however, can be applied to a monocultural stand in its entirety

Table - Tree Retention Value - Priority Matrix



15.2 Complete Tree and Impact Data Spreadsheet

15.3 Tree Location Map

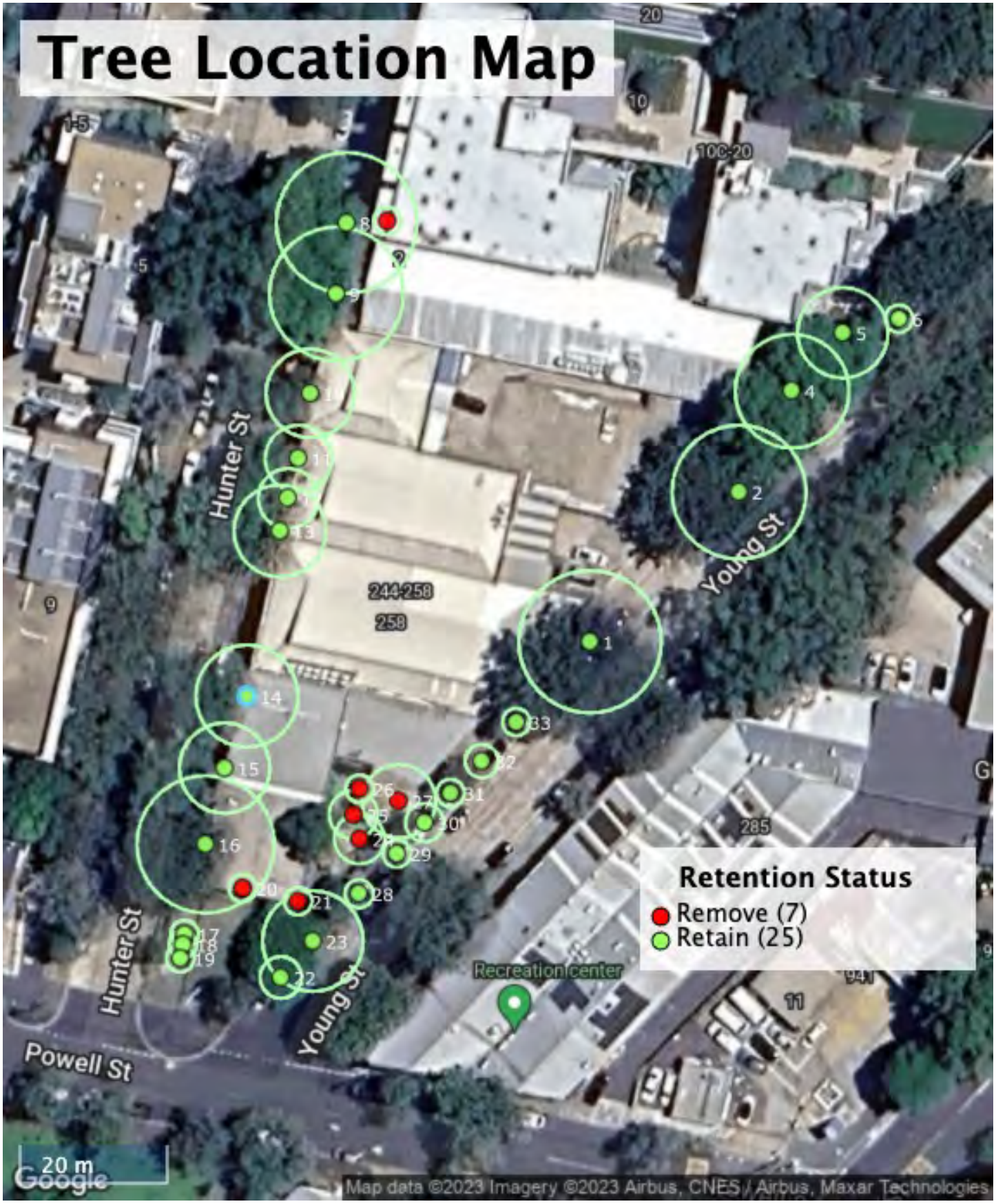
15.4 City of Sydney Street Tree Master Plan, Part D Technical Guidelines dated 2011 (Updated 2015)

15.5 Tree Protection and Management Plan

15.6 Tree Impact Plan

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees in Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Habitat Features	Landscape Significance (STARS)	Retention Value (SRIV)	Canopy distance over boundary	Existing Canopy overhang severity	Pruing Required for Proposed building	Pruing Required for Proposed Scaffold	Pruning Detail	Required Pruning %	Current TPZ Encraochment	Proposed TPZ Encroachment %	Proposed Impact	Proposed Action
1	Council land	Tallowwood	*Eucalyptus microcorys*	1	Mature	85	91	10.2	327	3.18	19	18	Good	Good	Amenity value, Shade value	Long (>40 years)	Crossing/rubbing branches, Deadwood > 30mm, Epicormic growth, Flush cuts	None sighted	High	High (A)	7	Major	None	Yes	Pruning 5 x 80mm diamter will give 3m spread reduction,	5%	Minor	9.9	Demoltion and reduced TPZ encroachment	Retain and Protect
2	Council land	Tallowwood	*Eucalyptus microcorys*	1	Mature	80	99	9.6	289	3.3	17	18	Good	Average	Amenity value, Shade value	Long (>40 years)	Co-dominant stems, Deadwood > 30mm, Epicormic growth, Previous failure(s)	None sighted	High	High (A)	8	Major	Yes	Yes	Pruning reduce 14 x 60 - 80mm diamter and 1 lower 100mmwould give 5m spread reduction. Plenty of pruning points are available.	15%	Minor	7.89	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
4	Client site	London Plane	*Platanus x hybrida*	1	Mature	68	72	8.16	209	2.88	20	16	Good	Good	Amenity value, Shade value	Long (>40 years)	Co-dominant stems, Deadwood < 30mm, Poor pruning	None sighted	High	High (A)	NA	Major	Yes	Yes	1x low branch at 3m 120mm back to collar. Upper canopy 6 x 60 - 80mm branch reductions gives 3m additional clearance. Numerous pruning points available	10%	20.8	18.2	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
5	Client site	London Plane	*Platanus x hybrida*	1	Mature	54	62	6.48	132	2.71	19	12	Good	Good	Amenity value, Shade value	Long (>40 years)	Co-dominant stems, Deadwood < 30mm, Poor pruning	None sighted	High	High (A)	NA	Major	Yes	Yes	10 x 60 - 80mm branch reductions + clear neighbours building to 1m. Can provide 4m additional clearance.	15%	None	4.06	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
6	Council land	Tallowwood	*Eucalyptus microcorys*	1	Juvenile	9	10	2	12.6	1.26	6	1.5	Good	Good	New tree planting	Long (>40 years)		None sighted	Medium	Medium (B)	None	Minor	None	None		None	None	None	No Impact	Retain and Protect
7	Client site	Dwarf Bull Bay	*Magnolia grandiflora 'Little Gem'*	1	Semi-Mature	7	9	2	12.6	1.2	6	1	Good	Good	Amenity value	Medium (15-40 years)	Deadwood < 30mm	None sighted	Low	Low (C)	NA	NA	None	None		None			Within foot Print	Remove
8	Council land	London Plane	*Platanus x hybrida*	1	Mature	84	95	10.08	319	3.24	20	22	Good	Average	Amenity value, Shade value	Medium (15-40 years)	Co-dominant stems, Deadwood < 30mm, Suppressed	None sighted	High	High (A)	3	Minor	Yes	Yes	Minor - 6 x 50mm branch reductions gives 2m additional clearance	<5%	Major	7.9	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
9	Council land	London Plane	*Platanus x hybrida*	1	Mature	80	93	9.6	289	3.21	20	22	Good	Average	Amenity value, Shade value	Medium (15-40 years)	Co-dominant stems, Deadwood < 30mm	None sighted	High	High (A)	6	Major	Yes	Yes	Major - 1x 300mm - elongated extends to propsed building. Gives 4m additional clearance + 5 - 60 - 80mm reductions gives 3m additional clearance.	15%	13.9	10.7	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
10	Council land	Southern Mahogany	*Eucalyptus botryoides*	1	Mature	53	56	6.36	127	2.59	16	16	Good	Average	Amenity value, Shade value	Medium (15-40 years)	Co-dominant stems, Epicormic growth, Previous failure(s), Suppressed	None sighted	Medium	Medium (B)	4	Minor	None	None	Minor reduction pruning of 4 x 50mm gives 2m clearance, improved branch direction for future building facade	<5%	Major	0	Demoltion, Excavation with reduced TPZ encroachment,	Retain and Protect
11	Council land	Southern Mahogany	*Eucalyptus botryoides*	1	Semi-Mature	40	43	4.8	72.4	2.32	15	11	Good	Average	Amenity value, Shade value	Medium (15-40 years)	Epicormic growth, Suppressed	None sighted	Medium	Medium (B)	3	Minor	None	None	Minor reduction pruning of 4 x 50mm gives 2m clearance, improved branch direction for future building facade	<5%	Major	0	Demoltion, Excavation with reduced TPZ encroachment,	Retain and Protect
12	Council land	Southern Mahogany	*Eucalyptus botryoides*	1	Semi-Mature	36	37	4.32	58.6	2.18	15	9	Good	Average	Amenity value, Shade value	Medium (15-40 years)	Epicormic growth, Suppressed	None sighted	Medium	Medium (B)	1	Minor	None	None		None	Major	0	Demoltion, Excavation with reduced TPZ encroachment,	Retain and Protect
13	Council land	Tallowwood	*Eucalyptus microcorys*	1	Mature	55	64	6.6	137	2.74	16	15	Good	Good	Amenity value, Shade value	Medium (15-40 years)	Deadwood < 30mm, Epicormic growth, Infrastructure damage	None sighted	Medium	Medium (B)	4	Major	None	None	Minor reduction pruning of 6 x 50mm gives 2m clearance, improved branch direction for future building facade	<5%	Major	0	Demoltion, Excavation with reduced TPZ encroachment,	Retain and Protect
14	Council land	Southern Mahogany	*Eucalyptus botryoides*	1	Mature	61	70	7.32	168	2.85	17	14	Good	Good	Amenity value, Shade value	Medium (15-40 years)	Co-dominant stems, Epicormic growth, Mechanical damage to root(s)	Stick nest(s)	Medium	High (A)	3	Major	None	None	Minor reduction pruning of 4 x 50mm gives 2m clearance, improved branch direction for future building facade	<5%	Major	1.5	Demoltion, Excavation with reduced TPZ encroachment,	Retain and Protect
15	Council land	Southern Mahogany	*Eucalyptus botryoides*	1	Mature	54	57	6.48	132	2.61	17	14	Good	Average	Amenity value, Shade value	Medium (15-40 years)	Crossing/rubbing branches, Epicormic growth, Mechanical damage to root(s), Suppressed, Wound(s)	None sighted	Medium	High (A)	3	Minor	None	None			Major	0	Demoltion, Excavation with reduced TPZ encroachment,	Retain and Protect
16	Council land	Tallowwood	*Eucalyptus microcorys*	1	Mature	82	98	9.84	304	3.28	21	19	Good	Good	Amenity value, Shade value	Medium (15-40 years)	Epicormic growth, Inappropriate location, Infrastructure damage, Mechanical damage to root(s)	None sighted	High	High (A)	7	Major	Yes	Yes	Pruning reduce 5 x 50mm diameter and 1 100mm would give 4m more clearance. Plenty of pruning points.	<10%	24.2	9.78	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
17	Council land	Crepe Myrtle	*Lagerstroemia indica*	1	Young	3	4	2	12.6	0.86	1	1	Good	Good	Landscape feature	Medium (15-40 years)			Low	Low (C)	0	None	None	None			None	0	No Impact	Retain and Protect
18	Council land	Tallowwood	*Eucalyptus microcorys*	1	Juvenile	14	17	2	12.6	1.57	7	2	Good	Good	Amenity value	Long (>40 years)		None sighted	Medium	Medium (B)	0	None	None	None			None	0	No Impact	Retain and Protect

Tree Id	Tree Ownership	Common Name	Botanical Name	Trees in Group	Tree Age	DBH [cm]	Root Crown Diameter [cm]	TPZ Radius [m]	TPZ Area [m2]	SRZ Radius [m]	Height [m]	Canopy [m]	Health	Structure	Significance	ULE [Yrs.]	Observations	Habitat Features	Landscape Significance (STARS)	Retention Value (SRIV)	Canopy distance over boundary	Existing Canopy overhang severity	Pruing Required for Proposed building	Pruing Required for Proposed Scaffold	Pruning Detail	Required Pruning %	Current TPZ Encraochment	Proposed TPZ Encroachment %	Proposed Impact	Proposed Action
19	Council land	Crepe Myrtle	*Lagerstroemia indica*	1	Young	3	4	2	12.6	0.86	1	1	Good	Good	Landscape feature	Medium (15-40 years)			Low	Low (C)	0	None	None	None			None	0	No Impact	Retain and Protect
20	Client site	North American Hackberry	*Celtis occidentalis*	1	Semi-Mature	8	10	2	12.6	1.26	5	3	Good	Good	Exempt Size	Medium (15-40 years)	Co-dominant stems, Inappropriate location	None sighted	Low	Low (C)	NA	NA	NA	NA					Within foot Print	Remove
21	Client site	North American Hackberry	*Celtis occidentalis*	1	Semi-Mature	8	10	2	12.6	1.26	5	3	Good	Good	Exempt Size	Medium (15-40 years)	Co-dominant stems, Inappropriate location	None sighted	Low	Low (C)	NA	NA	NA	NA					Within foot Print	Remove
22	Council land	Wallangarra White Gum	*Eucalyptus scoparia*	1	Semi-Mature	25	29	3	28.3	1.97	10	4	Average	Good	Amenity value	Medium (15-40 years)	Co-dominant stems, Deadwood < 30mm, Epicormic growth	None sighted	Medium	Medium (B)	1	Minor	None	None			None	0	No Impact	Retain and Protect
23	Council land	Fig	*Ficus sp.*	1	Semi-Mature	60.09	60	7.21	163	2.67	9	12	Good	Average	Amenity value, Shade value	Long (>40 years)	Co-dominant stems, Deadwood < 30mm, Included bark	None sighted	Medium	Medium (B)	4	Major	Yes	Yes	Minor - 10 x 50mm branch reduction of 2m	10%	None	0	Demoltion, Excavation with reduced TPZ encroachment, Pruning	Retain and Protect
24	Client site	Golden Scotch Elm	*Ulmus glabra 'Lutescens'*	1	Mature	30	39	3.6	40.7	2.23	7	7	Average	Poor	Amenity value	Short (5-15 years)	Cavity, Co-dominant stems, Deadwood > 30mm, Hanger(s), Wound(s)	Hollow(s)	Medium	Low (C)	NA	NA	NA	NA			None		Within foot Print	Remove
25	Client site	Southern Mahogany	*Eucalyptus botryoides*	1	Semi-Mature	29	34	3.48	38	2.1	12	6	Good	Good	Amenity value	Short (5-15 years)	Inappropriate location	None sighted	Medium	Low (C)	NA	NA	NA	NA			None		Within foot Print	Remove
26	Client site	North American Hackberry	*Celtis occidentalis*	1	Semi-Mature	6	8	2	12.6	1.15	6	2	Good	Good		Short (5-15 years)	Co-dominant stems	None sighted	Low	Low (C)	NA	NA	NA	NA			None		Within foot Print	Remove
27	Client site	Golden Scotch Elm	*Ulmus glabra 'Lutescens'*	1	Mature	44	45	5.28	87.5	2.37	8	10	Average	Average	Amenity value	Short (5-15 years)	Cavity, Co-dominant stems, Crossing/rubbing branches, Deadwood > 60mm. Wound(s)	Hollow(s)	Medium	Low (C)	NA	NA	NA	NA			None	30	Major TPZ encrpachment	Remove
28	Council land	Tallowwood	*Eucalyptus microcorys*	1	Juvenile	17	20	2.04	13.1	1.68	8	4	Good	Good	Amenity value	Long (>40 years)	Co-dominant stems	None sighted	Medium	Medium (B)	0	None	None	None			None	0	No Impact	Retain and Protect
29	Council land	Wallangarra White Gum	*Eucalyptus scoparia*	1	Juvenile	16	19	2	12.6	1.65	7	3	Average	Average	Amenity value	Short (5-15 years)	Deadwood < 30mm, Dieback, Mechanical damage, Wound response growth, Wound(s)	None sighted	Medium	Low (C)	0	None	None	None			None	0	No Impact	Retain and Protect
30	Council land	Tallowwood	*Eucalyptus microcorys*	1	Semi-Mature	23	26	2.76	23.9	1.88	11	4	Good	Good	Amenity value	Long (>40 years)	Co-dominant stems, Epicormic growth	None sighted	Medium	Medium (B)	0	None	None	None			None	0	No Impact	Retain and Protect
31	Council land	Tallowwood	*Eucalyptus microcorys*	1	Juvenile	12	14	2	12.6	1.45	7	2.5	Good	Good	Amenity value	Long (>40 years)	Deadwood < 30mm	None sighted	Medium	Medium (B)	0	None	None	None			None	0	No Impact	Retain and Protect
32	Council land	Wallangarra White Gum	*Eucalyptus scoparia*	1	Semi-Mature	20	26	2.4	18.1	1.88	8	4	Good	Average	Amenity value	Medium (15-40 years)	Dieback, Suppressed	None sighted	Medium	Medium (B)	0	None	None	None			None	0	No Impact	Retain and Protect
33	Council land	Tallowwood	*Eucalyptus microcorys*	1	Juvenile	13	14	2	12.6	1.45	7	3	Good	Good	Amenity value	Long (>40 years)	Co-dominant stems	None sighted	Medium	Medium (B)	0	None	None	None			None	0	No Impact	Retain and Protect


Tree Location Map
Retention Status
Remove (7)
Retain (25)
Hunter St
Young St
Powell St
Recreation center
244-258
258
285
20 m
Google
Map data ©2023 Imagery ©2023 Airbus, CNES / Airbus, Maxar Technologies

8. Existing Street Tree Protection Measures During Construction

8.1 Staff Training and Induction

All staff working on the contract shall be adequately inducted to ensure they are aware of the following tree protection requirements.

8.2 Trunk Protection

Trunk and major limb protection shall be installed to any tree within 5 metres of the work site prior to any delivery of machinery or works commencing, and shall remain in place for the duration of the works. It shall consist of wrapping of each tree trunk and any major branches within the work area with hessian or similar material to limit damage, then space planks (50mm x 100mm or similar), at 100mm intervals, and fixed against the trunk with tie wire, or strapping. The trunk protection shall not be fixed to the tree in any instance, or in any fashion, e.g., no nails or screws are to be used.

8.3 Trenching and Excavation Near Trees

During any trenching or excavation works, the use of mechanical equipment must stop if tree roots greater than 50mm diameter are encountered. Approval must be sought from the Council Street Tree Coordinator (ph 9265 9333) to cut any root greater than 50mm diameter. Excavation shall be done by hand, or other approved non-destructive method, in any area known to, or suspected of having roots larger than 50mm diameter.

8.4 Pruning

The Contractor shall not undertake pruning of any branch of any street tree without permission. If pruning or small branches or limbs are required for machinery access, or any other reason, contact the Council's Street Tree Coordinator.

8.5 Kerb Removal Adjacent To Trees

Existing sections of kerbs adjacent to any street tree shall not be removed without approval from the Street Tree Coordinator. Removal of kerbs adjacent to mature trees can cause trees to become unstable and fail.



Figure 88- Proper tree protection is essential to avoid unnecessary damage to trees during construction activities (Photo: Arterra)



Figure 89- This illustrates the minimum trunk protection measures expected by the Council for street trees adjoining construction sites. (Photo: Arterra)



Figure 90- Where access is required through an identified tree protection zone the ground surface shall be protected through appropriate boarding and mulch or gravel placed above the existing ground surface to protect the roots and limit soil compaction. (Photo: Arterra)

8.6 Signs - Tree Protection

Temporary signs, or any other items, shall not be fixed or attached to any street tree.

8.7 Stockpiling and Storage of Materials

Fuel or any type of liquid waste shall not be stored or disposed of at the base of any street tree.

8.8 Damage to Trees to be Retained

Any damage sustained to any street trees is to be immediately reported to the Council's Street Tree Contract Coordinator, to determine the appropriate response for maintaining the health and structural integrity of the tree/s.

Should any damage occur to Council's trees and not be rectified by the Contractor to a satisfactory standard, as directed by Council's Street Tree Coordinator, Council will undertake the necessary works, which may include the full replacement of trees, and all associated costs will be recovered. Damage to street trees may also result in a prosecution being sought under Sections 626 and 629 of the Local Government Act for an offence where such damage occurred wilfully or negligently. Significant financial penalties can be imposed for such offences.



Figure 91- Groups of street trees within a grass strip may also require tree protection fencing installed to protect the trees and the ground surface around them. (Photo: Arterra)



Figure 92- Where ground is uneven or the site is subject to strong winds the fencing may be held securely by wiring to strategically placed star pickets driven into the ground. (Photo: Arterra)



Figure 93- Where tree trunks are low branching and difficult to protect with other methods, water filled barricades and fencing may also be applied . (Photo: Arterra)



Figure 94- Younger trees that are too small to apply trunk protection shall be fenced as above to protect the roots, foliage and trunk during construction periods. (Photo: Arterra)



Figure 95- Hand excavation or other non-destructive methods such as water jetting and vacuum extraction to excavate around tree roots. (Photo: Arterra)



Figure 96- Non-destructive excavation methods can allow services to be installed across verges without the need to sever important and structural tree roots. (Photo: Arterra)



TPZ

SRZ

RETENTION CLASS

- HIGH
- MEDIUM
- LOW
- REMOVE

IACA Significance of a Tree, Assessment Rating System (STARS)

Priority for Retention (High) - These trees are considered important for retention and should be retained and protected. Design modification or re-location of buildings should be considered to accommodate the setbacks as prescribed by the Australian Standards AS4970 Protection of trees on development sites. Tree sensitive construction measures must be implemented e.g. pier and beam etc if works are to proceed within the Tree Protection Zone (TPZ).

Consider for Retention (Medium) – These trees may be retained and protected. These are considered less critical; however, their retention should remain priority with removal considered only if adversely affecting the proposed building/works and all other alternatives have been considered and exhausted.

Consider for Removal (Low) – These trees are not considered important for retention, nor require special works or design modification to be implemented for their retention.

Priority for Removal – These trees are considered hazardous, or in irreversible decline, or weeds and should be removed irrespective of development.

PROJECT.	258 YOUNG STREET, WATERLOO NSW			
CLIENT.	ARBORSAW			
PLAN TYPE.	TREE PROTECTION & MANAGEMENT PLAN			
PLAN DETAILS.	V 1.0	24.6.2022	A3	Scale: 1:384

0 3.25 6.5 13 19.5 26 Meters

ArborScan

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609

7 HUNTER ST

5 HUNTER ST

HUNTER STREET

MCEVOY STREET

10-20 YOUNG ST

POWELL STREET

YOUNG STREET

BUS ZONE

4,000

GATE TO SCHOOL

GATE TO SCHOOL

AUDITORIUM
462 SEATS
512.15 m²

FOLDING CHAIR STORAGE

STORAGE

STORAGE
21.00 m²

MINISTRY STAGE
25.06 m²

GREEN ROOM
71.17 m²

SERVICES
22.24 m²

SUBSTATION
41.93 m²

GROUND 00
RL+21,800

GROUND 00
RL+21,800

RL+21,250

RL+21,800

RL+20,100

RL+22,100

GROUND 00
RL+21,800

SCHOOL CIRCULATION
351.51 m²

ADMIN
60.59 m²

PRIMARY GLS
61.20 m²

PRIMARY GLS
59.96 m²

ADMIN
57.80 m²

ADMIN
59.04 m²

ADMIN
59.04 m²

OUTDOOR SPACE
514.17 m²

OUTDOOR SPACE
239.27 m²

GROUND 00
RL+22,100

GROUND 00
RL+20,200

BUILT FORM ABOVE

GROUND 00
RL+22,100

RL+22,100

RL+21,420

RL+21,420

RL+21,542

LOADING
182.95 m²

L O A D I N G
B A Y

I N T E R C O M

RL+21,800

RL+21,800

RL+23,580

WASTE/SERVICES
93.42 m²

GROUND 00
RL+23,500

SERVICES
6.09 m²

FILM SCHOOL LOBBY
165.87 m²

GROUND 00
RL+22,650

EXISTING BUILDING FOOTPRINT

CAFE
38.42 m²

GROUND 00
RL+21,800

RL+21,855

D R I V E W A Y

9,840

6,000

TPZ AREA = 289 SQM
EXISTING TPZ ENCROACHMENT =40.21 m²
13.9%

TPZ AREA = 319 SQM
TPZ ENCROACHMENT =25.42 m²
7.9%

TPZ AREA = 289 SQM
TPZ ENCROACHMENT =30.92 m²
10.7 %

TPZ AREA = 209.1SQM
TPZ ENCROACHMENT = 38.11 m²
18.2%

TPZ AREA = 131.9SQM
TPZ ENCROACHMENT = 5.35 m²
4.06%

TPZ AREA = 304 SQM
EXISTING TPZ ENCROACHMENT = 73.82 m²
24.2%

TPZ AREA = 168.3 SQM
TPZ ENCROACHMENT =2.65 m²
1.5%

TPZ AREA = 304 SQM
TPZ ENCROACHMENT = 29.72 m²
9.78%

TPZ AREA = 326.7 SQM
TPZ ENCROACHMENT = 32.32 m²
9.9%

TPZ AREA = 326.85 SQM
EXISTING TPZ ENCROACHMENT = 96.87 m²
29.6%

TPZ AREA = 289.4 SQM
TPZ ENCROACHMENT = 22.84 m²
7.89%

TPZ AREA = 209.1SQM
EXISTING TPZ ENCROACHMENT = 43.43 m²
20.8%

TREE 01
TREE 02
TREE 03
TREE 04
TREE 05
TREE 06
TREE 07
TREE 08
TREE 09
TREE 10
TREE 11
TREE 12
TREE 13
TREE 14
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TREE 30
TREE 31
TREE 32
TREE 33

RL+19,570
RL+19,560
RL+19,770
RL+20,090
RL+20,120
RL+21,210
RL+20,800
RL+20,880
RL+21,215
RL+19,540
RL+19,490
RL+19,630
RL+19,760
RL+19,920
RL+19,830
RL+19,970
RL+20,060
RL+20,260
RL+20,280
RL+20,270
RL+20,450
RL+20,720
RL+20,940
RL+21,130
RL+21,250
RL+21,260
RL+21,470
RL+21,420
RL+21,320
RL+21,760
RL+21,700
RL+21,910
RL+22,030

S1
PLA-PP-2100

S2
PLA-PP-2101

S3
PLA-PP-2102

INDICATIVE BATTER ZONE

INDICATIVE SCAFFOLD ZONE (1M FROM BUILT FORM ON LEVEL 01)

PICK UP/DROP OFF

EXISTING DRIVEWAY LOCATION

POTENTIAL 285-291 YOUNG ST FUTURE DEVELOPMENT

RESI LOBBY

RESI LOBBY

BOURKE AND YOUNG WOOLWORTHS FUTURE DEVELOPMENT

PLANNING PROPOSAL

DATE	REVISION	BY	CHK	NO.
15/01/2024	PLANNING PROPOSAL	IC	GH	A

DATE	REVISION	BY	CHK	NO.

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ARBORIST	☐	ARBORSAW	T 2413 842 183
FLOODING	☐	WMA WATER	T (02) 9299 2855
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The Builder/Contractor shall verify job dimensions prior to any work commencing. Figured dimensions shall take precedence over scaled work.

PROJECT	DRAWING TITLE
242-258 Young Street Waterloo Sydney NSW	GENERAL FLOOR PLAN - GROUND 00

SCALE		
1:250 @A1		
DATE	PLOT DATE	
15/01/2024	15/01/2024	
DRAWN	CHECKED	
IC	GH	
JOB NO.	DRAWING NO.	REVISION
20621	PLA-PP-1000	A

Attachment A14

Public Art Statement



244 – 258 YOUNG STREET, WATERLOO

PRELIMINARY PUBLIC ART PLAN

809

Prepared by

Amanda Sharrad Public Art Curator

for Sustainable Development Group

November 2023

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- 244 – 258 YOUNG STREET, WATERLOO
- PLANNING CONTEXT & STAKEHOLDERS
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- PUBLIC ART VISION & OBJECTIVES
- PUBLIC ART THEMATIC APPROACH
- PUBLIC ART OPPORTUNITIES
- PUBLIC ART COMMISSIONING PROCESS
- PUBLIC ART TIMELINE & BUDGET



PLANNING INTRODUCTION: 244 – 258 YOUNG STREET WATERLOO

This Preliminary Public Art Plan is submitted to the Council of the City of Sydney (**Council**) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
  - 45 GLS, 13 specialist / classrooms
  - A multi-purpose hall / auditorium
  - A library
  - A canteen
  - Administration, lobby and circulation spaces
  - An active green roof
  - A basement including 60 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m^2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
  - 10,608m^2 education floor area
  - 2,935m^2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m^2.

610

INTRODUCTION

This Preliminary Public Art Plan has been developed by public art curator Amanda Sharrad in support of a planning proposal for a mixed-use development comprising an independent K – 12 school and film school at 244 – 258 Young Street Waterloo.

The purpose of this Preliminary Public Art Plan is to provide a public art vision on behalf of Sustainable Development Group for the development and is based upon the Design Report prepared by Plus Architects, Landscape Schematic Concept prepared by Turf, and a planning report by Ethos Urban.

This Plan includes analysis of the historical, social and cultural context, and provides a public art vision, as well as objectives and principles to guide the commissioning of public art. It identifies the best initial opportunities for public art throughout the schematic architectural and landscape designs.

It is recommended that the public art curator drive and facilitate leading commissioning processes within a collaborative framework that allows for participation by the Sustainable Development Group, the selected design team and key external stakeholders such as the City of Sydney. Finally, a public art commissioning timeline and recommended budget allocation for art has been provided.

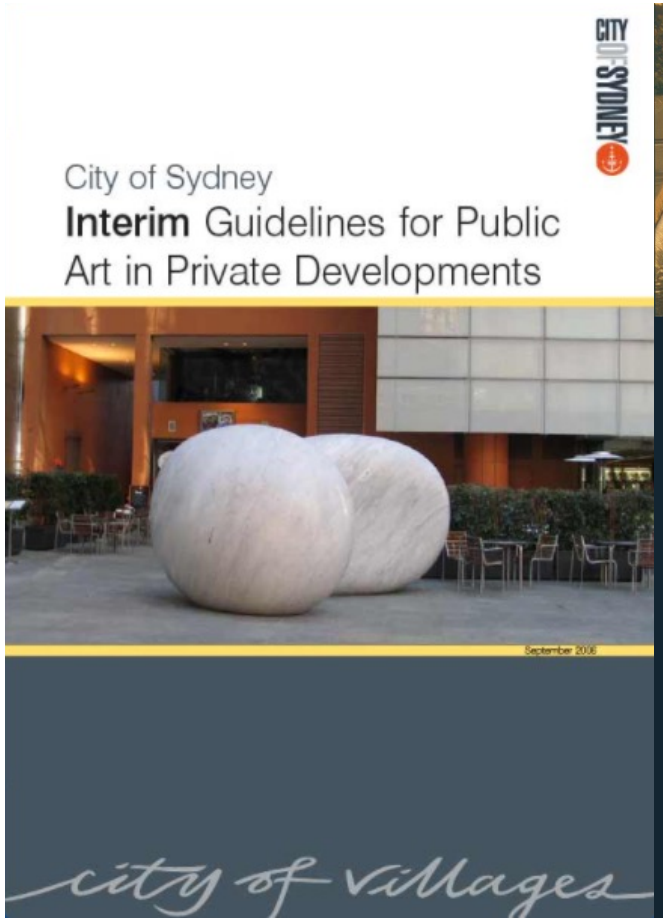


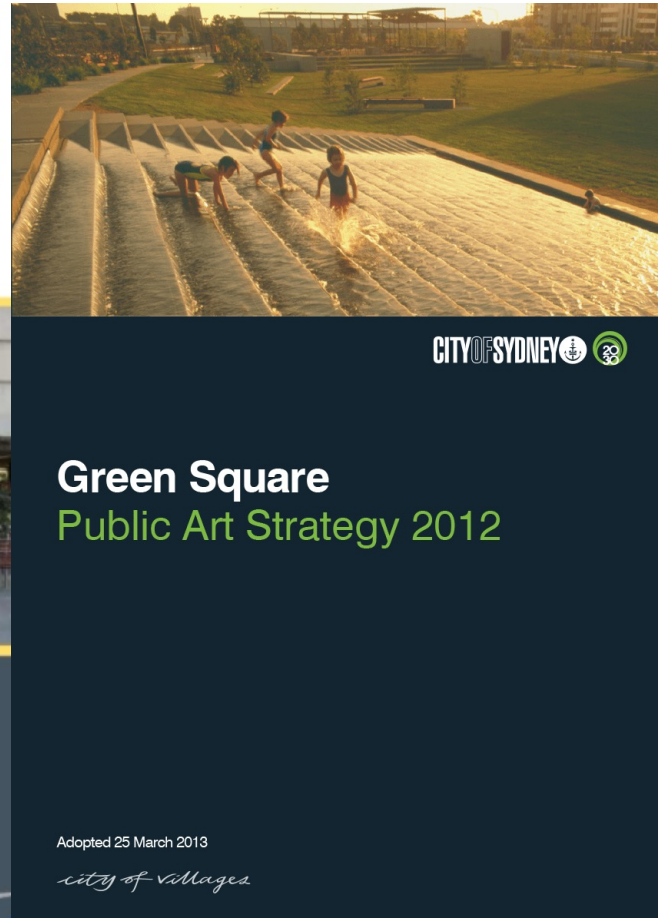
Image of 244 – 258 Young Street Waterloo development courtesy Plus Architects.

PLANNING CONTEXT & STAKEHOLDERS

As the development site is within the City of Sydney LGA the primary stakeholders are the City of Sydney. This Preliminary Public Art Plan has been developed in accordance with relevant planning principals identified in City of Sydney public art and urban planning policies and guidelines such as the City of Sydney *City Art Public Art Strategy*, *Public Art Policy*, *Guidelines for Public Art in Private developments, Guidelines for Acquisitions and Deaccessions* and *Sustainable 2030.* "The City's Public Art Policy provides a framework of principles to support the City's commitment to the experience of art in the strategic planning of the city and the implementation of Sustainable Sydney 2030", City of Sydney. The site is also within the greater Green Square renewal area, and therefore the *Green Square Public Art Strategy* authored by this curator, has also informed and guided this Plan.

The City of Sydney's guiding principles that have been considered in development of this Plan include recognising and celebrating Aboriginal stories and heritage in public space, supporting local artists and vibrant places in village centres with art projects, and promoting high quality public art in new development.The Plan provides guidelines for public art aims that will enhance the public domain, create high quality amenity, activate spaces, respect and reflect the site's heritage, and engage with the local diverse community in order to enhance wellbeing and meet the demands and needs of future generations.





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244 – 258 YOUNG STREET, WATERLOO SITE

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m^2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.

The site and is currently occupied by two storey office building and important to note in the cultural landscape of the area is that it also housed the Waterloo Studios, a film school that will be replaced and housed within the new development. The southern tip of the site is a grass lawn area.







Image of 244 – 258 Young Street Waterloo development courtesy Plus Architects.

WATERLOO CONTEXT ANALYSIS:
CURRENT & FUTURE DEVELOPMENT

The Young Street Waterloo public art will engage with local residents, film and school students attending the proposed school and visitors to the area.

The surrounding area has a highly multicultural community that has been privy to significant urban renewal over the last ten years. The Waterloo area in particular is currently undergoing substantial redevelopment. These areas include key strategic precincts such as the Waterloo Metro Quarter, and the proposed development directly interfacing with the site are the future Woolworths Waterloo development, Lachland Precinct and Dank Street South Precinct. These future redevelopments generally have a focus on mixed use, providing retail, commercial, and residential dwelling, and will greatly reshape the context of the site.

The character of this part of Sydney therefore includes light industrial dotted amongst an eclectic mix of contemporary creative spaces, galleries, cafes, retail and of course much new development. Best global practice architecture is on display nearby such as the new developments surrounding Green Square Town Centre by Koichi Takada, Peter Stutchbury, Andrew Burges and Stewart Hollenstein, soon be joined by high quality private development such as John Wardle's Bourke & Bowden mixed-use development nearby.

The Botany Road corridor will see many new office buildings catering for young workers in knowledge-based industries, and the establishment of new places to work and cultural amenities is supported by a new school in Green Square Town Centre by Bligh Voller Nield, in addition to this proposed new school and film school at 244 Young Street. The Drying Green Park by McGregor Coxall and Gunyama Park and Aquatic Centre provide important open space for new families to the area, and the future Waterloo Metro Station and upgrades to the Green Square station precinct will provide important public transport experiences and options.



+50,000 RESIDENTS (2041)
(REDFERN / WATERLOO / GREEN SQUARE)
https://forecast.id.com.au/sydney/about-forecast-areas?WebID=140
https://forecast.id.com.au/sydney/about-forecast-areas?WebID=2010



21,000 + NEW JOBS
(GREEN SQUARE)
https://www.urbanagendaplatform.org/best-practice/i-green-square-rich-industrial-past-vibrant-sustainable-and-connected-community



FUTURE WATERLOO METRO (2024)



+30,000 NEW DWELLINGS (2030)
(GREEN SQUARE, BEACONSFIELD, ZETLAND, ALEXANDRIA, ROSEBERY, WATERLOO)
https://www.cityofsydney.nsw.gov.au/green-square



+40 NEW PARKS IN GREEN SQUARE TOWN CENTRE
https://news.cityofsydney.nsw.gov.au/articles/green-square-new-park-drying-green-residents









Images of surrounding future development including clockwise from above left: Dank Street South; Lachland Precinct; Woolworths Waterloo and Waterloo Metro Quarter.

CONTEXT ANALYSIS: WATERLOO AND SURROUNDING SUBURBS HISTORICAL CONTEXT

Stories of First Nations culture, migration and industry colour the history of this part of Sydney.

The Gadigal people of the Eora are the traditional owners of the site. They relied on the natural resources of this freshwater wetland area for hunting and collecting. Heath and low scrub-covered sand dunes, mudflats and wetlands such as the Blackwattle Swamp, were fed by creeks such as Sheas and Blackwattle Creek constituting the landscape of pre-colonial Alexandria. Soon after the colonial contact, it is well known that many of the Gadigal around Port Jackson were wiped out due to introduced disease. As the Tank Stream near Sydney Cove became heavily polluted with colonial occupation, the Gadigal moved further out of the city to higher ground in this part of Sydney, and the natural wetlands were particularly abundant source of indigenous fruits and vegetables, fish and shellfish and a focus of Aboriginal activity and camps. Main roads throughout the area such as Botany Road closely follow historical walking tracks important for social connection, trade, sharing resources and reaching ceremonial sites. In warmer seasons clans travelled towards the coast to fish. Eora women had notable skills in fishing, swimming, diving and canoeing, providing food for their families whilst caring for their young, and held a powerful place within Eora society. Distinctive crescent-shaped *bara* (fish-hooks) were fashioned out of the shell of a sea snail. Shellfish, fish, eels, wildlife and vegetation such as watercress sustained the Gadigal. The Gadigal spent cooler seasons inland as evidenced by nearby sandstone rock shelters containing shell middens and white hand and foot stencils. Alexandra Canal has three sites recorded by the Metropolitan Aboriginal Land Council, including a Dugong skeleton with Aboriginal markings and two stone axe-heads nearby, uncovered over a hundred years ago that have been carbon-dated to indicate Aboriginal presence 6000 years ago.

Industries were important sources of employment, but the life and activity of the First Nations community was greatly depleted from the area with the draining of the wetlands for development and industry, and the use of waters systems as a waste drain. The industries in this area attracted people from country areas seeking employment, connection with community, and refuge with relatives due to the scarcity of rural work, closure of Aboriginal reserves and expansion of farming throughout NSW. The industries included glassmaking, brickworks, pottery works, metal foundries, tanneries, wool washers and mills.

This part of Sydney has seen large waves of migration throughout its modern history, often working class and Aboriginal people resulting in a diverse community. The Irish, Maltese, Lebanese, Syrian and Chinese were well represented. The heritage listed Yiu Ming Chinese Temple for example supported large populations of Chinese migrants throughout the last century who established market gardens.

Many local Aboriginal men and women have played an essential role in the welfare of the Aboriginal population and this part of Sydney over the last century. Nearby Redfern in particular, has been a focus for civil and land rights activism over the last 90 years. Jack Patten led the Aboriginal Progressive Association, Faith Bandler a leading Aboriginal rights campaigner was integral in the 1967 YES Referendum and Pearl Gibbs was the first and only female on the NSW Welfare Board who campaigned for the abolishment of the Aboriginal Protection Act that had resulted in the forced removal of Aboriginal children from their families. Colleen Shirley Smith was awarded with the Order of Australia and Order of the British Empire for her work for the Redfern Aboriginal Children's Services, and in 1971 co-founded Australia's first Aboriginal Medical Service in Redfern. Elder Charles 'Chicka' Dixon was Australian Aborigine of the year in 1984 for his commitment to Aboriginal issues, arts and culture through the Aboriginal Arts Board, and integral to establishing Australia's first Aboriginal Legal Service in Redfern in 1970. More recently respected Gadigal Elder Uncle Charles 'Chicka' Madden has served the Aboriginal community as Director of the Aboriginal Medical Service, Secretary of the Metropolitan Local Aboriginal Land Council, Director of the Aboriginal Hostels NSW and life member of the Redfern All Blacks. Jenny Munro has continued the fight for affordable housing in the area, establishing the Aboriginal Tent Embassy at 'The Block' in 2014.

DEVELOPMENT REFERENCE SCHEME

Despite the strong population growth forecast for the Waterloo-Green Square Corridor, there is a significant lack of planned school infrastructure to provide for the educational needs of children. No new high schools are currently in planning within a 2km radius of the target site, in the heart of Waterloo.

New schooling facilities are needed to cater to the educational needs of local students, with demand expected to double in this period.

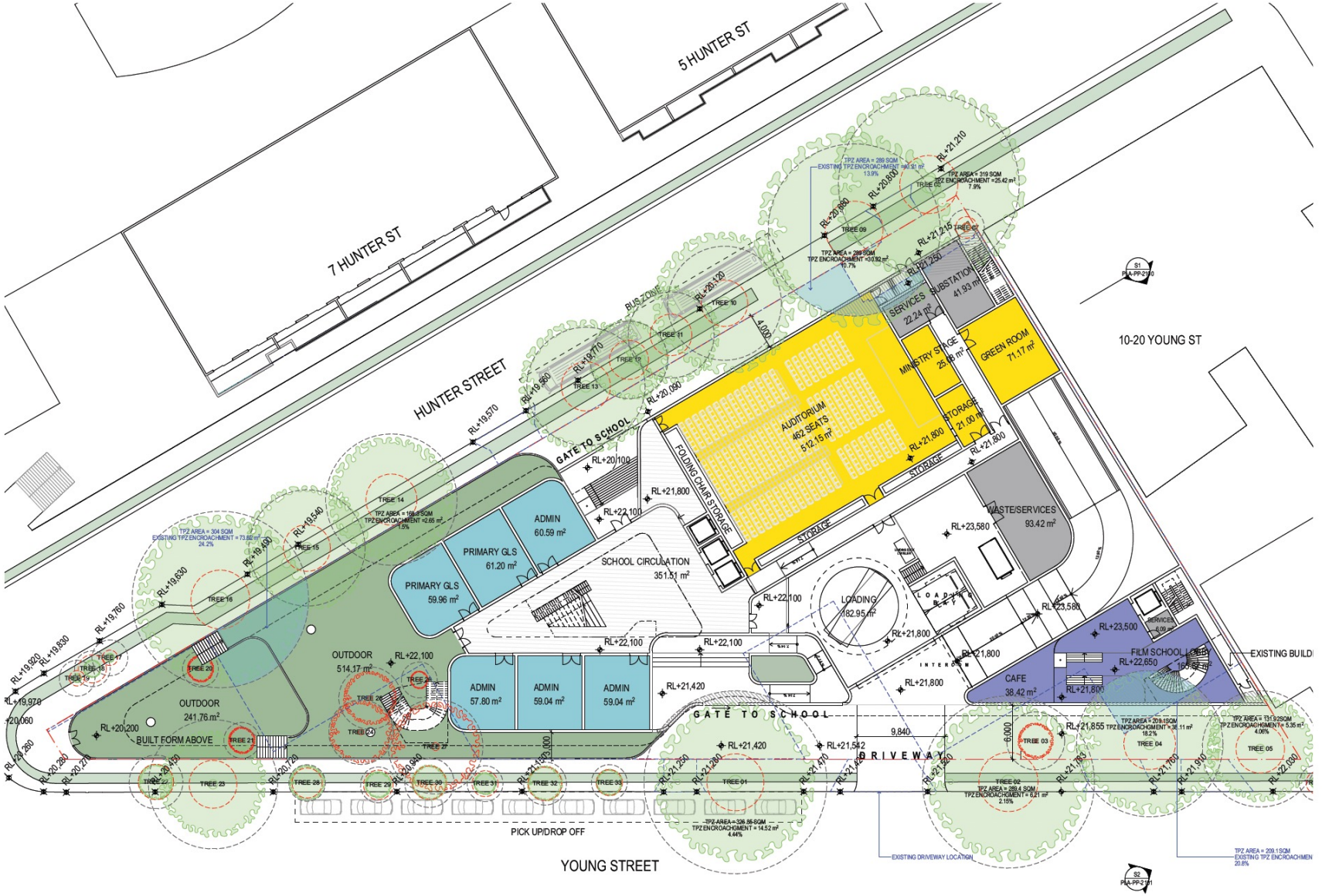
The proposal envisions a mixed-use infill building that is primarily a Kindergarten to Year 12 School, with spaces for the current film school on-site, which can be shared with the ministry. The aim for the development is to provide much needed educational infrastructure to the Waterloo area, as well as provide great urban activation to its surrounds. The proposal also envisions a community aspect through its flexible auditorium on ground floor, which can be used by the school, the ministry, as well as the community. Plus Architecture.





Perspectives of 244 – 258 Young Street Waterloo development courtesy Plus Architects.

244 – 258 YOUNG STREET GROUND FLOOR LAYOUT PLAN





SCHOOL



TERTIARY FILM SCHOOL



COMMUNITY



MINISTRY



WELCOMING TO COMMUNITY



FLEXIBLE USE AND INNOVATIVE LEARNING SPACES



DYNAMIC OUTDOOR SPACES



SUSTAINABILITY

Images: Design Principles for 244 – 258 Young Street Waterloo development courtesy Plus Architects.

PUBLIC ART VISION

The public art sought for the precinct will be of the highest quality. It will be relevant to the site and local community, as well as global contemporary art discourse, achieving excellence through artworks that are exceptional, unique, meaningful and engaging in order to enhance the experience of place and bring considerable value to the site.

Mandatory requirements for any permanent artworks integrated into the built environment will be the use of durable, low maintenance materials that are structurally stable, utilising the most up to date technologies and not a risk to public safety or accessibility.

PUBLIC ART PRINCIPLES

- High quality artworks that exhibit artistic excellence;
- Durable, safe and low maintenance artworks;
- Public art that respects the site's rich First Nations and multicultural histories of the area;
- Sustainability – artworks created with sustainable best practice;
- Artwork that engage with the school and film school students, local community and residents.

PUBLIC ART OBJECTIVES

The public art objectives will be applied to the artist briefs, seeking public art that responds to the following:

- Create public art that is inspiring and socially engaged;
- Provide public art that is layered with meaning and has conceptual depth beyond the decorative;
- Propose public art that is aesthetically pleasing and exhibits artistic excellence;
- Propose public artworks that engaging all the senses – with a specific emphasis on digital or projected works that are participatory and involve the viewer;
- Provide public art that is innovative, unique and contemporary;
- Integrate the public art into the fabric of the site – whether architecture or landscape design;
- Reflect upon the diverse stories in the community of the past, present and anticipated future audiences;
- Create works that are exceptional, distinctive and identifiable to enhance a sense of place and place identity.

THEMATIC FRAMEWORK & DIRECTION FOR ARTISTS

The public art will primarily address this as a site for a school and film school. It is to reflect upon themes around inner growth, cultural production, learning, performance and digital creation. The art is to also address cultural sustainability and social engagement.

The public art will acknowledge the diverse people who have inhabited this place throughout history, who live and work nearby and the students who will utilize the spaces throughout the development.

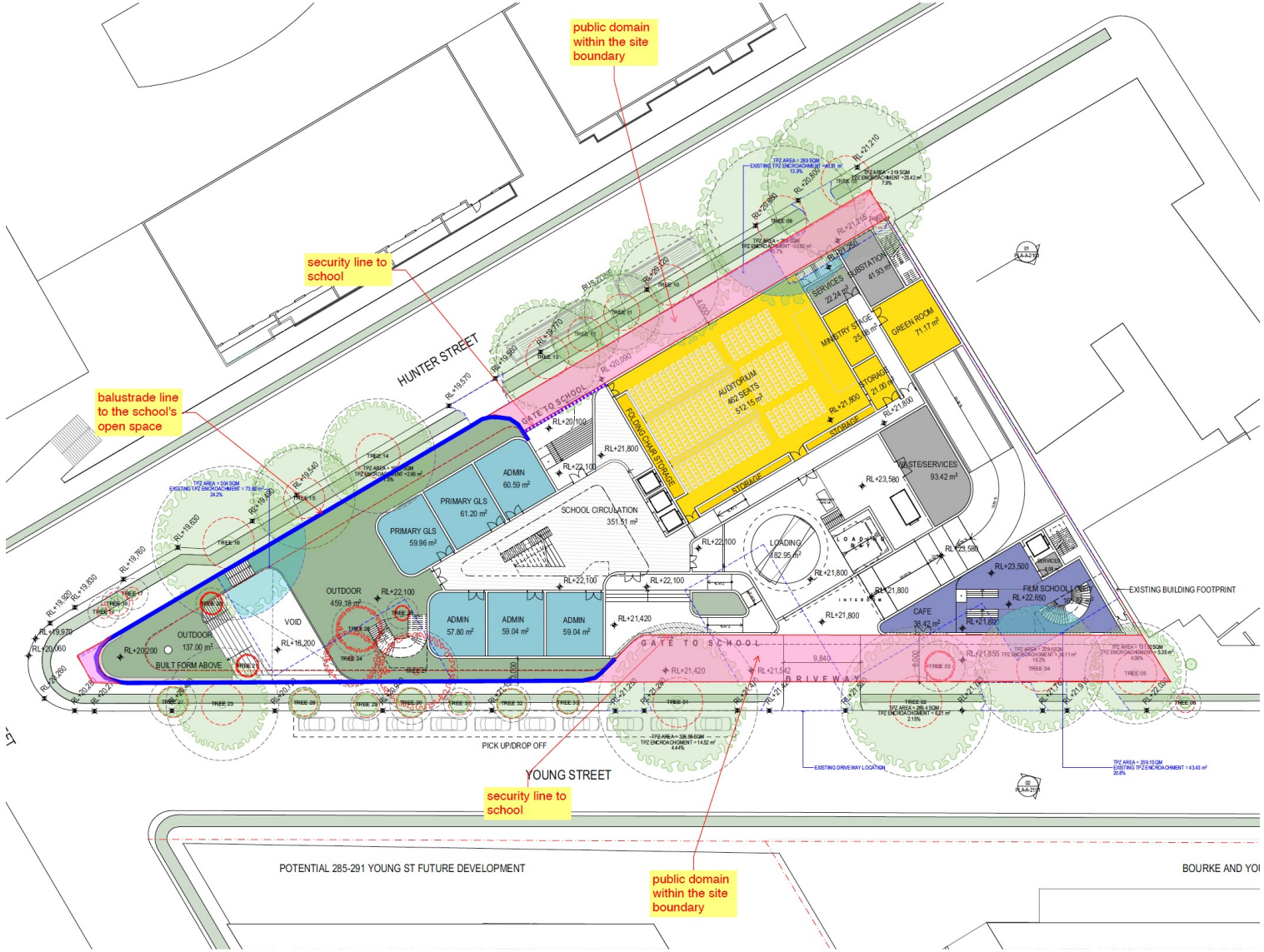
The following key themes will be explored by artists through public art:

- Performance – the body vs digital;
- Social Connection;
- Inner Growth & Learning;
- Cultural production;
- Sustainability;

PUBLIC ART OPPORTUNITIES

This notated plan indicates the public domain within the site boundary in pink that provides great opportunity for public art as it would be owned and maintained by the developer. The balustrade to the school indicated in blue sits on the boundary – so public art could be highly integrated into this boundary material.

The following pages identify specific opportunities for public art within these areas.



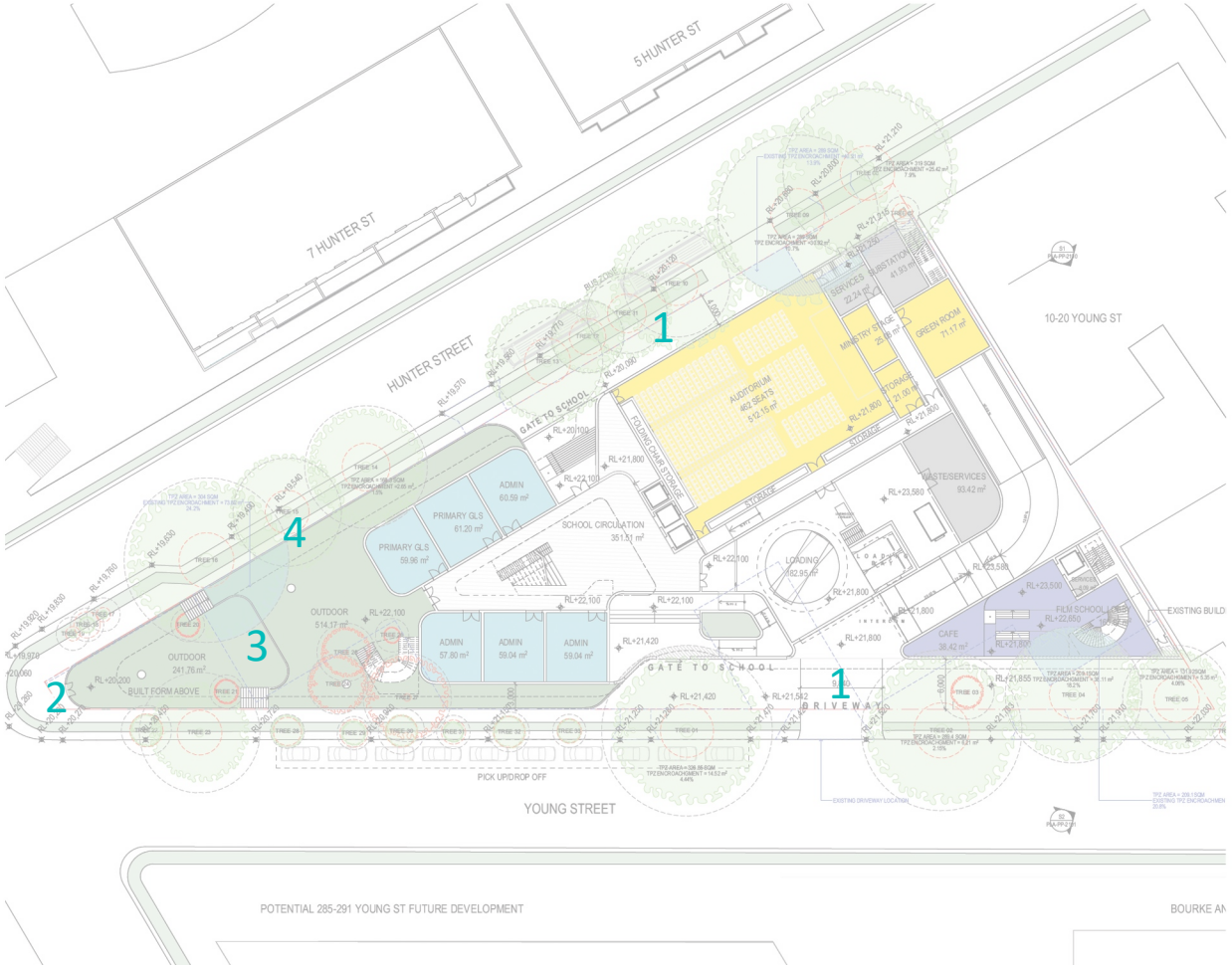
PUBLIC ART OPPORTUNITY SITES

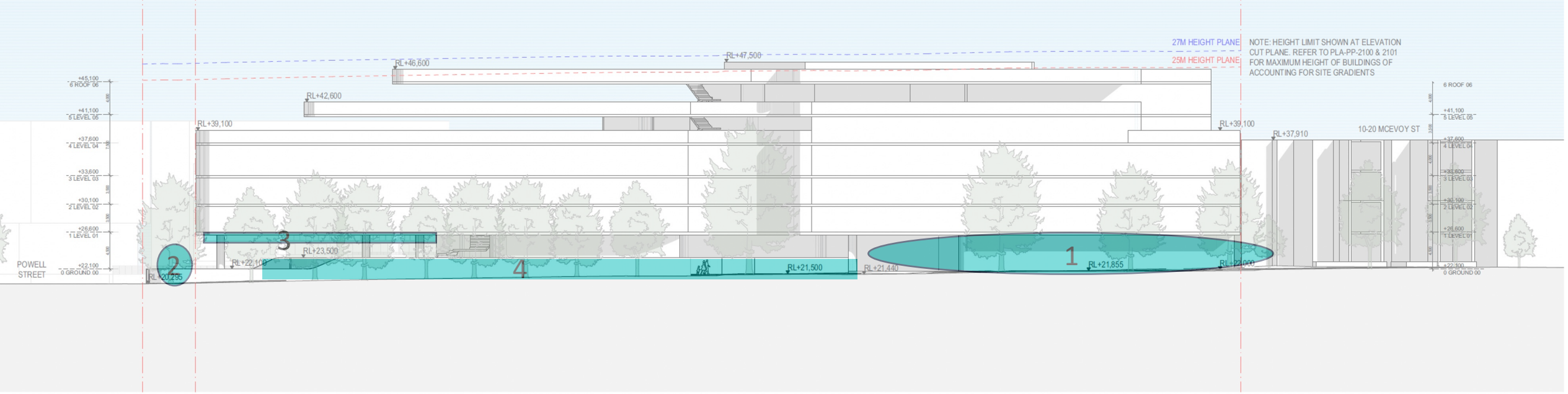
The school building envelope has two four-meter set-backs along Hunter and Young Streets that are currently intended to be landscaped. The spaces near the entrances to the proposed school along Young Street and Hunter Street could be activated by public art in order to announce the school and provide a destination focus.

At the western end of the development site, an area outside the boundary fence to the school sits within the development site – so also affords space for an artwork on public domain. The boundary fence material itself provides an opportunity for a public artwork that is highly integrated within the fencing material. An additional location for public art that is within the school development, but highly accessible visually, is the large soffit expanse leading up to the western point of the building. Public art that is sculptural could also be suspended from this soffit, and could include a lighting element in order to enhance a sense of safety at night for users of the building, particularly when the auditorium is used for community events and film school productions or screenings.

The various types of public art possible therefore include sculptural installations, sculptural seating, suspended or mounted artworks, lighting artwork, digital artworks displayed on screens or projections, art elements integrated into the ground plane or architectural fabric, cultural planting and sound. The following are recommended at the marked locations on the plan to the right:

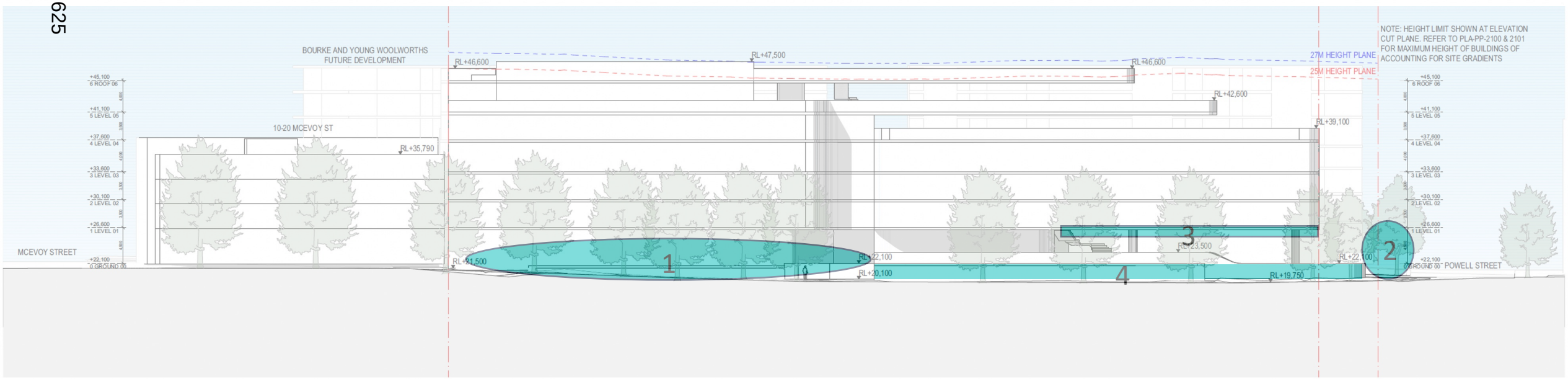
1. Sculptural artworks amongst landscaping/sculptural seating/shade structures/water/cultural planting;
2. A tall vertical sculptural landmark artwork;
3. Highly integrated artworks in the soffit of the architectural fabric or a sculptural / lighting artwork suspended from the soffit;
4. Highly integrated artwork in the boundary fence.





E1 YOUNG STREET ELEVATION
SCALE: 1:250@A1

625



E2 HUNTER STREET ELEVATION
SCALE: 1:250@A1

COMMISSIONING PROCESS

The intent is for Amanda Sharrad, the public art curator to be engaged to oversee the public art commissioning process from inception to completion. This curatorial stewardship will maximise the value of the artwork for the development, ensure that the artists achieve excellence, that the public art provided is unique and meaningful as well as highly contemporary and engaging.

The curator's network of suitable contemporary artists will be utilised for artist proposed, and the curators expertise will be called upon for managing the artist selection process, facilitating the engagement of artists with best practice agreements, and handholding artist and developer throughout the commission.

In the first instance the curator will deliver the required detailed public art strategy for the development application in collaboration with the developer. This will offer principles and objectives for public art that are aligned with the winning development design and to key planning objectives for the site. It will identify the best possible opportunity sites within the winning architectural scheme for public art, the range of approaches possible, along with benchmark projects to inspire and exemplify the vision that is sought. This collaboration will fine-tune specific locations possible for public artworks that can be developed and integrated into the winning architectural scheme.

An Evaluation Panel consisting of the developer, curator and design team member will be confirmed, and the curator will develop an artist brief for best identified opportunities throughout the development in collaboration with the developer and design teams. Insightful artist briefs will identify the most compelling aspects of place and opportune locations for art, and when this is delivered to the best possible most suitable artists, can deliver public art that is unique, meaningful and contributes fresh ideas to the field.

The curator will then propose best suited contemporary artists for the commission, recommending a shortlist of concepts from which to select a winning proposal. Selected shortlisted artists will be invited to submit proposed concepts and the curator will then manage the artist or concept selection process, engagement of artist/s, commissioning and development of the public artwork/s and final installation.

Artists will be selected according to their proven expertise and the strength of their concept proposal that are developed in response to an artist brief that will also be developed by the public art curator in collaboration with the selected architects, landscape architects and Sustainable Development Group.

This process is advised to achieve the best possible outcome for the development and site and for Sydney and the community.

PUBLIC ART TIMELINE

PLANNING

Stage One: Public Art Strategy:

The curator will develop this Preliminary Public Art Plan into a detailed Public Art Strategy.

Stage Two: Artist Brief, Shortlisted Concepts & Artist Selection

An evaluation panel is established to include the developer, curator and design team member. The Artist Brief is developed by the public art curator in collaboration with the developer and design teams. The curator provides a long list of suitable artists for commissions who are shortlisted by the evaluation panel. Shortlisted artists are invited to develop concept proposals in response to the public art artist brief. The successful artists are selected from these concept proposals and engaged. Successful artists are engaged by the developer through a process facilitated by the curator.

DESIGN

Stage Three: Artwork Concept Refinement:

The selected artwork concept is developed and refined in response to feedback provided by the developer, the curator, design team and key external stakeholders as required into a Refined Artwork Concept.

Stage Four: Detailed Design Development & Documentation:

The refined artwork concept is developed in response to feedback provided by the developer, the curator, design team and key external stakeholders as required into a Detailed Design package, the details of which are incorporated into a Detailed Public Art Plan for submission for formal approvals.

Approvals: A Detailed Public Art Plan is required for approvals.

CONSTRUCTION

Stage Five: Public Art Fabrication & Installation:

The public art will be fabricated with hold-points for inspection and approval of samples and fabricated works by the developer and curator. The artwork is transported to site, installed and completed on site.

Approvals: A Final Public Art Report may be required detailing the fabrication process and final installed images for formal approval.

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Attachment A15

Detailed Site Investigation

eiaustralia

Contamination | Remediation | Geotechnical

PACIFIC EQUITY PARTNERS PTY LTD



Detailed Site Investigation

242-244 Young Street, Waterloo NSW

Report E23915.E02_Rev0

18 October 2018

REPORT DISTRIBUTION

Detailed Site Investigation
242-244 Young Street, Waterloo NSW

EI Report No.: E23915.E02_Rev0
Date: 18 October 2018

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Author	Technical Reviewer
	
CHRIS SORDY Engineering Geologist – Project Coordinator	**NATHAN FOSTER** Senior Environmental Scientist

Revision	Details	Date	Amended By
0	Original	18 October 2018	-

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EXECUTIVE SUMMARY

Background

Pacific Equity Partners Pty Ltd engaged EI Australia (EI) to conduct a Detailed Site Investigation (DSI) for the former commercial property located at 242-244 Young Street, Waterloo NSW ('the site'). This environmental assessment was completed as part of a development application process through Inner West Council to allow site development for mixed residential apartment and commercial building with basement car parking.

Objectives

The main objectives of the assessment were to:

- Characterise site environmental conditions in relation to the nature, degree and sources of any soil, vapour and groundwater impacts;
- Target potentially impacted areas identified during the preliminary stages of the assessment for intrusive investigation;
- Understand the influence of site specific, geologic and hydrogeological conditions on the potential fate and transport of any impacts that may be identified;
- Evaluate potential risks that identified impacts may pose to human health and the environment; and
- Where site contamination is confirmed, provide data to assist in the selection and design of appropriate remedial options.

Findings

The work was conducted with reference to the regulatory framework outlined in **Section 1.3** of this report and assessment findings indicated the following:

- The site comprised an irregular shaped block covering a total area of approximately 4,500m^2. The site was bound by a construction site (north), Young Street (east), Powell Street (South) and Hunter Street (west).
- The site was free of statutory notices issued by the NSW EPA/DECC;
- SafeWork NSW records confirming the historical presence of UST's at this property. There is no information pertaining if the tanks have been removed from the site. There are some uncertainties of where some of the previous locations of the tanks mentioned are located.
- Soil sampling and analysis were conducted at ten (10) targeted test bore locations (BH1M, BH9M, BH10M and BH2-BH8) down to a maximum depth of 5.5 mBGL. Sampling regime was considered to be appropriate for investigation purposes and comprised a targeted sampling approach as a systematic sampling pattern could not be undertaken due to onsite obstructions;
- The sub-surface layers comprised a layer of granular and cohesive filling overlying cohesive residual soils, with sandstone bedrock below the residual soils;
- Groundwater was encountered during monitoring at depths ranging from 2.60 to 3.29 meters BTOC;

- Soil samples identified the following contaminants at concentrations above the adopted soil investigation levels:
    - BH1M – nickel, zinc, carcinogenic PAHs, F2 and F3
    - BH9M – zinc
    - BH10M – copper, lead and zinc
- Groundwater samples identified the following contaminants at concentrations above the adopted groundwater investigation levels:
    - BH1M & BH10M – copper and zinc
- On review of the Preliminary Conceptual Site Model (CSM) developed as part of this ESA, it was concluded that the model remains valid for the proposed development.

Conclusions and Recommendations

Based on the findings of this report and with consideration of the Statement of Limitations (**Section 13**), EI concludes that widespread contamination was not identified at the site.

It is concluded that the site can be remediated to a standard sufficient for proposed use of mixed commercial/retail and residential purposes as outlined in the proposed development plan. The remediation should follow demolition of the buildings and be undertaken in accordance with a remedial action plan to address the potential USTs that could be present onsite and any unknown or unexpected contamination identified during the demolition and excavation.

It is assumed that during the proposed construction of a basement level car park as part of the development, all fill and residual soil materials will be removed from the site, therefore in view of the above findings and in accordance with the NEPM 2013 guidelines, it is considered that the site will be made suitable for the proposed residential development on completion of the following recommendations:

- Conduct a Hazardous Materials Survey (HMS) of current site structures. EI recommend that a HMS is conducted prior to demolition of site structures;
- An additional site investigation (ASI) should be undertaken to close additional data gaps identified during this investigation. This would include:
    - The re-purging of the groundwater monitoring wells is to be undertaken before an additional round of groundwater sampling collected and tested for contaminants of concern (including PFAS);
- A Remedial Action Plan (RAP) should be prepared in accordance with the NSW Office of Environment and Heritage (2011) *Guidelines for consultants reporting on contaminated sites* prior to the commencement of site works. The RAP will provide details of the methodology and procedures required for effective site remediation, which may include:
    - A site inspection is to be complete after demolition by a qualified environmental consultant, to determine if addition sources of environmental concern can be identified;

- GPRS survey is to be conducted to identify location of potential UST infrastructure onsite;
- Removal and validation of potential UST's present at the site. If no evidence of validation is available, further detailed investigation may be required to confirm the contamination status of the property and its suitability for residential land use;
- Additional soil sampling to confirm the absence of PFAS compounds within soil. If additional investigation indicate the presence of PFAS compounds, impacted soils should be removed and excavations validated;
- If additional groundwater sampling indicates the presence on contaminants at significantly elevated concentrations, three soil vapour wells should be installed at targeted locations across the site footprint, above the depth of groundwater, after the completion of demolition;
- Any material being removed from site (including virgin excavated natural materials (VENM)) should be classified for off-site disposal in accordance the EPA (2014) Waste Classification Guidelines;
- Any material being imported to the site should be assessed for potential contamination in accordance with NSW EPA guidelines as being suitable for the intended use or be classified as VENM;
- Preparation of an unexpected finds protocol for implementation following demolition and during site excavation to ensure any potential contamination sources (e.g. soil staining, asbestos) that maybe identified are managed in accordance with the NSW EPA legislation and guidelines; and
- Preparation of a final site validation report by a qualified environmental consultant, documenting the suitability of site environmental conditions for the proposed development.

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Mr John Wilkin of Bennet Murda Architects on behalf of Pacific Equity Partners Pty Ltd (the Client) engaged EI Australia (EI) to conduct a Detailed Site Investigation (DSI) for site characterisation at 242-244 Young Street, Waterloo NSW ('the site').

The site currently consists of a number of warehouse, office buildings and a car parking facility, which is located approximately 3.55 km south of the Sydney central business district (**Figure 1**). The site comprises multiple lots (Lot 1 in DP84655 and Lot A&B in DP161650) and is situated within the Local Government Area of City of Sydney Council, covering a total area of approximately 4,500 m^2, as depicted in the site aerial photo presented as **Figure 2**.

This assessment was conducted as part of an environmental due diligence process and this report is provided in support of a Development Application (DA) to City of Sydney Council and for the purpose of enabling the developer to meet its obligations under the *Contaminated Land Management Act 1997* (CLM Act), for the assessment and management of contaminated soil and/or groundwater.

There has been a previous environmental site investigation conducted by SGA Environmental (Ref. Project No 93099, Dated September 2012). It is important to note that the report only was for the northern allotment of the site (Lot 1 in DP84655).

1.2 PROPOSED DEVELOPMENT

Based on development plans supplied by the Client, EI understands that the proposed redevelopment will include the demolition of existing structures and construction of a multi-storey mixed use structure (school, residential, and commercial/retail) overlying a basement car park.

Plans of the proposed development are included in **Appendix A**.

1.3 REGULATORY FRAMEWORK

The following regulatory framework and guidelines were considered during the preparation of this report:

- ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*;
- DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*;
- EPA (1995) *Sampling Design Guidelines*;
- EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*;
- NEMP (2018) *PFAS National Environmental Management Plan*;
- NEPC (2013) *Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater*;
- NEPC (2013) *Schedule B(2) Guideline on Site Characterisation*;
- *Contaminated Land Management Act 1997*;
- State Environment Protection Policy 55 (SEPP 55) – *Remediation of Land*, and

- OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*.

1.4 PROJECT OBJECTIVES

The primary objectives of this investigation were therefore to:

- Evaluate the potential for site contamination on the basis of historical land uses, anecdotal and documentary evidence of possible pollutant sources;
- To investigate the degree of any potential contamination by means of limited intrusive sampling and laboratory analysis, for relevant contaminants; and
- Where site contamination is confirmed, make recommendations for the appropriate management of any contaminated soils and/or groundwater.

1.5 SCOPE OF WORKS

In order to achieve the above objectives, the scope of works was as follows:

1.5.1 Desktop Study

- A review of relevant topographical, geological, hydrogeological and soil landscape maps for the project area;
- Review of the previous site investigation report prepared by SGA (2012).
- Search of historical aerial photographs archived at NSW Land and Property Information to review previous site use and the historical sequence of land development in the neighbouring area;
- A land titles search, also conducted through NSW Land and Property Information for information relating to historical ownership of the site;
- A search of City of Sydney Council records for information relating to operational site history and/or relevant environmental incidents;
- A search of NSW EPA Land Information records under the *Contaminated Land Management Act 1997* and *Protection of the Environment Operations Act 1997*;
- A search of the Stored Chemical Information Database (SCID) and microfiche records held by SafeWork NSW relating to possible underground tank approvals and locations, and dangerous goods storages; and
- A review of existing underground services on site.

1.5.2 Field Work & Laboratory Analysis

- A detailed site walkover inspection;
- Drilling of boreholes at ten locations (BH1 to BH10) across the un-investigated accessible areas of the site. It is noted that ten boreholes were proposed as part of the site investigation, in accordance with the minimum sampling protocol recommended under EPA (1995);

- Construction of two groundwater monitoring bores (to a maximum depth of 9 m) in hydraulically up-gradient and down-gradient locations onsite. Groundwater monitoring bores will be constructed to standard environmental protocols to investigate the potential for groundwater contamination, and migration of contaminants off-site;

- Multiple level soil sampling within fill and natural soils and one round of groundwater sampling from the constructed groundwater monitoring bores. Two monitoring wells installed by SGA (2012) will also be used for groundwater sampling purposes; and

- Laboratory analysis of selected soil and groundwater samples for relevant analytical parameters as determined from the site history survey and field observations during the investigation programme.

1.5.3 Data Analysis and Reporting

A DSI report would also be prepared to document desk study findings, the conceptual site model, data quality objectives, investigation methodologies and results. The report would also provide a record of observations made during the detailed site walkover inspection, borehole and monitoring well construction logs and a discussion of laboratory analytical results in regards to potential risks to human health, the environment and the aesthetic uses of the land.

2. SITE DESCRIPTION

2.1 PROPERTY IDENTIFICATION, LOCATION, AND PHYSICAL SETTING

The site identification details and associated information are presented in **Table 2-1**, while the site locality is shown in **Figure 1**.

Table 2-1 Site Identification, Location, and Zoning

Attribute	Description
Street Address	242-244 Young Street, Waterloo NSW
Location Description	Approx. 3.55 km south of Sydney CBD, an irregular shaped block bound by a construction site (north), Young Street (east), Powell Street (South) and Hunter Street (west).
Site Coordinates	Northeast corner of site (GDA94-MGA55): Easting: 334332.297 Northing: 6247371.091 (Source: http://maps.six.nsw.gov.au)
Site Area	Approx. 4,500 m^2 (Source: http://maps.six.nsw.gov.au)
Site Owner	Pacific Equity Partners Pty Ltd
Lot and Deposited Plan (DP)	Lot 1 in DP84655 and Lot A&B in DP161650
State Survey Marks	Two State Survey Marks (SSM) are situated in close proximity to the site: SS53805 on McEvoy Street and SS16632 on the corner of Young Street and McEvoy Street (Source: http://maps.six.nsw.gov.au)
Local Government Authority	City of Sydney Council
Parish	Alexandria
County	Cumberland
Current Zoning	B4 – Mixed Use (Sydney Local Environment Plan, 2012)
Current Land Uses	A number of warehouse, office buildings and a car parking facility

2.2 SURROUNDING LAND USE

The site is situated within an area of mixed land uses and current uses. Current uses of surrounding land are described in **Table 2-2**.

Table 2-2 Surrounding Land Uses

Direction Relative to Site	Land Use Description
North	Residential apartment blocks (under construction).
East	Young Street, followed by commercial properties.
South	Powell Street, followed by high density residential properties.
West	Powell Street, followed by high density residential properties.

2.3 REGIONAL SETTING

Regional topography, geology, soil landscape and hydrogeological information are summarised in **Table 2-3**.

Table 2-3 Regional Setting Information

Attribute	Description
Topography	The site generally lies flat, with a slight decline to the south west, towards Hunter Street (Ref. http://maps.six.nsw.gov.au)
Site Drainage	Site drainage is expected to be collected by an installed drainage system which discharges to the public wastewater network. The public network is expected to flow south-west towards Sheas Creek.
Regional Geology	The site directly overlies medium to fine grained “marine” sand with podsols, which is characterised by the deposits forming the Botany Sands (Ref. Geological Map Sydney 1:100,000 Geological Series Sheet 9130 DMR 1991). With reference to the Geological Survey of NSW Bulletin No.18 by R.J Griifin (1963), the site is located on aeolian dune sands associated with the Botany Basin. The site runs parallel to Cross Section 6, which shows a sequence of sands over fissured clays over Hawkesbury Sandstone. The Botany Basin basement contour map indicates the top of rock to be greater than 30 m. It is noted that the site is located within the Botany Sand Aquifer and the Botany Groundwater Management Zone 2 which bans domestic groundwater use.
Soil Landscapes	The Soil Conservation Service of NSW Soil Landscapes of the Sydney 1:100,000 Sheet (Chapman and Murphy, 1989) indicates that the site overlies an Aeolian Landscape – Tuggerah, which typically includes gently undulating to rolling coastal dune fields. It generally comprises deep (>2.0 m) red and brown podzolic soils on dunes and podzol/ humus podzol intergrade soils on swales
Acid Sulfate Soil Risk	With reference to the Botany Bay Acid Sulfate Soil Risk Map (1:25,000 scale; Murphy, 1997), the subject land lies within the map class description of *No Known Occurrence*. In such cases, acid sulfate soils (ASS) are not known or expected to occur and “land management activities are not likely to be affected by ASS materials”. The Sydney Local Environmental Plan 2012- Acid Sulfate Soils Risk Class 1:1,000 scale Map indicates that the site lies within a *Class 5* ASS area. Council consent is therefore required prior to commencing any works within 500 m of Class 1, 2, 3 or 4 land, with a ground elevation of below 5 m Australian Height Datum (AHD) and where the water table is likely to be lowered below 1 mAHD on adjacent Class 1, 2, 3 or 4 land.
Likelihood & Depth of Filling	Fill materials are expected to be present at varying depths across the site associated with levelling of the site during construction of the existing structures.

Attribute	Description
Typical Soil Profile	The typical soil profile is expected to comprise fill materials of varying depths overlying cohesive residual soils on shale bedrock.
Depth to Groundwater	Based on previous investigations on the site conducted by SGA (2012), the average depth to groundwater is anticipated to be approximately 3.05 mBGL.
Groundwater Flow Direction	In view of the local topography, groundwater flow direction in the vicinity of the site is inferred to be towards Sheas Creek located approximately 800 m south-west of the site.
Nearest Surface Water Feature	Sheas Creek located approximately 800 m south-west of the site which then flows into Alexandra Canal. It is understood that Alexandra Canal is tidally influenced and is considered to be a marine system for impact assessment purposes.

2.4 GROUNDWATER BORE RECORDS AND GROUNDWATER USE

An online search of registered groundwater bores was conducted by EI on the 3 September 2018 through the NSW Office of Water (Ref. http:// realtimedata.water.nsw.gov.au/water.stm). There were 84 registered bores within about 500m of the site. A summary of the closest registered bores is presented with selected details in **Table 2-4**. A bore location plan and detailed information regarding the listed bores is attached in **Appendix B**.

Table 2-4 Summary of Registered Water Bores within 1 km of the site

Bore No.	Date Drilled	Drilled Depth (m)	SWL*/Salinity/Yield	Bore Purpose
GW111959	07/08/2012	6.00	2.60/ - / -	Monitoring
GW111960	07/08/2012	6.00	3.52/ - / -	Monitoring
GW109745	02/08/2002	3.50	-	Monitoring

Notes:
- Data not recorded;
* SWL – Standing water level measured in mBGL,
Salinity – units unspecified,
Yield – measured in L/s.

All of the boreholes identified in close proximity were identified to be used for monitoring purposes. Most of the water bore did not contain information on drilled depth, standing water level, salinity and yield. The drilled bore depths ranged between 6.00 m and 6.50 mBGL. Standing water levels from bores ranged from 2.60 and 3.52 mBGL.

In view of the above information, and the fact that a reticulated water supply is available in the area, it is unlikely that groundwater extraction for beneficial domestic use is taking place in the locality.

2.5 SITE WALKOVER INSPECTION

EI staff made a number of observations during a detailed site inspection on 31 July 2018. The recorded observations are summarised below:

- The site was used for various commercial purposes, including an engineering workshop, office buildings, and a film school (**Photos 1**);

- A workshop, located in the central portion of the site, was utilised for the manufacturing of engineering materials (**Photo 2**);
- Soil landscaping/vegetation were present on site. Soil in the southern portion of the site were observed to be overall healthy and showed no signed of distressed. However, soil located in the eastern portion of the site appears to be unhealthy, due to vehicle parking on top of vegetation (**Photos 2 and 3**);
- Concrete floor slabs & pavements on site were in poor to moderate condition with cracks, staining noted and discrepancies (**Photo 4**);
- Evidence indicative of underground petroleum storage systems (UPSS) or above ground storage tanks (AST) was not observed in accessible site areas during the inspection; and
- Previous installed groundwater monitoring wells were located during the inspection. These wells relate to previous investigation by SGA (2012) (**Photo 5**).

Photographs from the site walkover inspection are included in **Appendix C**.

3. PREVIOUS INVESTIGATIONS

3.1 AVAILABLE DOCUMENTS

The following investigations have been previously conducted for the site:

- SGA (2012) *Environmental Site Investigation.* Ref. 93099, dated September 2012.

A summary works and key findings is outlined in **Table 3-1**.

Table 3-1 Summary of Previous Investigation Works and Findings

Assessment Details	Project Tasks and Findings
Environmental Site Investigation (SGA, 2012)	
Scope of Works	• Review of a previous SESL Preliminary Site Investigation report. • Drilling of six boreholes on a grid pattern, and collected of soil samples. • Installation and sampling of two groundwater monitoring wells. • Laboratory analysis of samples for asbestos, heavy metals, petroleum hydrocarbons, mono aromatic hydrocarbons (including benzene, toluene, ethyl benzene and xylene), and polycyclic aromatic hydrocarbons (PAHs). • Provision of a report detailing the findings of the field investigation and the laboratory results.
Investigation Findings and Conclusions	• Historical records indicated that site was former used as a foundry. Review of the report has observed some site history information to be missing from the investigation report. Additional site history information has been provided in **Section 4**. • Concentrations of copper, lead, C_{10}-C_{36} petroleum hydrocarbons, polycyclic aromatic hydrocarbons (including benzo(a)pyrene) were identified within fill material across the site exceeding NEPC (1999) commercial/industrial guidelines. • SGA concluded that chemicals of concern would not preclude continued commercial use if foreseeable exposure is appropriately managed (i.e. via a site management plan). SGA noted that the contaminants were unlikely to be mobile as negligible concentrations of the elevated contaminants were identified in natural soils and groundwater.

4. ADDITIONAL SITE HISTORICAL INFORMATION

4.1 LAND TITLES INFORMATION / HISTORIC AERIAL REVIEW

A historical land titles search was conducted through Legal Liaison Searching Services Pty Ltd. Copies of relevant documents resulting from this search are presented in **Appendix D**. A summary of all the previous and current registered proprietors (**Table 4-1**), along with information obtained from the available historical aerial photographs, in relation to past potential land uses (**Table 4-2**). The historical aerial photographs reviewed as part of this ESA included:

- 1930: February 1930, Run 16, Map 3428 B/W
- 1943: Sydney 1943 Imagery (source : http://maps.six.nsw.gov.au/)
- 1951: May 1951, Run 15, Map 467 – 28 B/W – Lands Photo
- 1961: Run 37E Map 1042 B/W, Cumberland 1961 series NSW 5156 - Lands Photo
- 1986: 02 August 1986, Run 24E, Map 115 NSW 3527 – Land and Property Information
- 1994: 4 October 1994, Run 11, Map 153-164 – Land Information Centre
- 2004: 08 October 2004, Run 7, Map 14-25, NSW 4877 – Department of Land

Table 4-1 Summary of Owner History

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**
As regards Lot 1 D.P. 84655	
08.08.1912 (1912 to 1940)	James Hunter and Sons Limited Now James Hunter & Sons Pty. Limited
18.03.1940 (1940 to 1968)	Gordon Marr & Sons Pty. Limited
01.11.1968 (1968 to 1986)	P. Rowe Pty Limited
27.05.1986 (1986 to 1986)	Leda Holdings Pty Limited
03.11.1986 (1986 to 1991)	Baese Pty. Limited
29.01.1991 (1991 to 1998)	Tridu Pty. Limited
20.05.1998 (1998 to 2013)	Coates Signco Manufacturing Pty Limited Now Alan Coates Pty Limited

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**
04.01.2013 (2013 to Date)	# International Screen Academy Property Pty Ltd
Easements: - • 28.07.1986 (D.P. 638902) – Easement for Support Leases: - • 01.11.1968 (L301856) – Gordon Marr & Sons Proprietary Limited – expired 17.05.1979 • Numerous leases were found from 29.01.1991 to 30.11.2010 – that have since expired due to effluxion of time, or have been surrendered – these have not been investigated • 16.05.2013 (AH734086) – International Screen Academy Property Pty Limited of 242 Young Street, Waterloo - expires 17.12.2015 - 26.07.2016 (AK625515) – expiry date now 31.12.2017	
As regards Lot A D.P. 161650	
08.08.1912 (1912 to 1956)	James Hunter and Sons Limited Now James Hunter & Sons Pty. Limited
10.05.1956 (1956 to 1968)	Gordon Marr & Sons Pty. Limited
01.11.1968 (1968 to 1982)	P. Rowe Pty Limited
16.03.1982 (1982 to 1989)	Perpetual Trustee Company Limited
16.03.1989 (1989 to 1995)	John Malcolm Sandilands Beverley Ann Sandilands
02.03.1995 (1995 to 1998)	Beverley Ann Sandilands
23.04.1998 (1998 to Date)	# Charvic Pty Limited
Easements: - • 28.07.1986 (D.P. 638902) – Easement for Support • 28.07.1986 (D.P. 638902) – Easement for Maintenance of Gutter Leases: - • 01.11.1968 (L301856) – Gordon Marr & Sons Proprietary Limited – expired 17.05.1979 • 01.07.1982 (T72760) – P. Rowe Pty Limited – expired 15.09.1988 • 15.09.1988 (X837002) – P. Rowe Fabrics Pty. Limited – surrendered 06.05.1994 • 06.05.1994 (U241772) – expired due to effluxion of time, or has been surrendered – this has not been investigated • 20.12.2007 (AD653553) – expired due to effluxion of time, or has been surrendered – this has not been investigated • 19.05.2017 (AM405465) – Paramount Property Group Pty Limited of Factory, 244 Young Street, Waterloo together with 38 on-site parking spaces numbered 1–38. – expires 01.04.2002 – option of renewal 2 years	

Date of Acquisition and term held	**Registered Proprietor(s) & Occupations (where documented)**
As regards Lot B D.P. 161650	
08.08.1912 (1912 to 1966)	James Hunter and Sons Limited Now James Hunter & Sons Pty. Limited
28.01.1966 (1966 to 1982)	P. Rowe Pty Limited
16.03.1982 (1982 to 1989)	Perpetual Trustee Company Limited
16.03.1989 (1989 to 1995)	John Malcolm Sandilands Beverley Ann Sandilands
02.03.1995 (1995 to 1998)	Beverley Ann Sandilands
23.04.1998 (1998 to Date)	# Charvic Pty Limited

Easements: -

- 01.04.2009 (D.P. 1136961) – Easement for Electricity and Other Purposes 3.365 metre(s) wide
- 01.04.2009 (D.P. 1136961) – Right of Carriageway 6.8 metre(s) wide

Leases: -

- 01.07.1982 (T72760) – P. Rowe Pty Limited – expired 15.09.1988
- 15.09.1988 (X837002) – P. Rowe Fabrics Pty. Limited – surrendered 06.05.1994
- 06.05.1994 (U241772) – expired due to effluxion of time, or has been surrendered – this has not been investigated
- 20.12.2007 (AD653553) – expired due to effluxion of time, or has been surrendered – this has not been investigated
- 19.05.2017 (AM405465) – Paramount Property Group Pty Limited of Factory, 244 Young Street, Waterloo together with 38 on-site parking spaces numbered 1–38. – expires 01.04.2002 – option of renewal 2 years

Notes: # Denotes Current Registered Proprietor

Table 4-2 Summary of Aerial Photograph History

	Site description based on historical aerial photographs	**Land use**
1930 20 February 1930	Due to the resolution of the 1930 photo, individual buildings cannot be distinguished. The site appeared to be utilised as a commercial buildings across the majority of the site. There were buildings located in the southern portion and the northern portion of the site.	Commercial
1943 Six Maps https://maps.six.nsw.gov.au	The site appears unchanged from the previous aerial photograph, with the exception of buildings along the northern portion of the site being redeveloped and a single building being constructed along the northern portion of the site.	
1951 May 1951	The site appeared unchanged from the previous aerial photograph.	

	Site description based on historical aerial photographs	Land use
1961	The site appeared unchanged from the previous aerial photograph.	
1986 2 August 1986	The site appeared unchanged from the previous aerial photograph, with the exception of vacant land in the central portion of the site, being developed with buildings and inferred to be used for commercial purposes.	
1994 4 October 1994	The site appeared unchanged from the previous aerial photograph.	
2004 8 October 2004	The site appeared unchanged from the previous aerial photograph.	
2016 Six Maps https://maps.six.nsw.gov.au	The site appeared unchanged from the previous aerial photograph.	

In summary, review of land titles records and historic aerial photography showed that a commercial development occupied the northern and southern portion of the site since the 1930s. There have been slight alterations to the building since that time but the site has always remained of the same nature till the current date.

4.2 SURROUNDING LAND USE

As part of the review, an assessment of surrounding land uses using historical aerial photographs sourced from NSW Land and Property Information was carried out. A summary of the pertinent information identified at surrounding land parcels from the reviewed photographs is presented in **Table 4-3**.

Table 4-3 Summary of Aerial Photograph Review

Aerial Photograph	Surrounding land uses based on historical aerial photographs
1930 20 February 1930	Site surroundings were predominantly commercial/industrial in nature. There were some residential buildings located further north-west and south east of the site.
1943 Six Maps https://maps.six.nsw.gov.au	Surrounding land use remained primarily unchanged from the previous aerial photograph.
1951 May 1951	Surrounding land use remained primarily unchanged from the previous aerial photograph.
1961	Surrounding land use remained primarily unchanged from the previous aerial photograph.
1986 2 August 1986	Surrounding land use remained primarily unchanged from the previous aerial photograph, except for the redevelopment of residential land to commercial use to the south-east of the site.
1994 4 October 1994	Surrounding land use remained primarily unchanged from the previous aerial, with the exception of the commercial buildings, adjacently north being redeveloped for high density residential purposes.
2004 8 October 2004	Surrounding commercial properties to the south and west have been redeveloped and predominantly used for high density residential purposes.

Aerial Photograph	Surrounding land uses based on historical aerial photographs
2016 Six Maps https://maps.six.nsw.gov.au	Surrounding land use remained primarily unchanged from the previous aerial photograph.

4.3 COUNCIL INFORMATION

An application to access records held by City of Sydney Council was initiated relating to the site was requested by EI, on behalf of the Client. Correspondence has not been during the time of writing of this report. Should pertinent information be identified from council, an addendum to the PSI will be prepared and issued.

However, a check of the Sydney of City Planning street cards identified some development and alterations that occurred on the site. A summary of the Development Applications can be seen in **Table 4-4**.

Table 4-4 Summary of Online Council Records

Reference	Date	DA Application Information
45-1	7-10-32	Refurbish existing building.
41-3-1273	10-09-36	Site usage for sign storage and fabrication of sign prototypes.
2181-55	2-12-55	Reconstruct roof.
148-1-62	27-2-62	Use of premises for the cleaning of drum reconditioners.
435-62	27-2-62	Replace roof.
290-63	15-2-63	Alterations to building.
1014-63	8-5-63	Fire escape stairs.
1228-63	7-6-63	Extension of roof.
1336-63	20-6-63	Septic tank.
2828-63	9-12-63	Alterations
2128-64	4-10-64	Reinstatement after fire.
155-1-65	8-3-65	Construction of vehicles crossing.
212-65	10-3-65	Use of preemies for soap manufacturing.
982-65	1-12-65	Erection of warehouse building offices, alterations and amenities.
544-66	15-3-66	New building warehouse.
87-73	5-3-73	Erection of warehouse building/offices/showroom and amenities.
45-84-5147	28-3-84	Upgrading fire egress & protection
45-86-2103	-	Refurbish building and mezzanine.
45-88-0224	-	Erection of pylon sign and flush wall.

Reference	Date	DA Application Information
210-62	-	Installation of equipment for the cleaning of tallow drum.

4.4 SAFEWORK NSW DATABASE SEARCH

A search of SafeWork NSW dangerous goods records was completed as part of this assessment. Correspondence from SafeWork NSW revealed that the following records pertaining to the premises were held, with details as described in **Table 4-5** (correspondence attached in **Appendix K**).

Table 4-5 Summary of SafeWork Records

Licence Holder / Premises	Type of Infrastructure	Goods Stored	Quantity	Location of storage	Status
P. Rowe Fabrics Pty Ltd/ corner of Powell & Young Street, Waterloo NSW 2017 Dated: 24-10-1988	Underground Tank	Petrol	10,000 L	North eastern portion of the site (See **Figure 3**)	Unknown
P. Rowe Fabrics Pty Ltd/ corner of Powell & Young Street, Waterloo NSW 2017 Dated: 09-06-1975	Underground Tank	Mineral Spirit	10,000 L	-	Unknown
	Brick-Concrete Storage Facility (*unknown if above or below ground storage*)	Mineral Oil	10,000 L	-	Unknown
		Class 3 Material (Nitro-Cellouse)	2 x 2,500 kg	-	Unknown

Land title searches revealed the property located at the site to have been previously owned by P. Rowe Pty Ltd, with SafeWork records confirming the historical presence of UST's at this property. There is no information pertaining if the tanks have been removed from the site. There are some uncertainties of where some of the previous locations of the tanks mentioned are located.

4.5 EPA ONLINE RECORDS

On 6 September 2018, an on-line search of the contaminated land public record of NSW Environment Protection Authority (EPA) Notices was conducted. The contaminated land public record is a searchable database of:

- Orders made under Part 3 of the *Contaminated Land Management Act 1997* (CLM Act);
- Approved voluntary management proposals under the CLM Act that have not been fully carried out and where the approval of the EPA has not been revoked;
- Site Audit Statements provided to the EPA under Section 53B of the CLM Act that relate to significantly contaminated land;
- Where practicable, copies of any documentation formerly required to be part of the public record; and
- Actions taken by the EPA under Sections 35 and 36 of the *Environmentally Hazardous Chemicals Act 1985*.

This search confirmed that the NSW OEH had no regulatory involvement in relation to the area of investigation. Properties in proximity to the site which the NSW OEH have been involved with area listed in **Table 4-5**.

Table 4-6 Properties listed on the contaminated land record

Name & Address of Property	Distance & Direction from Site	CLR Entries	Associated Contaminants
887-893 Bourke Street, Waterloo	400 m SE	**2005** – Declaration of remediation site **2016 –** Notice to end significantly contaminated land declaration	Groundwater – PCE, TCE, DCE, and vinyl chloride

A search through the List of NSW Contaminated Sites notified to the EPA under Section 60 of the CLM Act 1997 was also conducted on 6 September 2018. This list is maintained by NSW EPA and includes properties on which contamination has been identified. Not all notified land is deemed to be impacted significantly enough to warrant regulation by the EPA. The subject site has not been notified as contaminated to the EPA. Properties in proximity to the site which have been notified to the EPA are listed in **Table 4-6**.

Table 4-7 Land notified to NSW EPA

Suburb	Description and Address	Activity that caused contamination	Distance and direction from site	EPA site management class
Waterloo	Diversity Waterloo 1-13 Archibald Avenue	Other Industry	210 m E	Under Assessment
Waterloo	Iconic (Former Chubb Factory) Waterloo 830-838 Elizabeth Street	Other Industry	180 m SW	Regulation under CLM Act not required
Waterloo	Lawrence Dry Cleaners 887-893 Bourke Street	Unclassified	400 m SE	Contamination currently regulated under CLM Act

A search of the Protection of the Environment Operations (POEO) Act public register, regarding environmental protection licences, applications, notices, audits, pollution studies, and reduction programmes, did not identify any record for the site. Records were identified for sites in proximity of the application site, and these are shown in **Table 4-7**.

Table 4-8 POEO public register entries

Suburb	Description and Address	Distance and direction from site	Activity type	POEO Records
Waterloo	Heidelberg Graphic Equipment Limited 50 O'Dea Avenue	460m SE	Hazardous, Industrial or Group A Waste Generation or Storage	POEO Licence, Licence variations
Waterloo	Lawrence Dry Cleaners	400m SE	Hazardous, Industrial or Group A Waste Generation or Storage	POEO Licence, Licence variations

5. CONCEPTUAL SITE MODEL

In accordance with NEPM (2013) *Schedule B2 – Guideline on Site Characterisation* and to aid in the assessment of data collection for the site, EI developed a preliminary conceptual site model (CSM) assessing plausible pollutant linkages between potential contamination sources, migration pathways, and receptors. The CSM provides a framework for the review of the reliability and useability of the data collected and to identify data gaps in the existing site characterisation.

5.1 CHEMICAL HAZARDS AND CONTAMINATION SOURCES

On the basis of site history and search findings described by DLA (2014) (**Section 3**), EI consider potential chemical hazards and onsite contamination sources to be as follows:

- Imported fill soils of unknown origin distributed across the site;
- Impacts from previous commercial - industrial activities at the site;
- Painted surfaces in relation to the structures (buildings) that are currently present on the site;
- Hazardous materials, including potential asbestos-containing materials (ACM) from building products;
- Historical application of pesticides;
- Deeper, natural soils containing residual impacts, representing potential secondary sources of contamination; and
- Migrating contaminants from offsite sources.

5.2 PER OR POLY-FLUOROALKYL SUBSTANCES (PFAS)

The NSW EPA (2017) Auditor Guidelines require that PFAS substances are considered in assessing contamination. EI use the following Decision Tree (**Table 5-1** below) based on EnRisk (2016) for prioritising the potential for PFAS compounds being present on Site and whether PFAS sampling of soil and water is required.

Table 5-1 PFAS Decision Tree

Preliminary Screening	Probability
Did fire training occur onsite?	**Low**
Did fire training occur, or is an airport or fire station up-gradient of or adjacent to the Site? [1]	**Low**
Have “fuel” fires ever occurred onsite? e.g. ignition of fuel (solvent, petrol, diesel, kero) tanks?	**Low** Insufficient site history information available
Have PFAS been used in manufacturing or stored on-Site ?[2]	**Medium** Previous operations included fabric industry use, which are known to use products that may contain PFAS. A large store of nitrocellulose lacquer was noted in Safework records, which could be a possible point source of contamination.

Preliminary Screening	Probability
If Yes to any questions, has site analytical suite been optimised to include preliminary sampling and testing for PFAS in soil (ASLP Testing) and water?	**See Section 10 for commentary**

Note 1 Runoff from fire training areas may impact surface water, sediment and groundwater.
Note 2 PFAS is used wide range of industrial processes and consumer products, including in the manufacture of non-stick cookware, specialised garments and textiles, Scotchguard™ and similar products (used to protect fabric, furniture, leather and carpets from oils and stains), metal plating and in some types of fire-fighting foam (https://www.nicnas.gov.au/chemical-information/factsheets/chemical-name/perfluorinated-chemicals-pfas)

Although the PFAS decision tree does not identify the need to include PFAS within the testing suite, aerial photography analysis (DLA, 2014) indicates that part of the site may have burnt down. As such, it is considered likely that fire fighting foams were applied to the site and, as such, PFAS are included within the COPC (**Section 4.4**).

5.3 EMERGING CHEMICALS

The NSW EPA uses Chemical Control Orders (CCOs) as a primary legislative tool under the EHC Act (1985) to selectively and specifically control particular chemicals of concern, and limit their potential impact on the environment. CCOs provide the EPA a rapid and flexible mechanism for responding to emerging chemical issues. As with PFAS compounds, EI has considered chemicals controlled by CCOs and other potential emerging chemicals in this assessment as outlined in **Table 5-2** below.

Table 5-2 Emerging or Controlled Chemicals

Chemicals of Concern (CCO or emerging)	Decision
Were aluminium smelter wastes used or stored on Site (CCO, 1986)?	No
Do dioxin contaminated wastes (CCO, 1986) have the potential to impact the Site? [1]	No
Were organotin products (CCO, 1989) used or stored on Site? [2]	No
Were polychlorinated biphenyls (PCBs) used or PCB wastes (CCO, 1997) stored on-Site? [3]	Yes *If PCB containing pesticides were used onsite*
Were scheduled chemical or wastes (CCO, 2004) used or stored [4]	Yes *If OC pesticides were used onsite*
Are other emerging chemicals suspected? [5]	No
If Yes to any questions, has the site sampling suite been optimised to include specific sampling for other chemicals of concern in soil, air, and water	Yes

Note 1 From burning of certain chemicals, smelting or chemical manufacturing or fire on or near the Site.
Note 2 From anti-fouling paints used or removed at boat & ship yards and marinas.
Note 3 From older transformer oils & electrical capacitors
Note 4 Twenty-four mostly organochlorine pesticides and industrial by-products
Note 5 Other chemicals considered as emerging e.g. 1,4 dioxane (associated with some cVOCs).

5.4 CONTAMINANTS OF POTENTIAL CONCERN

Based on the findings of the site contamination appraisal the contaminants of potential concern (COPC) at the site are considered to be:

- Soil – heavy metals (HMs), petroleum hydrocarbons (TRHs, BTEX compounds), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOC), including chlorinated VOC (VOCC), organochlorine and organophosphate pesticides (OCP/OPP), polychlorinated biphenyls (PCB), Per- and Polyfluoroalkyl Substances (PFAS),and asbestos.

- Groundwater – HMs, TRH, BTEX, PAH, VOCs and VOCCs (such as trichloroethene (TCE)), and PFAS.

5.5 POTENTIAL SOURCES, EXPOSURE PATHWAYS, AND RECEPTORS

Potential contamination sources, exposure pathways and human and environmental receptors that were considered relevant for this assessment are summarised along with a qualitative assessment of the potential risks posed by complete exposure pathways in **Table 5-3**.

Table 5-3 Conceptual Site Model

Potential Sources	Potential Contaminants	Sensitive Receptor	Migration & Exposure Pathways
Imported Fill	HM, TRH, PAH, BTEX, OCP/OPP, PCB, Asbestos	Site Workers during demolition and construction Future site residents Adjacent land users	Dermal Contact Ingestion Inhalation
		Groundwater	Seepage into the subsurface soils, bedrock, and groundwater.
Historical and present site uses (Including a chemical manufacturer, plastic manufacturer, metal recycler)	HM, TRH, PAH, BTEX, VOC, Asbestos	Site Workers during demolition and remediation. Future site residents Adjacent site users	Dermal Contact Ingestion Inhalation
		Groundwater	Seepage into the subsurface soils, bedrock, and groundwater.
Painted surfaces on existing structures	HM (Lead)	Site Workers during demolition and construction Future site residents Adjacent site users	Dermal Contact Ingestion Inhalation
		Groundwater	Seepage into the subsurface soils, bedrock, and groundwater.
Deleterious materials within the existing structures	Asbestos	Site Workers during demolition and construction Future site residents Adjacent site users	Dermal Contact Ingestion Inhalation
Historical use of firefighting foams	PFAS	Site Workers during demolition and construction Future site residents Adjacent site users	Dermal Contact Ingestion Inhalation
		Groundwater	Seepage into the subsurface soils, bedrock, and groundwater.
Offsite contamination sources	HM, TPH, PAH, BTEX, VOC	Site Workers during demolition and construction Future site residents Adjacent site users	Dermal Contact Ingestion Inhalation

5.6 DATA GAPS

Based on information from the site walkover inspection and site history review, EI considered a programme of intrusive investigation was warranted to conduct targeted sampling at locations of known, potential sources of contamination (as listed in **Section 5.1**), with systematic sampling coverage across the site area.

6. SAMPLING, ANALYTICAL, AND QUALITY PLAN (SAQP)

The SAQP plays a crucial role in ensuring that the data collected as part of this, and ongoing environmental works carried out at the site are representative, and provide a robust basis for site assessment decisions. This SAQP includes the following:

- Data quality objectives, including a summary of the objectives of the ESA;
- Investigation methodology including media to be sampled, details of analytes and parameters to be monitored and a description of intended sampling points;
- Sampling methods and procedures;
- Field screening methods;
- Analysis Methods;
- Sample handling, preservation and storage; and
- Analytical QA/QC.

6.1 DATA QUALITY OBJECTIVES (DQO)

In accordance with the US EPA (2006) *Data Quality Assessment* and the EPA (2017) *Guidelines for the NSW Site Auditor Scheme*, the process of developing Data Quality Objectives (DQO) was used by the EI assessment team to determine the appropriate level of data quality needed for the specific data requirements of the project. The DQO process that was applied for this assessment is documented in **Table 6-1**.

Table 6-1 Summary of Project Data Quality Objectives

DQO Steps	Details	Comments (changes during investigation)
1. State the Problem Summarise the contamination problem that will require new environmental data, and identify the resources available to resolve the problem; develop a conceptual site model	• The site proposed demolition of existing structures and redevelopment into a mixed use development including a residential apartment building, townhouses and commercial/retail overlying a single level basement (**Section 1.2**). • Historical information and site inspection identified the potential for contamination to be present in site soil and/or groundwater, contributed by various potential sources, predominantly industrial use, listed in **Section 5.1**. Based on the site history information collected, a preliminary conceptual site model of the site has been developed, and is present in **Section 5.4**. • The investigation sampling must provide supportive information on the environmental conditions of the site to determine the site's suitability for the proposed development.	-
2. Identify the Goal of the Study (Identify the decisions) Identify the decisions that need to be made on the contamination problem and the new environmental data required to make them	Based on the objectives outlined in **Section 1.4**, the decisions that need to be made are • Has the nature, extent and source of any soil, vapour and/or groundwater impacts onsite been defined? • What impact do the site specific, geological, and hydrogeological conditions have on the fate and transport of any impacts that may be identified? • Does the level of impact coupled with the fate and transport of identified contaminants represent an unacceptable risk to identified human and/or environmental receptors on or offsite? • Does the collected data provide sufficient information to allow the selection and design of an appropriate remedial strategy, if necessary?	-

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DQO Steps	Details	Comments (changes during investigation)
3. Identify Information Inputs (Identify inputs to decision) Identify the information needed to support any decision and specify which inputs require new environmental measurements	Inputs to the decision making process include: • Proposed development plans and land use; • Regional and site settings including site geology, topography and surrounding land uses; • Previous investigation completed at the site by SGA Environmental (2012); • Areas of concern identified by SGA Environmental (2012) and during the site inspection prior to intrusive investigations; • National and NSW EPA guidelines under the NSW *Contaminated Land Management Act 1997*; • Intrusive investigation sampling to characterise environmental conditions at the site and to evaluate the potential risks to sensitive receptors; and • Laboratory analytical results of soil and groundwater samples collected. At the end of the assessment, a decision must be made regarding whether the soils and groundwater are suitable for the proposed development, or if additional investigation or remedial works are required to make the site suitable.	-
4. Define the Boundaries of the Study Specify the spatial and temporal aspects of the environmental media that the data must represent to support decision	• Lateral – the investigation will be conducted within the site boundaries; which defines the extent of the investigation; • Vertical – From existing ground surface, underlying fill and natural soil and rock horizons, to a maximum depth of 5.50 mBGL; and • Temporal – Results are valid on the day of data and sample collection and remain valid as long as no changes occur on site or contamination (if present) does not migrate on site or on to the site from off-site sources.	Lateral – the extent of the study onsite was limited to accessible areas of the site due to existing building structures, infrastructure, and provision of access, as detailed in **Section 7.2**. Vertical – BH3 to BH6 terminated within fill due to auger refusal.
5. Develop the Analytic Approach (Develop a decision rule) To define the parameter of interest, specify the action level, and integrate previous DQO outputs into a single statement that describes a logical basis for choosing from alternative actions	The decision rules for the investigation were: • If the concentrations of contaminants in the soil exceed the adopted land use criteria; then assess the need to further investigate the extent of impacts onsite. • Decision criteria for QA/QC measures are defined by the Data Quality Indicators (DQI) in **Table 6-2**.	-

DQO Steps	Details	Comments (changes during investigation)
6. Specify Performance or Acceptance Criteria (Specify limits on decision errors) Specify the decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data	Specific limits for this project are to be in accordance with the National and NSW EPA guidance, and appropriate indicators of data quality and standard procedures for field sampling and handling. This should include the following points to quantify tolerable limits: • The null hypothesis for the investigation is that: – The 95% Upper Confidence Limits (UCL) of the mean for contaminants of concern exceeding the adopted criteria across the site. • A minimum of 10 sampling points on a site of area 4,500 m^2 will allow detection of a circular hotspot with a nominal diameter of 19.9 m with 95% certainty; • The acceptance of the site will be based on the probability that – The 95% UCL of the mean of the data will satisfy the given site criteria. Therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect; and – The standard deviation of the results is less than 50% of the relevant remediation acceptance criterion; and – No single result exceeds the remediation acceptance criteria by 250% or more; • Soil concentrations for chemicals of concern that are below investigation criteria made or approved by the NSW EPA will be treated as acceptable and indicative of suitability for the proposed land use(s); • If contaminant concentrations in groundwater exceed the adopted criteria, further investigation will be considered prudent. If no contamination is detected in groundwater, further action will not be warranted.	An additional sampling point was added to the investigation to allow a more complete coverage of the site area. In light of access restrictions onsite, a systematic sampling pattern for assessment could not be adopted for every sampling position. A targeted sampling approach was utilised.
7. Develop the Detailed Plan for Obtaining Data (Optimise the design for obtaining data) Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs	• The site area (4,500 m^2) required eleven sampling points according to EPA (1995). • Soil sampling locations were set using a systematic sampling pattern across the accessible areas of the site. • An upper soil profile sample (soil extracted immediately beneath the concrete hardstand / pavement / ground level) will be collected at each borehole location and tested for chemicals of concern, to assess the conditions of any fill layer, and impacts from activities above ground. Further sampling would also be carried out at deeper soil layers. These samples would be selected for testing based on field observations (including visual and olfactory evidence, as well as soil vapour screening in headspace samples) whilst giving consideration to characterise the subsurface soil stratigraphy. • Three groundwater monitoring wells were proposed to characterise groundwater quality within the site. • Written instructions will be issued to guide field personnel in the required fieldwork activities.	An additional sampling point was added to the investigation to allow a more complete coverage of the site area. In light of access restrictions onsite, a systematic sampling pattern for assessment could not be adopted for every sampling position. A targeted sampling approach was utilised.

6.2 DATA QUALITY INDICATORS

To ensure that the investigation data collected was of an acceptable quality, the investigation data set was assessed against the data quality indicators (DQI) outlined in **Table 6-2**, which related to both field and laboratory-based procedures. The assessment of data quality is discussed in **Section 7**.

Table 6-2 Data Quality Indicators

Data Quality Objective	Data Quality Indicator	Acceptable Range
Accuracy	Field – Trip blank (laboratory prepared) Laboratory – Laboratory control spike and matrix spike	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Precision	Field – Blind replicate and spilt duplicate Laboratory – Laboratory duplicate and matrix spike duplicate	< 30 % relative percentage difference (RPD [%]) Prescribed by the laboratories
Representativeness	Field – Trip blank (laboratory prepared) Laboratory – Method blank	< laboratory limit of reporting (LOR) Prescribed by the laboratories
Completeness	Completion (%)	-

7. ASSESSMENT METHODOLOGY

7.1 SAMPLING RATIONALE

With reference to the preliminary CSM described in **Section 5**, soil and groundwater investigation works were planned in accordance with the following rationale:

- Sampling fill and natural soils from ten (10) test bore locations located systematically across the site using a grid-based sampling pattern to characterise in-situ soils;
- Sampling groundwater during a single groundwater monitoring event (GME) at three (3) monitoring wells located across the site to assess for potential groundwater impacts; and
- Laboratory analysis of representative soil and groundwater samples for the identified chemicals of concern.

7.2 INVESTIGATION CONSTRAINTS

The number of test bores drilled and monitoring wells installed during the investigation phase did not achieve the planned investigation scope described in **Section 7.1** due to a number of physical obstructions, which comprised:

- Previous groundwater wells identified in the previous SGA (2012) report, were unable to be re-sampled due to being concrete capped after the previous consultants finalised their report;
- An additional groundwater well was added to the scope of works, to determine an appropriate understanding of groundwater conditions of the site;
- Limited head-clearance for the mechanical drilling rig; and
- Buried impenetrable materials (buried deep slabs and rock boulders), which resulted in hand auger refusal.

Due to access and head clearance restrictions (limited ceiling height) within the existing buildings, proposed sampling locations BH2 to BH6 were completed using a hand auger.

Locations BH2 to BH6 were terminated within fill materials at a depths ranging between 0.30 -0.5 mBGL due to buried obstructions.

7.3 ASSESSMENT CRITERIA

For the purposes of this investigation, the adopted soil assessment criteria are referred to as the Soil Investigation Levels (SILs) and the adopted groundwater assessment criteria are referred to as the Groundwater Investigation Levels (GILs). SILs and GILs are presented alongside the analytical results in the corresponding summary tables, which are discussed in **Section 9**.

7.3.1 Soil

The assessment criteria proposed for this project are outlined in **Error! Not a valid bookmark self-reference.**. These were selected from available published guidelines that are endorsed by national or

state regulatory authorities, with due consideration of the exposure scenario that is expected for various parts of the site, the likely exposure pathways and the identified potential receptors.

Table 7-1 Adopted Investigation Levels for Soil

Environmental Media	Adopted Guidelines	Rationale
Soil	NEPM, 2013 Soil HILs, EILs, HSLs, ESLs & Management Limits for TPHs	**Soil Health-based Investigation Levels (HILs)** Samples from the north-western site area are to be assessed against the NEPM 2013 HIL-A (residential sites with accessible soils). The remainder of the site will be assessed against HIL-B thresholds for residential sites with minimal access to soils. **Ecological Investigation Levels (EILs)** BH4, BH7 & BH9 soil samples would also be assessed against the NEPM 2013 EILs for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene, which have been derived for protection of terrestrial ecosystems. **Soil Health-based Screening Levels (HSLs)** The NEPM 2013 Soil HSL-D thresholds for commercial/industrial sites for vapour intrusion would be applied to assess for potential human health impacts from residual vapours resulting from petroleum, BTEX, & naphthalene. Commercial/Industrial values have been adopted as Section 2.4.8 of Schedule B(1) of NEPM (2013) indicates that HSLs are applicable to ground floor uses. WADOH (2009) assessment criteria, as presented in NEPM (2013), were not adopted during this investigation. Presence / absence of asbestos (not-detected) were utilised for preliminary screening purposes. **Management Limits for Petroleum Hydrocarbons** Should the HSLs be exceeded for petroleum hydrocarbons, soil samples would also assessed against the NEPM 2013 *Management Limits* for the TRH fractions F1 – F4 to assess propensity for phase-separated hydrocarbons (PSH), fire and explosive hazards & adverse effects on buried infrastructure.

7.3.2 Groundwater

In accordance with DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*, groundwater acceptance criteria are based on environmental values considered relevant for groundwater use at the site and surrounding uses of groundwater and surface waters that may be effected by the site. Potential environmental values include:

- Aquatic ecosystems: surface water and groundwater ecosystems;
- Human Uses: these include but are not limited to potable water supply, agricultural water supply (irrigation and stock watering), industrial water use, aquaculture and human consumption of aquatic foods, recreational use (primary and secondary contact with surface waters), and visual amenity of surface waters;
- Human health in non-use scenarios: this includes consideration of health risks that may arise without direct contact between humans and the groundwater, for example, exposure to volatile contaminants above groundwater contaminant plumes; and

- Buildings and structures: this includes protection from groundwater contaminants that can degrade building materials through contact, for example, the weakening of building footings resulting from chemically aggressive groundwater.

Cultural and spiritual values that are associated with the environment, including groundwater, should also be protected. Cultural and spiritual values may include spiritual relationships, sacred sites, customary uses, the plants and animals associated with the water, drinking water supplies, and recreational activities. In managing groundwater contamination, it is generally considered that cultural and spiritual values will be protected where groundwater quality protects all other relevant environmental values on a site.

EI completed a search of registered groundwater bores within a 500 m radius of the site on the WaterNSW website (**Section 2.4**). 84 groundwater wells were registered within a 500 m radius, however these were all for monitoring purposes.

An assessment of the applicability of groundwater environmental values for the site and off-site is provided in **Table 7-2** below.

Table 7-2 Assessment of Groundwater Environmental Values

Environmental Value		Relevance
Aquatic Ecosystems - Surface water ecosystems and groundwater ecosystems		The nearest down-gradient surface water ecosystem is towards Sheas Creek located approximately 800 m south-west of the site. This environmental value applies to all natural waterways and should be assessed.
Human Uses	Potable Water	Potable water for the site will be supplied by municipal reticulated supply. The use of groundwater for potable uses is not registered within 500 m radius of the site, nor within a down-gradient (south easterly) direction from the site. Potable water is not considered to be a relevant environmental value for the site.
	Agricultural Water supply (Irrigation and livestock watering)	There is no planned use of groundwater for agricultural purposes (irrigation and stock watering) at the site and the site is situated in an urbanised setting. The use of groundwater for agricultural uses is not registered within 500 m radius of the site nor within a down-gradient (south easterly) direction from the site. Agricultural water supply is not considered to be a relevant environmental value for the site.
	Industrial Water use	There is no planned use of groundwater for industrial purposes at the site. Groundwater off-site for industrial purposes may be used however its use would be assessed for specific industrial use. The use of groundwater for industrial uses is not registered within 500 m radius of the site, nor within a down-gradient (south easterly) direction from the site. Industrial water supply is not considered to be a relevant environmental value for the site.
	Aquaculture / human consumption of Aquatic foods	There is no planned use of groundwater for aquaculture/human consumption of aquatic foods at the site. EI checked the NSW Department of Primary Industries Aquaculture Industry Directory 2016 for listings of aquaculture businesses in Waterloo and in neighbouring areas. The directory is not inclusive of all producers in NSW but does list businesses nominating to be listed. No businesses were listed for Waterloo or Surrounding Areas. The use of groundwater for aquaculture uses is not registered within 500 m radius of the site, nor within a down-gradient (south easterly) direction from the site. Aquaculture water supply is not considered to be a relevant environmental value for the site.

Environmental Value		Relevance
	Recreational use (primary and secondary contact)	There is no planned use of groundwater for recreational use at the site. The use of groundwater for recreational uses in swimming pools (i.e. pumping groundwater) is not registered within 500 m radius of the site. The use of groundwater for primary contact recreational uses is considered unlikely; however secondary contact may occur within the Sheas Creek. Recreational use is considered to be a relevant environmental value for the site.
	Visual amenity to surface waters	Given the distance of Sheas Creek from the site, this environmental value is not considered relevant to the site.
Human health in non-use scenarios		The potential for vapour exposure from groundwater, without direct contact with groundwater, may occur if groundwater is contaminated with volatile contaminants. This Environmental Value should be assessed.
Buildings and structures		Foundations may be in contact with groundwater. This environmental value should be assessed.

Based on the above assessment, the environmental values (REVs) to be further assessed are: Aquatic Ecosystems, Recreational Use, and Buildings and Structures.

For the relevant environmental values, the adopted GILs are summarised in **Table 7-3** below.

Table 7-3 Adopted Investigation Levels for Groundwater

Adopted Guidelines		Rationale
Groundwater	NEPM, 2013 GILs for Fresh Waters	**Groundwater Investigation Levels (GILs) for Fresh Water** NEPM 2013 provides GILs for typical, slightly-moderately disturbed aquatic ecosystems, which are based on the ANZG (2018) Trigger Values (TVs) for the 95% level of protection of aquatic ecosystems; however, the 99% TVs were applied for the bio-accumulative metals *cadmium* and *mercury*. The fresh water criteria were considered relevant as the closest, potential surface water receptor was Alexandra Canal, located 920 m south-east of the site. Due to the ANZECC (2000) criteria for petroleum hydrocarbons being below the laboratory limit of reporting, the PQL for each TRH fraction was adopted as the GIL for aquatic ecosystems, as per the guidance provided in DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*.
	NEPM, 2013 GILs for Drinking purposes	**Drinking Water GILs** The NEPM (2013) GILs for drinking water quality were applied for the assessment of direct contact with groundwater. Drinking Water values are multiplied by a factor of 100 to address potential groundwater contact by basement users, and construction and maintenance workers. These values are based on the Australian Drinking Water Guidelines (Ref. NHMRC, 2011).

For the purposes of this investigation, the adopted soil assessment criteria are referred to as the Soil Investigation Levels (SILs) and the adopted groundwater assessment criteria are referred to as the Groundwater Investigation Levels (GILs). SILs and GILs are presented alongside the analytical results in the corresponding summary tables, which are discussed in **Section 9**.

7.4 SOIL INVESTIGATION

The soil investigation works conducted at the site are described in **Table 7-4**. Test bore locations are illustrated in **Figure 2**.

Table 7-4 Summary of Soil Investigation Methodology

Activity/Item	Details
Fieldwork	The site investigation was conducted on 15 August 2018. Ten boreholes were completed, with three of these converted into monitoring wells (BH1M, BH9M, & BH10M).
Drilling Method & Investigation Depth	Boreholes BH1M, BH7, BH8, BH9M and BH10M were drilled using a ute-mounted solid flight auger drilling rig. Final bore depths were between 2.00 – 5.00 mBGL. Boreholes BH2 to BH6 were drilled using the hand auger method due to height/access restrictions within the buildings. Manual auger refusal was experienced at borehole BH3 to BH6 due to obstructions within fill soils.
Soil Logging	Drilled soils were classified in the field with respect to lithological characteristics and evaluated on a qualitative basis for odour and visual signs of contamination. Soil classifications and descriptions were based on Unified Soil Classification System (USCS) and Australian Standard (AS) 4482.1-2005. Bore logs are presented in **Appendix E**.
Field Observations (including visual and olfactory signs of potential contamination)	A summary of field observations is provided in borehole log descriptions (**Appendix E)**, and summarised in **Section 9.1.2**.
Soil Sampling	• Soil samples were collected using a dry grab method (unused, dedicated latex gloves) & placed into laboratory-supplied, acid-washed, solvent-rinsed glass jars. • Blind field duplicates was separated from the primary samples and placed into glass jars. • A small amount of duplicate was collected from each soil samples and placed into zip-lock bag for Photo-ionisation Detector (PID) screening. • A small amount of duplicate was separated from all fill samples and placed into a zip-lock bag for asbestos analysis.
Decontamination Procedures	*Drilling Equipment* - The drilling rods were decontaminated between sampling locations with potable water until the augers were free of all residual materials. *Sampling Equipment* – Tools (i.e. stainless steel hand trowel) were wiped clean using unused paper between near-surface sampling points, except where residue was observed after sampling, in which case they were washed with a potable water/phosphate-free detergent mixture, then rinsed with potable water and wiped with unused paper. Sampling gloves were replaced between sampling locations.
Sample Preservation	Samples were stored in a chilled (with ice-blocks) chest, whilst on-site and in transit to the laboratory. All samples were submitted and analysed within the required holding period, as documented in laboratory reports discussed in a later section.
Management of Soil Cuttings	Soil cuttings were used as backfill for completed boreholes.
Quality Control & Laboratory Analysis	A number of soil samples were submitted for analysis of previously-identified COPC by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes, as discussed in **Section 8**.
Soil Vapour Screening	Screening for potential VOCs in collected soil samples was conducted using a Photo-ionisation Detector (PID).

7.5 GROUNDWATER INVESTIGATION

The groundwater investigation works conducted at the site are described in **Table 7-5**. Monitoring well locations are illustrated in **Figure 3**.

Table 7-5 Summary of Groundwater Investigation Methodology

Activity/Item	Details
Fieldwork	Groundwater monitoring wells were installed and developed on 15 August 2018; whereas, water level gauging, well purging, field testing and groundwater sampling was conducted on 24 August 2018.
Well Construction	Test bores were converted to groundwater monitoring wells as follows: • BH1M, BH9M and BH10M – screen 2.00 – 5.00 mBGL Drilling was undertaken by HartGeo Pty Ltd using a ute-mounted solid flight auger drilling rig. Well construction details are tabulated in **Table 9-2** and documented in the bore logs presented in **Appendix E**. All three wells were installed to screen the shale bedrock. Well construction was in general accordance with the standards described in NUDLC, 2012 and involved the following: • 50 mm, Class 18 uPVC, threaded, machine-slotted screen and casing, with slotted intervals in shallow wells set to screen to at least 500 mm above the standing water level to allow sampling of phase-separated hydrocarbon product, if present; • Base and top of each well was sealed with a uPVC cap; • Annular, graded sand filter was used to approximately 300mm above top of screen interval; • Granular bentonite was applied above annular filter to seal the screened interval; • Drill cuttings were used to backfill the bore annulus to just below ground level; and • Surface completion comprised a steel road box cover set in neat cement and finished flush with the concrete slab level.
Well Development	Well development was conducted for each well directly following installation. This involved agitation within the full length of the water column using a stainless steel bailer, followed by removal of water and accumulated sediment. Water was removed from the wells until dry.
Well Survey (Elevation and location)	Well elevations at ground level were extrapolated from the spot elevations marked on the survey plan provided by the client (**Figure 3**). Well elevations at ground level were extrapolated in metres relative to Australian Height Datum (m AHD).
Well Gauging & Groundwater Flow Direction	Monitoring wells BH1M, BH2M, and BH3M were gauged for standing water level (SWL, depth to groundwater) prior to well purging at the commencement of the GME on 14 May 2018. The measured SWLs are shown in **Table 9-2**. Based on the reduced water levels (RWLs, i.e. SWLs corrected to AHD) calculated at each monitoring well (**Table 9-3**), the direction of groundwater flow was inferred to be southwest.
Well Purging & Field Testing	No volatile organic odours were detected during any stage of well purging. Measurement of water quality parameters was conducted repeatedly during well purging and were recorded onto field data sheets (**Appendix F**) once water quality parameters stabilised. In all wells groundwater was described as having moderate/low-moderate turbidity. Field measurements for Dissolved Oxygen (DO), Electrical Conductivity (EC) and pH of the purged water were also recorded during well purging. Purged water volumes removed from each well and field test results are summarised in **Table 9-3**.

Activity/Item	Details
Groundwater sampling	Groundwater purging and sampling was conducted using a low-flow/minimal drawdown sampling method with a MicroPurge kit (MP15) and pump. The MicroPurge system incorporates a low density poly-ethylene (LDPE) pump bladder, and a Teflon-lined LDPE sample delivery tube. The system used for this investigation employed pressurised carbon dioxide gas to regulate groundwater flow. Pump pressure and pumping cycles were adjusted accordingly to regulate extraction flow rate, and to avoid causing excessive drawdown of water level during the sampling process. Groundwater quality was measured repeatedly during purging using a calibrated Hanna Multi Parameter 9829 water quality meter. Three consecutive field measurements recorded within ± 3% for EC, ± 20 mV for redox, ± 20% for DO and ± 0.2 for pH were considered indicative of representative groundwater. Following stabilisation of parameters, groundwater was sampled.
Decontamination Procedure	The water level probe and water quality kit probes were washed in a solution of potable water and Decon 90 and then rinsed with potable water between measurements/wells.
Sample Preservation	Sample containers were supplied by the laboratory with the following preservatives: • One, 1 litre amber glass, acid-washed and solvent-rinsed bottle; • Two, 40ml glass vials, pre-preserved with dilute hydrochloric acid, Teflon-sealed; and • One, 250mL, HDPE bottle, pre-preserved with dilute nitric acid (1 mL). Samples for metals analysis were field-filtered using 0.45 µm pore-size filters. All containers were filled with sample to the brim then capped and stored in ice-filled chests, until completion of the fieldwork and during sample transit to the laboratory.
Quality Control & Laboratory Analysis	All groundwater samples were submitted for analysis of previously-identified chemicals of concern by SGS Laboratories (SGS). QA/QC testing comprised intra-laboratory duplicates ('field duplicates') tested blind by SGS and an inter-laboratory field duplicate tested blind by Envirolab Services (Envirolab). All samples were transported under strict Chain-of-Custody (COC) conditions and COC certificates and laboratory sample receipt documentation were provided to EI for confirmation purposes.
Sample Transport	After sampling, refrigerated sample chests were transported to SGS Australia Pty Ltd using strict Chain-of-Custody (COC) procedures. Inter-laboratory duplicate (ILD) samples were forwarded to Envirolab Services Pty Ltd (Envirolab) for QA/QC analysis. A Sample Receipt Advice (SRA) was provided by each laboratory to document sample condition upon receipt. Copies of SRA and COC certificates are presented in **Appendix G**.

8. DATA QUALITY ASSESSMENT

The assessment of data quality is defined as the scientific and statistical evaluation of environmental data to determine if these data meet the objectives of the project (Ref. USEPA 2006). Data quality assessment includes an evaluation of the compliance of the field sampling and laboratory analytical procedures and an assessment of the accuracy and precision of these data from the laboratory quality control measurements obtained.

The data quality assessment process for this assessment included a review of analytical procedures to confirm compliance with established laboratory protocols and an assessment of the accuracy and precision of analytical data from a range of quality control measurements. The QC measures generated from the field sampling and analytical program were as follows:

- Suitable records of fieldwork observations including borehole logs;
- Relevant and appropriate sampling plan (density, type, and location);
- Use of approved and appropriate sampling methods;
- Preservation and storage of samples upon collection and during transport to the laboratory;
- Complete field and analytical laboratory sample COC procedures and documentation;
- Sample holding times within acceptable limits;
- Use of appropriate analytical procedures and NATA-accredited laboratories; and
- Required LOR (to allow for comparison with adopted IL);
- Frequency of conducting quality control measurements;
- Laboratory blanks;
- Field duplicates;
- Laboratory duplicates;
- Matrix spike/matrix spike duplicates (MS/MSDs);
- Surrogates (or System Monitoring Compounds);
- Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percentage Difference (RPD); and
- Checking for the occurrence of apparently unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

The findings of the data quality assessment in relation to the soil and groundwater investigations at the site are discussed in detail in **Appendix I**. QA/QC policies and DQOs are presented in **Appendix J**.

On the basis of the analytical data validation procedure employed the overall quality of the soil and groundwater analytical data produced for the site were considered to be of an acceptable standard for interpretive use.

9. RESULTS

9.1 SOIL INVESTIGATION RESULTS

9.1.1 Site Geology and Subsurface Conditions

The general site geology encountered during the drilling of the soil investigation boreholes, installation of monitoring wells may be described as a layer of anthropogenic filling overlying Botany Sands, with Hawkesbury Sandstone at depth. The geological information obtained during the investigation is summarised in **Table 9-1** and borehole logs from these works are presented in **Appendix E**.

Table 9-1 Generalised Subsurface Profile

Layer	Description	Depth to top and bottom of strata (mBGL)
Fill	CONCRETE	0.00 – 0.15
	Gravelly Clayey SAND; fine to medium grained, light brown/orange/ grey, with low to medium plasticity clay and fine, sub-angular to angular gravels, with plastics and bark fragments.	0.12 – 0.80
	SAND: fine to medium grained, dark brown, with organics.	0.10 – 0.20
	Gravelly CLAY; low to medium grained, brown, with fine to coarse gravels.	0.15 – 1.50
	Gravelly SAND; fine to medium grained, brown, with fine to coarse, sub-angular to angular gravels,	0.00 – 0.70
Residual Soil	SAND; fine grained, light grey, brown, dark brown.	0.60 – 5.00 +
	Silty CLAY (PEAT); medium plasticity, dark brown.	1.50 – 2.00
	CLAY; medium to high plasticity, brown.	
Bedrock	SANDSTONE; fine grained, yellow, with coarse, sub-angular to angular sandstone fragments.	0.20 – 5.50+

Notes:
+ Termination depth of borehole

9.1.2 Field Observations and PID Results

Soil samples were obtained from the test bores at various depths ranging between 0.1 m to 3.5mBGL. All examined soil samples were evaluated on a qualitative basis for odour and visual signs of contamination (e.g. hydrocarbon odours, oil staining, petrochemical filming, asbestos fragments, ash and charcoal) and the following observations were noted:

- Visual or olfactory evidence of sulfate and hydrocarbon impacts were noted in boreholes BH1M, BH2, BH4 and BH6 during this assessment;
- No brick and tile fragments were noted in the fill layers at any of the borehole locations investigated during this assessment;
- No fibrous cement sheeting, ash or charcoal was observed in any of the examined fill soils. However, slag was noted in BH5; and

- Slightly elevated VOC concentrations ranging was detected in natural soil material in BH1M_3.4-3.5 (23.1ppm), which were field-screened using a portable PID fitted with a 10.9 eV lamp. The PID results are shown in the borehole logs (**Appendix E**) and the samples showing higher PID values were therefore assigned for laboratory VOC and SVOC analysis.

9.2 GROUNDWATER INVESTIGATION RESULTS

9.2.1 Monitoring Well Construction

A total of three groundwater monitoring wells were installed across the site (BH1M, BH9M, and BH10M). Well construction details for the installed groundwater monitoring wells are summarised in **Table 9-2**.

Table 9-2 Monitoring Well Construction Details

Well ID	Bore Depth (mBGL)	Screen Interval (mBGL)	Lithology Screened
BH1M	5.00	2.00-5.00	Sand
BH9M	5.00	2.00-5.00	Sand
BH10M	5.50	2.00-5.00	Sand

Notes:
mBGL - metres below ground level.
RL - Reduced Level – Surveyed elevation in metres relative to Australian Height Datum (mAHD).
TOC - top of well casing.
RL (TOC) - Surveyed elevation at TOC in mAHD.

9.2.2 Field Observations and Water Test Results

A single GME was conducted on all wells in 14 May 2018. On this date, standing water levels (SWLs) were measured within each well prior to well purging, the results of which were recorded with well purge volumes and field-based water test results. A summary of the recorded field data is presented in **Table 9-3** and copies of the completed Field Data Sheets are included in **Appendix F**.

Table 9-3 Groundwater Field Data

Well ID	SWL (mBTOC)	Purge Volume (L)	DO (mg/L)	Field pH	Field EC (µS/cm)	Temp (^{o}C)	Redox (mV)	Odours / Turbidity
BH1M	3.29	2.0	0.31	7.16	783	18.74	167.3	Hydrocarbon/ Very high
BH9M	2.60	2.0	1.43	6.62	605	17.15	181.6	None/ Very high
BH10M	2.64	2.0	1.54	6.48	226	19.46	168.5	None/ High

Notes:
GME – Groundwater monitoring event.
SWL – Standing Water Levels as measured from TOC (top of well casing) prior to groundwater sampling.
m BTOC – metres below top of well casing (Note: Ground Level = TOC for the wells MW110, MW112 and MW114).
RL (TOC) – Reduced Level, elevation at TOC in metres relative to Australian Height Datum (mAHD).
† WL - Calculated groundwater level, in m AHD (calculated as RL – SWL) Note: these values were used for groundwater contouring analysis.
L – litres (referring to volume of water purged from the well prior to groundwater sample collection).
EC – groundwater electrical conductivity as measured onsite using portable EC meter.
µS/cm – micro Siemens per centimetre (EC units).
DO – Dissolved Oxygen in units of milligrams per litre (mg/L)

All groundwater parameters (pH, EC and DO) were tested on site.
* Well not found, presumed damaged.

SWLs recorded during the GME indicate that groundwater flows in a south-westerly direction (**Figure 3**).

The field pH data indicated that the groundwater was circumneutral (pH ranged from 6.48 – 7.16). Electrical Conductivity (EC) measurements were recorded in the range 226 to 783 µS/cm indicating that the groundwater was fresh in terms of water salinity.

9.3 LABORATORY ANALYTICAL RESULTS

9.3.1 Soil Analytical Results

A summary of laboratory results showing test sample quantities, minimum/maximum analyte concentrations and samples found to exceed the SILs, is presented in **Table 9-4**. More detailed tabulations of results showing the tested concentrations for individual samples alongside the adopted soil criteria are presented in **Table T1** at the end of this report. Completed documentation used to track soil sample movements and laboratory receipt (i.e. COC and SRA forms) are copied in **Appendix G** and all laboratory analytical reports for tested soil samples are presented in **Appendix H**.

Table 9-4 Summary of Soil Analytical Results

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels
Hydrocarbons				
18	TRH F1	<25	<25	None
18	TRH F2	<25	180	**HILs** - None **EILs** - BH1M_0.3-0.4
18	TRH F3	<90	1,300	**HILs** - None **EILs** - BH1M_0.3-0.4
18	TRH F4	<120	<120	None
18	Benzene	<0.1	0.4	None
18	Toluene	<0.1	1.8	None
18	Ethyl benzene	<0.1	0.4	None
18	Total xylenes	<0.3	3.3	None
18	Naphthalene	<0.1	8.9	None
18	Benzo(a)pyrene	<0.1	10	None
18	Carcinogenic PAH	<0.3	14	**HILs** - BH1M_0.3-0.4 **EILs** - None
18	Total PAH	<0.8	170	None
Heavy Metals				
18	Arsenic	1	15	None
18	Cadmium	<0.3	2.6	None
18	Chromium (Total)	0.5	34	None
18	Copper	1.5	7,100	**HILs** - BH10M_0.4-0.5 **EILs** - BH10M_0.4-0.5

No. of primary samples	Analyte	Min. Conc. (mg/kg)	Max. Conc. (mg/kg)	Sample locations exceeding investigation levels
18	Lead	2	850	**HILs** - BH10M_0.4-0.5
18	Mercury	<0.05	0.53	None
18	Nickel	<0.5	59	**HILs** - None **EILs** - BH1M_0.3-0.4
18	Zinc	2.1	3,800	**HILs** - None **EILs** - BH1M_0.5-0.6, BH9M_0.3-0.4 and BH10M_0.4-0.5
OCPs				
11	Total OCPs	<1	6	None
OPPs				
11	Total OPPs	<1.7	<1.7	None
PCBs				
11	Total PCBs	<1	<1	None
Asbestos				
11	Asbestos	No asbestos detected	No asbestos detected	None

Heavy Metals

With reference to **Table T1**, heavy metals concentrations in sample BH10M_0.4-0.5 (7100 mg/kg for copper and 850 mg/kg for lead), exceeded health based SILs.

Exceedances of the EILs for copper, nickel and zinc were also identified in samples BH1M 0.3-0.4 (59 mg/kg for nickel) BH1M_0.5-0.6 (1200 mg/kg for zinc), and BH9M_0.3-0.4 (420 mg/kg for zinc) and BH10M_0.4-0.5 (7100 mg/kg for copper, 3800 mg/kg for zinc).

TRHs

As shown in **Table T1**, total recoverable hydrocarbons (TRH) were reported below the corresponding adopted SILs.

Exceedances of the EILs for F2 and F3 in BH1M_0.3-0.4 (180 mg/kg for F2 and 1,300 mg/kg for F3).

BTEX and Naphthalene

BTEX was below the corresponding SIL and ESL criteria, as shown in **Table T1**.

Naphthalene concentrations were also below the adopted SIL and ESL criteria.

PAHs

As summarised in **Table T1**, no exceedances of the adopted EILs were identified during testing.

Exceedances of the adopted SIL criteria for were also identified in sample BH1M_0.3-0.4 (14 mg/kg) for Carcinogenic PAH criteria.

OCPs, OPPs, and PCBs

With reference to **Table T1**, no detectable concentration of any of the screened OCP, OPP, and PCB compounds was identified in any of the tested samples. All laboratory PQLs were also within the corresponding SILs and EILs/ESLs criteria.

Asbestos

As summarised in **Table T1**, asbestos fibres were not identified by the laboratory in samples collected from shallow fill.

9.3.2 Groundwater Analytical Results

Laboratory analytical results for groundwater samples are summarised in **Table T2**, which also include the adopted GILs. Completed documentation used to track groundwater sample movements and laboratory receipt (COC and SRA forms) are copied in **Appendix G**. Copies of the laboratory analytical reports are attached in **Appendix H**.

Table 9-5 Summary of Groundwater Analytical Results

No. of primary samples	Analyte	Min. Conc. (µg/L)	Max. Conc. (µg/L)	Sample locations exceeding investigation levels
Hydrocarbons				
3	F1 (C_6–C_{10})	<50	160	**GILs Fresh Water Criteria**: BH1M-1
3	F2 (>C_{10}-C_{16})	<60	190	**GILs Fresh Water Criteria**: BH1M-1
3	F3 (>C_{16}-C_{34})	<500	<1000	None
3	F4 (>C_{34}-C_{40})	<500	<1000	None
3	Benzene	<0.5	<0.5	None
3	Toluene	<0.5	<0.5	None
3	Ethylbenzene	<0.5	<0.5	None
3	o-xylene	<1	<1	None
3	m/p-xylene	<0.5	<0.5	None
PAHs				
3	Benzo(a)pyrene	<0.1	<0.2	None
3	Naphthalene	<0.1	<0.2	None
Heavy Metals				
3	Arsenic	<1	6	None
3	Cadmium	<0.1	<0.1	None
3	Chromium (Total)	<1	3	None
3	Copper	2	85	**GILs Fresh Water Criteria**: BH1M-1, BH3M-1
3	Lead	1	3	None
3	Mercury	<0.1	<0.1	None
3	Nickel	<1	3	None
3	Zinc	10	110	**GILs Fresh Water Criteria**: BH1M-1, BH3M-1
VOCs				
3	Total VOC	<10	20	None
Phenols				
3	Total Phenolics	<0.05	<0.05	None

Heavy Metals

With reference to **Table T2** concentrations in excess of the adopted GILs were identified for groundwater as follows:

- Copper (85 µg/L in BH1M-1 and 110 µg/L in BH3M-1)
- Zinc (65 µg/L in BH1M-1 and 92 µg/L in BH3M-1).

Based on EI's experience, heavy metal concentrations exceeding water quality criteria are ubiquitous in groundwater systems in long-standing urban/industrial environments, and not considered to represent a cause for environmental concern.

TRHs and BTEX

With reference to **Table T2** concentrations in excess of the adopted GILs were identified for groundwater as follows:

- F1 (160 µg/L in BH1M-1)
- F2 (190 µg/L in BH1M-1).

PAHs and Phenols

PAHs and Phenols were below detected above the quantitation limits (PQLs) in any sample tested. All PQLs for PAHs were below the corresponding GILs, as shown in **Table T2**.

SVOCs & VOCs

As shown in **Table T2**, all laboratory results for the tested groundwater samples BH1M and BH7M showed non-detectable levels of SVOCs and VOCs.

10. SITE CHARACTERISATION

10.1 REVIEW OF CONCEPTUAL SITE MODEL

On the basis of investigation findings the CSM discussed in **Section 5** was considered to appropriately identify contamination sources, migration mechanisms and exposure pathways, as well as potential onsite and offsite receptors.

The following data gaps have been identified:

- Potential for soil and groundwater PFAS contamination has been identified from review of council information, presented in **Section 4.3**. Records indicate that site structures were re-established following a fire onsite. In addition a review of previous historical site usages (**Section 4.1**) indicated that the site was previously used for fabric manufacturing. In light of these findings, an additional round of soil and groundwater sampling for PFAS analysis must be conducted; and
- The quality of deeper fill and natural soils in the vicinity of borehole locations BH2, BH3, BH5, and BH6 where boreholes encountered obstructions in fill.

10.2 CONFIRMED POLLUTANT LINKAGES

Based on information that was gathered from soil and groundwater sampling conducted, the following confirmed pollutant linkages have been summarised in **Table 10-1**.

Table 10-1 Pollutant Linkages Model

Confirmed Contaminants	Contaminant Media	Migration & Exposure Pathways	Sensitive Receptor
F2 (BH1M_0.3-0.4)	Soil	Volatilisation Inhalation	Construction workers Future site users
Carcinogenic PAHs (BH1M_0.3-0.4)	Soil	Ingestion Inhalation Direct contact	Construction workers Future site users
F3 (BH1M_0.3-0.4) Copper (BH10M_0.4-0.5) Lead (BH10M_0.4-0.5) Nickel (BH1M_0.3-0.4) Zinc (BH1M_0.5-0.6, BH9M_0.3-0.4 & BH10M_0.4-0.5)	Soil	Direct contact /root uptake	Vegetation in future landscaping
F1 & F2 (BH1M-1)	Groundwater	Volatilisation Inhalation	Construction workers Future site users
Copper & Zinc (BH1M-1 & BH10M-1)	Groundwater	Ingestion Inhalation Direct contact	Construction workers Future site users

11. CONCLUSIONS

The property located at 242-244 Young Street, Waterloo NSW was the subject of a Detailed Site Investigation that was conducted in order to assess the nature and degree of on-site contamination associated with current and former uses of the property. Findings of this investigation identified the following:

- Historical records indicate that the site has been used for commercial/industrial purposes since the 1930s, with uses including soap and fabric manufacturing, and drum re-conditioning. Previous investigation by SGA (2012) also a former foundry was present at the site. Records also indicated that site structures were re-established following a fire onsite in the 1960s.

- SafeWork NSW records confirmed the presence of USTs at the property historically. While no information was identified indicating that tanks had been removed from the site, the tanks locations of the tanks could not be identified.

- Previous intrusive investigation by SGA (2012), in the very northern portion of the site, identified concentrations of copper, lead, C_{10}-C_{36} petroleum hydrocarbons, polycyclic aromatic hydrocarbons (including benzo(a)pyrene) in fill material at levels exceeding NEPC (1999) commercial/industrial guidelines. The compounds identified indicate that the contamination is likely associated with former foundry use

- As part of this investigation, soil sampling and analysis were conducted at ten (10) targeted test bore locations (BH1M, BH9M, BH10M and BH2-BH8) down to a maximum depth of 5.5 mBGL. Sampling regime was considered to be appropriate for investigation purposes and comprised a targeted sampling approach, as a systematic sampling pattern could not be undertaken due to onsite obstructions;

- The sub-surface layers comprised a layer of granular and cohesive filling overlying cohesive residual soils, with sandstone bedrock below the residual soils;

- Groundwater was encountered during monitoring at depths ranging from 2.60 to 3.29 meters BTOC;

- Soil samples identified the following contaminants at concentrations above the adopted soil investigation levels:

  - BH1M – nickel, zinc, carcinogenic PAHs, F2-TRH, and F3-TRH

  - BH9M – zinc

  - BH10M – copper, lead and zinc

- Groundwater samples identified the following contaminants at concentrations above the adopted groundwater investigation levels:

  - BH1M & BH10M – copper and zinc

- The following data gaps identified in this DSI will require closure by further investigations:

  - Potential for PFAS contamination of soil and groundwater as a result of historical site activities; and

- The quality of deeper fill and natural soils in the vicinity of borehole locations BH2, BH3, BH5, and BH6 where boreholes encountered obstructions in fill.

Based on the findings of this report, and with consideration of the Statement of Limitations (**Section 13**), EI concludes that localised contamination, and the presence of UPSS at the site, will require remediation to be performed at the site. EI consider that the site can be made suitable for the proposed development, subject to the implementation of the recommendations detailed in **Section 12** are

The works required to satisfactorily characterise and remediate the site should be completed following the demolition of all site structures. The requirement to complete these additional works can be included in Council's DA consent conditions.

12. RECOMMENDATIONS

It is assumed that during the proposed construction of a basement level car park as part of the development, all fill and residual soil materials will be removed from the site, therefore in view of the above findings and in accordance with the NEPM 2013 guidelines, it is considered that the site will be made suitable for the proposed residential development on completion of the following recommendations:

- Conduct a Hazardous Materials Survey (HMS) of current site structures. EI recommend that a HMS is conducted prior to demolition of site structures;
- An additional site investigation (ASI) should be undertaken to close additional data gaps identified during this investigation. This would include:
  - The re-purging of the groundwater monitoring wells is to be undertaken before an additional round of groundwater sampling. Samples collected are to be tested for contaminants of concern (including PFAS);
- A Remedial Action Plan (RAP) should be prepared in accordance with the NSW Office of Environment and Heritage (2011) *Guidelines for consultants reporting on contaminated sites* prior to the commencement of site works as part of the proposed development. The RAP will provide details of the methodology and procedures required for effective site remediation, including:
  - A site inspection after demolition by a qualified environmental consultant, to determine if addition sources of environmental concern can be identified;
  - A ground penetrating radar (GPR) survey to identify the location of potential UPSS infrastructure onsite;
  - Removal of UPSS and validation resulting excavations;
  - Additional soil sampling and laboratory analysis for PFAS compounds. If additional investigation indicates the presence of PFAS compounds, impacted soils should be removed and excavations validated;
  - If additional groundwater sampling indicates the presence on hydrocarbon contamination at significantly elevated concentrations, three soil vapour wells should be installed at targeted locations across the site footprint, above the depth of groundwater, after the completion of demolition;
  - Any material being removed from site (including virgin excavated natural materials (VENM)) should be classified for off-site disposal in accordance the EPA (2014) Waste Classification Guidelines;
  - Any material being imported to the site should be assessed for potential contamination in accordance with NSW EPA guidelines as being suitable for the intended use or be classified as VENM;
  - Preparation of an unexpected finds protocol for implementation following demolition and during site excavation to ensure any potential contamination sources (e.g. soil staining,

asbestos) that maybe identified are managed in accordance with the NSW EPA legislation and guidelines; and

- Preparation of a site validation report by a qualified environmental consultant, documenting the suitability of site environmental conditions for the proposed development.

13. STATEMENT OF LIMITATIONS

The findings presented in this report are the result of discrete and specific sampling methodologies used in accordance with best industry practices and standards. Due to the site-specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field investigation program.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from previous assessments conducted on site, regulatory agencies (e.g. Council, EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

Despite all reasonable care and diligence, the ground conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change at any time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and or spillages of contaminating substances. These changes may occur subsequent to EI's investigations and assessment.

EI's assessment is necessarily based upon the result of the site investigation and the restricted program of surface and subsurface sampling, screening and chemical testing which was set out in the proposal. Neither EI, nor any other reputable consultant, can provide unqualified warranties nor does EI assume any liability for site conditions not observed or accessible during the time of the investigations.

This report was prepared for the above named client and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This report and associated documents remain the property of EI subject to payment of all fees due for this assessment. The report shall not be reproduced except in full and with prior written permission by EI.

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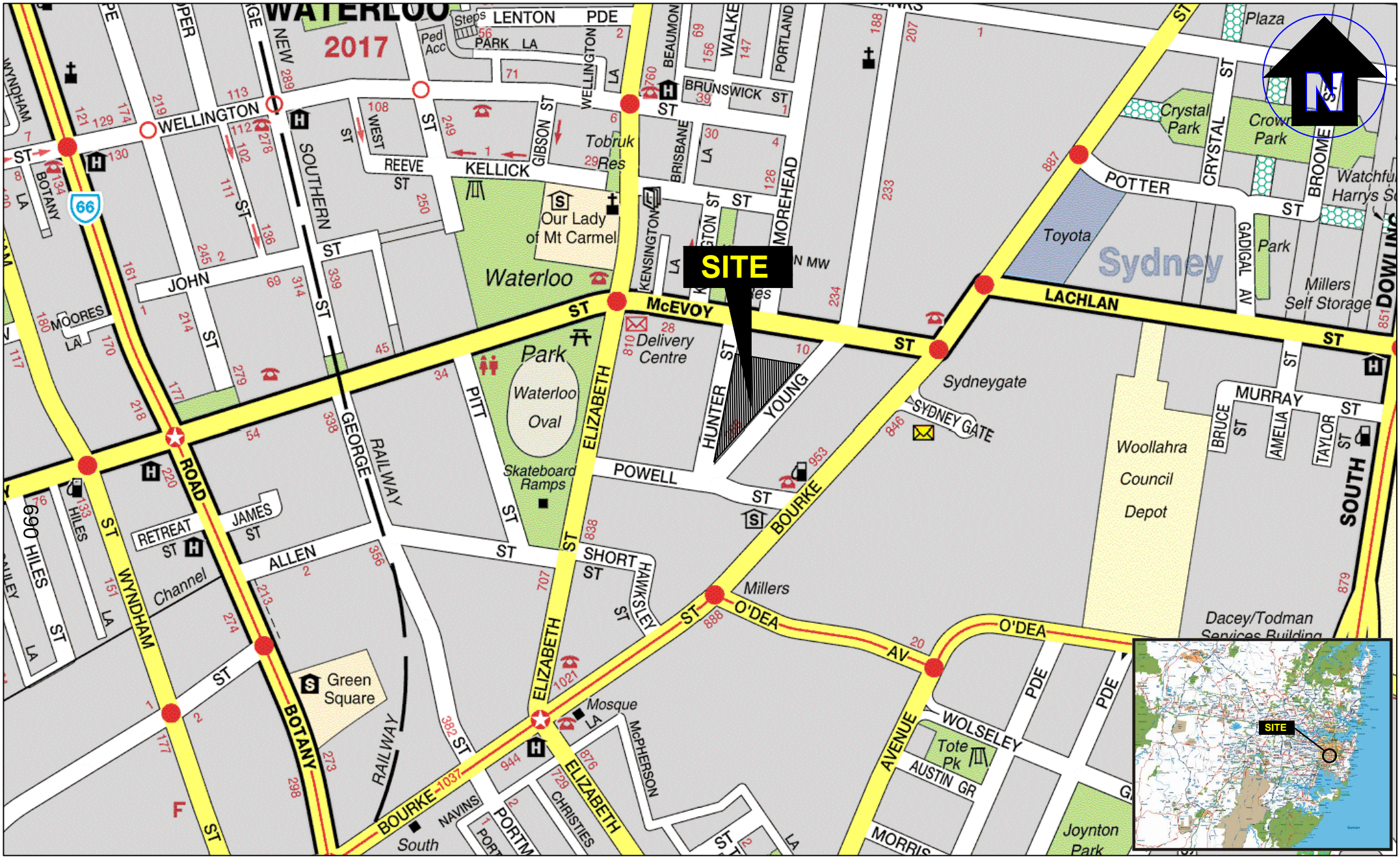
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ABBREVIATIONS

ACM	Asbestos-containing materials
ASI	Additional site investigation
ASS	Acid sulfate soils
B(a)P	Benzo(a)pyrene (a PAH compound)
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
COC	Chain of Custody
COPC	Contaminants of Potential Concern
cVOCs	Chlorinated Volatile Organic Compounds (a sub-set of the VOC analysis suite)
DEC	Department of Environment and Conservation, NSW (see OEH)
DECC	Department of Environment and Climate Change, NSW (see OEH)
DECCW	Department of Environment, Climate Change and Water, NSW (see OEH)
DA	Development Application
DO	Dissolved Oxygen
DP	Deposited Plan
EC	Electrical Conductivity
Eh	Redox potential
EI	EI Australia
EIL	Ecological Investigation Level
EPA	Environment Protection Authority
ESL	Ecological Screening Level
F1	TRH $C_6 – C_{10}$ less the sum of BTEX concentrations (Ref. NEPM 2013, Schedule B1)
F2	TRH $>C_{10} – C_{16}$ less the concentration of naphthalene (Ref. NEPM 2013, Schedule B1)
GIL	Groundwater Investigation Level
GME	Groundwater Monitoring Event
HIL	Health-based Investigation Level
HSL	Health-based Screening Level
km	Kilometres
LNAPL	Light, non-aqueous phase liquid (also referred to as PSH)
DNAPL	Dense, non-aqueous phase liquid
EIL	Ecological Investigation Level
ESL	Ecological Screening Level
m	Metres
MAH	Monocyclic Aromatic Hydrocarbons
mAHD	Metres Australian Height Datum
mBGL	Metres Below Ground Level
mg/L	Milligrams per litre
µg/L	Micrograms per litre
MW	Monitoring well
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage, NSW (formerly DEC, DECC, DECCW)
OPP	Organphosphorus Pesticides
PAHs	Polycyclic Aromatic Hydrocarbons

PCB	Polychlorinated Biphenyl
PFAS	Per or Poly-Fluoroalkyl Substances
pH	Measure of the acidity or basicity of an aqueous solution
PQL	Practical Quantitation Limit (limit of detection for respective laboratory instruments)
QA/QC	Quality Assurance / Quality Control
RAP	Remediation Action Plan
SRA	Sample receipt advice (document confirming laboratory receipt of samples)
SWL	Standing Water Level
TDS	Total dissolved solids (a measure of water salinity)
TPH	Total Petroleum Hydrocarbons (superseded term equivalent to TRH)
TRH	Total Recoverable Hydrocarbons (non-specific analysis of organic compounds)
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds (specific organic compounds which are volatile)
WADOH	Western Australian Department of Health

FIGURES



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Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	D.R.
Approved:	C.S.
Date:	21-08-18
Scale:	Not To Scale

Bennett Murada Architects

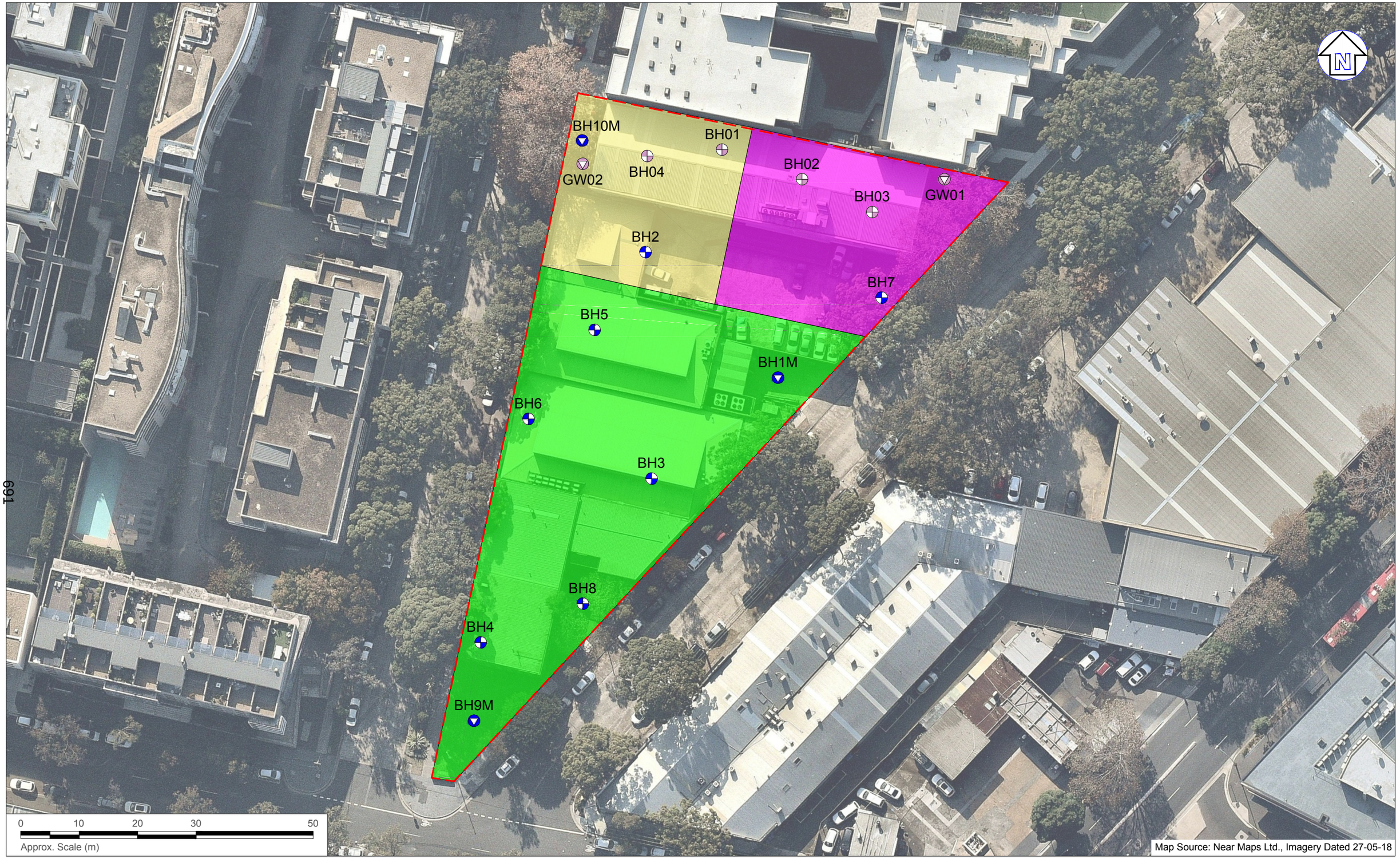
Detailed Site Investigation

242-244 Young Street, Waterloo NSW

Site Locality Plan

Figure: 1

Project: E23915.E02



691

LEGEND

- Approximate site boundary
- Approximate borehole location
- Approximate borehole location (SGA, 2012)
- Approximate borehole/monitoring well location
- Approximate borehole/monitoring well location (SGA, 2012)
- Approximate area for schooling (Area 1, assessed against Hil A NEPM Criteria)
- Approximate area for commercial (Area 2, assessed against Hil B NEPM Criteria)
- Approximate area for residential (Area 3, assessed against Hil B NEPM Criteria)

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Drawn:	D.R.
Approved:	C.S.
Date:	18-10-18

Pacific Equity Partners Pty Ltd
Detailed Site Investigation
242-244 Young Street, Waterloo NSW
Sampling Location Plan

Figure: 2

Project: E23915.E02

TABLES

Table T1 - Summary of Soil Analytical results

Sample ID	Media	Heavy Metals								PAHs				BTEX				TRHs				Total OCPs	Total OPPs	Total PCBs	Asbestos
		As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Carcinogenic PAHs (as B(a)P TEQ)	Benzo(a)pyrene	Total PAHs	Naphthalene	Benzene	Toluene	Ethylbenzene	Total Xylenes	F1	F2	F3	F4				
BH1M_0.3-0.4	Fill	15	0.5	34	50	76	0.42	59	140	14	10	170	8.9	<0.1	<0.1	<0.1	<0.3	<25	180	1300	<120	1	<1.7	<1	No
BH1M_0.5-0.6	Fill	4	1	14	34	84	0.53	30	1200	4	2.9	69	4	0.4	1.8	0.4	3.3	<25	48	300	<120	<1	<1.7	<1	No
BH1M_1.2-1.3	Natural Sand	2	<0.3	0.5	1.5	5	<0.05	<0.5	87	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
BH1M_3.4-3.5	Natural Sand	1	<0.3	2.7	2.2	10	<0.05	0.8	66	<0.3	<0.1	<0.8	0.1	<0.1	0.2	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
BH2_0.1-0.2	Fill	3	<0.3	15	16	24	<0.05	12	70	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	110	<120	<1	<1.7	<1	No
BH2_0.3-0.4	Natural Sandstone	2	<0.3	2.7	4.2	9	<0.05	2.2	15	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
BH3_0.2-0.3	Fill	3	<0.3	6.5	14	13	<0.05	21	56	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<1	<1.7	<1	No
BH4_0.2-0.3	Fill	5	0.7	8.9	50	180	0.25	4.3	290	1.1	0.7	9.6	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<1	<1.7	<1	No
BH5_0.1-0.2	Fill	3	0.3	11	28	140	0.17	10	110	1.4	1	10	0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	110	<120	6	<1.7	<1	No
BH6_0.2-0.3	Fill	3	<0.3	2.3	6.7	19	<0.05	1.9	27	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<1	<1.7	<1	No
BH7_0.3-0.4	Fill	5	0.4	9.3	31	73	0.16	6.3	150	3.1	2.3	20	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	160	<120	<1	<1.7	<1	No
BH8_0.3-0.4	Fill	2	<0.3	5.5	16	33	0.07	4	55	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<1	<1.7	<1	No
BH8_1.7-1.8	Natural Sand	2	0.3	1.9	5	61	0.09	<0.5	43	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
BH9M_0.3-0.4	Fill	7	1	12	52	210	0.23	5.8	420	0.9	0.6	6.3	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<1	<1.7	<1	No
BH9M_1.8-1.9	Natural Sand	2	<0.3	2.3	2	19	<0.05	0.6	3.5	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
BH10M_0.4-0.5	Fill	9	2.6	5	7100	850	0.09	12	3800	0.3	0.2	1.7	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	<1	<1.7	<1	No
BH10M_1.7-1.8	Peat	9	<0.3	5.2	9.9	10	<0.05	2.1	18	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
BH10M_2.4-2.5	Natural Sand	2	<0.3	3.5	2.4	2	<0.05	0.7	2.1	<0.3	<0.1	<0.8	<0.1	<0.1	<0.1	<0.1	<0.3	<25	<25	<90	<120	NA	NA	NA	NA
Statistical Analysis																									
Maximum Concentration		15	2.6	34	7100	850	0.53	59	3800	14	10	170	8.9	0.4	1.8	0.4	3.3	<25	180	1300	<120	6	<1.7	<1	No
95% UCL		NC	NC	NC	4327	NC	NC	19	2480	4.878	NC	NC	NC	NC	NC	NC	NC	NC	64.74	446.7	NC	NC	NC	NC	NC
SILs																									
HIL B - *Residential with minimal opportunities for soil access*		500	150	500 Cr(VI)	30000	1200	120	1200	60000	4	NR	400										NR	NR	1	
HSL D - *Commercial/Industrial Soil texture classification –Sand 1*	Source depths 0 m to <1 mBGL												NL	3	NL	NL	230	260	NL						
	Source depths 1 m to <2 mBGL												NL	3	NL	NL	NL	370	NL						
	Source depths 2 m to <4 mBGL												NL	3	NL	NL	NL	630	NL						
	Source depths >4 mBGL												NL	3	NL	NL	NL	NL	NL						
EILs / ESLs - *Residential*[1]		105		205[3]	125[3]	1260[3]		35[3]	350[3]		33[2]		170	50	85	70	105	180	120	300	2,800	180			
Management Limits – *Residential, parkland and public open space* Coarse grained soil texture[1]																		700	1000	2500	10000				
Asbestos contamination HSL – *Residential B*																									0.01
Bonded ACM (%w/w)																									
Asbestos contamination HSL for																									0.001

Notes:

Highlighted values indicates concentration exceeds Human Health Based Soil Criteria

Highlighted values indicates concentration exceeds Ecological Based Soil Criteria

HIL B	NEPC 1999 Amendment 2013 'HIL B" Health Based Investigation Levels applicable for residential exposure settings with minimal opportunities for soil access, including dwellings with fully and permanently paved yard space such as high rise buildings and apartments.
*	NEPM (2013) ESL Moderate Reliability Criteria
NR	No current published criterion.
NL	Not Limiting' If the derived soil vapour limit exceeds the soil concentration at which the pore water phase cannot dissolve any more of the individual chemical
-	'Not Tested' i.e. the sample as not analysed.
1	Coarse Grained soil values were applied, being the most conservative of the material types.
2	Ecological criteria for Benzo(a)pyrene selected from CRC Care Report No. 39 (2017)
3	EIL Criteria is calculated from summing the ACL and the ABC threshold values
F1	TPH C_6-C_{10} less the sum concentration of BTEX.
F2	TPH $C_{>10}$-C_{16} less the concentration of Naphthalene.
F3	TPH $C_{>16}$-C_{34}
F4	TPH $C_{>34}$-C_{40}

1	**UCL Statistics for Uncensored Full Data Sets**										
2											
3	User Selected Options										
4	Date/Time of Computation	3/09/2018 10:01:44 AM									
5	From File	WorkSheet.xls									
6	Full Precision	OFF									
7	Confidence Coefficient	95%									
8	Number of Bootstrap Operations	2000									
9											
10											
11	**Copper**										
12											
13	**General Statistics**										
14	Total Number of Observations	18			Number of Distinct Observations	16					
15					Number of Missing Observations	0					
16	Minimum	1.5			Mean	412.5					
17	Maximum	7100			Median	15					
18	SD	1669			Std. Error of Mean	393.4					
19	Coefficient of Variation	4.046			Skewness	4.242					
20											
21	**Normal GOF Test**										
22	Shapiro Wilk Test Statistic	0.261			**Shapiro Wilk GOF Test**						
23	5% Shapiro Wilk Critical Value	0.897			Data Not Normal at 5% Significance Level						
24	Lilliefors Test Statistic	0.53			**Lilliefors GOF Test**						
25	5% Lilliefors Critical Value	0.209			Data Not Normal at 5% Significance Level						
26	**Data Not Normal at 5% Significance Level**										
27											
28	**Assuming Normal Distribution**										
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**						
30	95% Student's-t UCL	1097			95% Adjusted-CLT UCL (Chen-1995)	1480					
31					95% Modified-t UCL (Johnson-1978)	1162					
32											
33	**Gamma GOF Test**										
34	A-D Test Statistic	3.734			**Anderson-Darling Gamma GOF Test**						
35	5% A-D Critical Value	0.88			Data Not Gamma Distributed at 5% Significance Level						
36	K-S Test Statistic	0.449			**Kolmogrov-Smirnoff Gamma GOF Test**						
37	5% K-S Critical Value	0.225			Data Not Gamma Distributed at 5% Significance Level						
38	**Data Not Gamma Distributed at 5% Significance Level**										
39											
40	**Gamma Statistics**										
41	k hat (MLE)	0.22			k star (bias corrected MLE)	0.22					
42	Theta hat (MLE)	1874			Theta star (bias corrected MLE)	1871					
43	nu hat (MLE)	7.924			nu star (bias corrected)	7.937					
44	MLE Mean (bias corrected)	412.5			MLE Sd (bias corrected)	878.5					
45					Approximate Chi Square Value (0.05)	2.699					
46	Adjusted Level of Significance	0.0357			Adjusted Chi Square Value	2.414					
47											
48	**Assuming Gamma Distribution**										
49	95% Approximate Gamma UCL (use when n>=50))	1213			95% Adjusted Gamma UCL (use when n<50)	1356					
50											
51	**Lognormal GOF Test**										
52	Shapiro Wilk Test Statistic	0.833			**Shapiro Wilk Lognormal GOF Test**						

53	5% Shapiro Wilk Critical Value				0.897	Data Not Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic				0.209	**Lilliefors Lognormal GOF Test**						
55	5% Lilliefors Critical Value				0.209	Data Not Lognormal at 5% Significance Level						
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data				0.405	Mean of logged Data						2.729
60	Maximum of Logged Data				8.868	SD of logged Data						1.941
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL				729.6	90% Chebyshev (MVUE) UCL						209.6
64	95% Chebyshev (MVUE) UCL				268.7	97.5% Chebyshev (MVUE) UCL						350.8
65	99% Chebyshev (MVUE) UCL				512							
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL				1060	95% Jackknife UCL						1097
72	95% Standard Bootstrap UCL				1067	95% Bootstrap-t UCL						43435
73	95% Hall's Bootstrap UCL				19506	95% Percentile Bootstrap UCL						1198
74	95% BCA Bootstrap UCL				1597							
75	90% Chebyshev(Mean, Sd) UCL				1593	95% Chebyshev(Mean, Sd) UCL						2127
76	97.5% Chebyshev(Mean, Sd) UCL				2869	99% Chebyshev(Mean, Sd) UCL						4327
77												
78	**Suggested UCL to Use**											
79	99% Chebyshev (Mean, Sd) UCL				4327							
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86												
87	**Nickel**											
88												
89	**General Statistics**											
90	Total Number of Observations				18	Number of Distinct Observations						16
91						Number of Missing Observations						0
92	Minimum				0.25	Mean						9.622
93	Maximum				59	Median						4.15
94	SD				14.68	Std. Error of Mean						3.461
95	Coefficient of Variation				1.526	Skewness						2.61
96												
97	**Normal GOF Test**											
98	Shapiro Wilk Test Statistic				0.659	**Shapiro Wilk GOF Test**						
99	5% Shapiro Wilk Critical Value				0.897	Data Not Normal at 5% Significance Level						
100	Lilliefors Test Statistic				0.269	**Lilliefors GOF Test**						
101	5% Lilliefors Critical Value				0.209	Data Not Normal at 5% Significance Level						
102	**Data Not Normal at 5% Significance Level**											
103												
104	**Assuming Normal Distribution**											

105	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
106				95% Student's-t UCL		15.64				95% Adjusted-CLT UCL (Chen-1995)		17.59
107										95% Modified-t UCL (Johnson-1978)		16
108												
109	**Gamma GOF Test**											
110				A-D Test Statistic		0.334	**Anderson-Darling Gamma GOF Test**					
111				5% A-D Critical Value		0.79	Detected data appear Gamma Distributed at 5% Significance Level					
112				K-S Test Statistic		0.125	**Kolmogrov-Smirnoff Gamma GOF Test**					
113				5% K-S Critical Value		0.213	Detected data appear Gamma Distributed at 5% Significance Level					
114	**Detected data appear Gamma Distributed at 5% Significance Level**											
115												
116	**Gamma Statistics**											
117				k hat (MLE)		0.609	k star (bias corrected MLE)					0.545
118				Theta hat (MLE)		15.79	Theta star (bias corrected MLE)					17.66
119				nu hat (MLE)		21.94	nu star (bias corrected)					19.62
120				MLE Mean (bias corrected)		9.622	MLE Sd (bias corrected)					13.03
121							Approximate Chi Square Value (0.05)					10.57
122				Adjusted Level of Significance		0.0357	Adjusted Chi Square Value					9.936
123												
124	**Assuming Gamma Distribution**											
125				95% Approximate Gamma UCL (use when n>=50)		17.86	95% Adjusted Gamma UCL (use when n<50)					19
126												
127	**Lognormal GOF Test**											
128				Shapiro Wilk Test Statistic		0.971	**Shapiro Wilk Lognormal GOF Test**					
129				5% Shapiro Wilk Critical Value		0.897	Data appear Lognormal at 5% Significance Level					
130				Lilliefors Test Statistic		0.1	**Lilliefors Lognormal GOF Test**					
131				5% Lilliefors Critical Value		0.209	Data appear Lognormal at 5% Significance Level					
132	**Data appear Lognormal at 5% Significance Level**											
133												
134	**Lognormal Statistics**											
135				Minimum of Logged Data		-1.386	Mean of logged Data					1.253
136				Maximum of Logged Data		4.078	SD of logged Data					1.595
137												
138	**Assuming Lognormal Distribution**											
139				95% H-UCL		50.23	90% Chebyshev (MVUE) UCL					25.45
140				95% Chebyshev (MVUE) UCL		32.05	97.5% Chebyshev (MVUE) UCL					41.2
141				99% Chebyshev (MVUE) UCL		59.18						
142												
143	**Nonparametric Distribution Free UCL Statistics**											
144	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
145												
146	**Nonparametric Distribution Free UCLs**											
147				95% CLT UCL		15.32	95% Jackknife UCL					15.64
148				95% Standard Bootstrap UCL		15.3	95% Bootstrap-t UCL					23.29
149				95% Hall's Bootstrap UCL		38.44	95% Percentile Bootstrap UCL					15.76
150				95% BCA Bootstrap UCL		18.22						
151				90% Chebyshev(Mean, Sd) UCL		20.01	95% Chebyshev(Mean, Sd) UCL					24.71
152				97.5% Chebyshev(Mean, Sd) UCL		31.24	99% Chebyshev(Mean, Sd) UCL					44.06
153												
154	**Suggested UCL to Use**											
155				95% Adjusted Gamma UCL		19						
156												

	A	B	C	D	E	F	G	H	I	J	K	L
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
159	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
160	For additional insight the user may want to consult a statistician.											
161												
162												
163	**Carc PAHs**											
164												
165	**General Statistics**											
166					Total Number of Observations	18			Number of Distinct Observations	8		
167									Number of Missing Observations	0		
168					Minimum	0.15			Mean	1.469		
169					Maximum	14			Median	0.15		
170					SD	3.317			Std. Error of Mean	0.782		
171					Coefficient of Variation	2.257			Skewness	3.555		
172												
173	**Normal GOF Test**											
174					Shapiro Wilk Test Statistic	0.46			**Shapiro Wilk GOF Test**			
175					5% Shapiro Wilk Critical Value	0.897			Data Not Normal at 5% Significance Level			
176					Lilliefors Test Statistic	0.345			**Lilliefors GOF Test**			
177					5% Lilliefors Critical Value	0.209			Data Not Normal at 5% Significance Level			
178	**Data Not Normal at 5% Significance Level**											
179												
180	**Assuming Normal Distribution**											
181	**95% Normal UCL**								**95% UCLs (Adjusted for Skewness)**			
182					95% Student's-t UCL	2.83			95% Adjusted-CLT UCL (Chen-1995)	3.456		
183									95% Modified-t UCL (Johnson-1978)	2.939		
184												
185	**Gamma GOF Test**											
186					A-D Test Statistic	2.615			**Anderson-Darling Gamma GOF Test**			
187					5% A-D Critical Value	0.803			Data Not Gamma Distributed at 5% Significance Level			
188					K-S Test Statistic	0.354			**Kolmogrov-Smirnoff Gamma GOF Test**			
189					5% K-S Critical Value	0.215			Data Not Gamma Distributed at 5% Significance Level			
190	**Data Not Gamma Distributed at 5% Significance Level**											
191												
192	**Gamma Statistics**											
193					k hat (MLE)	0.488			k star (bias corrected MLE)	0.444		
194					Theta hat (MLE)	3.011			Theta star (bias corrected MLE)	3.312		
195					nu hat (MLE)	17.57			nu star (bias corrected)	15.97		
196					MLE Mean (bias corrected)	1.469			MLE Sd (bias corrected)	2.206		
197									Approximate Chi Square Value (0.05)	7.944		
198					Adjusted Level of Significance	0.0357			Adjusted Chi Square Value	7.404		
199												
200	**Assuming Gamma Distribution**											
201					95% Approximate Gamma UCL (use when n>=50))	2.955			95% Adjusted Gamma UCL (use when n<50)	3.17		
202												
203	**Lognormal GOF Test**											
204					Shapiro Wilk Test Statistic	0.721			**Shapiro Wilk Lognormal GOF Test**			
205					5% Shapiro Wilk Critical Value	0.897			Data Not Lognormal at 5% Significance Level			
206					Lilliefors Test Statistic	0.36			**Lilliefors Lognormal GOF Test**			
207					5% Lilliefors Critical Value	0.209			Data Not Lognormal at 5% Significance Level			
208	**Data Not Lognormal at 5% Significance Level**											

					Lognormal Statistics						
				Minimum of Logged Data	-1.897				Mean of logged Data	-0.922	
				Maximum of Logged Data	2.639				SD of logged Data	1.456	
					Assuming Lognormal Distribution						
				95% H-UCL	3.763				90% Chebyshev (MVUE) UCL	2.28	
				95% Chebyshev (MVUE) UCL	2.845				97.5% Chebyshev (MVUE) UCL	3.629	
				99% Chebyshev (MVUE) UCL	5.168						
					Nonparametric Distribution Free UCL Statistics						
					Data do not follow a Discernible Distribution (0.05)						
					Nonparametric Distribution Free UCLs						
				95% CLT UCL	2.755				95% Jackknife UCL	2.83	
				95% Standard Bootstrap UCL	2.721				95% Bootstrap-t UCL	6.249	
				95% Hall's Bootstrap UCL	6.798				95% Percentile Bootstrap UCL	2.956	
				95% BCA Bootstrap UCL	3.781						
				90% Chebyshev(Mean, Sd) UCL	3.815				95% Chebyshev(Mean, Sd) UCL	4.878	
				97.5% Chebyshev(Mean, Sd) UCL	6.352				99% Chebyshev(Mean, Sd) UCL	9.249	
					Suggested UCL to Use						
				95% Chebyshev (Mean, Sd) UCL	4.878						
				Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
				These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
				and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
				For additional insight the user may want to consult a statistician.							
F2											
					General Statistics						
				Total Number of Observations	18				Number of Distinct Observations	3	
									Number of Missing Observations	0	
				Minimum	12.5				Mean	23.78	
				Maximum	180				Median	12.5	
				SD	39.87				Std. Error of Mean	9.398	
				Coefficient of Variation	1.677				Skewness	3.971	
					Normal GOF Test						
				Shapiro Wilk Test Statistic	0.323				**Shapiro Wilk GOF Test**		
				5% Shapiro Wilk Critical Value	0.897				Data Not Normal at 5% Significance Level		
				Lilliefors Test Statistic	0.5				**Lilliefors GOF Test**		
				5% Lilliefors Critical Value	0.209				Data Not Normal at 5% Significance Level		
					Data Not Normal at 5% Significance Level						
					Assuming Normal Distribution						
				95% Normal UCL					**95% UCLs (Adjusted for Skewness)**		
				95% Student's-t UCL	40.13				95% Adjusted-CLT UCL (Chen-1995)	48.64	
									95% Modified-t UCL (Johnson-1978)	41.59	

261	**Gamma GOF Test**											
262	A-D Test Statistic				5.596	**Anderson-Darling Gamma GOF Test**						
263	5% A-D Critical Value				0.76	Data Not Gamma Distributed at 5% Significance Level						
264	K-S Test Statistic				0.532	**Kolmogrov-Smirnoff Gamma GOF Test**						
265	5% K-S Critical Value				0.208	Data Not Gamma Distributed at 5% Significance Level						
266	**Data Not Gamma Distributed at 5% Significance Level**											
267												
268	**Gamma Statistics**											
269	k hat (MLE)				1.332	k star (bias corrected MLE)						1.147
270	Theta hat (MLE)				17.85	Theta star (bias corrected MLE)						20.73
271	nu hat (MLE)				47.96	nu star (bias corrected)						41.3
272	MLE Mean (bias corrected)				23.78	MLE Sd (bias corrected)						22.2
273						Approximate Chi Square Value (0.05)						27.57
274	Adjusted Level of Significance				0.0357	Adjusted Chi Square Value						26.5
275												
276	**Assuming Gamma Distribution**											
277	95% Approximate Gamma UCL (use when n>=50))				35.62	95% Adjusted Gamma UCL (use when n<50)						37.06
278												
279	**Lognormal GOF Test**											
280	Shapiro Wilk Test Statistic				0.377	**Shapiro Wilk Lognormal GOF Test**						
281	5% Shapiro Wilk Critical Value				0.897	Data Not Lognormal at 5% Significance Level						
282	Lilliefors Test Statistic				0.516	**Lilliefors Lognormal GOF Test**						
283	5% Lilliefors Critical Value				0.209	Data Not Lognormal at 5% Significance Level						
284	**Data Not Lognormal at 5% Significance Level**											
285												
286	**Lognormal Statistics**											
287	Minimum of Logged Data				2.526	Mean of logged Data						2.749
288	Maximum of Logged Data				5.193	SD of logged Data						0.687
289												
290	**Assuming Lognormal Distribution**											
291	95% H-UCL				28.66	90% Chebyshev (MVUE) UCL						29.51
292	95% Chebyshev (MVUE) UCL				34.06	97.5% Chebyshev (MVUE) UCL						40.37
293	99% Chebyshev (MVUE) UCL				52.77							
294												
295	**Nonparametric Distribution Free UCL Statistics**											
296	**Data do not follow a Discernible Distribution (0.05)**											
297												
298	**Nonparametric Distribution Free UCLs**											
299	95% CLT UCL				39.24	95% Jackknife UCL						40.13
300	95% Standard Bootstrap UCL				N/A	95% Bootstrap-t UCL						N/A
301	95% Hall's Bootstrap UCL				N/A	95% Percentile Bootstrap UCL						N/A
302	95% BCA Bootstrap UCL				N/A							
303	90% Chebyshev(Mean, Sd) UCL				51.97	95% Chebyshev(Mean, Sd) UCL						64.74
304	97.5% Chebyshev(Mean, Sd) UCL				82.47	99% Chebyshev(Mean, Sd) UCL						117.3
305												
306	**Suggested UCL to Use**											
307	95% Chebyshev (Mean, Sd) UCL				64.74							
308												
309	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
310	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
311	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
312	For additional insight the user may want to consult a statistician.											

313												
314												
315	**F3**											
316												
317	**General Statistics**											
318				Total Number of Observations	18			Number of Distinct Observations	5			
319								Number of Missing Observations	0			
320				Minimum	45			Mean	142.5			
321				Maximum	1300			Median	45			
322				SD	296.1			Std. Error of Mean	69.79			
323				Coefficient of Variation	2.078			Skewness	3.932			
324												
325	**Normal GOF Test**											
326				Shapiro Wilk Test Statistic	0.376			**Shapiro Wilk GOF Test**				
327				5% Shapiro Wilk Critical Value	0.897			Data Not Normal at 5% Significance Level				
328				Lilliefors Test Statistic	0.377			**Lilliefors GOF Test**				
329				5% Lilliefors Critical Value	0.209			Data Not Normal at 5% Significance Level				
330	**Data Not Normal at 5% Significance Level**											
331												
332	**Assuming Normal Distribution**											
333				**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**				
334				95% Student's-t UCL	263.9			95% Adjusted-CLT UCL (Chen-1995)	326.4			
335								95% Modified-t UCL (Johnson-1978)	274.7			
336												
337	**Gamma GOF Test**											
338				A-D Test Statistic	3.761			**Anderson-Darling Gamma GOF Test**				
339				5% A-D Critical Value	0.773			Data Not Gamma Distributed at 5% Significance Level				
340				K-S Test Statistic	0.416			**Kolmogrov-Smirnoff Gamma GOF Test**				
341				5% K-S Critical Value	0.211			Data Not Gamma Distributed at 5% Significance Level				
342	**Data Not Gamma Distributed at 5% Significance Level**											
343												
344	**Gamma Statistics**											
345				k hat (MLE)	0.852			k star (bias corrected MLE)	0.747			
346				Theta hat (MLE)	167.2			Theta star (bias corrected MLE)	190.7			
347				nu hat (MLE)	30.68			nu star (bias corrected)	26.9			
348				MLE Mean (bias corrected)	142.5			MLE Sd (bias corrected)	164.8			
349								Approximate Chi Square Value (0.05)	16.08			
350				Adjusted Level of Significance	0.0357			Adjusted Chi Square Value	15.27			
351												
352	**Assuming Gamma Distribution**											
353				95% Approximate Gamma UCL (use when n>=50))	238.5			95% Adjusted Gamma UCL (use when n<50)	251			
354												
355	**Lognormal GOF Test**											
356				Shapiro Wilk Test Statistic	0.592			**Shapiro Wilk Lognormal GOF Test**				
357				5% Shapiro Wilk Critical Value	0.897			Data Not Lognormal at 5% Significance Level				
358				Lilliefors Test Statistic	0.415			**Lilliefors Lognormal GOF Test**				
359				5% Lilliefors Critical Value	0.209			Data Not Lognormal at 5% Significance Level				
360	**Data Not Lognormal at 5% Significance Level**											
361												
362	**Lognormal Statistics**											
363				Minimum of Logged Data	3.807			Mean of logged Data	4.269			
364				Maximum of Logged Data	7.17			SD of logged Data	0.916			

	A	B	C	D	E	F	G	H	I	J	K	L
365												
366	**Assuming Lognormal Distribution**											
367					95% H-UCL	190.3				90% Chebyshev (MVUE) UCL		180.2
368					95% Chebyshev (MVUE) UCL	214.1				97.5% Chebyshev (MVUE) UCL		261.2
369					99% Chebyshev (MVUE) UCL	353.7						
370												
371	**Nonparametric Distribution Free UCL Statistics**											
372	**Data do not follow a Discernible Distribution (0.05)**											
373												
374	**Nonparametric Distribution Free UCLs**											
375					95% CLT UCL	257.3				95% Jackknife UCL		263.9
376					95% Standard Bootstrap UCL	249.3				95% Bootstrap-t UCL		898.8
377					95% Hall's Bootstrap UCL	675.2				95% Percentile Bootstrap UCL		271.9
378					95% BCA Bootstrap UCL	341.7						
379					90% Chebyshev(Mean, Sd) UCL	351.9				95% Chebyshev(Mean, Sd) UCL		446.7
380					97.5% Chebyshev(Mean, Sd) UCL	578.4				99% Chebyshev(Mean, Sd) UCL		836.9
381												
382	**Suggested UCL to Use**											
383					95% Chebyshev (Mean, Sd) UCL	446.7						
384												
385	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
386	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
387	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
388	For additional insight the user may want to consult a statistician.											
389												

1	**UCL Statistics for Uncensored Full Data Sets**										
2											
3	User Selected Options										
4	Date/Time of Computation	3/09/2018 10:20:21 AM									
5	From File	WorkSheet.xls									
6	Full Precision	OFF									
7	Confidence Coefficient	95%									
8	Number of Bootstrap Operations	2000									
9											
10											
11	**Zinc**										
12											
13	**General Statistics**										
14	Total Number of Observations	18			Number of Distinct Observations	18					
15					Number of Missing Observations	0					
16	Minimum	2.1			Mean	364					
17	Maximum	3800			Median	68					
18	SD	902.1			Std. Error of Mean	212.6					
19	Coefficient of Variation	2.478			Skewness	3.671					
20											
21	**Normal GOF Test**										
22	Shapiro Wilk Test Statistic	0.431			**Shapiro Wilk GOF Test**						
23	5% Shapiro Wilk Critical Value	0.897			Data Not Normal at 5% Significance Level						
24	Lilliefors Test Statistic	0.372			**Lilliefors GOF Test**						
25	5% Lilliefors Critical Value	0.209			Data Not Normal at 5% Significance Level						
26	**Data Not Normal at 5% Significance Level**										
27											
28	**Assuming Normal Distribution**										
29	**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**						
30	95% Student's-t UCL	733.9			95% Adjusted-CLT UCL (Chen-1995)	910.4					
31					95% Modified-t UCL (Johnson-1978)	764.6					
32											
33	**Gamma GOF Test**										
34	A-D Test Statistic	1.201			**Anderson-Darling Gamma GOF Test**						
35	5% A-D Critical Value	0.819			Data Not Gamma Distributed at 5% Significance Level						
36	K-S Test Statistic	0.259			**Kolmogrov-Smirnoff Gamma GOF Test**						
37	5% K-S Critical Value	0.218			Data Not Gamma Distributed at 5% Significance Level						
38	**Data Not Gamma Distributed at 5% Significance Level**										
39											
40	**Gamma Statistics**										
41	k hat (MLE)	0.409			k star (bias corrected MLE)	0.378					
42	Theta hat (MLE)	890.4			Theta star (bias corrected MLE)	963.7					
43	nu hat (MLE)	14.72			nu star (bias corrected)	13.6					
44	MLE Mean (bias corrected)	364			MLE Sd (bias corrected)	592.3					
45					Approximate Chi Square Value (0.05)	6.298					
46	Adjusted Level of Significance	0.0357			Adjusted Chi Square Value	5.826					
47											
48	**Assuming Gamma Distribution**										
49	95% Approximate Gamma UCL (use when n>=50))	786.1			95% Adjusted Gamma UCL (use when n<50)	849.8					
50											
51	**Lognormal GOF Test**										
52	Shapiro Wilk Test Statistic	0.975			**Shapiro Wilk Lognormal GOF Test**						

53	5% Shapiro Wilk Critical Value				0.897	Data appear Lognormal at 5% Significance Level						
54	Lilliefors Test Statistic				0.126	**Lilliefors Lognormal GOF Test**						
55	5% Lilliefors Critical Value				0.209	Data appear Lognormal at 5% Significance Level						
56	**Data appear Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data				0.742	Mean of logged Data						4.293
60	Maximum of Logged Data				8.243	SD of logged Data						1.836
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL				2362	90% Chebyshev (MVUE) UCL						821.9
64	95% Chebyshev (MVUE) UCL				1049	97.5% Chebyshev (MVUE) UCL						1363
65	99% Chebyshev (MVUE) UCL				1981							
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL				713.8	95% Jackknife UCL						733.9
72	95% Standard Bootstrap UCL				695.7	95% Bootstrap-t UCL						2753
73	95% Hall's Bootstrap UCL				2112	95% Percentile Bootstrap UCL						759
74	95% BCA Bootstrap UCL				963.9							
75	90% Chebyshev(Mean, Sd) UCL				1002	95% Chebyshev(Mean, Sd) UCL						1291
76	97.5% Chebyshev(Mean, Sd) UCL				1692	99% Chebyshev(Mean, Sd) UCL						2480
77												
78	**Suggested UCL to Use**											
79	99% Chebyshev (Mean, Sd) UCL				2480							
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86												
87	**B(a)P**											
88												
89	**General Statistics**											
90	Total Number of Observations				18	Number of Distinct Observations						8
91						Number of Missing Observations						0
92	Minimum				0.05	Mean						1.014
93	Maximum				10	Median						0.05
94	SD				2.39	Std. Error of Mean						0.563
95	Coefficient of Variation				2.357	Skewness						3.509
96												
97	**Normal GOF Test**											
98	Shapiro Wilk Test Statistic				0.467	**Shapiro Wilk GOF Test**						
99	5% Shapiro Wilk Critical Value				0.897	Data Not Normal at 5% Significance Level						
100	Lilliefors Test Statistic				0.343	**Lilliefors GOF Test**						
101	5% Lilliefors Critical Value				0.209	Data Not Normal at 5% Significance Level						
102	**Data Not Normal at 5% Significance Level**											
103												
104	**Assuming Normal Distribution**											

105	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
106					95% Student's-t UCL	1.994					95% Adjusted-CLT UCL (Chen-1995)	2.438
107											95% Modified-t UCL (Johnson-1978)	2.072
108												
109	**Gamma GOF Test**											
110					A-D Test Statistic	2.442	**Anderson-Darling Gamma GOF Test**					
111					5% A-D Critical Value	0.825	Data Not Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.364	**Kolmogrov-Smirnoff Gamma GOF Test**					
113					5% K-S Critical Value	0.219	Data Not Gamma Distributed at 5% Significance Level					
114	**Data Not Gamma Distributed at 5% Significance Level**											
115												
116	**Gamma Statistics**											
117					k hat (MLE)	0.379	k star (bias corrected MLE)	0.353				
118					Theta hat (MLE)	2.672	Theta star (bias corrected MLE)	2.87				
119					nu hat (MLE)	13.66	nu star (bias corrected)	12.72				
120					MLE Mean (bias corrected)	1.014	MLE Sd (bias corrected)	1.706				
121							Approximate Chi Square Value (0.05)	5.704				
122					Adjusted Level of Significance	0.0357	Adjusted Chi Square Value	5.258				
123												
124	**Assuming Gamma Distribution**											
125					95% Approximate Gamma UCL (use when n>=50))	2.261	95% Adjusted Gamma UCL (use when n<50)	2.452				
126												
127	**Lognormal GOF Test**											
128					Shapiro Wilk Test Statistic	0.732	**Shapiro Wilk Lognormal GOF Test**					
129					5% Shapiro Wilk Critical Value	0.897	Data Not Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.37	**Lilliefors Lognormal GOF Test**					
131					5% Lilliefors Critical Value	0.209	Data Not Lognormal at 5% Significance Level					
132	**Data Not Lognormal at 5% Significance Level**											
133												
134	**Lognormal Statistics**											
135					Minimum of Logged Data	-2.996	Mean of logged Data	-1.735				
136					Maximum of Logged Data	2.303	SD of logged Data	1.793				
137												
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	4.887	90% Chebyshev (MVUE) UCL	1.829				
140					95% Chebyshev (MVUE) UCL	2.329	97.5% Chebyshev (MVUE) UCL	3.023				
141					99% Chebyshev (MVUE) UCL	4.385						
142												
143	**Nonparametric Distribution Free UCL Statistics**											
144	**Data do not follow a Discernible Distribution (0.05)**											
145												
146	**Nonparametric Distribution Free UCLs**											
147					95% CLT UCL	1.941	95% Jackknife UCL	1.994				
148					95% Standard Bootstrap UCL	1.905	95% Bootstrap-t UCL	4.219				
149					95% Hall's Bootstrap UCL	4.823	95% Percentile Bootstrap UCL	2.092				
150					95% BCA Bootstrap UCL	2.636						
151					90% Chebyshev(Mean, Sd) UCL	2.704	95% Chebyshev(Mean, Sd) UCL	3.469				
152					97.5% Chebyshev(Mean, Sd) UCL	4.532	99% Chebyshev(Mean, Sd) UCL	6.619				
153												
154	**Suggested UCL to Use**											
155					99% Chebyshev (Mean, Sd) UCL	6.619						
156												

	A	B	C	D	E	F	G	H	I	J	K	L
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
159	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
160	For additional insight the user may want to consult a statistician.											
161												

Table T2 – Summary of Groundwater Analytical Results

Sample Identification		Heavy Metals								PAHs			BTEX					TRHs				VOCs Total	Phenols (Total)	PFAS	
		As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	Total PAHs	Benzo(a)pyrene	Naphthalene	Benzene	Toluene	Ethylbenzene	o-xylene	m/p-xylene	F1	F2	F3	F4			PFOS	PFOA
BH1M-1		6	<0.1	3	85	3	<0.1	3	110	2	<0.2 *	<0.2 *	<0.5	<0.5	<0.5	<1	<0.5	160	190	<1000 *	<1000 *	20	<0.05	NA	NA
BH9M-1		3	<0.1	<1	2	1	<0.1	<1	10	<1	<0.1	<0.1	<0.5	<0.5	<0.5	<1	<0.5	<50	<60	<500	<500	<10	<0.05	NA	NA
BH10M-1		<1	<0.1	<1	65	2	<0.1	2	92	<1	<0.1	<0.1	<0.5	<0.5	<0.5	<1	<0.5	<50	<60	<500	<500	<10	<0.05	NA	NA
Maximum Concentration		6	<0.1	3	85	3	<0.1	3	110	2	<0.2	<0.1	<0.5	<0.5	<0.5	<1	<0.5	160	190	<1000	<1000	20	<0.05	NA	NA
95% UCL		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
GILs																									
GIL	Fresh Water [4]	24 (AsIII) 13 (AsV)	1.04 [H1]	4.50 [H1] (CR VI)	6.2 [H1]	40.61 [H1]	0.06 [3]	52.76 [H1]	38.37 [H1]			16	950	180 [9]	80 [9]	350 [9]	275 [9]	50 [8]	60 [8]	500 [8]	500 [8]		320		
	Recreational Water [6,7]	100	20	500	20,000	100	10	200			0.01		1	800	300	600									
	Direct Contact [11]	1000	200	5,000	200,000	1,000	100	2,000			0.1		10	8,000	3,000	6,000									

Notes:

All values are µg/L unless stated otherwise

NL = Not Limiting

NA = 'Not Analysed' i.e. the sample was not analysed.

ND = Not Detected - i.e. concentration below the laboratory PQL

F1 = (C6-C10) minus BTEX.

F2 = (>C10-C16) minus Naphthalene.

F3 = (>C16-C34).

F4 = (>C34-C40).

H1 = Modified hardness trigger values

1 = Values have been calculated using a hardness of 30mg/L CaCO3 refer to ANZECC & ARMCANZ (2000) for further guidance on recalculating for site-specific hardness

2 = Figure may not protect key species from chronic toxicity, refer to ANZAST (2018) for further guidance

3 = Chemical for which possible bioaccumulation and secondary poisoning effects should be considered, refer to ANZAST (2018) for further guidance

4 = NEPM (2013) Groundwater Investigation Levels for fresh and marine water quality, based on ANZAST (2018).

5 = NEPC (2013) Table 1A(4) Groundwater HSL A&B and HSL D for vapour intrusion at the contaminant source depth ranges in sand 2m to <4m, as a conservative approach.

6 = NEPM (2013) Groundwater Investigation Levels for drinking water quality, based on Australian Drinking Water Guidelines (NHMRC 2017).

7 = Drinking Water value has been used multiplied by a factor of 10 to address the secondary contact recreation.

8 = In lack of a criteria the laboratory PQL has been used (DEC, 2007).

9 = Low reliability toxicity data, refer to ANZECC & ARMCANZ (2000)

10 = Maximum concentration derived from duplicate sample

11 = Australian Drinking Water Guidelines multiplied by 100

* = laboratory PQL has been raised due to interferences from the sample matrix

Highlighted indicates analyte concentration value exceeding the adopted human health criteria

Highlighted indicates analyte concentration value exceeding the adopted recreational and direct criteria

Highlighted indicates criteria exceeded

APPENDIX A
Proposed Development Plans

STRATEGY D CALCULATIONS

KEY	SITE	SITE AREA	GFA	FSR
1	School	1042.0 sqm	2043 sqm	2.0:1
2	Commercial/Student Housing	1150.5 sqm	2328 sqm	2.0:1
3	Residential	2351.5 sqm	4609 sqm	2.0:1
	Total Site Area	**4544 sqm**		
	Allowed FSR	**2:1**		



STRATEGY D - GROUND LEVEL

HUNTER STREET

709

POWELL STREET

YOUNG STREET

1

2

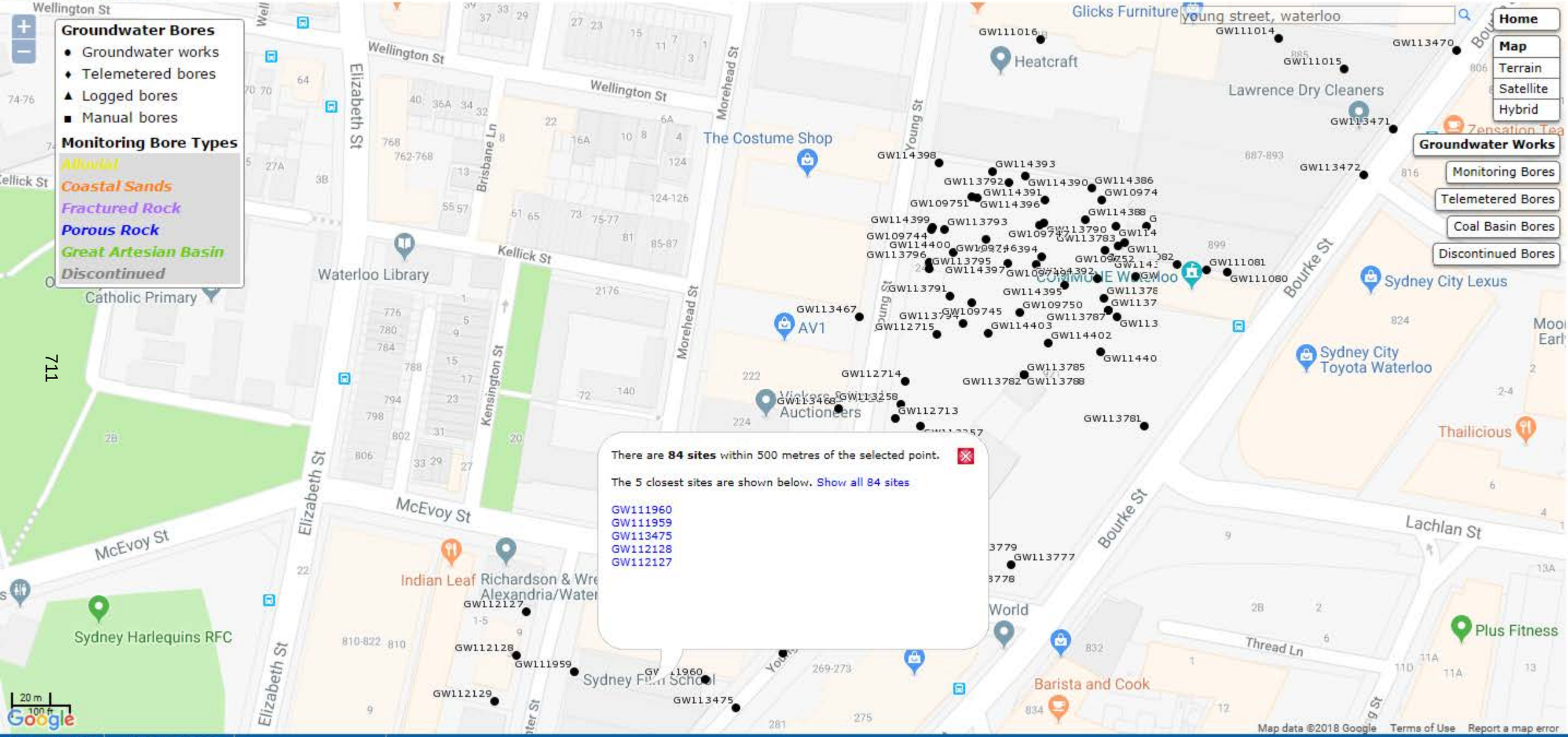
3

STRATEGY D - LEVELS 1-3

APPENDIX B
Groundwater Bore Search

Map | Info

current site: GW111959



711

Scale = 1 : 1693 | 151.208, -33.900

APPENDIX C
Site Photographs



Photograph 1: Commercial building (film school) located at 242-244 Young Street, Waterloo (the site), looking south-east.



Photograph 2: Manufacturing workshop located at the site, looking south-west.



Photograph 3: Commercial building (offices) located at the site, north.



Photograph 4: Interior of the manufacturing workshop located at the site.

APPENDIX D
Historical Property Titles Search

ABN: 36 092 724 251
Ph: 02 9099 7400

Level 14, 135 King Street, Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Report

NSW LRS
(Formerly LPI)

Sydney

Address: 242 & 244 – 258 Young Street, Waterloo

Description: - Lot 1 D.P. 84655 & Lots A & B D.P. 161650

As regards Lot 1 D.P. 84655

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
08.08.1912 (1912 to 1940)	James Hunter and Sons Limited Now James Hunter & Sons Pty. Limited	Book 976 No. 257
18.03.1940 (1940 to 1968)	Gordon Marr & Sons Pty. Limited	Book 1867 No. 316 Now Vol 5239 Fol 116
01.11.1968 (1968 to 1986)	P. Rowe Pty Limited	Vol 5239 Fol 116
27.05.1986 (1986 to 1986)	Leda Holdings Pty Limited	Vol 5239 Fol 116
03.11.1986 (1986 to 1991)	Baese Pty. Limited	Vol 5239 Fol 116 Now 1/84655
29.01.1991 (1991 to 1998)	Tridu Pty. Limited	1/84655
20.05.1998 (1998 to 2013)	Coates Signco Manufacturing Pty Limited Now Alan Coates Pty Limited	1/84655
04.01.2013 (2013 to Date)	# International Screen Academy Property Pty Ltd	1/84655

# Denotes Current Registered Proprietor

Easements: -

- 28.07.1986 (D.P. 638902) – Easement for Support

Leases: -

- 01.11.1968 (L301856) – Gordon Marr & Sons Proprietary Limited – expired 17.05.1979
- Numerious Leases were found from 29.01.1991 to 30.11.2010 – that have since expired due to effluxion of time, or have been surrendered – these have not been investigated
- 16.05.2013 (AH734086) – International Screen Academy Property Pty Limited of 242 Young Street, Waterloo – expires 17.12.2015
    - 26.07.2016 (AK625515) – expiry date now 31.12.2017

Email: james.mcdonnell@infotrack.com.au

ABN: 36 092 724 251
Ph: 02 9099 7400

Level 14, 135 King Street, Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards Lot A D.P. 161650

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
08.08.1912 (1912 to 1956)	James Hunter and Sons Limited Now James Hunter & Sons Pty. Limited	Book 976 No. 257
10.05.1956 (1956 to 1968)	Gordon Marr & Sons Pty. Limited	Book 2387 No. 363 Now Vol 8211 Fol 238
01.11.1968 (1968 to 1982)	P. Rowe Pty Limited	Vol 8211 Fol 238
16.03.1982 (1982 to 1989)	Perpetual Trustee Company Limited	Vol 8211 Fol 238
16.03.1989 (1989 to 1995)	John Malcolm Sandilands Beverley Ann Sandilands	Vol 8211 Fol 238 Now A/161650
02.03.1995 (1995 to 1998)	Beverley Ann Sandilands	A/161650
23.04.1998 (1998 to Date)	# Charvic Pty Limited	A/161650

# Denotes Current Registered Proprietor

Easements: -

- 28.07.1986 (D.P. 638902) – Easement for Support
- 28.07.1986 (D.P. 638902) – Easement for Maintenance of Gutter

Leases: -

- 01.11.1968 (L301856) – Gordon Marr & Sons Proprietary Limited – expired 17.05.1979
- 01.07.1982 (T72760) – P. Rowe Pty Limited – expired 15.09.1988
- 15.09.1988 (X837002) – P. Rowe Fabrics Pty. Limited – surrendered 06.05.1994
- 06.05.1994 (U241772) – expired due to effluxion of time, or has been surrendered – this has not been investigated
- 20.12.2007 (AD653553) – expired due to effluxion of time, or has been surrendered – this has not been investigated
- 19.05.2017 (AM405465) – Paramount Property Group Pty Limited of Factory, 244 Young Street, Waterloo together with 38 on-site parking spaces numbered 1–38. – expires 01.04.2002 – option of renewal 2 years

Email: james.mcdonnell@infotrack.com.au

ABN: 36 092 724 251
Ph: 02 9099 7400

Level 14, 135 King Street, Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards Lot B D.P. 161650

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
08.08.1912 (1912 to 1966)	James Hunter and Sons Limited Now James Hunter & Sons Pty. Limited	Book 976 No. 257 Now Vol 7448 Fol 29
28.01.1966 (1966 to 1982)	P. Rowe Pty Limited	Vol 7448 Fol 29
16.03.1982 (1982 to 1989)	Perpetual Trustee Company Limited	Vol 7448 Fol 29
16.03.1989 (1989 to 1995)	John Malcolm Sandilands Beverley Ann Sandilands	Vol 7448 Fol 29 Now B/161650
02.03.1995 (1995 to 1998)	Beverley Ann Sandilands	B/161650
23.04.1998 (1998 to Date)	# Charvic Pty Limited	B/161650

# Denotes Current Registered Proprietor

Easements: -

- 01.04.2009 (D.P. 1136961) – Easement for Electricity and Other Purposes 3.365 metre(s) wide
- 01.04.2009 (D.P. 1136961) – Right of Carriageway 6.8 metre(s) wide

Leases: -

- 01.07.1982 (T72760) – P. Rowe Pty Limited – expired 15.09.1988
- 15.09.1988 (X837002) – P. Rowe Fabrics Pty. Limited – surrendered 06.05.1994
- 06.05.1994 (U241772) – expired due to effluxion of time, or has been surrendered – this has not been investigated
- 20.12.2007 (AD653553) – expired due to effluxion of time, or has been surrendered – this has not been investigated
- 19.05.2017 (AM405465) – Paramount Property Group Pty Limited of Factory, 244 Young Street, Waterloo together with 38 on-site parking spaces numbered 1–38. – expires 01.04.2002 – option of renewal 2 years

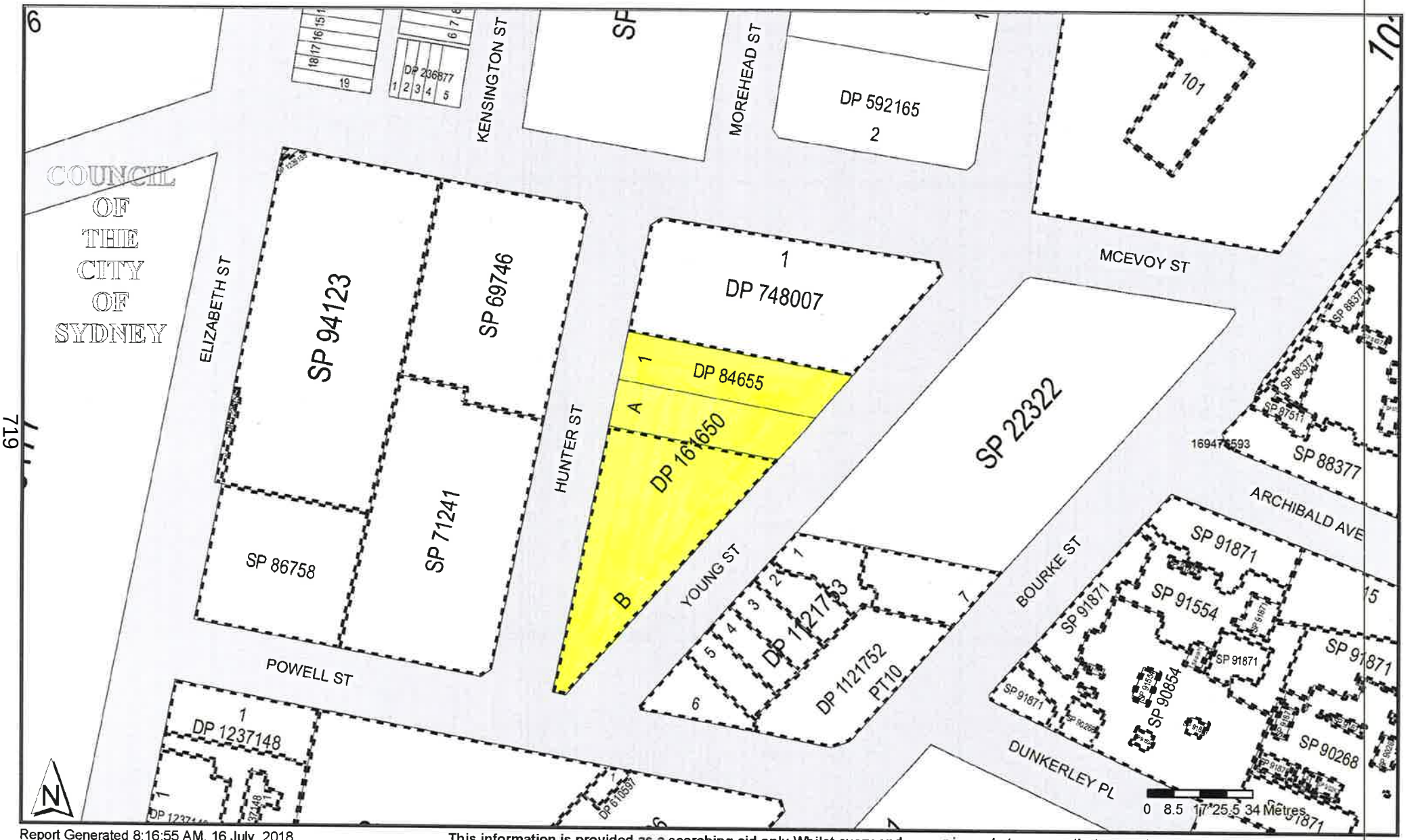
Yours Sincerely
James McDonnell
16 July 2018

LAND REGISTRY SERVICES

Cadastral Records Enquiry Report : Lot A DP 161650

Ref : NOUSER

Locality : WATERLOO
LGA : SYDNEY
Parish : ALEXANDRIA
County : CUMBERLAND



Report Generated 8:16:55 AM, 16 July, 2018
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This information is provided as a searching aid only.Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For ALL ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps

InfoTrack

Req:R915354 /Doc:DP 0084655 P /Rev:02-Aug-1992 /Sts:OK.OK /Pgs:ALL /Prt:13-Jul-2018 10:47 /Seq:1 of 1
Ref:Waterloo /Src:M

DP 84655

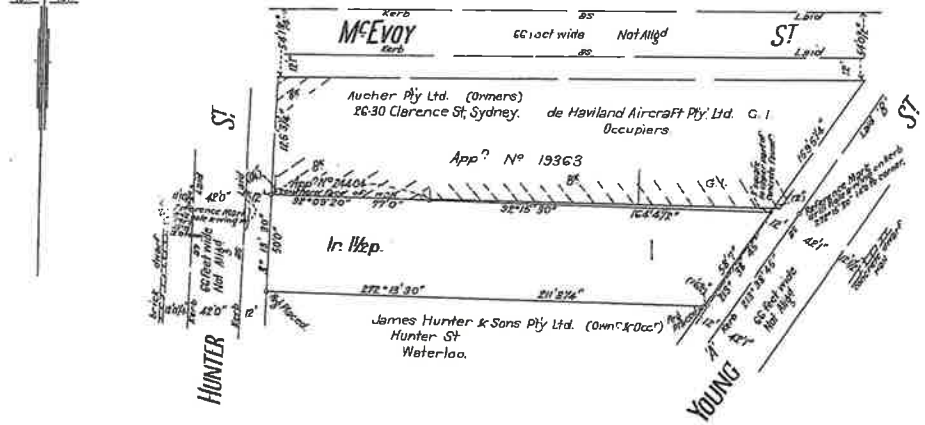
Muny. of Waterloo.
P.A. 34655

PLAN

of part of J. T. Campbell's 185ac. Grant

Parish of Alexandria County of Cumberland

Scale: 40 feet to one inch



I, William Deane Cornbeck of Sydney, a Surveyor registered under the Surveyors Act, 1929, do hereby solemnly and sincerely declare (1) that all bearings and measurements shown on this plan are correct, (2) that all survey marks found and recovered shown or referred to on this plan are sufficient to enable the said survey to be re-established, and (3) that the said survey and this plan are in accordance with the Regulations under the Surveyors Act, 1929, and that the reference mark has been placed as shown hereon, and was completed on the 20th day of September 1940.

And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act, 1900.

Subscribed and declared before me,
at Sydney this 27th day of September 1940. W. D. Cornbeck.

John Hawley J.P. Surveyor registered under the Surveyors' Act, 1929

Datum line of Azimuth A-B.

1022/101 6/3/41/40

PLAN AMENDED IN L.T.O. 19.6.1941

CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 84655

FEET	INCHES	METRES
-	1 1/4	0.032
-	2	0.051
1	5 1/2	0.470
11	10 1/2	3.620
12	-	3.658
12	0 1/4	3.664
12	1	3.683
12	1 1/2	3.696
16	5 3/4	5.023
42	-	12.802
42	1	12.827
50	-	15.240
54	0 1/2	16.472
54	1 3/4	16.504
58	7	17.856
66	-	20.117
77	-	23.470
125	3 1/4	38.183
159	5 1/4	48.597
164	4 1/2	50.102
211	8 1/4	64.522

AC	RD	P	SQ M
-	1	1 1/2	1050

AC	RD	P	HA
185	-	-	74.87

AMENDMENTS AND/OR ADDITIONS MADE ON PLAN IN THE LAND TITLES OFFICE

10 20 30 40 50 60 70 Table of mm 110 120 130 140

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day. 20th June, 1990

InfoTrack

Reg:R915359 /Doc:DP 0161650 P /Rev:21-Dec-1992 /Sts:OK.OK /Pgs:ALL /Prt:13-Jul-2018 10:47 /Seq:1 of 1
Ref:Waterloo /Src:M

MPS (OS) G 481847

X D P 161650

PLAN

of Part of Campbell's 185 Acre Grant
Parish of Alexandria County of Cumberland

Scale 60' to an inch.

City of Sydney

McEvoy Street

Factory Appn. 19363

Brick factory bldg.

Appn. 38455

Young Street

Hunter Street

Powell Street

Fourth Street

66' wide

Station Marks

Plan Approved by Council 13th February, 1934

Covered by Town Clerk's Certificate No. 6/1934

of 13th February 1934

William Philip Hill

185 Elizabeth St. Sydney

Approved by Council and covered by Council Clerks Certificate

No. of

Council Clerk

(Signature)

*Strike out either (1) or (2).

Plan Approved by Council 13th February, 1934

Covered by Town Clerk's Certificate No. 6/1934

of 13th February 1934

Copy of plan filed as 35674 D

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 3rd day of November, 1977

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

DP 161650

FEET	INCHES	METRES
-	1 3/4	0.044
-	3 1/2	0.089
1	-	0.305
1	3 1/2	0.394
1	4	0.406
1	6	0.457
6	7 1/4	2.013
11	6 7/8	3.527
11	11	3.632
11	11 3/4	3.651
12	-	3.658
12	0 1/2	3.670
12	7 1/2	3.848
13	9	4.171
13	9 1/8	4.194
14	-	4.267
14	0 3/4	4.286
30	-	9.144
30	1 1/4	9.176
42	-	12.802
42	1 1/4	12.833
42	1 3/4	12.846
50	-	15.240
58	7	17.856
66	-	20.117
125	3 1/4	38.183
182	3 1/4	55.556
211	11 1/4	64.599
285	10 3/4	87.141
334	11 7/8	102.105

AC	RD	P	SQ M
-	-	36	910.5
-	2	22 1/4	2586

This margin to be left free from notation

This is the plan marked "A" referred to in Deed dated 13th February 1934

1

Historical Title

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
3/7/2018 6:13PM

FOLIO: 1/84655

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 5239 FOL 116

Recorded	Number	Type of Instrument	C.T. Issue
2/9/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
22/5/1990		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
19/11/1990	Z340072	CAVEAT	
28/11/1990	DP644174	DEPOSITED PLAN	EDITION 1
5/12/1990	Z370018	CAVEAT	
22/1/1991	Z438284	WITHDRAWAL OF CAVEAT	
22/1/1991	Z438285	WITHDRAWAL OF CAVEAT	
22/1/1991	Z438286	DISCHARGE OF MORTGAGE	
22/1/1991	Z438287	DISCHARGE OF MORTGAGE	
22/1/1991	Z438288	DISCHARGE OF MORTGAGE	EDITION 2
29/1/1991	Z438289	TRANSFER	
29/1/1991	Z438290	MORTGAGE	
29/1/1991	Z445561	LEASE	EDITION 3
3/2/1994	I995265	VARIATION OF LEASE	EDITION 4
28/2/1995	O51110	LEASE	EDITION 5
4/9/1997		AMENDMENT: LOCAL GOVT AREA	
20/5/1998	3998514	DISCHARGE OF MORTGAGE	
20/5/1998	3998515	TRANSFER	
20/5/1998	3998516	MORTGAGE	EDITION 6
14/3/2004	AA472866	DEPARTMENTAL DEALING	
31/10/2005	AB876363	LEASE	EDITION 7
30/11/2010	AF717501	CHANGE OF NAME	
30/11/2010	AF717502	LEASE	
30/11/2010	AF717503	LEASE	EDITION 8
30/11/2010	AF911416	DEPARTMENTAL DEALING	EDITION 9

END OF PAGE 1 - CONTINUED OVER

waterloo

PRINTED ON 3/7/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
3/7/2018 6:13PM

FOLIO: 1/84655 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
24/8/2012	AH195909	CAVEAT	
31/10/2012	AH310950	CAVEAT	
18/12/2012	AH446824	WITHDRAWAL OF CAVEAT	
18/12/2012	AH446825	WITHDRAWAL OF CAVEAT	
18/12/2012	AH446826	CAVEAT	
4/1/2013	AH466173	DISCHARGE OF MORTGAGE	
4/1/2013	AH466174	REQUEST	
4/1/2013	AH466175	TRANSFER	EDITION 10
16/5/2013	AH734086	LEASE	EDITION 11
26/8/2014	AI844090	VARIATION OF LEASE	
26/7/2016	AK625515	VARIATION OF LEASE	

*** END OF SEARCH ***

waterloo PRINTED ON 3/7/2018

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Received: 03/07/2018 18:13:38

Req:R914900 /Doc:DL Z438289 /Rev:09-Jul-2010 /Sts:OK.SC /Pgs:ALL /Prt:13-Jul-2018 10:18 /Se
Ref:waterloo /Src:M STAMP DUTY

$1.00

OFFICE OF STATE REVENUE (N.S.W. TREASURY) 1990/91 $11 DULY STAMPED

Z 438289 B

TRANSFER

REAL PROPERTY ACT, 1900

(See Instructions for Completion on back of form)

T 3 | 6 of 7 | X

$ 47

R1/3

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
Folio Identifier 1/84655	WHOLE	Waterloo

DESCRIPTION OF LAND
Note (a)

TRANSFEROR
Note (b)

BAESE PTY. LIMITED

ESTATE
Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 1,700,000.00 and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE
Note (b)

TRIDU PTY. LIMITED, a duly incorporated company of Suite 628, 6th Floor, 3 Small Street, Broadway

OFFICE USE ONLY

S

TENANCY
Note (d)

as joint tenants/tenants in common

PRIOR ENCUMBRANCES
Note (e)

subject to the following PRIOR ENCUMBRANCES 1. DP638902 Easement for support

2. ..... 3. .....

DATE OF TRANSFER 6th December 1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

Signed in my presence by the transferor who is personally known to me

THE COMMON SEAL of BAESE PTY. LIMITED was hereunto affixed by authority of the Board of Directors and in the presence of:)

BAESE PTY. LIMITED Common Seal

Director

Name of Witness (BLOCK LETTERS)

Secretary

Address and occupation of Witness

Signature of Transferor

Signed in my presence by the transferee who is personally known to me

THE COMMON SEAL of TRIDU PTY. LIMITED was hereunto affixed by authority of the Board of Directors and in the presence of:)

TRIDU PTY. LIMITED Common Seal

Director

Name of Witness (BLOCK LETTERS)

Secretary

Address and occupation of Witness

Signature of Transferee

WESTPAC TRANSFER

TO BE COMPLETED BY LODGING PARTY
Notes (g) and (h)

LODGED BY Westpac Banking Corporation
THE BANKING HOUSE, 228 PITT STREET
SYDNEY 2000. PHONE: 260-6756
DELIVERY BOX No. 37Y

Ref.: 032027 910836 S.
Delivery Box Number

CT	OTHER	LOCATION OF DOCUMENTS
✓	WY, DM, T, M	Herewith.
		In R.G.O. with
		Produced by

OFFICE USE ONLY

Checked	Passed	REGISTERED — — 19
Signed	Extra Fee	29 JAN 1991

Secondary Directions: 2ND R.

Delivery Directions: 2935288

Req:R914901 /Doc:DL 3998515 /Rev:22-May-1998 /Sts:NO.OK /Pgs:ALL /Prt:13-Jul-2018 10:18 /Seq:1 of 1
Ref:waterloo /Src:M

Form: 97-01T
Licence: AUS/0634/96

TRANSFER

New South Wales
Real Property Act 1900

3998515 S

Instructions for filling out this form are available from the Land Titles Office

Office of State Revenue use only

070598 1822 04 20143858Z/03 $2.00

N.S.W. STAMP DUTY

(A) **LAND TRANSFERRED**
If appropriate, specify the share or part transferred.

1/84655

(B) **LODGED BY**

LTO Box	Name, Address or DX and Telephone
	NATIONAL AUSTRALIA BANK LIMITED National Australia Bank Limited 255 George Street, Sydney 237-1111 FAX 237-1284 Reference (12 character maximum): 98IB3802

(C) **TRANSFEROR** TRIDU PTY LIMITED ACN 001 958 854

(D) acknowledges receipt of the consideration of $1,630,000.00
and as regards the land specified above transfers to the transferee an estate in fee simple.

(E) Encumbrances (if applicable): 1. ..... 2. ..... 3. .....

(F) **TRANSFEREE**

T TS (s713 LGA) TW (Sheriff)	COATES SIGNCO MANUFACTURING PTY LIMITED ACN 067 970 807

(G) ~~TENANCY~~:

(H) We certify this dealing correct for the purposes of the Real Property Act 1900. DATE 14.5.98.
Signed in my presence by the transferor who is personally known to me.

Common Seal TRIDU PTY. LIMITED A.C.N. 001 958 854

Secretary

Director

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address of Witness

H W EDWARDS ~~Signature of Transferee~~
Solicitor for Transferee

If signed on the transferee's behalf by a solicitor or licensed conveyancer, show the signatory's full name in block letters.

Page 1 of .....

Checked by (LTO use) .....

Req:R918916 /Doc:DL AF717501 /Rev:06-Dec-2010 /Sts:NO.OK /Pgs:ALL /Prt:13-Jul-2018 15:56 /Seq:1 of 1
Ref:waterloo /Src:M

Form: 10CN
Licence: 01-05-069.
Licensee: LEAP Legal Software Pty Limited
Firm name: Clinch Long Letherbarrow Pty Limited

CHANGE OF N

New South Wales
Real Property Act 19

AF717501C

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authori... required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

(A) **LAND**

Torrens Title
1/84655

(B) **REGISTERED DEALING**

Number	Torrens Title

(C) **LODGED BY**

Delivery Box	Name, Address or DX and Telephone	CODE
479P	LLPN: 123339U Clinch Long Letherbarrow Pty Limited DX 13090 SYDNEY MARKET STREET Tel: 9279 4888 Reference: DJW:JAQ:100030	CN

(D) **REGISTERED PROPRIETOR**

COATES SIGNCO MANUFACTURING PTY LIMITED ACN 067 970 807

(E) **NEW NAME**

ALAN COATES PTY LIMITED ACN 067 970 807 Ø

Ø ASIC website searched. SMIO # 28.9.10

(F) The abovenamed registered proprietor of the land referred to above applies to have his/her new name recorded in the Register in respect of that land.

(G) **STATUTORY DECLARATION BY THE APPLICANT**

I Alan Bernard Coates,

solemnly and sincerely declare that-

1. I am the Sole Director/Secretary of the Registered Proprietor;
2. On 30 June 2008 Coates Signco Manufacturing Pty Limited ACN 067 970 807 changed its name to Alan Coates Pty Limited ACN 067 970 807.

I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Oaths Act 1900. and I certify this application to be correct for the purposes of the Real Property Act 1900.

Made and subscribed at X WATERLOO N.S.W in the State of New South Wales

on X 30th JUNE 2010 in the presence of-

Signature of witness: X

Name of witness: X B. MELLANDER

Address of witness: X 12/25 HARVEY ST, PYRMONT 2009

Qualification of witness: X JP 168808

Signature of applicant: X

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

LAND REGISTRY SERVICES Title Search

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 1/84655

SEARCH DATE	TIME	EDITION NO	DATE
13/7/2018	10:46 AM	11	16/5/2013

LAND

LOT 1 IN DEPOSITED PLAN 84655
LOCAL GOVERNMENT AREA SYDNEY
PARISH OF ALEXANDRIA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP84655

FIRST SCHEDULE

INTERNATIONAL SCREEN ACADEMY PROPERTY PTY LTD (T AH466175)

SECOND SCHEDULE (7 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 DP638902 EASEMENT FOR SUPPORT AFFECTING THE PART OF THE LAND WITHIN DESCRIBED SHOWN SO BURDENED IN DP638902
3 DP638902 EASEMENT FOR SUPPORT APPURTENANT TO THE LAND ABOVE DESCRIBED
4 DP638902 EASEMENT FOR MAINTENANCE OF GUTTER APPURTENANT TO THE LAND ABOVE DESCRIBED
5 DP644174 EASEMENT FOR SUPPORT APPURTENANT TO THE LAND ABOVE DESCRIBED
6 DP644174 EASEMENT FOR MAINTENANCE OF GUTTER AND FLASHING APPURTENANT TO THE LAND ABOVE DESCRIBED
7 AH734086 LEASE TO INTERNATIONAL SCREEN ACADEMY PTY LIMITED OF 242 YOUNG STREET, WATERLOO. EXPIRES: 17/12/2015.
* AI844090 VARIATION OF LEASE AH734086
* AK625515 VARIATION OF LEASE AH734086 EXPIRY DATE NOW 31/12/2017.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

waterloo PRINTED ON 13/7/2018

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Received: 13/07/2018 10:46:55

LAND REGISTRY SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
3/7/2018 6:13PM

FOLIO: A/161650

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 8211 FOL 238

Recorded	Number	Type of Instrument	C.T. Issue
31/8/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
11/10/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
6/5/1994	U241771	SURRENDER OF LEASE	
6/5/1994	U241772	LEASE	EDITION 1
2/3/1995	O56952	DISCHARGE OF MORTGAGE	
2/3/1995	O56953	TRANSFER	
2/3/1995	O56954	MORTGAGE	EDITION 2
3/9/1997		AMENDMENT: LOCAL GOVT AREA	
23/4/1998	3937680	DISCHARGE OF MORTGAGE	
23/4/1998	3937682	TRANSFER	EDITION 3
14/3/2004	AA472866	DEPARTMENTAL DEALING	
20/12/2007	AD653553	LEASE	EDITION 4
22/12/2008	AE406620	CAVEAT	
3/4/2009	AE595205	WITHDRAWAL OF CAVEAT	
5/7/2011	AG347378	VARIATION OF LEASE	
4/9/2012	AH212838	CHANGE OF NAME	
4/9/2012	AH212839	VARIATION OF LEASE	
18/6/2015	AJ575230	VARIATION OF LEASE	
19/5/2017	AM405464	SURRENDER OF LEASE	
19/5/2017	AM405465	LEASE	EDITION 5
1/6/2017	AM442236	CAVEAT	
15/6/2017	AM477806	CAVEAT	

END OF PAGE 1 - CONTINUED OVER

waterloo

PRINTED ON 3/7/2018

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
3/7/2018 6:13PM

FOLIO: A/161650

Recorded	Number	Type of Instrument	C.T. Issue
27/7/2017	AM596514	WITHDRAWAL OF CAVEAT	

*** END OF SEARCH ***

waterloo

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Req:R914922 /Doc:DL 0056953 /Rev:10-Mar-2010 /Sts:OK.SC /Pgs:ALL /Prt:13-Jul-2018 10:19 /Seq:1 of 1
Ref:waterloo /Src:M

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(2)

TRANSFER

Real Property Act, 1900

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(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

VOLUME 8211 FOLIO 238 and Now being A/161650
VOLUME 7448 FOLIO 29 and B/161650

(B) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
46A	NATIONAL AUSTRALIA BANK LIMITED National Australia Bank House 255 George Street, Sydney 237 - 1111 FAX 237 - 1284 REFERENCE (max. 15 characters): Tx3702

(C) **TRANSFEROR** JOHN MALCOLM SANDILANDS

(D) acknowledges receipt of the consideration of pursuant to Orders made on 19 January 1994 by the Family Court of Australia
and as regards the land specified above transfers to the transferee an estate in fee simple

(E) subject to the following **ENCUMBRANCES** 1. U241772 2. ..... 3. .....

(F) **TRANSFEREE**

T	BEVERLEY ANN SANDILANDS

(G) ~~as joint tenants/tenants in common~~

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATE** .....

Signed in my presence by the transferor who is personally known to me.

Joanna Budden
Signature of Witness

JOANNA BUDDEN
Name of Witness (BLOCK LETTERS)

11 HENRIETTA ST WAVERLEY
Address of Witness

J M Sandilands
Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

Stuart Grant Fowler
Solicitor acting for
Signature of Transferee

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LAND REGISTRY SERVICES **Title Search** InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: A/161650

SEARCH DATE	TIME	EDITION NO	DATE
13/7/2018	10:46 AM	5	19/5/2017

LAND

LOT A IN DEPOSITED PLAN 161650
AT WATERLOO
LOCAL GOVERNMENT AREA SYDNEY
PARISH OF ALEXANDRIA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP161650

FIRST SCHEDULE

CHARVIC PTY LIMITED (T 3937682)

SECOND SCHEDULE (5 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 DP638902 EASEMENT FOR SUPPORT AFFECTING THE PART OF THE LAND SO BURDENED IN DP638902
3 DP638902 EASEMENT FOR SUPPORT APPURTENANT TO THE LAND ABOVE DESCRIBED
4 DP638902 EASEMENT FOR MAINTENANCE OF GUTTER AFFECTING THE PART OF THE LAND SHOWN SO BURDENED IN DP638902
5 AM405465 LEASE TO PARAMOUNT PROPERTY GROUP PTY LIMITED OF FACTORY, 244 YOUNG STREET, WATERLOO TOGETHER WITH 38 ON-SITE PARKING SPACES NUMBERED 1-38. EXPIRES: 1/4/2020. OPTION OF RENEWAL: 2 YEARS.

* AM442236 CAVEAT AFFECTING LEASE AM405465 CAVEAT BY HANSON PRECAST PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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LAND REGISTRY SERVICES

Historical Title

InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
3/7/2018 6:13PM

FOLIO: B/161650

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 7448 FOL 29

Recorded	Number	Type of Instrument	C.T. Issue
29/7/1989		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
17/1/1990		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
1/7/1992	E577823	DEPARTMENTAL DEALING	
6/5/1994	U241771	SURRENDER OF LEASE	
6/5/1994	U241772	LEASE	EDITION 1
2/3/1995	O56952	DISCHARGE OF MORTGAGE	
2/3/1995	O56953	TRANSFER	
2/3/1995	O56954	MORTGAGE	EDITION 2
3/9/1997		AMENDMENT: LOCAL GOVT AREA	
23/4/1998	3937681	DISCHARGE OF MORTGAGE	
23/4/1998	3937682	TRANSFER	EDITION 3
14/3/2004	AA472866	DEPARTMENTAL DEALING	
20/12/2007	AD653553	LEASE	EDITION 4
22/12/2008	AE406620	CAVEAT	
1/4/2009	DP1136961	DEPOSITED PLAN	EDITION 5
3/4/2009	AE595205	WITHDRAWAL OF CAVEAT	
5/7/2011	AG347378	VARIATION OF LEASE	
4/9/2012	AH212838	CHANGE OF NAME	
4/9/2012	AH212839	VARIATION OF LEASE	
18/6/2015	AJ575230	VARIATION OF LEASE	
19/5/2017	AM405464	SURRENDER OF LEASE	
19/5/2017	AM405465	LEASE	EDITION 6

END OF PAGE 1 - CONTINUED OVER

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NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE
3/7/2018 6:13PM

FOLIO: B/161650 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
1/6/2017	AM442236	CAVEAT	
15/6/2017	AM477806	CAVEAT	
27/7/2017	AM596514	WITHDRAWAL OF CAVEAT	

*** END OF SEARCH ***

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Ref:waterloo /Src:M

RP13

(2)

TRANSFER

Real Property Act, 1900

0
056953 W

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(A) **LAND TRANSFERRED**

Show no more than 20 References to Title.
If appropriate, specify the share transferred.

VOLUME 8211 FOLIO 238 and Now being A/161650
VOLUME 7448 FOLIO 29 and B/161650

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L.T.O. Box	Name, Address or DX and Telephone
45A	NATIONAL AUSTRALIA BANK LIMITED National Australia Bank House 255 George Street, Sydney 237 - 1111 FAX 237 - 1284 REFERENCE (max. 15 characters): Tx3702

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(E) subject to the following **ENCUMBRANCES** 1. U241772 2. ..... 3. .....

(F) **TRANSFEREE**

T	BEVERLEY ANN SANDILANDS

(G) ~~as joint tenants/tenants in common~~

(H) We certify this dealing correct for the purposes of the Real Property Act, 1900. **DATE** .....

Signed in my presence by the transferor who is personally known to me.

Joanna Budden
Signature of Witness

JOANNA BUDDEN
Name of Witness (BLOCK LETTERS)

11 HENRIETTA ST WAVERLEY
Address of Witness

J M Sandilands
Signature of Transferor

Signed in my presence by the transferee who is personally known to me.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

Stuart Grant Fowler
Solicitor acting for
Signature of Transferee

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LAND REGISTRY SERVICES **Title Search** InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: B/161650

SEARCH DATE	TIME	EDITION NO	DATE
13/7/2018	10:46 AM	6	19/5/2017

LAND

LOT B IN DEPOSITED PLAN 161650
AT WATERLOO
LOCAL GOVERNMENT AREA SYDNEY
PARISH OF ALEXANDRIA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP161650

FIRST SCHEDULE

CHARVIC PTY LIMITED (T 3937682)

SECOND SCHEDULE (4 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 DP1136961 EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 3.365 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1136961
3 DP1136961 RIGHT OF CARRIAGEWAY 6.8 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1136961
4 AM405465 LEASE TO PARAMOUNT PROPERTY GROUP PTY LIMITED OF FACTORY, 244 YOUNG STREET, WATERLOO TOGETHER WITH 38 ON-SITE PARKING SPACES NUMBERED 1-38. EXPIRES: 1/4/2020. OPTION OF RENEWAL: 2 YEARS.
* AM442236 CAVEAT AFFECTING LEASE AM405465 CAVEAT BY HANSON PRECAST PTY LTD

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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APPENDIX E
Borehole Logs

BOREHOLE: BH1M

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	HartGeo Pty Ltd	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Ute-mounted Solid Flight Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level
DT			0	0.12	BH1M_0.3-0.4 ES QD1 QT1 PID = 1.9 ppm			-	CONCRETE: 120mm thick.	-		BH1M: Gatic Cover; Concrete
								-	FILL: Gravelly Clayey SAND; medium grained, light brown/orange/grey, with low to medium plasticity clay and fine, sub-angular to angular gravels, weak hydrocarbon odour.			Cuttings
				0.80	BH1M_0.5-0.6 ES PID = 5.6 ppm							50 mm uPVC Casing
			1					S	SAND; fine grained, light grey, no odour.			Bentonite
					BH1M_1.2-1.3 ES PID = 0.3 ppm					M		
			2	2.20								
AD/T	-				BH1M_2.4-2.5 ES PID = 0.7 ppm				From 2.2m, brown.	M - W	-	
			3	3.00					From 3.0m, dark brown, strong hydrocarbon odour.			Sand
		▽			BH1M_3.4-3.5 ES PID = 23.1 ppm							50 mm uPVC Screen
			4							W		
			5	5.00					Hole Terminated at 5.00 m Target Depth Reached. Borehole Converted into Monitoring Well.			
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EIA LIB 1.03.GLB Log IS AU BOREHOLE 3 E23915 LOGS.GPJ <<DrawingFile>> 21/08/2018 16:53 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: EIA 1.03 2014-07-05 Prj: EIA 1.03 2014-07-05

BOREHOLE: BH2

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	N/A	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Hand Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0.0	0.10				-	CONCRETE: 100mm thick.	-		CONCRETE HARDSTAND
AD/T	-	GWNE		0.20	BH2_0.1-0.2 ES PID = 2.2 ppm			-	FILL: SAND: fine to medium grained, dark brown, with organics, slight hydrocarbon odour.	M	-	FILL
				0.40	BH2_0.3-0.4 ES PID = 1.4 ppm			-	SANDSTONE; fine grained, yellow, with coarse, sub-angular to angular sandstone fragments, no odour.			BEDROCK
			0.5						Hole Terminated at 0.40 m Refusal on Sandstone Bedrock. Backfilled with Drilling Spoil.			
			1.0									
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH3

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	N/A	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Hand Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT	-	GWNE	0.0					-	CONCRETE: 150mm thick.	-		CONCRETE HARDSTAND
				0.15								
AD/T					BH3_0.2-0.3 ES PID = 2.1 ppm			-	FILL: Gravelly CLAY; low to medium grained, brown, with fine to coarse gravels, no odour.	M	-	FILL
				0.35								
									Hole Terminated at 0.35 m Refusal on Second Concrete Slab. Backfilled with Drilling Spoil.			
			0.5									
			1.0									
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH4

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	N/A	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Hand Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT	-	GWNE	0.0					-	CONCRETE: 150mm thick.	-		CONCRETE HARDSTAND
				0.15								
AD/T					BH4_0.2-0.3 ES PID = 2.1 ppm			-	FILL: Gravelly Clayey SAND; medium grained, light brown/orange/grey, with low to medium plasticity clay and fine, sub-angular to angular gravels, with plastics and bark fragments, weak hydrocarbon odour.	M	-	FILL
				0.30					Hole Terminated at 0.30 m Refusal on Coarse Concrete Gravels. Backfilled with Drilling Spoil.			
			0.5									
			1.0									
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH5

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	N/A	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Hand Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0.0					-	CONCRETE: 100mm thick.	-		CONCRETE HARDSTAND
				0.10								
AD/T	-	GWNE			BH5_0.1-0.2 ES PID = 2.1 ppm			-	FILL: Gravelly SAND; fine to medium grained, brown, with fine to coarse, sub-angular to angular gravels, with slag, with sulfate and hydrocarbon odour.	M	-	FILL
				0.30								
									Hole Terminated at 0.30 m Refusal. PVC pipe encountered and hand augering stopped due to being potential service. Backfilled with Drilling Spoil.			
			0.5									
			1.0									
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH6

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	N/A	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Hand Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
DT			0.0					-	CONCRETE: 150mm thick.	-		CONCRETE HARDSTAND
				0.15								
AD/T	-	GWNE			BH6_0.2-0.3 ES PID = 1.8 ppm			-	FILL: Gravelly Clayey SAND; medium grained, light brown/brown/grey, with low to medium plasticity clay and fine, sub-angular to angular gravels, weak hydrocarbon odour.	M	-	FILL
			0.5	0.50					Hole Terminated at 0.50 m Refusal on Coarse Gravels. Backfilled with Drilling Spoil.			
			1.0									
			1.5									
			2.0									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH7

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	HartGeo Pty Ltd	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Ute-mounted Solid Flight Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
AD/T	-	GWNE	0.0		BH7_0.3-0.4 ES PID = 4.7 ppm			-	FILL: Gravelly SAND; fine grained, brown, with fine, sub-angular to angular gravels, no odour.			FILL
			0.5	0.60				S	SAND; fine grained, light grey, no odour.	M	-	ALLUVIUM
			1.0									
			1.5		BH7_1.5-1.6 ES PID = 3.7 ppm							
			2.0	2.00					Hole Terminated at 2.00 m Target Depth Reached. Backfilled with Drilling Spoil.			

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH8

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	HartGeo Pty Ltd	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Ute-mounted Solid Flight Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.0					-	FILL: Gravelly SAND; fine grained, brown, with fine, sub-angular to angular gravels, no odour.			FILL
					BH8_0.3-0.4 ES PID = 2.1 ppm							
			0.5									
				0.70				S	SAND; fine grained, light grey, no odour.			ALLUVIUM
AD/T	-	GWNE	1.0							M	-	
					BH8_1.7-1.8 ES PID = 1.1 ppm							
			1.5									
									Hole Terminated at 2.00 m Target Depth Reached. Backfilled with Drilling Spoil.			
			2.0	2.00								

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

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BOREHOLE: BH9M

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Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	HartGeo Pty Ltd	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Ute-mounted Solid Flight Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level	
AD/T	-	▽	0					-	FILL: Gravelly SAND; fine grained, brown, with fine, sub-angular to angular gravels, no odour.			BH9M	No Surface Concrete Completion
					BH9M_0.3-0.4 ES PID = 1.8 ppm	■							Cuttings
				0.80									
			1					S	SAND; fine grained, light grey, no odour.	M			50 mm uPVC Casing
													Bentonite
			2		BH9M_1.8-1.9 ES PID = 1.7 ppm	■							
		▽	3										Sand
													50 mm uPVC Screen
			4							W			
				5.00					Hole Terminated at 5.00 m Target Depth Reached. Borehole Converted into Monitoring Well.				
			5										
			6										
			7										
			8										
			9										
			10										

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EIA UB 1.03.GLB Log IS AU BOREHOLE 3 E23915 LOGS.GPJ <<DrawingFile>> 21/08/2018 16:53 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: EIA 1.03 2014-07-05 Prj: EIA 1.03 2014-07-05

BOREHOLE: BH10M

eiaustralia
Contamination | Remediation | Geotechnical

Project	Detailed Site Investigation			Sheet	1 OF 1
Location	242-244 Young Street, Waterloo NSW			Date Started	15/8/18
Position	Refer to Figure 2			Date Completed	15/8/18
Job No.	E23915	Contractor	HartGeo Pty Ltd	Logged DR	Date: 15/8/18
Client	Bennet Murada Architects	Drill Rig	Ute-mounted Solid Flight Auger	Checked CS	Date: 21/8/18
		Inclination	-90°		

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	PIEZOMETER DETAILS ID / Static Water Level
DT			0	0.15				-	CONCRETE: 150mm thick.	-		BH10M: Gatic Cover; Concrete
AD/T	-				BH10M_0.4-0.5 ES PID = 1.4 ppm			-	FILL: Gravelly CLAY; low to medium grained, brown, with fine to coarse gravels, no odour.			Cuttings; 50 mm uPVC Casing; Bentonite
			1	1.50				CI	Silty CLAY (PEAT); medium plasticity, dark brown, no odour.	M		
				2.00	BH10M_1.7-1.8 ES PID = 2.4 ppm			S	SAND; fine grained, light grey, no odour.			
			2		BH10M_2.4-2.5 ES PID = 1.7 ppm							
			3									Sand; 50 mm uPVC Screen
			4							W		
				4.50				CI-CH	CLAY; medium to high plasticity, brown, no odour.			
			5	5.00				-	SANDSTONE; fine grained, yellow, no odour.			Cuttings
				5.50					Hole Terminated at 5.50 m Target Depth Reached. Borehole Converted into Monitoring Well.			
			6									
			7									
			8									
			9									
			10									

This borehole log should be read in conjunction with EI Australia's accompanying standard notes.

EIA UB 1.03.GLB Log IS AU BOREHOLE 3 E23915 LOGS.GPJ <<DrawingFile>> 21/08/2018 16:53 10.0.000 Datgel Lab and In Situ Tool - DGD | Lib: EIA 1.03 2014-07-05 Prj: EIA 1.03 2014-07-05

APPENDIX F
Field Data Sheets

Site Inspection Card - CLM Projects
Form OP 005 (Rev 2)

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009
ABN 42 909 129 957
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

Project Number:	E2395	Engineer Name:	DR/CS
Date:	31/7/18	Time ON Site:	8:30
Travel Time:	1 hr	Time OFF Site:	10:00

Site Address/Location: 242 - 244 ~~Alot~~ Young Street, Waterloo NSW

Climatic Conditions: Cloudy / Sunny

Current Site Uses: Film school, engineering / manufacturing workshop & offices for development company

Surrounding Land Uses:

North: Apartment block

South: Open space & apartments

East: Offices / workshops and general retail (hair dresser & cafes)

West: Apartments

Current Site Condition

Buildings Structures:

- ☑ slab on ground
- ☐ suspended slab
- ☐ basement ..... Level(s)
- ☑ sub-stations
- ☐ service pits / sumps
- ☐ potential ACM
- ☐ potential lead paint
- ☑ accessible soils (locations)
- ☐ Other (please decsribe):

Soil / Vegetation (overgrown, distressed, bare soil patches):

Locally good condition / locally poor condition (due to vehicle movement)

Condition of concrete, bitumen roading, flooring etc.:

Yes, generally in good condition, with slight cracking & staining.

Evidence of USTs / UPSS Infrastructure:

No

Evidence of Groundwater Monitoring Wells:

Presence of Waste / Rubbish / Stockpiles:

Storage by company under carpark.

Unusual Odours:

NO

Signed:	DR	Name:	DR	Date:	31/7/18

Site Inspection Card - CLM Projects
Form OP-005 (Rev 2)

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009
ABN 42 909 129 957
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

Site Topography (slope of site, surface water, drainage, closest receptor etc.)

Numbe of level changes throughout the building (loading bays) Hunter Street at lower elevation than Young St.

Hazardous materials / activities: (presence of asbestos, solid or liquid hazardous materials, infrastructure)

Numerous Engineering Machinery (lathes & turners)

Anecdotal Information:

- Previous occupiants: fibre optic cable manufacturer (Finsar ?)

Notes:

- Access for drilling rig was also completed.

Signed:	Name:	Date:

Site Inspection Card - General

Form OP 005b (Rev 1)

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Contamination | Remediation | Geotechnical

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009
ABN 42 909 129 957
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

Project Number:	E23915	Sheet: 1 of 1	Date: 15/8/18
Project Name:	Waterloo - DSI	Time at ARRIVAL: 7:30	(am)/pm
Client Contact:		Time at DEPARTURE: 2:30	am/(pm)
Site Address/Location:	242-244 Young St, Waterloo NSW		
Climatic Conditions:			

Completed Works (Describe site conditions, stage of works, relevant environmental conditions) (Take photos)

7:30: Arrive onsite

9:30: Dano's auger get stuck, started doing hand augers while he fixed the rig.

11:30: finished hand augering and & first well construction.

12:30: completed two augered holes and second monitoring well.

1:15: finish find monitoring wells.

1:45: finished concreting holes

2:15: finished developing wells.

2:30: packed up and started going back to office.

Comments / Issues / Conclusions / Further Testing Required / Actions to be Undertaken / Timing of Actions:

Name: Signed:

EI Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009

ABN 33 102 449 507
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

CALIBRATION CERTIFICATE FOR PHOTO IONISATION DETECTOR

Instrument: Mini RAE 3000

Serial Number: 592-906667 - EI **PID02** ☐ **OR** 592-901345 - EI **PID03** ☑

Instrument Conditions: Good

Calibration gas species: Isobutylene.

Calibration gas concentration: 100 ~~100~~ ppm

Gas bottle number: 676450 - 178

This PID has been calibrated to Isobutylene gas with the span concentration displayed as

100
~~99.7~~ ppm at 99.7 ppm span setting (allowable range +/-10ppm from span setting).

The PID is initially zero calibrated in fresh air.

Remaining gas in bottle: 430 psi (if reading is <250 psi, notify Equipment Manager to arrange new gas bottle order)

The above detector was calibrated in accordance with manufacturer's specifications.

Signed: [signature]

Date: 14/8/18

Time: 3:00 pm



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LEGEND

– – – Approximate site boundary

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Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	D.R.
Approved:	-
Date:	04-07-18

Mr Tim Sims
Detailed Site Investigation
242-244 Young Street, Waterloo NSW

Proposed Sampling Location Plan

Figure: X

Project: E23915.E02.Rev0

Site Inspection Card - General

Form OP 005b (Rev 1)

El Australia
Suite 6.01, 55 Miller Street
PYRMONT, NSW, 2009

ABN 42 909 129 957
E service@eiaustralia.com.au
W www.eiaustralia.com.au
T 02 9516 0722

Project Number:	E23915.E02	Sheet: 1 of 1	Date: 24/08/18
Project Name:		Time at ARRIVAL:	11:30 am/pm
Client Contact:		Time at DEPARTURE:	3:40 am/pm
Site Address/Location:	242 - 244 Young St, Waterloo, NSW		
Climatic Conditions:	raining		

Completed Works (Describe site conditions, stage of works, relevant environmental conditions) (Take photos)

3 Ground samples (BH1M-1, BH9M-1, BH10M-1)

QD and QT taken @ BH9M

Comments / Issues / Conclusions / Further Testing Required / Actions to be Undertaken / Timing of Actions:

Name: NB Signed:

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 242 - 244 Young St, Waterloo	Job Number: E23915.E02
Client: Pacific Equity Partners Pty Ltd	Date: 24/8/18
Field Staff: LB	Sampling Location ID BH1M
Well Location: See Fig 2	Round No: 1

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:	Stick up / (down) (m): -0.08 (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS

PID Headspace (ppm):	PID Background (ppm):
PID Breathing Space (ppm):	

PRE PURGE

Total Well Depth (mBTOC): 4.79	Well Head Condition: good
SWL (mBTOC): 3.29	Water Column (m): 1.5

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	

PURGE AND SAMPLE

Sampling Method ☑Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC): 4.00	Fill Timer:
Pump Pressure Regulator (psi): ~~25 psi~~ 60 psi	Discharge Timer:
Weather Conditions: raining	Cycle:
Pump on time: 12:21	Pump off time: 12:50

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
12:33	0.5	3.31	18.67	1385	167.2	1.58	7.22	brown, very h turb, yes (HC)
12:37	1.0	3.30	18.60	860	166.6	0.34	7.21	
12:39	1.5	3.30	18.72	799	167.1	0.35	7.17	yes (sheen a bit)
12:41	2.0	3.32	18.74	783	167.3	0.31	7.16	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

SIGNATURE: LB

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 242-244 Young St, Waterloo	Job Number: E23915
Client: Pacific Equity Partners Pty Ltd	Date: 24/08/18
Field Staff: LB	Sampling Location ID BH9M
Well Location: southern boundary (corner) (Fig 2)	Round No: 1
MEDIUM ☑Groundwater ☐Surface Water	☐Stormwater ☐Other:
SAMPLING POINT INFO	
Well Installation Date:	Stick up / down (m): - 0.08 (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):
PID READINGS	
PID Headspace (ppm):	PID Background (ppm):
PID Breathing Space (ppm):	
PRE PURGE	
Total Well Depth (mBTOC): 4.84	Well Head Condition: good
SWL (mBTOC): 2.60	Water Column (m): 2.24
PHASE SEPARATED HYDROCARBONS (PSH)	
Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	
PURGE AND SAMPLE	
Sampling Method ☑Bladder ☐Peristaltic ☐Submersible ☐Other:	
Depth of Pump Inlet (mBTOC): 3.50	Fill Timer:
Pump Pressure Regulator (psi): 60 psi	Discharge Timer:
Weather Conditions: Raining	Cycle: CPM4
Pump on time: 1:30	Pump off time: 2:30
WATER QUALITY PARAMETERS	
Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
1:45	0.5	2.64	17.28	702	180.2	1.84	6.63	brown/ grey, h- turbidity,
1:47	1.0	2.61	17.20	671	180.4	1.37	6.63	↓
1:51	1.5	2.60	17.26	606	181.5	2.32	6.62	no, no.
1:59	2.0	2.61	17.15	605	181.6	1.43	6.62	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

QD and QT taken @ BH9M.

SIGNATURE:

WATER SAMPLING FIELD SHEET

eiaustralia

Site Address: 242 - 244 Young St, Waterloo	Job Number: E23915
Client: Pacific Equity Partners Pty Ltd	Date: 24/8/18
Field Staff: LB	Sampling Location ID BH10M
Well Location: See Fig 2	Round No: 1

MEDIUM ☑Groundwater ☐Surface Water ☐Stormwater ☐Other:

SAMPLING POINT INFO

Well Installation Date:	Stick up / (down) (m): -0.10 (+ above ground - below ground)
Initial Well Depth (mBTOC):	Screen Interval (mBTOC):
Previous Sampling Date:	Previous SWL (mBTOC):

PID READINGS

PID Headspace (ppm):	PID Background (ppm):
PID Breathing Space (ppm):	

PRE PURGE

Total Well Depth (mBTOC): 5.10	Well Head Condition: good
SWL (mBTOC): 2.64	Water Column (m): 2.46

PHASE SEPARATED HYDROCARBONS (PSH)

Depth to PSH (mBTOC):	PSH Visually Confirmed (Bailer):
PSH Thickness (mm):	

PURGE AND SAMPLE

Sampling Method ☑Bladder ☐Peristaltic ☐Submersible ☐Other:

Depth of Pump Inlet (mBTOC):	Fill Timer:
Pump Pressure Regulator (psi):	Discharge Timer:
Weather Conditions:	Cycle:
Pump on time: 2:35	Pump off time:

WATER QUALITY PARAMETERS

Probe Make and Model:	Bump Test Date and Time:

Time	Volume (L)	SWL (mbtoc)	Temp (°C)	EC (µS/cm)	Redox (mV)	DO (mg/L)	pH (units)	Comments (colour, turbidity, odour, sheen etc.)
2:42	0.5	2.67	19.18	254	167.6	1.66	6.48	brown/grey, h, n, n.
2:44	1.0	2.67	19.31	251	167.9	1.47	6.49	↓
2:48	1.5	2.76	19.49	228	168.3	1.35	6.48	
2:51	2.0	2.79	19.46	226	168.5	1.54	6.48	
Stabilisation range: 3 consecutive readings			±0.2°C	±3%	±20mV	±10%	±0.2	

OTHER COMMENTS/OBSERVATIONS:

SIGNATURE: AB

APPENDIX G
Chain of Custody and Sample Receipt Forms

source: [Untitled].pdf page: 1 SGS Ref: SE182724_COC

Sheet 1 of 2

Site: 242 - 244 Young Street, Waterloo NSW

Project No: E23915

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM [B] / PAH
BH1M_0.3-0.4	1	J, ZLB	15/8/18	AM/PM		X		X															
_0.5-0.6	2	↓						X															
_1.2-1.3	3	J							X						X								
_2.4-2.5		↓																					
BH1M_2.4-2.5	4	J							X														
BH2_0.1-0.2	5	J, ZLB						X															
_0.3-0.4	6	J							X						X								
BH3_0.2-0.3	7	J, ZLB						X															
BH4_0.2-0.3	8	↓						X															
BH5_0.1-0.2	9							X															
BH6_0.2-0.3	10							X															
BH7_0.3-0.4	11	↓						X															
BH7_1.5-1.6		J	↓	↓		↓																	

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: David Rizkalla	Print: Ness
Signature:	Signature:
Date: 16/8/18	Date: 16/8/18 12:25

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC March 2018 FORM v.4 - SGS

SGS EHS Alexandria Laboratory

SE182724 COC
Received: 16 – Aug – 2018

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Sheet 2 of 2

Site: 242-244 Young Street, Waterloo

Project No: E23915

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM Δ /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM Δ /TRH/BTEX/PAHs	HM Δ /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM B / PAH
BH8_0.3-0.4	12	J, ZLB	15/8/18	AM/PM		X		X															
BH8_1.7-1.8	13	J	↓	↓		↓			X						X								
BH9M_0.3-0.4	14	J, ZLB						X															
↓ _1.8-1.9	15	J							X						X								
BH10M_0.4-0.5	16	J, ZLB						X															
BH10M_1.7-1.8	17	J							X						X								
BH10M_2.4-2.5	18	↓							X														
QD1	19	J								X													
TS	20	VC									X												
TB	21	VC				↓					X												
QR1	22	S, P, 2VC			X					X													
QRBL		↓	↓	↓	↓																		

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Comments

HM Δ
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: David Rizkalla	Print: Nessa
Signature: [signature]	Signature: [signature]
Date: 16/8/18	Date: 16/8/18 12:25

Sampler's Comments:

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

SAMPLE RECEIPT ADVICE

SE182724

CLIENT DETAILS

Contact	David Rizkalla
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	david.rizkallar@eiaustralia.com.au
Project	**E23915 242-244 Young St Waterloo NSW**
Order Number	**E23915**
Samples	22

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Thu 16/8/2018
Report Due	Thu 23/8/2018
SGS Reference	**SE182724**

SUBMISSION DETAILS

This is to confirm that 22 samples were received on Thursday 16/8/2018. Results are expected to be ready by COB Thursday 23/8/2018. Please quote SGS reference SE182724 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	21 Soil, 1 Water
Date documentation received	16/8/2018	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	4.1ºC	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

2 soil and 1 water samples on hold.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE182724

CLIENT DETAILS

Client EI AUSTRALIA

Project E23915 242-244 Young St Waterloo NSW

SUMMARY OF ANALYSIS

No.	Sample ID	OC Pesticides in Soil	OP Pesticides in Soil	PAH (Polynuclear Aromatic Hydrocarbons) in Soil	PCBs in Soil	pH in soil (1:5)	TRH (Total Recoverable Hydrocarbons) in Soil	VOC's in Soil	Volatile Petroleum Hydrocarbons in Soil
001	BH1M_0.3-0.4	29	14	26	11	-	10	12	8
002	BH1M_0.5-0.6	29	14	26	11	-	10	12	8
003	BH1M_1.2-1.3	-	-	26	-	1	10	12	8
004	BH1M_3.4-3.5	-	-	26	-	-	10	12	8
005	BH2_0.1-0.2	29	14	26	11	-	10	12	8
006	BH2_0.3-0.4	-	-	26	-	1	10	12	8
007	BH3_0.2-0.3	29	14	26	11	-	10	12	8
008	BH4_0.2-0.3	29	14	26	11	-	10	12	8
009	BH5_0.1-0.2	29	14	26	11	-	10	12	8
010	BH6_0.2-0.3	29	14	26	11	-	10	12	8
011	BH7_0.3-0.4	29	14	26	11	-	10	12	8
012	BH8_0.3-0.4	29	14	26	11	-	10	12	8
013	BH8_1.7-1.8	-	-	26	-	1	10	12	8
014	BH9M_0.3-0.4	29	14	26	11	-	10	12	8
015	BH9M_1.8-1.9	-	-	26	-	1	10	12	8
016	BH10M_0.4-0.5	29	14	26	11	-	10	12	8
017	BH10M_1.7-1.8	-	-	26	-	1	10	12	8
018	BH10M_2.4-2.5	-	-	26	-	-	10	12	8
019	QD1	-	-	-	-	-	10	12	8
020	TS	-	-	-	-	-	-	12	-
021	TB	-	-	-	-	-	-	12	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction.

SAMPLE RECEIPT ADVICE

SE182724

CLIENT DETAILS

Client EI AUSTRALIA

Project E23915 242-244 Young St Waterloo NSW

SUMMARY OF ANALYSIS

No.	Sample ID	Exchangeable Cations and Cation Exchange Capacity	Fibre Identification in soil	Mercury in Soil	Moisture Content	Total Recoverable Elements in Soil/Waste
001	BH1M_0.3-0.4	-	2	1	1	7
002	BH1M_0.5-0.6	-	2	1	1	7
003	BH1M_1.2-1.3	13	-	1	1	7
004	BH1M_3.4-3.5	-	-	1	1	7
005	BH2_0.1-0.2	-	2	1	1	7
006	BH2_0.3-0.4	13	-	1	1	7
007	BH3_0.2-0.3	-	2	1	1	7
008	BH4_0.2-0.3	-	2	1	1	7
009	BH5_0.1-0.2	-	2	1	1	7
010	BH6_0.2-0.3	-	2	1	1	7
011	BH7_0.3-0.4	-	2	1	1	7
012	BH8_0.3-0.4	-	2	1	1	7
013	BH8_1.7-1.8	13	-	1	1	7
014	BH9M_0.3-0.4	-	2	1	1	7
015	BH9M_1.8-1.9	13	-	1	1	7
016	BH10M_0.4-0.5	-	2	1	1	7
017	BH10M_1.7-1.8	13	-	1	1	7
018	BH10M_2.4-2.5	-	-	1	1	7
019	QD1	-	-	1	1	7
020	TS	-	-	-	1	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction.

SAMPLE RECEIPT ADVICE

SE182724

CLIENT DETAILS

Client EI AUSTRALIA

Project E23915 242-244 Young St Waterloo NSW

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
022	QR1	1	7	10	12	8

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction.

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Sheet 1 of 1

Site: 242-244 Young Street, Wedderburn NSW

Project No: E2295

Laboratory: Envirolab Services
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM[B] / PAH
BT1	1	J	16/8/18	AM/PM		X				X													

7704

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 198566

Date Received: 16/8/18

Time Received: 13:00

Received by:

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [ ]

Sampler's Name (EI):	Received by (Envirolab) 3.8
Print: Dana Rizkallo	Print: Kevin Ng
Signature:	Signature:
Date: 16/8/18	Date: 16/8/18

Sampler's Comments:

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	Lab Email

Sample Login Details

Your reference	E23915, Waterloo
Envirolab Reference	198566
Date Sample Received	16/08/2018
Date Instructions Received	16/08/2018
Date Results Expected to be Reported	23/08/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11.2
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	Acid Extractable metalsin soil
QT1	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info
Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

source: [Untitled].pdf page: 10 SGS Ref: SE183173_COC

Sheet 1 of 1

Site: 242 - 244 YOUNG ST WATERLOO

Project No: E23915. E02

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	HM [A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM [A] /TRH/BTEX/PAHs	HM [A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS	ALUMINIUM	PHENOL (TOTAL)	HARDNESS	TCLP HM [B] / PAH
BH1M-1	S,2xVC,P	1	24/8/18	PM	X				X			X				X				X	X	X	
BH9M-1	↓	2	↓	↓	↓				↓			↓				↓				↓	↓	↓	
BH10M-1	↓	3	↓	↓	↓				↓			↓				↓				↓	↓	↓	
QD1-GW	↓	4	↓	↓	↓					X													
	↓		↓	↓	↓																		
BHR-1	↓	5	↓	↓	↓					X													
GWQTB1	VC	6	LAB		X						X												
GWQTS1	VC	7	PREPARED		X						X												

Comments

HM [A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM [B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

SGS EHS Alexandria Laboratory

SE183173 COC
Received: 28 – Aug – 2018

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Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (SGS):
Print: CHRIS SORDY	Print: Suba
Signature:	Signature:
Date: 28.8.18	Date: 29/08/18 @ 3:20

Sampler's Comments:
PLEASE CC
david.rizkalla@eiaustralia.com.au

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC March 2018 FORM v.4 - SGS

SAMPLE RECEIPT ADVICE

SE183173

CLIENT DETAILS

Contact	Chris Sordy
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	christopher.sordy@eiaustralia.com.au
Project	**E23915-E02 - 242-244 Young St Waterloo**
Order Number	**E23915-E02**
Samples	7

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Tue 28/8/2018
Report Due	Tue 4/9/2018
SGS Reference	**SE183173**

SUBMISSION DETAILS

This is to confirm that 7 samples were received on Tuesday 28/8/2018. Results are expected to be ready by COB Tuesday 4/9/2018. Please quote SGS reference SE183173 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Water
Date documentation received	28/8/2018	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	7.2ºC	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE183173

CLIENT DETAILS

Client EI AUSTRALIA

Project E23915-E02 - 242-244 Young St Waterloo

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Water	Metals in Water (Dissolved) by ICPOES	PAH (Polynuclear Aromatic Hydrocarbons) in Water	pH in water	Total Phenolics in Water	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH1M-1	1	1	22	1	1	10	79	8
002	BH9M-1	1	1	22	1	1	10	79	8
003	BH10M-1	1	1	22	1	1	10	79	8
004	GW-QD1	-	-	-	-	-	10	12	8
005	BHR-1	-	-	-	-	-	10	12	8
006	GWQTB1	-	-	-	-	-	-	12	-
007	GWQTS1	-	-	-	-	-	-	12	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction.

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SAMPLE RECEIPT ADVICE

SE183173

CLIENT DETAILS

Client EI AUSTRALIA

Project E23915-E02 - 242-244 Young St Waterloo

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	Trace Metals (Dissolved) in Water by ICPMS
001	BH1M-1	1	8
002	BH9M-1	1	8
003	BH10M-1	1	8
004	GW-QD1	1	7
005	BHR-1	1	7

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction.

Sheet 1 of 1

Site: 242-244 YOUNG ST WATERLOO

Project No: E23915.E02

Laboratory: **Envirolab Services**
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	Sample Matrix: WATER	SOIL	OTHERS (i.e. Fibro, Paint, etc.)	Analysis: HM[A] /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM[A] /TRH/BTEX/PAHs	HM[A] /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Dewatering Suite	sPOCAS	PFAS				TCLP HM[B] / PAH
QT-1-GW	1	S,P,VCx2	24-8-18	PM	X					X													

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Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 190432

Date Received: 28/8/18
Time Received: 15:30
Received By: LN
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Comments

HM[A]
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM[B]
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J= solvent washed, acid rinsed,Teflon sealed, glass jar
S= solvent washed, acid rinsed glass bottle
P= natural HDPE plastic bottle
VC= glass vial, Teflon Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table ☐

Sampler's Name (EI):	Received by (Envirolab)
Print: CHRIS SORDY	Print: LN
Signature:	Signature:
Date: 28-8-18	Date: 28/8/18

Sampler's Comments:
PLEASE CC
david.rizkalla@eiaustralia.com.au

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	David Rizkalla

Sample Login Details

Your reference	E23915.E02
Envirolab Reference	199432
Date Sample Received	28/08/2018
Date Instructions Received	28/08/2018
Date Results Expected to be Reported	04/09/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10.6
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	HM in water - dissolved
QT-1-GW	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info
Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

APPENDIX H
Laboratory Analytical Reports

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	David Rizkalla
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 95160722
Facsimile	(Not specified)
Email	david.rizkallar@eiaustralia.com.au
Project	**E23915 242-244 Young St Waterloo NSW**
Order Number	**E23915**
Samples	22

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE182724 R0**
Date Received	16/8/2018
Date Reported	23/8/2018

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin .

SIGNATORIES

Akheeqar Beniameen
Chemist

Bennet Lo
Senior Organic Chemist/Metals Chemist

Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ravee Sivasubramaniam
Hygiene Team Leader

Shane McDermott
Inorganic/Metals Chemist

VOC's in Soil [AN433] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
Benzene	mg/kg	0.1	<0.1	**0.4**	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	**1.8**	<0.1	**0.2**	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	**0.4**	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	**2.7**	<0.2	**0.2**	<0.2
o-xylene	mg/kg	0.1	<0.1	**0.5**	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	**3.3**	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	**5.8**	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	**0.3**	**2.0**	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018	QD1 SOIL - 15/8/2018 SE182724.019	TS SOIL - 15/8/2018 SE182724.020
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	[86%]
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	[88%]
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	[80%]
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	[80%]
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	[86%]
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	-
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	-
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	-

VOC's in Soil [AN433] Tested: 22/8/2018 (continued)

PARAMETER	UOM	LOR	TB SOIL - 15/8/2018 SE182724.021
Benzene	mg/kg	0.1	<0.1
Toluene	mg/kg	0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2
o-xylene	mg/kg	0.1	<0.1
Total Xylenes	mg/kg	0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	**0.4**	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018	QD1 SOIL - 15/8/2018 SE182724.019
TRH C6-C9	mg/kg	20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
TRH C10-C14	mg/kg	20	**100**	**32**	<20	<20	<20
TRH C15-C28	mg/kg	45	**1100**	**270**	<45	<45	**88**
TRH C29-C36	mg/kg	45	**190**	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	**180**	**50**	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	**180**	**48**	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**1300**	**300**	<90	<90	**110**
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	**1400**	**310**	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	**1400**	**350**	<210	<210	<210

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	**86**	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	**110**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	**110**	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**160**	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	**110**	<110	<110	<110	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	<210	<210

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 22/8/2018 (continued)

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018	QD1 SOIL - 15/8/2018 SE182724.019
TRH C10-C14	mg/kg	20	<20	<20	<20	**25**
TRH C15-C28	mg/kg	45	<45	<45	<45	**200**
TRH C29-C36	mg/kg	45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100
TRH >C10-C16	mg/kg	25	<25	<25	<25	**42**
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25	**42**
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	**210**
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	**220**
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210	**250**

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
Naphthalene	mg/kg	0.1	8.9	4.0	<0.1	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	6.7	2.4	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	5.6	2.0	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	5.8	1.6	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	1.4	0.5	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	9.2	4.2	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	20	16	<0.1	<0.1	0.1
Anthracene	mg/kg	0.1	7.3	3.2	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	24	9.7	<0.1	<0.1	0.2
Pyrene	mg/kg	0.1	23	9.0	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	0.1	11	4.0	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	10	3.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	11	2.9	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	3.9	1.3	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	10	2.9	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	4.1	1.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	0.5	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	3.7	0.9	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	14	4.0	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	14	4.0	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	14	4.0	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	170	69	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	150	65	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	0.2	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	1.0	0.9	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	0.3	0.3	<0.1
Fluoranthene	mg/kg	0.1	0.1	<0.1	2.0	1.6	<0.1
Pyrene	mg/kg	0.1	0.1	<0.1	1.9	1.6	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	0.9	1.0	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	0.8	0.9	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.8	1.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	0.4	0.5	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	0.7	1.0	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	0.3	0.5	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	0.3	0.5	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	<0.2	1.0	1.3	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	1.1	1.4	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	1.0	1.4	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	9.6	10	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	9.6	10	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 22/8/2018 (continued)

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	**0.2**	<0.1	<0.1	**0.1**	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.8**	<0.1	<0.1	**0.4**	<0.1
Anthracene	mg/kg	0.1	**0.3**	<0.1	<0.1	**0.1**	<0.1
Fluoranthene	mg/kg	0.1	**3.0**	**0.1**	<0.1	**1.2**	<0.1
Pyrene	mg/kg	0.1	**3.2**	**0.1**	<0.1	**1.2**	<0.1
Benzo(a)anthracene	mg/kg	0.1	**2.1**	<0.1	<0.1	**0.7**	<0.1
Chrysene	mg/kg	0.1	**1.9**	<0.1	<0.1	**0.6**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**2.5**	<0.1	<0.1	**0.6**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**1.2**	<0.1	<0.1	**0.3**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**2.3**	<0.1	<0.1	**0.6**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**1.1**	<0.1	<0.1	**0.3**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**1.0**	<0.1	<0.1	**0.3**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**3.1**	<0.2	<0.2	**0.8**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**3.1**	<0.3	<0.3	**0.9**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**3.1**	<0.2	<0.2	**0.8**	<0.2
Total PAH (18)	mg/kg	0.8	**20**	<0.8	<0.8	**6.3**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**20**	<0.8	<0.8	**6.3**	<0.8

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.1**	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.3**	<0.1	<0.1
Pyrene	mg/kg	0.1	**0.4**	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	**0.2**	<0.1	<0.1
Chrysene	mg/kg	0.1	**0.2**	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.2**	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	**0.1**	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.2**	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	**0.2**	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	**0.3**	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	**0.3**	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	**1.7**	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	**1.7**	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	**0.3**	**0.2**	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	**0.9**	**0.6**	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	**1**	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 22/8/2018 (continued)

PARAMETER	UOM	LOR	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	**0.5**	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	**0.4**	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	**5.1**	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	**0.1**	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	**6**	<1	<1	<1	<1

OC Pesticides in Soil [AN420] Tested: 22/8/2018 (continued)

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1
Lindane	mg/kg	0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1
Aldrin	mg/kg	0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2
Endrin	mg/kg	0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1
Isodrin	mg/kg	0.1	<0.1
Mirex	mg/kg	0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1

OP Pesticides in Soil [AN420] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7	<1.7	<1.7

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016
Dichlorvos	mg/kg	0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2
Malathion	mg/kg	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2
Methidathion	mg/kg	0.5	<0.5
Ethion	mg/kg	0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7

PCBs in Soil [AN420] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016
Arochlor 1016	mg/kg	0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1

pH in soil (1:5) [AN101] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017
pH	pH Units	0.1	7.6	9.6	8.9	8.8	7.2

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 17/8/2018

PARAMETER	UOM	LOR	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017
Exchangeable Sodium, Na	mg/kg	2	15	150	37	18	11
Exchangeable Sodium, Na	meq/100g	0.01	0.06	0.66	0.16	0.08	0.05
Exchangeable Sodium Percentage*	%	0.1	6.8	21.5	6.9	3.3	0.2
Exchangeable Potassium, K	mg/kg	2	9	64	10	11	50
Exchangeable Potassium, K	meq/100g	0.01	0.02	0.16	0.03	0.03	0.13
Exchangeable Potassium Percentage*	%	0.1	2.3	5.3	1.1	1.1	0.6
Exchangeable Calcium, Ca	mg/kg	2	160	290	410	420	4200
Exchangeable Calcium, Ca	meq/100g	0.01	0.81	1.5	2.1	2.1	21
Exchangeable Calcium Percentage*	%	0.1	84.9	47.8	87.5	87.5	93.6
Exchangeable Magnesium, Mg	mg/kg	2	7	96	13	23	150
Exchangeable Magnesium, Mg	meq/100g	0.02	0.06	0.78	0.11	0.19	1.3
Exchangeable Magnesium Percentage*	%	0.1	6.1	25.4	4.5	8.1	5.6
Cation Exchange Capacity	meq/100g	0.02	0.96	3.1	2.3	2.4	22

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
Arsenic, As	mg/kg	1	15	4	2	1	3
Cadmium, Cd	mg/kg	0.3	0.5	1.0	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	34	14	0.5	2.7	15
Copper, Cu	mg/kg	0.5	50	34	1.5	2.2	16
Lead, Pb	mg/kg	1	76	84	5	10	24
Nickel, Ni	mg/kg	0.5	59	30	<0.5	0.8	12
Zinc, Zn	mg/kg	2	140	1200	87	66	70

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
Arsenic, As	mg/kg	1	2	3	5	3	3
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.7	0.3	<0.3
Chromium, Cr	mg/kg	0.3	2.7	6.5	8.9	11	2.3
Copper, Cu	mg/kg	0.5	4.2	14	50	28	6.7
Lead, Pb	mg/kg	1	9	13	180	140	19
Nickel, Ni	mg/kg	0.5	2.2	21	4.3	10	1.9
Zinc, Zn	mg/kg	2	15	56	290	110	27

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
Arsenic, As	mg/kg	1	5	2	2	7	2
Cadmium, Cd	mg/kg	0.3	0.4	<0.3	0.3	1.0	<0.3
Chromium, Cr	mg/kg	0.3	9.3	5.5	1.9	12	2.3
Copper, Cu	mg/kg	0.5	31	16	5.0	52	2.0
Lead, Pb	mg/kg	1	73	33	61	210	19
Nickel, Ni	mg/kg	0.5	6.3	4.0	<0.5	5.8	0.6
Zinc, Zn	mg/kg	2	150	55	43	420	3.5

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018	QD1 SOIL - 15/8/2018 SE182724.019
Arsenic, As	mg/kg	1	9	9	2	4
Cadmium, Cd	mg/kg	0.3	2.6	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	5.0	5.2	3.5	8.5
Copper, Cu	mg/kg	0.5	7100	9.9	2.4	11
Lead, Pb	mg/kg	1	850	10	2	210
Nickel, Ni	mg/kg	0.5	12	2.1	0.7	3.4
Zinc, Zn	mg/kg	2	3800	18	2.1	54

Mercury in Soil [AN312] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
Mercury	mg/kg	0.05	**0.42**	**0.53**	<0.05	<0.05	<0.05

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
Mercury	mg/kg	0.05	<0.05	<0.05	**0.25**	**0.17**	<0.05

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
Mercury	mg/kg	0.05	**0.16**	**0.07**	**0.09**	**0.23**	<0.05

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018	QD1 SOIL - 15/8/2018 SE182724.019
Mercury	mg/kg	0.05	**0.09**	<0.05	<0.05	**0.11**

Moisture Content [AN002] Tested: 22/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH1M_1.2-1.3 SOIL - 15/8/2018 SE182724.003	BH1M_3.4-3.5 SOIL - 15/8/2018 SE182724.004	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005
% Moisture	%w/w	0.5	12	6.9	1.6	7.4	9.9

PARAMETER	UOM	LOR	BH2_0.3-0.4 SOIL - 15/8/2018 SE182724.006	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010
% Moisture	%w/w	0.5	9.3	11	12	8.9	6.4

PARAMETER	UOM	LOR	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH8_1.7-1.8 SOIL - 15/8/2018 SE182724.013	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014	BH9M_1.8-1.9 SOIL - 15/8/2018 SE182724.015
% Moisture	%w/w	0.5	5.3	9.0	5.5	4.4	2.8

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016	BH10M_1.7-1.8 SOIL - 15/8/2018 SE182724.017	BH10M_2.4-2.5 SOIL - 15/8/2018 SE182724.018	QD1 SOIL - 15/8/2018 SE182724.019	TS SOIL - 15/8/2018 SE182724.020
% Moisture	%w/w	0.5	11	21	16	13	4.3

Fibre Identification in soil [AN602] Tested: 21/8/2018

PARAMETER	UOM	LOR	BH1M_0.3-0.4 SOIL - 15/8/2018 SE182724.001	BH1M_0.5-0.6 SOIL - 15/8/2018 SE182724.002	BH2_0.1-0.2 SOIL - 15/8/2018 SE182724.005	BH3_0.2-0.3 SOIL - 15/8/2018 SE182724.007	BH4_0.2-0.3 SOIL - 15/8/2018 SE182724.008
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH5_0.1-0.2 SOIL - 15/8/2018 SE182724.009	BH6_0.2-0.3 SOIL - 15/8/2018 SE182724.010	BH7_0.3-0.4 SOIL - 15/8/2018 SE182724.011	BH8_0.3-0.4 SOIL - 15/8/2018 SE182724.012	BH9M_0.3-0.4 SOIL - 15/8/2018 SE182724.014
Asbestos Detected	No unit	-	No	No	No	No	No
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PARAMETER	UOM	LOR	BH10M_0.4-0.5 SOIL - 15/8/2018 SE182724.016
Asbestos Detected	No unit	-	No
Estimated Fibres*	%w/w	0.01	<0.01

VOCs in Water [AN433] Tested: 17/8/2018

PARAMETER	UOM	LOR	QR1 WATER - 15/8/2018 SE182724.022
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Naphthalene	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 17/8/2018

PARAMETER	UOM	LOR	QR1 WATER - 15/8/2018 SE182724.022
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 17/8/2018

PARAMETER	UOM	LOR	QR1 WATER - 15/8/2018 SE182724.022
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C36	µg/L	450	<450
TRH C10-C40	µg/L	650	<650
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 20/8/2018

PARAMETER	UOM	LOR	QR1 WATER - 15/8/2018 SE182724.022
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	<1
Zinc, Zn	µg/L	5	<5

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 17/8/2018

PARAMETER	UOM	LOR	QR1 WATER - 15/8/2018 SE182724.022
Mercury	mg/L	0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is referenced to Rayment and Lyons, 2011, sections 15D3 and 15N1.-
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples, Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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CERTIFICATE OF ANALYSIS 198566

Client Details

Client	EI Australia
Attention	Lab Email
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E23915, Waterloo**
Number of Samples	1 Soil
Date samples received	16/08/2018
Date completed instructions received	16/08/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	23/08/2018
Date of Issue	21/08/2018

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Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Steven Luong, Senior Chemist

Authorised By



Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		198566-1
Your Reference	UNITS	QT1
Date Sampled		16/08/2018
Type of sample		Soil
Date extracted	-	17/08/2018
Date analysed	-	20/08/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	97

svTRH (C10-C40) in Soil		
Our Reference		198566-1
Your Reference	UNITS	QT1
Date Sampled		16/08/2018
Type of sample		Soil
Date extracted	-	17/08/2018
Date analysed	-	18/08/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	108

Acid Extractable metals in soil		
Our Reference		198566-1
Your Reference	UNITS	QT1
Date Sampled		16/08/2018
Type of sample		Soil
Date prepared	-	17/08/2018
Date analysed	-	17/08/2018
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	10
Copper	mg/kg	15
Lead	mg/kg	26
Mercury	mg/kg	0.1
Nickel	mg/kg	4
Zinc	mg/kg	110

Moisture		
Our Reference		198566-1
Your Reference	UNITS	QT1
Date Sampled		16/08/2018
Type of sample		Soil
Date prepared	-	17/08/2018
Date analysed	-	20/08/2018
Moisture	%	11

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			17/08/2018	[NT]	[NT]	[NT]	[NT]	17/08/2018	[NT]
Date analysed	-			20/08/2018	[NT]	[NT]	[NT]	[NT]	20/08/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	76	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	76	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	72	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	73	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	81	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	78	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	99	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			17/08/2018	[NT]	[NT]	[NT]	[NT]	17/08/2018	[NT]
Date analysed	-			18/08/2018	[NT]	[NT]	[NT]	[NT]	17/08/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate o-Terphenyl	%		Org-003	117	[NT]	[NT]	[NT]	[NT]	113	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			17/08/2018	[NT]	[NT]	[NT]	[NT]	17/08/2018	[NT]
Date analysed	-			17/08/2018	[NT]	[NT]	[NT]	[NT]	17/08/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	105	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

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Client	EI AUSTRALIA
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Telephone	61 2 95160722
Facsimile	(Not specified)
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Project	**E23915-E02 - 242-244 Young St Waterloo**
Order Number	**E23915-E02**
Samples	7

LABORATORY DETAILS

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SGS Reference	**SE183173 R0**
Date Received	28/8/2018
Date Reported	4/9/2018

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

TRH/PAH- The Limit of Reporting (LOR) has been raised due to interferences from the sample matrix.

SIGNATORIES

Akheeqar Beniameen
Chemist

Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Teresa Nguyen
Organic Chemist

VOCs in Water [AN433] Tested: 31/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003	GW-QD1 WATER - 24/8/2018 SE183173.004	BHR-1 WATER - 24/8/2018 SE183173.005
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3	<3	<3	<3
Naphthalene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5	-	-
Chloromethane	µg/L	5	<5	<5	<5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3	-	-
Bromomethane	µg/L	10	<10	<10	<10	-	-
Chloroethane	µg/L	5	<5	<5	<5	-	-
Trichlorofluoromethane	µg/L	1	<1	<1	<1	-	-
Acetone (2-propanone)	µg/L	10	**13**	<10	<10	-	-
Iodomethane	µg/L	5	<5	<5	<5	-	-
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5	-	-
Allyl chloride	µg/L	2	<2	<2	<2	-	-
Carbon disulfide	µg/L	2	<2	<2	<2	-	-
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	<2	<2	<2	-	-
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Vinyl acetate	µg/L	10	<10	<10	<10	-	-
MEK (2-butanone)	µg/L	10	<10	<10	<10	-	-
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chloroform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	**1.8**	-	-
2-nitropropane	µg/L	100	<100	<100	<100	-	-
Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5	-	-
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-hexanone (MBK)	µg/L	5	<5	<5	<5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	-	-

VOCs in Water [AN433] Tested: 31/8/2018 (continued)

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003	GW-QD1 WATER - 24/8/2018 SE183173.004	BHR-1 WATER - 24/8/2018 SE183173.005
Isopropylbenzene (Cumene)	µg/L	0.5	**0.6**	<0.5	<0.5	-	-
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3	-	-
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	-	-
Total VOC	µg/L	10	**20**	<10	<10	-	-

VOCs in Water [AN433] Tested: 31/8/2018 (continued)

PARAMETER	UOM	LOR	GWQTB1 WATER - 24/8/2018 SE183173.006	GWQTS1 WATER - 24/8/2018 SE183173.007
Benzene	µg/L	0.5	<0.5	[96%]
Toluene	µg/L	0.5	<0.5	[96%]
Ethylbenzene	µg/L	0.5	<0.5	[93%]
m/p-xylene	µg/L	1	<1	[88%]
o-xylene	µg/L	0.5	<0.5	[87%]
Total Xylenes	µg/L	1.5	<1.5	-
Total BTEX	µg/L	3	<3	-
Naphthalene	µg/L	0.5	<0.5	-
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	-
Chloromethane	µg/L	5	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	-	-
Bromomethane	µg/L	10	-	-
Chloroethane	µg/L	5	-	-
Trichlorofluoromethane	µg/L	1	-	-
Acetone (2-propanone)	µg/L	10	-	-
Iodomethane	µg/L	5	-	-
1,1-dichloroethene	µg/L	0.5	-	-
Acrylonitrile	µg/L	0.5	-	-
Dichloromethane (Methylene chloride)	µg/L	5	-	-
Allyl chloride	µg/L	2	-	-
Carbon disulfide	µg/L	2	-	-
trans-1,2-dichloroethene	µg/L	0.5	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	2	-	-
1,1-dichloroethane	µg/L	0.5	-	-
Vinyl acetate	µg/L	10	-	-
MEK (2-butanone)	µg/L	10	-	-
cis-1,2-dichloroethene	µg/L	0.5	-	-
Bromochloromethane	µg/L	0.5	-	-
Chloroform (THM)	µg/L	0.5	-	-
2,2-dichloropropane	µg/L	0.5	-	-
1,2-dichloroethane	µg/L	0.5	-	-
1,1,1-trichloroethane	µg/L	0.5	-	-
1,1-dichloropropene	µg/L	0.5	-	-
Carbon tetrachloride	µg/L	0.5	-	-
Dibromomethane	µg/L	0.5	-	-
1,2-dichloropropane	µg/L	0.5	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	-	-
2-nitropropane	µg/L	100	-	-
Bromodichloromethane (THM)	µg/L	0.5	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	-	-
cis-1,3-dichloropropene	µg/L	0.5	-	-
trans-1,3-dichloropropene	µg/L	0.5	-	-
1,1,2-trichloroethane	µg/L	0.5	-	-
1,3-dichloropropane	µg/L	0.5	-	-
Dibromochloromethane (THM)	µg/L	0.5	-	-
2-hexanone (MBK)	µg/L	5	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	-	-
Chlorobenzene	µg/L	0.5	-	-
Bromoform (THM)	µg/L	0.5	-	-
cis-1,4-dichloro-2-butene	µg/L	1	-	-
Styrene (Vinyl benzene)	µg/L	0.5	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	-	-
1,2,3-trichloropropane	µg/L	0.5	-	-
trans-1,4-dichloro-2-butene	µg/L	1	-	-

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VOCs in Water [AN433] Tested: 31/8/2018 (continued)

PARAMETER	UOM	LOR	GWQTB1 WATER - 24/8/2018 SE183173.006	GWQTS1 WATER - 24/8/2018 SE183173.007
Isopropylbenzene (Cumene)	µg/L	0.5	-	-
Bromobenzene	µg/L	0.5	-	-
n-propylbenzene	µg/L	0.5	-	-
2-chlorotoluene	µg/L	0.5	-	-
4-chlorotoluene	µg/L	0.5	-	-
1,3,5-trimethylbenzene	µg/L	0.5	-	-
tert-butylbenzene	µg/L	0.5	-	-
1,2,4-trimethylbenzene	µg/L	0.5	-	-
sec-butylbenzene	µg/L	0.5	-	-
1,3-dichlorobenzene	µg/L	0.5	-	-
1,4-dichlorobenzene	µg/L	0.3	-	-
p-isopropyltoluene	µg/L	0.5	-	-
1,2-dichlorobenzene	µg/L	0.5	-	-
n-butylbenzene	µg/L	0.5	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	-	-
1,2,4-trichlorobenzene	µg/L	0.5	-	-
Hexachlorobutadiene	µg/L	0.5	-	-
1,2,3-trichlorobenzene	µg/L	0.5	-	-
Total VOC	µg/L	10	-	-

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 31/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003	GW-QD1 WATER - 24/8/2018 SE183173.004	BHR-1 WATER - 24/8/2018 SE183173.005
TRH C6-C9	µg/L	40	**150**	<40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	**160**	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	**160**	<50	<50	<50	<50

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 30/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003	GW-QD1 WATER - 24/8/2018 SE183173.004	BHR-1 WATER - 24/8/2018 SE183173.005
TRH C10-C14	µg/L	50	**170**	<50	<50	<50	<50
TRH C15-C28	µg/L	200	<400↑	<200	<200	<200	<200
TRH C29-C36	µg/L	200	<400↑	<200	<200	<200	<200
TRH C37-C40	µg/L	200	<400↑	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	**190**	<60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<1000↑	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<1000↑	<500	<500	<500	<500
TRH C10-C36	µg/L	450	<900↑	<450	<450	<450	<450
TRH C10-C40	µg/L	650	<1300↑	<650	<650	<650	<650
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	**190**	<60	<60	<60	<60

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 30/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003
Naphthalene	µg/L	0.1	<0.2↑	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.2↑	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.2↑	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.2↑	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.2↑	<0.1	<0.1
Fluorene	µg/L	0.1	<0.2↑	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.2↑	<0.1	<0.1
Anthracene	µg/L	0.1	<0.2↑	<0.1	<0.1
Fluoranthene	µg/L	0.1	**0.2**	**0.1**	<0.1
Pyrene	µg/L	0.1	**0.3**	**0.1**	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.2↑	<0.1	<0.1
Chrysene	µg/L	0.1	<0.2↑	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.2↑	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.2↑	<0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.2↑	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.2↑	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.2↑	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.2↑	<0.1	<0.1
Total PAH (18)	µg/L	1	**2**	<1	<1

pH in water [AN101] Tested: 29/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003
pH**	No unit	-	**6.3**	**7.2**	**5.0**

Conductivity and TDS by Calculation - Water [AN106] Tested: 29/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003
Conductivity @ 25 C	µS/cm	2	**880**	**850**	**290**

Total Phenolics in Water [AN289] Tested: 3/9/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003
Total Phenols	mg/L	0.05	<0.05	<0.05	<0.05

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 30/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003
Total Hardness by Calculation	mg CaCO3/L	5	**330**	**240**	**25**

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 30/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003	GW-QD1 WATER - 24/8/2018 SE183173.004	BHR-1 WATER - 24/8/2018 SE183173.005
Arsenic, As	µg/L	1	6	3	<1	4	<1
Cadmium, Cd	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium, Cr	µg/L	1	3	<1	<1	<1	<1
Copper, Cu	µg/L	1	85	2	65	54	<1
Lead, Pb	µg/L	1	3	1	2	3	<1
Nickel, Ni	µg/L	1	3	<1	2	2	<1
Zinc, Zn	µg/L	5	110	10	92	66	<5
Aluminium, Al	µg/L	5	59	29	15	-	-

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 30/8/2018

PARAMETER	UOM	LOR	BH1M-1 WATER - 24/8/2018 SE183173.001	BH9M-1 WATER - 24/8/2018 SE183173.002	BH10M-1 WATER - 24/8/2018 SE183173.003	GW-QD1 WATER - 24/8/2018 SE183173.004	BHR-1 WATER - 24/8/2018 SE183173.005
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present , measured by the conductivity, are present as NaCl.
AN289	Analysis of Total Phenols in Soil Sediment and Water: Steam distillable phenols react with 4-aminoantipyrine at pH 7.9±0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye analysed by Discrete Analyser. Reference APHA 5530 B/D.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoveerable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/ Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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CERTIFICATE OF ANALYSIS 199432

Client Details

Client	EI Australia
Attention	David Rizkalla
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E23915.E02**
Number of Samples	1 Water
Date samples received	28/08/2018
Date completed instructions received	28/08/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	04/09/2018
Date of Issue	03/09/2018

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Results Approved By
Jaimie Loa-Kum-Cheung, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Steven Luong, Senior Chemist

Authorised By



Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		199432-1
Your Reference	UNITS	QT-1-GW
Date Sampled		24/08/2018
Type of sample		Water
Date extracted	-	29/08/2018
Date analysed	-	30/08/2018
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	100
Surrogate toluene-d8	%	98
Surrogate 4-BFB	%	97

svTRH (C10-C40) in Water		
Our Reference	UNITS	199432-1
Your Reference		QT-1-GW
Date Sampled		24/08/2018
Type of sample		Water
Date extracted	-	02/09/2018
Date analysed	-	03/09/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	70

HM in water - dissolved		
Our Reference	UNITS	199432-1
Your Reference		QT-1-GW
Date Sampled		24/08/2018
Type of sample		Water
Date prepared	-	29/08/2018
Date analysed	-	29/08/2018
Arsenic-Dissolved	µg/L	3
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	4
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	<1
Zinc-Dissolved	µg/L	5

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			29/08/2018	[NT]	[NT]	[NT]	[NT]	29/08/2018	[NT]
Date analysed	-			30/08/2018	[NT]	[NT]	[NT]	[NT]	30/08/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	123	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	123	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	125	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	128	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	122	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	105	[NT]	[NT]	[NT]	[NT]	107	[NT]
Surrogate toluene-d8	%		Org-016	96	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			02/09/2018	[NT]	[NT]	[NT]	[NT]	02/09/2018	[NT]
Date analysed	-			03/09/2018	[NT]	[NT]	[NT]	[NT]	03/09/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
Surrogate o-Terphenyl	%		Org-003	81	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			29/08/2018	[NT]	[NT]	[NT]	[NT]	29/08/2018	[NT]
Date analysed	-			29/08/2018	[NT]	[NT]	[NT]	[NT]	29/08/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	107	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

APPENDIX I
QA/QC Assessment

I1 QUALITY CONTROL PROGRAM

I1.1 INTRODUCTION

For the purpose of assessing the quality of data presented in this Contaminant Delineation Report, EI collected field QC samples for analysis. The primary laboratory, SGS Australia Pty Ltd (SGS) and secondary laboratory, Envirolab Services Pty Ltd (Envirolab) also prepared and analysed internal QC samples. Details of the field and laboratory QC samples, with the allowable data acceptance ranges are presented in **Table I-1**.

Table I-1 Sampling Data Quality Indicators

QA/QC Measures	Data Quality Indicators
Precision – A quantitative measure of the variability (or reproducibility) of data	Data precision would be assessed by reviewing the performance of blind field duplicate sample sets, through calculation of relative percentage differences (RPD). Data precision would be deemed acceptable if RPDs are found to be less than 30%. RPDs that exceed this range may be considered acceptable where: Results are less than 10 times the limits of reporting (LOR); Results are less than 20 times the LOR and the RPD is less than 50%; or Heterogeneous materials or volatile compounds are encountered.
Accuracy – A quantitative measure of the closeness of reported data to the "true" value	Data accuracy would be assessed through the analysis of: Method blanks, which are analysed for the analytes targeted in the primary samples; Matrix spike and matrix spike duplicate sample sets; Laboratory control samples; and Calibration of instruments against known standards.
Representativeness – The confidence (expressed qualitatively) that data are representative of each medium present onsite	To ensure the data produced by the laboratory is representative of conditions encountered in the field, the laboratory would carry out the following: Blank samples will be run in parallel with field samples to confirm there are no unacceptable instances of laboratory artefacts; Review of relative percentage differences (RPD) values for field and laboratory duplicates to provide an indication that the samples are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and The appropriateness of collection methodologies, handling, storage and preservation techniques will be assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation / transport methods).

QA/QC Measures	Data Quality Indicators
Completeness – A measure of the amount of useable data from a data collection activity	Analytical data sets acquired during the assessment will be evaluated as complete, upon confirmation that: Standard operating procedures (SOPs) for sampling protocols were adhered to; and Copies of all COC documentation are presented, reviewed and found to be properly completed. It can therefore be considered whether the proportion of "useable data" generated in the data collection activities is sufficient for the purposes of the land use assessment.
Comparability – The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event	Given that a reported data set can comprise several data sets from separate sampling episodes, issues of comparability between data sets are reduced through adherence to SOPs and regulator-endorsed or published guidelines and standards on each data gathering activity. In addition the data will be collected by experienced samplers and NATA-accredited laboratory methodologies will be employed in all laboratory testing programs.

I1.2 CALCULATION OF RELATIVE PERCENTAGE DIFFERENCE (RPD)

The RPD values were calculated using the following equation:

$$RPD = \frac{|C_O - C_R|}{[(C_O + C_R)/2]} \times 100$$

Where:

C_O = Concentration obtained for the primary sample; and

C_R = Concentration obtained for the blind replicate or split duplicate sample.

I2 FIELD QA/QC DATA EVALUATION

The field quality assurance/quality control (QA/QC) soil and groundwater samples collected during the investigations were as follows:

- Blind field duplicates;
- Inter-laboratory duplicates;
- Trip blanks;
- Trip spikes; and
- Rinsate blanks.

Analytical results for tested soil and groundwater QA/QC samples, including calculated RPD values between primary and duplicate samples, are presented in **Table I-2** and **Table I-3**, respectively.

I2.1 SOIL INVESTIGATION & SOIL VALIDATION

I2.1.1 Blind Field Duplicates

One blind field duplicate (BFD) soil sample were collected in total, as follows:

- Sample QD1 was collected from the primary sample BH1M_0.3-0.4 on 15 August 2018.

The preparation of the BFD samples involved the collection of a bulk quantity of soil from the same sampling point without mixing, before dividing the material into identical sampling vessels. The duplicate sample was then presented blind to the primary laboratory (SGS) to avoid any potential analytical bias. BFD soil sample was analysed for TRHs, BTEX, and selected heavy metals. Calculated RPD values were found to be within the Data Acceptance Criteria, with the exception of F2 (124.32%), F3 (144.37%), arsenic (115.79%), chromium (120.00%), copper (127.87%), lead (93.71%), mercury (116.98%), nickel (178.21%) and zinc (88.66%). These exceedances are not considered to be significant due to the heterogeneity of the fill. Duplicate samples for lead was identified to be higher than the primary sample, however, did not exceeded identified soil investigation criteria.

I2.1.2 Inter-Laboratory Duplicate

Sample QT1 was collected as an inter-laboratory duplicate (ILD) of the primary sample BH1M_0.3-0.4 on 7 May 2018. The preparation of the ILD sample was identical to the BFD sample, as described above, and was analysed for TRHs, BTEX, and selected heavy metals. The calculated RPD values were found to be within the Data Acceptance Criteria, with the exception of F2 (113.04%), F3 (171.43%), arsenic (85.71%), chromium (109.09%), copper (107.69%), lead (98.04%), mercury (123.08%) and nickel (174.60%). These exceedances are not considered to be significant due to the heterogeneity of the fill.

I2.1.3 Trip Blank

One trip blank (TB1) sample was prepared and analysed by the primary laboratory for BTEX. Analytical results for this sample were below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.

I2.1.4 Trip Spike

One trip spike (TS1) sample was submitted to the primary laboratory for BTEX analysis, the results for which were reported within the RPD acceptance levels for trip spike recovery. It was therefore concluded that satisfactory sample transport and handling conditions were achieved.

I2.1.5 Rinsate Blank

One rinsate blank sample QR1 was submitted to the primary laboratory for TRHs, BTEX, and selected heavy metals analysis, the results for which were reported below laboratory LOR; therefore, it was concluded that decontamination procedures performed during the field works had been effective.

I2.2 GROUNDWATER INVESTIGATION

I2.2.1 Blind Field Duplicates

One groundwater BFD sample was collected, as follows:

- GW-QD1 was collected from the primary sample BH1M during fieldwork on 24 August 2018.

The preparation of BFD samples involved the decanting of the groundwater collected from the respective monitoring well into two separate groups of appropriately labelled sampling containers. Volumes were split equally between the groups of sampling bottles such that the sample contained in each individual bottle, contained a similar proportion of each water volume. Sample mixing did not occur prior to decanting, in order to preserve the concentrations of volatiles potentially present within the sample. The duplicate sample was then presented blind to the primary laboratory (SGS) to avoid any potential analytical bias. The BFDs were analysed for TRHs, BTEX, and selected heavy metals.

The RPD values calculated for all the analytes tested were found to be within the Data Acceptance Criteria (DAC), with the exception of copper (185.71%), lead (100.00%), mercury (66.67%) and zinc (147.37%). These exceedances are not considered to be significant due variation that occurs in heavy metal concentrations in urban areas.

I2.2.2 Inter-Laboratory Duplicate

One ILD sample was collected in total, as follows:

- GW-QT1 was collected from the primary sample BH1M during fieldwork on 24 August 2018.

The preparation of a groundwater ILD sample was identical to the BFD sample as described above and also analysed for TRHs, BTEX, and selected heavy metals. The RPD values calculated for the ILD samples were found to be within the Data Acceptance Criteria, with the exception of copper (66.67%) and zinc (66.67%). These exceedances are not considered to be significant due to the marginal RPD exceedances and the concentration for copper and zinc duplicates were less than ten times the laboratory detection limit.

I2.2.3 Trip Blanks

One trip blank sample (GWTB1), prepared by the primary laboratory, was analysed for BTEX by the primary laboratory during groundwater testing. TB results were reported below the laboratory LOR, indicating that ideal sample transport and handling conditions were achieved.

I2.2.4 Trip Spikes

One TS sample (GWTS1) was submitted to the primary laboratory for BTEX analysis, the results for which were all reported within the RPD acceptance levels for trip spike recovery. It was therefore concluded that satisfactory sample transport and handling conditions were achieved.

I2.2.5 Rinsate Blanks

One rinsate blank sample (BHR-1) were submitted to the primary laboratory for TRHs, BTEX and selected heavy metals analyses. Analytical results were reported below the laboratory LOR for all analytes. In view of this finding it was concluded that decontamination procedures performed during the field works had been effective.

I2.4 ASSESSMENT OF FIELD QA/QC DATA

All samples were classified in the field with respect to soil/fill characteristics and any observable signs of contamination based on visual and odour assessment, in regards to soil and groundwater.

All samples, including field QC samples, were transported to the primary and secondary laboratories under strict Chain-of-Custody conditions and appropriate copies of relevant documentation were included in the respective reports.

The overall completeness of documentation produced under the field program of the subject assessment was considered to be adequate for the purposes of drawing valid conclusions regarding the environmental condition of the site.

Based on the results of the field QA/QC data EI considered the field QA/QC programme carried out during the investigations to be appropriate and the results to be acceptable.

Table H-2 RPD QC for soil

Sample identification	Description	TRH				BTEX				Heavy Metals							
		F1*	F2**	F3 (>C_{16} - C_{34})	F4 (>C_{34} - C_{40})	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicates - Soil Validation																	
BH1M_0.3-0.4	Fill	<25	180	1300	<120	<0.1	<0.1	<0.1	<0.3	15	0.5	34	50.0	76.0	0.42	59	140
QD1	BFD of BH1M_0.3-0.4	<25	42	210	<120	<0.1	<0.1	<0.1	<0.3	4	<0.3	8.5	11.0	210	0.11	3.4	54
RPD		*0.00*	124.32	144.37	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	115.79	*50.00*	120.00	127.87	93.71	116.98	178.21	88.66
Inter-laboratory Duplicate - Soil Validation																	
BH1M_0.3-0.4	Fill	<25	180	1300	<120	<0.1	<0.1	<0.1	<0.3	15	0.5	34	50	76	0.42	59	140
QT1	ILD of BH1M_0.3-0.4	<25	<50	<100	<100	<0.2	<0.5	<1	<3	6	<0.4	10	15	26	0.1	4	110
RPD		*0.00*	113.04	171.43	*NA*	*NA*	*NA*	*NA*	*NA*	85.71	*22.22*	109.09	107.69	98.04	123.08	174.60	*24.00*
Trip Blank/Trip Spike																	
TB1	Sand	-	-	-	-	<0.1	<0.1	<0.1	<0.3	-	-	-	-	-	-	-	-
TS1	Sand	-	-	-	-	[86%]	[88%]	[80%]	[80%]	-	-	-	-	-	-	-	-
Rinsate/Rinsate Blanks																	
QR1	De-ionised water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	<1	<1	<0.1	<1	<5

NOTE: All results are reported in mg/kg (soil) or µg/L (water)

0.00	RPD calculated by halving detection limit exceeds 30-50% range referenced from AS4482.1 (2005)
80.00	RPD exceeds 30-50% range referenced from AS4482.1 (2005)

Table H-3 RPD QC for groundwater

Sample identification	Description	TRH				BTEX				Heavy Metals							
		F1*	F2**	F3 (>C_{16} - C_{34})	F4 (>C_{34} - C_{40})	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate - Groundwater Investigation																	
GW-QD1		<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	3	<0.1	<1	2	1	<1	<0.1	10
GW-QD1	BFD of BH9M-1	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	4	<0.1	<1	54	3	2	<0.1	66
RPD		*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*28.57*	*0.00*	*0.00*	185.71	100.00	66.67	*0.00*	147.37
Inter-laboratory Duplicate - Groundwater Investigation																	
GW-QD1		<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	3	<0.1	<1	2	1	<1	<0.1	10
GW-QD1	ILD of BH9M-1	<10	<50	<100	<100	<1	<1	<1	<3	3	<0.1	<1	4	<1	<0.05	<1	5
RPD		*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	*0.00*	*0.00*	*0.00*	66.67	*0.00*	*NA*	*NA*	66.67
Trip Blank/Trip Spike																	
GWTB1	De-ionised water	NS	NS	NS	NS	<0.5	<0.5	<0.5	<1.5	NS	NS	NS	NS	NS	NS	NS	NS
GWTS1	De-ionised water	NS	NS	NS	NS	[96%]	[96%]	[93%]	[88%]	NS	NS	NS	NS	NS	NS	NS	NS
Rinsate/Rinsate Blanks																	
BHR-1	De-ionised water	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	<1	<1	<0.1	<1	<5

NOTE: All results are reported in mg/kg (soil) or µg/L (water)

66.67 RPD calculated by halving detection limit exceeds 30-50% range referenced from AS4482.1 (2005)

66.67 RPD exceeds 30-50% range referenced from AS4482.1 (2005)

I3 LABORATORY QA/QC

I3.1 LABORATORY ACCREDITATION

To undertake all analytical testing, EI commissioned SGS as the primary laboratory and Envirolab as the secondary laboratory. SGS and Envirolab, both established analytical laboratories which operate in accordance with the guidelines set out in ISO/IEC Guide 25 "General requirements for the competence of calibration and testing laboratories", conducted all respective analyses using National Association Testing Authorities (NATA)-registered procedures.

In relation to contingencies, should the pre-determined DQOs not be achieved, in accordance with each laboratory's QC policy (**Appendix J**), respective tests would be accordingly repeated. Should the results again fall outside the DQOs, then sample heterogeneity may be assumed and written comment will be provided to this effect on the final laboratory certificate. The laboratory QA/QC reports are included in **Appendix J**.

I3.2 SAMPLE HOLDING TIMES

Sample holding times were within the laboratory DQOs, which were consistent with standard environmental protocols as tabulated in **Appendix J**, **Tables QC1** and **QC2**.

I3.3 TEST METHODS AND PRACTICAL QUANTITATION LIMITS (PQLS)

Practical Quantitation Limits for all tested parameters during the assessment of soils and groundwater are presented in **Appendix J**, **Tables QC3** and **QC4, with the exception of samples with the following job;**

- SE183173 (Groundwater Samples) – 3 samples for pH in water.

I3.4 METHOD BLANKS

Concentrations of all parameters in method blanks during the assessment were below the laboratory PQLs and were therefore within the DAC.

I3.5 LABORATORY DUPLICATE SAMPLES

The Laboratory Duplicate Samples (LDS) for the analysis batches showed calculated RPDs that were within acceptable ranges and conformed to the DAC, with the exception of samples within the following job:

- SE182724 (Soil Samples) – three samples for total recoverable metals.

I3.6 LABORATORY CONTROL SAMPLES

The Laboratory Control Samples for the analysis batches were within acceptable ranges and conformed to the DAC.

I3.7 MATRIX SPIKES

All matrix spikes for the respective sample batches were within acceptable ranges and conformed to the DAC, with the exception of samples within the following job:

- SE182724 (Soil Samples) – one sample for mercury, three samples for total recoverable metals and 3 samples for TRH.

I3.8 SURROGATE

Recovery results for all surrogate samples conformed to the DAC.

I3.9 CONCLUDING REMARK

Based on the laboratory QA/QC results EI considers that although one discrepancy was identified, which was attributed to the non-homogenous nature of the submitted sample, the data generally confirms that the analytical results for the various phases of laboratory testing were valid and useable for interpretation purposes.

APPENDIX J
Laboratory QA/AC Policies and DQOs

SGS Environmental Services is accredited by NATA for Chemical Testing (Reg.No.2562) and Quality System compliance to ISO/IEC 17025. The QC parameters contained within are designed to meet NEPM 1999 requirements.

Quality Control samples included in any analytical run are listed below.

Reagent/Analysis Blank (BLK) **Method Blank (MB)**	Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. A reagent blank is prepared and analysed with every batch of samples plus with each new batch of solvent prior to use.
Sample Matrix Spike (MS) & Matrix Spike Duplicate (MSD)	Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water may be used. A duplicate spiked sample is analysed at least every 20 samples.
Surrogate Spike (SS)	At least one but up to three surrogate compounds are added to all samples requiring analysis for organics prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples. Where possible they are surrogate compounds recommended by the USEPA.
Control Matrix Spike (CMS)	To ensure spike recoveries can be determined for every batch of samples a control matrix is spiked with identical concentrations of target analyte(s) and then analysed. These results allow recoveries to be determined in the event that the matrix spikes are unusable (eg. matrix spikes performed on heavily contaminated samples). These are analysed at least every 20 samples.
Internal Standard (IS)	Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments. Where possible they are standard compounds recommended by the USEPA.
Lab Duplicates (D)	A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.
Lab Control Standards/Samples (LCS)	Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity. Thereafter they are analysed at least every one in 20 samples plus at the end of each analytical run. This data is not reported.
Continuous Calibration Verification (CCV) or **Calibration Check Standard & Blank**	A calibration check standard or CCV and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift. Calibration Standards are checked old versus new with a criteria of ±10%

Quality Assurance Programs are listed below:

Statistical analysis of Quality Control data (SQC)	Quality control data is plotted on control charts using the APHA procedure with warning and control limits at 2 and 3 standard deviations respectively. See also QMS Procedure "Statistical Quality Control".
Certified Reference Materials (CRM/SRM)	Certified Reference Materials and Standards are regularly analysed. These materials/standards have certified reference values for various parameters.
Proficiency Testing	Regular proficiency test samples are analysed by our laboratories. SGS Environmental participates in a number of programs. Results and proficiency status are compiled and sent to participating laboratory post data interpretation. Failure to comply with acceptable values result in further investigations.
Inter-laboratory & Intra-laboratory Testing	SGS Environmental Services has schedules in the Quality Systems to participate in Inter/Intra laboratory testing conducted internally and by other parties.
Data Acceptance Criteria Unless otherwise specified in the method or method manual the following general criteria apply to all inorganic tests. All recoveries are to be reported to 3 significant figures.	Failure to meet the internal acceptance criteria will result in sample batch repeats dependent upon investigation outcomes. For data to be accepted: <u>Inorganics (water samples)</u> • For all inorganic analytes the Reagent & Method Blanks must be less than the LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within ±15%. • Control Standards must be 80-120% of the accepted value. • The Calibration Check Blanks must be less than the LOR. • Lab Duplicates RPD to be <15%*. Note: If client <u>field</u> duplicates do not meet this criteria it may indicate heterogeneity and shall be noted on the data reports for QC samples. • Sample (and if applicable Control) Matrix Spike♬ Duplicate recovery RPD to be <30%. • Where CRMs are used, results to be within ± 2 standard deviations of the expected value. <u>Inorganics (soil samples)</u> • For all inorganic analytes the Reagent & Method Blanks must be less than the LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within ±15%. • Control Standards must be 80-120% of the accepted value. • The Calibration Check Blanks must be less than the LOR. • Lab duplicate RPD to be <30%* for sample results greater than 10 times LOR. • Sample Matrix Spike Duplicate (MS♬/MSD) recovery RPD to be <30%. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike (CMS/D). • Where CRMs are used, results to be within ± 2 standard deviations of the expected value.

Data Acceptance Criteria Unless otherwise specified in the method or method manual the following general criteria apply to all organic tests. All recoveries are to be reported to 3 significant figures.	Organics • Volatile & extractable Reagent & Method Blanks must contain levels less than or equal to LOR. • The Calibration Check Standards or Continuous Calibration Verification (CCV) must be within ±25%. Some analytes may have specific criteria. • Control Standards (LCS/CMS) and Certified Reference Materials (CRM) recoveries are to be within established control limits or as a default 60-140% unless compound specific limits apply. • Retention times are to vary by no more than 0.2 min. • **At least two of three** routine level soil sample Surrogate Spike (SS) recoveries are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as acceptance criterion. Any recoveries outside these limits will have comment. • Water sample Surrogates Spike (SS) recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion. Any recoveries outside these limits will have comment. • Lab Duplicates (D) must have a RPD <30%*. • Sample Matrix Spike Duplicate (MS♬/MSD) recovery RPD to be <30%. In the event that the matrix spike has been applied to samples whose matrix or contamination is problematic to the method then these acceptance criteria apply to the Control Matrix Spike (CMS/D).

*Only if results are at least 10 times the LOR otherwise no acceptance criteria for RPD's apply. Application of more stringent criteria shall be applied for clean water sample from water boards and any other nominated client contracts. Nominal 10xLOR criteria are dropped to 5xLOR where specified.
♬Matrix do not readily equate to definitive recovery due to inherent matrix interferences and thus do not have recovery compliance values set. As a guide inorganic recoveries should be between 70-130% and for organics 60-130%

Batch Structure Summary

An analytical batch is nominally considered as 20 samples or smaller. As a standard template the following should be **used as a guide** according to the above Quality Control Types:

1	MB	16	UNK_DUP
2	STD1	17	MS
3	STD2	18	MS_DUP
4	STD3	19	UNK 11
5	LCS	20	UNK 12
6	BLK	21	UNK 13
7	UNK 1	22	UNK 14
8	UNK 2	23	UNK 15
9	UNK 3	24	UNK 16
10	UNK 4	25	UNK 17
11	UNK 5	26	UNK 18
12	UNK 6	27	UNK 19
13	UNK 7	28	UNK 20 (SS if applicable)
14	UNK 8	29	UNK_DUP
15	UNK 9	30	CCV
16	UNK 10 (SS if applicable)	31	CRM / SRM / CMS / LCS

Table QC1 - Containers, Preservation Requirements and Holding Times - Soil			
Parameter	Container	Preservation	Maximum Holding Time
Acid digestible metals and metalloids - Total and TCLP (As,Cd.,Cu,Cr,Ni,Pb,Zn)	Glass with Teflon Lid	Nil	6 months
Mercury	Glass with Teflon Lid	Nil	28 days
TPH / BTEX / VOC / SVOC / CHC	Glass with Teflon Lid	4^oC, zero headspace	14 days
PAHs (total and TCLP)	Glass with Teflon Lid	4^oC [1]	14 days
Phenols	Glass with Teflon Lid	4^oC [1]	14 days
OCPs, OPPs and total PCBs	Glass with Teflon Lid	4^oC [1]	14 days
Asbestos	Sealed Plastic Bag	Nil	N/A

Table QC2 - Containers, Preservation Requirements and Holding Times - Water			
Parameter	Container Volume (mL)	Preservation	Maximum Holding Time
Heavy Metals	125mL Plastic	Field filtration 0.45μm HNO_3 / 4^oC	6 months
Cyanide	125mL Amber Glass	pH > 12 NaOH / 4^oC	6 months
TPH (C6-C9) / BTEX / VOCs SVOCs / CHCs	4 x 43mL Glass	HCl / 4^oC [1]	14 days
TPH (C10-C36) / PAH / Phenolics OCP / OPP / TDS / pH	3 x 1L Amber Glass	None / 4^oC [1]	28 days

Notes: [1] = Extraction within 14 days, Analysis within 40 days.

Table QC3 - Analytical Parameters, PQLs and Methods - Soil			
Parameter	**Unit**	**PQL**	**Method Reference**
Metals in Soil			
Arsenic - As[1]	mg / kg	1	USEPA 200.7
Cadmium - Cd[1]	mg / kg	0.5	USEPA 200.7
Chromium - Cr[1]	mg / kg	1	USEPA 200.7
Copper - Cu[1]	mg / kg	1	USEPA 200.7
Lead - Pb[1]	mg / kg	1	USEPA 200.7
Mercury - Hg[2]	mg / kg	0.1	USEPA 7471A
Nickel - Ni[1]	mg / kg	1	USEPA 200.7
Zinc - Zn[1]	mg / kg	1	USEPA 200.7
Total Petroleum Hydrocarbons (TPHs) in Soil			
C_6-C_9 fraction	mg / kg	25	USEPA 8260
C_{10}-C_{14} fraction	mg / kg	50	USEPA 8000
C_{15}-C_{28} fraction	mg / kg	100	USEPA 8000
C_{29}-C_{36} fraction	mg / kg	100	USEPA 8000
BTEX in Soil			
Benzene	mg / kg	1	USEPA 8260
Toluene	mg / kg	1	USEPA 8260
Ethylbenzene	mg / kg	1	USEPA 8260
m & p Xylene	mg / kg	2	USEPA 8260
o- Xylene	mg / kg	1	USEPA 8260
Other Organic Contaminants in Soil			
PAHs	mg / kg	0.05-0.2	USEPA 8270
CHCs	mg / kg	1	USEPA 8260
VOCs	mg / kg	1	USEPA 8260
SVOCs	mg / kg	1	USEPA 8260
OCPs	mg / kg	0.1	USEPA 8140, 8080
OPPs	mg / kg	0.1	USEPA 8140, 8080
PCBs	mg / kg	0.1	USEPA 8080
Phenolics	mg / kg	5	APHA 5530
Asbestos			
Asbestos	mg / kg	Presence / Absence	AS4964-2004

Notes:

1. Acid Soluble Metals by ICP-AES
2. Total Recoverable Mercury

Table QC4 - Analytical Parameters, PQLs and Methods - Groundwater

Parameter	Unit	PQL	Method
Heavy Metals			
Antimony - Sb	µg/L	1	USEPA 200.8
Arsenic - As	µg/L	1	USEPA 200.8
Beryllium - Be	µg/L	0.5	USEPA 200.8
Cadmium - Cd	µg/L	0.1	USEPA 200.8
Chromium - Cr	µg/L	1	USEPA 200.8
Cobalt - Co	µg/L	1	USEPA 200.8
Copper - Cu	µg/L	1	USEPA 200.8
Lead - Pb	µg/L	1	USEPA 200.8
Mercury - Hg	µg/L	0.5	USEPA 7471A
Molybdenum - Mo	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Selenium - Se	µg/L	1	USEPA 200.8
Silver - Ag	µg/L	1	USEPA 200.8
Tin (inorg.) - Sn	µg/L	1	USEPA 200.8
Nickel - Ni	µg/L	1	USEPA 200.8
Zinc - Zn	µg/L	1	USEPA 200.8
Total Petroleum Hydrocarbons (TPHs)			
C_6-C_9 fraction	µg/L	10	USEPA 8220A / 8000
C_{10}-C_{14} fraction	µg/L	50	USEPA 8000
C_{15}-C_{28} fraction	µg/L	100	USEPA 8000
C_{29}-C_{36} fraction	µg/L	100	USEPA 8000
BTEX			
Benzene	µg/L	1	USEPA 8220A
Toluene	µg/L	1	USEPA 8220A
Ethylbenzene	µg/L	1	USEPA 8220A
m- & p-Xylene	µg/L	2	USEPA 8220A
o-Xylene	µg/L	1	USEPA 8220A
Polyciclic Aromatic Hydrocarbons (PAHs)			
PAHs	µg/L	0.1	USEPA 8270
Benzo(a)pyrene	µg/L	0.01	USEPA 8270
OrganoChlorine Pesticides (OCPs)			
Aldrin	µg/L	0.001	USEPA 8081
Chlordane	µg/L	0.001	USEPA 8081
DDT	µg/L	0.001	USEPA 8081
Dieldrin	µg/L	0.001	USEPA 8081
Endosulfan	µg/L	0.001	USEPA 8081
Endrin	µg/L	0.001	USEPA 8081
Heptachlor	µg/L	0.001	USEPA 8081
Lindane	µg/L	0.001	USEPA 8081
Toxaphene	µg/L	0.001	USEPA 8081

Parameter	Unit	PQL	Method
Chlorinated Hydrocarbons (CHCs)			
1,2-dichlorobenzene	µg/L	1	USEPA 8260B
1,3-dichlorobenzene	µg/L	1	USEPA 8260B
1,4-dichlorobenzene	µg/L	1	USEPA 8260B
1,2,3-trichlorobenzene	µg/L	1	USEPA 8260B
1,2,4-trichlorobenzene	µg/L	1	USEPA 8260B
Hexachlorobutadeine	µg/L	1	USEPA 8260B
1,1,2-trichloroethane	µg/L	1	USEPA 8260B
Hexachloroethane	µg/L	10	USEPA 8270D
Other CHCs	µg/L	1	USEPA 8260B
Volatile Organic Compounds (VOCs)			
Aniline	µg/L	10	USEPA 8260B
2,4-dichloroaniline	µg/L	10	USEPA 8260B
3,4-dichloroaniline	µg/L	10	USEPA 8260B
Nitrobenzene	µg/L	50	USEPA 8260B
2,4-dinitrotoluene	µg/L	50	USEPA 8260B
2,4,6-trinitrotoluene	µg/L	50	USEPA 8260B
Phenolic Compounds			
Phenol	µg/L	10	USEPA 8041
2-chlorophenol	µg/L	10	USEPA 8041
4-chlorophenol	µg/L	10	USEPA 8041
2, 4-dichlorophenol	µg/L	10	USEPA 8041
2,4,6-trichlorophenol	µg/L	10	USEPA 8041
2,3,4,6-tetrachlorophenol	µg/L	10	USEPA 8041
Pentachlorophenol	µg/L	10	USEPA 8041
2,4-dinitrophenol	µg/L	10	USEPA 8041
Miscellaneous Parameters			
Total Cyanide	µg/L	5	APHA 4500C&E-CN
Fluoride	µg/L	10	APHA 4500 F-C
Salinity (TDS)	mg/L	1	APHA 2510
pH	units	0.1	APHA 4500H+
OrganoPhosphate Pesticides (OPPs)			
Azinphos Methyl	µg/L	0.01	USEPA 8141
Chloropyrifos	µg/L	0.01	USEPA 8141
Diazinon	µg/L	0.01	USEPA 8141
Dimethoate	µg/L	0.01	USEPA 8141
Fenitrothion	µg/L	0.01	USEPA 8141
Malathion	µg/L	0.01	USEPA 8141
Parathion	µg/L	0.01	USEPA 8141
Temephos	µg/L	0.01	USEPA 8141
Polychlorinated Biphenyls (PCBs)			
Individual PCBs	µg/L	0.01	USEPA 8081

Table QC5 - QC Sample Data Acceptance Criteria

QC Sample Type	Method of Assessment	Acceptable Range
Field QC		
Blind Duplicates and Split Samples	The assessment of split duplicate is undertaken by calculating the Relative Percent Difference (RPD) of the duplicate concentration compared with the primary sample concentration. The RPD is defined as: $RPD = 100 \times \frac{\lvert X_1 - X_2 \rvert}{\text{mean}(X1, X2)}$ Where: X_1 and X_2 are the concentrations of the primary and duplicate samples.	The acceptable range depends upon the levels detected: - 0-150% RPD (when the average concentration is <5 times the LOR/PQL) - 0-75% RPD (when the average concentration is 5 to 10 times the LOR/PQL) - 0-50% RPD (when the average concentration is >10 times the LOR/PQL)
Rinsate & Trip Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL
Laboratory prepared Trip Spike	The Trip Spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70 - 130%
Laboratory QC		
Laboratory Duplicates	Assessment of Lab Duplicate RPD as per Blind Duplicates and Split Samples.	Lab Duplicate RPD < 15% (Inorganics) Lab Duplicate RPD < 30% (Organics) for sample results > 10 LOR
Surrogates	Assessment is undertaken by determining the percent recovery of the known surrogate spike (SS) or addition to the sample.	at least 2 SS recoveries to be within 70-130% subject to matrix effects (Organics)
Matrix Spikes Laboratory Control Samples	$\%\ Recovery = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; and C = Calculated Concentration.	80-120% (Inorganics / Metals) 60-140% (Organics) 10-140% (SVOC and Speciated Phenols) If the result is outside the above ranges, the result must be <3x Standard Deviation of the Historical Mean (calculated over the past 12 months).
Sample Matrix Spike Duplicates	Recovery RPD	<30% (Inorganics & Organics)
Calibration Check Standards	Continuous Calibration Verification (CCV)	CCV must be within ±15% (inorganics) CCV must be within ±25% (inorganics)
Reagent, Method & Calibration Check Blanks	Each blank is analysed as per the original samples.	Analytical Result <LOR/PQL

Note: PQL - Laboratory Practical Quantitation Limit (PQL) or the minimum detection limit for a particular analyte.
LOR = Limit of Reporting

STATEMENT OF QA/QC PERFORMANCE

SE182724 R0

CLIENT DETAILS

Contact	David Rizkalla
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Project	**E23915 242-244 Young St Waterloo NSW**
Order Number	**E23915**
Samples	22

LABORATORY DETAILS

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Laboratory	SGS Alexandria Environmental
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SGS Reference	**SE182724 R0**
Date Received	16 Aug 2018
Date Reported	23 Aug 2018

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	3 items
Matrix Spike	Mercury in Soil	1 item
	Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES	3 items
	TRH (Total Recoverable Hydrocarbons) in Soil	3 items

SAMPLE SUMMARY

HOLDING TIME SUMMARY

SE182724 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.2-1.3	SE182724.003	LB154426	15 Aug 2018	16 Aug 2018	12 Sep 2018	17 Aug 2018	12 Sep 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154426	15 Aug 2018	16 Aug 2018	12 Sep 2018	17 Aug 2018	12 Sep 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154426	15 Aug 2018	16 Aug 2018	12 Sep 2018	17 Aug 2018	12 Sep 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154426	15 Aug 2018	16 Aug 2018	12 Sep 2018	17 Aug 2018	12 Sep 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154426	15 Aug 2018	16 Aug 2018	12 Sep 2018	17 Aug 2018	12 Sep 2018	23 Aug 2018

Fibre Identification in soil

Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154622	15 Aug 2018	16 Aug 2018	15 Aug 2019	21 Aug 2018	15 Aug 2019	23 Aug 2018

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE182724.022	LB154385	15 Aug 2018	16 Aug 2018	12 Sep 2018	17 Aug 2018	12 Sep 2018	20 Aug 2018

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018
QD1	SE182724.019	LB154680	15 Aug 2018	16 Aug 2018	12 Sep 2018	22 Aug 2018	12 Sep 2018	23 Aug 2018

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018

HOLDING TIME SUMMARY

SE182724 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Moisture Content (continued)

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH9M_0.3-0.4	SE182724.014	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
QD1	SE182724.019	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018
TS	SE182724.020	LB154681	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	27 Aug 2018	22 Aug 2018

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH4_0.2-0.3	SE182724.008	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_1.2-1.3	SE182724.003	LB154726	15 Aug 2018	16 Aug 2018	22 Aug 2018	22 Aug 2018	23 Aug 2018	22 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154726	15 Aug 2018	16 Aug 2018	22 Aug 2018	22 Aug 2018	23 Aug 2018	22 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154726	15 Aug 2018	16 Aug 2018	22 Aug 2018	22 Aug 2018	23 Aug 2018	22 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154726	15 Aug 2018	16 Aug 2018	22 Aug 2018	22 Aug 2018	23 Aug 2018	22 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154726	15 Aug 2018	16 Aug 2018	22 Aug 2018	22 Aug 2018	23 Aug 2018	22 Aug 2018

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH10M_1.7-1.8	SE182724.017	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018
QD1	SE182724.019	LB154675	15 Aug 2018	16 Aug 2018	11 Feb 2019	22 Aug 2018	11 Feb 2019	23 Aug 2018

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE182724.022	LB154475	15 Aug 2018	16 Aug 2018	11 Feb 2019	20 Aug 2018	11 Feb 2019	21 Aug 2018

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154679	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE182724.022	LB154392	15 Aug 2018	16 Aug 2018	22 Aug 2018	17 Aug 2018	26 Sep 2018	22 Aug 2018

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	22 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	22 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
TS	SE182724.020	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
TB	SE182724.021	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE182724 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE182724.022	LB154459	15 Aug 2018	16 Aug 2018	22 Aug 2018	17 Aug 2018	26 Sep 2018	21 Aug 2018

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M_0.3-0.4	SE182724.001	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	22 Aug 2018
BH1M_0.5-0.6	SE182724.002	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	22 Aug 2018
BH1M_1.2-1.3	SE182724.003	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH1M_3.4-3.5	SE182724.004	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.1-0.2	SE182724.005	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH2_0.3-0.4	SE182724.006	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH3_0.2-0.3	SE182724.007	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH4_0.2-0.3	SE182724.008	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH5_0.1-0.2	SE182724.009	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH6_0.2-0.3	SE182724.010	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH7_0.3-0.4	SE182724.011	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_0.3-0.4	SE182724.012	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH8_1.7-1.8	SE182724.013	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_0.3-0.4	SE182724.014	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH9M_1.8-1.9	SE182724.015	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_0.4-0.5	SE182724.016	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_1.7-1.8	SE182724.017	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
BH10M_2.4-2.5	SE182724.018	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
QD1	SE182724.019	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
TS	SE182724.020	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018
TB	SE182724.021	LB154678	15 Aug 2018	16 Aug 2018	29 Aug 2018	22 Aug 2018	01 Oct 2018	23 Aug 2018

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QR1	SE182724.022	LB154459	15 Aug 2018	16 Aug 2018	22 Aug 2018	17 Aug 2018	26 Sep 2018	21 Aug 2018

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	110
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	114
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	125
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	126
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	119
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	119
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	121
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	120
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	117
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	114
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	107

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	82
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	82
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	80
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	82
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	78
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	80
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	78
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	82
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	78
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	76
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	88
d14-p-terphenyl (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	84
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	88
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	84
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	82
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	78
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	78
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	80
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	94
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	80
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	80
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	86

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	70 - 130%	82
	BH1M_0.5-0.6	SE182724.002	%	70 - 130%	82
	BH1M_1.2-1.3	SE182724.003	%	70 - 130%	82
	BH1M_3.4-3.5	SE182724.004	%	70 - 130%	80
	BH2_0.1-0.2	SE182724.005	%	70 - 130%	80
	BH2_0.3-0.4	SE182724.006	%	70 - 130%	80
	BH3_0.2-0.3	SE182724.007	%	70 - 130%	82
	BH4_0.2-0.3	SE182724.008	%	70 - 130%	78
	BH5_0.1-0.2	SE182724.009	%	70 - 130%	80
	BH6_0.2-0.3	SE182724.010	%	70 - 130%	78
	BH7_0.3-0.4	SE182724.011	%	70 - 130%	82
	BH8_0.3-0.4	SE182724.012	%	70 - 130%	78
	BH8_1.7-1.8	SE182724.013	%	70 - 130%	76
	BH9M_0.3-0.4	SE182724.014	%	70 - 130%	76
	BH9M_1.8-1.9	SE182724.015	%	70 - 130%	84
	BH10M_0.4-0.5	SE182724.016	%	70 - 130%	88
	BH10M_1.7-1.8	SE182724.017	%	70 - 130%	86
	BH10M_2.4-2.5	SE182724.018	%	70 - 130%	82
d14-p-terphenyl (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	70 - 130%	84
	BH1M_0.5-0.6	SE182724.002	%	70 - 130%	88
	BH1M_1.2-1.3	SE182724.003	%	70 - 130%	84
	BH1M_3.4-3.5	SE182724.004	%	70 - 130%	82
	BH2_0.1-0.2	SE182724.005	%	70 - 130%	84

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d14-p-terphenyl (Surrogate)	BH2_0.3-0.4	SE182724.006	%	70 - 130%	82
	BH3_0.2-0.3	SE182724.007	%	70 - 130%	82
	BH4_0.2-0.3	SE182724.008	%	70 - 130%	78
	BH5_0.1-0.2	SE182724.009	%	70 - 130%	78
	BH6_0.2-0.3	SE182724.010	%	70 - 130%	80
	BH7_0.3-0.4	SE182724.011	%	70 - 130%	94
	BH8_0.3-0.4	SE182724.012	%	70 - 130%	80
	BH8_1.7-1.8	SE182724.013	%	70 - 130%	76
	BH9M_0.3-0.4	SE182724.014	%	70 - 130%	80
	BH9M_1.8-1.9	SE182724.015	%	70 - 130%	86
	BH10M_0.4-0.5	SE182724.016	%	70 - 130%	86
	BH10M_1.7-1.8	SE182724.017	%	70 - 130%	86
	BH10M_2.4-2.5	SE182724.018	%	70 - 130%	80
d5-nitrobenzene (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	70 - 130%	80
	BH1M_0.5-0.6	SE182724.002	%	70 - 130%	82
	BH1M_1.2-1.3	SE182724.003	%	70 - 130%	76
	BH1M_3.4-3.5	SE182724.004	%	70 - 130%	74
	BH2_0.1-0.2	SE182724.005	%	70 - 130%	82
	BH2_0.3-0.4	SE182724.006	%	70 - 130%	78
	BH3_0.2-0.3	SE182724.007	%	70 - 130%	78
	BH4_0.2-0.3	SE182724.008	%	70 - 130%	76
	BH5_0.1-0.2	SE182724.009	%	70 - 130%	76
	BH6_0.2-0.3	SE182724.010	%	70 - 130%	76
	BH7_0.3-0.4	SE182724.011	%	70 - 130%	80
	BH8_0.3-0.4	SE182724.012	%	70 - 130%	76
	BH8_1.7-1.8	SE182724.013	%	70 - 130%	76
	BH9M_0.3-0.4	SE182724.014	%	70 - 130%	74
	BH9M_1.8-1.9	SE182724.015	%	70 - 130%	80
	BH10M_0.4-0.5	SE182724.016	%	70 - 130%	78
	BH10M_1.7-1.8	SE182724.017	%	70 - 130%	78
	BH10M_2.4-2.5	SE182724.018	%	70 - 130%	74

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	110
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	114
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	125
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	126
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	119
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	119
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	121
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	120
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	117
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	114
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	107

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	84
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	100
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	73
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	77
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	71
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	74
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	74
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	88
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	90
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	73
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	91
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	122
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	118
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	105

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued) **Method: ME-(AU)-[ENV]AN433**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	91
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	92
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	101
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	79
	QD1	SE182724.019	%	60 - 130%	97
	TS	SE182724.020	%	60 - 130%	106
	TB	SE182724.021	%	60 - 130%	83
d4-1,2-dichloroethane (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	82
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	85
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	102
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	89
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	80
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	93
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	116
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	123
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	123
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	113
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	103
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	129
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	115
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	113
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	98
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	125
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	112
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	108
	QD1	SE182724.019	%	60 - 130%	115
	TS	SE182724.020	%	60 - 130%	124
	TB	SE182724.021	%	60 - 130%	100
d8-toluene (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	87
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	118
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	83
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	114
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	105
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	83
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	111
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	128
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	126
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	116
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	85
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	82
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	88
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	95
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	96
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	96
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	97
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	104
	QD1	SE182724.019	%	60 - 130%	97
	TS	SE182724.020	%	60 - 130%	101
	TB	SE182724.021	%	60 - 130%	90
Dibromofluoromethane (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	82
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	88
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	90
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	94
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	75
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	101
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	115
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	84
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	104
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	75
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	102
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	102

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Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOC's in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	BH8_1.7-1.8	SE182724.013	%	60 - 130%	85
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	97
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	98
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	89
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	107
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	105
	QD1	SE182724.019	%	60 - 130%	84
	TS	SE182724.020	%	60 - 130%	90
	TB	SE182724.021	%	60 - 130%	85

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QR1	SE182724.022	%	40 - 130%	95
d4-1,2-dichloroethane (Surrogate)	QR1	SE182724.022	%	40 - 130%	114
d8-toluene (Surrogate)	QR1	SE182724.022	%	40 - 130%	111
Dibromofluoromethane (Surrogate)	QR1	SE182724.022	%	40 - 130%	119

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	84
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	100
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	73
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	77
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	71
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	74
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	74
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	88
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	90
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	73
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	91
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	122
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	118
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	105
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	91
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	92
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	101
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	79
	QD1	SE182724.019	%	60 - 130%	97
d4-1,2-dichloroethane (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	82
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	85
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	102
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	89
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	80
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	93
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	116
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	123
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	123
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	113
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	103
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	129
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	115
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	113
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	98
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	125
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	112
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	108
	QD1	SE182724.019	%	60 - 130%	115
d8-toluene (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	87
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	118
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	83
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	114
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	105

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Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil (continued)

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	BH2_0.3-0.4	SE182724.006	%	60 - 130%	83
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	111
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	128
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	126
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	116
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	85
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	82
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	88
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	95
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	96
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	96
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	97
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	104
	QD1	SE182724.019	%	60 - 130%	97
Dibromofluoromethane (Surrogate)	BH1M_0.3-0.4	SE182724.001	%	60 - 130%	82
	BH1M_0.5-0.6	SE182724.002	%	60 - 130%	88
	BH1M_1.2-1.3	SE182724.003	%	60 - 130%	90
	BH1M_3.4-3.5	SE182724.004	%	60 - 130%	94
	BH2_0.1-0.2	SE182724.005	%	60 - 130%	75
	BH2_0.3-0.4	SE182724.006	%	60 - 130%	101
	BH3_0.2-0.3	SE182724.007	%	60 - 130%	115
	BH4_0.2-0.3	SE182724.008	%	60 - 130%	84
	BH5_0.1-0.2	SE182724.009	%	60 - 130%	104
	BH6_0.2-0.3	SE182724.010	%	60 - 130%	75
	BH7_0.3-0.4	SE182724.011	%	60 - 130%	102
	BH8_0.3-0.4	SE182724.012	%	60 - 130%	102
	BH8_1.7-1.8	SE182724.013	%	60 - 130%	85
	BH9M_0.3-0.4	SE182724.014	%	60 - 130%	97
	BH9M_1.8-1.9	SE182724.015	%	60 - 130%	98
	BH10M_0.4-0.5	SE182724.016	%	60 - 130%	89
	BH10M_1.7-1.8	SE182724.017	%	60 - 130%	107
	BH10M_2.4-2.5	SE182724.018	%	60 - 130%	105
	QD1	SE182724.019	%	60 - 130%	84

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QR1	SE182724.022	%	40 - 130%	95
d4-1,2-dichloroethane (Surrogate)	QR1	SE182724.022	%	60 - 130%	114
d8-toluene (Surrogate)	QR1	SE182724.022	%	40 - 130%	111
Dibromofluoromethane (Surrogate)	QR1	SE182724.022	%	40 - 130%	119

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result
LB154426.001	Exchangeable Sodium, Na	mg/kg	2	0
	Exchangeable Potassium, K	mg/kg	2	0
	Exchangeable Calcium, Ca	mg/kg	2	0
	Exchangeable Magnesium, Mg	mg/kg	2	0

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB154385.001	Mercury	mg/L	0.0001	<0.0001

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB154680.001	Mercury	mg/kg	0.05	<0.05

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB154679.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	107

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB154679.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	84
		d14-p-terphenyl (Surrogate)	%	-	86

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB154679.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	76
		2-fluorobiphenyl (Surrogate)	%	-	84
		d14-p-terphenyl (Surrogate)	%	-	86

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB154679.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	107

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB154675.001	Arsenic, As	mg/kg	1	2
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Nickel, Ni	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Zinc, Zn	mg/kg	2	<2.0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB154475.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB154679.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	45	<45
	TRH C29-C36	mg/kg	45	<45
	TRH C37-C40	mg/kg	100	<100
	TRH C10-C36 Total	mg/kg	110	<110

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result
LB154392.001		TRH C10-C14	µg/L	50	<50
		TRH C15-C28	µg/L	200	<200
		TRH C29-C36	µg/L	200	<200
		TRH C37-C40	µg/L	200	<200

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB154678.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	96
		d4-1,2-dichloroethane (Surrogate)	%	-	110
		d8-toluene (Surrogate)	%	-	124
		Bromofluorobenzene (Surrogate)	%	-	74
	Totals	Total BTEX	mg/kg	0.6	<0.6

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB154459.001	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5
	Hydrocarbons	Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	101
		d4-1,2-dichloroethane (Surrogate)	%	-	96
		d8-toluene (Surrogate)	%	-	97
		Bromofluorobenzene (Surrogate)	%	-	105

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB154678.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	96
		d4-1,2-dichloroethane (Surrogate)	%	-	110
		d8-toluene (Surrogate)	%	-	124

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB154459.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	108
		d4-1,2-dichloroethane (Surrogate)	%	-	106
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	94

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182734.001	LB154385.008	Mercury	µg/L	0.0001	<0.00005	<0.00005	200	188

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.010	LB154680.014	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE182724.019	LB154680.024	Mercury	mg/kg	0.05	0.11	0.08	82	26

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.010	LB154681.011	% Moisture	%w/w	0.5	6.4	6.0	46	7
SE182724.019	LB154681.021	% Moisture	%w/w	0.5	13	13.922356091(	37	6
SE182724.020	LB154681.023	% Moisture	%w/w	0.5	4.3	4.7	52	8

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.011	LB154679.028		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	0	200	0
			Alpha BHC	mg/kg	0.1	<0.1	0	200	0
			Lindane	mg/kg	0.1	<0.1	0	200	0
			Heptachlor	mg/kg	0.1	<0.1	0	200	0
			Aldrin	mg/kg	0.1	<0.1	0	200	0
			Beta BHC	mg/kg	0.1	<0.1	0	200	0
			Delta BHC	mg/kg	0.1	<0.1	0	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	0	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	0	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	0	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Dieldrin	mg/kg	0.2	<0.2	0	200	0
			Endrin	mg/kg	0.2	<0.2	0	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	0	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	0	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	0	200	0
			Methoxychlor	mg/kg	0.1	<0.1	0	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	0	200	0
			Isodrin	mg/kg	0.1	<0.1	0	200	0
			Mirex	mg/kg	0.1	<0.1	0	200	0
			Total CLP OC Pesticides	mg/kg	1	<1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.18	0.183	30	2

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.009	LB154679.026	Dichlorvos	mg/kg	0.5	<0.5	0	200	0
		Dimethoate	mg/kg	0.5	<0.5	0	200	0
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0	200	0
		Fenitrothion	mg/kg	0.2	<0.2	0	200	0
		Malathion	mg/kg	0.2	<0.2	0	200	0
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0.04	200	0
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0.06	200	0
		Bromophos Ethyl	mg/kg	0.2	<0.2	0.02	200	0
		Methidathion	mg/kg	0.5	<0.5	0	200	0
		Ethion	mg/kg	0.2	<0.2	0	200	0
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0	200	0
		Total OP Pesticides*	mg/kg	1.7	<1.7	0	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

OP Pesticides in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.009	LB154679.026	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	3
SE182724.016	LB154679.025		Dichlorvos	mg/kg	0.5	<0.5	0	200	0
			Dimethoate	mg/kg	0.5	<0.5	0	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0	200	0
			Fenitrothion	mg/kg	0.2	<0.2	0	200	0
			Malathion	mg/kg	0.2	<0.2	0	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	0	200	0
			Methidathion	mg/kg	0.5	<0.5	0	200	0
			Ethion	mg/kg	0.2	<0.2	0.07	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0	200	0
			Total OP Pesticides*	mg/kg	1.7	<1.7	0	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.41	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.41	30	5

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.009	LB154679.026		Naphthalene	mg/kg	0.1	0.1	0.12	113	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0.08	155	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0.06	197	0
			Acenaphthylene	mg/kg	0.1	0.1	0.1	117	26
			Acenaphthene	mg/kg	0.1	<0.1	0.03	200	0
			Fluorene	mg/kg	0.1	<0.1	0.07	163	0
			Phenanthrene	mg/kg	0.1	0.9	0.76	42	16
			Anthracene	mg/kg	0.1	0.3	0.28	65	4
			Fluoranthene	mg/kg	0.1	1.6	1.36	37	19
			Pyrene	mg/kg	0.1	1.6	1.35	37	19
			Benzo(a)anthracene	mg/kg	0.1	1.0	0.69	42	32
			Chrysene	mg/kg	0.1	0.9	0.67	43	33
			Benzo(b&j)fluoranthene	mg/kg	0.1	1.1	0.9	40	22
			Benzo(k)fluoranthene	mg/kg	0.1	0.5	0.46	51	10
			Benzo(a)pyrene	mg/kg	0.1	1.0	0.88	41	15
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	0.5	0.44	51	17
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0.04	200	0
			Benzo(ghi)perylene	mg/kg	0.1	0.5	0.44	52	11
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	1.3	1.1401	26	16
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	1.4	1.2401	32	15
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	1.4	1.1901	25	16
			Total PAH (18)	mg/kg	0.8	10	8.45	39	19
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.36	30	5
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	0
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	3
SE182724.016	LB154679.025		Naphthalene	mg/kg	0.1	<0.1	0.02	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0.03	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0	200	0
			Fluorene	mg/kg	0.1	<0.1	0	200	0
			Phenanthrene	mg/kg	0.1	0.1	0.11	117	9
			Anthracene	mg/kg	0.1	<0.1	0.04	200	0
			Fluoranthene	mg/kg	0.1	0.3	0.34	60	3
			Pyrene	mg/kg	0.1	0.4	0.37	57	3
			Benzo(a)anthracene	mg/kg	0.1	0.2	0.23	77	14
			Chrysene	mg/kg	0.1	0.2	0.21	78	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	0.2	0.22	80	20
			Benzo(k)fluoranthene	mg/kg	0.1	0.1	0.12	117	9
			Benzo(a)pyrene	mg/kg	0.1	0.2	0.2	83	11
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.1	141	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0.01	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.016	LB154679.025		Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.1	135	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	mg/kg	0.2	0.2	0.2691	90	15
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	mg/kg	0.3	0.3	0.3691	94	7
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	mg/kg	0.2	0.3	0.3191	76	10
			Total PAH (18)	mg/kg	0.8	1.7	1.99	73	16
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.36	30	8
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.41	30	7
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.41	30	5

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.011	LB154679.026		Arochlor 1016	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0.183	30	2

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.017	LB154726.021	pH	pH Units	0.1	7.2	6.617	31	9
SE182877A.012	LB154726.022	pH	pH Units	0.1	5.9	5.846	32	0

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.010	LB154675.014	Arsenic, As	mg/kg	1	3	2	74	23
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	2.3	2.0	54	15
		Copper, Cu	mg/kg	0.5	6.7	7.7	37	14
		Nickel, Ni	mg/kg	0.5	1.9	2.0	56	2
		Lead, Pb	mg/kg	1	19	13	36	43 ②
		Zinc, Zn	mg/kg	2	27	18	39	41 ②
SE182724.019	LB154675.024	Arsenic, As	mg/kg	1	4	6	49	30
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	200	0
		Chromium, Cr	mg/kg	0.3	8.5	10	35	18
		Copper, Cu	mg/kg	0.5	11	11	35	6
		Nickel, Ni	mg/kg	0.5	3.4	3.5	45	4
		Lead, Pb	mg/kg	1	210	57	31	116 ②
		Zinc, Zn	mg/kg	2	54	68	33	24

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182734.001	LB154475.011	Arsenic, As	µg/L	1	1	1	104	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	189	0
		Chromium, Cr	µg/L	1	10	10	25	0
		Copper, Cu	µg/L	1	11	11	24	0
		Lead, Pb	µg/L	1	9	9	26	0
		Nickel, Ni	µg/L	1	3	3	47	2
		Zinc, Zn	µg/L	5	59	60	23	0

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.009	LB154679.027	TRH C10-C14	mg/kg	20	<20	0	200	0
		TRH C15-C28	mg/kg	45	86	67	89	25
		TRH C29-C36	mg/kg	45	<45	0	200	0
		TRH C37-C40	mg/kg	100	<100	0	200	0
		TRH C10-C36 Total	mg/kg	110	<110	67	174	0

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Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.009	LB154679.027		TRH C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	110	80	127	16
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0
SE182724.016	LB154679.025		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH C10-C40 Total (F bands)	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16	mg/kg	25	<25	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.010	LB154678.015	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.7	50	1
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.6	5.2	50	8
			d8-toluene (Surrogate)	mg/kg	-	5.8	5.7	50	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.7	50	3
		Totals	Total Xylenes	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE182724.019	LB154678.032	Monocyclic	Benzene	mg/kg	0.1	<0.1	0	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	0	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	0	200	0
			m/p-xylene	mg/kg	0.2	<0.2	0.03	200	0
			o-xylene	mg/kg	0.1	<0.1	0.01	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.2	4.57	50	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.8	5.84	50	1
			d8-toluene (Surrogate)	mg/kg	-	4.9	4.65	50	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.9	5.12	50	5
		Totals	Total Xylenes	mg/kg	0.3	<0.3	0.04	200	0
			Total BTEX	mg/kg	0.6	<0.6	0.04	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182733.001	LB154459.020	Monocyclic	Benzene	µg/L	0.5	1.1	1.04	76	7
		Aromatic	Toluene	µg/L	0.5	<0.5	0.13	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0.12	200	0
			m/p-xylene	µg/L	1	<1	0.12	200	0
			o-xylene	µg/L	0.5	<0.5	0.07	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.4	4.09	30	27
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.1	3.76	30	29
			d8-toluene (Surrogate)	µg/L	-	4.8	5.27	30	10
			Bromofluorobenzene (Surrogate)	µg/L	-	4.5	4.59	30	1
SE182734.001	LB154459.019	Monocyclic	Benzene	µg/L	0.5	<0.5	0.2	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	0.34	169	0
			Ethylbenzene	µg/L	0.5	<0.5	0.06	200	0
			m/p-xylene	µg/L	1	<1	0	200	0
			o-xylene	µg/L	0.5	<0.5	0	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.2	4.61	30	11

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Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182734.001	LB154459.019	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.1	4.73	30	7
			d8-toluene (Surrogate)	µg/L	-	4.8	5.27	30	9
			Bromofluorobenzene (Surrogate)	µg/L	-	5.3	5.12	30	3

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182724.010	LB154678.015		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.7	30	1
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.6	5.2	30	8
			d8-toluene (Surrogate)	mg/kg	-	5.8	5.7	30	2
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.6	3.7	30	3
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE182724.019	LB154678.032		TRH C6-C10	mg/kg	25	<25	0	200	0
			TRH C6-C9	mg/kg	20	<20	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.2	4.57	30	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.8	5.84	30	1
			d8-toluene (Surrogate)	mg/kg	-	4.9	4.65	30	4
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.9	5.12	30	5
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	0	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	-0.04	200	0

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE182733.001	LB154459.020		TRH C6-C10	µg/L	50	<50	16.74	200	0
			TRH C6-C9	µg/L	40	<40	21.01	199	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.4	4.09	30	27
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.1	3.76	30	29
			d8-toluene (Surrogate)	µg/L	-	4.8	5.27	30	10
			Bromofluorobenzene (Surrogate)	µg/L	-	4.5	4.59	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	1.1	1.04	76	7
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	15.26	200	0
SE182734.001	LB154459.021		TRH C6-C10	µg/L	50	<50	0	200	0
			TRH C6-C9	µg/L	40	<40	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.5	4.95	30	11
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.6	5.72	30	3
			d8-toluene (Surrogate)	µg/L	-	5.1	5.71	30	11
			Bromofluorobenzene (Surrogate)	µg/L	-	4.5	4.23	30	6
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.22	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	-0.69	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154426.002	Exchangeable Sodium, Na	mg/kg	2	NA	72.68	80 - 120	105
	Exchangeable Potassium, K	mg/kg	2	NA	238.12	80 - 120	106
	Exchangeable Calcium, Ca	mg/kg	2	NA	692	80 - 120	93
	Exchangeable Magnesium, Mg	mg/kg	2	NA	134.2	80 - 120	100

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154680.002	Mercury	mg/kg	0.05	0.19	0.2	70 - 130	93

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154679.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	124
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	112
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	112
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	112
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	104
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	80
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.17	0.15	40 - 130	111

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154679.002		Dichlorvos	mg/kg	0.5	1.8	2	60 - 140	90
		Diazinon (Dimpylate)	mg/kg	0.5	1.9	2	60 - 140	94
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.0	2	60 - 140	102
		Ethion	mg/kg	0.2	1.6	2	60 - 140	81
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154679.002		Naphthalene	mg/kg	0.1	4.2	4	60 - 140	105
		Acenaphthylene	mg/kg	0.1	4.1	4	60 - 140	103
		Acenaphthene	mg/kg	0.1	4.2	4	60 - 140	105
		Phenanthrene	mg/kg	0.1	4.5	4	60 - 140	112
		Anthracene	mg/kg	0.1	4.1	4	60 - 140	103
		Fluoranthene	mg/kg	0.1	4.9	4	60 - 140	122
		Pyrene	mg/kg	0.1	4.9	4	60 - 140	122
		Benzo(a)pyrene	mg/kg	0.1	4.0	4	60 - 140	100
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	78
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	96

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154679.002	Arochlor 1260	mg/kg	0.2	0.4	0.4	60 - 140	100

pH in soil (1:5)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154726.003	pH	pH Units	0.1	7.4	7.415	98 - 102	100

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154675.002	Arsenic, As	mg/kg	1	350	336.32	79 - 120	103
	Cadmium, Cd	mg/kg	0.3	420	416.6	69 - 131	101
	Chromium, Cr	mg/kg	0.3	30	35.2	80 - 120	85
	Copper, Cu	mg/kg	0.5	320	370.46	80 - 120	85
	Nickel, Ni	mg/kg	0.5	180	210.88	79 - 120	86
	Lead, Pb	mg/kg	1	94	107.87	79 - 120	87

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154675.002	Zinc, Zn	mg/kg	2	280	301.27	80 - 121	93

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154475.002	Arsenic, As	µg/L	1	20	20	80 - 120	98
	Cadmium, Cd	µg/L	0.1	19	20	80 - 120	96
	Chromium, Cr	µg/L	1	19	20	80 - 120	96
	Copper, Cu	µg/L	1	20	20	80 - 120	98
	Lead, Pb	µg/L	1	20	20	80 - 120	102
	Nickel, Ni	µg/L	1	19	20	80 - 120	96
	Zinc, Zn	µg/L	5	20	20	80 - 120	102

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154679.002		TRH C10-C14	mg/kg	20	30	40	60 - 140	75
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	75
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	75
	TRH F Bands	TRH >C10-C16	mg/kg	25	30	40	60 - 140	75
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	75
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	85

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154392.002		TRH C10-C14	µg/L	50	1100	1200	60 - 140	95
		TRH C15-C28	µg/L	200	1300	1200	60 - 140	112
		TRH C29-C36	µg/L	200	1100	1200	60 - 140	90
	TRH F Bands	TRH >C10-C16	µg/L	60	1200	1200	60 - 140	100
		TRH >C16-C34 (F3)	µg/L	500	1300	1200	60 - 140	109
		TRH >C34-C40 (F4)	µg/L	500	520	600	60 - 140	86

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154678.002	Monocyclic	Benzene	mg/kg	0.1	2.0	2.9	60 - 140	70
	Aromatic	Toluene	mg/kg	0.1	2.5	2.9	60 - 140	87
		Ethylbenzene	mg/kg	0.1	2.1	2.9	60 - 140	71
		m/p-xylene	mg/kg	0.2	4.6	5.8	60 - 140	80
		o-xylene	mg/kg	0.1	2.1	2.9	60 - 140	74
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	5.3	5	60 - 140	106
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.2	5	60 - 140	103
		d8-toluene (Surrogate)	mg/kg	-	6.2	5	60 - 140	124
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	5	60 - 140	104

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154459.002	Monocyclic	Benzene	µg/L	0.5	50	45.45	60 - 140	110
	Aromatic	Toluene	µg/L	0.5	50	45.45	60 - 140	110
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	110
		m/p-xylene	µg/L	1	100	90.9	60 - 140	110
		o-xylene	µg/L	0.5	50	45.45	60 - 140	109
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	3.9	5	60 - 140	77
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.2	5	60 - 140	83
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	93
		Bromofluorobenzene (Surrogate)	µg/L	-	5.2	5	60 - 140	104

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154678.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	89
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	78
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	5.3	5	60 - 140	106
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5.2	5	60 - 140	103
		d8-toluene (Surrogate)	mg/kg	-	6.2	5	60 - 140	124
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.2	5	60 - 140	104
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	117

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Volatile Petroleum Hydrocarbons in Water — **Method: ME-(AU)-[ENV]AN433**

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB154459.002		TRH C6-C10	µg/L	50	960	946.63	60 - 140	102
		TRH C6-C9	µg/L	40	790	818.71	60 - 140	96
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.2	5	60 - 140	84
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.2	5	60 - 140	84
		d8-toluene (Surrogate)	µg/L	-	4.9	5	60 - 140	97
		Bromofluorobenzene (Surrogate)	µg/L	-	4.9	5	60 - 140	97
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	650	639.67	60 - 140	102

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182704.004	LB154385.004	Mercury	mg/L	0.0001	0.0068	<0.0001	0.008	85

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182724.001	LB154680.004	Mercury	mg/kg	0.05	0.42	0.42	0.2	3 ④

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE182724.005	LB154679.027		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	-	-
			Alpha BHC	mg/kg	0.1	<0.1	-	-
			Lindane	mg/kg	0.1	<0.1	-	-
			Heptachlor	mg/kg	0.1	<0.1	0.2	125
			Aldrin	mg/kg	0.1	<0.1	0.2	122
			Beta BHC	mg/kg	0.1	<0.1	-	-
			Delta BHC	mg/kg	0.1	<0.1	0.2	117
			Heptachlor epoxide	mg/kg	0.1	<0.1	-	-
			o,p'-DDE	mg/kg	0.1	<0.1	-	-
			Alpha Endosulfan	mg/kg	0.2	<0.2	-	-
			Gamma Chlordane	mg/kg	0.1	<0.1	-	-
			Alpha Chlordane	mg/kg	0.1	<0.1	-	-
			trans-Nonachlor	mg/kg	0.1	<0.1	-	-
			p,p'-DDE	mg/kg	0.1	<0.1	-	-
			Dieldrin	mg/kg	0.2	<0.2	0.2	109
			Endrin	mg/kg	0.2	<0.2	0.2	125
			o,p'-DDD	mg/kg	0.1	<0.1	-	-
			o,p'-DDT	mg/kg	0.1	<0.1	-	-
			Beta Endosulfan	mg/kg	0.2	<0.2	-	-
			p,p'-DDD	mg/kg	0.1	<0.1	-	-
			p,p'-DDT	mg/kg	0.1	<0.1	0.2	114
			Endosulfan sulphate	mg/kg	0.1	<0.1	-	-
			Endrin Aldehyde	mg/kg	0.1	<0.1	-	-
			Methoxychlor	mg/kg	0.1	<0.1	-	-
			Endrin Ketone	mg/kg	0.1	<0.1	-	-
			Isodrin	mg/kg	0.1	<0.1	-	-
			Mirex	mg/kg	0.1	<0.1	-	-
			Total CLP OC Pesticides	mg/kg	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.19	-	124

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE182724.005	LB154679.027		Dichlorvos	mg/kg	0.5	<0.5	2	84
			Dimethoate	mg/kg	0.5	<0.5	-	-
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	2	90
			Fenitrothion	mg/kg	0.2	<0.2	-	-
			Malathion	mg/kg	0.2	<0.2	-	-
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	2	99
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	-	-
			Bromophos Ethyl	mg/kg	0.2	<0.2	-	-
			Methidathion	mg/kg	0.5	<0.5	-	-
			Ethion	mg/kg	0.2	<0.2	2	76
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	-	-
			Total OP Pesticides*	mg/kg	1.7	<1.7	-	-
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	84
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	-	94

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE182724.005	LB154679.027		Naphthalene	mg/kg	0.1	<0.1	4	104
			2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	<0.1	4	102
			Acenaphthene	mg/kg	0.1	<0.1	4	106
			Fluorene	mg/kg	0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	0.1	4	117
			Anthracene	mg/kg	0.1	<0.1	4	113
			Fluoranthene	mg/kg	0.1	0.2	4	109
			Pyrene	mg/kg	0.1	0.2	4	111
			Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	<0.1	4	91
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	-	82
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	84
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	-	94

PCBs in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE182724.005	LB154679.025		Arochlor 1016	mg/kg	0.2	<0.2	-	-
			Arochlor 1221	mg/kg	0.2	<0.2	-	-
			Arochlor 1232	mg/kg	0.2	<0.2	-	-
			Arochlor 1242	mg/kg	0.2	<0.2	-	-
			Arochlor 1248	mg/kg	0.2	<0.2	-	-
			Arochlor 1254	mg/kg	0.2	<0.2	-	-
			Arochlor 1260	mg/kg	0.2	<0.2	0.4	121
			Arochlor 1262	mg/kg	0.2	<0.2	-	-
			Arochlor 1268	mg/kg	0.2	<0.2	-	-
			Total PCBs (Arochlors)	mg/kg	1	<1	-	-
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	-	126

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182724.001	LB154675.004	Arsenic, As	mg/kg	1	49	15	50	66 ④
		Cadmium, Cd	mg/kg	0.3	47	0.5	50	92
		Chromium, Cr	mg/kg	0.3	76	34	50	84
		Copper, Cu	mg/kg	0.5	99	50	50	98
		Nickel, Ni	mg/kg	0.5	100	59	50	86
		Lead, Pb	mg/kg	1	150	76	50	138 ④
		Zinc, Zn	mg/kg	2	220	140	50	174 ④

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182704.004	LB154475.004	Arsenic, As	µg/L	1	27	4	20	114
		Cadmium, Cd	µg/L	0.1	20	<0.1	20	100
		Chromium, Cr	µg/L	1	20	<1	20	95
		Copper, Cu	µg/L	1	17	2	20	74
		Lead, Pb	µg/L	1	22	2	20	101
		Nickel, Ni	µg/L	1	23	4	20	92
		Zinc, Zn	µg/L	5	28	10	20	89

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

TRH (Total Recoverable Hydrocarbons) in Soil (continued)

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE182724.002	LB154679.026		TRH C10-C14	mg/kg	20	32	40	80
			TRH C15-C28	mg/kg	45	270	40	-205 ⓖ
			TRH C29-C36	mg/kg	45	<45	40	100
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	310	-	-
			TRH C10-C40 Total (F bands)	mg/kg	210	350	-	-
		TRH F Bands	TRH >C10-C16	mg/kg	25	50	40	48 ⓖ
			TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	48	-	-
			TRH >C16-C34 (F3)	mg/kg	90	300	40	-220 ⓖ
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOC's in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182724.001	LB154678.004	Monocyclic	Benzene	mg/kg	0.1	2.5	<0.1	2.9	85
		Aromatic	Toluene	mg/kg	0.1	2.9	<0.1	2.9	99
			Ethylbenzene	mg/kg	0.1	1.9	<0.1	2.9	64
			m/p-xylene	mg/kg	0.2	4.2	<0.2	5.8	72
			o-xylene	mg/kg	0.1	2.0	<0.1	2.9	68
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	5.4	4.1	-	109
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	4.1	-	99
			d8-toluene (Surrogate)	mg/kg	-	6.3	4.4	-	126
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	4.2	-	102
		Totals	Total Xylenes	mg/kg	0.3	6.2	<0.3	-	-
			Total BTEX	mg/kg	0.6	13	<0.6	-	-

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182724.022	LB154459.022	Monocyclic	Benzene	µg/L	0.5	44	<0.5	45.45	96
		Aromatic	Toluene	µg/L	0.5	46	<0.5	45.45	101
			Ethylbenzene	µg/L	0.5	48	<0.5	45.45	105
			m/p-xylene	µg/L	1	88	<1	90.9	97
			o-xylene	µg/L	0.5	40	<0.5	45.45	87
		Polycyclic	Naphthalene	µg/L	0.5	51	<0.5	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.8	6.0	-	95
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.6	5.7	-	93
			d8-toluene (Surrogate)	µg/L	-	4.7	5.6	-	94
			Bromofluorobenzene (Surrogate)	µg/L	-	4.6	4.8	-	92

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182724.001	LB154678.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	97
			TRH C6-C9	mg/kg	20	<20	<20	23.2	81
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	5.4	4.1	-	109
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.9	4.1	-	99
			d8-toluene (Surrogate)	mg/kg	-	6.3	4.4	-	126
			Bromofluorobenzene (Surrogate)	mg/kg	-	5.1	4.2	-	102
		VPH F	Benzene (F0)	mg/kg	0.1	2.5	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	131

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE182724.022	LB154459.022		TRH C6-C10	µg/L	50	820	<50	946.63	86
			TRH C6-C9	µg/L	40	680	<40	818.71	82
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.8	6.0	-	95
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.6	5.7	-	93
			d8-toluene (Surrogate)	µg/L	-	4.7	5.6	-	94
			Bromofluorobenzene (Surrogate)	µg/L	-	4.6	4.8	-	92
		VPH F	Benzene (F0)	µg/L	0.5	44	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	550	<50	639.67	86

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

QC Sample	Sample Number	Parameter	Units	LOR

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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STATEMENT OF QA/QC PERFORMANCE

SE183173 R0

CLIENT DETAILS

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Project	**E23915-E02 - 242-244 Young St Waterloo**
Order Number	**E23915-E02**
Samples	7

LABORATORY DETAILS

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SGS Reference	**SE183173 R0**
Date Received	28 Aug 2018
Date Reported	04 Sep 2018

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Extraction Date	pH in water	3 items
Analysis Date	pH in water	3 items

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice Bricks
Samples received in correct containers	Yes	Sample counts by matrix	7 Water
Date documentation received	28/8/2018	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	7.2°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE183173 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155386	24 Aug 2018	28 Aug 2018	21 Sep 2018	29 Aug 2018	21 Sep 2018	29 Aug 2018
BH9M-1	SE183173.002	LB155386	24 Aug 2018	28 Aug 2018	21 Sep 2018	29 Aug 2018	21 Sep 2018	29 Aug 2018
BH10M-1	SE183173.003	LB155386	24 Aug 2018	28 Aug 2018	21 Sep 2018	29 Aug 2018	21 Sep 2018	29 Aug 2018

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155391	24 Aug 2018	28 Aug 2018	21 Sep 2018	30 Aug 2018	21 Sep 2018	30 Aug 2018
BH9M-1	SE183173.002	LB155391	24 Aug 2018	28 Aug 2018	21 Sep 2018	30 Aug 2018	21 Sep 2018	30 Aug 2018
BH10M-1	SE183173.003	LB155391	24 Aug 2018	28 Aug 2018	21 Sep 2018	30 Aug 2018	21 Sep 2018	30 Aug 2018
GW-QD1	SE183173.004	LB155391	24 Aug 2018	28 Aug 2018	21 Sep 2018	30 Aug 2018	21 Sep 2018	30 Aug 2018
BHR-1	SE183173.005	LB155391	24 Aug 2018	28 Aug 2018	21 Sep 2018	30 Aug 2018	21 Sep 2018	30 Aug 2018

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155413	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018
BH9M-1	SE183173.002	LB155413	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018
BH10M-1	SE183173.003	LB155413	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	03 Sep 2018
BH9M-1	SE183173.002	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	03 Sep 2018
BH10M-1	SE183173.003	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	03 Sep 2018
GW-QD1	SE183173.004	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	03 Sep 2018
BHR-1	SE183173.005	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	03 Sep 2018

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155386	24 Aug 2018	28 Aug 2018	25 Aug 2018	29 Aug 2018†	25 Aug 2018	29 Aug 2018†
BH9M-1	SE183173.002	LB155386	24 Aug 2018	28 Aug 2018	25 Aug 2018	29 Aug 2018†	25 Aug 2018	29 Aug 2018†
BH10M-1	SE183173.003	LB155386	24 Aug 2018	28 Aug 2018	25 Aug 2018	29 Aug 2018†	25 Aug 2018	29 Aug 2018†

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155620	24 Aug 2018	28 Aug 2018	21 Sep 2018	03 Sep 2018	21 Sep 2018	03 Sep 2018
BH9M-1	SE183173.002	LB155620	24 Aug 2018	28 Aug 2018	21 Sep 2018	03 Sep 2018	21 Sep 2018	03 Sep 2018
BH10M-1	SE183173.003	LB155620	24 Aug 2018	28 Aug 2018	21 Sep 2018	03 Sep 2018	21 Sep 2018	03 Sep 2018

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155415	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018
BH9M-1	SE183173.002	LB155415	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018
BH10M-1	SE183173.003	LB155415	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018
GW-QD1	SE183173.004	LB155415	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018
BHR-1	SE183173.005	LB155415	24 Aug 2018	28 Aug 2018	20 Feb 2019	30 Aug 2018	20 Feb 2019	30 Aug 2018

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	31 Aug 2018
BH9M-1	SE183173.002	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	31 Aug 2018
BH10M-1	SE183173.003	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	31 Aug 2018
GW-QD1	SE183173.004	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	31 Aug 2018
BHR-1	SE183173.005	LB155396	24 Aug 2018	28 Aug 2018	31 Aug 2018	30 Aug 2018	09 Oct 2018	31 Aug 2018

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
BH9M-1	SE183173.002	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
BH10M-1	SE183173.003	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
GW-QD1	SE183173.004	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
BHR-1	SE183173.005	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
GWQTB1	SE183173.006	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
GWQTS1	SE183173.007	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018

HOLDING TIME SUMMARY

SE183173 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M-1	SE183173.001	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
BH9M-1	SE183173.002	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
BH10M-1	SE183173.003	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
GW-QD1	SE183173.004	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
BHR-1	SE183173.005	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
GWQTB1	SE183173.006	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018
GWQTS1	SE183173.007	LB155586	24 Aug 2018	28 Aug 2018	31 Aug 2018	31 Aug 2018	10 Oct 2018	04 Sep 2018

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	64
	BH9M-1	SE183173.002	%	40 - 130%	72
	BH10M-1	SE183173.003	%	40 - 130%	70
d14-p-terphenyl (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	92
	BH9M-1	SE183173.002	%	40 - 130%	84
	BH10M-1	SE183173.003	%	40 - 130%	88
d5-nitrobenzene (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	50
	BH9M-1	SE183173.002	%	40 - 130%	60
	BH10M-1	SE183173.003	%	40 - 130%	62

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	105
	BH9M-1	SE183173.002	%	40 - 130%	106
	BH10M-1	SE183173.003	%	40 - 130%	106
	GW-QD1	SE183173.004	%	40 - 130%	86
	BHR-1	SE183173.005	%	40 - 130%	88
	GWQTB1	SE183173.006	%	40 - 130%	92
	GWQTS1	SE183173.007	%	40 - 130%	92
d4-1,2-dichloroethane (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	100
	BH9M-1	SE183173.002	%	40 - 130%	98
	BH10M-1	SE183173.003	%	40 - 130%	100
	GW-QD1	SE183173.004	%	40 - 130%	111
	BHR-1	SE183173.005	%	40 - 130%	120
	GWQTB1	SE183173.006	%	40 - 130%	112
	GWQTS1	SE183173.007	%	40 - 130%	95
d8-toluene (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	106
	BH9M-1	SE183173.002	%	40 - 130%	106
	BH10M-1	SE183173.003	%	40 - 130%	109
	GW-QD1	SE183173.004	%	40 - 130%	96
	BHR-1	SE183173.005	%	40 - 130%	106
	GWQTB1	SE183173.006	%	40 - 130%	98
	GWQTS1	SE183173.007	%	40 - 130%	91
Dibromofluoromethane (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	91
	BH9M-1	SE183173.002	%	40 - 130%	89
	BH10M-1	SE183173.003	%	40 - 130%	91
	GW-QD1	SE183173.004	%	40 - 130%	98
	BHR-1	SE183173.005	%	40 - 130%	107
	GWQTB1	SE183173.006	%	40 - 130%	97
	GWQTS1	SE183173.007	%	40 - 130%	83

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	97
	BH9M-1	SE183173.002	%	40 - 130%	93
	BH10M-1	SE183173.003	%	40 - 130%	85
	GW-QD1	SE183173.004	%	40 - 130%	86
	BHR-1	SE183173.005	%	40 - 130%	88
d4-1,2-dichloroethane (Surrogate)	BH1M-1	SE183173.001	%	60 - 130%	110
	BH9M-1	SE183173.002	%	60 - 130%	112
	BH10M-1	SE183173.003	%	60 - 130%	110
	GW-QD1	SE183173.004	%	60 - 130%	111
	BHR-1	SE183173.005	%	60 - 130%	120
d8-toluene (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	89
	BH9M-1	SE183173.002	%	40 - 130%	99
	BH10M-1	SE183173.003	%	40 - 130%	94
	GW-QD1	SE183173.004	%	40 - 130%	96
	BHR-1	SE183173.005	%	40 - 130%	106
Dibromofluoromethane (Surrogate)	BH1M-1	SE183173.001	%	40 - 130%	99
	BH9M-1	SE183173.002	%	40 - 130%	99
	BH10M-1	SE183173.003	%	40 - 130%	98
	GW-QD1	SE183173.004	%	40 - 130%	98

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Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Water (continued) — **Method: ME-(AU)-[ENV]AN433**

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Dibromofluoromethane (Surrogate)	BHR-1	SE183173.005	%	40 - 130%	107

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB155386.001	Conductivity @ 25 C	µS/cm	2	<2

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB155391.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB155396.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	68
		2-fluorobiphenyl (Surrogate)	%	-	72
		d14-p-terphenyl (Surrogate)	%	-	90

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result
LB155620.001	Total Phenols	mg/L	0.05	<0.05

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB155415.001	Aluminium, Al	µg/L	5	<5
	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB155396.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB155586.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB155586.001	Halogenated Aliphatics	Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		Iodomethane	µg/L	5	<5
		1,1-dichloroethene	µg/L	0.5	<0.5
		Dichloromethane (Methylene chloride)	µg/L	5	<5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5
		Bromochloromethane	µg/L	0.5	<0.5
		1,2-dichloroethane	µg/L	0.5	<0.5
		1,1,1-trichloroethane	µg/L	0.5	<0.5
		1,1-dichloropropene	µg/L	0.5	<0.5
		Carbon tetrachloride	µg/L	0.5	<0.5
		Dibromomethane	µg/L	0.5	<0.5
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5
		1,1,2-trichloroethane	µg/L	0.5	<0.5
		1,3-dichloropropane	µg/L	0.5	<0.5
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
		cis-1,4-dichloro-2-butene	µg/L	1	<1
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
		1,2,3-trichloropropane	µg/L	0.5	<0.5
		trans-1,4-dichloro-2-butene	µg/L	1	<1
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
		Hexachlorobutadiene	µg/L	0.5	<0.5
	Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
		Bromobenzene	µg/L	0.5	<0.5
		2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5
	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
		tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	2	<2
		Vinyl acetate	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB155586.001	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	114
		d8-toluene (Surrogate)	%	-	106
		Bromofluorobenzene (Surrogate)	%	-	92
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB155586.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	100
		d4-1,2-dichloroethane (Surrogate)	%	-	114
		d8-toluene (Surrogate)	%	-	106
		Bromofluorobenzene (Surrogate)	%	-	92

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183187.001	LB155386.014	Conductivity @ 25 C	µS/cm	2	3100	3200	15	2

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183192.006	LB155391.014	Mercury	µg/L	0.0001	<0.0001	0.0000	200	40

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183169.001	LB155620.004	Total Phenols	mg/L	0.05	<0.05	<0.05	200	0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183173.005	LB155415.012	Arsenic, As	µg/L	1	<1	<1	200	0
		Cadmium, Cd	µg/L	0.1	<0.1	<0.1	200	0
		Chromium, Cr	µg/L	1	<1	<1	200	0
		Copper, Cu	µg/L	1	<1	<1	200	0
		Lead, Pb	µg/L	1	<1	<1	200	0
		Nickel, Ni	µg/L	1	<1	<1	200	0
		Zinc, Zn	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183173.005	LB155396.022		TRH C10-C14	µg/L	50	<50	0	200	0
			TRH C15-C28	µg/L	200	<200	0	200	0
			TRH C29-C36	µg/L	200	<200	0	200	0
			TRH C37-C40	µg/L	200	<200	0	200	0
			TRH C10-C36	µg/L	450	<450	0	200	0
			TRH C10-C40	µg/L	650	<650	0	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	0	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	0	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	0	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	0	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183169.001	LB155586.023	Fumigants	1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	0	200	0
		Halogenated	1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	0	200	0
		Monocyclic	Benzene	µg/L	0.5	<0.5	0.04	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	0.09	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0.02	200	0
			m/p-xylene	µg/L	1	<1	0.1	200	0
			o-xylene	µg/L	0.5	<0.5	0.1	200	0
		Oxygenated	MEK (2-butanone)	µg/L	10	<10	0	200	0
		Compounds	2-hexanone (MBK)	µg/L	5	<5	0	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0.04	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.8	4.26	30	11
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.3	4.59	30	14
			d8-toluene (Surrogate)	µg/L	-	5.7	4.99	30	12
			Bromofluorobenzene (Surrogate)	µg/L	-	5.6	4.54	30	21
SE183169.003	LB155586.024	Monocyclic	Benzene	µg/L	0.5	<0.5	0.06	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	0.1	200	0
			Ethylbenzene	µg/L	0.5	<0.5	0.02	200	0
			m/p-xylene	µg/L	1	<1	0.04	200	0
			o-xylene	µg/L	0.5	<0.5	0.02	200	0
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	0.01	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.9	4.9	30	1

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Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183169.003	LB155586.024	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.6	5.03	30	10
			d8-toluene (Surrogate)	µg/L	-	4.8	4.77	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	4.6	4.01	30	13

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE183169.001	LB155586.023		TRH C6-C10	µg/L	50	<50	0	200	0
			TRH C6-C9	µg/L	40	<40	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	5.2	4.26	30	21
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.9	4.59	30	25
			d8-toluene (Surrogate)	µg/L	-	5.3	4.99	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	4.8	4.54	30	5
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.04	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	-0.35	200	0
SE183169.003	LB155586.024		TRH C6-C10	µg/L	50	<50	0	200	0
			TRH C6-C9	µg/L	40	<40	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.9	4.9	30	1
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.6	5.03	30	10
			d8-toluene (Surrogate)	µg/L	-	4.8	4.77	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	4.6	4.01	30	13
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	0.06	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	-0.24	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155386.002	Conductivity @ 25 C	µS/cm	2	290	303	90 - 110	95

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155396.002		Naphthalene	µg/L	0.1	32	40	60 - 140	81
		Acenaphthylene	µg/L	0.1	36	40	60 - 140	90
		Acenaphthene	µg/L	0.1	33	40	60 - 140	82
		Phenanthrene	µg/L	0.1	36	40	60 - 140	89
		Anthracene	µg/L	0.1	35	40	60 - 140	87
		Fluoranthene	µg/L	0.1	36	40	60 - 140	89
		Pyrene	µg/L	0.1	37	40	60 - 140	92
		Benzo(a)pyrene	µg/L	0.1	37	40	60 - 140	91
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.4	0.5	40 - 130	82
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	94

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155386.003	pH**	No unit	-	7.4	7.415	98 - 102	100

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN289

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155620.002	Total Phenols	mg/L	0.05	0.24	0.25	80 - 120	95

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155415.002	Aluminium, Al	µg/L	5	18	20	80 - 120	90
	Arsenic, As	µg/L	1	20	20	80 - 120	100
	Cadmium, Cd	µg/L	0.1	19	20	80 - 120	97
	Chromium, Cr	µg/L	1	19	20	80 - 120	97
	Copper, Cu	µg/L	1	19	20	80 - 120	96
	Lead, Pb	µg/L	1	20	20	80 - 120	102
	Nickel, Ni	µg/L	1	19	20	80 - 120	96
	Zinc, Zn	µg/L	5	20	20	80 - 120	101

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155396.002		TRH C10-C14	µg/L	50	1100	1200	60 - 140	91
		TRH C15-C28	µg/L	200	1400	1200	60 - 140	116
		TRH C29-C36	µg/L	200	1400	1200	60 - 140	116
	TRH F Bands	TRH >C10-C16	µg/L	60	1200	1200	60 - 140	96
		TRH >C16-C34 (F3)	µg/L	500	1600	1200	60 - 140	135
		TRH >C34-C40 (F4)	µg/L	500	610	600	60 - 140	102

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155586.002	Halogenated	1,1-dichloroethene	µg/L	0.5	50	45.45	60 - 140	110
	Aliphatics	1,2-dichloroethane	µg/L	0.5	50	45.45	60 - 140	110
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	50	45.45	60 - 140	110
	Halogenated	Chlorobenzene	µg/L	0.5	50	45.45	60 - 140	110
	Monocyclic	Benzene	µg/L	0.5	50	45.45	60 - 140	110
	Aromatic	Toluene	µg/L	0.5	50	45.45	60 - 140	110
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	110
		m/p-xylene	µg/L	1	100	90.9	60 - 140	110
		o-xylene	µg/L	0.5	50	45.45	60 - 140	110
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.1	5	60 - 140	81
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.1	5	60 - 140	83
		d8-toluene (Surrogate)	µg/L	-	4.8	5	60 - 140	96

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155586.002	Surrogates	Bromofluorobenzene (Surrogate)	µg/L	-	5.0	5	60 - 140	100
	Trihalomethan	Chloroform (THM)	µg/L	0.5	50	45.45	60 - 140	109

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB155586.002		TRH C6-C10	µg/L	50	940	946.63	60 - 140	100
		TRH C6-C9	µg/L	40	770	818.71	60 - 140	94
	Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.5	5	60 - 140	89
		d4-1,2-dichloroethane (Surrogate)	µg/L	-	4.4	5	60 - 140	88
		d8-toluene (Surrogate)	µg/L	-	4.7	5	60 - 140	93
		Bromofluorobenzene (Surrogate)	µg/L	-	4.9	5	60 - 140	97
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	640	639.67	60 - 140	99

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE183169.001	LB155391.004	Mercury	mg/L	0.0001	0.0078	<0.0001	0.008	97

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE183169.001	LB155415.004	Aluminium, Al	µg/L	5	240	230	20	79
		Arsenic, As	µg/L	1	21	<1	20	105
		Cadmium, Cd	µg/L	0.1	20	<0.1	20	98
		Chromium, Cr	µg/L	1	20	<1	20	94
		Copper, Cu	µg/L	1	31	14	20	89
		Lead, Pb	µg/L	1	21	<1	20	100
		Nickel, Ni	µg/L	1	22	4	20	91
		Zinc, Zn	µg/L	5	88	69	20	93

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE183169.002	LB155586.025	Monocyclic	Benzene	µg/L	0.5	<0.5	45.45	110
		Aromatic	Toluene	µg/L	0.5	<0.5	45.45	109
			Ethylbenzene	µg/L	0.5	<0.5	45.45	112
			m/p-xylene	µg/L	1	<1	90.9	111
			o-xylene	µg/L	0.5	<0.5	45.45	111
		Polycyclic	Naphthalene	µg/L	0.5	<0.5	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.4	-	102
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.0	-	116
			d8-toluene (Surrogate)	µg/L	-	4.5	-	103
			Bromofluorobenzene (Surrogate)	µg/L	-	4.3	-	99

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE183169.002	LB155586.025		TRH C6-C10	µg/L	50	<50	946.63	86
			TRH C6-C9	µg/L	40	<40	818.71	89
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	4.4	-	102
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	5.0	-	116
			d8-toluene (Surrogate)	µg/L	-	4.5	-	103
			Bromofluorobenzene (Surrogate)	µg/L	-	4.3	-	99
		VPH F	Benzene (F0)	µg/L	0.5	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	639.67	80

MATRIX SPIKE DUPLICATES

SE183173 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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APPENDIX K
SafeWork NSW Records

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D18/155466

17 July 2018

Mr David Rizkalla
EI AUSTRALIA
Suite 6.01, 55 Miller Street
PYRMONT NSW 2009

Dear Mr Rizkalla

RE SITE: 242-244 Young Street, WATERLOO NSW 2017

I refer to your site search request received by SafeWork NSW on 3 July 2018 requesting information on Storage of Hazardous Chemicals for the above site.

Enclosed are copies of the documents that SafeWork NSW holds on record number 35/004633 relating to the storage of Hazardous Chemicals at the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

Form [illegible]GI

Department of Industrial Relations

DANGEROUS GOODS ACT, 1975

LICENCE No. 35-004633-4

APPLICATION FOR LICENCE (or AMENDMENT or TRANSFER of LICENCE)* FOR THE KEEPING OF DANGEROUS GOODS

(* delete whichever is not required)

FEE: $15.00 per Depot for new licence.
$15.00 for amendment or transfer. N/Fee

Name of Applicant in full (see Item 1 - Explanatory notes - page 4)	P. ROWE FABRICS PTY LIMITED
Trading name or occupier's name (if any)	ROWE FABRICS.
Postal Address	PO BOX 206 WATERLOO. Postcode 2017
Address of the premises to be licensed. (Including Street No.)	POWELL & YOUNG STREETS WATERLOO Postcode 2017
Nature of premises (See Item 2 - Explanatory notes - page 4)	WAREHOUSE FOR FABRICS and OFFICES.
Telephone number of applicant	STD Code 02 Number 319 3399

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time.

Depot number	Type of depot (See item 3 - Explanatory notes - page 4)	Storage capacity	Dangerous goods: Product being stored	C & C Office use only
1	Underground Tank	10,000L	PETROL	
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

DEPARTMENTAL MAIL 26 OCT 1988 Dept of Industrial Relations and Employment

Has site plan been approved by the Dangerous Goods Branch? Yes / No — If yes, no plans required. If no, please attach site plan, or provide sketch plan overleaf.

Have premises previously been licensed? Yes / No — If, yes, state name of previous occupier, and licence No. (if known). Amendment only - Depot 2 deleted

Name of oil company supplying flammable liquid (if applicable). CALTEX.

Signature of applicant ..... Date 24/10/88.

For external explosives magazine(s), please fill in page 3. MICHAEL BALL Company Secretary

FOR OFFICE USE ONLY

CERTIFICATE OF INSPECTION

I, Leonard E. Brooks being an Inspector under the Dangerous Goods Act, 1975, do hereby certify that the premises described above do comply with the requirements of the Dangerous Goods Act, 1975, and the Dangerous Goods Regulation with regard to their situation and construction for the keeping of dangerous goods of the nature and in the quantity specified.

Signature of Inspector ..... Date 28-2-89

RS2 901 (1)

INFLAMMABLE LIQUID ACT, 1915

APPLICATION FOR: REGISTRATION OF PREMISES / STORE LICENCE / AMENDMENT TO REGISTRATION OR LICENCE } FOR THE KEEPING OF INFLAMMABLE LIQUID AND/OR DANGEROUS GOODS. B. 7

Name of Occupier: P. Rowe Pty Limited (Surname) (First Names)

Trading Name (if any):

Postal Address: Box 3455, G.P.O., SYDNEY Postcode 2001

Address of the premises in which the depot or depots are situated: cnr Powell & Young Streets, WATERLOO 2017 Postcode

Occupation: fabrics & automotive finishes

Nature of Premises: warehouse & offices

Particulars of construction of depots and maximum quantities of inflammable liquid and/or dangerous goods to be kept at any one time.

PLEASE SKETCH SITE ON BACK OR ATTACH PLAN

Depot No.	Construction of depots *			Inflammable Liquid		Dangerous Goods						
	Walls	Roof	Floor	Mineral spirit litres	Mineral oil litres	Class 1 litres	Class 2 litres	Class 3 kg	Class 4 m^3	Class 5A# litres	Class 5B# litres	Class 9 litres
1	brick	concrete	concrete	N.I.L				2500				
2	brick	concrete	concrete	N.I.L				2500				
3	brick	concrete	concrete	N.I.L	10000							
4	underground tank			10000								
5												
6												
7												
8												
9												
10												
TOTAL												

PUBLIC REVENUE A/c
Cash 25.00
9/6/75
(Date)
Receipt No. 3879

* If kept in tanks describe depots as underground or aboveground tanks.

\# Insert water capacity of tanks or cylinders.

Name of Company supplying inflammable liquid _____

Have premises previously been licensed? Yes B.4633 (7)

If known, state name of previous occupier P. Rowe & Co. Pty Limited

Signature of applicant J. Antonio Date 18.7.75

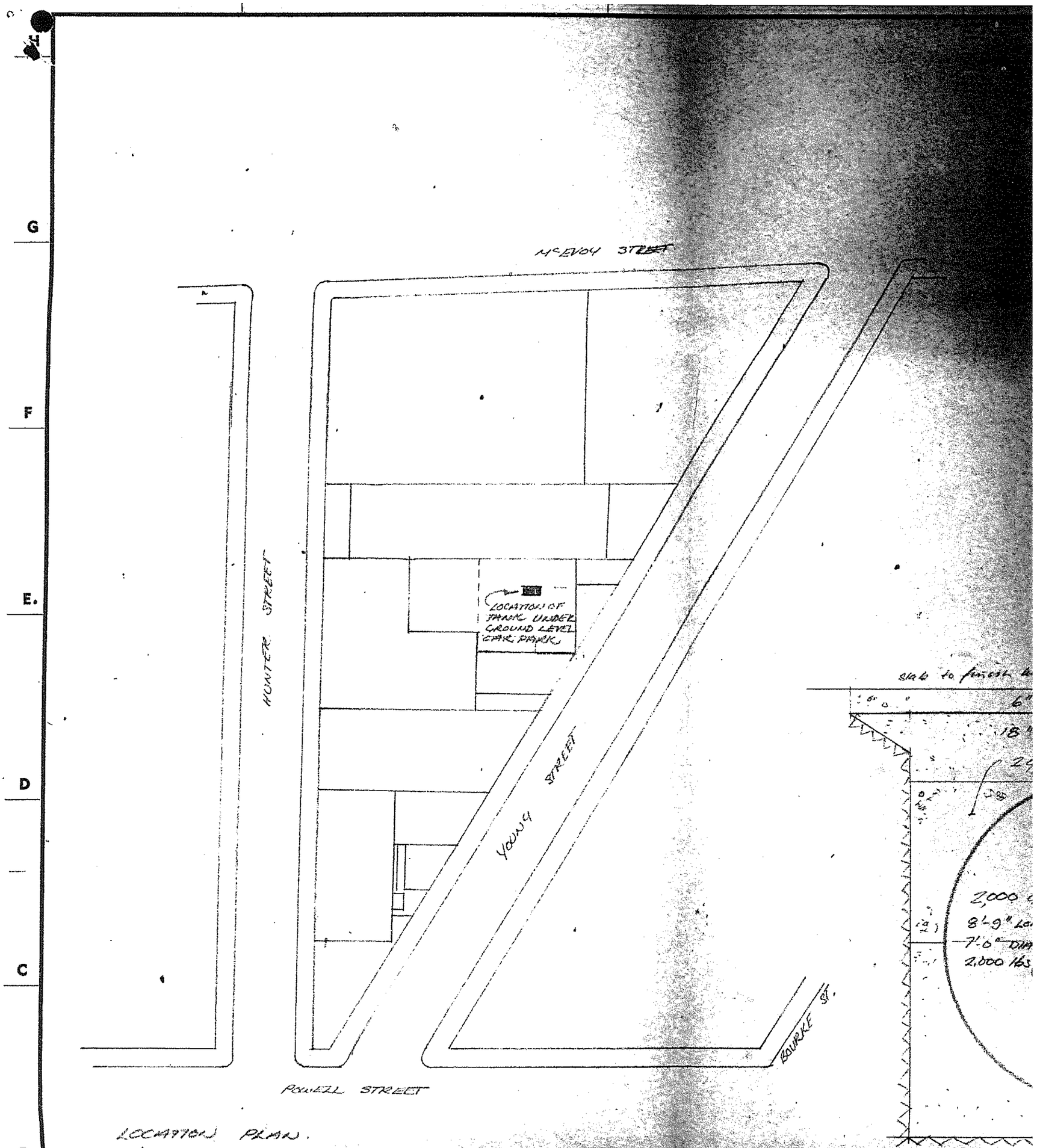
Insp.
Metrop.

CERTIFICATE OF INSPECTION

I, Harold Arthur Bonney being an Inspector under th Inflammable Liquid Act, 1915, do hereby certify that the premises or store described above does comply with th requirements of that Act and regulations with regard to its situation and construction for the keeping of inflammabl liquid and/or dangerous goods in quantity and nature specified.

902

Signature of Inspector H. Bonney

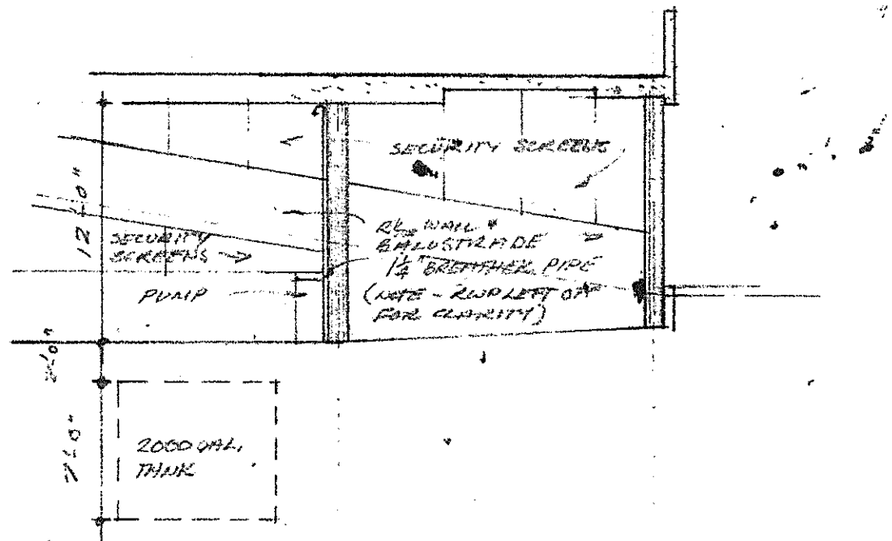


DO NOT SCALE. USE FIGURED DIMENSIONS. CONTRACTORS MUST VERIFY ALL DIMENSIONS AT THE JOB BEFORE COMMENCING WORK OR MAKING ANY SHOP DRAWINGS.

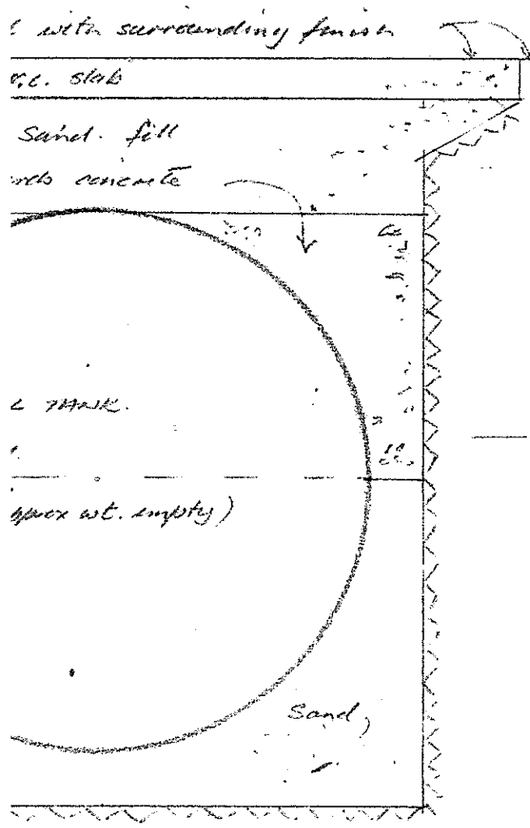
FOWELL MANSFIELD JA

ARCHITECTS ENGINEERS T
GRA

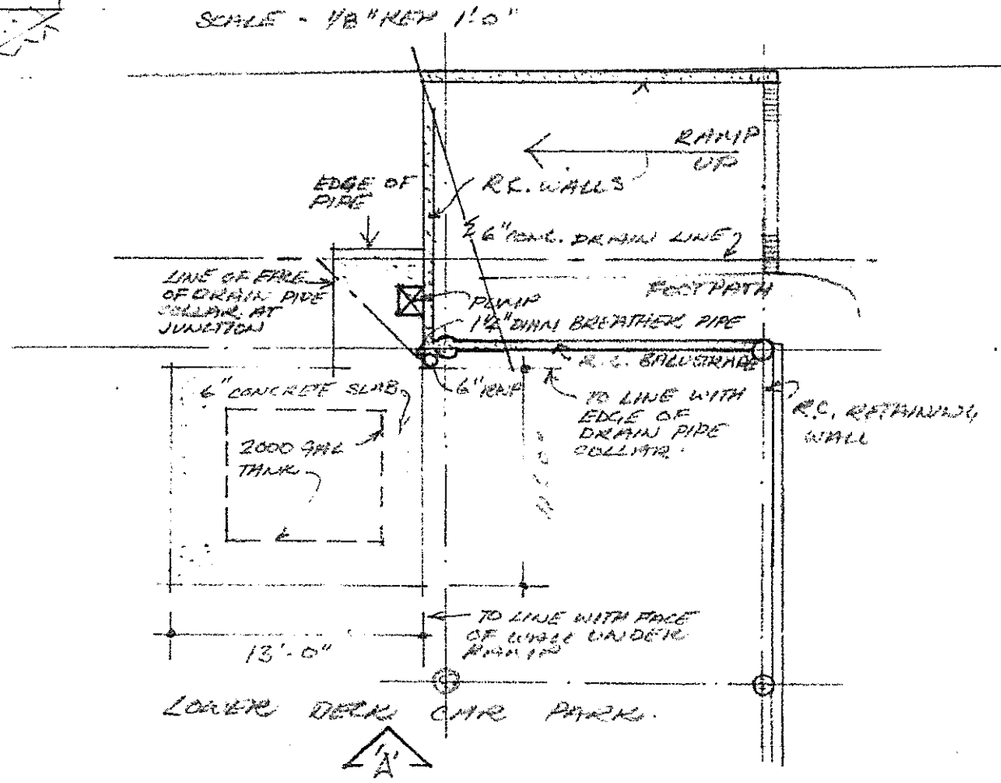
11 RANGERS ROAD NE
TELEPHONE 909-2144



ELEVATION 'A'
SCALE - ⅛" REDN 1'-0"



) THRO' INSTALLATION.
EP. 1'-0"



PLAN SHOWING LOCATION OF TANK.
SCALE - ⅛" REDN 1'-0"

EXPLOSIVES DEPARTMENT
PASSED
M. Conway
for CHIEF INSPECTOR
741 05 127.
SUBJECT TO COMPLIANCE WITH
REGULATIONS

IS & MACLURCAN PTY LTD
VN PLANNERS LANDSCAPE ARCHITECTS
C DESIGNERS
TRAL BAY JUNCTION 2089
TELEGRAMS 'CINQUEFOIL'

DRAWN EBM	P. ROWE PTY. LTD. NEW WAREHOUSE HUNTER ST. WATERLOO	PROJECT NO 2726/A
CHECKED		
DATE 17 MAY 94	PETROL TANK INSTALLATION	DRAWING NO 12.
SCALE AS NOTED		

CONNECT INTO 4" SP'R MAIN

3"

DROPPER

DROPPER

℄ TRUSS

S52

WAREHOUSE AREA

DENOTES OUTLINE OF SHELVES AND FITTINGS FOR STOCK. AVERAGE HEIGHT 9'-0"

6 'C' TYPE OPEN SPRINKLERS

℄ TRUSS

S55

$2\frac{1}{2}$"

$2\frac{1}{2}$"

2" "MULSIFYRE" DOUBLE OUTLET CONTROL

$2\frac{1}{2}$"

S57

S58

6 'C' TYPE OPEN SPRINKLERS

℄ TRUSS

S59

RING MAIN

S60

S61

S62

2 X 80 LB. CO_2 CYLINDERS. SERVING INFLAMMABLE LIQUIDS & HAZARDOUS GOODS STORE.

PRESSURE RELIEF VALVES

LEGEND

O	SPRINKLER POINT (WATER)
T	DISCHARGE POINT CO_2
▭	FLUORESCENT FITTING
◎	FLAMEPROOF INCANDESCENT FITTING
S.V.	STOP VALVE
C.V.	CHECK VALVE

905

EXPLOSIVES ACT PASSED 25.1.6

JOHN R. WALLIS, SPRATT & ASSOC
CONSULTING CHARTERED ENGINEERS
20-22 MOUNT STREET. NORTH SYDNEY. 925

FOWELL, MANSFIELD, JARVIS & MACL
CHARTERED ARCHITECTS
87 BERRY ST. NORTH SYDNEY. 92404

P. ROWE PTY. LTD.
WAREHOUSE & OFFICE. WATERLOC

FIRE PROTECTION

NITRO-CELLULOSE STO

Attachment A16

Geotechnical Assessment Report

Geotechnical Investigation Report

Project

242-258 Young Street, Waterloo NSW

Prepared for

Charvic Pty Ltd, &
International Screen Academy Property Pty Ltd

Date

20 December 2023

Report No

17185-GR-1-1



alliance
geotechnical & environmental solutions

Alliance Geotechnical Pty Ltd

Address: 8-10 Welder Road
Seven Hills, NSW
Phone: 1800 288 188
Office Email: info@allgeo.com.au
Web: www.allgeo.com.au

Document Control

Revision	Date	Description	Author	Reviewer
0	20/12/2023	Original issue	EW	MAG

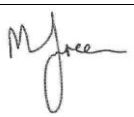
Author Signature		**Reviewer Signature**	
Name	Eric Wu	**Name**	Mark Green
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1 Introduction

This report presents the results of a geotechnical investigation for the proposed mixed-use development at 242-258 Young Street, Waterloo NSW (the site). Alliance was contacted by Sustainable Development Group, who were operating on behalf of the property owners, Charvic Pty Ltd and International Screen Academy Property Pty Ltd. The work was carried out in accordance with the quotation by Alliance Geotechnical Pty Ltd (Alliance) dated 8/9/2023, reference 17185-EST8961.

Based on the discussion with the client and the supplied documents, the following objectives were established for the geotechnical investigation:

- Characterise the subsurface geological and groundwater profile,
- Identify potential geotechnical hazards and risks within the influence of the site,
- Provide geotechnical advice for suitable foundation options and foundation layer,
- Provide options for shoring design,
- Provide advice regarding potential tanked basements and dewatering,
- Establish geotechnical parameters for foundation and shoring design,
- Provide classification of soil aggressivity for concrete and steel structures (to AS2159),
- Provide site sub-soil earthquake classification (to AS1170).

2 Proposed Development

To assist with the geotechnical investigation, the following drawings were supplied to us for this investigation comprised:

- Detailed Site Survey plans, prepared by Registered Surveyor Pty Ltd (Ref: 2079; dated:21/06/2022)
- Project Brief for Site Redevelopment with Preliminary Architectural Concept Plans, prepared by Sustainable Development Group (Dated: 09/2023)
- Detailed Site Environmental Investigation, prepared by EI Australia Pty Ltd (Ref: E23915.E02_Rev0; dated: 18/10/2018)

From the client-supplied preliminary architectural plan, it is understood that the proposed development will feature a four to seven storey building, with a single or double level basement level carpark. The proposed use cases for the development include schools, student accommodation, commercial office and retail space.

3 Site Description & Regional Geology

3.1 Site Description

The site is located 242-258 Young Street, Waterloo NSW, on an irregular shaped block bounded by Young Street to the east, Powell Street to the south and Hunter Street to the west. The northern boundary is adjacent another multi-storey structure, with at least a single-storey of basement level carpark. The site is located in an area which generally comprises other mixed-use and high-density residential developments.

At the time of the investigation fieldwork, the site was occupied by one and two storey buildings which were used by automotive businesses and an independent school. It is understood from a review of the previous detailed site environmental investigation that the site was formerly used by a variety of industrial and commercial businesses.

Topographically, the site is located on a slightly inclined slope dipping towards the south-west. The elevation at the north-eastern corner is approximately RL22.0m, and the elevation at the southern corner is approximately RL19.8m

3.2 Regional Geology

The 1:100,000 Sydney Geological Map indicates the site is underlain by coastal deposits, which are characterised by *marine-deposited and aeolian-reworked coastal sand dunes*. The marine deposits (Botany Sands) are underlain by fine-grained sandstones of the Hawkesbury Sandstone, which is characterised by *medium- to coarse-grained quartz sandstone with minor shale and laminite lenses*. An excerpt showing the geological context of the site can be found in Figure 1.

Make reference to the Griffin (1963) map/cross sections in Google Earth.

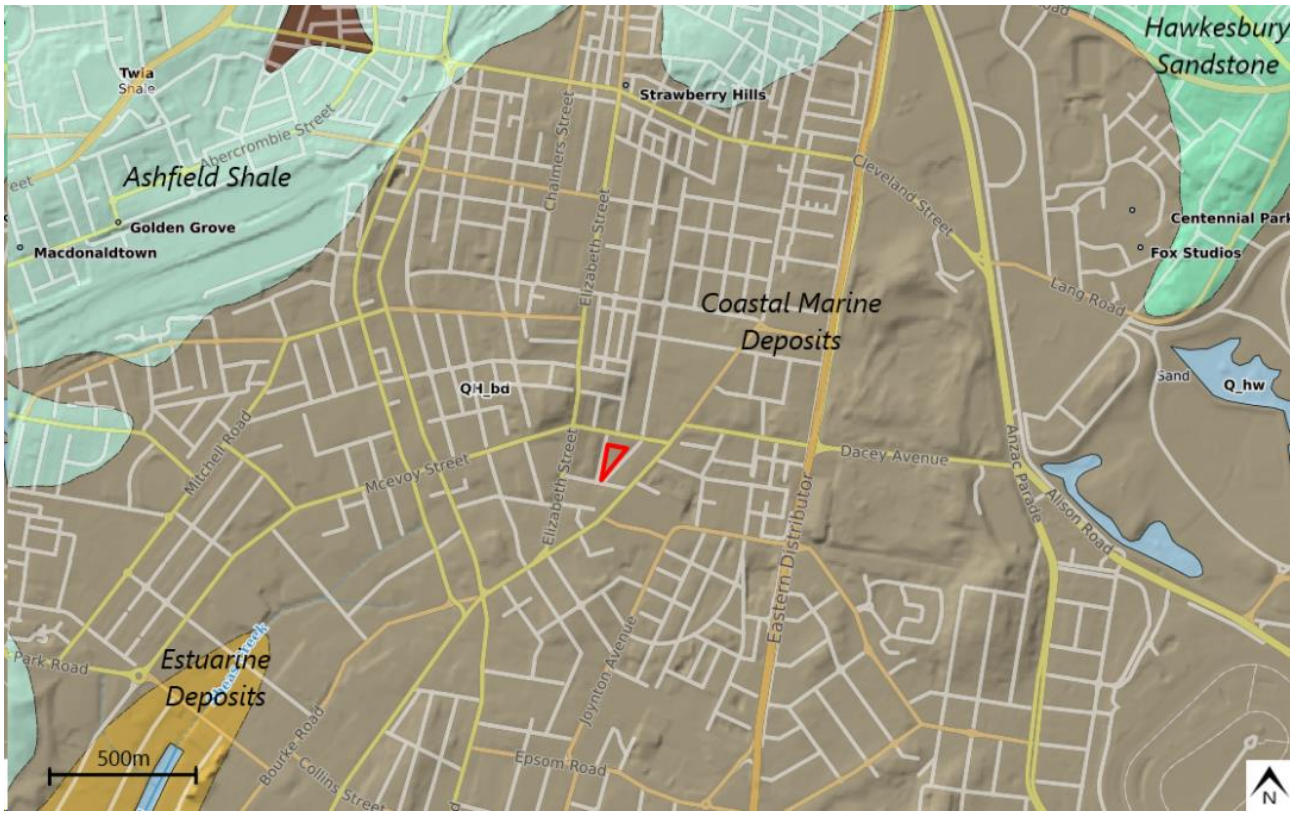


Figure 1-Excerpt from Minview showing the geological context of the site (highlighted red)

3.3 Previous Geotechnical Investigations

Prior to the Alliance investigation, it is understood that there were two previous investigations carried out at the site:

- Environmental Site Investigation, prepared by SGA (Ref: 93099, dated: 09/2012);
- Detailed Site Investigation (DSI), prepared by EI Australia (Ref: E23915.E02_Rev0, dated:18/10/2018)

Alliance was only supplied with the DSI prepared by EI Australia. Their scope of works included:

- Dilling 10 BHs across the site to collect samples for environmental laboratory testing purposes;
- Installation of two groundwater monitoring wells to facilitate sampling of groundwater;
- Laboratory analysis for soil and groundwater contaminates.

From their investigation, the site geological profile was generalised as follows:

Table 1-Generalised sub-surface profile, based on EI Australia DSI (extracted from Table 9-1 of Report E23915.E02_Rev0)

Geological Unit	Material Description	Depth to top and bottom of strata (m bgl)
Fill	Concrete	0.00-0.15
	Gravelly Clayey SAND, fine to medium grained	0.12-0.80

Geological Unit	Material Description	Depth to top and bottom of strata (m bgl)
	SAND, fine to medium grained	0.10-0.20
	Gravelly CLAY, low to medium plasticity	0.15-1.50
	Gravelly SAND, fine to medium grained	0.00-0.70
Residual	SAND, fine grained	0.60-5.00
	Silty CLAY, medium plasticity	1.50-2.00
Bedrock	SANDSTONE, fine grained	0.20-5.50

4 Fieldwork

4.1 Methods

The geotechnical site investigation was carried out between 20 November to 24 November 2023. Selected site photographs taken during the fieldwork are presented in Appendix A.

As a part of the investigation request, the client's representative had nominated four locations across the site for the boreholes based on access constraints. Prior to the commencement of borehole drilling, each location was checked by underground services by a qualified service locator using conventional EMR service location methods. Concrete coring was undertaken at each borehole location using a 150mm concrete coring diatube.

The investigation comprised of the drilling of four boreholes to a depth of 12.0m or approximately 3.0m into sandstone bedrock. The boreholes were drilled using a track-mounted drilling rig operated by a drilling subcontractor. Boreholes were advanced through the soil profile using solid flight augers fitted with a tungsten carbide bit (TC-bit). NMLC coring of the bedrock was initiated upon encountering TC-bit refusal. The encountered soils were logged by an experienced engineering geologist from Alliance and recovered samples were transported to Alliance's NATA accredited materials testing laboratory for further testing and storage. Standard Penetrometer Testing (SPT) was undertaken at 1.5m within the soil stratum to assess the soil consistency. Additionally, a Dynamic Cone Penetrometer (DCP) test was undertaken to a depth of 1.5m at each borehole to assess the upper soil layers consistency.

Three of the borehole locations were surveyed using a hand-held Trimble Rover GPS system. The one borehole which was drilled inside the existing warehouse could not be accurately surveyed, so an estimated value for the elevation and coordinates is provided. The borehole locations are shown on the Borehole Location Plan (Drawing 17185-GR-1-1-B) presented in Appendix B. The borehole log sheets and core photographs are attached in Appendix C. These log sheets should be read in conjunction with the attached Explanatory Notes, which explain the terms, abbreviations and symbols used, together with the interpretation and limitation of the logging procedure.

4.2 Results

Reference to the individual borehole log sheets, attached in Appendix C, should be made for a full description of the subsurface conditions encountered at each borehole. Summarised descriptions of the encountered subsurface geotechnical units are provided in Table 2**.**

Table 2-Summary of the encountered subsurface profile.

Geological Unit	Depth (m)			
	BH01	BH02	BH03	BH04
Pavement: Concrete	0.0 – 0.17	0.0 – 0.15	0.0 – 0.15	-
Topsoil: Sandy SILT, low plasticity	-	-	-	0.0-0.15
Fill: Gravelly SAND / Sandy GRAVEL, fine to coarse grained, appears well-compacted.	0.17 – 1.0	0.15 – 1.5	0.15 – 1.8	0.15 – 0.5
Marine: SAND, fine to medium grained, loose to medium dense.	1.0 – 4.3, 5.4 – 6.0	1.5 – 5.8, 5.8 – 7.3	1.8 – 6.4	0.5 – 6.2, 6.5 – 7.55
Marine: CLAY / Sandy CLAY, high plasticity, firm to stiff.	4.3 – 5.4, 6.0 – 6.3	5.8 – 6.7	6.4 – 8.8	6.2 – 6.5
Extremely Weathered Sandstone: SANDSTONE, fine to medium grained, extremely weathered, very low strength	6.3 – 7.0	7.3 – 8.78	8.8 – 9.0	7.55 – 7.98
Bedrock: SANDSTONE, fine to medium grained, moderately to highly weathered, very low to low strength. Class IV [2]	7.0 – 7.84	-	-	7.98 – 9.07
Bedrock: SANDSTONE, fine to medium grained, moderately to highly weathered, low to medium strength. Class III [2]	7.84 +	8.78 +	9.00 +	9.07 +
Termination Depth (m)	10.22	11.78	12.0	11.94

Notes:

1. The depths and unit thicknesses are based on the information from the test locations only and do not necessarily represent the maximum and minimum values across the site.
2. Classification of sandstone

Bedrock was generally encountered at 7-8m depth below ground level and comprises Hawkesbury Sandstone. The encountered bedrock was predominantly highly weathered, very low strength sandstone, overlying moderately weathered, low to medium strength sandstone. Bedrock defects and seams are listed in the attached logs.

4.3 Groundwater

No groundwater wells were installed as part of Alliance's investigation, however it is understood that previous investigations had installed groundwater monitoring wells. The previous detailed site investigation by EI Australia installed three monitoring wells. During the geotechnical investigation, Alliance used the existing wells to collect groundwater levels for the site, with the results summarised in Table 3. Both the initial groundwater data from the EI Australia DSI (from 14 May 2018) and the Alliance investigation (from 24 November 2023) are included.

Table 3-Summary of groundwater readings from the existing monitoring wells.

Monitoring Well ID	Groundwater Level (m bgl)	
	14/05/2018	24/11/2023
BH01M	3.29	N/A (Silt blockage at 2m depth)
BH09M	2.60	N/A (Not accessible)
BH10M	2.64	2.84

Notably, BH09M could not be accessed and BH01M had a silt blockage part way down the well during Alliance's investigation. It is noted that groundwater levels are prone to frequent fluctuations with weather variation. No long-term groundwater monitoring was carried out, nor were there any long-term groundwater data from the existing wells supplied to Alliance from the previous investigation.

Additionally, the groundwater table was encountered during the augered portion of the boreholes. The groundwater observations made during the drilling are summarised in Table 4 below.

Table 4-Summary of the encountered groundwater levels during drilling.

Borehole ID	Observed Groundwater Level (m bgl)
BH01	4.0
BH02	4.3
BH03	4.3
BH04	3.2

Based on the groundwater data presented. It is recommended that a design groundwater level of RL 18.1m be adopted. It is recommended that additional long-term groundwater monitoring may be required to provide a more accurate estimate of the groundwater table across the site. Given the presence of sand, which generally has higher permeability, the groundwater level is expected to fluctuate with rainfall variation.

5 Laboratory Testing

5.1 Soil Aggressivity

Aggressivity tests were performed to aid in the design of durable concrete and steel materials in contact with the site soils on selected soil samples collected from each of the boreholes. Table 5 presents the results of the aggressivity tests. The results were assessed in conjunction with AS 2159 – 2009 to classify the aggressivity of the soils for concrete and steel piles.

Table 5-Summary of soil aggressivity test results.

Test	Unit	BH01 4.8m	BH02 3.0m	BH03 6.4m	BH04 6.0m
Chloride	Mg/kg (ppm)	<10	<10	70	25
Ph	--	5.3	8.3	9.7	9.6
Sulfate (SO_4)	Mg/kg (ppm)	<10	17	120	33
Conductivity	Us/cm	<10	23	360	160

Test	Unit	BH01 4.8m	BH02 3.0m	BH03 6.4m	BH04 6.0m
Resistivity	Ohm.cm	110,000	43,000	2,800	6,200
Moisture	%	17	3	12	25
With respect to concrete		Moderate	Mild	Mild	Mild
With respect to steel		Non-aggressive	Non-aggressive	Mild	Non-aggressive

5.2 Uniaxial Compressive Strength Results

One sample of rock core was taken from each borehole for uniaxial compressive strength (UCS) testing. The testing was carried out in accordance with AS4133.4.2.2 at a NATA-accredited laboratory. The results are summarised in Table 6, with the detailed test certificates provided in Appendix E.

Table 6-Summary of UCS test results.

Sample ID	Material Description	Uniaxial Compressive Strength (MPa)
BH01 – 9.23-9.54m	Sandstone	14.0
BH02 – 10.34-10.65m	Sandstone	14.0
BH03 – 11.55-11.85m	Sandstone	11.0
BH04 – 10.50-10.76m	Sandstone	26.0

6 Comments and Recommendations

6.1 Excavation Conditions

The proposed development includes bulk excavation of the basement (proposed one or two levels). However, no specific depth of excavation below existing ground level was provided. However, given the encountered soil and rock profile, it is anticipated that the bulk excavation level will be founded on the marine soils, comprising fine to coarse grained sand, or potentially on the low to medium strength sandstone bedrock.

If the bulk excavation is founded within the soil layer, it is anticipated that groundwater ingress may be an issue given the presence of marine sands. Dewatering of the excavation below the excavation level will be required to provide a suitable working platform during construction. It is recommended that the dewatering wells to ensure the water level is at least 1.5m below the excavation base during construction and basement excavation.

Regarding excavatability, the soils should be readily excavated with conventional earthmoving equipment (e.g. excavators fitted with mud-buckets). Excavation through the low to medium strength sandstone encountered at the site may require the use of rock breaking hammers or other easy to hard ripping equipment. Low vibration equipment will be necessary near all site locations where vibration could impact on adjacent structures, infrastructures, and their footings. Alternatively, blocks of cut rock mass can be dislodged using small rock hammers and lifted out without generating large vibration. A rotary grinder may be required to trim rock faces instead of a large impact hammer.

Generally, the peak particle velocity during any demolition, excavation, and construction should be limited to 5mm/s (AS2187.2-1993 Appendix J) which is expected to be achieved provided that low impact rock-breaking equipment is used.

A dilapidation survey on nearby structures and infrastructures is recommended to be undertaken by a structural engineer prior to the commencement of any site excavations. The report should include precise measurements of the existing defects and cracks presented with the relevant photos of the development.

6.2 Excavation Stability and Retaining Structures

From the supplied architectural concept plans, the walls of the basement level are set at the property boundaries. Given the proximity of the site boundaries to adjacent buildings and roads, it is recommended that the excavation be supported by a permanent shoring wall. Batter slopes are not considered, given the site constraints. Temporary shoring options (e.g. sheet piles) were not considered due to the presence of nearby buildings, meaning construction vibration/noise would need to be limited.

From Table 1, it is noted that the site is generally comprised of soils up to a depth of 8.8m (at the deepest point). Given the presence of sandy soils and proximity of nearby buildings, it is recommended to the support the excavation with cantilevered or propped secant pile walls. Weep holes might need to be installed to reduce the build-up of hydrostatic pressure in the retained soil, should the depth of excavation extend below the groundwater table.

It is recommended to construct the piles using Continuous Flight Auger (CFA) techniques, due to the presence of groundwater and sandy soils. The piles would need to extend below the base of the excavation, to retain the soil, and would likely need to be socketed into the underlying sandstone bedrock (although this depends on the depth of the basement level). Notably, should the shoring piles be used to support elements of the structure above, then the pile socket would be extended to provide sufficient pile capacity.

Table 7- Summary of retaining wall design parameters.

Geological Unit	Unit Weight (kN/m^3), γ'	Undrained Shear Strength (kPa), c_u	Friction Angle (°), ϕ	Drained Cohesion (kPa), c'	Lateral Earth Pressure Coefficients			Young's Modulus (MPa), E
					Active, K_a	At-rest, K_0	Passive, K_p	
Fill – Gravelly SAND / Sandy GRAVEL	18	-	27	-	0.376	0.546	2.663	10
Marine – SAND	19	-	27	-	0.376	0.546	2.663	10
Marine - CLAY	17	25	24	2	0.422	0.593	2.371	8
Extremely Weathered Sandstone	21	-	28	50	0.361	0.531	2.770	75
Sandstone – Class IV or better	22	-	33	100	0.295	0.455	3.392	200

The permanent retaining wall should be designed in accordance with AS 4678 Earth Retaining Structures. If it is critical to limit the horizontal deformation an earth pressure coefficient 'at rest' (K_0) should be adopted. Where some lateral movement is acceptable, an 'active' lateral earth pressure coefficient (K_a) is recommended.

The lateral deflection of the design shoring system should be determined by the design engineer, considering the adjacent neighbouring structures footings. Monitoring of the magnitude of the deflections should be carried, particularly where deflections are critical to adjacent structures or critical underground services. Survey monitoring should be carried out during the construction of a shoring system to check and confirm that deflections and movements are within tolerable limits accepted in design. Alliance recommends survey monitoring point targets are installed on the adjacent buildings and then at the top of shoring system. Baseline survey readings should be taken, and then continued monitoring should be sequenced as followed:

1. At each 1.5m vertical lift
2. After excavation to the first row of supports/props, but prior to their installation
3. At the base of excavation and then at weekly intervals until the permanent structures are completed
4. After de-stressing or removal of any supports/props.

An indicative guide for the moment ranges is provided as follows:

- Green (Alert) Zone – For movements up to 80% of the predicted movements as referenced to baseline readings, construction can proceed with normal input from geotechnical and structural engineers.
- Amber (Action Zone) – For movement from 80% to 100% of the predicted movements, the geotechnical and structural engineers must be informed, and monitoring data must be reviewed by both. Construction can proceed under the advice of the geotechnical and structural engineer. The frequency of monitoring should be increased as directed by the engineers.
- Red (Alarm) Zone – For movements greater than the prescribed value, all construction activities must cease immediately, and geotechnical and structural engineers and relevant neighbouring properties/assets owners are to be notified. If the magnitude of movements reaches the ‘Red Zone’, it may be necessary to review the existing structural design and excavation methodology.

Actual threshold values are to be provided by the shoring system designer based on the analysis of the design. A suitable geotechnical monitoring program also depends on the subsurface conditions encountered during excavation and the construction methodology adopted by the contractor. The criteria above should be considered as a minimum.

6.3 Foundation Parameters

It is understood that the current proposed development features one basement level but could be increase to two levels of basement carpark. The proposed structure could be founded on shallow footings founded on low to medium sandstone bedrock at the basement level, assuming the basement extends far enough into the sandstone bedrock.

Alternatively, if the basement depth does not extend into the bedrock, piled foundations founded in the sandstone bedrock may be adopted instead. Given the soil stratum and the presence of groundwater, it is recommended to drill the piles with CFA methods or install temporary steel liners if conventional bored and cast-in-place piling is adopted, to minimise the potential for hole collapse during pile construction. Notably, the piles installed for the shoring wall may also be utilised to support structural loads at the perimeter. Piles should be designed in accordance with AS 2159—2009 Pilling—Design and Installation, using the parameters specified in Table 8.

The design parameters for the deep foundations are presented Table 8. It is recommended that all foundations are founded on the same stratum to minimise the risk of differential settlement.

Table 8-Summary of foundation parameters.

Geological Unit	End Bearing Capacity		Ultimate Shaft Adhesion [3] (kPa)	Young's Modulus (MPa)
	Ultimate [1] (kPa)	Serviceability [2] (kPa)		
Sandstone – Class IV	4,000	2,000	250	100
Sandstone – Class III	10,500	3,500	1,050	350

1 – Limit of approximately linear settlement against bearing pressure

2 – Bearing pressure to limit the settlement to <1% of the minimum footing dimension

3 – For clean sockets which are confirmed to be suitable roughness by a qualified geotechnical engineer on-site during construction. Values for piles in compression. If piles require resistance in tension, half the shaft adhesion values are to be used.

If shallow footings are considered, particularly for foundations located at the basement floor level, the end bearing capacity for the sandstone bedrock provided in Table 8 may be used as the shallow footing allowable bearing capacity. It is recommended that if shallow footings are designed for Class III sandstone, then spoon testing (up to 1.0m below founding level) should be undertaken on 1/3 of the footings to ensure allowable seams are <5% and defect spacing is >200mm.

Geotechnical inspection should be undertaken during pile boring or shallow footing excavation. An experienced geotechnical engineer or engineering geologist should be on site to confirm the design embedment depth and the assumptions made regarding the subsoil conditions. All footing excavations are required to be cleaned of any loose or disturbed material and any water immediately prior to installation of reinforcement casing and placing the concrete. In the case of piling with conventional bored cast-in-place methods, it is recommended that concrete be placed by tremie or concrete pump to ensure the concrete does not segregate during placement due to groundwater ingress.

6.4 Basement Construction and Dewatering

The water level depth below the existing ground levels range between 2.60m to 3.29m. In conjunction with the sandy soils, it is anticipated that the rate of groundwater inflows will be relatively high. As a result, it is recommended that the basement be tanked and the basement slab and walls be designed for a groundwater level of RL 18.1, based on the existing groundwater data. Designers should factor in both hydrostatic pressure and the uplift pressure that this design water level will exert on the basement slab and walls.

Alliance has not undertaken any detailed hydrogeological analysis to assess the hydraulic conductivity of the marine sands or the modelling estimate for the groundwater intake. It is recommended that additional rising head or slug testing be carried out to assess the hydraulic conductivity of the marine sands to better inform the tanked basement design. Typically, the permeability value is of the order of $1x10^{-5}$ m/s.

6.5 Site Classification – Earthquake Actions

Given the thickness of the overlying marine sands, the site sub-soil class is C_e or "*Shallow soil site*" in accordance with AS1170.4. A hazard factor of 0.09 should be adopted, per Table 2.1 from AS1170.4.

7 Limitations

Alliance Geotechnical Pty Ltd (Alliance) has prepared this report for the proposed residential development at 242-258 Young Street, Waterloo NSW in accordance with Alliance's fee proposal and Terms of Engagement. This geotechnical report has been prepared for Charvic Pty Ltd and International Screen Academy Property Pty Ltd for this project and for the purposes outlined in this report. This report cannot be relied upon for other projects, other parties on this alignment or any other site. The comments and recommendations provided in this report are based on the assumption that the geotechnical recommendations contained in this report will be fully complied with during the design and construction of the proposed development.

The borehole investigation results provided in this report are indicative of the subsurface conditions at the site only at the specific sampling and testing location, and to the depth drilled at the time of the investigation. Subsurface conditions can change significantly due to geological and human processes. Where variations in conditions are encountered further geotechnical advice should be sought from Alliance.

Alliance accepts no liability where our recommendations are not followed or are only partially followed.

8 References

AS 1726 - 2017 - Geotechnical Site Investigations

AS 2159 - 2095 - Piling - Design and Installation

AS 3798 – 2007 - Guidelines n Earthworks for Commercial and Residential Developments

AS4678 – Earth Retaining Structures

Pells et al "Foundations on Sandstone and Shale in the Sydney Region" AGJ, 1998

APPENDIX A – Site Photographs



Figure 2-Photo of the drilling setup.



Figure 3-Photo of the marine sands (left) and clay (right) from BH04.

APPENDIX B – Investigation Location Plan



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Site Plan Scale 1:575 on A3

Client Name:	Charvic Pty Ltd & International Screen Academy Property Pty Ltd	N	Figure Number:	17185-GR-1-1-A
Project Name:	Proposed Multi Storey Complex with single or double level basement	0 10 Metres	Figure Date:	08/12/2023
Project Location	242-258 Young Street, Waterloo NSW		Report Number:	17185-GR-1-1

APPENDIX C – Borehole Logs and Explanatory Notes

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Explanatory Notes
Drill & Excavation Logs

General

Information obtained from site investigations is recorded on log sheets. Soils and very low strength rock are commonly drilled using a combination of solid-flight augers with a Tungsten-Carbide (TC) bit. Descriptions of these materials presented on the “Borehole Log” are based on a combination of regular sampling and in-situ testing. Rock coring techniques commences once material is encountered that cannot be penetrated using a combination of solid-flight augers and Tungsten-carbide bit. The "Cored Borehole Log" presents data from drilling where a core barrel has been used to recover material - commonly rock.

The "Excavation – Geological Log" presents data and drawings from exposures of soil and rock resulting from excavation of pits or trenches.

The heading of the log sheets contains information on Project Identification, Hole or Test Pit Identification, Location and Elevation. The main section of the logs contains information on methods and conditions, material description and structure presented as a series of columns in relation to depth below the ground surface which is plotted on the left side of the log sheet. The scale is presented in the depth column as metres below ground level.

As far as is practicable the data contained on the log sheets is factual. Some interpretation is included in the identification of material boundaries in areas of partial sampling, the location of areas of core loss, description and classification of material, estimation of strength and identification of drilling induced fractures, and geological unit. Material description and classifications are based on Australian Standard Geotechnical Site Investigations: AS 1726 - 2017 with some modifications as defined below.

These notes contain an explanation of the terms and abbreviations commonly used on the log sheets.

Drilling

Drilling, Casing and Excavating

Drilling methods deployed are abbreviated as follows

Abbreviation	Method
AS	Auger Screwing
ADV	Auger Drilling with V-Bit
ADT	Auger Drilling with TC Bit
BH	Backhoe
E	Excavator
HA	Hand Auger
HQ	HQ core barrel (~63.5 mm diameter core) *
HMLC	HMLC core barrel (~63.5 mm diameter core) *
NMLC	NMLC core barrel (~51.9 mm diameter core) *
NQ	NQ core barrel (~47.6 mm diameter core) *
RR	Rock Roller
WB	Wash-bore drilling

* Core diameters are approximate and vary due to the strength of material being drilled.

Drilling Fluid/Water

The drilling fluid used is identified and loss of return to the surface estimated as a percentage. It is introduced to assist with the drill process, in particular, when core drilling. The introduction of drill fluid/water does not allow for accurate identification of water seepages.

Drilling Penetration/Drill Depth

Core lifts are identified by a line and depth with core loss per run as a percentage. Ease of penetration in non-core drilling is abbreviated as follows:

Abbreviation	Description
VE	Very Easy
E	Easy
F	Firm
H	Hard
VH	Very Hard

Groundwater Levels

Date of measurement is shown.


Standing water level measured in completed borehole


Level taken during or immediately after drilling


Groundwater inflow water level

Samples/Tests

Samples collected and testing undertaken are abbreviated as follows

Abbreviation	Test
ES	Environmental Sample
DS	Disturbed Sample
BS	Bulk Sample
U50	Undisturbed (50 mm diameter)
C	Core Sample
SPT	Standard Penetration Test
N	Result of SPT (*sample taken)
VS	Vane Shear Test
IMP	Borehole Impression Device
PBT	Plate Bearing Test
PZ	Piezometer Installation
HP	Hand Penetrometer Test
HB	Hammer Bouncing

Excavation Logs

Explanatory notes are provided at the bottom of drill log sheets. Information about the origin, geology and pedology may be entered in the "Structure and other Observations" column. The depth of the base of excavation (for the logged section) at the appropriate depth in the "Material Description" column. Refusal of excavation plant is noted should it occur. A sketch of the exposure may be added. Photos are recommended.

Material Description – Soil

Material Description - In accordance with AS 1726-2017

Classification Symbol - In accordance with the Unified Classification System (AS 1726-2017).

Abbreviation	Typical Name
GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
GP	Poorly graded gravels and gravel-sand mixtures, little or no fines, uniform gravels.
GM	Silty gravels, gravel-sand-silt mixtures.
GC	Clayey gravels, gravel-sand-clay mixtures.
SW	Well graded sands, gravelly sands, little or no fines.
SP	Poorly graded sands and gravelly sands; little or no fines, uniform sands.
SM	Silty sand, sand-silt mixtures.
SC	Clayey sands, sand-clay mixtures.
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
CL, CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
OL	Organic silts and organic silty clays of low plasticity. *
MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, clastic silts.
CH	Inorganic clays of high plasticity, fat clays.
OH	Organic clays of medium to high plasticity, organic silts. *
Pt	Peat and other highly organic soils. *

* Additional details may be provided in accordance with the Von Post classification system (1922).

Organic Soils – Identification using laboratory testing:

Material	Organic Content - % of dry mass
Inorganic	<2
Organic Soil	<2 ≤ 25
Peat	> 25

Organic Soils – Descriptive terms for the degree of decomposition of peat:

Term	Decomposition	Remains	Squeeze
Fibrous	Little or none	Clearly recognizable	Only water No solid
Pseudo-fibrous	Moderate	Mixture of fibrous and amorphous	Turbid water < 50% solids
Amorphous	Full	Not recognizable	Paste > 50% solids

Particle Characteristics – Definitions are as follows:

Fraction	Component (& subdivision)		Size (mm)
Oversize	**Boulders**		> 200
	Cobbles		> 63 ≤ 200
Coarse grained soils	**Gravel**	Coarse	> 19 ≤ 63
		Medium	> 6.7 ≤ 19
		Fine	> 2.36 ≤ 6.7
	Sand	Coarse	> 0.6 ≤ 2.36
		Medium	> 0.2 ≤ 0.6
		Fine	> 0.075 ≤ 0.21
Fine grained soils	**Silt**		0.002 ≤ 0.075
	Clay		< 0.002

Secondary and minor soil components

In coarse grained soils – The proportions of secondary and minor components are generally estimated from a visual and tactile assessment of the soils. Descriptions for secondary and minor soil components in coarse grained soils are as follows.

Designation of components	Percentage fines	Terminology (as applicable)	Percentage accessory coarse fraction	Terminology (as applicable)
Minor	≤ 5	Trace clay / silt	≤ 5	Trace sand / gravel
	> 5 ≤12	With clay / silt	> 5 ≤12	With sand / gravel
Secondary	> 12	Silty or clayey	> 30	Sandy or gravelly

Descriptions for secondary and minor soil components in fine grained soils are as follows.

Designation of components	Percentage coarse grained soils	Terminology (as applicable)
Minor	≤ 5	Trace sand / gravel / silt / clay
	> 5 ≤12	With sand / gravel / silt / clay
Secondary	> 30	Sandy / gravelly / silty / clayey

Plasticity Terms - Definitions for fine grained soils are as follows:

Descriptive Term	Range of Liquid Limit for silt	Range of Liquid Limit for clay
Low Plasticity	≤ 50	≤ 35
Medium Plasticity	N/A	> 35 ≤50
High Plasticity	> 50	> 50

Particle Characteristics

Particle shape and angularity are estimated from a visual assessment of coarse-grained soil particle characteristics. Terminology used includes the following:

Particle shape – spherical, platy, elongated,

Particle angularity – angular, sub-angular, sub-rounded, rounded.

Moisture Condition – Abbreviations are as follows:

D	Dry, looks and feels dry.
M	Moist, No free water on remoulding.
W	Wet, free water on remoulding.

Moisture content of fine-grained soils is based on judgement of the soils moisture content relative to the plastic and liquid limit as follows:

MC < PL	Moist, dry of plastic limit.
MC ≈ PL	Moist, near plastic limit.
MC > PL	Moist, wet of plastic limit.
MC ≈ LL	Wet, near liquid limit.
MC > LL	Wet of liquid limit.

Consistency - of cohesive soils in accordance with AS 1726-2017, Table 11 are abbreviated as follows:

Consistency Term	Abbreviation	Indicative Undrained Shear Strength Range (kPa)
Very Soft	**VS**	< 12
Soft	**S**	12 ≤ 25
Firm	**F**	25 ≤ 50
Stiff	**St**	50 ≤ 100
Very Stiff	**VSt**	100 ≤ 200
Hard	**H**	≥ 200
Friable	**Fr**	-

Density Index (%) of granular soils is estimated or is based on SPT results. Abbreviations are as follows:

Description	Abbreviation	Relative Density	SPT N
Very Loose	**VL**	< 15%	0 - 4
Loose	**L**	15 - 35%	4 - 10
Medium Dense	**MD**	35 - 65%	10 - 30
Dense	**D**	65 - 85%	30 - 50
Very Dense	**VD**	> 85%	> 50

Structures – Fissuring and other defects are described in accordance with AS 1726-2017 using the terminology for rock defects

Origin – Where practicable an assessment is provided of the probable origin of the soil, e.g. fill, topsoil, alluvium, colluvium, residual soil.

MATERIAL DESCRIPTION - ROCK

Material Description – In accordance with AS 1726-2017

Rock Naming – Where possible conventional geological names are used within the logs. Engineering properties cannot be inferred directly from the rock names in the table, but the use of a particular name provides an indicative range of characteristics to the reader. Lithological identification of rock is provided to appreciate the geology of an area, to correlate geological profiles seen in boreholes or to distinguish boulders from bedrock.

Grain Size – Grain size is done in accordance with AS1726-2017 as follows:

For sedimentary rock:

Coarse grained	Mainly 0.6mm to 2mm
Medium grained	Mainly 0.2mmto 0.6mm
Fine grained	Mainly 0.06mm to 0.2mm

For igneous and metamorphic rock:

Coarse grained	Mainly greater than 2 mm
Medium grained	Mainly 0.6mm to 2mm
Fine grained	Mainly less than 2mm

Colour - Rock colour is described in the moist condition.

Texture and Fabric

Frequently used terms:

Sedimentary Rock	Metamorphic Rock	Igneous
Bedded	Banded	Amorphous
Cross-bedded	Cleaved	Crystalline
Folded	Folded	Flow banded
Graded	Foliated	Folded
Interbedded	Gneissose	Lineated
Laminated	Lineated	Massive
Massive	Schistose	Porphyritic

Bedding and fabric:

Description	Spacing
Very Thickly Bedded	> 2m
Thickly Bedded	0.6m to 2m
Medium Bedded	0.2m to 0.6m
Thinly Bedded	60mm to 200mm
Very Thinly Bedded	20mm to 60mm
Thickly Laminated	6mm to 20mm
Thinly Laminated	< 6mm

Degree of development:

Massive	No layering or fabric. Rock is homogeneous.
Indistinct	Layering or fabric just visible, There is little effect on strength properties.
Distinct	Layering or fabric obvious. The rock may break more easily parallel to the fabric.

Features, inclusions, and minor components - Features, inclusions and minor components within the rock material shall be described where those features could be significant such as gas bubbles, mineral veins, carbonaceous material, salts, swelling minerals, mineral inclusions, ironstone or carbonate bands, cross-stratification, or minerals the readily oxidise upon atmospheric exposure.

Moisture content - Where possible descriptions are made by the feel and appearance of the rock using one according to following terms:

Dry	Looks and feels dry.
Moist	Feels cool, darkened in colour, but no water is visible on the surface.
Wet	Feels cool, darkened in colour, water film or droplets visible on the surface.

The moisture content of rock cored with water may not be representative of its in-situ condition.

Durability – Descriptions of the materials durability such as tendency to develop cracks, break into smaller pieces or disintegrate upon exposure to air or in contact with water are provided where observed.

Rock Material Strength – The strength of the rock material is based on uniaxial compressive strength (UCS). The following terms are used:

Term / Abbreviation		Description	UCS (MPa)	Point Load Strength Index (MPa)
Very Low	**VL**	Crumbles under firm blow with sharp end of pick, can be peeled with a knife; too hard to cut a triaxial by hand; 30mm pieces can be broken by hand.	0.6 – 2	0.03 – 0.1
Low	**L**	Easily scored with a knifed; indentations 1-3mm show with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.	2 – 6	0.1 – 0.3
Medium	**M**	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.	6 – 20	0.3 – 1
High	**H**	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.	20 – 60	1 – 3
Very High	**VH**	Hand specimen breaks with pick after more than one blow; rock rings under hammer.	60 – 200	3 – 10
Extremely High	**EH**	Specimen requires many blows with geological pick to break into intact materials; rock rings under hammer.	> 200	> 10

Strengths are estimated and where possible supported by Point Load Index Testing of representative samples. Test results are plotted on the graphical logs as follows:

D	Diametral Point Load Test
A	Axial Point Load Test

Where the estimated strength log covers more than one range it indicates the rock strength varies between the limits shown. Point Load Strength Index test results are presented as $I_{s\,(50)}$ values in MPa.

Weathering – Weathering classification assists in identification but does not imply engineering properties. Descriptions are as follows:

Term / Abbreviation		Description
Residual Soil	**RS**	Material has soil properties. Mass structure and material texture and fabric of original rock not visible, but the soil has not been significantly transported.
Extremely Weathered	**EW**	Material has soil properties. Mass structure, material texture and fabric of original rock are still visible.
Highly Weathered	**HW**	Material is completely discoloured, significant decrease in strength from fresh rock.
Moderately Weathered	**MW**	Material is `completely discoloured, little or no change of strength from fresh rock.
Slightly Weathered	**SW**	Partly stained or discoloured, little or no change to strength from fresh rock.
Fresh	**FR**	No signs of mineral decomposition or colour change.

Alteration – Physical and chemical changes of the rock material due to geological processes by fluids at depth at pressures and temperatures above atmospheric conditions. Unlike weathering, alteration shows no relationship to topography and may occur at any depth. When altered materials are recognized, the following terms are used:

Term / Abbreviation				Description
Extremely Altered		**XA**		Material has soil properties. Structure, texture, and fabric of original rock are still visible. The rock name is replaced with the name of the parent material, e.g., Extremely Altered basalt. Soil descriptive terms are used.
Highly Altered	**Distinctly altered**	**HA**	**DA**	The whole of the rock material is discoloured. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be higher or lower due to loss of minerals or precipitation of secondary minerals in pores.
Moderately Altered	**Distinctly altered**	**MA**	**DA**	The whole of the rock material is discoloured. Little or no change of strength from fresh rock. The term 'Distinctly Altered' is used where it is not practicable to distinguish between 'Highly Altered' and 'Moderately Altered'. Distinctly Altered is defined as follows: - The rock may be highly discoloured; - Porosity may be higher due to mineral loss; or may be lower due to precipitation of secondary minerals in pores; and - Some change of rock strength.
Slightly Altered		**S**		Rock is slightly discoloured. Little or no change of strength from fresh rock.

Alteration is only described in the context of the project where it has relevance to the civil and structural design.

Defect Descriptions

General and Detailed Descriptions – Defect descriptions are provided to suit project requirements. Generalized descriptions are used for some projects where it is unnecessary to describe each individual defect in a rock mass, or where multiple similar defects are present which are too numerous to log individually. The part of the rock mass to which this applies is delineated.

Detailed descriptions are given of defects judged to be particularly significant in the context of the project. For example, crushed seams in an apparently unstable slope. As a minimum, general descriptions outlining the number of defect sets within the rock mass and their broad characteristics are provided where it is possible to do so.

Defect Type – Defect abbreviations are as follows:

BP	Bedding parting	**SSM**	Sheared seam	**DB**	Drilling break
JT	Joint	**CS**	Crushed seam	**HB**	Handling break
SS	Shear surface	**SM**	Infilled seam		
SZ	Sheared zone	**EWS**	Extremely weathered seam		

Sheared surfaces, sheared zones, sheared seams, and crushed seams are generally faults in geological terms.

Defect Orientation

For oriented core: The dip and dip direction are recorded as a two-digit and three-digit number separated by a slash, are collected e.g., 50°/240° and there is not core loss that could obscure core orientation. If alternative measurements are made, such as dip and strike or dip direction relative to magnetic north this shall be documented.

For non-oriented core: The dip is recorded as a two-digit number, e.g., 10°. In vertical boreholes the dip is generally measured relative to the horizontal plan. If the borehole is inclined the dip is generally measured from the core axis.

Surface Roughness – Defect surface roughness is described as follows:

VR	**Very rough**	Many large surface irregularities with amplitude generally more than 1 mm.
RO	**Rough**	Many small surface irregularities with amplitude generally less than 1 mm.
SO	**Smooth**	Smooth to touch. Few or no surface irregularities.
PO	**Polished**	Shiny smooth surface
SK	**Slickensided**	Grooved or striated surface, usually polished.

Surface Shape – Defect surface roughness is described as follows:

PL	**Planar**	The defect does not vary in orientation.
CU	**Curved**	The defect has a gradual change in orientation
UN	**Undulating**	The defect has a wavy surface.
ST	**Stepped**	The defect has one or more well defined steps
IR	**Irregular**	The defect has many sharp changes of orientation

Defect Infilling – Common abbreviation as follows:

Ca	Calcite	**Fe**	Iron Oxide	**Qz**	Quartz
Cy	Clay	**MS**	Secondary mineral	**X**	Carbonaceous

Defect Coatings and Seam Composition - Coatings are described using the following terms:

CN	**Clean**	No visible coating.
SN	**Stained**	No visible coating but surfaces are discoloured.
VN	**Veneered**	A visible coating of soil or mineral, too thin to measure; may ne patchy.
CO	**Coating**	A visible coating up to 1 mm thick. Soil in-fill greater than 1 mm shall be described using defect terms (e.g., infilled seam). Defects greater than 1 mm aperture containing rock material great described as a vein.

Defect Spacing, Length, Openness and Thickness – Described directly in millimetres and metres. In general descriptions, half order of magnitude categories is used, e.g. joint spacing typically 100 mm to 300 mm, sheared zones 1m to 3m thick.

Depending on project requirements and the scale of observation, spacing may be described as the mean spacing within a set of defects, or as the spacing between all defects within the rock mass. Where spacing is measured within a specific set of defects, measurements shall be made perpendicular to the defect set.

Where significant, the nature of the defect end condition is recorded in the context of the scale of the exposure.

Block Shape – Where it is considered significant, block shape should be described using terms given in Table 23, AS 1725:2017.

Stratigraphic Unit – Geological maps related to the project are used for the designation of lithological formation name and, where possible geological unit name, e.g., Bringelly Shale, Potts Hill Sandstone Member.

Core Loss – Core loss occurs when material is lost during the drilling process It is shown at the bottom of the run unless otherwise indicated where core loss is known.

Total Core Recovery – The percentage of rock recovered excluding core loss per core run.

Defect Spacing – The spacing of successive defects or the mean spacing for relatively broken core.

Fracture Index – Which is the number defects per metre of core.

Rock Quality Designation (RQD) – The percentage of sound core pieces of 100mm or greater per core run and is calculated using Deere et al. (1989) method.

Rock Classification System – For design purpose, Sydney Rock Mass Classification System (Pells et al. 1998, 2019) is adopted.

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BH No: BH01
PAGE 1 OF 4
Job No: 17185

Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 22/11/2023
Finished: 22/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 21.63m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
CC		21.5			-	Concrete, 170mm thickness.		-	-	PAVEMENT
ADT			0.5		-	FILL: Gravelly SAND, fine to medium grained, brown and dark brown, fine sized gravel, with silt, appears well compacted.		-	-	FILL
		21.0				At 0.6-1.0m: rare terracotta and concrete fragments.				
			1.0		SW	SAND, fine to medium grained, dark brown and pale brown.		D	L	MARINE
		20.5								
			1.5							
		20.0					SPT 5, 5, 3 N=8			
			2.0							
		19.5								
			2.5							
		19.0								
			3.0		SC	SAND, fine to medium grained, brown grey, trace silt.		W - M	MD	
						At 2.8m: with silt.				
		18.5					SPT 1, 5, 6 N=11			
			3.5							
		18.0								
			4.0							
	GW @ 4.0m	17.5								
			4.5		SC	Clayey SAND, fine to medium grained, pale grey and grey.		W	-	
		17.0			CH	CLAY, high plasticity, pale grey, trace fine grained sand.	SPT 4, 9, 10 N=19 ES - 4.8m	MC ~ PL	F	
			5.0							

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Borehole Log

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Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 22/11/2023
Finished: 22/11/2023
Borehole Size 110 mm

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RL Surface: 21.63m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
ADT		16.5			CH	CLAY, high plasticity, pale grey, trace fine grained sand. *(continued)*		MC ~ PL	F	
			5.5		SW	SAND, fine to medium grained, pale brown, with trace silt.		W	MD	
		16.0								
			6.0		CH	CLAY, high plasticity, pale grey, trace fine grained sand.	SPT 4, 18, 18 N=36	MC ~ PL	VSt	
		15.5			-	SANDSTONE, fine to medium grained, pale grey, very low strength.		D	-	EXTREMELY WEATHERED MATERIAL
			6.5							
		15.0				Borehole BH01 continued as cored hole				
			7.0							
		14.5								
			7.5							
		14.0								
			8.0							
		13.5								
			8.5							
		13.0								
			9.0							
		12.5								
			9.5							
		12.0								
			10.0							

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Cored Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Started: 22/11/2023
Project: Proposed Mixed-Use Commercial Development
Finished: 22/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 21.63m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 / VL -0.1 / L -0.3 / M -1 / H -3 / VH -10 / EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm 30 / 100 / 300 / 1000 / 3000	Additional Data
		16.5	5.5								
		16.0	6.0								
		15.5	6.5								
		15.0			Continued from non-cored borehole						
NMLC			7.0		SANDSTONE, fine to medium grained, pale grey, very low strength. *(continued)*	EW					
		14.5			SANDSTONE, fine to medium grained, orange brown and red brown, bedding fabric.	HW					7.0 - HB. 7.05 - CS, PL, RO, CT. 7.14 - EWS, PL, RO, CN.
			7.5						20		7.28 - EWS, PL, RO, CN.
		14.0									7.58-7.65 - CS, PL, RO, CT.
			8.0			MW		D 0.694			7.78 - BP, PL, RO, CN. 7.78-7.84 - EWS, PL, RO, CN. 8.0 - HB.
		13.5									
			8.5								
		13.0									8.58 - EWS, PL, RO, CT.
			9.0					D 0.476 A 0.246	97		8.78-8.82 - EWS, PL, RO, CN. 9.0 - HB.
		12.5									
			9.5								9.24 - BP, 5°, PL, RO, CN.
		12.0									
			10.0								9.72 - HB.

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Started: 22/11/2023
Project: Proposed Mixed-Use Commercial Development
Finished: 22/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 21.63m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm 30 100 300 1000 3000	Additional Data
NMLC		11.5			SANDSTONE, fine to medium grained, orange brown and red brown, bedding fabric. *(continued)*	MW		D 1.22 A 1.69	97		10.0 - HB. 10.06 - BP.
					Target depth. BH01 terminated at 10.22m						End of Borehole.

11.0 10.5 10.0 9.5 9.0 8.5 8.0 7.5 7.0

10.5 11.0 11.5 12.0 12.5 13.0 13.5 14.0 14.5 15.0

6. CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23



BH01	Box 1/1	6.63-10.22m

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Client Name	Charvic Pty Ltd International Screen Academy Property Pty Ltd	Photo Date:	22/11/23
Project Name	Proposed Mixed Use Development	Report Number:	17185-GR-1-1
Project Location	242-258 Young Street, Waterloo NSW		

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Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 20/11/2023
Finished: 20/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 21.23m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
CC					-	Concrete, 150mm thickness.		-	-	PAVEMENT
ADT		21.0	0.5		-	FILL: Gravelly SAND, fine to coarse grained, dark brown, fine to medium sized gravel, with high plasticity clay, appears well compacted.		D	-	FILL
		20.5	1.0							
		20.0	1.5							
		19.5	2.0		SW	SAND, fine to medium grained, brown, trace silt.	SPT 5, 7, 6 N=13	D	MD	MARINE
		19.0	2.5							
		18.5	3.0							
		18.0	3.5		SW	SAND, fine to coarse grained, pale brown, trace silt.	SPT 6, 9, 9 N=18 ES - 3.0m	D	MD	
		17.5	4.0							
	GW @ 4.3m	17.0	4.5			At 4.3m: dark brown.		W	L	
		16.5	5.0				SPT 1, 1, 2 N=3			4.5m: Potential sand collapse or affected by groundwater ingress.

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Finished: 20/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 21.23m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
ADT		16.0	5.5		SW	SAND, fine to coarse grained, pale brown, trace silt. *(continued)*		D	MD	
		15.5			CH	CLAY, high plasticity, pale grey, with fine to medium grained sand.		MC > PL	St	
		15.0	6.0				SPT 3, 6, 9 N=15			
		14.5	6.5		SW	SAND, fine to coarse grained, dark brown, trace silt.		W	MD	
		14.0	7.0		-	SANDSTONE, fine to coarse grained, pale grey, very low strength.		D	-	EXTREMELY WEATHERED MATERIAL
		13.5	7.5							
		13.0	8.0							
		12.5	8.5			Borehole BH02 continued as cored hole				
		12.0	9.0							
		11.5	9.5							
			10.0							

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Cored Borehole Log

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Project: Proposed Mixed-Use Commercial Development
Finished: 20/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 21.23m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm 30 100 300 1000 3000	Additional Data
		16.0	5.5								
		15.5	6.0								
		15.0	6.5								
		14.5	7.0								
		14.0	7.5								
		13.5	8.0								
		13.0	8.5								
		12.5			Continued from non-cored borehole						
NMLC			9.0		SANDSTONE, fine to medium grained, red brown, bedding fabric.	MW	●	D A 1.095 1.37	92		8.78 - DB. 9.0 - HB. 9.42 - BP, 10°, PL, RO, CN.
		12.0	9.5								
		11.5					●	D A 2.092 2.947			9.78 - BP, 5°, PL, RO, CN.
			10.0								

6. CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Cored Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Started: 20/11/2023
Project: Proposed Mixed-Use Commercial Development
Finished: 20/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 21.23m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral; EL -0.03, VL -0.1, L -0.3, M -1, H -3, VH -10, EH)	$Is_{(50)}$ MPa (D- diametral, A- axial)	RQD %	Defect Spacing mm (30, 100, 300, 1000, 3000)	Additional Data
NMLC		11.0	10.5		SANDSTONE, fine to medium grained, red brown, bedding fabric. *(continued)*	MW		D 1.448 A 1.698	92		10.0 - HB. 10.35 - BP, 5°, PL, RO, SN. 10.73 - BP, 15°, PL, RO, VN. 10.86-10.88 - EWS, PL, RO, clay. 10.88-10.9 - EWS, PL, RO, CT.
		10.5	11.0								11.0 - HB. 11.04 - BP, 5°, PL, RO, VN. 11.07-11.12 - EWS, PL, RO, clay.
		10.0	11.5								11.35 - HB. 11.39 - BP, 15°, PL, RO, SN.
		9.5						D 2.882 A 2.569			11.63 - DB.
			12.0		Target depth. BH02 terminated at 11.78m						End of Borehole.
		9.0	12.5								
		8.5	13.0								
		8.0	13.5								
		7.5	14.0								
		7.0	14.5								
		6.5	15.0								

6. CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23



BH02	Box 1/1	8.78-11.78m

alliance	Client Name	Charvic Pty Ltd International Screen Academy Property Pty Ltd	Photo Date: 20/11/23
	Project Name	Proposed Mixed Use Development	Report Number: 17185-GR-1-1
	Project Location	242-258 Young Street, Waterloo NSW	

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Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 23/11/2023
Finished: 23/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 21.45m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
CC					-	Concrete, 150mm thickness.		-	-	PAVEMENT
ADT		21.0	0.5		-	FILL: Sandy CLAY, high plasticity, brown and dark brown, fine to medium grained sand, trace fine sized gravel, reworked clay, appears well compacted.		MC < PL	F	FILL
		20.5	1.0							
		20.0	1.5				SPT 10, 16, 16 N=32			
		19.5	2.0		SW	SAND, fine to medium grained, dark grey.		M	L - MD	MARINE
		19.0	2.5							
		18.5	3.0				SPT 1, 1, 2 N=3			
		18.0	3.5							
		17.5	4.0			At 3.8m: with silt and organic content, slight hydrocarbon odour, wood fragments.				
	GW @ 4.3m	17.0	4.5		SW	SAND, fine to medium grained, pale grey and dark grey.		W	MD	
		16.5	5.0				SPT 4, 7, 8 N=15			

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 23/11/2023
Finished: 23/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 21.45m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
ADT		16.0	5.5		SW	SAND, fine to medium grained, pale grey and dark grey. *(continued)*		W	MD	
		15.5	6.0				SPT 3, 2, 3 N=5 ES - 6.4m			6.0m: Potential sand collapse or affected by groundwater ingress.
		15.0	6.5		CH	CLAY, high plasticity, pale grey, trace fine grained sand.		MC ~ PL	F	
		14.5	7.0							
		14.0	7.5				SPT 3, 5, 8 N=13			
		13.5	8.0							
		13.0	8.5							
		12.5	9.0		-	SANDSTONE, fine to medium grained, pale grey, very low strength.		D	-	EXTREMELY WEATHERED MATERIAL
						Borehole BH03 continued as cored hole				
		12.0	9.5							
		11.5	10.0							

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Cored Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 23/11/2023
Finished: 23/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 21.45m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm 30 100 300 1000 3000	Additional Data
		16.0	5.5								
		15.5	6.0								
		15.0	6.5								
		14.5	7.0								
		14.0	7.5								
		13.5	8.0								
		13.0	8.5								
		12.5	9.0		Continued from non-cored borehole						
NMLC		12.0	9.5		SANDSTONE, fine to medium grained, orange brown and pale grey, bedding fabric.	MW		D A 1.075 2.525	91		9.2 - BP, 5°, PL, RO, CN. 9.6 - DB. 9.8 - HB.
		11.5	10.0								

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Cored Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Started: 23/11/2023
Project: Proposed Mixed-Use Commercial Development
Finished: 23/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 21.45m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm (30 100 300 1000 3000)	Additional Data
NMLC		11.0	10.5		SANDSTONE, fine to medium grained, orange brown and pale grey, bedding fabric. *(continued)*	MW		D 1.36 A 1.82			10.0 - HB. 10.15 - BP, 5°, PL, RO, SN. 10.19 - BP, 55°, PL, RO, SN. 10.56-10.69 - EWS, PL, RO.
		10.5	11.0						91		11.0 - HB. 11.16 - DB.
		10.0	11.5								11.55 - BP, 5°, PL, RO, CN.
		9.5	12.0					D 1.16 A 1.47			
					BH03 terminated at 12m						End of Borehole.
		9.0	12.5								
		8.5	13.0								
		8.0	13.5								
		7.5	14.0								
		7.0	14.5								
		6.5	15.0								



BH03	Box 1/1	9.0-12.0m

alliance	Client Name	Charvic Pty Ltd International Screen Academy Property Pty Ltd	Photo Date: 23/11/23
	Project Name	Proposed Mixed Use Development	Report Number: 17185-GR-1-1
	Project Location	242-258 Young Street, Waterloo NSW	

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BH No: BH04
PAGE 1 OF 4
Job No: 17185

Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 21/11/2023
Finished: 21/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 20.25m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
ADT		20.0	0.0		-	TOPSOIL: Sandy SILT, low plasticity, brown, fine to coarse grained, trace fine to medium sized gravel, organic.		MC < PL	F	TOPSOIL
					-	FILL: Sandy GRAVEL, fine to coarse sized, subangular grey, fine to coarse grained sand, appears well compacted.		D	MD - D	FILL
					-	FILL: SAND, fine to medium grained, pale brown, appears well compacted. At 0.3m: rare red brick.		D	MD	
		19.5	0.5		SW	SAND, fine to medium grained, pale brown.		D	MD	MARINE
		19.0	1.0							
		18.5	1.5				SPT 6, 7, 9 N=16			
		18.0	2.0							
		17.5	2.5							
		17.0	3.0				SPT 3, 2, 4 N=6			3.0m: Potential sand collapse or affected by groundwater ingress.
	GW @ 3.2m				SW	SAND, fine to medium grained, pale grey, trace silt.		W	L - MD	
		16.5	3.5							
		16.0	4.0							
		15.5	4.5			At 4.5m: becoming dense.	SPT 4, 9, 14 N=23			
			5.0							

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Project: Proposed Mixed-Use Commercial Development
Location: 242-258 Young Street, Waterloo, NSW

Started: 21/11/2023
Finished: 21/11/2023
Borehole Size 110 mm

Rig Type: Massenza MI3 | **Hole Location:** Refer to Drawing 17185-GR-1-1-B | **Driller:** MG | **Logged:** SC
RL Surface: 20.25m | **Contractor:** Stratacore | **Bearing:** --- | **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Samples Tests Remarks	Moisture Condition	Consistency/ Density Index	Additional Observations
ADT		15.0	5.5		SW	SAND, fine to medium grained, pale grey, trace silt. *(continued)*		W	L - MD	
		14.5	6.0				ES - 6.0m			
		14.0			CH	Sandy CLAY, high plasticity, pale brown mottled pale brown, fine to medium grained sand.	SPT 2, 3, 3 N=6	MC > PL	F	
			6.5		SW	SAND, fine to medium grained, pale grey, trace silt.		W	D	
		13.5	7.0							
		13.0	7.5			Borehole BH04 continued as cored hole				
		12.5	8.0							
		12.0	8.5							
		11.5	9.0							
		11.0	9.5							
		10.5	10.0							

2. NON CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Cored Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Started: 21/11/2023
Project: Proposed Mixed-Use Commercial Development
Finished: 21/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 20.25m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm 30 100 300 1000 3000	Additional Data
		15.0	5.5								
		14.5	6.0								
		14.0	6.5								
		13.5	7.0								
		13.0	7.5		Continued from non-cored borehole						
NMLC		12.5	8.0		SANDSTONE, fine to medium grained, pale grey and orange brown.	EW					
		12.0	8.5		SANDSTONE, fine to medium grained, white, bedding fabric.	MW		D 0.054 A 0.601	59		8.0 - HB. 8.04 - BP, PL, RO, CN. 8.11 - BP, 5°, PL, RO, CN. 8.15-8.19 - EWS, PL, RO. 8.22 - HB. 8.44 - BP, 5°, PL, RO, CN.
		11.5	9.0								8.69 - BP, 5°, PL, RO, CN. 8.96-9.0 - EWS, PL, RO. 9.0 - HB. 9.07 - BP, PL, RO, SN.
		11.0	9.5		CLAY, high plasticity, pale grey, trace fine to medium grained sand.	N/A					
		10.5	10.0		SANDSTONE, fine to medium grained, white, bedding fabric.	MW		D 2.431 A 2.384	93		9.59 - HB. 9.63 - BP, 5°, PL, RO, CT. 9.94 - BP, 5°, PL, RO, VN.

6. CORED BOREHOLE (NO COORD/RL) 17185.GPJ GINT STD AUSTRALIA.GDT 20/12/23

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Cored Borehole Log

Client: Charvic Pty Ltd & International Screen Academy Property Pty Ltd
Started: 21/11/2023
Project: Proposed Mixed-Use Commercial Development
Finished: 21/11/2023
Location: 242-258 Young Street, Waterloo, NSW
Borehole Size 110 mm

Rig Type: Massenza MI3 **Hole Location:** Refer to Drawing 17185-GR-1-1-B **Driller:** MG **Logged:** SC
RL Surface: 20.25m **Contractor:** Stratacore **Bearing:** --- **Checked:** MAG

Method	Water	RL (m)	Depth (m)	Graphic Log	Material Description	Weathering	Estimated Strength (● Axial, ○ Diametral) EL -0.03 VL -0.1 L -0.3 M -1 H -3 VH -10 EH	$Is_{(50)}$ MPa D- diametral A- axial	RQD %	Defect Spacing mm 30 100 300 1000 3000	Additional Data
NMLC		10.0	10.5		SANDSTONE, fine to medium grained, white, bedding fabric. *(continued)*	MW		D 3.995 A 5.617			10.0 - HB. 10.15 - HB. 10.3 - BP.
		9.5									10.76 - HB.
			11.0						93		
		9.0									11.0 - HB.
			11.5								
		8.5									11.68-11.72 - EWS, PL, RO. 11.81 - DB.
			12.0					D 0.891 A 0.894			
		8.0			BH04 terminated at 11.94m						End of Borehole.
			12.5								
		7.5									
			13.0								
		7.0									
			13.5								
		6.5									
			14.0								
		6.0									
			14.5								
		5.5									
			15.0								



BH04	Box 1/1	7.55-11.94m

alliance	Client Name	Charvic Pty Ltd International Screen Academy Property Pty Ltd	Photo Date: 21/11/23
	Project Name	Proposed Mixed Use Development	Report Number: 17185-GR-1-1
	Project Location	242-258 Young Street, Waterloo NSW	

APPENDIX D – Laboratory Testing Results

Material Test Report

Alliance Specialised Testing

Date Issued:	07/12/2023
Report Number:	P233937-1
Issue Number:	1
Reissue Reason:	N/A

Client:	Alliance Geotechnical Pty Ltd
Client Address:	8-10 Welder Road, Seven Hills NSW 2147
Client Contact:	Eric Wu <eric@allgeo.com.au>

Project Number:	P233937
Project Name:	242-258 Young Street, Waterloo
Project Location:	242-258 Young Street, Waterloo NSW

Page	Test Date	Sample Number	Borehole	Depth	Test
2	04/12/2023	23-31055A	BH01	9.23-9.54m	Rock Strength - AS 4133.4.2.2
3	04/12/2023	23-31055B	BH02	10.34-10.65m	Rock Strength - AS 4133.4.2.2
4	04/12/2023	23-31055C	BH03	11.55-11.85m	Rock Strength - AS 4133.4.2.2
5	04/12/2023	23-31055D	BH04	10.50-10.76m	Rock Strength - AS 4133.4.2.2

Work Request:	31055
Date Sampled:	29/11/2023
Sampling Method:	Sampled by Client
	The results apply to the sample as received
Specification:	-

Approved Signature:

Ian Goldschmidt
Specialist Testing Manager

Accredited for compliance with ISO/IEC 17025 - Testing
NATA Accredited Laboratory Number: 15100

NATA
WORLD RECOGNISED ACCREDITATION

alliance Specialty Testing

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Phone 1800 288 188
Email ian@allgeo.com.au
Website allgeo.com.au

alliance

Specialised Testing - 1800 288 188

Uniaxial Compressive Strength of Rock Strength less than 50MPa

Test Method: AS4133.4.2.2

Report Number:	P233937-1	Sample Date:	29/11/2023
Sample Number:	23-31055A	Test Date:	04/12/2023
Sample Source:	BH01, Depth: 9.23-9.54m	Report Date:	07/12/2023

Project Name:	242-258 Young Streeet, Waterloo
Client:	Alliance Geotechnical Pty Ltd
Identification:	Sandstone
Storage History, Curing and Environment:	Stored in laboratory at room temperature.

Specimen Details	
Diameter (mm)	51.8
Height (mm)	133.0
Moisture Content at Time of Test (%)	8.0

Results	
Uniaxial Compressive Strength (MPa)	14
Rate of Displacement (mm/min)	0.10
Test Duration (min)	15.4
Description of Failure	Single Shear Plane
Pertinent Observations	N/A

Photos

Before Testing	After Testing
	

Comments

N/A.

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NATA Accredited Laboratory Number: 15100

Approved Signature:

Ian Goldschmidt
Specialised Testing Manager

alliance
Specialised Testing - 1800 288 188

Uniaxial Compressive Strength of Rock Strength less than 50MPa

Test Method: AS4133.4.2.2

Report Number:	P233937-1	Sample Date:	29/11/2023
Sample Number:	23-31055B	Test Date:	04/12/2023
Sample Source:	BH02, Depth: 10.34-10.65m	Report Date:	07/12/2023

Project Name:	242-258 Young Streeet, Waterloo
Client:	Alliance Geotechnical Pty Ltd
Identification:	Rock Core
Storage History, Curing and Environment:	Stored in laboratory at room temperature.

Specimen Details	
Diameter (mm)	51.7
Height (mm)	137.7
Moisture Content at Time of Test (%)	7.4

Results	
Uniaxial Compressive Strength (MPa)	14
Rate of Displacement (mm/min)	0.10
Test Duration (min)	16.1
Description of Failure	Single Shear Plane
Pertinent Observations	N/A

Photos

Before Testing	After Testing
	

Comments

N/A.

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Accredited for compliance with ISO/IEC 17025 - Testing
NATA Accredited Laboratory Number: 15100

Approved Signature:

Ian Goldschmidt
Specialised Testing Manager

alliance

Specialised Testing - 1800 288 188

Uniaxial Compressive Strength of Rock Strength less than 50MPa

Test Method: AS4133.4.2.2

Report Number:	P233937-1	Sample Date:	29/11/2023
Sample Number:	23-31055C	Test Date:	04/12/2023
Sample Source:	BH03, Depth: 11.55-11.85m	Report Date:	07/12/2023

Project Name:	242-258 Young Streeet, Waterloo
Client:	Alliance Geotechnical Pty Ltd
Identification:	Rock Core
Storage History, Curing and Environment:	Stored in laboratory at room temperature.

Specimen Details	
Diameter (mm)	51.7
Height (mm)	135.8
Moisture Content at Time of Test (%)	8.1

Results	
Uniaxial Compressive Strength (MPa)	11
Rate of Displacement (mm/min)	0.10
Test Duration (min)	12.2
Description of Failure	Mixed Mode
Pertinent Observations	N/A

Photos

Before Testing	After Testing
	

Comments

N/A.

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NATA Accredited Laboratory Number: 15100

Approved Signature:

Ian Goldschmidt
Specialised Testing Manager

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Uniaxial Compressive Strength of Rock Strength less than 50MPa

Test Method: AS4133.4.2.2

Report Number:	P233937-1	Sample Date:	29/11/2023
Sample Number:	23-31055D	Test Date:	04/12/2023
Sample Source:	BH04, Depth: 10.50-10.76m	Report Date:	07/12/2023

Project Name:	242-258 Young Streeet, Waterloo
Client:	Alliance Geotechnical Pty Ltd
Identification:	Rock Core
Storage History, Curing and Environment:	Stored in laboratory at room temperature.

Specimen Details	
Diameter (mm)	51.7
Height (mm)	136.5
Moisture Content at Time of Test (%)	7.0

Results	
Uniaxial Compressive Strength (MPa)	26
Rate of Displacement (mm/min)	0.10
Test Duration (min)	8.9
Description of Failure	Single Shear Plane
Pertinent Observations	N/A

Photos

Before Testing	After Testing
	

Comments

N/A.

NATA
WORLD RECOGNISED ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing
NATA Accredited Laboratory Number: 15100

Approved Signature:

Ian Goldschmidt
Specialised Testing Manager

Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Sean Cunningham**

Report **1046817-S**
Project name 242-258 YOUNG STREET WATERLOO
Project ID 17185
Received Date Nov 22, 2023

Client Sample ID			**BH01**	**BH02**	**BH04**
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S23-No0055939**	**S23-No0055940**	**S23-No0055941**
Date Sampled			**Nov 22, 2023**	**Nov 21, 2023**	**Nov 20, 2023**
Test/Reference	LOR	Unit			
Chloride	10	mg/kg	< 10	< 10	25
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	< 10	23	160
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	5.3	8.3	9.6
Resistivity*	0.5	ohm.m	1100	430	62
Sulphate (as SO4)	10	mg/kg	< 10	17	33
Sample Properties					
% Moisture	1	%	17	3.0	25

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Nov 23, 2023	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Nov 23, 2023	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Nov 23, 2023	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Nov 23, 2023	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
% Moisture	Sydney	Nov 23, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name:	Alliance Geotechnical	**Order No.:**		**Received:**	Nov 22, 2023 6:50 PM
Address:	10 Welder Road	**Report #:**	1046817	**Due:**	Nov 28, 2023
	Seven Hills	**Phone:**	1800 288 188	**Priority:**	3 Day
	NSW 2147	**Fax:**	02 9675 1888	**Contact Name:**	- ALL SRAS/RESULTS/INVOICES
Project Name:	242-258 YOUNG STREET WATERLOO				
Project ID:	17185				

Eurofins Analytical Services Manager : Andrew Black

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Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH01	Nov 22, 2023		Soil	S23-No0055939	X	X
2	BH02	Nov 21, 2023		Soil	S23-No0055940	X	X
3	BH04	Nov 20, 2023		Soil	S23-No0055941	X	X
Test Counts						3	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Chloride	mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	uS/cm	< 10			10	Pass	
Sulphate (as SO4)	mg/kg	< 10			10	Pass	
LCS - % Recovery							
Chloride	%	108			70-130	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	%	101			70-130	Pass	
Resistivity*	%	101			70-130	Pass	
Sulphate (as SO4)	%	108			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Chloride	W23-No0041097	NCP	%	109			70-130	Pass	
Sulphate (as SO4)	W23-No0041097	NCP	%	104			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S23-No0055939	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	S23-No0055939	CP	uS/cm	< 10	12	22	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	S23-No0055939	CP	pH Units	5.3	5.1	<1	30%	Pass	
Resistivity*	S23-No0055939	CP	ohm.m	1100	870	22	30%	Pass	
Sulphate (as SO4)	S23-No0055939	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-No0055916	NCP	%	8.7	8.8	1.3	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Andrew Black	Analytical Services Manager
Ryan Phillips	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Alliance Geotechnical
10 Welder Road
Seven Hills
NSW 2147

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Sean Cunningham**

Report **1047848-S**
Project name 242-258 YOUNG STREET WATERLOO
Project ID 17185
Received Date Nov 24, 2023

Client Sample ID			**BH03 - 6.4m**
Sample Matrix			**Soil**
Eurofins Sample No.			**S23-No0063215**
Date Sampled			**Nov 24, 2023**
Test/Reference	LOR	Unit	
Chloride	10	mg/kg	70
Conductivity (1:5 aqueous extract at 25 °C as rec.)	10	uS/cm	360
pH (1:5 Aqueous extract at 25 °C as rec.)	0.1	pH Units	9.7
Resistivity*	0.5	ohm.m	28
Sulphate (as SO4)	10	mg/kg	120
Sample Properties			
% Moisture	1	%	12

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Chloride	Sydney	Nov 27, 2023	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Conductivity (1:5 aqueous extract at 25 °C as rec.)	Sydney	Nov 27, 2023	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (1:5 Aqueous extract at 25 °C as rec.)	Sydney	Nov 27, 2023	7 Days
- Method: LTM-GEN-7090 pH by ISE			
Sulphate (as SO4)	Sydney	Nov 27, 2023	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
% Moisture	Sydney	Nov 25, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name:	Alliance Geotechnical	**Order No.:**		**Received:**	Nov 24, 2023 7:10 PM
Address:	10 Welder Road Seven Hills NSW 2147	**Report #:** **Phone:** **Fax:**	1047848 1800 288 188 02 9675 1888	**Due:** **Priority:** **Contact Name:**	Nov 30, 2023 3 Day Sean Cunningham
Project Name:	242-258 YOUNG STREET WATERLOO				
Project ID:	17185				

Eurofins Analytical Services Manager : Andrew Black

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Sample Detail						Aggressivity Soil Set	Moisture Set
Sydney Laboratory - NATA # 1261 Site # 18217						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH03 - 6.4m	Nov 24, 2023		Soil	S23-No0063215	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ppm:** parts per million
µg/L: micrograms per litre	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit	**Colour:** Pt-Co Units	

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 70 – 130%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Chloride			mg/kg	< 10			10	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)			uS/cm	< 10			10	Pass	
Sulphate (as SO4)			mg/kg	< 10			10	Pass	
LCS - % Recovery									
Chloride			%	101			70-130	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)			%	99			70-130	Pass	
Resistivity*			%	99			70-130	Pass	
Sulphate (as SO4)			%	103			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Chloride	S23-No0053551	NCP	%	106			70-130	Pass	
Sulphate (as SO4)	S23-No0053551	NCP	%	113			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S23-No0053558	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Conductivity (1:5 aqueous extract at 25 °C as rec.)	S23-No0063215	CP	uS/cm	360	320	12	30%	Pass	
pH (1:5 Aqueous extract at 25 °C as rec.)	S23-No0063215	CP	pH Units	9.7	9.8	<1	30%	Pass	
Resistivity*	S23-No0063215	CP	ohm.m	28	31	12	30%	Pass	
Sulphate (as SO4)	S23-No0053558	NCP	mg/kg	36	36	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	S23-No0063224	NCP	%	4.5	4.0	11	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised by:

Andrew Black	Analytical Services Manager
Dilani Samarakoon	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Attachment A17

Sustainability Strategy



242-258 Young St, Waterloo NSW – Sustainability Strategy Report

242-258 Young St,
Waterloo NSW

JN
Responsive Engineering

Revision History

REVISION	DATE	BY	CHECKED	COMMENTS
1	24/11/2023	BS	GC	Initial Issue
2	11/12/2023	BS	GC	Revised Issue
3	12/12/2023	BS	GC	Revised Issue

The recipient of the latest issue as noted above will be responsible for superseding/destroying all previous documents.

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1. Executive Summary

JN has been engaged by Sustainable Development Group to undertake the required Ecologically Sustainable Design (ESD) assessments and provide a Sustainability Strategy Report for the Planning Proposal at 242-258 young St, waterloo NSW.

The principles of ecologically sustainable design will be an integral consideration throughout this development. This report summarises the ESD provisions for the development which demonstrate commitment to environmental sustainability.

The sustainability targets for the development will be achieved in an integrated and staged approach through minimising the need for energy consumption (via passive measures) and then consumption optimisation (energy efficiency) and use of renewable resources where required.

The initiatives presented in this report demonstrate a wide range of measures which will result in high levels of environmental performance and also improvement of occupants' health, productivity, comfort and satisfaction.

Aiming at leading practice in energy and environmental targets, the project architect and building services design team will maximise energy efficiency in an integrated and staged approach as described in Table 1 below.

Table 1. Sustainability Approach.

Load Reduction (Minimising the need for resource consumption e.g., energy, water, and material)	Passive Design
	Building fabric improvements
	Maximise use of natural lighting
	Maximise use of Natural ventilation
	Maximise use of native plants and species
Optimising resources consumption (energy, water & materials)	High efficiency Heating, Ventilation and Air Conditioning
	High efficiency lighting
	High efficiency hot water systems
	High efficiency appliances
	Commissioning and tuning of building services post completion
	High efficiency building control, automation and BMS
Indoor Environmental Quality	Thermal Comfort
	Acoustic comfort
	Effective Daylighting / Natural Lighting
	Natural Ventilation
	Volatile Organic Compounds (VOC) & Formaldehyde Minimisation
Material	Maximise separation and recycling of demolition and construction materials.
	Minimise use of Ozone Depleting materials
	Avoid specifying materials with environmentally sensitive content
	Participation in waste minimisation training for contractors and sub-contractors.
	Waste minimisation plan to reduce site waste to landfill.
Transport Efficiency	Sustainable transport measures & bicycle racks
Use of renewable resources	Application of Solar Energy & Heat Pump technology

(renewable energy and rainwater harvesting)	Rainwater harvesting
Land use and Ecology	Maintaining and improving the ecological value of the land
Emissions	Insulation products with low Ozone Depletion Potential
	Refrigerants with Ozone Depletion Potential of zero
	Stormwater Management
	Light Pollution: Minimise light beams directed upwards or outside the buildings.

Benchmarking and compliance requirements:

The development will meet and outperform the following regulatory sustainability requirements:

- NCC Section J – Energy Efficiency
- State Environmental Planning Policy (Sustainable Buildings) 2022.

Sustainability benchmarks beyond the minimum requirements

The design team will also target the following:

- Green Star Buildings Tool – Green Building Council of Australian. 5 Star Design Aspiration.
- NABERS – 4 Star NABERS tool for Schools (to be released in 2024)

2. INTRODUCTION

This Sustainability Strategy Report is submitted to the Council of the City of Sydney (**Council**) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
    - 45 GLS, 13 specialist / classrooms
    - A multi-purpose hall / auditorium
    - A library
    - A canteen
    - Administration, lobby and circulation spaces
    - An active green roof
    - A basement including 60 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m2 of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
    - 10,608m2 education floor area
    - 2,935m2 commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m^2.

The design team recognise the importance of sustainable developments in terms of environmental preservation, occupants' health, safety and wellbeing, as well as in terms of greenhouse gases emissions reduction.

The project architect, consultants and contractors will strive to design and construct the building based on the Environmentally Sustainable Design (ESD) principles which exceed the minimum NCC Section J requirements.

The facade and floor plans are designed with the vision to give occupants the very best in terms of passive heating and passive cooling. This, when combined with other energy efficiency strategies (listed later in the report) will lead to low energy demands for the tenancies and base building and therefore lower greenhouse gas emissions during the life of this development.

Natural lighting and natural ventilation will be utilised very effectively throughout the development. In addition to thermal comfort, energy and water efficiency, the proposed building design will provide sustainable and efficient operation to the occupants.

The proposed sustainable design initiatives will not only improve the building services life but are low-cost, low maintenance and reliable, especially when compared to often prohibitively complex and expensive retrofits. Furthermore, the passive design principles will facilitate a low-

energy and cost-effective operation for the occupants.

The following are some of the design initiatives which will improve the environmental performance of the development and deliver long term energy efficiency during the life of the building.

- Optimising the size of the mechanical plant to ensure the plant is working at its peak efficiency and minimise the capital cost of the plant;
- Having high efficiency lighting and air conditioning equipment will reduce the energy consumption of the buildings;
- Variable Speed Drives (VSD) controls the speed of pumps, fans and other mechanical plant to ensure that they are only using as much power as it is needed;
- Commissioning of all services equipment to ensure their correct operation;
- A high-performance façade will limit the heat entering the buildings, reducing air conditioning system sizes and the energy use over the year;
- A mixed mode approach allowing the buildings to be naturally ventilated when outdoor conditions are suitable allowing significant energy reduction by not requiring the air conditioning system to operate at all times.
- Emission reductions and material optimisation.
- Maximise use of non-toxic building materials
- Maximise use of materials that are recyclable
- Minimise Waste in Construction
- Minimise Waste in Operation
- Renewable Energy generation – Solar PV & Heat Pump technology.

3. Benchmarking

The development will meet and outperform the following regulatory sustainability requirements:

- Standard Secretary's Environmental Assessment Requirements (SEARs) – ESD requirements.
- NCC Section J - Energy Efficiency.

Sustainability targets beyond the minimum requirements

The design team will also target the following:

- Green Star Buildings Tool – Green Building Council of Australian. 5 Star Design Aspiration.
- NABERS – 4 Star NABERS tool for Schools (to be released in 2024)

3.1 National Construction Code (NCC) Section J

Section J of the NCC sets regulations for energy efficiencies for all types of buildings with respect to the building's construction, design, and activity.

The objective of the NCC Section J is to reduce the greenhouse gas emissions. Section J requires that a building, including its services, must have features to the degree necessary that facilitate the efficient use of energy.

The NCC offers two compliance methods that differ in complexity and flexibility. The two compliance methods are:

- Deemed-to-Satisfy (DTS) Compliance.
- J1V3 – Verification using a referenced building.

The Deemed-to-Satisfy Provisions in Section J of the NCC 2022 include the following 8 components.

- Part J1 - Energy efficiency performance requirements.
- Part J2 - Energy efficiency.
- Part J3 - Elemental provisions for a sole-occupancy unit of a Class 2 building or a Class 4 part of a building.
- Part J4 - Building Fabric relates to the building fabric and minimum thermal performance for constructions according to climate zone for roofs, ceilings, roof lights, walls, glazing and floors.
- Part J5 – Building Sealing – Provisions to reduce the loss of conditioned air and restrict unwanted infiltration to a building.
- Part J6 - Air-Conditioning and Ventilation – Requirements to ensure these services are used and use energy in an efficient manner.
- Part J7 - Artificial Lighting and Power – Requirements for lighting and power to ensure energy is used efficiently within a building.
- Part J8 - Heated water supply and swimming pool and spa pool plant – Restrictions for hot water supply design except for solar systems within climate zones 1, 2 and 3.
- Part J9 - Energy monitoring and on-site distributed energy resources.

The development will meet and outperform the NCC energy efficiency requirements of Part J4 report will be prepared once the design is further progressed.

3.2 State Environmental Planning Policy (Sustainable Buildings) 2022 – SEPP 2022

3.2.1 Chapter 3 – Standards for non-residential development

Cl. 3.2 Development consent for non-residential development

(1) In deciding whether to grant development consent to non-residential development, the consent authority must consider whether the development is designed to enable the following—

(a) the minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials,

(b) a reduction in peak demand for electricity, including through the use of energy efficient technology,

(c) a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design,

(d) the generation and storage of renewable energy,

(e) the metering and monitoring of energy consumption,

(f) the minimisation of the consumption of potable water.

(2) Development consent must not be granted to non-residential development unless the consent authority is satisfied the embodied emissions attributable to the development have been quantified.

Cl. 3.4 Other considerations for certain State significant development

(1) This section applies to non-residential development that is declared to be State significant development by *State Environmental Planning Policy (Planning Systems) 2021*, section 2.6(1) and specified in that policy, Schedule 1, sections 13–15.

(2) In deciding whether to grant development consent to development to which this section applies, the consent authority must consider whether the development will minimise the use of on-site fossil fuels, as part of the goal of achieving net zero emissions in New South Wales by 2050.

The development will satisfy the SEPP Chapter 3 Clauses 3.2 and 3.4 noted above. The relevant sustainability measures are provided in Section 5 of this report. The design and construction team shall comply with the requirements above during the detailed design stage of the development.

3.2.2 SEPP (Transport and Infrastructure) 2021: Schedule 8 – Design Quality Principles in Schools (Chapter 3)

Principle 2—sustainable, efficient, and durable

Good design combines positive environmental, social, and economic outcomes. Schools and school buildings should be designed to minimise the consumption of energy, water and natural resources and reduce waste and encourage recycling.

Schools should be designed to be durable, resilient, and adaptable, enabling them to evolve over time to meet future requirements.

Principle 6—whole of life, flexible and adaptive

School design should consider future needs and take a whole-of-life-cycle approach underpinned by site wide strategic and spatial planning. Good design for schools should deliver high environmental performance, ease of adaptation, and maximise multi-use facilities.

The development will satisfy the SEPP 3.2.2 SEPP (Transport and Infrastructure) 2021: Schedule 8 noted above. Principles 2 and 3 will be satisfied by utilising the relevant sustainability measures provided in Section 5 & 6 of this report. The design and construction team shall comply with the requirements above during the detailed design stage of the development.

3.3 Green Star

Green Star is an environmental rating tool developed by the Green Building Council of Australia (GBCA) that has a holistic approach over a wide range of issues that covers a range of sustainability impact areas. There are various Green Star tools developed to suit a range of different building types including:

- Green Star Buildings.
- Design and As-Built.
- Office Interiors.
- Performance.
- Communities.

Green Star rating tools use Stars to rate performance:

- Legal compliance: The building is compliant with legislation (National Construction Code 2022)
- Good Practice: The building meets the Minimum Expectations of good practice energy and water efficient, good indoor environment quality and built to operate well.
- 4 Star reflects a Best Practice environmental performer. It builds on the Minimum Expectations to deliver a building that is
- Either climate positive or a higher performer in energy, water, and health related issues (15 out of 100 points)
- 5 Star demonstrates Australian Excellence by being a high environmental performer that addresses social issues relevant to the building owner (35 out of 100 points)
- 6 Star showcases World Leadership. It has been built to be a highly efficient building fully powered by renewables that addresses a significant number of environmental and social issues, and contributes to the community (70 out of 100 points).

The diagram in Figure 2. below details the ratings awarded by Green Star Buildings.



Figure 1. The ratings awarded by Green Star Buildings.

Green Star rating tools include eight separate environmental impact categories, as shown Figure 3. and Figure 4 follows.



Figure 3. Environmental impact categories list used in Green Star rating tools.

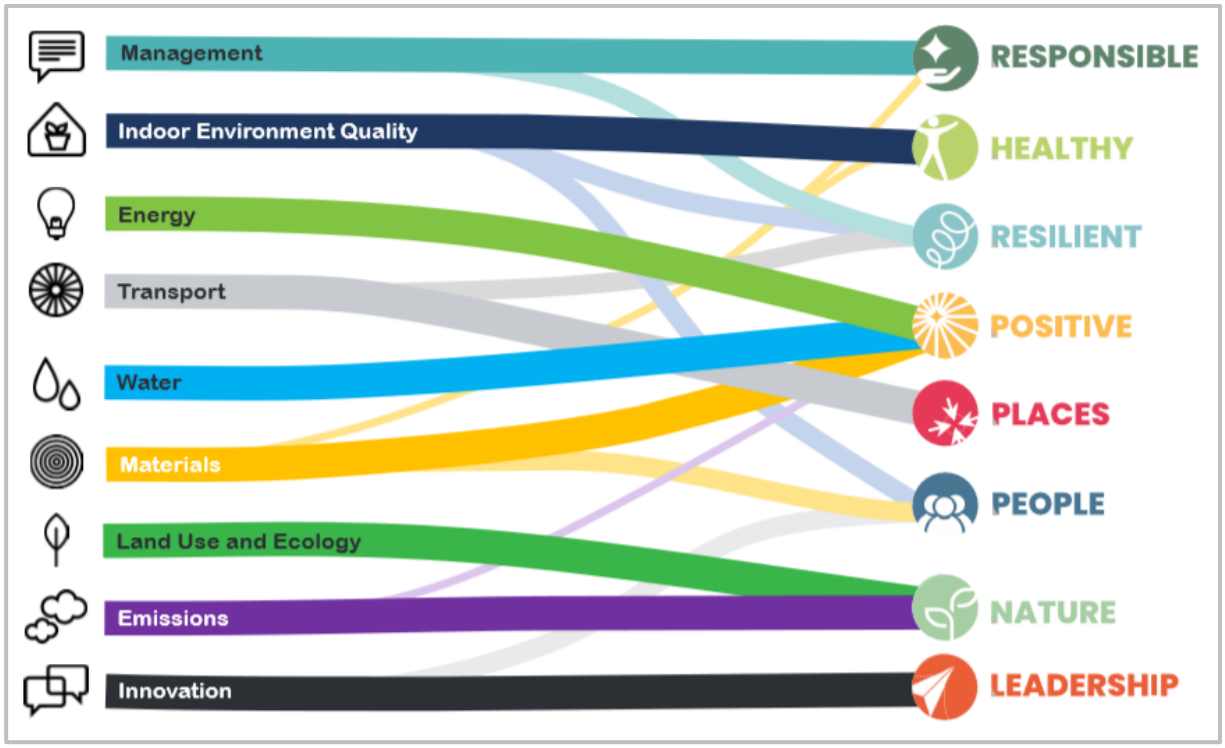


Figure 4. Eight separate environmental impact categories chart used in Green Star rating tools.

The design team will also target a 5 Star Green Star and a 4 Star NABERS tool for Schools (to be released in 2024).

4. Development Location

4.1 Site location and context

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m^2 and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.

The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.

An aerial photo of the site is shown at Figure 1.



Figure 1 - Aerial Map - Source: Nearmap + Ethos Urban

The development is located in Waterloo NSW which is within the NCC climate zone 5 (warm temperate). The climate zone map of the development is depicted in Figure 5.

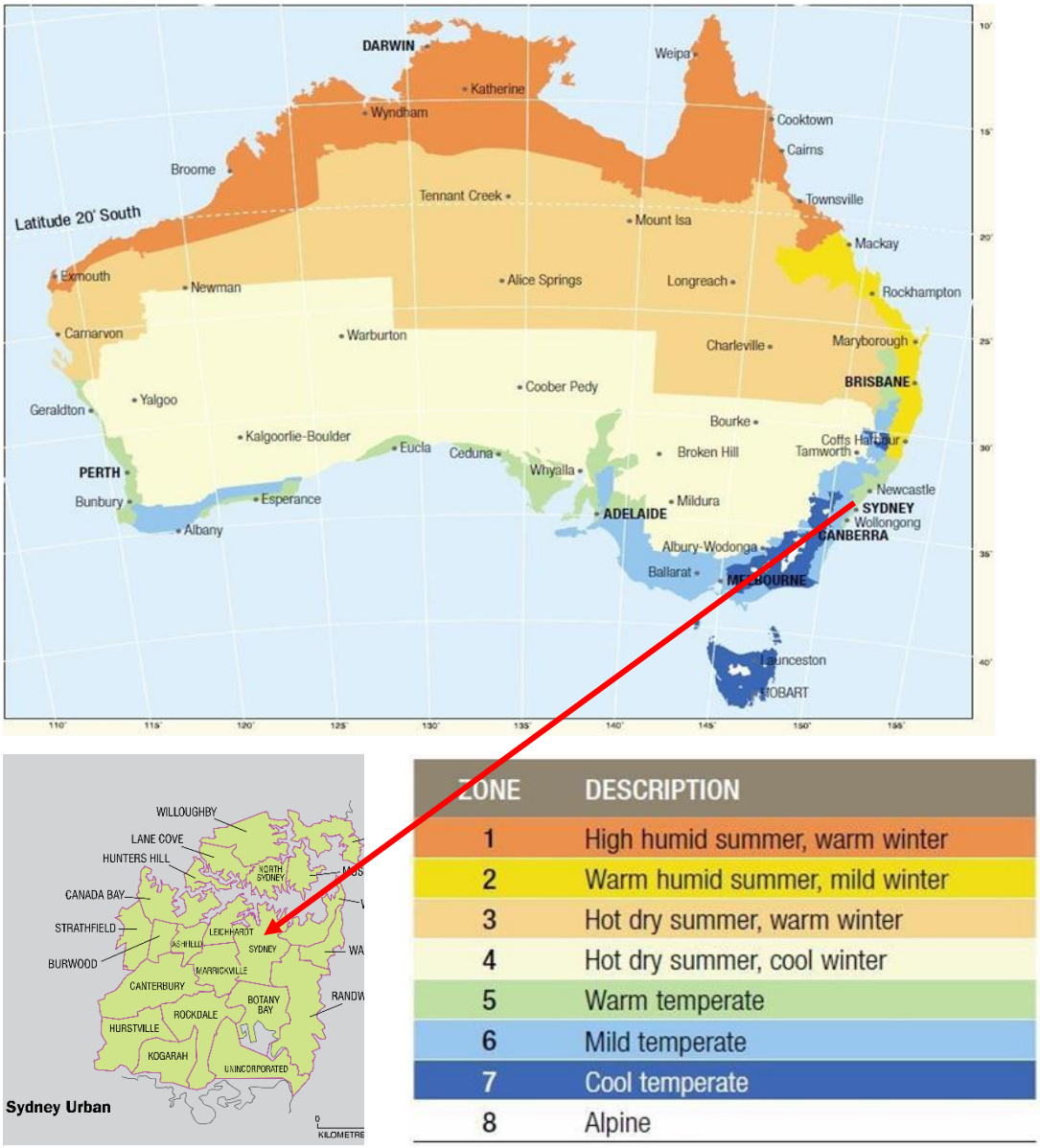


Figure 2. NCC Climate zone map.

4.2 Information Used in Review

Our review is based on the following preliminary architectural drawings provided by Plus Architecture (Table 3).

Table 1. Architectural drawing list.

DRAWING TITLE	DRAWING NUMBER
General Floor Plan - Basement 01	PLA-A-10B1
General Floor Plan - Ground 00	PLA-PP-1000
General Floor Plan - Level 01	PLA-PP-1001
General Floor Plan - Level 02	PLA-PP-1002
General Floor Plan - Level 03	PLA-PP-1003
General Floor Plan - Level 04	PLA-PP-1004
General Floor Plan - Level 05	PLA-PP-1005
General Floor Plan - Roof 06	PLA-PP-1005

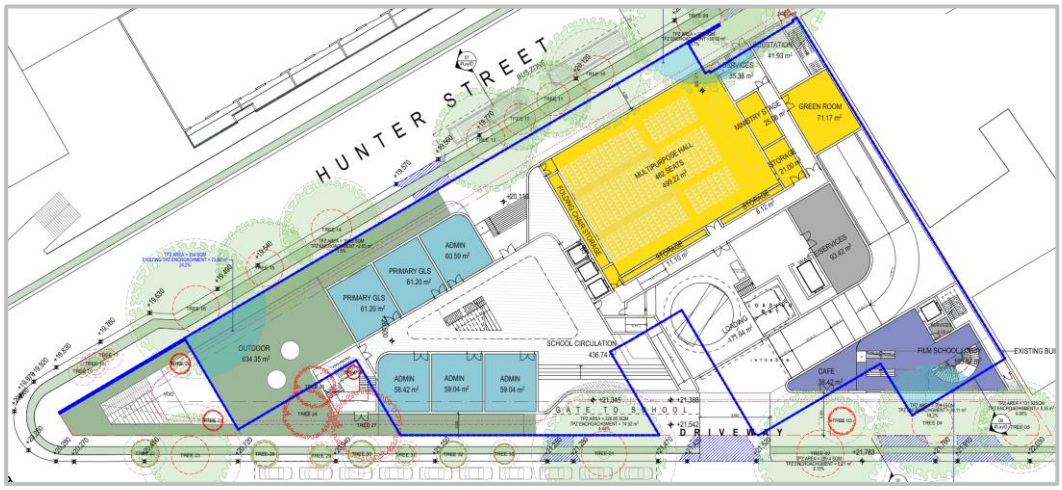
4.3 Architectural Drawings

Selected architectural plans and elevations for the proposed development are provided below.

Basement 01 - Floor Plan



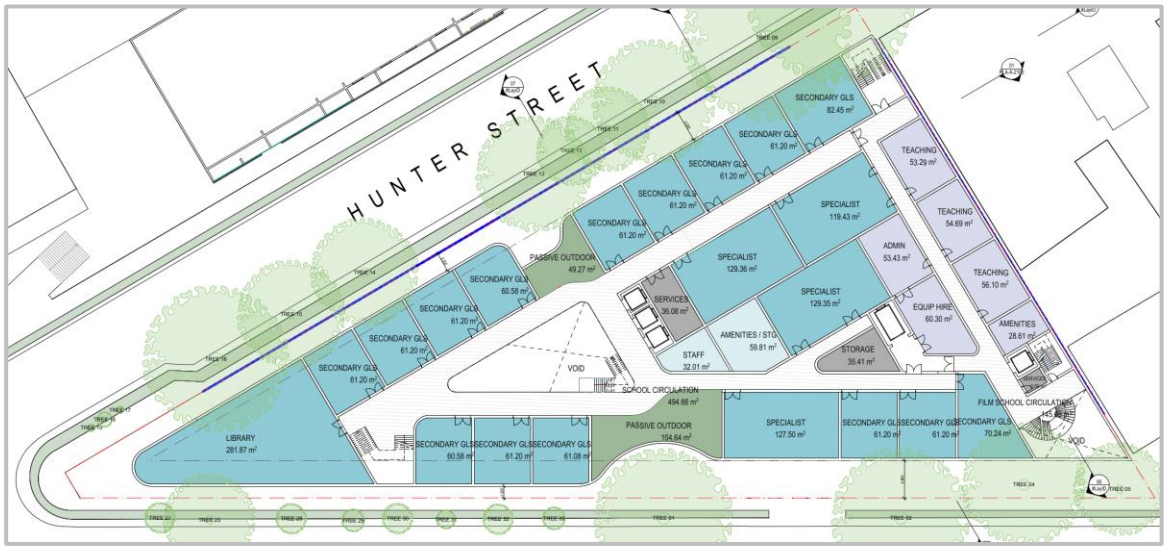
Ground - Floor Plan



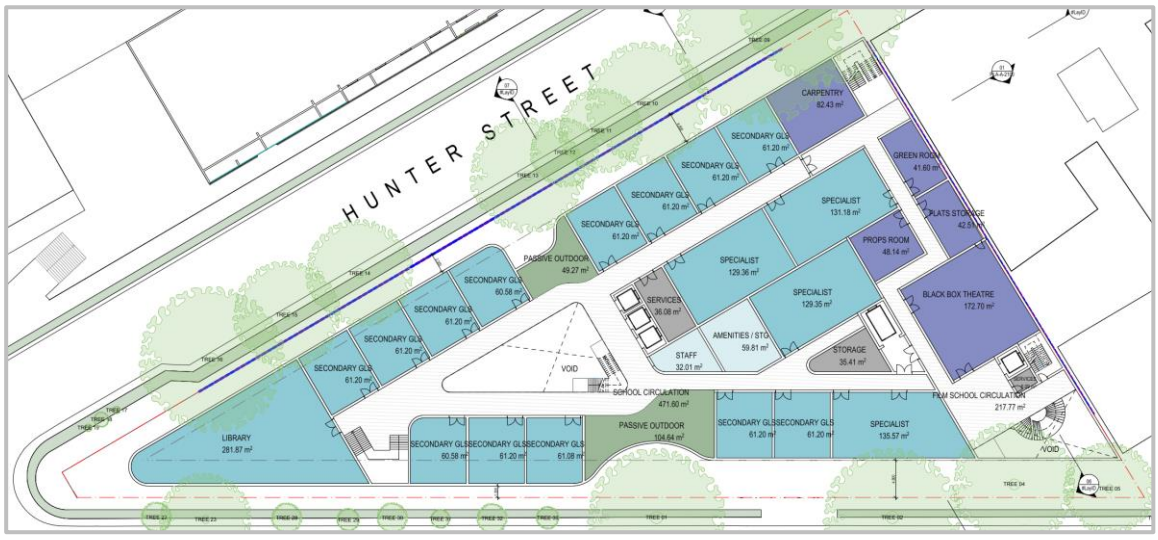
Level 1 - Floor Plan



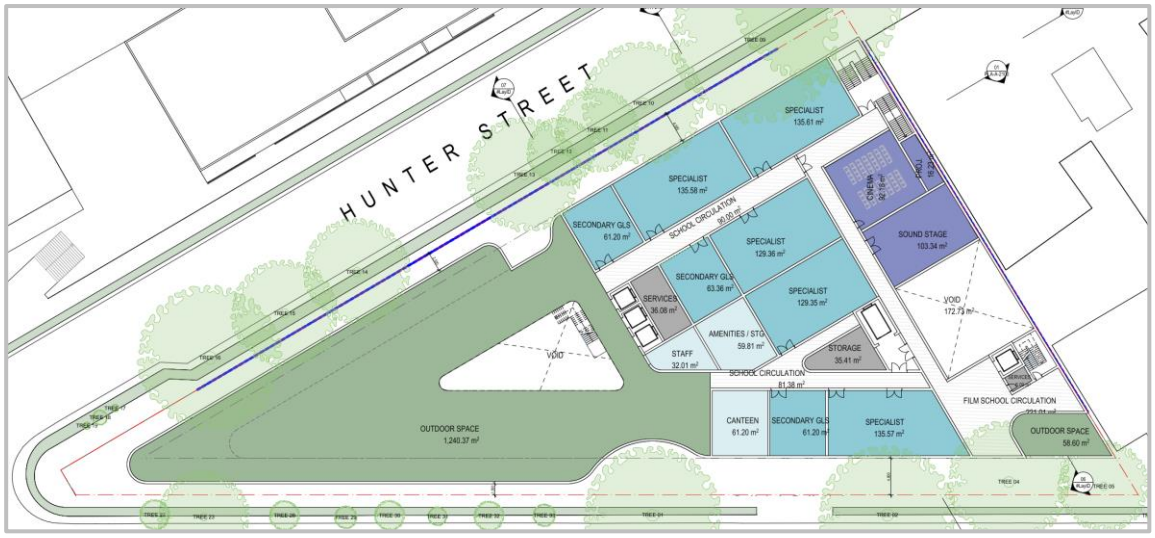
Level 2 - Floor Plan



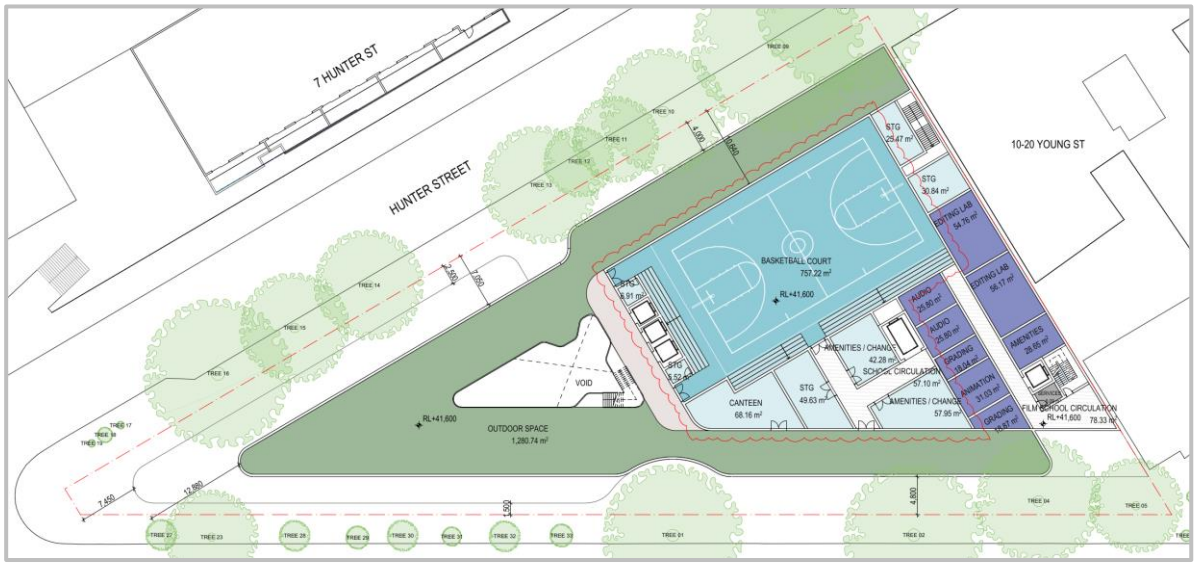
Level 3 - Floor Plan



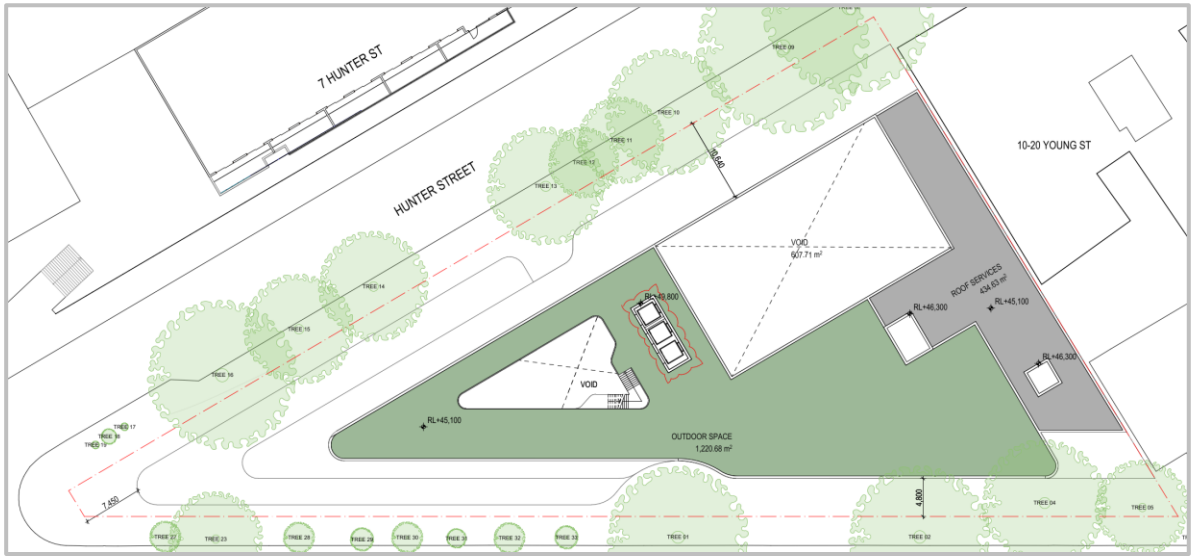
Level 4 - Floor Plan



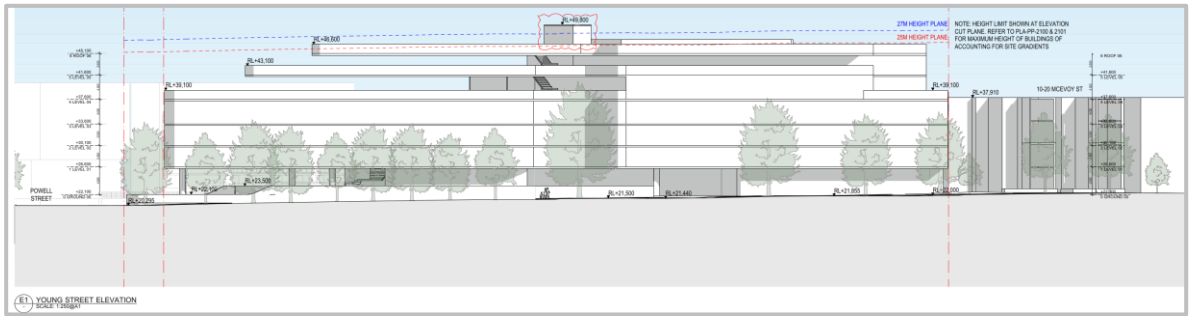
Level 5 - Floor Plan



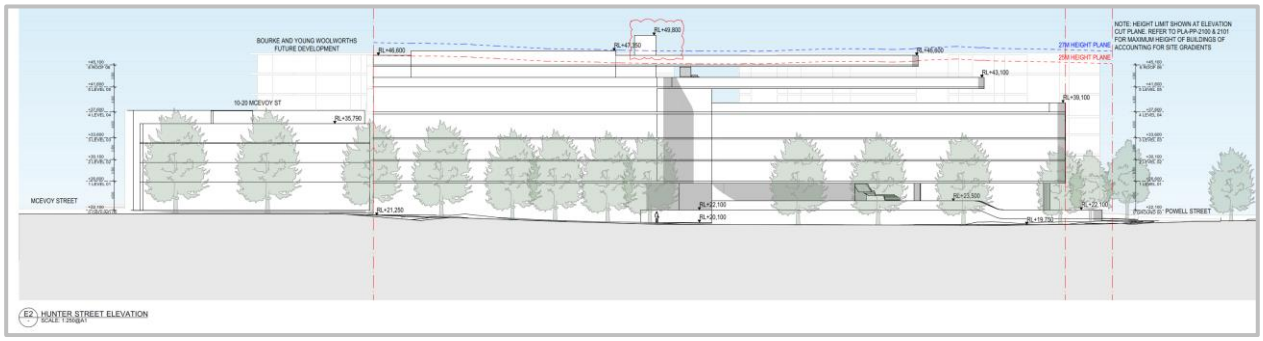
Roof Plan



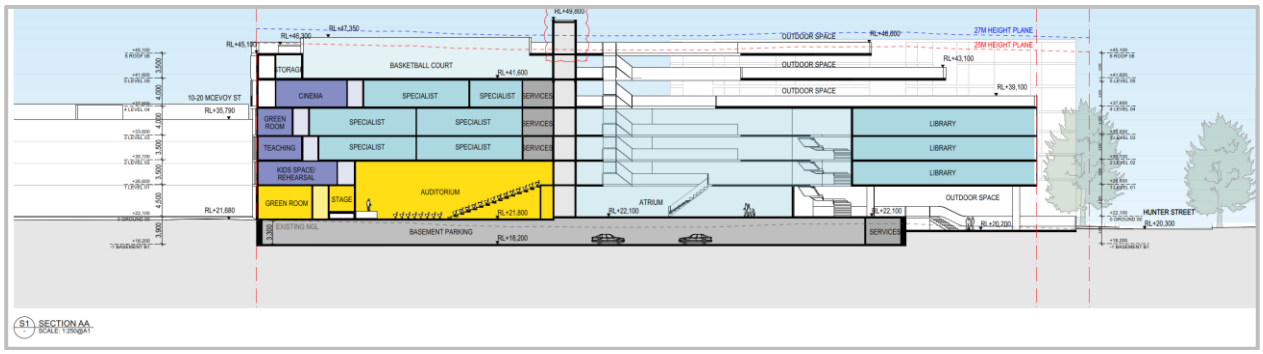
Young St Elevation



Hunter St Elevation



Section AA



5. ECOLOGICALLY SUSTAINABLE DESIGN (ESD) INITIATIVES

The principles of ecologically sustainable development are an integral consideration in design and construction of proposed development and also in assessing its benefits and impacts.

The design team will focus on a wide range of ESD strategies which will result in high levels of environmental performance and an increment on occupant's health, productivity, comfort and satisfaction.

5.1 Integrated Design Approach

The integrated design process is a process by which all of the design variables that affect one another are considered together and resolved in an optimal fashion. Often referred to as holistic design, this approach considers the development as a whole with the emphasis on integrating the different aspects of building's design.

5.2 Greenhouse gas emission reduction

Greenhouse gas emission reduction is achieved in a staged approach:

- First, reduction in overall energy consumption through demand reduction, passive design and energy efficiency, then;
- Reduction in electricity and gas utility consumption by utilising waste products, rainwater harvesting and renewable energy technologies (where feasible).

The integrated response to energy proposed for this project is summarised below:

1. Load Reduction and Passive Design
2. System Efficiency
3. Capture Waste
4. Renewable Energy (where feasible)

Energy consumption will be reduced through the efficient design of lighting, air-conditioning and ventilation systems, as well as energy efficient water heating and renewable energy technologies (where feasible). The development will consider Greenhouse gas emission reduction in design and operation through utilising energy conservation measures suitable for the development.

The following sections of the report outline the sustainability initiatives that will be considered and further developed by the design team during the detailed design stages.

5.3 Management

The initiatives under the management category promote the adoption of environmental principles from project inception, design and construction phases to the operation of the building and its systems.

This category aims to highlight the importance of a holistic and integrated approach to constructing a building with good environmental performance. The following measures are some of the initiatives targeted within the management category and are subject to further design development. These initiatives aim to reduce environmental impacts at construction and operational stages as well as to maximise building performance at commissioning.

5.3.1 Environmental Ratings and Involvement of a GSAP

Environmental rating schemes such as Green Star (Australia), LEED (US), Living Building Challenge (US) or BREEAM (UK) are used to create a marketable environmental credential based on achievement of a recognised benchmark. Ratings can be useful for marketing to the occupants and for demonstrating ESD achievement for planning submissions.

Green Star is the most recognised rating scheme in Australia, with hundreds of certified buildings, mostly office buildings. The new Green Star – Design and As-Built chosen as an appropriate benchmark for the project.

Green Star includes a range of categories under which credits are available. Points are scored under each credit, and the total score is used to determine a final rating; 45-59 points for 4 Star, indicating Best Practice, 60-74 points for 5 Star, indicating Australian Excellence; and 75 or more points for 6 Star, indicating World Leadership. The categories are as follows:

- Management
- Indoor environment quality
- Energy
- Water
- Transport
- Materials
- Land use and ecology
- Emissions
- Innovation

A Green Star Accredited Professional (GSAP) is involved as part of the design and construction to prepare the necessary ESD guidelines.

5.3.2 Commissioning Clauses

Commissioning of building systems to a high standard, with independent oversight, will ensure that a quality process is followed and provide an outside review of the practicalities of the design. An extended building tuning period should be undertaken following defects liability period to ensure that systems are performing as intended, taking into account different seasonal variables, and that any need for recommissioning is identified and carried out.

To adopt commissioning and handover initiatives that ensure that all building services can operate to optimal design potential, such as:

- Where possible, comprehensive pre-commissioning, commissioning, and quality monitoring to be contractually required to be performed for all building services (BMS, mechanical, electrical and hydraulic).

5.3.3 Building Tuning

After handover, the building owner is expected to implement tuning of all building systems and undertake full re-commissioning 12 months after practical completion;

5.3.4 Building User's Guide

To produce a Building User's / Occupant's Guide, information management that enables building users / occupants to optimise the building's environmental performance during its operation;

5.3.5 Environmental Management Plan

The contractor is expected to adhere to a comprehensive Environmental Management Plan (EMP) for the works. Contractors are recommended to be ISO 14001:2004 certified. Environmental management plans and systems should be implemented to ensure that demolition and construction activities appropriately manage and mitigate environmental impacts.

5.3.6 Waste Management System

To encourage and facilitate effective waste management once the development is in operation, sufficient spatial provision will be made to allow for the effective separation of waste from recycling. Dedicated waste recycling rooms allow space for the separation and storage of recyclable waste during the building's operation, allowing for the following waste streams to be separated:

- Glass;
- Cardboard;
- Paper;
- Organics.
- Plastics,
- Metals.



Waste management solutions are varied and dependant on the extent of commitment of the end user. Recycling, reuse and composting are examples of waste management options.

5.3.7 Environmental Management and Maintenance

Effective environmental and waste management will be implemented throughout the demolition, construction and operational stages of this development.

The EMP shall include a Waste Management Plan, specifying recycling targets for demolition and construction waste. It is recommended that construction and demolition contracts stipulate a minimum 90% target for diversion of waste from landfill. This may be achieved through recycling or reuse.

- Identification of appropriate waste sub-contractors for recycling, costs of collection and timing of collection service;
- Participation in waste minimisation training for contractors and sub-contractors;
- Published waste minimisation plan to reduce site waste to landfill;

Provision of separate waste skips for cardboard, timber, metal, soft plastic, polystyrene, insulation, concrete, glass and bricks.

5.4 Indoor Environmental Quality (IEQ) Initiatives

Indoor Environmental Quality initiatives consider the wellbeing of occupants, addressing factors such as heating, ventilating and air conditioning (HVAC), lighting, indoor air quality and building attributes, all of which contribute to good indoor environmental quality.

The following measures are some of the initiatives targeted within the IEQ category for further consideration and development during detailed design.

- Improvement of outside air rate by providing at a rate greater than AS1668.2 requirements. Air-conditioning system will be installed with carbon dioxide monitoring and control to ensure sufficient outside is delivered to occupants.
- Optimisation of the air quality by improving air change effectiveness
- Maximisation of natural lighting level to the building occupants
- Minimisation of the contribution and levels of Volatile Organic Compounds (VOCs) via the use of low VOC paints, adhesives and sealants, carpets and flooring.
- All engineered wood products to be used in the development will have low formaldehyde emission.
- High efficiency lighting system with suitable luminance levels to avoid causing discomfort and strain for the occupants. All fluorescent luminaries are to be installed with high frequency ballasts to avoid discomfort caused by low frequency flicker.
- External Views: The design allows unobstructed external views for the majority of occupied spaces;
- Internal noise level at an appropriate level to ensure the occupants' satisfaction and wellbeing.

5.4.1 Thermal Comfort

Thermal comfort can be provided by passive and mechanical means. Passive design initiatives will be considered before the design of the mechanical systems to reduce operational energy costs, with potential reductions in the air conditioning size and ongoing maintenance.

Thermal comfort is a function of the following factors:

- Radiant temperature (45% of net comfort effect);
- Air temperature and humidity (35% of net comfort effect);
- Air movement, clothing and activity (20% of net comfort effect).

Passive heating and cooling design strategies which will improve occupant thermal comfort include:

- Roof insulation not only reduces heat gain and loss, but will also moderate radiant temperatures from the walls, floor and ceiling;
- Building facades with high performance glazing and window frames will have a combination of external shading and high-performance glass to reduce heat transfer and radiant temperatures in proximity to the windows.

Indoor areas will be designed to be protected from excessive summer solar radiation, reducing radiant heat loads on the space, but still providing enough daylight during appropriate times of the year to improve comfort levels.

The approximate annual Dry-bulb temperature and comfort range for the site is shown in Figure 6.

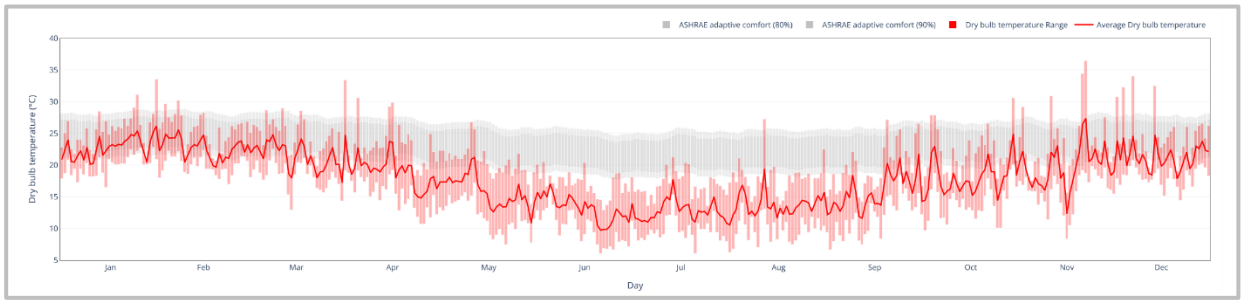


Figure 3. Annual Dry-bulb temperature and comfort range.

5.4.2 Effective Daylighting / Natural Lighting

Daylighting is the architectural and services design to allow maximum daylight penetration into a building whilst minimizing heat gain and thereby reducing indoor lighting loads.

The level of natural light in the building is primarily determined by the extent and type of glazing, and the depth of the building floor plate. Extent of glazing must be optimised to allow maximum daylight, views, and winter sun, while minimising uncomfortable glare and excessive solar heat gains in summer. Glazing should be selected with a high Visual Light Transmission to maximise daylight penetration.

Daylighting strategies will be considered to allow effective control of indoor lighting levels whilst minimising power consumption for the building. High level of architectural input regarding design, orientation and external shading will be considered to effectively maximise natural lighting for the building.

Daylighting strategies combined with dimmable lighting systems will allow high control of indoor lighting levels whilst minimising power consumption for the building.

5.4.3 Volatile Organic Compounds (VOC) & Formaldehyde Minimisation

To ensure long term comfort of occupants, all due care will be taken to minimise VOC and formaldehydes used within the building. Maintaining VOC limits below the recommended levels will assist in reducing any potential detrimental impacts on occupant health arising from products which may emit volatile pollutants.

VOC's are commonly found in carpets, paints, adhesives and sealants uses in construction and extensive exposure to VOC's can cause Sick Building Syndrome effects (eye, nose and skin irritation, headaches lethargy etc.).

Formaldehydes are found within composite wood products and extensive exposure can cause irritation to eyes, nose and throat, lead to skin ailments and respiratory system ailments such as asthma.

Where possible, contamination of indoor air by common indoor pollutants will be minimised in this development by careful material selection, including:

- Use of low-VOC and water-based paints rather than oil-based paints, stains or sealants, reducing indoor air contamination and consequent side-effects including sick-building syndrome and respiratory problems;
- Selection of low-VOC carpets and adhesives;
- Selection of low formaldehyde composite wood products, avoiding the carcinogenic effects of formaldehyde off-gassing.

5.5 Energy Conservation Initiatives

It is essential to ensure the building is designed and built to minimise energy consumption and reduce or eliminate greenhouse gas emission to the atmosphere. Energy performance is considered by the design team as a crucial issue.

The energy conservation initiatives aim to reduce the overall energy consumption for the project directly contributing to greenhouse gas emissions and energy production capacity.

Greenhouse reductions are achieved in a staged approach:

- Reduction in overall energy consumption through demand reduction and energy efficiency.
- Reduction in electricity and gas utility consumption by utilising waste products and renewable energy technologies.

Several strategies will be assessed and put in place to minimise energy consumption.

The integrated energy strategies being considered for the development include items which are listed in Table 4 below:

Table 4. The integrated energy strategies.

Load Reduction (Minimising the need for energy consumption)	Passive Design
	Building fabric improvements
	Maximise use of natural lighting
	Maximise use of natural ventilation
Optimising energy consumption	High efficiency Heating, Ventilation and Air Conditioning
	High efficiency LED lighting with occupancy controls
	High efficiency hot water systems
	High efficiency appliances
	Commissioning and tuning of building services post completion
	High efficiency building control, automation and BMS
Use of renewable resources (renewable energy and rainwater harvesting)	Application of Solar Energy & Heat Pump technology

5.5.1 Passive Design

The development will utilise passive design to minimise the amount of air-conditioning required and therefore significantly reduce the building's energy consumption and greenhouse performance. A building's form, fabric and orientation will have the biggest influence on its thermal comfort and environmental performance. The following factors will be considered in the detailed stages of the design:

- Orientation
- Shading
- Structure
- Insulation
- Glazing

Climate data for the site

The following indicative site information data can be used to inform the design team (Figure 7).

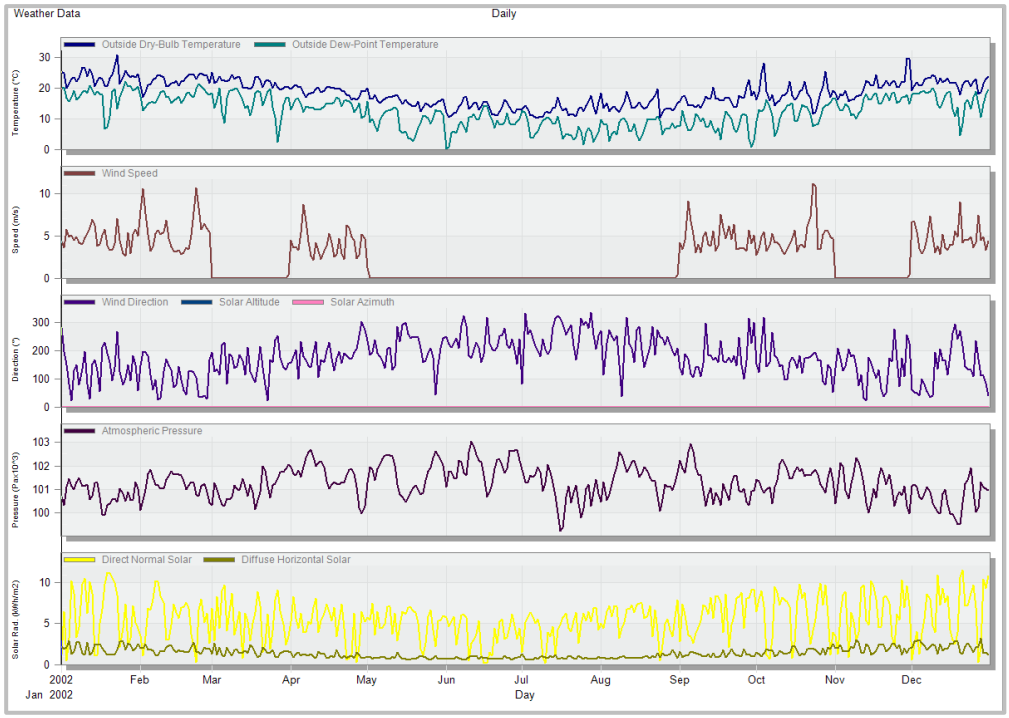


Figure 7. Climate data for the site.

Wind data based on the nearest weather station

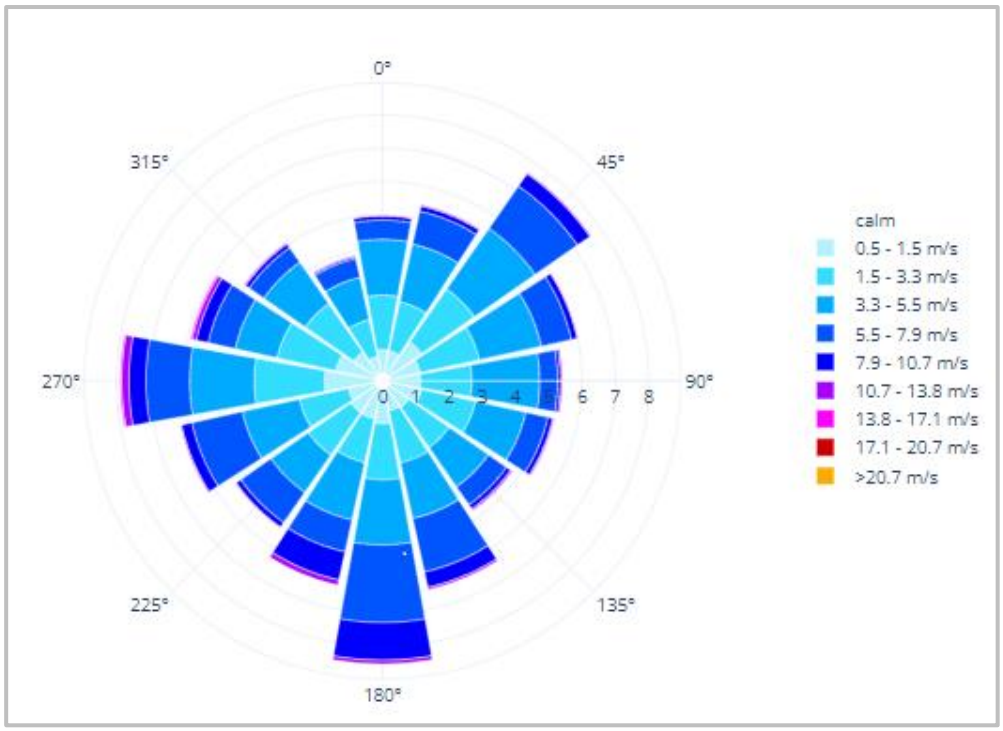


Figure 8. Wind data based on the nearest weather station.

Sun path and temperature chart for the site

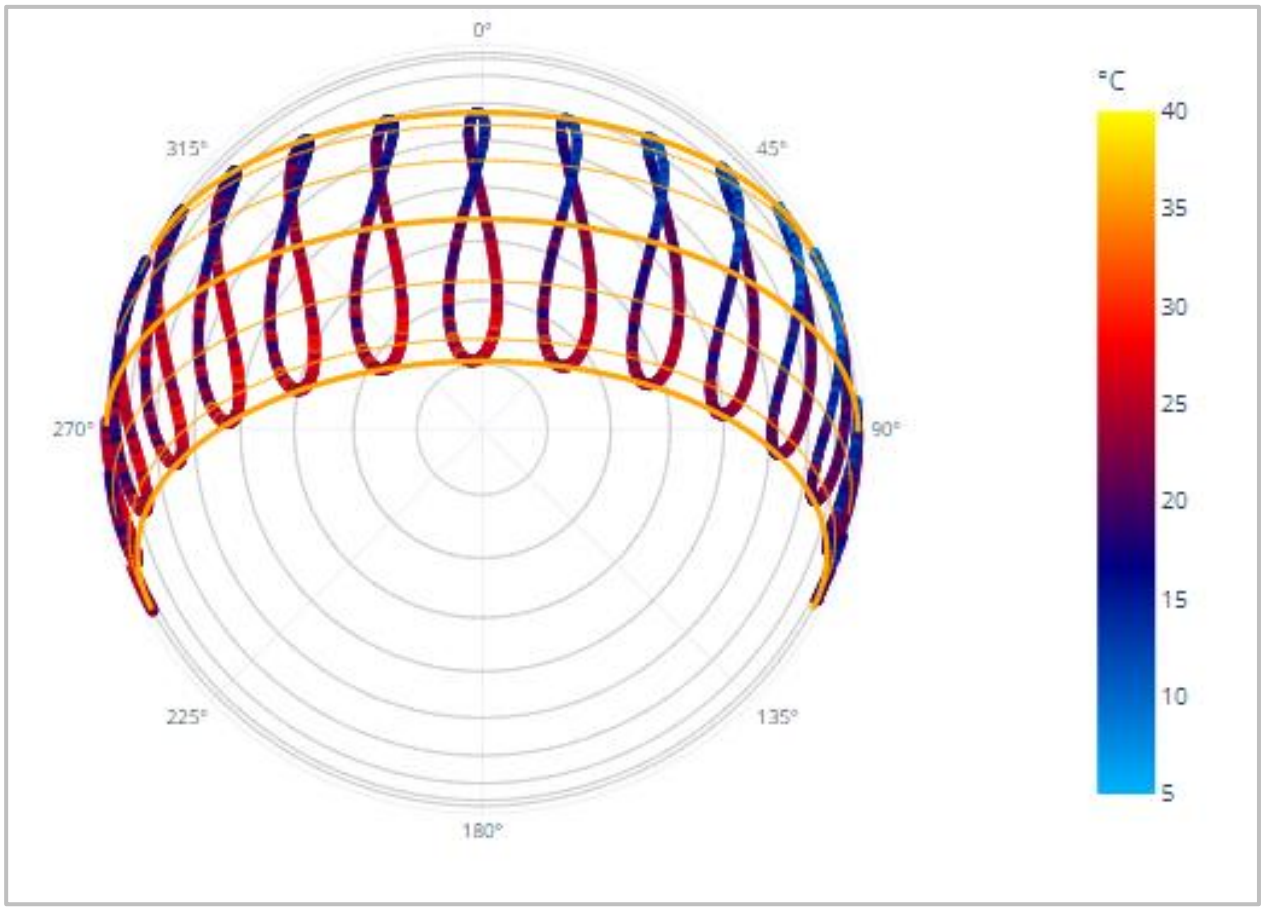


Figure 4. Sun *path* and temperature chart for the site.

5.5.2 Building Envelope

The building envelope will be designed to reduce heating and cooling requirements through passive design principles. The role of the building envelope is to block solar gains from penetrating the building fabric in summer while optimising daylight and minimising glare. The glazing performance and shading configuration for each orientation will be optimised to ensure that thermal comfort is achieved and solar gains are adequate for the efficient operation of the mechanical system.

5.5.2.1 Insulation

The building envelope will be treated with the required levels of thermal insulation to reduce heat gains in hot days and to minimise heat losses in cold days through conduction. This will have significant impact on reducing energy consumption.

Insulation reduces the heat transfer between the internal and external conditions. Adequate insulation will be allowed for the ceilings, floors and walls to reduce the heating and cooling load of the building and to reduce the ongoing operational costs. This has a twofold saving through a smaller mechanical system capacity along with operating energy consumption reduction.

All insulations installed are required to meet NCC and AS/NZ 4859.1 and the builder is required to ensure compliance, during construction.

5.5.2.2 Glazing and Window Framing

Adequate performance glass will be provided to reduce excessive heat gains in hot conditions, reducing the frequency of air conditioning use.

The following glazing parameters will be considered:

- U-Value: a measure of how much heat is passed through the glass.
- Solar Heat Gain Coefficient (SHGC)
- Visible Light Transmission (VLT): the percentage of visible light transmitted by the glass.

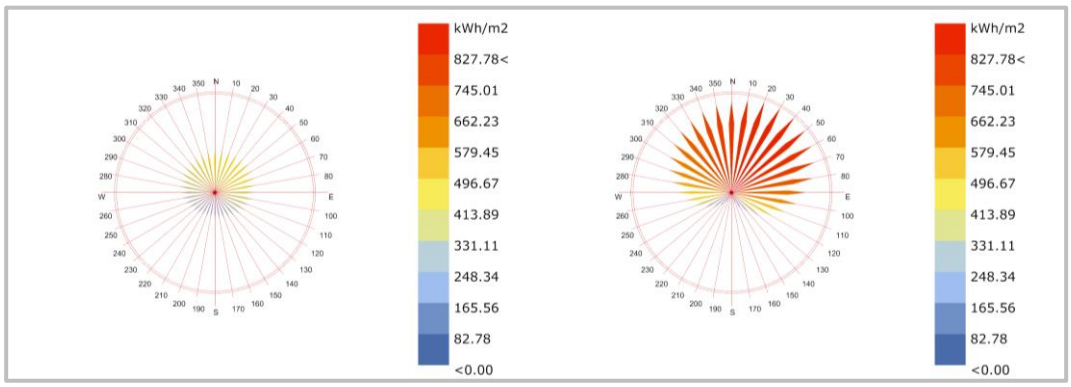
Where possible, the glazing will have a low SHGC to avoid heat gains in the summer, and a low U-value to reduce losses in the winter through the glass. The performance of the proposed glazing systems (glass and frame) is required to comply with NFRC100-2001 conditions and using the tested AFRC values.

Consideration will be given to incorporating effective shading features into the design to avoid the necessity for low shading coefficients in the glass, which usually also decrease the visible light transmission (VLT) of the glass. To maximise the natural daylight within the building, VLT should be as high as possible.

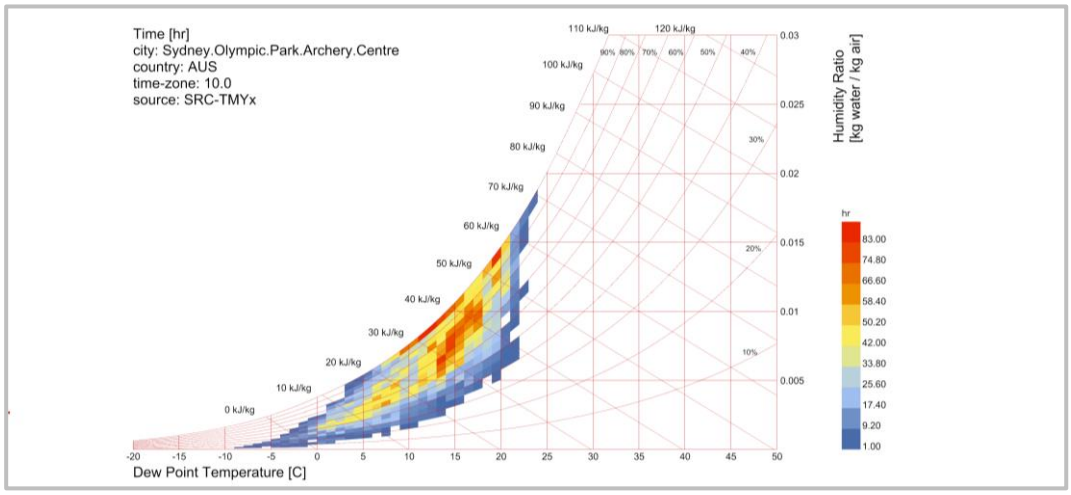
Glazing properties will be specified in conjunction with the shading arrangement on each orientation to control solar loads imposed on the mechanical systems, ensuring thermal comfort, optimising daylight penetration and preventing glare. This strategy will effectively minimise direct solar loads whilst maximising daylight penetration and access to views.

To reduce heat losses in cold days, especially at night, the use of blinds will limit the contact between the internal air and the glass, therefore reducing heat losses by conduction.

Solar Radiation Rose



Psychrometric Chart



5.5.3 Energy Efficient Systems and Services

The mechanical and electrical systems for the building will be developed to minimise the need for plant equipment and will be designed to be responsive to the immediate climatic conditions.

Energy consumption will be reduced through the efficient design of lighting, air-conditioning, hot water and ventilation systems. The following energy efficiency initiatives will be further investigated and where feasible incorporated in the building services design.

5.5.3.1 Efficient Artificial Lighting

Lighting efficiency is important in maintaining low energy consumption for reuse projects. Lighting consumption for a facility such as this could account between 15-25% of the estimated energy use of the facility.

High efficiency lighting and effective control initiatives such as daylight and movement sensors will be considered to reduce artificial lighting energy consumption and allow maximum advantage to be taken of natural lighting.



Lighting power density is required to meet AS1680 and NCC requirements. Energy efficiency for the internal lighting throughout the building is required to be in accordance with NCC energy efficiency requirements and the following.

- High quality LED lighting where applicable;
- Lighting control system based on smart zoning, occupancy profiles and operational hours, dimming controls and timers.

Photoelectric (PE) / Photodiode sensors or similar controls to detect when external lighting should switch on and off to reduce the energy consumption associated with external lighting where possible.

No external lighting is to be installed such that any direct light beam results into the night sky either generated from within the site. The path of any direct light's angle of incidence that is directed to the sky must be obstructed by a non-transparent surface and the lighting design and is to comply with AS4282 'Control of the Obtrusive Effects of Outdoor Lighting.

5.5.3.2 Efficient Heating, Ventilation & Air-Conditioning (HVAC)

Heating and cooling of the building accounts for a large portion of the building's energy use throughout the year. Selection of highly efficient HVAC equipment with high performance levels not only minimises energy consumption, but also reduces operational energy costs.

The design of the mechanical services will be to industry Best Practise Standards. An emphasis will be placed on providing low energy Heating Ventilation Air Conditioning (HVAC) systems and

strategies. To ensure the energy efficient performance of HVAC systems specified and installed mechanical plant will be of high quality and supplied by leading industry manufacturers.

The energy efficiency of HVAC system is required to meet the minimum requirements of the National Construction Code (NCC), Green Star provisions where feasible and relevant Australian Standards including but not limited to AS1668.1, AS1668.2, AS 1682 and AS3666.

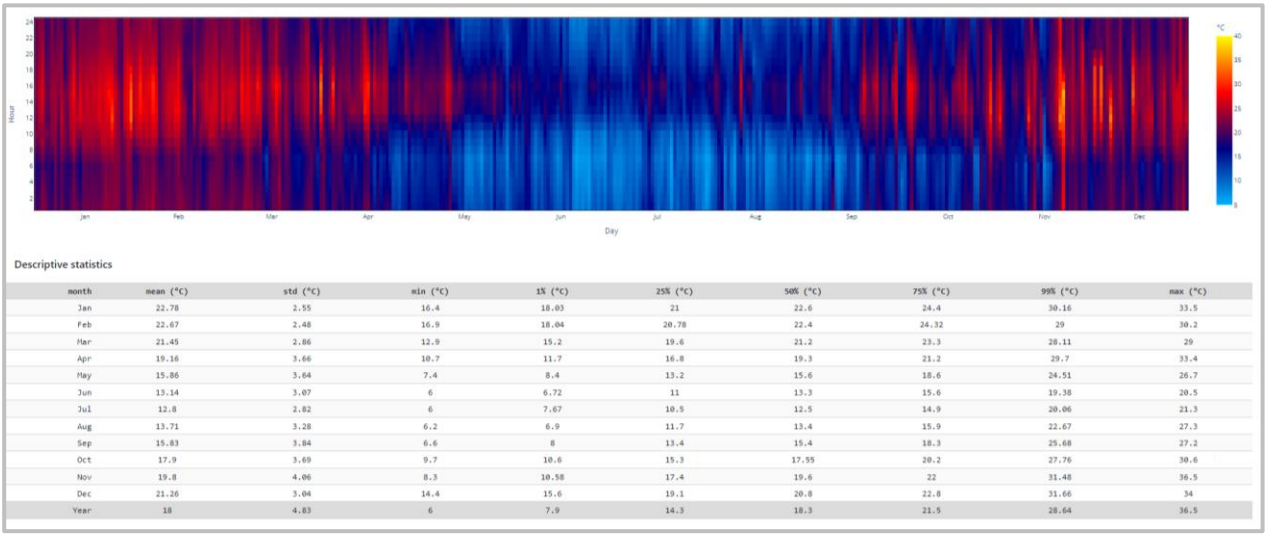
The following energy initiatives will be further considered in the detailed design phase:

- The air conditioning strategy is optimized to reduce energy consumption and maximize efficiency. For example, by moderating the amount of fresh air relative to the number of people in the space, through the use of CO2 detectors. The system will be zoned to increase the flexibility in the use of different spaces and reduce overall consumption.
- Variable speed drives will be provided to fans and pumps where feasible.
- Full outside air cycle will be provided to all air handling systems.
- Building commissioning and building tuning to be undertaken to ensure that the building systems function as required to achieve energy efficiency design targets.
- All refrigerant plant will be specified such that the refrigerant type has Zero Ozone Depletion Potential (ODP).

Common area ventilation systems are to include variable speed modes where appropriate and are to be linked to light switches where feasible to limit the extent of operation and improve energy efficiency of these areas.

The Mechanical services will be designed to satisfy the minimum Green Star and NABERS requirements.

Heatmap Chart based on the data from the nearest weather station is depicted in Figure 5 below.



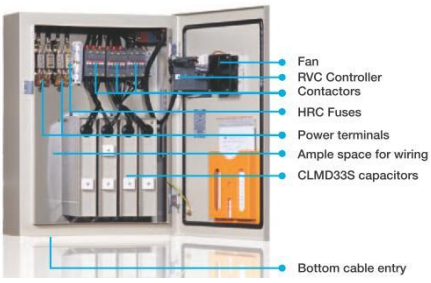
month	mean (°C)	std (°C)	min (°C)	1% (°C)	25% (°C)	50% (°C)	75% (°C)	99% (°C)	max (°C)
Jan	22.78	2.55	16.4	18.03	21	22.6	24.4	30.16	33.5
Feb	22.67	2.48	16.9	18.04	20.78	22.4	24.32	29	30.2
Mar	21.45	2.86	12.9	15.2	19.6	21.2	23.3	28.11	29
Apr	19.16	3.66	10.7	11.7	16.8	19.3	21.2	29.7	33.4
May	15.86	3.64	7.4	8.4	13.2	15.6	18.6	24.51	26.7
Jun	13.14	3.07	6	6.72	11	13.3	15.6	19.38	20.5
Jul	12.8	2.82	6	7.67	10.5	12.5	14.9	20.06	21.3
Aug	13.71	3.28	6.2	6.9	11.7	13.4	15.9	22.67	27.3
Sep	15.83	3.84	6.6	8	13.4	15.4	18.3	25.68	27.2
Oct	17.9	3.69	9.7	10.6	15.3	17.55	20.2	27.76	30.6
Nov	19.8	4.06	8.3	10.58	17.4	19.6	22	31.48	36.5
Dec	21.26	3.04	14.4	15.6	19.1	20.8	22.8	31.66	34
Year	18	4.83	6	7.9	14.3	18.3	21.5	28.64	36.5

Figure 5. Heatmap Chart.

5.5.3.3 Power Factor Correction

To reduce maximum kVA demand on the electricity grid and lower the demand charges, power factor correction units will be provided at the main switch board(s) in accordance with the NSW Installation and Service Rules.

The power factor correction units proposed will improve the power to a factor of 0.98 or higher.



5.5.3.4 Monitoring & reporting

To enable effective monitoring and tracking of energy and water consumption, sub-metering will be considered for systems with major energy use, to help identify areas of inefficiency with potential for improvement.



Metering is to be provided throughout the building and central services for all major building plant and equipment. An effective monitoring system is to be provided to monitor energy and water consumption throughout the building as required.

Ongoing reporting may allow the manager of the facility to set goals for energy consumption reductions and attributed energy costs to particular uses. By monitoring energy, losses and wastage can be identified, therefore improving the overall performance of the building in operation. This initiative is subject to further design development and review.

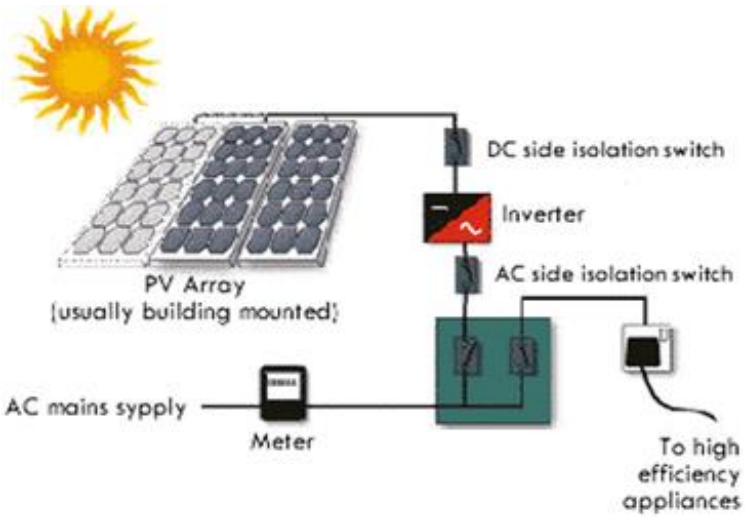
5.5.3.5 Hot Water Systems

High efficiency gas hot water systems will be used to provide the Domestic Hot Water demands for the facility.

5.5.4 Renewable Energy – Solar Photovoltaic (PV) System

Photovoltaic (solar PV) is a common and widely accepted technology to generate electricity onsite. The generated electricity can be harnessed and used to power any number of devices. It is proposed that the PV panels are mounted on the roof where they will be out of sight and produce the optimum energy output.

PV modules have a very long lifetime with many manufacturers guaranteeing an output of at least 80% of manufactured capacity for 20 years. Another benefit of PV is that it can be installed in various system sizes and the modular design of the systems allows retro-fitting of additional panels if required in the future.



There are generally three types of solar panels available: mono-crystalline (proposed for this development), poly-crystalline and amorphous. Each of these have their advantages and disadvantages and efficiencies range from 6% for amorphous to 19% for mono-crystalline.

Based on a hypothetical solar PV capacity of 30 kW Solar PV, the expected renewable energy generation is approx. 43.5 MWh per annum.

5.5.4.1 Solar PV - System Components

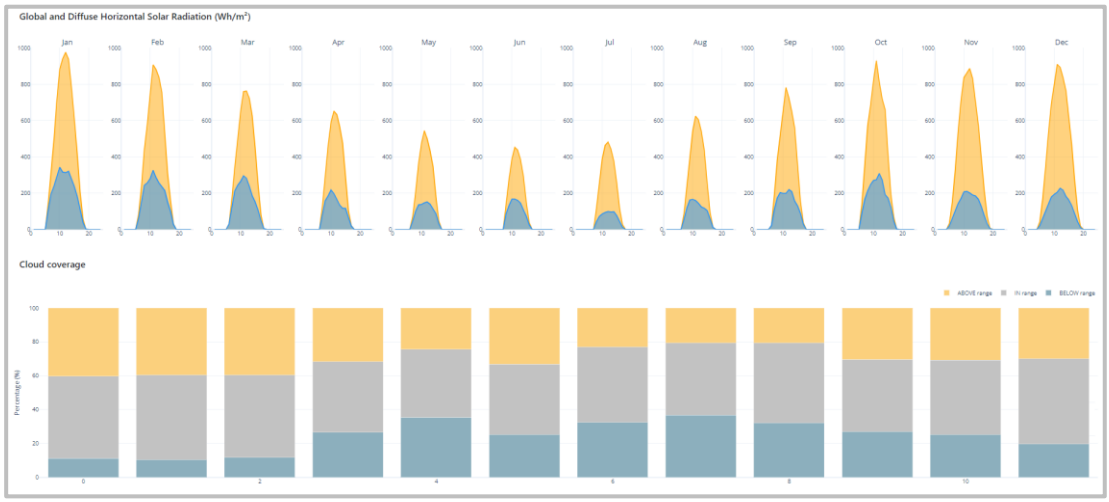
The Photovoltaic (PV) system may consist of the following main components or of equal capacity.

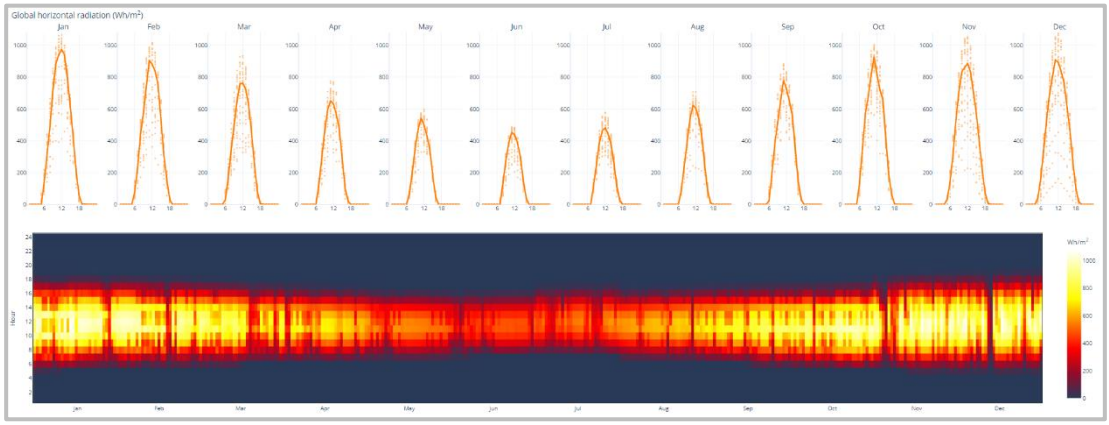
Total nominal power:	**30 kW**
Approx. roof space requirements:	**180 m²**

Components	Brand, Model & Quantity
PV Inverter	Sungrow 15kW - SG15RT - Quantity: 2
PV Panels	Trina Vertex 600W - - Quantity:50
Battery storage (optional - if required)	Tesla Powerpack or other similar systems
PV mounting frame and system balance	Quantity: depending on the requirements and final design

The exact sizing, configuration and final design will be completed during the design stage. Please refer to Appendices A & B for technical data sheets of the proposed PV panels (Trina) and grid-connected inverter (Sungrow).

5.5.4.1.1 Solar Ration and Cloud Coverage for the site





5.6 Transport sustainability measures

The use of transport (both private and commercial) is a major contributor to environmental pollution and the excessive consumption of natural resources. The following sustainable transport principles are recommended.

- Improve amenity for active transport users (pedestrians and cyclists), with attention paid to the needs of specific user groups likely to have a greater reliance on active transport such as youths, office employees, and nearby community groups.
- Promote nearby cyclist facilities to enhance the uptake of cyclists to the site.
- Integrate transport initiatives into community engagement and communication strategies.

Given the site location of the development, the occupants will be able to take advantage of local public transport networks and available facilities around the site such as retail shops.

The following measures are some of the initiatives recommended to reduce dependence on motorised vehicles, encouraging walking, cycling and the use of mass public transport.

- **Cyclist facilities:** provision of bicycle racks; where possible adequately sized and fully equipped secure cyclist facilities with change room and showers are to be provided to promote the use of cycling to work.
- **Public Transport:** The building is close to public transport with a number of bus routes served; building occupants are encouraged to use mass transport to travel to work.
- **Trip Reduction:** The development is located adjacent to a number of local amenities, reducing the need for trips.
- **Fuel efficient vehicles:** encouraging the use of more fuel-efficient vehicles by providing adequate parking spaces at prime parking spot solely dedicated for use by small cars, car-pool participants or other alternative fuel vehicles and EV charging points.

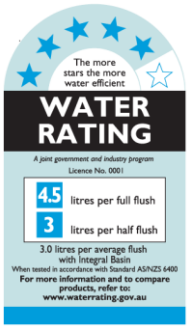
5.7 Water Conservation and Management Initiatives

The water conservation category aims to reduce the overall water potable consumption and provide effective mechanisms for recycling of water uses on site.

The approach to water efficiency for the development will focus on reducing water demand through conservation measures and water reuse systems. Water conservation strategies proposed for this project include:

- Reducing the potable water consumed within the development through demand management.
- Substituting mains water required to meet this demand by utilising alternative sources such as rainwater.

5.7.1 Demand Management



Strategies to minimise consumption include water-efficient fittings and fixtures, water-efficient appliances and low-water use air-conditioning and irrigation systems. In order to reduce the overall water consumption for this development, the following initiatives will be considered.

All water fixtures to be installed to the building are to be water efficient and where possible exceed the BASIX requirements. The following criteria are provided as a guide and subject to further design development.

Water Fixtures	Hand wash basins – 6 Star WELS;
	Kitchen taps (where provided) – 6 Star WELS;
	Showerheads (where provided) – 3 Star WELS or higher;
	Toilets – 4 Star WELS or higher;
Appliances	Dishwashers (where provided) – 4 Star WELS or higher
Air Conditioning	Minimise use of water-cooled systems
Landscape Irrigation (where applicable)	Native and water efficient species
	Sub-surface irrigation
	Rainwater usage for landscape

5.7.2 Landscape Selection

The use of native, drought-resistant planting will be considered to reduce water consumption used in irrigation. Sub-soil irrigation systems should be considered where non-native species are selected.

5.7.3 Rainwater collection and recycling

In order to reduce the impacts of stormwater runoff from the site, the following stormwater management strategies will be considered:

- Rainwater capture from rooftops for reuse in building reducing stormwater runoff as well as mains potable water use.
- The use of permeable surfaces to be considered where suitable, allowing stormwater to seep directly into the earth and reducing stormwater flows off-site.

Collecting rainwater from roof runoff is a common way to recycle water. In addition to saving potable water, it allows preparation for times of low rainfall, so landscapes will be maintained throughout the year. It also reduces loads on storm water systems because roof runoff is not flushed into the drains. Rainwater will be collected from roof runoff and piped to storage tanks and will be used on site.

Ultra-violet (UV) treatment is the disinfection process of passing water by a special light source. Immersed in the water in a protective transparent sleeve, the special light source emits UV waves that can inactivate harmful microorganisms. This method of treatment is growing in popularity because it does not require the addition of chemicals.

Harvested water will be considered to supplement non-potable water uses such as common area landscape irrigation.

This strategy will assist to significantly reduce the potable water consumption for the facility.

5.7.4 Water consumption monitoring and reporting

Where practical, it is recommended that all major water uses within the building to be provided with water meters. This includes central services, rainwater tanks, irrigation systems, potable water, non-potable water sources.



Water monitoring will assist to identify abnormal usage patterns usually associated with leaks, helping to reduce the considerable water lost in this way. In addition, it would also allow to measure and verify the impact of any water efficiency measures implemented in the facilities.

5.8 Materials

This category aims to reduce the consumption of natural resources and encourage the reuse of materials. The various environmental and human health impacts arising from building materials are reduced when special attention is given to the selection of ecologically preferable materials.

To minimise the environmental impact of the development, preference will be given to environmentally responsible materials during the selection process, according to the following principles:

- Avoidance of ecologically sensitive products (such as scarce minerals and old-growth forest)
- Selection of materials with a low embodied energy and high recycled content;
- Low toxicity material selection;
- Low impact on the indoor environment;
- Durability, flexibility and recyclability;
- Emissions in manufacture and composition, including greenhouse gases and ozone depleting substances;
- Waste reduction
- Provisions for appropriate recycling storage space that facilitates recycling

The targeted initiatives will reduce embodied energy and environmental impacts caused by the whole life cycle of building materials.

5.8.1 Reuse and Conservation of materials

Where possible reuse the building material to conserve embodied energy and water. By conserving the building fabric or structure the waste volumes are significantly reduced for the development.

5.8.2 New Materials

Material specifications for the project will consider elements of sustainability that relate to the following factors of durability, embodied energies, renewable sources content, ease of manufacturing, ability to be recycled / reused / reconditioned, maintenance, local availability, VOC content, emission production, affordability and toxicity.

Where feasible the materials specified for this project are to consider the above environmental measures through a comparison between different product types and manufacturers where possible. The design team is to adopt this approach in assessing suppliers and products for the development.

Interiors finishes will consider the concentration of Volatile Organic Compounds with products for adhesives, paints, carpets and floor sealants. The design team will work with suppliers and contractors to identify opportunities to reduce the level of VOC's within products and finishes.

5.8.3 Materials with Ozone Depletion Potential

Selection of insulation will be targeted to minimise Ozone Depletion Potential (ODP).

5.8.4 Operational Waste Minimisation

To encourage and facilitate effective waste management once the facility is in operation, sufficient spatial provision will be made to allow for the effective separation of waste from recycling. Dedicated waste recycling rooms allow space for the separation and storage of recyclable waste during the building's operation, allowing for the following waste streams to be separated:

- Glass;
- Cardboard;
- Paper;
- Organics.
- Plastics,
- Metals.

Waste management solutions are varied and dependant on the extent of commitment of the end user. Recycling, reuse and composting are examples of waste management options.

The following waste streams have currently been identified:

- Office waste
- Paper and cardboard
- Plastics
- PET bottles and containers, cans and glass
- Compostable material
- Grease and fats
- Cigarette butts
- Light tubes
- Toxic or hazardous materials
- Foam
- Cleaning products and other substances going down drains
- Composting of organic waste from the restaurant, for re-use within the Greenhouse.

5.8.5 Timber

Where possible, timber will be supplied from sustainable sources including Forestry Stewardship Council (FCS) certified plantation timbers and recycled products. No timber (either solid or veneer form) will be sourced from rainforests or old-growth forests.

5.8.6 PVC Minimisation

PVC is being phased out in the European Union, as there is widespread evidence to its harmful environmental impact, particularly during disposal or fire. PVC is used in almost all electrical and data cabling and for drainage pipework. Alternatives to PVC products will be used where feasible:

- HDPE and polypropylene pipe work instead of PVC pipe for water supply and drainage systems;
- Linoleum and other natural products instead of vinyl floor coverings;
- Composite materials for electrical cabling.

5.9 Land Use and Ecology

This initiative refers to improvements through Reuse of Land or Change of Ecological Value. The site has been previously built on, and is not a Greenfield. The new development will aim to enhance permeable area and vegetation improving the ecological value of the site.

5.10 Emissions

In addition to the reduction in greenhouse emissions as a result of lower on-site energy usage, emissions to land, air and water will be minimised. The following measures are some of the initiatives targeted within the emissions category:

- Where available, thermal insulation products should be selected which have a low Ozone Depletion Potential in their manufacture and composition, reducing the impacts of insulation on the atmosphere;
- Where feasible, refrigerants will have an Ozone Depletion Potential of zero; and integrated refrigerant leak detection will ensure early identification of leaks;
- Estimated wastewater discharge to sewer will be significantly reduced relative to a standard building through the implementation of water efficiency measures;
- Watercourse Pollution: Design that minimises stormwater run-off to and the pollution of the natural watercourses.
- Light Pollution: No light beam will be directed upwards or outside the building. External lighting will be in accordance with AS 4282-1997. This will assist to minimise interference and disturbance to neighbouring properties and wildlife.

6. Climate Change Adaptation

6.1 NARCliM Climate Change Projections

The information provided in this section of the report follows the climate change projections based on the NSW and ACT Regional Climate Modelling (NARCliM) project. NARCliM is a multi-agency research partnership between the NSW and ACT governments and the Climate Change Research Centre at the University of NSW. NSW Government funding comes from the Office of Environment and Heritage (OEH), Sydney Catchment Authority, Sydney Water, Hunter Water, NSW Office of Water, Transport for NSW, and the Department of Primary Industries.

Climate change projections are presented for the near future (2030) and far future (2070), compared to the baseline climate (1990–2009). The projections are based on simulations from a suite of twelve climate models run to provide detailed future climate information for NSW and the ACT.

The climate change projections are made for the following 5 parameters:

1. Temperature extremes
2. Hot days
3. Cold nights
4. Rainfall
5. Fire weather

Reference: https://climatechange.environment.nsw.gov.au/

NSW Office of Environment and Heritage (OEH)

6.1.1 Temperature

Waterloo NSW is expected to experience an increase in all temperature variables (average, maximum and minimum) for the near future and the far future

- Maximum temperatures are projected to increase by 0.7°C in the near future and up to 1.9°C in the far future. Spring will experience the greatest change in maximum temperatures, increasing by up to 2.2°C in the far future. Increased maximum temperatures are known to impact human health through heat stress and increasing the number of heatwave events.
- Minimum temperatures are projected to increase by 0.6°C in the near future up to 2°C in the far future. Increased overnight temperatures (minimum temperatures) can have a considerable effect on human health.

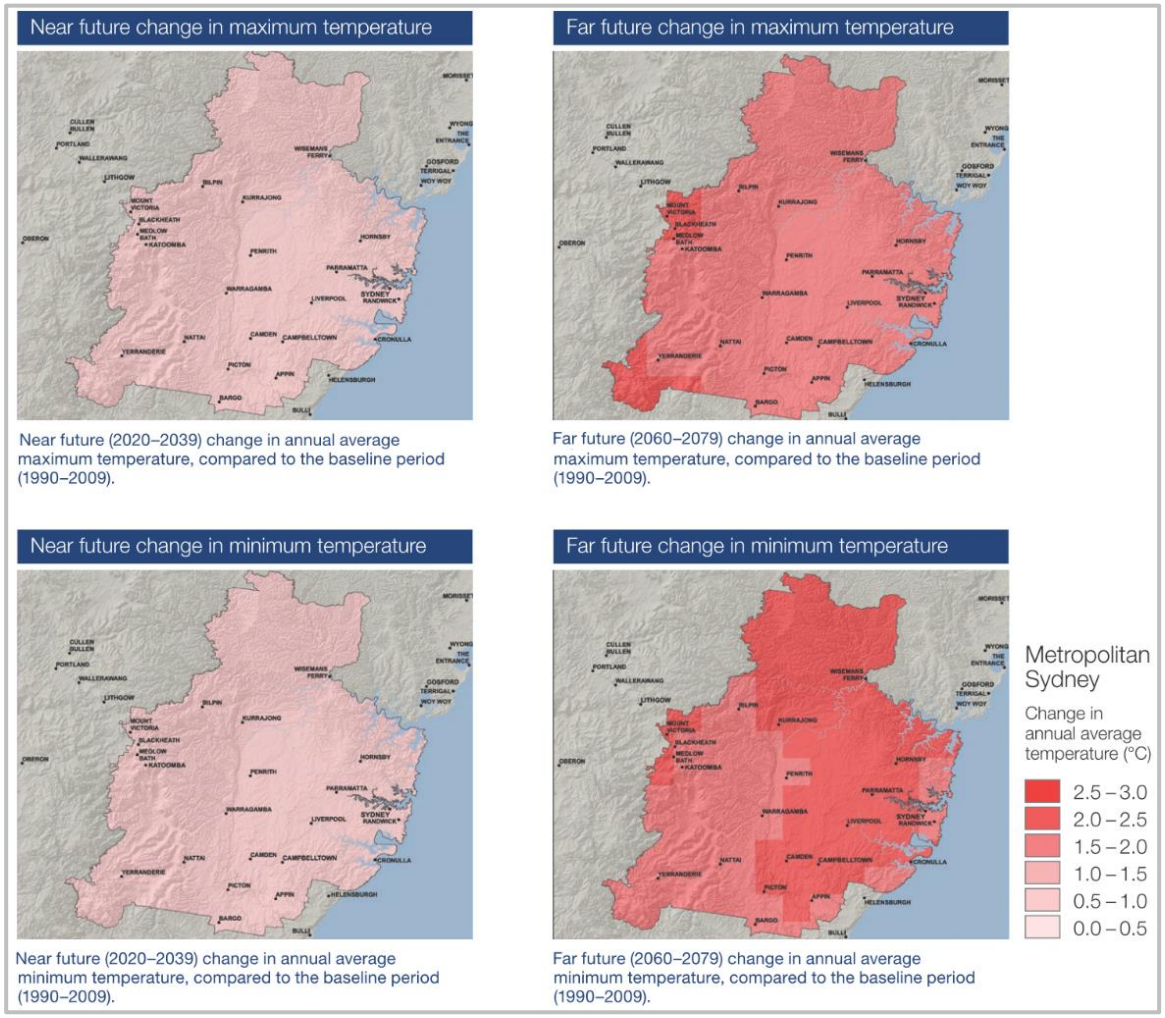


Figure 6. Annual average temperature – Sydney variation map.

6.1.2 Hot days (days per year above 35°C)

Currently Waterloo NSW experiences fewer than 10 days above 35°C each year due to its proximity to the coast. Seasonal changes are likely to have considerable impacts on bushfire danger, infrastructure development and native species diversity.

- The facility is expected to experience more hot days in the near future and in the far future.
- These increases in hot days are projected to occur mainly in spring and summer although in the far future hot days are also extending into autumn.

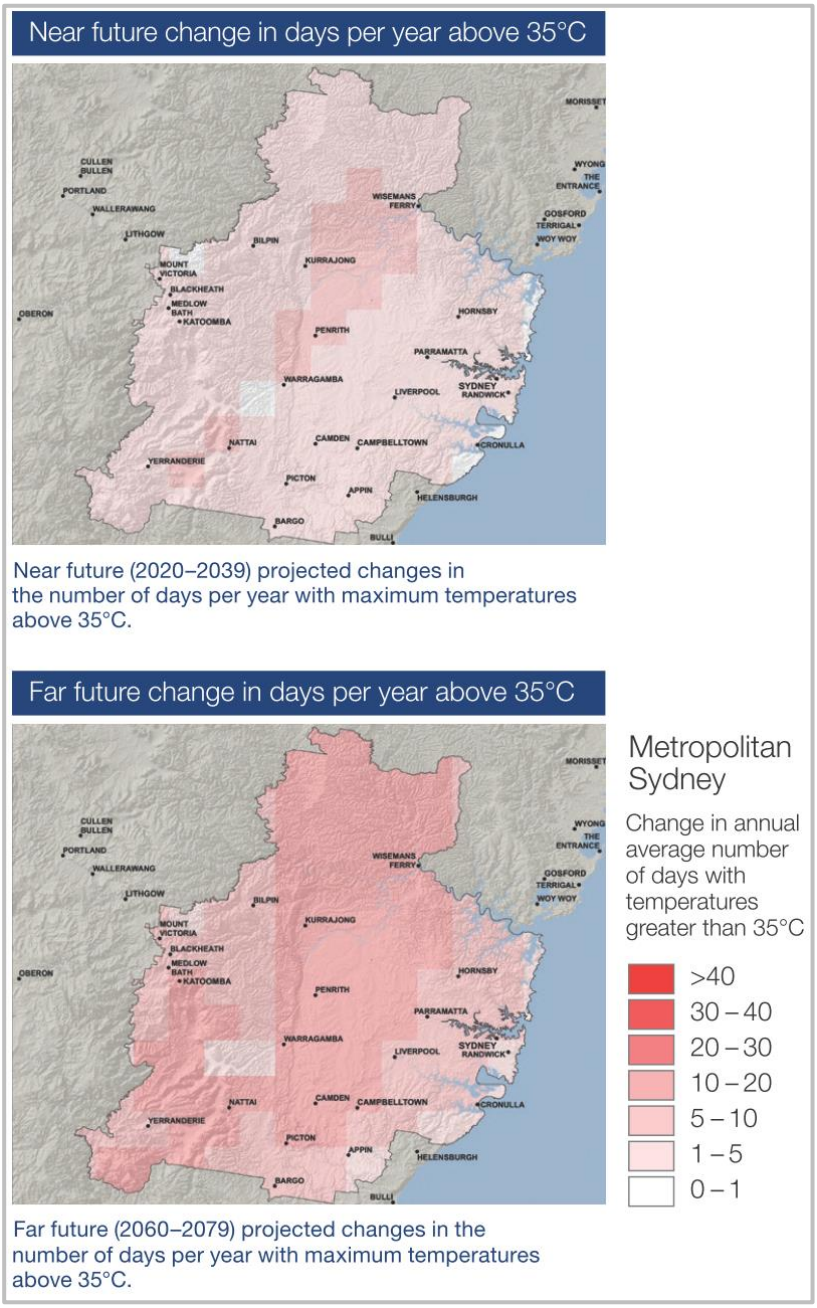


Figure 7. Change in annual average number of days with temperatures greater than 35°C – Sydney variation map.

6.1.3 Cold nights (days per year below 2°C)

Most of the emphasis on changes in temperatures from climate change has been on hot days and maximum temperatures, but changes in cold nights are equally important in the maintenance of our natural ecosystems and agricultural/horticultural industries. For example, some common temperate fruit species require sufficiently cold winters to produce flower buds.

- The greatest decreases are projected to occur in the south-west and in the Blue Mountains, with decreases of up to 20 nights by 2030 and more than 40 fewer cold nights by 2070.
- NARCliM projections suggest that Waterloo NSW will not see a considerable decrease in cold nights (see the white areas in the map).

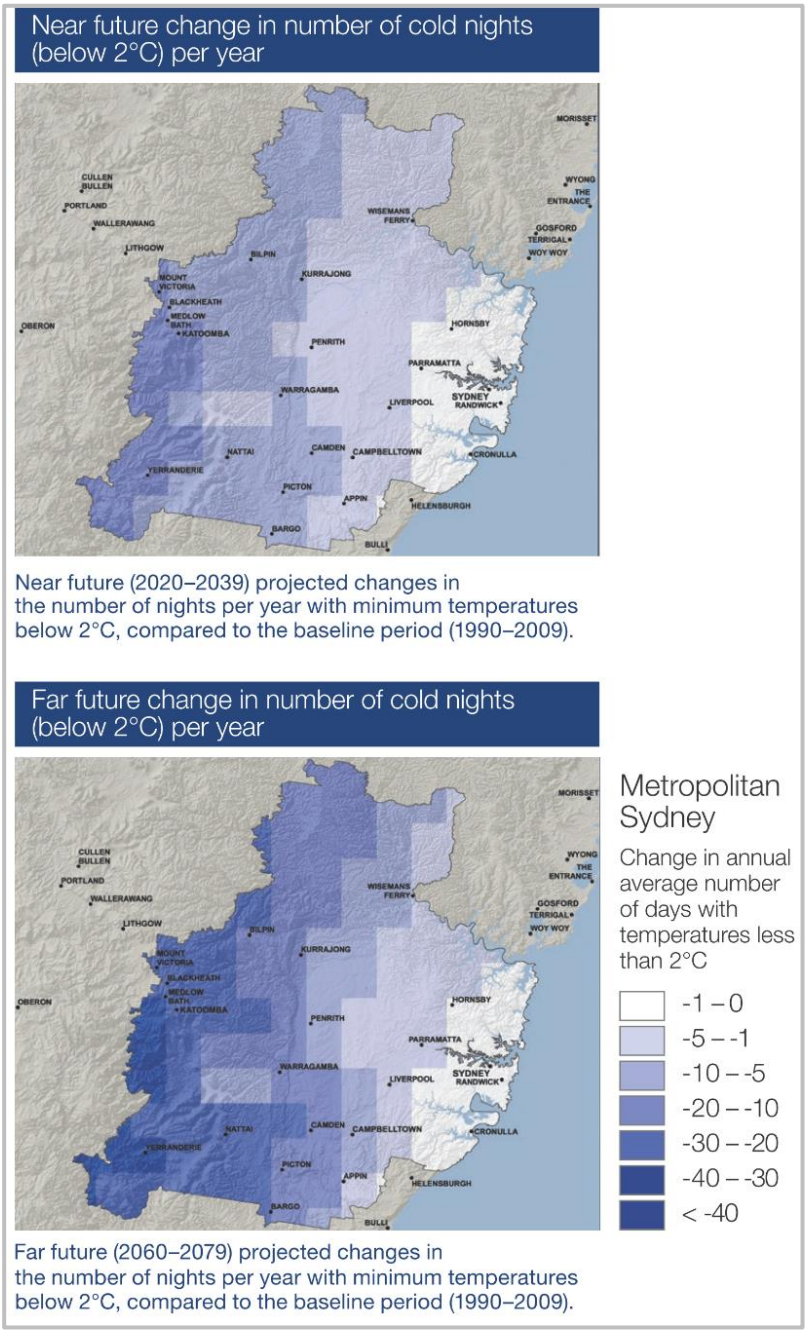


Figure 8. Change in annual average number of days with temperature less than 2°C – Sydney variation map.

6.1.4 Rainfall

Changes in rainfall patterns have the potential for widespread impacts. Seasonal shifts can often impact native species' reproductive cycles as well as impacting agricultural productivity, for example crops that are reliant on winter rains for peak growth. The majority of models (8 out of 12) agree that autumn rainfall will increase in the near future and the far future (7 out of 12). Rainfall is projected to increase in autumn.

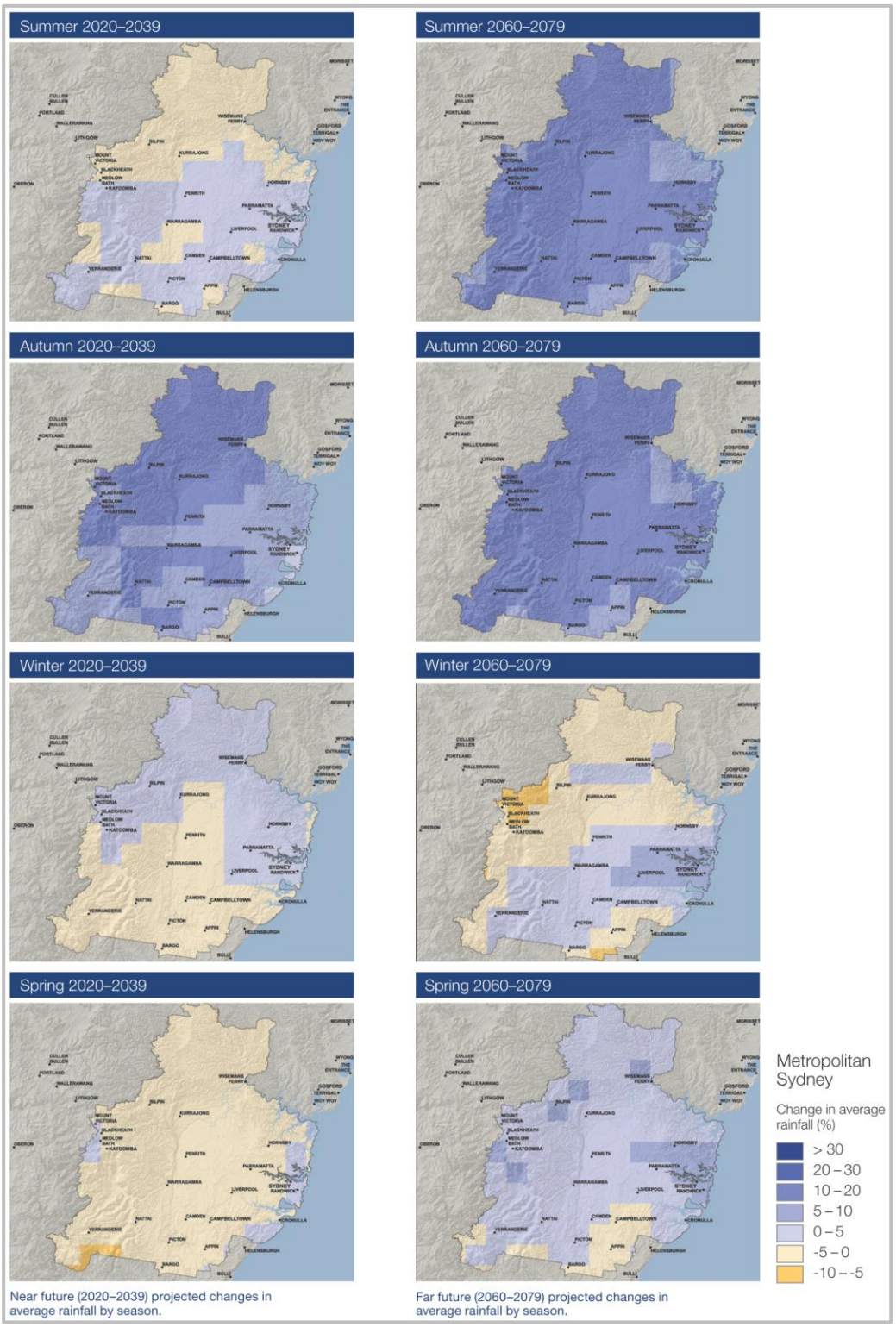


Figure 9. Change in average rainfall (%) – Sydney variation map.

6.1.5 Fire weather

The Bureau of Meteorology issues Fire Weather Warnings when the FFDI (Forest Fire Danger Index) is forecast to be over 50. High FFDI values are also considered by the Rural Fire Service when declaring a Total Fire Ban.

Projected regional climate changes

- Metropolitan Sydney is expected to experience an increase in average and severe fire weather in the near future and the far future.
- The increases are projected mainly in summer and spring in the far future. These changes are projected in prescribed burning periods (spring) and the peak fire risk season (summer).
- The majority of models (7 out of 12) project an increase of severe fire weather in spring in the near future, with a greater confidence in the increase in the far future.

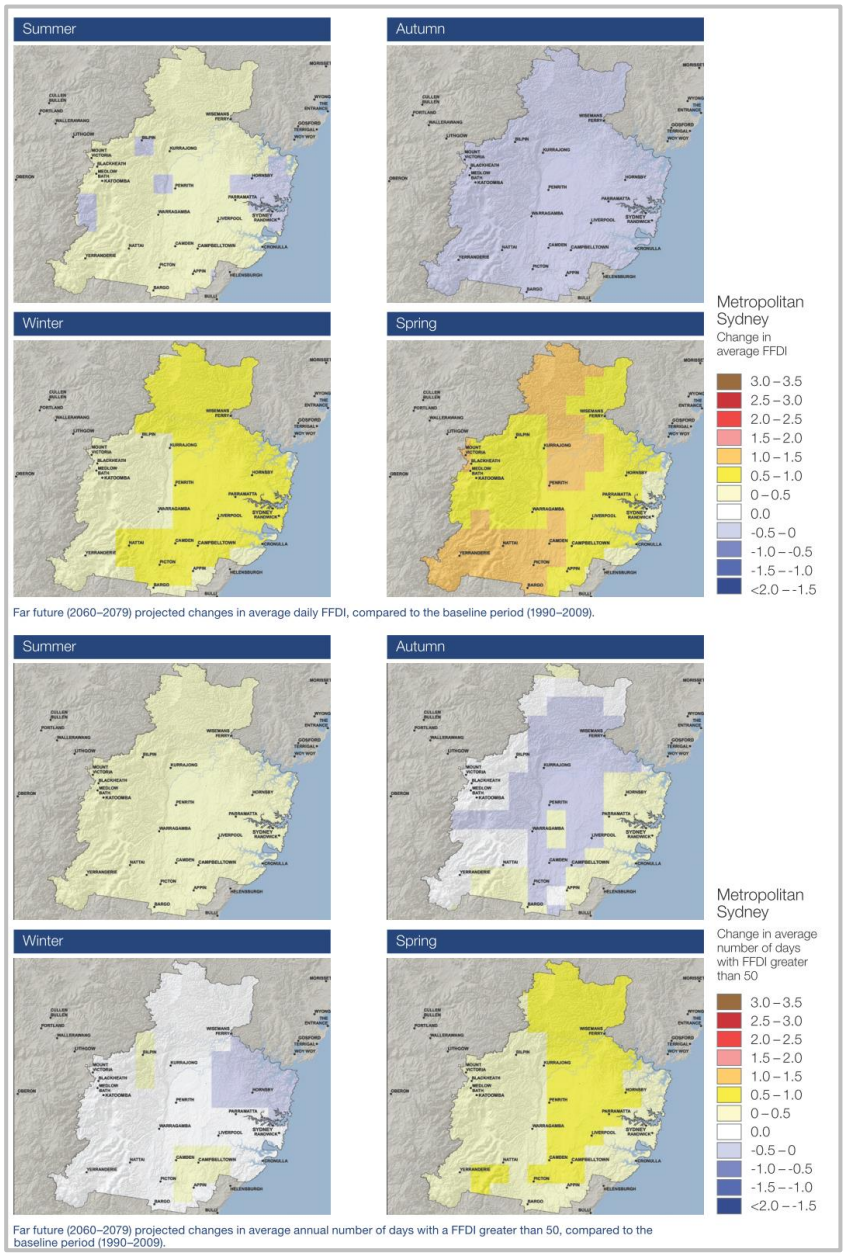


Figure 10. Change in average FFDI & Change in average number of days with FFDI greater than 50 – Sydney variation map.

6.2 Climate Change Adaptation Plan

The climate change adaptation plan (CCAP) follows the ISO31000 Risk Management Process.

The plan involves three key steps to develop risks and mitigation strategies collaboratively with key project stakeholders.

1. Review of the development and context
2. Risk analysis
3. Mitigation Strategies

6.2.1 Risk Assessment Framework

To assess risks systematically, a likelihood scale was used to determine how likely a risk was to occur, followed by consequence assessment. The first stage of the assessment is to define the likelihood of a given risk. The likelihood level can be described as the frequency or probability for a risk to occur.

Table 2. Risk likelihood matrix.

Likelihood	Almost Certain expected in most circumstances
	Likely will probably occur in most circumstances
	Possible might occur at some time
	Unlikely could occur at some time
	Rare may occur, only in exceptional circumstances

Table 3. Example Consequence Scale and Success Criteria (AGO 2007).

	Public Safety	Local Economy and Growth	Community and Lifestyle	Environment and Sustainability	Financial /Time Program/Budgets
Catastrophic	Large numbers of serious injuries or loss of life	Precinct decline leading to widespread business failure	The area is considered very unattractive, moribund and unable to support its community	Major widespread loss of environmental amenity and progressive irrecoverable environmental damage	Loss or increased cost of 50% or greater of annual budget.
Major	Isolated instances of serious injuries or loss of lives	Precinct stagnation such that businesses are unable to thrive	Severe and widespread decline in services and quality of life within the community	Severe loss of environmental amenity and a danger of continuing environmental damage	Loss or increased cost of 25%-50% of annual budget.

Moderate	Small numbers of injuries	Significant general reduction in precinct economic performance	General applicable decline in services	Isolated but significant instances of environmental damage that might be reversed with intensive efforts	Loss or increased cost of 10%-25% of annual budget
Minor	Serious near misses or minor injuries	Isolated areas in precinct decline	Isolated but noticeable examples of decline in services	Minor instances of environmental damage that could be reversed	Loss or increased cost of 5% to 10% of annual budget
Insignificant	Appearance of a threat but no actual harm	Minor shortfall to forecast growth	There would be minor areas in which the region was unable to maintain its current services	No environmental damage	Loss or increased cost of less than 5% of annual budget

Risk likelihood and consequence were then combined using the risk assessment matrix in Table below, leading to the systematic development of a risk rating used to prioritise risk management strategies.

Table 4. Example Risk matrix:

Show	**Matrix Score**				
Risk Rating Number + Name	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	**Medium**	**High**	**High**	**Critical**	**Critical**
Likely	**Medium**	**Medium**	**High**	**Critical**	**Critical**
Possible	**Low**	**Medium**	**Medium**	**High**	**Critical**
Unlikely	**Low**	**Low**	**Medium**	**Medium**	**High**
Rare	**Low**	**Low**	**Low**	**Medium**	**High**

Risk management strategies aim to reduce risk levels by reducing either likelihood or consequence of the risk, or both. The objective is to develop cost-effective options for treating/controlling each identified risk and minimise its impact to the project.

Table 5. Risk management.

Show	**Matrix Score**				
Risk Rating Number + Name	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	**Medium**	**High**	**High**	**Critical**	**Critical**
Likely	**Medium**	**Medium**	**High**	**Critical**	**Critical**

Possible	Low	Medium	Medium	High	Critical
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	High

6.2.2 Risk Assessment outcomes

Climate variable	Risk Statement	Likelihood	Consequence	Level of Risk	Adaptation actions	Residual Likelihood	Residual Consequence	Residual level of Risk
Increase in hot days	Accelerated structural material fatigue and degradation of facades leading to increased maintenance and repair costs	Rare	Catastrophic	High	Select materials which have a higher temperature tolerance if required. Review material datasheets for in-service temperature range and allow for increase in peak temperatures.	Rare	Moderate	Low
Increase in hot days	Brownouts/ Blackouts leading to failure of critical electrical equipment	Possible	Major	High	Ensure that existing plans to add to backup generation based on demand is followed through. Consider use of Solar Energy with Battery Energy Storage Systems (BESS).	Possible	Minor	Medium
Increased rainfall variability	Parapet roof retains water due to blockage in syphonic drainage system leading to structural failure.	Possible	Major	High	Check the design includes overflow outlets in parapet. Add to design if required.	Rare	Major	Medium
Increased rainfall variability	Parapet roof retains water due to insufficient capacity in the syphonic drainage system leading to structural failure.	Possible	Major	High	Overflow systems in place in the form of overflow slots. The capacity of these can be increased if required to allow for increased rainfall intensity.	Rare	Major	Medium

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Climate variable	Risk Statement	Likelihood	Consequence	Level of Risk	Adaptation actions	Residual Likelihood	Residual Consequence	Residual level of Risk
Increased rainfall variability	Onsite Water Detention Tank (OSD) cannot deal with increased flows leading to overflow and flooding of basement.	Possible	Major	High	If necessary, overflow system to be provided. Hydraulic engineers to check if systems can manage the increased flows and implement further measures if required.	Rare	Major	Medium
Increased rainfall variability	Overland flow of water leads to pooling around sub-station, switch room and generator room, causing electrical failure and power outage.	Possible	Catastrophic	Critical	Primary storm water drainage system to be designed to cater for a minimum of a 100-year storm. System to also have full backup of either piped overflow or overland flow designed to a higher storm intensity. Also, ensure that generator can provide backup to critical services in the event of a flood and introduce operational management plan to include measures to account for residual risk. Consider other feasible mitigation measure as required.	Rare	Major	Medium
Increased intensity of storm events	Mechanical plant on the roof (if any) are damaged by extreme hail event leading to failure of ventilation system.	Possible	Major	High	Consider options for protecting the mechanical plant in design. Implement if required.	Rare	Major	Medium

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Climate variable	Risk Statement	Likelihood	Consequence	Level of Risk	Adaptation actions	Residual Likelihood	Residual Consequence	Residual level of Risk
Increased intensity of storm events	Severe hail blocking roof drains causing increased water ingress into building envelope and potential structural impacts, leading to increased maintenance costs	Possible	Major	High	Screen outlets with hail guards. Planned overflow slots should allow rain to overflow for all but the most severe hail events.	Rare	Major	Medium
Increased intensity of storm events	Airborne debris causing damage to exterior building elements and increased maintenance costs.	Possible	Major	High	Check wind load thresholds in engineering for façade and glazing. If required, adopt heat treated glazing for greater impact strength.	Rare	Major	Medium
Increased intensity of storm events	Wind driven rain penetrates the building, creating slip hazards for public circulation spaces.	Likely	Moderate	High	Consider in design and highlight risk for building managers. Include wet weather management plan in facilities management contract.	Rare	Moderate	Low
Increased fire weather	Smoke ingress into facility via HVAC system causing increased health risks for the occupants.	Almost certain	Major	Critical	Evacuation plan to be developed by FM company, including use of link to nearby hospitals for particularly vulnerable occupants. Consider use of non-latching outside air smoke detectors to shut down outside air systems in the event of a bushfire situation.	Almost certain	Insignificant	Medium

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6.2.3 Recommendations

Many of the potential risks to the building are already addressed by existing design features of the building or are being explored as an immediate consequence of this process. All those identified through the workshop and subsequent discussions as requiring additional action are set out in table below, along with responsibility for those actions.

This information should be added to the overall project risk register, with actions implemented and recorded, and subsequently reported in the Green Star documentation.

Table 6. Adaptation Actions Required to Achieve Revised Risk Rating.

Risk Statement	Initial Risk	Residual Risk	Action requiring implementation	Design / Operations	Proposed Responsibility
Brownouts/Blackouts leading to failure of critical electrical equipment.	High	Medium	Backup generator in place. Overall generator capacity can be increased to deal with the loads. Solar PV with Battery Energy Storage System (BESS).	Design and operations	Electrical Engineer
Accelerated structural material fatigue and degradation of façades, leading to increased maintenance and repair costs	High	Low	Review material datasheets for in-service temperature range and allow for a nominal tolerance on peak temperatures based on today's values. Select materials which have a higher temperature tolerance if required.	Design	Façades Engineer, Structural Engineer
Water restrictions during prolonged droughts leading to inability to deliver core services.	High	Low	Develop a Drought Management Plan. Water restrictions would likely be signposted well in advance. Consider alternative water supply.	Operations	Facilities Manager
Parapet roof retains water due to blockage in symphonic drainage system leading to structural failure.	High	Medium	Check the design includes overflow outlets in parapet. Add to design if required.	Design	Hydraulic Engineer
Parapet roof retains water due to insufficient capacity in the symphonic	High	Medium	Check whether capacity of overflow slots and drainage system is sufficient to allow for increased rainfall intensity. Increase either/both if required.	Design	Hydraulic Engineer, Architect

drainage system leading to structural failure.					
Onsite Water Detention Tank (OSD) cannot deal with increased flows leading to overflow and flooding of basement.	High	Medium	Ensure secondary overflow system provided and check if systems can manage increased flows. Implement further measures if required.	Design	Civil Engineer
Overland flow of water leads to pooling around sub-station, switch room and backup generator room, causing electrical failure and power outage.	Critical	Medium	Primary storm water drainage system to be designed to cater for a minimum of a 100- year storm. System to also have full backup of either piped overflow or overland flow designed to a higher storm intensity. Ensure generator will provide backup to critical services in the event of a flood and develop operational management plan to include measures to account for residual flood risk. Consider other feasible mitigation measures as required.	Design	Hydraulic Engineer, Architect, Electrical Engineer
Mechanical plant on the roof (if any) are damaged by extreme hail event leading to failure of ventilation system.	High	Medium	Consider options for protecting the mechanical plant in design. Implement if required.	Design	Mechanical Engineer
Severe hail blocking roof drains causing increased water ingress into building envelope and potential structural impacts, leading to increased maintenance costs	High	Medium	Screen outlets with hail guards.	Design	Hydraulic Engineer

Airborne debris causing damage to exterior building elements and increased maintenance costs - particularly discussed potential increase in wind loadings due to CC.	High	Medium	Check wind load thresholds in engineering for façade and glazing. Adopt heat treated glazing for greater impact strength if required.	Design	Façades Engineer, Structural Engineer
Wind driven rain penetrates the building, creating slip hazards for public circulation spaces.	High	Low	Consider in design and highlight risk for building managers. Include wet weather management plan in facilities management contract.	Design and operations	Architects and Facilities Manager
Smoke ingress into facility via HVAC system causing increased employee health risks	Critical	Medium	Evacuation plan to be developed by FM company, including use of link to nearby hospitals for particularly vulnerable occupants. Consider use of non-latching outside air smoke detectors to shut down outside air systems in the event of a bushfire situation.	Design and operations	Mechanical Engineer, Facilities Manager, Owner

7. Disclaimer

This report is prepared using the information described above and inputs from other consultants. Whilst JN Consulting has endeavoured to ensure the information used is accurate, no responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact JN Consulting for detailed advice which will take into account that party's particular requirements.

Computer performance assessment provides an estimate of building performance. This estimate is based on a necessarily simplified and idealised version of the building that does not and cannot fully represent all the intricacies of the building once built. As a result, simulation results only represent an interpretation of the potential performance of the building. No guarantee or warrantee of building performance in practice can be based on simulation results alone. JN Consulting and its employees and agents shall not be liable for any loss arising because of, any person using or relying on the Report and whether caused by reason or error, negligent act or omission in the report. The draft assessment has been prepared indicatively and using the limited architectural and building services design with the view to conduct a detailed assessment once the design is further developed.

Performance of the completed building may be significantly affected by the quality of construction; the quality of commissioning, ongoing management of the building, and the way the building is operated, monitored and maintained.

APPENDIX A - TECHNICAL DATASHEETS FOR SAMPLE PV PANELS (600 W)

Vertex

BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

PRODUCT: TSM-DEG20C.20
PRODUCT RANGE: 580-600W

600W	0~+5W	21.2%
MAXIMUM POWER OUTPUT	POSITIVE POWER TOLERANCE	MAXIMUM EFFICIENCY



High customer value

- Lower LCOE (Levelized Cost of Energy), reduced BOS (Balance of System) cost, shorter payback time
- Lowest guaranteed first year and annual degradation;
- Designed for compatibility with existing mainstream system components
- Higher return on Investment

High power up to 600W

- Up to 21.2% module efficiency with high density interconnect technology
- Multi-busbar technology for better light trapping effect, lower series resistance and improved current collection

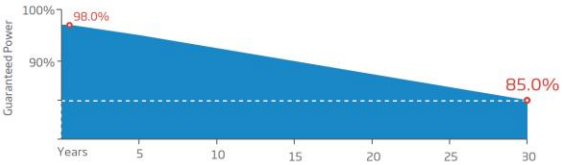
High reliability

- Minimized micro-cracks with innovative non-destructive cutting technology
- Ensured PID resistance through cell process and module material control
- Resistant to harsh environments such as salt, ammonia, sand, high temperature and high humidity areas
- Mechanical performance up to 5400 Pa positive load and 2400 Pa negative load

High energy yield

- Excellent IAM (Incident Angle Modifier) and low irradiation performance, validated by 3rd party certifications
- The unique design provides optimized energy production under inter-row shading conditions
- Lower temperature coefficient (-0.34%) and operating temperature
- Up to 25% additional power gain from back side depending on albedo

Trina Solar's Vertex Bifacial Dual Glass Performance Warranty



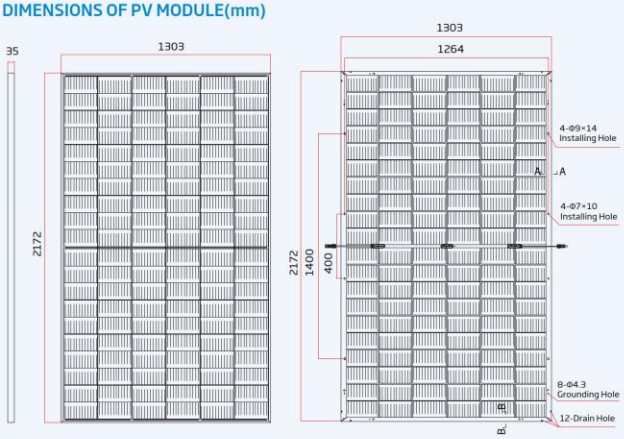
Comprehensive Products and System Certificates

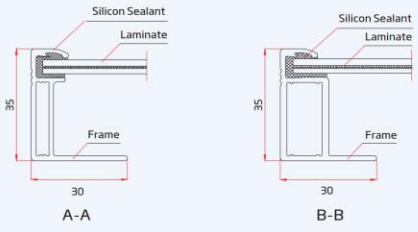
IEC61215/IEC61730/IEC61701/IEC62716/UL61730
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Verification
ISO45001: Occupational Health and Safety Management System

Trinasolar

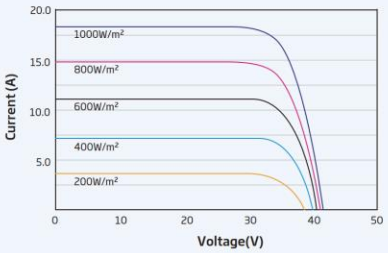
Vertex BIFACIAL DUAL GLASS MONOCRYSTALLINE MODULE

DIMENSIONS OF PV MODULE(mm)

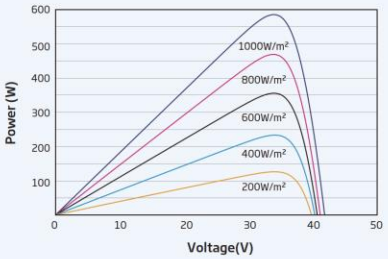




I-V CURVES OF PV MODULE(590 W)



P-V CURVES OF PV MODULE(590 W)



ELECTRICAL DATA (STC)

Peak Power Watts-PMAX (Wp)*	580	585	590	595	600
Power Tolerance-PMAX (W)			0 ~ +5		
Maximum Power Voltage-VMPP (V)	33.8	34.0	34.2	34.4	34.6
Maximum Power Current-IMPP (A)	17.16	17.21	17.25	17.30	17.34
Open Circuit Voltage-VOC (V)	40.9	41.1	41.3	41.5	41.7
Short Circuit Current-ISC (A)	18.21	18.26	18.31	18.36	18.42
Module Efficiency η m (%)	20.5	20.7	20.8	21.0	21.2

STC: Irrdiance 1000W/m2, Cell Temperature 25°C, Air Mass AM1.5. *Measuring tolerance: ±3%.

Electrical characteristics with different power bin (reference to 10% Irradiance ratio)

Total Equivalent power -PMAX (Wp)	621	626	631	637	642
Maximum Power Voltage-VMPP (V)	33.8	34.0	34.2	34.4	34.6
Maximum Power Current-IMPP (A)	18.36	18.41	18.46	18.51	18.55
Open Circuit Voltage-VOC (V)	40.9	41.1	41.3	41.5	41.7
Short Circuit Current-ISC (A)	19.48	19.54	19.59	19.65	19.71
Irradiance ratio (rear/front)			10%		

Power Bifaciality:70±5%.

ELECTRICAL DATA (NOCT)

Maximum Power-PMAX (Wp)	439	443	447	451	454
Maximum Power Voltage-VMPP (V)	31.5	31.7	31.9	32.0	32.2
Maximum Power Current-IMPP (A)	13.93	13.97	14.01	14.06	14.10
Open Circuit Voltage-VOC (V)	38.5	38.7	38.9	39.1	39.3
Short Circuit Current-ISC (A)	14.68	14.72	14.76	14.80	14.84

NOCT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

MECHANICAL DATA

Solar Cells	Monocrystalline
No. of cells	120 cells
Module Dimensions	2172×1303×35 mm (85.51×51.30×1.38 inches)
Weight	35.3 kg (77.8 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	EVA/POE
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	35mm(1.38 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0mm² (0.006 inches²), Portrait: 280/280 mm(11.02/11.02 inches) Length can be customized
Connector	MC4 EVO2 / TS4*

*Please refer to regional datasheet for specified connector.

TEMPERATURE RATINGS

NOCT(Nominal Operating Cell Temperature)	43°C (±2°C)
Temperature Coefficient of PMAX	- 0.34%/°C
Temperature Coefficient of VOC	- 0.25%/°C
Temperature Coefficient of ISC	0.04%/°C

MAXIMUMRATINGS

Operational Temperature	-40~+85°C
Maximum System Voltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	35A

WARRANTY

12 year Product Workmanship Warranty
30 year Power Warranty
2% first year degradation
0.45% Annual Power Attenuation

(Please refer to product warranty for details)

PACKAGING CONFIGUREATION

Modules per box: 25/36 pieces
Modules per 40' container: 549 pieces

Trinasolar

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.
© 2021 Trina Solar Limited, All rights reserved, Specifications included in this datasheet are subject to change without notice.
Version number: TSM_EN_2021_B
www.trinasolar.com

APPENDIX B - TECHNICAL DATASHEETS FOR SAMPLE PV INVERTERS

SG5.0RT/SG7.0RT/SG10RT/ SG15RT/SG20RT New

SUNGROW
Clean power for all

Multi-MPPT String Inverter for 1000 Vdc System



HIGH YIELD

- Lower startup & wider MPPT voltage
- Compatible with bifacial modules
- Built-in PID recovery function

SMART MANAGEMENT

- Smart IV curve scanning
- 24/7 Live monitoring
- Over-the-air firmware updates

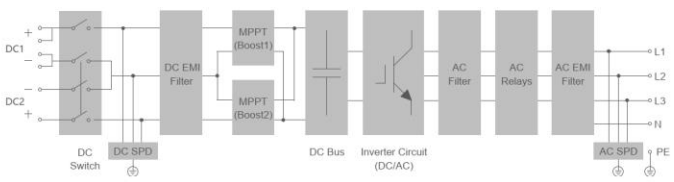
SAFE AND DURABLE

- Quick arc fault circuit interrupter
- Build-in Type II DC & AC SPD
- High anti-corrosion rating at C5

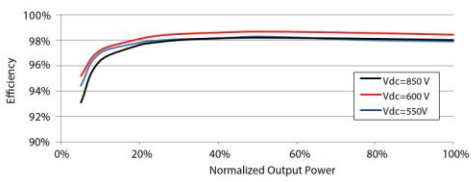
EASY AND USER FRIENDLY

- 18 kg compact design
- Unique push-in connectors
- Fast and easy commissioning via App

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG5.0RT	SG7.0RT	SG10RT	SG15RT	SG20RT
Input (DC)					
Recommended max. PV input power	7.5 kW	10.5 kW	15 kW	22.5kW	30 kW
Max. PV input voltage	1100 V				
Min. PV input voltage / Start-up input voltage	180 V				
Nominal input voltage	600 V				
MPP voltage range	160 V – 1000 V				
No. of independent MPP inputs	2				
No. of PV strings per MPPT	1 / 1	2 / 1	2 / 1	2 / 2	2 / 2
Max. PV input current	25 A (12.5 A / 12.5 A)	37.5 A (25 A / 12.5 A)	37.5 A (25 A / 12.5 A)	50 A (25 A / 25 A)	50 A (25 A / 25 A)
Max. current for input connector	30A				
Max. DC short-circuit current	32 A (16 A / 16 A)	48 A (32 A / 16 A)	48 A (32 A / 16 A)	64 A (32 A / 32 A)	64 A (32 A / 32 A)
Output (AC)					
Nominal AC power (@230 V, 50 Hz)	5000 W	7000 W**	10000 W	15000 W	20000 W
Max. AC output power	5500 VA*	7700 VA**	11000 VA*	16500 VA*	22000 VA*
Max. AC output current	8.3 A	11.7 A	16.7 A	25 A	31.9 A
Nominal AC voltage	3 / N / PE, 220 / 380 V 3 / N / PE, 230 / 400 V 3 / N / PE, 240 / 415 V				
AC voltage range	180 V – 276 V				
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz 60 Hz / 55 – 65 Hz				
Harmonic(THD)	<3 % (at nominal power)				
Power factor at nominal power / Adjustable power factor	>0.99 / 0.8 leading – 0.8 lagging				
Feed-in phases / AC connection	3 / 3				
Efficiency					
Max. efficiency	98.40%	98.40%	98.50%	98.50%	98.50%
European efficiency	97.40%	97.70%	97.90%	98.10%	98.10%
Protection					
Grid monitoring	Yes				
DC reverse connection protection	Yes				
AC short-circuit protection	Yes				
Leakage current protection	Yes				
Surge Protection	DC Type II / AC Type II				
DC switch	Yes				
Arc fault circuit interrupter (AFCI)	Yes				
PID recovery function	Yes				
General Data					
Dimensions (W*H*D)	370 * 480 * 195 mm				
Mounting method	Wall-mounting bracket				
Weight	18 kg	18 kg	18 kg	21 kg	21 kg
Topology	Transformerless				
Degree of protection	IP65				
Operating ambient temperature range	-25 ℃ to 60 ℃				
Allowable relative humidity range	0% – 100%				
Cooling method	Natural cooling	Natural cooling	Natural cooling	Smart forced air cooling	Smart forced air cooling
Max. operating altitude	4000 m (> 2000 m derating)				
Noise(Typical)	35dB (A)	35dB (A)	35dB (A)	45dB (A)	45dB (A)
Display	LED				
Communication	WLAN, Ethernet, RS485, DI, DO				
DC connection type	MC4				
AC connection type	Plug and play				
Compliance	EN 61000-6-1/-3, IEC62109-2, IEC 61727, IEC 62116, AS/NZS 4777.2:2015, VDE-AR-N-4105, DIN VDE0126-1-1, CEI 0-21, EN50549-1				

Attachment A18

Acid Sulfate Soils Assessment

1 February 2024 Ref: 17185-ER-1-1

Charvic Pty Ltd &
International Screen Academy Property Pty Ltd

Attention: Richard Huynh (richard.huynh@sdg.org.au)

Project: Desktop Acid Sulfate Soils Assessment, 242-258 Young Street, Waterloo, NSW

1. Introduction

1.1. Background

Alliance Geotechnical Pty Ltd (Alliance) has been engaged by Charvic Pty Ltd and International Screen Academy Property Pty Ltd to prepare an acid sulfate soils assessment report for 242-258 Young Street, Waterloo, NSW 2017 (refer **Figure 1**).

At the commencement of the project, Alliance had the following project appreciation:

- The site consists of a portion of Lot A and B in DP 161650 and Lot 1 in DP84655;
- The site consists of light industrial/warehouse buildings on 244-258 Young Street and a commercial building on 242 Young Street;
- The site is proposed for redevelopment comprising demolition of all existing buildings and construction of a new mixed-use building between 4-7 storeys, with 1 or 2 level basement car parking, details of which are still to be finalised (refer to **Appendix A** for preliminary design plans); and
- This acid sulfate soil assessment is required to assist the client address relevant development consent decision making processes.

1.2. Objectives

The objective of this project was to assess whether the proposed development is within 500m of Class 1, 2, 3 or 4 land (in the context of acid sulfate soils):

- that is below 5m Australian Height Datum (AHD); and
- by which the water table is likely to be lowered below 1m AHD on adjacent Class 1, 2, 3 or 4 land.

1.3. Scope of Work

The following scope of works was undertaken to address the project objective:

- a desktop review of council acid sulfate soil maps and land elevation maps.

2. Site Identification

2.1. Site Details

Site identification details are presented in **Table 2.1**.

Table 2.1 Site Identification Details

Cadastral Identification	Lot A and B in DP 161650 and Lot 1 in DP84655
Geographic Coordinates (Nearmap)	33° 90' 11" S and 151° 20' 77" E
Site Area	Approximately 4,700m^2
Local Government Authority	City of Sydney
Current Zoning	MU1 – Mixed Use

A survey of the site boundary is presented in **Appendix B**.

3. Site Environmental Setting

3.1. Geology

The 1:100,000 Sydney Geological Map indicates the site is underlain by coastal deposits, which are characterised by *marine-deposited and aeolian-reworked coastal sand dunes*. The marine deposits (Botany Sands) are underlain by fine-grained sandstones of the Hawkesbury Sandstone, which is characterised by *medium- to coarse-grained quartz sandstone with minor shale and laminite lenses*.

3.2. Site Topography and Elevation

Topographically, the site is located on a slight slope towards the south-west. The elevation at the north-eastern corner is approximately RL22.0m, and the elevation at the southern corner is approximately RL19.8m. A copy of a survey plan of the site is presented in **Appendix B**.

3.3. Acid Sulfate Soils

A review of https://www.environment.nsw.gov.au/eSpade2Webapp indicated that the proposed development site is located in an area mapped as:

- N: no known occurrence

A review of https://geomap.cityofsydney.nsw.gov.au/gxe/?viewer=Planning# indicated that the proposed development is located on land mapped as:

- Class 5

A Class 4 area is located approximately 500m away from the subject site to the south-west (refer **Figure 2**). The elevation of that Class 4 land is approximately 17m AHD (based on NearMap elevation), which is greater than 5m AHD.

4. Conclusions

Based on the assessment undertaken by Alliance, the following conclusions are made:

- The proposed development:
    - is not within 500m of Class 1, 2 or 3 land;
    - is within 500m Class 4 land, however that class 4 land is located above 5m AHD; and
- An acid sulfate soils management plan is not required for the proposed development.

Based on these conclusion, an acid sulfate soils management plan is not required for the proposed development.

This report must be read in conjunction with the ***Important Information About This Report*** statements in **Section 6** this report.

For and on behalf of,
Alliance Geotechnical Pty Ltd

Max Campbell
Environmental Consultant

Figures
Figure 1 Site Locality Plan
Figure 2 Acid Sulfate Soils Zoning Plan

Appendices
APPENDIX A – Proposed Development Plans
APPENDIX B – Site Survey

5. References

Alliance 2023, ‘Geotechnical Investigation Report, 242-258 Young Street, Waterloo NSW’, ref: 17185-GR-1-1, dated 20 December 2023

City of Sydney 2024, City of Sydney website, accessed 1 February 2024, <https://geomap.cityofsydney.nsw.gov.au/gxe/?viewer=Planning#>

6. Important Information About this Report

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This document is produced by Alliance solely for the use and benefit by the named client in accordance with the terms of the engagement between Alliance and the name client. Alliance (and the document Certifier if applicable) does not and shall not assume any liability or responsibility whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

This report must be reviewed in its entirety and in conjunction with the objectives, scope and terms applicable to Alliance's engagement. The report must not be used for any purpose other than the purpose specified at the time Alliance was engaged to prepare the report.

The findings presented in this report are based on specific data and information made available during the course of this project. To the best of Alliance's knowledge, these findings represent a reasonable interpretation of the general condition of the site at the time of report completion.

No warranties are made as to the information provided in this report. All conclusions and recommendations made in this report are of the professional opinions of personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to personnel and which may impact on those opinions is not the responsibility of Alliance.

Logs, figures, and drawings are generated for this report based on individual Alliance consultant interpretations of nominated data, as well as observations made at the time fieldwork was undertaken.

Data and/or information presented in this report must not be redrawn for its inclusion in other reports, plans or documents, nor should that data and/or information be separated from this report in any way.

Should additional information that may impact on the findings of this report be encountered or site conditions change, Alliance reserves the right to review and amend this report.

APPENDIX A – Proposed Development Plans

STRICTLY CONFIDENTIAL

ANNEXURE A - Project Brief for Redevelopment of 242 – 258 Young Street Waterloo

Prepared by: Sustainable Development Group
September 2023
Revision 4

Sustainable Development Group Ltd
Level 4, 233 Castlereagh Street
Sydney, NSW 2000

Contents

1. Introduction 2
2. The Site 2
3. Site Details 4
4. Planning Pathway 4
5. Tender and Construction Phase 5
6. Long Term Asset Management 5
7. Target Program 5

8. Attachments..... 6

1. Introduction

The Waterloo site is located at 242, 244-258 Young Street, Waterloo NSW 2017 (the Site). The Site is located centrally within Waterloo and bounded by Young Street to the east, Hunter to the West and Powell Street to the south. The Site tapers to a point on the south where these three streets intersect and there is a slight gradient down from north to south. The redevelopment of the Site includes the proposed demolition of all existing buildings and construction of a new building between 4-7 storeys (subject to council consultation) with minimal setback to the boundaries. It is also proposed to construct one or two level basement for car parking. The proposed development will be a long term investment hold by the landowners with potential leased premises including some of the following (subject to tenant interest):

- Independent Secondary School
- Film School
- Place of Worship
- Student Accommodation
- Commercial Offices
- Community Facilities

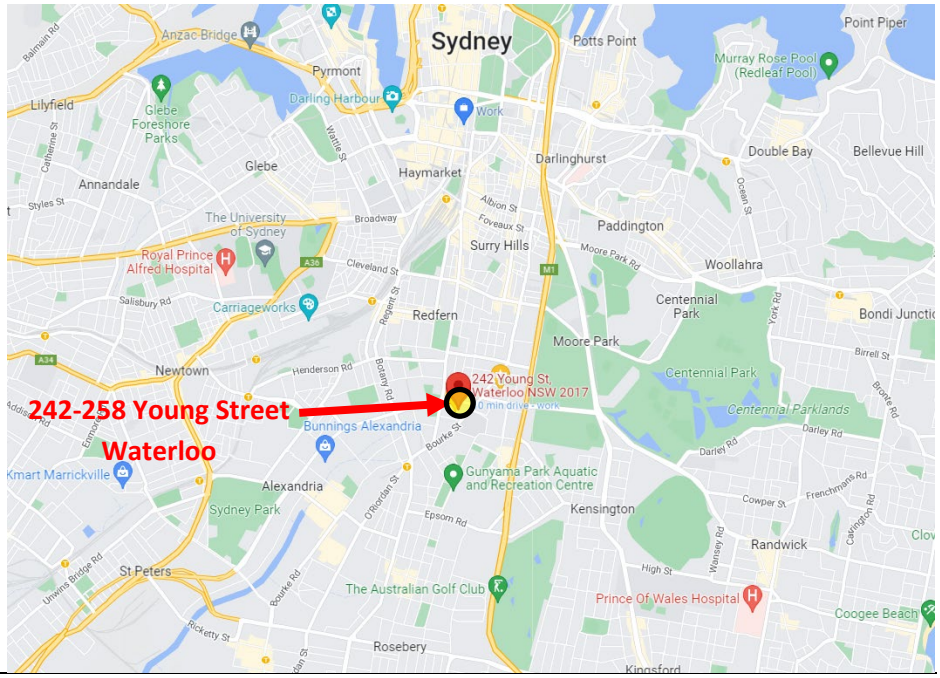
The below metrics reflect the initial yield study prepared by Plus Architecture (with some adjustments for commercial), but is indicative only and will change as the concept design is progressed with prospective tenants. Refer to ATTACHMENT 1 for the preliminary concept design. **NOTE THAT THE PLANS WILL BE UPDATED SO THEY ARE FOR INFORMATION PURPOSES ONLY.**

Description	Approx. sqm	Comments
Total GFA (approx.)	13,919	Exceeds permissible GFA
School GFA	10,028	Internal areas to be linked with external covered corridors
Film School GFA	3891	
Multipurpose Hall GFA	750	To be shared by tenants and wider community. Included in School GFA.
Car Parking	Between 49-65	1 Basement car parking level. Total number TBC.

2. The Site

A descriptive analysis of the site is shown as follows:

Characteristic	Description
Shape	Three parcels of land in Irregular triangular shape
Zoning	B4 Mixed Use
Topography	Slight gradient fall from north to south
Frontage	Frontage to Young Street, Hunter Street and minor frontage to Powell Street where all three street intersect.
Existing Buildings	The existing buildings on site consist of older style light industrial/warehouse buildings on 244-258 Young Street and a contemporary purpose built building on 242 Young Street. All

	buildings are proposed to be demolished, but the building on 242 Young Street may be retained.
Flora and Fauna	Large trees exist along the footpath (outside of site boundary) of Young and Hunter streets which are mature and potential impact on these trees must carefully be considered.
Surroundings	Residential buildings to the north, south and west and light industrial and retail buildings to the east. There is a pocket park directly south.
Location Plan	
Site Plan	

3. Site Details

Item	Description	
Address	242, 244-258 Young Street Waterloo NSW 2017	
Title/s:	Lot 1 of	DP 84655
	Lot A and B of	DP 161650
Council Area:	City of Sydney Council	
Site Area:	3502 and 1053 = 4555sqm (Source: Survey)	
Zoning:	B4 Mixed Use	
Max. FSR:	1.5:1; bonus 0.5:1 available for *Community infrastructure floor space at Green Square of the Sydney LEP 2012*	
Max. Height of Building:	15m	
Permissible Max GFA:	6,832.5sqm OR 9,110sqm (with bonus)	
Permissible Uses:	The proposed uses including Education Establishments (schools), Commercial Premises (Office premises, retail premises) and Student Accommodation are all permissible with consent on the site. Refer to separate planning report for additional information.	
Heritage Significance:	Not heritage listed or mapped.	

4. Planning Pathway

The proposal is to include an independent school as a major tenant and it is also proposed to exceed the permissible maximum height limit and FSR. On this basis, the planning pathway for planning approval will require a planning proposal (PP) to be negotiated with the City of Sydney Council and subject to PP approval. A State Significant Development Application (SSDA) is then to be lodged with the Department of Planning and Environment (DPE) as the determining authority. Relevant education uses of the project will be assessed under the Education SEPP with other uses to be assessed under the Sydney LEP 2012. All proposed uses in the current scheme are permissible.

The proposal will seek additional height and FSR above what is permissible for the site.

Preliminary meetings with both the City of Sydney Council and the DPE have been held and they are both generally in support of the provision of education facilities on the site. Attachment 2 includes initial feedback from the City of Sydney on the preliminary concept design prepared by Plus Architecture as contained in Attachment 1. The feedback includes key matters that council see as important and that any proposed design is to carefully consider. The Consultant is to review this information and where relevant to provision of their Services, consider how it may impact any proposed design and be a proactive project team member in seeking solutions that maximise positive outcomes for the Landowners. Refer to the Scope of Services document for full services and deliverables to be provided.

5. Tender and Construction Phase

It is proposed to engage a contractor on a lump sum design and construct contract arrangement via a competitive tendering process although an ECI process may also be considered and other contractual arrangement may eventuate depending on market conditions at the time construction procurement is to occur.

Where design services are required as part of the scope of services, the Consultant will be required to prepare tender documentation to approximately 70% design completion or as further instructed. Timing of this step may commence prior to receipt of DA approval to meet target program timeframes, but will be confirmed during the DA assessment period.

The Consultant may be novated (depending on the discipline) to the contractor during construction and the fee proposal should reflect this arrangement. However, the Consultant may alternately be engaged for peer review services during construction. Refer to Scope of Services for further details.

6. Long Term Asset Management

It is Important to note that the Landowners are seeking to redevelop the Site with the intention to fully retain and manage the completed asset for the foreseeable future. The long-term view of this Project and the Landowners, should inform design decisions and inputs expected from all engaged consultants. It is important that consultants consider the long-term ownership and management of the asset and ensure the Project can be more efficiently and sustainably managed over a long time horizon.

7. Target Program

The following program is indicative only and may be subject to modification from SDG, Authority requirements and approvals as required. The Consultant accepts that if engaged, the Consultant's fee is not linked to the indicative program and agrees that it will not submit a variation should there be a requirement to modify the Target Program. If the Consultant disagrees with this condition it can elect to withdraw from submitting a fee proposal. The Consultant's decision to submit a fee proposal will be taken as confirmation of agreement of this condition.

Phase	Target Start	Est. Duration
Prepare and Lodge Planning Proposal - Target Planning Proposal lodgment – Dec 2023	Mid-May 2023	7 months (Iterative process with City of Sydney Council)
SSDA Preparation Phase - Target SSDA lodgment – Mid-Jun 2025 - Assume SSDA approval takes 10 months.	Mid Sep 2024	6 months
Design Development and Tender Documentation Phase	Apr 2026	6 months
Construction Phase (including Demolition)	Oct 2026	18 months (TBC)
Defects Liability Period	TBC	12 months or as per legislative requirement, whichever is greater

8. Attachments

Attachment 1 – Plus Architecture Preliminary Concept Design.

Attachment 2 – City of Sydney Council Feedback to Plus Architecture Preliminary Concept Design

PROPOSED DESIGN

PERSPECTIVE - OVERVIEW

ATTACHEMENT 1



1038

242-258 YOUNG ST WATERLOO

COUNCIL MEETING

JOB NO. 20621

DATE 27/06/2023

SCALE NTS

SDG plus architecture

PROPOSED DESIGN

PERSPECTIVE- STREET VIEW



1039

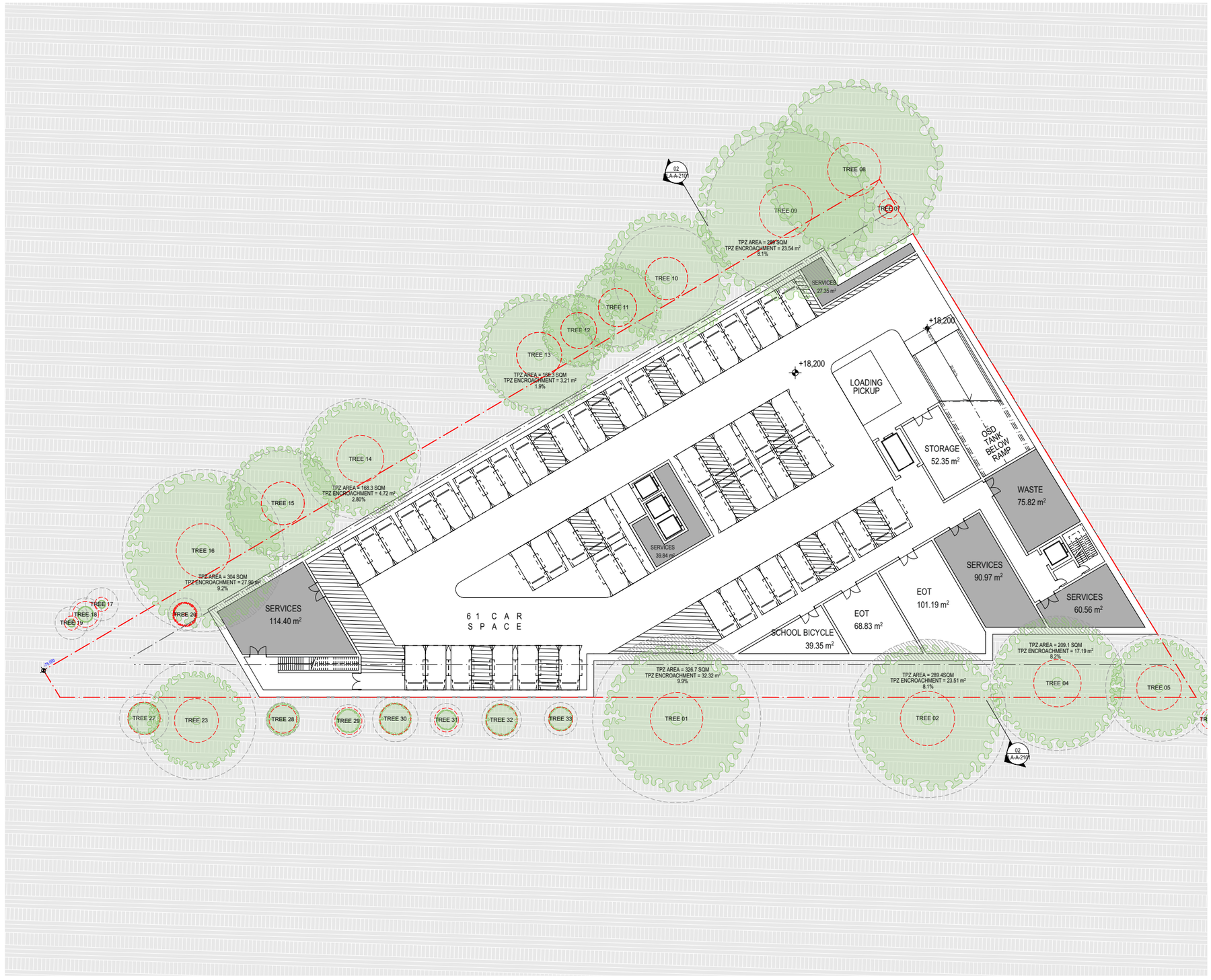
PROPOSED DESIGN

PERSPECTIVE- STREET VIEW



1040

PLANS - BASEMENT



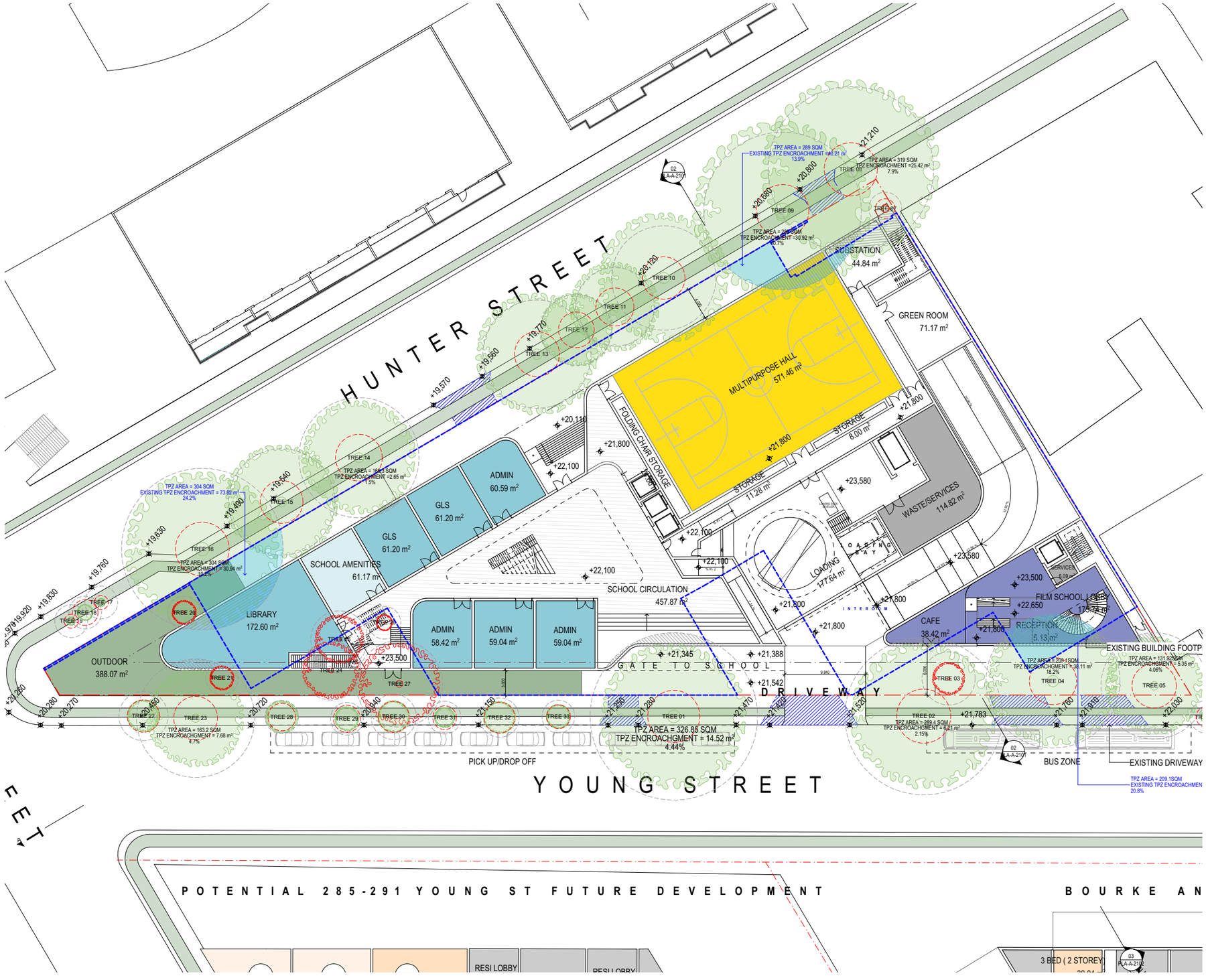






1041

PLANS - GROUND









242-258 YOUNG ST WATERLOO
COUNCIL MEETING

JOB NO. 20621
DATE 27/06/2023
SCALE 1:600@A3

SDG plus architecture

PLANS - LEVEL 01







1043

PLANS - LEVEL 02









PLANS - LEVEL 03





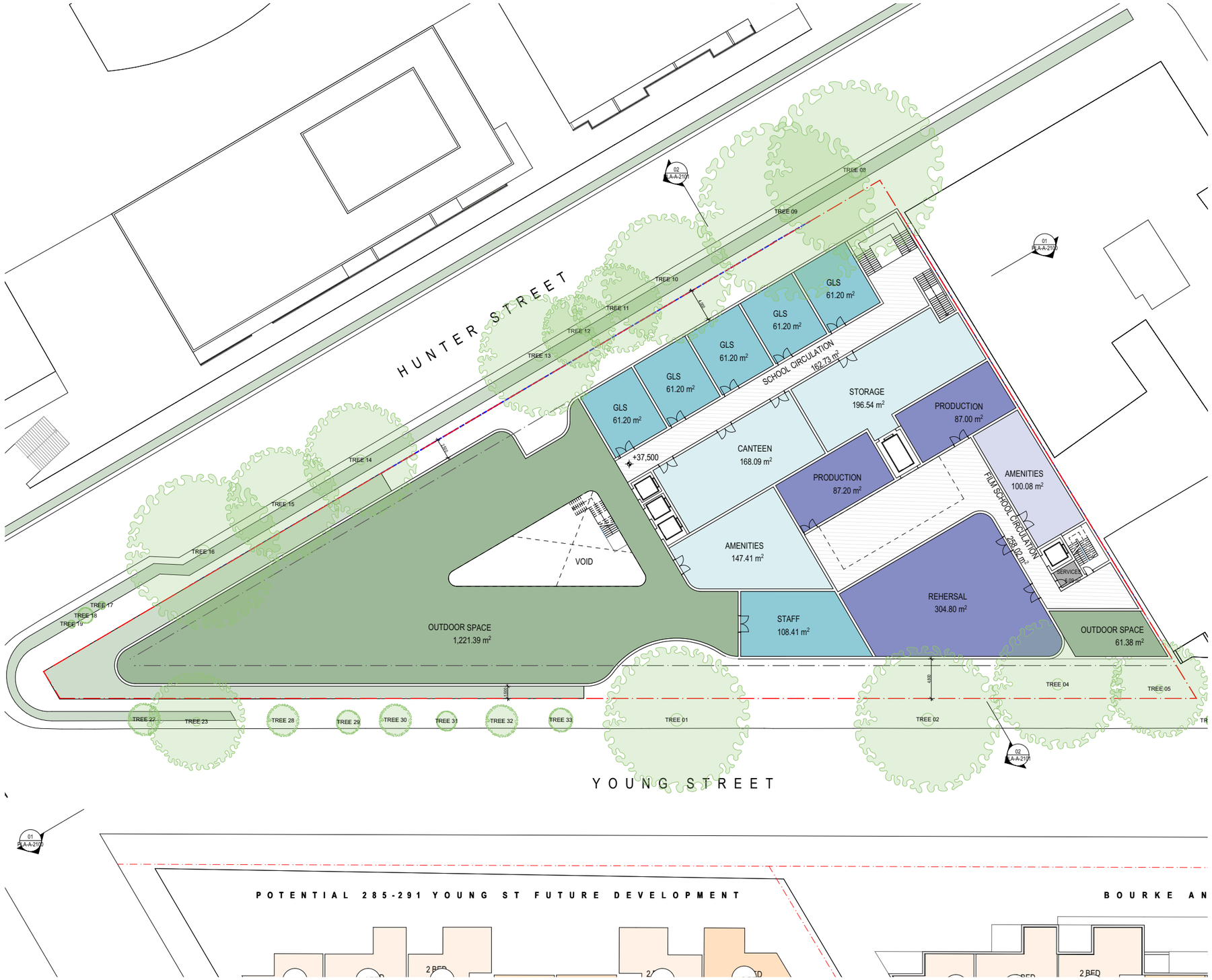




1045

APPENDIX

PLANS - LEVEL 04



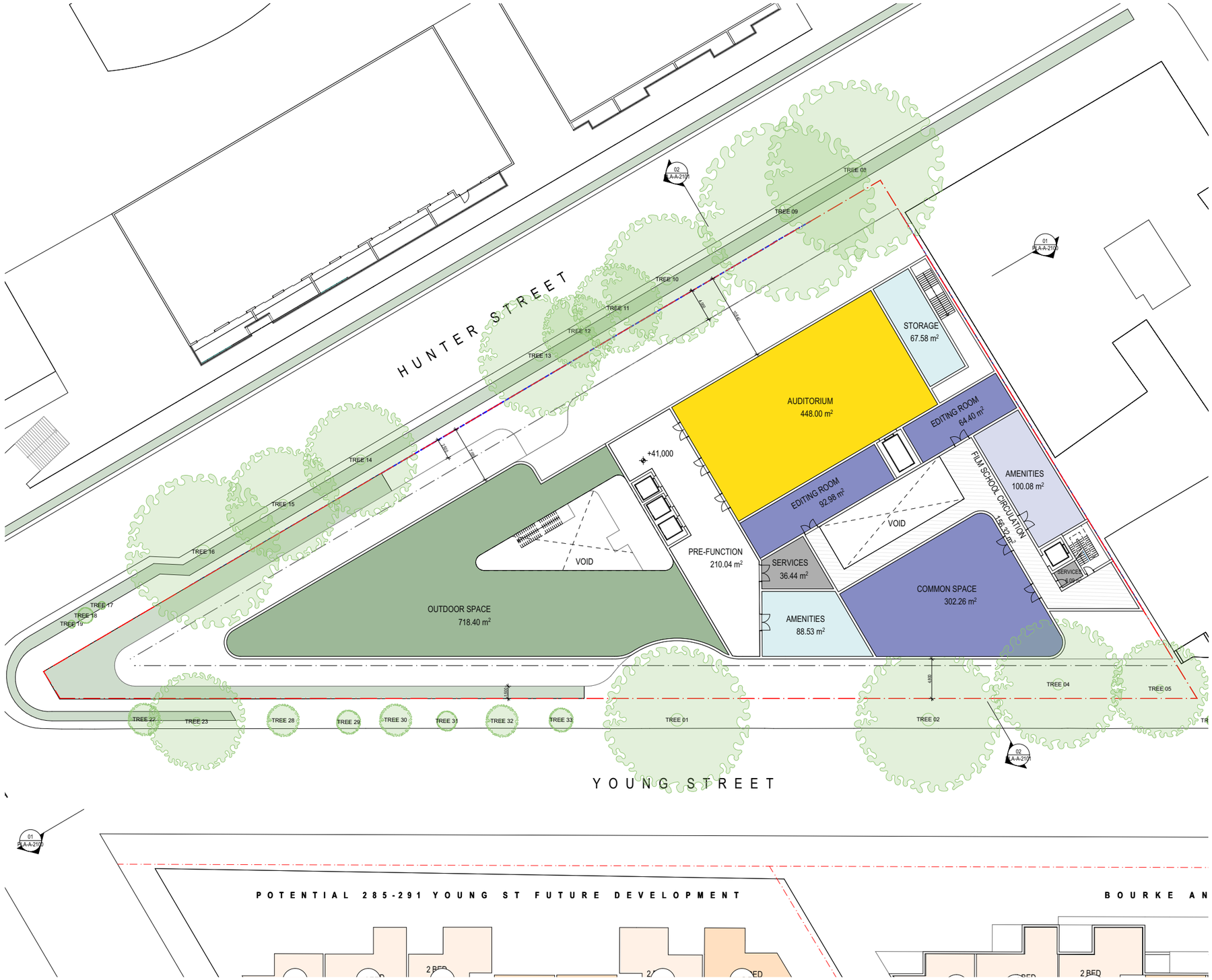




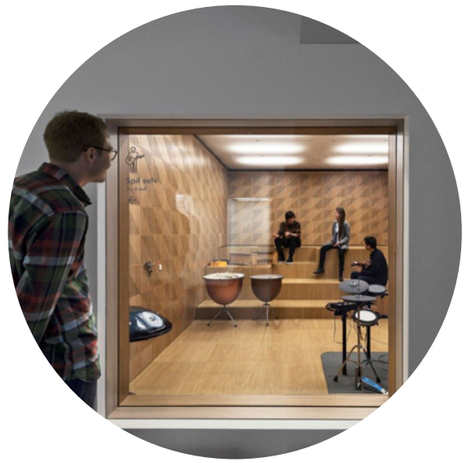


1046

PLANS - LEVEL 05



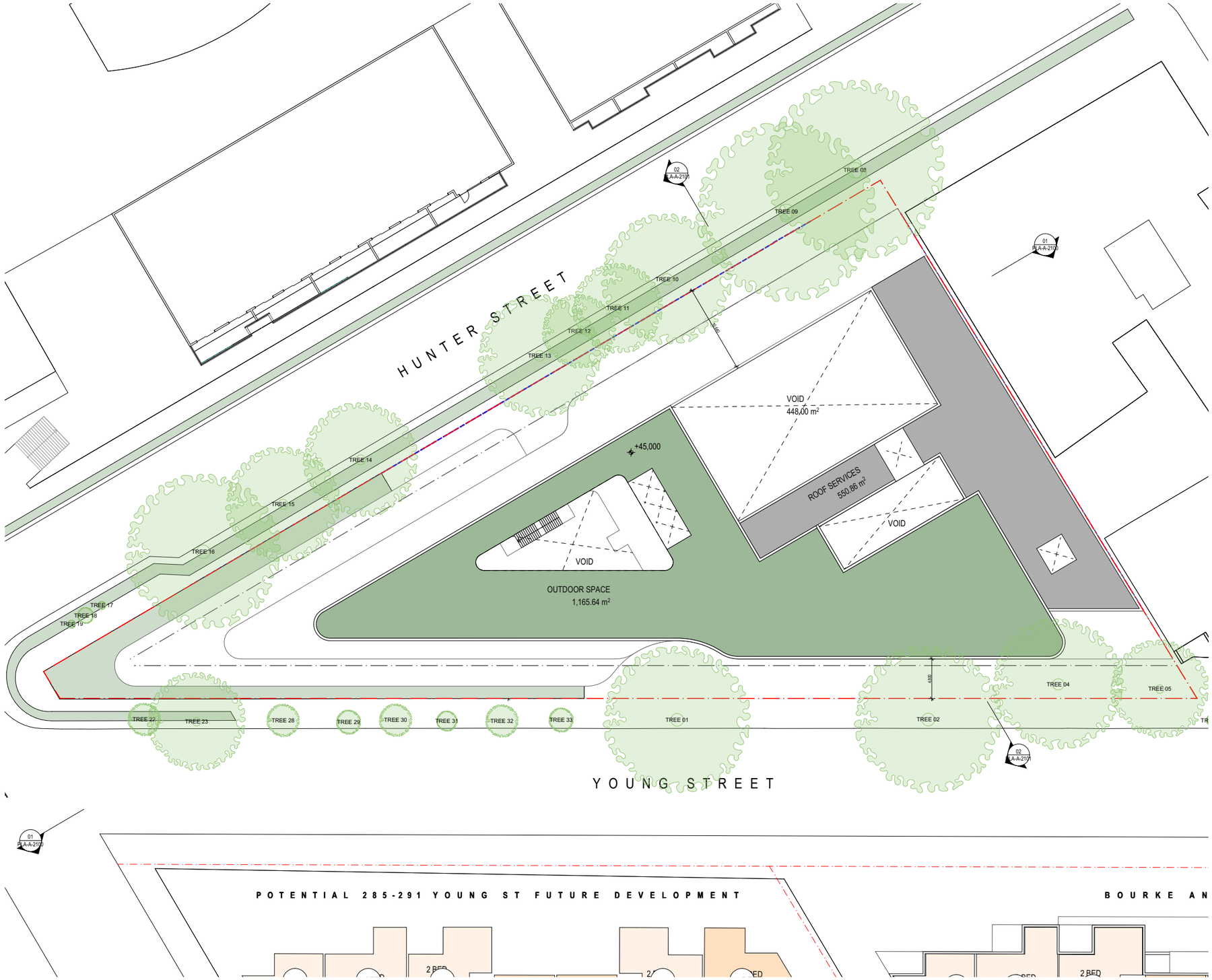






1047

PLANS - LEVEL 06









SCHEDULE

LEVEL	G.F.A (m2) NOT INCLD. CIRCULATION	G.F.A (m2) INCLD. CIRCULATION	CARS Provided
L6			
L5	1560	1560	
L4	1647	1967	
L3	1738	2650	
L2	2310	3135	
L1	1685	2482	
G	1531	2126	
B1			61
TOTAL	10472	13919	61

EDUCATION													
TOTAL G.F.A. (m2) INCLUDING CORRIDOR	GLS/CLASS ROOM	LABS/WORKSHOP	ADMIN/STAFF	AMENITIES	LOBBY	CANTEEN	SERVICES/LOADING	HALL	PRE-FUNCTION	AUDITORIUM	LIBRARY	CIRCULATION SPACE	SCHOOL OUTDOOR SPACE
	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)
													1166
825				89					210	448			718
1121	306		108	147		168						163	1221
2176	794	225	108	147							159	654	
2164	794	127	108	147							159	654	
1793	488	123	95	107				135			159	531	
1949	122		237	61			327	615			128	474	388
10028	2505		657	699	0	168	327	750		448	605	2475	3494
NO. OF GLS	41												3.16

Not Included in Total GFA

Seats 500

OUTDOOR / STUDENT @ 27/GLS (SQM)

FILM SCHOOL					
TOTAL G.F.A. (m2)	AMENITIES	CAFE	FILM SCHOOL CORRIDOR	FILM SCHOOL	FILM SCHOOL OUTDOOR SPACE
	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)	NLA (m2)
735	100		157	460	
846	100		258	479	61
474	100		172	165	
971			265	574	
689	84		120	422	
177		40			
3892	385	40	972	2100	61

GLS FOR K - 12			TOTAL STUDENT / GLS	NO.STUDENT X NO. GLS	TOTAL OUTDOOR REQ @ 6/STUDENT
YEAR	GLS				
K	2		27	54	6156
1	2		27	54	
2	2		27	54	
3	2		27	54	
4	2		27	54	
5	2		27	54	
6	2		27	54	
7	4		27	108	
8	4		27	108	
9	4		27	108	
10	4		27	108	
11	4		27	108	
12	4		27	108	
TOTAL	38			1026	

SITE AREA	4611 m^2
FSR ALLOWED (+0.5 BONUS)	2.0 :1
GFA ALLOWABLE	9222 m^2
GFA PROPOSED (NOT INCL. CIRCULATION)	10472 m^2
FSR PROPOSED (NOT INCL. CIRCULATION)	2.27 :1
GFA PROPOSED (INCL. CIRCULATION)	13919 m^2
FSR PROPOSED (INCL. CIRCULATION)	3.02 :1
HOB ALLOWED	15 m
HOB PROPOSED	25.0 m

CITY OF SYDNEY

City of Sydney
Gadigal Country
456 Kent Street
Sydney NSW 2000

+61 2 9265 9333
council@cityofsydney.nsw.gov.au
GPO Box 1591 Sydney NSW 2001
cityofsydney.nsw.gov.au

ATTACHEMENT 2

28 August 2023

Our Ref: X093892
File No: 2023/430247

Richard Huynh
Head of Development
Sustainable Development Group Limited
Level 4, 233 Castlereagh Street, Sydney, NSW, 2000

By email: richard.huynh@SDG.org.au
cc: ademarco@ethosurban.com

Dear Richard

Request to prepare a Planning Proposal – 242-258 Young Street, Waterloo

I refer to your meeting with the City on 27 June 2023 about the potential amendment of the planning controls for the site at 242-258 Young Street, Waterloo (the site). I note the material presented at the meeting was provided to the City by email on 3 July 2023, with further material provided 4 August 2023.

It is understood the intention is to lodge a planning proposal request to amend Sydney Local Environment Plan 2012 (LEP) to increase the maximum floor space ratio (FSR) from 2:2 to 3:1 and the building height limit from 15 metres to 27 metres. The proposed six-storey development would comprise a school, film school and multi-purpose hall.

In addition to this letter, advice to be received from the City's Design Advisory Panel (DAP), at their future meeting on 31 August 2023, will be provided to inform the preparation of the planning proposal request.

Strategic merit

Any planning proposal request must establish the strategic merit of the proposal.

The City of Sydney's strategic planning is informed by the Greater Sydney Region Plan, Eastern City District Plan and Sustainable Sydney 2030-2050: Continuing the Vision, which provide the foundations for the priorities outlined in our Local Strategic Planning Statement (City Plan 2036). All requests to change the planning controls must give effect to City Plan 2036.

A key consideration for this site, and its proposed use as a school, is determining whether there is sufficient local infrastructure to support the demands generated by the proposal. In particular, understanding how, when and how often students will access facilities in the City of Sydney and surrounding LGAs, in particular sporting fields.

The City of Sydney acknowledges
the Gadigal of the Eora Nation as the
Traditional Custodians of our local area.

Sporting fields in the City of Sydney are in high demand and it is strongly recommended that prior to progressing your planning proposal you meet with the City's sports field manager to discuss your needs and determine if they can be met in the local area. Contact details can be provided on request. Where need cannot be accommodated in the local area, the City will require evidence that your requirements can be met in other locations.

I note that in some circumstances upgrades to local parks within proximity of the site may be required to accommodate higher volumes of usage. In this case the City may consider a proposal to enter into a planning agreement for the upgrade of suitable local open spaces.

Site-specific merit

Any planning proposal request must establish the site-specific merit of the proposal. Key matters that are to be addressed are outlined in the lodgement checklist attached to this letter that also details supporting studies to be lodged with the request.

Lodgement and assessment

Planning proposal requests and all associated documents must be lodged online through the NSW Planning Portal at www.planningportal.nsw.gov.au. Supporting studies are to be prepared as identified in the attached checklist.

The current Major Planning Proposal Application fee of $161,900.00 is payable electronically at lodgement. The fee is described in Council's Revenue Policy available on the City's website under Policies > Revenue policy: Fees and charges.

The City will undertake an assessment of the request and prepare a planning proposal if the request demonstrates strategic and site-specific planning merit. The Council and Central Sydney Planning Committee will then determine whether to proceed with any planning proposal.

Under the current CIV thresholds (which are under review) the proposed future development if the Planning Proposal is supported will automatically be classed as State Significant Development (SSD). However, the City would be willing to accept a delegation from the Department and Minister to handle the assessment and approval of any future development application as occurred with the SSD Green Square School (under construction) on Zetland Avenue. This can be further discussed in due course.

The City will also prepare a Design Guide (instead of a development control plan) as it will remain SSD (under current CIV thresholds) whether it is delegated to the City or not.

The Design Guide is to contain the site-specific controls that will apply to the site as well as an appropriate design excellence strategy.

Nothing in this advice implies endorsement of the planning proposal request or precludes the City from requesting additional information or changes as part of any assessment of the request.

Should you wish to speak with a Council officer about the above, please contact Gibran Khouri, Specialist Planner, on 9265 9945 or at gkhouri@cityofsydney.nsw.gov.au

Yours sincerely,



Graham Jahn AM LFRAIA Hon FPIA
Director
City Planning I Development I Transport

Enclosed:
Lodgement checklist – planning proposal

APPENDIX B – Site Survey

M.G.A. NORTH
TRUE NORTH

LOT 1
DP 748007

No.10-20
FOUR STOREY
BRICK & RENDERED BUILDING
(FLAT ROOF)

No.242
TWO STOREY
RENDERED & CLAD BUILDING
(METAL ROOF)

LOT 1
DP 84655
AREA 1053 m²
BY SURVEY

LOTS A & B
DP 161650
AREA 3502 m²
BY SURVEY

No.244-258
ONE & TWO STOREY
BRICK OFFICES & WAREHOUSE
(METAL ROOF)

STREET
HUNTER
YOUNG
POWELL
YOUNG ST

SEE SHEET 2

SEE DIAGRAM 1

STATION 9002
NAIL IN CONC
E 334 253.154m
N 6 247 355.414m
RL 20.160m

STATION 9003
NAIL IN CONC
E 334 322.969m
N 6 247 358.990m
RL 21.662m

STATION 9001
NAIL IN CONC
E 334 236.044m
N 6 247 271.155m
RL 20.016m

SEE SHEET 3
FOR WALL TO
BOUNDARY
DIAGRAMS 2-10

0 4m 8m 12m 16m 20m
SCALE 1:200

LOTS A & B
DP 161650
AREA 3502 m²
BY SURVEY

No.244-258
ONE & TWO STOREY
BRICK OFFICES & WAREHOUSE
(METAL ROOF)

SEE DIAGRAM 3
SEE DIAGRAM 4
SEE DIAGRAM 5
SEE DIAGRAM 6
SEE DIAGRAM 7

STATION 9001
NAIL IN CONC
E 334 236.044m
N 6 247 271.155m
RL 20.016m

3.83
280° 43' 05"

DIAGRAM 1
0 2m 4m 6m 8m 10m
LENGTHS ARE IN METRES. SCALE 1:100

CO-ORDINATE SYSTEM:-

DRAWING UNITS IN CAD ARE IN MILLIMETRES

THE FOLLOWING SHIFT NEEDS TO BE APPLIED TO BRING THE CO-ORDINATES OF THE CAD DRAWING MODEL TO MGA (GDA2020) ZONE 56:
+334 000 000mm EASTING
+6 247 000 000mm NORTHING

LEVEL DATUM IS AUSTRALIAN HEIGHT DATUM

DIMENSIONS ARE SHOWN IN METRES

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(B) RIGHT OF CARRIAGEWAY 6.8 WIDE (DP1136961)
(C) EASEMENT FOR SUPPORT VARIABLE WIDTH (DP638902)
(D) EASEMENT FOR MAINTENANCE OF GUTTER VARIABLE WIDTH (DP638902)
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- BEARINGS RELATE TO MGA NORTH BY SCIMS (GDA2020).
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- THIS NOTE IS AN INTEGRAL PART OF THIS PLAN INCLUDING SUBSEQUENT SHEETS.

M.G.A. CO-ORDINATES OF BOUNDARY CORNERS		
No.	EASTING	NORTHING
1	334,257.428	6,247,371.214
2	334,320.908	6,247,359.239
3	334,240.429	6,247,270.248
4	334,236.667	6,247,270.961
5	334,332.875	6,247,372.471
6	334,260.518	6,247,386.137
7	334,283.586	6,247,381.809

ABBREVIATIONS:

B	- SILL (BOT. WINDOWS)	PP	- POWER POLE
BM	- BENCHMARK	PPT	- PARAPET
EL	- ELECTRICAL POLE	R	- ROOF LINE
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GM	- GAS METER	SL	- SURFACE LEVEL
GU	- GUTTER RL	SV	- STOP VALVE
H	- HYDRANT	SVP	- SEWER VENT PIPE
IL	- INVERT LEVEL	T	- LINTEL (TOP WINDOWS)
KO	- KERB OUTLET	TW	- TOP OF WALL
LP	- LIGHT POLE	VC	- VEHICLE CROSSING
MB	- MAIL BOX	WT	- WATER TAP
PC	- PRAM CROSSING	WM	- WATER METER

W-B DENOTES WALL TO BOUNDARY

01	ADDITIONAL LOT ADDED	08/07/2022
00	ORIGINAL ISSUE	04/07/2022

NOTE:-
UNDERGROUND SERVICES WHERE LOCATED FROM SURFACE FEATURES ONLY.

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REGISTERED SURVEYOR

NOTES:-
A BOUNDARY SURVEY HAS BEEN MADE.

REGISTERED SURVEYOR PTY LTD
ACN 658 811 011 ABN 46 658 811 011
www.registeredsurveyor.com.au
Timothy John Sigley M.I.S., BSpSc (Hons) Surv.
Registered Surveyor, Grad. Dip. Geog. Inf. Sys., Grad. Cert. Surv.
L14 ALFRED ST N, North Sydney NSW 2059
P.O. Box 1118, North Sydney NSW 2059
tim@registeredsurveyor.com.au | 0499 905 401

LARKI
DETAIL SURVEY OF
LOTS A & B IN DP 161650 & LOT 1 IN DP 84655
No.242-258 YOUNG ST
WATERLOO NSW 2017
L.G.A.: COUNCIL OF THE CITY OF SYDNEY

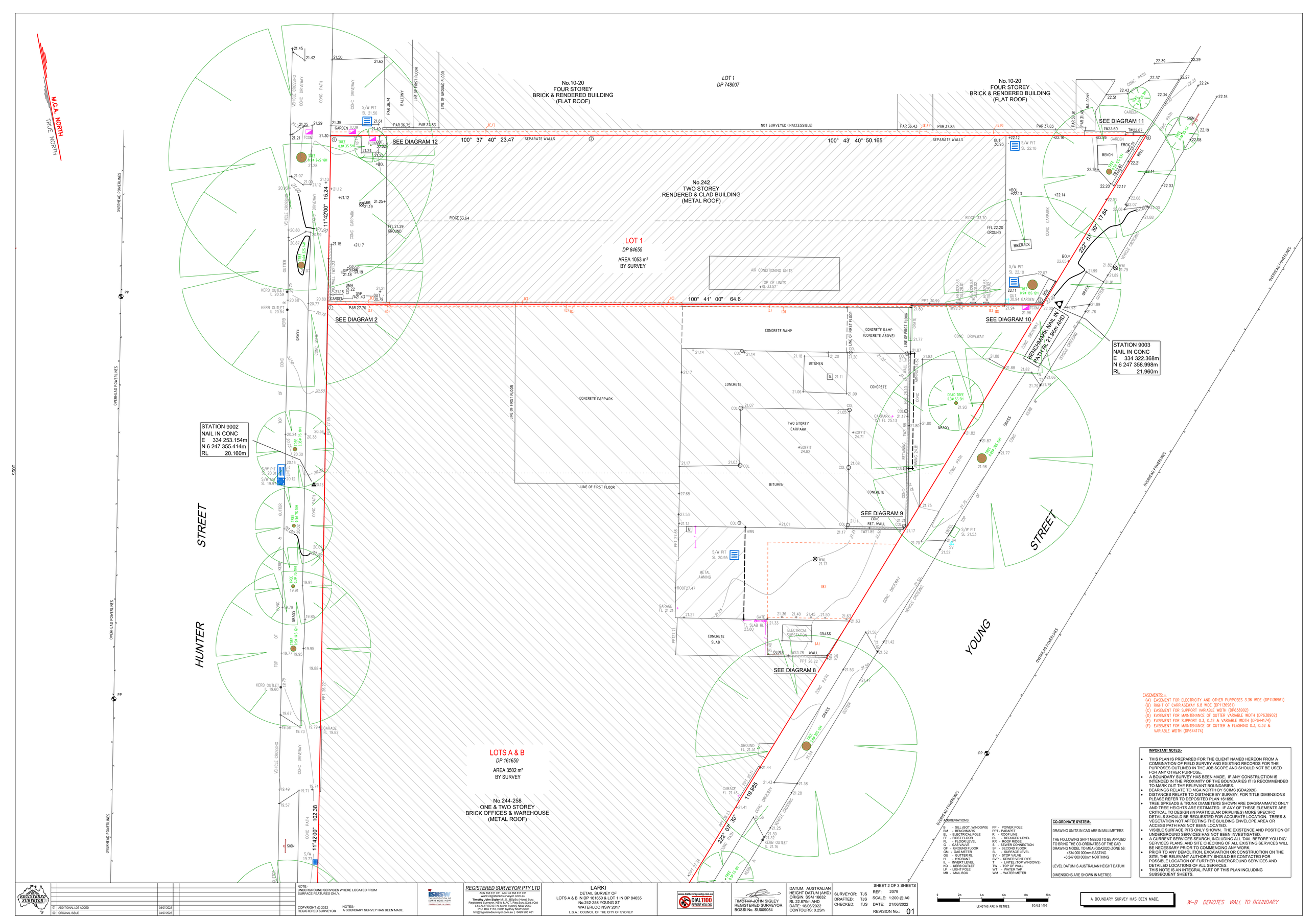
www.dialbeforeyoudig.com.au
DIAL1100 BEFORE YOU DIG

TIMOTHY JOHN SIGLEY
REGISTERED SURVEYOR
BOSSI No. SU009054

DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
ORIGIN: SSM 16632
RL 22.879m AHD
DATE: 18/06/2022
CONTOURS: 0.25m

SHEET 1 OF 3 SHEETS
SURVEYOR: TJS
DRAFTED: TJS
CHECKED: TJS
REF: 2079
SCALE: 1:200 @ A0
DATE: 21/06/2022
REVISION No.: 01

A BOUNDARY SURVEY HAS BEEN MADE.


M.G.A. NORTH
TRUE NORTH
No.10-20
FOUR STOREY
BRICK & RENDERED BUILDING
(FLAT ROOF)
LOT 1
DP 748007
NOT SURVEYED (INACCESSIBLE)
SEE DIAGRAM 12
SEE DIAGRAM 11
100° 37' 40" 23.47
SEPARATE WALLS
100° 43' 40" 50.165
No.242
TWO STOREY
RENDERED & CLAD BUILDING
(METAL ROOF)
LOT 1
DP 84655
AREA 1053 m²
BY SURVEY
RIDGE 33.64
RIDGE 33.70
FFL 21.29
GROUND
FFL 22.20
GROUND
AIR CONDITIONING UNITS
TOP OF UNITS
+RL 33.52
100° 41' 00" 64.6
SEE DIAGRAM 2
SEE DIAGRAM 10
SEE DIAGRAM 9
SEE DIAGRAM 8
11°42'00" 15.24
222° 07' 30" 17.84
11°42'00" 102.38
222° 07' 30" 119.985
STATION 9003
NAIL IN CONC
E 334 322.368m
N 6 247 358.998m
RL 21.960m
BENCHMARK NAIL IN PATH RL 21.96m AHD
STATION 9002
NAIL IN CONC
E 334 253.154m
N 6 247 355.414m
RL 20.160m
LOTS A & B
DP 161650
AREA 3502 m²
BY SURVEY
No.244-258
ONE & TWO STOREY
BRICK OFFICES & WAREHOUSE
(METAL ROOF)
CONCRETE CARPARK
CONCRETE RAMP
CONCRETE RAMP (CONCRETE ABOVE)
LINE OF FIRST FLOOR
BITUMEN
CONCRETE
TWO STOREY CARPARK
METAL AWNING
CONCRETE SLAB
ELECTRICAL SUBSTATION
GRASS
BIKERACK
BENCH
DEAD TREE
0.39 SS SH
TREE
0.99 165 12H
TREE
0.99 245 16H
TREE
0.99 205 16H
TREE
0.99 75 16H
TREE
0.99 75 16H
TREE
0.99 75 16H
TREE
0.99 125 12H
TREE
0.99 205 16H
TREE
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TREE
0.99 205 16H
TREE
0.99 75 16H
TREE
0.99 75 16H
TREE
0.99 75



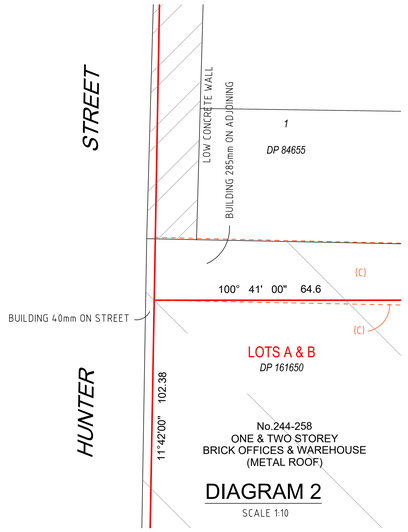


DIAGRAM 2
SCALE 1:10

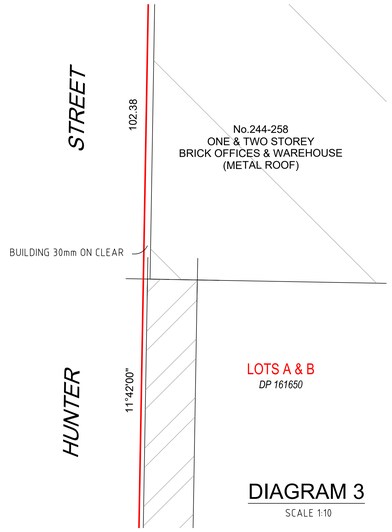


DIAGRAM 3
SCALE 1:10



DIAGRAM 4
SCALE 1:10

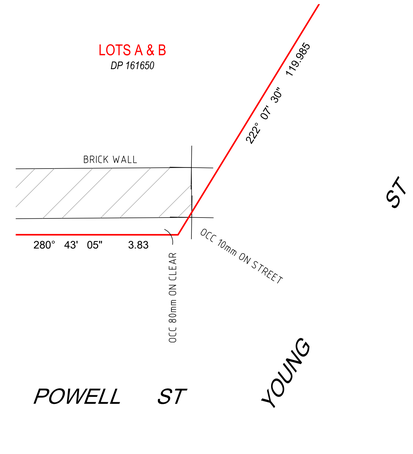


DIAGRAM 5
SCALE 1:10

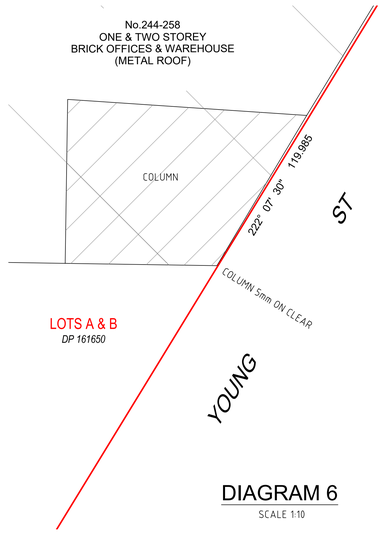


DIAGRAM 6
SCALE 1:10

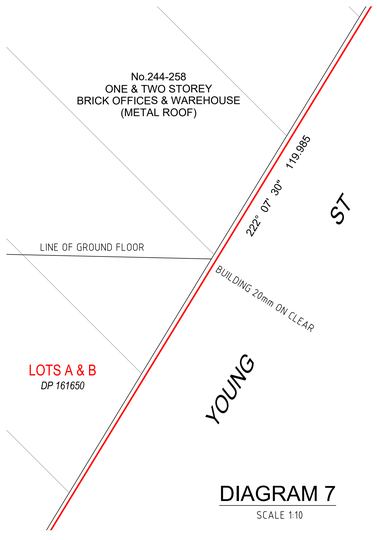


DIAGRAM 7
SCALE 1:10

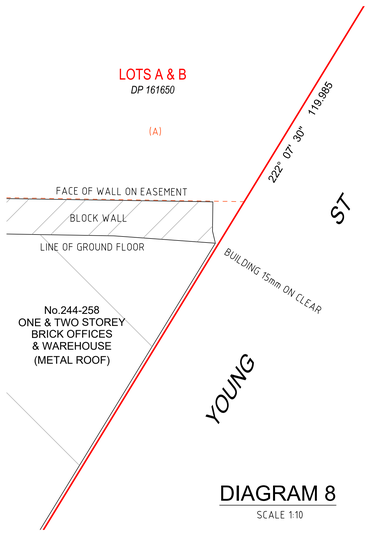


DIAGRAM 8
SCALE 1:10

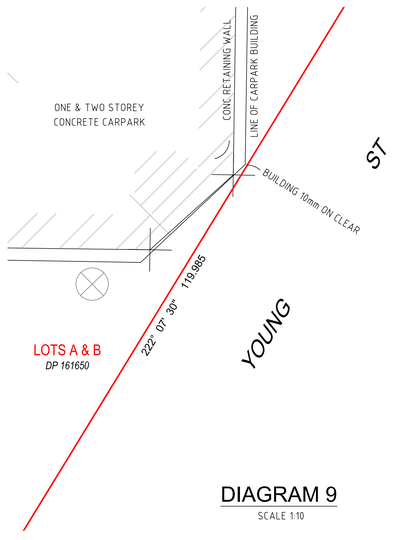


DIAGRAM 9
SCALE 1:10

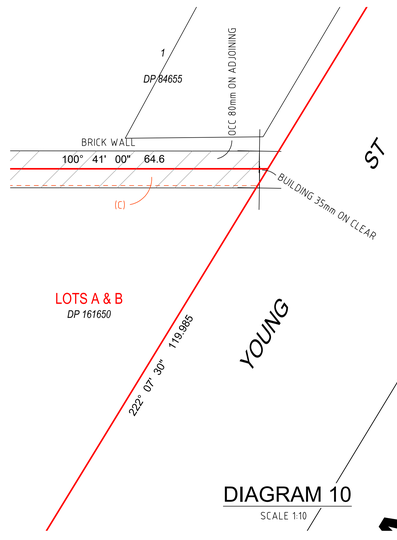


DIAGRAM 10
SCALE 1:10

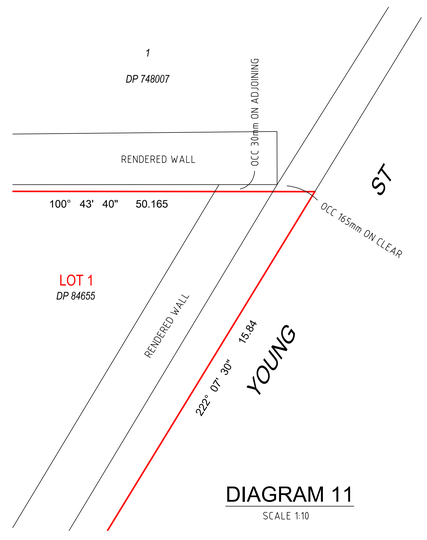


DIAGRAM 11
SCALE 1:10

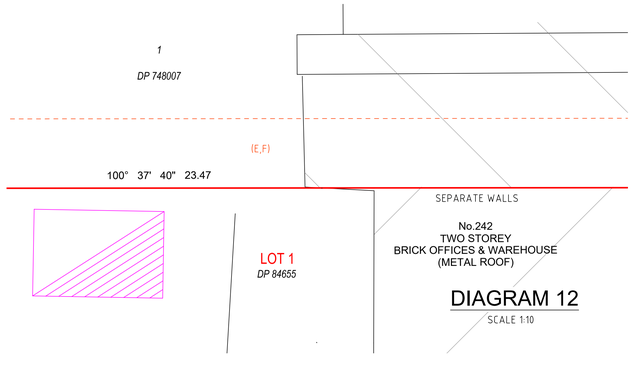


DIAGRAM 12
SCALE 1:10

CO-ORDINATE SYSTEM:-

DRAWING UNITS IN CAD ARE IN MILLIMETRES

THE FOLLOWING SHIFT NEEDS TO BE APPLIED TO BRING THE CO-ORDINATES OF THE CAD DRAWING MODEL TO MGA (GDA2020) ZONE 56:
+334 000 000mm EASTING
+6 247 000 000mm NORTHING

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WALL TO BOUNDARY DIAGRAMS 2-10

0 0.2m 0.4m 0.6m 0.8m 1m
LENGTHS ARE IN METRES. SCALE 1:10

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01	ADDITIONAL LOT ADDED	08/07/2022	
00	ORIGINAL ISSUE	04/07/2022	

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REGISTERED SURVEYOR PTY LTD
ACN 608 811 011 ABN 49 608 811 011
Suite 2, 37-39 Brisbane Street, Berry, NSW 2535
Timothy John Sigley M.I.S., BSpSc (Hons) Surv.
Registered Surveyor, NSW & ACT. Reg.Surv.(Cad.) Qld
L14 ALFRED ST N, North Sydney NSW 2059
P.O. Box 1118, North Sydney NSW 2059
tim@registeredsurveyor.com.au | 0499 905 401

LARKI
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WATERLOO NSW 2017
L.G.A.: COUNCIL OF THE CITY OF SYDNEY

www.dialbeforeyoudig.com.au
DIAL1100 BEFORE YOU DIG

TIMOTHY JOHN SIGLEY
REGISTERED SURVEYOR
BOSSI No. SU009054

DATUM: AUSTRALIAN
HEIGHT DATUM (AHD)
ORIGIN: SSM 16632
RL 22.879m AHD
DATE: 18/06/2022
CONTOURS: 0.25m

SURVEYOR: TJS
DRAFTED: TJS
CHECKED: TJS

SHEET 3 OF 3 SHEETS
REF: 2079
SCALE: 1:200 @ A0
DATE: 21/06/2022
REVISION No.: 01

A BOUNDARY SURVEY HAS BEEN MADE.

W–B DENOTES WALL TO BOUNDARY

Attachment B

Draft Design Guide – 242-258 Young Street, Waterloo

1 Introduction

This document is intended to guide the design of 242-258 Young Street, Waterloo and provides a resource to assist the evaluation of design quality and excellence.

The 242-258 Young Street, Waterloo Design Guide (Design Guide) outlines the desired design and place outcomes for the site and includes objectives and design guidance for built form, publicly accessible spaces, amenity, movement, connectivity and interfaces between the site and surrounding area. It will help to achieve the design quality outcomes for 242-258 Young Street, Waterloo.

1.1 Land to which this Design Guide applies

This Design Guide applies to the land identified in Figure 1: Land Application Map, being 242-258 Young Street, Waterloo, Lot 1 in DP84655 and Lots A and B in DP 161650.

The site is located at the junction of Young Street, Hunter Street and Powell Street, as outlined in red.

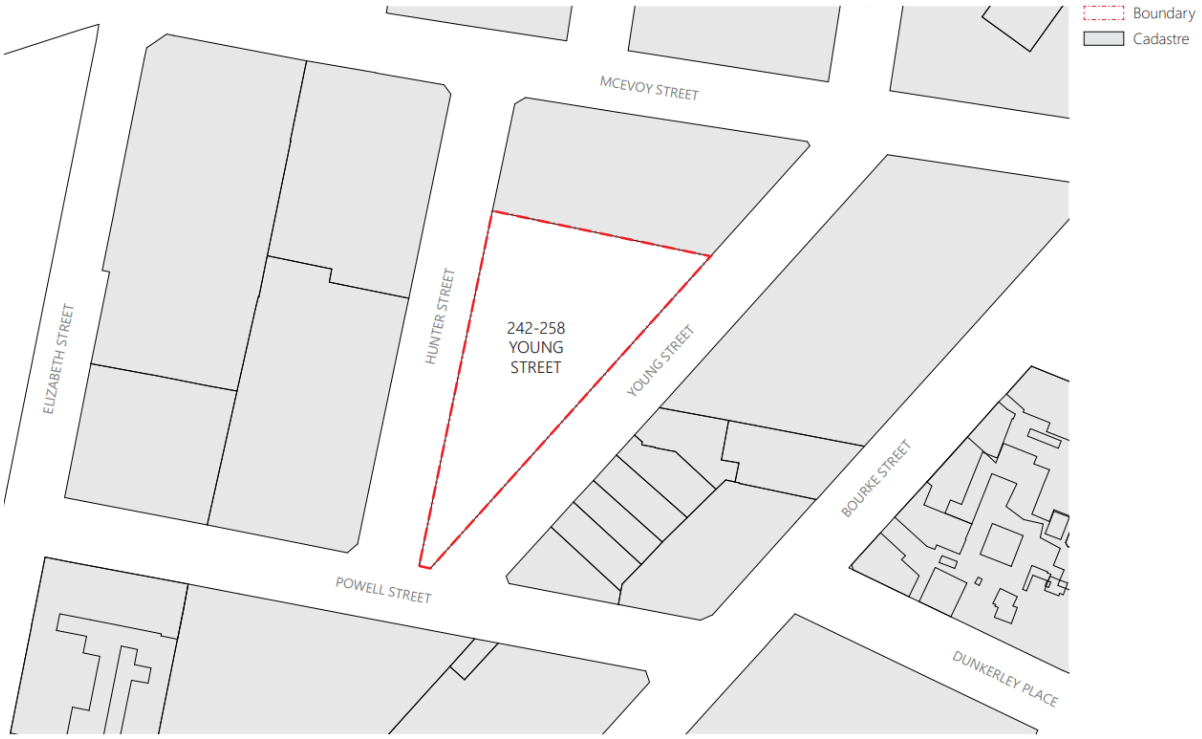


Figure 1: Land Application Map

1.2 Commencement

The Design Guide commences on the day on which the 242-258 Young Street Waterloo amendments to the Sydney Local Environmental Plan 2012 come into effect.

1.3 Relationship to other documents (and instruments)

This Design Guide is to be read in conjunction with the provisions and requirements:

- the Sydney Local Environmental Plan 2012 (Sydney LEP 2012)
- other relevant Environmental Planning Instruments.

The Design Guide is subordinate to the Sydney LEP 2012 and other environmental planning instruments that apply to the site. Where a provision of this Design Guide conflicts with a provision in the Sydney LEP 2012 or a State environmental planning policy, the Sydney LEP 2012 or the relevant State environmental planning policy prevails to the extent of the inconsistency.

1.4 Purpose

The purpose of this Design Guide is to support the implementation of Sydney Local Environmental Plan (LEP) 2012 as it applies to the site by providing more detailed provisions to guide development.

It is given effect by reference in Division 5, Part 6 Site specific provisions of the LEP 2012. This Design Guide replaces the provisions of the Sydney Development Control Plan 2012 in so far as they apply to the site. The sections of this Design Guide inform the preparation, assessment and determination of Development Applications as follows:

Section 1 sets out the land to which the Design Guide applies, administrative matters and the relationship to other elements of the planning framework that apply to the site.

Section 2 contains the Principles for the site, which have informed the planning framework (including this Design Guide and relevant provisions of the Sydney LEP 2012). The vision, desired future character and principles are to be considered when assessing whether a development application will deliver the intended outcomes for the site.

Section 3 contains general provisions and design guidance for development applications in the site. Each subsection in Section 3 includes:

- Objectives that describe the intent of provisions and the anticipated outcomes; and
- Provisions that specify numeric or performance-based considerations to guide detailed design of development within the site.

1.5 How to use this Design Guide

This Design Guide provides a hierarchy of objectives and provisions to guide future development on the site.

The Design Guide sets clear provisions for how the objectives can be practically achieved. If it is not possible to satisfy the provisions, applications must demonstrate what other responses are used to achieve the objectives.

A reference in this Design Guide to any Australian Standard, legislation or policy including to Sydney LEP 2012 or Sydney DCP 2012 is also a reference to any amendment or replacement as made.

This Design Guide is only to be used for development with the primary purpose of an educational establishment.

2 Principles

1. Protect the established street tree canopies along Young and Hunter Streets.
2. Achieve areas of high-quality, deep-soil landscaping within the site.
3. Maximise opportunities for cycling, public transport and walking and minimise on-site parking.
4. Ensure heights of buildings minimise overshadowing to the neighbouring park (south of Powell Street) and properties.
5. Ensure that flood planning effectively manages and mitigates flood risk without exacerbating potential damage and hazards to human life, existing development and the public domain.
6. Ensure building design mitigates noise impacts on surrounding development.
7. Dedicate land to widen surrounding footpaths to create a safe public pedestrian environment for students and members of the public.
8. Ensure rooftop open spaces provide high-quality well-designed landscaping.
9. Ensure development achieves design excellence.
10. Ensure development minimises carbon emissions and manages energy, water and waste effectively.

3 Design guide

3.1 Height, massing and amenity

Objectives

a) To ensure the development responds to the site's context.
b) To minimise overshadowing of surrounding residential development and open spaces.
c) Ensure buildings are appropriately sited in relation to and protect the canopy and roots of existing trees.

Provisions

1. Building heights in storeys and building setbacks are to be consistent with Figure 2: Building Heights and Setbacks.

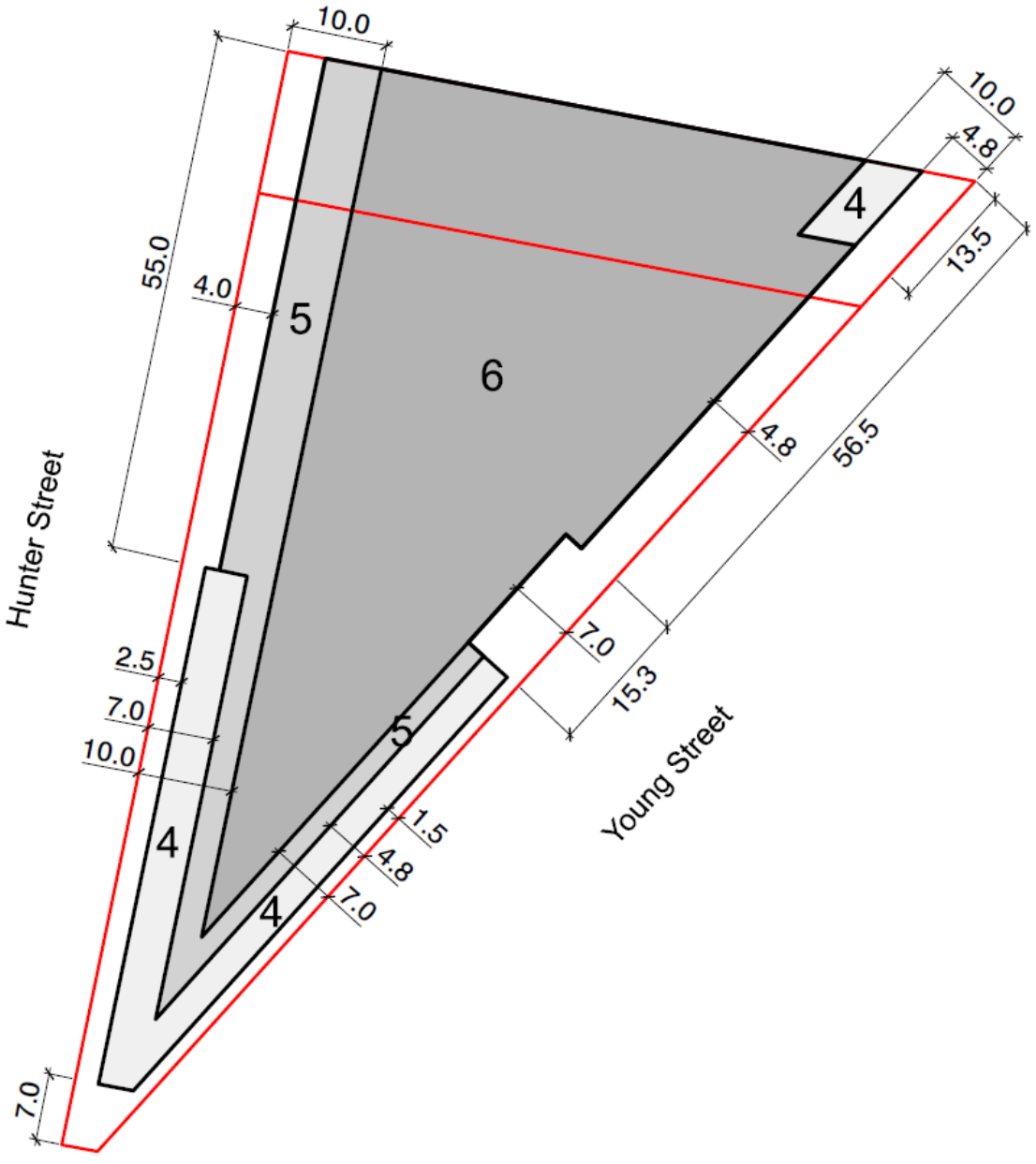


Figure 2: Building heights and setbacks

Large numerals are maximum building heights in storeys above ground.

Small numerals are minimum dimensions in metres.

2. For neighbouring residential apartments, minimise overshadowing as set out in the Apartment Design Guide. Applications must provide solar access (insolation) diagrams and views from the sun showing the period of sunlight with one hour gradients/intervals between 9am to 3pm on 21 June consistent with any City of Sydney guide.
3. Any void that forms or atrium that forms part of a development on the site is to be sealed from above with a roof.

3.2 Public domain

Objectives

a) Ensure development provides additional public footpath space to comfortably manage student and members of the public.
b) Ensure development provides areas of deep soil landscaping.
c) Ensure that development improves the safety, amenity and quality of streets.
d) Ensure development provides high quality frontages facing public places in terms of scale, massing, finishes and architectural detailing.
e) Maximise the legibility, visibility and accessibility of entries from surrounding public places.
f) Minimise and ameliorate the visual effect of blank walls both at ground level and exposed blank side walls above ground level.
g) Ensure the placement and design of building services, access ramps, fences and walls is integrated into the building design and that their visibility from public places are minimised.

Provisions

1. Deep soil landscaping, footpath widening dedications and basement carpark location is to be in accordance with 'Figure 3: Footpath widening and landscape setbacks' specifically incorporating:
    a) Footpath widening setbacks along Young Street, Hunter Street and Powell Street as shown in orange. Footpath widenings are to be dedicated to the City of Sydney and are to be free of structures above and below ground.
    b) A 4.8m deep soil landscape setback along Young Street as shown in green.
    c) A 2m deep soil landscape setback along Hunter Street as shown in green.
    d) Basement carparking is to be located as shown in grey to maximise the extent of deep soil tree retention zones.
    e) The landscape zone on Young Street may include a driveway crossover (see Figure 3) and a pedestrian entry path of a maximum width of 6m.

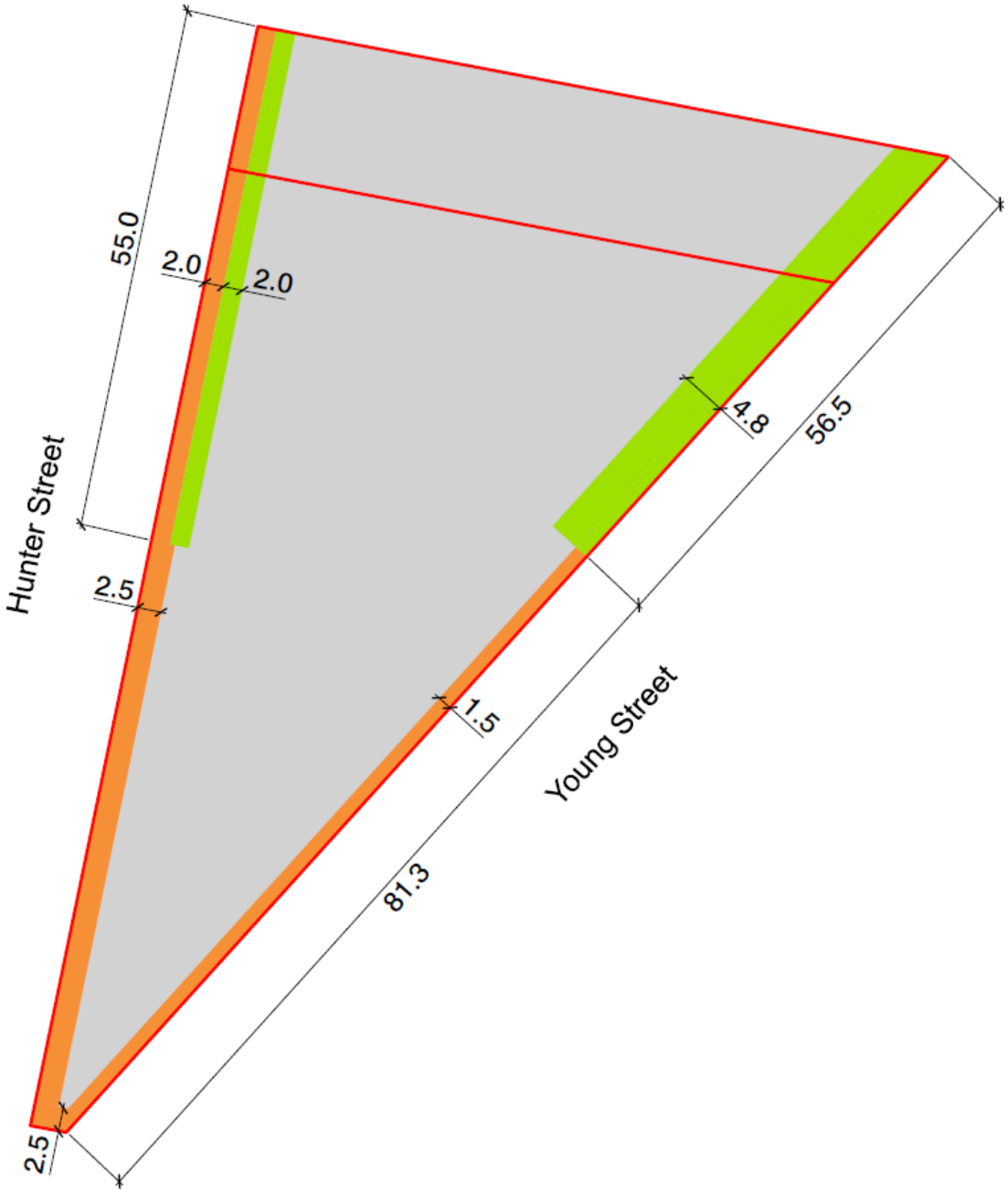


Figure 3: Footpath widening and landscape setbacks

2. Footpath widenings are to be finished in accordance with detailed public domain plans, RLs, cross and longitudinal sections and construction specifications to be supplied by the City of Sydney at detailed development application stage.
3. Footpath widenings are to be clear of all obstructions.
4. The deep soil landscape setbacks identified in 'Figure 3: Footpath widening and landscape setbacks' are to retain existing trees through measures defined by a suitably qualified arborist, and set out in an arboriculture impact assessment.
5. Development that exposes the blank side of an adjoining building or has a party or side wall visible from public space is to be designed with a visually interesting treatment and/or high quality design features applied to that wall.
6. Walls fronting a public place are to be screened from view with plantings with minimum setbacks and minimum soil depths of 500mm where:

a) the fence or wall has an average height greater than 1.2 metres, or
b) the fence or wall has an absolute height greater than 1.5 metres.

7. Level changes near the interface with a street or other public place are to be carefully designed and consolidated. Plans and renders are to show all necessary stairs, balustrades, handrails and tactile surface indicators required by the proposed level changes at a 1:50 scale.
8. Public or common stairs are to have shallow gradients with 135mm risers and 350mm goings in high use areas and 150mm risers and 300 goings elsewhere.
9. No built structures (other than landscape elements) are permitted to encroach on the footpath widening or deep soil landscape setbacks for the full height of the building.
10. Services and facilities such as substations, fire escapes, waste collection areas, meters and on-site detention tanks are to be contained within the building envelope and not located in footpath widening or deep soil landscape setbacks. The location of all required services are to be shown on plans and elevations at a 1:50 scale and in perspectives and illustrations.
11. Services that require direct street access such as fire hydrant boosters are to be incorporated into the street facing facade, whether that is a fence or the building envelope, and not located in deep soil landscape setbacks. They are to be fully shielded from view from public places within an enclosure that relates to the architectural design of the building. The location of fire hydrant boosters are to be shown on plans and elevations at a 1:50 scale and in perspectives and illustrations.
12. Building elements visible from public places such as access panels, service enclosures, soffits, wall returns, bollards and elements visible when garage doors are open are to be high quality and well-integrated into the architectural design and materiality of the ground floor street facing facade. These elements are to be shown on plans, sections and elevations at a 1:50 scale.
13. For publicly accessible open space south of Powell Street, development is to enable 50% of the total area to receive sunlight for a minimum of 4 hours between 9am to 3pm on 21 June (Winter solstice).
14. Solar access insolation diagrams showing the period of sunlight with one hour gradients between 9am to 3pm on 21 June and the % receiving four hours of sunlight are to be submitted with the development application. Diagrams are to indicate the existing condition and proposed. If required, the consent authority may request additional detail to assess the overshadowing impacts.

3.3 Trees, deep soil and landscaping

Objectives

a) Retain and protect existing trees to provide amenity and shade.
b) Ensure that the amenity of occupants is enhanced by high quality landscaping, and open space within the site.
c) Increase canopy cover. Ensure that tree canopy cover is considered in all development and provided appropriately.
d) Ensure the provision of sufficient soil volumes and quality to provide for long term tree health.
e) Increase biodiversity through the provision of shrubs, grasses, native herbs and trees.
f) Ensure the provision of sufficient soil volumes and quality to provide for long term tree health.

Provisions

1. Retain and protect trees shown in blue both on the site, and the surrounding street trees, in accordance with Figure 4 Tree retention and protection.

2. Trees shown in red, identified in Figure 4 Tree Retention and Protection may be removed for any future development. These trees are 3, 7, 20, 21, 24, 25, 26 and 27.

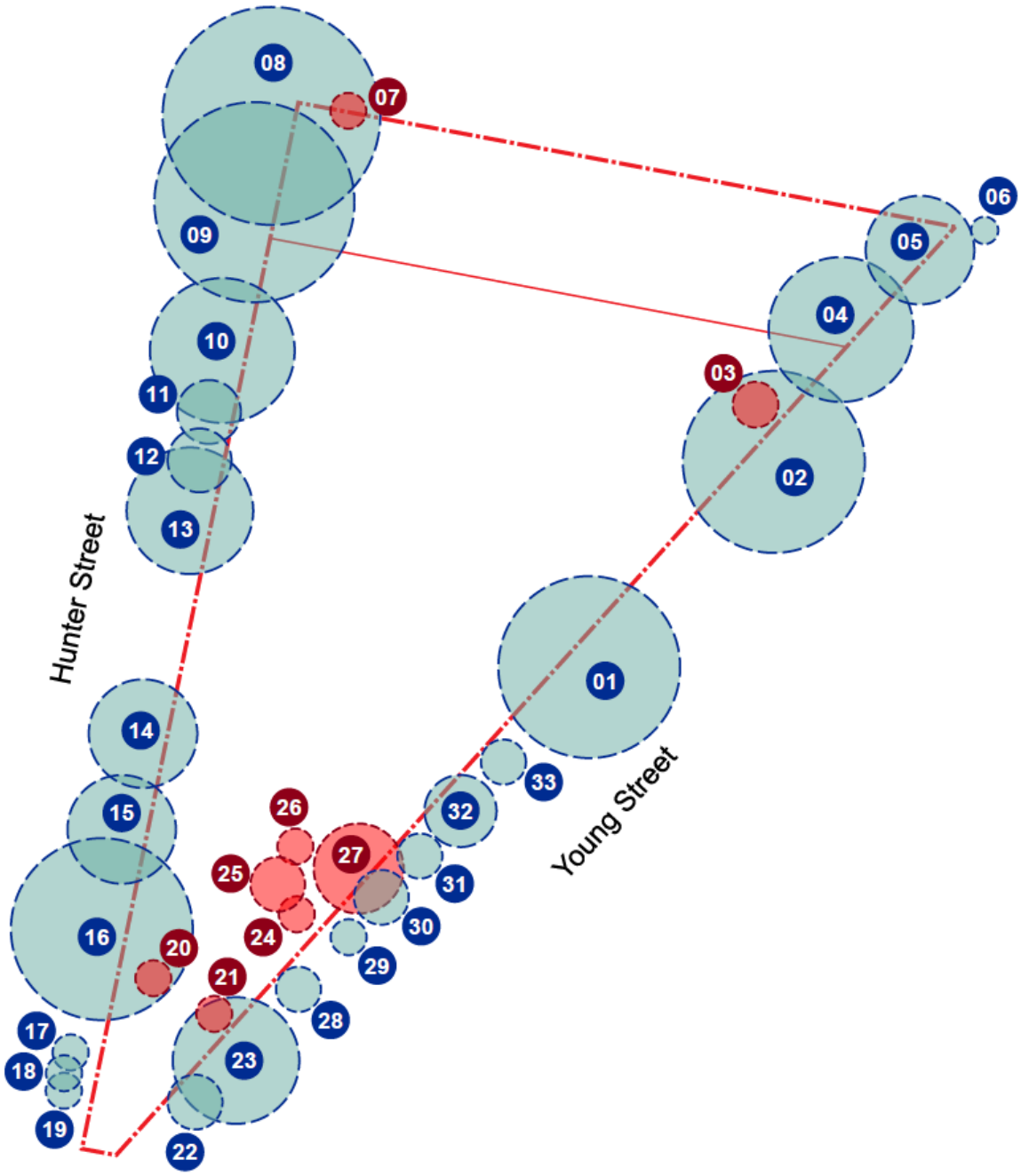


Figure 4: Tree Retention and Protection

3. The root zones of trees to be retained are to be protected in accordance with the Australian Standard 4970 Protection of Trees on Development Sites throughout construction.
4. Any future driveway or pedestrian crossing shall not result in the removal of any street tree or occupy a suitable location for future street tree plantings.
5. Trees to be retained must not have more than 15% of their canopy removed and must be pruned by a qualified Arborist (AQF Level 3 Arboriculture) in accordance with AS4373-2007 Australian Standard.
6. Appropriate tree sensitive construction measures will be put in place to protect all retained trees from damage during building work.

7. Any development application is to provide details of:
    a) proposed pruning of tree and likely impacts on the ongoing health and viability of the trees;
    b) proposed extent and effect
    c) how the massing and location of new development will allow for sufficient aeration and groundwater intake for the long-term survival or trees; and
    d) the construction methodology and management measures to be put in place to protect existing trees from damage during demolition, excavation and construction, including for piling scaffolding, loading and operation of cranes.
8. A landscape plan is to be prepared by a suitably qualified landscape architect and submitted with the development application. The landscape plan is to show the:
    a) planting schedule with numbers and species of plants including botanical and common names;
    b) number and name including botanical and common names of mature trees on site;
    c) type, levels and detail of paving, fencing, retaining walls and other details of external areas of the site;
    d) response to other relevant requirements under this Design Guide; and
    e) proposed canopy coverage with adequate soil volumes for planting on deep soil and on slab.
9. Landscape plans are to incorporate a diverse range of species to increase resilience and diversity and assist the City in achieving overall LGA targets of no more than:
    a) 40% in any one family is to be used;
    b) 30% in any one genus;
    c) 10% in any one species.
10. Landscaping is to give preference to species with low water needs, including native plant species, and trees and shrubs are to be selected and located to manage sun and wind impacts, while also being easily accessed and maintained.
11. While individual species may number more than 10%, consideration should be given to species suitability for the site and ability to thrive long term.
12. A qualified Arborist (AQF Level 5), with experience managing similar projects of this type and scale, is to be engaged to provide tree management advice throughout the design and construction phase of development.
13. Tree management must be in accordance with requirements outlined in the Australian Standard 4970 – Protection of Trees on Development Sites and the City's Tree guidelines for pruning, reporting and using an arborist.
14. Any development application is to:
    a) be guided by an Arboricultural impact assessment;
    b) comply with site-specific tree protection measures;
    c) include commitment to monitoring the site works to ensure the health and structural stability of existing trees; and
    d) provide tree protection certification.
15. Green roofs must comply with the recommended soil depths listed in Table 5: Soil Depths of Green Roofs below.

Plant type	Minimum soil requirements
Turf	200mm
Grass and ground covers	300 – 450mm
Shrubs	500 – 600mm
Trees	800 – 1200mm (tree size dependent)

Table 5: Soil Depths of Green Roofs

3.4 Accessible Design

Objectives

a) Ensure that the public areas of new development provide equitable and safe and legible access for everyone.
b) Provide equitable access and facilities for all people to all new development and upgraded or intensified uses in existing buildings.
c) Encourage consideration of access issues early in the development design process.
d) Raise awareness and understanding of access issues for people with disability through investigation of best practice.

Provisions

1. All development must comply with the following:
   a) all Australian Standards relevant to accessibility;
   b) the Building Code of Australia access requirements;
   c) Disability Discrimination Act 1992; and
   d) the City of Sydney's Inclusive and Accessible Public Domain Guidelines.
2. Complex developments where compliance is proposed through alternative solutions must be accompanied by an Access report prepared by a suitably qualified access professional.
3. Access for pedestrians and vehicles are to be separated.
4. Access arrangements are to be:
   a) integral with the overall building and landscape design and not appear as 'add-on' elements or as of secondary importance;
   b) as direct as possible; and
   c) designed so that a person does not need to summon help.

3.5 Public art

Objectives

a) Increase the number and improve the quality of public artworks in private developments.
b) Promote sustainability through public art in new development.
c) Ensure that public art is an integrated and cohesive part of new development.
d) Recognise former environmental, historic and contemporary layers through interpretive public art.

Provisions

1. Public Art is to be provided in accordance with the City of Sydney Guidelines for Public Art in Private Development and the Public Art Policy.
2. Development is to incorporate high quality public art in publicly accessible locations.
3. The scale and budget of the public art is to be commensurate with the scale of development.
4. Where appropriate, public art should reference the history of the site, or area, recognise and respond to former and existing uses including by traditional custodians of the land and cultural practices.
5. Ensure the respectful engagement of First Nations artists and cultural knowledge by following Indigenous Cultural and Intellectual Property protocols.

3.6 Contamination

Objective

a) Minimise the risk to human and environmental health on land contaminated by past uses.

Provisions

1. Each development application is to include information sufficient to allow the consent authority to meet its obligation to determine whether development should be restricted due to the presence of contamination.
2. Development is to be consistent with the City of Sydney Contaminated Land Policy 2022.
3. Environmental Management Plans are to be avoided where possible.

Note: These obligations are outlined in State Environmental Planning Policy (Resilience and Hazards) 2021 Chapter 4 'Remediation of land'

3.7 Noise and vibration

Objective

a) To provide appropriate interface and mitigation of noise, to ensure high amenity is preserved for neighbouring properties.

Provisions

1. Development is to be designed with appropriate noise mitigation measures to ensure good amenity for neighbouring properties.
2. An Acoustic Report, prepared by a suitably qualified acoustical consultant, is to accompany any future Development Application. The report is to investigate and identify:
    a) sensitive noise receivers potentially impacted by the development;
    b) the existing acoustic environment at the receiver locations;
    c) suitable assessment criteria;
    d) proposed acoustic control measures;
    e) predicted noise at the identified sensitive receivers; and
    f) whether the development will cause a nuisance or result in an 'offensive noise' as defined in the Protection of the Environment Operations Act 1997.
3.

3.8 External Lighting

Objectives

a) Encourage appropriate external lighting of buildings that adds to the architectural character of the building.
b) Provide an enhanced level of lighting to the streetscape.
c) Coordinate appropriate lighting around the building vicinity with a similar light colour and technique, visually linking the lighting design between the spaces.
d) Ensure future development is inviting, has an increased feeling of safety and security when within the space.

e) Ensure lighting design is developed in a manner sensitive to ESD and light spill impacts.

Provisions

1. Lighting is to be consistent with the Sydney Lights Public Domain Design Code (City of Sydney),
2. Public lighting design shall enhance wayfinding, safety and orientation, integrating lighting within architecture wherever possible.
3. Public artwork shall be lit appropriately.
4. The external lighting system must be energy efficient and subject to appropriate times of operation.
5. External lighting must not reduce the amenity of residents in the locality.
6. Eternal lighting must not negatively impact areas of habitat for local fauna.
7. External lighting must minimise the light spill into the night sky.
8. LED down lighting is preferred over up lighting to minimise light pollution.

3.9 Ecologically sustainable development and green infrastructure

Objectives

a) Minimise energy and water use, waste generation and urban heat effects.
b) Maximise on-site renewable energy generation, water re-use and waste recycling.
c) Ensure the efficient use of resource in building design, construction and operation.
d) Ensure that development is resilient again the effects of climate change.

Provisions

1. Development is to be designed and constructed to reduce the need for active heating and cooling by incorporating passive design measures including design, location and thermal properties of glazing, natural ventilation, appropriate use of thermal mass and external shading, including vegetation.
2. The consent authority must be satisfied that educational premises achieves a minimum 4 Star NABERS Energy Commitment Agreement for schools and achieve a minimum 5 Star Green Star – Education v1 rating at certification.
3. Design, performance and features are to be referenced in City of Sydney Design for Environmental Performance Template submitted with the detailed development application.
4. Parking spaces are to be equipped with electric vehicle charging infrastructure as follows:
    a) power supply and distribution boards for electric vehicle charging in accordance with Section J9D4 ‘Facilities for electric vehicle charging equipment’ in NCC 2022 Volume One – Building Code of Australia.
    b) 10% of worker car spaces are to be fitting with a Level 2 charger or higher.

3.10 Waste management

Objectives

a) Reduce the amount of construction, demolition and operational waste going to landfill and maximise resource recovery.
b) Ensure waste from within developments can be collected and disposed in a manner that is healthy, efficient, minimises disruption to amenity, and is conducive to the overall minimisation of waste generated.

Provisions

Waste and Recycling Management Plans

1. A Waste and Recycling Management Plan, prepared by a suitably qualified consultant, is to be submitted with the Development Application, consistent with the City of Sydney Guidelines for Waste Management in New Developments.

Construction and demolition waste

1. The Waste and Recycling Management Plan is to address construction and demolition waste and include:
   a) details regarding how waste is to be minimised within a development;
   b) estimations of quantities and types of materials to be re-used or left over for removal from the site;
   c) details regarding the types of waste and likely quantities of waste to be produced;
   d) a site plan showing storage areas away from public access for reusable materials and recyclables during demolition and construction and the vehicle access to these areas;
   e) targets for recycling and reuse;
   f) nomination of the role/person responsible for ensuring targets are met and the person responsible for retaining waste dockets from facilities appropriately licensed to receive the development's construction and demolition waste;
   g) confirmation that all waste going to landfill is not recyclable or hazardous; and
   h) measures to reuse or recycle at least 80% of construction and demolition waste, either on site or diverted for reuse and recycling with receipts sufficient to demonstrate the target will be achieved.

Collection and minimisation of waste during occupation

1. The Waste and Recycling Management Plan is to address the generation of waste from the occupants of the development and include:
   a) plans and drawings of the proposed development that show:
      I. the location and space allocated to the waste and recycling management systems;
      II. the nominated waste collection point/s for the site; and
      III. identify the path of access for users and collection vehicles.
   b) details of the on-going management of the storage and collection of waste and recycling, including responsibility for cleaning, transfer of bins between storage areas and collection points, maintenance of signage, and security of storage areas; and
   c) a summary document for building management and users to inform them of waste and recycling management arrangements.
2. Waste incineration devices are not permitted.
3. Development is to include sufficient space to separate food waste for collection.
4. Waste management, collection and loading is to be in accordance with the City of Sydney's Guidelines for Waste Management in New Developments, including:
   a) development applications must incorporate well designed waste management systems;
   b) the development includes sufficient space for the management and storage of all bins required to manage predicted waste and recycling generation; and
   c) waste management, storage and collection must be wholly accommodated within the built form.
5. Vehicle access for loading docks and waste collection points must provide for:

a) a Medium Rigid Vehicle in accordance with Australian Standard 'AS 2890.2:2018', or a larger design vehicle as required including for waste collection;
b) 2 metres unobstructed space at the rear of the waste collection point to manoeuvre bins between storage and the vehicle;
c) entry and egress from the loading dock in a forward direction;
d) a capacity of 30 tonne vehicles for any turntables;
e) maximum grades and rate of change on ramps in compliance with AS 2890.2:2018 for a Medium Rigid Vehicle;
f) two-way vehicle movement on driveways using a single lane;
g) a minimum driveway width of 3.5 metres per lane; and
h) footpath and cycleway crossings that respect the priority of pedestrians and cyclists and do not employ sirens or flashing lights in the public domain.

3.11 Water and flood management

Objectives

a) Ensure an integrated approach to water management across the site through the use of water sensitive urban design principles.
b) Assist in the management of stormwater to minimise flooding and reduce the effects of stormwater pollution on receiving waterways.
c) Ensure that development manages and mitigates flood risk and does not exacerbate the potential for flood damage or hazard to existing development and to the public domain.
d) Ensure that development above the flood planning level, as defined in the Sydney LEP 2012, will minimise the impact of stormwater and flooding on other developments and the public domain both during the event and after the event.
e) Ensure that flood risk management addresses public safety and protection from flooding.
f) Ensure development minimises risk to human life and damage to property caused by flooding.
g) Ensure that, in the event of a flood, adequate access to affected properties is available for emergency service personnel and that safe egress is available for occupants.
h) Ensure that proposed development does not increase the flood inundation in the neighbouring properties.

Provisions

Site specific flood study

1. A development application is to be accompanied by a site-specific Flood Impact and Risk Assessment (FIRA), prepared by a suitably qualified and experienced hydraulic engineer. The FIRA is to be prepared in accordance with the:
   a) the NSW Government Flood Prone Lands Policy;
   b) the NSW Flood Risk Management Manual 2023 and accompanying toolkits;
   c) the NSW Coastal Planning Guideline: Adapting to Sea Level Rise;
   d) the NSW Coastal Risk Management Guide: Incorporating Sea Level Rise Benchmarks In Coastal Risk Assessments;
   e) the NSW Flood Risk Management Guide: Incorporating Sea Level Rise Benchmarks In Flood Risk Assessments;
   f) the City of Sydney Interim Floodplain Management Policy (if still in effect); or
   g) any other flooding requirements in the Sydney Development Control Plan 2012.

2. The FIRA is to include, but not be limited to:
    a) a detailed topographical survey that defines flow paths, storage areas and hydraulic controls; and
    b) flood modelling that uses appropriate hydrological and hydraulic techniques and incorporates boundary conditions.
3. The FIRA shall address impacts of proposed development based on changes in flood levels, duration of flooding, depth and velocity, flood warning and evacuation time and frequency of inundation.
4. The FIRA shall include flood modelling for longer duration PMF events to establish duration of flood inundation for the access / egress road around the site, and period of isolation and its impacts on building occupants.
5. The FIRA is to show pre-development and post-development scenarios, and at a minimum is to include the following information:
    a) water surface contours;
    b) velocity vectors;
    c) velocity and dept product contours;
    d) delineation of flood risk precincts;
    e) flood hazard classification for 20%, 10%, 5%, 1% and PMF events, based off the Combined Hazard Curves – Vulnerability Threshold Classification Limits (Smith et al., 2014);
    f) flood profiles for the full range of events up to and including probable maximum flood for total development including all structures and works (such as revegetation and physical enhancements); and
    g) flood function mapping for 20%, 10%, 5%, 1% and PMF events.
6. The FIRA should include a comprehensive flood emergency response management plan to address all emergency management issues associated with all events up to PMF.
7. The Flood Emergency Response Management Plan shall be placed on the property title to ensure that the information is effectively transmitted to users, commercial operators, patrons, and wider community and is reviewed and updated, as necessary.
8. The FIRA is to assume the 'worst case scenario' conditions for blockages to pipes, culverts and other infrastructure, such that:
    a) development minimises risk to human life and damage to property caused by flooding;
    b) apply a merit-based approach to all development decisions considering ecological, social, and environmental considerations;
    c) ensure that, in the event of a flood, adequate access to affected properties is available for emergency service personnel and that safe egress is available for occupants; and
    d) ensure that proposed development does not increase the flood inundation in the neighbouring properties.
9. Building flood planning levels will be set at 1% AEP flood level, and the probable maximum flood level at a closer (1m) interval.

Drainage and stormwater management

10. A local Stormwater Drainage Management Plan, prepared by a suitably qualified engineer with experience in drainage design, is required for any development application on the site.
11. The local stormwater drainage management plan is to address:
    a) the hydrology of the locality and its relationship to the drainage system;
    b) the distribution of soil types and the scope for on-site infiltration;
    c) any expected rise in ground water level due to development;

d) the role of the principal landscape components on the site for water conservation and on-site detention;
e) the scope for on-site stormwater detention and retention, including collection of water for re-use;
f) how any detrimental impacts on the existing natural hydrology and water quality are proposed to be minimised;
g) how pedestrian safety is to be ensured; and
h) integration of drainage management responses and open space areas.

12. The development proposal must demonstrate how the major drainage system addresses any site-specific conditions and connects to the downstream drainage system.
13. Major drainage systems are to be designed so that public safety is not compromised.
14. Surface runoff from within the site and neighbouring property is to be conveyed into proposed stormwater drainage system, to avoid flood inundation in the neighbouring properties.
15. Minor flows from a development site are not to be discharged to the kerb if direct connection to an existing stormwater pipe is available, unless it can be demonstrated there is sufficient capacity within the existing gutter and the flow velocity and depth within the gutter will be limited to 0.6m2/s.
16. Where the proposed development is located on a floodplain, high level overflows are permitted for roof drainage systems where the overflow is set above the 1% annual exceedance probability level.
17. The maximum allowable permissible site discharge and minimum on-site detention volume for the development is to be advised by Sydney Water Authority.
18. The post development run-off from impermeable surfaces (such as roofs, driveways and paved areas) is to be managed by stormwater source control measures that:
    a) contain frequent low-magnitude flows;
    b) maintain the natural balance between run-off and infiltration;
    c) remove some pollutants prior to discharge into receiving waters;
    d) prevent nuisance flows from affecting adjacent properties; and
    e) enable appropriate use of rainwater and stormwater.
19. Stormwater detention devices are to be designed to ensure that the overflow and flowpath have sufficient capacity during all design rainfall events, discharge to the public stormwater system without affecting adjoining properties, and are free of obstructions, such as fences.
20. Where filtration and bio-retention devices are proposed, they are to be designed to capture and provide temporary storage for stormwater.
21. Stormwater discharge to the kerb and gutter is to be in accordance with the Sydney Streets Technical Specifications'.

Stormwater quality

22. A Stormwater Quality Assessment, prepared by a suitably qualified engineer with experience in water sensitive urban design (WSUD), is required to be submitted with any Development Application on the site. The Assessment must include:
    a) modelling of pollutant load standards with an industry standard water quality model;
    b) the design of WSUD measures used to achieve the post-development pollutant load standards; and
    c) maintenance schedules of any proposed WSUD measure that requires maintenance or full replacement including the likely recycling or disposal location of any wastes that may be generated.
23. Development must achieve the post-development pollutant load standards indicated below:

a) reduce the baseline annual pollutant load for litter and vegetation larger than 5mm by 90%;
b) reduce the baseline annual pollutant load for total suspended solids by 85%;
c) reduce the baseline annual pollutant load for total phosphorous by 65%; and
d) reduce the baseline annual pollutant load for total nitrogen by 45%.

Water re-use, recycling and harvesting

24. Where there is a commitment to provide a recycled water network in the area, all buildings are to be capable of providing a dual reticulation water system for water services and be capable of fully connecting to a non-potable recycled water network and configured to supply all toilets, washing machine taps, car wash bays, cooling towers and irrigation usage.

3.12 Design Excellence Strategy

Objectives

a) Ensure high quality design through the use of competitive design process.
b) Ensure development contributes to the architectural and overall urban design quality of the local government area.
c) Encourage variety in architectural design and character to provide a fine grain which enriches and enlivens the City's public space.

Provisions

1. A competitive design process(es) is to be undertaken across the entire site in accordance with Clause 6.21D of Sydney LEP 2012 and the City of Sydney Competitive Design Policy. The Competitive Design Process is to be undertaken in accordance with this Design Excellence Strategy.
2. A building demonstrating design excellence is eligible for up to 10% additional floor space in accordance with the Sydney LEP 2012. No additional height is to be awarded as a result of the competitive design process.
3. The proponent is to invite a minimum of five (5) Competitors to participate in the competitive design process.
4. The selected competitors will:
   a) include a range of emerging and established architectural practices;
   b) require that each competitor will be a person, corporation or firm registered as an architect in accordance with the NSW Architects Act 2003, or in the case of interstate or overseas Competitors, eligible for registration with their equivalent association.
   c) require each competitor to have demonstrated capabilities in design excellence by being the recipient of an Australian Institute of Architects (AIA) award or commendation, or in the case of overseas competitors the same with their equivalent professional association.
5. Where the Minister is the consent authority, the jury will be endorsed by the Government Architect NSW and will be comprised of a 5 -person jury as set out in Section 2.3 Jury composition of the Government Architect NSW Design Competition Guidelines.
6. Jury members are to:
   a) represent the public interest;
   b) include only persons who have expertise and experience in the design and construction professions and industry; and
   c) include a majority of registered architects.

7. Ecologically sustainable development benchmarks and outcomes are to be targeted in the competitive design process as prescribed in Sydney LEP 2012 and in this Design Guide.

3.13 Vehicular access

Objectives

a) Encourage alternatives to private motor vehicle use and support sustainable transport, such as public transport, walking or cycling.
b) To ensure vehicle access and basement layouts maximise pedestrian safety and create a high-quality ground level relationship with the building and public domain.

Provisions

1. Vehicular access is to be provided from Young Street.
2. The vehicular driveway and crossover are to be clearly visible and include active safety measures.
3. A Traffic Management Plan is to accompany any future Development Application and must include an assessment of potential traffic and safety measures.

3.14 Transport, Movement and Parking

Objectives

a) Ensure that the demand for transport generated by development is managed in a sustainable manner.
b) Ensure that bike parking is considered in all development and provided in appropriately scaled developments with facilities such as change rooms, showers and secure areas for bike parking.
c) Design vehicle access and basement layouts and levels to maximise pedestrian safety and create high quality ground level relationships between the building and the public domain.
d) Reduce reliance on private car ownership

Provisions

1. A Transport Impact Study, prepared by a suitably qualified consultant, is required to be submitted with any Development Application on the site. The Assessment identify and address the potential impact of the development on surrounding movement systems.
2. A Parking and Access Report is required to accompany a development application.
3. A Transport Access Guide and a strategy for the future availability of the Guide to staff, students and visitors of a development is to be prepared for all developments and provided to the consent authority for review prior to issue of Occupation Certificate:
4. A Construction Management Plan is required detailing:
   a) predicted construction vehicle routes;
   b) access and parking arrangements;
   c) coordination with other construction occurring on the area;
   d) how impacts on existing traffic, pedestrian and bicycle networks would be managed and mitigated.
5. Vehicular parking spaces for educational establishments are to be provided within the basement and at a rate of no more than one parking space for every two staff members.
6. End of trip and bicycle parking facilities are to be provided at a rate of 10% of all students and staff on the site, with all student spaces and 20% of staff spaces to be provided as horizontal spaces.

7. End of trip and bicycle parking facilities are to be accommodated on-site, weather protected and in a secure location for users.
8. All development is to provide on-site bike parking designed in accordance with the relevant Australian Standards for the design criteria of bike parking facilities.
9. Where bike parking is provided in a basement, it is to be located close to entry/exit points and subject to security camera surveillance where such security systems exist.
10. A safe path of travel from bike parking areas to entry/exit points is to be marked.
11. Access to bike parking areas are to be:
    a) a minimum of 1.8m wide to allow a pedestrian and a person on a bike to pass each other and may be shared with vehicles within buildings and at entries to buildings;
    b) accessible via a ramp;
    c) clearly identified by signage; and
    d) accessible via appropriate security or intercom systems.
12. Parking spaces for motorbikes are to be included in the allocation of car parking.
13. Each motorcycle parking space is to be designated and located so that parked motorcycles are not vulnerable to being struck by a manoeuvring vehicle.
14. All visitor spaces are to be grouped together in the most convenient locations relative to car parking area entrances, pedestrian lifts and access points and are to be separately marked and clearly sign-posted.
15. Development applications are to indicate how visitor parking is to be accessed, including arrangements for access into a secure area if proposed.
16. Development is to achieve high quality ground level relationships between the buildings and all public open space interfaces even where this will result in inefficient basement car parking layouts including, spilt basement levels or additional excavation.
17. Development proposing less than the maximum number of parking spaces permissible under Clause 7.5 of the LEP must adjust the number of visitor parking spaces in accordance with the reduction of total car parking spaces.
18. Accessible car parking spaces for people with a mobility impairment are to be included in the allocation of car parking for a development and provided in accordance with the following:
    a) one space for every 20 car parking spaces or part thereof is to be allocated as accessible visitor parking; and
    b) accessible parking is to be designed in accordance with the requirements of relevant Australian Standards.
19. Accessible parking is not required in car parking areas where a parking service is provided and direct access to any of the car parking spaces is not available to the general public or occupants.
20. Basement parking areas and structures must not protrude above the level of the adjacent street or public domain.
21. Vehicle ramps must not be visible from the public domain and are to be located inside the building.
22. Car parking areas are to:
    a) be well lit, visible, and avoid hidden and enclosed areas to allow for casual surveillance;
    b) include, mirrors or similar devices where hidden and enclosed areas such as staircases and lift lobbies cannot be avoided;
    c) be well ventilated and provide natural rather than mechanical ventilation where practicable; and
    d) be subordinate in appearance to the main building.
23. Car parking spaces are not to be located in areas used for the manoeuvring of service vehicles.
24. Loading and servicing activities are to be carried out on-site.

Attachment C

Planning Agreement – Public Benefit Offer – 242-258 Young Street, Waterloo – dated 2 May 2024

2 May 2024

Ms Monica Barone

Chief Executive Officer

City of Sydney Council
456 Kent Street
Sydney NSW 2000

Attention: Mr Graham Jahn AM, Director of City Planning, Development & Transport

242 -258 Young Street, Waterloo
Planning Proposal – Indicative Public Benefit Offer

On behalf of the Landowners, we write to you regarding the Planning Proposal which has been submitted in relation to the above property.

This letter sets out the indicative public benefit offer that is proposed to be associated with the Planning Proposal for 242-258 Young Street, and which is intended to be delivered through a future Voluntary Planning Agreement (VPA). It is acknowledged that a future public benefit offer and VPA may be required at the development application stage for other works. This offer is provided in confidence.

Detailed components of the indicative public benefit offer are provided as follows.

- Delivery of a new pedestrian crossing on Young Street
- Delivery of a new pedestrian crossing on Powell Street
- Construction of public domain improvements to meet RMS standards for pedestrian crossings

The street improvements have arisen from discussions with City of Sydney Council (the City) planning officers. They will enhance the pedestrian network around the site and assist with the movement of students and staff to and from the site when it is redeveloped in the future.

Once agreement has been reached in principle with the City of Sydney Council, it is the intent of the proponent to prepare a draft VPA that will be available for public exhibition together with the Planning Proposal. The VPA will be executed prior to the gazettal of any LEP Amendment, with delivery of the agreed public benefit to occur prior to issuance of an Occupation Certificate for the future development.

The Sustainable Development Group Ltd (SDG) presents a unique opportunity to provide a high-quality all-through school, which embodies a true community focus. SDG is committed to working with the City to create a genuinely meaningful public benefit on the site, which is connected and leveraged upon the City's successful existing programs in the community.

The proponent believes that working with the City from the outset and in a collaborative capacity is essential if we are to meet Waterloo's growing social needs and we welcome the opportunity to have further discussions with Council in relation to this initial offer and the proposal more broadly. Should you have any further queries, please do not hesitate to contact the team.

Yours sincerely,

Matthew Thrum
Urbanist, Planning
mthrum@ethosurban.com
0434 858 564

Ben Craig
Director, Planning
bcraig@ethosurban.com
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International Screen Academy Property Pty Ltd
c/o Pacific Equity Partners
Level 31, 126-130 Phillip Street
Sydney NSW 2000
Ph: +61 2 8238 2600 Fax: +61 2 8238 2690

3 May 2024

Ms Monica Barone
Chief Executive Officer
City of Sydney Council
456 Kent Street
Sydney NSW 2000

Attention: Mr Graham Jahn AM, Director of City Planning, Development & Transport

RE: Landowner's consent for public benefit offer
242 Young Street, Waterloo NSW 2017

I refer to the aforementioned Public Benefit Offer dated 2 May 2024 prepared by Ethos Urban on behalf of Sustainable Development Group. International Screen Academby Property Pty Ltd ACN 160 984 574 is the registered owner of the property of LOT 1 / DP 84655.

I confirm that I am a Director of International Screen Academy Property Pty Ltd and consent to the aforementioned Public Benefit Offer being submitted to City of Sydney Council.

If you have any queries, please do not hesitate to contact Richard Huynh at Richard.huynh@sdg.org.au

Yours sincerely,



Tim Sims
Director

CHARVIC PTY LTD

A.B.N. 25 003 181 093

191-193 Cleveland Street
Redfern NSW 2016
AUSTRALIA

Telephone: (02) 9910 4183
Fax: (02) 9910 4144

Address all correspondence to:
PO Box 444
STRAWBERRY HILLS NSW 2012

6 May 2024

Ms Monica Barone
Chief Executive Officer
CITY OF SYDNEY COUNCIL
456 Kent Street
SYDNEY NSW 2000

Attention: Mr Graham Jahn AM
Director of City Planning, Development & Transport

RE: Landowner's consent for public benefit offer:
244 - 258 Young Street, Waterloo NSW 2017

We refer to the aforementioned Public Benefit Offer dated 2 May 2024 prepared by Ethos Urban on behalf of Sustainable Development Group.

Charvic Pty Ltd ACN 003 181 093 is the registered owner of the property of LOT A & B / DP 161650.

Charvic Pty Ltd consent's to the aforementioned Public Benefit Offer being submitted to City of Sydney Council.

If you have any queries, please do not hesitate to contact me on 02 9910 4100.

Yours sincerely

V M PARSONS
Director

Item 5.

Public Exhibition - Planning Proposal - 8-24 Kippax Street, Surry Hills - Sydney Local Environmental Plan 2012 and Sydney Development Control Plan 2012 Amendments

File No: X101286

Summary

The lower slopes of Surry Hills forms part of the Eastern Creative District, City Fringe and 'Tech Central' precincts. The built form character of medium scale commercial and former warehouse buildings is complemented by high levels of amenity through close proximity to Central Sydney and excellent transport connections attracting creative and tech industries and highly skilled employees.

This proposal will help embed and grow the City's tech and creative industries in Surry Hills, strengthening its competitiveness, economic potential and reputation as a place for creative technology firms and workers. Supporting development and new investment through additional employment floor space in this area is a key action of City Plan 2036, the City's local strategic planning statement, and the Greater Sydney Region Plan.

A planning proposal has been prepared for 8-24 Kippax Street, Surry Hills, following a request from the landowner, Canva, to amend the planning controls for the site. The proposal seeks to adaptively reuse the existing building and deliver Canva's headquarters. Located on Kippax Street 100 metres from Central Railway Station, the site is well located to provide the additional employment floor space to support the creative and tech employment cluster.

This planning proposal seeks to amend the building height and floor space ratio controls for the site, facilitating the adaptive reuse of the existing 10-storey commercial building comprising two new rooftop levels and improved high-end office space. The proposed removal of all on-site parking and new end of journey facilities takes advantage of the site's close proximity to excellent transport connections, including recent infrastructure investments and capacity increases through the light rail and Sydney Metro projects and public domain upgrades. The adaptive reuse of the building minimises embodied carbon and capturing sequestered carbon through the adaptive reuse of the existing building.

A concurrent development application was approved by the Central Sydney Planning Committee (CSPC) in May 2024 for preliminary structural works and refurbishment of the existing building, including internal reconfiguration for open plan office space. If the LEP is amended by this planning proposal, the proponent intends to modify this development consent to accommodate the two storey rooftop addition as detailed in the indicative scheme supporting this planning proposal. Both the planning proposal and development application have been assessed to ensure alignment and consistency between the two applications.

This report recommends approval of the planning proposal for submission to the Department of Planning, Housing and Infrastructure seeking a Gateway Determination, followed by public exhibition. It also recommends that a draft site-specific development control plan is endorsed and exhibited concurrently.

Recommendation

It is resolved that:

(A) Council approve Planning Proposal – 8-24 Kippax Street, Surry Hills, as shown at Attachment A to the subject report, to be submitted to the Minister for Planning and Public Spaces with a request for Gateway Determination;

(B) Council approve Planning Proposal – 8-24 Kippax Street, Surry Hills, as shown at Attachment A to the subject report for public authority consultation and public exhibition in accordance with any conditions imposed under the Gateway Determination;

(C) Council seek authority from the Minister for Planning and Public Spaces to exercise the delegation of all the functions under section 3.36 of the Environmental Planning and Assessment Act 1979 to make the local environmental plan and to put into effect Planning Proposal – 8-24 Kippax Street, Surry Hills;

(D) Council approve the Draft Sydney Development Control Plan 2012 – 8-24 Kippax Street, Surry Hills, shown at Attachment B to the subject report for public authority consultation and public exhibition concurrent with the Planning Proposal;

(E) authority be delegated to the Chief Executive Officer to make any variations to Planning Proposal – 8-24 Kippax Street, Surry Hills, to correct any drafting errors or to ensure consistency with the Gateway Determination; and

(F) authority be delegated to the Chief Executive Officer to make any variations to Draft Sydney Development Control Plan 2012 – 8-24 Kippax Street, Surry Hills, to correct any drafting errors or ensure it is consistent with the Planning Proposal following the Gateway Determination.

Attachments

Attachment A. Planning Proposal – 8-24 Kippax Street, Surry Hills and appendices

Attachment B. Draft Sydney Development Control Plan 2012 – 8-24 Kippax Street, Surry Hills

Background

1. A planning proposal request has been lodged for a site in Surry Hills, close to Central Railway Station and the Central Business District (CBD) comprising Central Sydney and Haymarket. The site has street frontages to Kippax, Sohpia and Terry Streets and a common boundary with an adjoining residential building, as shown in Figure 1.



Figure 1: Land affected by this planning proposal

2. The subject site has an area of 1,032 square metres. Existing development comprises a ten storey commercial building constructed in the late 1960s. The building has an existing height of 30 metres (RL 53m) and gross floor area of 9,374 square metres, equating to an FSR of 9.1:1, which exceeds the mapped development controls of 27 metres and 3.5:1 FSR.

3. The existing building consists of ground floor retail and small-scale office and commercial suites on the upper floors. The building has not been significantly refurbished since the late 1990s and is not compliant with contemporary building codes and standards.

4. Further details of the subject site, surrounding area and planning controls are included in section 2 of the Planning Proposal at Attachment A to this report. A photo of the subject site and existing development is at Figure 2.

5. Canva, the landowner, submitted a request to prepare a planning proposal through the NSW Planning Portal in December 2023 following pre-lodgement advice.

6. A development application for structural and refurbishment works to the existing building was lodged at the same time as the planning proposal request and approved by the Central Sydney Planning Committee in May 2024. The approved DA provides for the internal reconfiguration of the building including the relocation of the lift core and stairs, new rooftop plant and equipment and open plan office space. These works will support the indicative scheme proposed by this planning proposal, if approved, will enable a development application to be lodged and assessed for the remainder of the works, including the rooftop addition comprising two new floors, outdoor terrace and plant. Plans detailing the existing building, works delivered by the development application and those facilitated by the planning proposal are illustrated at Figure 6.



Figure 2: 8-24 Kippax Street, viewed from the south-east outlined in red

Key Implications

Proponent has requested changes to height and floor space controls to enable the adaptive reuse of the existing building to support improved work space

7. The proponent has requested a planning proposal to facilitate the redevelopment and adaptive reuse of the existing building on site to include:

   (a) a 12-storey office building, comprising two new rooftop levels, to a maximum height of RL 67.06 metres (44 metres above street level);

   (b) approximately 10,500 square metres of refreshed work space, comprising up to 1,130 square metres of new floor space, to a maximum floor space ratio of 10.2:1; and

(c) removal of all on-site car parking to be replaced with retail and meeting space, basement end-of-journey facilities and two loading spaces.

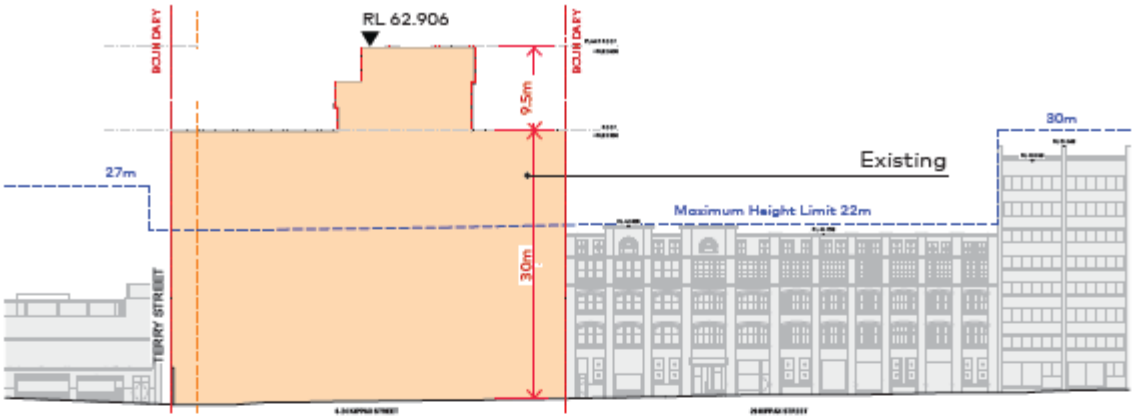
8. Photomontage images of the proposed indicative scheme prepared by the proponent are included blow in Figures 3 and 4.



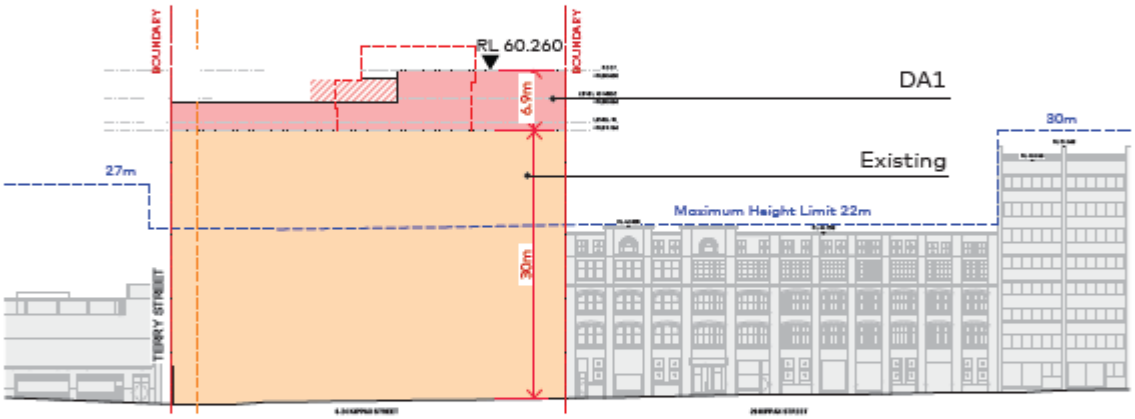
Figure 3: Photomontage of the planning proposal concept development viewed from the north



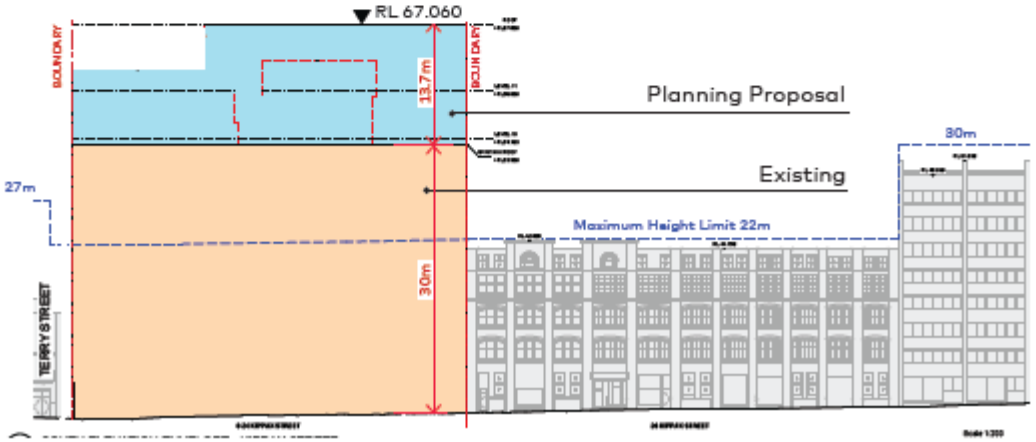
Figure 4: Photomontage of the planning proposal concept development viewed from the south



Existing Southern (Kippax Street) Elevation



DA Southern (Kippax Street) Elevation



Planning Proposal Southern (Kippax Street) Elevation

Figure 5: Elevations detailing the existing built form, approved development application changes and proposed additions facilitated by this planning proposal

The City has prepared a planning proposal to increase the height and floor space controls for a commercial development

9. The planning proposal details the proposed amendments to the Sydney Local Environmental Plan 2012 (Sydney LEP 2012) by inserting new site-specific provisions to incentivise commercial floor space. The provisions are to:

    (a) permit a maximum building height of RL 67.06 metres (44 metres), an increase from the current control of 22 metres (which is currently below the height of the existing building);

    (b) increase the maximum floor space ratio control from 4:1 to 10.2:1 inclusive of end of journey floor space. Design excellence additional floor space or height is not applicable in this instance;

    (c) ensure development consent may only be provided subject to the following:

        (i) the resultant building will not be used for residential accommodation or serviced apartments;

        (ii) the provision of end of journey facilities; and

        (iii) does not include any car parking spaces except for a minimum of two loading spaces for servicing of the building;

    (d) ensure the existing building is retained; and

    (e) waive the requirements for a competitive design process under clause 6.21D of the LEP.

10. Further information regarding the proposal including the objectives and intended outcomes can be found in section 3 of the Planning Proposal at Attachment A to this report.

Changes to the Development Control Plan will ensure the proposed additions are appropriate to its context and the surrounding area

11. A site-specific draft development control plan (draft DCP) provides detailed guidance to ensure future development is consistent with this planning proposal and to ensure a high-quality built form. The draft DCP provisions include:

    (a) maximum building envelope dimensions including upper-level setbacks, street wall heights and maximum height (as shown at Figure 6);

    (b) controls relating to active street frontages along Kippax Street and Sophia Street at the rear;

    (c) amenity controls for the use of the external terrace; and

    (d) off-street loading, servicing and access provisions.

12. The draft DCP amendment will be exhibited with this planning proposal.

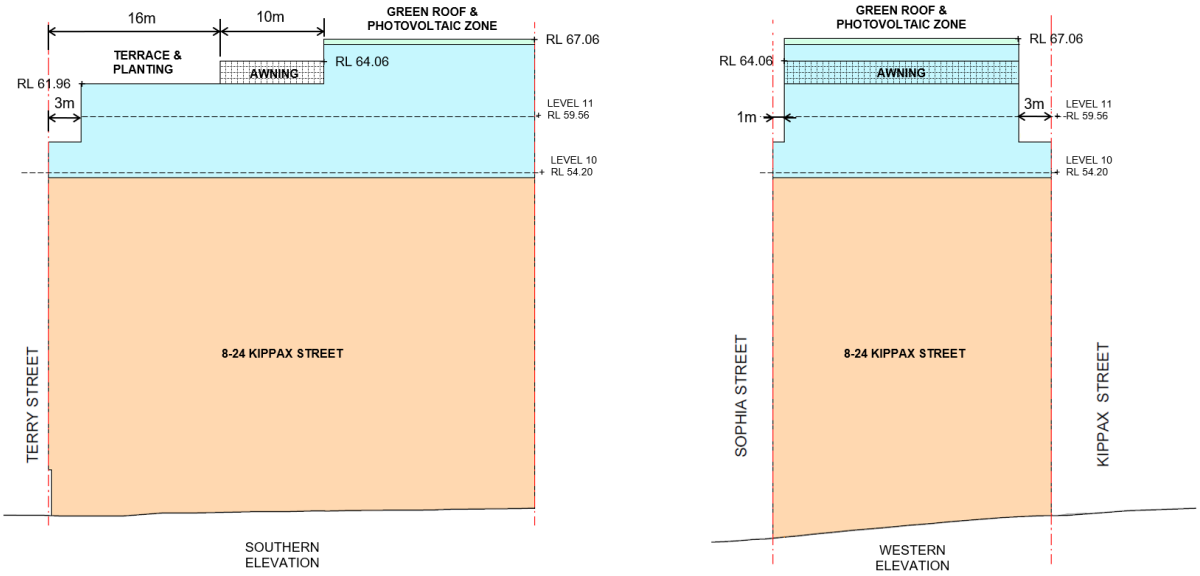


Figure 6: Elevations of the proposed building envelope, new additions shown in blue

The proposal in this location provides a good contextual fit and has site-specific merit

13. The additional building height and floor space ratio facilitated by this planning proposal will provide for the adaptive reuse of the existing ageing commercial building to significantly improve the work space and support the growth of innovation businesses within the precinct.

14. The existing building height of 30 metres (RL 53m) to the parapet exceeds the mapped height control of 22 metres and the existing gross floor area of 9,374 square metres (FSR of 9.1:1) exceeds the mapped FSR of 3.5.1. For a building in this location, the current controls unreasonably limit alterations and modest additions to the building and does not support the sustainable adaptive reuse of the existing building. The proposed building height of RL 67.06m and FSR of 10.2:1 is a modest increase to the existing building of two setback levels.

15. The proposed redevelopment will retain much of the existing building with pragmatic interventions to improve functionality, sustainability or to bring in line with current standards for high-end office space. The reuse of this aging commercial building will enable Canva to expand their operations and remain in Surry Hills and the wider Tech Central precinct.

16. The proposed amendments are unlikely to result in any adverse amenity impacts that cannot be managed. The proposed scheme has been developed in collaboration with the proponent with any environmental impacts resulting from the proposal having been identified and addressed during assessment.

17. The proposed envelope will not result in any adverse overshadowing or amenity impacts to nearby residential apartments as show in Figure 7. Draft provisions will ensure the rooftop additions will be recessive through the use of materials and setbacks, minimising any excessive visual bulk and scale impacts to the surrounding area.

18. The planning proposal and draft Development Control Plan facilitates the redevelopment of the subject site to enable a new commercial development with the following key benefits:

    (a) the delivery of 10,000 square metres of refurbished work space in Surry Hills, supported by existing and planned infrastructure;

    (b) catalysing additional investment in the knowledge-intensive employment cluster of the Innovation Corridor, City Fringe, Eastern Creative District and Camperdown-Ultimo Collaboration Area (Tech Central), particularly in creative industries, professional services and information media; and

    (c) the proposed development scheme will deliver a new commercial building with significantly improved sustainability outcomes.

19. The Planning Proposal addresses the urban design, environmental, social and economic impacts of the future development. Accompanied by a number of technical and specialist reports, which are included as appendices to the planning proposal.

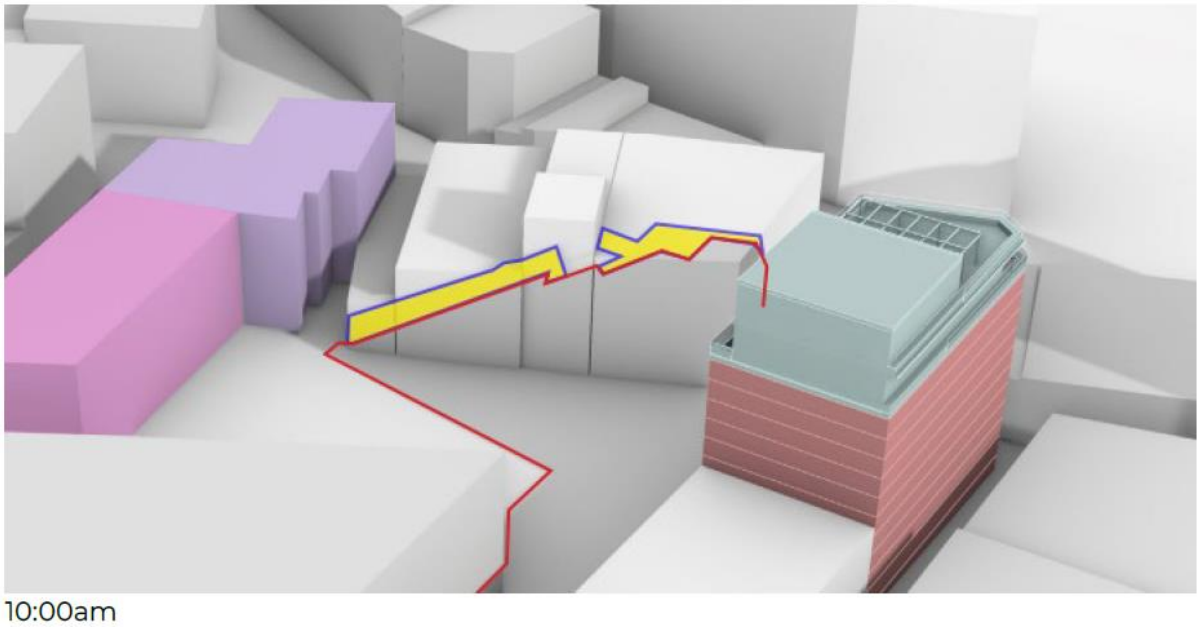


Figure 7: Overshadowing analysis of the proposed additions at winter equinox. Additional shadows from the proposed additions are shown in yellow and nearby residential buildings are shown in pink.

Development application

20. A concurrent development application (D/2023/1162) has been lodged for preliminary structural works and refurbishment of the existing building. The proposed works include relocation of the lift core and stairs, new rooftop plant and internal reconfiguration for open plan office space. These works were approved by the Central Sydney Planning Committee (CSPC) on 9 May 2024.

21. Works to the lower ground floor and basement levels consists of the removal of on-site parking and ramps and reconfiguration to include end of journey facilities, bicycle parking, retail and meeting space. Ground floor works include a new glazed frontage to Kippax Street, refurbished lobby and town hall meeting space. The existing loading dock at Kippax Street will be relocated to the Sophia Street frontage. These works are consistent with the indicative scheme facilitated by the planning proposal.

22. If the LEP is amended through this planning proposal, the proponent intends to submit a modification application for the two storey rooftop addition facilitated by this planning proposal.

Planning proposal is consistent with the City's strategic vision

23. The City's local strategic planning statement, City Plan 2036, sets out the 20-year vision for land use planning in the city and the planning priorities and actions needed to achieve the vision.

24. This planning proposal facilitates additional work space in an existing employment cluster, helping strengthen and generate additional jobs in the knowledge-intensive technology sector. This will further support the tech industry in the City Fringe area, building on the nearby Western Gateway precinct and other businesses in the area such as Afterpay, Hivery, Morse Micro and SafetyCulture.

25. The proposal aligns development growth with supporting infrastructure, as it is well positioned, close to transport infrastructure at Central, including the light rail and the imminent Sydney Metro extension through Central Sydney. Both projects will provide increased public transport capacity and support additional jobs.

26. Sustainable Sydney 2030-2050 is the vision for a city that is green, global and connected achieved through sustainable growth, creativity and innovation. It sets targets, objectives and actions to achieve this vision. This planning proposal is aligned with the following strategic directions.

    (a) Direction 2: A leading environmental performer – future development implements sustainability measures including a passive control and smart building system, with photovoltaic systems placing less demand on electricity networks.

    (b) Direction 5: A city for walking, cycling and public transport – the site will take advantage of existing transport infrastructure, including rail, light rail and nearby cycleways. The removal of all on-site parking reduces the demand for private vehicle trips and encourages walking, cycling and public transport use.

    (c) Direction 9: A transformed and innovative economy – this planning proposal supports further employment growth in the City Fringe, building on its strong locational advantage for an expanding cluster of high-tech creative industries in the area, and as a destination for business, investment and talent.

27. Further information regarding the alignment of the Planning Proposal with the strategic planning framework can be found at section 5.2 in Attachment A to this report.

Relevant Legislation

28. Environmental Planning and Assessment Act 1979.

29. Environmental Planning and Assessment Regulation 2021.

Critical Dates / Time Frames

30. Should Council and the CSPC endorse the planning proposal for public exhibition, it will be forwarded to the Department of Planning, Housing and Infrastructure in accordance with section 3.34 of the Act for Gateway Determination. The Gateway Determination will provide the required date for the completion of the Local Environmental Plan amendment. Following public exhibition, the outcomes will be reported back to Council and the CSPC.

Public Consultation

31. Public exhibition for this planning proposal will be determined by the Department of Planning, Housing and Infrastructure. It is planned for the public exhibition of the planning proposal and draft Development Control Plan will be in accordance with:

    (a) the Gateway Determination issued by the Department of Planning, Housing and Infrastructure under section 3.34 of the Act;

    (b) the Environmental Planning and Assessment Regulation 2021; and

    (c) the City of Sydney's Community Engagement Strategy and Participation Plan.

32. It is likely that the public exhibition of the planning proposal would be a minimum of 28 days.

33. The planning proposal and draft Development Control Plan will be publicly exhibited online on the City of Sydney website in accordance with the Environmental Planning and Assessment Regulation 2021.

GRAHAM JAHN AM

Director City Planning, Development and Transport

Daniel Thorpe, Specialist Planner

Attachment A

Planning Proposal -
8-24 Kippax Street, Surry Hills

CITY OF SYDNEY

Planning Proposal – 8-24 Kippax Street, Surry Hills



The City of Sydney acknowledges the Gadigal of the Eora Nation as the Traditional Custodians of our local area.

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Executive Summary

This planning proposal has been prepared by the City of Sydney (the City) for 8-24 Kippax Street, Surry Hills (the site), in response to a request from the landowner, Canva, for the City to prepare a planning proposal for the site.

This planning proposal details the intent and justification for the proposed amendments to the Sydney Local Environmental Plan 2012 (LEP) as it applies to the site. This planning proposal has been prepared by the City in accordance with section 3.33 of the Environmental Planning and Assessment Act 1979 and the Department of Planning, Housing and Infrastructure's Local Environmental Plan Making Guideline dated August 2023.

The planning proposal will facilitate the adaptive reuse of the existing commercial building to permit a two-storey addition and deliver additional premium-grade office space, consistent with City Plan 2036, the City's local strategic planning statement and the Greater Sydney Region Plan.

The site is approximately 1,037m^2 in area, bound by Kippax Street, Sophia Street and Terry Street. Existing development is a c1960s 10 storey commercial building with ground floor retail and small-scale office and commercial suites on the upper floors. The building has not been significantly refurbished since the 1990s and is not up to date with current standards. Surrounding development is generally similar in character comprising a mixture of residential, commercial and office uses.

Under the existing LEP controls, the site is zoned MU1 Mixed Use, has a maximum height of building control of 22 metres and a maximum floor space ratio of 3.5:1. The existing building has a height of 30 metres to the parapet and a floor space ratio of 9.1:1, both of which exceed the mapped development control and constraint the adaptive reuse of the building.

The City has prepared this planning proposal following a detailed review of the proponent's planning proposal request and accompanying documentation.

This proposal seeks to increase the maximum building height and floor space ratio for the site to support future redevelopment delivering the following key benefits:

- new premium-grade office space in Surry Hills, helping to foster and further develop targeted employment clusters and industries in a strategic location supported by infrastructure;
- supporting development and investment within the Innovation Corridor, City Fringe, Eastern Creative District and Camperdown-Ultimo Collaboration Area, an area identified as an existing employment cluster, supporting employment uses particularly in knowledge-intensive sectors such as health, education, creative industries, professional services and information media.

This planning proposal seeks to insert a new site-specific clause in Division 5 of the LEP to:

- set a maximum building height of RL 67.06 metres (44m) for two additional setback storeys;
- set a maximum floor space ratio of 10.2:1 inclusive of end of journey floor space;
- waive the requirements for a competitive design process;
- ensure development consent may only be provided subject to the following:
  - the building will not be used for residential accommodation or serviced apartments;
  - provision of active street frontages and end of journey facilities; and
  - does not include any car parking spaces except for a minimum of two loading spaces for servicing of the building; and
  - ensure these provisions do not apply to the erection of a new building.

The City has prepared a draft site-specific amendment to the Sydney Development Control Plan 2012 (draft DCP) to help ensure the objectives and intended outcomes of this planning proposal are achieved. The draft DCP includes controls relating to the built form, setbacks, servicing and loading, active frontages and amenity. The draft DCP amendment will be publicly exhibited with this planning proposal.

1. Background

1.1 Site identification

This planning proposal relates to the property 8-24 Kippax Street, Surry Hills, otherwise referred to as “the site”. The legal description and basic qualities of the subject site is detailed below in Table 1 and a map of the site, outlined in red is shown at Figure 1.

Address	Legal description	Area m^2	Existing development
8-24 Kippax Street	Lot 3 DP 547558	1,032m^2	10 storey commercial building c1960s

Table 1. Legal description and basic qualities of the subject site



Figure 1. Land affected by this planning proposal

1.2 Site location

The subject site is located in Surry Hills, adjacent to the Central Business District (CBD) which comprises Central Sydney and Haymarket. The site has frontages to Kippax Street along its front boundary, Sophia Street to the north and Terry Street to the west. It shares a common boundary with a five storey residential building to the east.

Centrally and well located, the subject site is close to both residential and employment centres in the CBD and Surry Hills and the emerging Western Gateway precinct.

The site is 100m away from Central Railway Station with intercity, suburban and light rail connections. Bus stops are located nearby on Chalmers Street, Foveaux Street and on Elizabeth Street close to the intersection with Kippax Street. Cycling connections run along Chalmers Street and through Prince Alfred Park approximately 250m to the south west of the site.

1.3 Site characteristics

The primary street frontage to Kippax Street is approximately 36 metres, the frontage to Sophia Street at the rear is 40 metres and eastern frontage to Terry Street is approximately 24 metres in length. The common boundary with the adjoining site to the east is 24 metres.

Existing development on the site comprises a 10 storey commercial building originally constructed in the 1960s. The building consists of ground floor retail and small-scale office and commercial suites on the upper floors. The building has not been significantly refurbished since the late 1990s and is not compliant with contemporary building codes and standards. Photos of the subject site as shown below in Figures 2 – 5.

Surrounding development consists of a mixture of residential, commercial and office development. Adjoining the subject site to the east is a five storey residential apartment building with ground floor retail. On the southern side of Kippax Street is a six storey office building that houses News Corp Australia's offices and at-grade car park. Fronting Elizabeth Street to the south-west of the site is a seven storey commercial building comprising small-scale retail and creative suites. The Aurora Hotel fronts Elizabeth Street to the west of the site and is directly adjoined by a row of two storey residential terraces that front Terry Street. A four storey commercial building fronts Foveaux Street to the north of the site and houses an education facility. Photos of the surrounding area are shown below in Figures 6 – 7.



Figure 2. Looking towards the Kippax Street frontage of the site

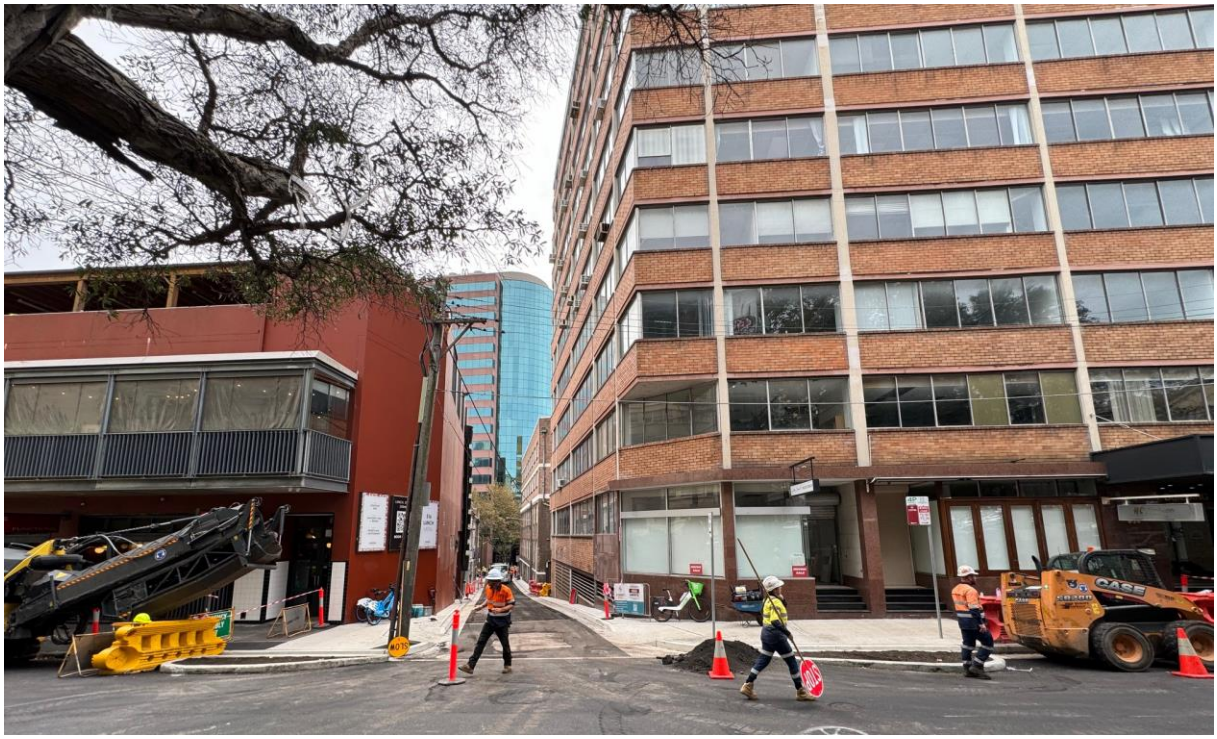


Figure 3. Looking towards the site as viewed along Terry Street



Figure 4. Looking towards the site along Sophia Street



Figure 5. Corner of Sophia Street and Terry Street looking towards the site



Figure 6. Surrounding area – looking west towards Elizabeth Street



Figure 7. Surrounding area – looking east along Kippax Street

1.4 Landowner request and development application

Canva, the landowner, submitted this planning proposal request through the NSW Planning Portal in December 2023. This request was accompanied by a number of technical reports including a Design Report and Indicative Reference Scheme Drawings prepared by Cox Architecture as well as a Traffic and Parking Assessment, Sustainability Statement and Structural Statement detailing the alteration and strengthening works required to support the proposed additions.

Concurrently, a development application was lodged with the City for structural works and refurbishment of the existing building. Approved by the Central Sydney Planning Committee in May 2024, the approved works include relocation of the lift core and stairs, new rooftop plant and equipment and internal reconfiguration for open plan office space.

Works to the lower ground floor and basement levels fronting Sophia Street includes the removal of all on-site parking and the demolition of existing driveways and vehicle ramps and reconfiguration of basement and lower ground to provide end of trip facilities and bicycle parking. Ground floor works include a new glazed frontage to Kippax Street to a refurbished ground floor lobby and town hall meeting space, a new retail space located at the corner of Sophia Street and Terry Street and demolition of an existing loading dock at Kippax Street and replacement with a two car space loading dock at the Sophia Street frontage.

If the LEP is amended by this planning proposal, the proponent intends to modify this development consent to accommodate the two storey rooftop addition as detailed in the indicative scheme supporting this planning proposal.

Both the planning proposal and development application have been assessed to ensure alignment and consistency between the two applications.

The City has prepared this planning proposal following detailed review and assessment of the proposed development concept. An amendment to the Sydney Development Control Plan 2012 (DCP), to be exhibited with this planning proposal, contains more detailed site-specific planning provisions.



Figure 8. Photomontage of the planning proposal concept development

2. Current planning controls

2.1 Zoning

The site is zoned MU1 Mixed Use in Sydney LEP 2012 as shown in Figure 8. A broad range of uses are permitted within this zone, including commercial premises, residential, community facilities, education facilities and visitor accommodation.

The MU1 zone objectives include providing for a mixture of land uses in accessible locations to ensure these uses support the vitality of centres. This planning proposal will not change the site's zoning.



Figure 9. Extract from the Zoning map in Sydney LEP 2012

2.2 Development controls

Maximum height of building

The site is subject to a maximum height of building control of 22m in Sydney LEP 2012, as shown in Figure 9. This is the same height as the adjoining sites to the east and north. Adjacent sites to the west and south are subject to a building height of 27 metres.



Figure 10. Extract from the Height of building map in Sydney LEP 2012

Floor space ratio

The maximum floor space ratio for the site is 3.5:1 as shown in Figure 10. Sites to the east and north have the same FSR. Sites to the west and south are subject to a mapped FSR of 4:1.



Figure 11. Extract from the Floor space ratio map in Sydney LEP 2012

2.3 Heritage

The site is not heritage listed or located within a heritage conservation area. There are however a number of heritage items within the vicinity. Figure 11 shows the location of these heritage items in relation to the subject site, including:

- I1469 – Dental Hospital including interior – 2-18 Chalmers Street, Surry Hills
- I1533 – "Hibernian House" including interior – 328-344 Elizabeth Street, Surry Hills
- I2267 – Former Farleigh Nettheim & Co Ltd warehouse including interiors – 1-15 Foveaux Street, Surry Hills

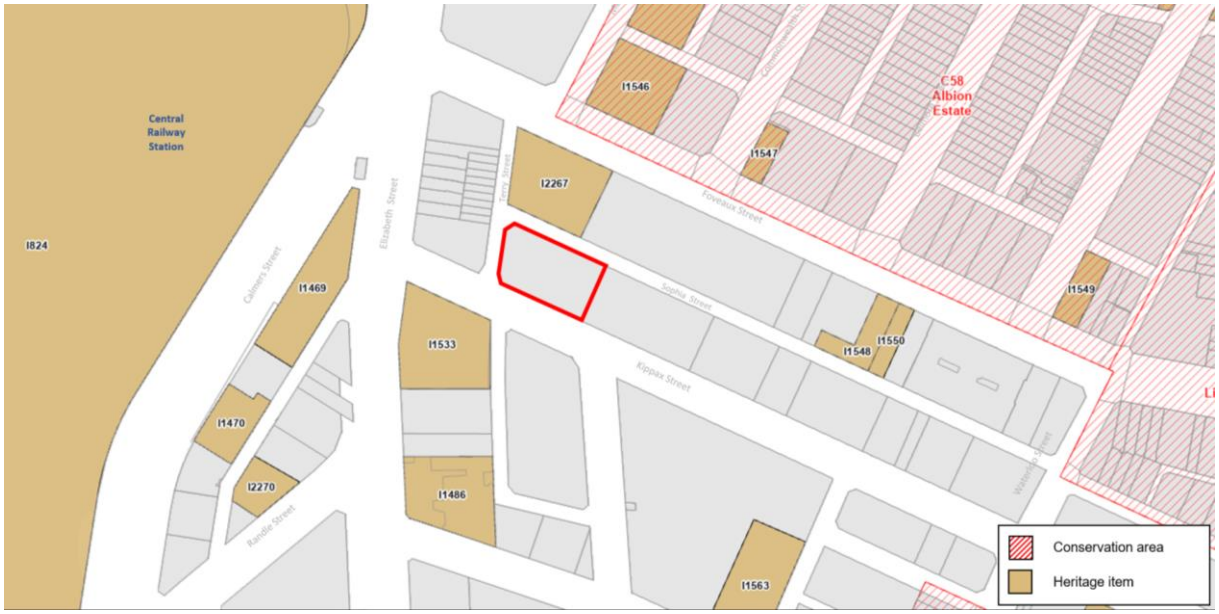


Figure 12. Extract from the Heritage map in Sydney LEP 2012

3. Objectives and intended outcomes

The objective of this planning proposal is to amend the Sydney Local Environmental Plan 2012 to provide additional building height and floor space ratio for 8-24 Kippax Street, Surry Hills to enable upgrades to the existing building comprising two additional floors and deliver improved office space.

The intended outcomes of this proposed amendment to the planning controls for the site are as follows:

- Facilitate high-quality office space in a well-located, strategic location, delivering new jobs in the City Fringe and Eastern Creative Precinct and maximising the site's location in Surry Hills close to Central Sydney;
- Encouraging greater walking, cycling and public transport usage through the removal of all on-site parking, utilising the site's location close to Central Railway Station and other public and active transport networks;
- Ensures the existing building is substantially retained and upgraded sympathetically;
- An upgraded built form that delivers an improved urban design and pedestrian experience at ground level through greater street activation;
- Additional building height and floor space to support new additions that are respectful, recessive and responds to the surrounding context and existing building's character;
- Realise the full development potential of the site by delivering new office floor space in the commercial precinct of Surry Hills; and
- Deliver an improved built form that delivers acceptable sustainability outcomes.

Draft site-specific amendments to the Sydney DCP 2012 accompany this planning proposal and provides more detailed design guidance for the future redevelopment of the site.

4. Explanation of provisions

4.1 Sydney Local Environmental Plan 2012

To achieve the intended outcomes, this planning proposal seeks to amend the Sydney Local Environmental Plan 2012 by inserting new site-specific provisions for the subject site, 8-24 Kippax Street, Surry Hills under Division 5 Site specific provisions to:

- incentivise the delivery of employment uses;
- allow a maximum building height of RL 67.06 metres;
- permit a maximum FSR of 10.2:1, inclusive of additional floor space and end of journey floor space;
- ensure development consent may only be provided subject to the following:
    - the building will not be used for residential accommodation or serviced apartments;
    - street frontages are activated by retail premises;
    - the provision of end of journey facilities; and
    - does not include any car parking spaces except for a minimum of two loading spaces for servicing of the building; and
- ensure this clause does not apply to the erection of a new building.
- waive the requirements for a competitive design process under clause 6.21D of the LEP, excluding bonus floor space and building height for design excellence.

Maximum building height

The current maximum building height for the site pursuant to clause 4.3 of the LEP is 22 metres, which is consistent with the adjoining sites to the north and east. While nearby sites fronting Elizabeth Street have a mapped height of 27 metres and 30 metres fronting Kippax Street to the east of the site.

The building on site has an existing height of 30 metres (RL 53m) to the parapet and 40 metres (RL 63m) to the top of the plant equipment, which already exceeds the mapped height control.

This planning proposal seeks to insert new site specific provisions with a maximum building height of RL 67.06 metres for the uses proposed. The indicative plans prepared by Cox Architecture detail the proposed two-storey building additions and external terrace include upper level setbacks to reduce their visual prominence. No additional height can be achieved through a design excellence competition, in this instance.

Floor space ratio

The mapped floor space ratio for the site pursuant to clause 4.4 of the LEP is 3.5:1, consistent with adjoining sites to the east along Kippax Street, while nearby sites to the south and along Elizabeth Street have a mapped FSR of 4:1.

Future development may also be subject to 0.3:1 end of journey floor space and design excellence additional floor space of up to 10% resulting in a maximum eligible floor space of 4.8:1.

Notwithstanding the above, the existing building on site has a gross floor area of 9,374m^2 which equates to an FSR of 9.1:1.

This planning proposal introduces new site specific provisions with maximum floor space ratio for the subject site of 10.2:1, inclusive of end of journey floor space. Design excellence additional floor space is not applicable in this instance.

Non-residential uses

To facilitate the delivery of additional commercial office floor space in this strategic location, only non-residential uses will be eligible for the additional building height and floor space site-specific provisions delivered as part of this planning proposal. As such, residential or serviced apartment uses are excluded from the proposed provisions.

This planning proposal will not change the MU1 Mixed Use zoning for the site, which permits a range of uses including retail, commercial and residential uses. Any future redevelopment of the site to include residential or serviced apartment uses will however be limited to the existing building height and floor space ratio controls.

Design excellence

The future development detailed in the reference scheme triggers the design excellence provisions pursuant to clause 6.21D of the LEP. Notwithstanding, the competitive design process requirements are considered unnecessary in this instance and will not be applicable for the site-specific provisions of this planning proposal.

The development concept has been prepared to ensure a high-quality outcome that will minimise any adverse impacts to the surrounding area and is appropriate to the building type. The site-specific DCP provisions detail the upper level setbacks to ensure the additions are recessive in nature with the bulk and scale minimised.

Drafting instructions

Appendix 1 of this planning proposal provides some example clauses of the proposed controls for the subject site to provide clear guidance of the outcomes this this planning proposal aims to achieve.

The final version of the clauses to be inserted into the LEP would be subject to drafting and agreement with the NSW Parliamentary Counsel's Office.

4.2 Sydney Development Control Plan 2012

To ensure future development is consistent with the objectives of the planning proposal, site-specific provisions for the DCP will be drafted to ensure a high-quality built form and public domain. These provisions include the maximum building envelope dimensions, controls relating to street activation, the use of the external terrace and servicing and access provisions.

A draft of the new site-specific provisions for the DCP can be found at as an attachment to this planning proposal.

5. Justification

The purpose of this planning proposal is to incentivise additional height of building and floor space controls to facilitate the adaptive reuse of this commercial building and bring it in line with current building standards for office space. No change to the land use zoning is proposed, nor would the future use of the building change significantly from its existing use.

5.1 Need for the planning proposal

Is the planning proposal a result of an endorsed LSPS, strategic study or report?

This planning proposal has been prepared following a request from the landowner to change the planning controls that relate to the site.

The landowner has provided a Planning Proposal Report prepared by Ethos Urban and a number of technical reports to support their request, including an Urban Design Report and Indicative Reference Scheme Drawings prepared by Cox Architecture. These reports detail how the proposal demonstrates strategic and site specific merit and is capable of supporting additional density and additional employment generating floor space without unacceptable public domain and amenity impacts.

The supporting documentation submitted by with landowner to support their request accompany this planning proposal as follows:

– Attachment A – Urban Design Report – Cox Architecture
– Attachment B – Indicative Reference Scheme – Cox Architecture
– Attachment C – Landscape Report – Arcadia
– Attachment D – Survey Plan – C & A Surveyors
– Attachment E – Draft Sydney Development Control Plan 2012 Amendment – Ethos Urban
– Attachment F – Public Benefit Offer Letter – Ethos Urban
– Attachment G – Public Art Strategy – UAP
– Attachment H – Noise Impact Assessment – Pulse White Noise Acoustics
– Attachment I – Traffic and Parking Assessment – Transport and Traffic Planning Associates
– Attachment J – Sustainability Statement – E-LAB Consulting
– Attachment K – Structural Statement – Meinhardt
– Attachment L – Civil Engineering Report – Enstruct

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

This planning proposal seeks to insert new site-specific provisions into Division 5 of Sydney LEP 2012 for the subject site. The proposed envelope has been assessed to ensure future development is appropriate to its context and does not result in any unacceptable impacts on adjoining properties or the public domain. The amended controls facilitate additional employment generating floor space consistent with the Local Strategic Planning Statement.

5.2 Relationship to the strategic planning framework

Will the planning proposal give effect to the objectives and actions of the applicable regional or district plan or strategy (including any exhibited draft plans or strategies)?

This planning proposal is consistent with the relevant actions and objectives of the applicable regional and district plans, as summarised below.

Greater Sydney Region Plan

A Metropolis of Three Cities – The Greater Sydney Region Plan is the NSW Government's overarching strategic plan for growth and change in Sydney.

The Plan outlines how Greater Sydney will manage and deliver growth and guide infrastructure delivery. This planning proposal gives effect to the Plan, as follows:

- Infrastructure – the future redevelopment of the site will support recent infrastructure investment as the site is well-positioned to maximise rail, light rail, bus, and future metro usage.
- Liveability – future development will contribute towards the public domain surrounding the site through new fine grain retail, greater activation and passive surveillance.
- Productivity – the proposal will deliver additional employment generating floor space for the digital and creative industry within the identified innovation corridor.
- Sustainability – future redevelopment of the site will deliver an upgraded building with improved sustainability outcomes, as well as embodied carbon benefits through the retention of the building structure.

Eastern City District Plan

The Eastern City District Plan sets out the vision, priorities and actions for the Eastern District of the Greater Sydney area, which includes the City of Sydney.

This planning proposal is consistent with the following priorities from the Plan:

- Planning Priority E1 – Planning for a city supported by infrastructure – this planning proposal will deliver additional employment generating floor space on a site close to existing and planned transport infrastructure, helping maximise existing and future service capacity.
- Planning Priority E6 – Creating and renewing great places and local centres, respecting the District's heritage – this planning proposal includes the adaptive reuse of the existing building to include fine-grain retail and greater street level activation. This will help support future public domain strategies.
- Planning Priority E7 – Growing a stronger and more competitive Harbour CBD – the subject site lies at the core of the Harbour CBD. This Planning Proposal delivers additional employment floor space, maximising the site's location close to Central railway station.
- Planning Priority E10 – Delivering integrated land use and transport planning for a 30 minute city – the future development scheme satisfies the 30 minute city objective as it will deliver additional employment floor space close to existing and future public transport connections, which includes direct train connections to many parts of Greater Sydney within 30 minutes.
- Planning Priority E11 – Growing investment, business opportunities and jobs in strategic centres – future development on site will deliver additional employment floor space, contributing to the Harbour CBD, City Fringe and Innovation Corridor economies.
- Planning Priority E13 – Supporting growth of targeted industry sectors – this planning proposal will deliver new floor space for digital and creative industries, which are targeted by the City and NSW government.
- Planning Priority E19 – Reducing carbon emissions and managing energy, water and waste efficiently – the proposed development scheme will deliver a new commercial building with significantly improved sustainability outcomes. Future development on the site is to achieve ambitious ecological sustainable development targets.

Is the planning proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy of strategic plan?

City Plan 2036 – Local Strategic Planning Statement

City of Sydney's endorsed local strategic planning statement, City Plan 2036 sets the land use planning context, vision and planning priorities to positively guide development. The planning statement outlines how the City will plan for and manage change. This planning proposal gives effect to the following priorities of the Statement:

Infrastructure

- I1. Movement for walkable neighbourhoods and a connected city – this planning proposal will contribute towards more walkable neighbourhoods with greater street activation and additional jobs in an accessible location, close to places for shopping, socialising and essential services.
- I2. Align development and growth with supporting infrastructure – the subject site is well located to take advantage of nearby existing and future transport infrastructure, including the light rail and the imminent Sydney Metro extension through the CBD, both projects will increase the public transport capacity supporting additional employment capacity.

Liveability

- L2. Creating great places – future development on the subject site comprises the adaptive reuse of the existing building delivering greater street activation through new ground floor uses and fine-grain retail space on the rear lanes, delivering improved street life.

Productivity

- P2. Developing innovative and diverse business clusters in City Fringe – this planning proposal facilitates additional office space in an existing employment cluster, supporting jobs in the knowledge-intensive technology sector. This will further support the wider tech industry cluster in the City Fringe, building on the nearby Western Gateway precinct.

Sustainability

- S2. Creating better buildings and places to reduce emissions and water and use water efficiently – development facilitated through this planning proposal includes measures to reduce emissions, including the retention of embodied carbon retained in the existing structure, passive design controls and a bio solar green roof to reduce energy consumption.

Sustainable Sydney 2030-2050: Continuing the vision

Sustainable Sydney 2030-2050 is the vision for a city that is green, global and connected achieved through sustainable growth, creativity and innovation. It sets targets, objectives and actions to achieve this vision. This planning proposal is aligned with the following strategic directions:

- Direction 2: A leading environmental performer – future development facilitated by this planning proposal will implement sustainability measures including a passive control and smart building system, which with photovoltaic systems will help place less demand on electricity networks.
- Direction 5: A city for walking, cycling and public transport – the site is well positioned to take advantage of existing transport infrastructure, including rail, light rail and bus connections as well as nearby cycleways. The removal of all on-site parking reduces the demand for private vehicle trips and encourages walking and public transport use.
- Direction 9: A transformed and innovative economy – this planning proposal supports further employment growth in the City Fringe, building on its strong locational advantage for an expanding cluster of high-tech creative industries in the area, and as a destination for business, investment and talent.

Is the planning proposal consistent with any other applicable State and regional studies or strategies?

Camperdown-Ultimo Collaboration Area Place Strategy

This planning proposal gives effect to the following priorities of the Place Strategy:

– Priority 5: Foster healthy, creative, culturally rich, socially connected and welcoming communities – Future development on the subject site will include greater street activation through new fine-grain retail space and active ground floor uses delivering passive surveillance and contributing towards a more welcoming public domain.

– Priority 7: Cultivate an internationally competitive health, education, research and innovation area – This planning proposal would facilitate the delivery of new office space in Surry Hills, close to Central railway station, supporting convergence, the further development of the cluster, attracting investment and driving jobs growth.

Is the planning proposal consistent with applicable State Environmental Planning Policies?

This planning proposal is consistent with all applicable State Environmental Planning Policies (SEPPs), as summarised in Table 2

Table 2: Consistency with State Environmental Planning Policies

State Environmental Planning Policy	Comment
SEPP (Biodiversity and Conservation) 2021	This planning proposal is consistent. The site is located within the Sydney Harbour Catchment Area, but not within the Foreshores and Waterways Area. The proposed indicative scheme includes the adaptive reuse of the existing building on site and does not propose any significant excavation or change to the stormwater network adjacent to the site that would result in impacts to the groundwater, flood impacts or pollution. Further, the indicative scheme and approved development demonstrate that the proposal complies.
SEPP (Exempt and Complying Development Codes) 2008	Consistent
SEPP (Housing) 2021	Consistent
SEPP (Industry and Employment) 2021	Consistent
SEPP (Planning Systems) 2021	Consistent
SEPP (Precincts–Eastern Harbour City) 2021	Consistent
SEPP (Resilience and Hazards) 2021	This planning proposal is consistent. Proposed development facilitated by this planning proposal seeks to retain the existing building for alterations and additions and will not result in adverse additional impacts. Further investigation regarding potential contamination and remediation will be undertaken as part of any future development application process. The site is not located within the Coastal Environment Area nor the Coastal Use Area.
SEPP (Resources and Energy) 2021	Consistent

State Environmental Planning Policy	Comment
SEPP (Sustainable Buildings) 2022	Consistent
SEPP (Transport and Infrastructure) 2021	Consistent – this planning proposal seeks to remove all on-site car parking to encourage greater public transport patronage, delivering efficient use of new and existing infrastructure.

The following SEPPs are not applicable to this planning proposal:

– SEPP (Precincts – Central River City) 2021, SEPP (Precincts – Regional) 2021, SEPP (Precincts – Western Parkland City) 2021, SEPP (Primary Production) 2021

Is the planning proposal consistent with applicable Ministerial Directions (section 9.1 Directions) or key government priority?

This planning proposal is consistent with all Ministerial Directions issued under section 9.1 of the Environmental Planning and Assessment Act 1979, as summarised in Table 3.

Table 3: Consistency with Ministerial Directions

Ministerial Direction	Comment
Focus area 1: Planning Systems	
1.1 Implementation of Regional Plans	Consistent – this proposal gives effect to the Greater Sydney Region Plan as detailed above.
1.3 Approval and Referral Requirements	Consistent – no provision includes concurrence, consultation or referral provisions, or identifies any designated development.
1.4 Site Specific Provisions	Consistent – this proposal does not restrict the permitted uses on the land. This planning proposal provides an uplift for commercial development, consistent with local, district and State strategies. Other uses remain permissible on the site pursuant to its zoning.
1.4A Exclusion of Development Standards from Variation	Consistent – this planning proposal does not propose to exclude a development standard from variation under clause 4.6.
Focus area 3: Biodiversity and Conservation	
3.1 Conservation Zone	Consistent – no amendment in this proposal hinders the application of this Direction
3.2 Heritage Conservation	Consistent – the site is not a heritage item or in conservation area, however it is adjacent to a number of heritage items. This planning proposal does not alter heritage controls applicable to the site. Any future development application will be assessed on impacts to nearby heritage.

Ministerial Direction	Comment
3.5 Recreation Vehicle Areas	Consistent – no amendment in this proposal hinders the application of this Direction
3.7 Public Bushland	Consistent – no amendment in this proposal hinders the application of this Direction
3.9 Sydney Harbour Foreshores and Waterways Area	Consistent – the site is outside the Foreshores and Waterways Area and will not impact the application of this Direction or the SEPP.
Focus area 4: Resilience and Hazards	
4.1 Flooding	Consistent – the street at the rear of the site has an identified flood risk. The indicative scheme and approved development application demonstrate that the proposal is able to comply with the City's Interim Floodplain Management Policy meeting the requirements of this Direction. The LEP amendments will not inhibit future development from complying with flood planning requirements, nor result in adverse impacts to other properties.
4.2 Coastal Management	Consistent – the subject site is within a coastal zone as defined under the Coastal Management Act 2016. No provision contained in this planning proposal hinders the application of this Act.
4.4 Remediation of Contaminated Land	Consistent – this proposal seeks to adaptively reuse the existing commercial building on site for office use and does not include any excavation. If needed a detailed contamination assessment can be carried out at development application stage.
4.5 Acid Sulfate Soils	Consistent – the site is located on Class 5 Acid Sulfate Soils identified land as per the LEP. The nearest Class 2 land is 686m to the west in Haymarket. The proposal does not include any change of use or excavation and will not result in the disturbance or impact to sensitive uses.
Focus area 5: Transport and Infrastructure	
5.1 Integrating Land Use and Transport	Consistent – the subject site is well-located close to key public transport connections including Central Railway Station.
Focus area 6: Housing	
6.1 Residential Zones	Consistent – the site's zoning permits residential use. This planning proposal seeks to encourage commercial uses in a particular development outcome and will not prohibit any residential use.

Ministerial Direction	Comment
6.2 Caravan Parks and Manufactured Home Estates	Consistent – no amendment in this proposal hinders the application of this Direction
Focus area 7: Industry and Employment	
7.1 Employment Zones	Consistent – this planning proposal will deliver employment growth in a suitable location, helping protect and support the viability of this area.

The following Directions are not applicable to this planning proposal:

– 1.2 Development of Aboriginal Land Council Land, 1.5 Parramatta Road Urban Transformation Strategy, 1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan, 1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan, 1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan, 1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor, 1.10 Implementation of the Western Sydney Aerotropolis Plan, 1.11 Implementation of Bayside West Precincts 2036 Plan, 1.12 Implementation of Planning Principles for the Cooks Cove Precinct, 1.13 Implementation of St Leonards and Crows Nest 2036 Plan, 1.14 Implementation of Greater Macarthur 2040, 1.15 Implementation of the Pyrmont Peninsula Place Strategy, 1.16 North West Rail Link Corridor Strategy, 1.17 Implementation of the Bays West Place Strategy, 1.18 Implementation of the Macquarie Park Innovation Precinct, 1.19 Implementation of the Westmead Place Strategy, 1.20 Implementation of the Camellia-Rosehill Place Strategy, 1.21 Implementation of the South West Growth Area Structure Plan, 1.22 Implementation of the Cherrybrook Station Place Strategy, 3.3 Sydney Drinking Water Catchments, 3.4 Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs, 3.6 Strategic Conservation Planning, 3.8 Willandra Lakes Region, 3.10 Water Catchment Protection, 4.3 Planning for Bushfire Protection, 4.6 Mine Subsidence and Unstable Land, 5.2 Reserving Land for Public Purpose, 5.3 Development Near Regulated Airports and Defence Airfields, 5.4 Shooting Ranges, 7.2 Reduction in non-hosted short-term accommodation period, 7.3 Commercial and Retail Development along the Pacific Highway, North Coast, 8.1 Mining, Petroleum Production and Extractive Industries, 9.1 Rural Zones, 9.2 Rural Lands, 9.3 Oyster Aquaculture, 9.4 Farmland of State Regional Significance on the NSW Far North Coast.

5.3 Environmental, social and economic impact

Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected because of the proposal?

The planning proposal is unlikely to adversely affect any critical habitat or threatened species, populations or ecological communities of their habitats. The subject site is located in Surry Hills at the centre of the Harbour CBD, which does not contain any critical habitats or threatened species, populations or ecological communities.

Are there any other likely environmental effects of the planning proposal and how are they proposed to be managed?

The additional building height and floor space ratio facilitated by this planning proposal will provide for the adaptive reuse of the existing ageing commercial building to accommodate premium-grade office space.

The proposed amendments are unlikely to result in any adverse amenity impacts that cannot be controlled. Existing policies, regulations and standards are in place to ensure environmental impacts are mitigated during the construction phase and eventual use of the development.

The proposed scheme has been developed in collaboration with the proponent with any environmental impacts resulting from the proposal having been identified and resolved during assessment.

The key environmental consideration arising from the planning proposal, particularly in relation to urban amenity, are discussed below.

Building envelope and tower setbacks

This planning proposal inserts site-specific provisions in the LEP. The increase in the maximum building height from 30m to 44m (RL 67.06m) provides for a building envelope that will accommodate the increase to the floor space ratio, from 9.1:1 to 10.2:1, inclusive of end of journey floor space. Bonus floor space for design excellence is not applicable in this instance. There is no change to the mapped building height or floor space ratio controls for the site.

The site-specific provisions will facilitate the refurbishment and adaptive reuse of the existing ageing commercial building on the site comprising premium-grade office space and retail use on the ground floor. To achieve the proposed development concept, the site-specific provisions will restrict the additional building height to non-residential accommodation and non-serviced apartment uses only.

The proposed concept design includes the retention of the existing 10 storey commercial building with a new two storey rooftop addition. No significant external change will be made to the existing building and the new built elements shall be designed to be recessive in nature and setback from the parapet of the existing building. Provisions in the site-specific DCP will detail the required building height and setbacks to ensure an appropriate built form. The planning envelope, building height and setbacks are detailed in Figure 13.

The proposed provisions will ensure the rooftop additions will be recessive in nature through the use of materials and setbacks. This will ensure the additions will not contribute unnecessary visual bulk and scale impacting the surrounding area and provides for a sensitive redevelopment of the site and delivering much needed additional employment floor space in the precinct.

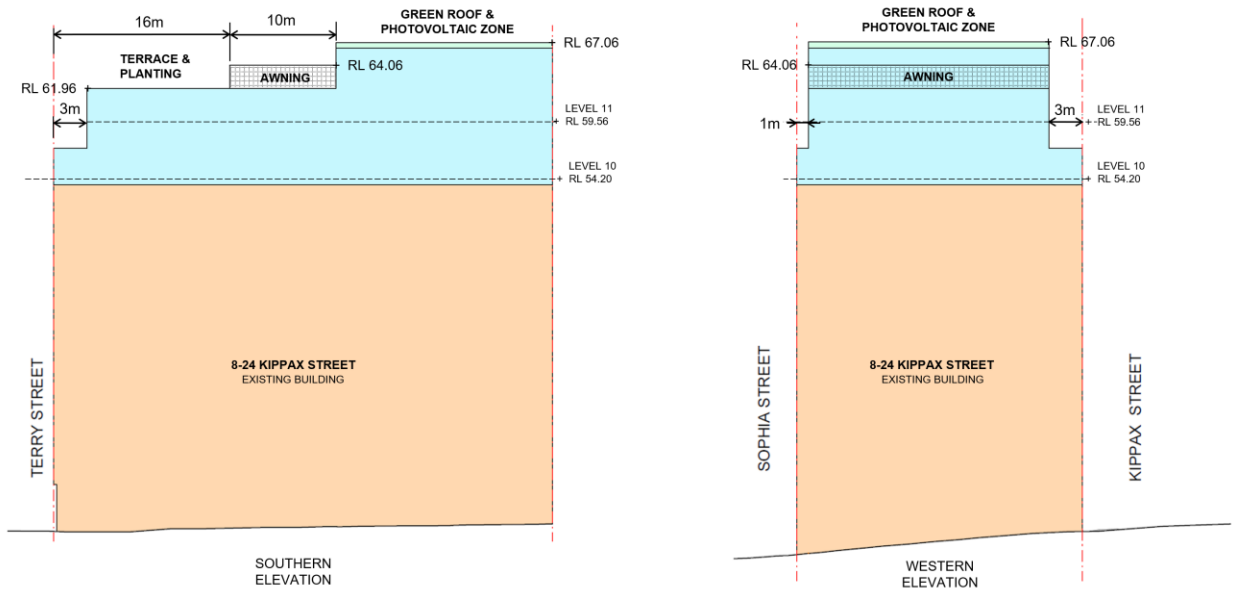


Figure 13. Proposed building envelope with rooftop additions

Overshadowing

An overshadowing analysis prepared by Cox Architecture accompanies this planning proposal detailing overshadowing impacts of adjacent buildings and public domain from the proposed additions.

The buildings to the south west of the site that front Elizabeth Street experience overshadowing from the existing building as well as the proposed additions until 11.00am at the winter solstice as shown in Figure 14 below. It is noted that these buildings do not include residential uses. The nearest residential buildings which front Cooper Street (as shown in pink and purple below) are not impacted by the proposal.

An analysis was also undertaken on a hypothetical future redevelopment of the carpark to the south of the site into residential apartments, finding that the proposed additions would not impact the site's ability to achieve adequate direct sunlight.

The proposed envelope will not result in any additional overshadowing or significant amenity to the any of the apartments within the adjoining apartment building on Kippax Street.

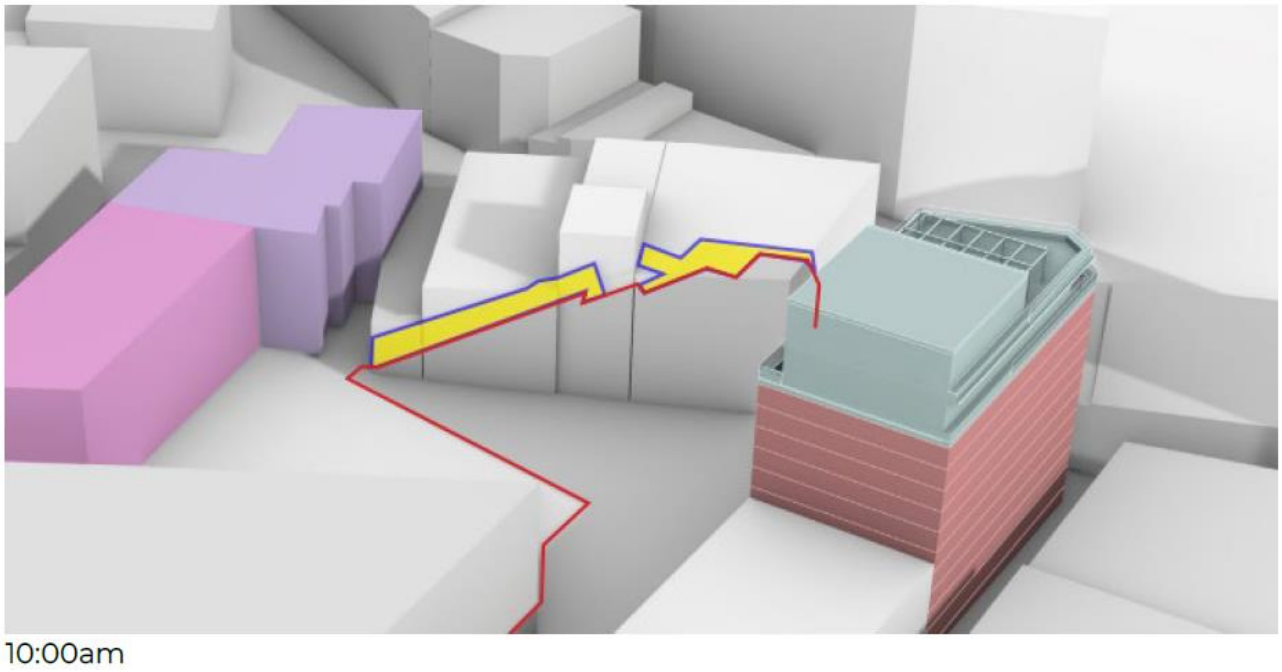


Figure 14. Overshadowing analysis of the proposed additions at winter equinox

Transport and servicing

The redeveloped building will not include any on-site car parking, resulting in fewer private vehicle trips and less traffic congestion. The proposed future redevelopment retains employment uses on the site, close to Central Railway Station and public and active transport infrastructure. The proposal presents an opportunity for the strategically located site to maximise its connections to these networks.

End of journey facilities shall be accommodated within the basement, accessed from Sophia Street, with bicycle parking in accordance with section 3.11.3 of the Sydney DCP.

A minimum of two off-street servicing and loading spaces are to be provided at the rear of the subject site accessed from Sophia Street. This will ensure that the servicing and loading demands of the building can be accommodated internally within the site alleviating pressure from the on-street parking network and help make the surrounding area more pedestrian friendly.

Waste collection will continue to be collected from Sophia Street at the rear of the site in accordance with existing arrangements. The reconfiguration of the lower-ground floor moves the waste storage room to the Sophia Street frontage to speed up collection times and minimise any disruption.

It is intended that the site-specific LEP provisions facilitated by this planning proposal will ensure that development consent may only be granted to a building that includes end of journey facilities and does not include any car parking spaces except for a minimum of two loading spaces for servicing of the building.

Flooding

The Darling Harbour Catchment Floodplain Risk Management Plan prepared by the City identifies the subject site as being flood-affected. The proposal removes the basement car park and converts the area into retail and meeting spaces as well as other land uses, which may have the effect of exposing users to flood risk.

A Stormwater Management Plan has been prepared by Enstruct L which sets the application of flood planning levels in accordance with the relevant requirements of City's Interim Floodplain Management Policy and details measures to mitigating the impacts of flooding on the site.

Sustainability

The proposed redevelopment of the subject site facilitated by this planning proposal shall be subject to the sustainability requirements outlined in Sydney LEP 2012 and Sydney DCP 2012.

The planning proposal request was accompanied by a Sustainable Statement that outlined the sustainability commitments of the proposal and demonstrating that future development is capable of achieving the ESD objectives and controls of the Sydney DCP 2012, therefore meeting LEP requirements and the energy and water standards and provisions of the Sustainable Buildings SEPP. Particularly delivering embodied carbon benefits through the retention and adaptive reuse of the existing building.

Has the planning proposal adequately addressed any social and economic effects?

This planning proposal provides an opportunity for the adaptive reuse of the existing building on site to accommodate additional employment generating floor space and serve as the new national headquarters for a technology company in Surry Hills. Redevelopment will provide the following positive economic and social effects:

- delivering more than 10,000m^2 of refreshed office space including approximately 1,000m^2 of additional employment generating floor space which will strengthen and contribute towards the viability of the Innovation Corridor;
- creating an estimated 110 additional jobs;
- revitalisation of an ageing commercial building further contributing to the regeneration of the surrounding area; and
- improved activation of the adjoining public domain, delivering improved amenity and safety for the public.

5.4 Infrastructure (Local, State and Commonwealth)

Is there adequate public infrastructure for the planning proposal?

There is adequate public infrastructure to support this planning proposal. The subject site is 100m from Central Railway Station and close to Central Sydney and Haymarket. As such, the site is well served by a full range of public utilities including electricity, telecommunications, water, sewer and stormwater. It is expected these services will be upgraded where required by the land owner.

Furthermore, the site is also well served by existing public and active transport infrastructure as well as nearby parks and social infrastructure. In particular, the site is located 250m from Prince Alfred Park and pool to the south, 250m from Belmore Park to the north and 400m to Surry Hills Library on Crown Street to the east.

The detailed development application will be subject to statutory development contributions, which will contribute towards local infrastructure and public domain improvements, in line with the City's endorsed strategies and planned upgrades for the precinct.

5.5 State and Commonwealth interests

What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

The gateway determination will advise the public authorities to be consulted as part of this planning proposal process. Issues raised will be incorporated into this planning proposal following the consultation in the public exhibition period.

6. Mapping

This planning proposal does not include any amendments to maps.

No change will be made to any maps contained in the LEP, instead alternative building height and floor space ratio development controls are proposed through a new site-specific provision under Division 5 of the LEP.

The draft DCP that accompanies this planning proposal includes detailed figures and diagrams to reflect the proposed future development concept as discussed in this planning proposal.

7. Community consultation

This planning proposal shall be exhibited in accordance with the requirements of the gateway determination once issued by the Department of Planning, Housing and Infrastructure.

It is anticipated that the gateway determination will require public exhibition for a period of not less than 20 working days in accordance with the Environmental Planning and Assessment Act 1979 and Local Environmental Plan Making Guideline dated August 2023.

Notification of the public exhibition will be consistent with the gateway determination and the City's Community Participation Plan. This will include publication on the City of Sydney website and notification to surrounding landowners and occupiers via letter.

Consultation with the necessary state and federal agencies, authorities, other relevant organisations and stakeholders will be undertaken in accordance with the conditions contained in the gateway determination.

8. Project timeline

This planning proposal is categorised as a Principal planning proposal as per the Local Environmental Plan Making Guidelines dated August 2023, the anticipated timeframe for the completion of the planning proposal is as follows:

Stage	Timeframe
Commencement / gateway determination	August 2024
Government agency consultation	September-October 2024
Public exhibition	September-October 2024
Review of issues raised in submissions	November-December 2024
Post-exhibition reporting	February 2025
LEP drafting	March 2025
LEP made	April 2025
LEP notification	April 2025

Appendix 1

Example provisions

The final version of the site-specific provisions to be inserted into the LEP are subject to drafting and agreement with NSW Parliamentary Counsel's Office, but may be as follows:

Part 6 Local provisions – height and floor space

Division 5 Site specific provisions

6.XX 8-24 Kippax Street, Surry Hills

(1) The objective of this clause is to provide for additional building height and floor space to be granted as an incentive for the adaptive reuse of the building on land to which the clause applies.

(2) This clause applies to 8-24 Kippax Street, Surry Hills, being Lot 3 in DP 547558.

(3) A building on land to which this clause applies may have–

(a) maximum building height of RL 67.06 metres.

(b) maximum floor space ratio of 10.2:1

(4) Development consent must not be granted under this clause unless the consent authority is satisfied that the resulting building–

(a) will not be used for the purposes of residential accommodation or serviced apartments, and

(b) the development will result in business premises or retail premises at street level, and

(c) the building will include end of journey facilities, and

(d) does not include any car parking spaces except for a minimum of two loading spaces for servicing of the building

(5) A building on land to which this clause applies is not entitled to any other additional floor space permitted by this plan except as provided by this clause.

(6) This clause does not apply to the erection of a new building on land to which this clause applies.

(7) Clause 6.21D(1) and (3)(a) and (b) do not apply to a building on the land to which this clause applies.

(8) In this clause—

end of journey facilities means all of the following facilities together in one area of the building—

(a) showers,

(b) change rooms,

(c) lockers,

(d) bicycle storage areas.

Attachment A1

Planning Proposal Report

9 April 2024

2230181

Sally Peters
Manager Central Sydney Planning
City of Sydney Council
456 Kent Street,
SYDNEY NSW 2000

Attn: Daniel Thorpe, Senior Planner, City of Sydney

Dear Daniel,

8-24 Kippax Street, Surry Hills – PP/2023/2802

Response to Council's Request for Additional Information

This letter prepared by Ethos Urban on behalf of Canva Pty Ltd (Canva), constitutes a response to the request for information from the City of Sydney (Council) dated 27 February 2024 in relation to the abovementioned Planning Proposal.

This response should be read in conjunction with the following supporting technical studies which have been updated to reflect Council's specific requests:

- Updated Indicative Reference Scheme Drawings prepared by Cox Architecture (**Attachment A**);
- Updated Design Report prepared by Cox Architecture (**Attachment B**); and
- Flood Report prepared by Enstruct (**Attachment C**).

Key matters raised by Council in their letter and a response to each is provided in **Table 1** below.

Table 1 Response to Council's RFI

Council Comment	Response
Envelope • Council have requested the Planning Proposal envelope drawings be updated to accommodate all elements of the currently (and as modified) lodged application.	Refer to updated Indicative Reference Scheme Drawings provided at **Attachment A** and updated Design report provided at **Attachment B**.
Servicing • Council have requested consideration of on-site servicing and loading and the provision of two servicing spaces fronting Sophia Street for B99 sized vehicles.	The loading and servicing arrangement has been addressed as part of Canva's response to Council's request for further information relating to D/2023/1162 which was submitted on 8 April 2024. The Planning Proposal drawings have been updated accordingly (refer to **Attachment A**).
Flooding • Council have requested all possible mitigation options have been explored and documented to ensure that	The Flood Report provided with Canva's response to Council's request for further information relating to D/2023/1162 considers the potential flood mitigation

Council is satisfied that none of the options can be implemented.	options. It has been provided at **Attachment C** for Council's information.
Public Benefit Offer • Council have requested a monetary contribution be provided in line with the City's infrastructure and affordable housing contribution requirements at the time of the development application.	The Planning Proposal no longer seeks to convert Sophia Street into a shared zone as a public benefit offer. Monetary contributions associated with the future development application will apply

We trust the above is sufficient to allow Council to proceed with the lodgement of PP/2023/2802. Should you require anything further, please do not hesitate to contact the undersigned.





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Senior Urbanist
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Stephen Gouge
Director
sgouge@ethosurban.com
0410 291 014

Planning Proposal Report

Amendments to Sydney Local Environmental Plan 2012

8-24 Kippax Street, Surry Hills
Prepared on behalf of Canva



Ethos Urban

Canva

Prepared by Ethos Urban
Submitted to City of Sydney Council
12 December 2023 | 2230181



'Gura Bulga'

Liz Belanjee Cameron

'Gura Bulga' – translates to Warm Green Country. Representing New South Wales.



'Dagura Buumarri'

Liz Belanjee Cameron

'Dagura Buumarri' – translates to Cold Brown Country. Representing Victoria.



'Gadalung Djarri'

Liz Belanjee Cameron

'Gadalung Djarri' – translates to Hot Red Country. Representing Queensland.

'Gura Bulga' – translates to Warm Green Country. Representing New South Wales.
By using the green and blue colours to represent NSW, this painting unites the contrasting landscapes. The use of green symbolises tranquillity and health. The colour cyan, a greenish-blue, sparks feelings of calmness and reminds us of the importance of nature, while various shades of blue hues denote emotions of new beginnings and growth. The use of emerald green in this image speaks of place as a fluid moving topography of rhythmical connection, echoed by densely layered patterning and symbolic shapes which project the hypnotic vibrations of the earth, waterways, and skies.

Ethos Urban acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We pay our respects to their Elders past, present and emerging.

In supporting the Uluru Statement from the Heart, we walk with Aboriginal and Torres Strait Islander people in a movement of the Australian people for a better future.

Contact	Stephen Gouge Associate Director	sgouge@ethosurban.com 9956 6962

This document has been prepared by:		**This document has been reviewed by:**	
Jules Wittenoom Louw and Liam Serra	12.12.2023	Stephen Gouge	12.12.2023

Version No.	**Date of issue**	**Revision by**	**Approved by**
Working Draft	1.12.2023	LS/JWL	
Revised Working Draft	7.12.2023	LS/JWL	
FInal	12.12.2023	LS/JWL/SG	SG

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B.	**Indicative Reference Scheme**	*Cox Architecture*
C.	**Landscape Report**	*Arcadia*
D.	**Survey Plan**	*C & A Surveyors*
E.	**Draft Sydney Development Control Plan 2012 Amendment**	*Ethos Urban*
F.	**Public Benefit Offer Letter**	*Ethos Urban*
G.	**Public Art Strategy**	*UAP*
H.	**Noise Impact Assessment**	*Pulse White Noise Acoustics*
I.	**Traffic and Parking Assessment**	*Transport and Traffic Planning Associates*
J.	**Sustainability Statement**	*E-LAB Consulting*
K.	**Structural Statement**	*Meinhardt*
L.	**Civil Engineering Report**	*Enstruct*

Executive Summary

Ethos Urban has prepared this report on behalf of the Canva Pty Ltd (the Proponent) in support of a Planning Proposal to amend the *Sydney Local Environmental Plan 2012* (LEP 2012). The Planning Proposal intends to facilitate additional high quality commercial office floorspace at 8-24 Kippax Street (the site) through minor increases the maximum building height and floor space.

Specifically, the Planning Proposal seeks to amend the LEP 2012 to increase the site's maximum permissible building height from 22m to RL 66.060m and FSR to 9.85:1. This would be supported by a site-specific clause to SLEP 2012 tied to specific requirements for ground/lower ground level activation, removal of all on-site car parking on the site and exemplar sustainability standards.

The Planning Proposal will maximise the site's strategic value by facilitating additional employment within walking distance of the Central Station, the Central precinct and the expansion of Tech Central to help support the role of Sydney CBD in line with the objectives and actions in both State and Council Strategic Plans.

The Site

The land that is the subject of this planning proposal is located at the heart of the newly emerging technology precinct of 'Tech Central', at 8-24 Kippax Street, Surry Hills. The site currently comprises a ten-storey commercial building above one storey of basement, known as the KMS Building, covering an area of 1,032m^2. The building was wholly acquired by Canva Pty Ltd in December 2022, and is currently partially occupied, with Canva managing the exit of remaining tenants. The site is situated within the western edge of Surry Hills and forms part of the 'Surry Hills Central' precinct of Surry Hills, as identified under the Sydney DCP 2012. It sits approximately 100 metres east from the western entrance to Central Station. The site is approximately 2.3km south east of the Sydney CBD.

The existing KMS Building on the site currently has significant limitations which is leading to operational challenges. This prevents Canva Pty Ltd from accessing the unique opportunity to undertake a comprehensive refurbishment and fit out of the building to meet their ambition to create the best workplace for their employees. Considering the location of the site in the heart of the emerging 'Tech Central' precinct, the existing building is in need of renewal, enabling the conversion of an existing underutilised commercial asset, into a modern, sustainable benchmark and workplace that is within immediate proximity to Sydney's major transport hub.

Key Objectives and outcomes

The objective of the planning proposal is to amend the SLEP 2012 to enable the upgrade of the existing KMS Building to deliver a significantly improved commercial office outcome, within the emerging 'Tech Central' precinct, as Australian headquarters of Canva. The proposed amendments to the SLEP 2012 seeks to capitalise on government investment and proximity to infrastructure allow for improved commercial office outcome and investment, whilst responding the site's characteristics, and suitably responding to opportunities and constraints.

The intended outcomes of the planning proposal are to:

- Facilitate the renewal of the site by creating high quality, fine grain active frontages addressing Kippax Street, while also delivering high quality commercial office space that addresses the identified need to support innovative and digital industries within the 'Surry Hills Central' and emerging nearby 'Tech Central' precinct, as well as throughout the wider Sydney CBD.
- Achieve Canva's vision for the site and project for a world-class commercial office building that unlocks the full development potential of the site in delivering premium-grade floor space that accommodates emerging future work practices and support Sydney's role of Australia's global city.
- Support the 30-minute city concept by growing employment in an established centre within the Harbour CBD with a high level of existing amenity and infrastructure, including proximity to transport services.
- Realise a significant increase in employment capabilities within the vicinity of multiple Sydney Metro stations and other key transport networks (i.e., existing light rail and heavy rail).
- Apply a maximum building height and FSR standard that is commensurate with Surry Hill Central's role as the retail centre of Surry Hills, supported with active frontages and a mixture of commercial offerings.
- Provide an improved urban design and pedestrian experience at ground level, with enhanced street activation, the protection of sunlight and appropriate wind conditions.

- Support the provision of premium-grade floorplates of up to 895m^2 GFA in size.

The proposed changes to the LEP to increase the maximum FSR and height of building controls will enable the delivery of the expansion of the current building, of a bulk and scale that is respectful and recessive to the built form, bulk and scale of the existing building.

Proposed Amendments

The Planning Proposal seeks the following amendments to the Sydney LEP 2012:

- Propose a site-specific clause that enables the site's maximum permissible building height to increase from 22m to 42.7m (from an existing building of 39.5m) FSR of 9.85:1 (from an existing building FSR of 9.1:1). The clause will also include a restriction on any on-site car parking and residential uses, removes the potential for any additional designed excellence bonuses (up to 10%) and a requirement for active frontages.
- A concurrent site specific DCP amendments is also provided to provide guidance on the built form envelope, landscaping and canopy coverage, retail uses and ESD performance.

The proposed amendments to Sydney LEP 2012 are supported by the Urban Design Report and Concept Envelopes within the Indicative Reference Scheme prepared by Cox Architecture (**Appendix A** & **B**).

Strategic Justification

The Planning Proposal aligns with the fundamental strategic and site-specific principles that are established to guide growth in appropriate locations. The proposal, to provide the headquarters for Canva as owner/occupier with Surry Hills, seeks to adaptive reuse an existing vacant and underperforming building. The proposal leverages significant investment in transport infrastructure to provide world class employment space for more than 1,000 staff.

Environmental Assessment

The Planning Proposal provides an environmental assessment of an indicative proposal in accordance with the amended development standard, providing a summary of the detailed environmental investigations undertaken. It includes:

- Built form and Urban Design
- Overshadowing
- Visual Impacts
- Design Excellence
- Acoustic Impacts
- Flooding
- Traffic and Parking
- Structural Capability
- Public Art
- Ecologically sustainable design
- Social and Economic Impacts

The findings of the environmental assessment conclude that the proposed planning control is acceptable and does not compromise the amenity of the surrounding precinct.

Planning Process and Next Steps

It is requested that Council consider the proposed amendments contained in this Planning Proposal and, should Council form the view that there is strategic merit in proceeding with the recommended amendments:

- Refer the proposal to the NSW Department of Planning and Environment's Gateway Determination Panel.
- Post Gateway Determination.
- Publicly exhibit the Planning Proposal to obtain community and stakeholder input.

Future planning applications would be required for the detail and assessment of specific proposals to carry out works at the site.

1.0 Introduction

This planning proposal justification report forms part of a rezoning request submitted to the City of Sydney Council (Council) in support of proposed amendments to the Sydney Local Environmental Plan 2012 (SLEP 2012). The proposed amendments will facilitate the redevelopment of 8-24 Kippax Street, Surry Hills (the site). The planning proposal has arisen from the opportunity to renew the existing commercial building on the site, aligning with the need to upgrade existing commercial office space to a world class standard within the newly emerging technology precinct of 'Tech Central'.

The Planning Proposal seeks the following amendment to the LEP 2012

- Propose a site-specific clause that enables the site's maximum permissible building height to increase from 22m to 42.7m (from an existing building of 39.5m) FSR of 9.85:1 (from an existing building FSR of 9.1:1). The clause will also include a restriction on any on-site car parking and residential uses, removes the potential for any additional designed excellence bonuses (up to 10%) and a requirement for active frontages.
- A concurrent site specific DCP amendments is also provided to provide guidance on the built form envelope, landscaping and canopy coverage, retail uses and ESD performance.

As required by Section 3.33 of the Environmental Planning & Assessment Act 1979 (EP&A Act), and in reference to the Local Environmental Plan Making Guideline, this planning proposal report includes:

- a statement of the objectives or intended outcomes of the proposed instrument (**Section 6.0**);
- an explanation of the provisions that are to be included in the proposed instrument (**Section 7.0**);
- the justification for those objectives, outcomes and provisions and the process for their implementation (including whether the proposed instrument will comply with relevant directions under Section 9.1 of the EP&A Act) (**Section 8.0**);
- maps containing sufficient detail to indicate the substantive effect of the proposed amendments (**Section 10.4**);
- details of community consultation (**Section 10.5**); and
- project timeline (**Section 10.6**).

This planning proposal report describes the site, the proposed amendments to the SLEP 2012 and provides an environmental assessment of the proposed reference design. The report should be read in conjunction with the Urban Design Report prepared by Cox Architecture (refer to **Appendix A**) and specialist consultant reports appended to this proposal.

1.1 The Proponent

The proponent for the Planning Proposal is **Canva Pty Ltd.**

1.2 Background and Context

1.2.1 Canva

Launched in 2013, Canva is an online design and visual communication platform with a mission to empower everyone in the world to design anything and publish anywhere. They are a proud Australian success story with an annual Revenue of $1.7B and are now an international company of 4,000+ people with offices in Australia, New Zealand, United States, United Kingdom, China, Austria, Philippines and Czech Republic. In Australia Canva have offices in Sydney, Melbourne, Brisbane, Adelaide and Perth with their headquarters located in Surry Hills.

As a global platform with a community across 190 countries, Canva strongly believe in the important responsibility it has to use their voice, platform, and each to stand behind these values that drive Canva, While different values might resonate more at various points in time for each Canva employee (Canvanaut), the one that intrinsically threads through everything Canva does is to be 'Be a Force For Good' and has been a core part of its mission, culture, and overall company DNA from the very beginning.

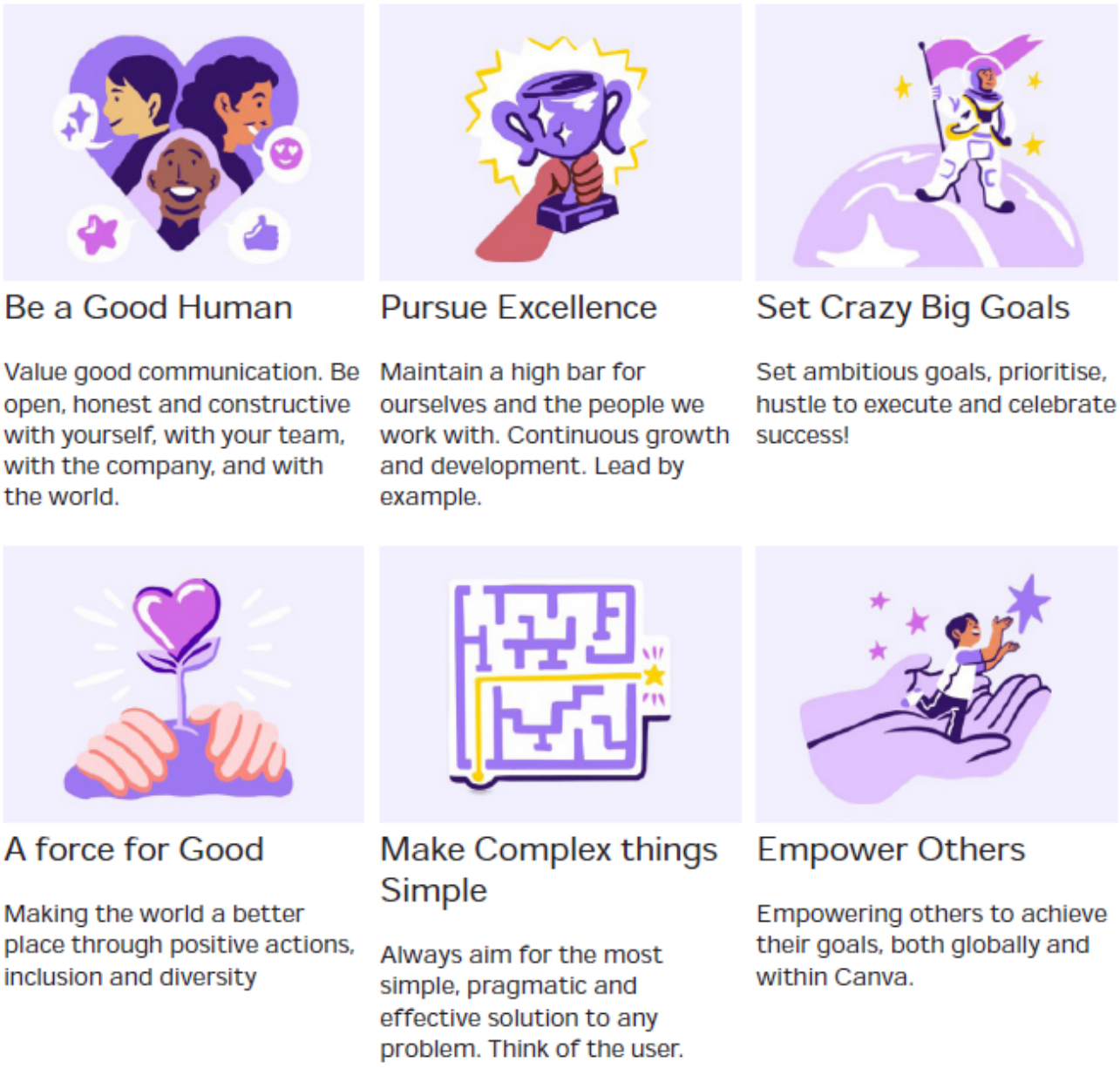


Figure 1 Canva Values
Source: Canva + Cox

1.3 Site Vision

Surry Hills has been the home of Canva for nearly a decade – the company is embedded in its creative and vibrant pulse and are invested in continued growth and expansion of the ecosystem as part of the wider Tech Central precinct. In 2022, Canva purchased 8-24 Kippax Street, Surry Hills with a vision to create a new national headquarters whilst still retaining the Canva campus within Surry Hills.

The redevelopment of 8-24 Kippax Street (the site) provides a unique opportunity for Canva to expand their presence and commitment to the suburb of Surry Hills. In December 2022, Canva completed the acquisition of the site, with the existing building having been built in the 1960s, and having last underwent a refurbishment in the late 1990s. The project will involve undertaking a comprehensive refurbishment and fit out of the building to meet Canva's ambition to create the best workplace for their employees.

Located at the heart of the newly emerging technology precinct of 'Tech Central', the proposed development will integrate with existing Canva offices in the area (**Figure 2**) and deliver a new state-of-the-art central office for Canva that turns an existing underutilised commercial asset into a modern, sustainable benchmark and model workplace for the 21st century.



Figure 2 Position of the proposed development in relation to existing Canva offices (the 'Canva Campus')
Source: Cox Architecture

In keeping with Canva's aspirations of being a 'Force for Good', and the principle to 'do more with less', the proposed redesign maintains as much of the existing building as possible, making only pragmatic interventions where it improves functionality, or sustainability initiatives. The proposed redesign will offer a benchmark model in the re-use and rejuvenation of an existing tired commercial building.

The vision is for Canva to maintain the existing campus building within the Surry Hills precinct whilst expanding into the Site. This conveys the long-term commitment to the City of Sydney and Surry Hills, whilst maintaining great respect for connection to the city scape and the surrounding community they are part of.

Canva is a committed member of the Surry Hills community, occupying a number of buildings along Kippax Street and in its immediate vicinity.

Canva's investment in 8-24 Kippax Street will rejuvenate a tired and underutilised commercial asset. The expansion of Canva's Surry Hills footprint will enable it to expand its community offerings, enabling it to be "a force for good" in this precinct of Sydney. In addition to its ongoing community offerings the following items will form part of the future development of the site"

- Improvement of Sophia Street through Community Cafe/restaurant partnering with non for profits, creatives and Canva collaborators funded by the Canva Foundation
- Street upgrade to Sophia Street to City of Sydney to match proposed Terry Street shared way
- A public art strategy with art opportunities on the eastern and northern facade
- Achieving ESD commitments both as outlined in the planning framework and proposed by Canva
- Development of a private primary meeting and gathering space for 900 employees
- All car parking bays have been removed, to promote the use of public transport and bicycles and reduce the impact of vehicles to the congested city roads.

1.4 Consultation with Council

A meeting was held with the landowner and applicant (Canva), project architects (Cox) and Ethos Urban on 1 August 2023, followed by a further meeting on 20 November 2023 to discuss the proposal. The meetings informed the planning strategy for the project.

Following the meeting on 20 November 2023, pre-lodgement advice was provided by Council on 8 December outlining the items that are to be considered as part of the proposal as outlined below:

- GFA, built form and height
- Servicing
- Shared zone and public benefit offer
- Flooding
- Sustainability
- Building age

All of these items have been addressed in the proposal, as well as in the accompanying technical inputs.

2.0 The Site

2.1 Site location and context

The site is located at 8-24 Kippax Street, Surry Hills within the City of Sydney Local Government Area. Surry Hills is a popular inner-city suburb, located immediately south of the Sydney Central Business District and is bounded by Central Station to the west. Surrounding local centres include Haymarket, Darlinghurst, Paddington, and the Sydney CBD.

The site is located within the heart of the emerging 'Tech Central' precinct, which is characterised by a mixture of commercial and residential land uses, from large footprint warehouse buildings to small lot retail, shop top and terrace houses. There are also several educational establishments within the surrounding area, including the Australian Institute of Music, Global English College and the Academy of Film, Theatre and Television.

The site's locational context is shown at **Figure 3.**



Figure 3 Locational Context

Source: SIX Maps, edits by Ethos Urban

2.2 Site Description

8-24 Kippax Street is legally described as Lot 3 in DP547558. This allotment is 1,032m^2 in area, and irregular in shape. The site is characterised by a gently sloping topography from an RL of approximately 23m in the south-east corner to about RL20m to approximately RL 20m in the north-west corner. The site was acquired and has been wholly owned by Canva since December 2022.

A detailed Site Survey including a survey of existing floor plans, elevations and a 3D model has been prepared by C&A Surveyors and is provided at **Appendix D**. A site aerial is provided in **Figure 4** below.



Figure 4 Site Aerial Map

Source: Nearmap, edits by Ethos Urban

2.3 Existing Development

Existing development on the site comprises a ten-storey commercial building above one storey of basement (55 car parking spaces), known as the KMS Building. Due to the site's topography, the basement is accessed from the street level at the rear of the site along Sophia Street at the corner of Sophia and Terry Streets.

The building was wholly acquired by Canva in December 2022, and is currently partially occupied, with Canva managing the exit of remaining tenants (which is expected to be completed by the end of Q3 2023 with one remaining tenant vacating in Q1 2024). Originally built in the 1960s, the property has not undergone refurbishment since the late 1990s, and in its current form is dated and in need of renewal and upgrade for occupation of a commercial office user. The current building is not compliant with contemporary and required codes and standards.

The existing attributes of the building is provided in **Table 1**. The site's current condition is shown in **Figure 5** and **Figure 6** below.

Table 1 Existing building attributes

Attribute	Detail
Address	8-24 Kippax Street, Surry Hills
Building height	RL 62.91m
Building height (storeys)	9 storeys + 1 lower-ground level + 1 level of basement
Gross floor area (GFA)	9,374m^2
Floor space ratio (FSR)	9.1:1

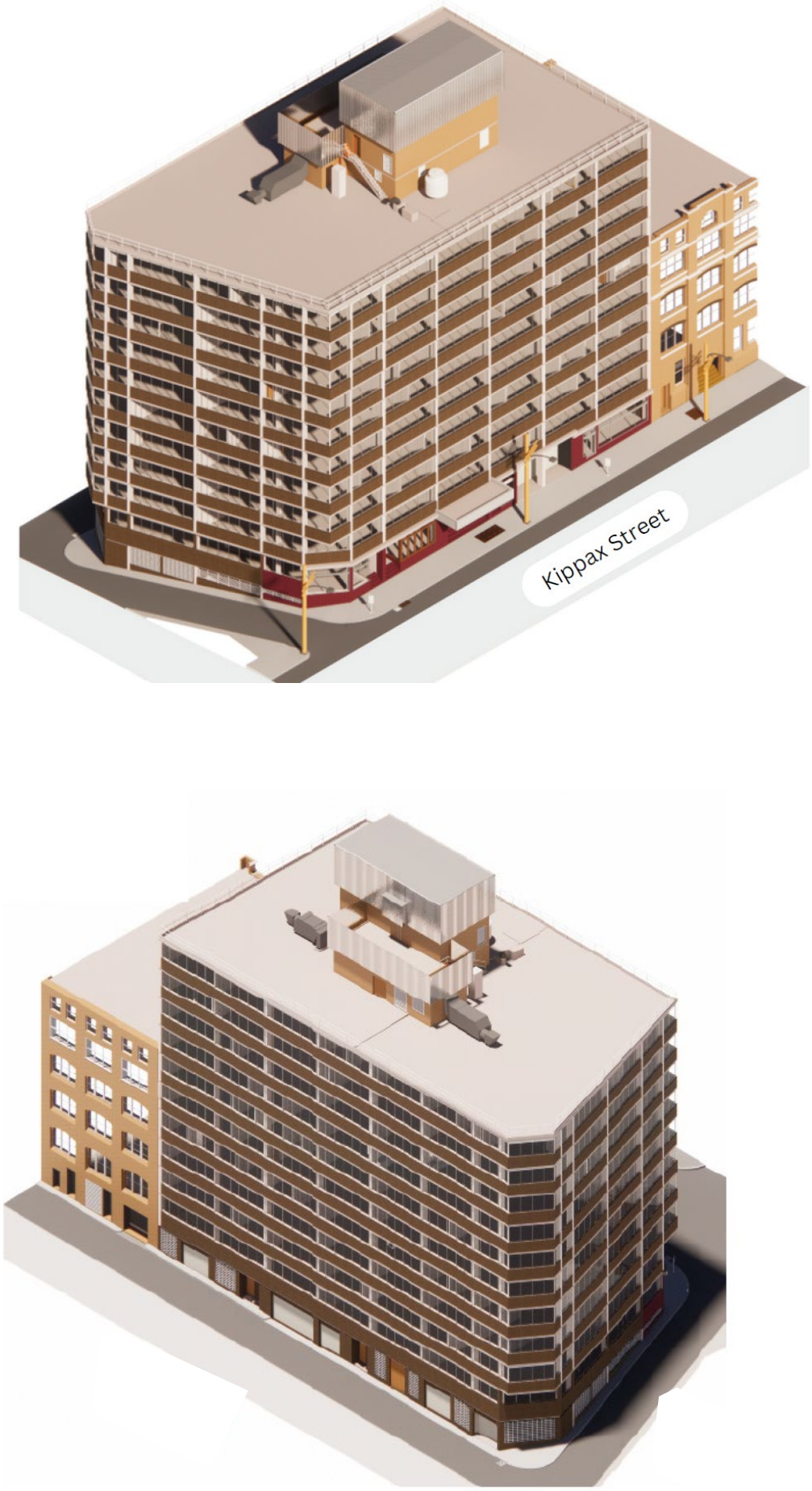


Figure 5 Massing of the existing building
Source: Cox Architecture





S

Figure 6 Photographs of the existing site condition

Source: Cox Architecture

2.4 Basement Car Parking – Existing

The current building incorporates 2 x levels of car parking, consisting of 55 spaces, with primary access from Kippax Street and secondary Access from Sophia Street.



Basement Upper Plan



Basement Lower Plan

Figure 7 Basement (lower and upper) Car Parking – Existing
Source: Historic building plans

2.5 Access and transport

The site is located within the emerging 'Tech Central' precinct, as well as the 'Surry Hills Central' precinct as identified within the Sydney DCP 2012. The site benefits from excellent access to public transport and existing infrastructure and services. It is located approximately 100 metres east from the western entrance to Central Station, which provides access to the entire Sydney Trains and NSW Trainlink network, as well as the imminent Sydney Metro City and South-West network in mid-2024. Furthermore, the site is also serviced by several bus services, with the closest bus stop located at Foveaux Street, opposite Mary Street (directly adjacent to the site), which provides bus connections to the CBD, Circular Quay, Coogee, Maroubra and La Perouse via routes 338, 339, 374, 376 and 391. This adds significant connectivity to the entirety of the greater Sydney region and surrounding regional cities, as well as Sydney's eastern suburbs.

The nearby Foveaux Street is a regional road with moderate to high traffic volumes throughout the day, linking the site to the Elizabeth Street and the Sydney CBD further beyond as well as the Eastern Distributor to the east towards Moore Park. Vehicle access to the site is currently provided via Kippax Street via two garage doors which leads to basement car parking. The site is also in proximity to Elizabeth Street, a major north-south arterial road from Waterloo through to the Sydney CBD. The main pedestrian entrance is located at Kippax Street.

The site is very well serviced by public transport. It is located approximately 100 metres east from the western entrance to Central Station, providing access to the entire Sydney Trains and NSW TrainLink network. The closest bus stop is located at Foveaux Street opposite Mary Street directly adjacent to the site, which provides bus connections to the CBD, Circular Quay, Coogee, Clovelly, Maroubra, and La Perouse via routes 338, 339, 374, 376 and 391.

The site's locational context is shown at **Figure 3**.



Figure 8 Transport Infrastructure context
Source: SIX Maps + Ethos Urban

2.6 Heritage

The site is not a heritage item, nor is it located within a heritage conservation area. Although it is proximate to several heritage items, including the "Hibernian House" (item I1533) to the south at 328-344 Elizabeth Street, and the "Former Farleigh Nettheim & Co Ltd warehouse" (item I2267) at 17 Foveaux Street to the north, as the proposal maintains the envelope of the existing building on site, it is not considered to have adverse impacts on the heritage qualities or curtilage of those heritage items.

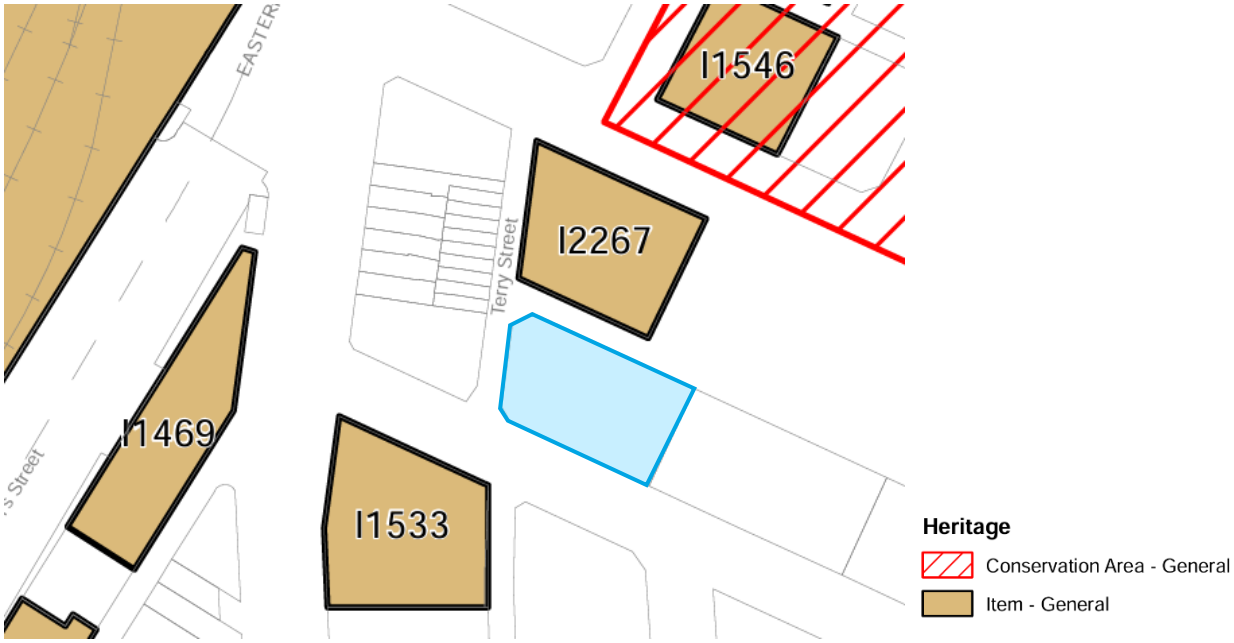


Figure 9 Sydney LEP Heritage Map
Source: Sydney LEP 2012 + Ethos Urban

2.7 Locality and Site Identification – Planning

The site is identified as being within the 'residual land' on the Sydney LEP 2012 Locality and Site Identification Map. As shown in **Figure 10** below, whilst the site is adjacent to the boundary of "Central Sydney" the setting straddles a visual catchment and accessibility as part of the of Sydney CBD context.

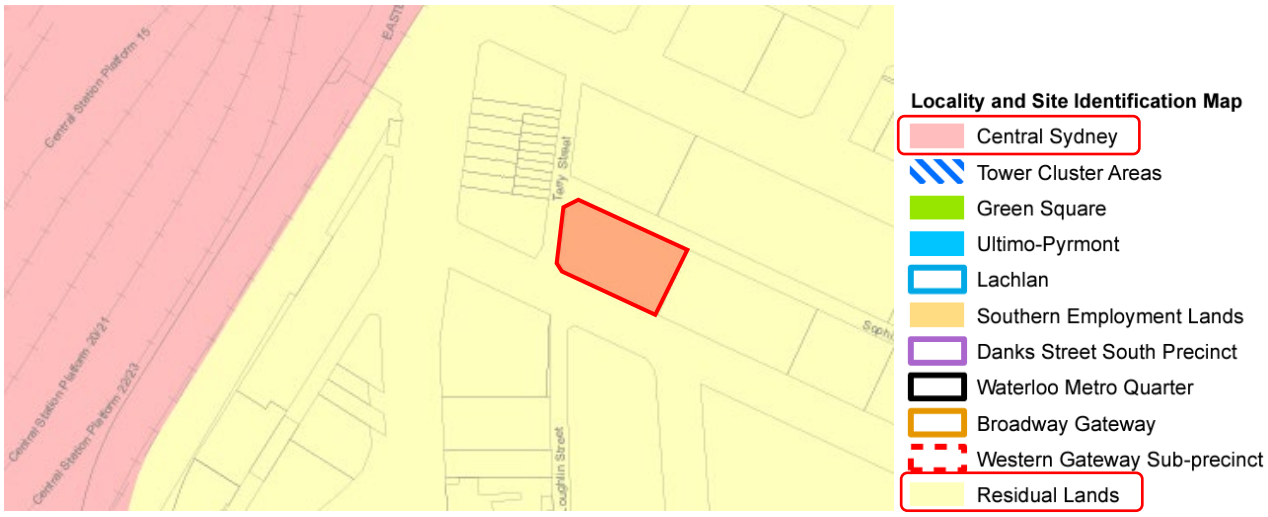


Figure 10 Locality and Site Identification Map (site in red) – Sydney LEP 2012
Source: Sydney LEP 2012 + Ethos Urban

2.8 Surrounding Development

Broadly, development surrounding the site comprises a mix of commercial offices and residential uses, with these buildings having a mix of ground floor retail (including limited food and beverage offerings), as well as purely commercial uses. Land surrounding the site is also likely to be subject to future development. The heights of the buildings within this section of Surry Hills and the City of Sydney more broadly are characterised by a mix of higher rise commercial buildings, integrated with smaller 4 to 6 storey buildings.

North

To the north of the site across Sophia Street are a collection of commercial buildings which range in height from two to five storeys and have a primary street frontage to Foveaux Street. Further beyond is Foveaux Street, with a series of commercial buildings with ground floor retail offerings, centred at Centennial Place Sydney, which is a collection of commercial buildings ranging from 10 to 17 storeys in height. Further north is the continuation of Surry Hills to Paddington, which is largely captured within the "Albion Estate" (C58) heritage conservation area and comprises of predominantly four to six storeys adaptively reused commercial buildings and lower density residential terrace housing.

South

To the immediate south of the site is Kippax Street, with a public car park currently present on the opposite side of the site. The surrounding buildings within the vicinity of the public car park and along Kippax are characterised by 5 to 6 storey adaptively reused commercial buildings. One of these buildings is known as "Dawesleigh", which is identified as a heritage item of state significance (no I553) under the Sydney LEP. Further south is Cooper Street, with a series of mixed-use buildings, with Prince Alfred Park and the remainder of Surry Hills further beyond.

East

Immediately east is a series of commercial and residential buildings ranging from 4 to 8 storeys, which is then staggered into two to three storey residential and shop top housing buildings leading to Waterloo Street. This built form continues further east past Waterloo Street slightly, and then reduces to lower density terrace housing buildings, which are located within the "Little Riley Street" (C65) heritage conservation area under the Sydney LEP 2012. This typology continues further beyond to Moore Park West.

West

To the immediate west of the site across Terry Street are a collection of 3 to 4 storey buildings with retail shopfront offerings, which have a primary street frontage to Elizabeth Street. Further beyond Elizabeth Street is the Sydney City and South East network Central Chalmers Street station, which is directly adjacent to the Sydney Dental Hospital, with the extent of Central Station directly adjacent. Further west, beyond Central Station is the anticipated centre of 'Tech Central', with Broadway and the University of Technology Sydney further beyond.



Figure 11 Surrounding built form context along Kippax Street
Source: Cox Architecture

2.9 Streetscape Context – Kippax Street

The streetscape of Kippax Street, between Elixabeth Street (west and Waterloo Street (east) is varied and consists primarily of commercial and warehousing buildings in different styles and at different stages of lifecycle. As shown in the Streetscape section provided **Figure 12**, the building form and height of the existing buildings vary, with the relevant height of building controls being somewhat reflective of the context – with the exception of the subject site.

The area is not identified as a conservation area and no items of heritage significance are located in immediate proximity.

As shown below and within the Urban Design Report (**Appendix A**), the existing building on the site sits above the heights of surrounding buildings (with large lift motor room and over at the centre) but is afforded the same building height controls as the adjacent building to the east (22m).

Kippax Street is predominantly occupied by wholesale outlets and commercial office premises, many of which have been converted or repositioned from historic wholesaling, industrial retail units and warehousing uses. As a result, whilst some activation exists, the majority of the ground plane is occupied by service/operational uses, driveways and vehicle entries.

Limited food and beverage and retailing exists within the precinct, with four food and beverage uses, including the Aurora Hotel.

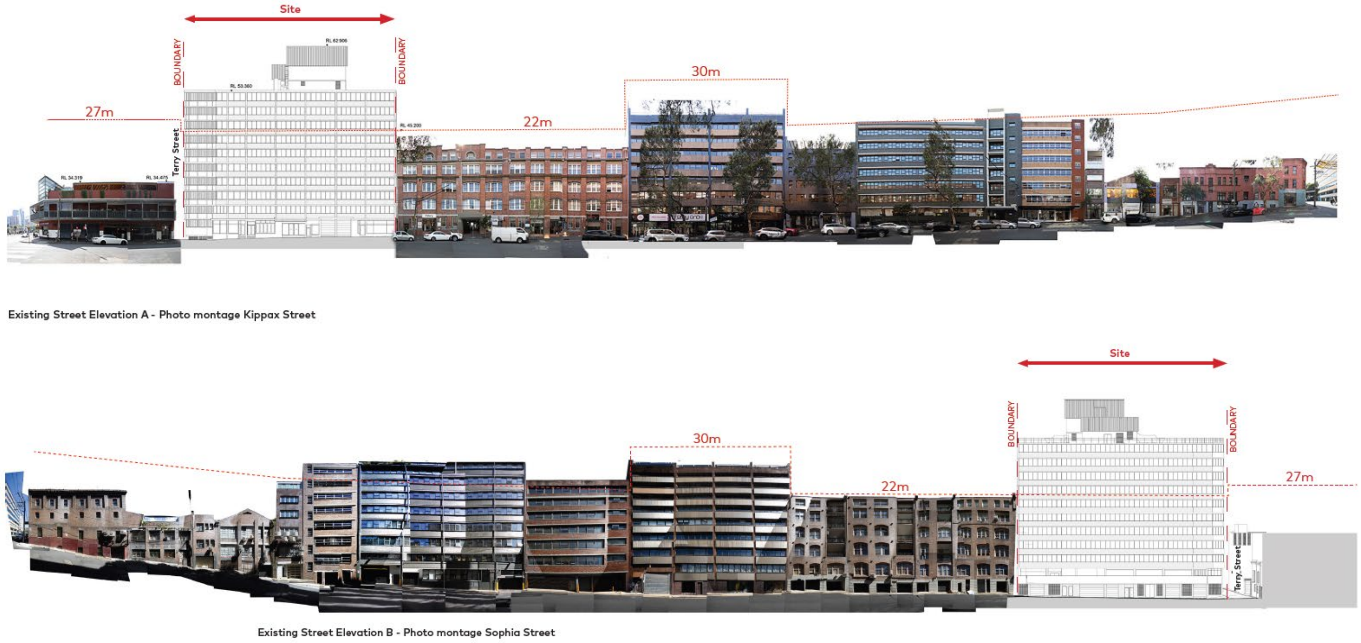


Figure 12 Kippax Street – Streetscape Views and Setting
Source: Cox Architecture

2.10 Council Public Domain Works – Terry Street

The Surry Hills Pedestrian Cycling and Traffic Calming Committee (PCTC) Plan adopted by City of Sydney Council in 2008 included a proposal to install Shared Zone in Terry Street, between Foveaux and Kippax Streets, to prioritise access for pedestrians, control vehicle speeds and preserve residential amenity.

In 2019, as part of a range of Streetscape upgrades across the city fringe area of the LGA (part of the better streets and spaces), Council approved an internal proposal to convert the existing Terry Street laneway (one way from Foveaux Street to Kippax Street) to a shared way.

The proximity to Central Train Station, the Chalmers Street Light Rail Stop and the Surry Hills commercial precinct and proximity to cafes, restaurants, shopping centre, hotel, pub and public transport was identified by Council as attracting a high volume of pedestrians to the area.

The current footpaths to Terry Street being less than one metre wide were identified as being substandard, resulting in pedestrians having to walk along the road. However, due to the narrow road/carriageway width footpaths cannot be widened, so a shared zone was identified. However, localised widening of the interface of Terry Street on Foveaux and Kippax Streets has been identified (see **Figure 13**).

On 20 March 2019, in compliance with RMS Technical Direction for the Design and implementation of Shared Zones the City sought RMS approval to install a Shared Zone which was granted on 29 March 2019. The works have not yet commenced.

The installation of the approved shared zone was confirmed by Council to affect traffic flows or result in any loss of parking but will create a pedestrian-friendly environment that allows pedestrians to walk safely and legally within the road carriageway. Visibly, the appearance and signposting of the shared way will provide clarity to motorists and pedestrians of the pedestrian priority.



Figure 13 Terry Street Shared Way improvement Proposal – site annotated in red
Source: City of Sydney Business Papers – 2019 + Ethos Urban

3.0 Current Planning Controls

3.1 Sydney Local Environmental Plan 2012

The current development standards applying to the site under the Sydney Local Environmental Plan 2012 (SLEP 2012) are outlined in **Table 2** and illustrated in the LEP map extracts at **Figures 14** to **18**.

Table 2 Current controls and provisions applying to the site under the SLEP 2012

Clause	Control
Clause 2.3 *Objectives and Land Use Table*	To encourage a diversity of business, retail, office and light industrial land uses that generate employment opportunities. To ensure that new development provides diverse and active street frontages to attract pedestrian traffic and to contribute to vibrant, diverse and functional streets and public spaces. To minimise conflict between land uses within this zone and land uses within adjoining zones. To encourage business, retail, community and other non-residential land uses on the ground floor of buildings. To ensure land uses support the viability of nearby centres. To integrate suitable business, office, residential, retail and other land uses in accessible locations that maximise public transport patronage and encourage walking and cycling.
Permitted with Consent	Amusement centres; Boarding houses; Car parks; Centre-based child care facilities; Commercial premises; Community facilities; Entertainment facilities; Function centres; Information and education facilities; Light industries; Local distribution premises; Medical centres; Oyster aquaculture; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Shop top housing; Tank-based aquaculture; Tourist and visitor accommodation; Vehicle repair stations; Any other development not specified [as development without consent or prohibited]
Prohibited	Extractive industries; Heavy industrial storage establishments; Heavy industries; Pond-based aquaculture
Clause 4.3 *Height of Buildings*	The site is subject to a maximum height if buildings of 22m.
Clause 4.4 *Floor Space Ratio*	The site is subject to a mapped FSR of 3.5:1.
Clause 5.10 *Heritage Conservation*	The site is not a nominated heritage item or located within a heritage conservation area or
Clause 5.21 *Flood Planning*	The site is identified as being located on land subject to flooding – located within the Sydney harbour Catchment
Clause 6.13 *End of journey floorspace*	A building on land that is used for the purposes of a commercial premises that has showers, change rooms, lockers and bicycle storage areas together is eligible for an amount of additional floorspace.
Clause 6.21 +6.21A-E *Design Excellence*	Development consent must not be granted unless the consent authority believes it exhibits design excellence. The height of the building exceeding 25m triggers the application of this clause (including relevant provision for a waiver in certain circumstances)
Clause 7.6 *Office premises and business premises*	Each office and business premises has a maximum amount of car parking spaces permitted.
Clause 7.14 *Acid sulfate soils*	The site is mapped as Class 5 Acid Sulfate Soils (ASS).
Clause 7.20 *Development requiring or authorising preparation of a development control plan*	The height of the building exceeding 25m triggers the application of this clause (including relevant provision for a waiver in certain circumstances). This planning proposal seeks to implement a site-specific development control plan that would satisfy the requirements of this clause.
Clause 7.33 *Sustainability requirements for certain large commercial developments*	In accordance with the requirements of the Clause and the SB SEPP the proposal is defined as a "Large Commercial Development: As set out in subclause 2, in deciding whether to grant development consent, the consent authority must consider whether the development is designed to optimise energy efficiency and the use of renewable energy generated on-site.

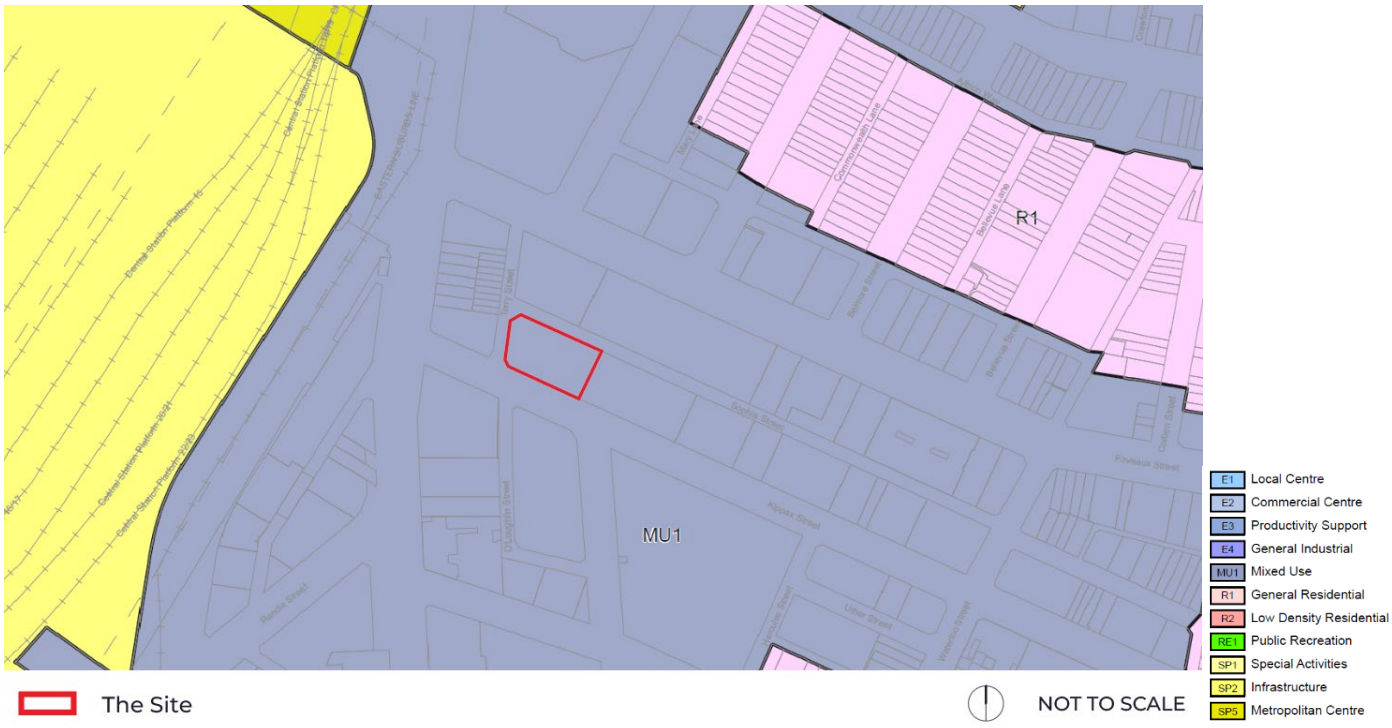


Figure 14 Extract of Land Use Zoning Map

Source: SLEP 2012 / Ethos Urban



Figure 15 Extract of Maximum Height of buildings Map

Source: SLEP 2012 / Ethos Urban

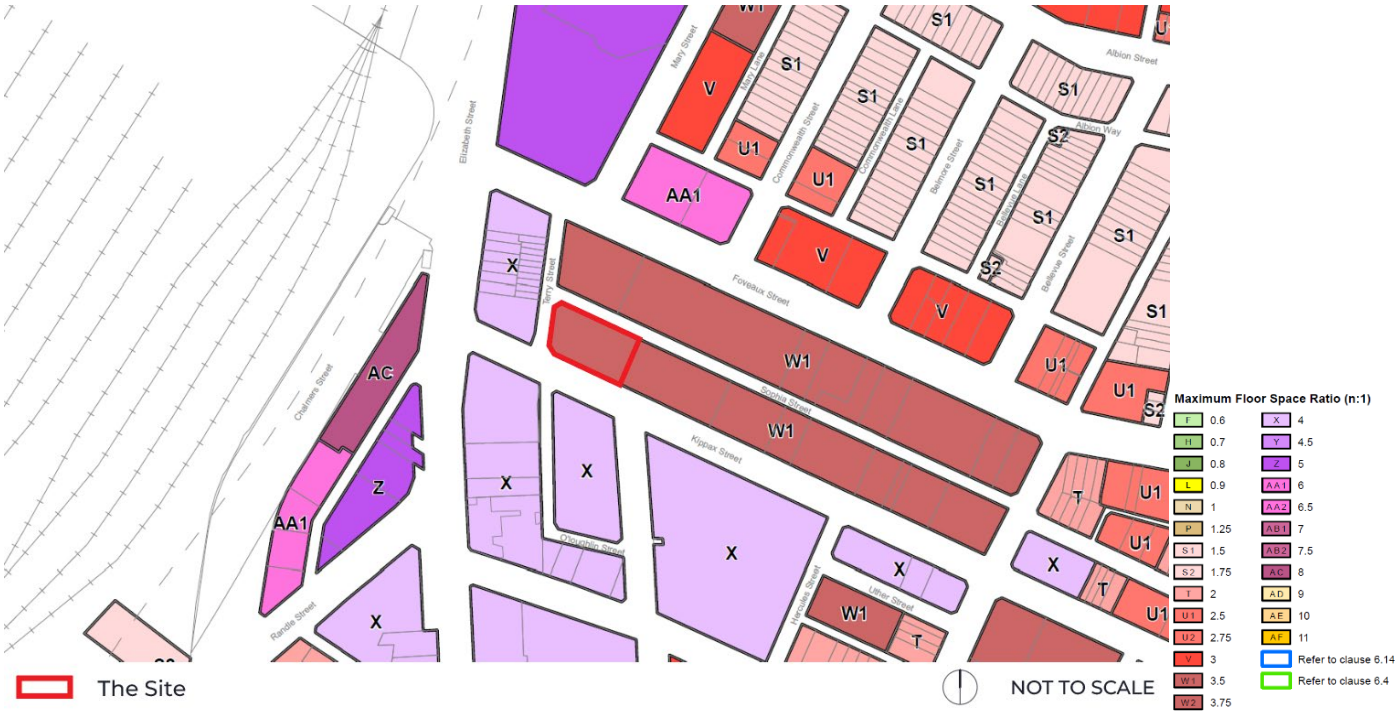


Figure 16 Extract of Maximum Floor Space Ratio Map

Source: SLEP 2012 / Ethos Urban



Figure 17 Extract of Heritage Conservation Map

Source: SLEP 2012 / Ethos Urban

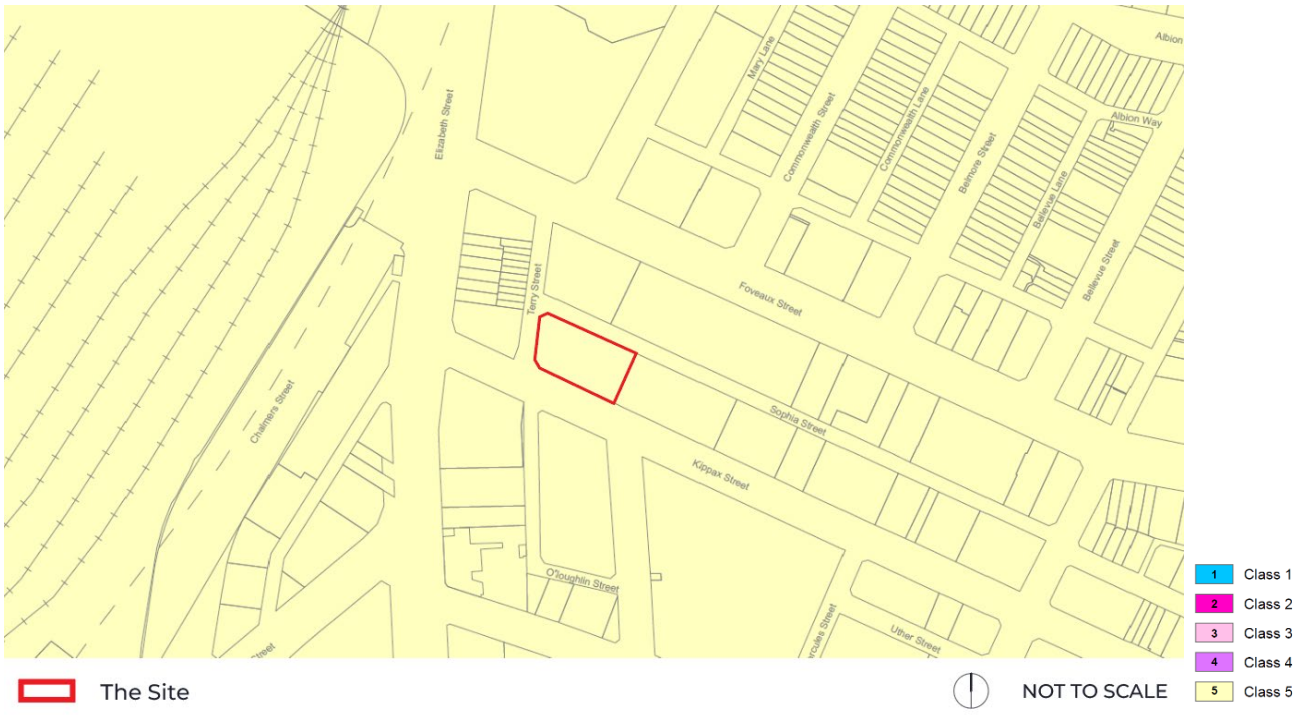


Figure 18 Extract of Acid Sulfate Soils Map

Source: SLEP 2012 / Ethos Urban

A discussion of the proposed changes to the SLEP 2012 development standards sought under this planning proposal is provided in **Section 7.0**. The proposed changes will seek to align the site with its position within the 'Surry Hills Central' precinct as discussed in **Section 8.1**.

3.2 Sydney Development Control Plan 2012

The Sydney Development Control Plan 2012 (SDCP 2012) builds upon and provides more detailed provisions than SLEP 2012. Under the SDCP 2012 the site falls within the Surry Hills locality, which is segmented into eight separate precincts. Specifically, the site is located on the western edge within the 'Surry Hills Central' precinct, which is situated within the central portion of the broader Surry Hills locality.

Locality Statement - Surry Hills Central
The site is located within the Surry Hills Central locality area. It is therefore subject to the relevant provisions of Section 2.7.11 of the Sydney DCP 2012 – Extract of the principles below:

> *This locality is bounded by Foveaux Street to the north, Devonshire Street to the south, the rear of lots fronting Elizabeth Street to the west, and the rear of lots fronting Bourke Street to the east.*
>
> *The area is to continue to constitute the retail centre of Surry Hills with active frontages consolidated along Crown, Foveaux and Kippax Streets. The future built form character is to maintain the transition in scale and use, from large footprint warehouse buildings in the west to small lot retail, shop-top and terrace houses in the east.*

The proposed development is keeping with the character and the design principles of both locality areas through the conversion of a relatively close streetscape/ground level interface and creation of active frontage to Kippax, Terry and Sophia Streets as well as having little impact to the existing scale and relationship between building on Kippax Street and in the western and eastern part of the locality, as mentioned. A summary of the proposal's consistency with the Surry Hills Centre Locality Principle is provided below (**Table 3**):

Table 3 Summary of Locality Statement and Principles – Surry Hills Central

Principle	Proposal
(a) Development must achieve and satisfy the outcomes expressed in the character statement and supporting principles.	Yes – Refer to commentary above
(b) Development is to respond to and complement heritage items and contributory buildings within heritage conservation areas, including streetscapes and lanes.	Yes – the proposal retained the existing building composition, structure and majority of materiality to the streetscape. Interventions to the lower levels of the building are proposed to improve activation, usability and amenity and additions to the rooftop are minor.
(c) Maintain consistent intact residential streets.	Noted – N/A for the proposal.
(d) Maintain views along Riley Street to Ward Park.	Noted – N/A for the proposal.
(e) Maintain the transition in built form scale, from taller buildings in the west, to consistent two storey areas in the east.	Yes - The proposal involves minor alterations and additions to the existing building, maintaining the existing built form and scale relationship between the site and surrounds.
(f) Provide a strong edge and passive surveillance to Ward Park Sites on the corner of Riley and Devonshire Streets while creating a gateway to Riley Street from the south.	Noted – N/A for the proposal.
(g) Retain the low scale of terrace houses along Richards Avenue. Single storey additions only are allowed at the rear of these houses to minimise the impact on Shannon Reserve.	Noted – N/A for the proposal.
(h) New development is to maintain and respond to intact low scale terrace areas.	Noted – N/A for the proposal.
(i) Retain and reinforce the two distinct retail characters; including the warehouse style retail outlets of Foveaux and Kippax Streets and the small lot pattern traditional retail strip of Crown Street with active uses dominated by restaurants, cafes and specialty shops.	Yes - The proposal for adaptive reuse of the building, and retention of the majority of the existing form and façade (with the exception of replacement of windows improvement for amenity, landscaping and environmental performance) seeks to retain and continue to enforce the characteristics of the identified sub character of large warehouse style development in the Foveaux and Kippax Street precincts
(j) Allow the commercial precinct around Waterloo Street between Kippax and Devonshire Streets to continue, defined by remnant commercial warehouses, and landmarks such as the Reader's Digest building.	Yes - The proposal aligns with this principle through the retention of the existing building in proximity of the areas specified.
(k) Retain the mixed use character of the north side of Devonshire Street.	Noted – N/A for the proposal.

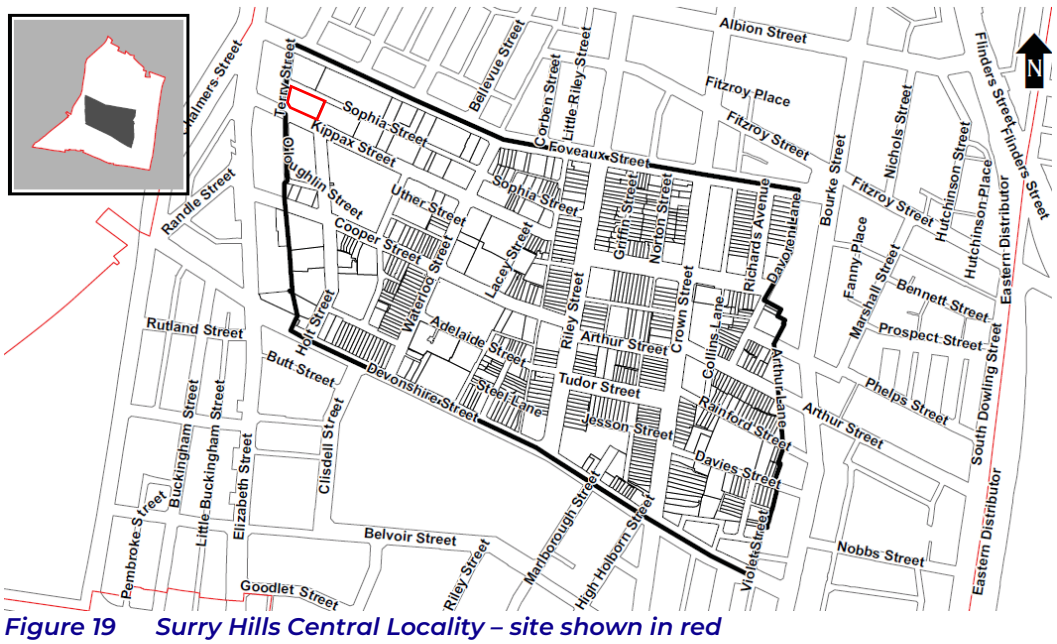


Figure 19 Surry Hills Central Locality – site shown in red

Source: City of Sydney DCP 2012 – Section 2.7.11

4.0 Strategic Context

This section identifies the relevant State and local strategic planning policies which are relevant to the site and this height-specific Planning Proposal. It provides an overview of the strategic framework that has been established to deliver the vision for the Greater Sydney Region, the Eastern City District, and the Sydney LGA.

4.1 Greater Sydney Region Plan – A Metropolis of Three Cities

The Greater Sydney Region Plan (**the Region Plan**) provides the overarching strategic plan for growth and change in Sydney. It is a 20-year plan with a 40-year vision that seeks to transform Greater Sydney into a metropolis of three cities – the Western Parkland City, Central River City and Eastern Harbour City.

The Region Plan includes objectives and strategies for infrastructure and collaboration, liveability, productivity and sustainability. These objectives are supported by job creation and infrastructure delivery targets that align with forecasted population growth across Greater Sydney.

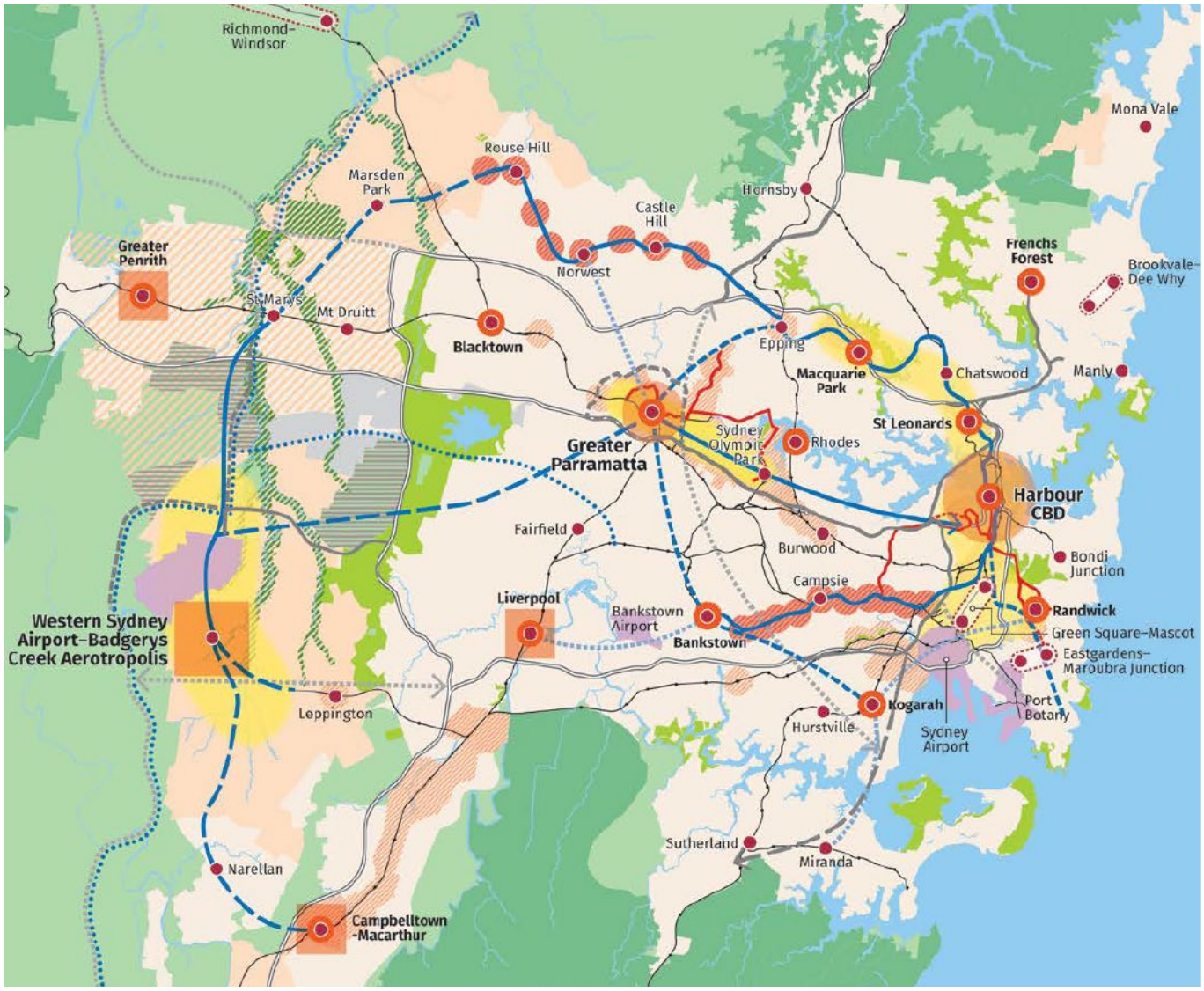


Figure 20 Location of the harbour CBD within the Sydney Region Plan
Source: Greater Cities Commission

4.2 Eastern City District Plan

The Eastern City District Plan (**the District Plan**) establishes planning priorities and actions to support strategic directives from the Region Plan. The District Plan sets the 20-year vision for the North District in the form of 24 'Planning Priorities'.

The District Plan includes a Structure Plan that identifies the key centres, economic and employment locations, land release and urban renewal areas, and existing and future transport infrastructure to support growth aspirations. Planning Priorities that are relevant to this height-specific Planning Proposal include those listed below. The location of the Sydney CBD (Harbour CBD) within the Eastern City is shown at **Figure 21**.

E1. Planning for a city supported by infrastructure

E7. Growing a stronger and more competitive Harbour CBD

E8. Growing and investing in health and education precincts and the Innovation Corridor

E10. Delivering integrated land use and transport planning and a 30-minute city

E13. Supporting growth of targeted industry sectors

E19. Reducing carbon emissions and managing energy, water and waste efficiently

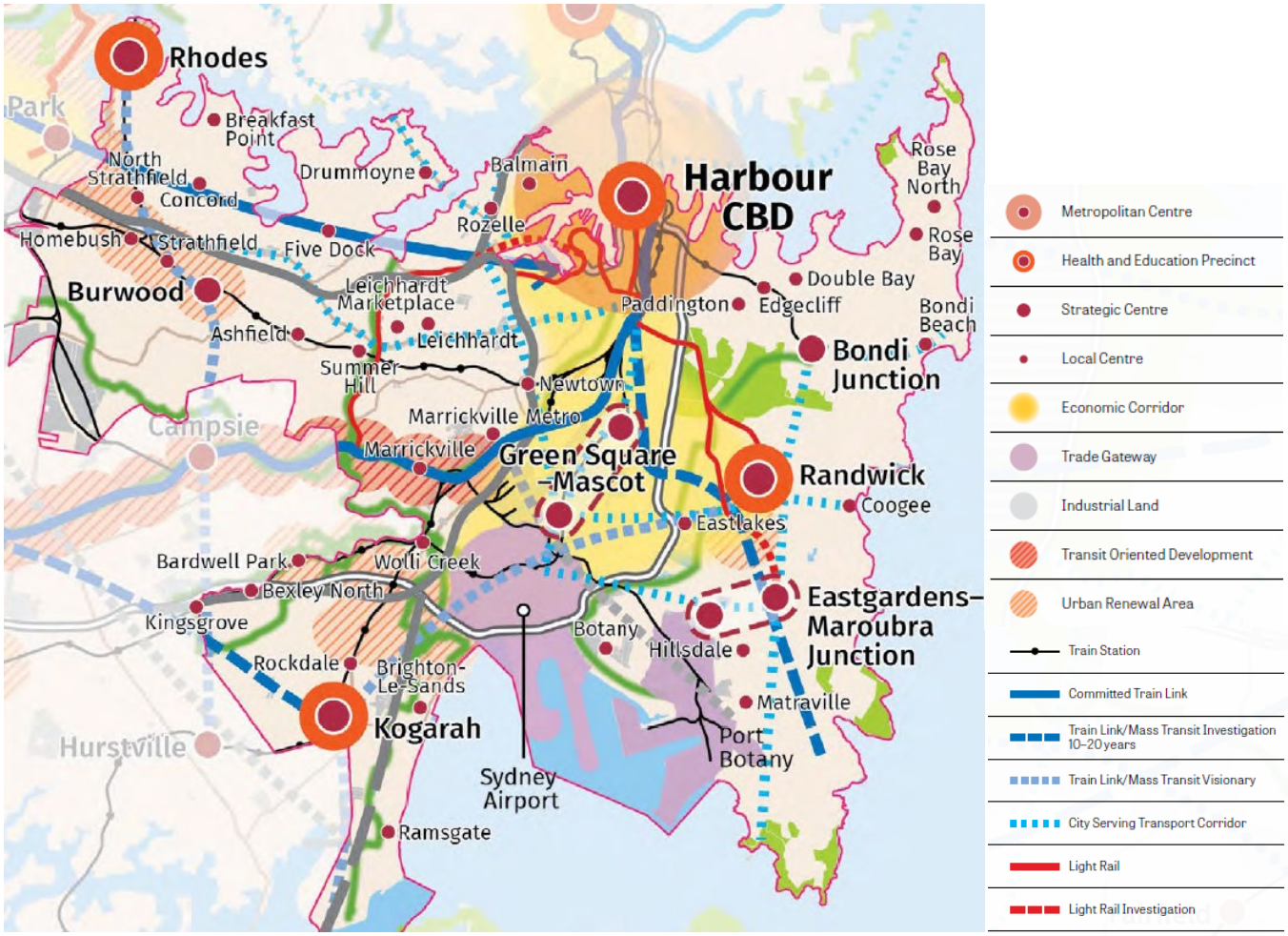


Figure 21 Location of the Sydney CBD within the Easter City District Plan
Source: Greater Cities Commission

4.3 Sydney Local Strategic Planning Statement

The City of Sydney Local Strategic Planning Statement (the LSPS) is the principal strategic planning document guiding land use planning and development in the City of Sydney Local Government Area (LGA). The LSPS represents Council's 20-year vision for the LGA's future direction, and contains directions about infrastructure, liveability, productivity, and sustainability. The LSPS draws from the Greater Sydney Commission's Greater Sydney Regional Plan and Eastern City District Plan and implements the planning priorities identified from these larger strategic documents at a local level.

The LSPS identifies four (4) key themes, each with a suite of planning priorities. The planning proposal responds to each of these themes, which include the following:

- Productivity;
- Sustainability;
- Infrastructure; and
- Liveability.

The LSPS was prepared to align with the priorities and actions that have been established by the District Plan and Region Plan. The strategic intent of the LSPS is to implement these directives in the context of the Sydney LGA. Visions and Planning Priorities that are relevant to this height-specific Planning Proposal are listed below.

- **Planning Priority P2** *(Productivity)* **–** Developing innovative and diverse business clusters in City Fringe.
- **Planning Priority S2** *(Sustainability)* **–** Creating better buildings and places to reduce emissions and waste and use water efficiently.
- **Planning Priority S3** *(Sustainability)* **–** Increasing resilience of people and infrastructure against natural and urban hazards.
- **Planning Priority I1** *(Infrastructure)* **–** Movement for walkable neighbourhoods and a connected city.
- **Planning Priority I3** *(Infrastructure)* **–** Supporting community wellbeing with social infrastructure.
- **Planning Priority L2** (*Liveability)*– Creating great places.

Along with the Sydney Community Strategic Plan (the CSP), the LSPS is integral to the 'line of site' between local and district / regional level strategic plans, as shown at **Figure 22**.



Figure 22 'Line of Site' between Local and District / Regional Level Strategic Plans
Source: Greater Cities Commission; City of Sydney

5.0 Proposed Development Opportunity

5.1 Overview

The proposed height and floor space amendments via a site-specific clause will provide for additional floor space that will support the renewal of a key opportunity site that accommodates a vacant and underutilized building. The Planning Proposal leverages the site's proximity to the Central Station and the Central Precinct. which presents an unparalleled opportunity within Surry Hills for the adaptive reuse of an existing building, providing world class commercial space and ESD performance, along with access to rooftop space and canopy coverage.

The proposed height amendment has also sought to address opportunities and constraints that are integrated with the economic and character aspiration of the precinct and broader CBD including:

- **Employment targets. -** The commercial uplift that is being sought by this Planning Proposal will help provide greater capacity to achieve employment targets within the harbour CBD. This will maximise the current confidence in the market for an owner occupier, as opposed to general leasing requirements for future tenants.

- **Capitalisation Government investment in new infrastructure -** Sydney Metro is Australia's largest public transport project. The site is located to leverage the NSW State Government's investment in this project, which has continued to catalyse the evolution of the Sydney CBD and the southern fringe, including Surry Hills.

- **Activation and Economic Activity -** Design provision has been made for the introduction of active uses at ground level, including retail tenancies and food and beverage premises. This will further support the activation of the Sydney CBD and the fringe outside of regular office hours.

- **Owner Occupier investment -** As the harbour city, the strategic focus for Sydney is underpinned by innovation and global competitiveness. The attraction of market-leading companies that operate tech and creative services to Surry Hills and fringe of the CBD. These sectors will be integral to the continued viability of the Sydney CBD.

5.2 Summary of Proposal

The proposed development seeks approval for the adaptive reuse and reinvigoration of the existing 9 storey building with minor rooftop addition to allow for improve functionality and use of the site as Canva's Australian headquarters, whilst maintaining their existing Surry Hills Campus

The Ground Level, accessed from Kippax Street will visually connect to the Lower Ground Level along Sophia Street, creating permeability and sight lines through the building between the two streets, when compared to the closed and inactive facades to both street frontage. The existing car parking (55 spaces) will be removed to make way for necessary building services, plant, end of trip facilities and a community retail space located on the corner of Sophia and Terry Street.

To adaptively reuse the existing building and implement necessary structure and servicing upgrades as required, the existing central core is proposed to be relocated to the eastern end of the building. The majority of the façade material, with the exception of the lower levels, is sought to be retained and sympathetic, but functional, additions are proposed to the roof level.

The provision of additional access to the landscaped terraces will provide opportunity to invigorate the currently underutilised rooftop and provide much needed landscaping and landscaped canopy coverage whilst incorporating bio-solar for on site electricity generation. The addition of a function room level and terrace will provide opportunity to invigorate the currently under-utilised rooftop space through outdoor, undercover seating areas with views towards the Sydney CBD and surrounds.

The public domain around the site consists mainly of narrow streets with limited pedestrian access due to narrow footpaths, responding to the nature of use fronting Kippax Street and servicing requirements of Sophia Street at the rear. This is currently being addressed by the City of Sydney through their proposed Shared Zone along Terry Street, between Foveaux and Kippax Streets.

The proposed design offers opportunity to deliver an excellent working environment, providing whilst retaining and reusing a key building asset on the fringe of Sydney CBD.

The Planning Proposal is accompanied by an Urban Design Report (**Appendix A**) which includes a reference scheme and detailed analysis of the relevant urban design principles and assessment matters applicable to the Planning Proposal.



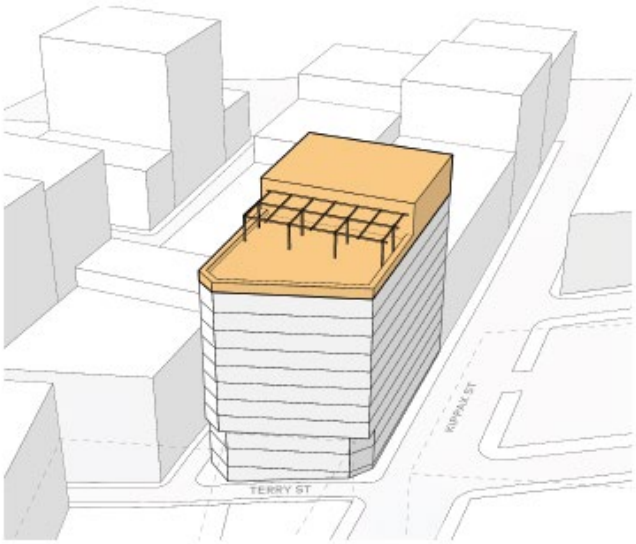
Figure 23 Artist Impression of Planning Proposal Scheme
Source: Cox Architecture

5.3 Planning Proposal Principles

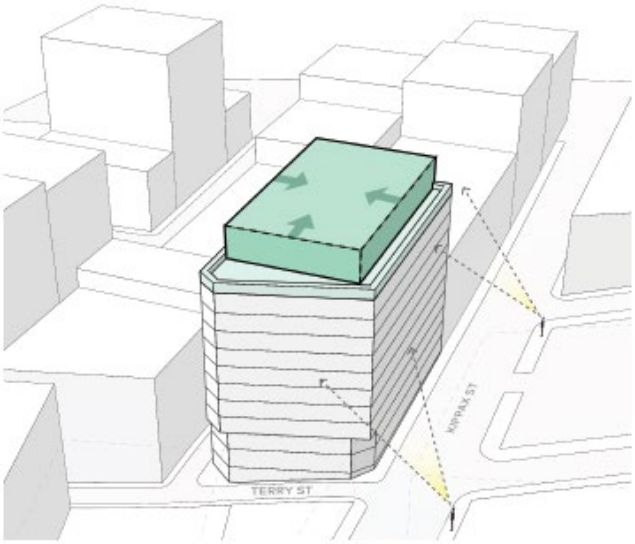
The Urban Design Report (**Appendix A**) sets out the design principles to the proposal which are summarised in the diagram below.

8-24 Kippax Street, located just off Elizabeth Street and only a two-minute walk from Central Station will firmly place Canva at the heart of the newly emerging technology precinct Tech Central. Additionally, the site's location places Canva in close proximity to the Central Precinct surrounding Central Station.

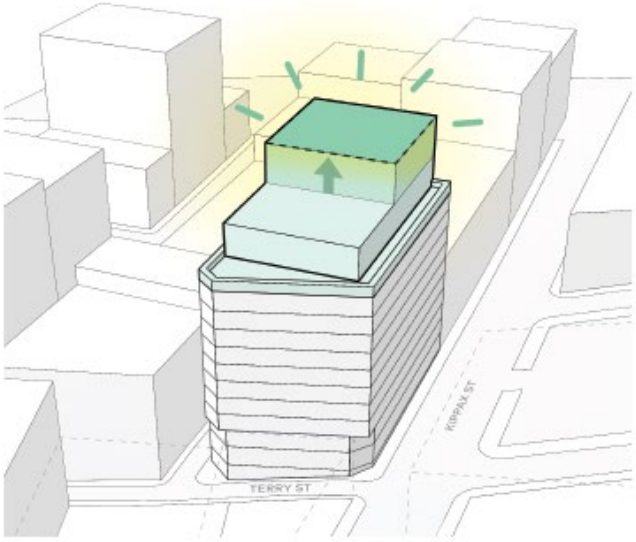
In keeping with Canva`s aspirations of being a "Force for Good", and the principles to "do more with less", the proposed rooftop additions maintain as much of the existing building as possible and only makes pragmatic interventions where it improves functional planning or sustainability initiatives, such as introducing natural light. The proposed additions will offer a benchmark model in the re-use and rejuvenation of an existing tired commercial building.



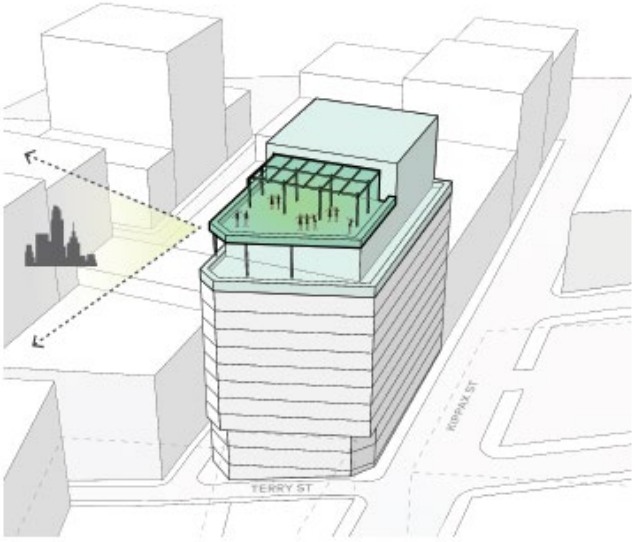
Massing (DA1)



Setback and reduce visual bulk



Touch the sky memorably



Reach out - Add roof terrace

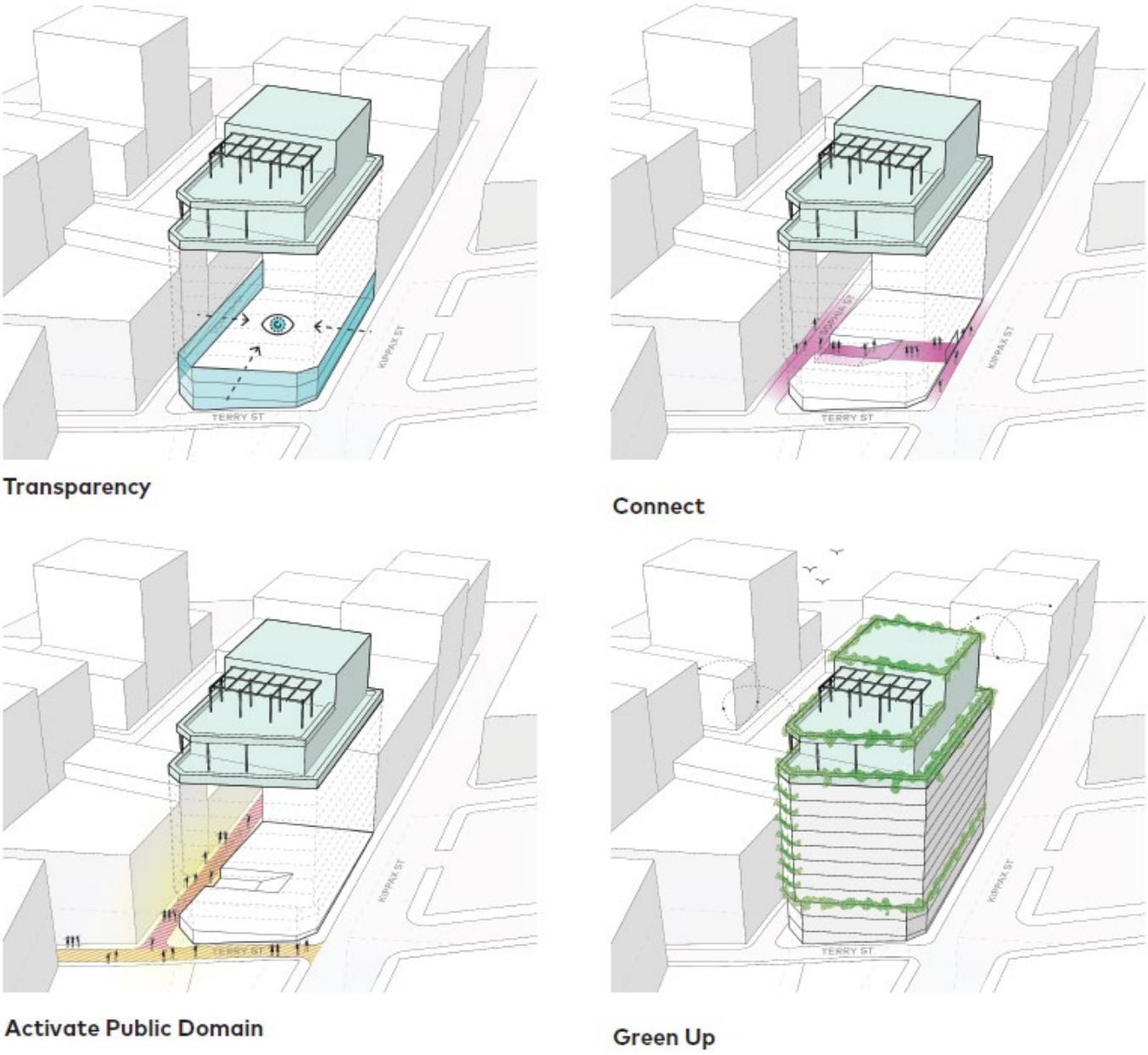


Figure 24 Planning Proposal Design Principles
Source: Cox Architecture

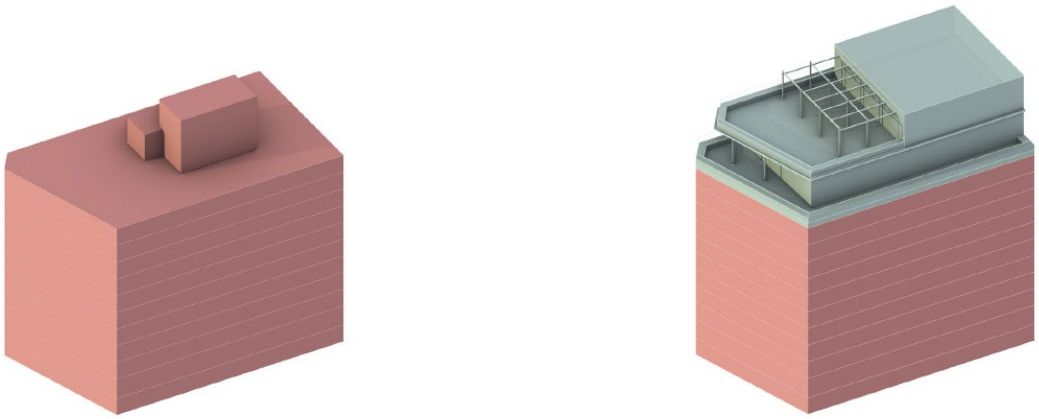


Figure 25 Existing vs proposed massing
Source: Cox Architecture

5.4 Public Benefits

In addition to its ongoing community offerings the following benefits will also be a direct result of the 8-24 Kippax Street upgrade.

- Improvement of Sophia Street through Community Cafe/restaurant partnering with non for profits, creatives and Canva collaborators funded by the Canva Foundation
- Laneway upgrade to Sophia Street to City of Sydney to match proposed Terry Street Shared way
- A public art strategy with art opportunities on the eastern and northern facade
- ESD commitments
- All car parking bays removed and controlled in the site-specific provisions to promote the use of public transport and bicycles and reduce the impact of vehicles to the congested city roads
- Provision of a visual through site linkage from Kippax Street to Sophia Street, as well as a private gathering space for approximately 900 employees.

As outlined above, as part of the Planning Proposal and concurrent DA, Canva propose a Public Benefit Offer with Council to facilitate the construction and delivery of road works (shared way) amendments to the portion of Sophia Street between Terry Street and the extent of the site boundary at the east of the site.

It is acknowledged the land highlighted in red in **Figure 26** is subject to a shared zone under *The Surry Hills Pedestrian Cycling and Traffic Calming (PCTC) Plan* that was adopted by Council in 2008. It is noted approval was granted by RMS in 2019 but works are yet to commence.

Specifically, the works-in-kind proposal includes the following:

- Construction and delivery of a proposed shared way to Sophia Street between the corner of Terry Street and the extent of the site – with works proposed to the existing carriageway and southern kerb (adjoining the site) only. The kerb to the northern extent of Sophia Street and any associated stormwater infrastructure would not be impacted (with the exception of any necessary augmentation and connection works). The proposed works will consist of:
  - Amendments to the existing kerb and guttering on the southern side of Sophia Street in front of the site;
  - Regrading and reserving the carriageway – with material to be confirmed with Council;
  - Creation of a proposed share way for the extent of the roadway;
  - Installation of any necessary crash barriers to the southern side of the proposed shared way; and
  - Creation of a loading zone for a Small Rigid Vehicle (SRV) at the eastern of the site. This loading zone will not have any impact to the shared way or any opposing driveways.

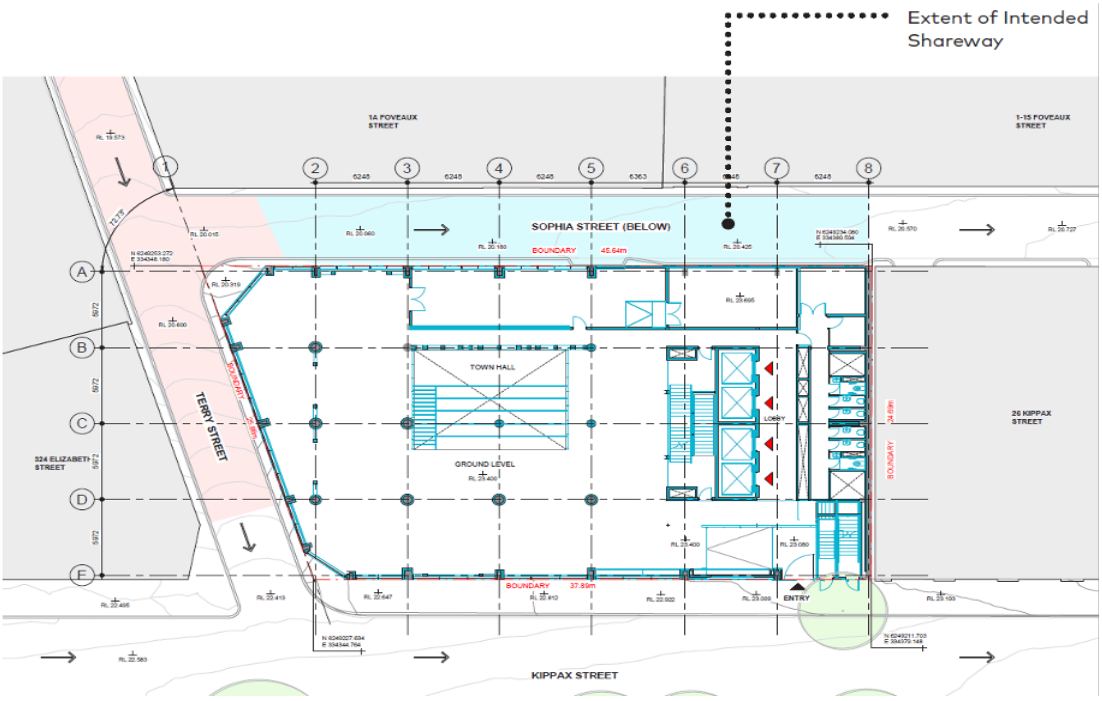


Figure 26 Extent of land subject to public benefit offer for shared way

Source: Cox Architecture

6.0 Part 1 – Objectives and intended outcomes

This Planning Proposal has been prepared in accordance with Section 3.33 of the EP&A Act and 'A Guide to Preparing Planning Proposals' prepared by the NSW Department of Planning and Environment

The following section outlines the objectives and intended outcomes and provides an explanation of provisions in order to achieve those outcomes, including relevant mapping. The justification and evaluation of impacts is set out in **Sections 8.0** and **9.0** of this report.

6.1 Objective

The objective of the planning proposal is to amend the SLEP 2012 to enable the upgrade of the existing KMS Building to deliver a significantly improved commercial office outcome, within the emerging 'Tech Central' precinct, as Australian headquarters of Canva. The proposed amendments to the SLEP 2012 seeks to capitalise on government investment and proximity to infrastructure allow for improved commercial office outcome and investment, whilst responding the site's characteristics, and suitably responding to opportunities and constraints.

6.2 Intended Outcomes

The intended outcomes of the planning proposal are to:

- Facilitate the renewal of the site by creating high quality, fine grain active frontages addressing Kippax Street, while also delivering high quality commercial office space that addresses the identified need to support innovative and digital industries within the 'Surry Hills Central' and emerging nearby 'Tech Central' precinct, as well as throughout the wider Sydney CBD.
- Achieve Canva's vision for the site and project for a world-class commercial office building that unlocks the full development potential of the site in delivering premium-grade floor space that accommodates emerging future work practices and support Sydney's role of Australia's global city.
- Support the 30-minute city concept by growing employment in an established centre within the Harbour CBD with a high level of existing amenity and infrastructure, including proximity to transport services.
- Realise a significant increase in employment capabilities within the vicinity of multiple Sydney Metro stations and other key transport networks (i.e., existing light rail and heavy rail).
- Apply a maximum building height and FSR standard that is commensurate with Surry Hill Central's role as the retail centre of Surry Hills, supported with active frontages and a mixture of commercial offerings.
- Provide an improved urban design and pedestrian experience at ground level, with enhanced street activation, the protection of sunlight and appropriate wind conditions.
- Support the provision of premium-grade floorplates of up to 895m^2 GFA in size.

The proposed changes to the LEP to increase the maximum FSR and height of building controls will enable the delivery of the expansion of the current building, of a bulk and scale that is respectful and recessive to the built form, bulk and scale of the existing building.

7.0 Part 2 – Explanation of provisions

7.1 Amendments to the Sydney LEP 2012

The SLEP 2012 sets out the planning controls that apply to the site. This planning proposal seeks to amend the SSLEP 2015 to facilitate a better outcome for the site and support the redevelopment of the existing building into a higher quality commercial office offering, meeting the significant demand for world class commercial office space in the Harbour CBD and Surry Hills.

It is noted that the existing building on the site currently exceeds both the height of building and floor space ratio development standards allocated within the SLEP 2012. The proposed amendments to the SLEP 2012 controls are outlined below and justification is provided in **Section 8.0**.

Table 4 Proposed SLEP 2012 Amendments

Planning Controls	Existing Mapped Development Controls	Existing Height and FSR	Proposed Controls/Provisions
Clause 4.3 – Maximum Height of Buildings	22m	39.5m	42.7m
Clause 4.4 – Floor Space Ratio	3.5:1	9.1:1	9.85:1 Increase of 789sqm
As set out in **Section 7.2**, it is proposed for a site-specific provision to be included in Part 6, Division 5 of LEP 2012 – Site Specific Provisions			

Height of buildings

The proposed maximum height of building development standard is proposed to be amended to 42.7m. This increase is appropriate to cater for the delivery of renewed commercial office space in Surry Hills within proximity of several public transport nodes and key services.

The proposed amendment seeks to apply a maximum building height standard that will be commensurate with 'Surry Hills Central' function as a retail and commercial precinct, integrated with medium density housing to the east, acting as a guide for future redevelopment throughout Kippax Street.

Floor Space Ratio

This planning proposal seeks to increase the maximum FSR across the site to 9.85:1. This is commensurate with the proposed maximum height of building, catering for a redevelopment that is consistent with the intent and desired outcomes identified throughout Surry Hills, and particularly the commercial and retail character of the 'Surry Hills Central' precinct. The floor space ratio is also reflective of the removal of an existing 55 car parking space within the basement that are to be available to be converted to other uses.

Use and Design Particulars

The site-specific provisions are proposed to incorporate detailed particulars that control development that is not intended within the proposed additional height and floorspace but would otherwise be permitted by virtue of the underlying zoning and generic building envelope controls. These provisions seek to secure the intended development outcome, permitting additional height and floorspace only if these aspects are complied with.

7.2 Proposed Site-specific Additional Local Provision – SLEP 2012

The Planning Proposal seeks to introduce a new site-specific clause to facilitate the proposed amendments.

This involves introducing a new additional local provision under Part 6, Division 5 of the LEP 2012 that reads as follows:

Clause 6.## 8-24 Kippax Street, Surry Hills

1) This clause applies to 8-24 Kippax Street, being Lot 3, DP 547558.

2) Despite clauses 4.3 and 4.4, the consent authority may grant development consent to alterations or additions to an existing building on the land to which this clause applies that will result in a building—
a) with a maximum building height of RL 66.060 metres, and
b) with a maximum floor space ratio of 9.85:1

3) Development consent must not be granted under this clause unless the consent authority is satisfied that the resulting building—
a) will not be used for the purpose of residential accommodation or serviced apartments, and
b) does not include any car parking spaces on site
c) the development will result in activated commercial or retail premises at street level

4) This clause does not limit the operation of clause 6.13 in its application to the land to which this clause applies.

5) *Clause 6.21D(1) and (3)(a) do not apply to the development.*

The above Clause is consistent with other clauses under Division 5, which facilitate additional building height and floor space whilst imposing specific additional controls (such as restricting particular uses or the ability for on-site car parking). The final wording of the proposed site-specific clause will be subject to further discussions with Council and for Parliamentary Counsel drafting and endorsement.

7.3 Amendments to the Sydney DCP 2012

Concurrent amendments are proposed to the supporting Sydney DCP 2012 through the addition of provisions at Section 6 (Specific Sites) that incorporates site specific details. Site specific provisions relating to the following items are provided, along with a site of site-specific diagrams that will control the future built form – with an extract provided below in **Figure 27**.

- Objectives
- Built Form
- Public Domain
- Landscaping and Tree Canopy
- Sophia Street Retail
- Building Articulation and Public Art

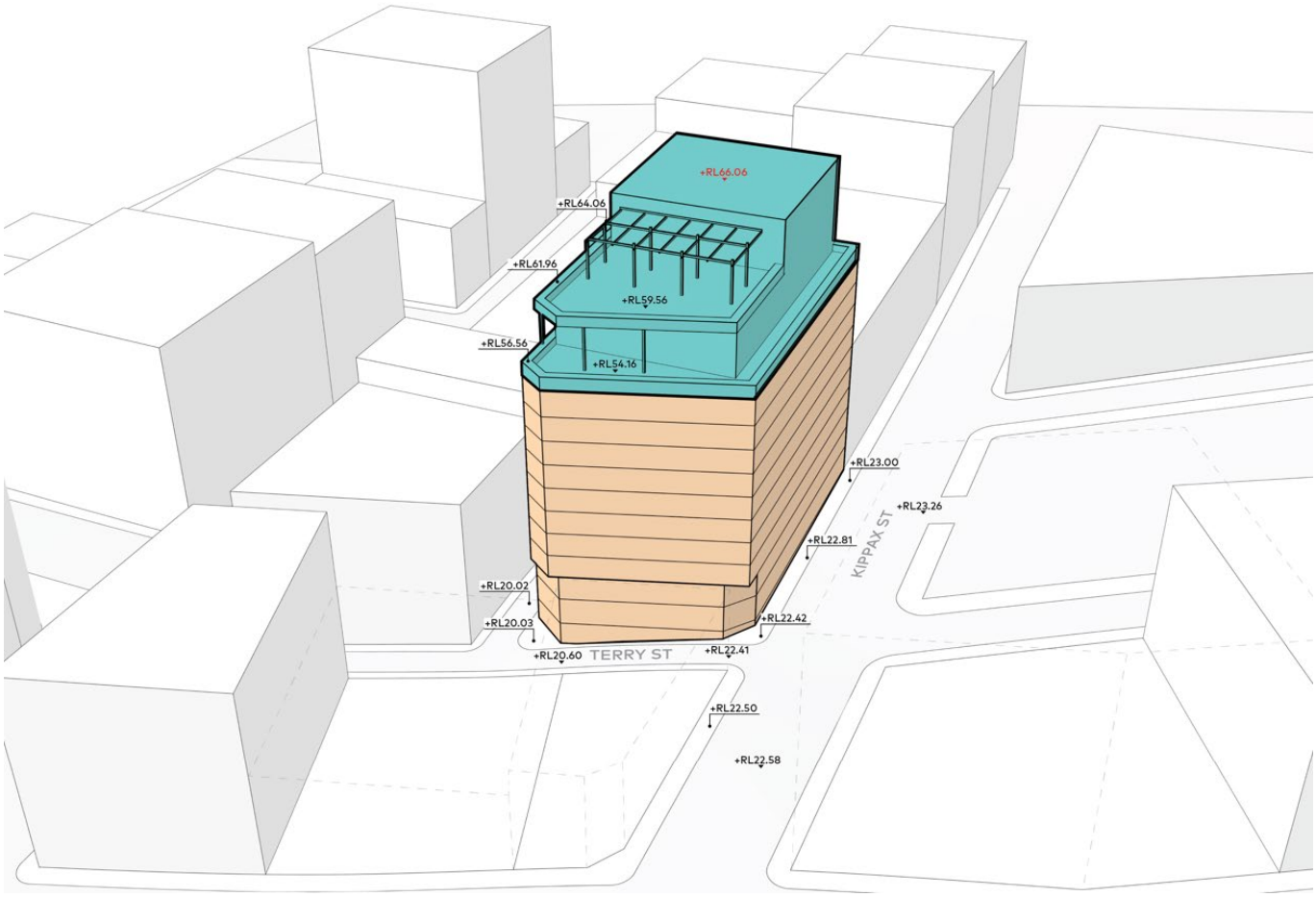


Figure 27 Massing of the Planning Proposal to be included in the site specific DCP
Source: Cox Architecture

8.0 Part 3 – Justification of strategic and site-specific merit

8.1 Strategic merit

8.1.1 Section A – need for the Planning Proposal

Q1. Is the Planning Proposal a result of an endorsed local strategic planning statement, strategic study or report?

This Planning Proposal has been derived from a detailed analysis of the site and its future use, as well as accommodating the intended the occupation of the main tenant, and owner of the site, Canva Pty Ltd.

This planning proposal has been initiated by the proponent so as to allow for a building envelope and floor plates that expand on the existing building core and is commensurate with height, scale and density of the locality and which seeks to provide for the conversion of an outdated commercial building into high quality employment floor space close to public transportation. Accordingly, the proposal is consistent with a range of key strategic planning documentation, including the Eastern City District Plan and the City of Sydney Local Strategic Planning Statement (LSPS).

Q2. Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes. In preparing this Planning Proposal, three options were considered to facilitate the intended outcomes for the site. These are listed and discussed below:

- **Option 1:** Do nothing.
- **Option 2:** Prepare a Development Application with supporting Clause 4.6 variations to Height and FSR and no Planning Proposal.
- **Option 3:** Prepare a Planning Proposal to amend the maximum floor space ratio and height for the site under SLEP 2012.

Option 1: Do nothing

Option 1 involves the continued operation of the existing commercial building in its current form. It is considered that this option represents a lost opportunity to expand on the site's potential in an established commercial and retail locality with a prime position within Surry Hills, close to major modes of transportation.

The existing building already exceeds the SLEP 2012 height and FSR control Given this context, it is considered that development of the site, particularly for the provision of additional commercial floor space should be pursued, and as such, Option 1 is not viable and loses the opportunity to provide high quality commercial floor space within Surry Hills.

Option 2: Prepare a Development Application with supporting Clause 4.6 variations to Height and FSR and no Planning Proposal.

This option would involve the progression of a development application accompanied by 2 x clause 4.6 variations seeking to add additional commercial office floors to the building – beyond plant and equipment that is necessary to adaptively reuse the exiting building and achieve necessary performance, safety and ESD standards. Given the nature of the existing height and floor space exceedances of the existing building as well as the proposed for additional building envelope and internal floorspace, this option was not considered the most appropriate pathway.

Option 3: Prepare a Planning Proposal to amend the maximum floor space ratio and height for the site under SLEP 2012.

This option allows the proponent to realise the most beneficial redevelopment scheme intended on the site through amending the height and FSR controls under SLEP 2012. Therefore, Option 3 is considered to be the most viable option.

8.1.2 Section B – relationship to the strategic planning framework

Q3. Will the Planning Proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

A Guide to Preparing Planning Proposals sets out that in order to answer this question, a planning proposal needs to justify that it meets the Strategic Merit Test. The consistency of this planning proposal with the mandated assessment criteria is set out below.

(a) Does the proposal have strategic merit?

Yes. The strategic merit of the proposal is demonstrated to be consistent with relevant strategic planning documents, as discussed in the following sections.

Greater Sydney Region Plan – A Metropolis of Three Cities

This Planning Proposal will give effect to the directions of *The Greater Sydney Region Plan – A Metropolis of Three Cities.* The Greater Sydney Region Plan (GSRP) is the overarching strategy for growing and shaping the Greater Sydney Area. It sets a 40-year vision (to 2056) and establishes a 20-year plan to manage growth and change for Greater Sydney in the context of social, economic, and environmental matters. The plan was adopted in March 2018, with the site and seeks to reposition Sydney as a metropolis of three cities – the site is located in the Eastern Harbour City.

The Region Plan has established 40 overarching objectives to achieve this vision, which are broken down into the five themes of Infrastructure and Collaboration, Liveability, Productivity, Sustainability, and Implementation. Key themes and directions from the Region Plan that are applicable to this Planning Proposal include:

- **A Globally Competitive Harbour CBD**

  The Region Plan emphasises the need to provide for the continued viability of the Harbour CBD as a globally competitive node for commercial activity.
- **Transit Oriented Development**

  The Region Plan establishes a strong theme that promotes transit orientated development, including the integration of Greater Sydney's rapid transit network with economic corridors and centres.
- **Creating Conditions for a Stronger Economy**

  The Region Plan establishes the goal to increase the number of jobs in Metropolitan and Strategic Centres, including Sydney CBD – Harbour City

The proposed height and FSR amendment will reinforce the above-listed themes to support the Strategic Directions from the Region Plan. Specifically, the Planning Proposal will facilitate an improved commercial uplift and urban design outcome for the site that will be consistent with the directions of the Region Plan. Relevant Strategic Directions from the Region Plan are further considered in relation to the proposed height and FSR amendment at **Table 5**.

Table 5 Consistency with Strategic Directions from the Region Plan

Direction	Consistency
Infrastructure supporting new development.	As mentioned, the Region Plan has a strong theme of promoting transit orientated development, including the integration of Greater Sydney's rapid transit network with economic corridors and centres. This Strategic Direction supports land use planning that is co-ordinated with the delivery of significant transport infrastructure investments, including Sydney Metro. As established, the proposed height amendment supports this approach. This Planning Proposal presents a height and FSR amendment that will enable commercial uplift at a site that will be serviced by a range of existing and planned infrastructure. This compliments the Strategic Direction to deliver infrastructure that supports new development.
A city of great places.	This Planning Proposal will facilitate an outcome for the site that responds to the unique characteristics that are associated with its context. As established, the site's current poor urban design outcomes and ground level activation will be addressed. In this regard, the Planning Proposal will deliver a positive urban design outcome that utilises a place-based and collaborative approach throughout planning, design, development and management by prioritising a people-friendly public realm and the public domain as a central organising design principle.

Direction	Consistency
	"Respecting heritage" is also emphasised by this Strategic Direction. This should be noted in regard to the location of the site, which is not proximate to any heritage-listed buildings and is not within a Heritage Conservation Area. As highlighted, the proposal will respect nearby local heritage items and the character of heritage conservation areas. The Planning Proposal would facilitate an amalgamated development outcome with the capacity for additional rooftop planting and canopy cover, as well as the creation of Sophia Street as a Shared Way.
Jobs and skills for the city.	This Strategic Direction is supported by job creation and infrastructure delivery targets that align with forecasted population growth across Greater Sydney. The Region Plan has established this Strategic Direction to address the requirement for 817,000 additional jobs to be created across Greater Sydney by 2036. This Strategic Direction is also intended to support the ongoing objective of ensuring that the economy of Greater Sydney remains internationally competitive, including in relation to other advanced and emerging urban economies across the Asia Pacific Rim. As set out in **Section 9.11.5**, this Planning Proposal will support the achievement of various job creation targets that are established by state, regional and local strategic frameworks. The opportunity to deliver additional high-grade commercial floorspace to keep an international technology company in Canva within Surry Hills within proximity to the emerging Tech Central precinct is complimentary to this Strategic Direction.
A city that is well-connected.	A key outcome that is sought by this Strategic Direction is the achievement of a '30-minute city' model of urban development around three metropolitan clusters, including the Harbour CBD. This outcome is only achievable if state investments are leveraged through co-locating employment generating land uses and public transport nodes. As discussed, the site is within the walkable catchment of Central Train Station, the Central Chambers light rail station and the proposed Central Metro Station, which will be operational in 2024. The integration of land use, transport and infrastructure planning is re-emphasised by this Strategic Direction. It has already been established that this Planning Proposal supports this approach. It has also been established that the Planning Proposal will allow for the future pedestrian network and public domain network surrounding the site to be leveraged. This would be supported by the establishment of a shared zone on Terry Street, the widening to the footpath on the southern side of Foveaux Street, west of Terry Street and streetscape activation through the provision of activated retail space from Sophia Street. Further to the above, the Reference Scheme conveys the design intent for an activated ground plane that includes a dual-access public lobby from Kippax and Sophia Street. This would also support through-site movement, especially during periods of inclement weather. The lobby space would also be designed to provide informal gathering opportunities.  ***Region Plan: Vision Diagram for 'Fine Grain Walkable Places'*** *Greater Sydney Commission*
An efficient city	The Planning Proposal will aid an innovative resource management outcome of the site, which not only reduces transport-related greenhouse gas emissions but will also reduce energy use per capita. This will be realised within the reference scheme through a series of passive design controls and energy efficient methods, which include the following:

Direction	Consistency
	• Providing photovoltaic (PV) solar panels on site. • Ensuring that by matching the energy demand of the reference scheme to grid-scale renewable energy generation, allowing further operational carbon reductions to be achievable with running cost renewable firming able to be realised. • Implement external shading, natural light and ventilation design features. • Installation of a bio solar green roof, producing solar energy and curbing the detrimental impacts of the urban heat island effect.

Eastern City District Plan

The Eastern City District Plan underpins the Greater Sydney Region Plan and sets the 20-year vision for the district through 'Planning Priorities' that are linked to the Region Plan. The Eastern City District Plan echoes the Region Plan in that it identifies the importance of aligning areas of employment growth with access to additional housing supply, through public transport services and services.

In particular, the District Plan provides detailed planning priorities which integrate relevant objectives, strategies and actions in response to the identified challenges and opportunities. The planning priorities relate to three key aims of the District Plan, being:

- A productive city;
- A liveable city; and
- A sustainable city.

The Surry Hills area, located within the Eastern City District, is considered a strategic location for the development and intensification of innovative commercial spaces. Surry Hills is located on the fringe of the Sydney CBD, which tends to be highly desirable location for creative and innovated industries. The District Plan recognises Surry Hills as an innovation corridor with digital and cultural industries requiring event spaces and affordable and scalable office spaces, normally seeking out character buildings in these areas. It is noted that the owner and intended main occupant, the Canva business model supporting digital and innovative employment, is a reflection of Surry Hill's innovative employment character.

The Surry Hills area presents a number of geographic, demographic and industry factors which increase the desirability and suitability for the location of collaborative commercial spaces, including:

- The Surry Hills area has a relatively young and highly educated population and workforce, with education qualifications in fields that are highly represented in digital and collaborative spaces. This has likely driven the growth of commercial spaces in the area;
- Residents and the local workforce are in industries that are conducive to new digital, innovative and "campus style" workspaces; and
- The Surry Hills area is in proximity to the CBD with an iconic pre-existing cluster of commercial spaces. The pre-existing cluster indicates strong demand for commercial spaces that are not necessarily required to be located within the Sydney CBD area.

The District Plan identifies a baseline employment target of 662,000 additional jobs for the Harbour CBD by 2036. This Planning Proposal will enable the delivery of additional employment generating floorspace at the site, which will support the achievement of this target.

An extended assessment against the Planning Priorities that are established by the East District Plan is provided at **Table 6**.

Table 6 Consistency with the Planning Priorities from the District Plan

Planning Priority / Objective *Established by the Region Plan*	Consistency *Consistency with the District Plan response to the Planning Priority / Objective*
E1. Planning for a city supported by infrastructure	
O.1 Infrastructure supports the three cities	The District Plan emphasises the importance of efficient transport connections within and between each of the three cities. The proximity of Central Train Station, Central Chalmers Street Light Rail Station, several bus

Planning Priority / Objective *Established by the Region Plan*	Consistency *Consistency with the District Plan response to the Planning Priority / Objective*
	services and the future Central Metro Station to the site must be noted in this regard. While this Planning Proposal will not directly facilitate the delivery of additional public transport infrastructure, it does support an outcome that will utilise new and planned infrastructure that are/have been delivered to satisfy Objective O1 of the Region Plan.
O.2 Infrastructure aligns with forecasted growth	As above, while this Planning Proposal will not directly facilitate the delivery of additional public transport infrastructure, it does support an outcome for the site that will compliment Objective O2 of the Region Plan, which has been echoed by the District Plan. This is because it will provide additional commercial floorspace at a site that is well serviced by existing transport infrastructure and planned transport infrastructure, which will be delivered to address forecasted growth.
O.4 Infrastructure use is optimised	The site is well-serviced by existing public and active transport infrastructure. The level of access to public transport services will further improve once the Central Metro Station is operational (est. 2024). This Planning Proposal presents a height amendment that will achieve additional commercial uplift at an accessible location. This is considered to reinforce Objective O4 and Planning Priority N1. The proposed height and FSR amendments should also be considered in the context of Action 6 of the District Plan, which has been quoted below for reference. ***Action 6:*** *Maximise the utility of existing infrastructure assets and consider strategies to influence behaviour changes, to reduce the demand for new infrastructure, including supporting the development of adaptive and flexible regulations to allow decentralised utilities.* The removal of the existing 55 car parking spaces will result in an overall reduction of vehicle traffic throughout the surrounding road network. Ultimately, the benefits of unlocking additional commercial uplift at the site have been well-established in relation to the accessibility and use of public transport. This height and FSR specific Planning Proposal is therefore considered to support the District Plan response to Objective 04.
E7. Growing a stronger and more competitive Harbour CBD	
O.15 The Eastern, GPOP and Western Economic Corridor are better connected and more competitive	In the Eastern District the Eastern Economic Corridor includes Surry Hills as part of the Harbour CBD, as well as Central Sydney and the strategic centre of Randwick. Several committed and potential transport infrastructure projects will improve accessibility between these agglomerations, in addition to areas of concentrated economic activity outside of the corridor area. Action 25 of the East District Plan identifies to review planning controls within transit-oriented centres as required to facilitate economic activity to deliver on job targets. It has been well-established throughout this report that the proposed height and FSR amendment will support this transit-oriented model of development.
O.18 The harbour CBD is stronger and more competitive	The need for a “stronger and more competitive Harbour CBD” is referenced commonly across the broader strategic framework for the site. The District Plan has sought to support this overarching goal through promoting the Harbour CBD as an attractive destination for high profile office tenants.

Planning Priority / Objective *Established by the Region Plan*	Consistency *Consistency with the District Plan response to the Planning Priority / Objective*
	The Planning Proposal directly responds to this objective through continually embedding Canva Pty Ltd, a leader in the digital and innovation industry within Surry Hills as part of the wider Tech Central precinct.
E8. Growing and investing in health and education precincts and the Innovation Corridor	
O.21 Internationally competitive health, education, research and innovation precincts	The need for additional commercial floorspace for digital and creative industries is displayed within the East District Plan. Action 26 seeks to facilitate an innovation corridor that not only delivers additional affordable and scalable commercial spaces, but also delivers a high amenity, highly walkable and safe corridor for the employment workforce. The Planning Proposal responds to this through its significant public benefit offerings, as well as flexible commercial floorspace provision.
E10. Delivering integrated land use and transport planning and a 30-minute city	
O.14 Integrated land use and transport creates walkable and 30-minute cities.	The East District Plan reinforces the vision for the '30-minute city' model of development to be achieved. It has been well-established throughout this report that the proposed height amendment will facilitate an outcome at the site that will support this objective.
E13. Supporting growth of targeted industry sectors	
O.24 Economic sectors targeted for success	The District Plan recognises the need to support the growth of internationally competitive industry sectors, which would in turn increase the rate of skilled job creation. Industry-leading businesses that operate in competitive knowledge, digital and innovation-based industries must be attracted to and accommodated in Surry Hills and the broader Harbour CBD to support this goal. It has been established that this Planning Proposal will support the accommodation of a high-profile commercial tenant in Canva Pty Ltd at the site. This is considered to compliment the District Plan in its response to Objective O24.
E19. Reducing carbon emissions and managing energy, water and waste efficiently	
O.33 A low carbon city contributes to net-zero emissions by 2050 and mitigates climate change	The District Plan establishes the overarching goal to provide for a 'low carbon district' under Planning Priority E19. This forms part of the district-level response to Objective O33 of the Region Plan, which has a strong emphasis on the utilisation of existing and future public transport infrastructure. The reference scheme achieved from the delivery of the height and FSR specific Planning Proposal will implement a series of Ecologically Sustainable Design (ESD) measures. These include the implementation of passive design controls, and the matching of energy demand to grid-scale renewable energy, both of which are discussed in further detail in **Section 9.10** and **Table 7**. Notwithstanding the above, the commercial uplift that would be unlocked by the proposed height and FSR amendment is relevant to the assessment of this height-specific Planning Proposal. In this regard, the transit-orientated context for the site should be considered. It has been well-established that providing additional employment-generating floorspace at the site would encourage the uptake of sustainable public transport modes.

Q4. Is the Planning Proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy or strategic plan?

City Plan 2036: City of Sydney Local Strategic Planning Statement

The City of Sydney Local Strategic Planning Statement (the LSPS) is the principal strategic planning document guiding land use planning and development in the City of Sydney Local Government Area (LGA). The LSPS represents Council's 20-year vision for the LGA's future direction, and contains directions about infrastructure, liveability, productivity, and sustainability. The LSPS draws from the Greater Sydney Commission's Greater Sydney Regional Plan and Eastern City District Plan and implements the planning priorities identified from these larger strategic documents at a local level.

The LSPS identifies four (4) key themes, each with a suite of planning priorities. The planning proposal responds to each of these themes, which include the following:

- Productivity;
- Sustainability;
- Infrastructure; and
- Liveability.

An assessment of the planning proposal as an adaptively reused, mixed use commercial office building, has been made against the relevant priorities is detailed in **Table 7**.

Table 7 Assessment against City of Sydney Local Strategic Planning Statement 2020

Planning Priority (PP)	Assessment	Consistency
Planning Priority P2 – Developing innovative and diverse business clusters in City Fringe	The LSPS highlights that the City Fringe covers strategically important and jobs-rich areas within the District Plan's Harbour CBD metropolitan area, but also outside Central Sydney. Specifically, it seeks to support the growth of knowledge-based and technology-driven activities through aiding innovation and creativity as central features for driving economic growth within the city fringe. In supporting this, it notes the importance of industry clusters and agglomeration of innovative and digital industries within the city fringe. The planning proposal directly aligns with Planning Priority P2 – Developing innovative and diverse business clusters in City Fringe by way of the following: • Seeks to deliver a high quality, adaptively reused mixed use space that supports commercial office development to support the City Fringe's economic diversity and resilience with a focus on knowledge-intensive sectors. • Aims to provide additional commercial floorspace that will enhance the physical and technological connectivity and legibility of office workers within City Fringe. This will support the ability for Canva Pty Ltd and other digital/innovative businesses to interest, grow and agglomerate with other people, businesses and clusters within the immediate area. • Provide additional commercial floorspace, as well as an existing, adaptively reused commercial building that will be utilised by Canva Pty Ltd and other businesses within the digital and innovative industry.	✓
Planning Priority S2 – Creating better buildings and places to reduce emissions and waste and use water efficiently	The LSPS aims to ensure that all new buildings constructed within the City of Sydney LGA, as well as existing buildings undergoing upgrade works reduce their C02 emissions and utilise waste and water more efficiently. The overarching goal of this initiative is to enable the healthy operation of circular economies on a precinct scale. The planning proposal directly aligns with Planning Priority S2 – Creating better buildings and places to reduce emissions and wastewater efficiently by way of the following: • Providing photovoltaic (PV) solar panels on site, increasing renewable energy generation implementation opportunities throughout the reference scheme. • Ensuring that by matching the energy demand of the reference scheme to grid-scale renewable energy generation, allowing further operational carbon reductions to be achievable with running cost renewable firming able to be realised.	✓

Planning Priority (PP)	Assessment	Consistency
	• Implementation of passive design controls, such as external shading, natural light, and ventilation, as well as a bio solar green roof to reduce energy consumption.	
Planning Priority S3 – Increasing resilience of people and infrastructure against natural and urban hazards	The LSPS seeks to better understand the resilience challenges facing Sydney and identify ways to address them. Natural hazards that impacted the City of Sydney were identified such as the urban heat island effect and flooding. Urban hazards identified included water pollution, soil contamination, noise pollution and air pollution. The planning proposal is coordinated with Planning Priority S3 – Increasing resilience of people and infrastructure against natural and urban hazards by way of the following: • Developing a suitable design and development approach to address flooding concerns present on the subject site. • Will provide a bio solar green roof that combines a green roof and PV solar array into one system, with the cooling effect of vegetation increasing solar output by up to 5%, whilst curbing the impacts of the urban heat island effect. • Implementing sound building management practices to prevent pollution and reduce litter when handling waste during the construction and operation of the reference scheme.	✓
Planning Priority I1 – Movement for walkable neighbourhoods and a connected city	The LSPS emphasises the importance of aligning development and growth to maximise the liveability and productivity benefits of an integrated transport network are key to achieving a truly connected city. It also highlights that creating walkable neighbourhoods are integral in delivering the 30-minute city concept within the City of Sydney LGA. The planning proposal is consistent with Planning Priority I1 – Movement for walkable neighbourhoods and a connected city by way of the following: • Seeking to implement a zero-parking approach through removing all existing car parking spaces on the site, prioritising end of trip facilities and bicycle parking space instead. • Prioritising the reduction of through traffic in Terry Street through the establishment of a shared zone, creating a pedestrian friendly environment that clearly communicates to road users that there Is a change in the street environment that pedestrians have priority.	✓
Planning Priority I3 – Supporting community wellbeing with social infrastructure	The LSPS recognises that the wellbeing of the city's residents, workers and visitors is supported with high-quality and accessible community infrastructure. It also emphasises the importance for new employment generating development to be in proximity to functional open space, in order to support wellbeing and social cohesion. This is recognised as being particularly important in higher density urban environments, such as the urban area within the City of Sydney LGA. Accordingly, the planning proposal is coordinated with Planning Priority I3 – Supporting community wellbeing with social infrastructure, due to the subject site being located within 400 metres of quality, functional open space that is greater than 3,000sqm in area	✓
Planning Priority L2 – Creating great places	The LSPS emphasises the importance of protecting and celebrating the unique character of neighbourhoods such as Surry Hills. It recognises that a pathway to recognising this is through the prioritisation of walkable neighbourhoods through incorporating shared zones in the local road network, as well as wider footpaths and pedestrian priority at crossings. The planning proposal aligns with Planning Priority L2 – Creating great places by way of the following: • The establishment of a shared zone on Terry Street, creating a pedestrian friendly environment that clearly communicates to road users that there Is a change in the street environment that pedestrians have priority.	✓

Planning Priority (PP)	Assessment	Consistency
	• Widening to the footpath on the southern side of Foveaux Street, west of Terry Street. This is proposed to be tied into the continuous footpath treat at Terry Street to help alleviate congestion on the footpaths leading to the Chalmers Street light rail stop and Central Station. • Establishing streetscape activation through the provision of activated retail space from Sophia Street, with the tenancy offered to a tenant at free to low rent for emerging retailers which may consist of food and beverage operators.	

Strategic and Site-Specific Principles for Growth

The proposal complies with the combined strategic and site-specific principles for growth as set out in the LSPS as set out below.

Strategic principles for growth:

- Proposals must be consistent with the Greater Sydney Region Plan and Eastern City District Plan.
- Proposals for sites in the Harbour CBD, Innovation Corridor (including Camperdown-Ultimo Health and Education Precinct) must be consistent with the objectives for these areas in the Eastern City District Plan.
- Proposals must be consistent with the relevant directions, objectives and actions of the City's community strategic plan, Sustainable Sydney 2030 and Sustainable Sydney 2050 in the future.
- Proposals must be consistent with the relevant liveability, productivity, infrastructure and sustainability priorities, objectives and actions in this Local Strategic Planning Statement.
- Proposals must be consistent with the relevant priorities, objectives and actions of the Local Housing Strategy.
- Proposals must support the strategic objectives in the City's adopted strategies and action plans.
- Proposals must not compromise non-residential development needed to meet employment targets for centres.
- Proposals which seek to respond to a significant investment in infrastructure must be considered in a wider strategic context with other sites. This may include, but is not limited to, consideration of other infrastructure demand and provision, appropriate distribution of development potential across an area, value capture for public benefit and infrastructure delivery and orderly sequencing of development.
- Proposals must give consideration to strategically valuable land uses that are under-provided by the market, such as but not limited to hotels, cultural space (including performance and production space), medical uses, education uses and childcare centres, and having regard to the appropriateness of the use for the context.

Site-specific principles for growth:

- Proposals must locate development within reasonable walking distance of public transport that has capacity (assuming development capacity will be delivered) and is frequent and reliable.
- Proposals must meet high sustainability standards and mitigate negative externalities.
- Proposals must include an amount and type of non-residential floor space appropriate to the site's strategic location and proximity to or location within a centre or activity street.
- Proposals must create public benefit.
- Proposals must be supported by an infrastructure assessment and demonstrate any demand for infrastructure it generates can be satisfied, assuming existing development capacity in the area will be delivered.
- Proposals must make a positive contribution to the built environment and result in an overall better urban design outcome than existing planning controls.
- Proposals must result in high amenity for occupants or users.
- Proposals must optimise the provision and improvement of public space and public connections.

City of Sydney Economic Development Strategy 2013

The City of Sydney's Economic Development Strategy 2013 (the Strategy) builds on and provides an update to the broad economic themes identified in the City of Sydney's previous LSPS, Sustainable Sydney 2030. The Strategy provides an overarching framework that guides the City's economic development aspirations, role, priorities, and approach. Of relevance to the Proposal is the Strategy's recognition of the subject site within a creative and innovative industry cluster, emphasising that support of development within the city's industry clusters can contribute to the transmission of ideas into innovation. This would enable the capacity for each of the clusters to provide a productivity base to realise the potential of the city fringe economy.

An extended assessment against the strategic economic priorities that are established within the Economic Development Strategy is provided at **Table 8**.

Table 8 Consistency with strategic economic priorities from the Economic Development Strategy

Strategic Economic Priority	Consistency
Strengthen Sydney's Competitiveness	The proposal is consistent with the priority to strengthen Sydney's competitiveness through enabling the renewal and adaptive re-use of an existing commercial building, as well as the incorporation of additional commercial floorspace for the use by Canva Pty Ltd. Ultimately, this directly supports an Australian business through fostering a space to operate and undertake business operations as leaders of the digital and innovative industry.
Improve productivity and capacity	As highlighted within **Table 7** the proposal is within proximity to several key current and future public transport nodes, including Central Station, Chalmers Street light rail station, and the new Sydney Metro City and Southwest Central Station. Furthermore, the site's 400m proximity to significant greens space further aid's the proposals proximity to 'productive infrastructure' for the future workforce. In addition, affordable housing levies and infrastructure contributions within the DA stage will ensure appropriate provision is made to social infrastructure. Overall, the proposal is consistent with the productivity priorities of the strategy, with contributions at the DA stage and proximity to existing and future public transport infrastructure. This will ensure that the proposal continues to contribute to equitable infrastructure provision throughout the cities' economy.
Promote opportunity	The proposal contributes to the elevation of a key business (Canva Pty Ltd) within the creative and digital industry cluster. The increased presence of Canva Pty Ltd in Surry Hills will positively facilitate the continual development of informal networks, improving the overall amenity of Surry Hills, especially in proximity to the emerging 'Tech Central' precinct. Therefore, the placing of Canva Pty Ltd within this space can further encourage commercial interactions between the digital and innovation industries, encouragement of the exchange of ideas, as well as 'knowledge spill-overs' to other businesses.

Draft Economic Development Strategy Discussion Paper 2022

A new Economic Development Strategy is currently being developed for the City of Sydney and is proposed to be finalised in 2024. This updated strategy reflects the new economic conditions present within the locality, particularly focusing on the economic problems exposed and amplified during the COVID-19 pandemic such as barriers to participation and inequality, unaffordable space, lack of economic diversity, environmental damages, insecure jobs, as well as skill and labour shortage. The strategy focuses on four new strategic priorities:

- Transitioning to a green and circular economy.
- Building an innovation economy.
- Strengthening our inclusive economy.
- Revitalising our city centre.

The planning proposal and use of the site for the purpose of a mixed use and commercial office environment, supports the priorities of the draft Economic Development Strategy in that it will:

- Align with Canva's principle to 'do more with less'. Therefore, the operations of the proposed development will showcase strong leadership and commitment in demonstrating green and circular economy initiatives,

whilst undertaking education and knowledge sharing within the digital and innovation industry on green and circular economy benefits.

- Support the local innovation ecosystem, with the proposed development housing Canva Pty Ltd likely to share information and further drive innovation with the development of the nearby and emerging 'Tech Central' precinct. This will see the proposal act as a catalyst of innovation clusters and strengthen productivity gains within Surry Hills and the broader 'Tech Central' precinct.
- Enable inclusive economic development through incorporating affordable/free rent to the activated Sophia Street retail space for emerging retailers which may consist of food and beverage operators.
- Create an improved public domain outcome through the establishment of a shared zone on Terry Street, providing a pedestrian friendly environment, widening to the footpath on the southern side of Foveaux Street and establishing streetscape activation through the provision of an activated retail tenancy from Sophia Street.

Sydney Local Environmental Plan 2012

Consistency with Aims of SLEP 2012

The proposal's consistency with the overall aims of the SLEP 2012 is outlined in **Table 9** below.

Table 9 Consistency with the overall aims of the SLEP 2012

Aim	Proposal	Consistency
(aa) to protect and promote the use and development of land for arts and cultural activity, including music and other performance arts,	The proposal will not result in the loss of event spaces and land dedicated for arts and cultural activity, including music and other performing arts. Rather the provision of a public art wall on the eastern and northern facades will promote greater artistic expression within the proposal's design fabric.	✓
(a) to reinforce the role of the City of Sydney as the primary centre for Metropolitan Sydney,	The proposal will facilitate the delivery of additional commercial office floorspace within the site for usage from the main tenant Canva Pty Ltd, as well as other emerging and established businesses within the digital and innovation industry. This will increase employment and business opportunities within an established inner-city suburb, reinforcing the City of Sydney's role as the primary centre for Metropolitan Sydney.	✓
(b) to support the City of Sydney as an important location for business, educational and cultural activities and tourism,	The proposal will facilitate the promotion of the digital and innovative industries as key business activities within an inner-city suburb.	✓
(c) to promote ecologically sustainable development,	Future development of the site will incorporate the principles of ecologically sustainable development. The project will pursue a smart building design response, coupled with on-site solar photovoltaic (PV) systems to drive grid resilience and demand management outcomes to ensure a net-zero outcome is achieved.	✓
(d) to encourage the economic growth of the City of Sydney by— (i) providing for development at densities that permit employment to increase, and (ii) retaining and enhancing land used for employment purposes that are significant for the Sydney region,	The proposal will facilitate the retention ongoing use of employment land within the City of Sydney locality. Redevelopment of the site for the upgrade of existing commercial office floorplates and addition of new floorspace will provide additional employment opportunities within the digital and innovative industries in proximity to public transport and services.	✓
(e) to encourage the growth and diversity of the residential population of the City of Sydney by	The proposal does not seek to provide additional housing. However, it will deliver an enhanced commercial office building that will be able to	✓

Aim	Proposal	Consistency
providing for a range of appropriately located housing, including affordable housing,	accommodate more employees within an inner-city suburb close to housing, public transport and services, offering a flexible and accessible working environment.	
(f) to enable a range of services and infrastructure that meets the needs of residents, workers and visitors,	The proposal will facilitate the delivery of employment and business services through the provision of 10,173m^2 of additional commercial floorspace, supporting the services of the building owner, Canva Pty Ltd, as well as other digital and innovative businesses.	✓
(g) to ensure that the pattern of land use and density in the City of Sydney reflects the existing and future capacity of the transport network and facilitates walking, cycling and the use of public transport,	The proposal does not seek to alter the pattern of land use within the locality. Rather, it will facilitate the redevelopment of the existing commercial building on site in accordance with the proposed design, maintaining a large proportion of the building core, expanding additional floors from the top level. It is intended that this will be commensurate to the existing built form of the site, and the higher density character of the western edge of the 'Surry Hills Central' precinct.	✓
(h) to enhance the amenity and quality of life of local communities,	The proposal seeks to facilitate the redevelopment of the site as an enhanced built form capable of fostering a highly adaptive, high quality, commercial office environment. In addition to the ground floor shopfront offerings, this will provide the opportunity for an integrated proposal that interacts with the amenity and high quality of life throughout the surrounding public domain. This will enhance the amenity and the quality of the local commercial context.	✓
(i) to provide for a range of existing and future mixed-use centres and to promote the economic strength of those centres,	The proposal seeks to facilitate the redevelopment of the site as an enhanced built form capable of fostering a high-quality commercial office space offering. The proposed future use of the site is commensurate to the growing technology, digital and innovation industry presence within Surry Hills, especially with the emergence of the 'Tech Central' precinct to the west.	✓
(j) to achieve a high quality urban form by ensuring that new development exhibits design excellence and reflects the existing or desired future character of particular localities,	The Development Concept has been designed to ensure high quality-built form that is commensurate to the staggered built form character (from higher to medium density) embedded with heritage of Surry Hills. Particularly, the heritage characteristics of the adjacent local heritage item "Former Farleigh Nettheim & Co Ltd warehouse" (no I2267) and nearby Albion Estate Conservation Area have been considered.	✓
(k) to conserve the environmental heritage of the City of Sydney,	As outlined in **Section 2.6**, the site is located within the immediate proximity of a local heritage item and nearby to the Albion Estate Conservation Area. The proposed development is predominantly located within the building envelope, besides the additional levels proposed and provides an anchor to the transition of building storeys as it steps down from the west to east. The proposed building is not considered to visually dominate the heritage items and ensures a suitable visual curtilage around the heritage items and the conservation area.	✓

Aim	Proposal	Consistency
(l) to protect, and to enhance the enjoyment of, the natural environment of the City of Sydney, its harbour setting and its recreation areas.	The future redevelopment of the site will not result in any impacts on the harbour and setting.	✓

Consistency with Floor Space Ratio Objectives of SLEP 2012

The proposal's consistency with the objectives of the floor space ratio (FSR) under the SLEP 2012 is outlined in **Table 10** below.

Table 10 Consistency with the floor space ratio objectives of the SLEP 2012

Aim	Proposal	Consistency
(a) to provide sufficient floor space to meet anticipated development needs for the foreseeable future,	The Proposal seeks to provide sufficient floor space to facilitate the redevelopment of the site in accordance with relevant built form controls under the SLEP 2012 and SDCP 2012. The Proposal will provide additional commercial office floor space and ensure the ongoing operation of the site supports the operation of commercial uses and ground floor shopfront tenancies.	✓
(b) to regulate the density of development, built form and land use intensity and to control the generation of vehicle and pedestrian traffic,	The proposed increase to the maximum FSR on the site will facilitate the enhancement of the existing commercial floorplates and the rooftop addition of commercial floor space above. The main increase in GFA is concentrated in the additional commercial office levels and landscaped rooftop terrace established at rooftop additions. Through the provision of a nil street setback, the proposed building envelope responds to the existing built form context of the site and surrounding locality and will be consistent with the setback pattern within the streetscape. With respect to vehicle and pedestrian traffic, the proposal is not anticipated to generate any vehicle traffic or significant pedestrian traffic, as the opportunity to provide parking on site has been removed in place of end of journey facilities and bicycle parking.	✓
(c) to provide for an intensity of development that is commensurate with the capacity of existing and planned infrastructure,	The Proposal will result in the development of the site to a level that is commensurate with the capacity of existing and planned infrastructure. The deletion of on-site parking and the addition of end of trip facilities and bicycle parking is a distinct benefit of the scheme with respect to existing and planned infrastructure in the locality. Furthermore, the removal of car parking is also consistent with the extremely accessible nature of the site, which is approximately 160m east of Central station, which provides train services to the entire Sydney rail network, light rail services to the Sydney CBD and South-East, and in 2024, the Sydney Metro City and South-West.	✓
(d) to ensure that new development reflects the desired character of the locality in which it is located and minimises adverse impacts on the amenity of that locality.	The proposed development has been prepared with regard to the existing character of the site and surrounding locality. The identified use, built form setbacks, building height, ground floor and façade treatment and interaction with the surrounding public domain have been considered so as to minimise impacts on the amenity of the	✓

Aim	Proposal	Consistency
	Surry Hills locality and fit into the emerging 'Tech Central' precinct vision.	

Consistency with Height of Buildings Objectives of SLEP 2012

The proposal's consistency with the objectives for height of buildings (HOB) under the SLEP 2012 is outlined in **Table 11** below.

Table 11 Consistency with the height of building objectives of the SLEP 2012

Aim	Proposal	Consistency
(a) to ensure the height of development is appropriate to the condition of the site and its context,	The proposal seeks to provide an increased height to what currently exists on the site. The increased building height will be commensurate to the nature of maximum building heights in Surry Hills, which is currently staggered from higher buildings situated towards the west to Central station down to smaller heights along the east throughout Kippax Street. Therefore, it is considered that the proposed height of development is appropriate to the condition of the site and its context.	✓
(b) to ensure appropriate height transitions between new development and heritage items and buildings in heritage conservation areas or special character areas,	The proposed building will result in a similar bulk and scale through pushing back the additional floor envelopes to reduce visual bulk as well as providing planting to the façade and rooftop to cater more gentle scale with the surrounding area. These design interventions will ensure that appropriate height transitions between the local heritage item I2267 – *"Former Farleigh Nettheim & Co Ltd warehouse including interiors"* opposite the site on Sophia Street and the Albion Estate Conservation Area (C58) are maintained.	✓
(c) to promote the sharing of views outside Central Sydney,	The proposal will not result in a development that will restrict view sharing outside of Central Sydney. Rather, it will result in a development with subtle changes to height, with a commensurate bulk and scale to the surrounding built form. Thus, view sharing is likely to remain consistent with the existing building.	✓
(d) to ensure appropriate height transitions from Central Sydney and Green Square Town Centre to adjoining areas,	The proposal will develop a height and scale that is commensurate with the surrounding 'Surry Hills Central'. Therefore, where possible, appropriate height transitions from Central Sydney will be maintained.	✓
(e) in respect of Green Square – (i) to ensure the amenity of the public domain by restricting taller buildings to only part of a site, and (ii) to ensure the built form contributes to the physical definition of the street network and public spaces.	Not applicable. The site of the planning proposal is not located within Green Square.	N/A

Q5. Is the planning proposal consistent with any other applicable State and regional studies or strategies

NSW State Infrastructure Strategy 2022

The NSW State Infrastructure Strategy 2022-2042 brings together the infrastructure investment and land use planning of the Future Transport Strategy 2056 and the Greater Sydney Region Plan and is underpinned by the State Infrastructure Strategy 2018-2038: Building Momentum that establishes a pipeline of investment for infrastructure that is underway or in advanced planning. The Strategy sets out the NSW Government's vision for infrastructure over the next 20 years, focussing on aligning investment with sustainable growth. For Metropolitan NSW, the primary goal is to provide residents with access to jobs and services within 30 minutes, known as the '30-minute city' model.

The Strategy sets out sets out nine directions for infrastructure in NSW, of which the following are relevant:

- Boost economy: wide productivity and competitiveness – the proposal will contribute to the additional supply of high-quality commercial floorplates, supporting digital and innovative industry employment within scalable office spaces.
- Integrate infrastructure, land use and service planning – the proposal will deliver additional jobs in line with the delivery of Sydney Metro, so that capital investment keeps pace with new jobs.

The proposal will deliver additional employment floor space to accommodate increased commuter numbers associated with the anticipated arrival of the Sydney Metro at Central Station. The new Central Metro Station entry is located to the immediate south west of the site and will provide greater transport access to the site. The new Central Station Metro entry is located approximately 160m south west of the site.

Future Transport Strategy 2056

The Future Transport Strategy (FTS) 2056 sets out the NSW government's vision for transport in a growing and changing state. It guides the community on strategic directions for future planning integrated with evolving transport networks throughout the Sydney metropolitan area and the state. The strategy delivers a framework that informs place-based planning and policy decisions to achieve successful outcomes, aiming to connect community to the city and state shaping infrastructure and services pipeline.

The proposal is consistent with the objectives of this plan through:

- supporting the expansion of the by providing significant employment opportunities in direct proximity to existing heavy rail stations and future metro stations;
- assisting in unclogging the Sydney CBD transport system by connecting more people to existing heavy rail and future metro rail infrastructure and encouraging patronage of an existing network with spare capacity; and
- encouraging public transport use by providing significant employment opportunities in close proximity to future metro, light rail, rail and bus services.

Q6. Is the Planning Proposal consistent with applicable State Environmental Planning Policies?

The State Environmental Planning Policies directly applicable to the planning proposal are identified in **Table 12**.

Table 12 Consistency with State Environmental Planning Policies

SEPP	Consistent			Comment
	Yes	No	N/A	
State Environmental Planning Policy (Biodiversity and Conservation) 2021	✓			Nothing in this amendment will prevent a future DA's ability to comply with the Biodiversity and Conservation SEPP.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Housing) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Industry and Employment) 2021	✓			The future development of the site, including ground floor uses will have signage that is compatible with the desired amenity and visual character of the 'Surry Hills Central' precinct. The design principles for signage provided in Schedule 5 of the Industry & Employment SEPP 2021 will be further addressed as part of the detailed development application after this planning proposal.
State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development			✓	Not relevant to the proposed LEP amendment.

SEPP	Consistent			Comment
State Environmental Planning Policy (Planning Systems) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Precincts—Central River City) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Precincts—Eastern Harbour City) 2021	✓			Nothing in this amendment will prevent a future DA's ability to comply with the Eastern Harbour City SEPP 2021.
State Environmental Planning Policy (Precincts—Regional) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Precincts—Western Parkland City) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Primary Production) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Resilience and Hazards) 2021	✓			Nothing in this amendment will prevent a future DA's ability to comply with the Resilience and Hazards SEPP.
State Environmental Planning Policy (Resources and Energy) 2021			✓	Not relevant to the proposed LEP amendment.
State Environmental Planning Policy (Sustainable Buildings) 2022	✓			Nothing in this amendment will prevent a future DA's ability to comply with the Sustainable Buildings SEPP in the near future.
State Environmental Planning Policy (Transport and Infrastructure) 2021	✓			Nothing in this amendment will prevent a future DA's ability to comply with the Transport and Infrastructure SEPP.

Q7. Is the Planning Proposal consistent with the applicable Section 9.1 Directions?

Yes. An assessment of the Planning Proposal against applicable Section 9.1 Directions is set out in **Table 13**.

Table 13 Assessment of Section 9.1 Directions

Ministerial Direction	Consistent			Comment
	Yes	No	N/A	
Focus area 1: Planning Systems				
1.1 Implementation of Regional Plans	✓			As discussed in **Section 8.1.2** the planning proposal is consistent with the Greater Sydney Region Plan.
1.2 Development of Aboriginal Land Council land			✓	The planning proposal does not seek to develop on Aboriginal Land Council land.
1.3 Approval and Referral Requirements	✓			The planning proposal does not comprise designated development and does not require external agency concurrence.
1.4 Site Specific Provisions	✓			The proposed amendments to SLEP 2012 are uncomplicated and will not impose unnecessarily restrictive planning controls on the site.

Ministerial Direction	Consistent			Comment
1.4A Exclusion of Development Standards from Variation	✓			The proposed amendments do not minimise the exclusion of development standards from variation under clause 4.5 of a Standard Instrument LEP or an equivalent provision of any other environmental planning instrument.
Focus area 1: Planning Systems – Place-based				
1.5 Parramatta Road Corridor Urban Transformation Strategy			✓	The site of the planning proposal is not located in the Parramatta Road Corridor.
1.6 Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan			✓	The site of the planning proposal is not located in the North West Priority Growth Area.
1.7 Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan			✓	The site of the planning proposal is not located in THE Greater Parramatta Priority Growth Area.
1.8 Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan			✓	The site of the planning proposal is not located in the Wilton Priority Growth Area.
1.9 Implementation of Glenfield to Macarthur Urban Renewal Corridor			✓	The site of the planning proposal is not located in the Glenfield to Macarthur Urban Renewal Corridor.
1.10 Implementation of Western Sydney Aerotropolis Plan			✓	The site of the planning proposal is not located in the Western Sydney Aerotropolis.
1.11 Implementation of Bayside West Precincts 2036 Plan			✓	The site of the planning proposal is not located in any of the Bayside West precincts.
1.12 Implementation of Planning Principles for the Cooks Cove Precinct			✓	The site of the planning proposal is not located in the Cooks Cove precinct.
1.13 Implementation of St Leonards and Crows Nest 2036 Plan			✓	The site of the planning proposal is not located in the boundaries of the St Leonards and Crows Next Plan.
1.14 Implementation of Greater Macarthur 2040			✓	The site of the planning proposal is not located in the boundaries of the Greater Macarthur 2040 plan.
1.15 Implementation of the Pyrmont Peninsula Place Strategy			✓	The site of the planning proposal is not located in the boundaries of the Pyrmont Peninsula Place Strategy.
1.16 North West Rail Link Corridor Strategy			✓	The site of the planning proposal is not located in the North West Rail Link Corridor.
1.17 Implementation of the Bays West Place Strategy			✓	The site of the planning proposal is not located in the Bays West Precinct.
1.18 Implementation of the Macquarie Park Innovation Precinct			✓	The site of the planning proposal is not located in Macquarie Park.
1.19 Implementation of the Westmead Place Strategy			✓	The site of the planning proposal is not located in Westmead.
1.20 Implementation of the Camellia-Rosehill Place Strategy			✓	The site of the planning proposal is not located in Camellia, nor Rosehill.
1.21 Implementation of South West Growth Area Structure Plan			✓	The site of the planning proposal is not located in the South West Growth Area.
1.22 Implementation of the Cherrybrook Station Place Strategy			✓	The site of the planning proposal is not located in the Cherrybrook station precinct.

Ministerial Direction	Consistent			Comment
Focus area 2: Design and Place				
Focus area 3: Biodiversity and Conservation				
3.1 Conservation Zones			✓	The planning proposal is not proposed to infringe on any heritage conservation zones.
3.2 Heritage Conservation	✓			The planning proposal respects the heritage items surrounding the site, including the local heritage item *"Former Farleigh Nettheim & Co Ltd warehouse including interiors"* (I2267), directly adjacent to the site across Sophia Street.
3.3 Sydney Drinking Water Catchments			✓	Not relevant to the proposed LEP amendment.
3.4 Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs			✓	The site of the planning proposal is not located in, or in proximity to, any C2 or C3 zones.
3.5 Recreation Vehicle Areas			✓	The site of the planning proposal is not located in a Recreation Vehicle Area.
3.6 Strategic Conservation Planning			✓	The site of the planning proposal is not located in an area that requires Strategic Conservation Planning.
3.7 Public Bushland			✓	The site of the planning proposal is not located in an area of Public Bushland.
3.8 Willandra Lakes Region			✓	The site of the planning proposal is not located in the Willandra Lakes Region.
3.9 Sydney Harbour Foreshores and Waterways Area			✓	The site of the planning proposal is not located in the Sydney Harbour Foreshores and Waterways Area.
3.10 Water Catchment Protection			✓	The site of the planning proposal is not located in a Water Catchment Protection zone.
Focus area 4: Resilience and Hazards				
4.1 Flooding			✓	The site of the planning proposal is not located in a flood planning area, nor is it identified as flood prone land.
4.2 Coastal Management			✓	The site of the planning proposal is not located in a coastal management area.
4.3 Planning for Bushfire Protection			✓	The site of the planning proposal is not located in a bushfire prone land area.
4.4 Remediation of Contaminated Land			✓	The site of the planning proposal is not classified as contaminated land.
4.5 Acid Sulfate Soils	✓		✓	The site of the planning proposal is identified as having class 5 acid sulfate solil and will be managed through the DA process
4.6 Mine Subsidence and Unstable Land			✓	The site of the planning proposal is not located in land identified as mine subsidence or unstable land.
Focus area 5: Transport and Infrastructure				
5.1 Integrating Land Use and Transport	✓			The planning proposal improves access to new employment for workers by walking, cycling and public transport by taking into consideration the proximity of the site to existing networks.

Ministerial Direction	Consistent			Comment
5.2 Reserving Land for Public Purposes			✓	Not relevant to the proposed LEP amendment.
5.3 Development Near Regulated Airports and Defence Airfields			✓	Not relevant to the proposed LEP amendment.
5.4 Shooting Ranges			✓	Not relevant to the proposed LEP amendment.
Focus area 6: Housing				
6.1 Residential Zones	✓			Not relevant to the proposed LEP amendment.
6.2 Caravan Parks and Manufactured Home Estates			✓	Not relevant to the proposed LEP amendment.
Focus area 7: Industry and Employment				
7.1 Business and Industrial Zones	✓			The planning proposal will maintain and enhance the employment generating uses on the site and support the viability of the of the 'Surry Hills Central' precinct, as well as the Surry Hills innovation corridor.
7.2 Reduction in non-hosted short-term rental accommodation period			✓	Not relevant to the proposed LEP amendment.
7.3 Commercial and Retail Development along the Pacific Highway, North Coast			✓	The site of the planning proposal is not located along the Pacific Highway or North Coast.
Focus area 8: Resources and Energy				
8.1 Mining, Petroleum Production and Extractive Industries			✓	Not relevant to the proposed LEP amendment.
Focus area 9: Primary Production				
9.1 Rural Zones			✓	The site of the planning proposal is not located in a Rural Zone.
9.2 Rural Lands			✓	The site of the planning proposal is not identified as Rural Lands.
9.3 Oyster Aquaculture			✓	Not relevant to the proposed LEP amendment.
9.4 Farmland of State and Regional Significance on the NSW Far North Coast			✓	The site of the planning proposal is not identified as Farmland, nor is it located in a regional area.

8.2 Site-specific merit

8.2.1 Section C – Environmental, social and economic impact

Q8. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The site's location within the urban inner-city area of Surry Hills, on the edge of the Sydney CBD significantly limits its exposure to critical habitat or threatened species, as well as the populations or ecological communities that are associated with them. As addressed in the Biodiversity and Conservation Ministerial Directions in **Table 13** the site of the planning proposal:

- is not located in, or in proximity to, any C2 Environmental Conservation or C3 Environmental Management land;
- is not located in an area that requires strategic conservation planning;
- is not located in an area of Public Bushland; and
- is not located in a Water Catchment Protection Zone.

Therefore, it is considered that the renewal and redevelopment of the site can be achieved without resulting in adverse impacts to the flora and fauna identified in the site and surrounding area.

Q9. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

A detailed assessment of the environmental effects as a result of this request for a planning proposal is identified in **Section 9.0** of this report. Relevant management measures are identified where appropriate and, on this basis, no unacceptable impacts are likely to result for a planning proposal or future development on the site.

Q10. Has the planning proposal adequately addressed any social and economic effects?

Yes. The economic and social impacts arising from this request for a planning proposal have been fully identified and addressed by specialised reports which are assessed at **Section 9.0**. The planning proposal will contribute to several positive social and economic effects, including:

- providing a significant uplift to the ground floor level fronting Kippax Street, enabling high quality, fine-grain shop frontages that will improve the activation of the site to Kippax Street, delivering a space that will encourage improved direct and incidental social interaction, improved foot traffic and improved amenity and safety for the public within the surrounding public domain;
- providing improved commercial office spaces that will support digital and innovative businesses within the Surry Hills innovation corridor and the nearby emerging 'Tech Central' precinct; and
- provision of 789sqm of additional high quality commercial office space that is in proximity public transport infrastructure and key services throughout Surry Hills and the nearby Sydney CBD.

Refer to **Section 9.11.5** for further social and economic assessment.

8.2.2 Section D – Infrastructure (Local, State and Commonwealth)

Q11. Is there adequate public infrastructure for the Planning Proposal?

The redevelopment of the site will be serviced by the existing public infrastructure and services including connections to power, telecommunications, water and sewerage. This infrastructure for the site has been considered by the project engineers, ADP.

8.2.3 Section E – State and Commonwealth Interests

Q12. What are the views of state and federal public authorities and government agencies consulted in order to inform the Gateway determination?

The site of the request for a planning proposal is located within the catchment of the 'Surry Hills Central' precinct, as well as within the Surry Hills innovation corridor, which is serviced by significant transport infrastructure and government investment. Where necessary, further consultation with relevant authorities will be undertaken as required in accordance with the Gateway Determination. State and Commonwealth authorities will have the opportunity to provide comment on the planning proposal as part of its formal exhibition.

9.0 Environmental Assessment

This section provides an environmental assessment of the proposed planning controls and the indicative reference scheme that those controls are capable of accommodating.

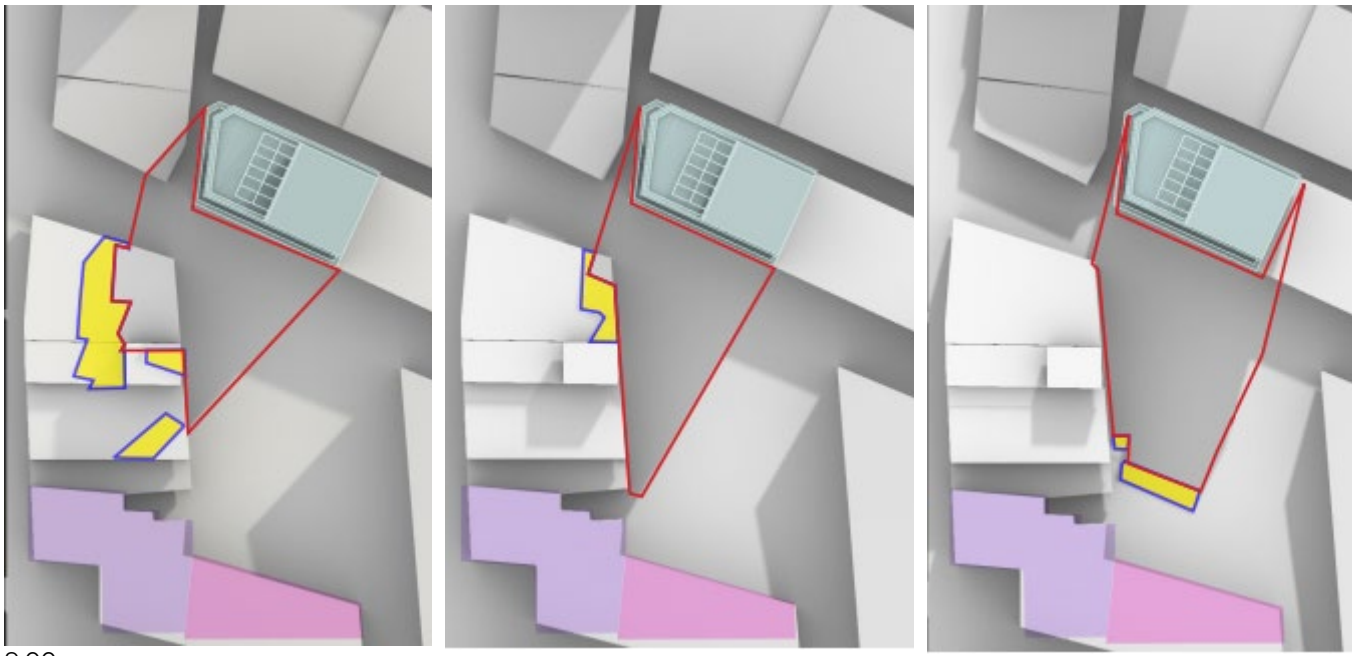
9.1 Built form and Urban Design

The proposal's-built form and urban design have been considered in detail within the Urban Design Report set out at **Appendix A**. The design has been configured to be respectful and recessive to the existing building envelope, whilst providing high quality and high amenity floorspace and mitigating external impacts.

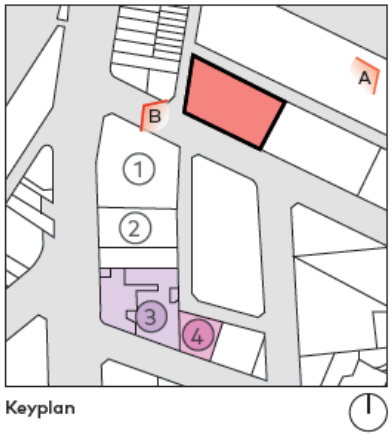
9.2 Overshadowing

A shadow analysis has been prepared by Cox Architecture and is provided in the Urban Design Report at **Appendix A**. The analysis has been undertaken in one-hour intervals between 9:00am to 3:00pm during the winter solstice (21 June) where the overshadowing impacts are considered to be the worst. The diagrams provided are replicated below in **Figure 28** below with the maximum extent of the Indicative Reference Scheme outlined in blue. The analysis demonstrates the overshadowing impacts are at their greatest on the commercial buildings located south west of the site which is the case with the existing building. It can be confirmed the Indicative Reference Scheme will not result in any overshadowing impacts to the residential properties (Icon Apartments and Calibrae Apartments) located to the south west of the site.

Cox Architecture have also undertaken testing on a hypothetical residential envelope on the carpark site (opposite the site) to ensure adequate sunlight is still achieved at the site. It was found that the Indicative Reference Scheme would not impact the site's ability to be designed for a mixed use development.



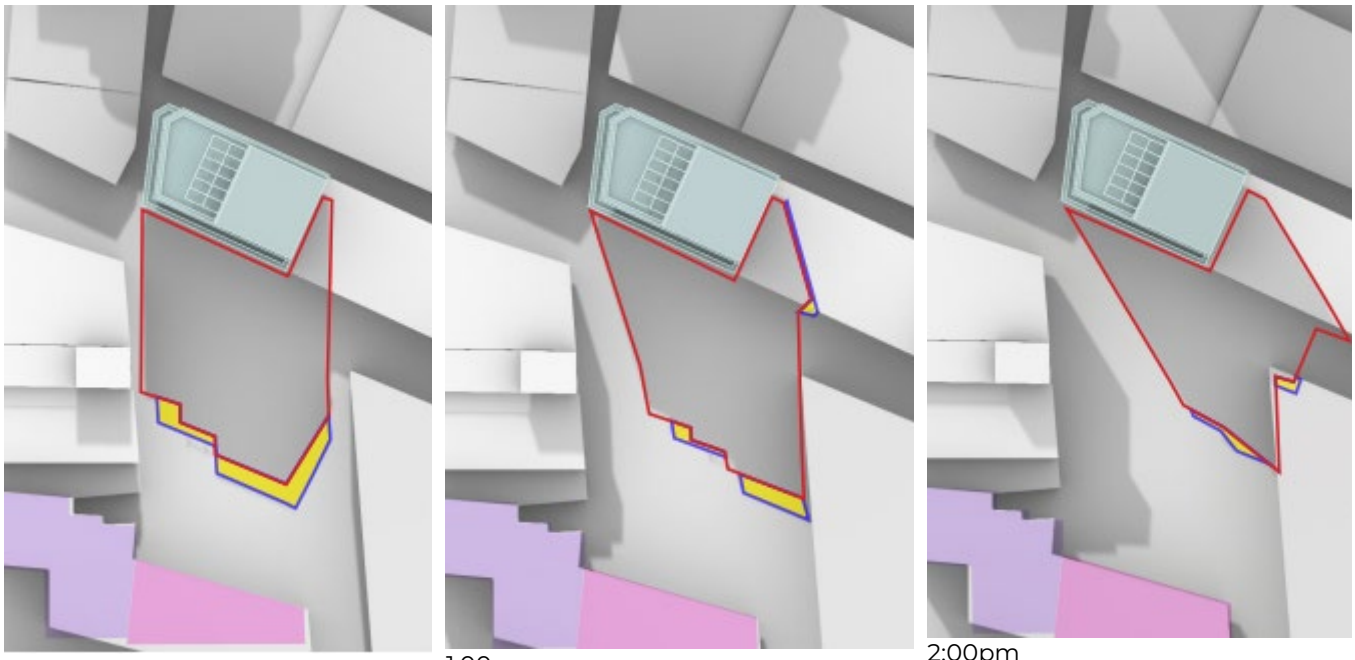
9:00am 10:00am 11:00am



Keyplan

LEGEND

- Site
- 1 Mixed use
- 2 Crisis Accommodation
- 3 Icon Apartments
- 4 Calibrae Apartments

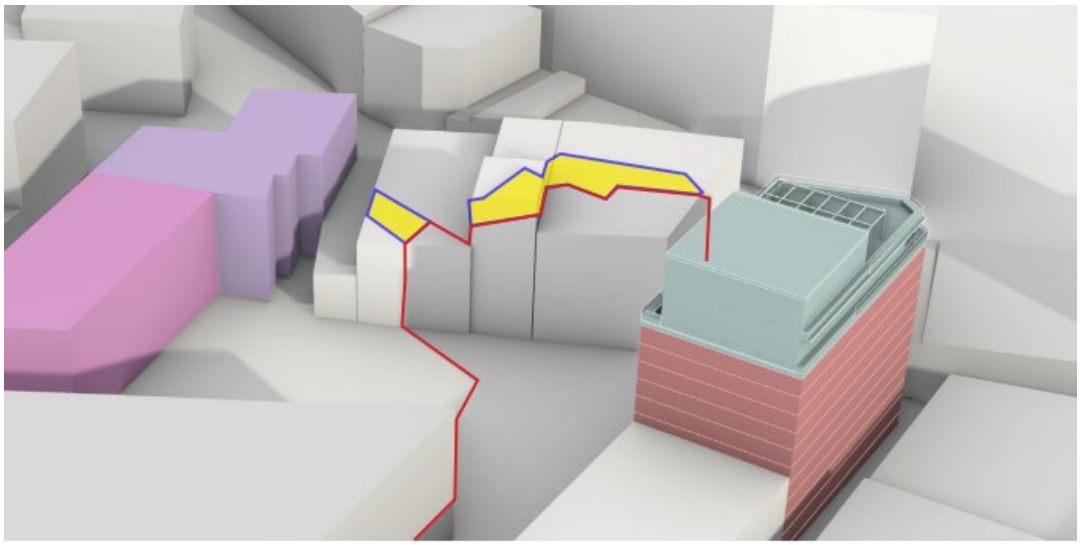


12:00pm 1:00pm 2:00pm

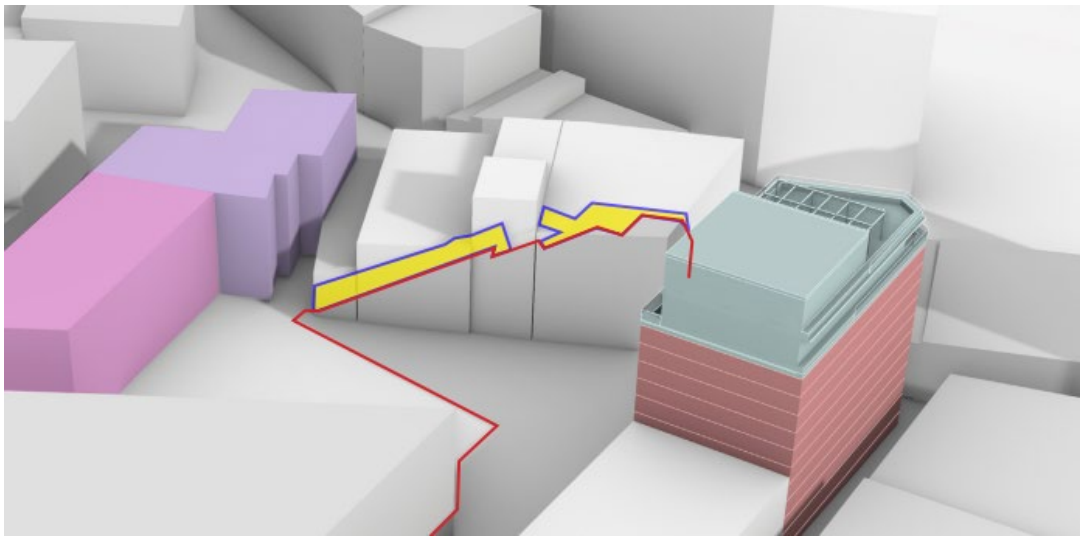
Figure 28 Hourly views of the Indicative Reference Scheme overshadowing impacts (total extent within blue outline) during the mid-winter solstice

Source: Cox Architecture

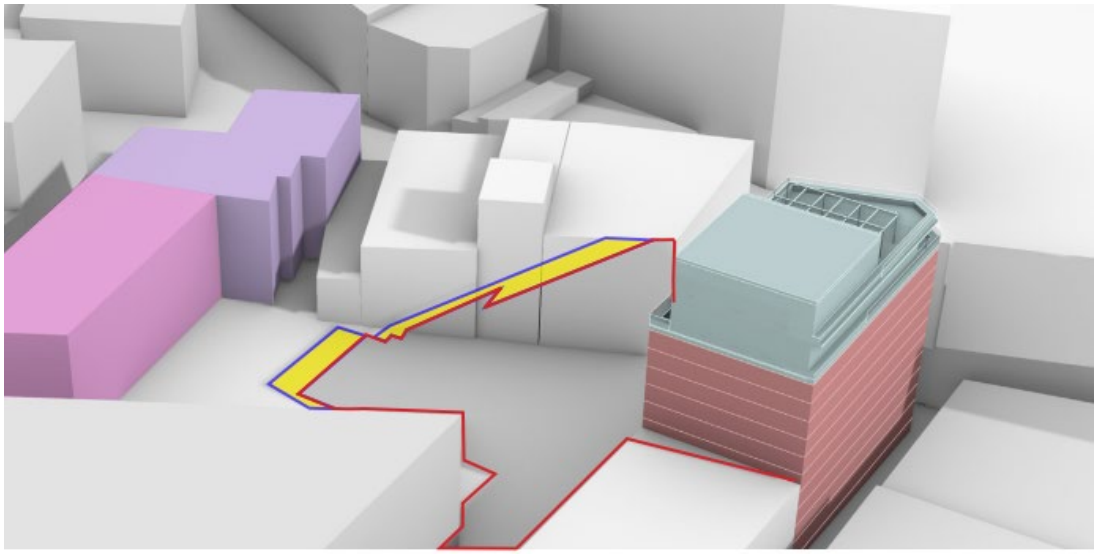
Axonometric views of the overshadowing between 9:00am and 11:00am have been provided in **Figure 29** which further demonstrates the existing residential buildings within the vicinity of the site will not be impacted by the Indicative Reference Scheme envisaged under the Planning Proposal.



9:00am



10:00am



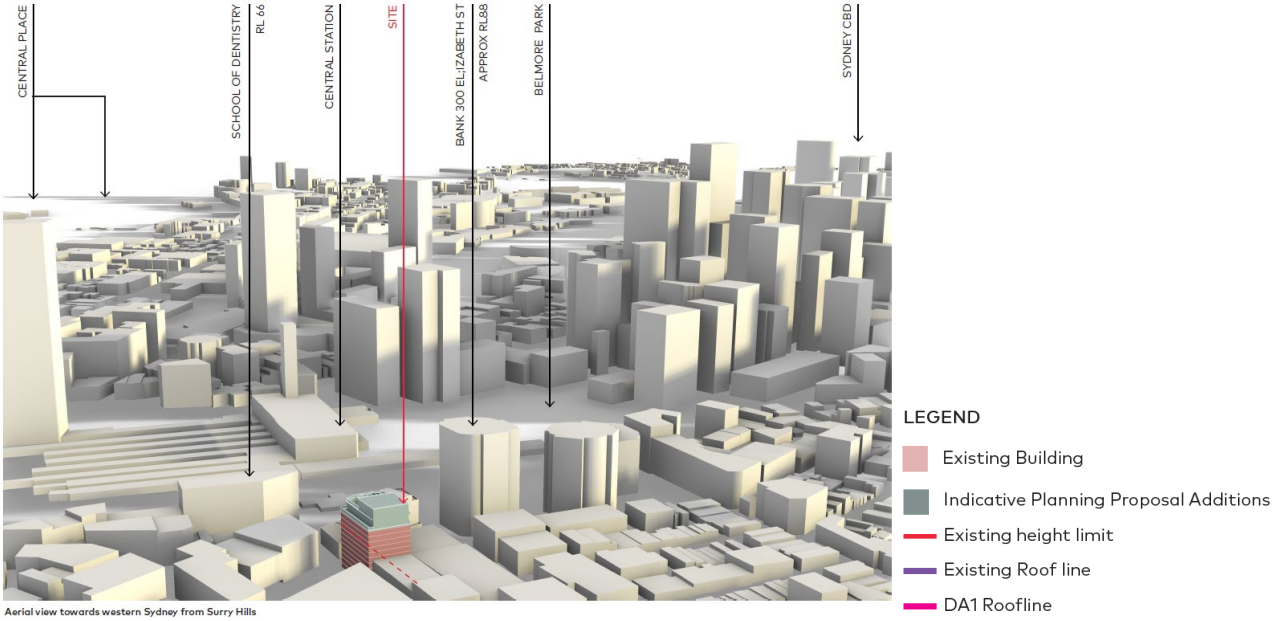
11:00am (after which shadow do not fall on building elevation)

Figure 29 Axonometric views of the Planning Proposal envelope Overshadowing (total extent within blue outline)

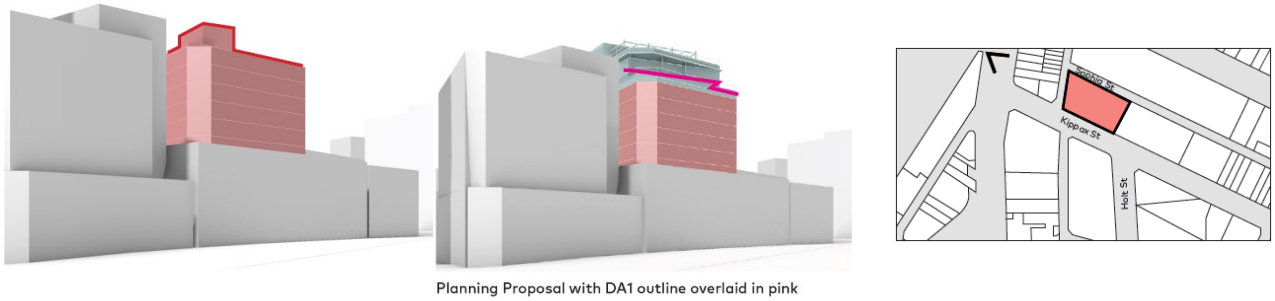
Source: Cox Architecture

9.3 Visual Impacts

A selection of perspective views of the proposed building envelope additions, compared to existing are provided in **Figure 30** below. Whilst the proposed additional will be visible, the recessed scale of the form and tapering from west to east, reduces the appearance of bulk and massing. This will be future mitigated through the detailed design of the roof and canopy, along with the proposed landscaping and rooftop greening proposed and shown indicatively in the artist impression in **Figure 23**.



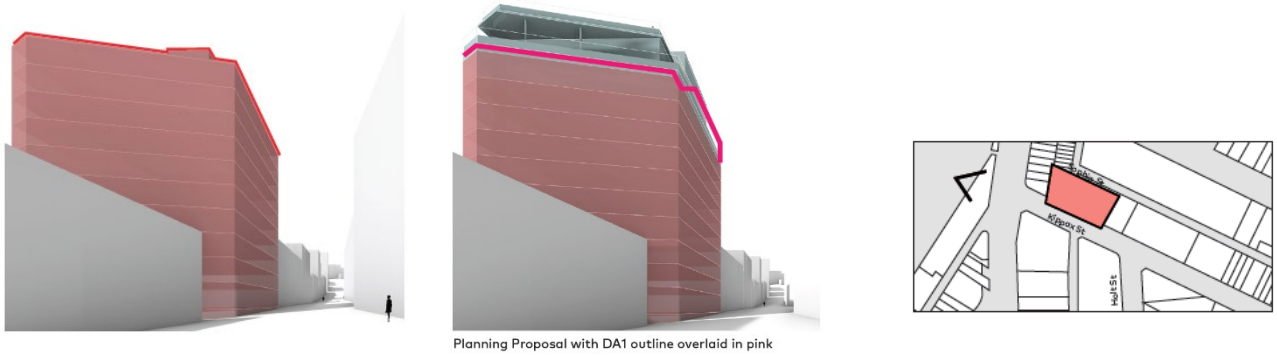
Aerial view towards western Sydney from Surry Hills



Planning Proposal with DA1 outline overlaid in pink



Planning Proposal with DA1 outline overlaid in pink



Planning Proposal with DA1 outline overlaid in pink

Figure 30 Visual Assessment of the proposal from key vantage points.

Source: Cox Architecture

9.4 Design Excellence

The proposed envelope and reference scheme as set out in **Appendix B** exhibits design excellence having regard to those matters under Clause 6.21C(2) of Sydney LEP 2012 thus achieving the objective of the design excellence clause to deliver the highest standard of architecture. A detailed assessment of the Planning Proposal's achievement of these principles is outlined in detail as part of the Urban Design Report at **Appendix A**.

Clause 6.21D of the LEP sets out a number of triggers for the requirement of a competitive design process, with those applicable to the site and proposal being:

- development in respect of a building that has, or will have, a height above ground level (existing) greater than 25 metres on any other land (outside of Central Sydney)
- development in respect of which a development control plan is required to be prepared under clause 7.20 (which will be addressed through the preparation of a site specific DCP accompanying this Planning Proposal,
- Notwithstanding the application of this Clause, subclause 6.21D(2) of the LEP gives power to the consent authority to waive the requirement for a competitive design process where it is satisfied that it would be unreasonable or unnecessary in the circumstances.

The requirement to conduct a competitive design process is considered unnecessary in the circumstances of this proposal for the following reasons:

- The proposal by Cox Architecture achieves design excellence, as it is of the highest standard of architectural design, demonstrates, materials and detailing, and is appropriate to the building type and location. The proposal exhibits design excellence having regard to those matters under Clause 6.21C(2) thus achieving the objective of the design excellence clause to deliver the highest standard of architecture.
- COX Architecture are highly credentialled and awarded Australian architects with demonstrated capability of designing buildings of the highest calibre. COX Architecture has delivered a number of award-winning projects including a number of adaptive reuse projects in the City Sydney.

Accordingly, the requirement to undertake a design competition is considered both unreasonable and unnecessary in the circumstances, and separately, meets all other criteria set out Clause 6.21D(2)(a)-(d).

9.5 Acoustic Impacts

A Noise Impact Assessment (NIA) has been prepared by Pulse White Noise Acoustics (PWNA) and is provided at **Appendix H**. The Assessment includes the acoustic investigation into the noise and vibration impacts expected from the Indicative Reference Scheme, including entertainment operations, as well as potential noise impacts from existing noise sources within the vicinity of the site from surrounding noise sources. This includes the specific elements of the proposal to the roof area including:

- level 10 roof terrace as internal function room with small adjoining terrace;
- constructing a new level 11 on top of the level 10 function room;
- level 11 external terrace; and
- ancillary works, including site services.

A site map showing the nearest nine (9) sensitive receivers to the site and the unattended and attended monitoring location is provided in **Figure 31**.

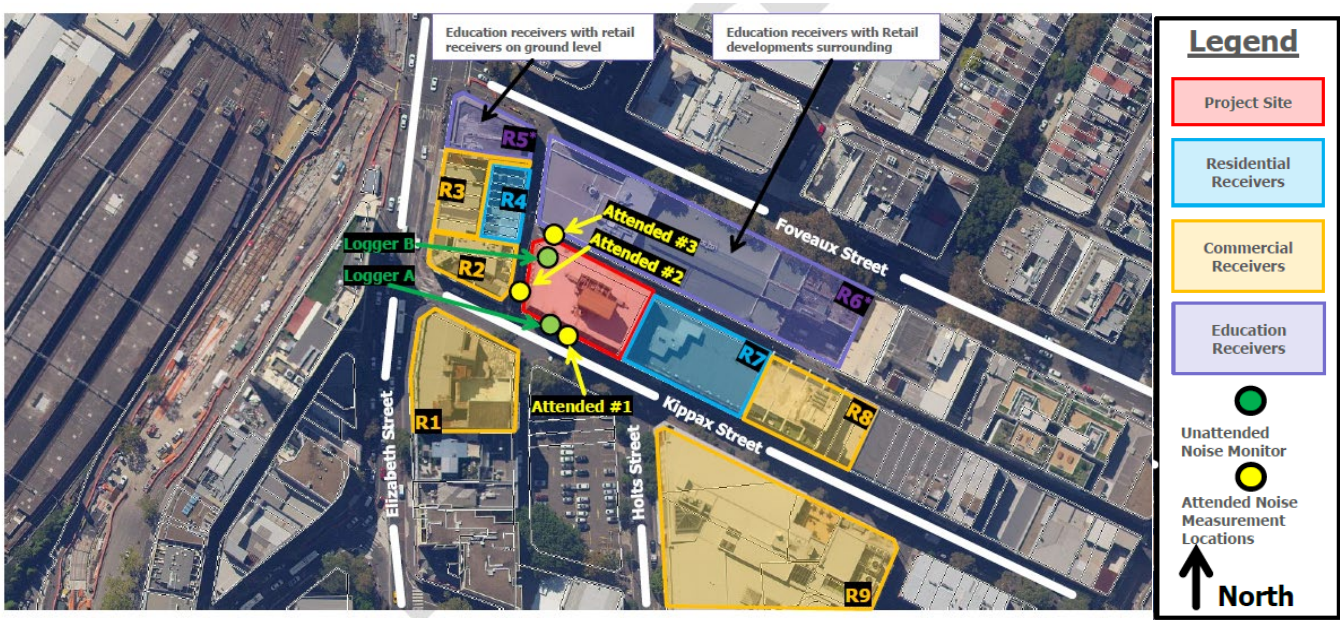


Figure 31 Measurement Locations and Surrounding Receivers
Source: PWNA

9.5.1 Operational Acoustic Assessment

Noise emissions are expected to be generated from engineering services, additional vehicles (negligible impact), the retail tenancy on Sophia Street, the loading dock on Sophia Street and the use of Level 10 as a function space and the rooftop as a recreational space.

Noise Associated with the Mechanical Equipment on Site

All future plant and equipment are to be acoustically treated to ensure the noise levels at all surrounding receivers comply with noise emission criteria identified. Acoustic treatments to mechanical equipment have been provided as part of the NIA and considered as being capable of complying with the relevant noise criteria.

Predicted rooftop terrace noise Levels

The predicted noise levels associated with the rooftop space envisaged as part of the Indicative Reference Scheme, based on the assumption 320 patrons using the space within the period of 7am to midnight has been provided. The worst-case predictions were identified for the nearest receivers and the results indicate the entertainment noise emissions from the proposed use of the rooftop area during the day period (7am-midnight) will comply with the City of Sydney entertainment noise criteria adopted. The following recommendations have been provided (based on operational hours of 7am-midnight):

- Operation hours are: 7:00 am – midnight – 7 days per week;
- Amplified music/sound is permitted on the roof terrace, however, must be limited to 85 dB(A) LAeq when measured as a sound pressure level within the space; and
- A 2.3 m high glass balustrade must be installed along the perimeter of the rooftop area (excluding the eastern façade).

Level 10 Function Space

The Indicative Reference Scheme includes a Level 10 Function Space which is anticipated to be similar in nature to the Level 11 roof terrace. As the Level 10 function space is proposed to be enclosed, the recommended façade glazing located in the NIA is considered to be sufficient to contain entertainment noise breakout from generating adverse noise impacts at nearby sensitive receivers. To ensure compliance is achieved, the following recommendations must be implemented:

- Operation hours are: 7:00 am – midnight – 7 days per week; and
- Amplified music/sound is permitted within the level 10 function space provided that the reverberant sound pressure level from the sound system is limited to 85 dB(A) LAeq when measured as a sound pressure level within the space.

9.6 Flooding

It is acknowledged that the site is identified as being located on land subject to flooding and that the Indicative Reference Scheme seeks to activate the perimeter of the site which is flood prone. A Stormwater Management Plan has been prepared by Enstruct and is provided at **Appendix L** which sets the application of flood planning levels in accordance with the relevant requirements of Council's Interim Floodplain Management Policy. The Indicative Reference Scheme has been found to:

- Be compatible with the established flood hazard of the land;
- Not significantly adversely affect flood behaviour, the environment, or cause avoidable erosion,
- Incorporate measures to manage risk to life; and
- Be consistent with the principles of Ecologically Sustainable Development.

In summary, the Indicative Reference Scheme proposes a considered response to mitigating the impacts of flooding on the site.

9.7 Traffic and Parking

A Traffic and Parking Assessment has been prepared by Transport and Traffic Planning Associates (TTPA) and is provided at **Appendix I**. The Indicative Reference Scheme seeks to remove the 55 existing car spaces and accommodate adequate end of trip facilities, comprising change facilities and bicycle parking within a combined area within the basement and lower ground floor.

In accordance with the proposed amendments Sydney LEP 2012 controls related to parking, no on-site car parking for future development on the site is proposed given the site's proximity to major public transport services including heavy rail, light rail and buses which all interchange at the recently ungraded Central Railway Station within walking distance from the site.

While the Planning Proposal will involve the provision of 789m^2 additional commercial floorspace from the existing building on the site, the traffic movements generated will be generally consistent with that of the existing building. It is understood the site will be used for meetings and functions which will involve visitors to the site however these are not expected to involve travel in the AM/PM peak period and will only involve minimal pick up/set down movements by motor vehicles.

The traffic generation of the proposed development on the basis the proposed no provision of parking spaces will be limited to the associated on-street set down/pick up and service/delivery vehicle movements.

This projected traffic generation will be very minor and significantly less than the movements generated by the existing site use with its on-side car parking and accordingly there will be no adverse traffic implications as a result of the proposed development.

- development will not result in any unsatisfactory traffic or parking implications particularly as:
- there will be no-site parking provision
- there will be suitable and appropriate on-site provision for bicycle parking and EoT facilities
- there will be excellent public transport services available in close proximity to the site.

In summary, the Planning Proposal is supportable from a traffic and parking perspective for the reasons outlined above.

9.8 Structural Capability

A Structural Statement has been prepared by Meinhardt and is provided at **Appendix K**. The Statement's structural recommendations have been incorporated within the Indicative Reference Scheme to ensure the existing structure together with the new structural elements will be able to support the proposed new loads. It is acknowledged there is a list of non-compliances against the building codes and standards that are expected due to the older nature of the existing building (refer to **Appendix K**).

9.9 Public Art

A Public Art Strategy has been prepared by UAP and is provided at **Appendix G**. The objective of the Strategy is to analyse and identify the best potential approaches for the inclusion of public art within a future proposal on the site. A number of locations have been identified across the site that are considered to be highly visible from the public realm that would be appropriate for public art intervention.

Public art for 8-24 Kippax Street will be developed to align with the City of Sydney's vision and goals for public art and drawing from the City's Sustainable Sydney 2030-2050 Continuing the Vision and related public art policies, strategies, and plans. The matrix (right) outlines the '8 Guiding Principles' for City of Sydney public art and provides an overview that demonstrates how public art for 8-24 Kippax Street will align with these principles.

The Curatorial Vision (as set out in the Public Art Strategy) is based on contextual analysis, including research into the history, aspirations, environment, urban character and users of the place. It ensures that the public art is conceptually connected by setting an overarching vision for art, describing what the artworks aspire to achieve, and providing thematic inspiration for artists. Directing artists in creating a site-specific response to public art, the Curatorial Vision provides a starting point for inspiration, not a prescriptive theme.

This curatorial vision also sits in alignment with the architectural drivers of the building redesign by Cox Architecture, a design heavily imbued with the desire to do 'More With Less'. In this project the details are critical – what materials are recycled, what can be re-used, and how can waste be minimised? It is the accumulation of these considered details that define the impact of the whole.

Possible typologies explored include mural and sculptural attachments with possible locations including:

- Kippax Street eastern wall;
- Kippax Street Soffit; and
- Sophia Street Lanway.



Sophia Street – Location of potential art highlighted in blue



Kippax Street Soffit – Location of potential art highlighted in blue



Kippax Street Eastern Wall – Location of potential art highlighted in blue

Figure 32 Public Art Strategy – Potential locations
Source: Cox Architecture + UAP

9.10 Ecologically Sustainable Design

An Ecologically Sustainable Development (ESD) Report has been prepared by E-LAB Consulting for the proposal. It explores Canva's sustainability practices and goals and translates these into an implementation framework that showcases bold climate action in the built environment and demonstrates a Project design response that is aligned with the applicable statutory planning framework.

The proposal will enable a *large commercial development* (as defined in the Sustainable Building SEPP) of greater than 1,000m² involving the major refurbishment of an existing commercial office premises with a project value greater than $10 million, will be subject to a range of statutory planning controls, policies, and guidelines at a local and state government level, and sustainability certification tools.

These controls, policies, guidelines, and tools are a material consideration when developing project sustainability requirements that reflect a credible, market-leading sustainability strategy and implementation framework for the Project.

- Sydney Local Environmental Plan 2012;
- Sydney Development Control Plan (DCP) 2012 – including Section 3.6 and Section 3.11;
- NSW Sustainable Buildings SEPP;
- Green Star (Green Building Council of Australia);
- NABERS Energy and Water for Offices; and
- A Guide to Office Building Quality (Property Council of Australia).

As set out in the ESD report, the site's future redevelopment and adoption of the reference scheme is capable of achieving the:

- ESD objectives and controls of the Sydney DCP 2012 and thereby achieving the objectives of Sydney LEP 2012;
- Energy and water standards, and net zero provisions) of the NSW Sustainable Buildings SEPP – as applicable; and
- Embodied emissions reporting requirements of the NSW Sustainable Buildings SEPP (by others).

Adaptive Reuse and Embodied Carbon

The proposal inherently responds to a whole life carbon shift in the built environment – minimising embodied carbon and capturing sequestered carbon through the adaptive reuse and relining of existing buildings. This 'never demolish' mindset is a core tenet of the whole life net zero ready design response.

Through the sensitive integration of a modern workplace that reinforces the Canva Community, the Indicative Reference Scheme seeks to retain a high proportion of the structure and envelope where not impacted by fundamental functional adjustments, including:

- Double brick cavity upstands on Levels 1 – 9 on north, and Levels 2 – 9 on west and south (subject to strengthening and internally lined)
- Party wall on east (subject to strengthening and internally lined)
- Columns and beams
- Suspended floors
- Existing pad footings to be retained and strengthened for re-use, where practicable

Smart Building

As extract of the ESD report below (**Figure 33**) is provided to demonstrating the proposal to pursue a smart building design response, coupled with on-site solar photovoltaic (PV) systems, to drive grid resilience and demand management outcomes.

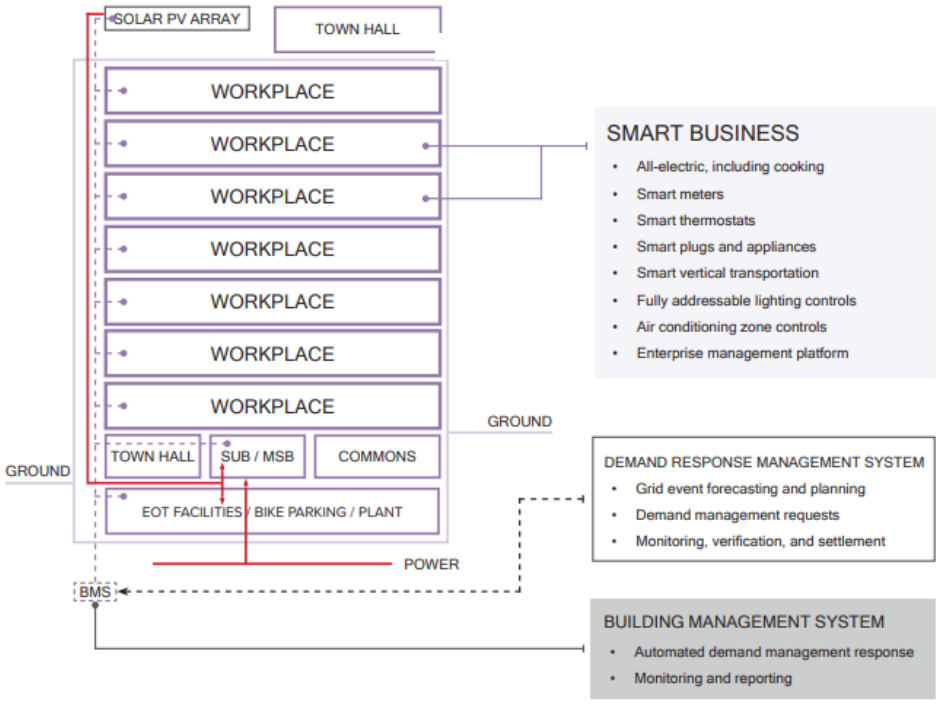


Figure 33 Proposed Smart Building design configuration
Source: E-LAB

9.11 Social and Economic Impacts

This section sets out a consideration of social and economic impacts and benefits of the proposal.

9.11.1 Strategic Planning and Policy Framework

A Plan for Growing Sydney

The Plan for Growing Sydney identifies a number of key challenges facing Sydney. Of relevance to the proposed development is the need to create 689,000 new jobs by 2031.

In this respect, the proposed development provides additional employment opportunities in a highly accessible location. Given the demographic characteristics of the area, the proposed development is likely to be an attractive place to work for local residents, allowing residents to work close to home.

Eastern City District Plan

The Eastern City District Plan identifies Surry Hills as part of the 'Innovation Corridor'. As such, Surry Hills needs to provide appropriately located and designed space for creative businesses, particularly in the technology sector. In addition, the Plan seeks to ensure sufficient amenity to attract local workers and ensure that market capacity exists to retain and grow local businesses, minimising the need for re-location.

An objective of the proposed development is to refurbish a commercial building that has become dated. This refurbishment will improve the overall façade of the building and continue the trend of revitalisation in the streets of Surry Hills. A number of additional benefits to the local commercial office market are discussed below. The refurbishment will also involve a modest increase in GFA, with a large proportion of this increase coming from the conversion of a carpark into end-of-trip facilities. Additional GFA will also involve improvements to overall worker amenity at the site (workplace amenities and circulation space) and provide additional workforce capacity.

The outcomes of the proposed development are expected to support the existing creative cluster within Surry Hills and help to maintain Surry Hills as an 'Innovation Corridor'.

Sustainable Sydney 2030: Community Strategic Plan (2013)

The Sustainable Sydney 2030 plan sets out the City of Sydney's Strategic Plan for achieving a sustainable city, including a number of key targets and objectives.

Of relevance to the proposed development is Target 7, aiming to have at least 10 per cent of City Trips made by bicycle and 50 per cent on foot.

In addition, several other objectives relate to incentivising and encouraging more sustainable travel options. For example, Objective 4.3 "Green Travel is the preferred transport choice to City workplaces and venue" notes insufficient end of trip facilities for cyclists and pedestrians. Action item 4.3.1 targets providing these end of trip facilities by 2030, as a key initiative to encourage walking and cycling to work.

Under the proposed development at Foveaux Street, the complete removal of the car park and conversion to an end-of-trip facility will assist in the City of Sydney achieving Target 7 and Objective 4.3. While the redevelopment will increase the building's GFA, as the current car park is excluded from the existing GFA calculation, this increase directly incentivises sustainable transport by providing workers with end of trip facilities. In addition, given the site's proximity to existing public transport nodes, it is expected that a significant proportion of workers will use local public transport services.

Overall, the proposed redevelopment will positively contribute to the City of Sydney in achieving its vision for a sustainable Sydney, as set out in the *Sustainable Sydney 2030: Community Strategic Plan (2013)*.

9.11.2 Future Community and Economic Profile

The population of Surry Hills is forecast to increase from 16,400 in 2016 to around 21,900 residents by 2036, a total increase of approximately +5,500 at an average annual growth rate of 1.5%.

This growth rate is much lower than for the for the City of Sydney (2.0%) and slightly lower than Greater Sydney's at 1.5%.

Importantly, approximately 61% of the total population growth is expected to be in the working age cohorts between 20 and 64 years of age. This suggests that the area will continue retain a large number of young professionals.

Between 2016 and 2036, the total number of jobs within Surry Hills are projected to increase by around 6,800 positions at an average annual growth rate of 1.1%. Within the City of Sydney, the number of jobs are forecast to grow at an average annual growth rate of 1.4%. This increase in employment in Surry Hills is projected to be concentrated in industries such as Professional, Scientific and Technical Services, Education and Training, and Health Care and Social Assistance.

9.11.3 Sydney Commercial Office Market

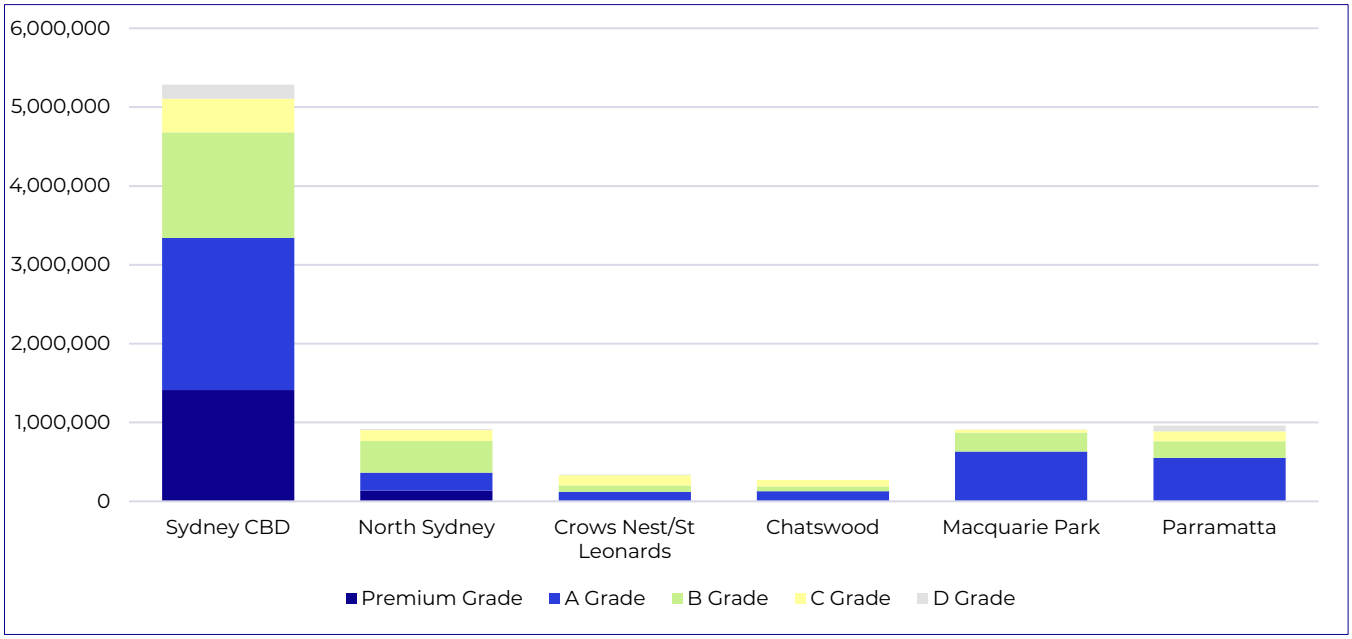
The Sydney CBD forms the major commercial office destination, providing over 5 million square metres of commercial office floorspace and serves a critical role in Australia's national economy. The role of the

metropolitan office markets across Greater Sydney also serves an important local and regional function that complement the higher-order role of the Sydney CBD.

A breakdown of the provision of commercial office floorspace across the Sydney CBD and major Sydney metropolitan office markets is outlined below. (Sourced from the PCA Office Market Report, January 2023).

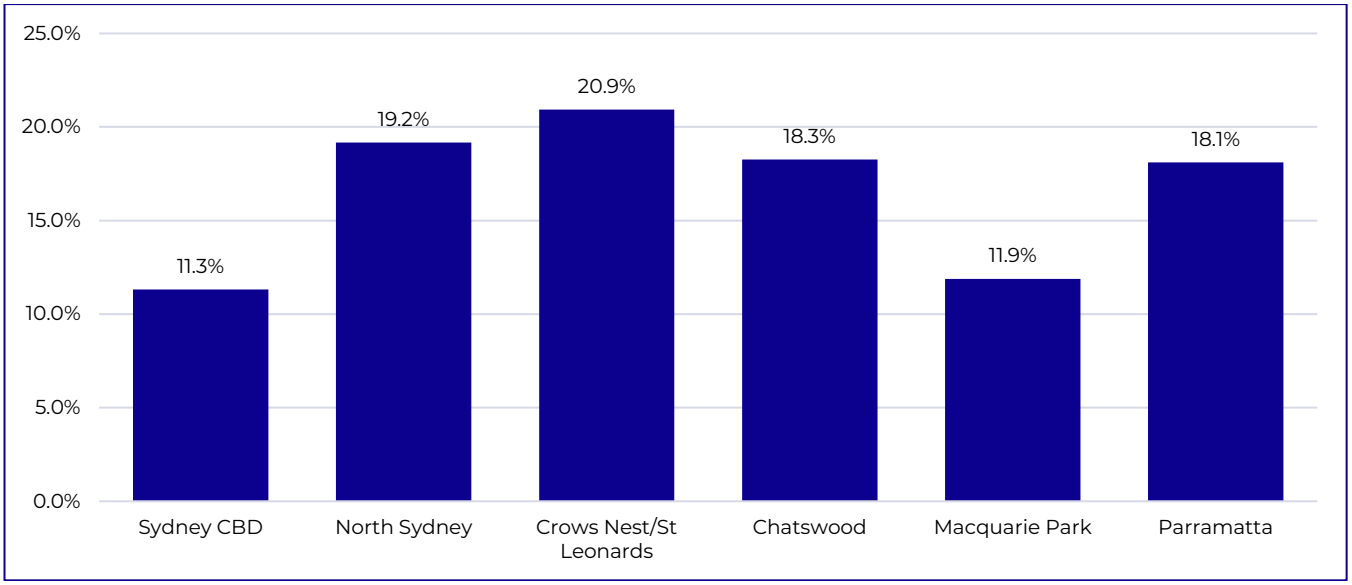
Key markets and the provision of commercial office floorspace include:

- Sydney CBD – 5,283,190m^2
- Parramatta – 959,820m^2
- North Sydney – 918,140m^2
- Macquarie Park – 908,870m^2
- Crows Nest/St Leonards – 340,890m^2
- Chatswood – 271,000m^2



Total Office Stock by Grade – Sydney CBD and Metropolitan Markets
Source: PCA Office Market Report, January 2023

As shown below, the level of vacancy across each commercial market varies quite substantially, with Sydney CBD the best performing market (with a 11.3% vacancy rate), followed by Macquarie Park (11.9% vacancy). Metropolitan markets in the Lower North Shore have the highest levels of vacancy, with St Leonards at 20.9%, and Chatswood at 18.3%.



Total Office Vacancy – Sydney CBD and Metropolitan Markets
Source: PCA Office Market Report, January 2023

As the core commercial office destination, the Sydney CBD benefits from a larger provision of higher quality commercial office stock, with 26.7% of stock classified as premium grade, and 36.5% as A grade quality. The only other market with premium grade floorspace is North Sydney. Remaining metropolitan office markets typically incorporate a higher proportion of secondary grade stock (classified as B, C or D grade floorspace). The exception is Macquarie Park, which includes some 69.4% of floorspace that is classified as A grade. As a result, Macquarie Park has established itself a key destination for modern tenants seeking larger 'campus' style facilities outside of the CBD.

The amount of new supply planned in the metropolitan office markets has also been steadily increasing. Currently there is significant amount of development activity underway or planned in markets such as the Sydney CBD (over 650,000m2) and North Sydney with 260,000m2 of additional floorspace planned.

In addition to these metropolitan markets, a range of office tenants also seek out spaces in city fringe locations such as Redfern, Pyrmont and Surry Hills (the site). More recently, major development and investment in key areas such as South Eveleigh have emphasised the appeal of these types of locations, particularly with companies focused around technology, innovation and creative industries.

9.11.4 Canva

Canva has over 4,000 employees across the globe, with more than 1,750 employees calling Sydney home, based in the Surry Hills Campus of buildings. A snapshot of Canva is provided in **Figure 34**.

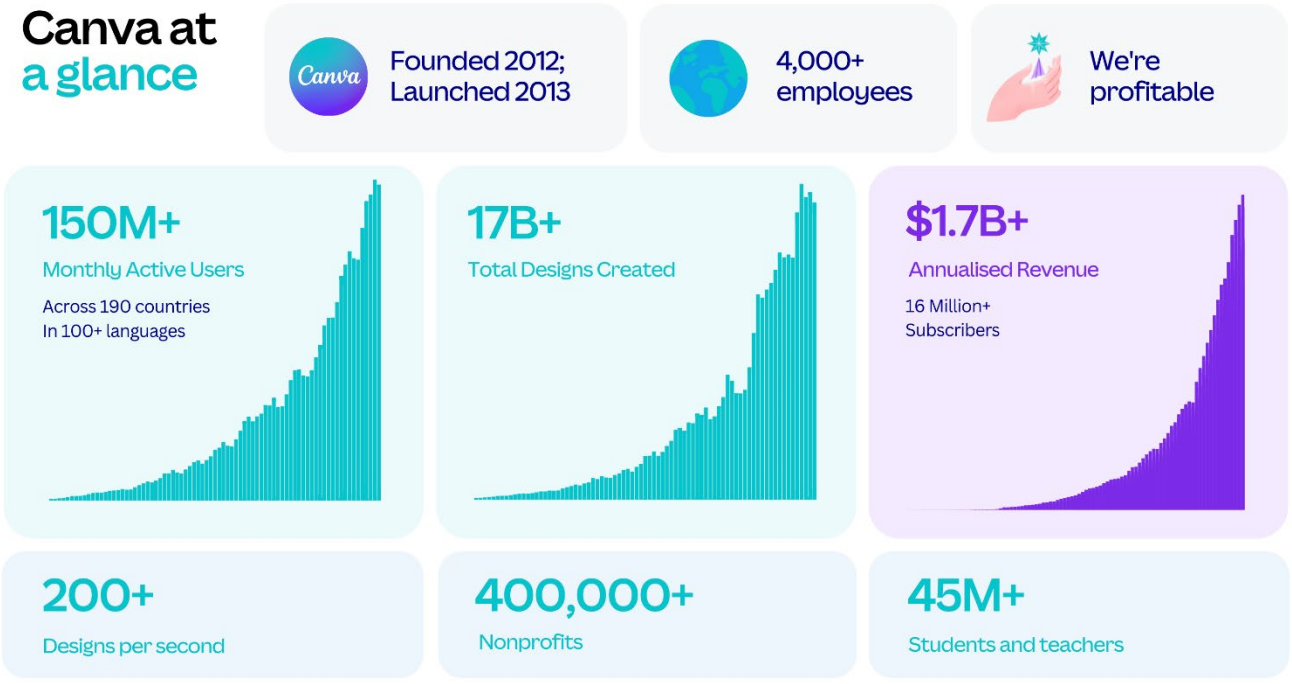


Figure 34 Canva – at a glance
Source: Canva

9.11.5 Social and Economic Benefits

The following section examines the social and economic benefits of the proposed development.

Employment Generation

The employment effects of the proposed development are considered in terms of employment effects during the construction phase and employment effects during the operation phase.

Construction Phase

The construction of the proposed project will create new employment opportunities for the local and regional economy. The Capital Investment Value (CIV) for proposed development MBM at approximately $80-90 million over the lifetime of the project. A project with a CIV of $80-90 million is estimated to support approximately 190-200 full-time equivalent jobs years during the construction phase of the project.

As construction of a project of this size, with the certainty of timing and the sole tenant occupancy relies on the input of a range of industries, the economic contribution and benefits extend beyond the direct capital expenditure for project goods and on-site employment. The flow-on benefits of construction activity are categorised for measurement into two types of economic multipliers described as a production induced effect and consumption induced effect:

- **Production induced effect** – including both a first-round effect which is all of the direct inputs and employment required to construct the project, and an industrial-support effect which relates to the flow-on employment and expenditure required to produce the inputs into the materials/services obtained in the first-round effect. For example, the purchase of reinforced steel bars from a supplier is measured in the first-round expenditure and employment, whilst the induced demand for mining, transport and manufacturing to produce this product is captured in the industrial-support effect.
- **Consumption induced effect** – being the forward effects of expenditure in all industries from wages/salaries of persons employed as a result of the direct and production-induced effects of the project.

The Australian National Accounts 2008/09, published by the Australian Bureau of Statistics, indicate that for every 1 job directly supported in construction, a further 0.57 jobs are supported within the region as a result of production induced and consumption induced effect within the local region. Input-output models for Australian construction projects indicate that for every 1 job directly provided directly by a construction project, an additional 0.3 to 0.9 jobs are supported throughout the broader Australian economy.

Therefore, based on the estimated direct employment for the construction phase of the project, it is estimated that the proposed developed will support a total flow on effect to approximately 110 jobs across the Australian economy. Cumulatively the project will therefore support more than 200 (including production and consumption induced) during construction.

Operation/Occupation Phase

Alignment with the LSPS for the cultural and creative uses in the corridor.

During the operations phase, it is expected that the indicative design concept would generate approximately 140 office jobs. This estimate is based on an assumption of 1 office job per 14 sqm of leasable floorspace.

Currently between its campus of offices, Canva employs approximately 1,500 employees. Across Australia the firm has approximately 3,000 employees.

Increased Local Expenditure

The additional workers located at the subject site will also increase retail expenditure available in the local area. This local retail expenditure is expected to be directed toward food-related purchases such as take-away, cafés, restaurant dining and take-home groceries.

Assuming that the proposal will provide for more than 1,000 additional workers who spend an average of $12 per working day on local food and beverages, this would result in a net increase in annual spending on local businesses of around $3million per annum. Spread across a number of traders, this will help support overall trading viability and profitability for businesses in the precinct.

The remainder of workforce expenditure is dedicated to spending on retail goods, such as clothing and accessories, entertainment, leisure activities and personal services. As a result, the trading conditions of retailers near the proposed development will likely improve. This will be to the benefit of the wider retail/commercial precinct along Foveaux Street and surrounding areas.

The level of spending by workers on these non-food categories is more difficult to specifically forecast. However, local non-food businesses are expected to experience a positive impact on sales associated with exposure to a larger local workforce population.

A key differentiator of this proposal as compared to a spec development were certainty of development and vacancy of the development is a factor, is that Canva is committed for its new Australian Headquarters. The way the building will be used will see local and international investment direction through Sydney CBD.

Revitalisation and Improvement of surrounding area

The proposed redevelopment will also contribute to the improvement of Sophia Street as a shared way, connecting to the Council endorsed improvement of Terry Street Shared way.

In recent years, the overall amenity of the surrounding precinct including significant public domain improvement in and surrounding Central Station, including improvement on Foveaux Street and other surrounding streets. This improvement is the result of combined investment by the NSW state Government and streetscape initiatives by the City of Sydney well as the number of new and refurbished buildings along the street.

The proposed development will continue this trend by revitalising a building and façade, patricianly at Street level. It will further incentivise improvements in the quality of other nearby buildings and be and anchor for investment and expansion of the Tech precinct surrounding Central Station.

Proposed Development will Incentivise Active Modes of Transport

As noted above, the proposed development will promote "green travel" and active modes of transport through the conversion of a 55-car parking into an end of trip facilities and other services, including a gym.

Workers will be encouraged to take active modes of transport, such as cycling, while discouraging private vehicle use. It will also assist the City of Sydney in achieving its vision under the *Sustainable Sydney 2030: Community Strategic Plan (2013).*

In addition, given the site's proximity to existing public transport notes, it's expected that a significant proportion of workers will walk to work from these nodes.

Efficient and Productive Use of Land

The proposed adaptive reuse and minor alterations and additions provide for a high quality and unique office environment within an area that already has a high number of office buildings and that has generally experienced tight office market conditions. Given the current circumstances of the market and hesitancy for delivery, the occupancy of Canva as an owner/occupier is considered to be a welcomed addition (whilst already being present within the the precinct).

Though minor additions to the rooftop, and reconfiguration of existing massing, the subject site can accommodate a scale of office that will be fit for purpose for Canva as an anchor and attractor for additional investment of other similar business in the area.

Overall, the site is an ideal location for office space. The building is located at the western end of Kippax Street, on the edge of the CBD. As set out elsewhere in this Planning Proposal, it is situated within the creative cluster around Surry Hills and there are already high levels of worker amenity. The desirability of the location as a commercial building is demonstrated through Canva's current commitment to the Surry Hill Campus, and further investment in the subject site.

Support Surry Hills as an 'Innovation Corridor'

The proposed development will help support Surry Hills as an "innovation corridor" and help to assist in the (previous) Greater Cities Commission (nor NSW Department of Planning and Environment) in achieving its objective related to innovation corridors. The planning proposal will help support this innovation corridor through the occupancy of a significant owner/occupier in Canva.

Within Sydney, creative industries have situated within the City Fringe due to its locational advantages. Creative industries tend to locate in high amenity areas outside the CBD, that provide a unique cultural experience, are close to where workers live and are cost-effective. In addition, creative industries tend to cluster near other similar businesses to take advantage of important agglomeration effects that benefit businesses and workers. The unique and high-quality office environment, as well as the culture of Canva, is considered to drive further business investment and commitment to Surry Hills.

9.11.6 Conclusion

The key findings of this report are as follows:

- The proposed development scheme is consistent with the land use and economic outcomes sought by relevant key strategic documents.
- Surry Hills is an attractive location for businesses operating in creative industries, as highlighted by discussions with local real estate agents. As such, the proposed development represents a tailored solution to provide the new national headquarters as a rapidly growing Australian technology company, in Surry Hills.

- The commercial office market in Sydney and the City Fringe, which includes Surry Hills, is tight by historic standards with only limited opportunities for new and expanding businesses, with very little willingness for owners to commit.
- Cumulatively the project will support approximately more than 200 jobs (production and consumption induced) during construction. While during the operation phase approximately 1,000office jobs are expected to be provided for on-site. The increase in local expenditure will support local businesses in the area.
- The proposed development will support Surry Hills as an 'innovation corridor' and help to maintain the creative industry cluster within Surry Hills.
- The proposed development will incentive "green travel" and active modes of transport.

10.0 Planning Proposal Guideline - Summary

This section provide a summary of the proposal against the *NSW Department of Planning and Environment's Local Environmental Plan Making Guidelines (August 2023).*

10.1 Part 1 – Objectives and Intended Outcomes

Section 6.0 of this report presents the Planning Proposal's objectives and intended outcomes.

10.2 Part 2 – Explanation of Provisions

Section 7.0 outlines how the Planning Proposal's objectives and intended outcome will be achieved through a proposed amendment to the *Sydney Local Environmental Plan 2012.*

10.3 Part 3 – Justification of Strategic and Site-Specific Merit

10.3.1 Section A – Need for the Planning Proposal

Q1 – Is the Planning Proposal a result of an endorsed local strategic planning statement, strategic study or report?

Yes. As detailed in **Section 8.1.1**, the Planning Proposal responds to the hierarchy of strategic plans, including the principles for growth and other priorities set out in the Sydney Local Strategic Planning Statement (LSPS)

Q2 – Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

Yes. There is one alternative to a Planning Proposal to achieve the additional building height:

- Submit a development application supported by clause 4.6 variation requests.

The Planning Proposal was selected as the best option as it can establish the site's ability to accommodate additional height and floor space in accordance with an analysis of the potential impacts. Having established the site's capacity to meet these tests, strategic alignment and benefits, the full assessment of a detailed design can be the subject of a future DA.

This approach enables the Council to first undertake a detailed assessment of the environmental impacts of the built form through the Planning Proposal process before considering other more detailed matters at the DA stage. The Planning Proposal also responds to re-lodgement discussions with Council and pre-lodgement advice provided on 8 December 2023.

As an alternative to proposing a site-specific clause, the Planning Proposal could have sought to increase the site's maximum permitted height through an amendment to the Height of Buildings Map under Clause 4.3 and Floor Space Ratio under Clause 4.4 of the LEP 2012. However, such an approach would forfeit the public benefit of linking the other detailed components of the site that are capture through site specific controls.

10.3.2 Section B – Relationship to Strategic Planning Framework

Q3 – Will the Planning Proposal give effect to the objectives and actions of the applicable regional, or district plan or strategy (including any exhibited draft plans or strategies)?

Yes. **Section 8.1.2** details the Planning Proposal's alignment with the objectives and actions of the Region Plan and Eastern City District Plan.

Q4 – Is the planning proposal consistent with a council LSPS that has been endorsed by the Planning Secretary or GSC, or another endorsed local strategy or strategic plan?

Yes. **Section 8.1.2** details the Planning Proposal's consistency with the City of Sydney Strategic Planning Statement – City Plan 2036.

Q5 – Is the planning proposal consistent with any other applicable State and regional studies or strategies?

Yes. **Section 8.1.2** details the Planning Proposal's consistency with the hierarchy of Strategic plans.

Q6 – Is the Planning Proposal consistent with applicable State Environment Planning Policies?

Yes. **Section 8.1.2** details the Planning Proposal's consistency with applicable State Environment Planning Policies.

Q7 – Is the Planning Proposal consistent with the applicable Section 9.1 Directions?

Yes. **Section 8.1.2** details the Planning Proposal's compliance with applicable Section 9.1 Directions.

10.3.3 Section C – Environmental, Social and Economic Impact

Q8 – Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

No. The Planning Proposal is unlikely to result in any impact on critical habitat or threatened species, populations or ecological communities or their habitats. These matters can be appropriately considered at the DA stage, if relevant.

Q9 – Are there any other likely environmental effects as a result of the Planning Proposal and how are they proposed to be managed?

Section 9.0 provides an assessment of the Planning Proposal's anticipated environmental effects supported by various technical reports.

Q10 – Has the planning proposal adequately addressed any social and economic effects?

Yes. **Section 9.11** identifies the Planning Proposal's anticipated social and economic effects.

10.3.4 Section D – Infrastructure (Local, State and Commonwealth)

Q11 – Is there adequate public infrastructure for the Planning Proposal?

Yes. Commercial developments place demand on public infrastructure, including nearby public transport, roads, cycle infrastructure, and public open space. The site is adequately serviced by these types of public infrastructure to accommodate additional commercial building height (and associated floorspace).

10.4 Part 4 – Mapping

This Planning Proposal seeks to incorporate a site-specific provisions under Division 5 of SLEP 2012. As such, the underlying zoning, height, or FSR maps of LEP 2012 are not proposed or required to be amended.

Concurrent amendments are proposed to the supporting Sydney DCP 2012 through the addition of provisions at Section 6 (Specific Sites) that incorporates site specific details. This will require some minor modification of site identification maps (to be completed by Council) and incorporates a number of figures that represent the proposed building envelope in detail.

10.5 Part 5 – Community Consultation

Formal public consultation will take place in accordance with Sections 3.34 and 3.35 of the EP&A Act. This is likely to involve notification of the Proposal:

- On Council's website;
- In newspapers that circulate widely in the Sydney LGA; and
- In writing to the adjoining and nearby landowners; relevant community groups; and the surrounding community in the immediate vicinity of the Site.

It is noted that confirmation of the public exhibition period and requirements for the Planning Proposal will be given by the Minister as part of the LEP Gateway determination. Any future DA for the site would also be exhibited in accordance with Council requirements, at which point the public and any authorities would have the opportunity to make further comment on the proposal.

10.6 Part 6 – Project timeline

Table 14 provides the project timeline anticipated for the subject planning proposal which is predicated on the nature and scale of the Planning Proposal.

Table 14 Anticipated Project Timeline

Action	Timeframe
Submission of Planning Proposal	December 2023
Reporting of Planning Proposal to Council including (Central Sydney Planning Committee)	March 2024
Referral to Minister for Gateway Determination	March/April 2024
Gateway determination	April 2024
Post-Gateway	May 2024
Public Exhibition and Assessment	June 2024 – July 2024
Post Exhibition Reporting to Council	August 2024
Finalisation	September 2024

11.0 Conclusion

This request for a planning proposal is submitted to the City of Sydney Council seeking amendments to SLEP 2012. The request for a planning proposal seeks to introduce a new maximum height of buildings and FSR development standards for the site, unlocking the potential of the site to provide additional, high quality commercial office space, as well as develop an improved public domain outcome throughout the existing building's Kippax Street frontage. Both of these outcomes are consistent with the vision and intent of the City of Sydney Local Strategic Planning Statement.

The Planning Proposal will maximise the site's strategic value by facilitating additional high quality commercial floorspace within immediate vicinity of Central Station, the grow of the Central Precinct and Tech Central, and help support the Sydney CBD's economic vitality consistent with the objectives and actions in State and Council Strategic plans.

The request for a planning proposal concurrently with a development application is the first stage of the redevelopment program for the site which will enable the delivery of additional commercial floor space and overall improvements to the existing building façade and internal floors accommodating:

- A maximum height of 42.7m.
- A maximum FSR of 9.86:1 equating to 10,173m^2 of GFA (and increase of 789sqm).

The subject site harnesses an opportunity to redevelop an existing outdated, commercial building within the Surry Hills Innovation Corridor in proximity to significant public transport connections. Ultimately, it will deliver on the expectations of the City of Sydney Local Strategic Planning Statement, providing an improved commercial building integrated in the boundaries of the corner site, as well as facilitating several community benefits.

The improved existing and additional commercial floor space will set a benchmark for the provision of world class office floorplates that are catered to suit digital and innovative industries. This will elevate the commercial office offerings within the Surry Hills Innovation Corridor, as well as in proximity to the emerging 'Tech Central' precinct designed in accordance with the vision of Canva Pty Ltd to create their Australian headquarters.

It is considered that the Proposal:

- Is consistent with the aims and objectives of the relevant strategic plans and policies, including the City of Sydney Economic Development Strategy 2013;
- Is consistent with the relevant statutory plans and policies including the aims of the SLEP 2012 and SDCP 2012;
- Demonstrates site specific merit;
- Will result in no adverse environmental, economic or social impacts; and
- Will deliver employment floorspace fostering the creation of new jobs and businesses within the digital and innovation industries.
- The proposal is In light of the above, we would have no hesitation in recommending that a planning proposal be prepared, endorsed and proceed through the Gateway to public exhibition.

Given the planning merits described above, and the significant public benefits associated with the site's redevelopment, we have no hesitation in recommending a planning proposal be prepared for Gateway Determination.

Attachment A2

Urban Design Report

April 2024

Planning Proposal / Urban Design Report

8-24 Kippax Street



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PROJECT INFORMATION

Discipline	Representation
Client	Canva
Architect	COX Architecture
Interior	COX Architecture
Project Manager	Generate Property Group
PCA	McKenzie Group
Town Planner	Ethos Urban
Structural Engineer	Meinhardt
Civil Engineer	Enstruct
Fire Engineer	E-Lab Consulting
Services Engineer	ADP Consulting
Environmentally Sustainable Design ESD	E-Lab Consulting
BCA	Jensen Hughes
Waste	MRA Consulting Group
Surveyor	C & A Surveyors
Vertical Transportation	Norman Disney & Young
Geotechnical Engineer	Douglas Partners
Quantity Surveyor	MBM
Traffic Consultant	TTPA
Public Art Consultant	UAP
First Nations Consultant	Yerrabingin
Landscape Architect	Arcadia

DOCUMENT REGISTER

ISSUE	AMENDMENT	DATE	CHECKED
Planning Proposal	V2	08/12/2023	RB
Planning Proposal	V3	04/04/2024	RB

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Executive Summary

Purpose of this Report

This Urban Design Report is to support the Planning Proposal submission to increase the height and FSR for the purpose of an adaptive reuse of a commercial property located 8-24 Kippax Street, Surry Hills.

8-24 Kippax Street shows Canva's long term commintment to the City of Sydney and Surry Hills, expanding the footprint of their Campus with great respect for connection to the city scape and the surrounding community.

8-24 Kippax Street, located just off Elizabeth Street and only a two minute walk from Central Station will firmly place Canva at the heart of the newly emerging technology precinct Tech Central. Additionally, the site's location places Canva in close proximity to the Central Precinct surrounding Central Station.

In keeping with Canva`s aspirations of being a "Force for Good", and the principle to "do more with less", the proposed rooftop additions maintain as much of the existing building and only makes pragmatic interventions where it improves functional planning or sustainability initiatives, such as introducing natural light. The proposed additions will offer a benchmark model in the re-use and rejuvenation of an existing tired commercial building.

The addition of 2 partial levels, one for meeting spaces and one for plant and access to a roof terrace, will offer Canva the opportunity to gather, connect and celebrate their unique 'vibe' with employees, collaborators and guests.

Innovation and creativity are at the heart of Canva's DNA – it's something they've always championed when empowering their team to do the best work of their lives. This DNA has translated into their current workplace winning them the coveted prize of Best Workplace for Innovators on the Fast Company's 2023 list.

This global best accolade is the benchmark for their project at 8-24 Kippax Street. It will be a workplace imbued with the good vibes of Canva. The conceptual narrative for the building is to create a place that fosters a virtuous cycle of growth and culture. The culture will inform the place and the place will support the culture.

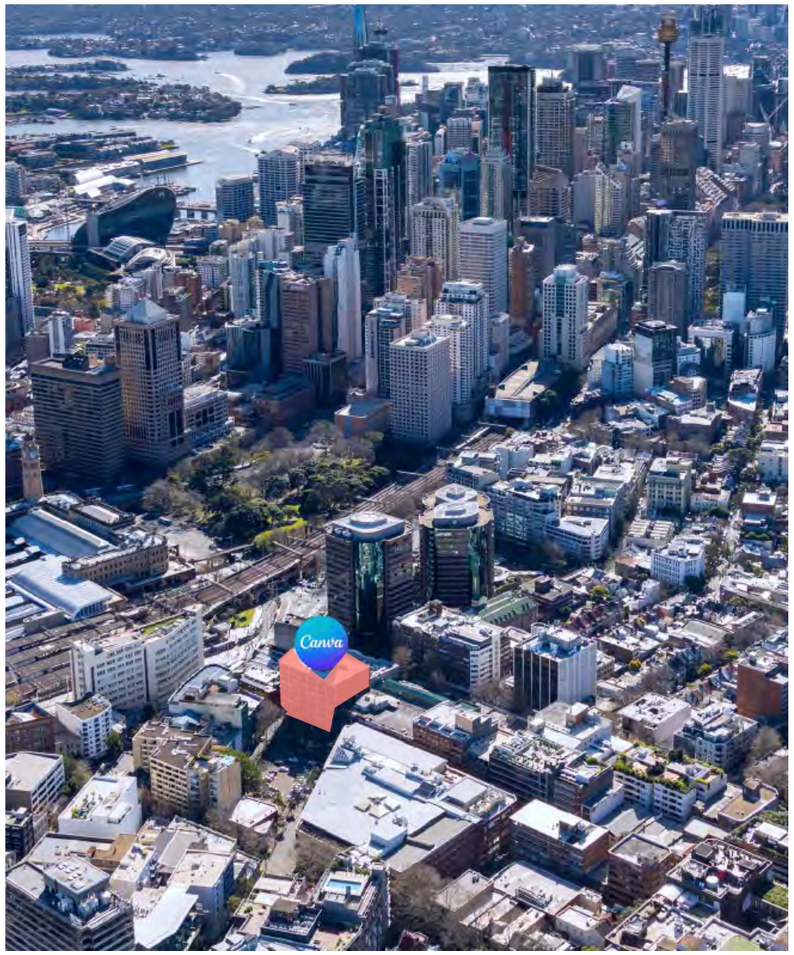
Strategic Context

The subject site is is situated in a predominantly commercial district of Surry Hills and is located at 8-24 Kippax Street. The site is within 150 meters of Central Train Station, The Sydney Light rail and commuter bus stops.

The site is 1031.58 sqm in size and bounded by Sophia Street to the north, Terry Street to the west and Kippax Street to the south. Along the eastern boundary, the existing building shares a party-wall with 26 Kippax Street, up to 6 stories. The site has approximately a 4 meter level difference between Kippax and Sophia Streets, sloping from the south eastern corner of the site towards the north western corner of Sophia and Terry Streets.

The boundary along Kippax Street is 37.89m and is the main entry facade. The Sophia Street boundary is 25.86m and the site depth between Kippax and Sophia Street is 24.96m. Vehicular access to the existing basement is from Sophia Street, as is an existing Substation.

The City of Sydney LEP zones the site MU1, Mixed Use with a maximum building height of 22m.



Aerial Landscape photo looking north west from Surry Hills

LEGEND

Site

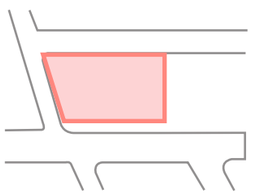
Executive Summary

The elevations shown on site right identifies the differing City of Sydney LEP 2012 height limits along Kippax Street. The Aurora Hotel at 324 Elizabeth Street has a Maximum height limit of 27m, the subject site and 26 Kippax street have a maximum height limit of 22m while 46 Kippax Street has a maximum building height limit of 30m.

However the existing building currently exceeds the LEP height limit of 22m with the existing street facade height at 30m with an additional 9.5m of plant above this.

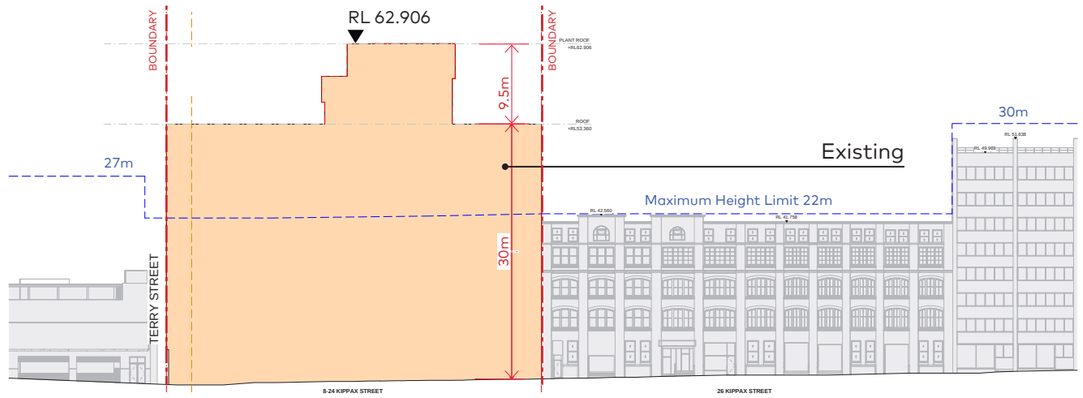
Canva have also lodged a DA for the removal of the existing plant and its replacement with updated plant and roof access.

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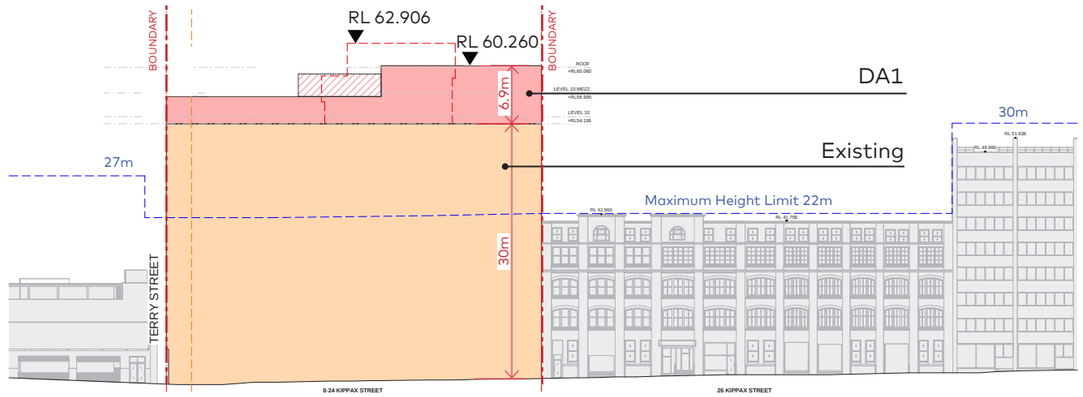


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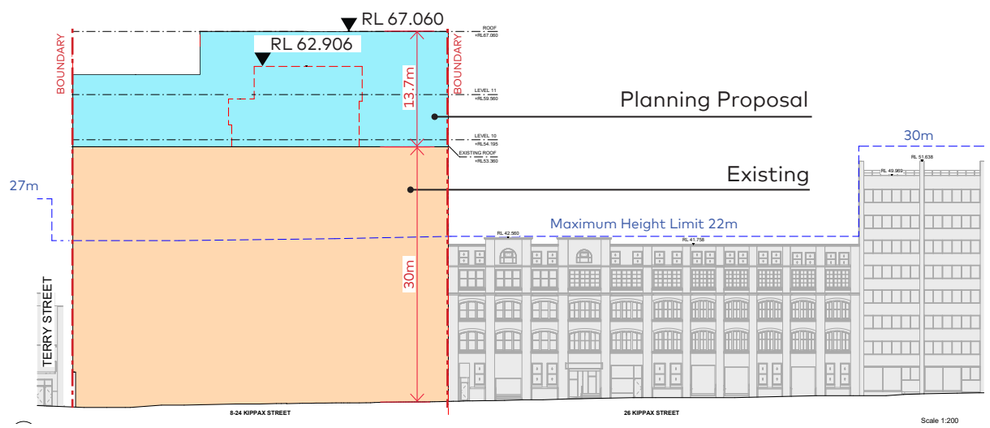
- View
- Site
- Planning Proposal
- DA1
- Canopy Extent - DA1
- Existing Building
- Building height
- Boundary
- Outline of existing plant



Existing Southern (Kippax Street) Elevation



DA Southern (Kippax Street) Elevation



Planning Proposal Southern (Kippax Street) Elevation

Project Introduction

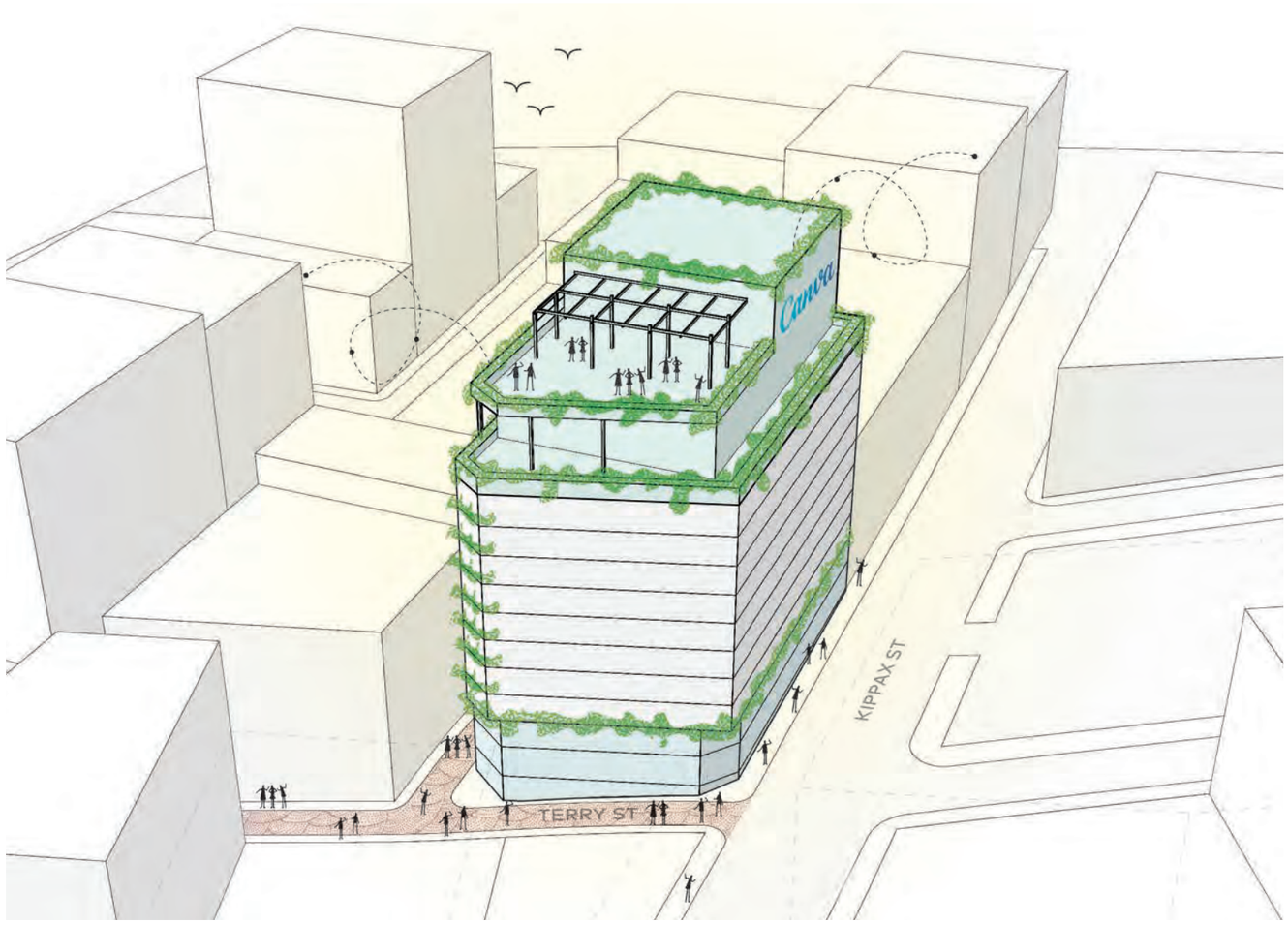
The proposed Concept Design for the Planning Proposal utilises the existing 9 storey building facade with 2 additional storeys incorporating a new function/ meeting level and terrace access with associated upgraded plant rooms. Both function/meeting level and roof terrace are for the use of Canva's employees and invited guests only..

The ground level, accessed from Kippax Street will connect to the lower ground Level along Sophia Street, visually linking the two streets.

The public domain around the site consists mainly of narrow streets with limited pedestrian access due to narrow footpaths. This is currently being addressed by the City of Sydney through their proposed Shared Zone along Terry Street, between Foveaux and Kippax Streets.

The proposed Concept Design offers opportunity to deliver a good working environment to Canva's employees and will encourage the use of public transport due to the site's prime location.

The addition of a function room level and terrace will provide opportunity to invigorate the currently under-utilised rooftop space through outdoor, undercover seating areas with views towards the Sydney CBD and surrounds.



Introduction to Canva

Canva's Mission

8-24 Kippax Street offers a unique opportunity for Canva to improve their presence and commitment of giving back to community within the suburb of Surry Hills. Although currently occupying several properties in the area, Canva now aims to consolidate their office spaces to one main office building specifically designed to suit their requirements.

The site is 1031.58 sqm in size and bounded by Sophia Street to the north, Terry Street to the west and Kippax Street to the south. Along the eastern boundary, the existing building shares a party-wall with 26 Kippax Street, up to 6 stories. The site has approximately a 4-meters level difference between Kippax and Sophia Streets, sloping from the south eastern corner of the site towards the north western corner of Sophia and Terry Streets.

In keeping with Canva`s aspirations of being a "Force for Good", and the principle to "do more with less", the proposal retains as much of the existing building and facade as possible with minor rooftop addition to accommodate an upgraded lift and necessary services, plant, solar panels, green roof and access to a rooftop terrace.

The Ground Level, accessed from Kippax Street will connect to the Lower Ground Level along Sophia Street, visually linking the two streets. The public domain around the site consists mainly of narrow streets with limited pedestrian access due to narrow footpaths. This is currently being addressed by the City of Sydney through their proposed Shared Zone along Terry Street, between Foveaux and Kippax Streets.

The proposed Concept Design offers opportunity to deliver a good working environment to Canva's employees as well activating the ground plane for community engagement, including a public café.



Be a Good Human

Value good communication. Be open, honest and constructive with yourself, with your team, with the company, and with the world.



Pursue Excellence

Maintain a high bar for ourselves and the people we work with. Continuous growth and development. Lead by example.



Set Crazy Big Goals

Set ambitious goals, prioritise, hustle to execute and celebrate success!



A force for Good

Making the world a better place through positive actions, inclusion and diversity



Make Complex things Simple

Always aim for the most simple, pragmatic and effective solution to any problem. Think of the user.



Empower Others

Empowering others to achieve their goals, both globally and within Canva.

Community Benefits

Canva is a committed member of the Surry Hills community, occupying a number of buildings along Kippax Street and in its immediate vicinity.

Canva's investment in 8-24 Kippax Street will rejuvenate a tired and underutilised commercial asset. The expansion of Canva's Surry Hills footprint will enable it to expand its community offerings, enabling it to be "a force for good" in this precinct of Sydney.

In addition to its ongoing community offerings the following benefits will also be a direct result of the 8-24 Kippax Street upgrade.

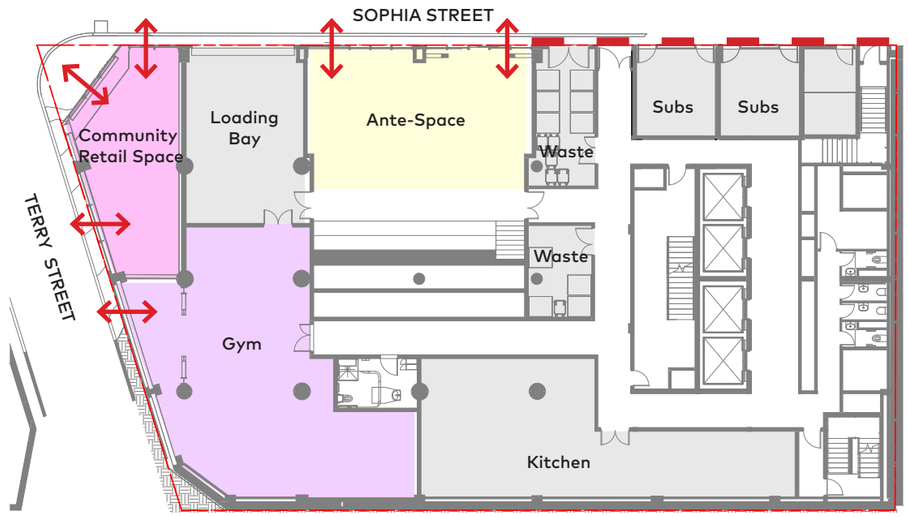
- Improvement of Terry and Sophia Street through Community Cafe/restaurant partnering with non for profits, creatives and Canva collaborators funded by the Canva Foundation
- A public art strategy with art opportunities on the eastern and northern facade
- ESD commitments
- All car parking bays have been removed, to promote the use of public transport and bicycles and reduce the impact of vehicles to the congested city roads.



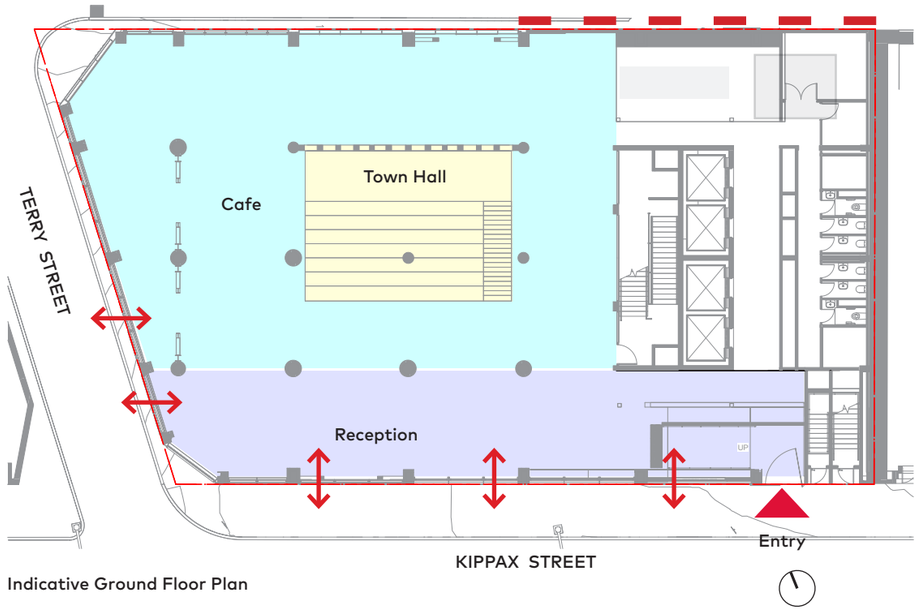
Artwall on eastern facade (Indicative only)



View looking towards Indicative Community Retail space



Indicative Lower Ground Plan



Indicative Ground Floor Plan

LEGEND

Art Wall Location

Visual Connection to Street

Community Benefits

Community benefits could include:

- New Community Cafe/Space will activate Terry and Sophia Street, improving street activation and creating a safer environment for pedestrians.
- New curated Art Wall will create visual interest and be a draw for pedestrians in addition to the extended shareway.



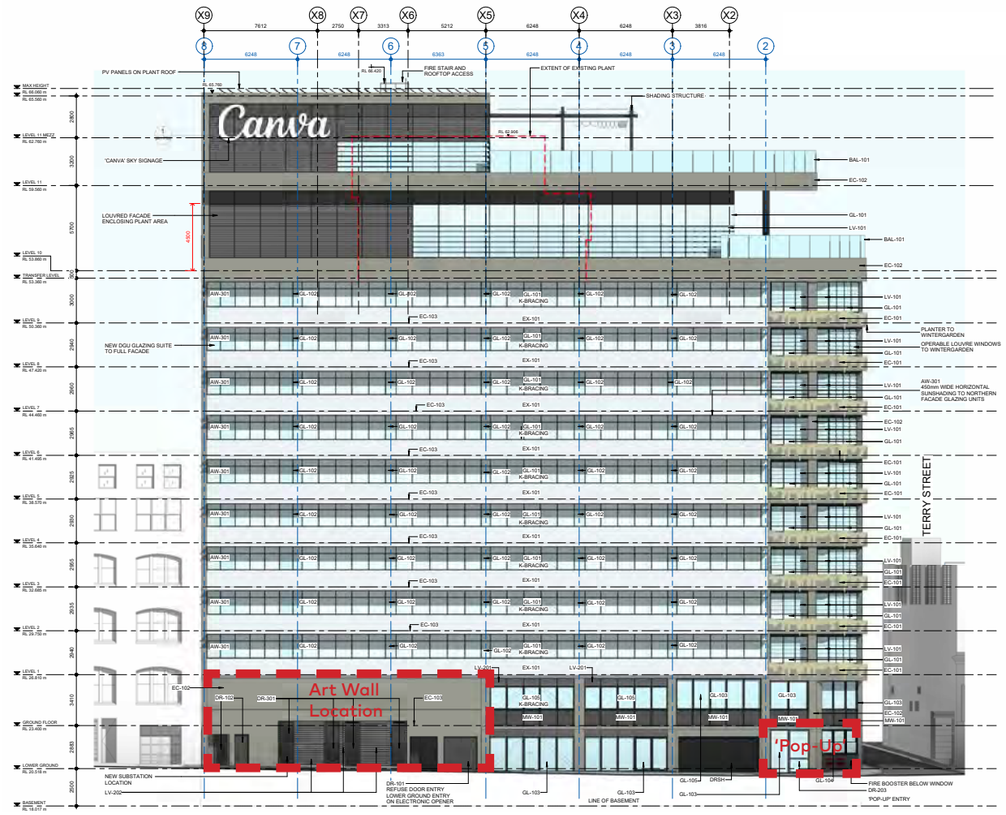
1. View looking south along Terry Street



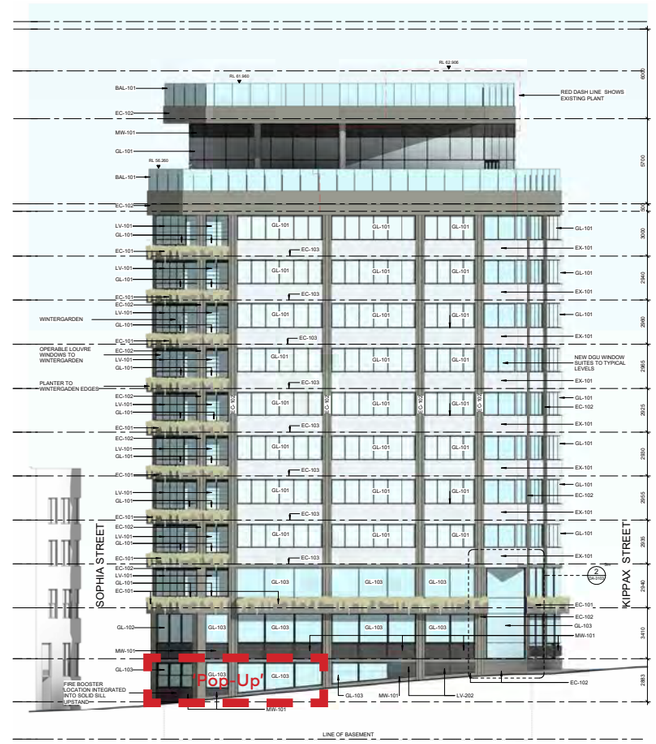
2. View looking east along Sophia Street



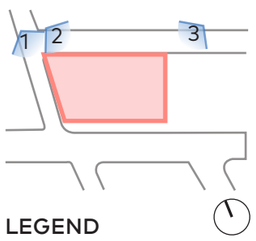
3. Art Wall Sophia Street



Indicative North (Sophia Street) Elevation



Indicative West (Terry Street) Elevation



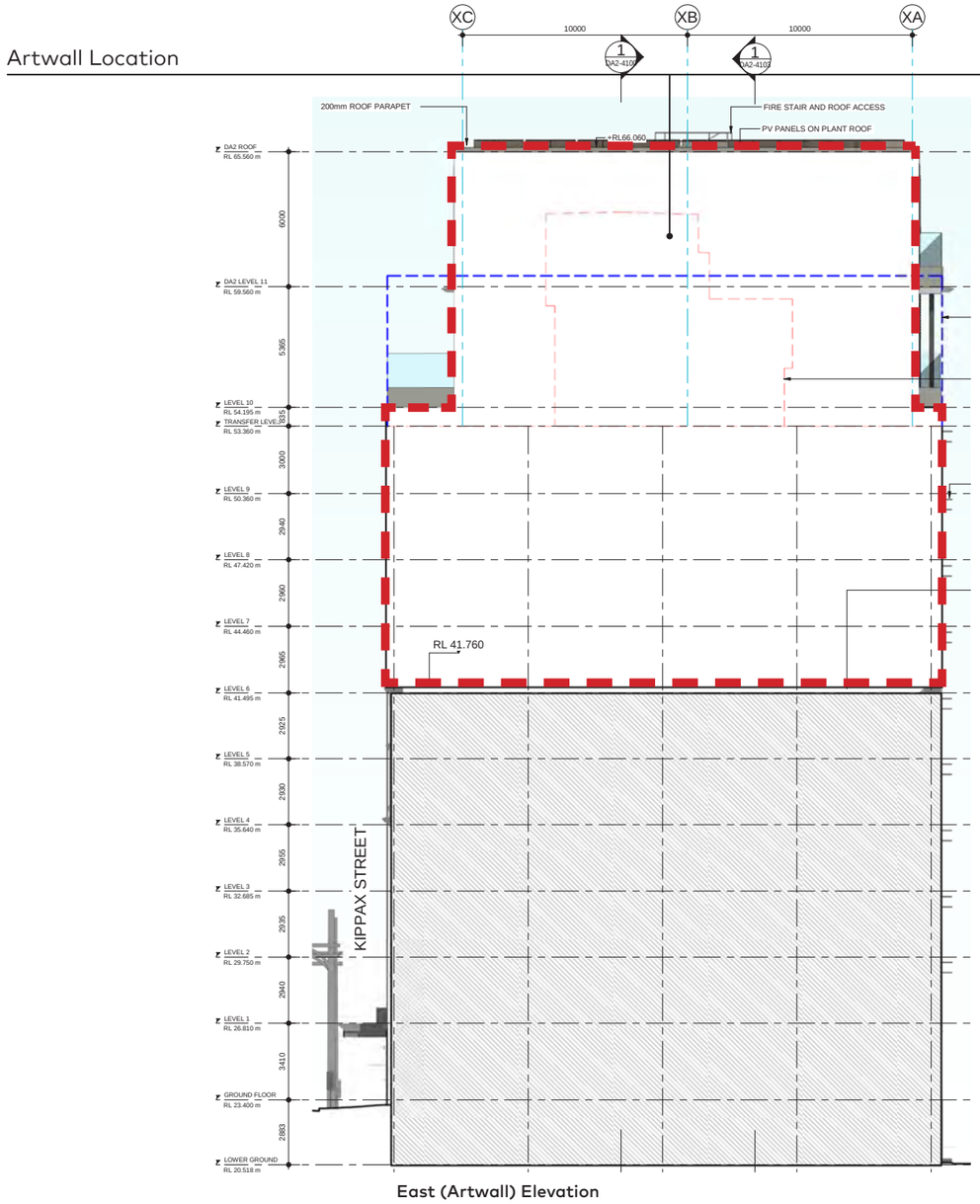
LEGEND

- 1 View
- Site
- Community Benefit Locations

Community Benefits

Community benefits could include:

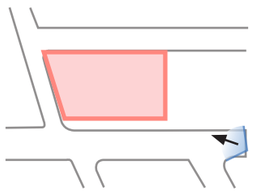
- New art wall showcasing emerging Australian artists this would build on the existing rich history of art and murals in Surry Hills streets.



East (Artwall) Elevation



East (Artwall) - Kippax Street



LEGEND

Art Wall Location

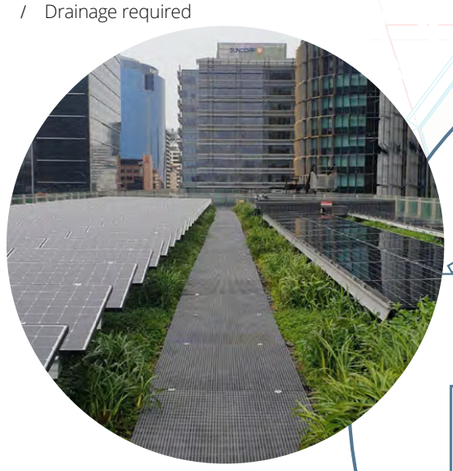
Community Benefits

Community benefits could include:

- The introduction of a planted roof terrace and an integrated green roof & PV approach, will increase the tree canopy and number of green roofs in the city. It will create a micro climate helping to reduce heat island effect and increase biodiversity, while improving the visual outlook of surrounding building with views over 8-24 Kippax Street.

- Planting palette incorporates a variety of native vegetation to meet sustainability initiatives. Please refer to landscape report for further detail.

/ Soil depth requirement: 170mm (including mulch layer, media mix, geofabric, drainage cell)
/ Total saturation weight: 173kg/m2
/ Waterproofing required
/ Irrigation required
/ Drainage required



Indicative Roof Plan

* Information taken from Arcadia Landscape Approach pdf

Environmentally Sustainable Design (ESD)

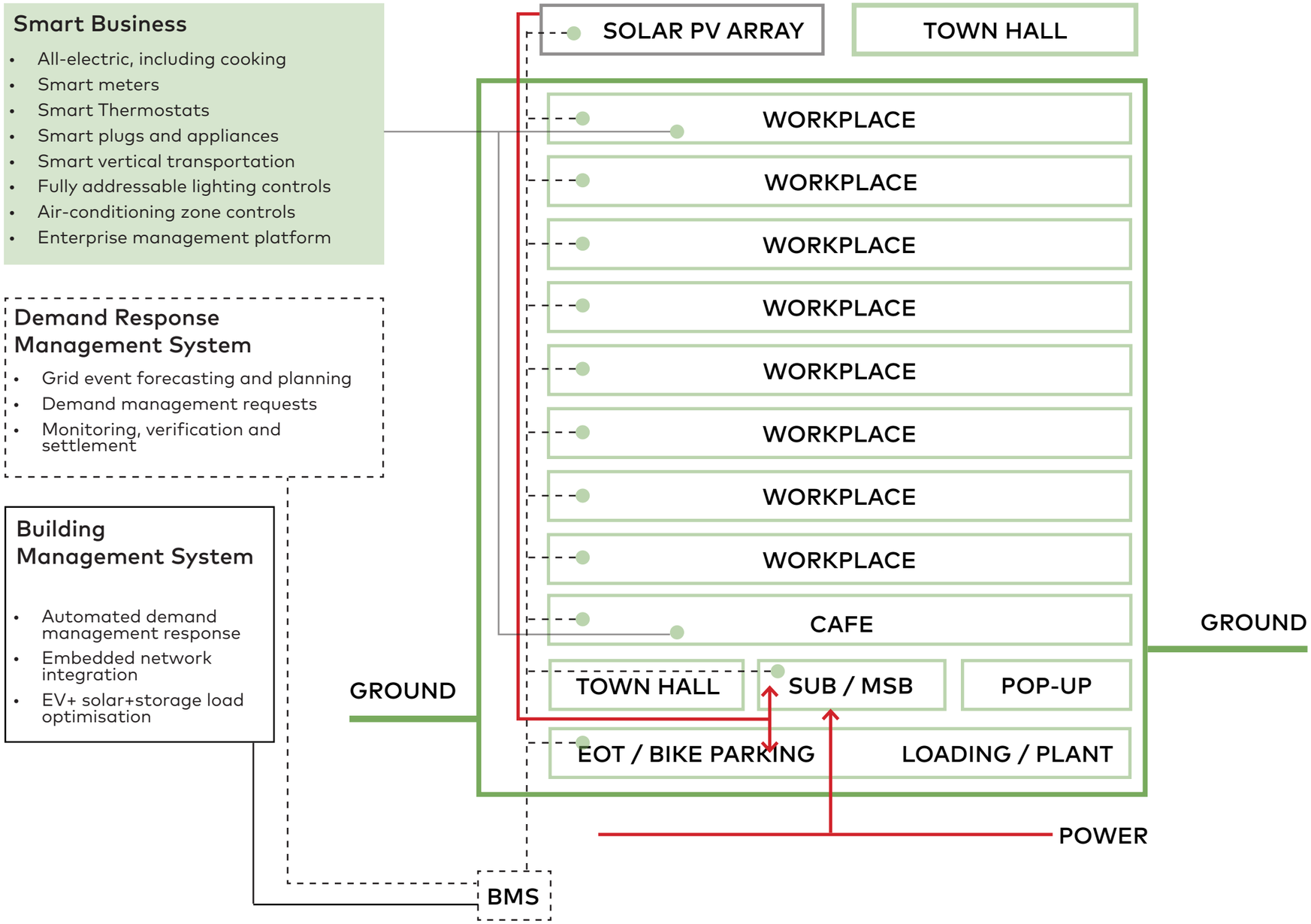
Beyond Net Zero:

1. Building water use and wastewater treatment

2. Building operational waste (collection and treatment)

3. Refrigerant plant and equipment

4. Movement and transport of Canvanaughts, workers and visitors to support building/organisation operations



* Information taken from E-Lab Consulting Sustainability Strategy

Site Context

Site Location

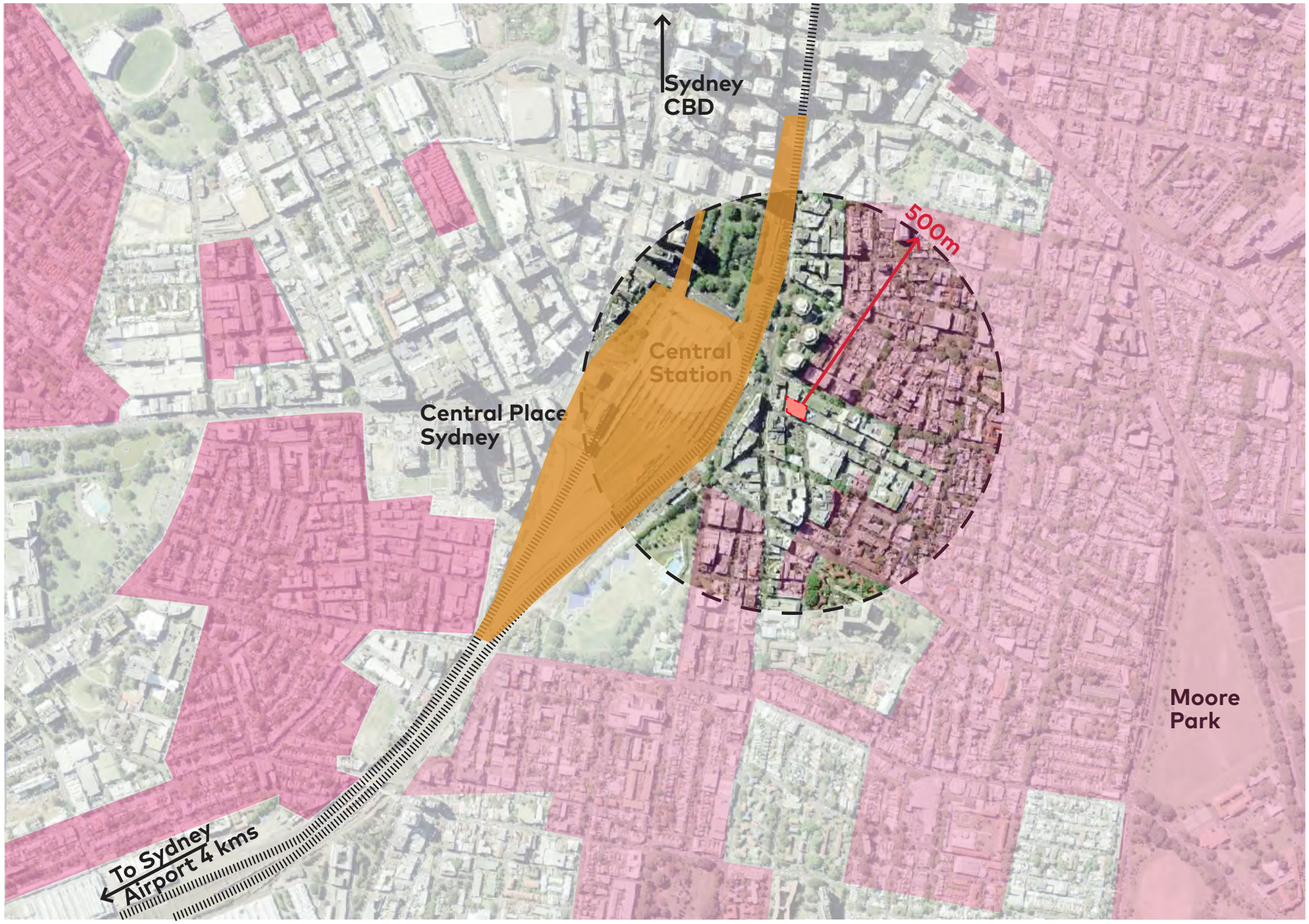
The site is strategically located, close to local, regional and international transportation and Central Sydney Business District.

While Heritage Conservation Areas are in close proximity to the site, the site itself is not within a Heritage Conservation Area. The precinct is a commercial area with a mixture of converted terrace houses, 2-8 storey brick buildings and the 8 storey School of Dentistry.

The areas to the south and east are characterised by residential terrace houses and multi-storey social housing developments.

A mixture of residential, commercial and retail lie to the north of the site.

Central Station lies to the west of the site and future high rise Central Place Sydney developments.



LEGEND

- Site
- Central Precinct
- Heritage Conservation Zones
- 500m from site

Site Location Plan

Image Source: SixMaps

Site Context Analysis

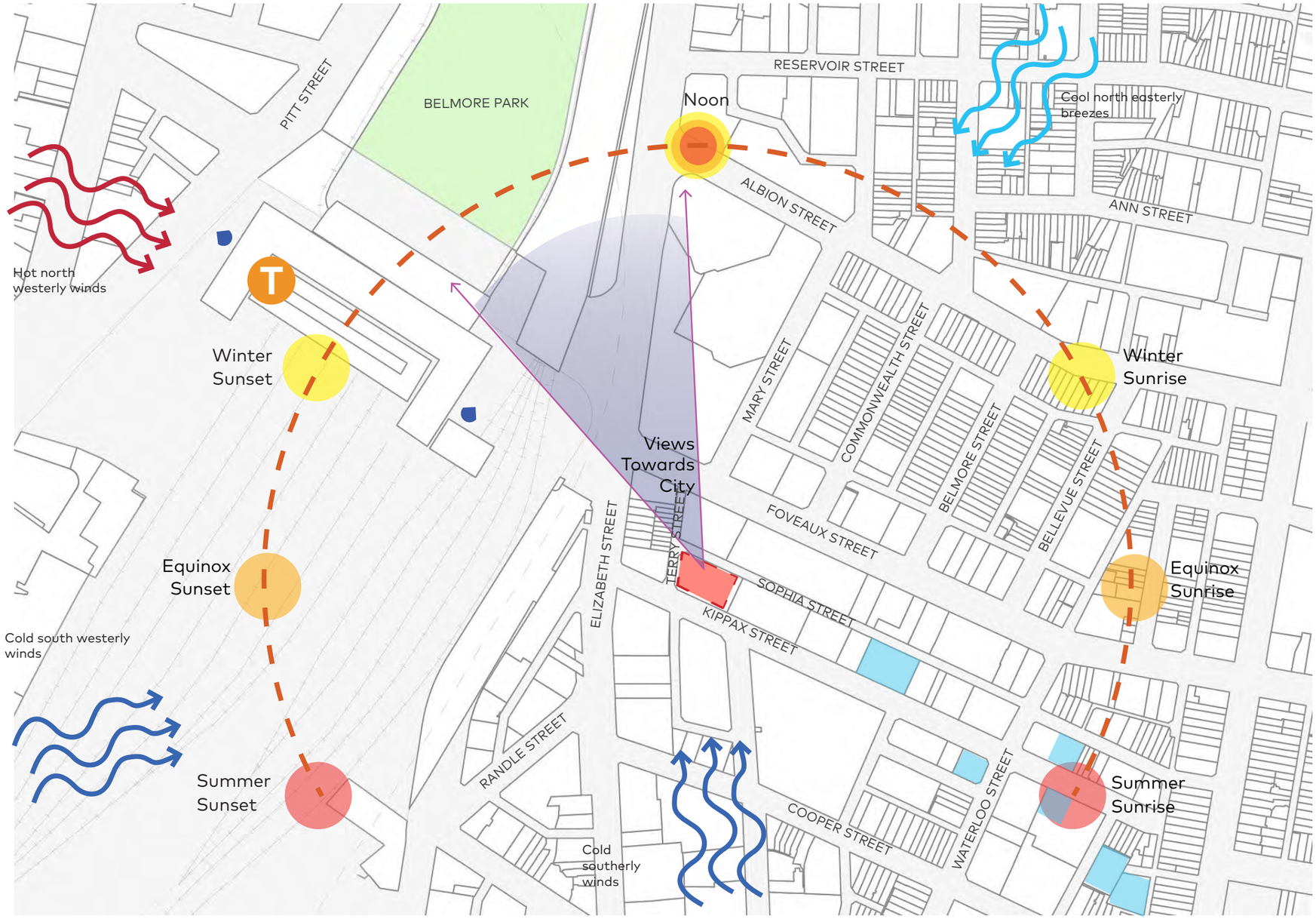
Located in close proximity to Elizabeth Street, in Surry Hills, the site is situated at the lower, western end of Kippax Street. The site is approximately 150m to Central Train Station.

Kippax, Terry and Sophia Streets

Kippax Street slopes in an east-west direction and intersects Elizabeth Street at the lower, western end. The upper, eastern end transitions from commercial brick buildings into residential terrace houses. The site is bounded by streets on three sides and shares a party wall with 26 Kippax Street along its eastern boundary. Along the Southern boundary is Kippax Street, Terry Street along the western boundary and Sophia Street along the northern boundary. There is a three meter difference in height between the highest Level on Kippax Street and the lowest Level on Sophia Street. Terry Street slopes from Kippax to Sophia Street. A carpark is accessed directly opposite the subject site on Kippax Street, while Terry and Sophia Streets are narrow, one way streets and function as laneways.

LEGEND

- Site
- Summer Solstice
- Equinox
- Winter Solstice
- Solar Path
- Central Train Station
- Train Station Entry Point
- Views From site
- Existing Canva Offices



Context Analysis Plan

Tech Central

What is Tech Central?

*"*This Precinct is the NSW Government's commitment to creating the biggest technology hub of its kind in Australia. It is located in southern Central Sydney to capitalise on the existing rich heritage, culture, activity, innovation and technology, education and health institutions of the surrounding suburbs and the excellent transport links provided by Central and Redfern Station transport interchanges.*

*The Innovation and Technology Precinct Panel Report identifies the goals of Tech Central. It will aim to create 250,000 square metres of net lettable floor space for technology companies, including affordable work space for start ups and early stage companies. It will also aim to create 25,000 new jobs, increased educational opportunities focused on Science, Technology, Education and Mathematics (STEM) and life sciences and increased technology exports".**

Ultimo, Haymarket, Surry Hills, Darlington North Eveleigh, South Eveleigh and Camperdown

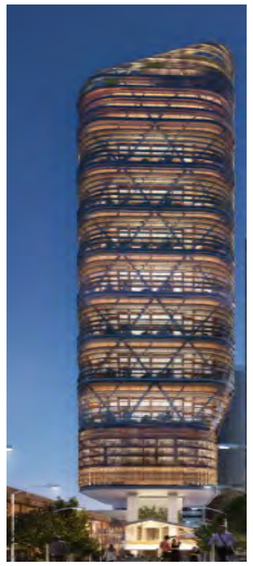
LEGEND

1. Atlassian Central
2. Toga Central
3. Central Place North & South Towers
- Site
- Sydney Harbour
- Tech Central

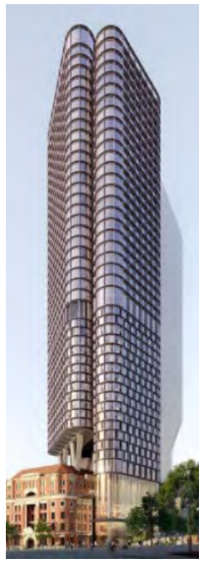
* Imagery and text sourced from report: Central Precinct - Urban Deign Framework - Transport for NSW - July 2022



*Map of Tech Central



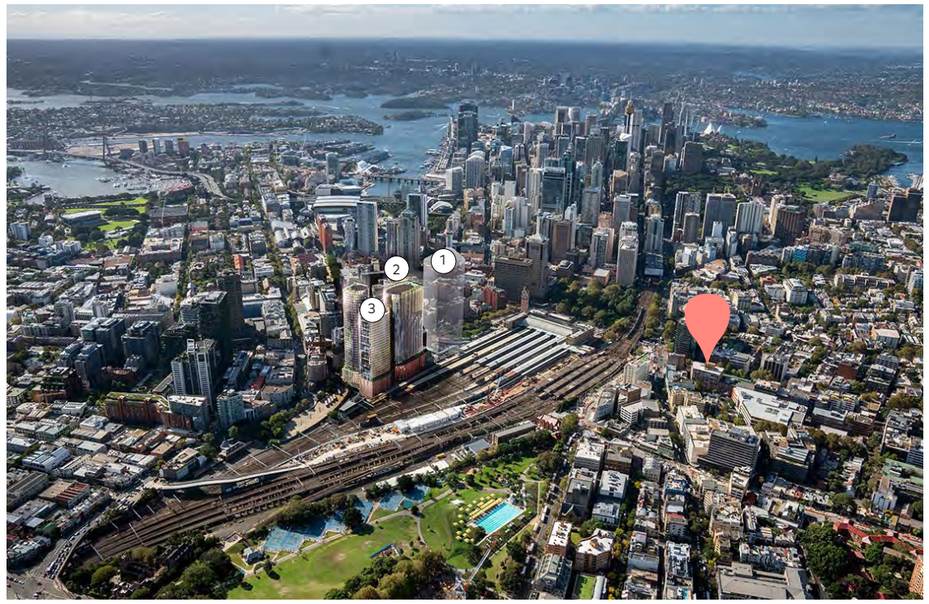
1. Atlassian Central



2. Toga Central



3. Central Place North & South Towers

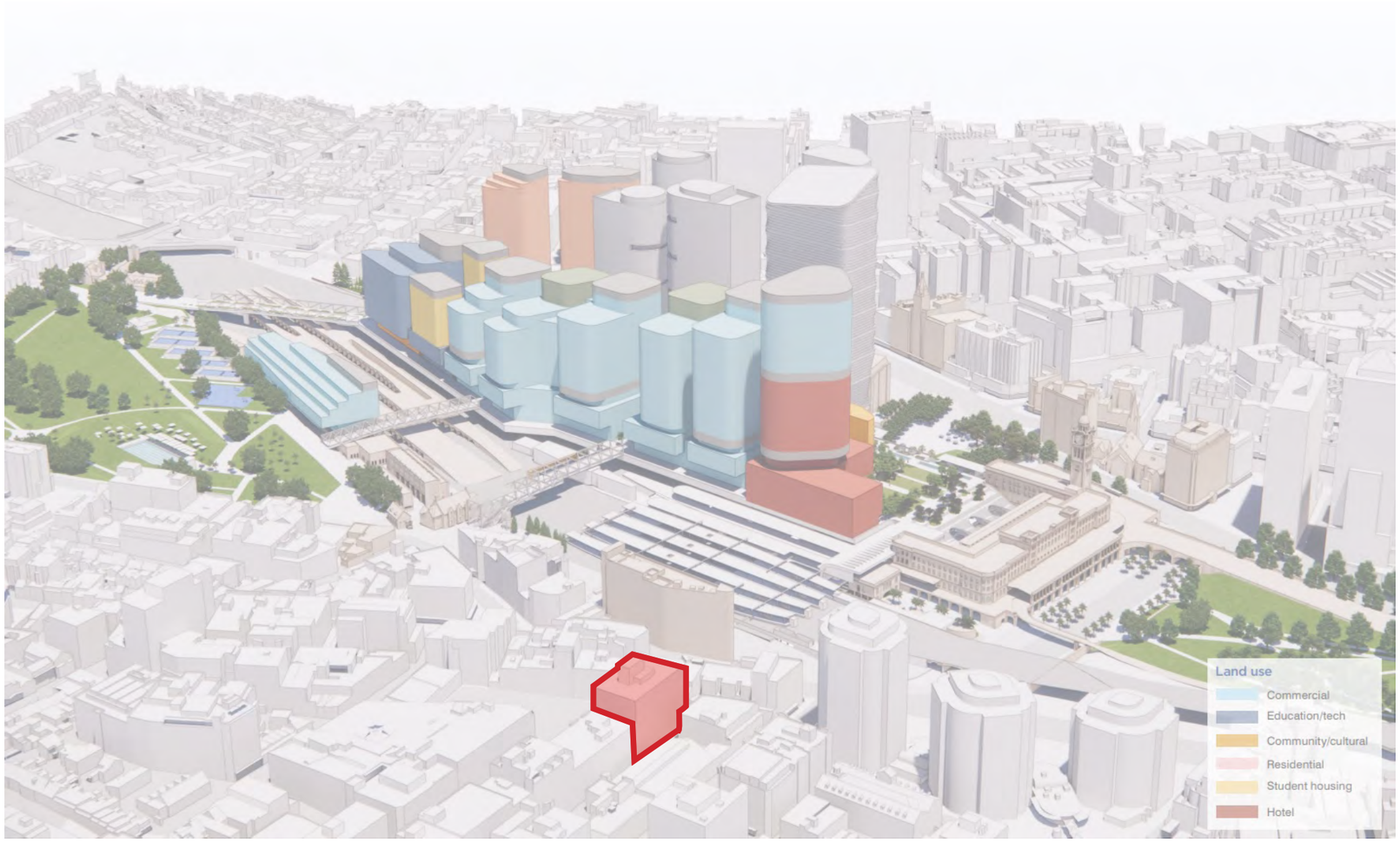


* Aerial view looking north west

Central Precinct

Canva's new home is firmly located in the Surry Hills area where Canva occupy other buildings, however it it is in close proximity to the new Central Precinct and as such the proposed development is not out of scale.

*"*The Central Precinct Place Strategy establishes the structure plan which provides a robust framework to guide future renewal of Central Precinct. The renewal will provide an enhanced transport interchange experience, important space for jobs in innovation and technology, improved connections through the precinct and with surrounding areas, new and improved public spaces and social infrastructure to support the community". *



Aerial view looking south west*

LEGEND
Site

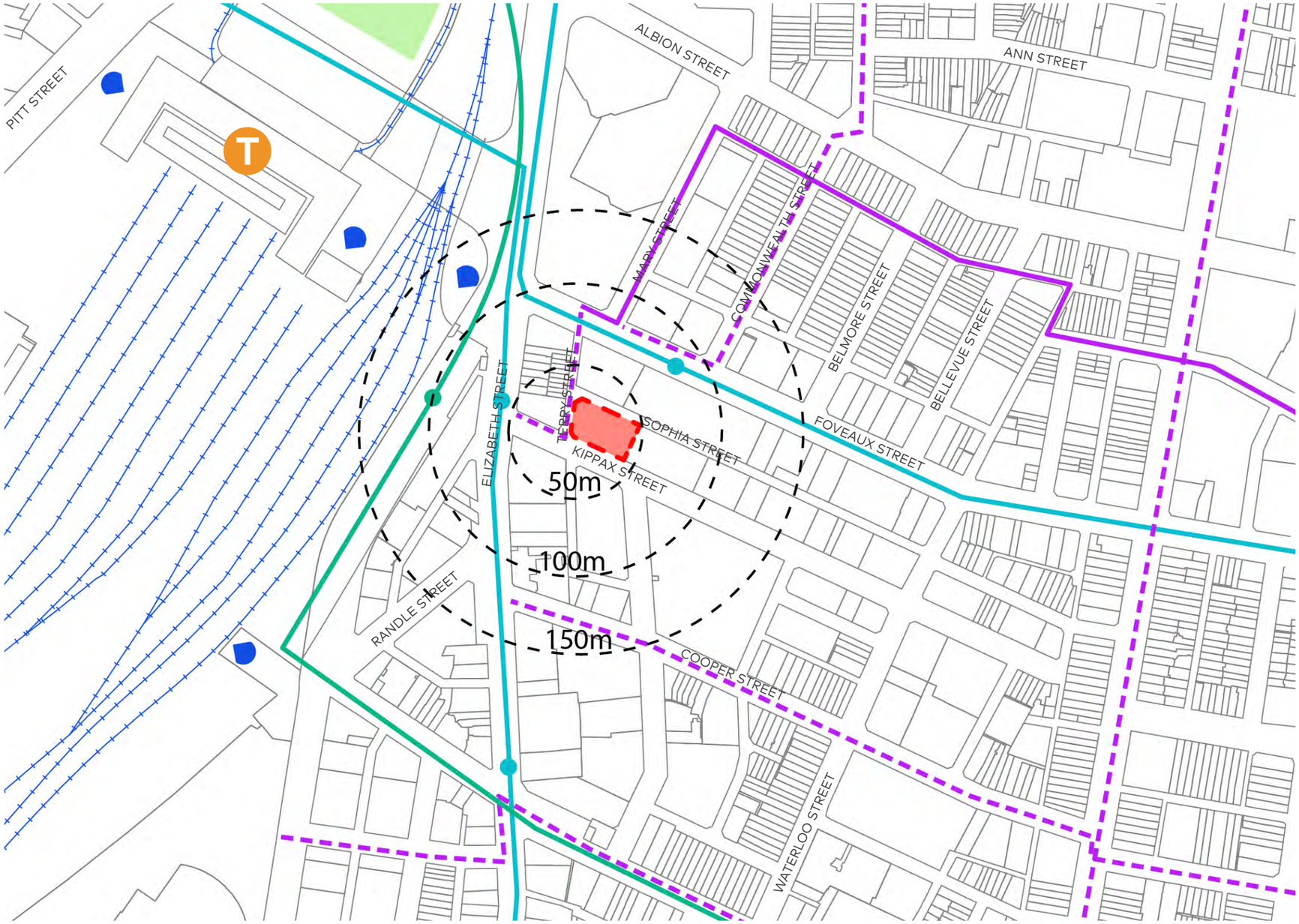
* Imagery and text sourced from report: Central Precinct - Urban Deign Framework - Transport for NSW - July 2022

Transport

The site is well serviced by public transport including trains (both metro and regional) and metropolitan buses. The light rail is within walking distance and the site is on the bicycle routes provided by the City of Sydney. Additionally, the site is within 5kms of Sydney International Airport.

Trains are within 150 meters of the site. The light rail is within 100 meters of the site and buses are within 50 meters of the site. All modes of transport are easily accessible by foot.

The site has vehicular access though offers limited on-site parking. End of Trip facilities are to be provided by Canva to encourage cycling and walking.



LEGEND

- Site
- Bus Stop
- Bus Route
- Light Rail Station
- Light Rail Route
- Train Station
- Train Route
- Train Station Entry Point
- Bicycle path - Separate
- Bicycle path - On Road

Map of transport connections

0 50 100 200

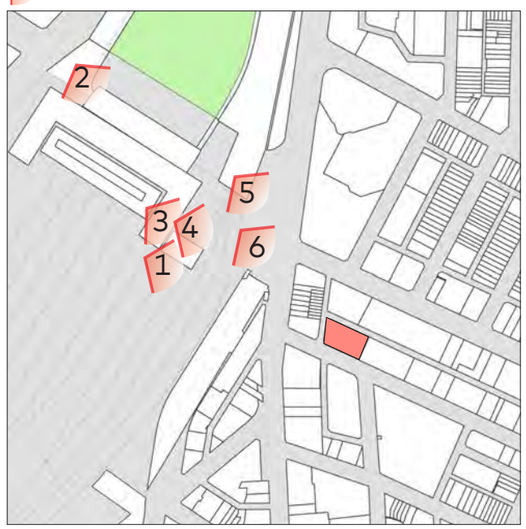
Views towards Subject Site

Partial views of the existing building can be seen from Central Station and Elizabeth Street.

LEGEND

Site

1 Camera view



Key Plan



1. View towards site from Central Station Platform looking east



2. View towards site from Central Station Bridge looking south east



3. View towards site from Central Station Exit looking east



4. View towards site from Central Station entry looking east



5. View towards site from Eddy Avenue tunnel looking south east



6. View towards site from intersection of Eddy Avenue and Elizabeth & Foveaux Streets looking south east

Buildings with Rooftop Additions

An increasing number of buildings are improving the roof-scape of Surry Hills and utilising the space for residents, workers and their guests. The examples shown indicate the range of alterations and additions made to existing buildings, from rooftop extensions to whole new developments.

*6. 300 Elizabeth Street has submitted a DA for Alterations and Additions to create a breakout space on the rooftop of the existing building.

LEGEND

- Site
- Camera view
- Indicating Rooftop Addition



Key Plan



1. 46 Foster Street, Surry Hills



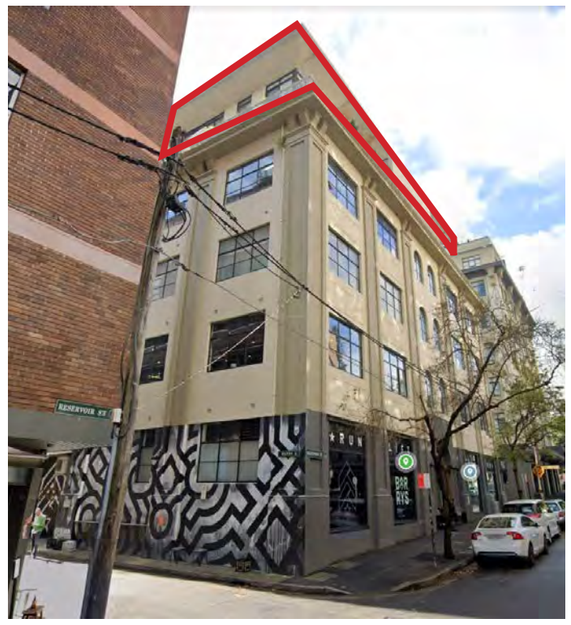
2. 15 Randle Street, Surry Hills



3. 121 Kippax Street, Surry Hills



4. 2 Holt Street Surry Hills

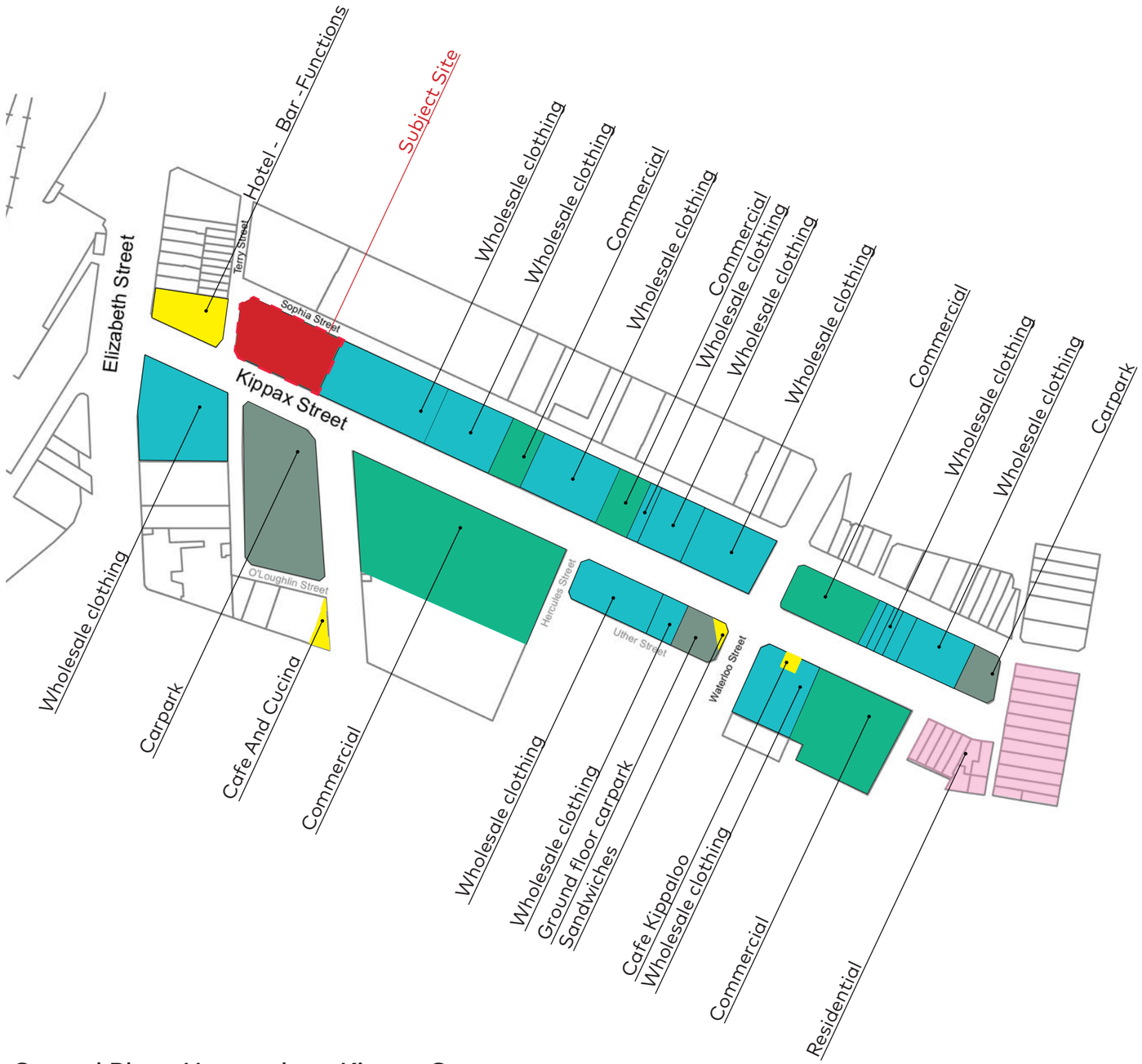


72 Reservoir Street, Surry Hills

Surrounding Ground Floor Uses

Kippax Street is predominantly activated by wholesale outlets and commercial premises. There are two Food and Beverage (F&B) operations, the Aurora Hotel and Roll in and Out sandwich shop. The Aurora Hotel, situated on the corner of Elizabeth and Kippax Streets, contains a bottle shop, bar and rooftop function room. The sandwich shop, Roll in and Out, is positioned on the corner of Kippax and Waterloo Streets and provides breakfast/ lunch for local workers during weekdays only. The south eastern end of Kippax Street is bookended by residential terrace houses.

Additionally, at either end of Kippax Street are ground level carparks. The larger positioned directly opposite the subject site.



Ground Plane Usage along Kippax Street

LEGEND

- Site
- Food and Beverage
- Commercial
- Wholesale
- Retail
- Residential
- Car Park

Planning Controls

Planning Controls

Documents referenced in the Planning Proposal for 8-24 Kippax Street.



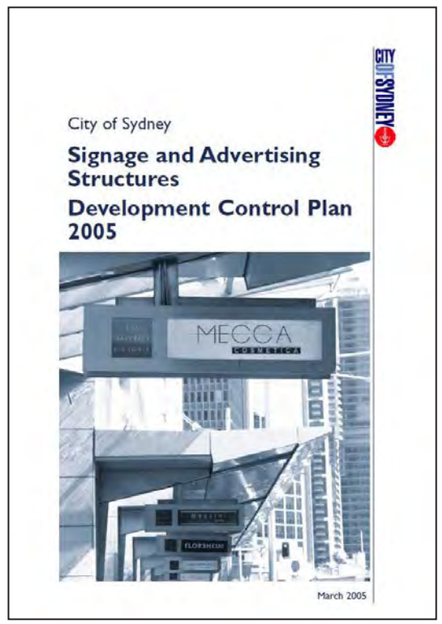
City of Sydney: Local Environmental Plan 2012



City of Sydney: Development Control Plan 2012



City of Sydney: City Plan 2036



City of Sydney: Development Control Plan 2005 - Signage and Advertising Structures

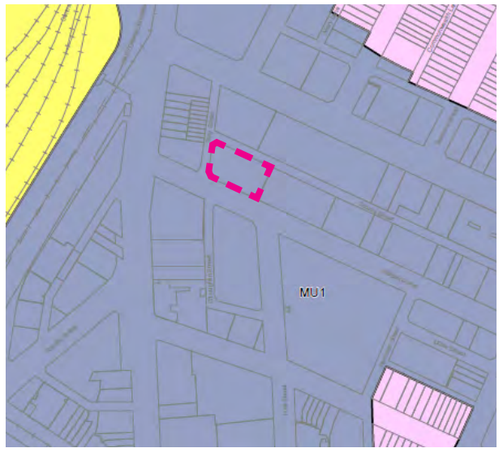
Sydney Land Environmental Plan 2012

Summary

Max FSR:	3.5
Max Height:	22m
Land Zoning:	MU1 Mixed Use

Site Calculations

Site Area (approx.)	1031.58 m2
Total Allowable GFA	3610.53 m2



LZN: Land Zoning
MU1 = Mixed Use

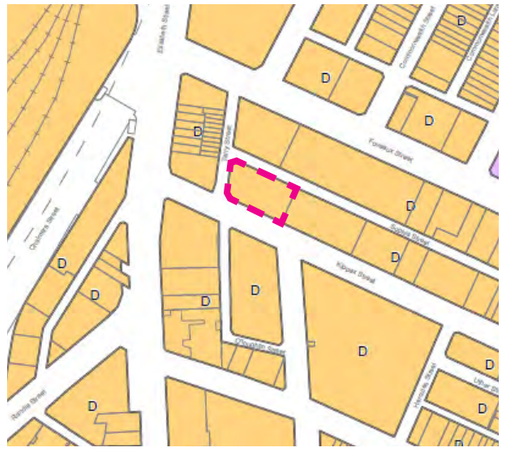


FSR: Floor Space Ratio
W1 = 3.5

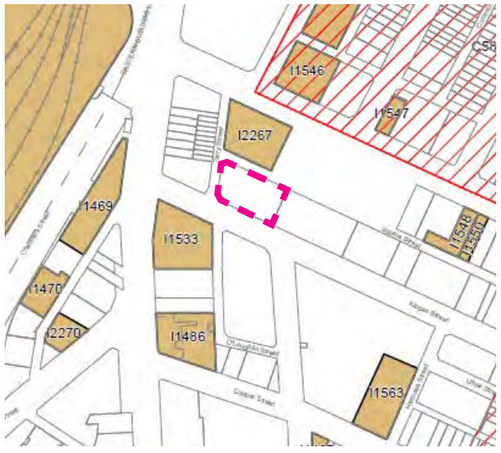


HOB: Maximum Building Height (m)
R = 22

Sydney Local Environmental Plan 2012
Part 7, Division 1
TAL*
7.6 Office premises and business premises
The maximum number of car parking spaces for a building used for the purposes of office premises or business premises is as follows—
(a) if the building is on land in category D and has a floor space ratio of no more than 3.5:1—1 space for each 175 square metres of gross floor area of the building used for those purposes,
(d) if the building is on land in category D, E or F and has a floor space ratio greater than that specified in paragraph (a), (b) or (c) respectively, the following formula is to be used:
M = (G x A) / (50 x T)
where—
M is the maximum number of parking spaces, and
G is the gross floor area of all office premises and business premises in the building in square metres, and
A is the site area in square metres, and
T is the total gross floor area of all buildings on the site in square metres.



TAL: Public Transport Accessibility Level*
Category D



HER: Heritage Map
The subject site is not Heritage Listed

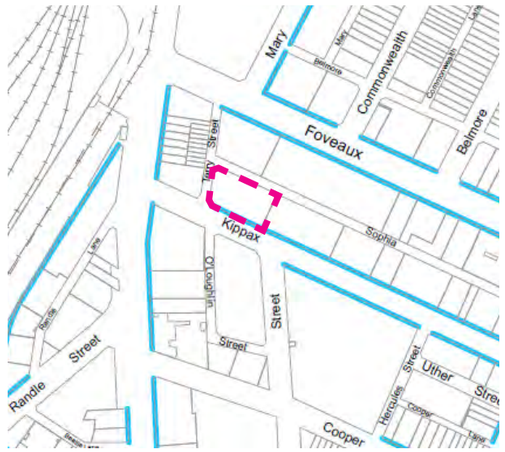
Sydney Development Control Plan 2012

Summary

Height in Storeys:	9
Active Frontages:	Kippax Street
Through site link:	Terry Street



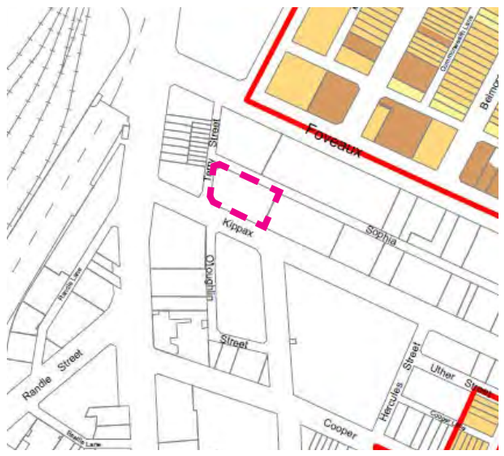
Height In Storeys
6 Storeys



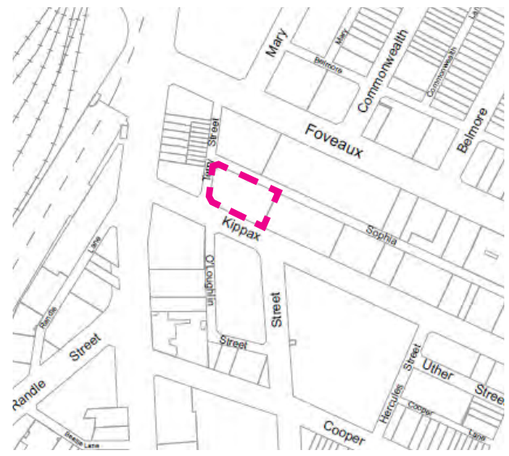
Active Frontages
Minimum 80% of each frontage / Provide awnings



Through Site Links
Existing through site link in Terry St



Building Contributions
N/A



Public Domain Setbacks
N/A

Better Streets and Spaces

Terry Street Shared Zone

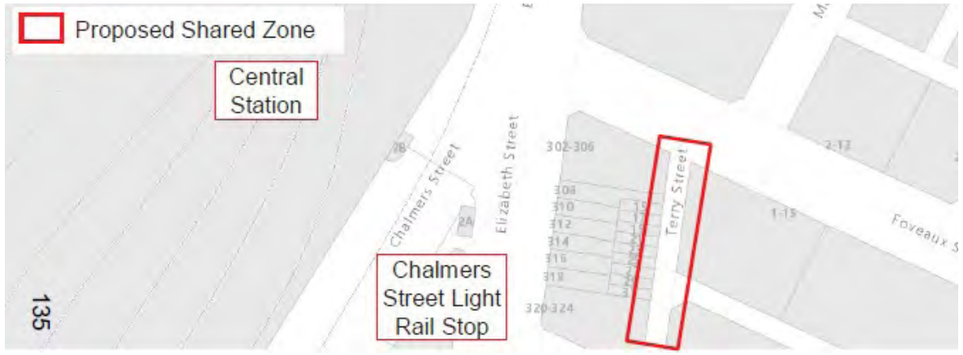
** "Terry Street is located in the vicinity of Central Train Station, the Chalmers Street Light Rail Stop and the Surry Hills commercial precinct. Due to its proximity to cafes, restaurants, shopping centre, hotel, pub and public transport, Terry Street attracts a high volume of pedestrians to the area.*

The proposed Shared Zone will create a pedestrian-friendly environment that allows pedestrians to walk safely and legally within the road carriageway. The appearance of the Shared Zone will be considerably different to nearby local streets to clearly communicate to road users that there is a change in the street environment and that pedestrians have priority.

Foot path widening

The footpath on the southern side of Foveaux Street, west of Terry Street is proposed to be widened and tied into the proposed continuous footpath treatment at terry street to help alleviate congestion on the footpaths leading to the Chalmers Street Light Rail stop and Central Station.

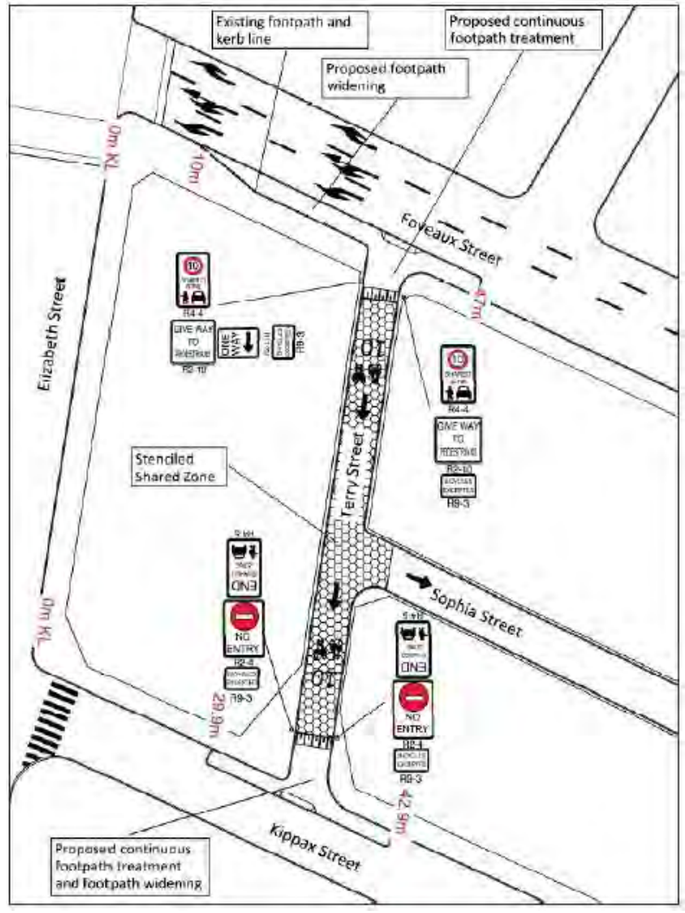
*The footpath on the northern side of Kippax Street, at the intersection with Terry Street is also proposed to be widened and tied into the proposed continuous footpath treatment to further highlight pedestrian priority and control vehicle speeds. " **



Locality Plan*



Typical Shared Zone*



Concept Design - Shared Zone*

* Imagery and text sourced from City of Sydney Local Pedestrian, Cyling and Traffic Calming Committee Meeting 2019/165290 Item 41.

Site

Existing Building

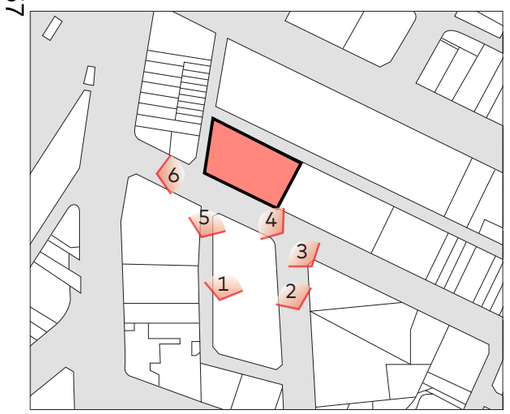
1 KIPPAX STREET

2 TERRY STREET

3 SOPHIA STREET



Existing building



Key plan



View 1. Looking North from existing carpark 19-31 Kippax Street



View 2. Looking north west from existing carpark 19-31 Kippax Street



View 3. Looking north west at corner of Holt and Kippax Street



View 4. Looking west along Kippax Street



View 5. Looking north east at corner of O'Loughlin and Kippax Street



View 6. Looking east along Kippax Street

LEGEND

Site

1 Camera view

Existing Building

1 KIPPAX STREET

2 TERRY STREET

3 SOPHIA STREET

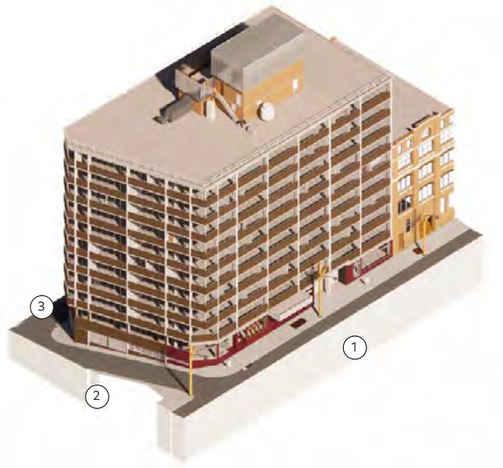


Diagram - Existing- 3D



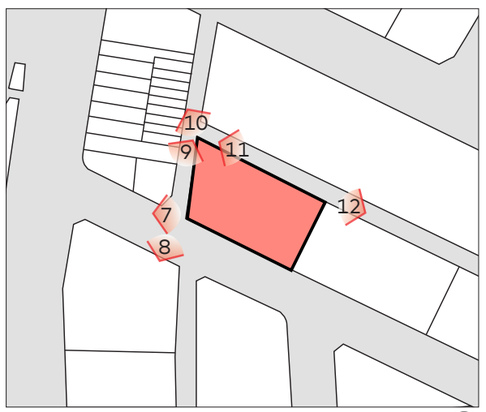
View 7. Looking south east at corner of Terry and Kippax Street



View 8. Looking north along Terry Street



View 9. Looking south along Terry Street



Keyplan



View 10. Looking south east at corner of Terry and Sophia Street



View 11. Looking south east along Sophia Street



View 12. Looking north west along Sophia Street

LEGEND

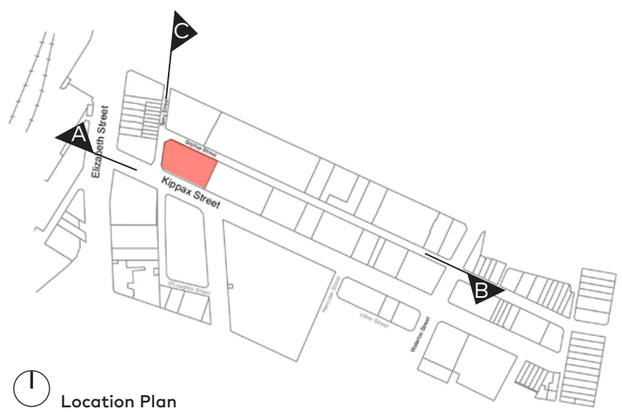
Site

1 Camera view

Street Elevations



Street Elevation A - Photo montage Kippax Street



Location Plan

LEGEND

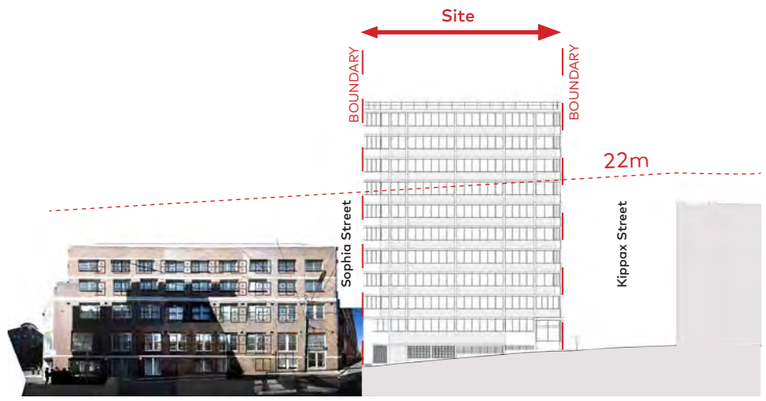
Height Plane Line

Site

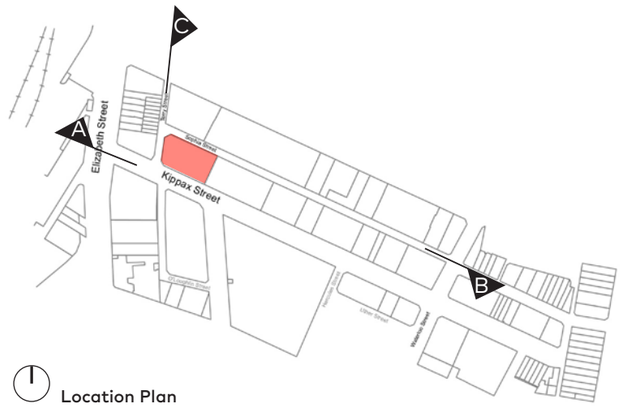
Street Elevations



Street Elevation B - Photo montage Sophia Street



Street Elevation C - Photo montage Terry Street



Location Plan

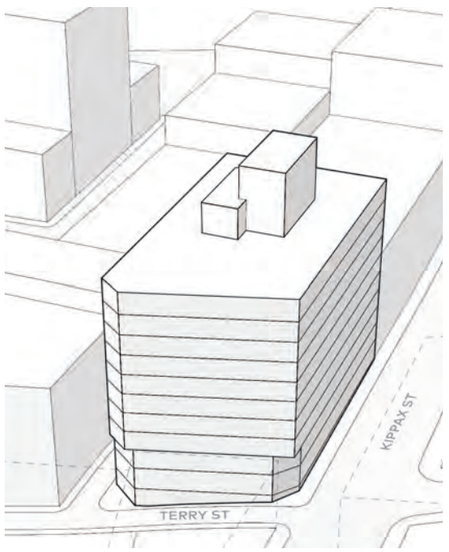
LEGEND

----- Height Plane Line

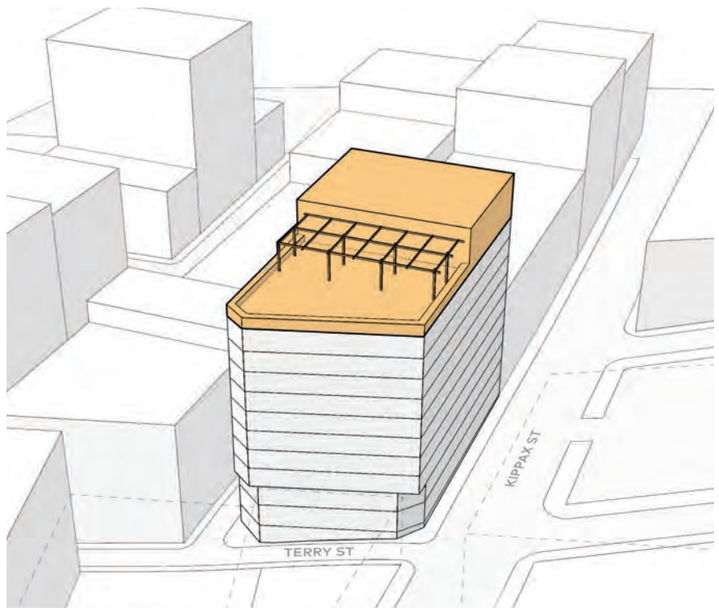
Site

Design Principles

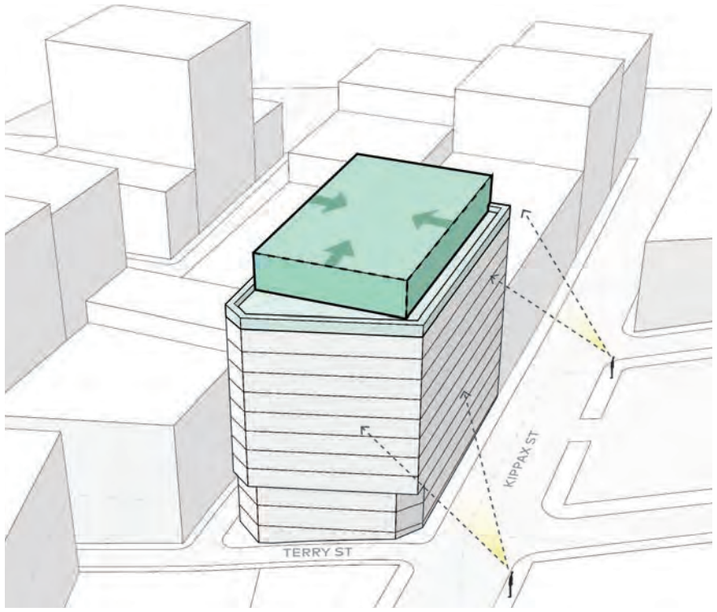
Planning Proposal Design Principles



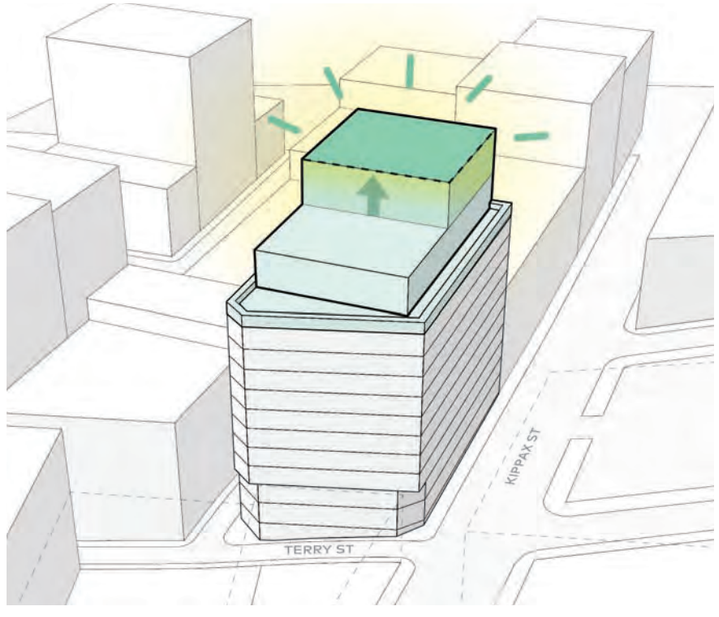
Existing envelope with rooftop plant



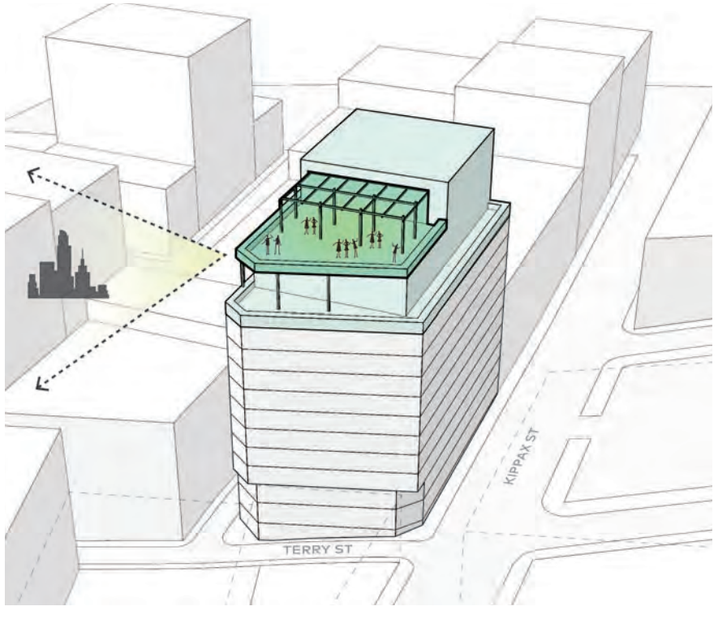
Massing (DA1)



Setback and reduce visual bulk



Touch the sky memorably

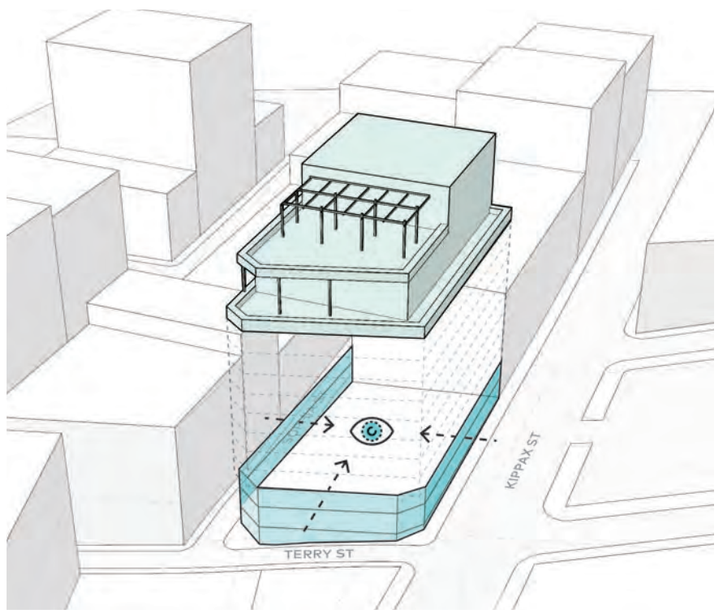


Reach out - Add roof terrace

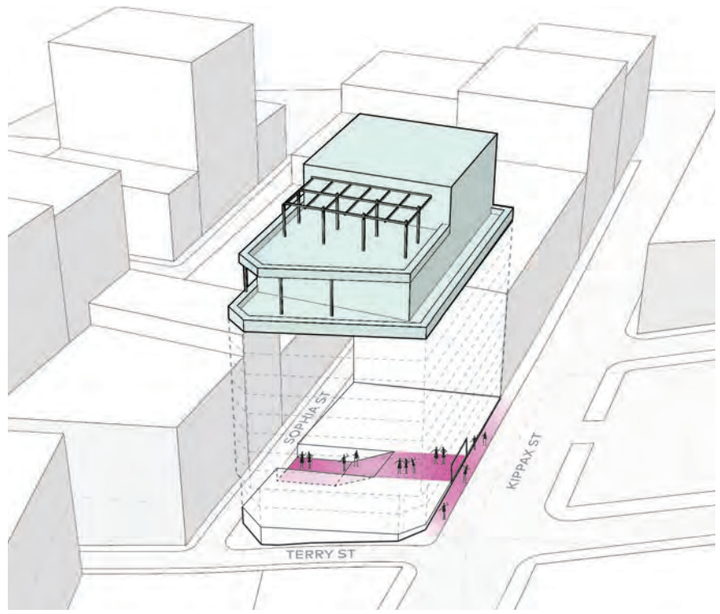
LEGEND

- DA1 Building Envelope
- Planning Proposal

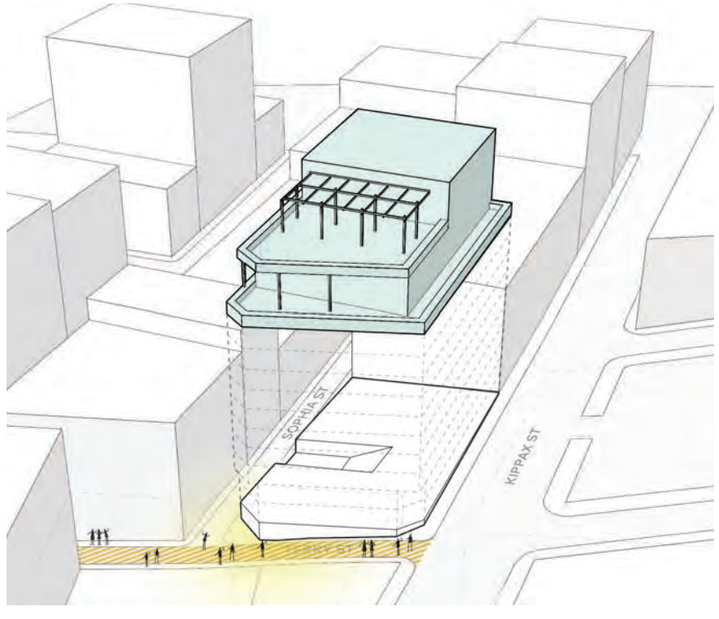
Broad Design Principles from DA1



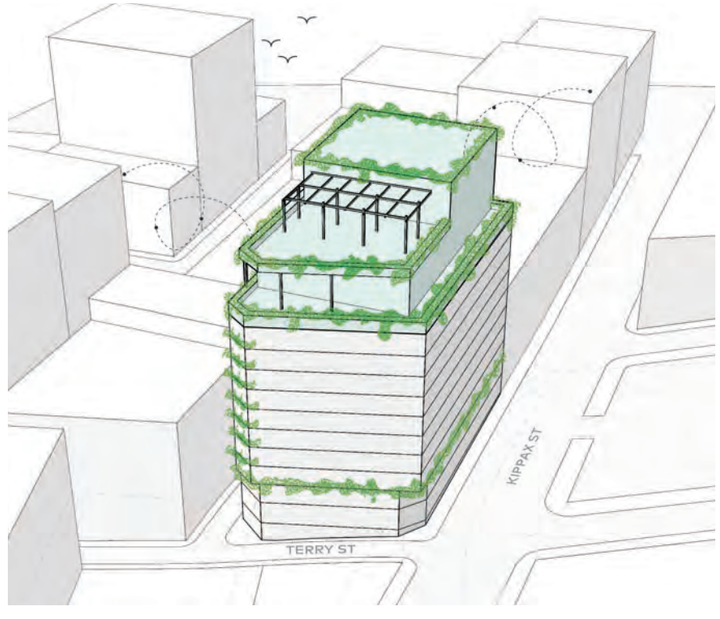
Transparency



Connect



Activate Public Domain



Green Up

LEGEND

- DA1 Building Envelope
- Planning Proposal

Proposed Envelope

Setback Diagram

Subject Site

Locality: City of Sydney

Address: 8-24 Kippax Street

Site Area: 1031.58m²

Approximate Ground RL

RL @ North west corner:	RL20.18
RL @ North east corner:	RL20.40
RL @ South west corner:	RL22.60
RL @ South east corner:	RL23.20

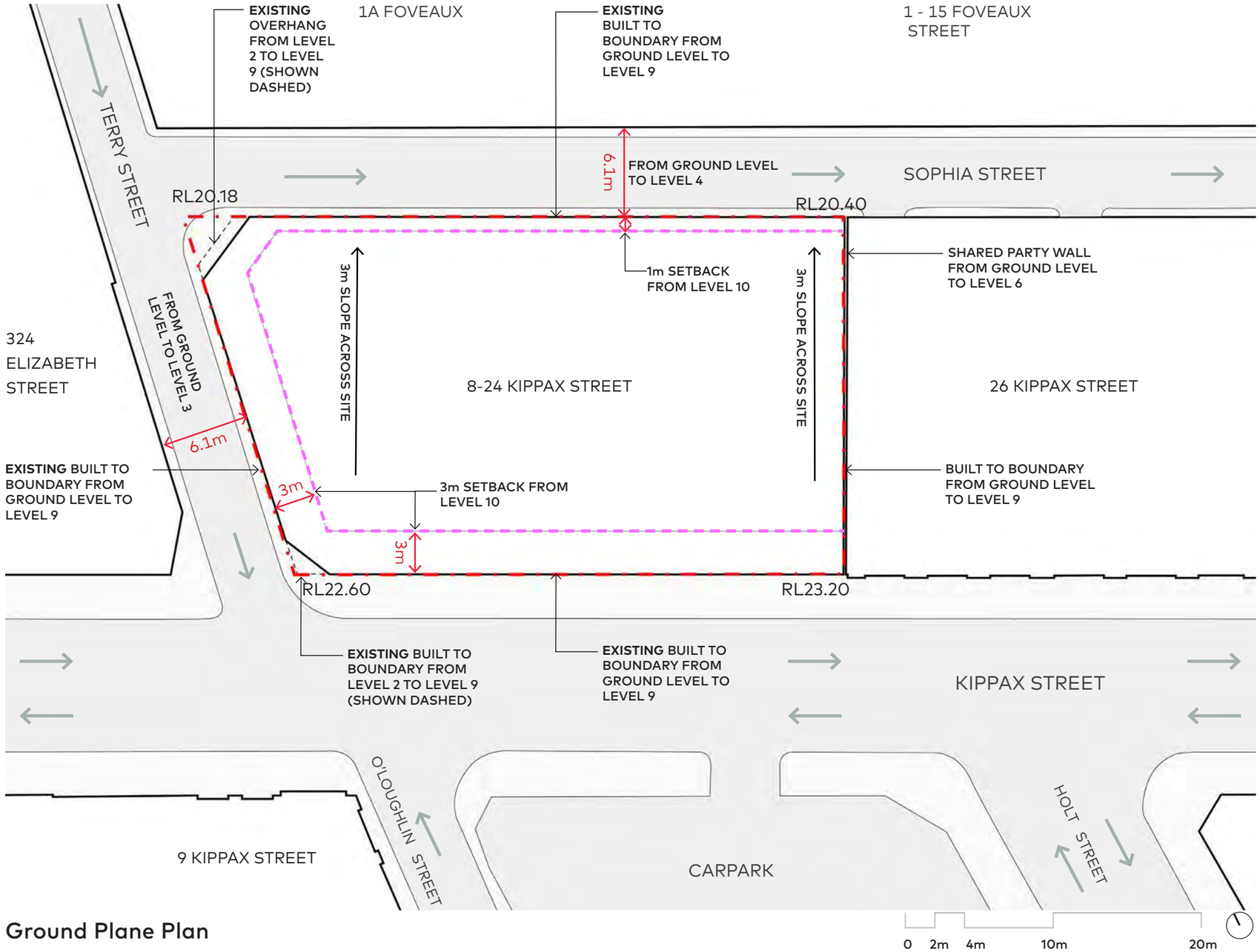
Approximate Frontage

- Approx. 37.89m Kippax Street
- Approx. 45.64m Terry Street
- Approx.25.86xm Sophia Street
- Approx 24.69m nth east Boundary line

Existing GFA: 9374m²

Existing FSR: 9.1:1

Existing Height (inc. Plant): 39.4m

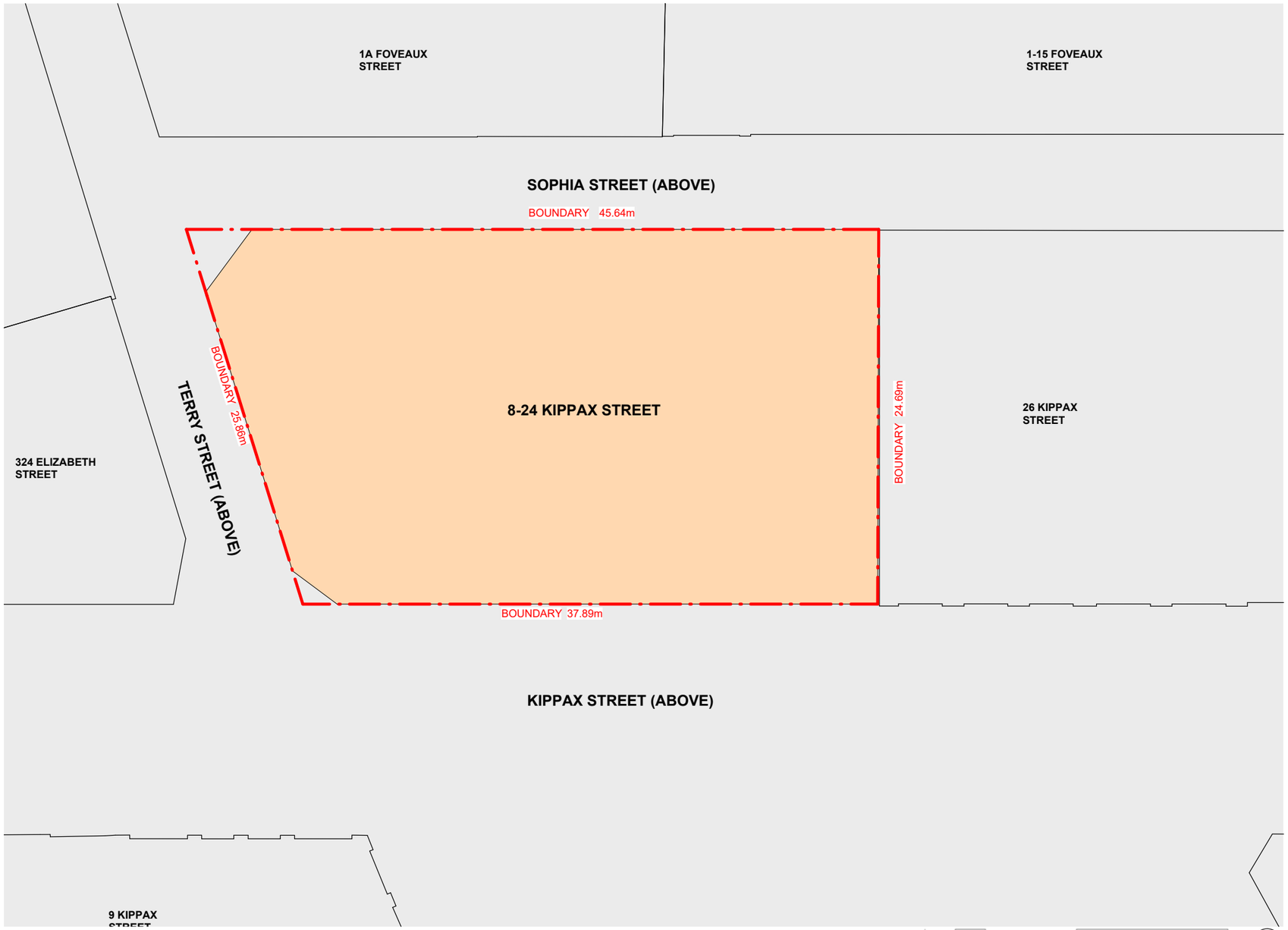


Ground Plane Plan

LEGEND

- Building Setback
- Boundary

Building Envelope Plans

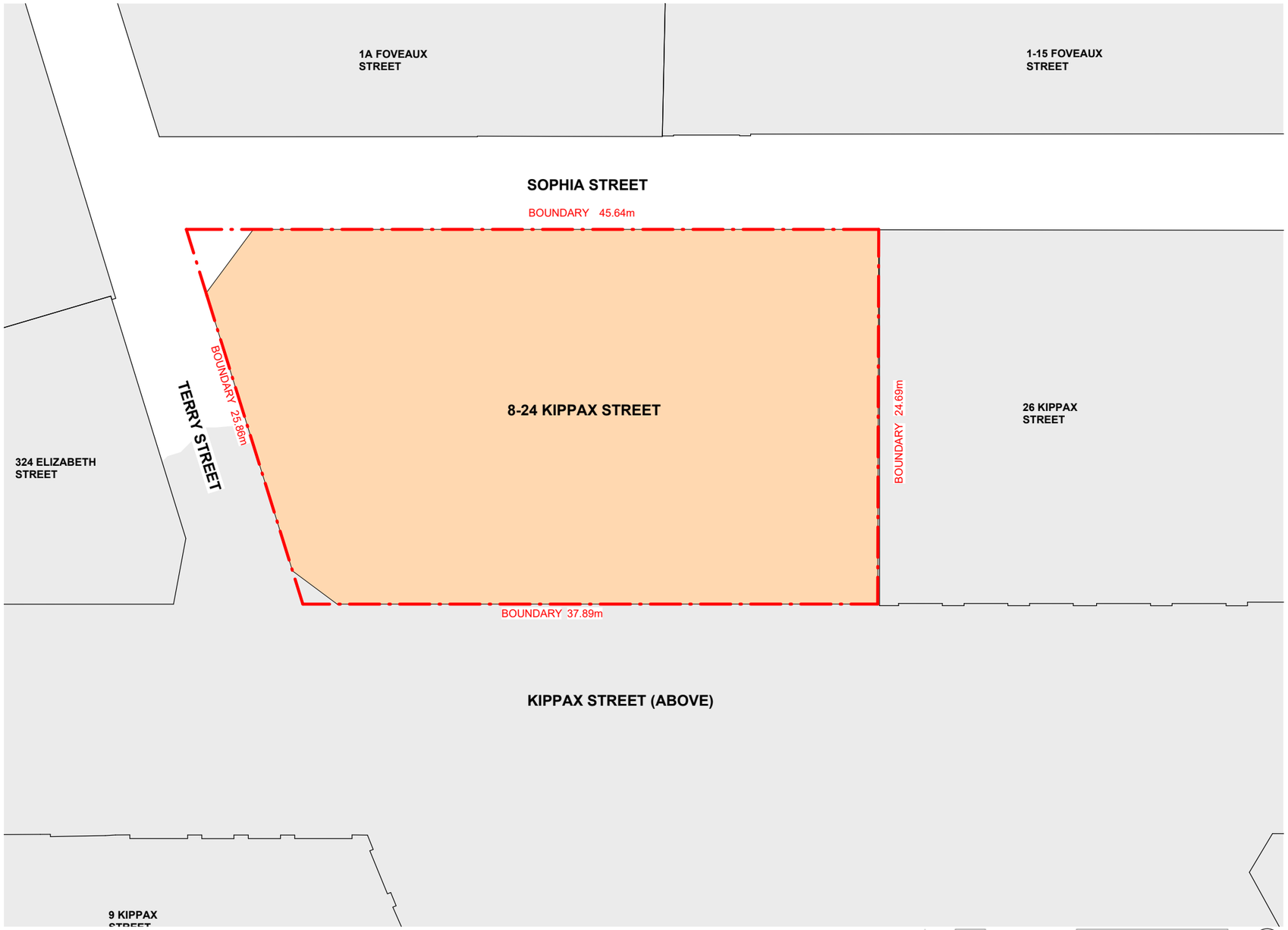


Basement

LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Boundary

Building Envelope Plan



Lower Ground

LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Boundary

Building Envelope Plan



LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Boundary

Ground Plan

Building Envelope Plan



LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Boundary

Typical Plan

Building Envelope Plan

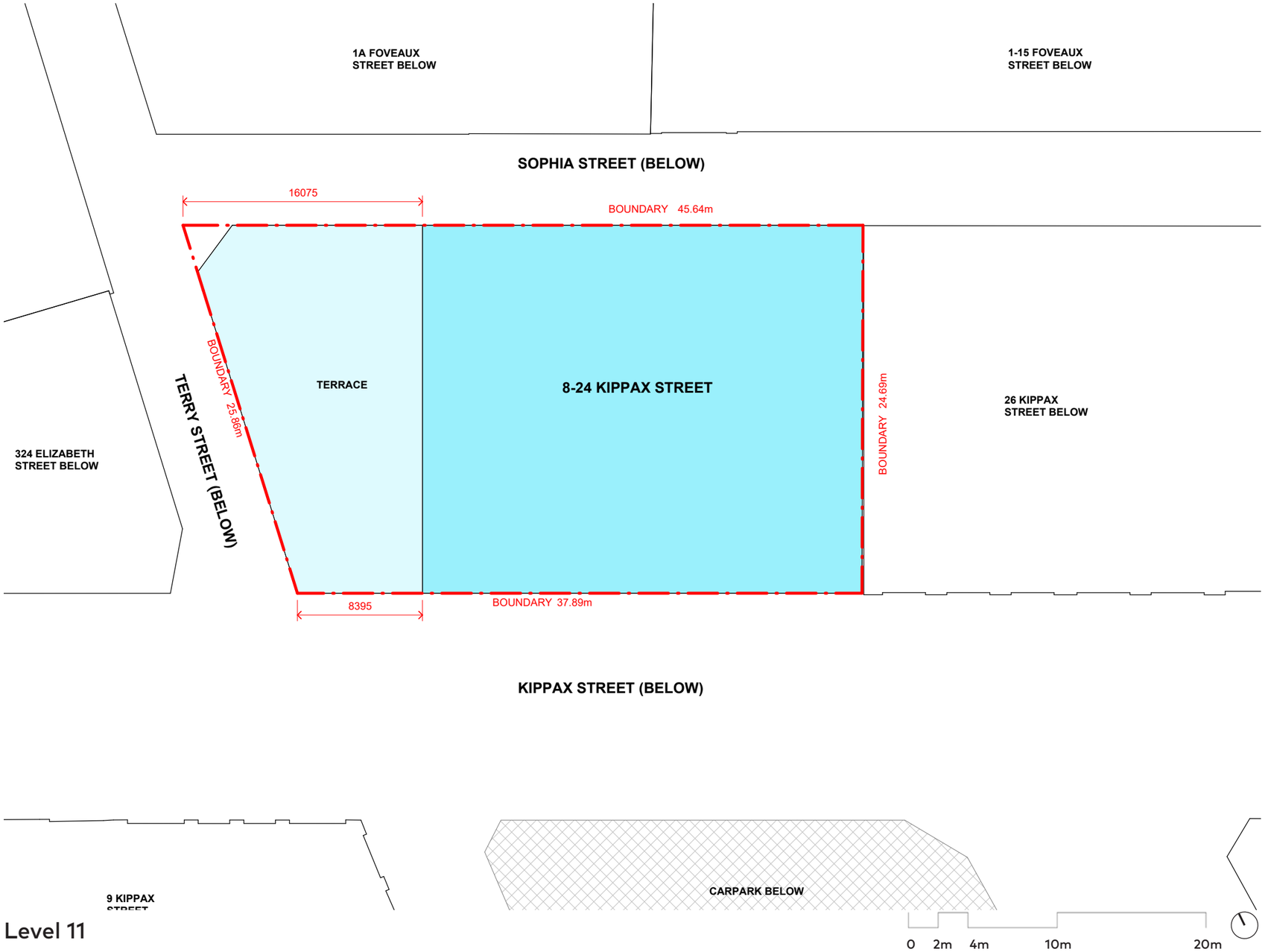


LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Boundary

Level 10

Building Envelope Plan



LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Boundary

Level 11

Building Envelope Plan

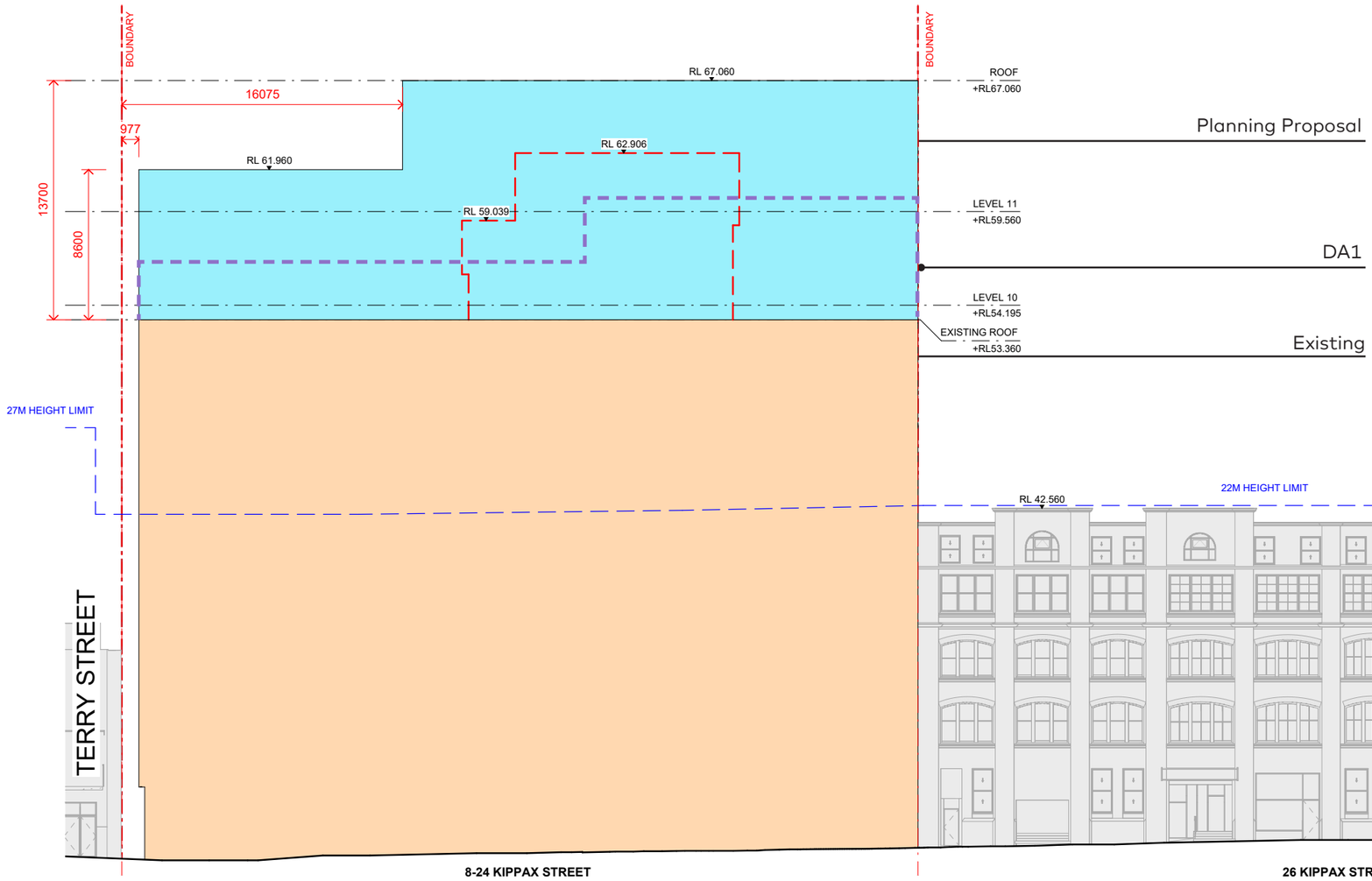


Roof

LEGEND

- Existing Building Envelope
- Planning Proposal Envelope
- Green Roof
- Boundary

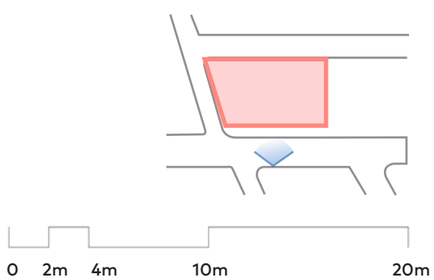
Building Envelope Elevation



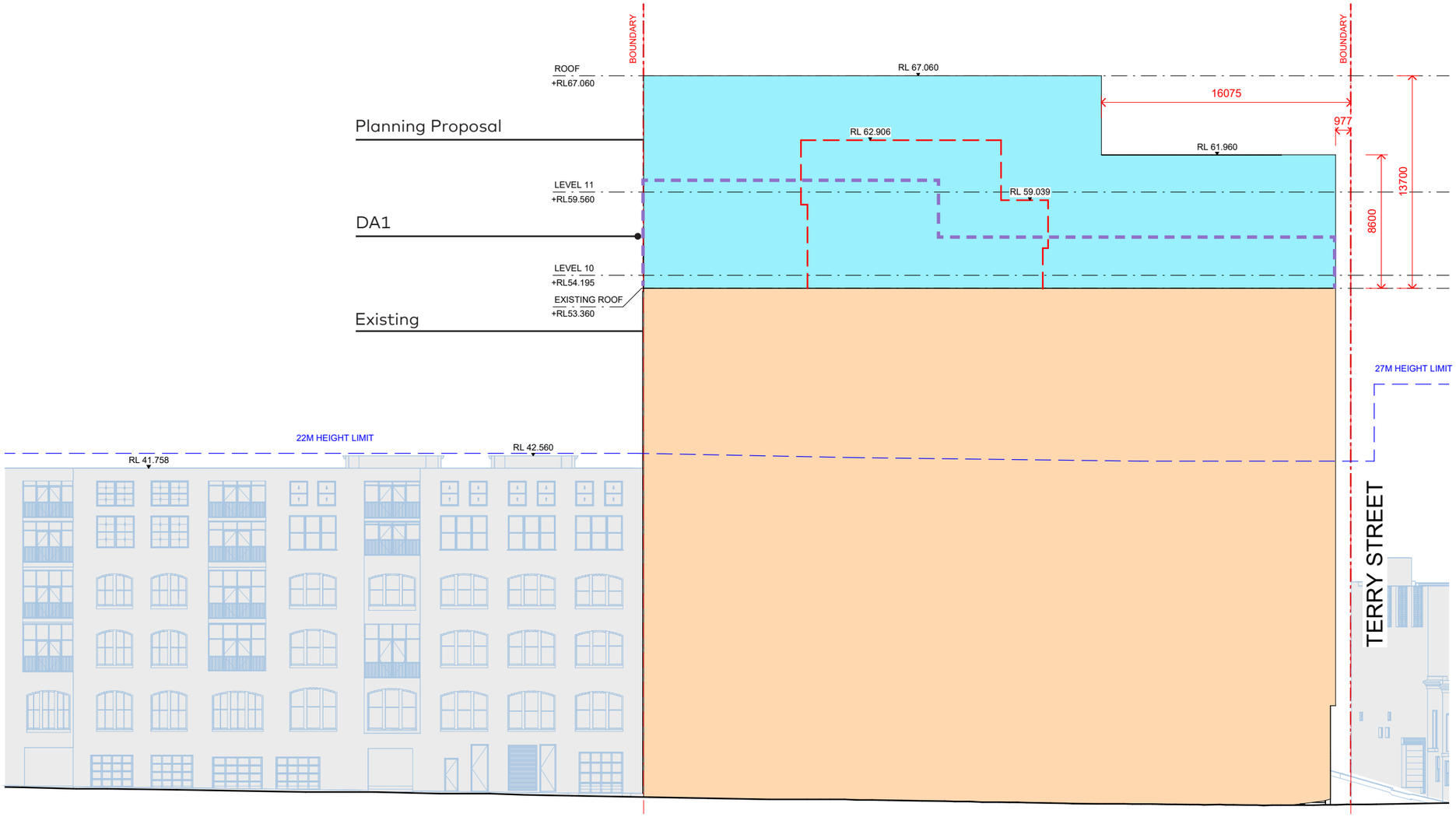
South (Kippax Street) Elevation

LEGEND

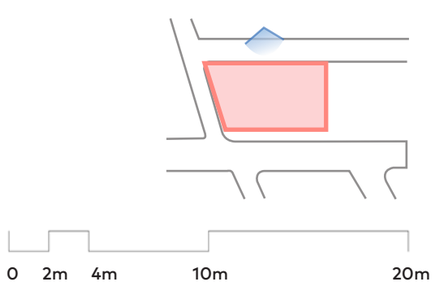
- View
- Site
- Planning Proposal Envelope
- DA 1 Outline
- Existing Building Envelope
- Building height
- Boundary
- Outline of existing plant



Building Envelope Elevation



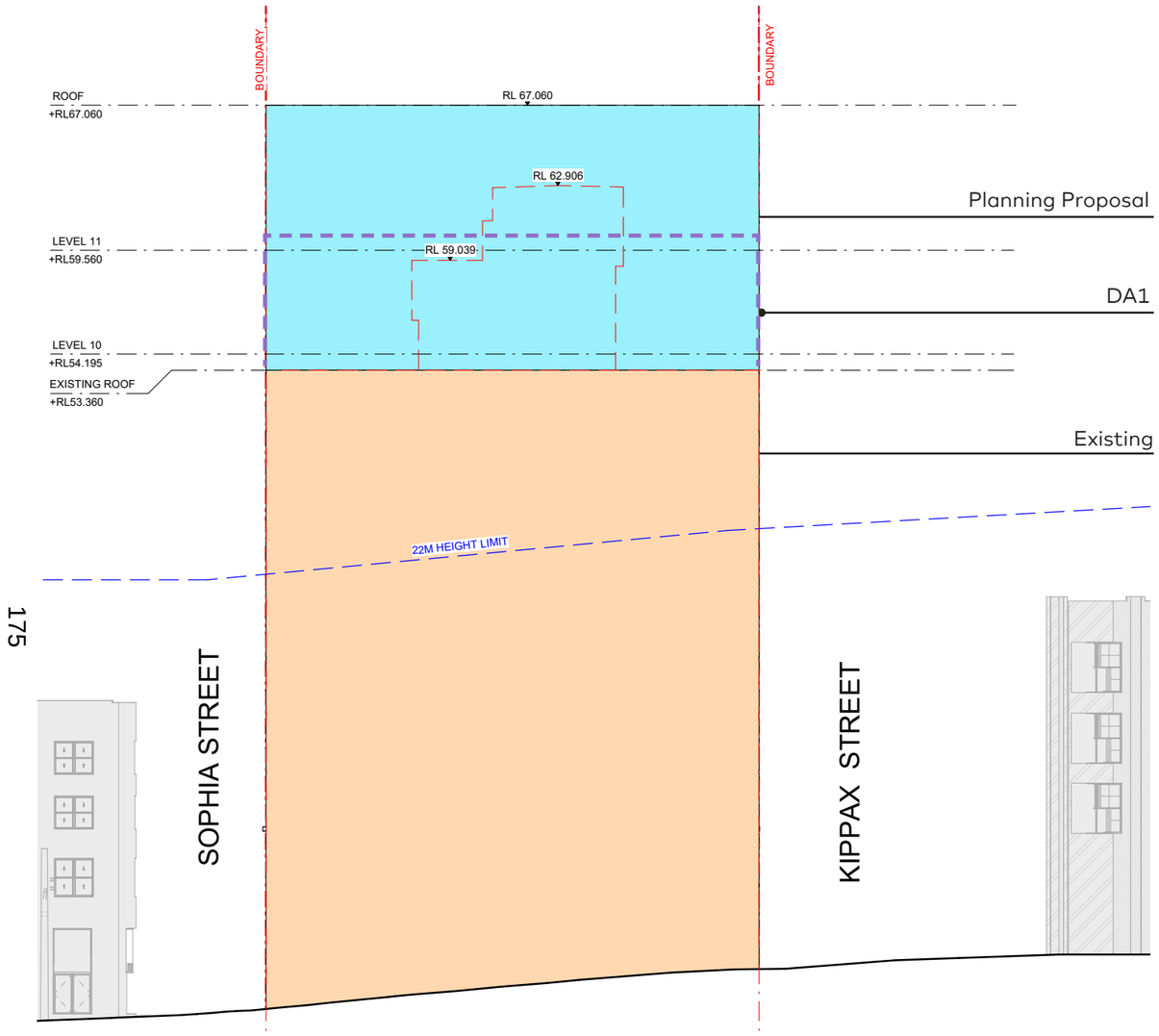
North (Sophia Street) Elevation



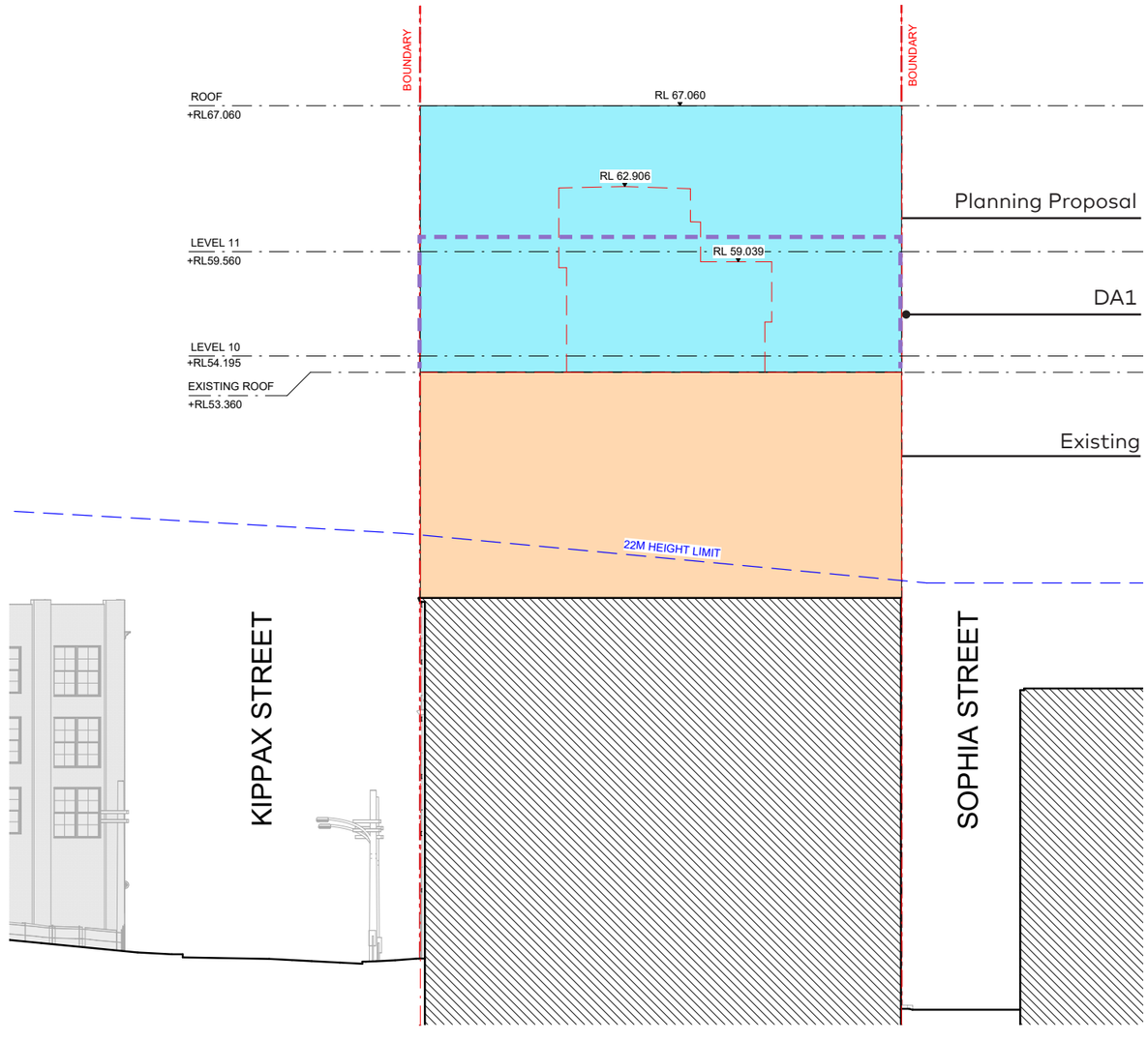
LEGEND

- View
- Site
- Planning Proposal Envelope
- DA 1 Outline
- Existing Building Envelope
- Building height
- Boundary
- Outline of existing plant

Building Envelope Elevation



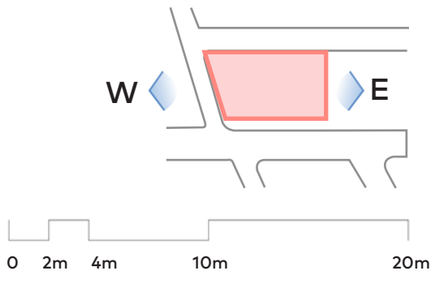
West (Terry Street) Elevation



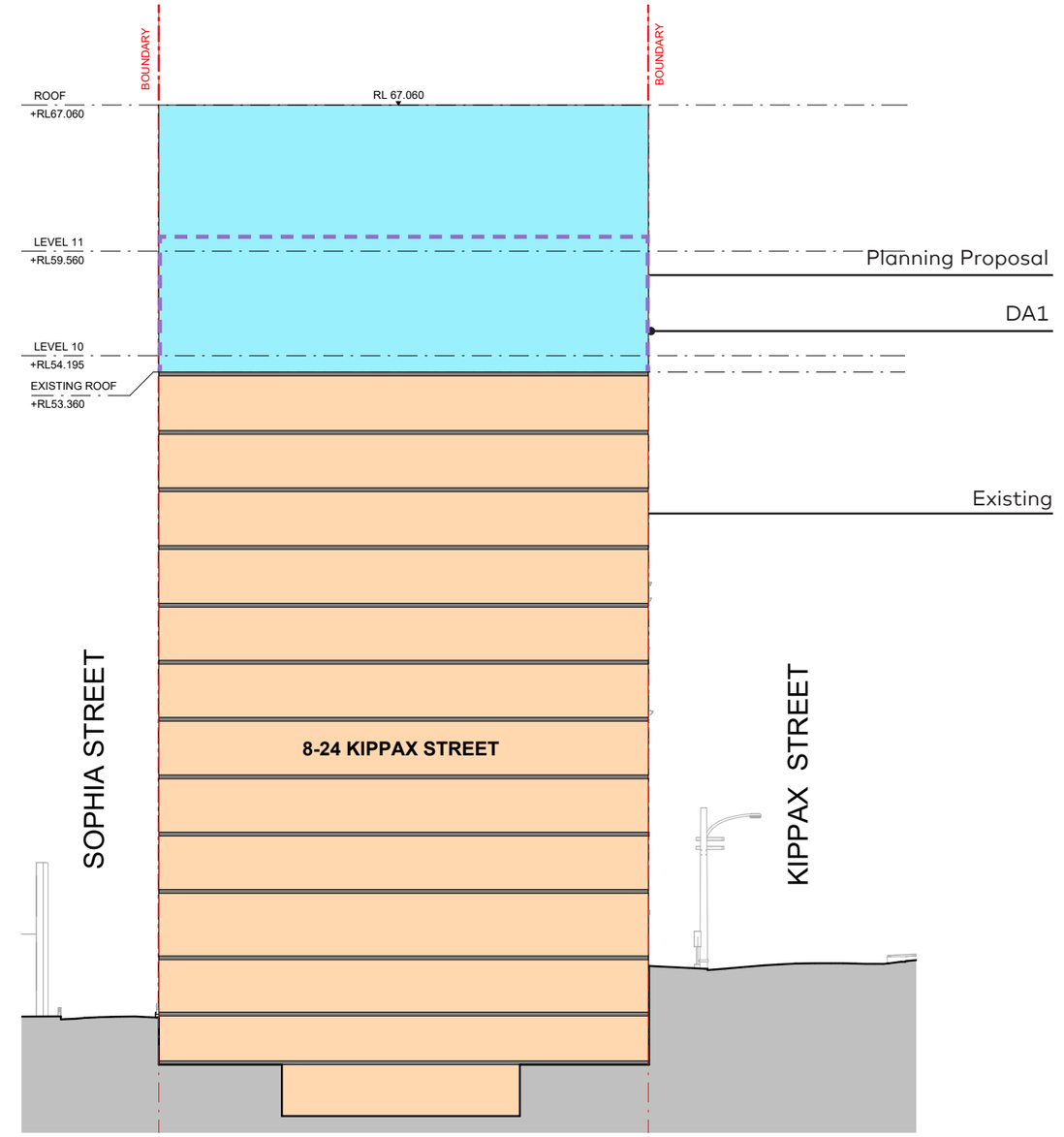
East (Terry Street) Elevation

LEGEND

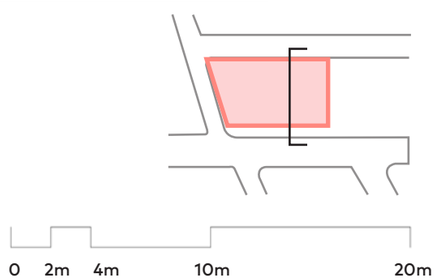
- View
- Site
- Planning Proposal Envelope
- DA 1 Outline
- Existing Building Envelope
- Building height
- Boundary
- Outline of existing plant



Building Envelope Section



Section



LEGEND

- View
- Site
- Planning Proposal Envelope
- DA 1 Outline
- Existing Building Envelope
- Building height
- Boundary
- Outline of existing plant

176

Area Calculations

Subject Site

Locality: City of Sydney

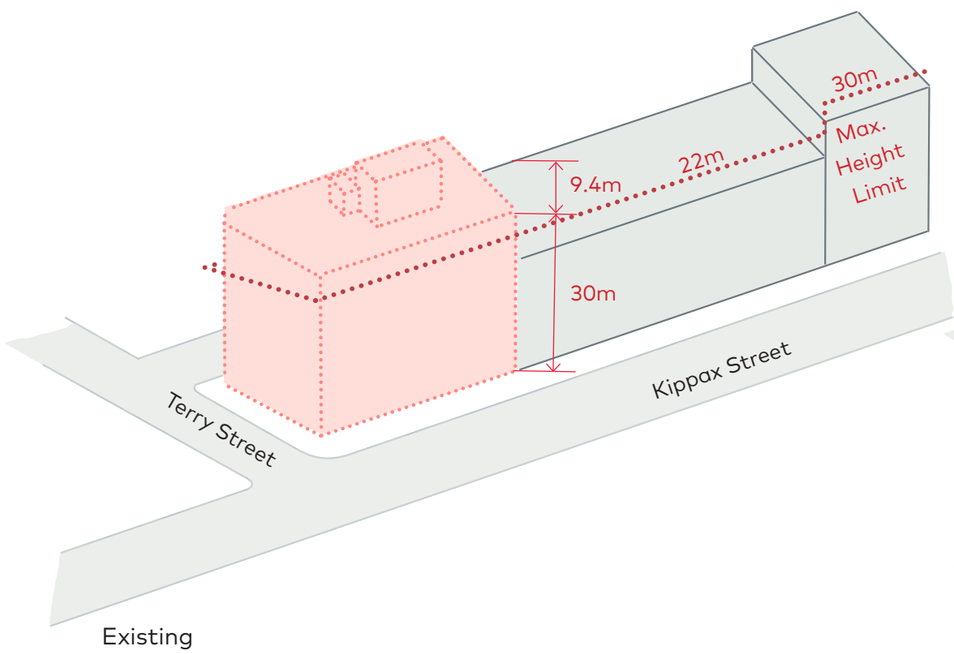
Address: 8-24 Kippax Street, Surry Hills

Site Area: 1031.58m^2

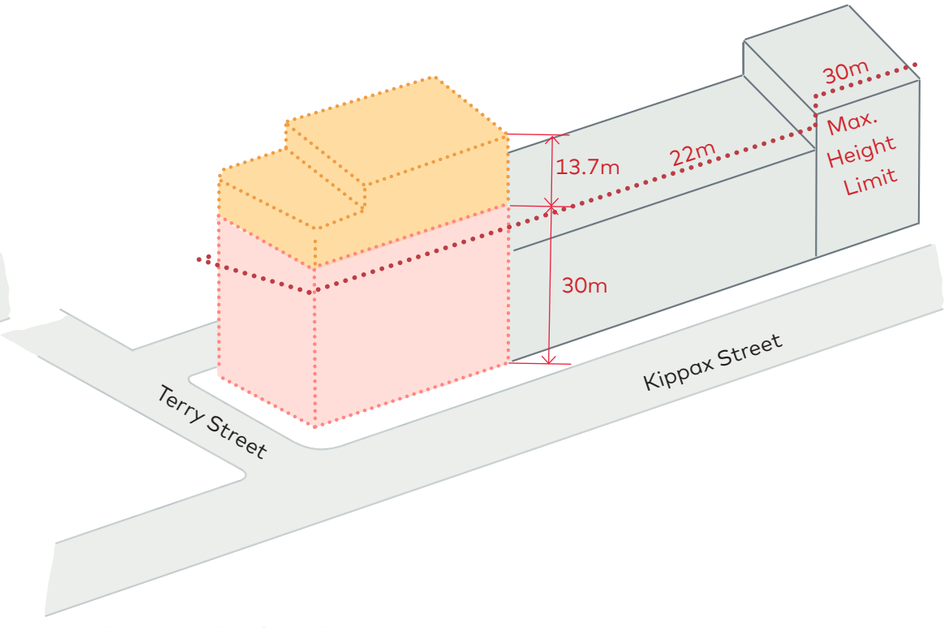
Existing Height: 30m (Including Plant: 39.4m)

Land Zoning: MU1 Mixed Use

Development Summary			
Control	**Existing**	**Permissible**	**Proposed**
Building Height	30m + 9.5m plant	22m	43.7m
FSR	9.1:1	3.5:1	9.88:1
GFA	9,374 sqm	3610.53m2	10,199m^2



Existing



Proposed Rooftop Envelope

LEGEND

- Existing Building
- Indicative Additions

Proposed Massing Analysis

Building Height

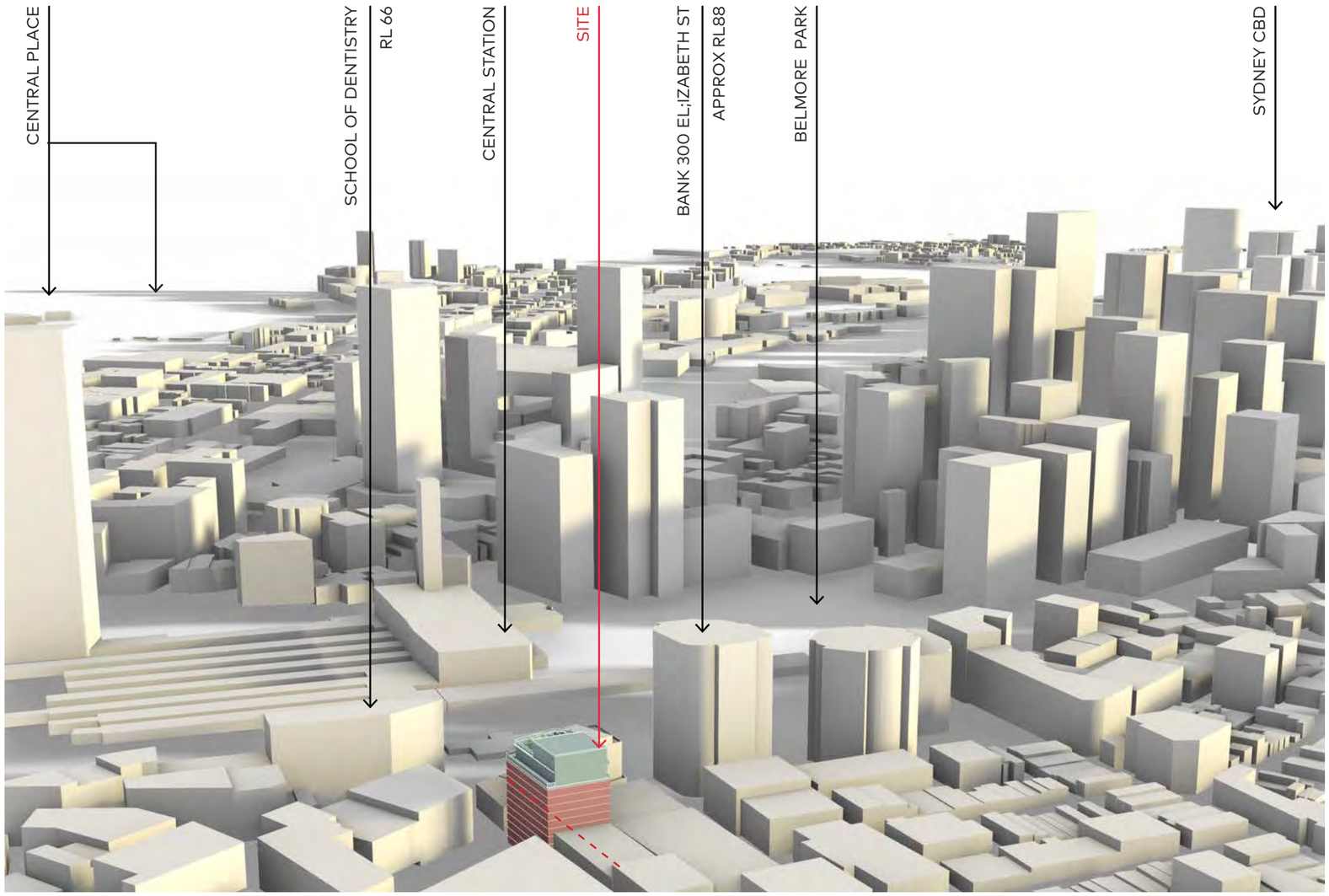
Context

Canva plays a significant part in the development of the Tech Central precinct within Sydney. The changing nature of the precincts' surrounding Central Station provides opportunity for Canva to establish a good central commercial premises for their employees within a sympathetic redevelopment of an existing building. The Canva proposal is sympathetic in height, scale and form to the surrounding precinct.

The Aerial view looking west towards Haymarket provides a good visualisation regarding scale and context.

The illustrated elevations on the following page demonstrate and compare the building heights between the existing building and the proposed additions.

The existing building roof height is RL53.36 and the Plant roof RL62.90. The building height limit @22m is indicated in a dashed red line.



Indicative scheme aerial view towards western Sydney from Surry Hills

LEGEND

Site

Height Limit

Building Height

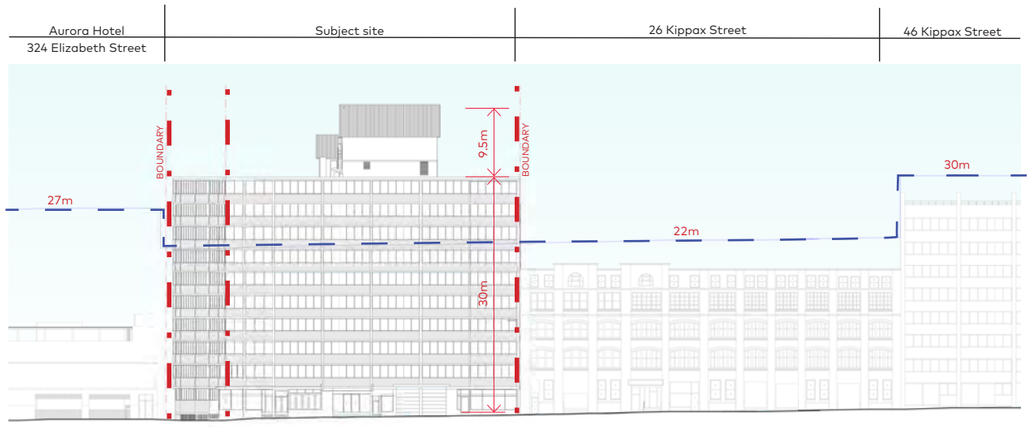
The Elevations shown right identify the differing City of Sydney LEP 2012 height limits along Kippax Street. The Aurora Hotel at 324 Elizabeth Street has a Maximum height limit of 27m, the subject site and 26 Kippax street have a maximum height limit of 22m while 46 Kippax Street has a maximum building height limit of 30m.

The existing building has a street facade height of 30m with the plant room an additional 9.5m above this.

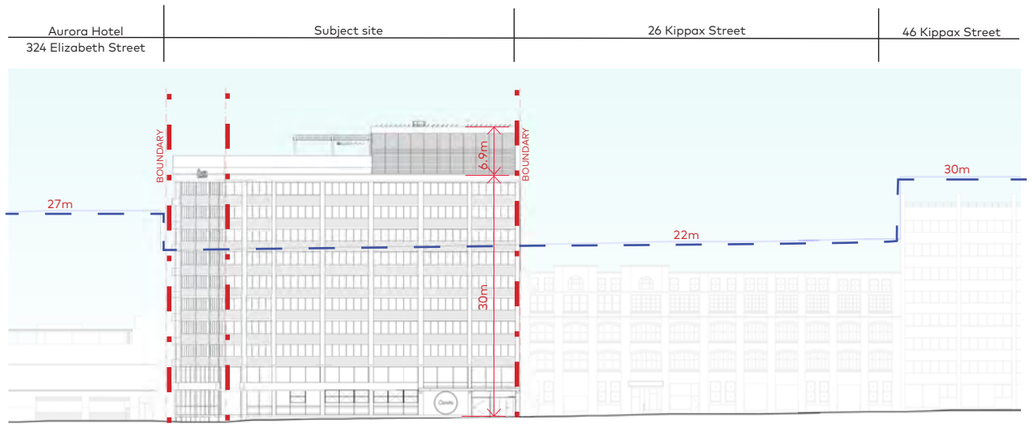
The Current DA application seeks to amend the existing plant room and provide roof access to a roof terrace. This reduces the overall building height by approx. 2.6m

This Planning Proposal would increase the overall height of the building by an additional 4.2m above the existing building plant, and an additional 6.8m above the current DA1 hight.

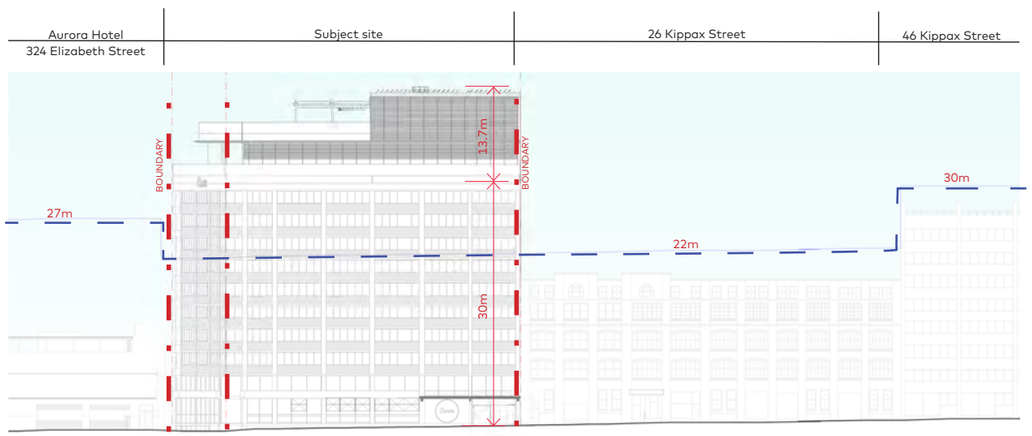
This is to accommodate a new function/ meeting level for Canva and access to a new roof terrace (in addition to the minimum plant requirements)



Existing Southern (Kippax Street) Elevation



DA1 Southern (Kippax Street) Elevation



Proposed Southern (Kippax Street) Elevation

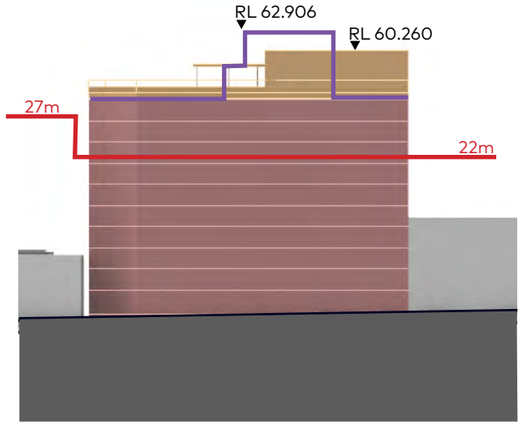
LEGEND

Boundary

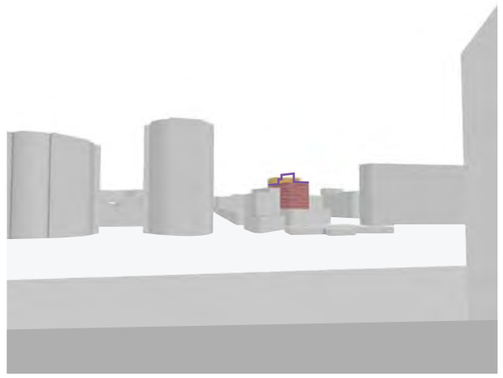
Height Limit

Bulk and Scale

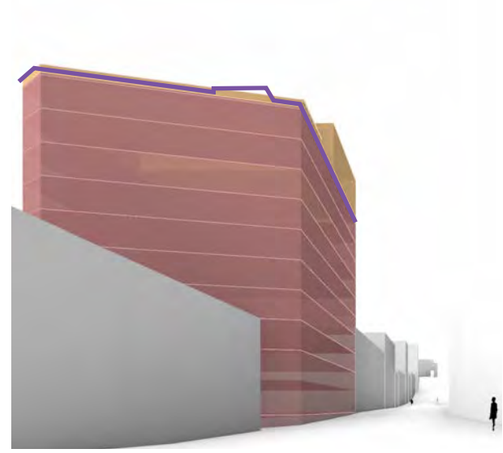
The following diagrams compare the proposed DA and Planning Proposal massing with the current building massing as seen from the public domain vantage points.



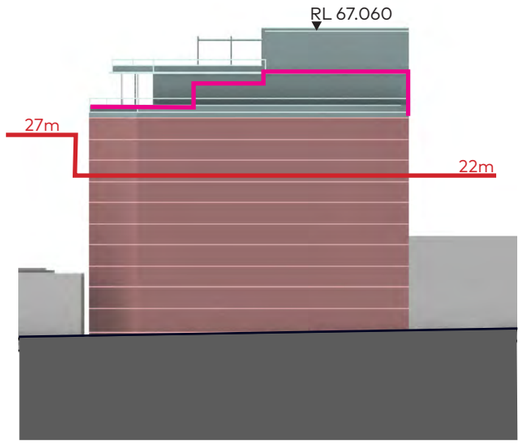
Elevation: Existing and DA1 - Kippax Street



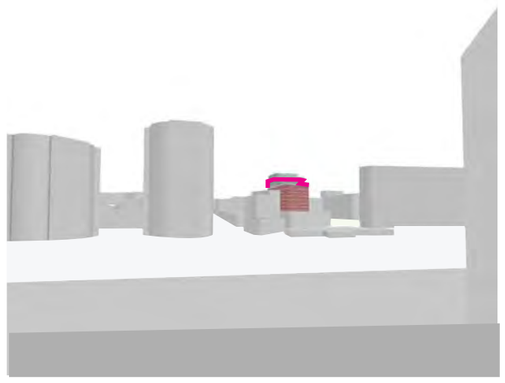
DA1 with Existing building outline overlaid in purple



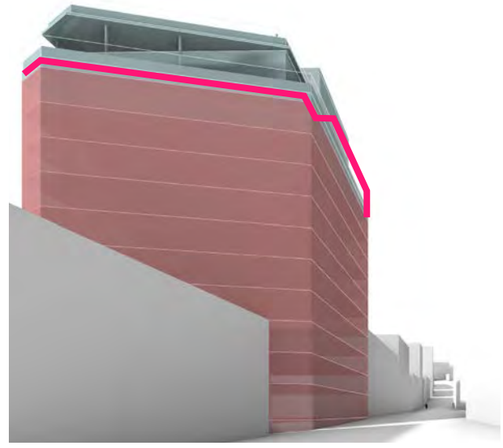
DA1 with Existing building outline overlaid in purple



Elevation: Indicative Planning Proposal with DA1 outline overlaid



Indicative Planning Proposal with DA1 outline overlaid in pink



Indicative Planning Proposal with DA1 outline overlaid in pink

LEGEND

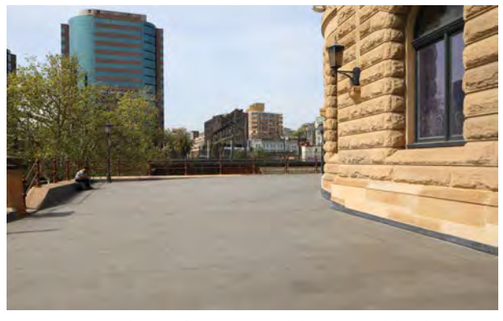
- Existing Building
- DA1 Additions
- Indicative Planning Proposal Additions
- Existing height limit
- Existing Roof line
- DA1 Roofline
- 1 Camera view
- Site



Key plan



View 1. Looking north east at corner of O'Loughlin and Kippax Street

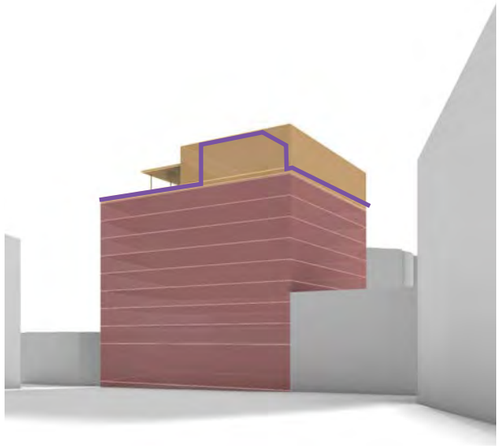


2. View towards site from Central Station Bridge looking south east

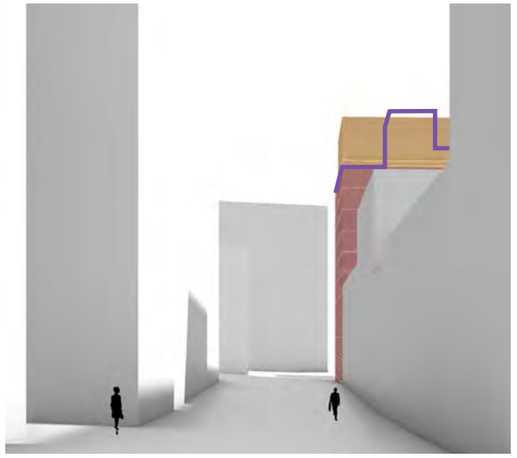


3. Bulk and Massing View from Elizabeth St

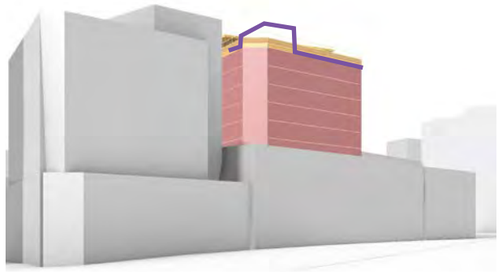
Bulk and Scale



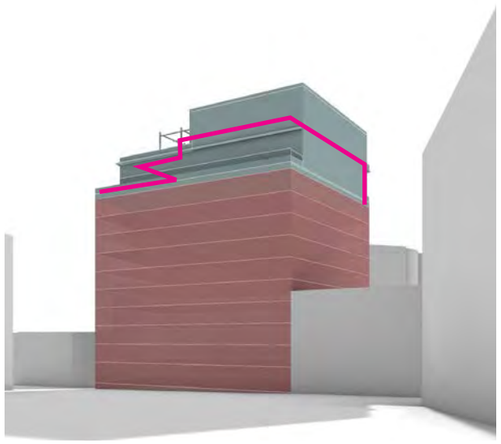
DA1 with Existing building outline overlaid in purple



DA1 with Existing building outline overlaid in purple



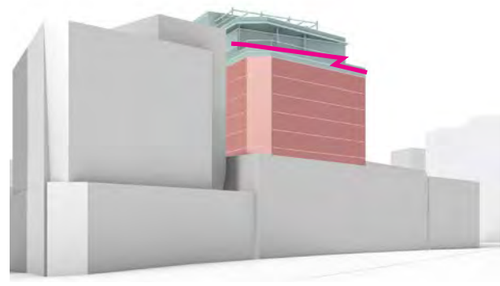
DA1 with Existing building outline overlaid in purple



Indicative Planning Proposal with DA1 outline overlaid in pink



Indicative Planning Proposal with DA1 outline overlaid in pink

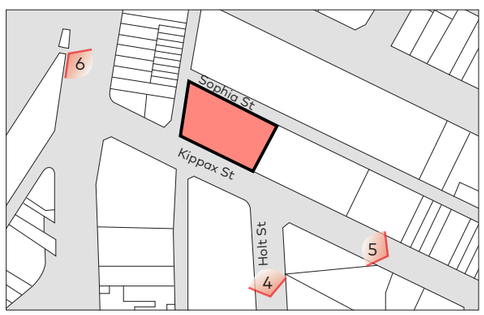


Indicative Planning Proposal with DA1 outline overlaid in pink

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LEGEND

- Existing Building
- DA1 Additions
- Indicative Planning Proposal Additions
- Existing height limit
- Existing Roof line
- DA1 Roofline
- 1 Camera view
- Site



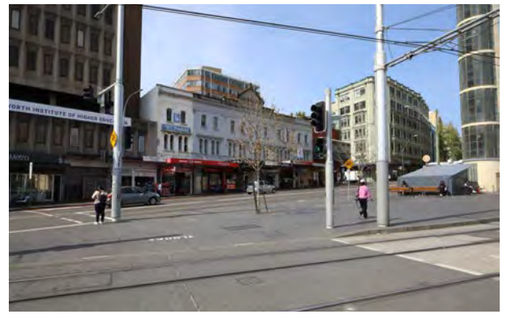
Key plan



4. Bulk and Massing View from Holt St

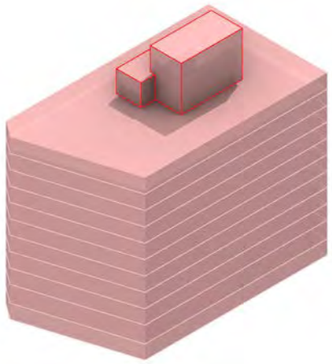


5. Bulk and Massing View from Kippax St

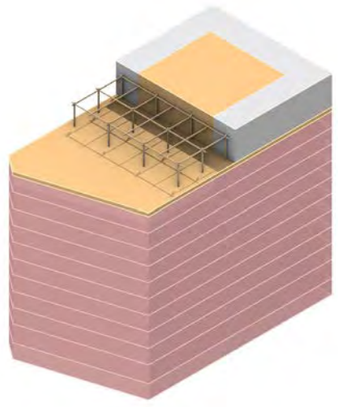


6. Bulk and Massing View from Elizabeth St

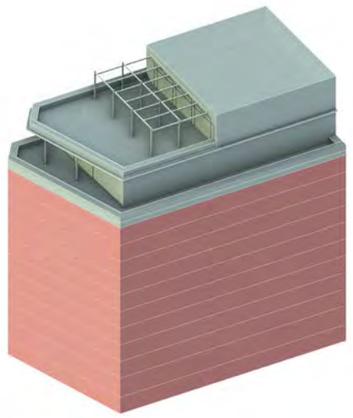
Solar Analysis Context



Existing Building



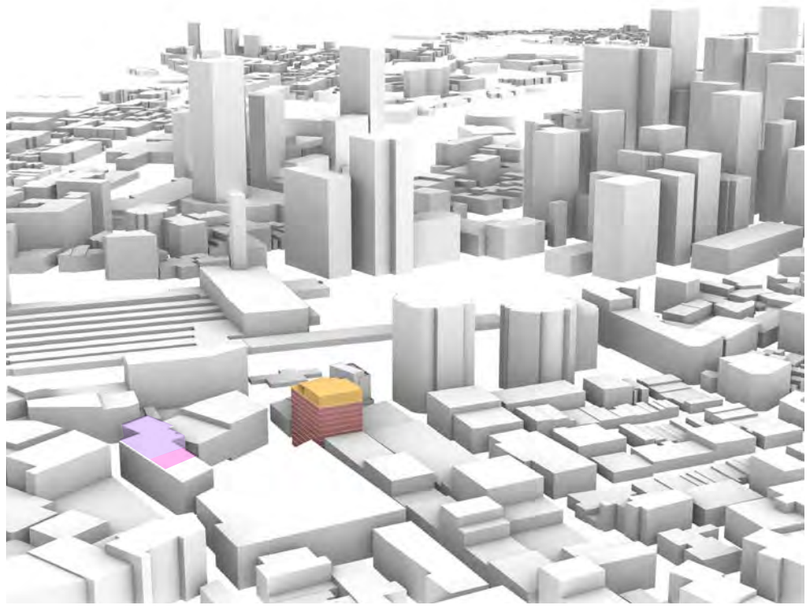
DA1 Massing



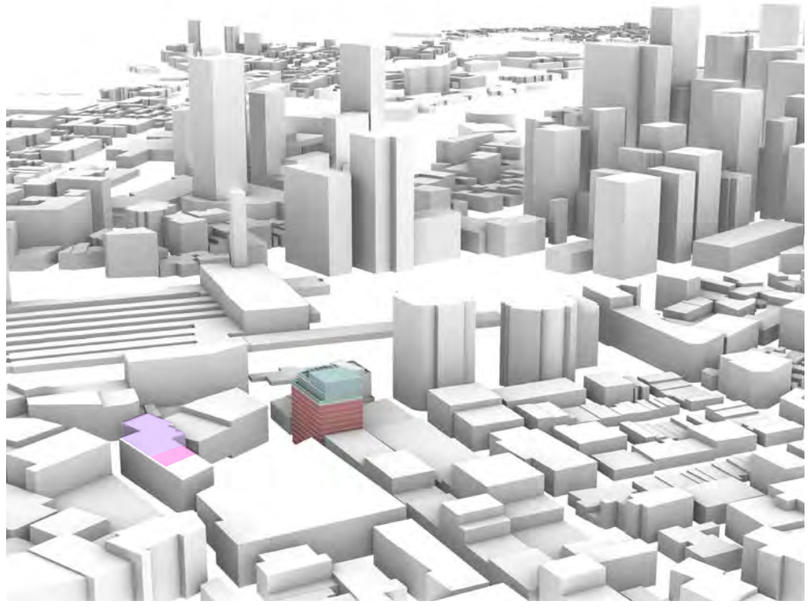
Planning Proposal Indicative Massing

LEGEND

- Existing Building
- DA1 Addition
- PP Addition
- Neighbouring buildings: See following page



Existing building in Context | Aerial view looking north west



Indicative Rooftop Additions in Context | Aerial view looking north west

Solar Analysis Context

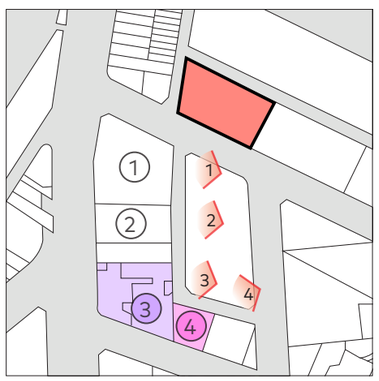
The surrounding development is comprised of predominantly commercial buildings, however there are a number of residential building to the south-west of Holt Street Carpark. The following shadow analysis compares the existing overshadowing with that of the proposed DA and Planning Proposal application.

It shows that neither the proposed DA or Planning Proposal application impact any residential units ability to comply with the ADG Solar Access requirement.

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LEGEND

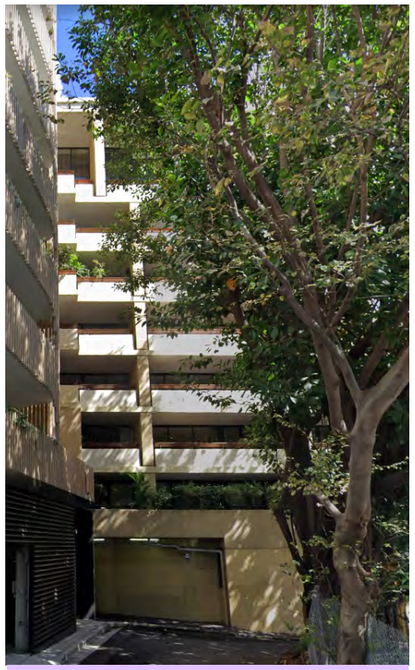
- Site
- 1 Camera view
- 1 Commercial
- 2 Commercial
- 3 Icon Apartments
- 4 Calibrae Apartments



Keyplan



4. Calibrae Apartments



3. Icon Apartments



2. 344-354 Elizabeth Street
Commercial

1. 328-336 Elizabeth Street
Commercial

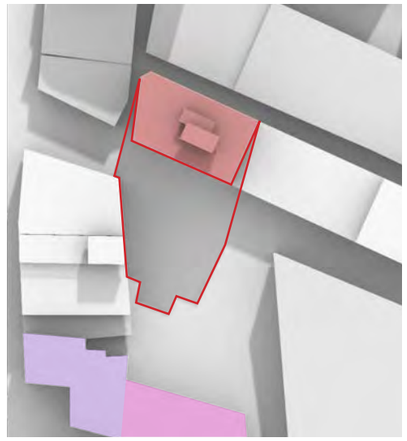
Solar Analysis Plans

Shadow comparison of existing and proposed (DA1 & Planning Proposal) on the winter solstice (June 21) between 9am and 3pm.

The comparison of shadows between DA1 and the Planning Proposal highlights minimal change in overshadowing.


Existing | Winter Solstice @ 9am


Existing | Winter Solstice @ 10am


Existing | Winter Solstice @ 11am


Existing | Winter Solstice @ 12pm


DA1 | Winter Solstice @ 9am


DA1 | Winter Solstice @ 10am


DA1 | Winter Solstice @ 11am


DA1 | Winter Solstice @ 12pm


Planning Proposal |
Winter Solstice @ 9am

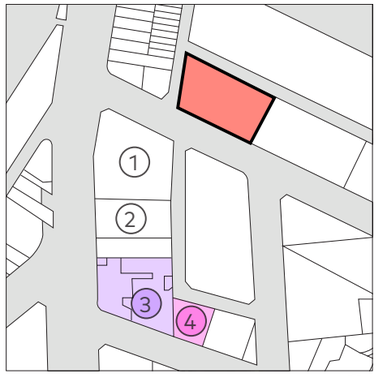

Planning Proposal |
Winter Solstice @ 10am


Planning Proposal |
Winter Solstice @ 11am


Planning Proposal |
Winter Solstice @ 12pm

LEGEND

- Site
- (1) Mixed use
- (2) Crisis Accommodation
- (3) Icon Apartments
- (4) Calibrae Apartments
- DA1 Proposed
- Planning Proposal Proposed
- Existing Building Shadow Profile
- Additional Proposed Shadow Profile



Keyplan

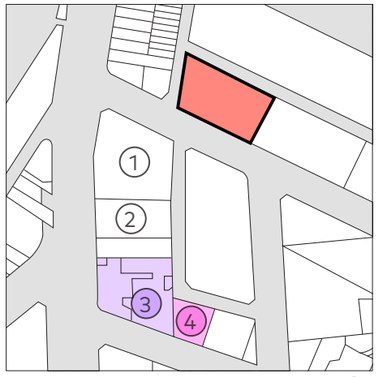
Solar Analysis Plans

Shadow comparison of existing and proposed (DA1 & Planning Proposal) on the winter solstice (June 21) between 9am and 3pm.

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LEGEND

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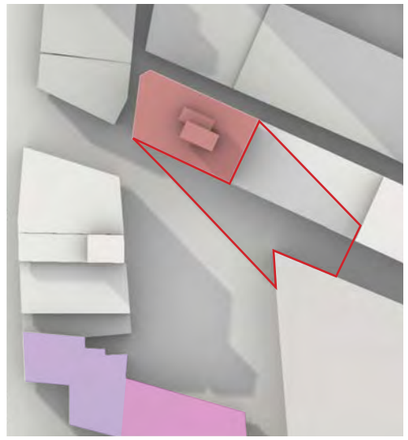
Keyplan



Existing | Winter Solstice @ 1pm



Existing | Winter Solstice @2pm



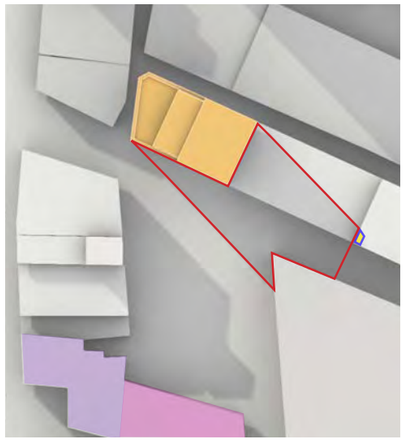
Existing | Winter Solstice @ 3pm



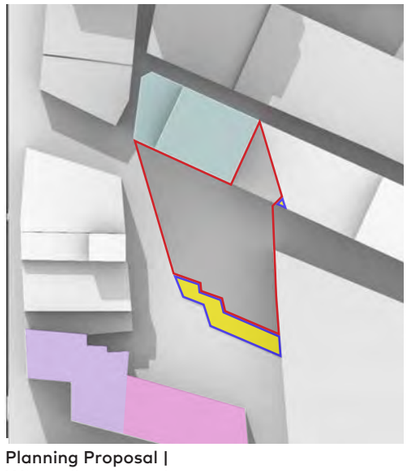
DA1 | Winter Solstice @ 1pm



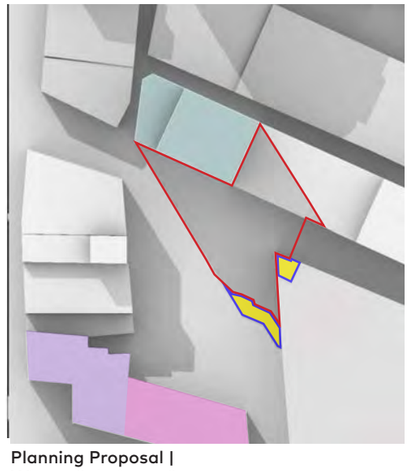
DA1 | Winter Solstice @ 2pm



DA1 | Winter Solstice @ 3pm



Planning Proposal |
Winter Solstice @ 1pm



Planning Proposal |
Winter Solstice @ 2pm

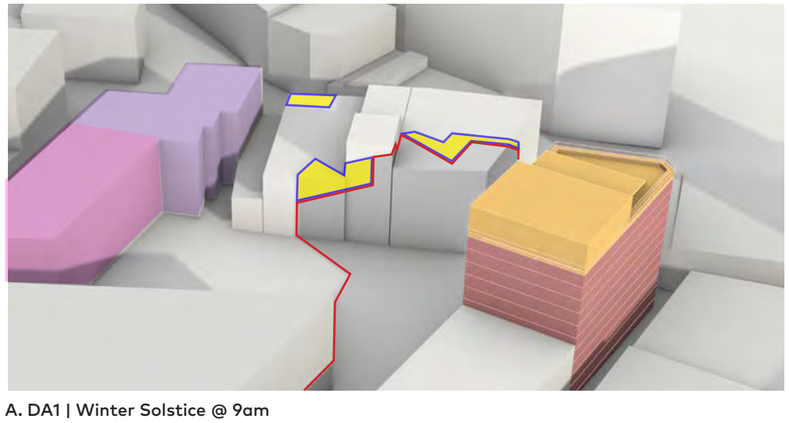


Planning Proposal |
Winter Solstice @ 3pm

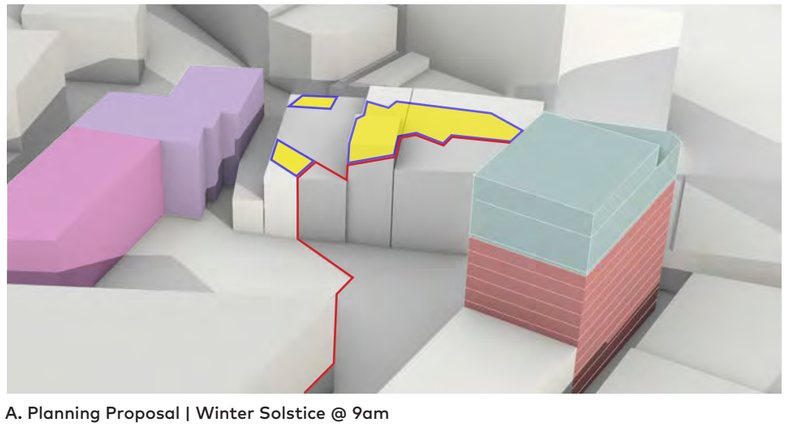
Solar Analysis Views

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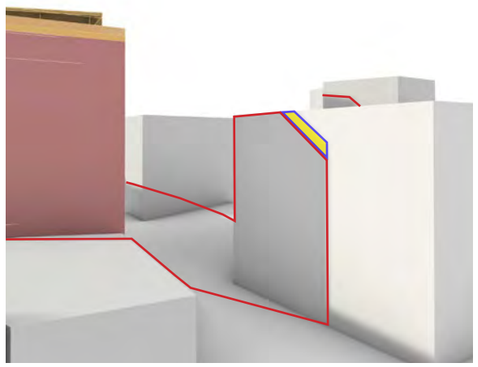
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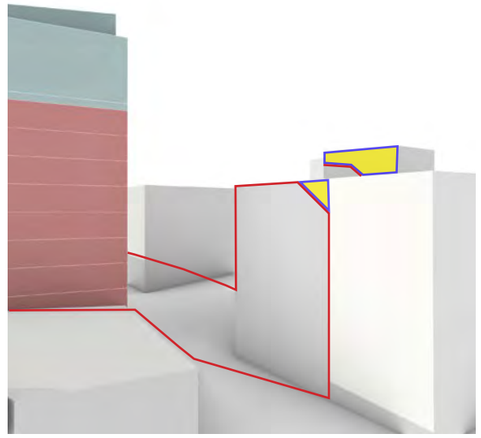
A. DA1 | Winter Solstice @ 9am



A. Planning Proposal | Winter Solstice @ 9am



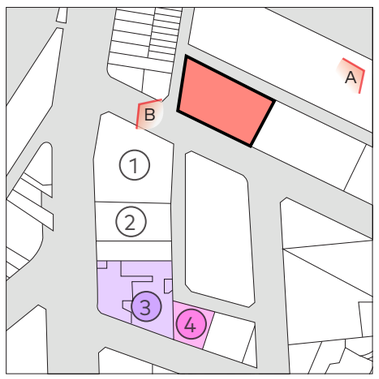
B. DA1 | Winter Solstice @ 9am



B. Planning Proposal | Winter Solstice @ 9am

LEGEND

- Site
- 1 Mixed use
- 2 Crisis Accommodation
- 3 Icon Apartments
- 4 Calibrae Apartments
- DA1 Proposed
- Planning Proposal Proposed
- Existing Building Shadow Profile
- Additional Proposed Shadow Profile

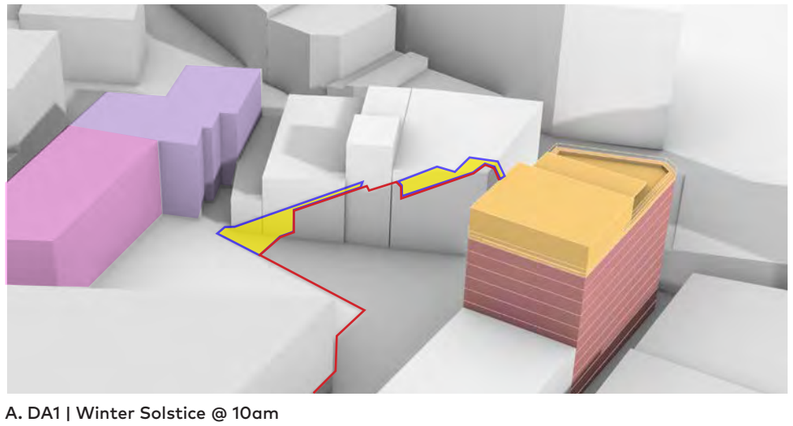


Keyplan

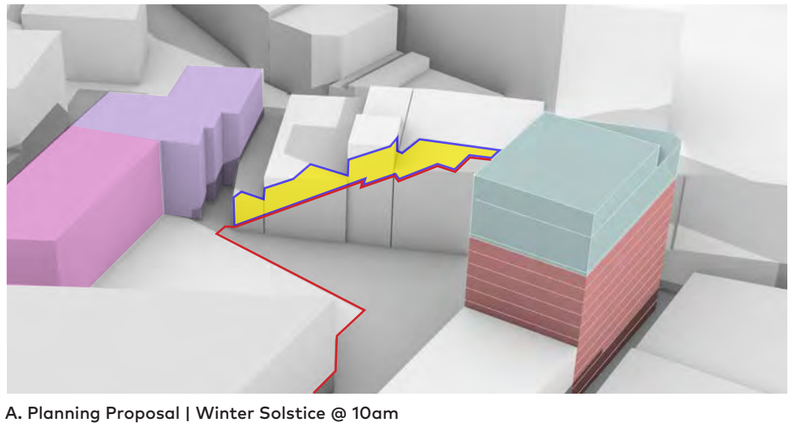
Solar Analysis Views

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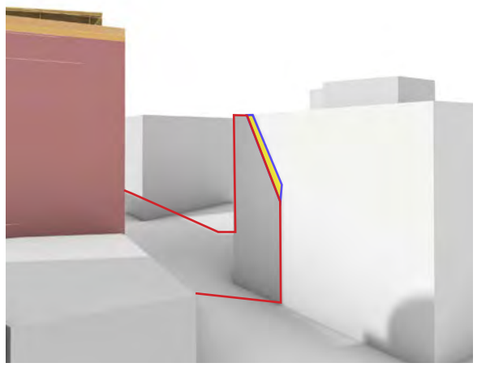
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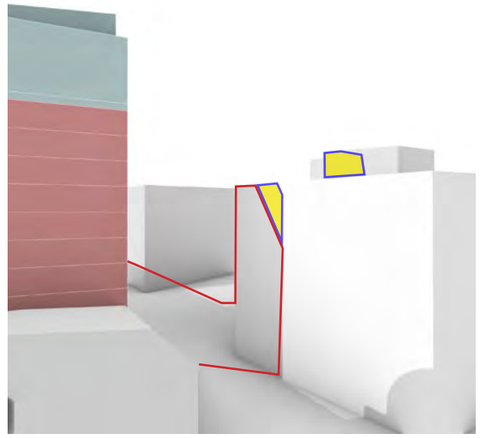
A. DA1 | Winter Solstice @ 10am



A. Planning Proposal | Winter Solstice @ 10am



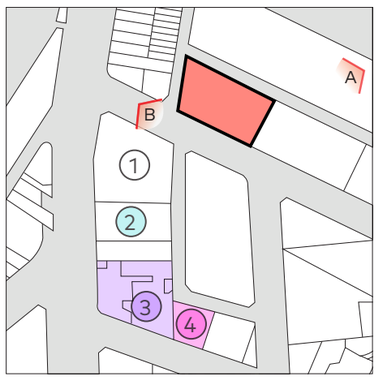
B. DA1 | Winter Solstice @ 10am



B. Planning Proposal | Winter Solstice @ 10am

LEGEND

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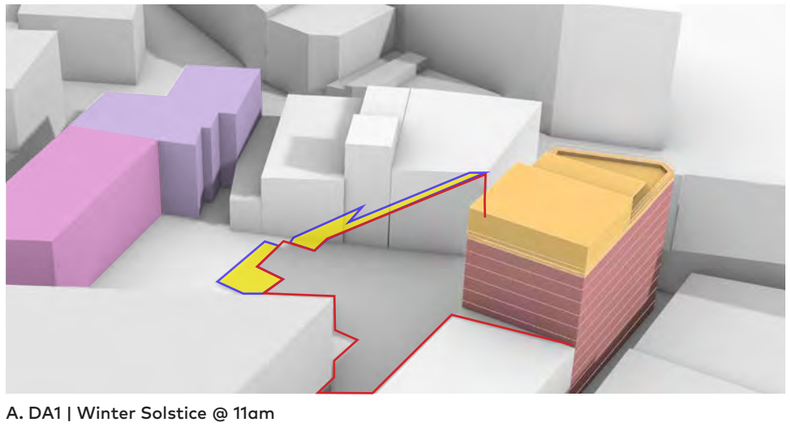


Keyplan

Solar Analysis Views

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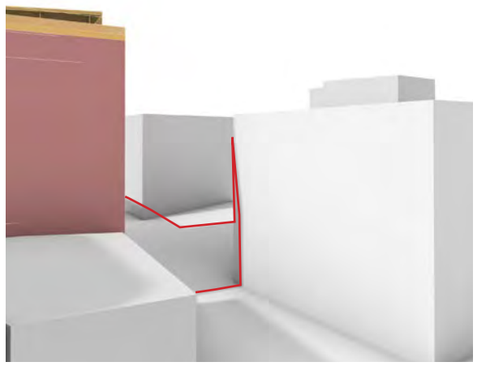
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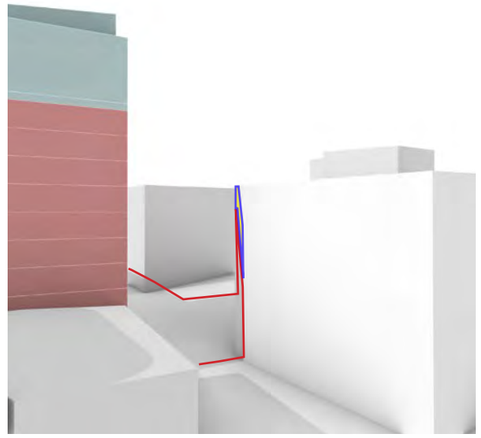
A. DA1 | Winter Solstice @ 11am



A. Planning Proposal | Winter Solstice @ 11am



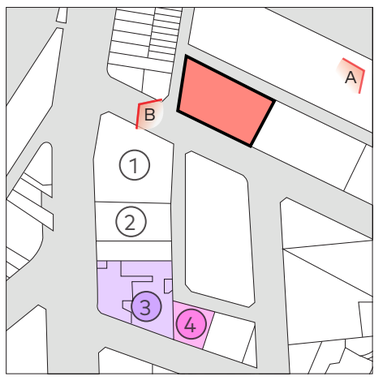
B. DA1 | Winter Solstice @ 11am



B. Planning Proposal | Winter Solstice @ 11am

LEGEND

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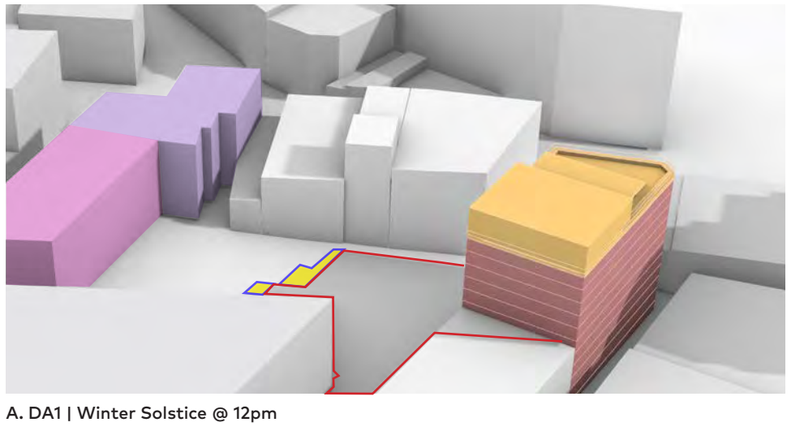


Keyplan

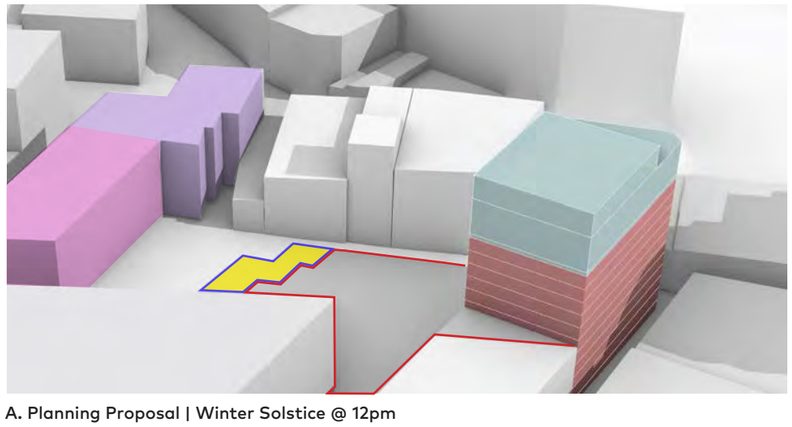
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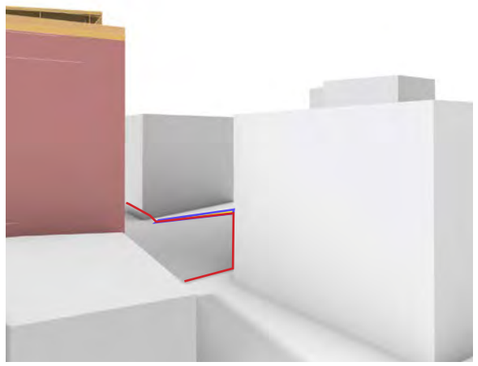
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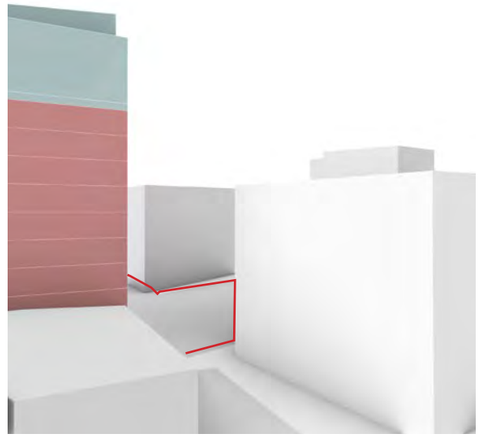
A. DA1 | Winter Solstice @ 12pm



A. Planning Proposal | Winter Solstice @ 12pm



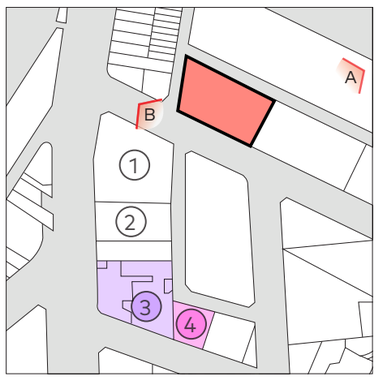
B. DA1 | Winter Solstice @ 12pm



B. Planning Proposal | Winter Solstice @ 12pm

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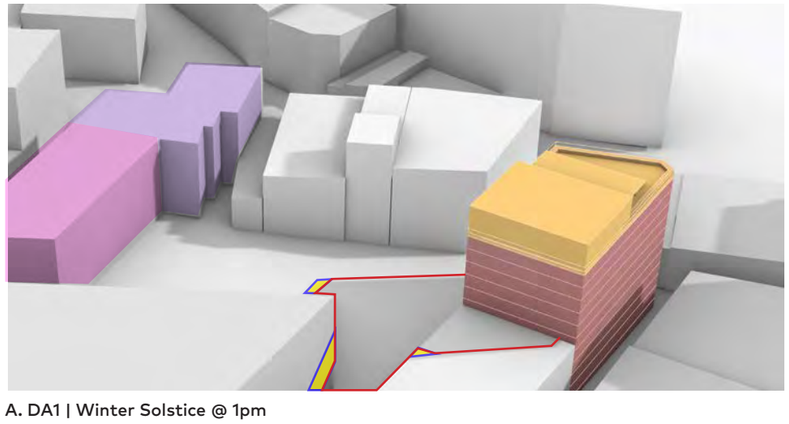


Keyplan

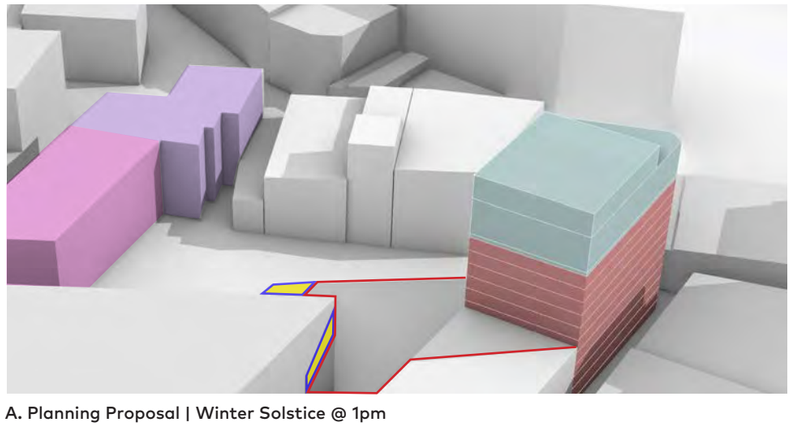
Solar Analysis Views

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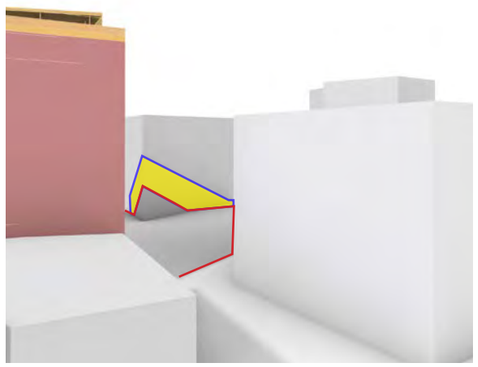
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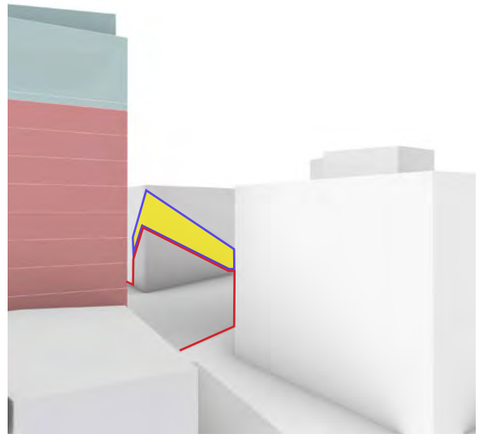
A. DA1 | Winter Solstice @ 1pm



A. Planning Proposal | Winter Solstice @ 1pm



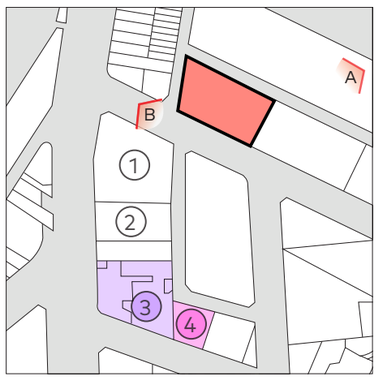
B. DA1 | Winter Solstice @ 1pm



B. Planning Proposal | Winter Solstice @ 1pm

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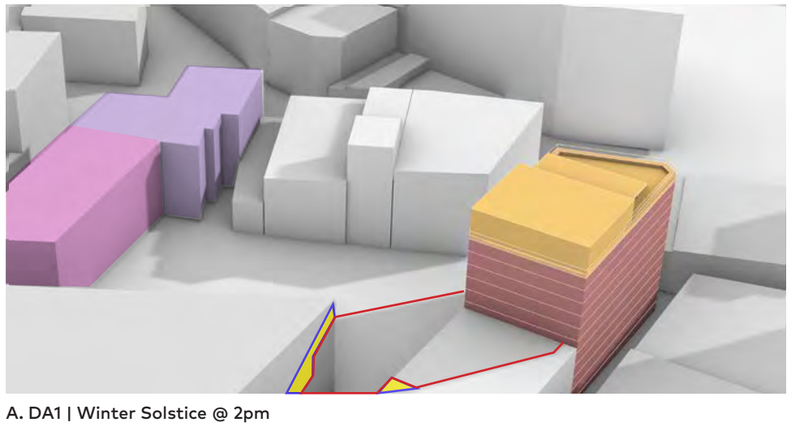


Keyplan

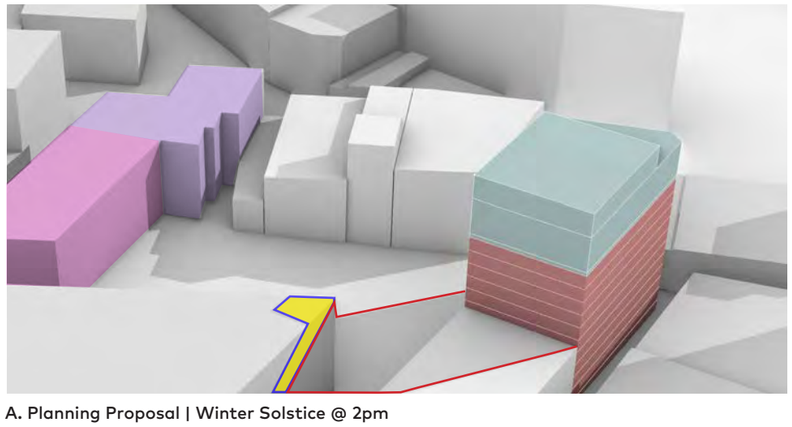
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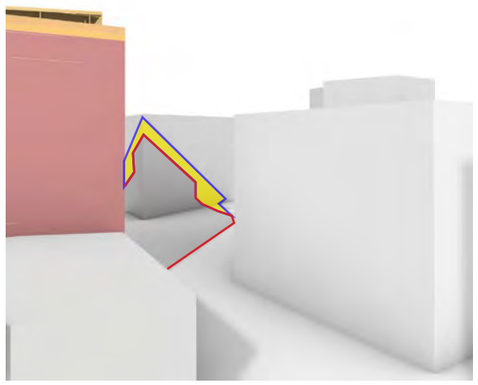
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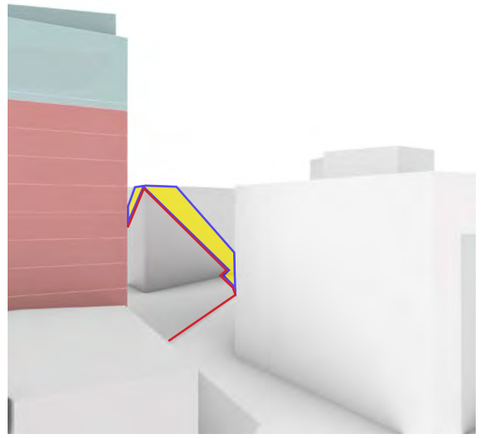
A. DA1 | Winter Solstice @ 2pm



A. Planning Proposal | Winter Solstice @ 2pm



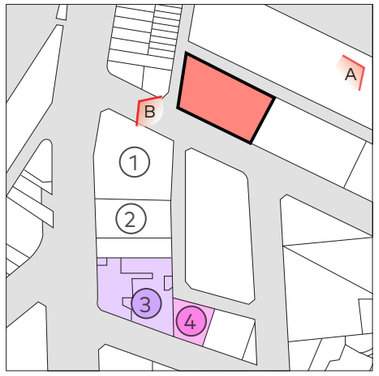
B. DA1 | Winter Solstice @ 2pm



B. Planning Proposal | Winter Solstice @ 2pm

LEGEND

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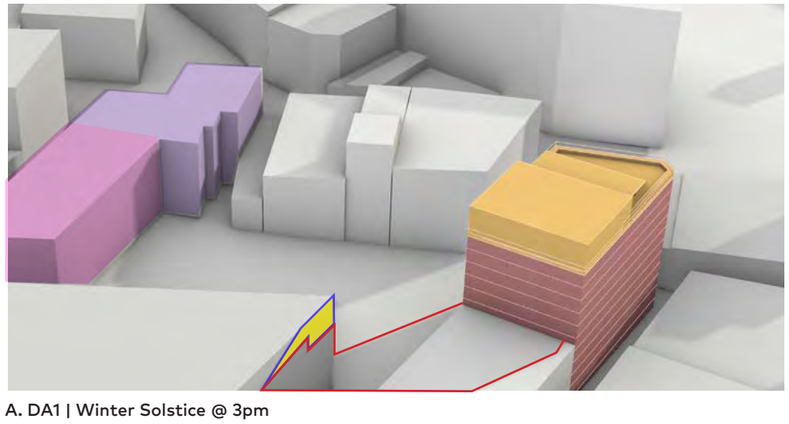


Keyplan

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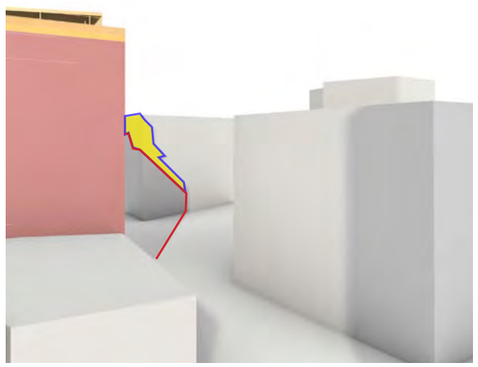
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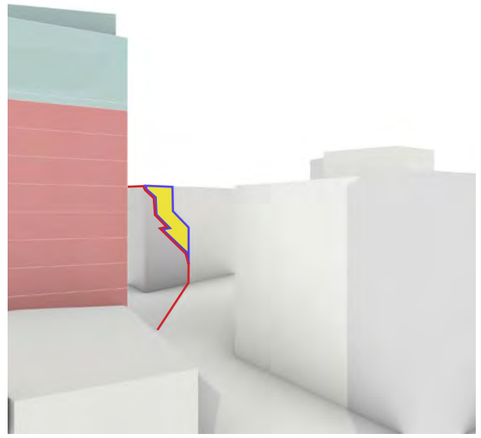
A. DA1 | Winter Solstice @ 3pm



A. Planning Proposal | Winter Solstice @ 3pm



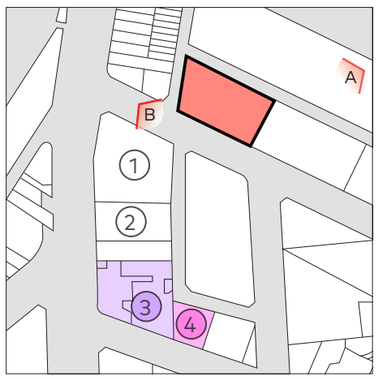
B. DA1 | Winter Solstice @ 3pm



B. Planning Proposal | Winter Solstice @ 3pm

LEGEND

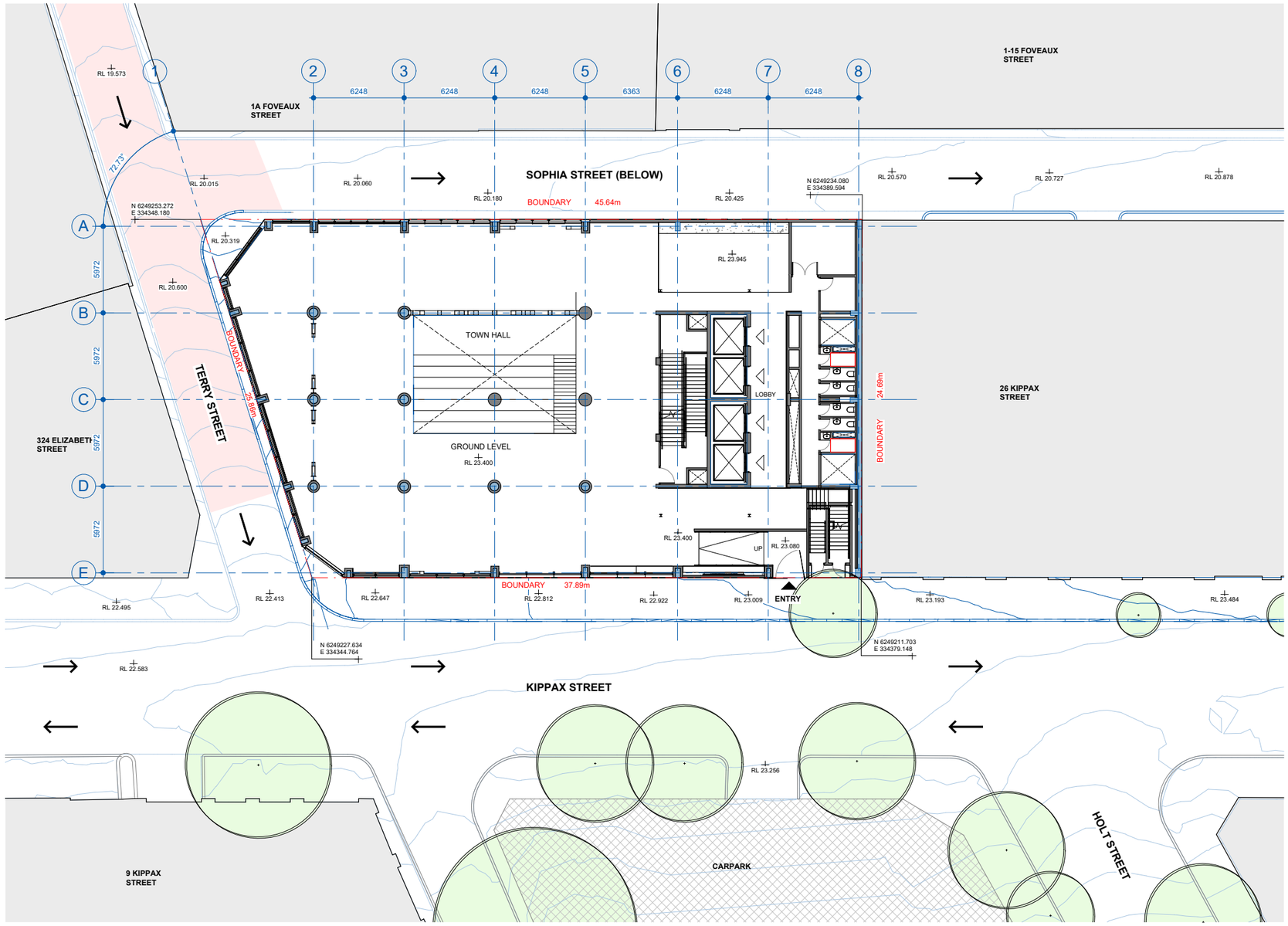
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Keyplan

Reference Design

Site Plan



Site Plan

Scale 1:150

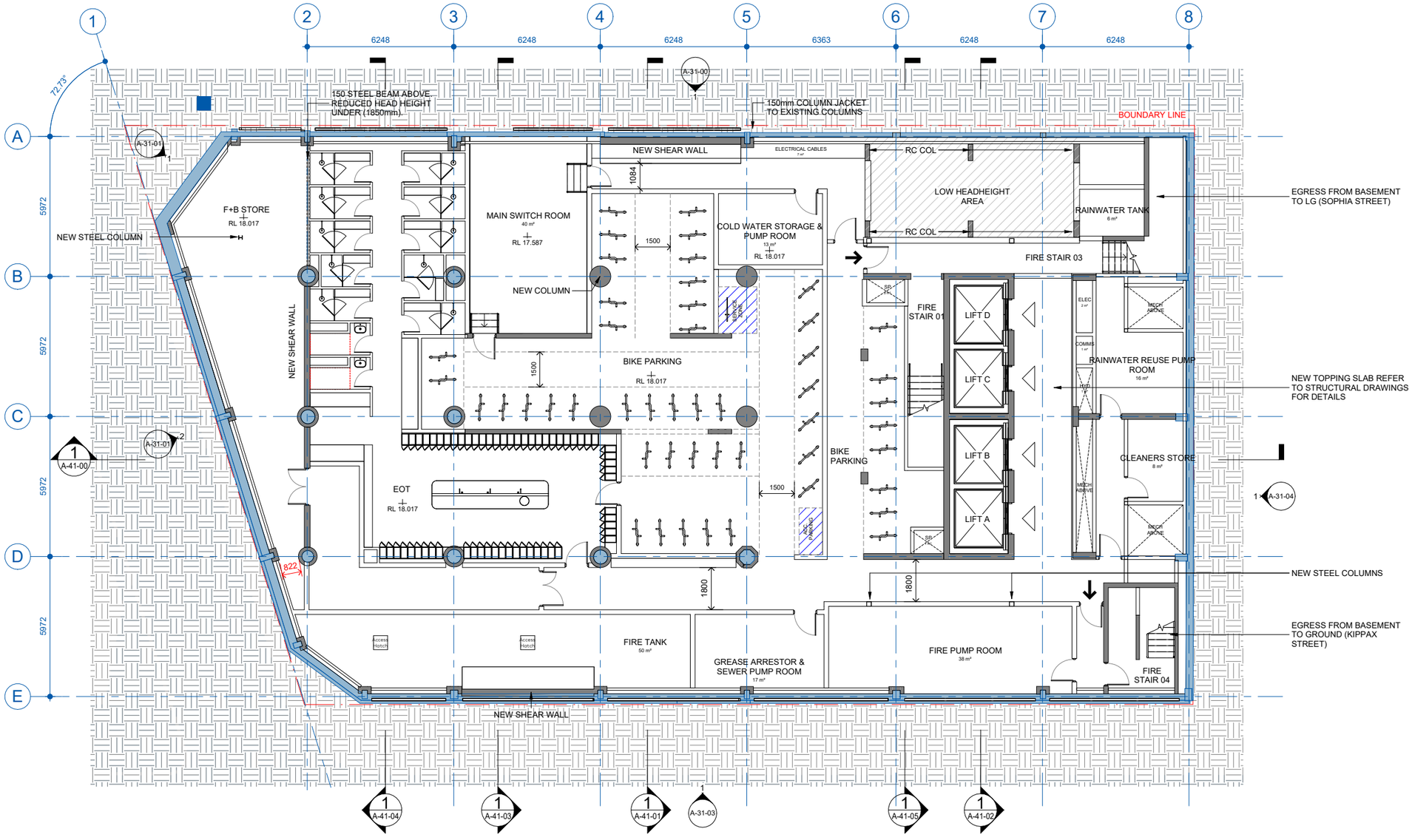
0 1.5m 3m 7.5m 15m

LEGEND

- Existing Elements
- Trees
- Shared Zone Terry St.
- Road direction
- Boundary

Indicative Layout

Basement Level Plan

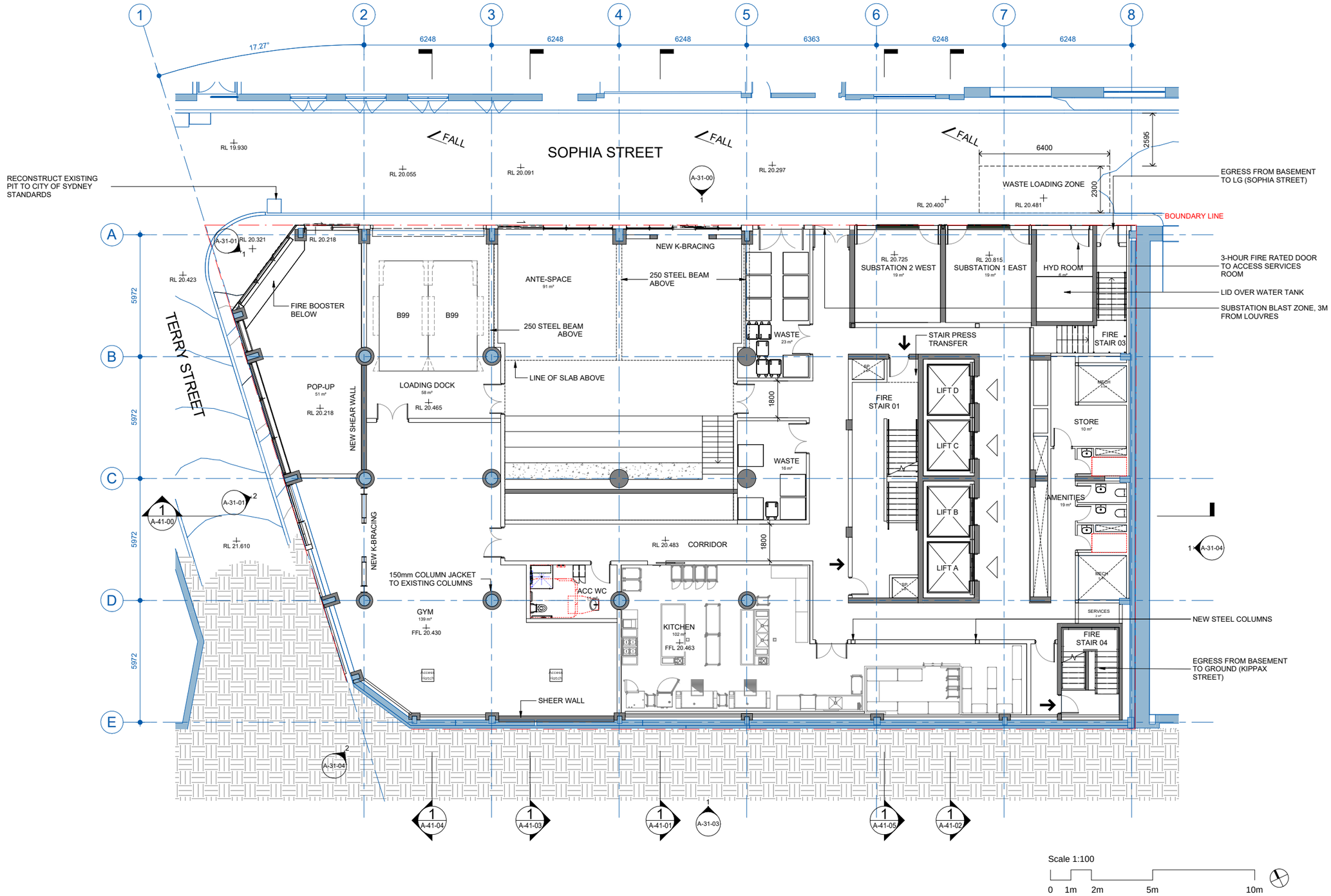


Scale 1:100

0 1m 2m 5m 10m

Indicative Layout

Lower Ground Level Plan

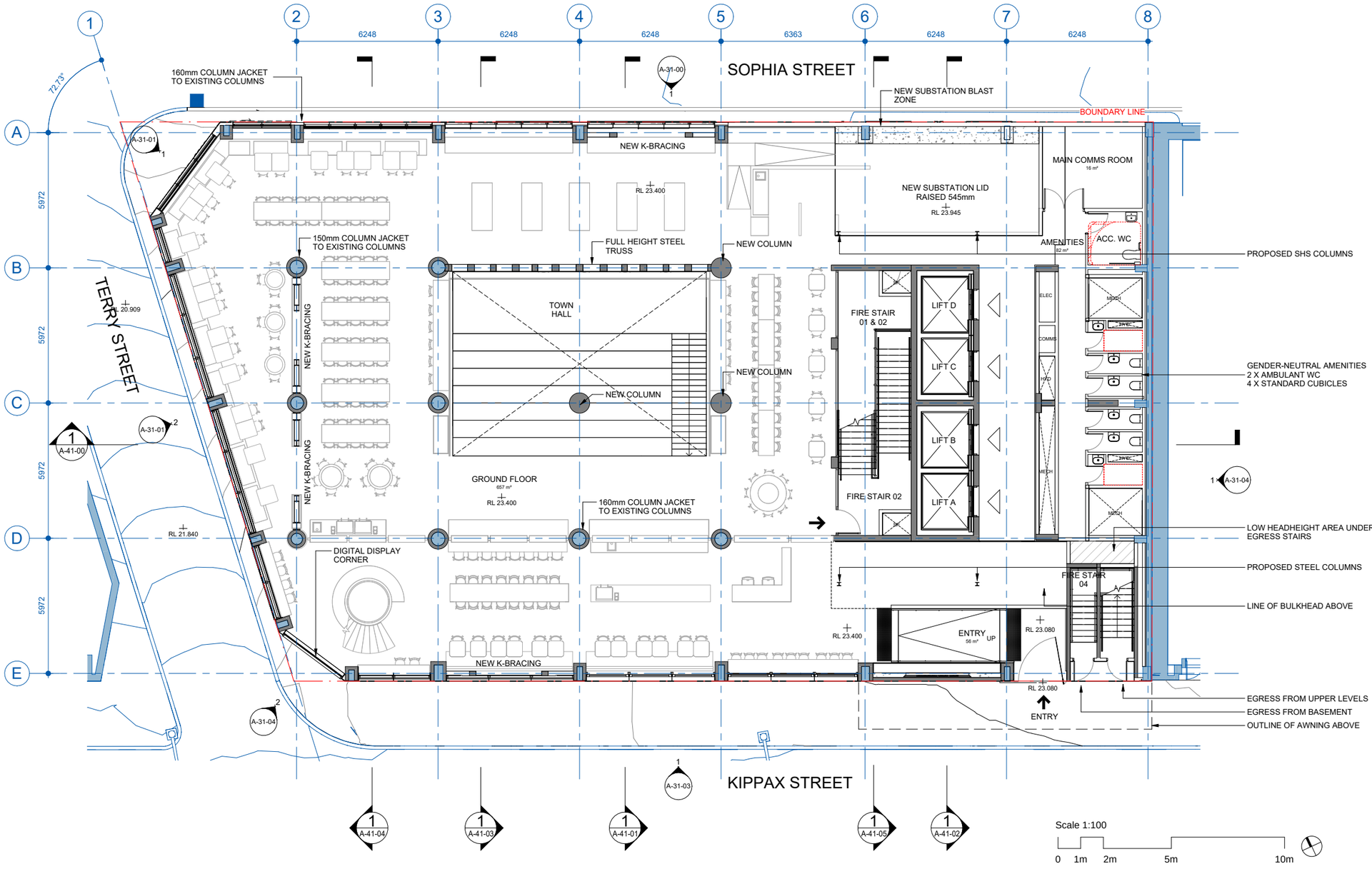


Scale 1:100

0 1m 2m 5m 10m

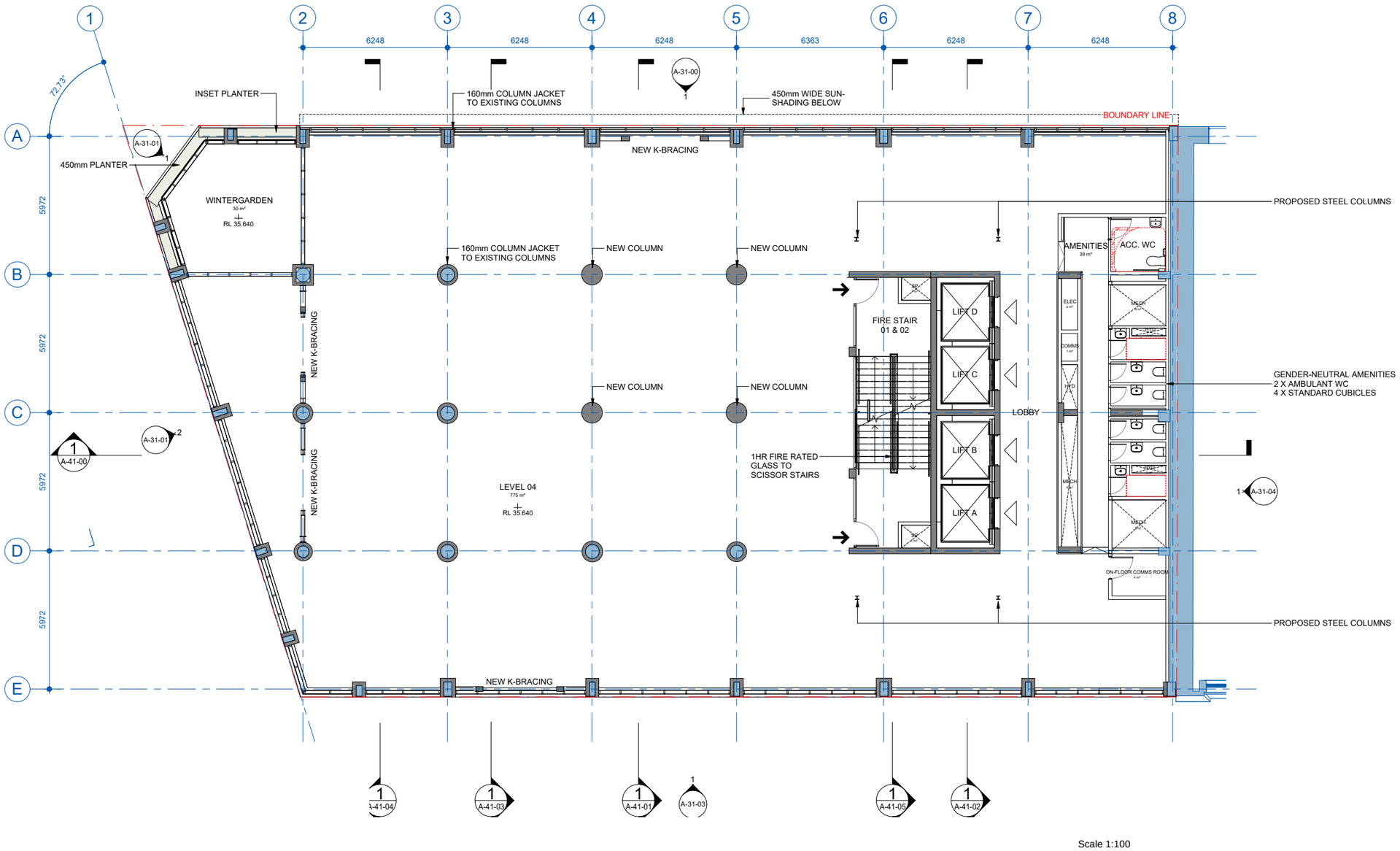
Indicative Layout

Ground Level Plan



Indicative Layout

Typical Level

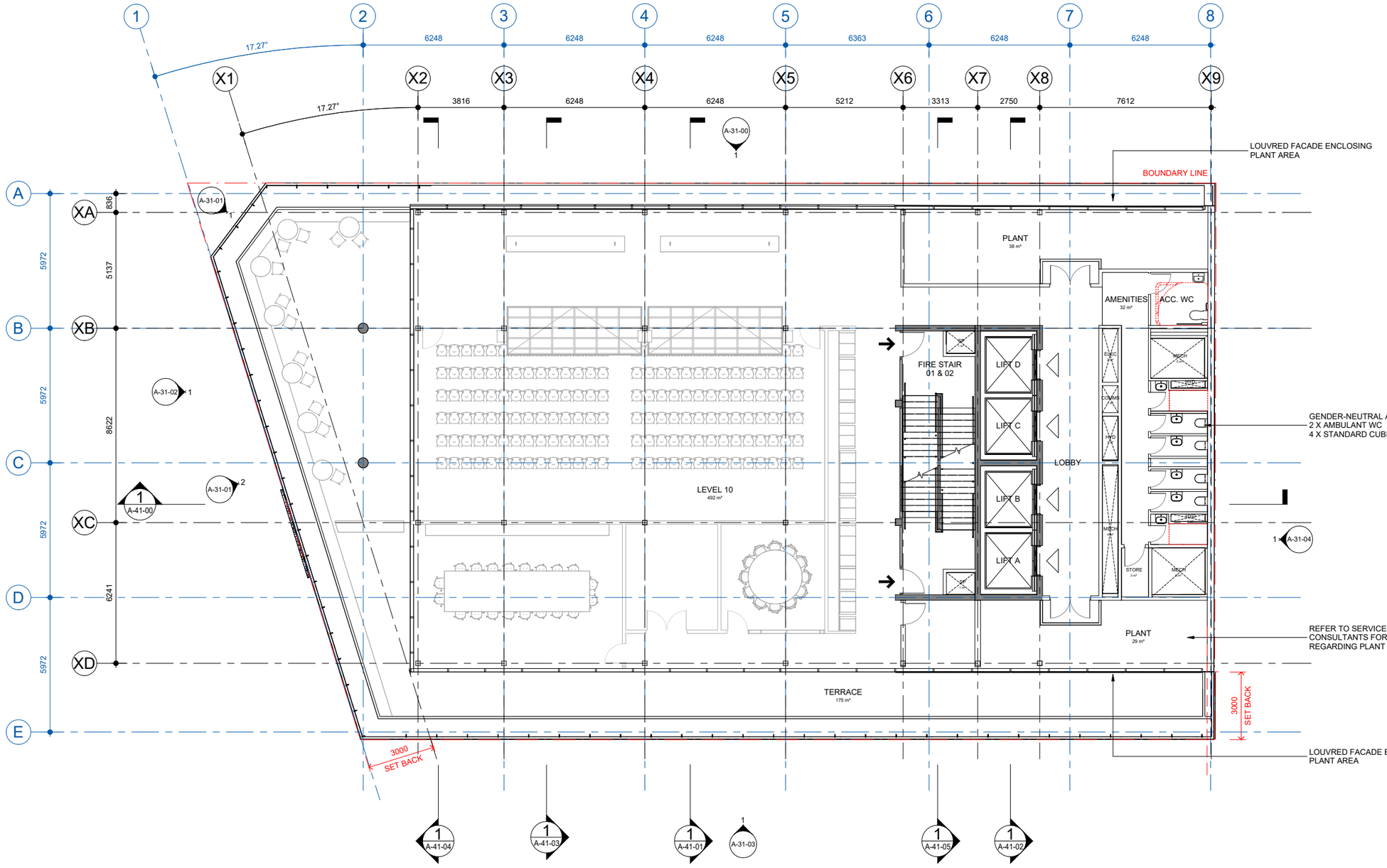


Scale 1:100

0 1m 2m 5m 10m

Indicative Layout

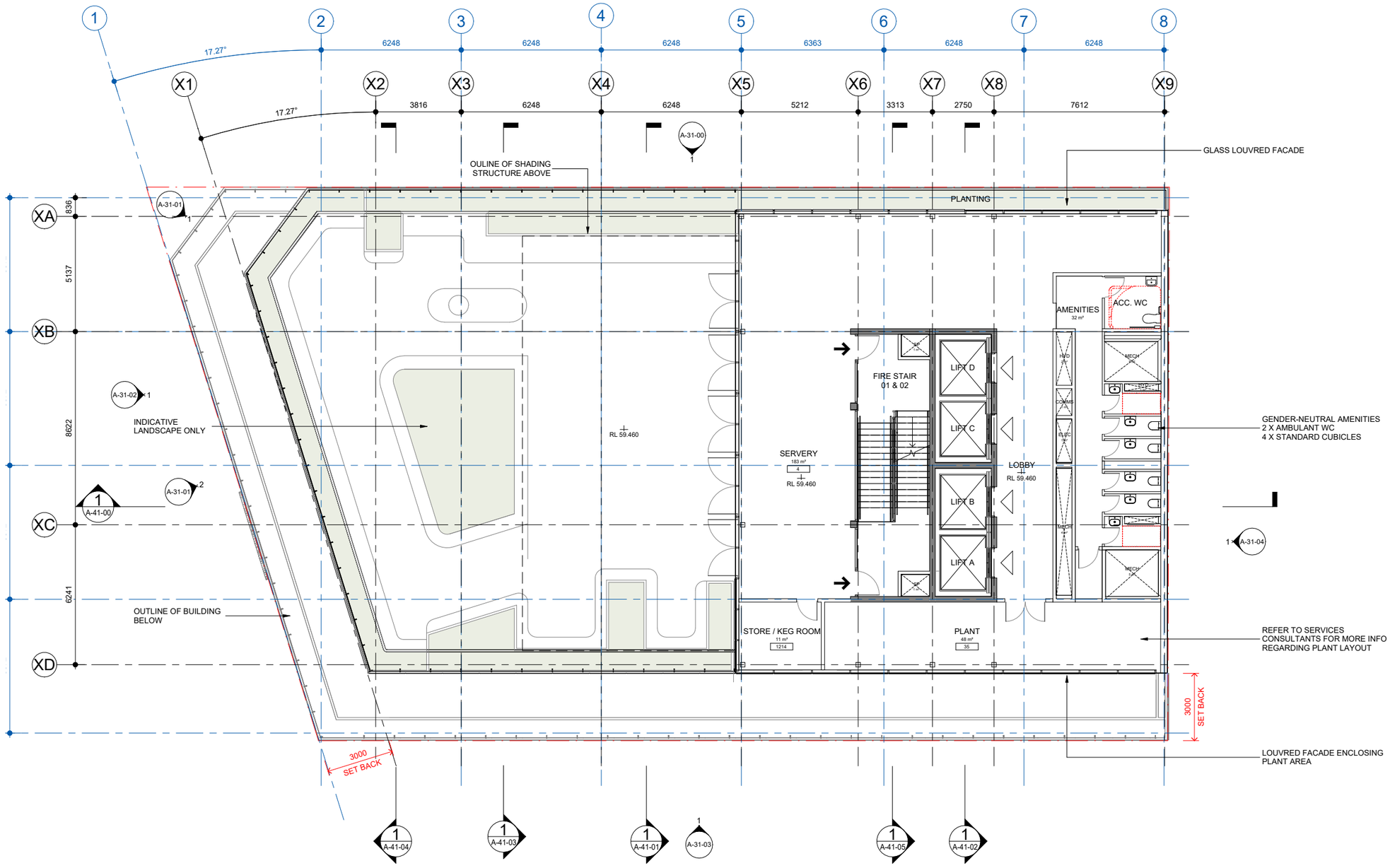
Level 10



200

Indicative Layout

Level 11

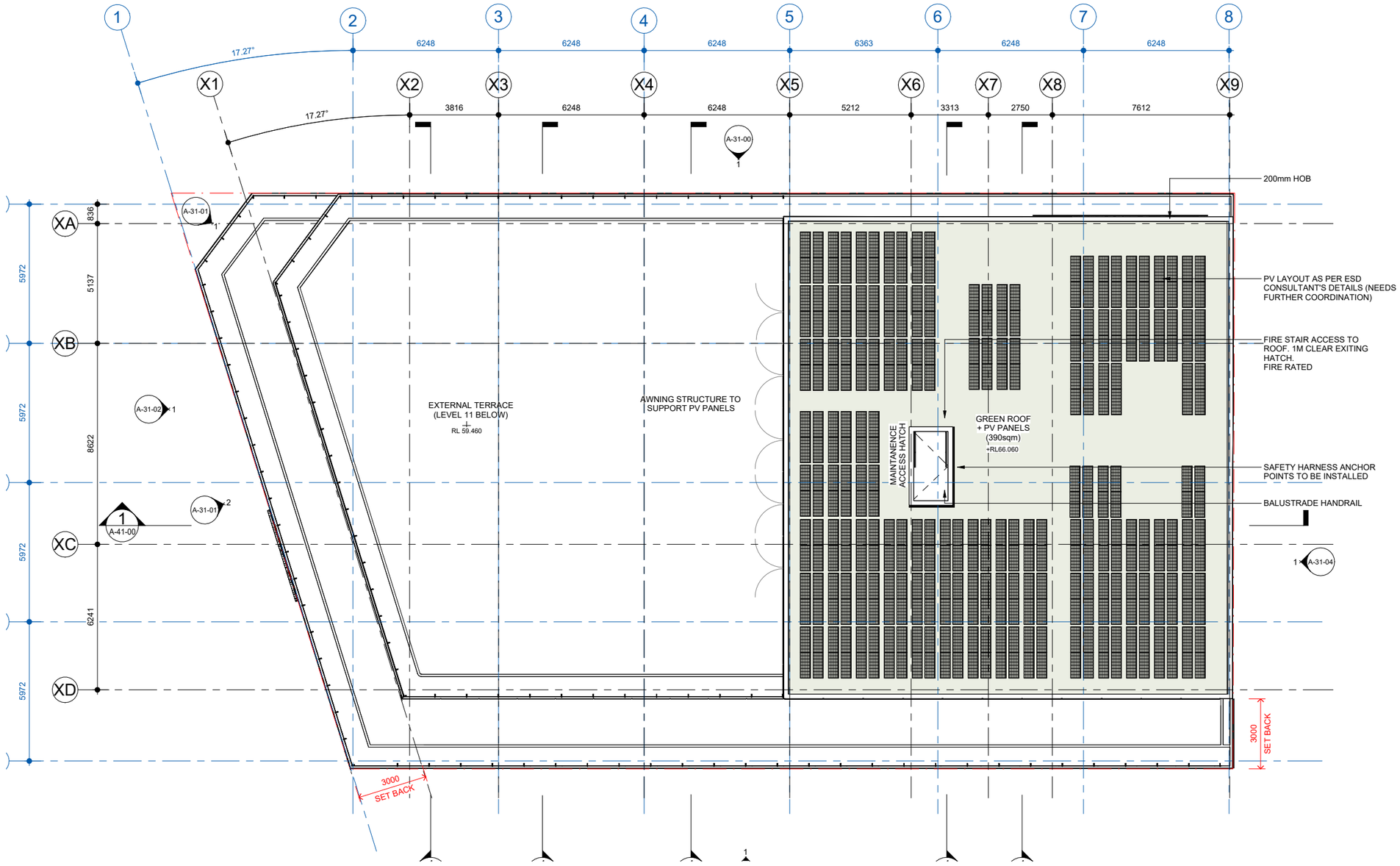


Scale 1:100

0 1m 2m 5m 10m

Indicative Plan

Level Roof

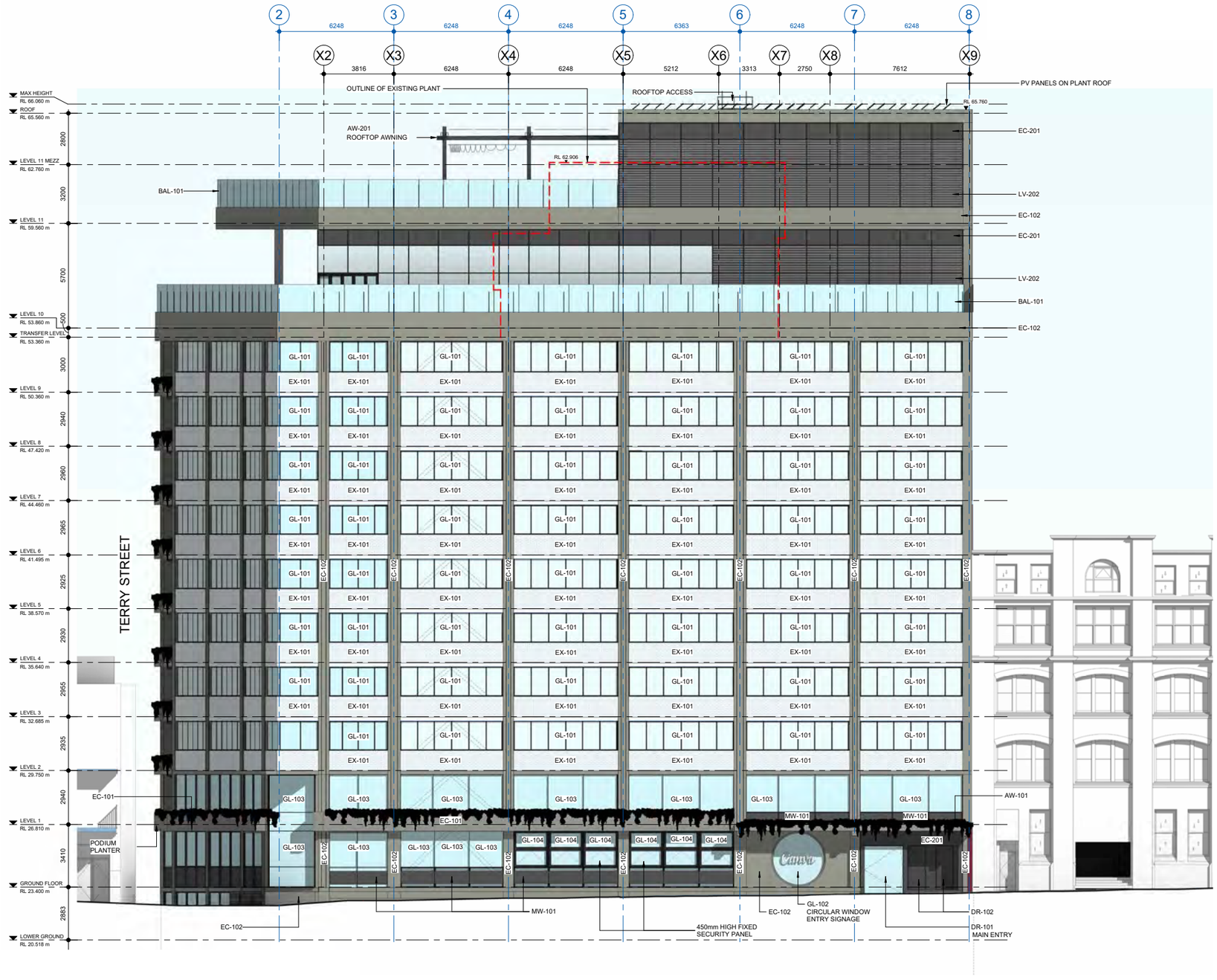


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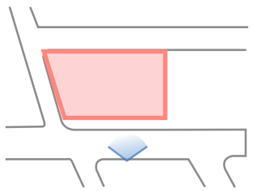
0 1m 2m 5m 10m

Indicative Elevation

Southern (Kippax Street) Elevation



Existing Building Plant

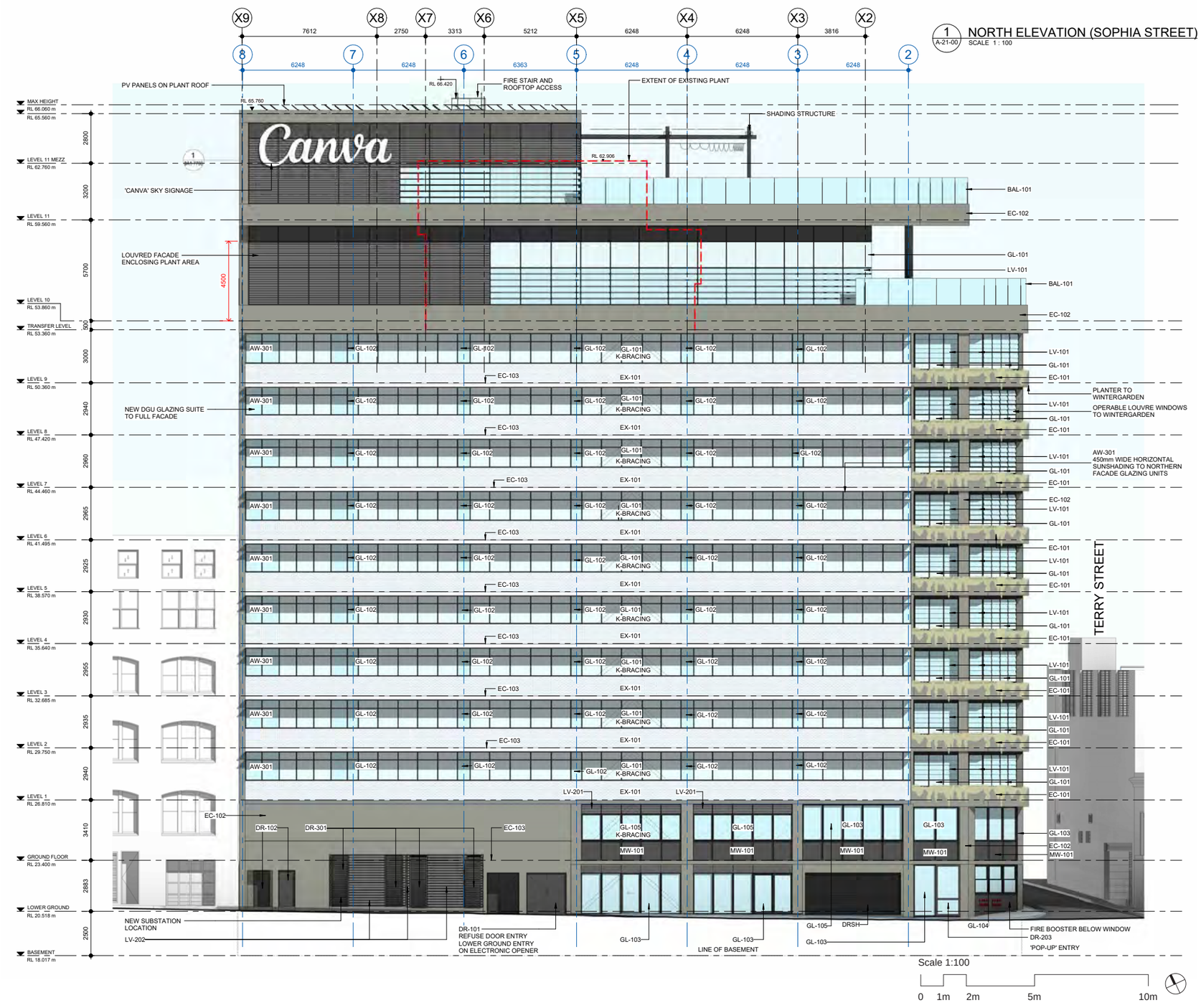


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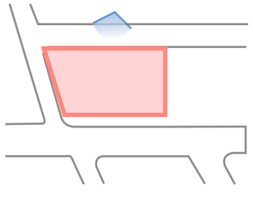
0 1m 2m 5m 10m

Indicative Elevation

Northern (Sophia Street) Elevation



Existing Building Plant

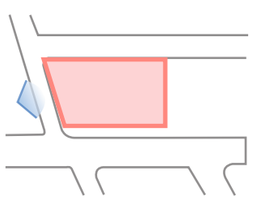


Indicative Elevation

Western (Terry Street) Elevation



Existing Building Plant

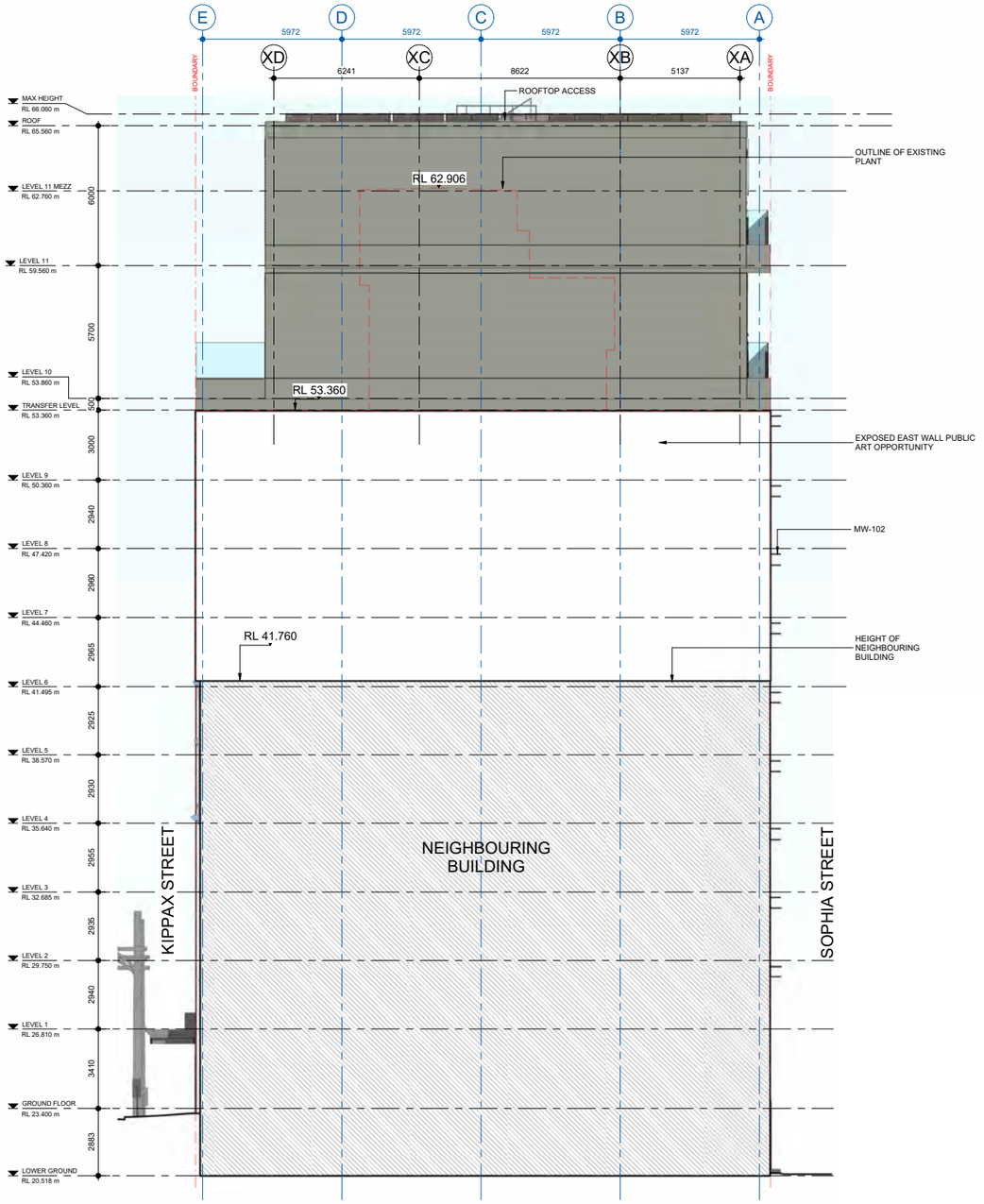


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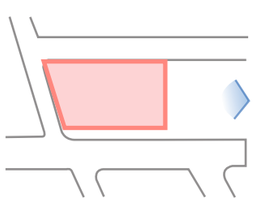
0 1m 2m 5m 10m

Indicative Elevation

Eastern (Party Wall) Elevation



Existing Building Plant

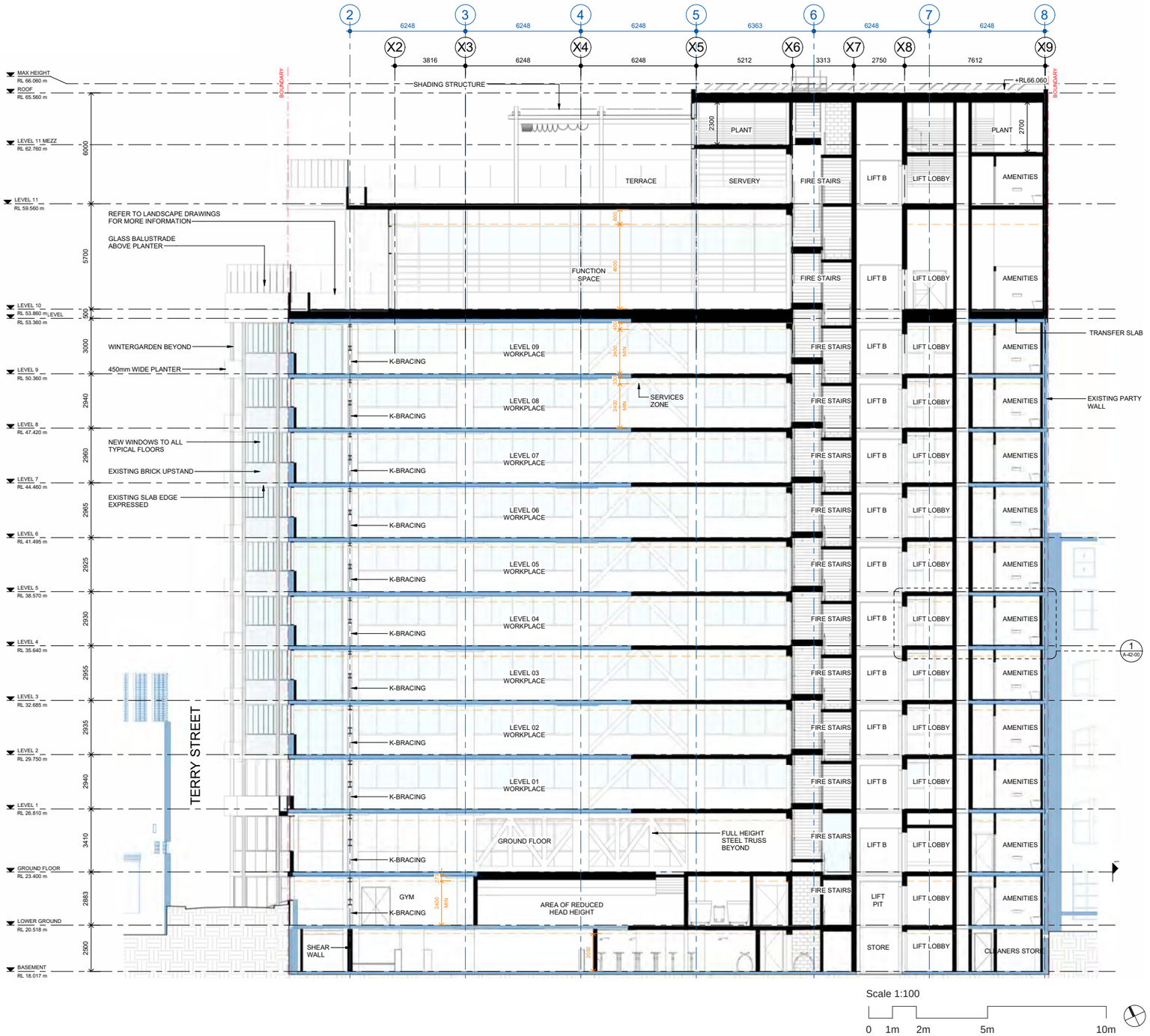


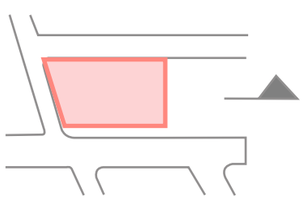
Scale 1:100

0 1m 2m 5m 10m

Indicative Section

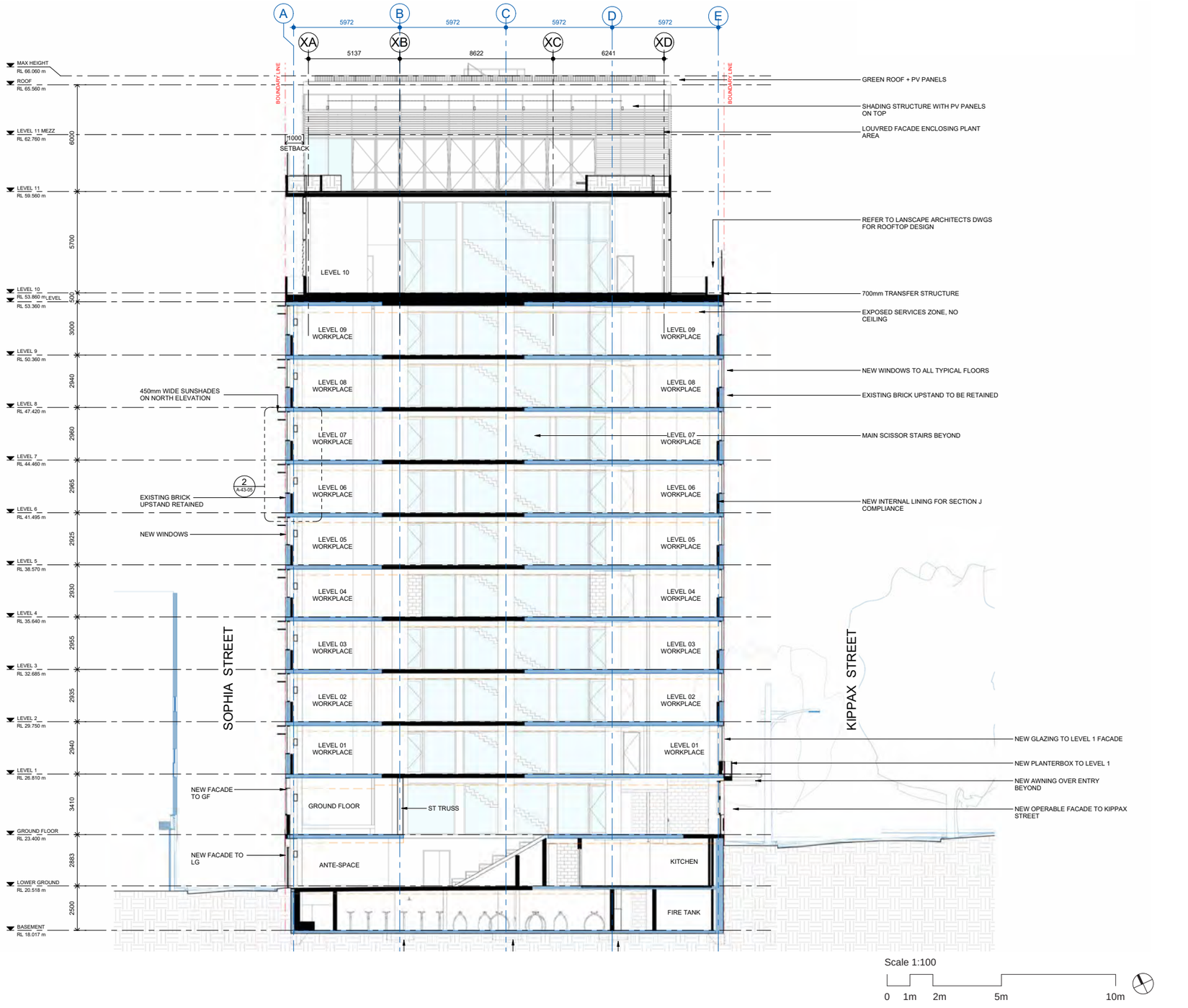
Long Section (east-west)





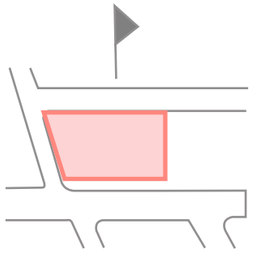
Indicative Section

Cross Section (north-south)



Scale 1:100

0 1m 2m 5m 10m



Indicative Section

Addition Height required to:

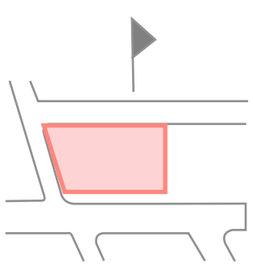
- Accommodate New Function Meeting Level

- Roof Access

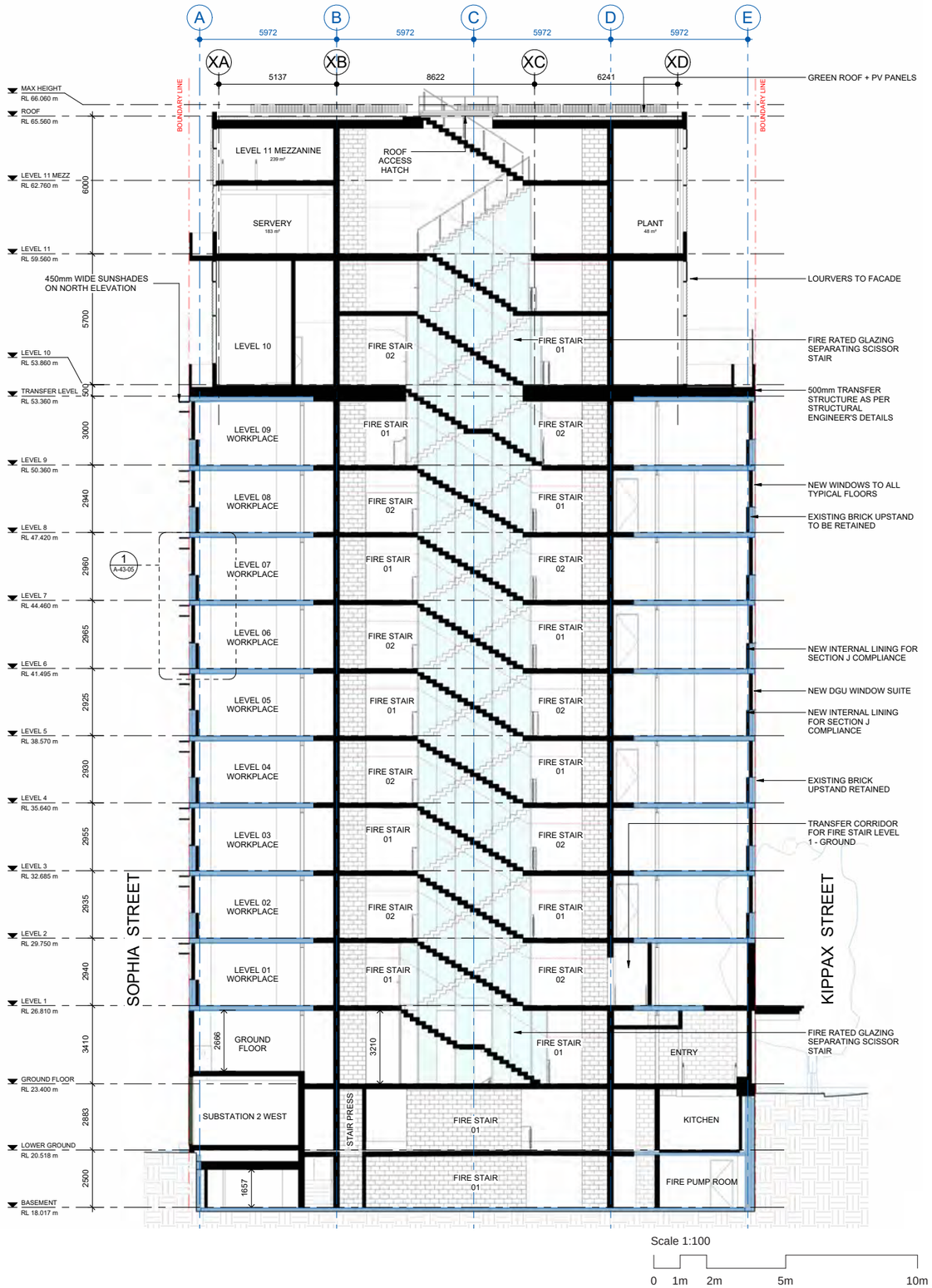
- Lift Overrun

- Upgraded Plant





Cross Section (north-south)



Scale 1:100

0 1m 2m 5m 10m

Development Calculations

Existing GFA & FSR Information

- (Based on 3D Survey provided in June 2023)
- GFA = 9,374m²
- FSR = 9.1:1

DA1 GFA & FSR

- GFA = 9,900m² | FSR = 9.6:1
- EOT GFA = 315m²
- TOTAL GFA (-EOT) = 9,585m² | FSR = 9.3:1

Planning Proposal GFA & FSR

(Based on Drawings provided on following page)

- GFA = **10,514**m² | FSR = 10.1:1
- EOT GFA = 315m²
- TOTAL GFA (- EOT) = 10,199m² | FSR = 9.88:1

LEGEND

DA1 GFA

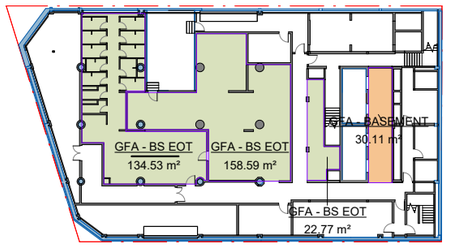
Planning Proposal GFA

Area Schedule		
Level	**Name**	**Planning Proposal Area (m²)**
Basement	GFA - Basement	**30**
Basement	GFA - EOT	**160**
Basement	GFA - EOT	**135**
Basement	GFA-EOT	**23**
Lower Ground	GFA - LG	**607**
Lower Ground	GFA - LG RETAIL	**58**
Ground Floor	GFA - GF	**750**
Level 1	GFA - L1	**846**
Level 2	GFA - L2	**893**
Level 3	GFA - L3	**893**
Level 4	GFA - L4	**893**
Level 5	GFA - L5	**893**
Level 6	GFA - L6	**893**
Level 7	GFA - L7	**870**
Level 8	GFA - L8	**893**
Level 9	GFA - L9	**893**
Level 10	GFA - L10	**547**
Level 11	GFA - L11	**237**
GFA Total		**10,514m²**
Basement & Lower Ground	EOT Area	**315**
GFA Total (without EOT)		**10,199m²**

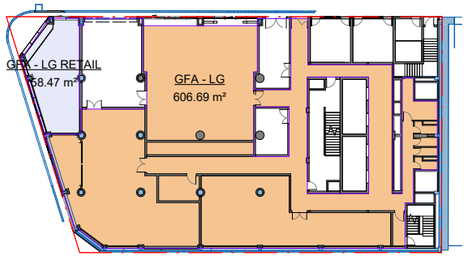
GFA

GFA Plans:

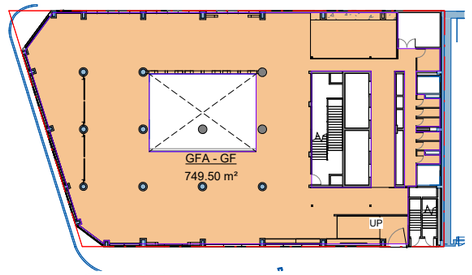
Levels Basement to Level 11



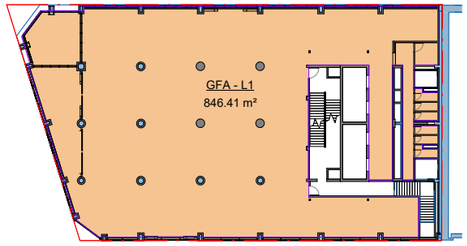
Basement
GFA: 348m2



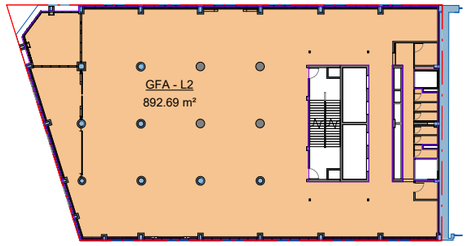
Lower Ground Floor
GFA: 665m2



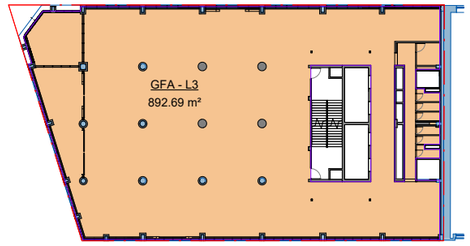
Ground Floor
GFA: 750m2



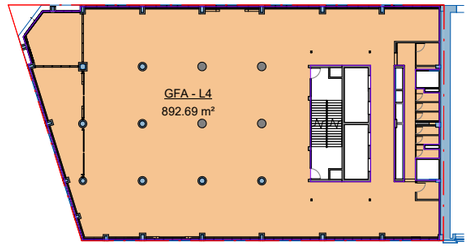
Level 1
GFA: 846



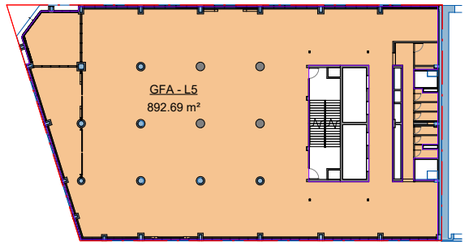
Level 2
GFA: 893m2



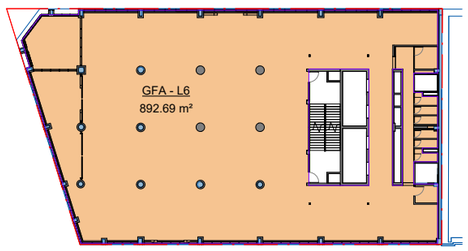
Level 3
GFA: 893m2



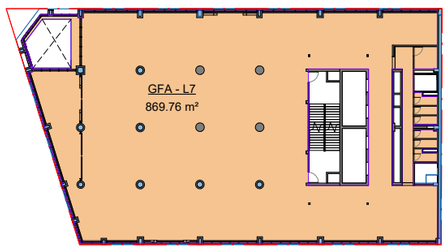
Level 4
GFA: 893m2



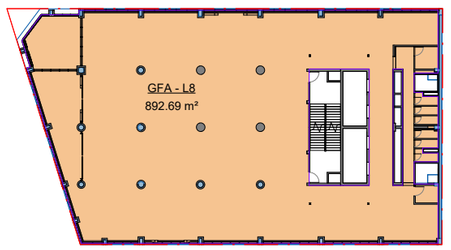
Level 5
GFA: 893m2



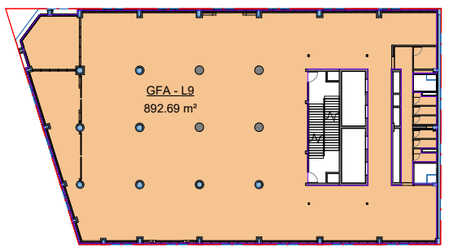
Level 6
GFA: 893m2



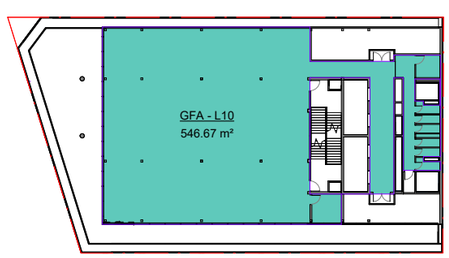
Level 7
GFA: 870m2



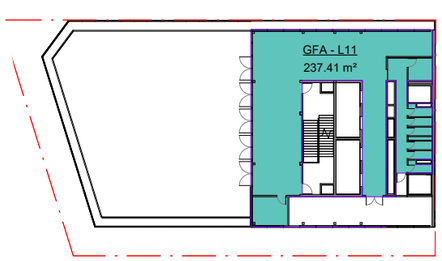
Level 8
GFA: 893m2



Level 9
GFA: 893m2



Level 10
GFA: 547m2



Level 11
GFA: 237m2

LEGEND

- DA1 GFA
- Planning Proposal GFA
- Boundary

Design Quality and Process

Design Quality and Process

Design Excellence

Design excellence is a key objective of 8-24 Kippax Street

The proposal exhibits design excellence having regard to those matters under Clause 6.21c(4) thus achieving the objective of the design excellence clause to deliver the highest standard of architecture. An assessment of the proposal`s achievement of these principles is outlined in the following section.

COX Architecture are highly credited and awarded Australian architects with demonstrated capability of designing buildings of the highest calibre. COX Architecture has delivered a number of award winning projects including a number of adaptive reuse projects in the City Sydney.

Australian Museum Project Discovery

NSW Architecture Medallion, AIA NSW, 2021

Greenway Award, Heritage Architecture, AIA NSW, 2021

John Verge Award, Interior Architecture, AIA NSW, 2021

Shortlisted, Public Architecture, AIA 2021

High Commendation, Heritage, National Trust Awards 2021

70 George Street

Award, Interior Architecture, AIA NSW 2023

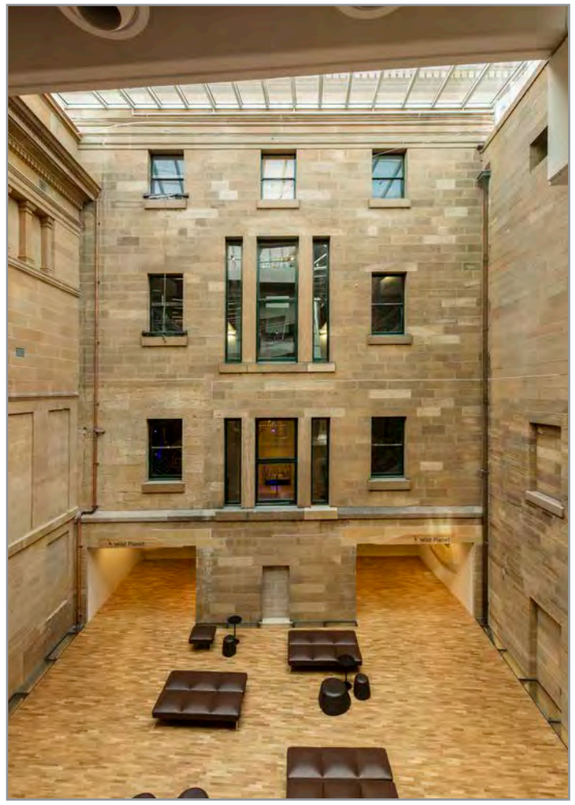
Commendation, Workplace Design, Australian Interior Design Awards, 2023

Merit Award, PLACE Category, Designers Australia Awards (DIA), 2023

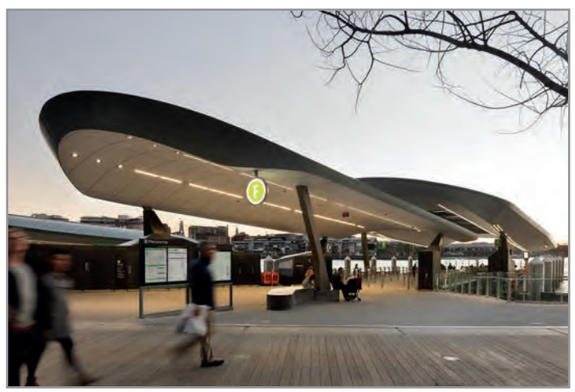
Barangaroo Ferry Wharf

City of Sydney Lord Mayor`s Prize, AIA NSW 2018

Commendation,Public Architecture, AIA NSW 2018



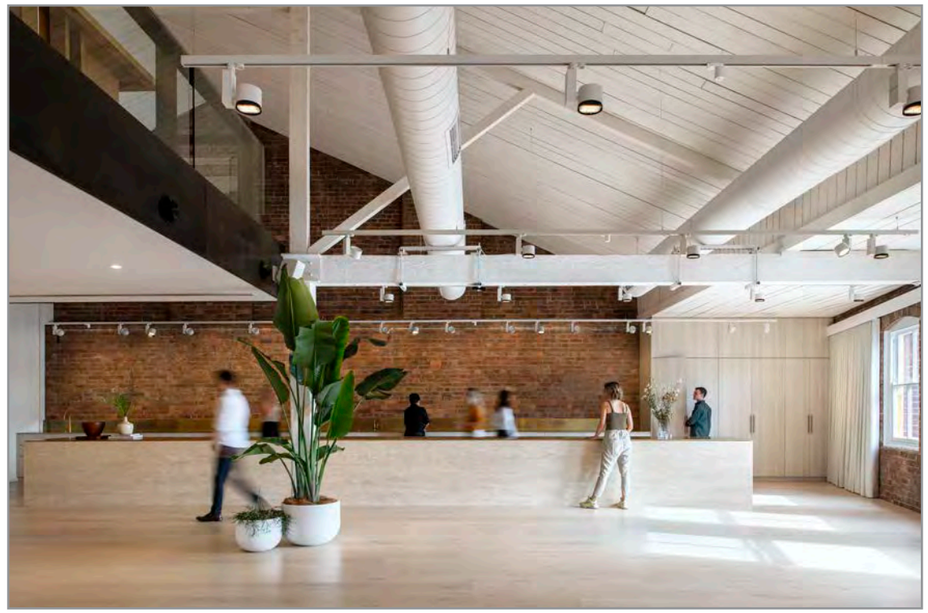
Australian Museum Project Discovery, Sydney



Barangaroo Ferry Wharf, Sydney



Wynyard Station Upgrade, Sydney



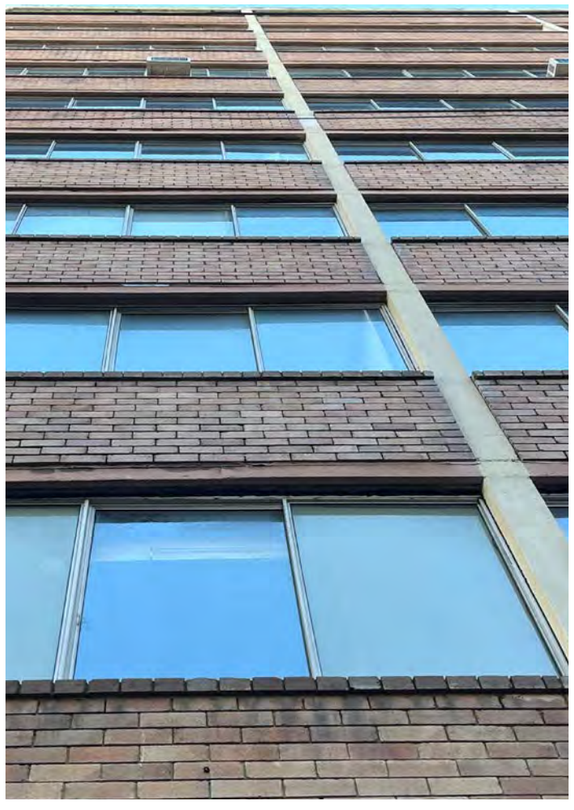
70 George Street, Sydney

Design Quality and Process

6.21C Design Excellence

2 a *Whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved*

The proposed form and appearance of the new addition will have minimal impact on the existing building and provide a positive contribution to the public domain. It is appropriate in its context and is compatible with additions to existing buildings in the surrounding area.





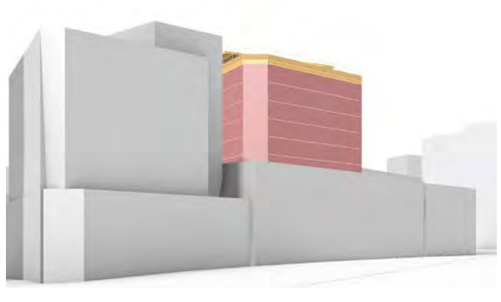
6.21C Design Excellence

2 b *Whether the form and external appearance of the proposed development will improve the quality of the amenity of the public domain*

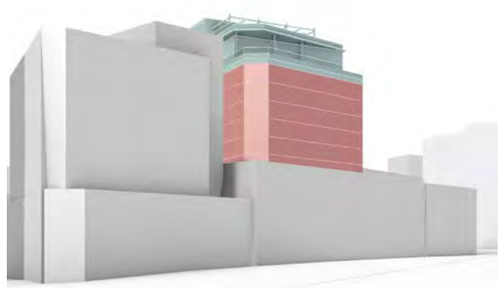
Although the proposed addition sits slightly higher than the current plant level (RL62.9 vs RL 66.06), the massing has been relocated to the eastern end of the site to minimise its visibility from the public domain. The proposal will not result in any significant detrimental impacts on any view corridor.

LEGEND

- Site
- Current DA
- Proposed Addition
- Existing Building Height



Existing Building and DA1



Proposed Indicative Addition

*** Text taken from Sydney Local Environmental Plan 2012 Part 6, Division 4, Subdivision 2, Section 6.21C**

Design Quality and Process

6.21C Design Excellence

2 d (i) *the suitability of the land for development*

The proposed adaptive reuse comprises commercial (office) premises, which is permitted in this area. The site is located adjacent major bus, light rail and rail connections and is ideally located to contribute to the cities employment targets.



Public Transport Network

6.21C Design Excellence

2 d (ii) *the existing and proposed uses and use mix*

The proposed use as an office for a Tech company (Canva), will not only add high-quality commercial space, but also reinforces this area of the city as an innovation and technology precinct.



Tech Central

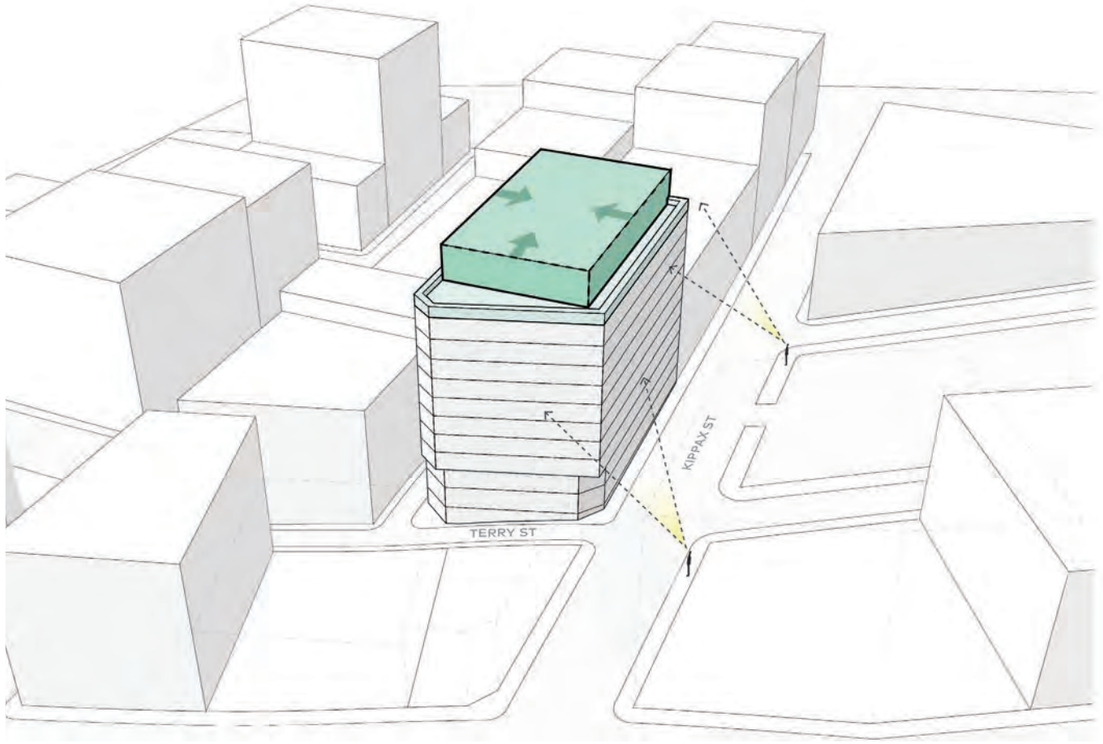
* Text taken from Sydney Local Environmental Plan 2012
Part 6, Division 4, Subdivision 2, Section 6.21C

Design Quality and Process

6.21C Design Excellence

2 d (iii) *any heritage issues and street scape constraints*

The existing building is being retained with the addition of a set back above, as such the proposal is compatible with the existing street scape. The proposed addition is sympathetic to and compatible with the heritage items within the sites visual catchment.



6.21C Design Excellence

2 d (iv) *the location of any tower proposed, having regard to the need to achieve an acceptable relationship with other towers, existing or proposed, on the same site on neighbouring sites in terms of separation, setbacks, amenity and urban form*

No tower is proposed.



Current Building



Proposed Indicative Addition

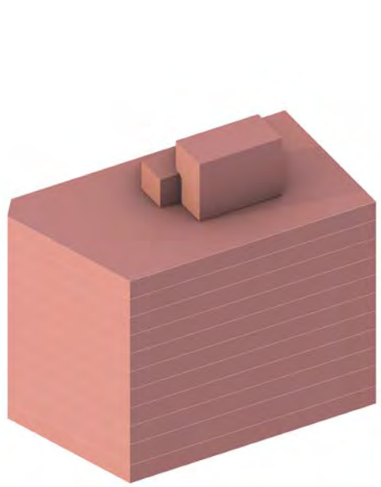
*** Text taken from Sydney Local Environmental Plan 2012 Part 6, Division 4, Subdivision 2, Section 6.21C**

Design Quality and Process

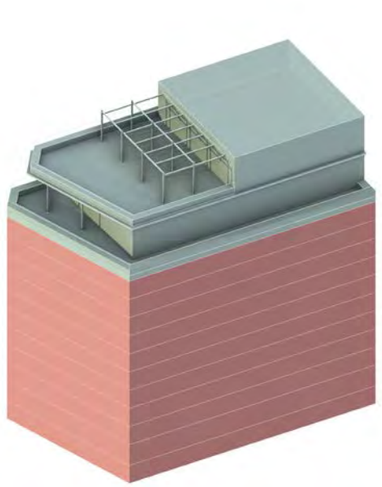
6.21C Design Excellence

2 d (v) *the bulk, massing and modulation of buildings*

The proposed extension which minimally exceeds the height of the current plant room has been minimised in size to respond appropriately to the existing and adjoining development.



Existing Building

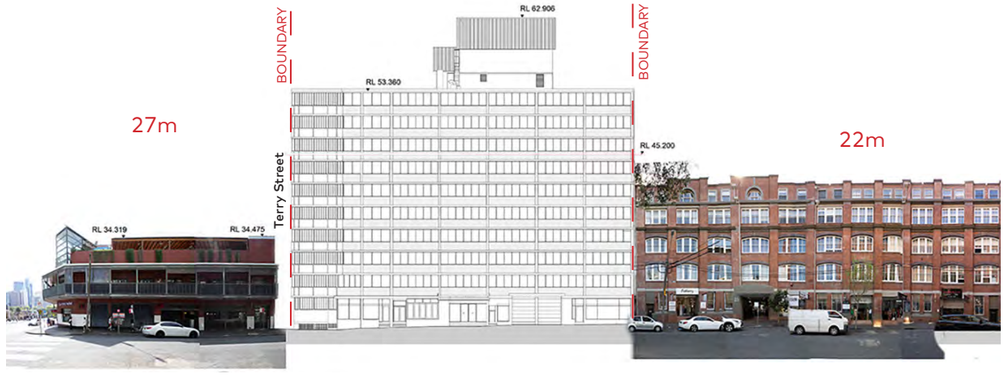


Proposed Indicative Massing

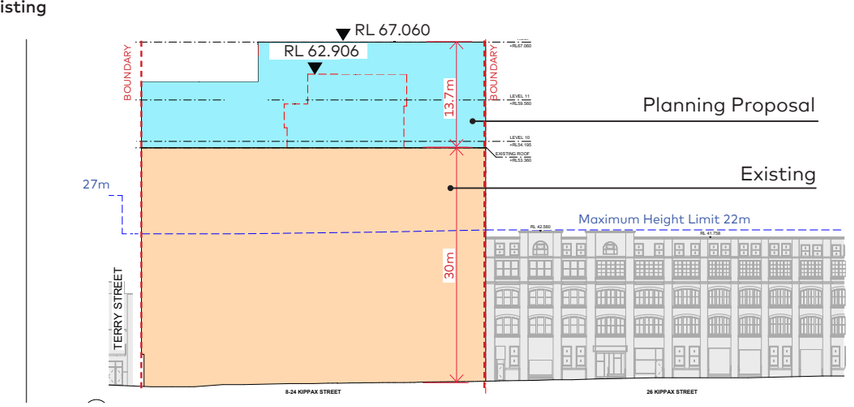
6.21C Design Excellence

2 d (vi) *street frontage heights*

The existing building currently exceeds the LEP height controls. The proposal maintains the current street frontage height to Kippax Street with the proposed additional massing setback approximately 3m from Kippax Street to minimise its visual impact and maintain the visual prominence of the existing facade.



Kippax Street Existing



Kippax Street Proposed

* Text taken from Sydney Local Environmental Plan 2012
Part 6, Division 4, Subdivision 2, Section 6.21C

Design Quality and Process

6.21C Design Excellence

2 d (vii) *environmental impacts, such as sustainable design, overshadowing and solar access, visual and acoustic privacy, noise, wind and reflectivity*

The proposal will not have adverse environmental impacts by way of overshadowing, visual and acoustic privacy, noise wind and reflectivity.

Additional shadow cast beyond the extent of DA1.

Refer to full shadow analysis later in report



Proposed @ 9am June 21st



Proposed @ 12pm June 21st



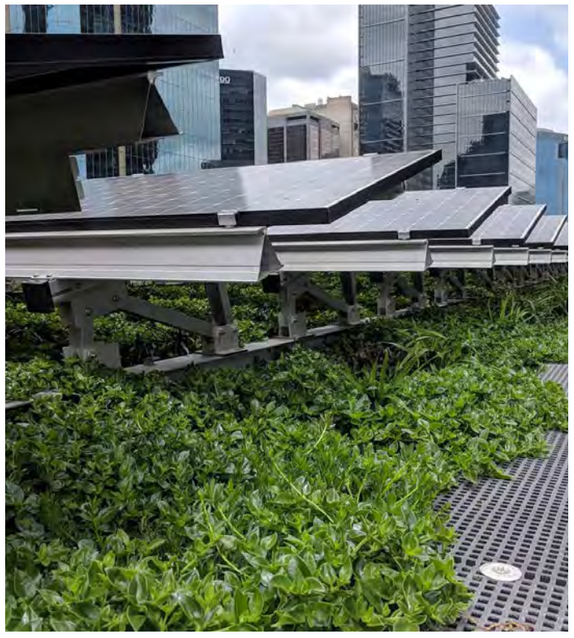
Proposed @ 3pm June 21st

6.21C Design Excellence

2 d (viii) *the achievement of the principles of ecologically sustainable development*

The application is supported by an ESD report which identifies a number of sustainability measures to be incorporated in the development. The proposal is an environmental exemplar in the adaptive reuse of an older stock low scale commercial building.





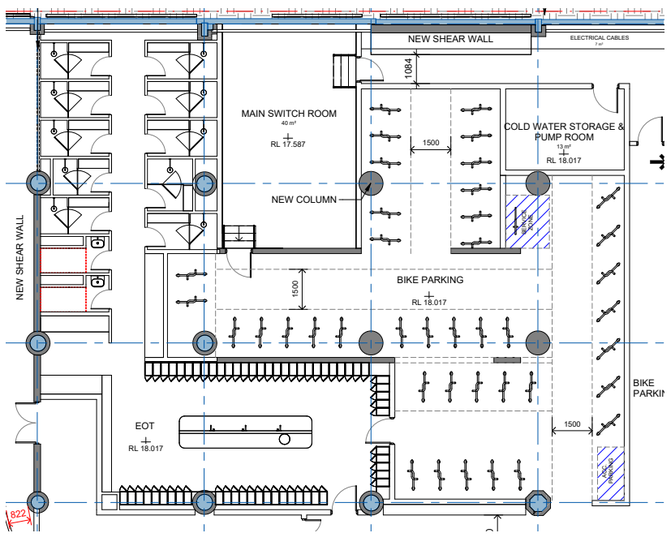
*** Text taken from Sydney Local Environmental Plan 2012 Part 6, Division 4, Subdivision 2, Section 6.21C**

Design Quality and Process

6.21C Design Excellence

2 d (ix) *pedestrian, cycle, vehicular and service access and circulation requirements, including the permeability of any pedestrian network*

The proposal removes existing on site car parking and replaces it with bike parking and end of trip facilities. Additional glazing to the ground floors of both Kippax and Sophia Street, additional community retail on the corner of Terry and Sophia Street and awnings to Kippax Street will improve the pedestrian experience.



Indicative EOT Facilities



Indicative Community retail

6.21C Design Excellence

2 d (x) *the impact on, and any proposed improvements to, the public domain*

The proposal will have a positive contribution to the public domain through visual interest, activation and public art.





Indicative Views of the Public Domain Interface



* Text taken from Sydney Local Environmental Plan 2012
Part 6, Division 4, Subdivision 2, Section 6.21C

Design Quality and Process

6.21C Design Excellence

2 d (xi) *the impact on any special character area*

The proposal does not sit within a special character area.



The subject site is not Heritage Listed

* Text taken from Sydney Local Environmental Plan 2012
Part 6, Division 4, Subdivision 2, Section 6.21C

6.21C Design Excellence

2 d (xii) *achieving appropriate interfaces at ground level between the building and the public domain*

The interface of the proposal with the public domain at ground level has been a fundamental component of the design, Canva`s desire for both activated and visual permeable frontages which positively engage with the public domain.

Indicative Interface to Public Domain

Design Quality and Process

6.21C Design Excellence

2 d (xiii) *excellence and integration of landscape design*

Although the existing building covers the site in its entirety the proposal aims to introduce a substantial landscape concept across numerous areas of the building. Planter boxes to Kippax and Terry Street transition into planted wintergardens up the north-western chamfered facade up to the planted terrace and green roof. The proposed landscaping will positively contribute to the precinct and provide visual amenity for neighbouring buildings with views of the site.



Planted Terraces and Green Roof



Planter Boxes



Planted Wintergardens

6.21C Design Excellence

2 d (xiv)*the incorporation of high quality public art into the fabric of buildings in the public domain or in other areas to which the public have access*

A preliminary Public Art Plan will be submitted as part of a detailed DA application. The site presents many opportunities for high quality public art.



Sophia Street Mural (indicative)



Eastern Wall Mural (indicative)

* Text taken from Sydney Local Environmental Plan 2012
Part 6, Division 4, Subdivision 2, Section 6.21C

222



Indicative Massing View

April 2024

COX

223

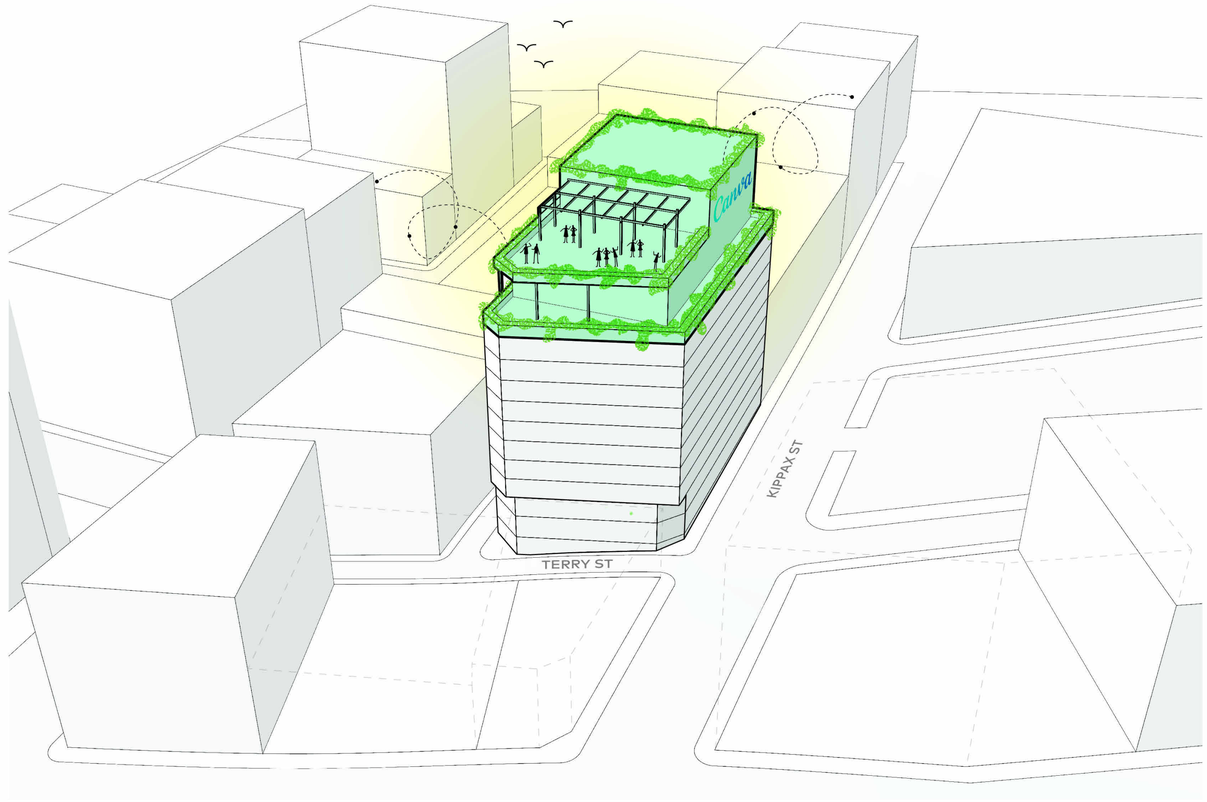
Attachment A3

Indicative Reference Scheme

CANVA WORKPLACE

8-24 KIPPAX STREET, SURRY HILLS 2010, AUSTRALIA
22058.0

DRAWING LIST - PLANNING PROPOSAL		
SHEET No.	SHEET NAME	Current Revision
Massing		
PP-0100	COVER SHEET - DRAWING INDEX	2
PP-1102	LOCATION PLAN	2
PP-1103	SITE PLAN	2
PP-2100	BASEMENT PLAN - ENVELOPE	2
PP-2101	LOWER GROUND PLAN - ENVELOPE	2
PP-2102	GROUND PLAN - ENVELOPE	2
PP-2103	LEVEL 1 PLAN - ENVELOPE	2
PP-2104	TYPICAL LEVEL PLAN - ENVELOPE	2
PP-2105	LEVEL 10 PLAN - ENVELOPE	2
PP-2106	LEVEL 11 PLAN - ENVELOPE	2
PP-2107	ROOF PLAN - ENVELOPE	2
PP-3100	ENVELOPE ELEVATIONS - SHEET 1	2
PP-3101	ENVELOPE ELEVATIONS - SHEET 2	2
PP-4100	ENVELOPE SECTION	2



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2	Amendments to PP Submission	LV	04/04/2024

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Nominated Architects:
Joe Agius no. 6491
Russell Lee no. 6367

Client
CANVA

Project No.
22058.0

Project
CANVA

8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title
COVER SHEET - DRAWING INDEX

Document Control Status:

PLANNING PROPOSAL

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** @ A1
Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-0100	**Revision:** 2

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1 LOCATION PLAN

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8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
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Drawing Title
LOCATION PLAN

Document Control Status:
PLANNING PROPOSAL

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** @ A1
Project Director: RJ	**Date:** 15/03/2024
Drawing Number: PP-1102	**Revision:** 2

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1 SITE PLAN
SCALE 1 : 150

Scale 1:150

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LEGEND

- CONTEXT BUILDINGS
- COUNCIL TERRY STREET SHARED ZONE (PROPOSED)
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- BOUNDARY LINE

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Project No.
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Project
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8-24 KIPPAX STREET, SURRY HILLS

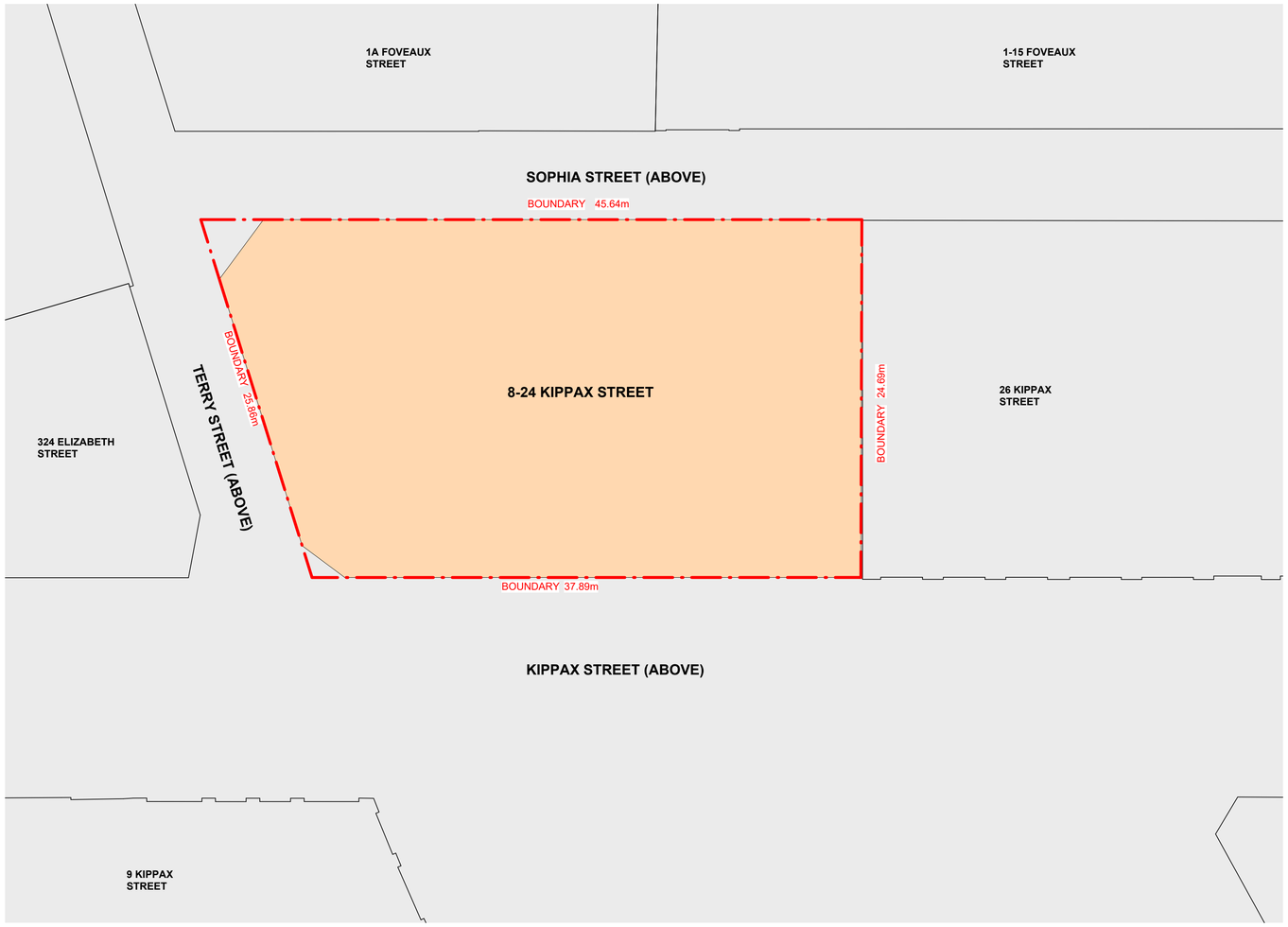
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Drawing Title
SITE PLAN

Document Control Status:
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Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-1103	**Revision:** 2

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1 BASEMENT PLAN - ENVELOPE
SCALE 1 : 200

Scale 1:200

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LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- LEVEL 11 TERRACE
- LANDSCAPING / GREEN ROOF
- BOUNDARY LINE

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Project No.
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Project
CANVA
8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title
BASEMENT PLAN - ENVELOPE

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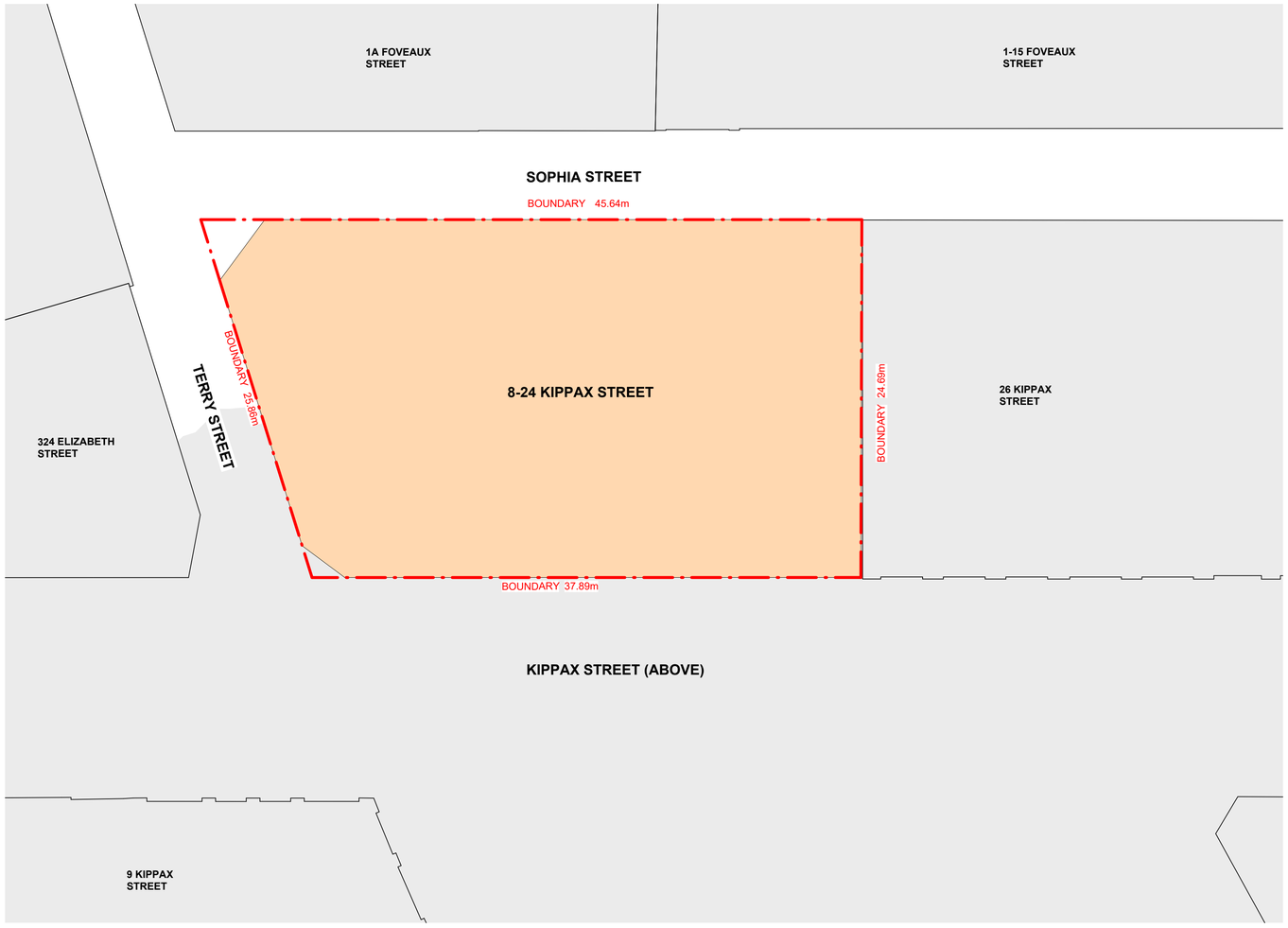
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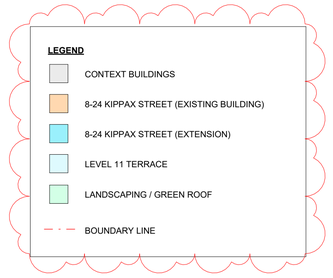
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1 LOWER GROUND PLAN - ENVELOPE
SCALE 1 : 200



Scale 1:200
0 2m 4m 10m 20m

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Russell Lee no. 6367

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Project No.
22058.0

Project
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8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
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Drawing Title
LOWER GROUND PLAN - ENVELOPE

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1 GROUND LEVEL PLAN - ENVELOPE
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LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- LEVEL 11 TERRACE
- LANDSCAPING / GREEN ROOF
- BOUNDARY LINE

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8-24 KIPPAX STREET, SURRY HILLS

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Drawing Title
GROUND PLAN - ENVELOPE

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1 LEVEL 01 PLAN - ENVELOPE
SCALE 1 : 200

LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- LEVEL 11 TERRACE
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Scale 1:200

0 2m 4m 10m 20m

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COX

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Project No.
22058.0

Project
CANVA
8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
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Drawing Title
LEVEL 1 PLAN - ENVELOPE

Document Control Status:
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Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** As indicated @ A1
Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-2103	**Revision:** 2

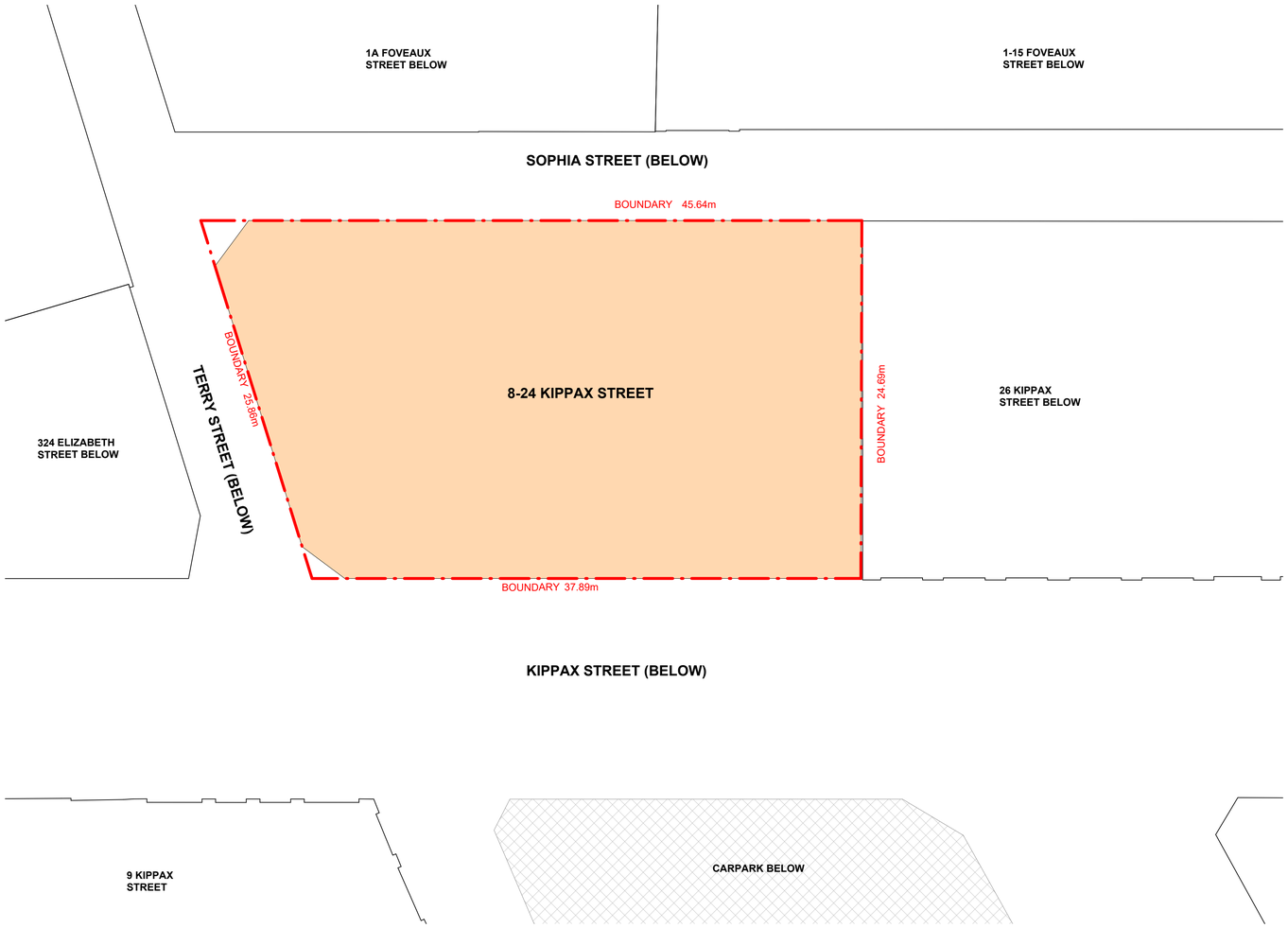
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LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- LEVEL 11 TERRACE
- LANDSCAPING / GREEN ROOF
- BOUNDARY LINE

1 TYPICAL LEVEL PLAN - ENVELOPE
SCALE 1 : 200

Scale 1:200

0 2m 4m 10m 20m

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Project No.
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Project
CANVA

8-24 KIPPAX STREET, SURRY HILLS

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Drawing Title
TYPICAL LEVEL PLAN - ENVELOPE

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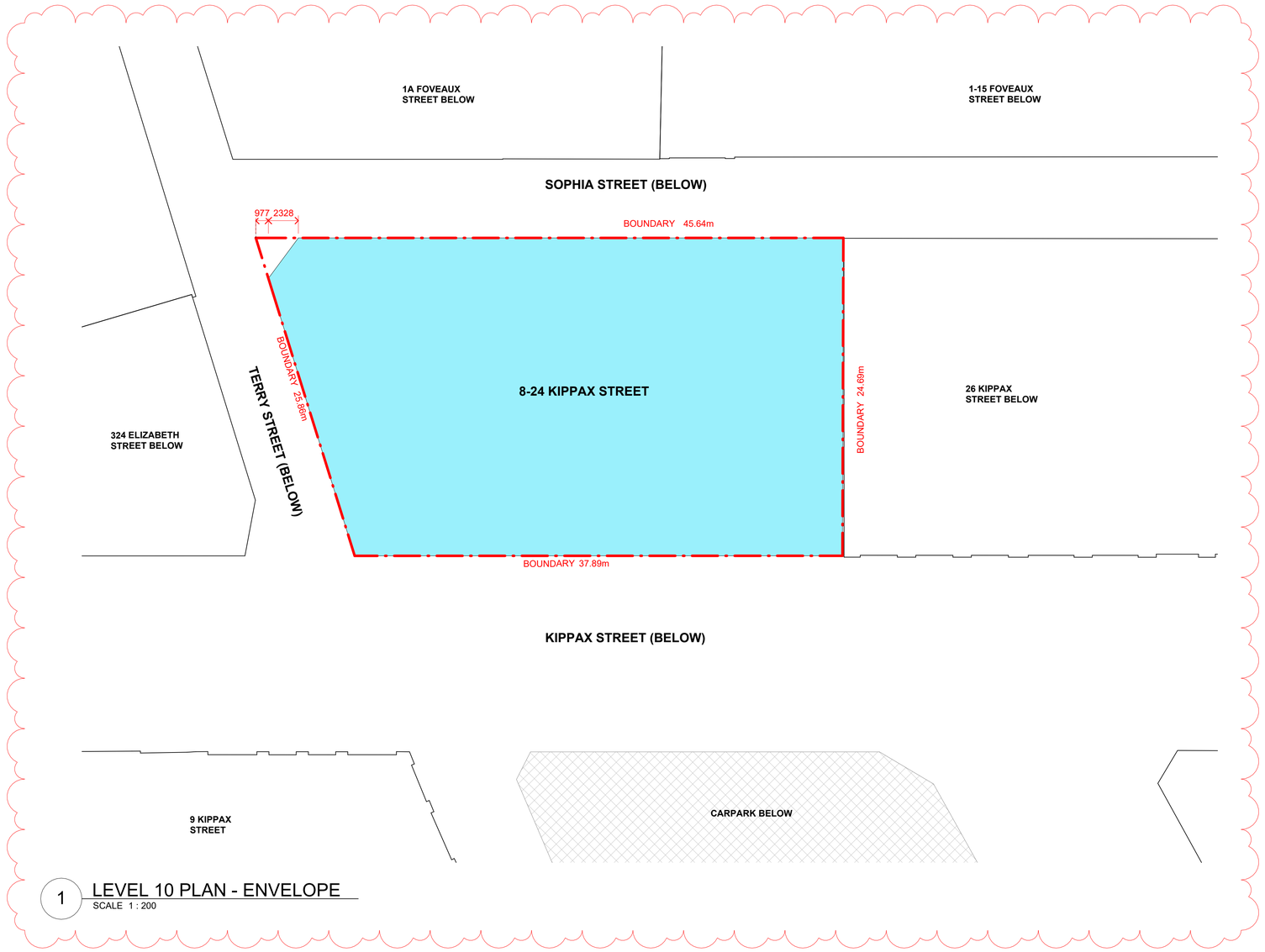
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Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-2104	**Revision:** 2

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Rev	Description	By	Date
1	Issue For PP Submission	LV	06/12/2023
2	Amendments to PP Submission	LV	04/04/2024



1 LEVEL 10 PLAN - ENVELOPE
SCALE 1 : 200

Scale 1:200

0 2m 4m 10m 20m

PROJECT MANAGER — GENERATE PROPERTY GROUP
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LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- LEVEL 11 TERRACE
- LANDSCAPING / GREEN ROOF
- BOUNDARY LINE

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coxarchitecture.com.au

Nominated Architects:
Joe Agius no. 6491
Russell Lee no. 6367

Client
CANVA

Project No.
22058.0

Project
CANVA
8-24 KIPPAX STREET, SURRY HILLS

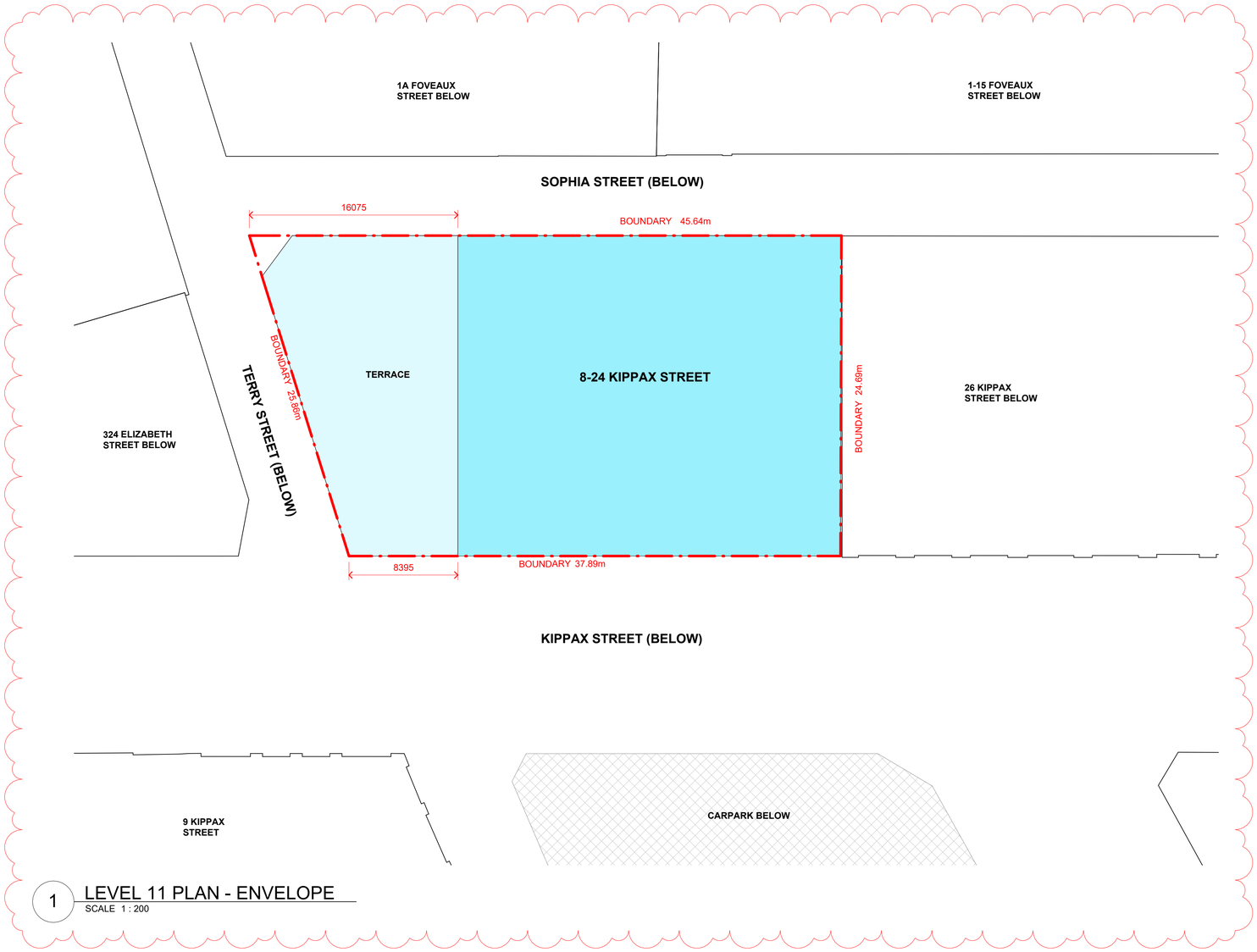
Acknowledgement
In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title
LEVEL 10 PLAN - ENVELOPE

Document Control Status:
PLANNING PROPOSAL

Co-ordinated: LV	**Drawn:** HC
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Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-2105	**Revision:** 2

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1 LEVEL 11 PLAN - ENVELOPE
SCALE 1 : 200

Scale 1:200

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LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
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- LEVEL 11 TERRACE
- LANDSCAPING / GREEN ROOF
- BOUNDARY LINE

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Nominated Architects:
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Russell Lee no. 6367

Client
CANVA

Project No.
22058.0

Project
CANVA
8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title
LEVEL 11 PLAN - ENVELOPE

Document Control Status:
PLANNING PROPOSAL

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** As indicated @ A1
Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-2106	**Revision:** 2

PLOT STAMP DATE: 4/04/2024 2:35:39 PM



1 LEVEL 12 ROOF PLAN - ENVELOPE
SCALE 1 : 200

Scale 1:200

0 2m 4m 10m 20m

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2	Amendments to PP Submission	LV	04/04/2024

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BCA / DDA CONSULTANT Suite 302, Level 3, 151 Castlereagh Street +61 2 9411 5360	**JENSEN HUGHES**

LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- LEVEL 11 TERRACE
- LANDSCAPING / GREEN ROOF
- BOUNDARY LINE

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In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title
ROOF PLAN - ENVELOPE

Document Control Status:
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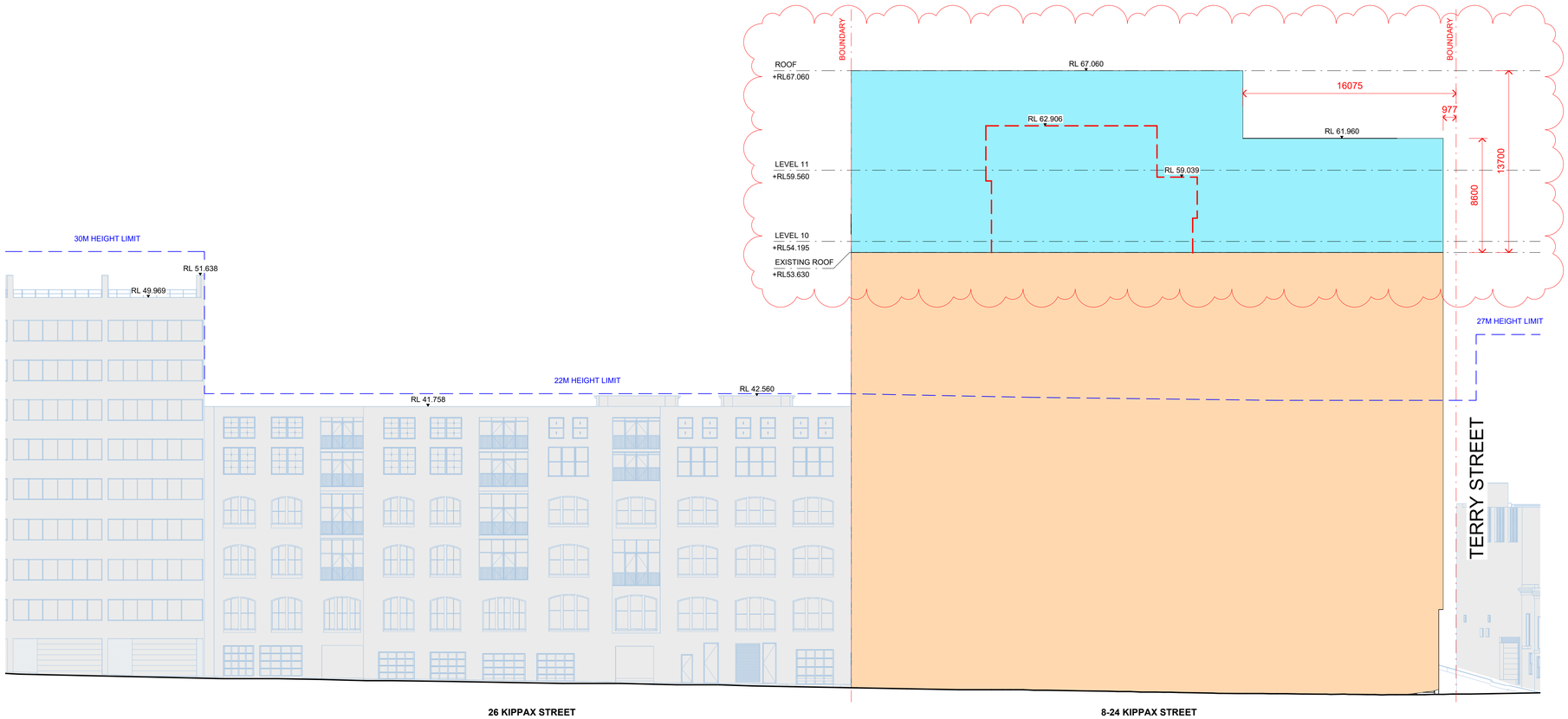
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Project Architect: LV	**Scale:** As indicated @ A1
Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-2107	**Revision:** 2

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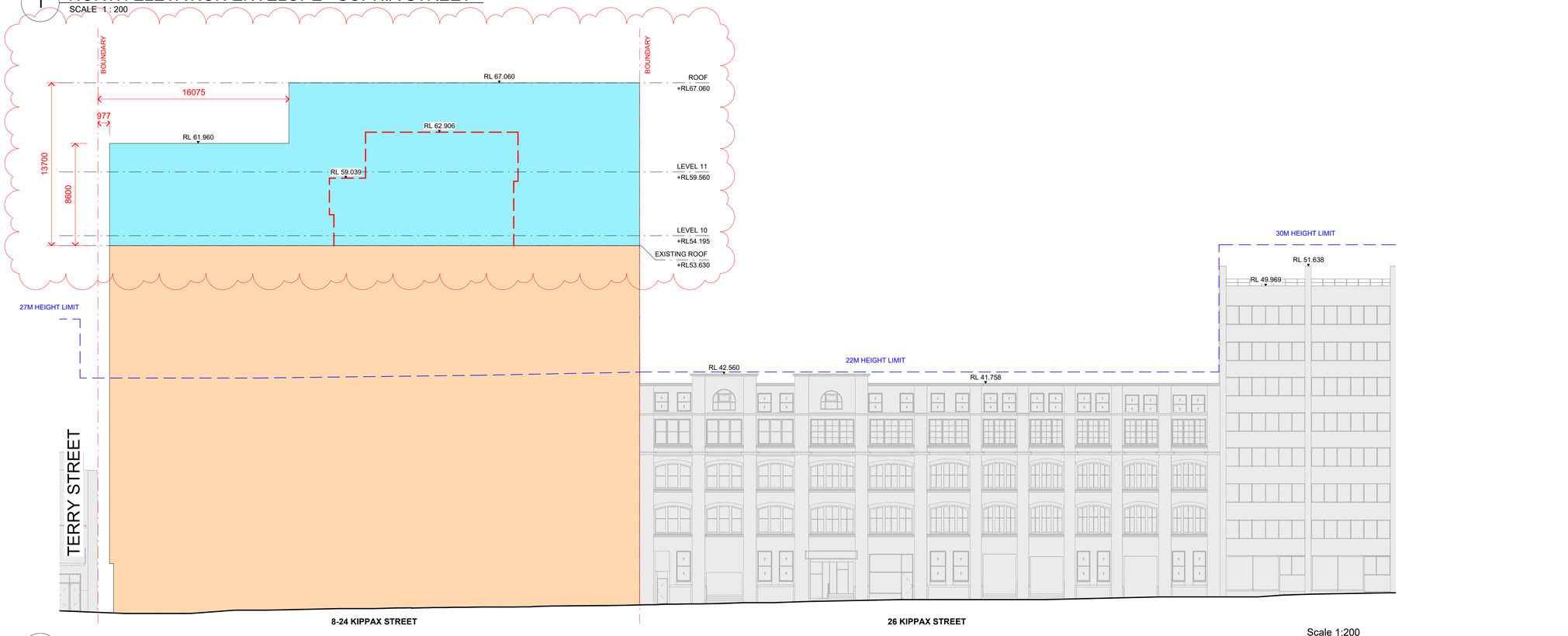
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1	Issue For PP Submission	LV	06/12/2023
2	Amendments to PP Submission	LV	04/04/2024



1 NORTH ELEVATION ENVELOPE - SOPHIA STREET
SCALE 1 : 200



2 SOUTH ELEVATION ENVELOPE - KIPPAX STREET
SCALE 1 : 200

Scale 1:200

0 2m 4m 10m 20m

LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- EXISTING PLANT OUTLINE
- HEIGHT LIMIT PLANE
- BOUNDARY LINE

PROJECT MANAGER Level 13/25 Bligh St, Sydney NSW 2000	**GENERATE PROPERTY GROUP**
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Project
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8-24 KIPPAX STREET, SURRY HILLS

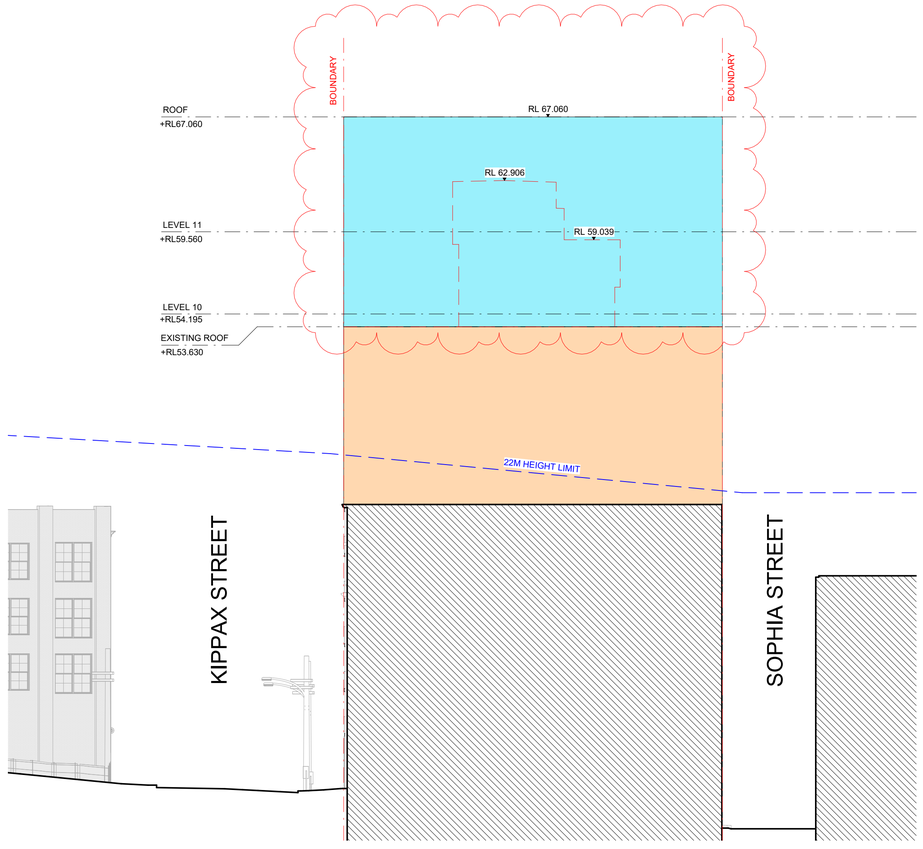
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Drawing Title
ENVELOPE ELEVATIONS - SHEET 1

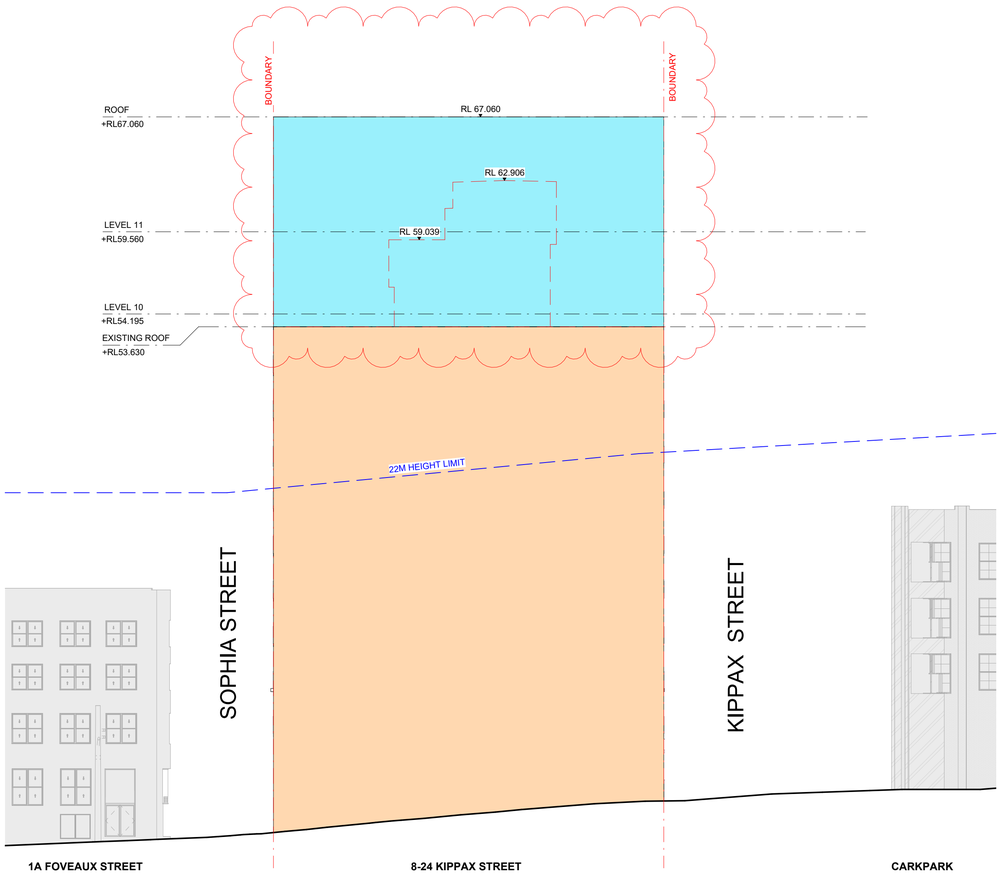
Document Control Status:
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Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** As indicated @ A1
Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-3100	**Revision:** 2

PLOT STAMP DATE: 4/04/2024 2:35:56 PM



1 EAST ELEVATION ENVELOPE
SCALE 1 : 200



2 WEST ELEVATION ENVELOPE - TERRY STREET
SCALE 1 : 200

Scale 1:200

0 2m 4m 10m 20m

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LEGEND

- CONTEXT BUILDINGS
- 8-24 KIPPAX STREET (EXISTING BUILDING)
- 8-24 KIPPAX STREET (EXTENSION)
- EXISTING PLANT OUTLINE
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8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
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Drawing Title
ENVELOPE ELEVATIONS - SHEET 2

Document Control Status:
PLANNING PROPOSAL

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** As indicated @ A1
Project Director: RJ	**Date:** 04/04/2024
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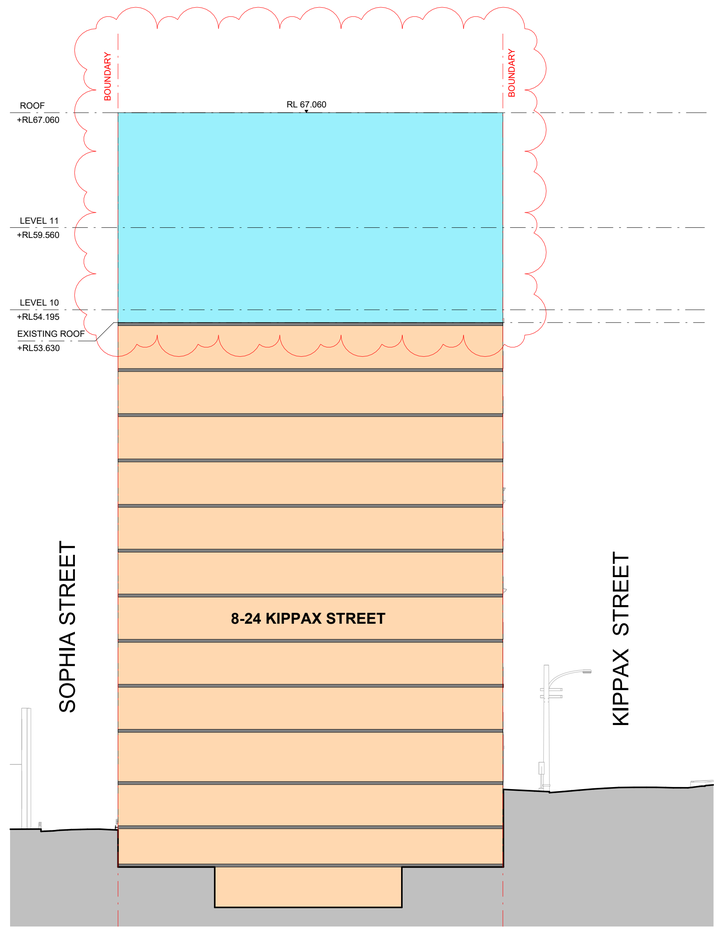
WASTE CONSULTANT — MRA CONSULTING
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+61 2 8541 6169

TRAFFIC CONSULTANT — TTPA
10 Help St, Chatswood NSW 2067
+61 2 9411 5660

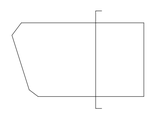
FACADE ENGINEER — SURFACE DESIGN
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1 SECTION ENVELOPE
SCALE 1 : 200


KEY PLAN

Scale 1:200

0 2m 4m 10m 20m



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8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
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Drawing Title
ENVELOPE SECTION

Document Control Status:
PLANNING PROPOSAL

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** As indicated @ A1
Project Director: RJ	**Date:** 04/04/2024
Drawing Number: PP-4100	**Revision:** 2

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Attachment A4

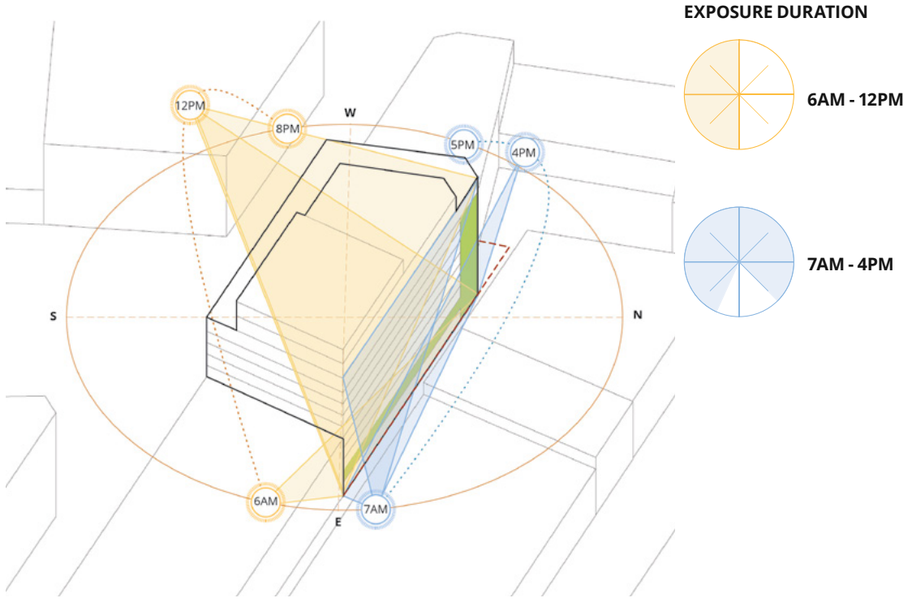
Landscape Report

Solar Exposure

Understanding the solar exposure of the facades and rooftop areas is essential for gaining insights into the environment, which is crucial for planning rooftop landscaping and layout guidance.

The 3D analysis based on positioning the project model and its contextual surroundings in the real-world coordinates in SketchUp.

Sophia St Facade (North Facing)

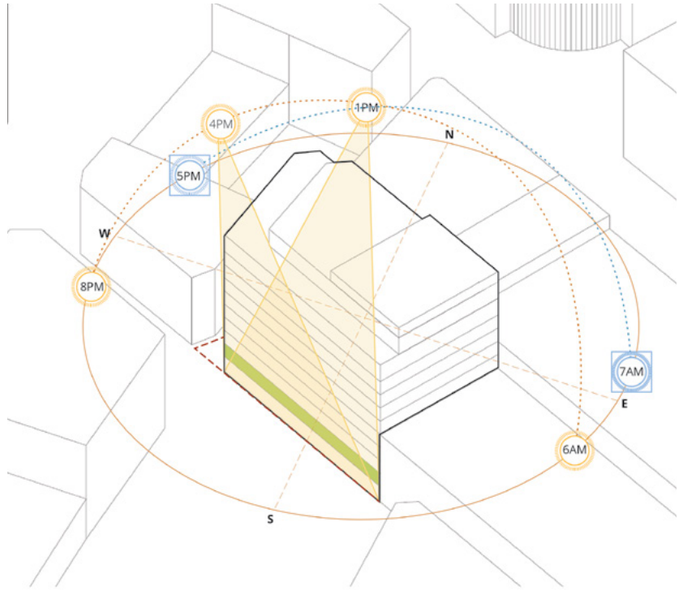


EXPOSURE DURATION

6AM - 12PM

7AM - 4PM

Kippax St Facade (South-West Facing)

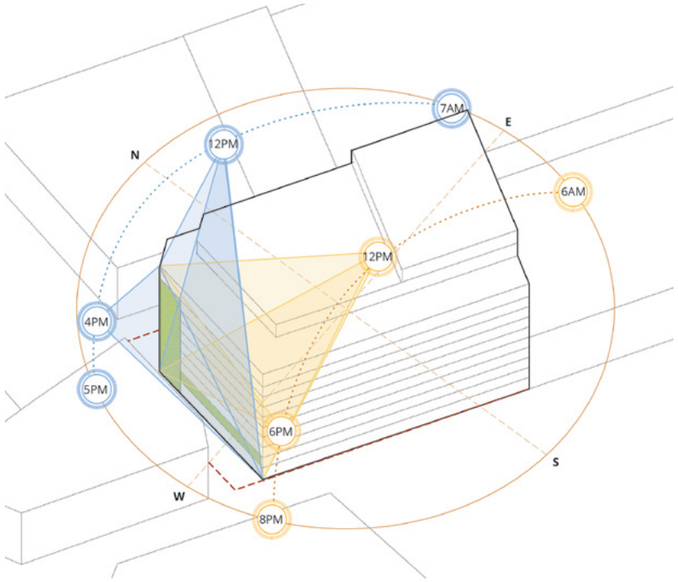


EXPOSURE DURATION

1PM - 4PM

NEGLIGABLE

Terry Street Facade (North-West Facing)

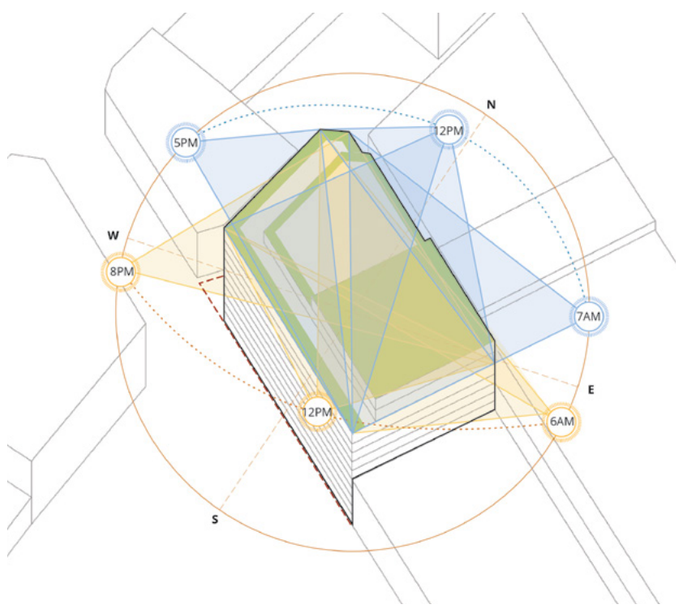


EXPOSURE DURATION

12PM - 6PM

12PM - 4PM

Rooftop Garden



EXPOSURE DURATION

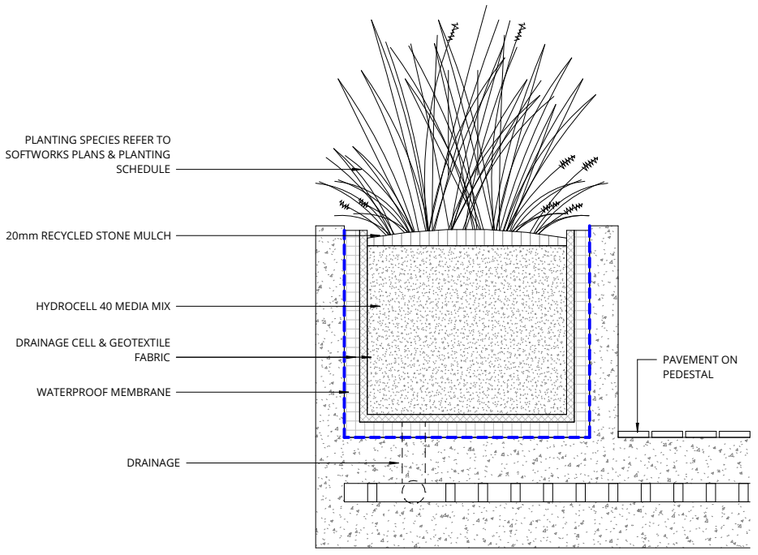
ALL DAY

ALL DAY

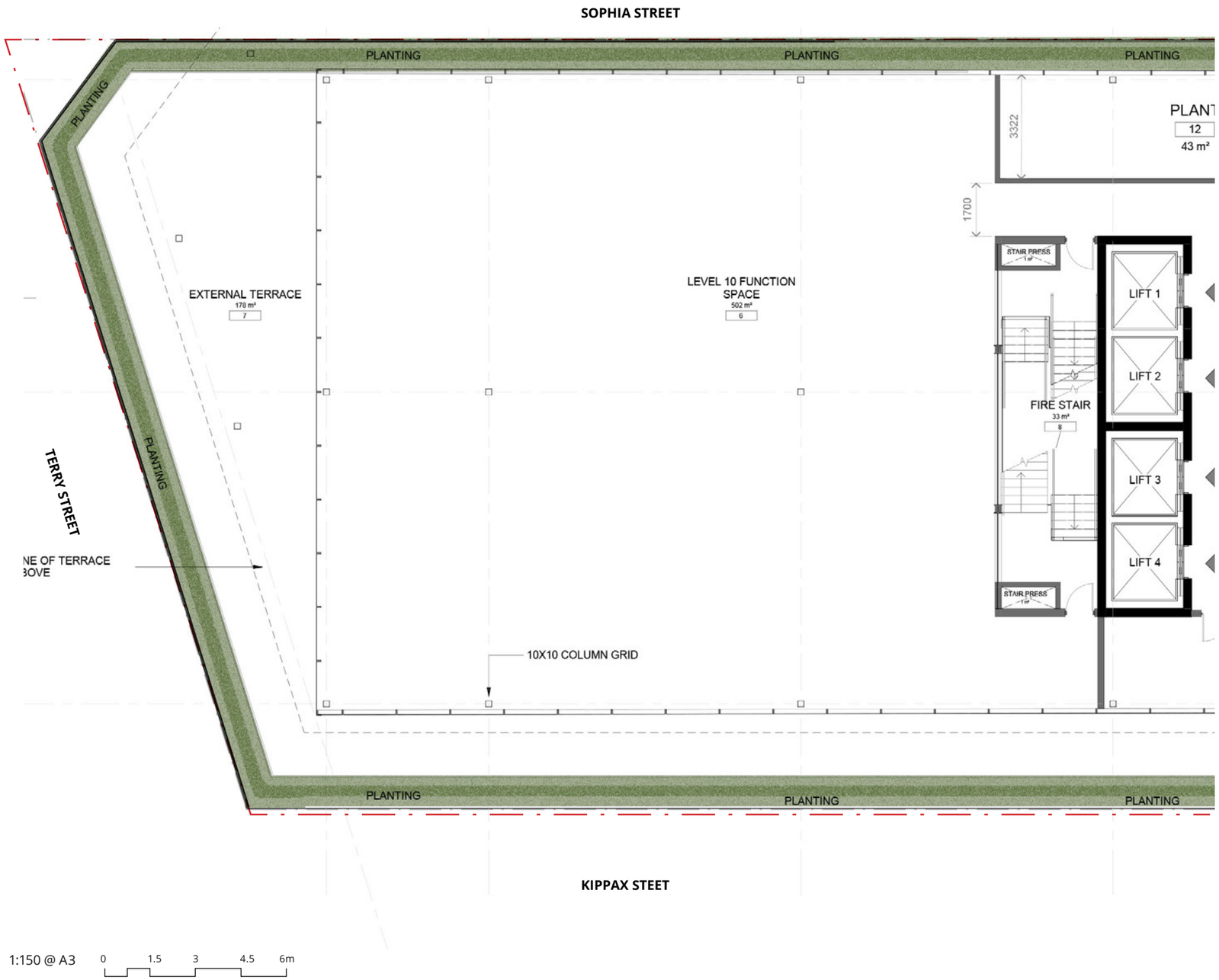
KEY

- SUMMER SUN EXPOSURE CLOCK
- WINTER SUN EXPOSURE CLOCK
- SUMMER SUN PATH
- WINTER SUN PATH
- TIME OF SUMMER SUN EXPOSURE
- TIME OF WINTER SUN EXPOSURE

Landscape Concept / Level 10



TYPICAL DETAIL 1:20



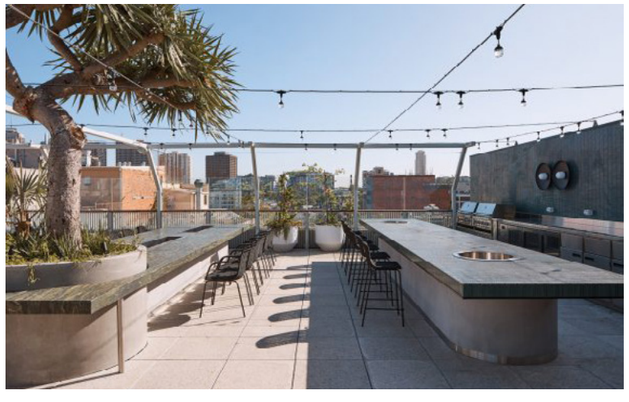
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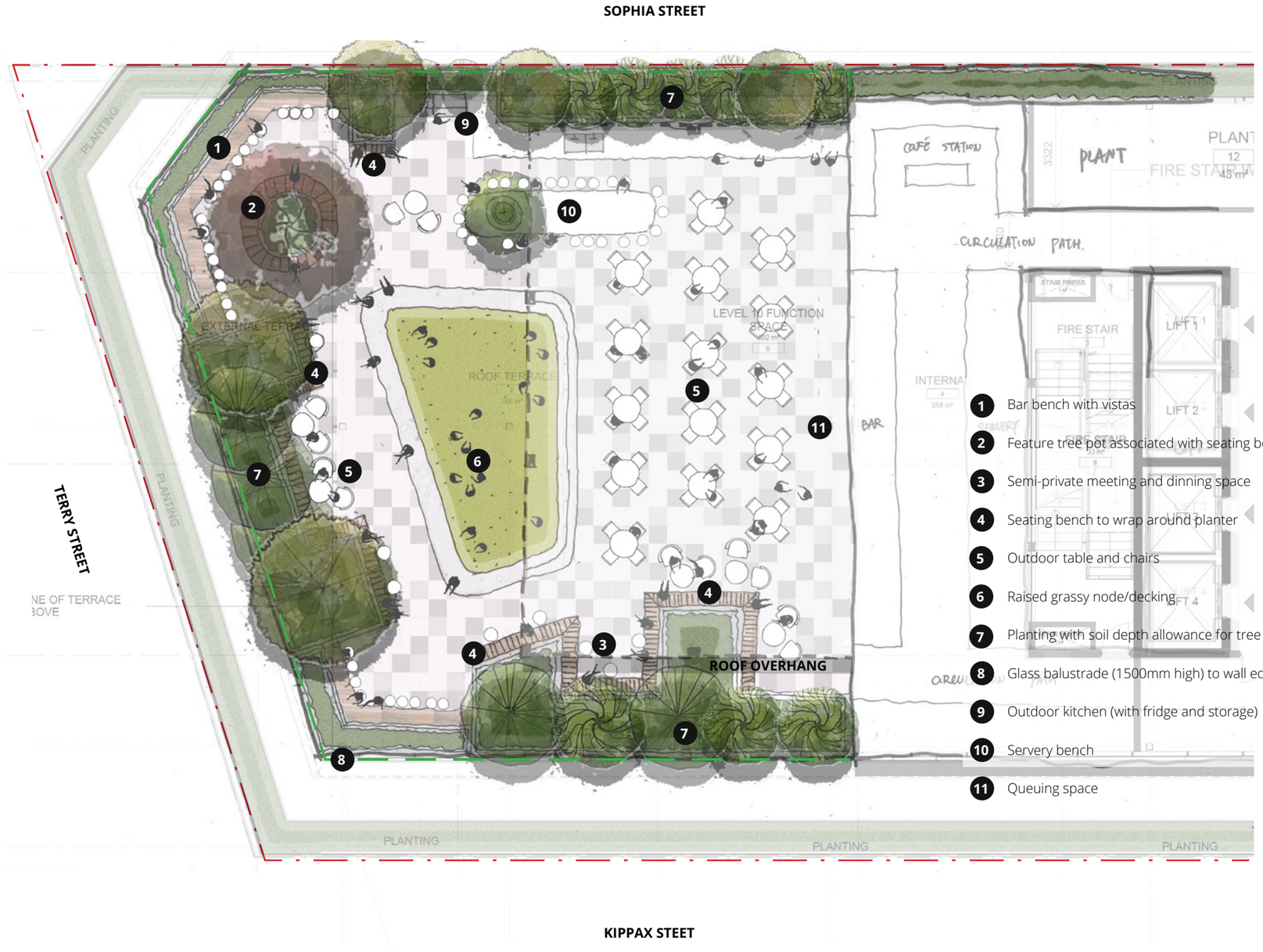
Landscape Concept / Roof Terrace Level 11









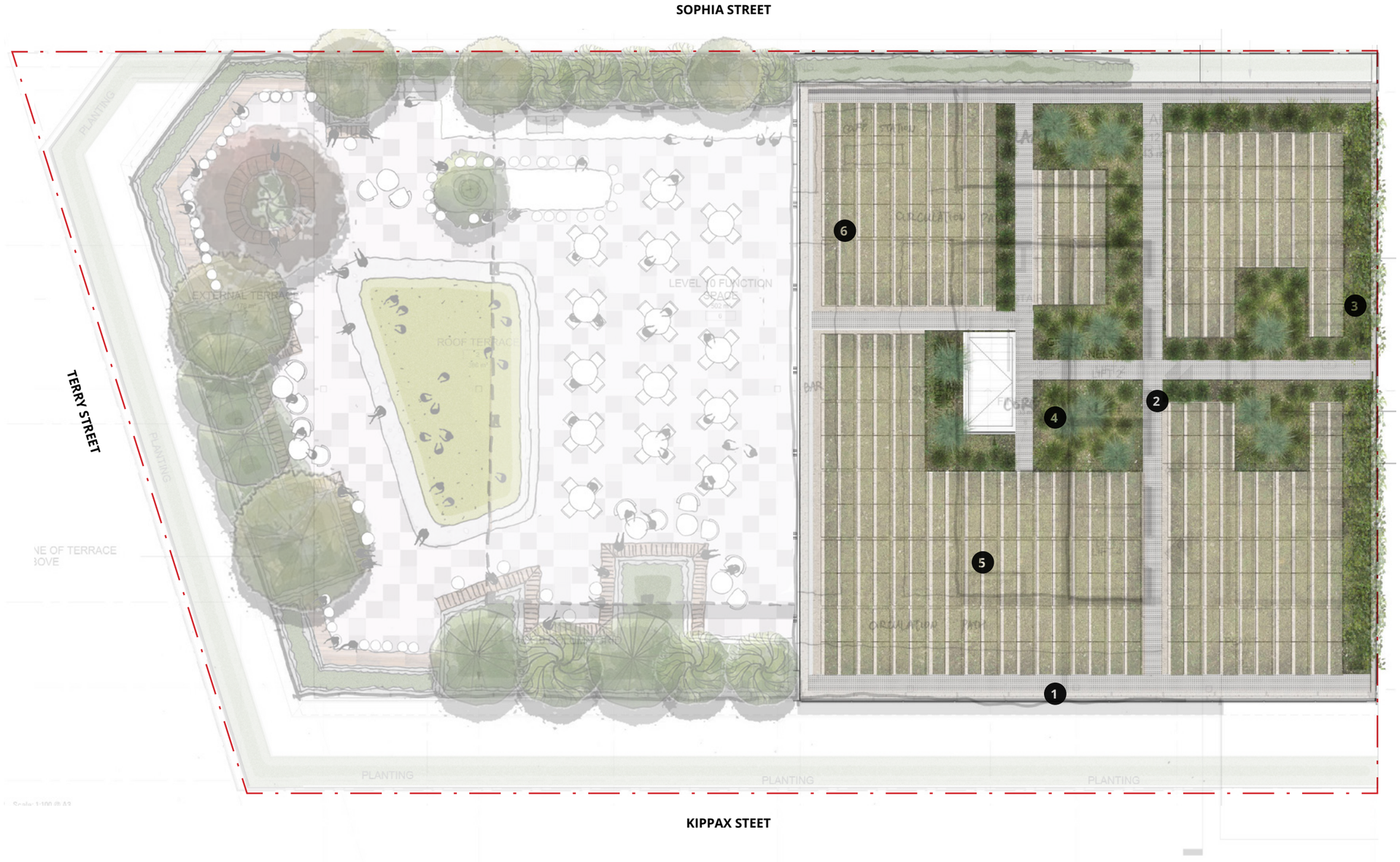


1:150 @ A3 0 1.5 3 4.5 6m

Landscape Concept / Green Roof



1. Concrete hob along edges (200mm thick)
2. Maintenance path (600mm wide)
3. Perimeter planting with cascading plants to the edge)
4. Dense planting zone with small shrubs and low grasses
5. Low planting zone with groundcovers
6. Mulch/decomposed granite under area not suitable for planting



1:150 @ A3 0 1.5 3 4.5 6m

Attachment A5

Survey

BEFORE YOU DIG
www.byda.com.au
Zero Damage - Zero Harm

17 - 51 FOVEAUX STREET
LOT 10
DP1228703

MULTI STOREY COMMERCIAL BUILDING
WITH METAL ROOF

"AURORA HOTEL"
320-324 ELIZABETH STREET
LOT 1 & 2
DP1042078

TWO STOREY COMMERCIAL BUILDING
WITH METAL ROOF

8-24 KIPPAX STREET
LOT 3
DP547558
9 STOREY COMMERCIAL BUILDING WITH ROOF DECK

SITE AREA
1037m²
(BY DP547558)
1031.6m²
(BY CALCULATION)

26-44 KIPPAX STREET
SP57612

MULTI STOREY COMMERCIAL BRICK BUILDING WITH METAL ROOF

53-55 FOVEAUX STREET
LOT B
DP398932

2 STOREY COMMERCIAL BRICK BUILDING WITH METAL ROOF

46-56 KIPPAX STREET
LOT 203
DP578501

MULTI STOREY COMMERCIAL BRICK BUILDING WITH METAL ROOF

342 ELIZABETH STREET
LOT 1
DP89004

MULTI STOREY COMMERCIAL BRICK BUILDING WITH METAL ROOF

1-21 HOLT STREET
LOT 1
DP1121086

COMMERCIAL PARKING AREA

61-81 KIPPAX STREET
LOT 1
DP86372

MULTI STOREY COMMERCIAL BUILDING WITH METAL ROOF

TERRY STREET
SOPHIA STREET
KIPPAX STREET
O'LOUGHLIN STREET
HOLT STREET

1 SURVEY PLAN
1 : 150

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

EASEMENTS FOR GROUND LEVEL
(A) - RIGHT OF WAY 1.06 WIDE & 7.874 LONG (VIDE M695704)
(B) - SUBSTATION PREMISES NO.3164 (VIDE M695704)

SECOND SCHEDULE (4 NOTIFICATIONS) AS SEARCHED ON 24/04/2023

1. RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2. LAND EXCLUDES THE ROAD(S) SHOWN IN DP 553194
3. PREMISES KNOWN AS 8 - 24 KIPPAX STREET, SURRY HILLS
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   AK971502 MORTGAGE OF LEASE AK971351 TO ANZ FIDUCIARY SERVICES PTY LTD
   AK971571 CHANGE OF NAME AFFECTING LEASE I32839 LESSEE NOW ALPHA DISTRIBUTION MINISTERIAL HOLDING CORPORATION

NOTES:

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C) LEVELS SHOWN ARE OF AUSTRALIAN HEIGHT DATUM.
   ORIGIN OF LEVELS : PM53243 RL 18.302 (AHD), CLASS LC
D) USE STATED DIMENSIONS. DO NOT SCALE.
E) THESE NOTES FORM PART OF THIS PLAN AND CANNOT BE REMOVED.
F) NO COVENANTS AND/OR RESTRICTIONS HAVE BEEN INVESTIGATED BY C & A SURVEYORS PTY LTD.

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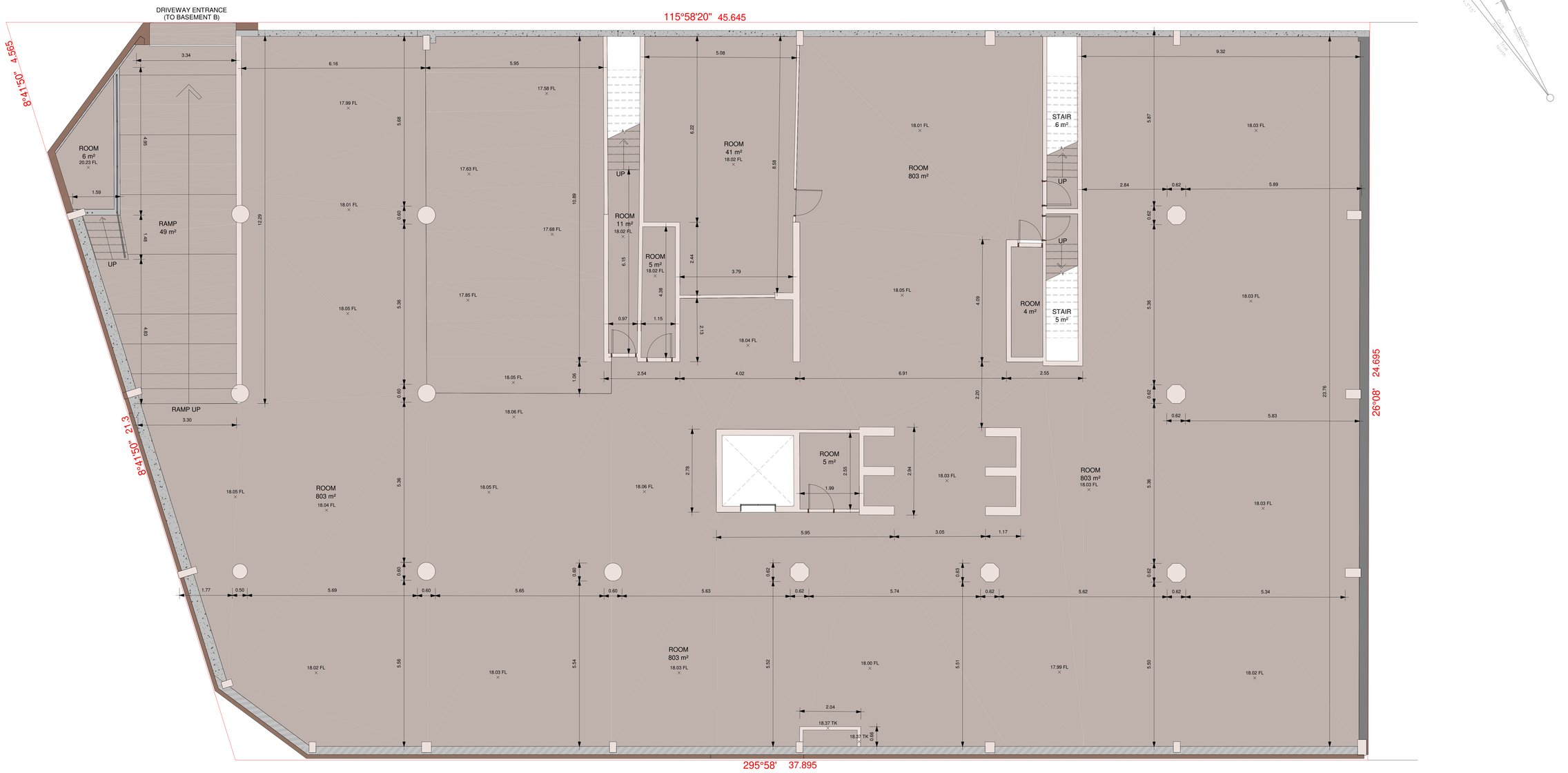
DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 150@A0
REFERENCE:	24874-23	SHEET:	2 OF 34

245



246

BASEMENT B AREA		
LEVEL	NAME	AREA
BASEMENT B	RAMP	49 m²
BASEMENT B	ROOM	803 m²
BASEMENT B	ROOM	6 m²
BASEMENT B	ROOM	41 m²
BASEMENT B	ROOM	5 m²
BASEMENT B	ROOM	11 m²
BASEMENT B	ROOM	5 m²
BASEMENT B	ROOM	4 m²
BASEMENT B	STAIR	6 m²
BASEMENT B	STAIR	5 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

1 BASEMENT B FLOOR PLAN

1 : 50

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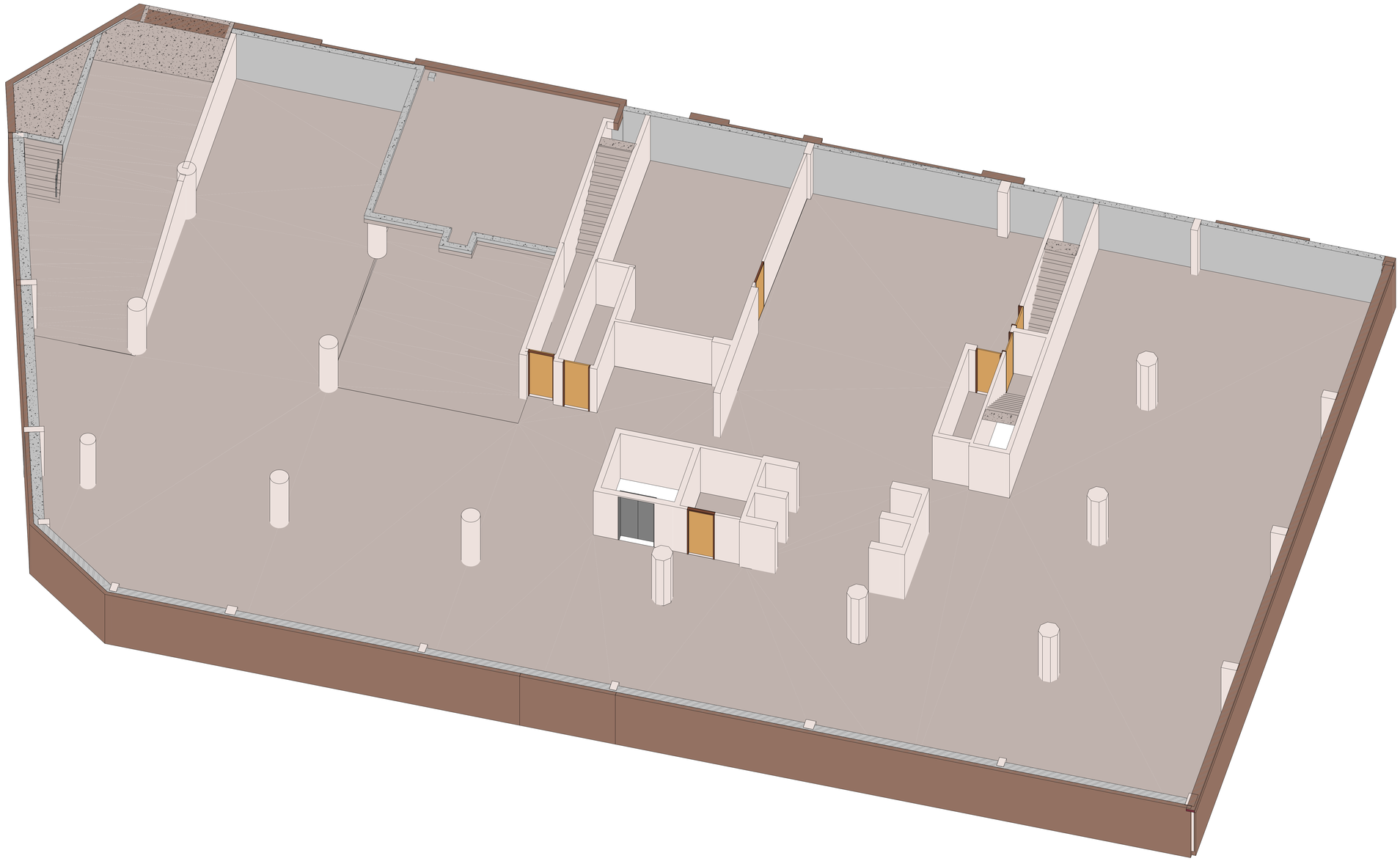
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT 8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	3 OF 34



1 BASEMENT B 3D FLOOR PLAN VIEW

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

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NOTES:

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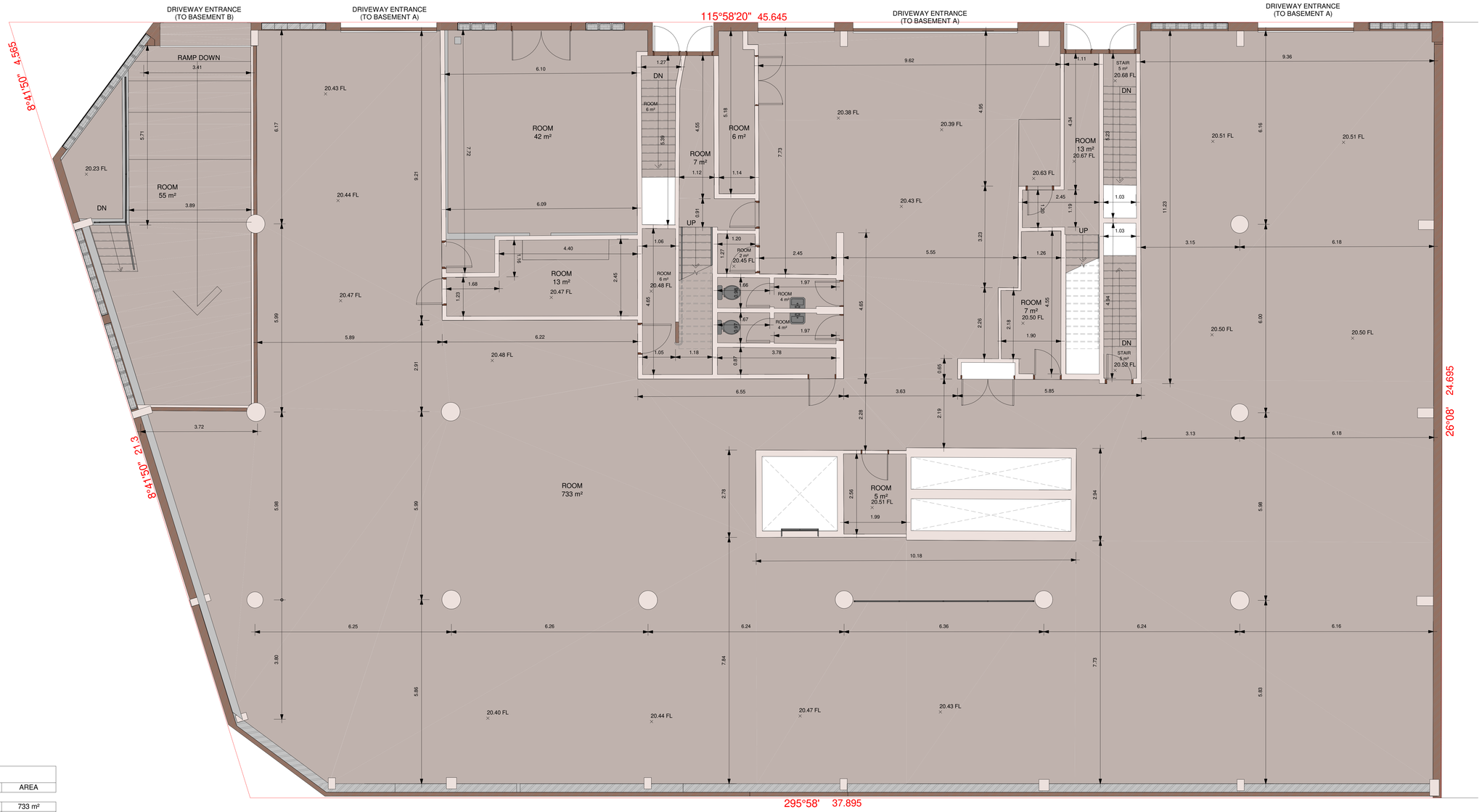
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
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DATE DRAWN:	29/04/2023	SCALE:	@A0
REFERENCE:	24874-23	SHEET:	4 OF 34



1 BASEMENT A FLOOR PLAN
1 : 50

BASEMENT A AREA		
LEVEL	NAME	AREA
BASEMENT A	ROOM	733 m²
BASEMENT A	ROOM	5 m²
BASEMENT A	ROOM	42 m²
BASEMENT A	ROOM	13 m²
BASEMENT A	ROOM	7 m²
BASEMENT A	ROOM	6 m²
BASEMENT A	ROOM	6 m²
BASEMENT A	ROOM	6 m²
BASEMENT A	ROOM	2 m²
BASEMENT A	ROOM	4 m²
BASEMENT A	ROOM	4 m²
BASEMENT A	ROOM	7 m²
BASEMENT A	ROOM	13 m²
BASEMENT A	ROOM	55 m²
BASEMENT A	STAIR	5 m²
BASEMENT A	STAIR	5 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
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02		
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DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	5 OF 34



1 BASEMENT A 3D FLOOR PLAN VIEW

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
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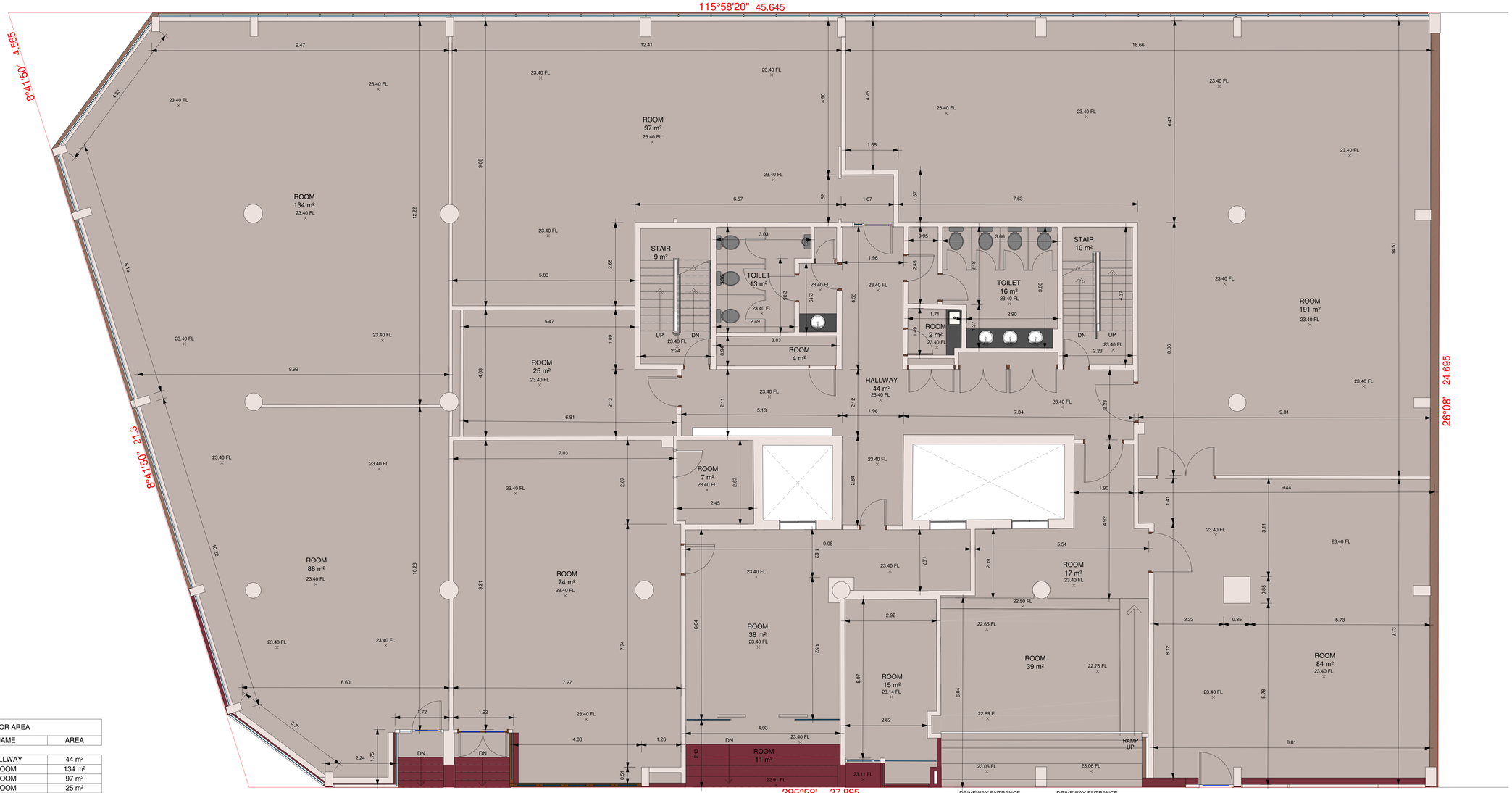
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT 8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

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DATE DRAWN:	29/04/2023	SCALE:	@A0
REFERENCE:	24874-23	SHEET:	6 OF 34



1 GROUND FLOOR PLAN
1 : 50

GROUND FLOOR AREA		
LEVEL	NAME	AREA
GROUND FLOOR	HALLWAY	44 m²
GROUND FLOOR	ROOM	134 m²
GROUND FLOOR	ROOM	97 m²
GROUND FLOOR	ROOM	25 m²
GROUND FLOOR	ROOM	74 m²
GROUND FLOOR	ROOM	38 m²
GROUND FLOOR	ROOM	11 m²
GROUND FLOOR	ROOM	15 m²
GROUND FLOOR	ROOM	39 m²
GROUND FLOOR	ROOM	17 m²
GROUND FLOOR	ROOM	84 m²
GROUND FLOOR	ROOM	191 m²
GROUND FLOOR	ROOM	7 m²
GROUND FLOOR	ROOM	2 m²
GROUND FLOOR	ROOM	4 m²
GROUND FLOOR	ROOM	88 m²
GROUND FLOOR	STAIR	9 m²
GROUND FLOOR	STAIR	10 m²
GROUND FLOOR	TOILET	16 m²
GROUND FLOOR	TOILET	13 m²

LEGEND:

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EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

SECOND SCHEDULE (4 NOTIFICATIONS) AS SEARCHED ON 24/04/2023

1. RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2. LAND EXCLUDES THE ROAD(S) SHOWN IN DP 553194
3. PREMISES KNOWN AS 8 - 24 KIPPAX STREET, SURRY HILLS
4. I32839 LEASE TO SYDNEY ELECTRICITY OF PART BEING SUBSTATION NO.3164 TOGETHER WITH RIGHT OF WAY SHOWN IN PLAN WITH M695704. EXPIRES 31.8.2041
   AK971351 LEASE OF LEASE I32839 TO BLUE ASSET PARTNER PTY LTD, ERIC ALPHA ASSET CORPORATION 1 PTY LTD, ERIC ALPHA ASSET CORPORATION 2 PTY LTD, ERIC ALPHA ASSET CORPORATION 3 PTY LTD & ERIC ALPHA ASSET CORPORATION 4 PTY LTD EXPIRES: SEE DEALING, CLAUSE 2.3 (b) (ii).
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   AK971571 CHANGE OF NAME AFFECTING LEASE I32839 LESSEE NOW ALPHA DISTRIBUTION MINISTERIAL HOLDING CORPORATION

NOTES:

A) SERVICES SHOWN HAVE BEEN DERIVED FROM VISUAL EVIDENCE APPARENT AT THE TIME OF SURVEY. SERVICES MAY EXIST WHICH ARE NOT SHOWN. THE RELEVANT SERVICE AUTHORITY SHOULD BE CONTACTED TO VERIFY THE EXISTENCE AND POSITION OF SERVICES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION.
B) DIAMETER, HEIGHT & SPREAD OF TREES ARE APPROXIMATE ONLY.
C) LEVELS SHOWN ARE OF AUSTRALIAN HEIGHT DATUM.
   ORIGIN OF LEVELS : PM53243 RL 18.302 (AHD), CLASS LC
D) USE STATED DIMENSIONS. DO NOT SCALE.
E) THESE NOTES FORM PART OF THIS PLAN AND CANNOT BE REMOVED.
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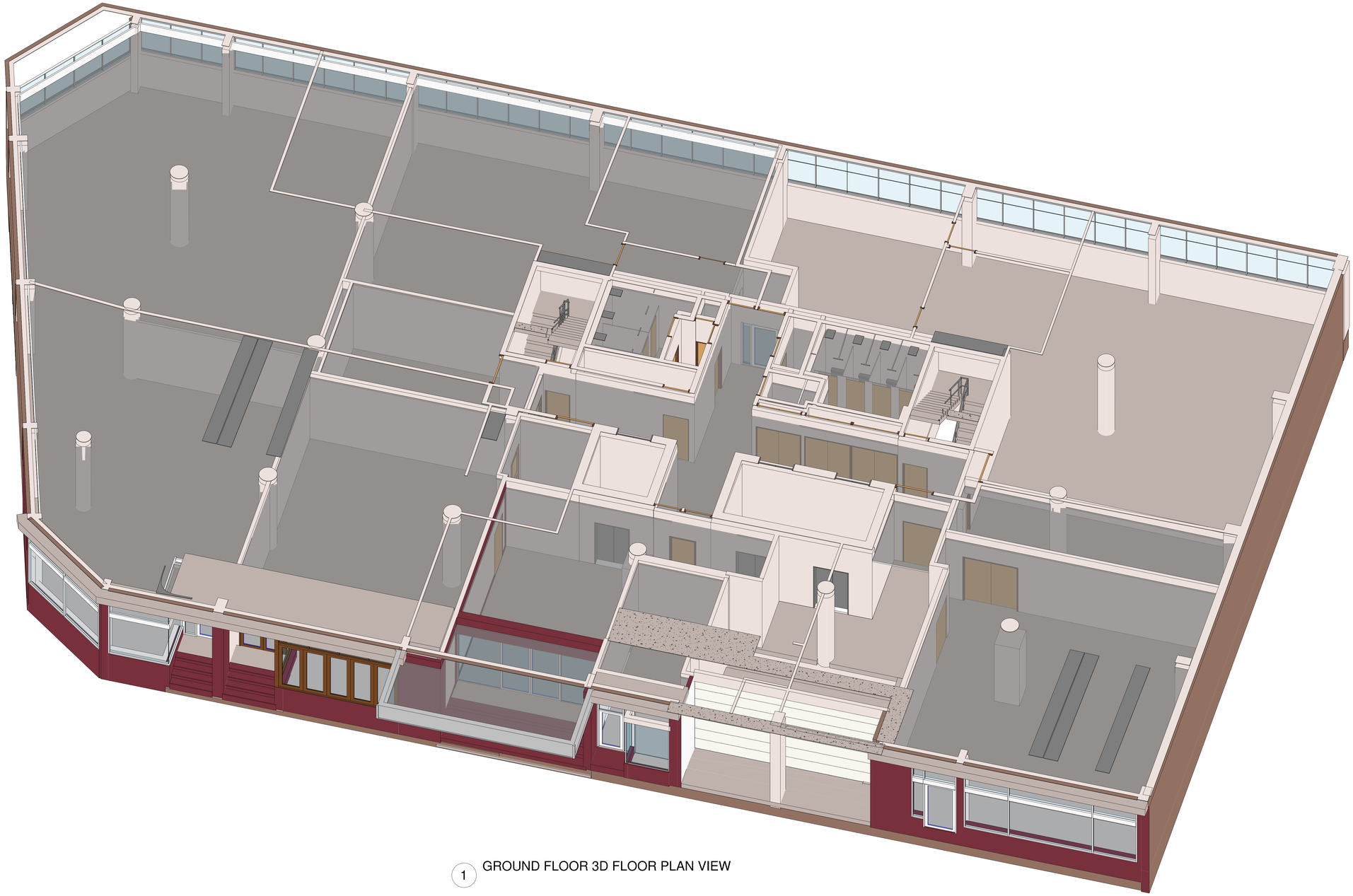
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT 8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	7 OF 34



1 GROUND FLOOR 3D FLOOR PLAN VIEW

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

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NOTES:

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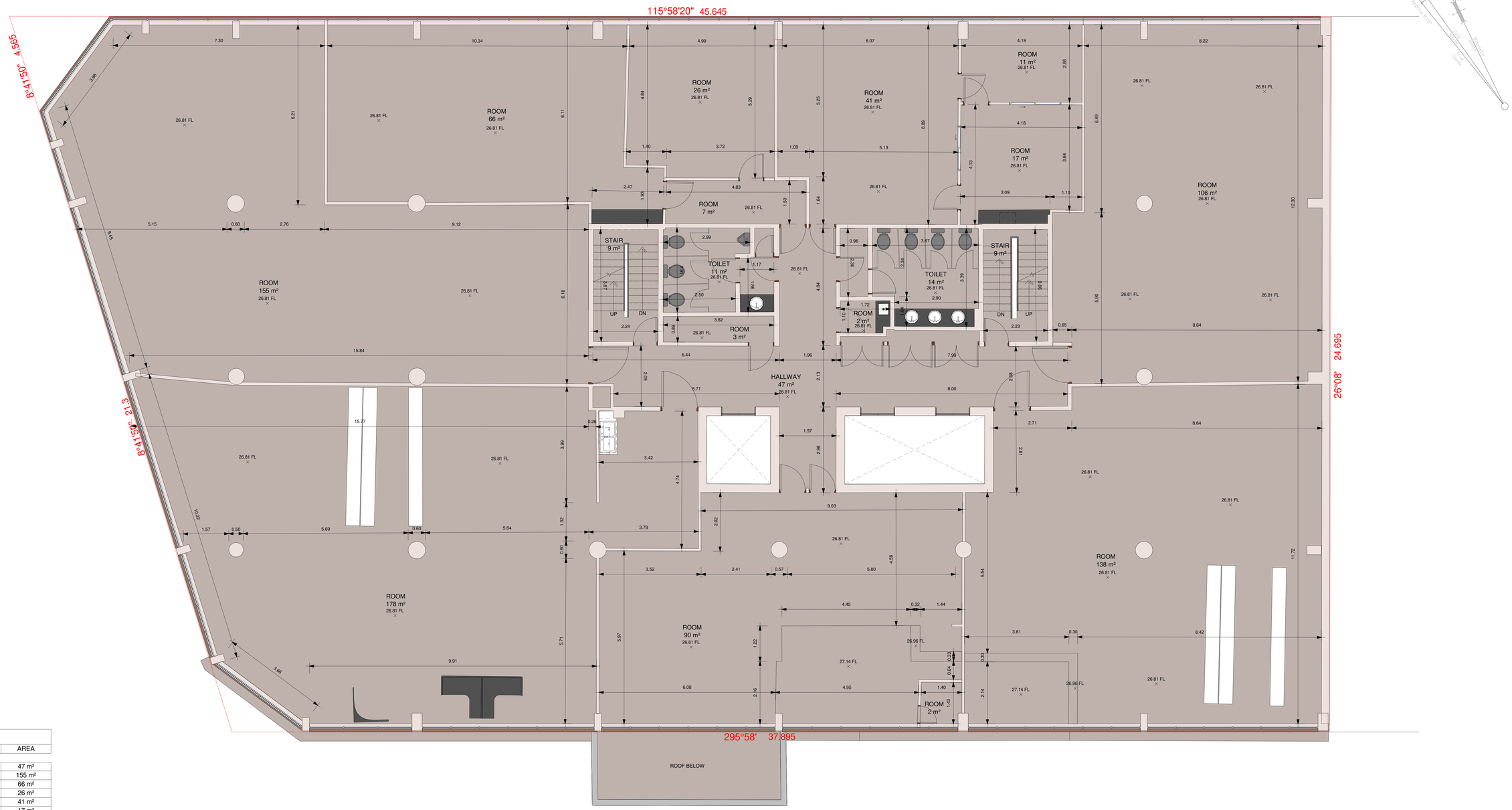
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
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DATE DRAWN:	29/04/2023	SCALE:	@A0
REFERENCE:	24874-23	SHEET:	8 OF 34



1 LEVEL 1 FLOOR PLAN
1 : 50

LEVEL 1 AREA		
LEVEL	NAME	AREA
LEVEL 1	HALLWAY	47 m²
LEVEL 1	ROOM	155 m²
LEVEL 1	ROOM	66 m²
LEVEL 1	ROOM	26 m²
LEVEL 1	ROOM	41 m²
LEVEL 1	ROOM	17 m²
LEVEL 1	ROOM	11 m²
LEVEL 1	ROOM	7 m²
LEVEL 1	ROOM	178 m²
LEVEL 1	ROOM	90 m²
LEVEL 1	ROOM	138 m²
LEVEL 1	ROOM	3 m²
LEVEL 1	ROOM	2 m²
LEVEL 1	ROOM	2 m²
LEVEL 1	ROOM	106 m²
LEVEL 1	STAIR	9 m²
LEVEL 1	STAIR	9 m²
LEVEL 1	TOILET	11 m²
LEVEL 1	TOILET	14 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
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LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

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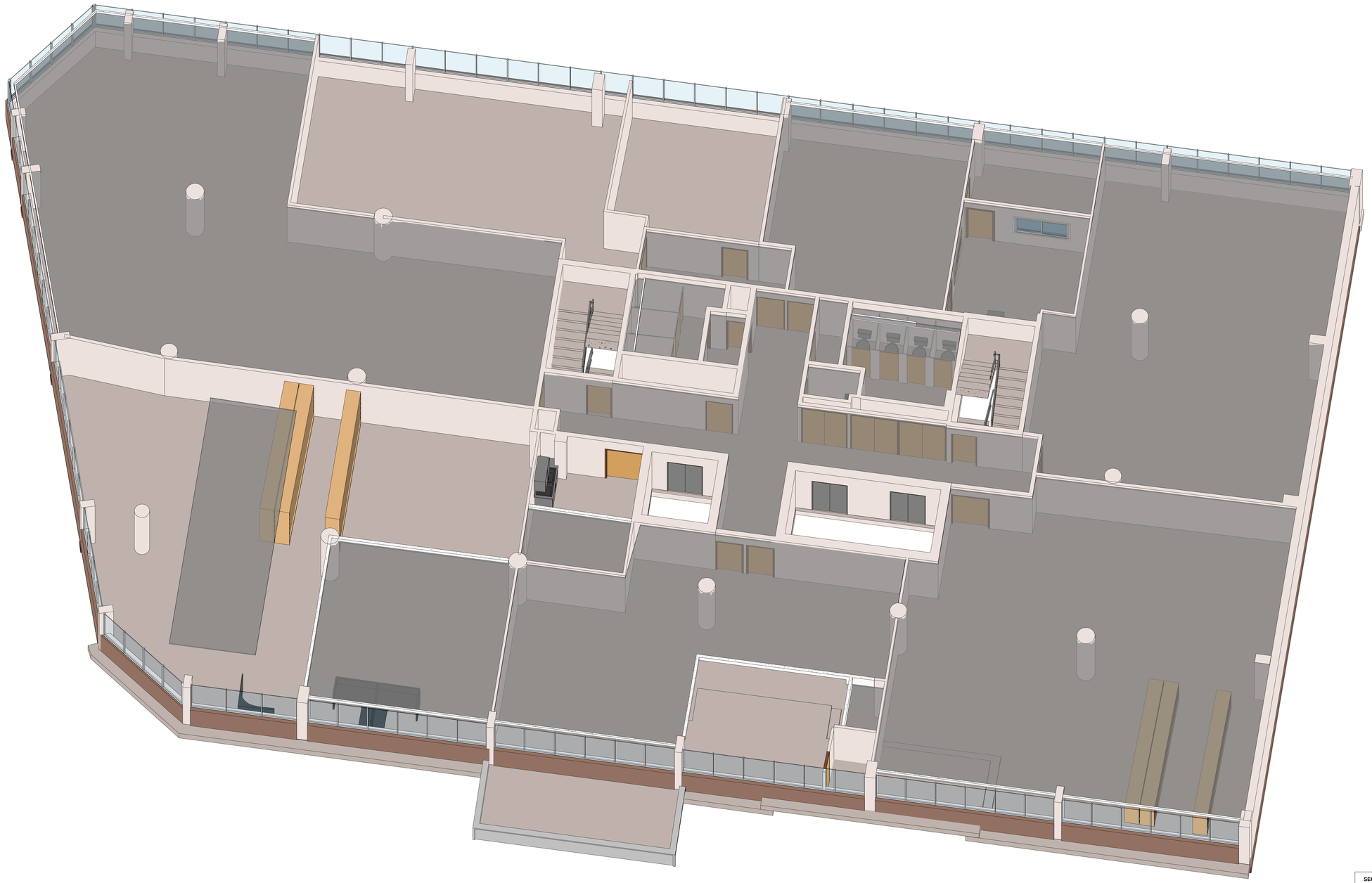
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
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DATUM:	AHD	SURVEYED BY:	TS
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DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	9 OF 34



1 LEVEL 1 3D FLOOR PLAN VIEW

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
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NOTES:

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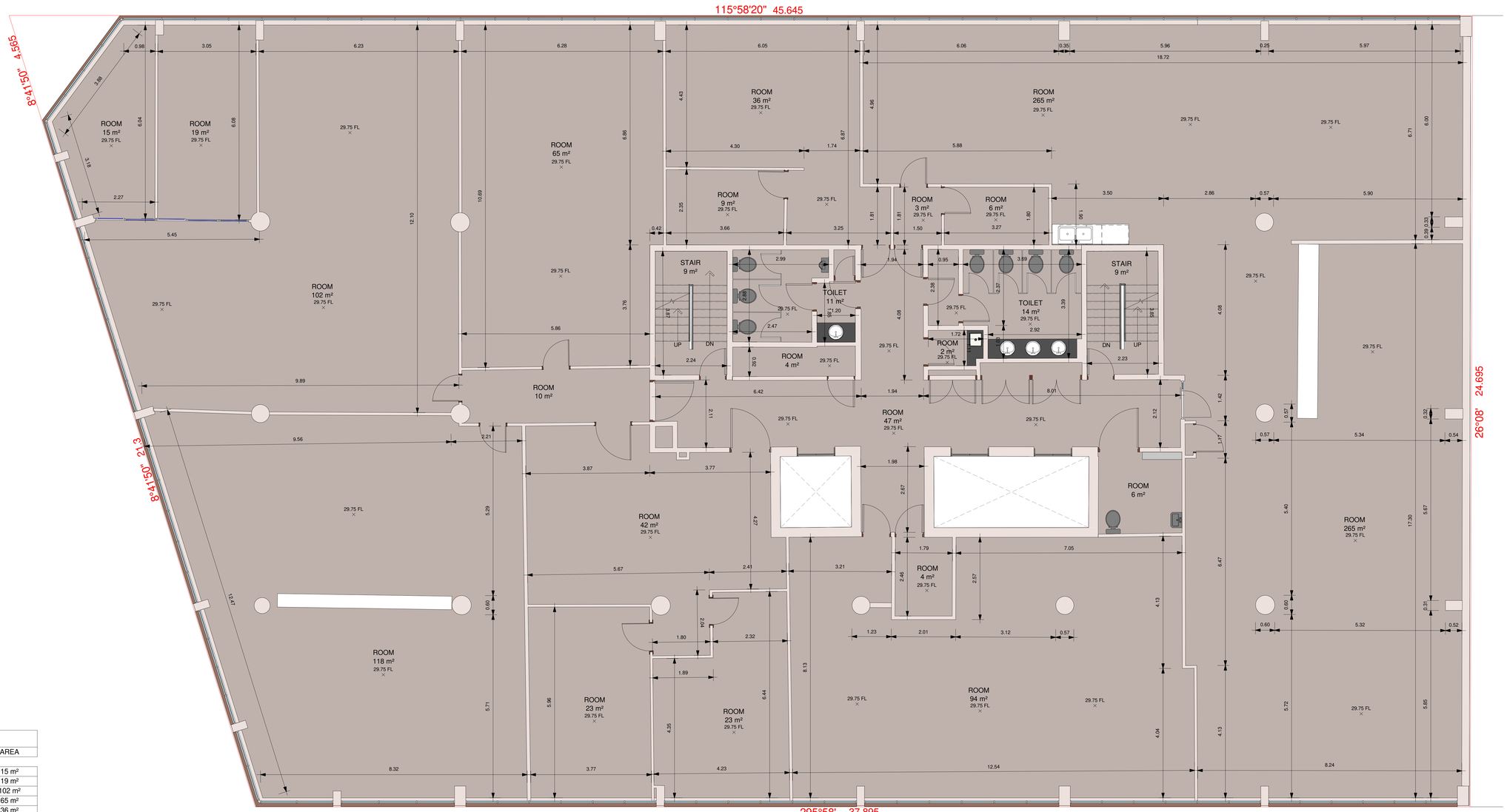
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
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REFERENCE:	24874-23	SHEET:	10 OF 34



1 LEVEL 2 FLOOR PLAN
1 : 50

LEVEL 2 AREA		
LEVEL	NAME	AREA
LEVEL 2	ROOM	15 m²
LEVEL 2	ROOM	19 m²
LEVEL 2	ROOM	102 m²
LEVEL 2	ROOM	65 m²
LEVEL 2	ROOM	36 m²
LEVEL 2	ROOM	9 m²
LEVEL 2	ROOM	265 m²
LEVEL 2	ROOM	47 m²
LEVEL 2	ROOM	2 m²
LEVEL 2	ROOM	6 m²
LEVEL 2	ROOM	3 m²
LEVEL 2	ROOM	4 m²
LEVEL 2	ROOM	10 m²
LEVEL 2	ROOM	42 m²
LEVEL 2	ROOM	23 m²
LEVEL 2	ROOM	23 m²
LEVEL 2	ROOM	118 m²
LEVEL 2	ROOM	94 m²
LEVEL 2	ROOM	4 m²
LEVEL 2	ROOM	6 m²
LEVEL 2	STAIR	9 m²
LEVEL 2	STAIR	9 m²
LEVEL 2	TOILET	11 m²
LEVEL 2	TOILET	14 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
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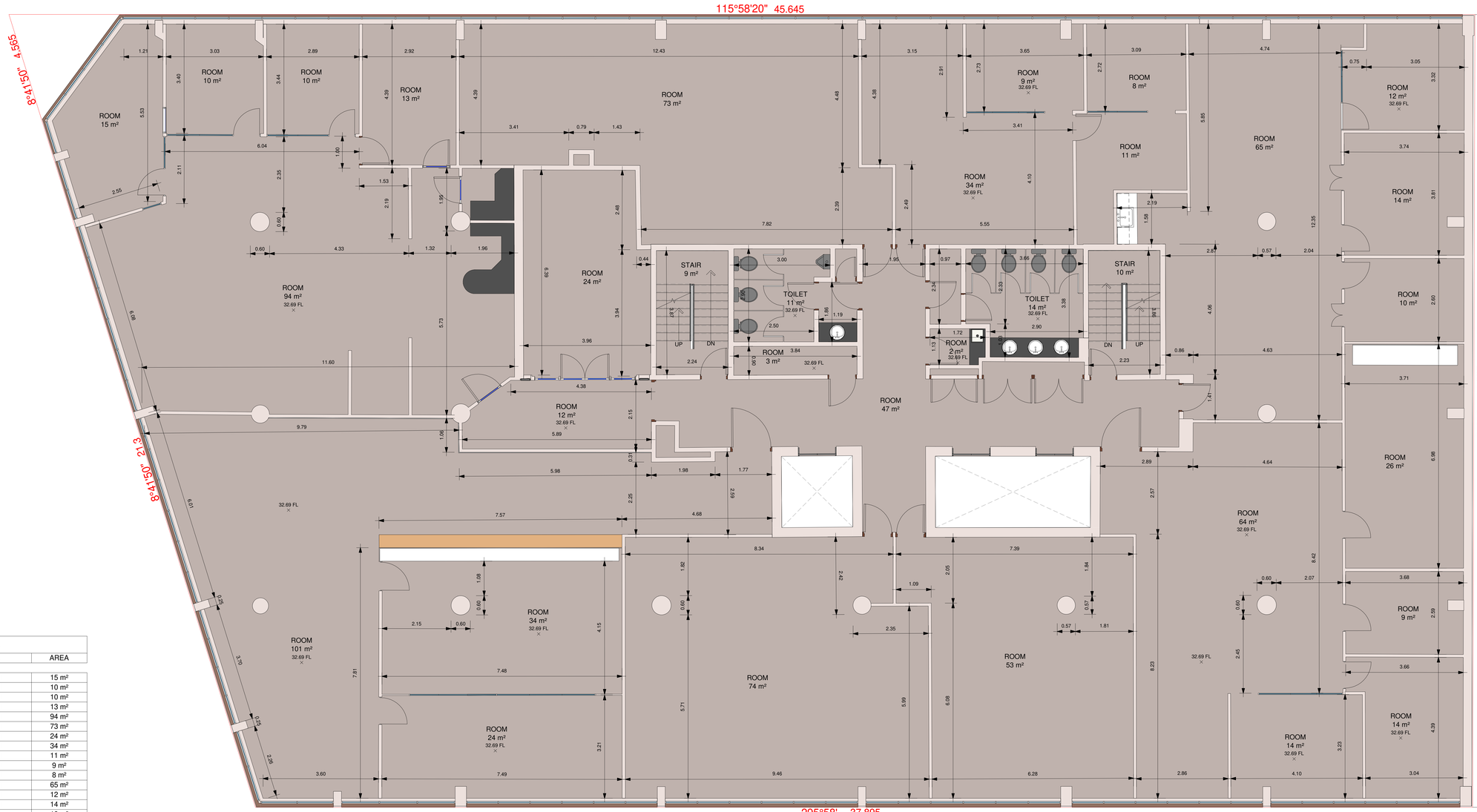
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LEVEL 3 AREA		
LEVEL	NAME	AREA
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LEVEL 3	ROOM	10 m²
LEVEL 3	ROOM	10 m²
LEVEL 3	ROOM	13 m²
LEVEL 3	ROOM	94 m²
LEVEL 3	ROOM	73 m²
LEVEL 3	ROOM	24 m²
LEVEL 3	ROOM	34 m²
LEVEL 3	ROOM	11 m²
LEVEL 3	ROOM	9 m²
LEVEL 3	ROOM	8 m²
LEVEL 3	ROOM	65 m²
LEVEL 3	ROOM	12 m²
LEVEL 3	ROOM	14 m²
LEVEL 3	ROOM	10 m²
LEVEL 3	ROOM	26 m²
LEVEL 3	ROOM	64 m²
LEVEL 3	ROOM	9 m²
LEVEL 3	ROOM	14 m²
LEVEL 3	ROOM	14 m²
LEVEL 3	ROOM	53 m²
LEVEL 3	ROOM	74 m²
LEVEL 3	ROOM	34 m²
LEVEL 3	ROOM	24 m²
LEVEL 3	ROOM	101 m²
LEVEL 3	ROOM	12 m²
LEVEL 3	ROOM	47 m²
LEVEL 3	ROOM	2 m²
LEVEL 3	ROOM	3 m²
LEVEL 3	STAIR	9 m²
LEVEL 3	STAIR	10 m²
LEVEL 3	TOILET	14 m²
LEVEL 3	TOILET	11 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

1 LEVEL 3 FLOOR PLAN
1 : 50

SECOND SCHEDULE (4 NOTIFICATIONS) AS SEARCHED ON 24/04/2023

1. RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2. LAND EXCLUDES THE ROAD(S) SHOWN IN DP 553194
3. PREMISES KNOWN AS 8 - 24 KIPPAX STREET, SURRY HILLS
4. I32839 LEASE TO SYDNEY ELECTRICITY OF PART BEING SUBSTATION NO.3164 TOGETHER WITH RIGHT OF WAY SHOWN IN PLAN WITH M695704. EXPIRES 31.8.2041
   AK971351 LEASE OF LEASE I32839 TO BLUE ASSET PARTNER PTY LTD, ERIC ALPHA ASSET CORPORATION 1 PTY LTD, ERIC ALPHA ASSET CORPORATION 2 PTY LTD, ERIC ALPHA ASSET CORPORATION 3 PTY LTD & ERIC ALPHA ASSET CORPORATION 4 PTY LTD EXPIRES: SEE DEALING, CLAUSE 2.3 (b) (ii).
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   AK971502 MORTGAGE OF LEASE AK971351 TO ANZ FIDUCIARY SERVICES PTY LTD
   AK971571 CHANGE OF NAME AFFECTING LEASE I32839 LESSEE NOW ALPHA DISTRIBUTION MINISTERIAL HOLDING CORPORATION

NOTES:

A) SERVICES SHOWN HAVE BEEN DERIVED FROM VISUAL EVIDENCE APPARENT AT THE TIME OF SURVEY. SERVICES MAY EXIST WHICH ARE NOT SHOWN. THE RELEVANT SERVICE AUTHORITY SHOULD BE CONTACTED TO VERIFY THE EXISTENCE AND POSITION OF SERVICES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION.
B) DIAMETER, HEIGHT & SPREAD OF TREES ARE APPROXIMATE ONLY.
C) LEVELS SHOWN ARE OF AUSTRALIAN HEIGHT DATUM.
   ORIGIN OF LEVELS - PM53243 RL 18.302 (AHD), CLASS LC
D) USE STATED DIMENSIONS. DO NOT SCALE.
E) THESE NOTES FORM PART OF THIS PLAN AND CANNOT BE REMOVED.
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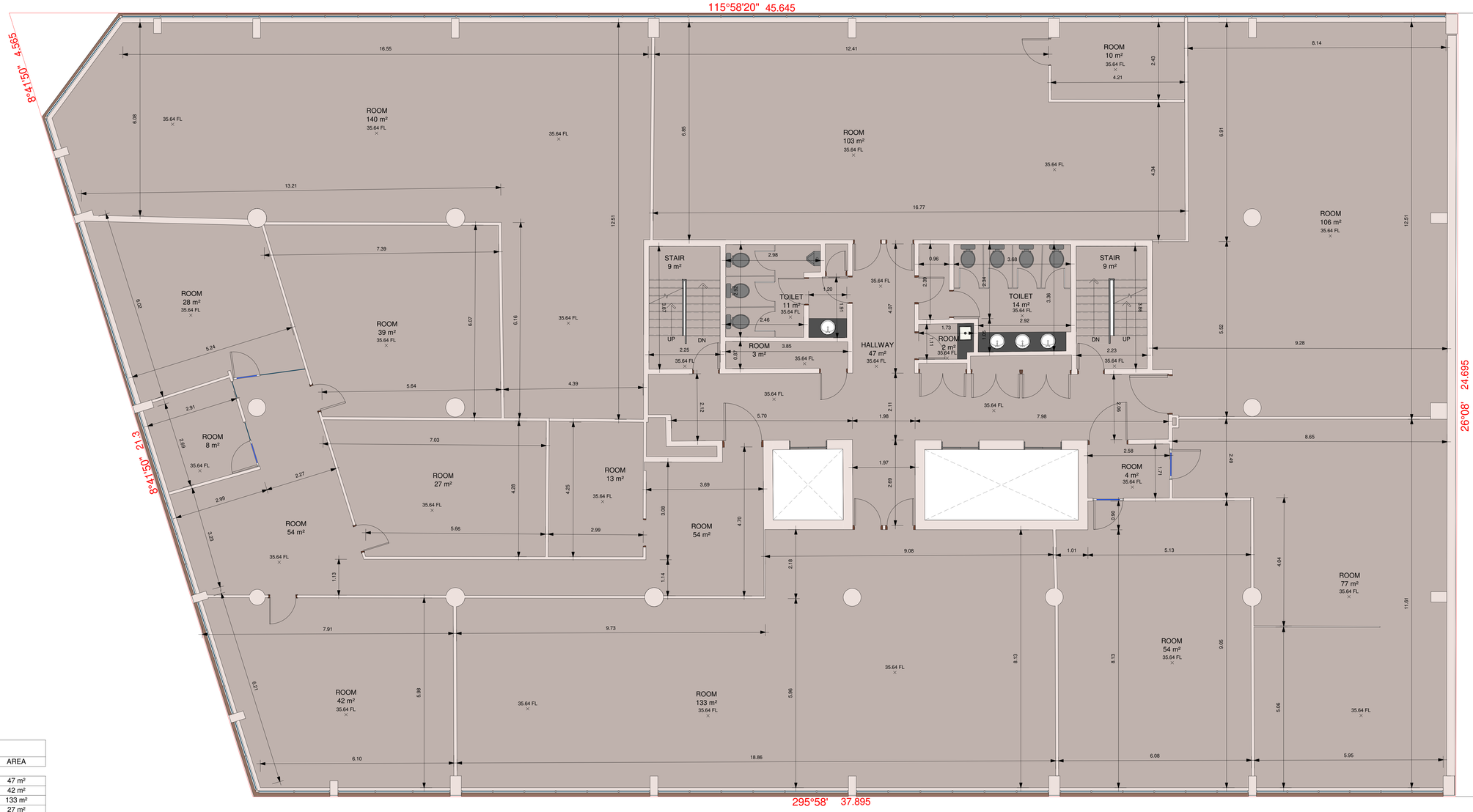
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	13 OF 34



1 LEVEL 4 FLOOR PLAN
1 : 50

LEVEL 4 AREA		
LEVEL	NAME	AREA
LEVEL 4	HALLWAY	47 m²
LEVEL 4	ROOM	42 m²
LEVEL 4	ROOM	133 m²
LEVEL 4	ROOM	27 m²
LEVEL 4	ROOM	13 m²
LEVEL 4	ROOM	54 m²
LEVEL 4	ROOM	140 m²
LEVEL 4	ROOM	39 m²
LEVEL 4	ROOM	28 m²
LEVEL 4	ROOM	8 m²
LEVEL 4	ROOM	103 m²
LEVEL 4	ROOM	10 m²
LEVEL 4	ROOM	106 m²
LEVEL 4	ROOM	77 m²
LEVEL 4	ROOM	54 m²
LEVEL 4	ROOM	2 m²
LEVEL 4	ROOM	3 m²
LEVEL 4	ROOM	4 m²
LEVEL 4	STAIR	9 m²
LEVEL 4	STAIR	9 m²
LEVEL 4	TOILET	14 m²
LEVEL 4	TOILET	11 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

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NOTES:

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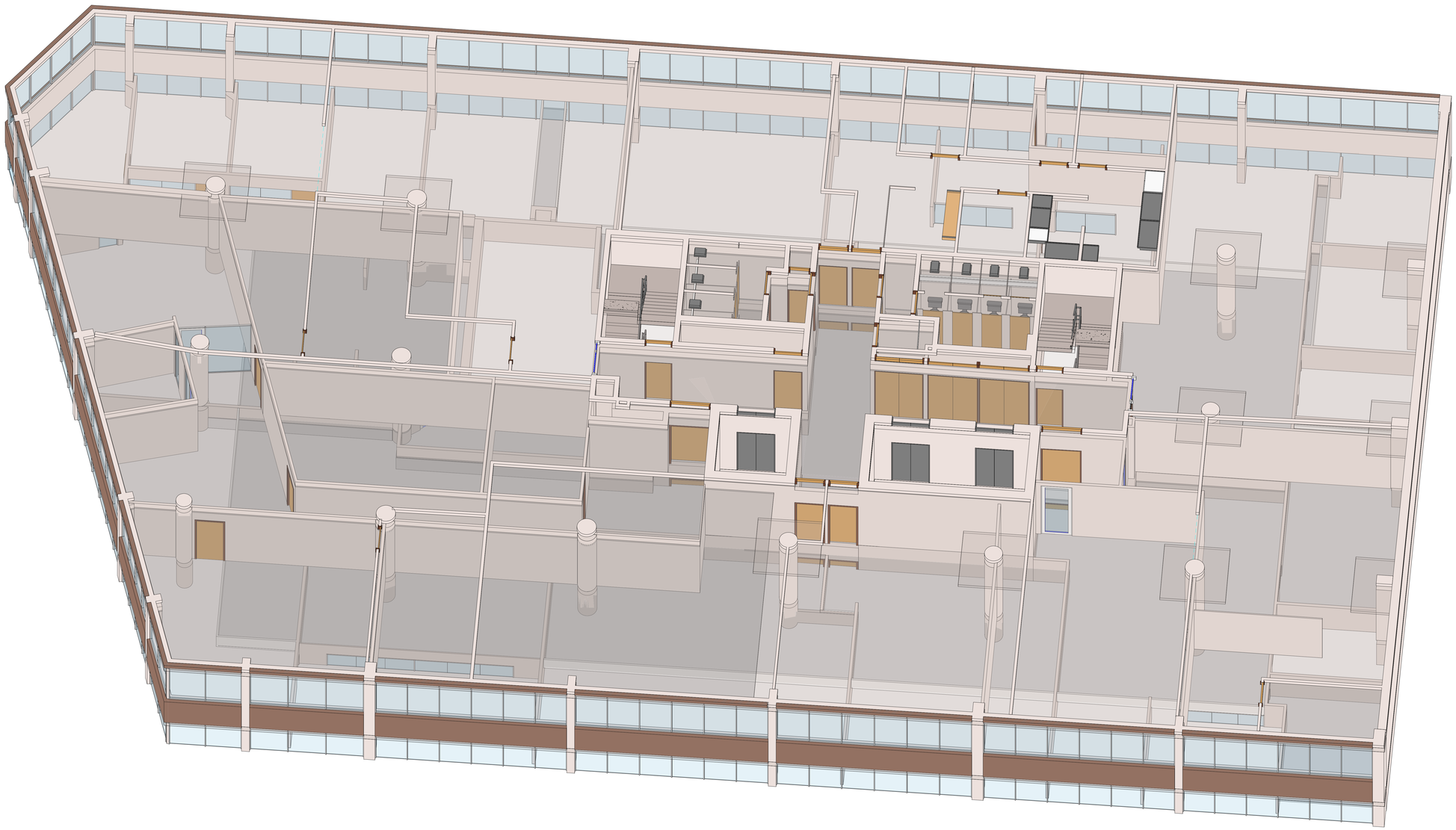
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	15 OF 34



1 LEVEL 4 3D FLOOR PLAN VIEW

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

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   AK971571 CHANGE OF NAME AFFECTING LEASE I32839 LESSEE NOW ALPHA DISTRIBUTION MINISTERIAL HOLDING CORPORATION

NOTES:

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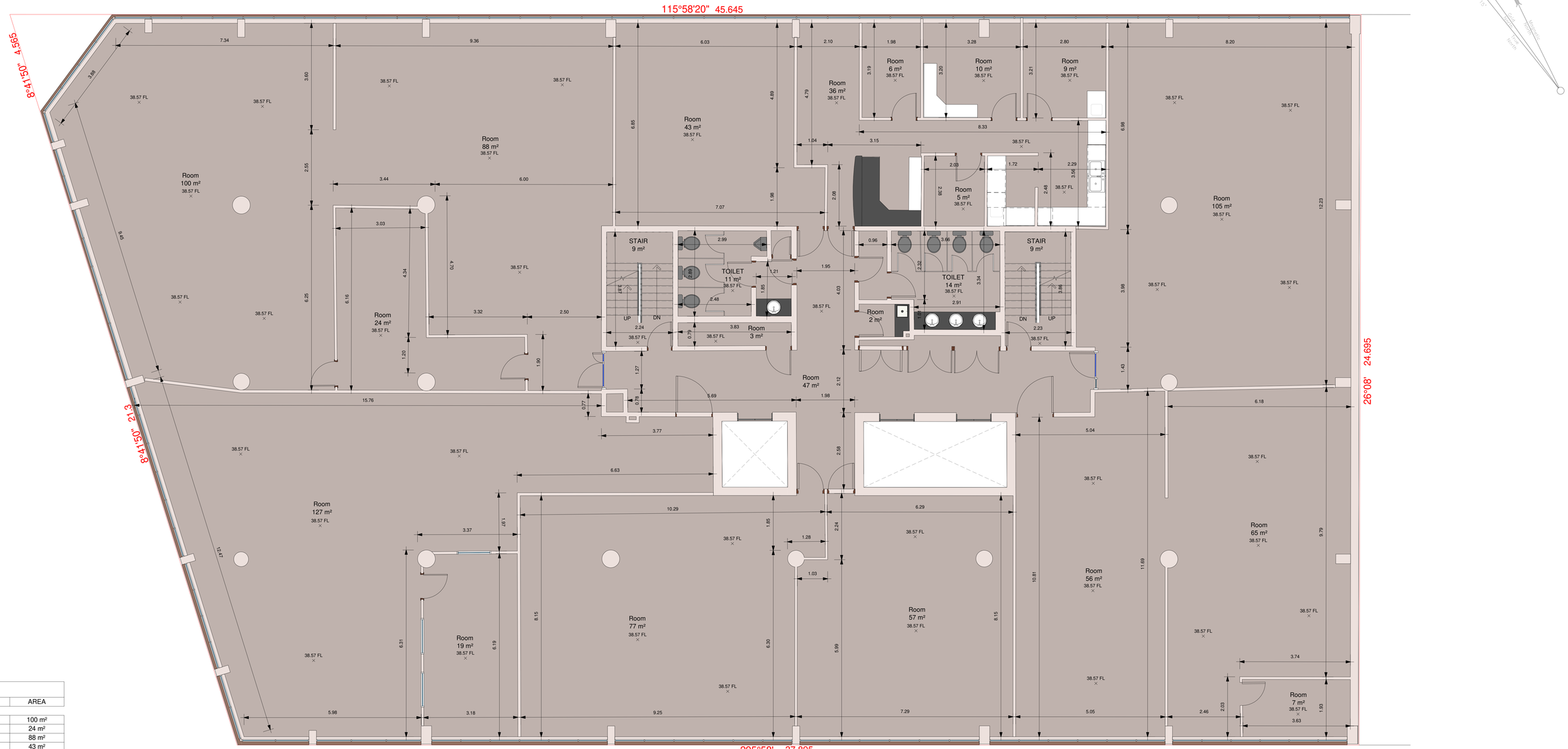
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	@A0
REFERENCE:	24874-23	SHEET:	16 OF 34



1 LEVEL 5 FLOOR PLAN
1 : 50

LEVEL 5 AREA		
LEVEL	NAME	AREA
LEVEL 5	Room	100 m²
LEVEL 5	Room	24 m²
LEVEL 5	Room	88 m²
LEVEL 5	Room	43 m²
LEVEL 5	Room	36 m²
LEVEL 5	Room	6 m²
LEVEL 5	Room	10 m²
LEVEL 5	Room	9 m²
LEVEL 5	Room	5 m²
LEVEL 5	Room	47 m²
LEVEL 5	Room	2 m²
LEVEL 5	Room	3 m²
LEVEL 5	Room	105 m²
LEVEL 5	Room	65 m²
LEVEL 5	Room	7 m²
LEVEL 5	Room	57 m²
LEVEL 5	Room	77 m²
LEVEL 5	Room	127 m²
LEVEL 5	Room	19 m²
LEVEL 5	Room	56 m²
LEVEL 5	STAIR	9 m²
LEVEL 5	STAIR	9 m²
LEVEL 5	TOILET	11 m²
LEVEL 5	TOILET	14 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
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GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

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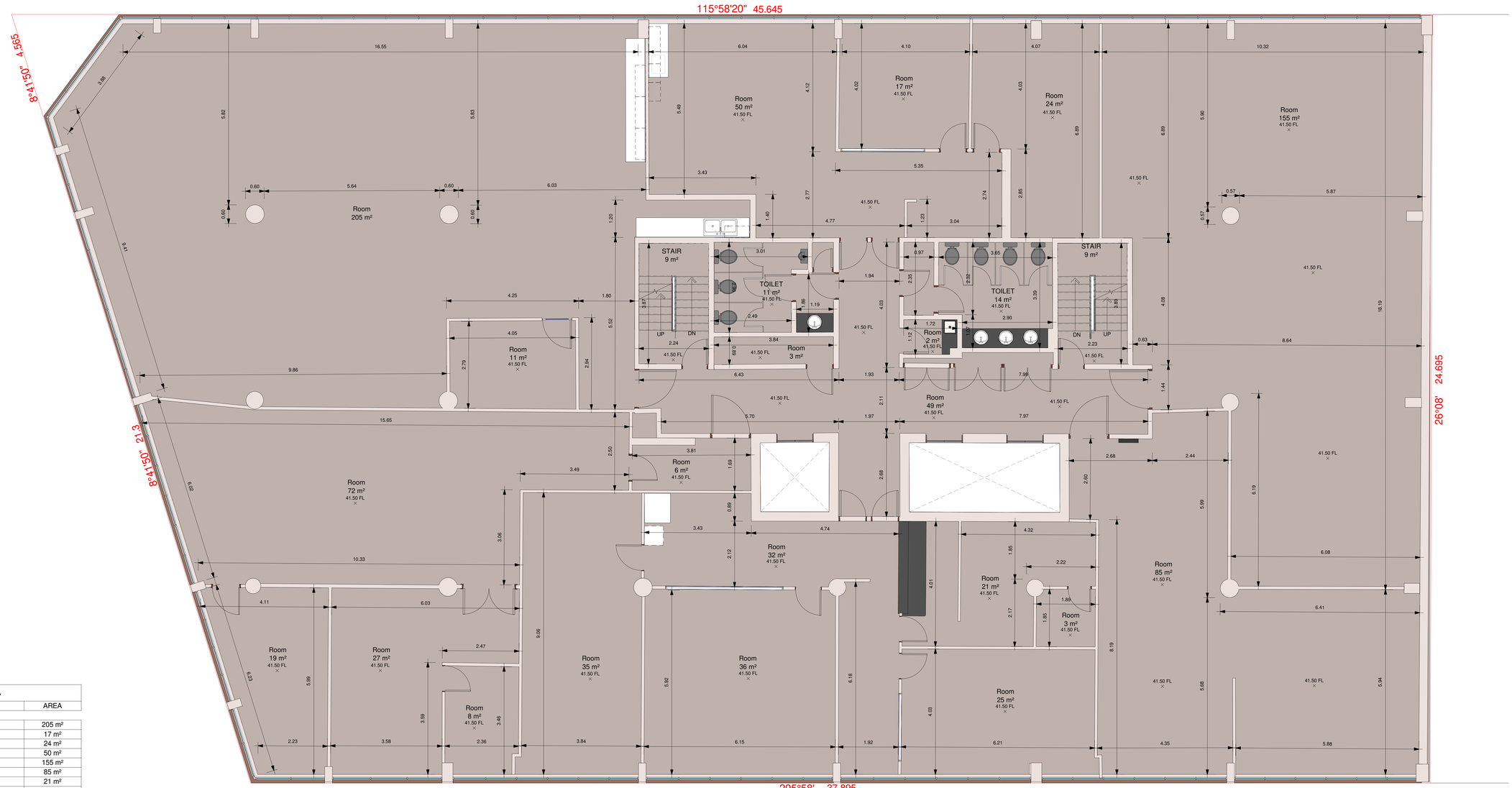
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REFERENCE:	24874-23	SHEET:	17 OF 34

258



1 LEVEL 6 FLOOR PLAN
1 : 50

LEVEL 6 AREA		
LEVEL	NAME	AREA
LEVEL 6	Room	205 m²
LEVEL 6	Room	17 m²
LEVEL 6	Room	24 m²
LEVEL 6	Room	50 m²
LEVEL 6	Room	155 m²
LEVEL 6	Room	85 m²
LEVEL 6	Room	21 m²
LEVEL 6	Room	3 m²
LEVEL 6	Room	25 m²
LEVEL 6	Room	32 m²
LEVEL 6	Room	49 m²
LEVEL 6	Room	6 m²
LEVEL 6	Room	11 m²
LEVEL 6	Room	72 m²
LEVEL 6	Room	19 m²
LEVEL 6	Room	27 m²
LEVEL 6	Room	8 m²
LEVEL 6	Room	35 m²
LEVEL 6	Room	36 m²
LEVEL 6	Room	3 m²
LEVEL 6	Room	2 m²
LEVEL 6	STAIR	9 m²
LEVEL 6	STAIR	9 m²
LEVEL 6	TOILET	14 m²
LEVEL 6	TOILET	11 m²

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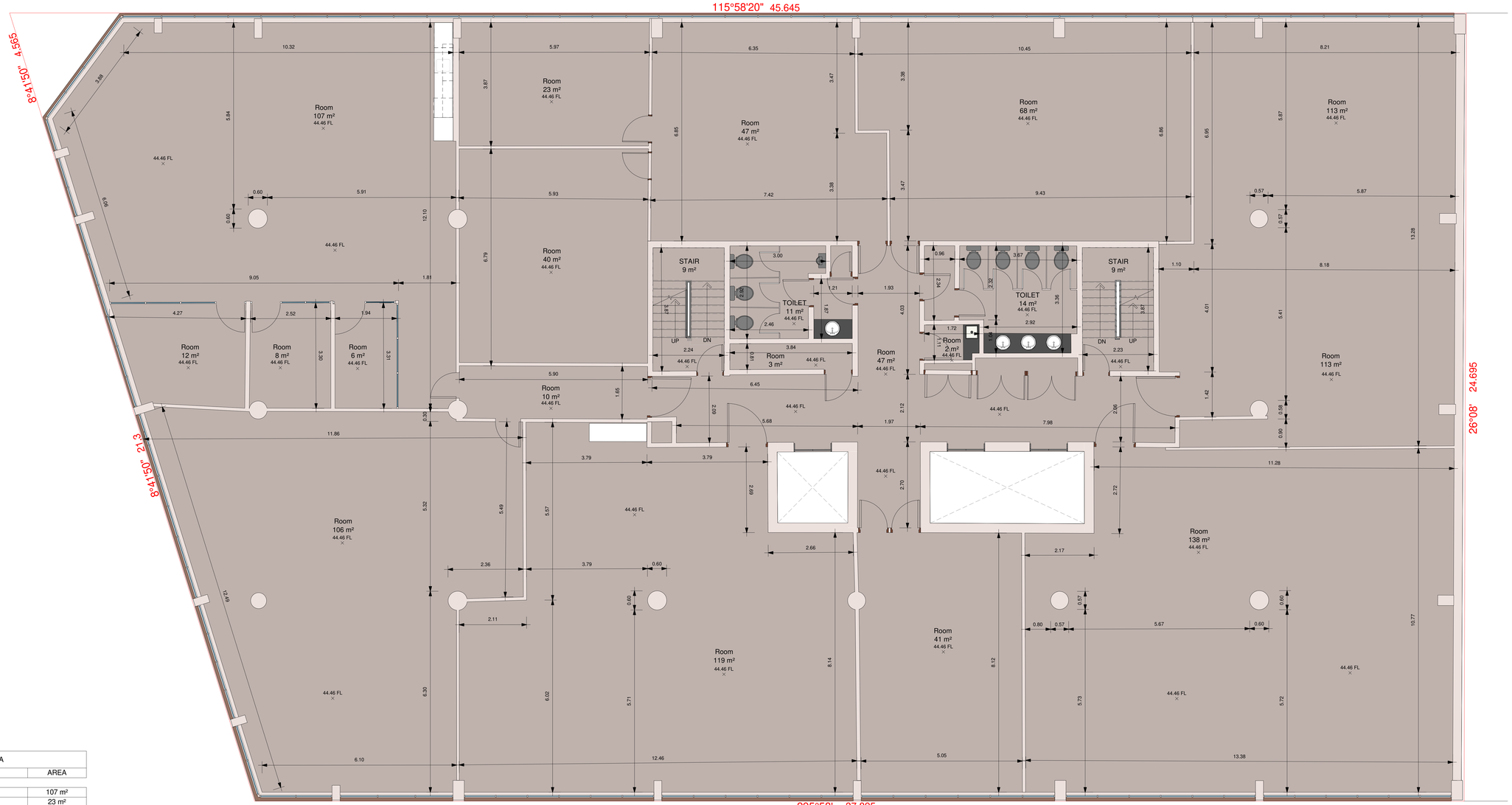
DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT 8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	19 OF 34

259



1 LEVEL 7 FLOOR PLAN
1 : 50

LEVEL 7 AREA		
LEVEL	NAME	AREA
LEVEL 7	Room	107 m²
LEVEL 7	Room	23 m²
LEVEL 7	Room	40 m²
LEVEL 7	Room	6 m²
LEVEL 7	Room	8 m²
LEVEL 7	Room	12 m²
LEVEL 7	Room	106 m²
LEVEL 7	Room	47 m²
LEVEL 7	Room	68 m²
LEVEL 7	Room	113 m²
LEVEL 7	Room	138 m²
LEVEL 7	Room	41 m²
LEVEL 7	Room	119 m²
LEVEL 7	Room	10 m²
LEVEL 7	Room	47 m²
LEVEL 7	Room	2 m²
LEVEL 7	Room	3 m²
LEVEL 7	STAIR	9 m²
LEVEL 7	STAIR	9 m²
LEVEL 7	TOILET	11 m²
LEVEL 7	TOILET	14 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

NOTE: THIS SURVEY WAS COMPLETED USING LASER SCANNING TECHNOLOGY AND CONVENTIONAL SURVEY EQUIPMENT. THE DATA WAS ACCURATE AT TIME OF SURVEY TO A TOLERANCE OF ±5MM

SECOND SCHEDULE (4 NOTIFICATIONS) AS SEARCHED ON 24/04/2023

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2. LAND EXCLUDES THE ROAD(S) SHOWN IN DP 553194
3. PREMISES KNOWN AS 8 - 24 KIPPAX STREET, SURRY HILLS
4. I32839 LEASE TO SYDNEY ELECTRICITY OF PART BEING SUBSTATION NO.3164 TOGETHER WITH RIGHT OF WAY SHOWN IN PLAN WITH M695704. EXPIRES 31.8.2041
   AK971351 LEASE OF LEASE I32839 TO BLUE ASSET PARTNER PTY LTD, ERIC ALPHA ASSET CORPORATION 1 PTY LTD, ERIC ALPHA ASSET CORPORATION 2 PTY LTD, ERIC ALPHA ASSET CORPORATION 3 PTY LTD & ERIC ALPHA ASSET CORPORATION 4 PTY LTD EXPIRES: SEE DEALING. CLAUSE 2.3 (b) (ii).
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   AK971502 MORTGAGE OF LEASE AK971351 TO ANZ FIDUCIARY SERVICES PTY LTD
   AK971571 CHANGE OF NAME AFFECTING LEASE I32839 LESSEE NOW ALPHA DISTRIBUTION MINISTERIAL HOLDING CORPORATION

NOTES:

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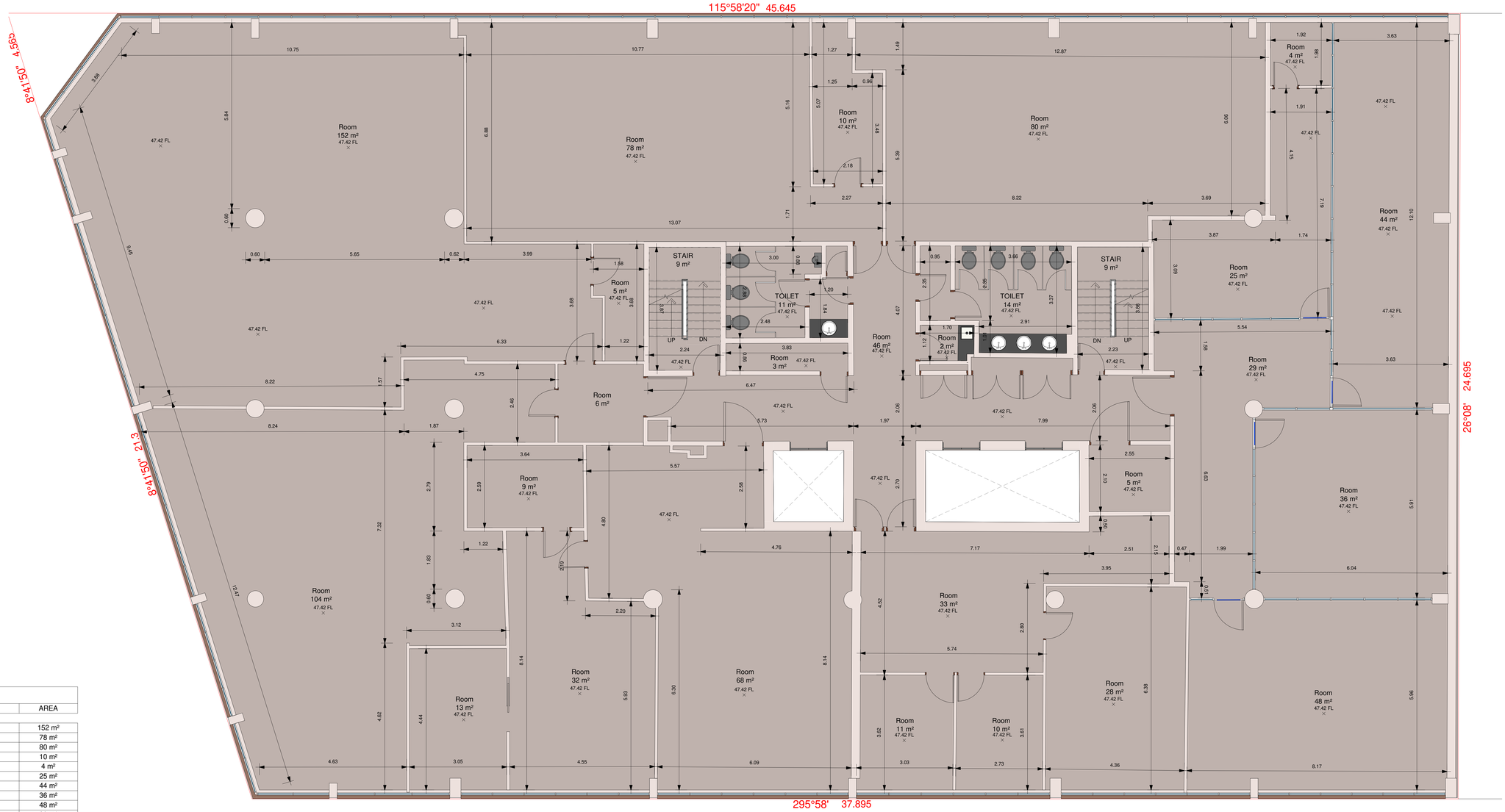
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

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DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	21 OF 34



1 LEVEL 8 FLOOR PLAN
1 : 50

LEVEL 8 AREA		
LEVEL	NAME	AREA
LEVEL 8	Room	152 m²
LEVEL 8	Room	78 m²
LEVEL 8	Room	80 m²
LEVEL 8	Room	10 m²
LEVEL 8	Room	4 m²
LEVEL 8	Room	25 m²
LEVEL 8	Room	44 m²
LEVEL 8	Room	36 m²
LEVEL 8	Room	48 m²
LEVEL 8	Room	29 m²
LEVEL 8	Room	28 m²
LEVEL 8	Room	10 m²
LEVEL 8	Room	11 m²
LEVEL 8	Room	33 m²
LEVEL 8	Room	68 m²
LEVEL 8	Room	32 m²
LEVEL 8	Room	13 m²
LEVEL 8	Room	104 m²
LEVEL 8	Room	9 m²
LEVEL 8	Room	6 m²
LEVEL 8	Room	46 m²
LEVEL 8	Room	5 m²
LEVEL 8	Room	3 m²
LEVEL 8	Room	2 m²
LEVEL 8	Room	5 m²
LEVEL 8	STAIR	9 m²
LEVEL 8	STAIR	9 m²
LEVEL 8	TOILET	11 m²
LEVEL 8	TOILET	14 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

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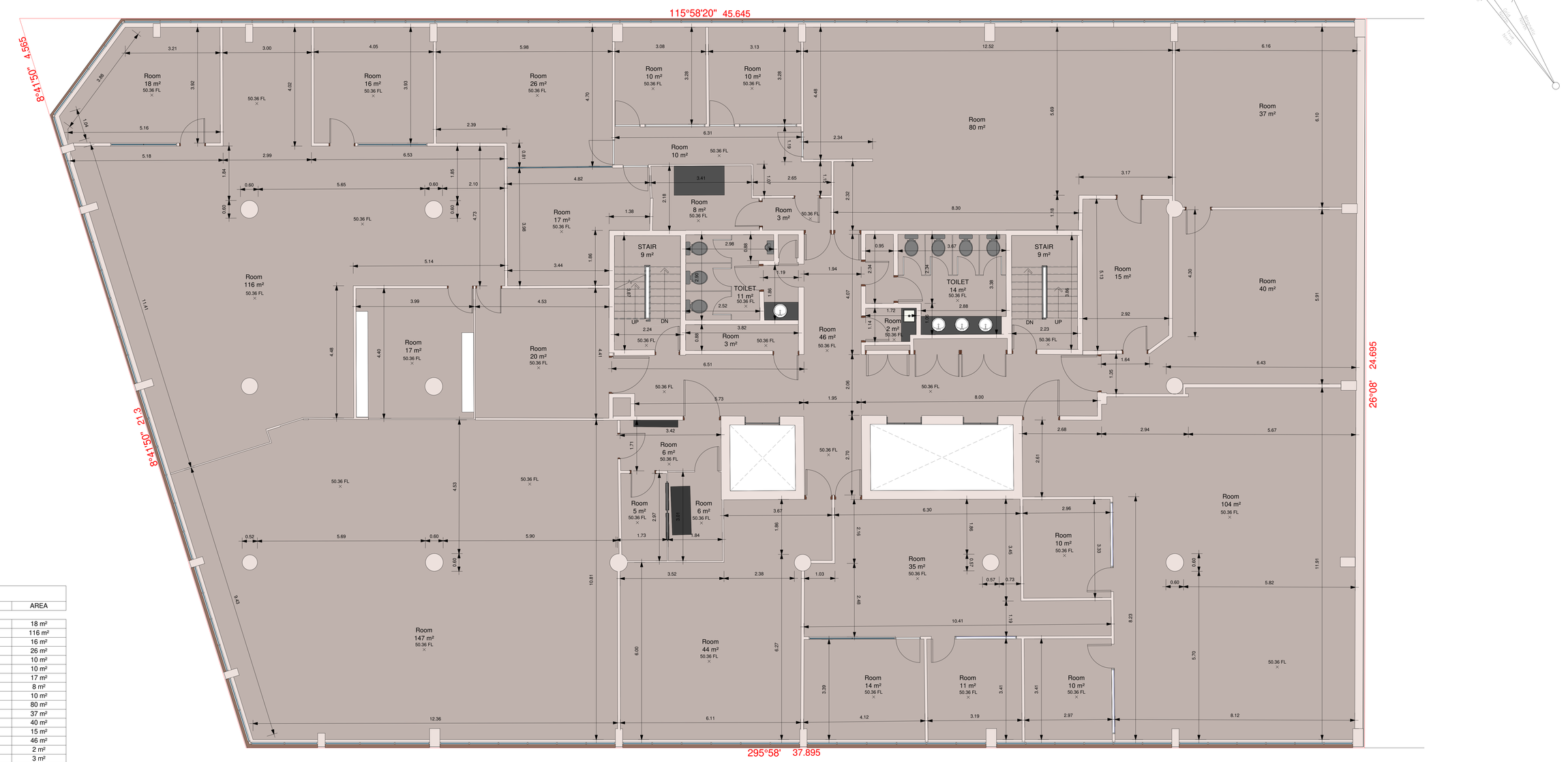
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
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DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
DATE DRAWN:	29/04/2023	SCALE:	1 : 50@A0
REFERENCE:	24874-23	SHEET:	23 OF 34



1 LEVEL 9 FLOOR PLAN
1 : 50

LEVEL 9 AREA		
LEVEL	NAME	AREA
LEVEL 9	Room	18 m²
LEVEL 9	Room	116 m²
LEVEL 9	Room	16 m²
LEVEL 9	Room	26 m²
LEVEL 9	Room	10 m²
LEVEL 9	Room	10 m²
LEVEL 9	Room	17 m²
LEVEL 9	Room	8 m²
LEVEL 9	Room	10 m²
LEVEL 9	Room	80 m²
LEVEL 9	Room	37 m²
LEVEL 9	Room	40 m²
LEVEL 9	Room	15 m²
LEVEL 9	Room	46 m²
LEVEL 9	Room	2 m²
LEVEL 9	Room	3 m²
LEVEL 9	Room	20 m²
LEVEL 9	Room	17 m²
LEVEL 9	Room	147 m²
LEVEL 9	Room	44 m²
LEVEL 9	Room	6 m²
LEVEL 9	Room	5 m²
LEVEL 9	Room	6 m²
LEVEL 9	Room	104 m²
LEVEL 9	Room	10 m²
LEVEL 9	Room	35 m²
LEVEL 9	Room	14 m²
LEVEL 9	Room	11 m²
LEVEL 9	Room	10 m²
LEVEL 9	Room	3 m²
LEVEL 9	STAIR	9 m²
LEVEL 9	STAIR	9 m²
LEVEL 9	TOILET	14 m²
LEVEL 9	TOILET	11 m²

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
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D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
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EG	EAVE & GUTTER	TK	TOP OF KERB
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IL	INVERT LEVEL	WM	WATER METER
LH	LAMP POLE	WS	WINDOW SILL
NS	NATURAL SURFACE	WT	TOP OF WINDOW

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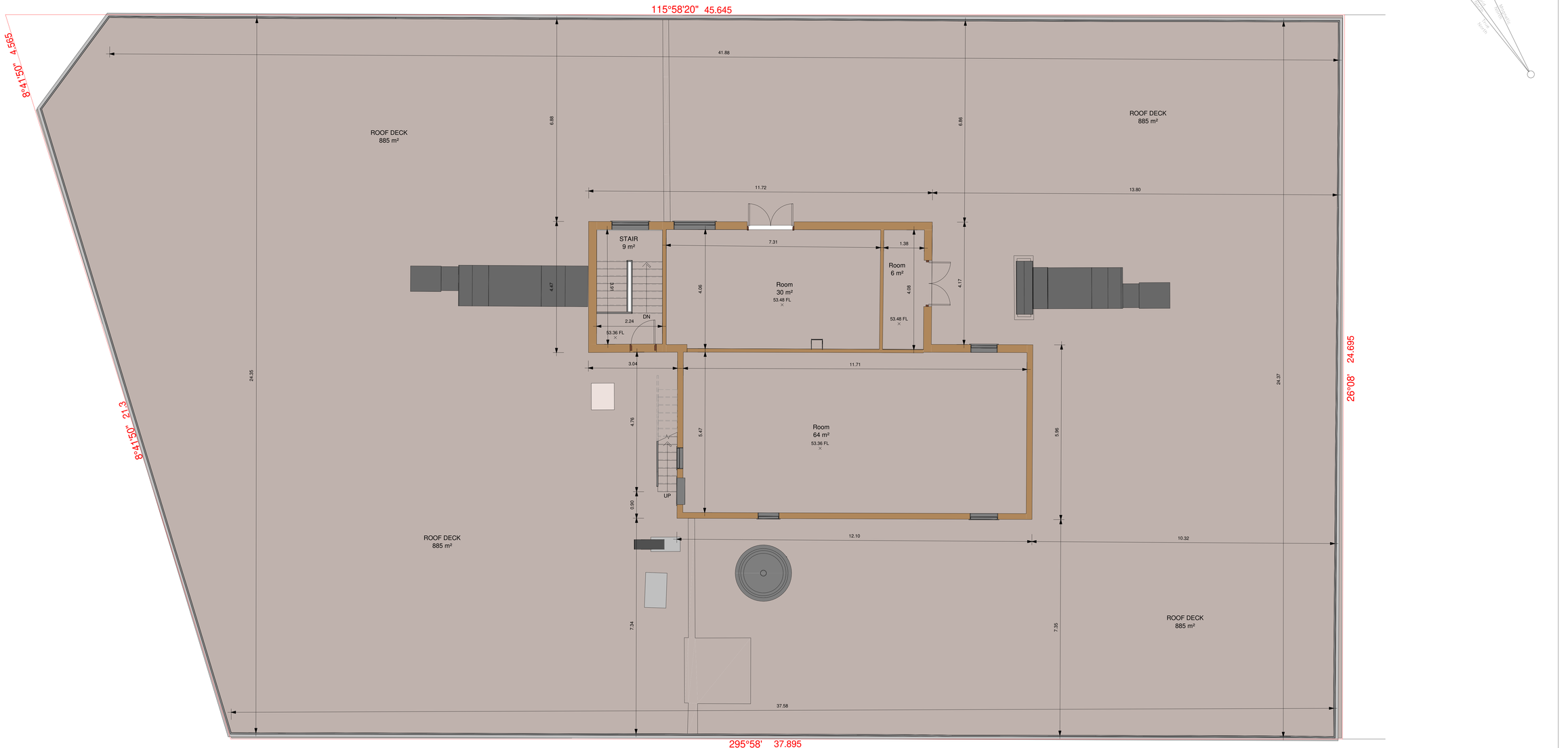
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

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REFERENCE:	24874-23	SHEET:	25 OF 34



1 ROOF FLOOR PLAN
1 : 50

ROOF AREA		
LEVEL	NAME	AREA
ROOF	ROOF DECK	885 m²
ROOF	Room	30 m²
ROOF	Room	6 m²
ROOF	Room	64 m²
ROOF	STAIR	9 m²

LEGEND:

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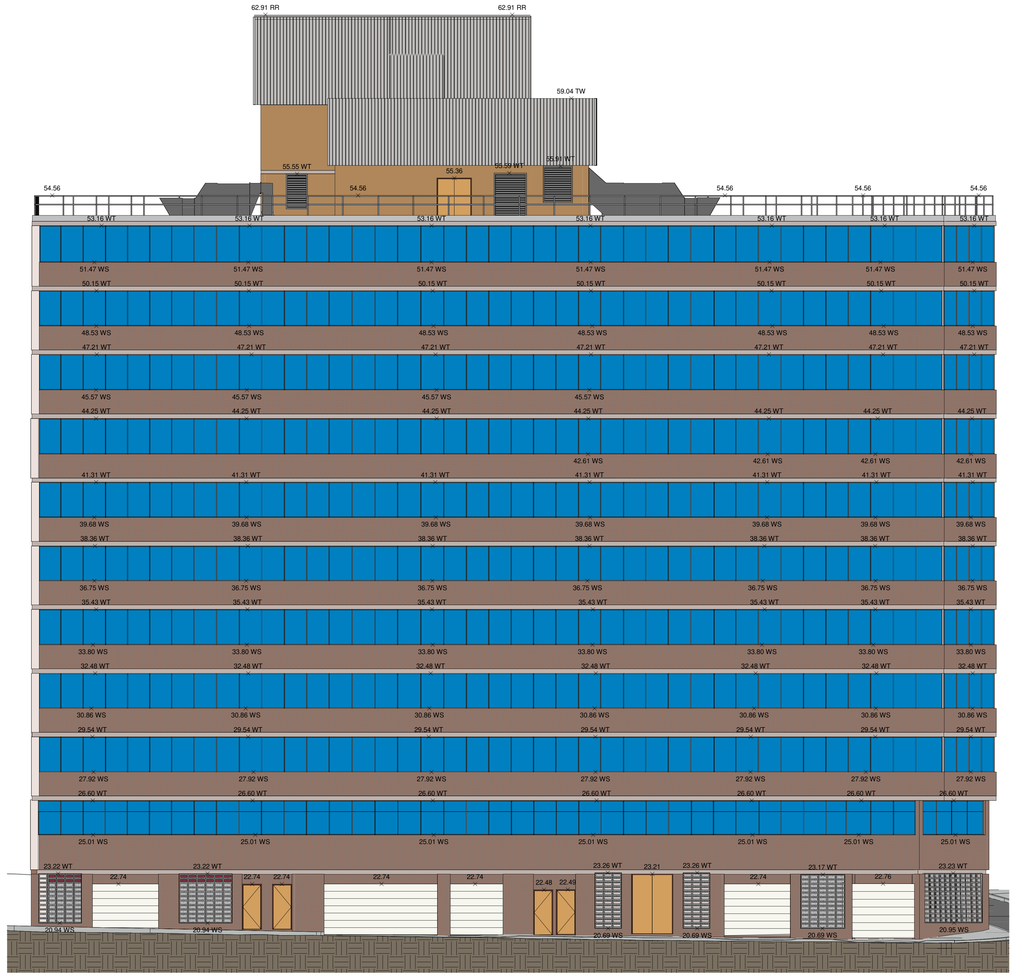
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263



1 24 KIPPAX STREET FRONT ELEVATION
1 : 100



2 24 KIPPAX STREET REAR ELEVATION
1 : 100

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
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NS	NATURAL SURFACE	WT	TOP OF WINDOW

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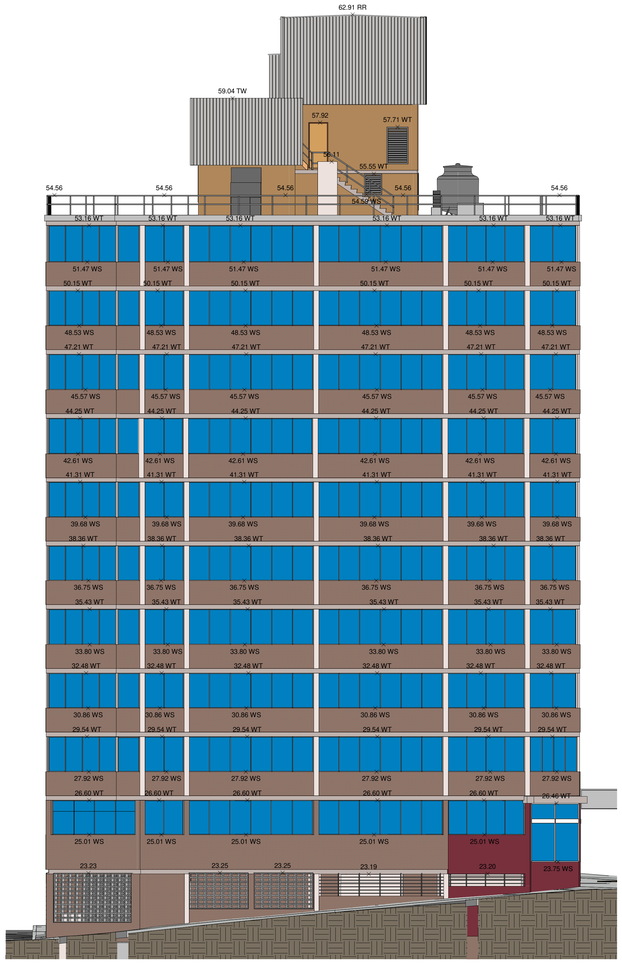
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT
8-24 KIPPAX STREET SURRY HILLS

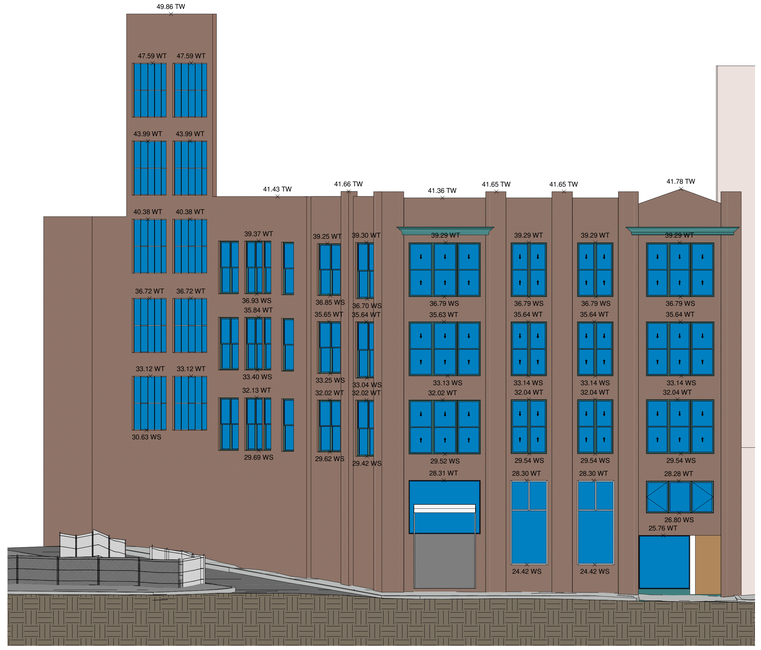
INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

DATUM:	AHD	SURVEYED BY:	TS
SURVEY DATE:	26/04/2023	DRAWN BY:	DT
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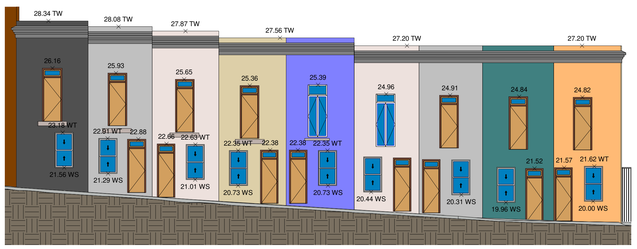
1 24 KIPPAX STREET LEFT ELEVATION
1 : 100



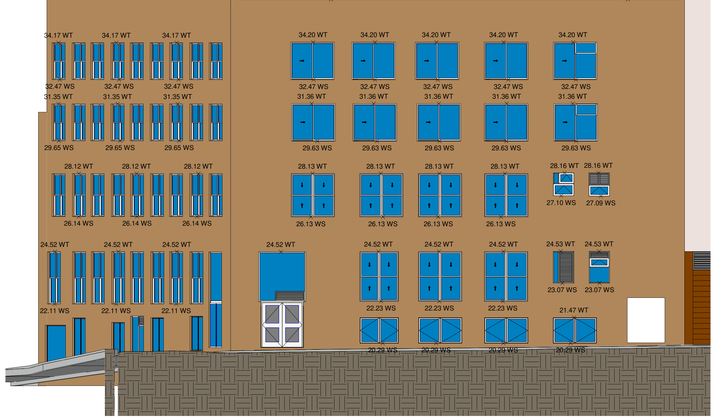
2 342 ELIZABETH STREET FRONT ELEVATION
1 : 100



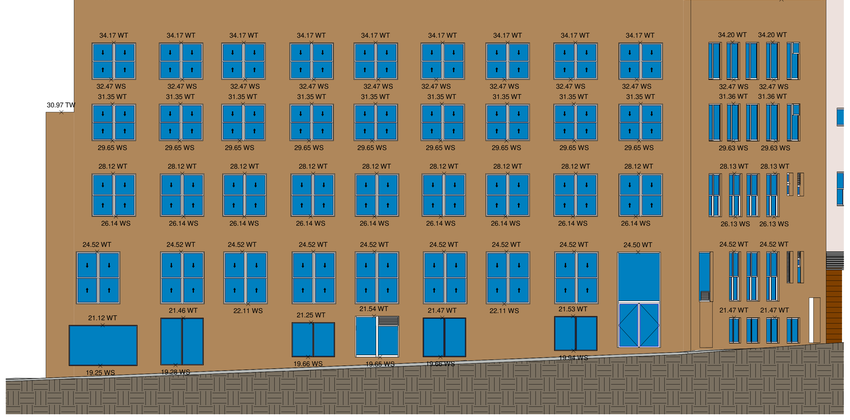
3 342 ELIZABETH STREET LEFT ELEVATION
1 : 100



6 17-29 TERRY STREET FRONT ELEVATION
1 : 100



4 17-51 FOVEAUX STREET REAR ELEVATION
1 : 100



5 17-51 FOVEAUX STREET RIGHT ELEVATION
1 : 100

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT 8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

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REFERENCE:	24874-23	SHEET:	31 OF 34



1 26-44 KIPPAX STREET FRONT ELEVATION
1 : 100



2 26-44 KIPPAX STREET REAR ELEVATION
1 : 100



3 61-81 KIPPAX STREET FRONT ELEVATION
1 : 100



4 61-81 KIPPAX STREET RIGHT ELEVATION
1 : 100

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
BM	BENCH MARK	RL	REDUCED LEVEL
CONC	CONCRETE	RR	ROOF RIDGE
CS	CONCRETE SURFACE	S	STAIRS
D/H/S	DIAMETER/HEIGHT/SPREAD	SC	SERVICE COVER
D	DOOR	SV	STOP VALVE
EC	EDGE OF CONCRETE	TEL	TELSTRA PIT
EG	EAVE & GUTTER	TK	TOP OF KERB
FL	FLOOR LEVEL	TW	TOP OF WALL
GDN	GARDEN	V	SERVICE VALVE
HYD	HYDRANT	VC	VEHICLE CROSSING
IL	INVERT LEVEL	WM	WATER METER
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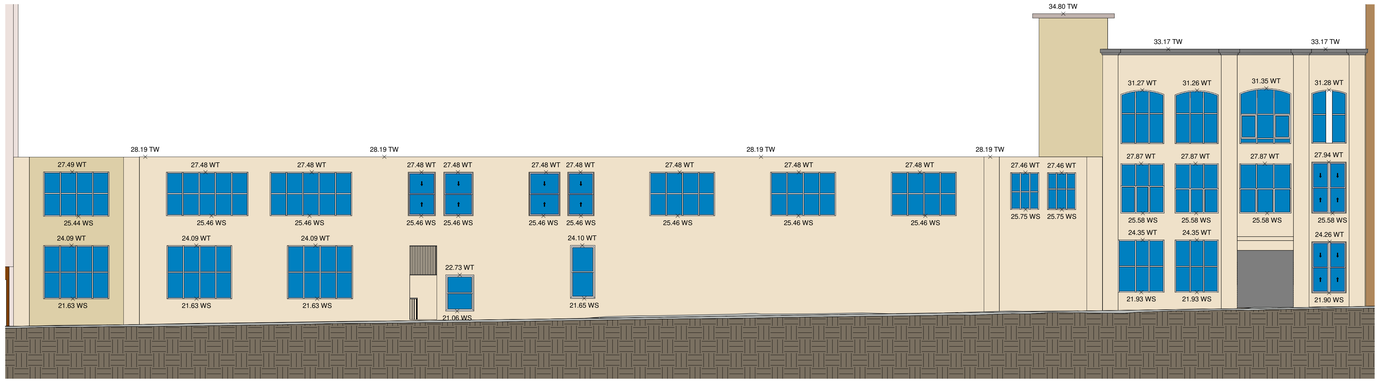
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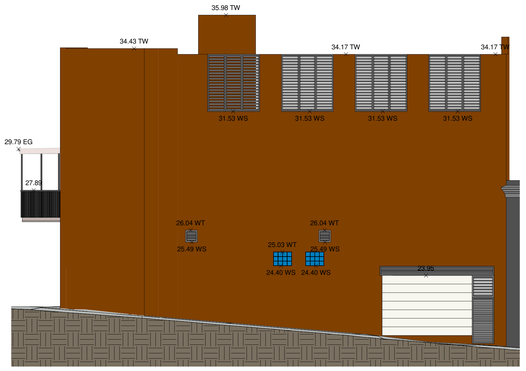
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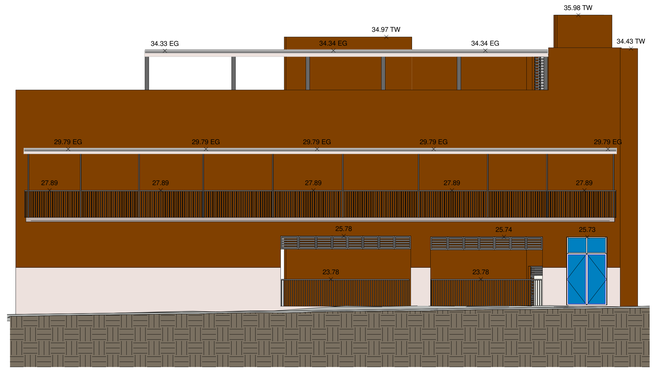
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REFERENCE:	24874-23	SHEET:	32 OF 34



1 17-51 FOVEAUX STREET ELEVATION
1 : 100



2 324 ELIZABETH STREET REAR ELEVATION
1 : 100



3 324 ELIZABETH STREET RIGHT ELEVATION
1 : 100

LEGEND:

AHD	AUSTRALIAN HEIGHT DATUM	PAV	PAVERS
AWN	AWNING	PP	POWER POLE
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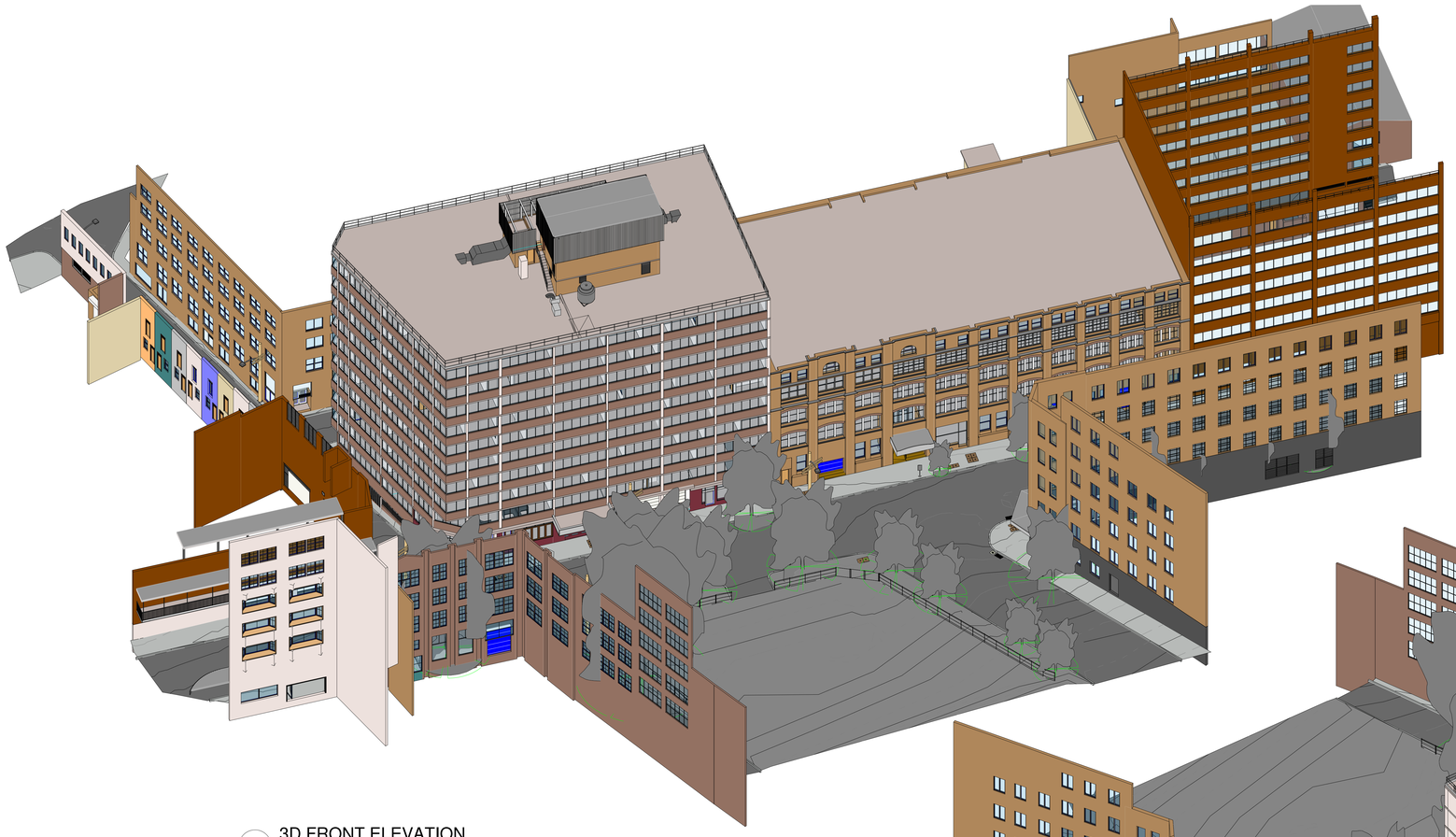
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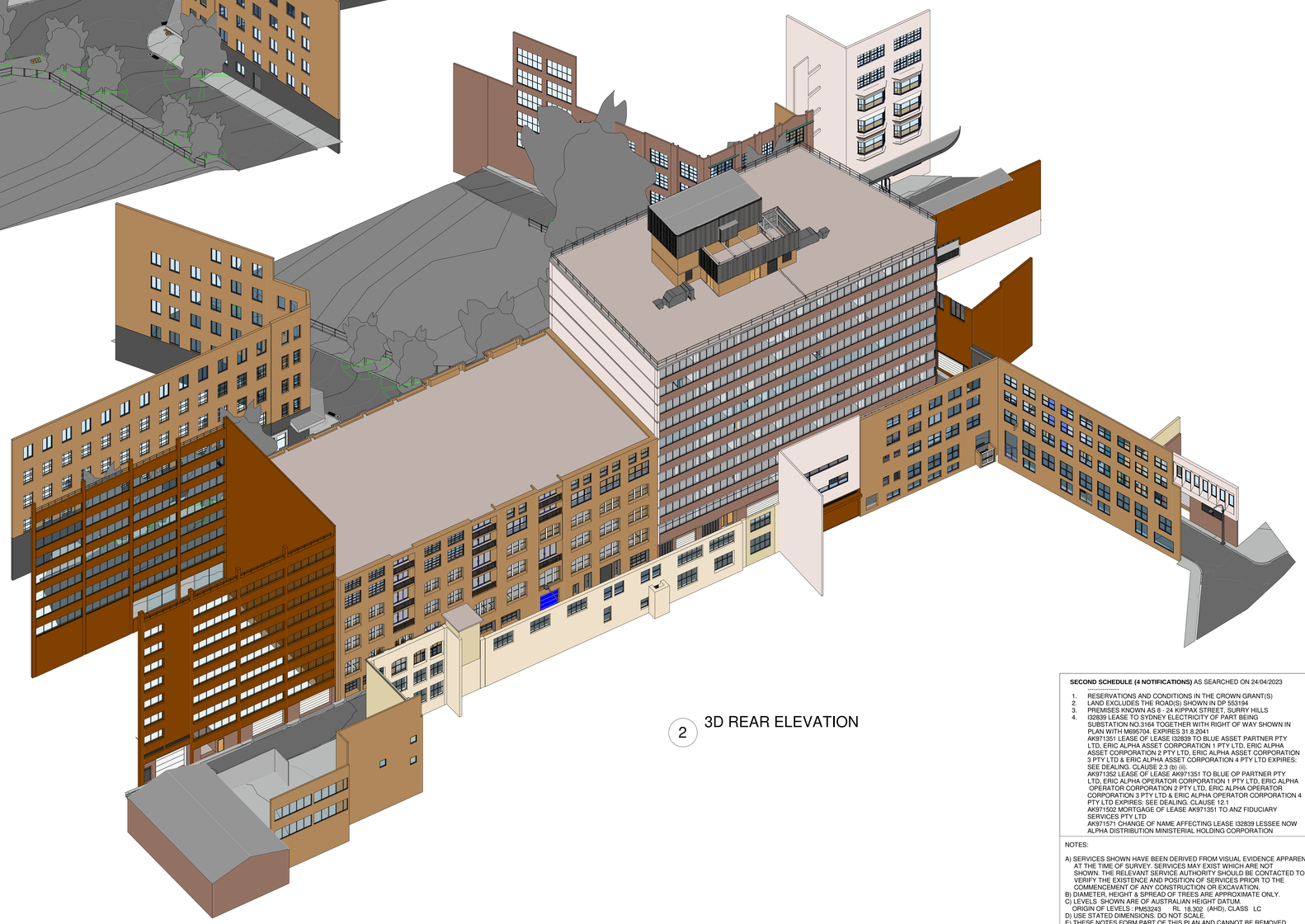
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1 3D FRONT ELEVATION



2 3D REAR ELEVATION

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DETAIL AND IDENTIFICATION SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL OF LOT 3 ON DP547558 AT 8-24 KIPPAX STREET SURRY HILLS

INSTRUCTING PARTY: 05/06/2023

Revision No.	Description	Date
01	DETAIL/IDENT SURVEY, FLOOR PLANS, ELEVATIONS & 3D MODEL	09/05/2023
02		
03		
04		

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Attachment A6

Draft DCP - Prepared by the Proponent

Draft DCP 2012 Amendment

Section 6: Specific Sites

8-24 Kippax Street, Surry Hills
Prepared on behalf of Canva



Ethos Urban

Canva

Prepared by Ethos Urban
Submitted to City of Sydney Council

6 December 2023 | 2230181



'Gura Bulga'
Liz Belanjee Cameron

'Gura Bulga' – translates to Warm Green Country. Representing New South Wales.

By using the green and blue colours to represent NSW, this painting unites the contrasting landscapes. The use of green symbolises tranquillity and health. The colour cyan, a greenish-blue, sparks feelings of calmness and reminds us of the importance of nature, while various shades of blue hues denote emotions of new beginnings and growth. The use of emerald green in this image speaks of place as a fluid moving topography of rhythmical connection, echoed by densely layered patterning and symbolic shapes which project the hypnotic vibrations of the earth, waterways, and skies.

Ethos Urban acknowledges the Traditional Custodians of Country throughout Australia and recognises their continuing connection to land, waters and culture.

We acknowledge the Gadigal people, of the Eora Nation, the Traditional Custodians of the land where this document was prepared, and all peoples and nations from lands affected.

We pay our respects to their Elders past, present and emerging.

Contact	Stephen Gouge Associate Director	sgouge@ethosurban.com 9956 6962

Version No.	**Date of issue**	**Revision by**	**Approved by**
Working Draft	1.12.2023	JWL	SG
Draft	11.12.2023	SG	SG
Final	12.12.2023	SG	SG

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Draft Sydney Development Control Plan 2012
Section 6: Specific Sites
8-24 Kippax Street, Surry Hills

Drafting Note:
This document provides a draft of suggested amendments to the Sydney DCP 2012 that will operate in unison with the site-specific provision of Sydney LEP 2012. The controls are intended to provide the necessary specific to the Planning Proposal, so as to ensure the outcome envisage in the proposal will be realised in any future development.

Where a reference to "##" is provided below, this is subject to the final numbering to coincide with the sequencing to which this section is incorporated into the Sydney DCP 2012 upon adoption by Council.

Section 6. ## 8-24 Kippax Street, Surry Hills

The following objectives and provisions apply to 8-24 Kippax Street, Surry Hills as shown in 'Figure 6.1 Specific sites map', where relevant site specific provisions of the Sydney Local Environmental Plan 2012 (Sydney LEP 2012) are implemented.

Clause 6.## of the Sydney LEP 2012 enables development to exceed the height and floor space ratio shown in the height in metres and floor space ratio maps up to a prescribed amount, providing the development delivered in accordance with site specific provisions.

If a development at 8-24 Kippax Street, Surry Hills, seeks to utilise additional height and/or floor space permitted by Clause 6.##, then the provisions in this section also apply to the assessment of the proposed development and override other provisions in this DCP where there is an inconsistency.

Objectives

1) Deliver a high quality built form that:
    a) provides an appropriate height transition between adjacent taller and lower scale buildings along Kippax Street, Surry Hills;
    b) ensure the bulk, massing and modulation of buildings responds to the characteristics of the surrounding streetscapes surrounding heritage items ;
    c) identifies the location of pedestrian entries and activate frontage – to Kippax Street and Sophia Street;
    d) provides opportunities for accessible rooftop spaces for occupants and to support for increased planting and canopy coverage;
    e) includes active uses to provide passive surveillance of the public domain; and
    f) includes the provision of visible and well-integrated public art.
2) Define the maximum building envelope that respects the local context and minimises amenity impacts including solar access and acoustic amenity impacts.
3) Establish benchmarks to achieve ecologically sustainable development.

Provisions

6.##.# Built Form

1) Building layout, including height (expressed in RLs and storeys) and pedestrian entries to ensure at grade access is provided, is to be set out in accordance with 'Figure 6.##: 8-24 Kippax Street – Structure plan'.
2) Building height and form are to be in accordance with:
    a) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Maximum building envelope'.
    b) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Level 10 Floor Plan'.
    c) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Level 11 Floor Plan'..
    d) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Kippax Street Elevation';
    e) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Sophia Street Elevation'; and
    f) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Terry Street Elevation';
    g) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Eastern Elevation';
3) Development is not to exceed the maximum number of storeys shown in Figure 6.##: 8-24 Kippax Street, Surry Hills – Kippax Street elevation', established by the current floor levels of the existing building and shall not exceed 9 storeys to the parapet fronting Kippax Street, with the reaming built form set back.
4) The final building extent is to be entirely within the envelope shown at 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Maximum building envelope'.
5) Street frontage heights shall be maximum of RL 59.6 metres fronting Kippax Street, with massing above this height to be set back in accordance with Figure 6.##: 8-24 Kippax Street, Surry Hills – Maximum building envelope, including:
    a) RL 62.66 metres to level 10 and RL 64.060 to the top of the proposed canopy extent above level 10
    b) RL 66.060 metres to the top of roof/plant
6) The area identified as canopy extent is to be constructed to be unenclosed (with the exception of the horizontal projection) and shall not comprise of an extension of the building envelope.

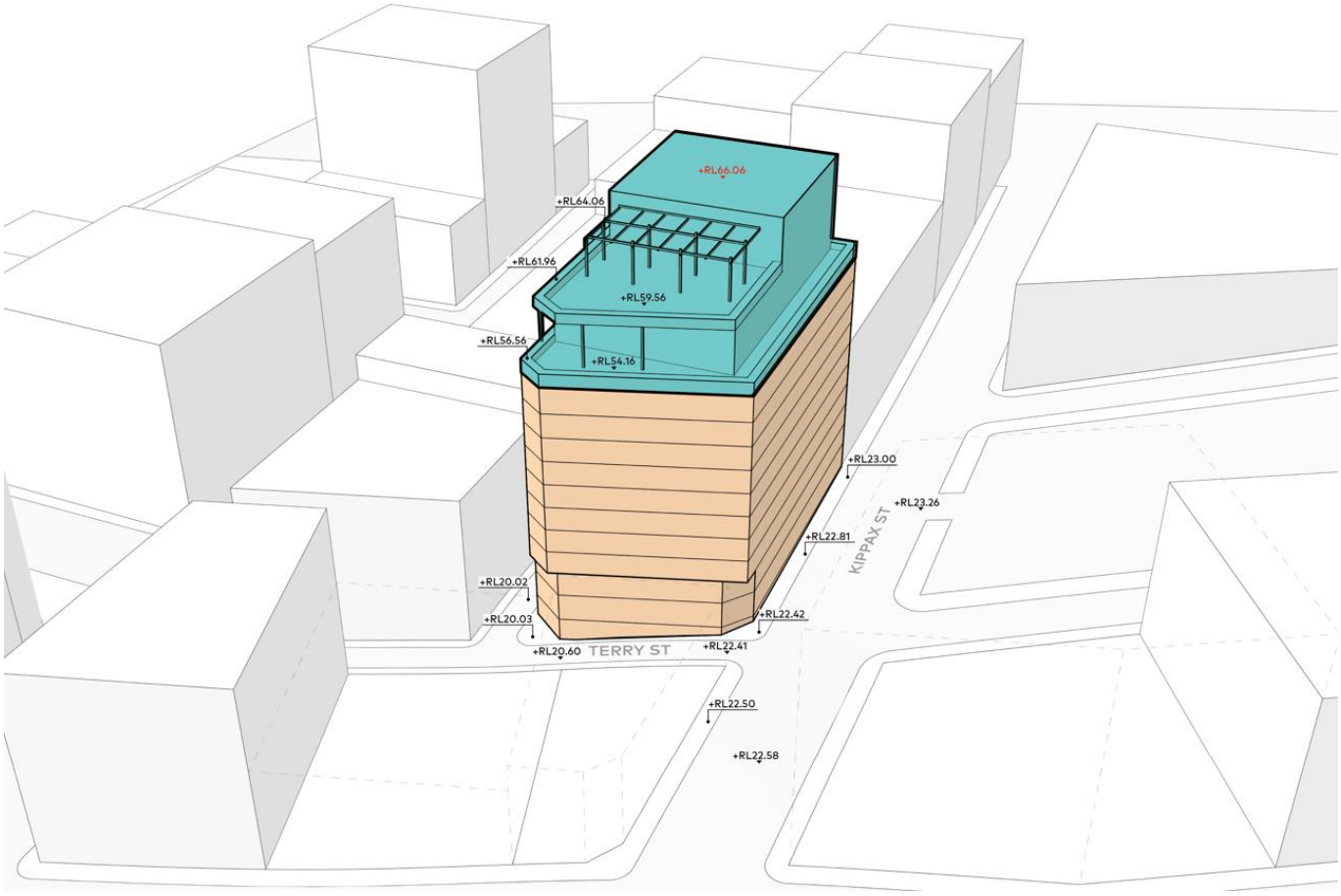


Figure 6## Maximum Building Envelope
Source: Cox Architecture

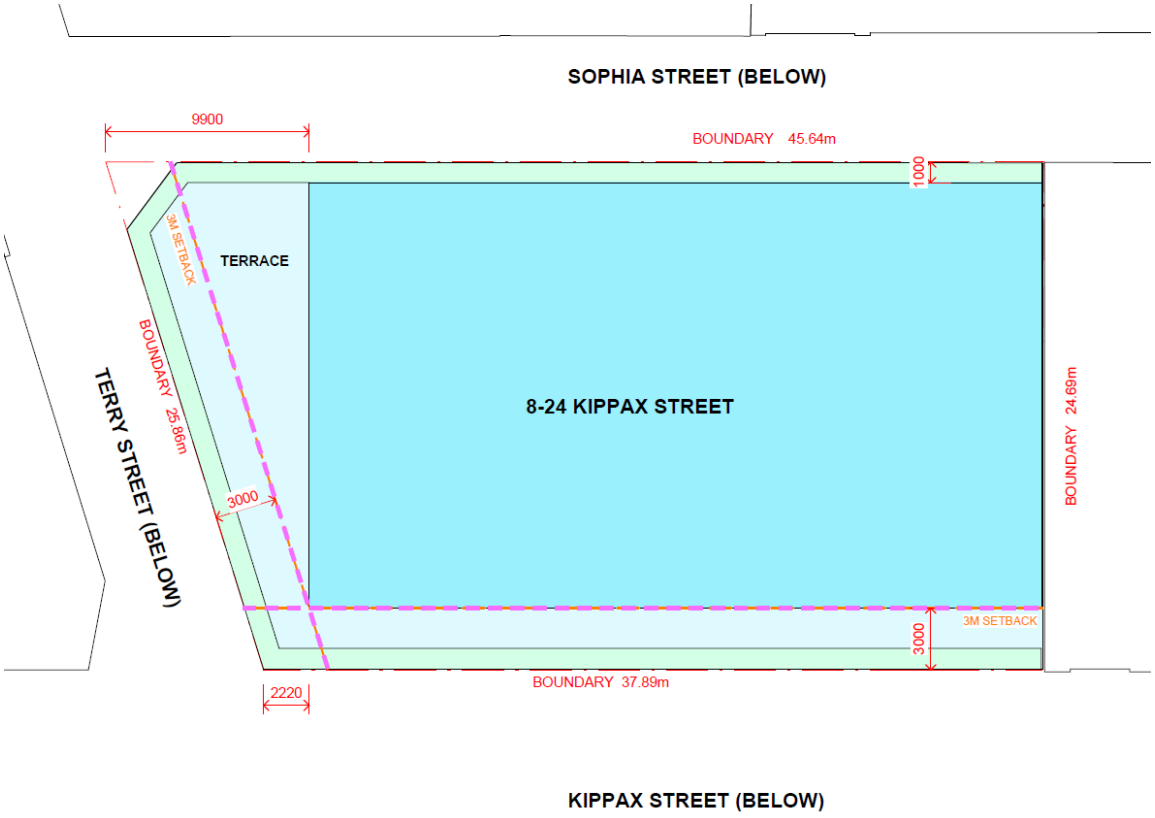


Figure 6## Level 10 Floor Plan
Source: Cox Architecture

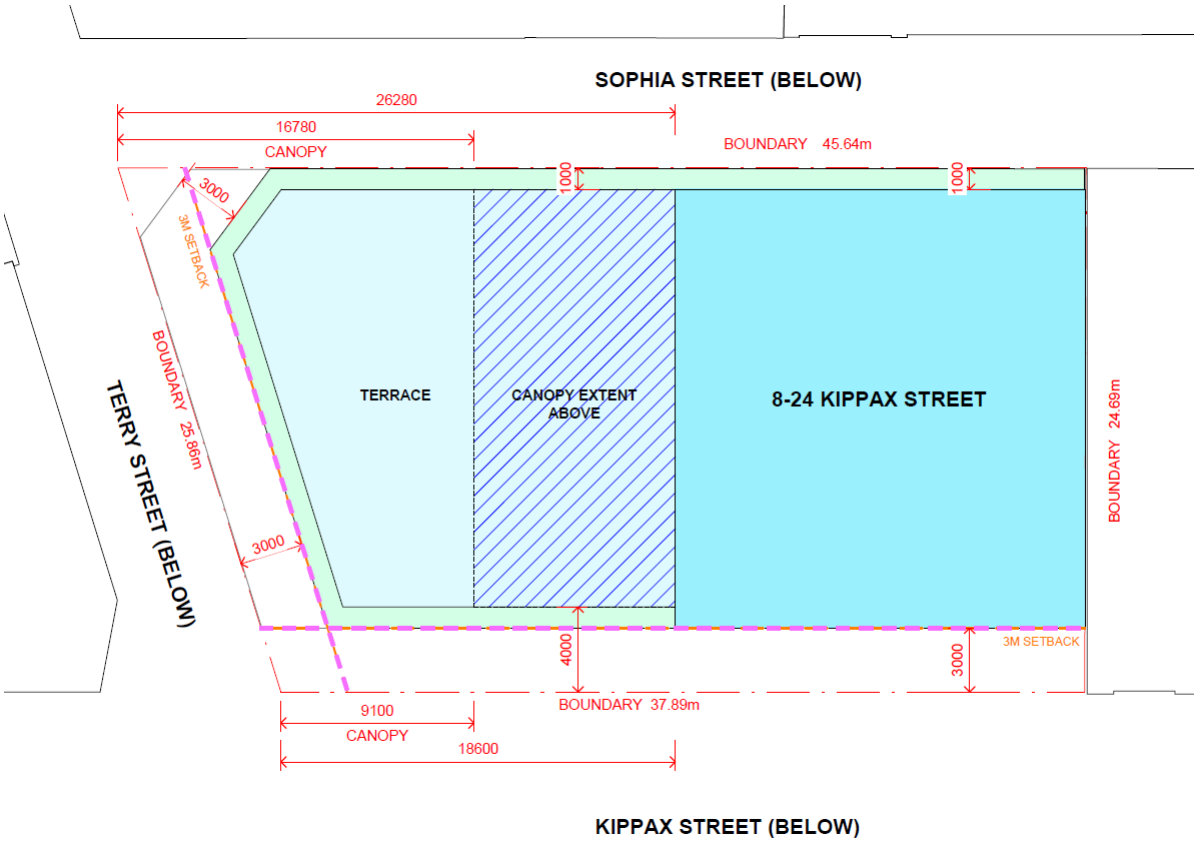


Figure 6## Level 11 Floor Plan
Source: Cox Architecture

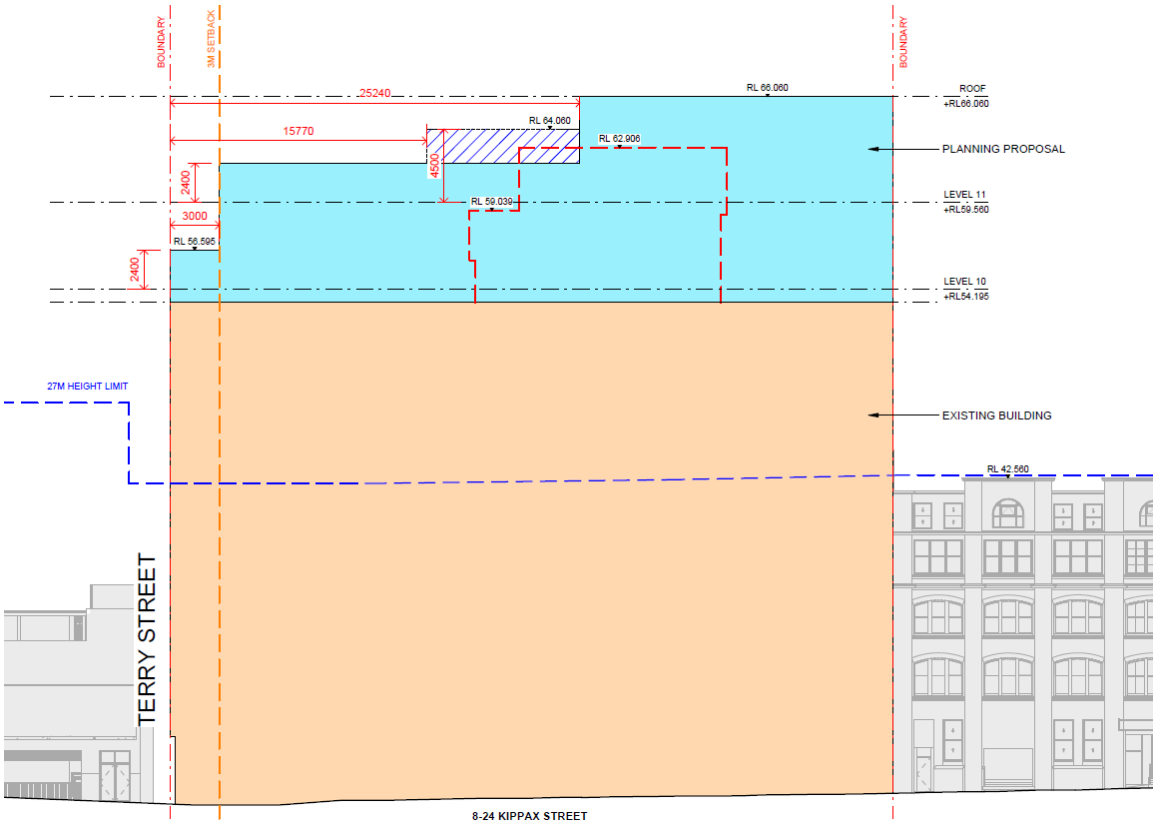


Figure 6## Kippax Street Elevation
Source: Cox Architecture

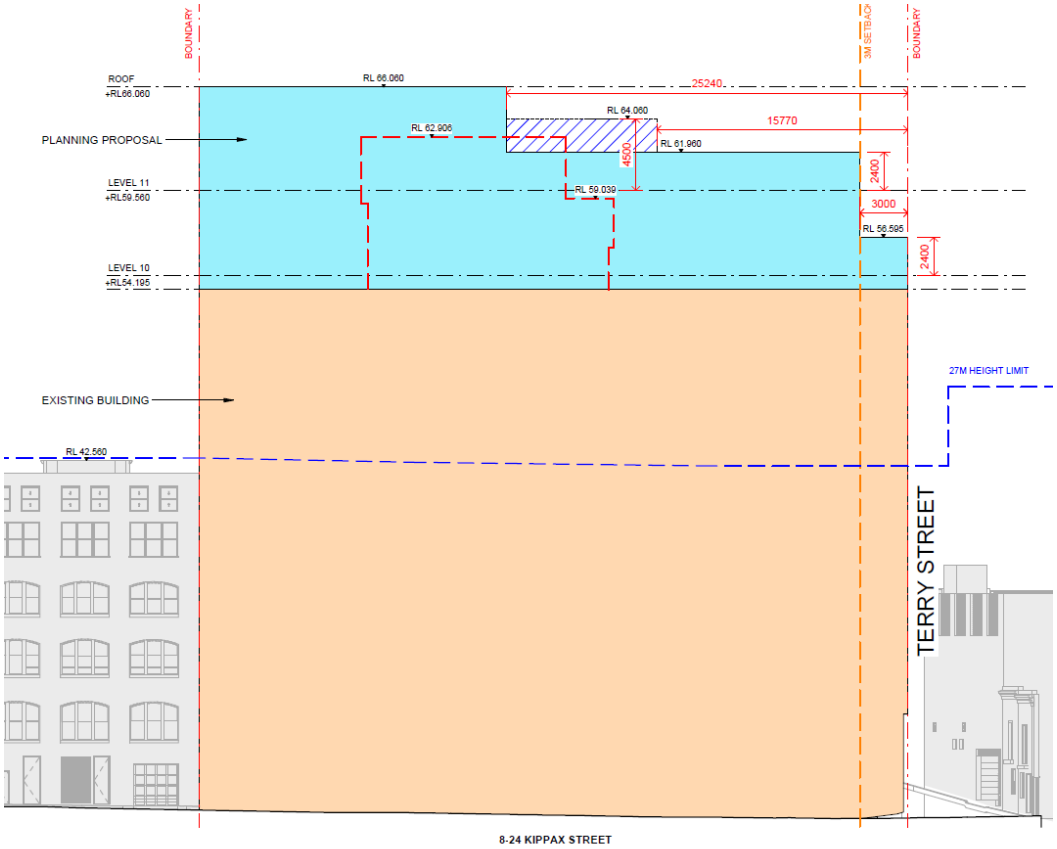


Figure 6## Sophia Street Elevation
Source: Cox Architecture

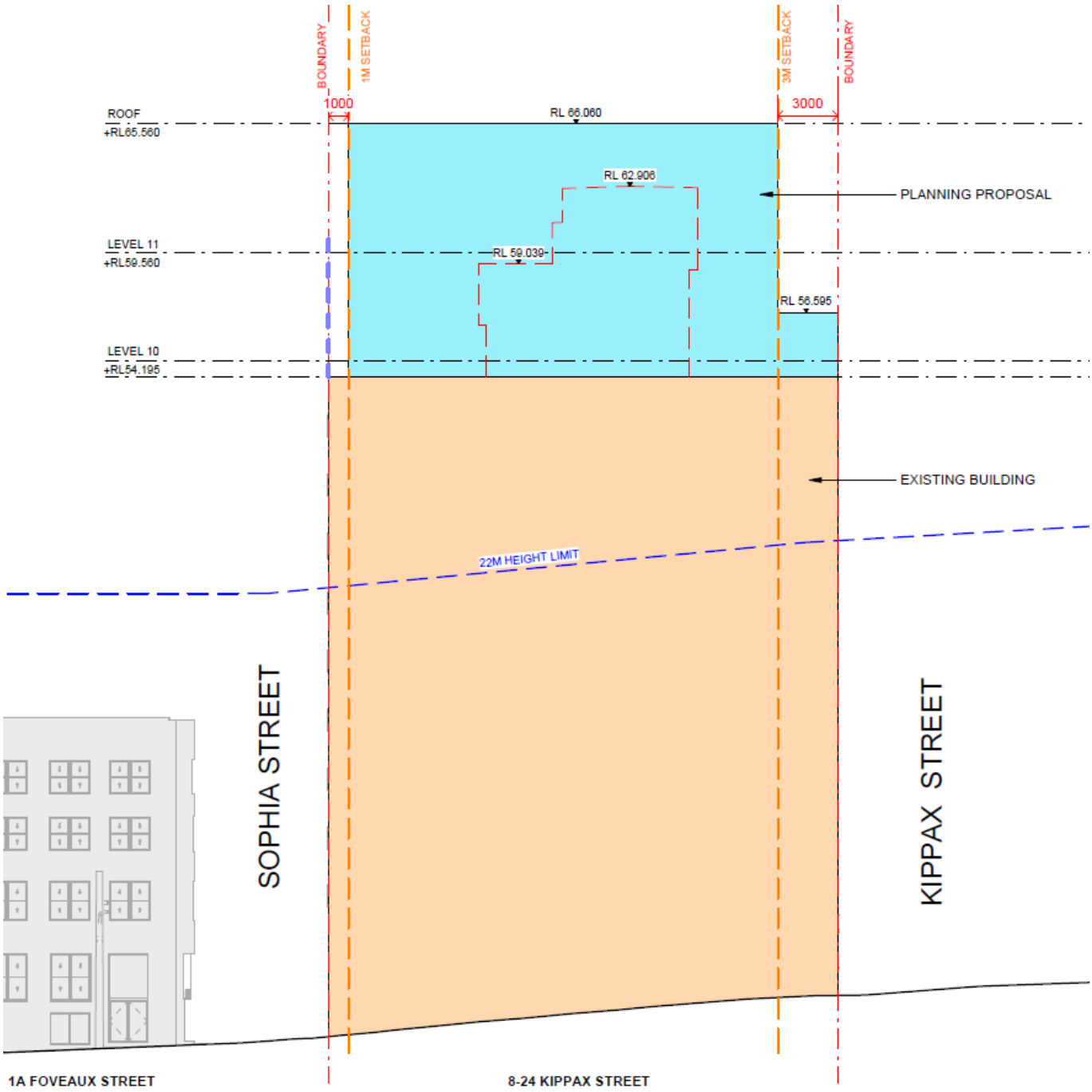


Figure 6## Terrey Street Elevation
Source: Cox Architecture

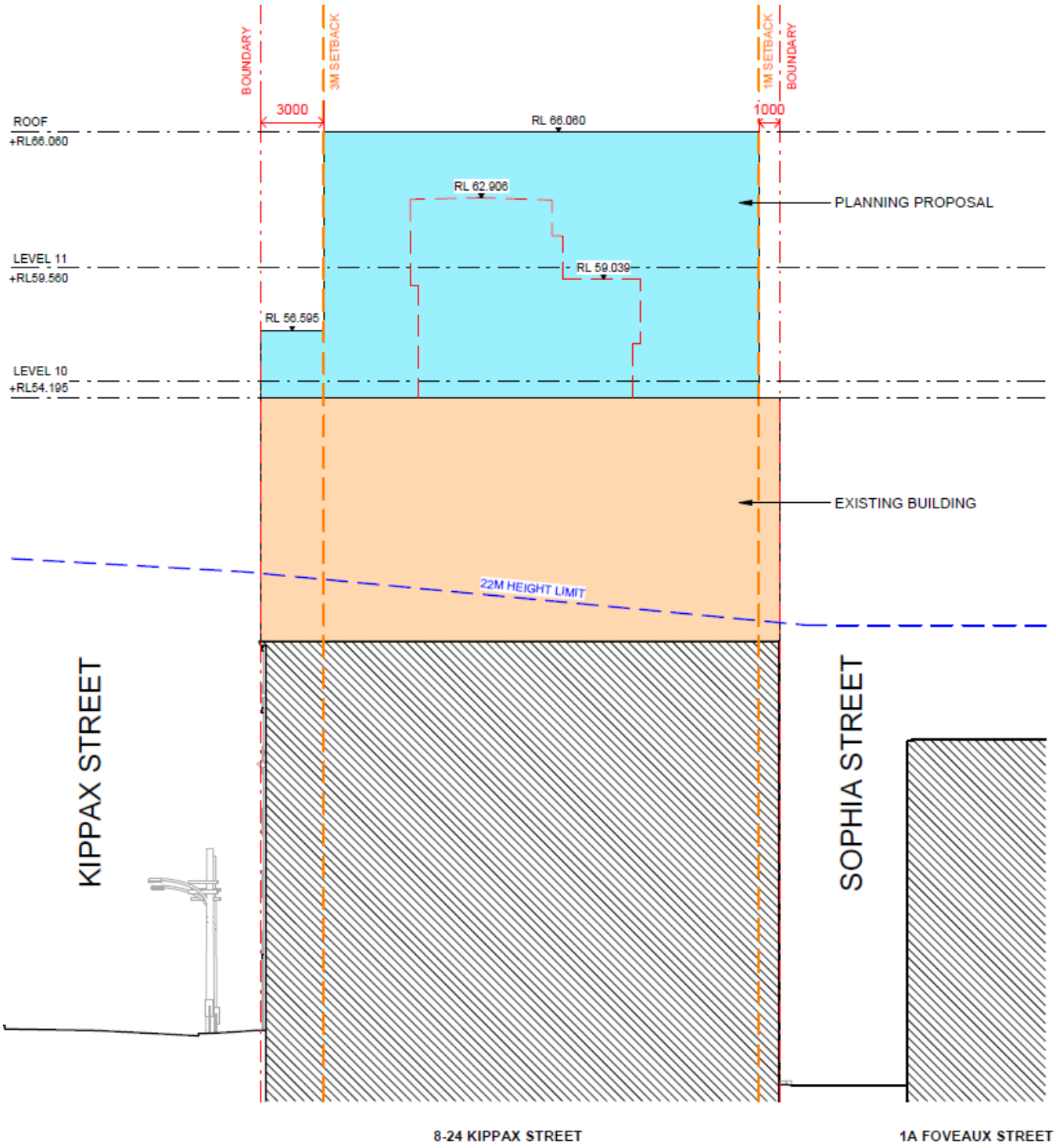


Figure 6## East Elevation
Source: Cox Architecture

6.#.##.# Public Domain

1) Active uses or uses that allow visual permeability to the ground floor use are to be located at ground level to Kippax Street and Sophia Street to provide passive surveillance of the public domain.
2) Development must ensure it does not damage or affect the health or structural stability of any adjacent street trees.

6.#.##.# Landscaping and Tree Canopy

1) Landscaping is to be provided generally in accordance with the following plans:
    a) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Maximum building envelope'.
    b) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Level 10 Floor Plan'.
    c) 'Figure 6.##: 8-24 Kippax Street, Surry Hills – Level 11 Floor Plan'.
2) A perimeter zone of planting of no less than 1m width for landscaping is required to be provided to level 10
3) Planting to the level 11 terrace is to have a canopy cover of not less than 10% of the site area within 10 years from the completion of development.
4) Landscaping is to be incorporated to the rooftop (other than the area of level 10 and 11 terrace), including beneath any installed photovoltaic cells.
5) The design of any planter boxes to the building façade are to project no more than 450mm from the existing site boundary and have a clearance of not less than 3000mm.
6) Any landscaping to the building façade must be designed so as to be capable of maintenance from within the site.

6.#.##.# Sophia Street Retail

1) The corner of Sophia and Terry Street at the lower ground floor is to be used for active retail use

6.#.##.# Articulation and Public Art

1) The design of the building is to relate sympathetically to the surrounding heritage items and streetscape character through:
    d) maintaining the existing architectural language and proportions of openings to the existing
    e) provide a visual transition to surrounding building through the use of varied materiality and form for any new additions.
2) Future development is to provide high quality public art integrated in the building's eastern façade and opportunities to Sophia Street at the rear of the site.

Attachment A7

Public Art Strategy

UAP acknowledges the Traditional Custodians of the land on which we are meeting and recognise the value, diversity and integrity of First Nations arts, cultures and expressions, and their continual significance today.

We pay our respect to Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander people. We acknowledge that Indigenous sovereignty has never been ceded.

UA

8-24 KIPPAX STREET, SURRY HILLS PRELIMINARY PUBLIC ART STRATEGY PP SUBMISSION

Client
Canva

UAP Reference
P3630

Document Type
Public Art Strategy

December
2023

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UAP

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Introduction

UAP is an internationally renowned Public Art company specialising in collaborative placemaking and the management and delivery of integrated art and design solutions for the public realm.

UAP has been invited by Canva to prepare this Public Art Strategy to support the proposed implementation of public art at 8-24 Kippax Street, Surry Hills.

The primary objective of this Public Art Strategy is to analyse and identify the best potential approaches for the inclusion of public art within the development. The strategy will assist in ensuring that ample consideration is given to the integration and role of public art across the site and in sympathy with the architectural design.

To inform the successful commissioning of suitable public art for 8-24 Kippax Street, this Public Art Strategy will:

- Research the local context, including current planning/design status, historic, cultural, environmental and social factors relevant to the site and surrounding precinct
- Develop a curatorial vision to align with client objectives and guide the conceptual approach in future project stages
- Identify suitable artwork types and advise relevant preferred forms, locations and desired experiences
- Provide benchmark imagery to illustrate the opportunity and potential advise on budget allocation
- Develop the implementation plan with program and procurement method recommendations, confirmed budget plan, and identification of authority approval processes

PROJECT CONTEXT

Project Context
Overview

Situated on Gadigal Land, within the emerging ‘Tech Hub’ of Surry Hills, 8-24 Kippax Street is primed to become the new Sydney headquarters for Canva. The corner site provides excellent street frontage, across Kippax Street, and into the laneways of Terry and Sophia Streets.

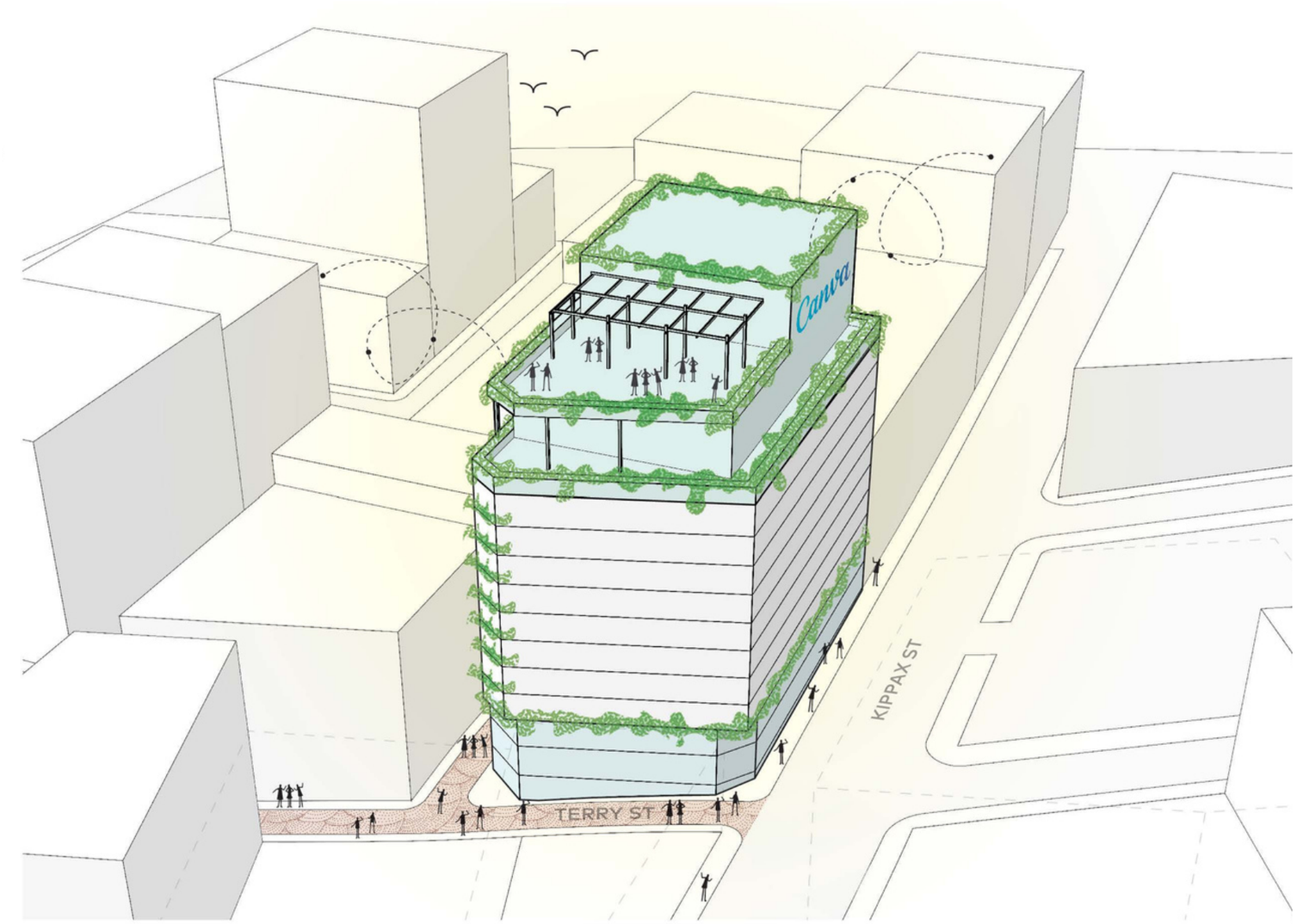
This development sits within a 400m radius of six pre-existing Canva offices, two of which are sited on Kippax Street itself. The site is centrally located adjacent to Sydney’s Central Station and is easily accessible via train, light rail and bus.

The proposed refurbishment aims to retain as much of the existing architecture as possible. The red brick of the original building is a feature of the updated design, with pragmatic interventions applied to improve functional planning and sustainability initiatives.

Canva is both owner and occupier of the site. The possibility for deeply integrated, purpose-driven design in collaboration with Cox Architecture is optimum. Notable features of the redesign include a gym, studio, cafe, commercial kitchen, outdoor roof terrace and tiered Town Hall space.

Size of Development 1031.58m2

Floor Count: 11 storeys (including existing 9 storeys)



Render courtesy of Cox

Project Context
Design Principles

"The proposed redesign will offer a benchmark model in the re-use and rejuvenation of an existing, tired commercial building"

COX ARCHITECTURE

Cox Architecture are leading the redesign of the 8-24 Kippax Street site. In keeping with Canva's unwavering commitment to sustainability, the decision to redesign a pre-existing building supports their company-wide value of "being a force for good". By retaining what was previously known as the KMS building, the design is driven by a desire to repurpose the existing structure and minimise waste.

The facade expression has been designed with three key personalities in mind:

- Re-fresh
- Re-use
- Biophilia

Three key drivers have been identified across the site-wide redesign:

- **Be a good neighbour**
  - Engaging - open to street
  - Fine grain - crafted human scale
  - Permeable - street to lane
  - Transparent - clear glazing
- **More with less**
  - Sustainability - reusing existing facade
  - More with Less - recycled elements
  - Environmental - solar shading - natural ventilation
  - Pragmatic - improve as opposed to upgrade
- **Touch the sky memorably**
  - Simple massing
  - 3m set back to Kippax and Terry Streets
  - Fully glazed with dramatic 360 degree views
  - Terraces to Levels 10 & 11



RE-FRESH



RE-USE



BIOPHILIA

Images courtesy of Cox Concept Design Report, 2023

Project Context
Canva Values

Established in 2013, Canva has a vision to empower people worldwide to design anything and publish anywhere. Globally recognised as one of the best online design and visual communication platforms, the company prides itself on being user-friendly and accessible. With a comprehensive free-to-use platform, it is now used across 190 countries and in 100 different languages.

The Canva Values are core to every decision that the company makes and are deeply integrated into the culture, vision and impact of the company. These values are distilled into the below key drivers:

- **Be a force for good**
  Making the world a better place through positive actions, inclusion and diversity
- **Be a good human**
  Value good communication. Be open, honest and constructive with yourself, with your team, with the company, and with the world.
- **Empower others**
  Empowering others to achieve their goals, both globally and within Canva
- **Make complex things simple**
  Always aiming for the most simple, pragmatic and effective solution to any problem. Think of the user.
- **Pursue excellence**
  Maintain a high bar for ourselves and the people we work with. Continuous growth and development. Lead by example.
- **Set crazy big goals**
  Set ambitious goals, priortise, hustle to execute and celebrate success!

Canva is committed to designing a sustainable future. The company reached global carbon neutral in 2021, and they've now entered the Beyond Net Zero phase with a focus on regeneration and healing the planet. This is evident in their procurement of 8-24 Kippax Street, and the commitment to adaptive reuse of a pre-existing site.

Project Context

First Nations Context and Site Heritage

UAP

First Nations Context

The 8-24 Kippax Street site is situated on the land of the Gadigal (Cadigal) People, part of the Eora Nation. The Gadigal clan occupies the southern shore of Sydney Harbour from Watsons Bay to Sydney Cove. Once characterised by windswept sand dunes and small swamps, what is known as Surry Hills once saw a large sandhill split the land between Cleveland and Devonshire Streets. Expansive lands were distinguished by native vegetation and water resources which supported the Gadigal people and their lifestyle. The Gadigal people were key in early water resourcing and management, maintaining local waterways with deep understanding. Middens from Darling Harbour speak to the Gadigal knowledge and skill around collecting, cooking and eating freshwater shellfish. The sandy soils of the area provided major source food and medicinal resources with grounds for yams, berries, possums, and bats.

In 1984, Artspace Gallery was located in Surry Hills and hosted *Koori Art*, the first exhibition in Australia to focus on contemporary Aboriginal artists. Supported by the Aboriginal Arts Board, it featured 25 First Nations artists and over 50 artworks. This exhibition was pivotal in fostering urban Aboriginal art as a movement.

European Settlement

After the First Fleet arrived in Sydney Cove in 1788, the wealthier settlers spread out into surrounding areas, including Surry Hills. A few villas were built in the neighbourhood in the late 1820s. The region found itself in vast contrast; housing both wealthy merchants and the working class. High-rise developments crowded into the streets, making the area quite densely populated. The wealthier residents began to flee for more fashionable suburbs. In the 1930s, the government began to clear out the land and rezone it. Victorian homes were renovated, high-density apartments were constructed, and commercial areas were designated.

Site History

Previously known as the KMS Building, 8-24 Kippax Street has had a rich history as a mixed-use retail, corporate and residential space. While the site is currently a vacant office building, the street-facing retail areas have been home to labels such as Morrisday, Zen Garden, Sweetpot, as well as providing offices for SIA Ecological, DM Legal, Mutual Credit Union, National Aboriginal History & Heritage Council (2010) and many others. Level Six of the building was the Sydney Campus for the Australian National Education for international students.

Contemporary Surry Hills

Surry Hills is part of Sydney's 'Tech Central', which along with Haymarket, Ultimo, Camperdown, Darlington and Eveleigh, forms one of the densest and most vibrant innovation corridors in Australia. Established by the NSW Government, the intention is to cement Sydney's position as a go-to destination for Tech advancement, creating a central gathering place for Australia's tech pioneers. Deputy Secretary for the Department of Social Services NSW, Letitia Hope states that, "organisations headquartered at Tech Central will be part of a globally-recognised community. Tech Central attracts thinkers, creatives and problem solvers who push boundaries".

Beyond the technological hub, the suburban streets of Surry Hills are characterised by tree-fringed terrace houses, hole-in-the-wall cafes and boutique stores. It is recognised as one of the most in-demand residential inner city neighbourhoods in Sydney. Tiny laneways weave across the suburb, making it a local favourite for urban photoshoots for the creative crowd. Surry Hills' immediate proximity to Sydney's thriving CBD makes it a popular area for corporate workers, while the density of public parks gives the area family-friendly greenspaces.







Image Credit (L-R) *Four Thousand Fish,* Sydney Festival, 2018; City of Sydney, *Kippax Street Surry Hills*, c.1930; What's On, *Sydney Streets on Crown Street*, 2023

Project Context
Location and Access

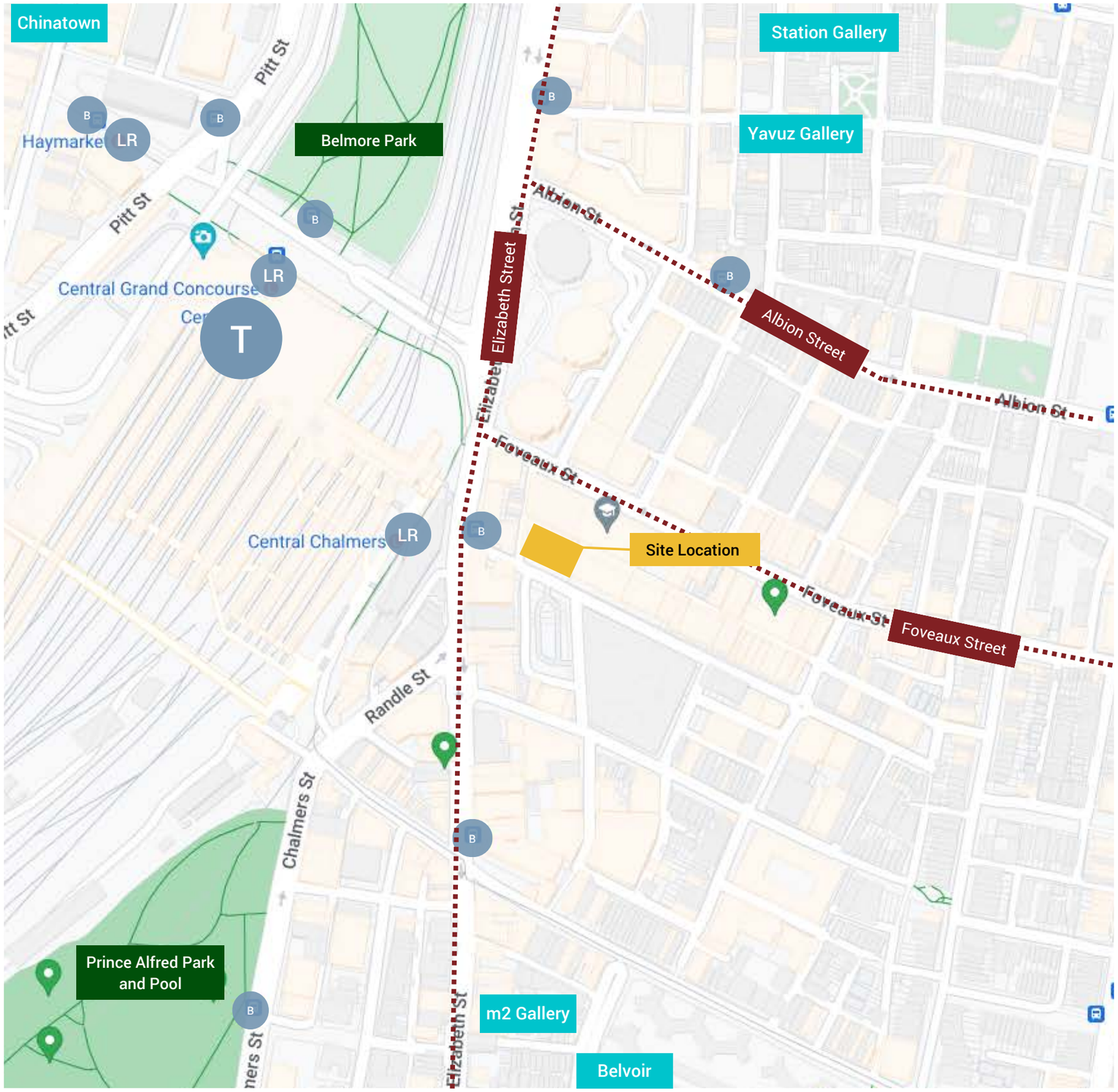
The 8-24 Kippax Street site is centrally located within the very heart of Sydney's Surry Hills. Directly adjacent to Central Station, it has never been easier to connect across the inner-city, suburbs and interstate through trains, buses, coaches and light-rail options.

While public transport is often the preference for locals, the site is well connected via main roads and is very walkable via pedestrian pathways. Some key methods of transport to and from the site are listed below.

Public Transport
Located less than a minute from Sydney's Central Station, this transport hub boasts 24 platforms of trains, two light rail stops connecting to both lines, bus stops A-N and a meeting place for most interstate and recreational coaches. Central Station is the centre of public transport in Sydney, connecting commuters throughout the city, suburbs and interstate through a plethora of transport modes.

Pedestrian and Cycle Access
Kippax Street is very well connected to wider Surry Hills through Elizabeth Street, at the eastern end. Many commuters exiting from Central Station may use the exits just opposite Kippax Street. Surry Hills and further into Sydney's CBD is well connected for cyclists wanting to commute on just two wheels. Dedicated bike lanes wind around Central station.

Major Roads and Transport
Elizabeth Street is one of the longest streets running north-south through Sydney, beginning in the CBD and coursing directly to Waterloo. Running parallel to Kippax is Foveaux Street, running east-west between Elizabeth and Bourke Streets. Other notable streets nearby include Crown Street, and Kings Cross' famous Oxford Street Beyond Central station, is Pitt Street, connecting to George Street and onto Broadway.



Project Context
Site Characteristics

Surry Hills is a vibrant and active suburb of inner-Sydney. There are an abundance of laneways to explore, with a wide collection of cultural, recreational and historical features and a vast greenspaces peppered throughout the urban landscape.

Listed below are some of the many features sited in proximity to 8-24 Kippax Street:

National Parks and Reserves

- Prince Alfred Park
- Belmore Park
- Harmony Park
- Frog Hollow Reserve
- Cooper Street Reserve

Historical

- The Cathedral of the Annunciation of Our Lady
- Central Station
- Sydney's Rainbow Crossing
- The Goods Line

Cultural

- Belvoir Street Theatre
- Capitol Theatre
- Powerhouse Museum
- Chinatown
- 4A Centre for Contemporary Asian Art
- Yavuz Gallery
- STATION Gallery
- m2 Gallery
- Brett Whiteley Studio

Recreational

- Prince Alfred Park Public Pool
- City Community Tennis
- Central Yoga School
- Paddy's Markets

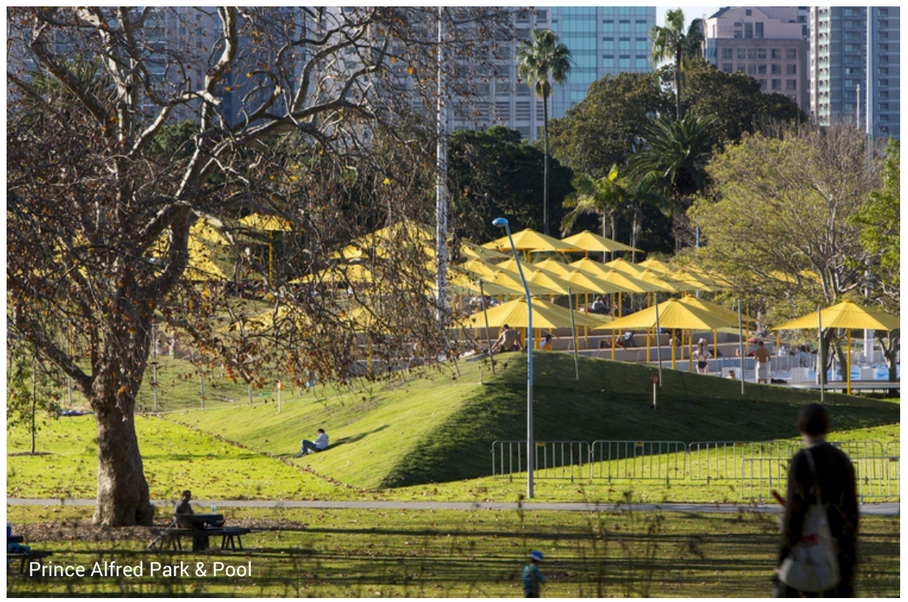

Sydney's Rainbow Crossing



Surry Hills



Belvoir Theatre


Prince Alfred Park & Pool


Central Station


Yavuz Gallery

Project Context

Nearby Public Art

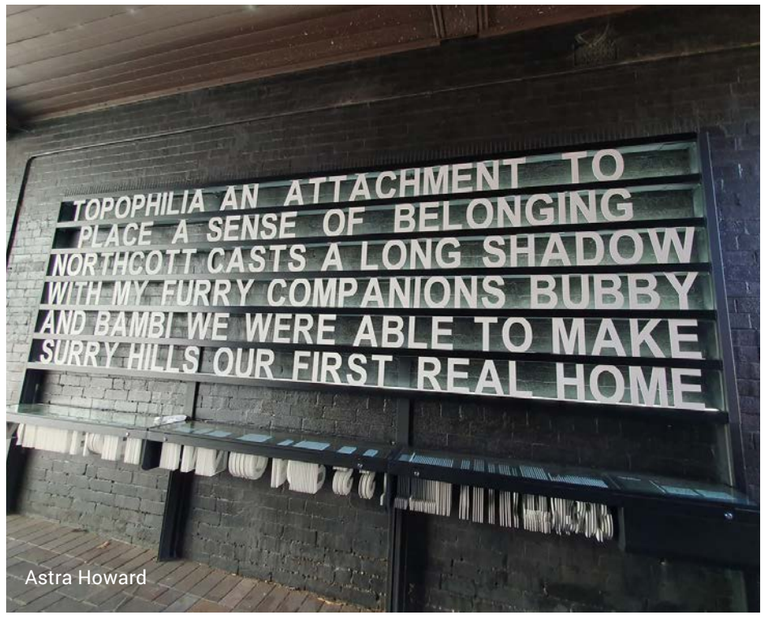
Surry Hills is home to a vast collection of permanent public artworks, often considered as the ever-growing outdoor gallery of the city. Weaving through laneways, there is no end to discoverable artworks around every corner. Jacob Nash's addition to 477 Pitt Street was a key moment within the Tech Central development, while Thierry Noir's iconic mural on the Corner of Devonshire and Bourke Street is striking and bold within the urban landscape.

Nearby Public Artworks

- Marisa Purcell, 2023 52 Reservoir Street, Surry Hills
- Rose Nolan, *All alongside of each other*, 2023, Central Station
- Jacob Nash, 477 Pitt Street, 2023
- Callum Morton, *City Lights,* Ace Hotel, 2022
- Sonia van de Haar, *Shades of Green*, 2013, Prince Alfred Park Pool
- Astra Howard, *Village Voices*, 2016, Laneway between Crown St and Wilshire St
- Hamish McBride, Laura Paige, Megan Hales, Jacqueline Butterworth and Kailin Hegel, *Adam Goodes* 2020, corner of Crown Street and Foveaux Streets
- Thierry Noir, *Surrey Hills*, 2015, Corner of Devonshire Street and Bourke Street
- Agatha Goethe-Snape, *Here, An Ech*o, 2016, Wemyss Lane
- Mikala Dwyer, Lamp for Mary, 2010, Bourke Street to Clare St


Jacob Nash


Callum Morton



Astra Howard


Rose Nolan


McBride, Paige, Hales, Butterworth and Hegel


Thierry Noir

VISIONING

Visioning
Public Art Policy Alignment

Public art for 8-24 Kippax Street will be developed to align with the City of Sydney's vision and goals for public art, and drawing from the City's *Sustainable Sydney 2030-2050 Continuing the Vision* and related public art policies, strategies and plans. The matrix (right) outlines the '8 Guiding Principles' for City of Sydney public art and provides an overview that demonstrates how public art for 8-24 Kippax Street will align with these principles.

Sydney 'Creative City' Vision

The City of Sydney demonstrates a strong commitment to the provision of creative offerings for the people who work in, live in, and visit the City. Along with a strong history of public art programming, and the combined success of City of Sydney's various temporary laneway art projects, City of Sydney has also recently conducted wide-scale strategic planning for 'A Revitalised City Centre'. Culminating in Sydney's *Sustainable Sydney 2030-2050 Continuing the Vision*, culture and creativity are recognised as playing an integral role in Sydney's future as a world-class city – a role that is emphasised and evidenced through numerous accompanying arts policy and strategy documents.

Supported by the *Sustainable Sydney 2030-2050 Continuing the Vision*, Sydney's cultural life is one that is:

- Visible
- Innovative
- Proud
- Engaged
- Diverse
- Bold
- Curious

City of Sydney Public Art Objectives	8-24 Kippax Street Public Art
Align significant public art projects with major *Sustainable Sydney 2030-2050 Continuing the Vision* urban design projects	Artwork will be commissioned in consideration of other major public art projects located within the City of Sydney municipality as well as those outlined within the *Sustainable Sydney 2030-2050 Continuing the Vision* strategy.
Recognise Aboriginal stories and heritage in the public domain	Selected artists will be encouraged to draw inspiration from the rich heritage of the site, including First Nations histories and stories. The Public Art Team will work with the Cultural Consultants Yerabingin, to ensure any material is culturally appropriate and in keeping the broader cultural narratives for the site
Support local artists and activate city spaces with temporary art projects	Providing a significant opportunity to showcase local talent, distinguished professional local artists or artists with a significant connection to Sydney will be highly considered for this opportunity.
Support vibrant places in Village Centres with community art and public art in City projects	Public Artworks at 8-24 Kippax Street will be a memorable addition to public space contributing to a meaningful, active and vibrant public realm.
Promote the integration of high quality public art in new development	Significant Australian contemporary artists whose practice supports the prestige of this opportunity will be considered. Close collaboration with the project team will ensure that public artwork for the site is of a high-quality.
Support stakeholder and government partners to facilitate public art opportunities	The creation of public art for 8-24 Kippax Street is indicative of the success of the City of Sydney Public Art Strategy and Policy, facilitating the incorporation of a major permanent commission for the City.
Manage and maintain the City's collection of permanent art, monuments and memorials	This Public Art Strategy provides guidelines and recommendations on the management and maintenance of public artworks to be developed for the site. Artworks created will not be a duplication of existing artworks, monuments, memorials and/or related concepts.
Initiate and implement programs to communicate, educate and engage the public about City Art projects	Public art created for 8-24 Kippax Street can be incorporated into existing City Art projects and programs, whilst providing a quality artwork that is publicly accessible and engaging.

Visioning
Curatorial Vision

The Curatorial Vision is based on contextual analysis, including research into the history, aspirations, environment, urban character and users of the place. It ensures that the public art is conceptually connected by setting an overarching vision for art, describing what the artworks aspire to achieve, and providing thematic inspiration for artists Directing artists in creating a site-specific response to public art, the Curatorial Vision provides a starting point for inspiration, not a prescriptive theme.

–

The curatorial vision for 8-24 Kippax Street is a play on words that speaks to the dual concepts of distillation and discovery. To *refind* is an invitation to rediscover, repurpose and reinvigorate. It is to find again; to reimagine and reconnect with a sense of wonderment and celebration. To *refine* is it to achieve clarity through distillation. To expect and accept only the highest quality; to polish and play with precision in pursuit of a cultivated outcome.

This vision connects with two of Canva's key drivers:

- *Refind* connects with sustainability, elevating the focus to 'Be A Force For Good'.
- *Refined* is to pursue excellence, to extract and present only the most exceptional work.

This curatorial vision also sits in alignment with the architectural drivers of the building redesign by Cox Architecture, a design heavily imbued with the desire to do 'More With Less'. In this project the details are critical - what materials are recycled, what can be re-used, and how can waste be minimised? It is the accumulation of these considered details that define the impact of the whole.

The identity of the building is inherently linked to its location in Surry Hills. Where once workers cottages and factories lined the streets, the area is now home to leading creative and innovation industries. Yet it is the finegrain of the suburb - the laneways, original buildings and amenities - that give Surry Hills its character and inspire world-leading creative pursuits.

The theme *Re-find / Re-fined* encourages a consideration of the history of the site and locale, while stepping forward into the future with brave thinking and a bold imagination.

Contemporary Australian artists, including First Nations artists, will be considered for 8-24 Kippax Street.

Image: Timo Nasseri, *One and One* series, 2008 - ongoing

ARTWORK OPPORTUNITIES

Artwork Opportunities
Overview

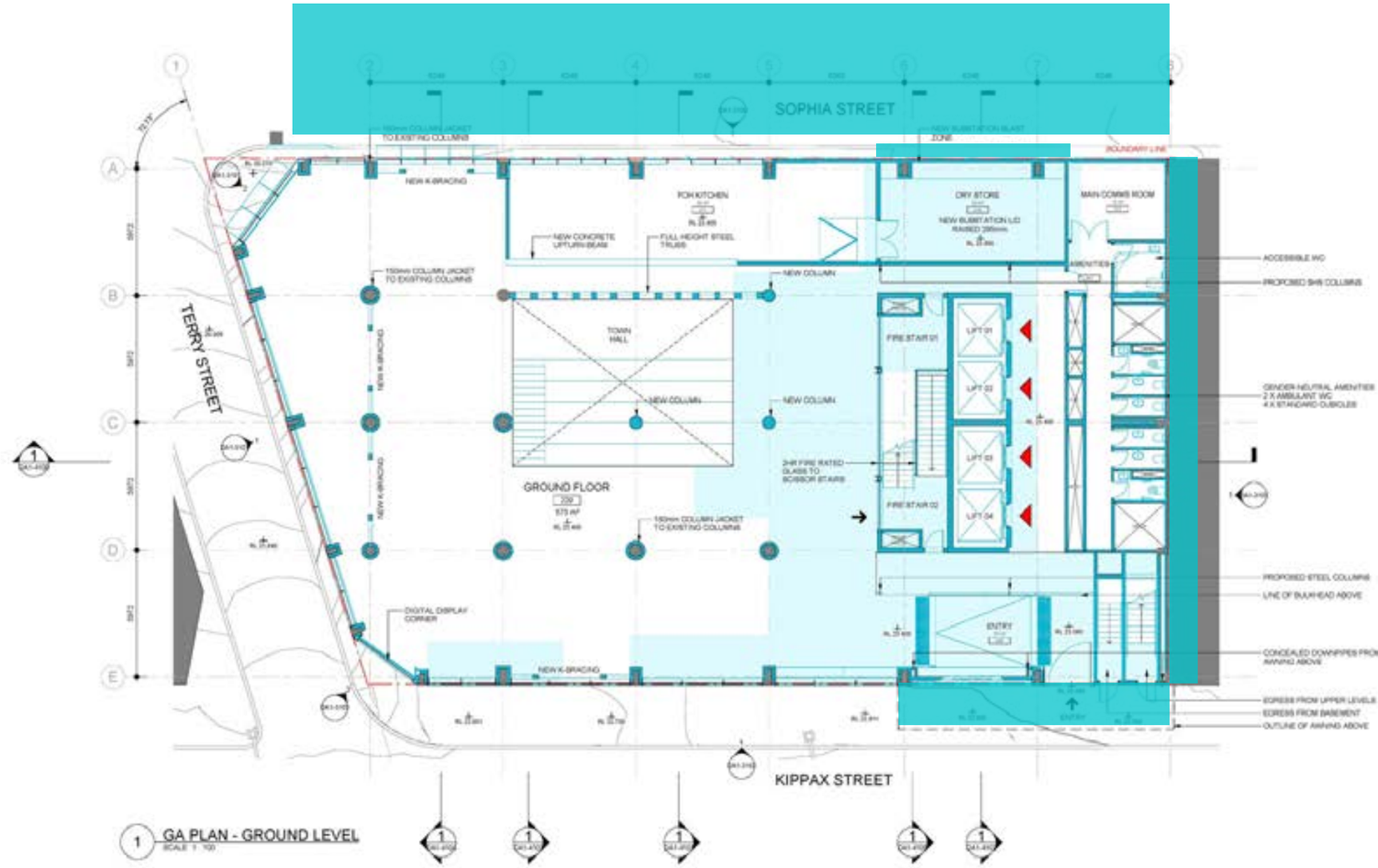
There are a number of locations identified across the site that are highly visible from the public realm that would be appropriate for a public art intervention.

Possible Locations:
- Kippax Street - East Wall
- Kippax Street Soffit
- Sophia Street Laneway

Possible Typologies:
- Mural
- Sculptural Attachments

Budget:
The total artwork budget will be equal to 1% of the project costs. This budget will be inclusive of all public art costs including Art Consultant, Artist fees, and associated manufacturing and installation costs.

It is anticipated that one or a combination of artwork locations may be explored within the budget.



Artwork Opportunities

Renders courtesy of Cox

Artwork Opportunities
Kippax East Wall

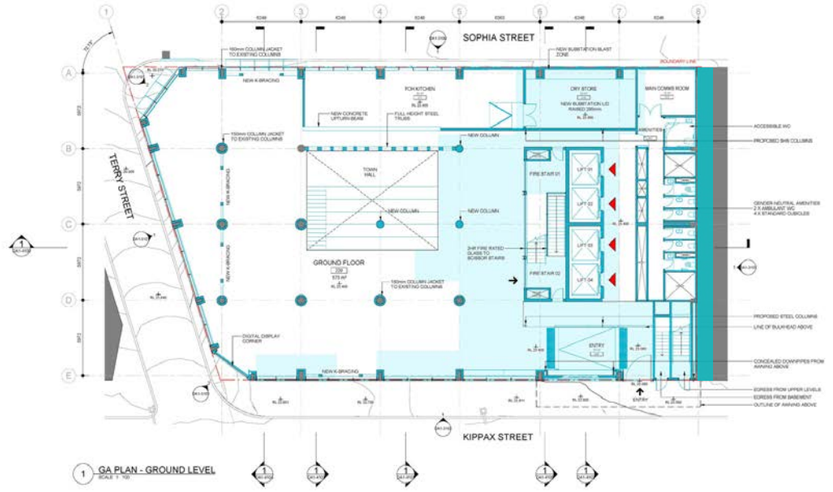
The Kippax East Wall provides a large scale canvas for a significant public artwork that is highly visible from neighbouring buildings. The total size of the wall is approximately 450 sqm.

A mural in this location has capacity to become an iconic landmark and a notable artwork within the urban landscape, adding to the rich character of Surry Hills.

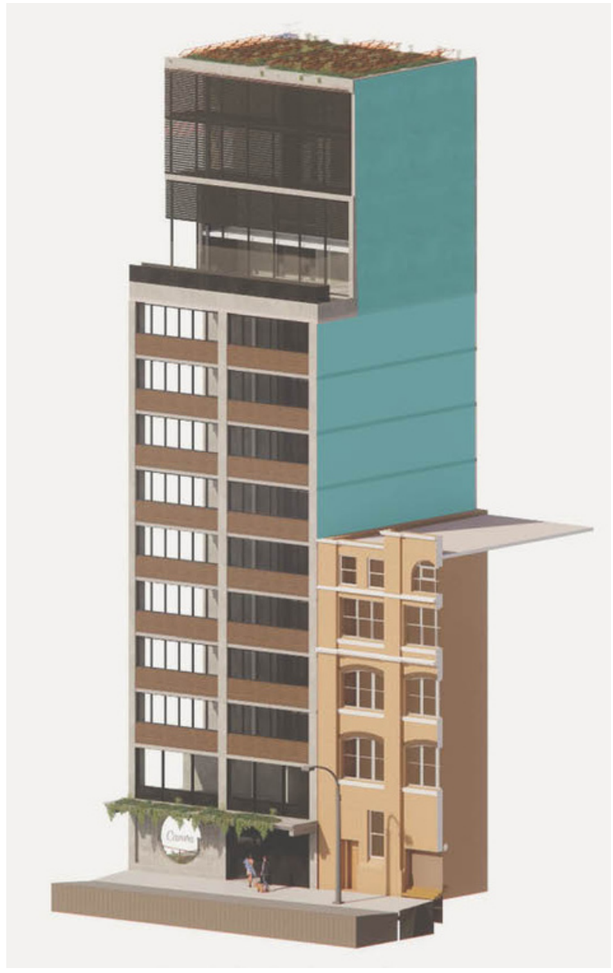
Possible Typologies:
- Mural

Role & Function:
- The creation of an iconic and highly identifiable landmark artwork
- Placemaking within the rich character of Surry Hills
- Visible from a distance and at height

Design Considerations:
- It is noted that the artwork cannot exceed the site boundary
- The site to the east (26-44 Kippax St) has a height control of 22m, slightly higher than the current building height.







Renders courtesy of Cox

Art Opportunity


Amok Island



Dylan Mooney



Maria Fernanda Cardosa


Emma Coulter




Amok Island

Artwork Opportunities
Kippax Street Soffit

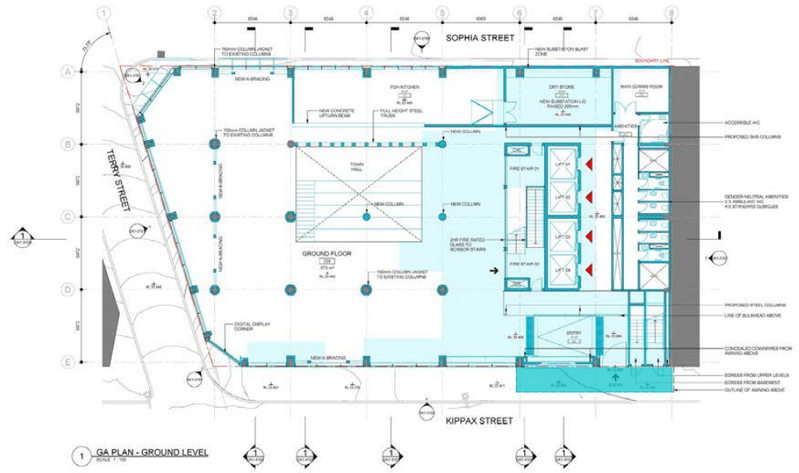
UAP

The Kippax Street entrance is the main entrance onto the site, and will be the key area for visitors to and from the development. As part of the redesign, the original awning is being retained. This artwork opportunity features the amalgamation of old and new as part of the redesign.

Possible Typologies:
- Sculptural attachments

Role & Function:
- Encouraging wayfinding across the site, supporting visitors in clear cues as to the main entrance location.
- Rewarding curious passers by engaging with public art close-up

Design Considerations:
- This opportunity would be realised in close collaboration with the building and landscape architects to achieve a high level of integration and ensure the artwork complements the built form, ensuring an artwork doesn't interfere or will be affected by the surrounding foliage.
- The final soffit materiality is yet to be confirmed and considerations must be made as to the viability of fixing into and weight-loading abilities.
- The commissioned artist may consider incorporating lighting elements to offer both a day and night activation, with power provided by the site.





Art Opportunity

Renders courtesy of Cox

Typology
Soffit Sculptural Attachment

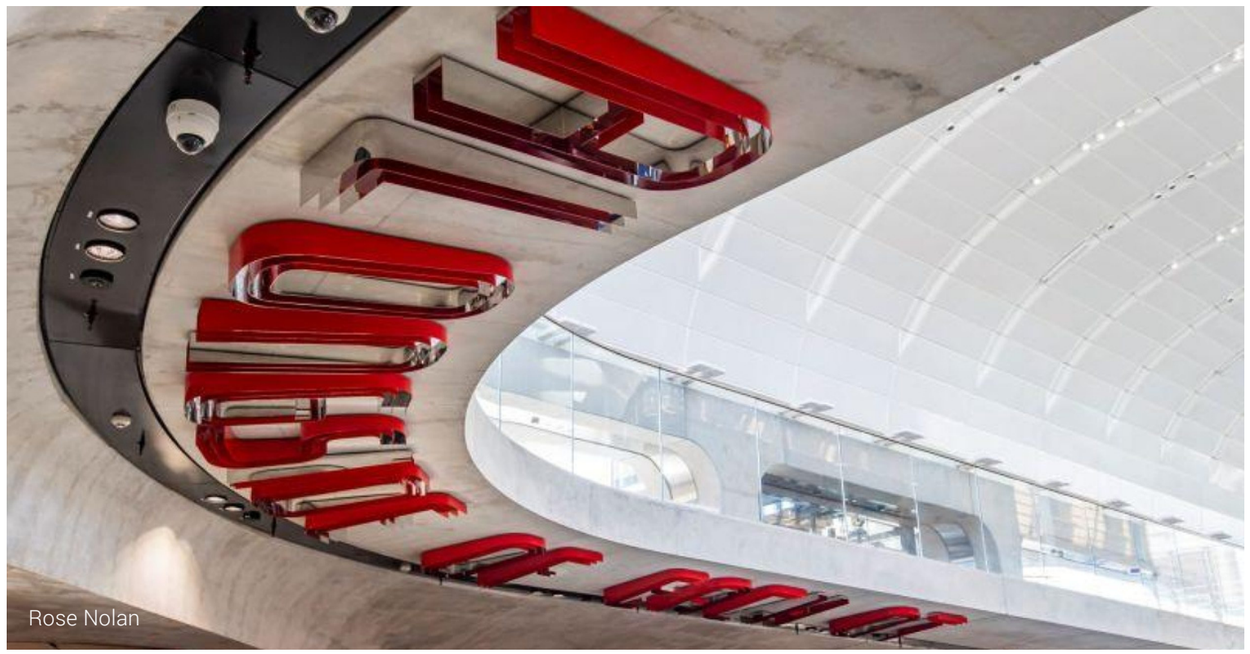
UAP


Jacob Nash


Meagan Streader


Dion Horstman


Emily Floyd


Rose Nolan

Artwork Opportunities
Sophia Street

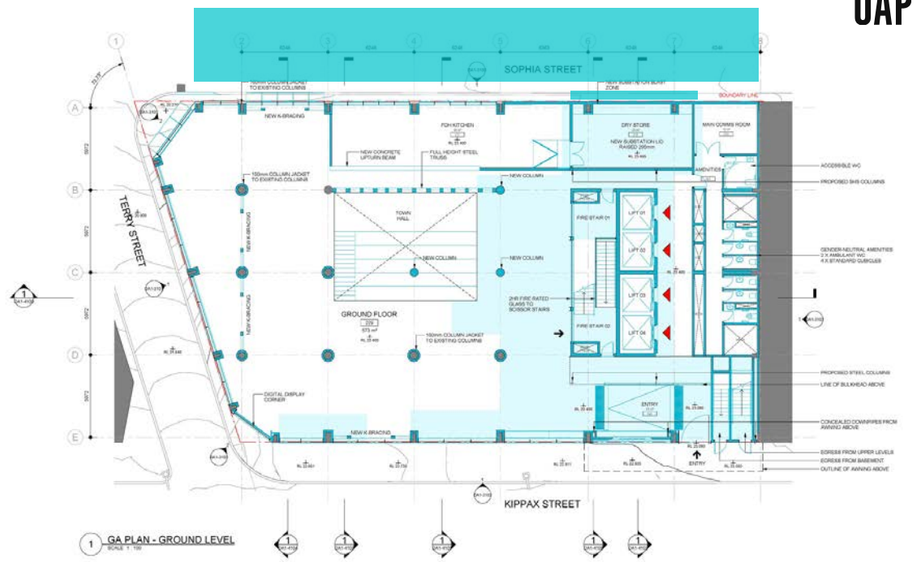
UAP

Sophia Street is set to become a highly activated laneway behind the Canva building. To encourage discovery and exploration throughout this laneway, Sophia Street has been highlighted as a possible location for public art.

Possible Typologies:
- Sculptural Attachments (3D) /with Surface Treatment (2D)

Role & Function:
- Supporting the enrichment and development of Surry Hills laneways
- Encouraging movement through and activation of Sophia Street
- Adding permanent artwork elements to a site used for pop-up activations and events.

Design Considerations:.
- Considerations must be made to ensure the street remains road worthy, and accessible as a thoroughfare for vehicles and pedestrians. This includes considerations pertaining to the height of suspended artworks and airspace permissions.
- The final facade design of the development is yet to be confirmed and considerations must be made as to the viability of fixing into and weight-loading capacity
- Sophia Street laneway is regularly used by a neighbouring film studio, and consultations with them are recommended ahead of final design confirmations.
- Sculptural attachments should consider maintenance, lifespan and public safety when identifying specific locations on the facade wall.
- The commissioned artist may consider incorporating lighting elements to offer both a day and night activation, with power provided by the site.
- A suspended installation must use 8-24 Kippax Street as the sole anchorage point. Risk assessments will need to be undertaken to ensure the viability of weight-loading and stability.





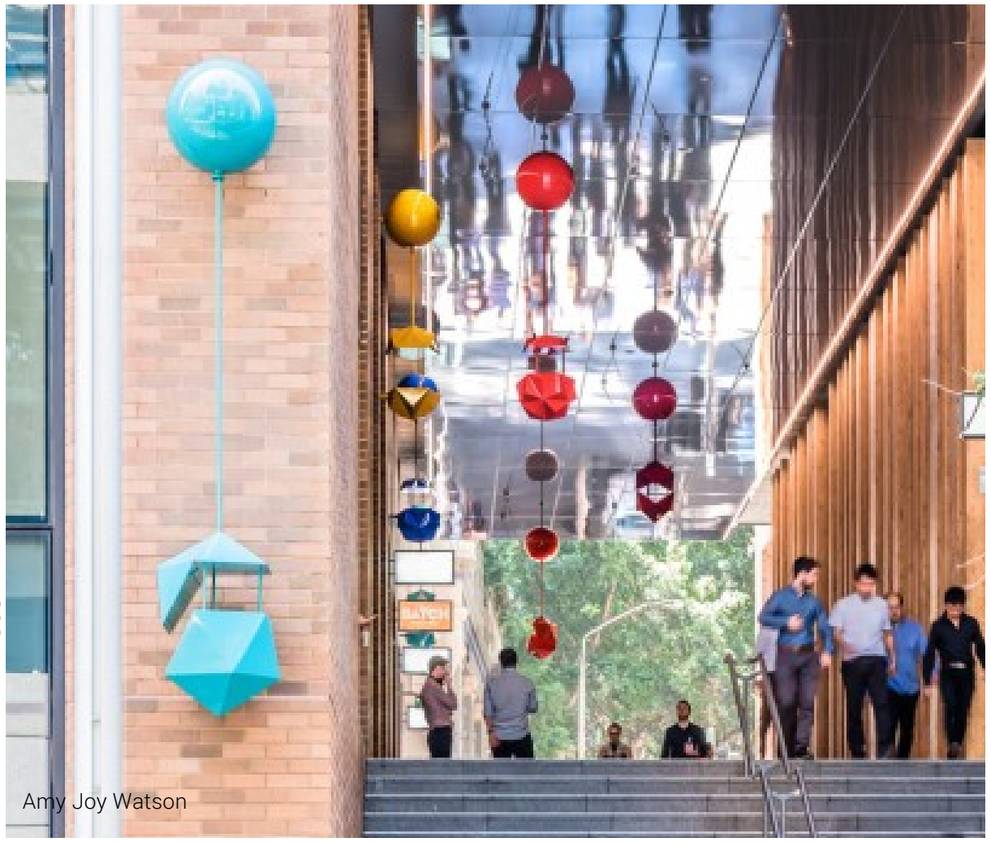


Art Opportunity

Renders courtesy of Cox

Typology
Wall-based Sculptural Attachment

UAP


Amy Joy Watson


Caroline Rothwell


Callum Morton


Jacky Tsai


Nike Saavas

IMPLEMENTATION

Implementation

Indicative Public Art Process and Timeline

The below program outlines the typical process for the planning and delivery of public art, aligned to key Council and Client review points. Please note this program is indicative only.

PLANNING

Art Strategy (4 – 6 weeks)

- Project initiation meeting and workshop process with key stakeholders
- Review of development's design documents
- Research into local culture, history and environment
- Development and documentation of Art Strategy with identification of art locations and benchmarking
- Implementation planning
- including development of; art budget guide, art process and initial program, maintenance and sustainability methodologies

CURRENT STAGE

Artist Procurement (2– 4 weeks)

- Facilitate and support artist short-listing and selection process with Client
- Confirm artist availability
- Develop Artist Briefing documents

Design Assist (6– 10 weeks)

- Contract selected Artists
- Brief contracted Artists
- Artist support for research and investigation, concept development, selection of materials, colours and scale
- Concept Design presentation including narrative descriptions, sketches and visualisations prepared by artists
- Preliminary manufacturing program and budget
- Management of Client review and selection of winning Concept Designs

DELIVERY

Technical Assist (10 – 12 weeks)

- Artist support for further materials investigation
- Preliminary engineering advice and liaison with design consultants and manufacturing team
- Final models and computer generated visualisations (as required)
- Material selection and fabrication budget review with client
- Management of Client review and approval of Developed Designs

Manufacturing and Installtion (18 – 24 weeks)

- Full manufacturing documentation and engineering certification including samples and prototypes (as required)
- Final manufacturing budget review with client
- Project management and budget
- control of artwork manufacturing
- Management of fabrication
- process, including:
- Artwork fabrication
- Client approvals
- during manufacturing
- Quality control
- Transportation to site
- Maintenance advice
- and development of
- Maintenance Manual/s
- Attribution plaque

Council review points by stage

City of Sydney review Art Strategy

City of Sydney review selected Concept Design(s)

City of Sydney review and approval point, confirming completion of art requirement

Implementation
Artist Procurement

UAP

UAP acknowledges the importance of First Nations cultural knowledge and should the project team invite a First Nations' artist to respond to the site, UAP will consult Yerrabingin, Cultural Advisors for the site prior to the artwork being designed and delivered.

There are two (2) main methods recommended for the procurement of an artist for 8 - 24 Kippax Street, Surry Hills.

- Direct Engagement
- Limited Competition

Within this process, artists will be paid a fee for any concept designs developed. In some cases, the artist may be paid a higher fee and asked to submit more than one concept for consideration. The artist's concept design will be presented to the client team for approval before progressing into production.

It is anticipated that two artwork opportunities will be commissioned for 8-24 Kippax Street, with at least one work procured through a direct selection, and at least one work procured through a limited competition.

A direct selection approach supports a practice-led appointment that allows for genuine engagement and collaboration between artist, architect and commissioner. Procuring any additional commissions via a competition process ensures a greater number of artists are given the opportunity to propose bold creative artworks for this particular site.





Images courtesy of UAP – Barangaroo Workshop.

Implementation
Maintenance

Maintenance is a key factor in the long-term care and quality of public artworks and should be taken into consideration during concept and design development, during material selection and construction.

In addition, the development of a maintenance program will ensure that the benefits generated by public art can be enjoyed over a long period and that maintenance costs can be kept to a minimum.

There are climatic conditions for the 8-24 Kippax Street site that all artists and fabricators must consider during permanent artwork development to ensure the longevity of all artworks. These conditions include humidity, fatigue, vehicular pollution, UV degradation and vandalism.

Material Selection

To withstand these conditions, artists will be required to ensure their artworks are of a robust nature, incorporate technologies that are easily replaced and be constructed from materials suitable for long-term exterior installations.
Artworks may be constructed from materials such as:

- Brass
- Cast aluminium
- Cast bronze
- Ceramic/Mosaics
- Concrete
- Copper
- Glass (select)
- Stainless Steel (select)
- Exterior grade paint

Please note the list on the left provides examples only and is not prescriptive to the selection of materials.
Materials not considered suitable include resins, soft timbers and any materials that are not UV stable.
Where artworks include technology elements, these should be high quality, warrantied components and fittings that are easily accessible for replacement. Use of LEDs is recommended for longevity and power efficiency of lighting installations.

Maintenance Program

During the development of a public art project, consideration should be given to the thorough documentation of the processes involved in the future care and maintenance requirements of the artwork. This information is captured in an Artwork Maintenance Manual which outlines the following information in relation to the artwork:

- Contact details for the construction company/companies involved
- Materials used during construction and supplier details
- Treatments, aftercare works and processes
- Design and structural drawings
- Predicted lifespan of components
- Location of power source, power supply, water supply etc.
- Cleaning program outlining processes and recommended frequency
- Any specific specialist maintenance requirements

The Artwork Maintenance Manual forms the final handover of ownership of the artwork.

Financial Implications

While artworks should be designed to be durable and require minimum maintenance, all permanent artworks in the public realm will require a certain amount of maintenance to ensure their longevity and reduce replacement costs. All commissioners of artworks must understand the maintenance responsibilities of each artwork which will be minimised and explained during the design stages.

In order that maintenance responsibilities and associated costs do not become onerous it is recommended that responsibility for maintenance is clearly established and that a condition check of the artwork is undertaken on a regular basis with any remedial works and cleaning carried out when necessary. This will prevent any deterioration of the artwork that may lead to more expensive restoration works in the long-term.

Artwork Life-Span

Permanent artworks commissioned for 8-24 Kippax Street should be intended to have a life expectancy equivalent to the life of the building. Where artworks include technology elements with expected lifespans shorter than 25 years, the future owner of the artwork may choose to conduct a review of the artwork before the intended expectancy is reached.

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Attachment A8

Noise Impact Statement

8-24 Kippax Street Surry Hills

CANVA Office Building Minor Additions Planning Proposal Noise Impact Statement

Canva Pty Ltd

Report number: 230530 – Canva Office Base Build PP NIA - R0 .docx
Date: 1 December 2023
Version: Issue

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DOCUMENT CONTROL

Project Name	8-24 Kippax Street Surry Hills
Project Number	230530
Report Reference	230530 – Canva Office Base Build PP NIA - R0
Client:	Canva Pty Ltd

Revision	Description	Reference	Date	Prepared	Checked	Authorised
0	Issue	230530 – Canva Office Base Build DA2 NIA - R0	1 December 2023	Nikolaj Drydale-Cech / Leo Tsui	Leo Tsui	Matthew Harrison

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This report has been prepared by Pulse White Noise Acoustics Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Canva Pty Ltd
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Pulse White Noise Acoustics disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1 INTRODUCTION

This Noise Impact Assessment has been prepared by Pulse White Noise Acoustics (PWNA) on behalf Canva (the applicant) in support of a Planning Proposal (PP) submitted to the City of Sydney Council (CoSC). This PP relates to the proposed minor rooftop additions at 8-24 Kippax Street, Surry Hills (the site).

This PP is for the minor rooftop additions which include increased building height and FSR, and comprise of:

- Enclosing and converting the current level 10 roof terrace into an internal function room
- Constructing a new level 11 on top of the level 10 function room.
- Relocate current level 10 external terrace to the new level 11.
- Ancillary works, including site services.

The function room and new terrace will not increase the number of office spaces as it is specifically designed for inhouse functions, events and entertaining.

This PP statement refers to previous noise surveys and established noise criteria undertaken for the site by PWNA. This statement also addresses the potential for noise impacts from the operation of the minor additions to the rooftop, as well as potential noise impacts from existing noise sources within the vicinity of the site from surrounding noise sources.

The development will be assessed against relevant statutory regulations and guidelines including the *Sydney Development Control Plan (DCP) 2012,* Australian / New Zealand Standard *AS/NZS 2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors*, and the acoustic requirements of the Environment Protection Authority's (EPA) *Noise Policy for Industry (NPI)*.

1.1 Relevant Guidelines and Reference Documents

The guidelines applicable to this assessment include:

- *Sydney Development Control Plan (DCP) 2012 - Part 4 - Section 4.2.3.11 – Acoustic Privacy;*
- *Australian / New Zealand Standard AS/NZS 2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors;*
- *NSW Noise Policy for Industry* 2017 (NPI)

This assessment has been based on and references the following Planning Proposal documentation including:

- Previous Noise Impact Assessment for the 8-24 Kippax Street site prepared by Pulse White Noise Acoustics
- Architectural PP package prepared by Cox Architects

1.2 Site Location and Nearby Sensitive Receivers

The project site is located at 8 – 24 Kippax Street, Surry Hills, NSW 2010.

The nearest sensitive receivers to the site have been identified below.

Receiver 1: A mixed use commercial and retail building to the south-west of the site at the corner of Elizabeth and Kippax Street. The site is formally described as Lot DP 89004.

Receiver 2: Aurora Rooftop Hotel, A commercial building to the west of the site at 324 Elizabeth Street, Surry Hills. The site is formally described as Lot DP 86543 & DP 1042078.

Receiver 3: Commercial building to the west of the site at 316 – 302 Elizabeth Street, Surry Hills. The sites are formally described as part of Lot DP 33877.

Receiver 4: Residential receivers to the west of the site at 25 – 15 Terry Street, Surry Hills. The sites are formally described as part of Lot DP 33877.

Receiver 5: Education and retail buildings located at the corner of Elizabeth and Foveaux Street, Surry Hills. The site is formally described as Lot DP 854813.

Receiver 6: Education building with retail shops surrounding education spaces. Located to the north of the site at 1 – 51 Foveaux Street, Surry Hills. Formally described as Lot DP 1228703.

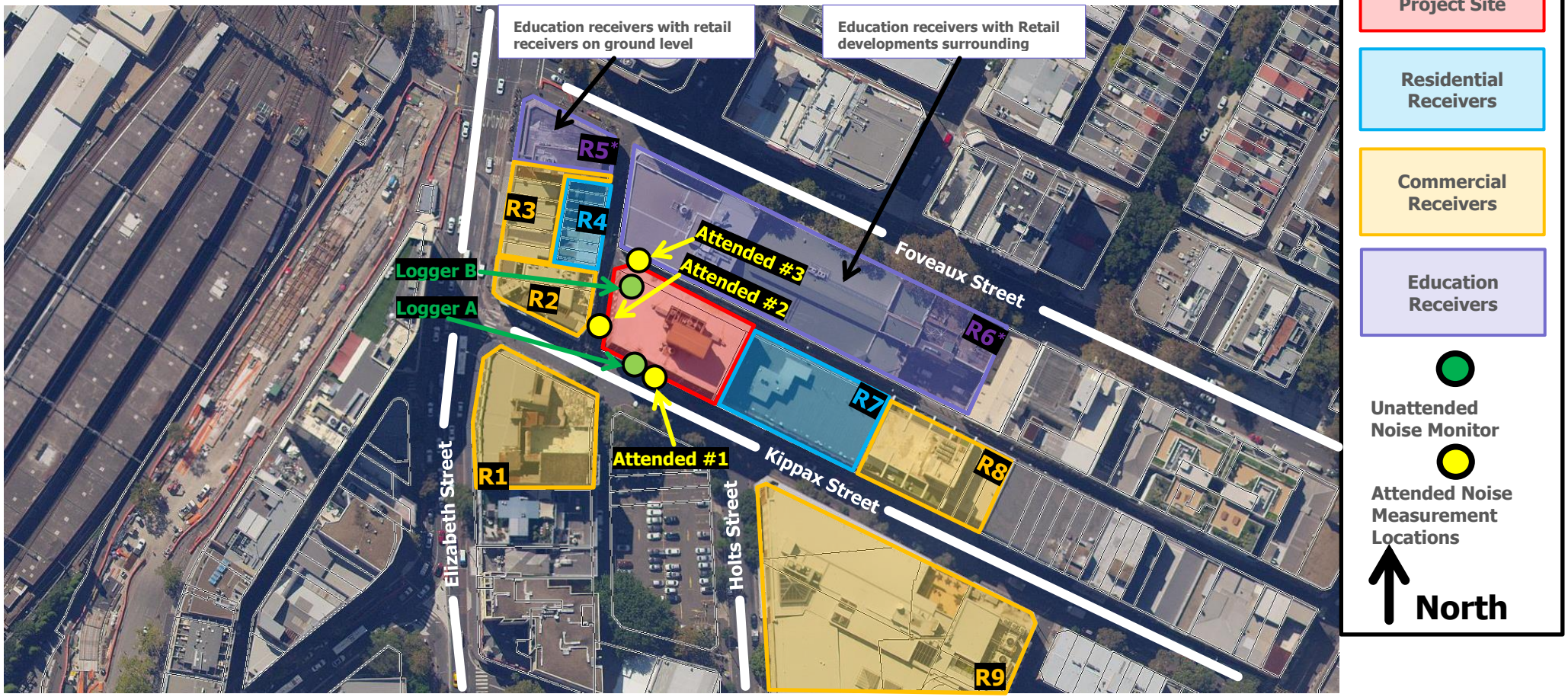
Receiver 7: Residential and commercial building to the east of the site at 26 – 44 Kippax Street, Surry Hills. Described as lot SP 57612.

Receiver 8: Commercial building to the east of the site at 46 Kippax Street, Surry Hills. Described as Lot DP 578501.

Receiver 9: Commercial building located to the south-east of the project site at 2 Holt Street, Surry Hills. Formally described as Lot DP 86372.

A map depicting the site location, unattended and attended monitoring locations, and the nearest receivers is provided in Figure 1 below.

Figure 1 Site Map, Measurement Locations and Surrounding Receivers – Sourced from SixMaps NSW



316

2 EXISTING ACOUSTIC ENVIRONMENT

As stated above, PWNA has previously undertaken noise survey of the subject site for development application noise impact assessment and this statement refers to the noise survey data from that previous assessment. This section of the report is a summary of the noise survey data adopted for the planning proposal. Refer to the previous PWNA noise impact assessment report for details of the acoustic survey.

2.1 Summary of Unattended Noise Monitoring Results

Table 1 Measured Ambient Noise Levels corresponding to the NPI's Assessment Time Periods

Measurement Location	Daytime[1] 7:00 am to 6:00 pm		Evening[1] 6:00 pm to 10:00 pm		Night-time[1] 10:00 pm to 7:00 am	
	L_{A90}[2] (dBA)	L_{Aeq}[3] (dBA)	L_{A90}[2] (dBA)	L_{Aeq}[3] (dBA)	L_{A90}[2] (dBA)	L_{Aeq}[3] (dBA)
Logger A – Level 1, Kippax Street (See Figure 1)	55	62	52	60	49	58
Logger B – Roof top (north-western corner) (See Figure 1)	60	63	58	62	56	61

Note 1: For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2: The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Note 3: The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

Table 2 Measured Ambient Noise Levels corresponding to the EPA Road Noise Policy (RNP) 2011 Time Periods

Measurement Location	Measured Noise Level	
	Daytime[1] 7:00 am to 10:00 pm	Night-time[1] 10:00 pm to 7:00 am
	$L_{Aeq\ (15hour)}$[1] (dBA)	$L_{Aeq\ (9hour)}$[1] (dBA)
Logger A – Level 1, Kippax Street (See Figure 1)	61	59
Logger B – Roof top (north-western corner) (See Figure 1)	63	61

Note 1: The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

2.2 Attended Noise Measurements

Table 3 Results of the Attended Noise Survey

Measurement Location	Date and Time	Measured Noise Level (dBA)		Comments
		$L_{A90\ (15\text{-}min)}$[1]	$L_{Aeq\ (15\text{-}min)}$[2]	
#1 Kippax Street (see Figure 1)	8:00pm to 8:30pm, 5th October 2023	58	61	Noise levels impacting the site dominated by music and patron noise at the Aurora Hotel.
#2 Corner of Kippax Street and Terry Street (see Figure 1)	8:00pm to 8:30pm, 5th October 2023	58	61	Noise levels impacting the site dominated by music and patron noise at the Aurora Hotel.
#3 Sophia Street (see Figure 1)	8:00pm to 8:30pm, 5th October 2023	53	55	Noise levels impacting the site dominated by mechanical services noise from nearby buildings.
#4 Project Site Roof top	10:00am to 11:00am, 29th September 2023	57	58	Noise levels driven by nearby buildings mechanical services, with occasional train / light rail noise from Central Station.
#5 Level 9 – North-western corner (Internal)	10:00am to 11:00am, 29th September 2023	44	48	Noise levels driven by nearby buildings mechanical services, with occasional train / light rail noise from Central Station.
#6 Level 9 – North-western corner (outside window)	10:00am to 11:00am, 29th September 2023	62	63	Noise levels driven by internal mechanical services noise, with occasional train / light rail noise from Central Station.
#7 Level 3 – North-western corner (Internal)	10:00am to 11:00am, 29th September 2023	44	63	Noise levels driven by internal mechanical services noise, with additional train / light rail noise from Central Station and road traffic noise.
#8 Level 3 – North-western corner (outside window)	10:00am to 11:00am, 29th September 2023	60	61	Noise levels driven by internal mechanical services noise, with occasional train / light rail noise from Central Station / road traffic noise.
#9 Level 3 – North-western corner (outside window) – Delivery truck pass-by	10:00am to 11:00am, 29th September 2023	62	67	Noise levels dominated by passing by delivery truck (Woolworths Metro)
#10 Level 2 – Western corner (Internal)	10:00am to 11:00am, 29th September 2023	45	46	Noise levels driven by internal mechanical services noise, with occasional train / light rail noise from Central Station / road traffic noise.
#11 Level 2 – Western corner (outside window)	10:00am to 11:00am, 29th September 2023	60	63	Noise levels driven by internal mechanical services noise, with additional train / light rail noise from Central Station and road traffic noise.

Note 1: The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Note 2: The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

2.3 Calculated L_{Aeq} Noise Levels at Future Facades (Noise Intrusion)

In determining the required construction for the future building envelope, contributing L_{Aeq} noise levels from surrounding roads to each future façade need to be determined. Utilising the 15-minute interval difference between the attended measurement and the unattended monitors, the predicted façade noise levels are presented in Table 4 below.

Table 4 Predicted Noise Levels at Future Façades

Prediction Location	Predicted Façade Noise Level $L_{Aeq\ (Period)}$ [1] (dBA)			
	Daytime (7:00am-10:00pm)		Night-time (10:00pm-7:00am)	
	$L_{Aeq\ (Whole\ Period)}$	$L_{Aeq\ (1\ Hour)}$	$L_{Aeq\ (Whole\ Period)}$	$L_{Aeq\ (1\ Hour)}$
Northern Façade (facing Sophia Street)	63	65	61	62
Southern Façade (facing Kippax Street)	61	64	59	61
Western Façade (facing Terry Street)	63	65	61	63

Note 1: The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

Note 2: Façade noise levels are constant between ground – roof level. This has been verified by external attended measurements at façade levels (see Section 0 above).

3 ACOUSTIC AND VIBRATION CRITERIA

This section of the report is a summary of the previously established noise criteria adopted for the planning proposal. Refer to the previous PWNA noise impact assessment report for detail information of the established criteria.

3.1 Noise Intrusion Criteria

External noise intrusion into the building will generally be via the building envelope (External wall, glazing or external roof). The design of the building envelope should be such that the requirements listed below are achieved.

Table 5 AS2107 Design Sound Levels for Different Occupancies

Type of Occupancy/Activity	Design sound level range ($L_{Aeq,t}$)
Office buildings	
Corridors and lobbies	45 – 50
Function area	40 - 45
Roof top external private recreation areas	50 - 55

Generally, where the final noise levels are within +/- 2 dB of the specified level given above, the design criteria will be considered met. Both the upper and lower limits will need to be satisfied especially where privacy is important or where noise intrusion to be avoided.

3.1.1 Project Airborne Noise Requirements

Based on the details included in the section above, the project internal noise levels requirements are summarised in Table 6 below.

Table 6 Project Airborne Internal Noise Levels Requirements

Room Type	Internal Environmental Noise Levels (Traffic and Airborne Train Noise) – dBA $L_{Aeq\ (period)}$
Office buildings	
Corridors and lobbies	50 dB(A) $L_{Aeq\ (period)}$
Townhall (function areas)	45 dB(A) $L_{Aeq\ (period)}$
Roof top private recreation areas	55 dB(A) $L_{Aeq\ (period)}$

3.2 Noise Emission Criteria (Operational Criteria)

Noise emissions from the operation of the development impacting on adjacent land users are outlined below. Noise emissions expected from the use of the site include building services noise and activity noise associated with communal areas.

3.2.1 City of Sydney Council Development Control Plan (DCP) 2012

Noise emissions from the use of the site are not covered in the City of Sydney Council Development Control Plan 2012. However, typical conditions of consent that are adopted in relation to permitted noise emissions from a project site have been shown below. Typically, these are in line with the requirements of the NSW EPA *Noise Policy for Industry (NPI) 2017*.

3.2.2 NSW EPA Noise Policy for Industry (NPI) 2017

The intrusive and amenity criteria for industrial noise emissions, derived from the measured data, are presented in Table 7. These criteria are nominated for the purpose of determining the operational noise limits for mechanical plant associated with the development which can potentially affect noise sensitive receivers.

For each assessment period, the lower (i.e., the more stringent) of the amenity or intrusive criteria are adopted, which are shown in bold text.

Table 7 External noise level criteria in accordance with the NSW NPI

Location	Time of Day [1]	Project Amenity Noise Level, $L_{Aeq,\ period}$ (dBA)	Measured $L_{A90,\ 15\ min}$ (RBL) [2] (dBA)	Measured $L_{Aeq,\ period}$ Noise Level (dBA)	Intrusive $L_{Aeq,\ 15\ min}$ Criterion for New Sources (dBA)	Amenity $L_{Aeq,\ 15\ min}$ Criterion for New Sources (dBA)
Residential Receivers (Logger A)	Day	55	55	62	60	**58**
	Evening	45	52	60	57	**53**[4]
	Night	40	49	58	54	**51**[4]
Residential Receivers (Logger B)	Day	55	60	63	65	**58**
	Evening	45	58	62	63	**55**[4]
	Night	40	56	61	61	**54**[4]
Education Receivers	Noisiest 1-hour period when in use	30	N/A	N/A	N/A	**33**
Commercial Receivers	When in use	60	N/A	N/A	N/A	**63**

Note 1: For Monday to Saturday, Daytime 7:00 am – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 10:00 pm; Night-time 10:00 pm – 8:00 am.

Note 2: L_{A90} Background Noise or Rating Background Level.

Note 3: Project Noise Trigger Levels are shown in bold and underlined.

Note 4: Where the measured L_{Aeq} noise levels are more than 10 dB higher than the Project Amenity Criterion, then the 15 minute Amenity Noise Criteria is equal to the measured $L_{Aeq,period}$ noise levels minus 10 dBA + 3 dB to convert from the measurement "period" to a 15 minute criteria.

3.2.2.1 Maximum Noise Level Event Assessment

Based on the measured noise levels outlined in section 2.1 the resulting maximum noise level event requirements are:

Logger A:

- 49 dBA $L_{A90\ (10pm\text{-}7am)}$ + 5 dBA = **54 dBA $L_{Aeq(15\text{-}mins)}$**, which is greater than 40 dBA and therefore the 54 dBA will be adopted.
- 49 dBA $L_{A90\ (10pm\text{-}7am)}$ + 15 dBA = **64 dBA $L_{AFMax)}$**, which is greater than 52 dBA and therefore the 64 dBA L_{AFMax} will be adopted.

Logger B:

- 56 dBA $L_{A90\ (10pm\text{-}7am)}$ + 5 dBA = **61 dBA $L_{Aeq(15\text{-}mins)}$**, which is greater than 40 dBA and therefore the 48 dBA will be adopted.
- 56 dBA $L_{A90\ (10pm\text{-}7am)}$ + 15 dBA = **71 dBA $L_{AFMax)}$**, which is greater than 52 dBA and therefore the 71 dBA L_{AFMax} will be adopted.

3.3 City of Sydney Council Entertainment Noise Requirements

The previously established criteria for Entertainment Noise set out in the City of Sydney Council DCP are reproduced below. These criteria are applicable for the assessment of patron and music noise emissions from the potential food and beverage areas located on ground level of the proposed development and the rooftop private bar area.

Table 8 City of Sydney Council Noise – Entertainment Conditions Criteria

Parameter	Octave Band Centre Frequency, Hz, dB								
	31.5	63	125	250	500	1k	2k	4k	8k
Day Period (7.00am to midnight) – External Criteria – Logger A									
Measured L_{90}	65	62	60	58	59	57	52	44	31
Criteria L_{eq}	70	67	65	63	64	62	57	49	36
Day Period (7.00am to midnight) – Internal Criteria – Logger A									
Measured L_{90}	65	62	60	58	59	57	52	44	31
Criteria L_{eq}	*60**	52	50	48	49	47	42	34	21
Night Period (Midnight to 7.00am) – External Criteria – Logger A									
Measured L_{90}	61	58	56	54	55	53	48	40	27
Criteria L_{eq}	61	58	56	54	55	53	48	40	27
Night Period (Midnight to 7.00am) – Internal Criteria – Logger A									
Measured L_{90}	61	58	56	54	55	53	48	40	27
Criteria L_1	*60**	48	46	44	45	43	38	30	17
Day Period (7.00am to midnight) – External Criteria – Logger B									
Measured L_{90}	69	70	67	64	61	58	52	44	32
Criteria L_{eq}	74	75	72	69	66	63	57	49	37
Day Period (7.00am to midnight) – Internal Criteria – Logger B									
Measured L_{90}	69	70	67	64	61	58	52	44	32
Criteria L_{eq}	*60**	60	57	54	51	48	42	34	22
Night Period (Midnight to 7.00am) – External Criteria – Logger B									
Measured L_{90}	69	65	63	61	57	55	50	41	29
Criteria L_{eq}	69	65	63	61	57	55	50	41	29
Night Period (Midnight to 7.00am) – Internal Criteria – Logger B									
Measured L_{90}	69	65	63	61	57	55	50	41	29
Criteria L_1	*60**	55	53	51	47	45	40	31	19

*Note * - Criteria value determined by the threshold of hearing curve for the octave band frequency.*

Internal criteria assume opened facades at the receivers hence internal background noise levels inside receiver will be governed by the external background noise level.

4 OPERATIONAL ACOUSTIC ASSESSMENT

In addressing all the criteria shown above, each component of the development is assessed and presented below.

4.1 Summary of Measured/Predicted Noise Level and Building Envelope Acoustic Criteria

The results of the monitoring that provides the façade noise levels of the proposed building are presented in Table 4. The relevant noise intrusion criterion for land-based noise intrusion sources are summarised in Table 9 below together with the monitored external noise levels and the predicted noise levels on the relevant building façades.

Table 9 Summary of Facade Noise Levels and Relevant Assessment Criteria

Facade Location	Document/ Guideline/ Standard	Day Time [1 2] (dBA)		Night Time [1 2] (dBA)	
		$L_{Aeq\ (Whole\ Period)}$	$L_{Aeq\ (1\ Hour)}$	$L_{Aeq\ (Whole\ Period)}$	$L_{Aeq\ (1\ Hour)}$
Measured/Predicted Noise Levels					
Northern Façade (facing Sophia Street)		63	65	61	62
Southern Façade (facing Kippax Street)		61	64	59	61
Western Façade (facing Terry Street)		63	65	61	63
Noise Criteria Applicable (All Façades)					
Corridors and lobbies	50 dB(A) LAeq (period)				
Function area	45 dB(A) LAeq (period)				
Roof top Terrace	55 dB(A) LAeq (period)				

Note 1: For Monday to Sunday, Daytime 7:00 am – 10:00 pm; Night-time 10:00 pm – 7:00 am.

Note 2: For internal noise level criteria which are presented as a range, compliance is determined based on the highest level in the range.

4.2 Building Envelope Assessment

This section of the report details the recommended building constructions to ensure the required acoustic criteria detailed in this report will be achieved.

4.2.1 Glazing Recommendations

The recommended sound transmission loss requirements required to satisfy the specified internal noise level criteria outlined above are summarised in Table 10 below. Please note that these recommendations are also based on the floor details shown in the architectural drawings of the proposed development.

Table 10 Recommended External Glazing

Location	Spaces	Minimum Glazing System Rating Requirements [1]	Indicative Construction [1]
Northern Façade (facing Sophia Street)	All areas	Rw (C;Ctr): 35 (0;-3)[3]	Windows with min. construction: IGU system of 6 mm float / 12 mm air gap / 10 mm float
Southern Façade (facing Kippax Street)	All areas	Rw (C;Ctr): 35 (0;-3)[3]	Windows with min. construction: IGU system of 6 mm float / 12 mm air gap / 10 mm float
Western Façade (facing Terry Street)	All areas	Rw (C;Ctr): 35 (0;-3)[3]	Windows with min. construction: IGU system of 6 mm float / 12 mm air gap / 10 mm float

Note 1: These are preliminary selections; they will be confirmed in the detailed design stage once the layouts and façade orientations are approved.

Note 2: Recommended treatments apply to all levels.

Note 3: Note: if executive offices / acoustically sensitive spaces are located against the external façade, a higher rated glazing system would be recommended.

Please note for windows, this performance is not only subject to the glazing selection but also to the construction of the window frame and the frame seal selection. Therefore, it is recommended that the window manufacturer should confirm that the required sound insulation can be achieved. It is anticipated that the window system should comprise Q-Lon (or equivalent) or fin seals with deep C channels as part of the window track (i.e., Performance levels outlined above need to be achieved with glazed panels + frame + seals).

4.2.2 External Wall Construction

It is expected that the external wall constructions are constructed either from concrete or a masonry construction, no further acoustic upgrading is required. If penetrations through any external skin are required, all gaps remaining in the penetration are to be filled with an acoustic grade sealant which provides an equal or better performance to the system being penetrated.

Any light-weight external plasterboard walls should be constructed from a construction with a minimum acoustic performance of Rw 55.

4.2.3 External Roof Construction

It is proposed that the new roof will be a green roof incorporating roof garden and PV panels, on top of concrete slab structure. As the roof is anticipated to be concrete external roof construction, no additional acoustic treatment will be required.

If penetrations through any external skin are required, all gaps remaining in the penetration are to be filled with an acoustic grade sealant which provides an equal or better performance to the system being penetrated.

4.3 External Noise Emissions from Engineering Services

At this stage of the project, the proposed location of the key plant items has been determined, however, equipment has not been selected.

All future plant and equipment are to be acoustically treated to ensure the noise levels at all surrounding receivers comply with noise emission criteria detailed within this report. Experience with similar projects indicates that it is both possible and practical to treat all mechanical equipment such that the relevant noise levels are achieved. Examples of the possible acoustic treatments to mechanical equipment includes the following:

- Supply and Exhaust Fans – location of fans within the building and treated using internally lined ductwork or acoustic silencers.

- General supply and exhaust fans – general exhaust and supply fans such as toilet, kitchen, lobby and other small mechanical fans can be acoustically treated using acoustic flex ducting or internally lined ducting.

- External Chillers/Cooling Equipment – The project will include external chillers for the operation of the cooling of the building. The proposed location of the cooling tower equipment, including the roof top plant area on the new level 11 of the building.

Details of all mechanical services equipment and associated acoustic treatments to ensure the relevant noise level criteria is achieved will be provided as part of the Construction Certificate submission of the project.

Experience with similar projects indicates that the acoustic treatment of whatever mechanical equipment is to be installed on the project is both possible and practical.

4.4 Noise from additional vehicles on surrounding road network

As previously stated, the function room and new terrace will not increase the number of office spaces as it is specifically designed for inhouse functions, events and entertaining. As such, it is anticipated that the proposed minor addition will not result in increase in vehicle movements to the site.

4.5 Operation noise – Rooftop terrace noise assessment

The assessment of entertainment noise emissions from the proposed rooftop private recreation area have been assessed against the adopted entertainment noise criteria identified previously in Section 3.3 above.

4.5.1 Calculation assumptions

For the purpose of this assessment, the following assumptions have been applied in the calculations of the entertainment and patron noise emission to the nearest noise sensitive receivers.

- Entertainment noise sources from the roof top private recreation area has been assessed by considering the barrier effects of a 2.3 m high glass balustrade that is proposed to be installed along the perimeter of the roof top area.

- For a total patron number of 320, it is assumed that 1 in 2 patrons will be speaking at any one time. A relatively conservative calculation.

- It is assumed that a single person speaking with a raised voice has a Sound Power Level (Lw) of 76 dB(A). This has been formulated in accordance with the published noise levels from Klark Teknik (The Audio System Designer Technical Reference, Chapman Partnership).

- With regards to amplified music within the entertainment facility, the adopted typical music spectrum is shown below.

Table 11 Single Octave (1/1) Spectrum of Reverberant SPL of Amplified Music

Location	Parameter 1	Octave Band Centre Frequency, Hz									Overall dBA
		31.5	63	125	250	500	1k	2k	4k	8k	
SPL within proposed terrace areas	Typical amplified music for a multipurpose venue.										
	Adopted LAeq	75	75	79	81	81	81	76	76	75	85

4.5.2 Predicted Entertainment Noise Levels

Noise emission calculations for the combination of patron noise and amplified music are provided below.

Predicted noise levels to the surrounding receivers are based on a full capacity (defined as 320 patrons) within the Level 11 roof terrace, and during the proposed operation hours (daytime period only 7:00 am – midnight). A conservative approach of 1 in 2 patrons speaking at any given time has been applied.

Outlined in the tables below are the predicted operational noise levels to the nearest two noise sensitive receivers to site as identified above. Predicted noise levels include distance attenuation and any barrier effects.

Provided below are the worst-case predictions for the identified nearest receivers surrounding the project site.

Table 12 Predicted Operational Noise Levels – Receiver 1 - Daytime period (7:00am – midnight)

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted LAeq Noise Levels	38	24	36	39	39	32	27	22	18	**38**
Daytime entertainment noise criterion (Logger A)	70	67	65	63	64	62	57	49	36	**66**
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Table 13 Predicted Operational Noise Levels – Receiver 2 - Daytime period (7:00am – midnight)

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted LAeq Noise Levels	37	22	32	35	35	31	27	21	17	**36**
Daytime entertainment noise criterion (Logger B)	74	75	72	69	66	63	57	49	37	**68**
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Table 14 Predicted Operational Noise Levels – Receiver 4 – Daytime period (7:00am – midnight)

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted LAeq Noise Levels	37	21	32	34	35	31	27	21	17	**36**
Daytime entertainment noise criterion (Logger B)	74	75	72	69	66	63	57	49	37	**68**
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Table 15 Predicted Operational Noise Levels – Receiver 6 - Daytime period (7:00am – midnight)

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted LAeq Noise Levels	37	22	32	34	35	31	27	21	17	**36**
Daytime entertainment noise criterion (Logger B)	60*	60	57	54	51	48	42	34	22	**59**
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Table 16 Predicted Operational Noise Levels – Receiver 7 - Daytime period (7:00am – midnight)

Parameter	Octave Band Centre Frequency, Hz									Overall dBA
	31.5	63	125	250	500	1k	2k	4k	8k	
Predicted LAeq Noise Levels	36	22	32	35	35	29	25	20	16	**35**
Daytime entertainment noise criterion (Logger A)	70	67	65	63	64	62	57	49	36	**66**
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

4.5.3 Assessment Results and Recommendations

Entertainment noise levels including patron noise and amplified music noise from the operation of the proposed level 11 roof terrace have been assessed with the above assumptions. The predicted results indicate that the entertainment noise emission from the proposed use of the rooftop area during the day period (7:00am – midnight) will comply with the City of Sydney entertainment noise criteria adopted for this assessment. To ensure compliance is achieved, the following recommendations must be implemented:

- Operation hours are: 7:00 am – midnight – 7 days per week.
- Amplified music/sound is permitted on the roof terrace, however, must be limited to 85 dB(A) LAeq when measured as a sound pressure level within the space.
- A 2.3 m high glass balustrade must be installed along the perimeter of the rooftop area (excluding the eastern façade).

On the assumption the recommendations outlined are incorporated compliance with the acoustic project criteria outlined in Section 3 above will be achieved.

4.6 Operational Noise – Level 10 Function Space

Entertainment noise from the use of the proposed level 10 Function Space is anticipated to be similar in nature and noise characteristics to the adopted assumptions to the Level 11 roof terrace. As the level 10 function space is proposed to be enclosed, the recommended façade glazing in Table 10 will be sufficient to contain entertainment noise breakout from generating adverse noise impacts at nearby sensitive receivers.

To ensure compliance is achieved, the following recommendations must be implemented:

- Operation hours are: 7:00 am – midnight – 7 days per week.
- Amplified music/sound is permitted within the level 10 function space provided that the reverberant sound pressure level from the sound system is limited to 85 dB(A) LAeq when measured as a sound pressure level within the space.

5 CONCLUSIONS

This Noise Impact Assessment has been prepared by Pulse White Noise Acoustics (PWNA) on behalf Canva (the applicant) in support of a Planning Proposal (PP) submitted to the City of Sydney Council (CoSC). This PP relates to the proposed minor rooftop additions at 8-24 Kippax Street, Surry Hills (the site).

This PP is for the minor rooftop additions which include increased building height and FSR, and comprise of:

- Enclosing and converting the current level 10 roof terrace into an internal function room
- Constructing a new level 11 on top of the level 10 function room.
- Relocate current level 10 external terrace to the new level 11.
- Ancillary works, including site services.

The function room and new terrace will not increase the number of office spaces as it is specifically designed for inhouse functions, events and entertaining.

As part of this assessment, we have undertaken a review of the building envelope and noise emissions from the minor additions. From this assessment we note the following:

- Minimum acoustic performances and associated indicative constructions for the building envelope of the Level 10 Function Space have been provided in section 4.2 of this report. The recommended treatments have been provided to ensure compliance with the objectives presented in 3.1.
- To control noise impacts at external receivers, recommended indicative treatments for major engineering services have been provided in Section 4.3. From our review we have formulated the following opinion:
    - At this stage of the project the exact selections/locations of plant items are not completed. A preliminary assessment, however, has been carried out using our experience with similar types of developments and the typical plant items installed. Experience with similar projects indicates that the acoustic treatment of the likely mechanical equipment to be installed on the project is both possible and practical.
- Entertainment noise emissions from the use of the Level 11 roof terrace and the Level 10 function space have been assessed. Compliance with the City of Sydney Council typical entertainment noise criteria can be achieved with the implementation of the recommended noise controls.

Based on this assessment, the Planning Proposal for the minor additions at 8 – 24 Kippax Street Surry Hill is acoustically acceptable and can be designed to meet typical acoustic criteria listed above providing the recommendations detailed in this report are included in the design and construction of the project.

Regards,



Leo Tsui

Principal Acoustic Engineer

PULSE WHITE NOISE ACOUSTICS PTY LTD

APPENDIX A: ACOUSTIC TERMINOLOGY

The following is a brief description of the acoustic terminology used in this report.

Sound power level	The total sound emitted by a source
Sound pressure level	The amount of sound at a specified point
Decibel [dB]	The measurement unit of sound
A Weighted decibels [dB(A])	The A weighting is a frequency filter applied to measured noise levels to represent how humans hear sounds. The A-weighting filter emphasises frequencies in the speech range (between 1kHz and 4 kHz) which the human ear is most sensitive to, and places less emphasis on low frequencies at which the human ear is not so sensitive. When an overall sound level is A-weighted it is expressed in units of dB(A).
Decibel scale	The decibel scale is logarithmic in order to produce a better representation of the response of the human ear. A 3 dB increase in the sound pressure level corresponds to a doubling in the sound energy. A 10 dB increase in the sound pressure level corresponds to a perceived doubling in volume. Examples of decibel levels of common sounds are as follows:

0 dB(A)	Threshold of human hearing
30 dB(A)	A quiet country park
40 dB(A)	Whisper in a library
50 dB(A)	Open office space
70 dB(A)	Inside a car on a freeway
80 dB(A)	Outboard motor
90 dB(A)	Heavy truck pass-by
100 dB(A)	Jackhammer/Subway train
110 dB(A)	Rock Concert
115 dB(A)	Limit of sound permitted in industry
120 dB(A)	747 take off at 250 metres

Frequency [f]	The repetition rate of the cycle measured in Hertz (Hz). The frequency corresponds to the pitch of the sound. A high frequency corresponds to a high pitched sound and a low frequency to a low pitched sound.
Ambient sound	The all-encompassing sound at a point composed of sound from all sources near and far.
Equivalent continuous sound level [L_{eq}]	The constant sound level which, when occurring over the same period of time, would result in the receiver experiencing the same amount of sound energy.
Reverberation	The persistence of sound in a space after the source of that sound has been stopped (the reverberation time is the time taken for a reverberant sound field to decrease by 60 dB)
Air-borne sound	The sound emitted directly from a source into the surrounding air, such as speech, television or music
Impact sound	The sound emitted from force of one object hitting another such as footfalls and slamming cupboards.
Air-borne sound isolation	The reduction of airborne sound between two rooms.
Sound Reduction Index [R] (Sound Transmission Loss)	The ratio the sound incident on a partition to the sound transmitted by the partition.
Weighted sound reduction index [R_w]	A single figure representation of the air-borne sound insulation of a partition based upon the R values for each frequency measured in a laboratory environment.
Level difference [D]	The difference in sound pressure level between two rooms.

Normalised level difference [D_n]	The difference in sound pressure level between two rooms normalised for the absorption area of the receiving room.
Standardised level difference [D_{nT}]	The difference in sound pressure level between two rooms normalised for the reverberation time of the receiving room.
Weighted standardised level difference [$D_{nT,w}$]	A single figure representation of the air-borne sound insulation of a partition based upon the level difference. Generally used to present the performance of a partition when measured in situ on site.
C_{tr}	A value added to an R_w or $D_{nT,w}$ value to account for variations in the spectrum.
Impact sound isolation	The resistance of a floor or wall to transmit impact sound.
Impact sound pressure level [L_i]	The sound pressure level in the receiving room produced by impacts subjected to the adjacent floor or wall by a tapping machine.
Normalised impact sound pressure level [L_n]	The impact sound pressure level normalised for the absorption area of the receiving room.
Weighted normalised impact sound pressure level [$L_{n,w}$]	A single figure representation of the impact sound insulation of a floor or wall based upon the impact sound pressure level measured in a laboratory.
Weighted standardised impact sound pressure level [$L'_{nT,w}$]	A single figure representation of the impact sound insulation of a floor or wall based upon the impact sound pressure level measured in situ on site.
C_I	A value added to an L_{nW} or $L'_{nT,w}$ value to account for variations in the spectrum.
Energy Equivalent Sound Pressure Level [$L_{A,eq,T}$]	'A' weighted, energy averaged sound pressure level over the measurement period T.
Percentile Sound Pressure Level [$L_{Ax,T}$]	'A' weighted, sound pressure that is exceeded for percentile x of the measurement period T.

*Definitions of a number of terms have been adapted from Australian Standard AS1633:1985 *"Acoustics – Glossary of terms and related symbols"*

Attachment A9

Traffic and Parking Assessment

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

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Date: 07 December 2023
Ref: 23116
Rev: B

M's Cassie Bailey
Generate Property Groups

E: *cassie@generatepropertygroup.com.au*

Dear Cassie,

Planning Proposal For
8 – 24 Kippax Street, Surry Hills
Traffic and Parking Assessment

A Development Application has been prepared for "alterations and fit out" of the existing 9 level commercial building of some 8500 m^2 at the subject site to provide for occupation as the Sydney office for Canva. The Development Application works involve an increase in floorspace to 9819.7 m^2 including:

- provision of a rooftop terrace
- provision of bicycle and EOT facilities
- deletion of the existing on-site car parking

The Planning Proposal involves the proposed construction of 2 additional levels (ie total 11 levels) increasing the total floorspace to 10173 m^2 GFA while retaining the upgraded building as proposed in the Development Application.

PARKING

In accordance with the provisions of Councils LEP it is not proposed to provide any on-site car parking for the development. The site is located in close proximity to major public transport services including:

- Heavy Rail
- Light Rail
- Buses

These services interchange at the recently upgraded nearby Central Railway Station complex providing ready access to the Metropolitan Transport Network.

The Council's DCP requirement for the provision of bicycle facilities in as follows:

Bicycles

Staff	1 space per 150m^2 (Class 2)
Visitor	1 space per 400m^2 (Class 3)

EoT

1 personal locker for each bike space
1 shower and change cubicle for up to 10 bike spaces
2 shower and change cubicles for 11 to 20 bike spaces
2 additional shower and change cubicles for each additional bike spaces or part theory of.

Application of this criteria to the proposal 10173 m^2 would indicate the provision of:

- 94 bikes
- 94 lockers
- 7 shower/change rooms

It is proposed to a total of 94 bicycle spaces with a total of 10 showers and 131 lockers in satisfaction of the DCP requirements for the planning proposal.

TRAFFIC

As there will be no on-site parking provision the traffic movements generated by the proposed development will be limited to that of:

- Set down / pick up movements (Taxis, Uber etc)
- Service and delivery vehicles

While the Planning Proposal involves the provision of additional commercial floorspace the traffic movements generated will continue to be very similar to that of the circumstances with the proposed DA and that of the existing building (with its attendant on-site parking).

It is understood that the Canva use will involve some meetings/functions with visitors to the site however these essentially will not involve travel in the AM/PM peak periods and again will only involve minimal pick up/set down movements by motor vehicles.

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SERVICING

The proposed additional floorspace under the Planning Proposal will not introduce any perceptible increased need for additional refuse removal or delivery vehicle movements particularly as the whole building will be occupied by Canva with significant elements of staff/visitor facilities which will be ancillary to the Commercial floor space.

As noted for the Development Application the removal of existing driveways on the site frontage will create additional kerb space for service/delivery vehicles while refuse will be collected using small contract vehicles stopping on the Sophia Sheet frontage.

MITIGATION MEASURES

There is no assessed need for any mitigation measures.

CONCLUSION

The assessment of the potential traffic and parking implications of the Planning Proposal for 8 - 24 Kippax Street, Surry Hills has concluded that:

- the car parking circumstances will be compliant with Councils "nil minimum" provision
- adequate and appropriate provision will be made for bicycles
- there will not be any adverse traffic implications
- the provisions for refuse removal and deliveries will be suitable and appropriate

Yours faithfully



Ross Nettle
Director
Transport and Traffic Planning Associates

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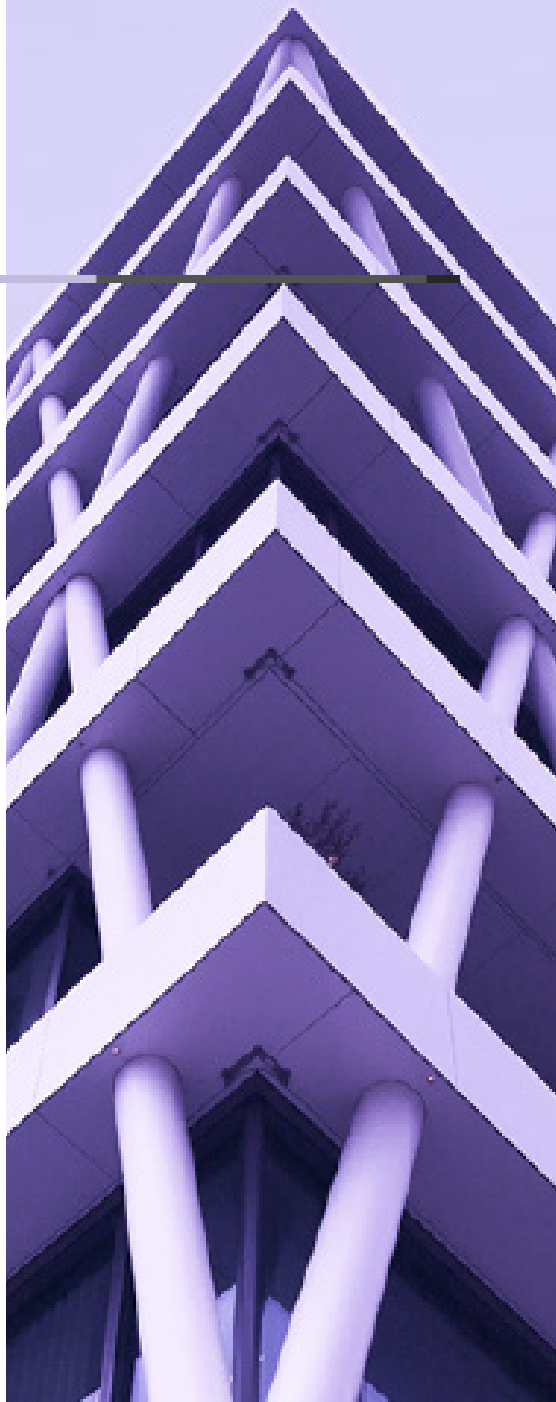
Attachment A10

Sustainability Statement

Sustainability Statement | PP

8 Kippax St, Surry Hills |

December 2023



E-LAB Consulting
Where Engineering and Science Inspire Design.

Issue and Revision Record

Revision	Date	Originator	Approver	Description
00	4.12.2023	J. Madew	A. Davis	Progress Issue
01	6.12.2023	J. Madew	A. Davis	Draft Issue
02	7.12.2023	J. Madew	A. Davis	Final Issue

Engineering Lab NSW Pty Ltd

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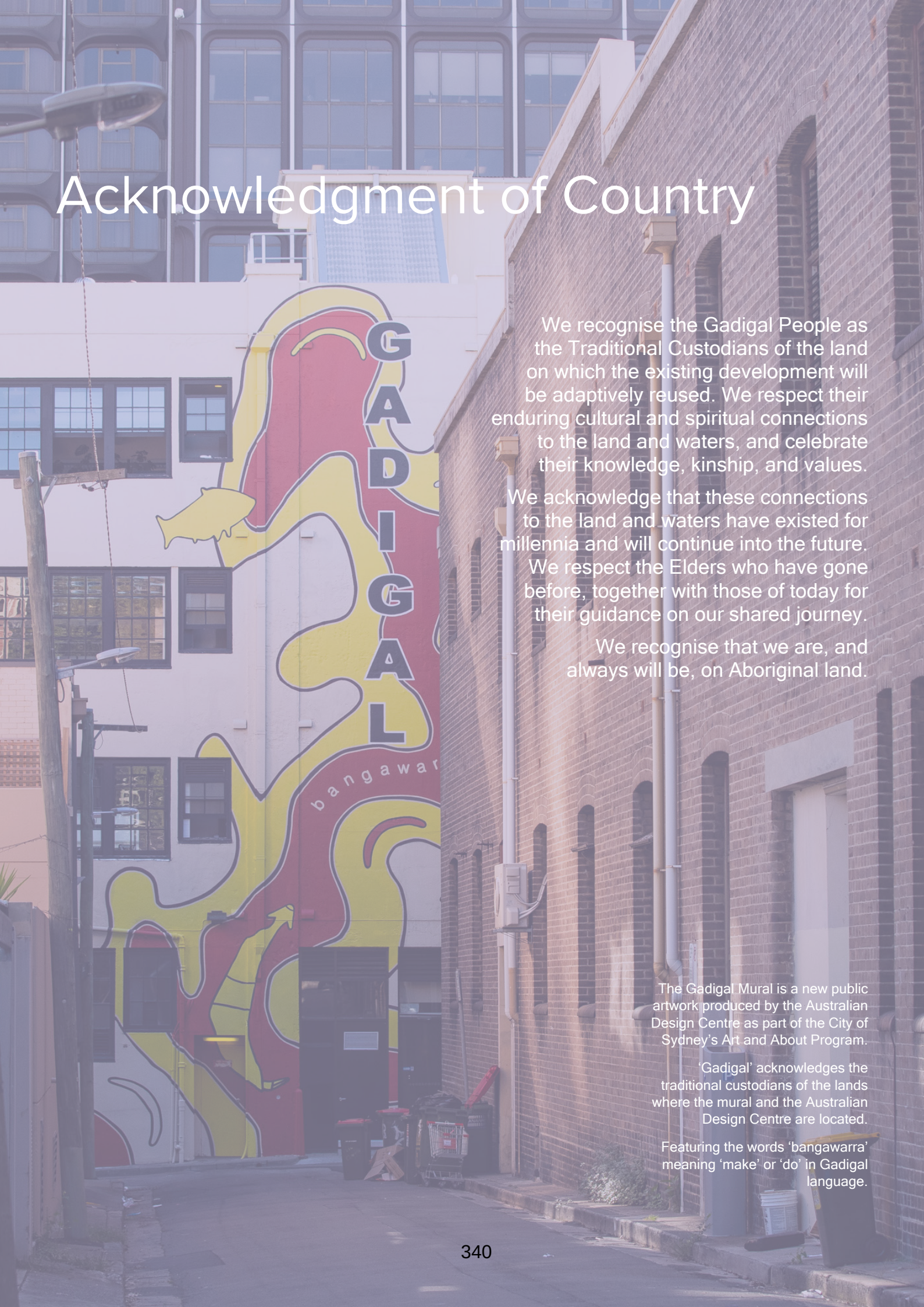
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E-LAB Consulting

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Sydney, NSW 2000

e-lab.com.au

Acknowledgment of Country



We recognise the Gadigal People as the Traditional Custodians of the land on which the existing development will be adaptively reused. We respect their enduring cultural and spiritual connections to the land and waters, and celebrate their knowledge, kinship, and values.

We acknowledge that these connections to the land and waters have existed for millennia and will continue into the future. We respect the Elders who have gone before, together with those of today for their guidance on our shared journey.

We recognise that we are, and always will be, on Aboriginal land.

The Gadigal Mural is a new public artwork produced by the Australian Design Centre as part of the City of Sydney's Art and About Program.

'Gadigal' acknowledges the traditional custodians of the lands where the mural and the Australian Design Centre are located.

Featuring the words 'bangawarra' meaning 'make' or 'do' in Gadigal language.

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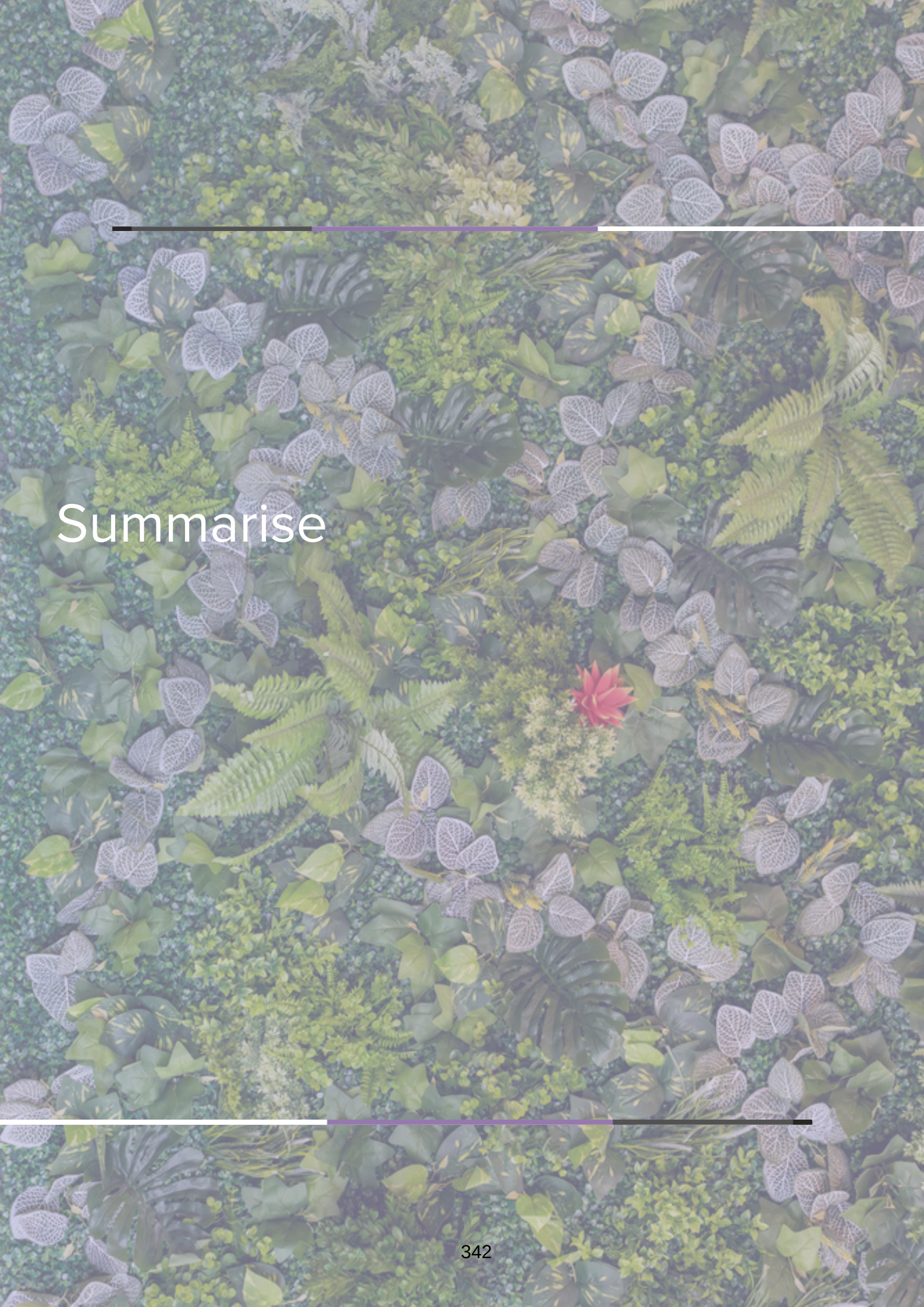
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Summarise

Designing for a more sustainable future -

Translating Canva's sustainability practices and goals into the adaptive reuse of 8 Kippax St to showcase bold climate action in the built environment

Purpose

Advancing Net Zero, a World Green Building Council (WorldGBC) global program, is working towards total built environment sector decarbonisation by 2050. It sets a 'Whole Life Carbon Vision'.

Canva is a vocal about its stance on protecting the planet and the urgency in which we need to take serious action. As one of the fastest growing technology companies in the world, Canva is in a unique position to help champion this effort.

The built environment sector must pursue a strategy to compensate for the total impacts of its activities that prioritises a reduction first approach, and embraces the potential of the offsets market to facilitate positive social and environmental impact in pursuit of overall net zero emissions.

This Sustainability Statement has been prepared by E-LAB Consulting on behalf of Canva for the proposed redevelopment (the Project) at 8 Kippax St, Surry Hills, NSW. It explores Canva's sustainability practices and goals, and translates these into an implementation framework that showcases bold climate action in the built environment.

This Sustainability Statement accompanies a Planning Proposal (PP) to the City of Sydney. Canva's aspirations of 'being a force for good", and the principle to "do more with less", have been embraced, with the proposed rooftop additions retaining as much of the existing building as possible and only making pragmatic interventions where it improves functional planning or sustainability initiatives.

This Sustainability Statement can be read in conjunction with the Ecologically Sustainable Development (ESD) Report prepared in support of a Development Application (DA1) for the Project.

This Sustainablity Statement demonstrates a Project design response that represents design excellence and is aligned with the following statutory planning documents:

- Sydney Local Environment Plan (LEP) 2012
- Sydney Development Control Plan (DCP) 2012
- NSW State Environment Planning Policy (Sustainable Buildings) 2022 (or Sustainable Buildings SEPP)

Strategise

The Project design, delivery, and operation will be governed by a guiding value → Climate Action. This guiding value fundamentally informs sustainability practices → Sustainable Offices → Beyond Net Zero → Running on Renewables

Figure 1 outlines the Project sustainability strategy → setting sustainability practices and goals that translate into action.

Figure 2 details credible 'Whole Life Net Zero Ready' requirements for the Project, aligned with the Climate Positive Pathway defined in the Green Star Buildings tool.



Figure 1 Sustainability practices and goals

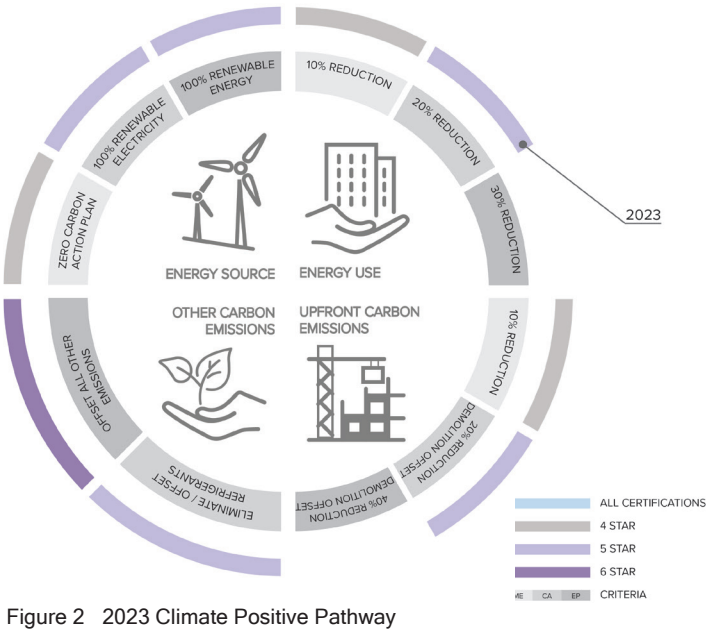


Figure 2 2023 Climate Positive Pathway

Whole Life Net Zero Ready

1. Highly energy efficient - 20% reduction in energy use
2. Low environmental impact - 20% reduction in upfront carbon
3. Fossil fuel-free - all-electric + 100% renewable electricity
4. Address high impact refrigerant systems

Implement

Table1 summarises the Project design response against key sustainability goals.

The Project is capable of achieving:

- Design excellence in sustainable development, in line with the ESD principles of the Sydney LEP 2012
- ESD objectives and controls of the Sydney DCP 2012
- Energy and water standards, and net zero provisions (see Appendix A) of the NSW Sustainable Buildings SEPP

The Project will be a force for good → acting on climate change by going beyond net zero + building social cohesion through the Canva Community

Table 1 Implementation of key sustainability goals

Requirement		Met	Design Response
1.	Highly energy efficient - 20% reduction in energy use	Yes Sections 4.2.1 - 4.2.3	• Predicted 5.5 star NABERS Energy performance (margin ≥ 25%) • Operational net zero
2.	Low environmental impact - 20% reduction in upfront carbon	Yes Section 4.2.4 Embodied Emissions Materials Form (by others)	• Established design response for primary construction materials and construction-related activities • NABERS Embodied Carbon performance (equivalent to a benchmark performance of 600 kgCO2e/m^2)
3.	Fossil fuel-free - all-electric + 100% renewable electricity	Yes Section 4.2.2	• Full building electrification, including commercial kitchen use • 100% renewable electricity supply
4.	Low impact refrigerant systems	Chillers - Yes Heat pumps - Future ready Section 4.4.5	• HFC refrigerant volume is minimised through the selection of air-to-water heat pump systems, which do not circulate refrigerants • Future ready for phase out of HFC refrigerants by 2035
5.	Meet the water standard	Section 4.4.2	• Predicted 3 star NABERS Water performance, incl. commercial kitchen use • Where commercial kitchen use is excluded, the Project is capable of meeting a 4 star NABERS Water performance
6.	Building strong communities, provide nutritional support, and integrate biophilic design initiatives	Section 4.4.1	• A Shared Zone to address the poor street condition and create a more functional public realm • Ground, accessed from Kippax Street, will connect to Lower Ground, accessed from Sophia Street, visually linking the two streets • Integration of a solar canopy and biosolar green roof, extensive roof terrace landscaping and wintergardens, the Project offers a leading design response to reduce the urban heat island effect
7.	Address the the permeability of the pedestrian network		



1 Introduce

Designing for a more sustainable future -

Translating Canva's sustainability practices and goals into the adaptive reuse of 8 Kippax St to showcase bold climate action in the built environment

1.1 Purpose

Advancing Net Zero, a World Green Building Council (WorldGBC) global program, is working towards total built environment sector decarbonisation by 2050. It sets a 'Whole Life Carbon Vision' (see Figure 1.1).

Canva is a vocal about its stance on protecting the planet and the urgency in which we need to take serious action. As one of the fastest growing technology companies in the world, Canva is in a unique position to help champion this effort.

The built environment sector must pursue a strategy to compensate for the total impacts of its activities that prioritises a reduction first approach, and embraces the potential of the offsets market to facilitate positive social and environmental impact in pursuit of overall net zero emissions.

This Sustainability Statement has been prepared by E-LAB Consulting on behalf of Canva for the proposed redevelopment (the Project) at 8 Kippax St, Surry Hills, NSW (see Figure 1.2). It explores Canva's sustainability practices and goals, and translates these into an implementation framework that showcases bold climate action in the built environment.

This Sustainability Statement accompanies a Planning Proposal (PP) to the City of Sydney. Canva's aspirations of 'being a force for good", and the principle to "do more with less", have been embraced, with the proposed rooftop additions retaining as much of the existing building as possible and only making pragmatic interventions where it improves functional planning or sustainability initiatives.

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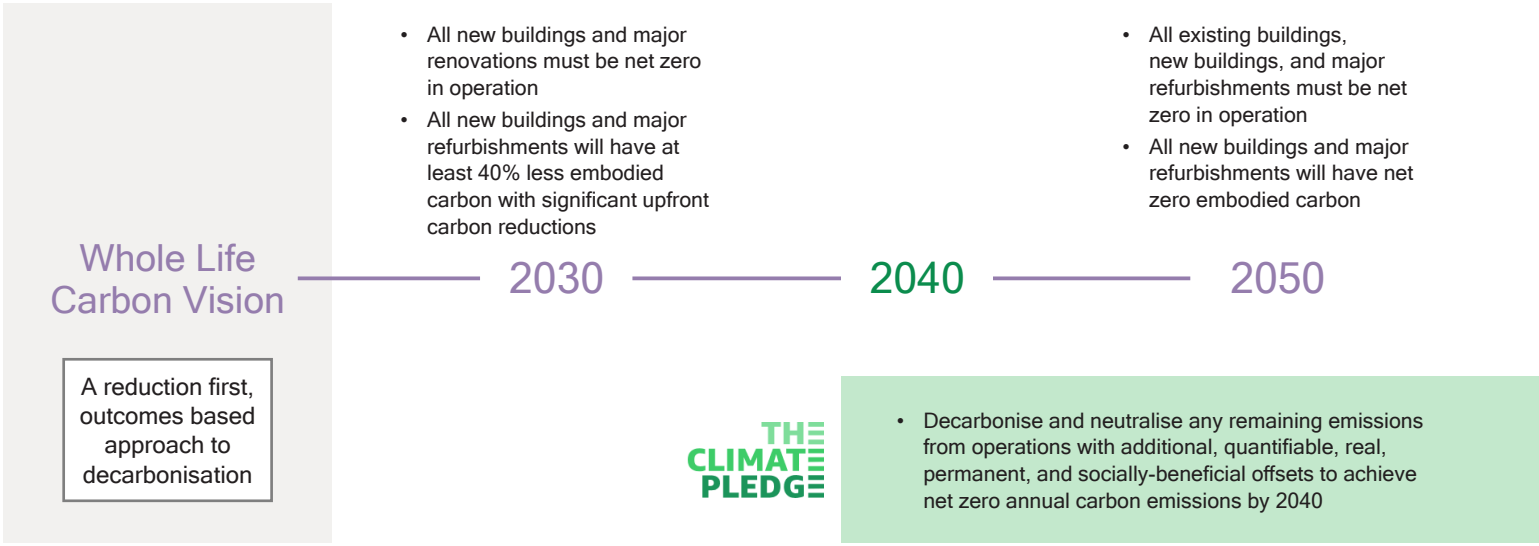


Figure 1.1 Decarbonisation roadmap

Canva is the first Australian company to sign The Climate Pledge

1.2 Project

Growing the Canva Community

In December 2022, Canva completed the acquisition of 8-24 Kippax Street, Surry Hills. The building comprises a basement, lower ground, ground, and nine (9) levels of commercial office space totalling approximately 8,500m^2 of net lettable area (NLA) (see Figure 1.4). Built in the 1960s, the property last underwent a refurbishment in the late 1990s.

The Project will involve undertaking a comprehensive refurbishment and fit out of the building to meet Canva's ambition to create the best workplace for Canvanaughts. It offers a unique opportunity to improve Canva's presence and commitment of giving back to the Surry Hills community. Although currently occupying several properties in the area, Canva now aims to consolidate their office spaces to a headquarter building specifically designed to meet their workplace requirements.

8-24 Kippax Street, located just off Elizabeth Street and only a two-minute walk from Central Station (see Figure 1.2), will firmly position Canva as part of Australia's largest technology and innovation hub, Tech Central.

In keeping with Canva's aspirations of "being a force for good", the Project seeks to retain as much of the existing building structure and envelope as possible (see Figure 1.5), and only apply pragmatic interventions where it improves functional planning or sustainability outcomes (e.g., improving daylight availability).

The proposed additions will offer a benchmark model in the re-use and rejuvenation of an existing, tired, and under-performing commercial asset (see Figure 1.3).

The addition of a function room and roof terrace over the existing building, will offer Canva the opportunity to gather, connect, and celebrate their unique 'vibe' with Canvanaughts, collaborators, and guests.

The function room will not increase the workplace area, but will fundamentally support its function; specifically designed for in-house functions, events, and entertaining that presents opportunities for formal and informal collaboration.

The Ground Level, accessed from Kippax Street, will directly connect to the Lower Ground Level along Sophia Street, visually linking the two streets.

Table 1.1 provides a development summary for the Project.

Works include:

- Relocating and upgrading the transformer chamber substation on Sophia Street, including demolition and reinstatement of basement ground slab to support infrastructure augementation
- Relocating the core to the east to maximise daylight access, and high quality external and internal views to the floor plates, and set back rooftop plant and equipment to be less visible
- Reinforcing the existing structure to accommodate a new core, rooftop, and plant and equipment
- Installing a new façade to Lower Ground, Ground, and Level 1 to increase transparency and maximise activation
- Fitting out new end of trip facilities
- Providing a biosolar green roof (combined solar PV array and green roof) and solar canopy over the roof terrace
- Providing extensive landscaping to the roof terrace
- Installing new high performance glazing throughout workplace Levels 1 (north only), and Levels 2 to 9 (all) with optimised external shading to the north façade. Neutral glazing with a high solar control and a good visible light transmittance (VLT) performance is applied, in combination with automated internal blinds, to provide a high indoor environment quality.
- Introducing wintergardens to the north-west corner of the floor plates on Levels 1 to 9 to create a connection to nature. This will be reinforced with extensive planters at each level.
- Retrofitting high efficiency building services that are capable of supporting the Project's structural constraints, workplace drivers and sustainability targets



Figure 1.2 Site location



Figure 1.3 Proposed concept design

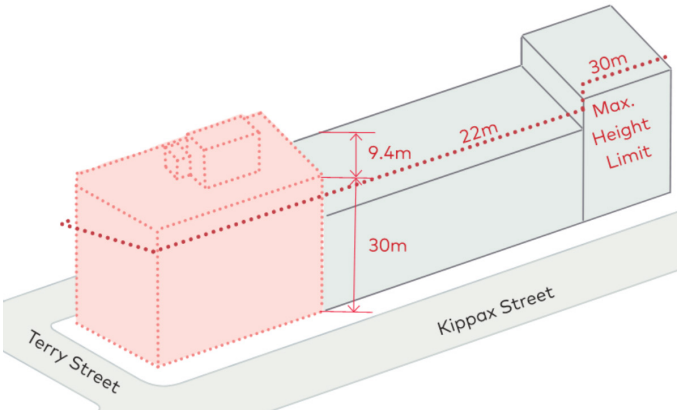


Figure 1.4 Existing envelope

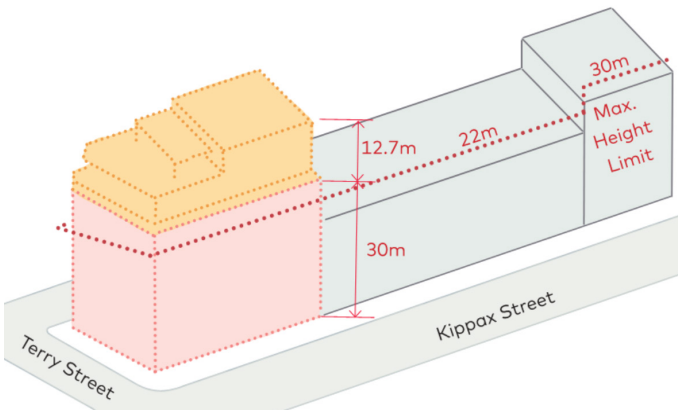
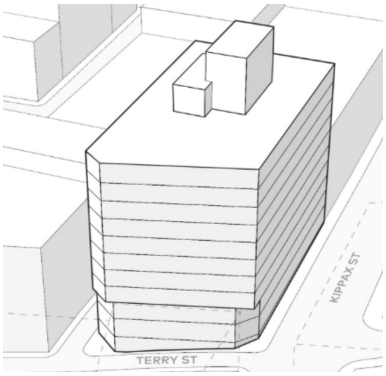


Figure 1.5 Proposed envelope

Table 1.1 Development summary

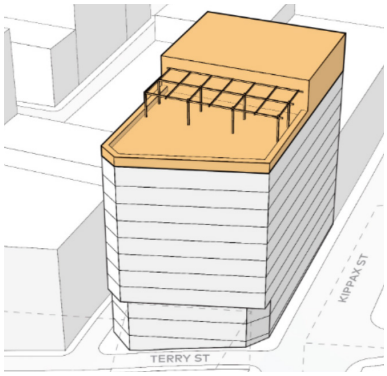
Control	Existing	Permissible	Proposed
Building height	30m + 9.5m Plant	22m	42.7m
FSR	9.1 : 1	3.5 : 1	9.86 : 1
GFA (m^2)	9,374	3,611	10,173

1.3 Design Principles



Existing Massing

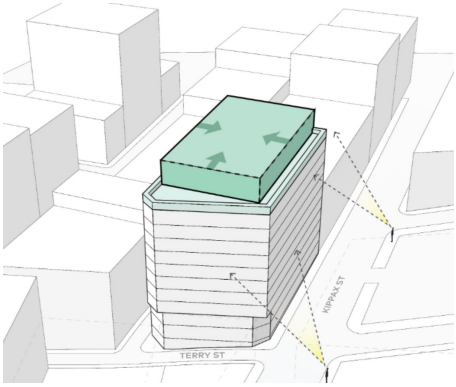
- Reuse - integrate existing materials
- Perform - introduce high performance glazing
- Adapt - improve as opposed to upgrade



DA1 Massing

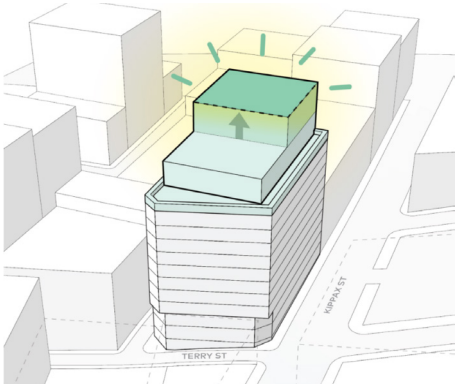
- Respond - sensitive massing
- Integrate - solar canopy and biosolar green roof
- Create - Level 10 communal open space (rooftop terrace)

Planning Proposal



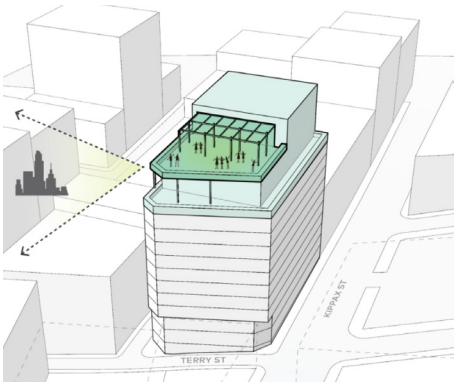
Push Back

- Manage - push back and reduce the visual bulk



Touch the Sky Memorably

- Resolve - massing approach
- Maintain - solar canopy and biosolar green roof



Reach Out

- Add - Level 11 communal open space
- Enhance - views to City for the Canva Community

1.4 Sustainability Practices & Goals

Tackling climate change by actively working to reduce carbon emissions is one of the ultimate ways of "being a force for good", one of Canva's guiding values.

To reinforce this thinking, Canva has developed sustainability practices and 'big' goals, which recognise that companies have a much greater responsibility than the old mantra 'to do no evil'.

Climate action

- Thinking about our ability to reduce our carbon emissions





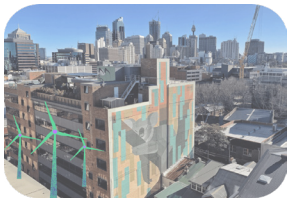
Beyond net zero

- Thinking about our ability to reduce the carbon emissions of our supply chain, and redefine the boundary of our operational carbon footprint

Sustainable offices

- Sourcing fresh food from responsible sources
- eWaste management systems and organic waste composting
- Biodiversity initiatives, incl. beekeeping





Running on renewables

- Australian operations are powered by renewable energy
- Working to match demand to renewable energy generation



2 Require

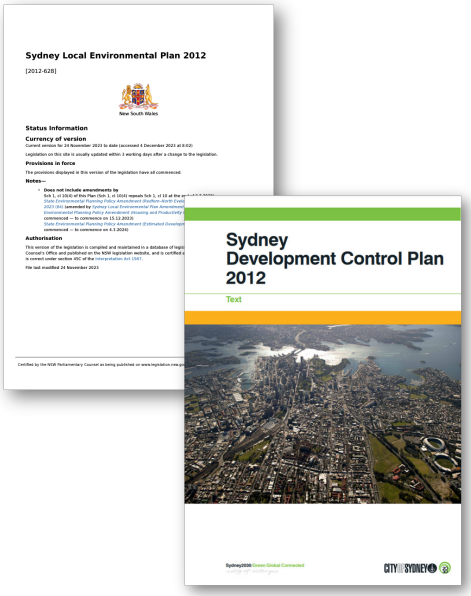
2.1 Basis

The Project, a large commercial development of greater than 1,000m² NLA involving the major refurbishment of an existing commercial office premises with a project value greater than $10 million, is subject to a range of statutory planning controls, policies, and guidelines at a local and state government level, and sustainability certification tools.

These controls, policies, guidelines, and tools are a material consideration when developing project sustainability requirements that reflect a credible, market-leading sustainability strategy and implementation framework for the Project.

1. Sydney Local Environment Plan (LEP) 2012
2. Sydney Development Control Plan (DCP) 2012
3. NSW Sustainable Buildings SEPP
4. Green Star (Green Building Council of Australia)
5. NABERS Energy and Water for Offices
6. A Guide to Office Building Quality (Property Council of Australia)

2.1.1 Development Objectives and Controls



- Improve the quality and amenity of the public domain
- Integrate the principles of ecologically sustainable development
- Reduce the need for active heating and cooling by incorporating passive design measures
- Target a 5.5 star (+25% margin) NABERS Energy Commitment Agreement or meet the Green Star Buildings v1, Credit 22 Energy Use, Credit Achievement criteria - achieve a 20% reduction in energy use when compared to a reference building
- Develop a robust water strategy, including water efficient fixtures and fittings, and rainwater harvesting and reuse for landscape irrigation
- Install adequate energy and water metering, and sub-metering to support monitoring and reporting for efficient building operations
- Promote active movement and low carbon transport options
- Specify non-toxic interior finishes, including paints, adhesives, sealants, carpets, and engineered wood products
- Procure responsible building materials and products to support a supply chain transformation

2.1.2 Sustainable Buildings Policies

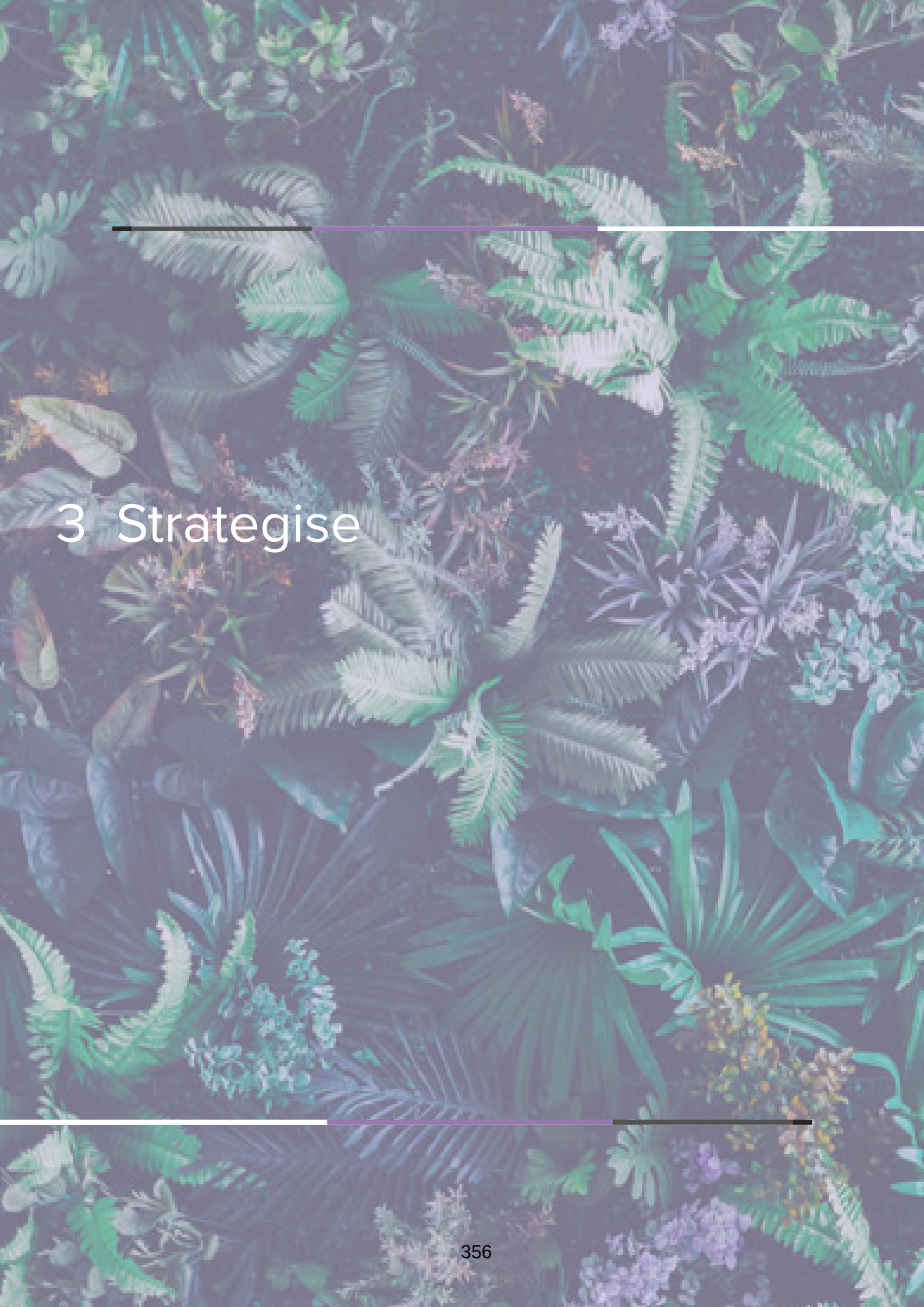


- Prepare a Net Zero Statement, including:
  - High performance building design, including on-site active generation and energy storage systems
  - Estimated scope 1 and 2 emissions up to 2050
  - Transition planning for residual fossil fuel-dependent building services to operate fossil fuel-free by 2035
- Offset the fossil fuel use of any residual fossil fuel-dependent building services calculated over a 10-year period
- Achieve the following minimum energy and water standards:
  - 5.5 star NABERS Energy for Offices (base building) (Commitment Agreement) (without GreenPower)
  - 3 star NABERS Water for Offices (Agreement to Rate)
- Measure primary construction materials for structure, envelope, permanent internal walls and doors, services, and external works via a bill of quantities (BOQ)

2.1.3 Sustainable Buildings Tools



- Respond to global megatrends, and national and regional policies to define a Climate Positive Pathway
- Demonstrate a credible path to whole life net zero
- Disclose operational energy and water performance
- Demonstrate credible savings in energy and water costs through the efficient design of a building's fabric and services
- Represent good quality design and reflect market requirements
- Generally align with Grade A office environmental quality guidelines, including:
  - Achieve a 5.5 star NABERS Energy for Offices rating (base building) (Commitment Agreement) (without GreenPower)
  - Undertake operational waste management planning and implement waste reduction practices
  - Deliver a high indoor environment quality
  - Conduct a climate change risk assessment and undertake adaptation planning



3 Strategise

3.1 Sustainability Framework

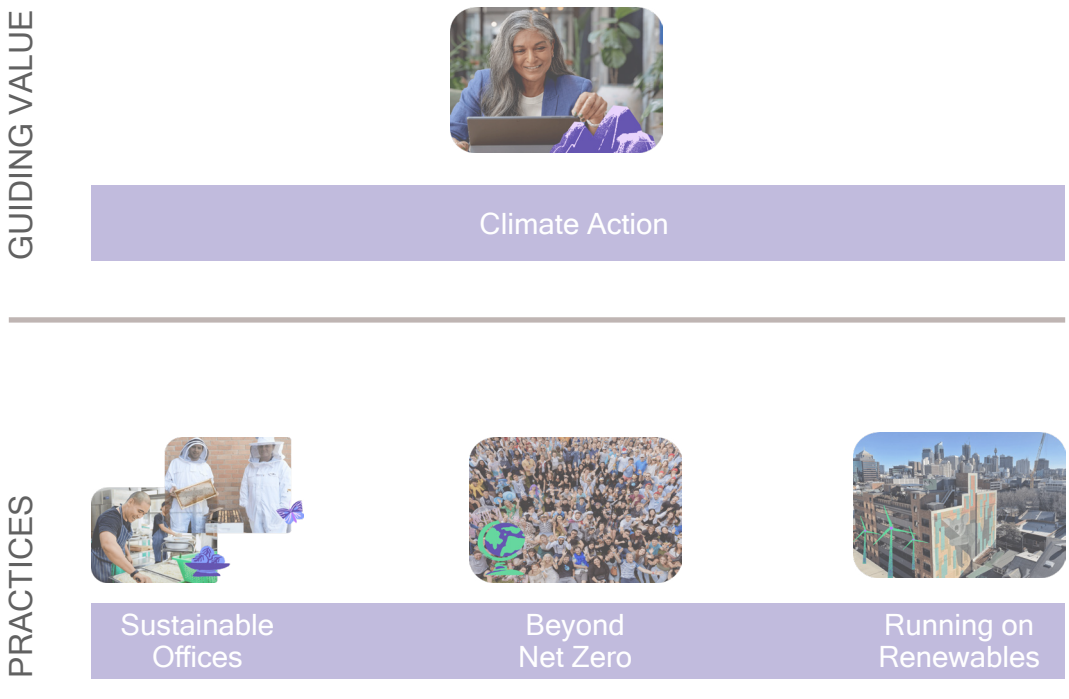
The Project will be a force for good → acting on climate change by going beyond net zero + building social cohesion through the Canva Community

The Project design, delivery, and operation will be governed by a guiding value

→ Climate Action

This guiding value fundamentally informs sustainability practices

→ Sustainable Offices
→ Beyond Net Zero
→ Running on Renewables



3.2 Sustainability Strategy

The Project will adopt and implement Canva's guiding value, and supporting sustainability practices and goals (see Figure 3.1).

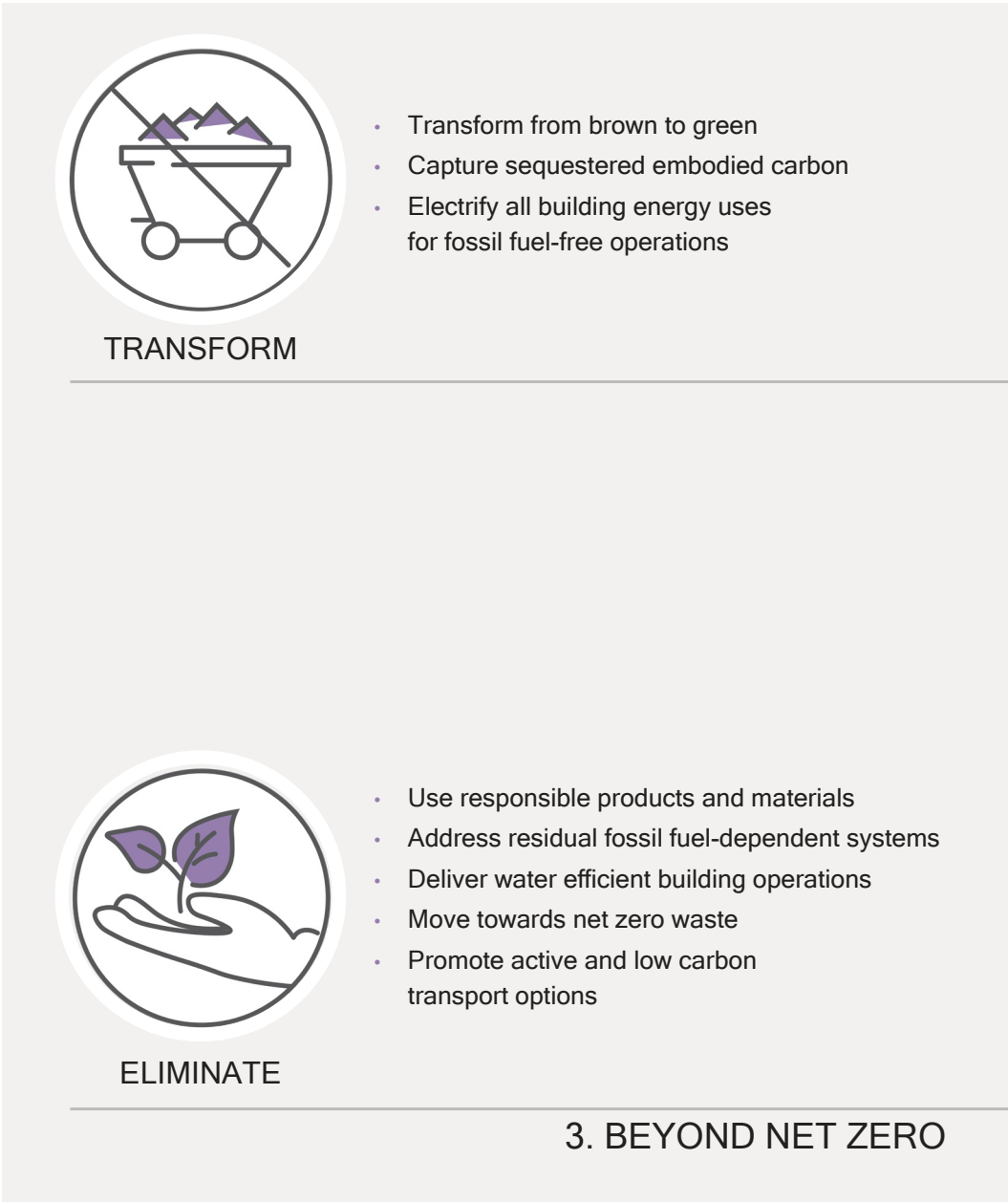


Figure 3.1 Sustainability practices and goals



READY

- Deliver energy efficient building operations
- Deploy on-site active generation systems
- Be 'Whole Life Net Zero Ready'

1. CLIMATE ACTION

- Deliver an exceptional workplace design & reinforce the Canva Community

2. SUSTAINABLE OFFICES



DECARBONISE

- Power the Australian operations with renewable electricity
- Leverage on-site active generation systems and demand response management strategies to match demand to renewable electricity generation

4. RUNNING ON RENEWABLES

3.3 Sustainability Practices & Goals

3.3.1 Climate Action

To be a force for good, the Project must demonstrate a credible response to global heating. In the built environment, this calls for real and transparent carbon reductions in the design and delivery, and operation of buildings, and limiting the reliance on compensation mechanisms, such as the procurement of carbon credits to offset carbon emissions.

A 'Whole Life Net Zero Ready' design response is required.

This thinking is reinforced by the NSW Government's objective to achieve net zero emissions by 2050, and reduce emissions by 50% below 2005 levels by 2030, and 70% beloow 2005 levels by 2035. The transformation of the built environment towards net zero emissions is being accelerated under a range of Net Zero Buildings initiatives and policies.

The Green Star Buildings rating tool embeds the WorldGBC's 'Whole Life Carbon Vision' by defining a Climate Positive Pathway for building design and delivery (see Figure 3.2). It's represents the market-leading benchmark for ecologically sustainable development in Australia.

The Climate Positive Pathway increases in stringency over this decade. All projects are required to achieve whole life (upfront and operational) net zero by 2030. This sustainable built environment response is captured in strengthening credit criteria over three-year cycles (2020 → 2023 → 2026 → 2030).



Figure 3.2 2020-2030 Climate Positive Pathway

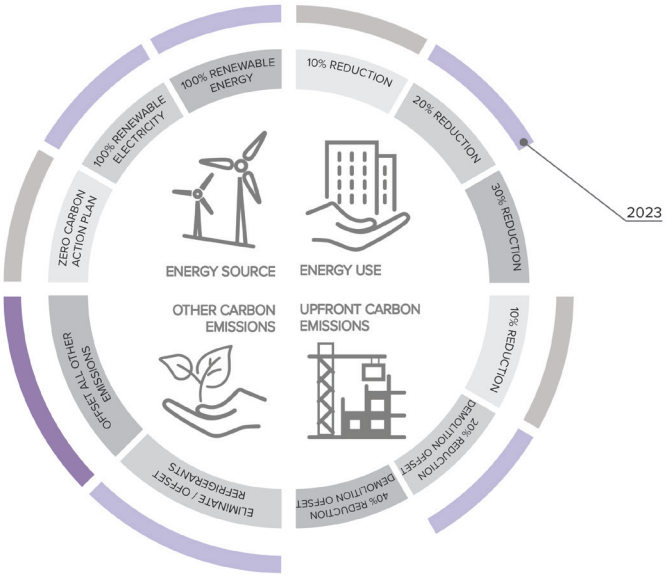


Figure 3.3 2023 Climate Positive Pathway

For the 2023 cycle, the Climate Positive Pathway includes:

1. Whole Life Net Zero Ready
   a. Highly energy efficient - 20% reduction in energy use
   b. Low environmental impact - 20% reduction in upfront carbon
   c. Fossil fuel-free - all-electric + 100% renewable electricity
   d. Address high impact refrigerant systems

3.3.2 Sustainable Offices

The Canva workplace will be designed to excite Canvanaughts, attract community, and provide an environment that has a net positive health and wellbeing benefit to staff, workers, and visitors.

Human-Centred Design Framework

The Project will overlay a robust evidence-based human-centred design (HCD) framework that responds to a range of factors:

1. High Indoor Air & Water Quality | Prevent significant impacts on human physiology and performance metrics, such as short-term memory, focus, and cognition
2. Building Strong Communities | Tune the space mix needs, operations, and policies to achieve a common culture
3. Nutritional Support | Ensure good healthy food availability and nutritional education is weaved into the fabric of the workplace
4. Lighting Design |
    a. Understand lighting is a powerful bio-influencer with significant impact on human circadian rhythms, mood, and overall wellbeing
    b. Balance the availability of daylight in harmony with artificial lighting
5. Enhancing Active & Passive Movement | Increase the availability of incidental movement and greater opportunities for physical activity
6. Achieving Thermal Comfort | Aspire to provide a variability in thermal environments that cater for the needs of varying thermal expectations of the Canva community
7. Acoustic Excellence | Strive to provide good acoustic amenity through the use of technology, spatial planning of acoustic zones throughout, and operational procedures
8. A Mentally Healthy and Resilient Workplace | Provide a workplace environment that supports mental health and nurtures mental fitness
9. Biophilic Design | Integrate nature-based solutions to create a connection to nature and visual interest in the workplace
10. Universal Design | Implement a design process that encompasses topics such as accessible design, designing for neurodiversity, and sensory sensitivity, among others

3.3.3 Beyond Net Zero

Beyond net zero requires us to redefine the boundary of the Project's operational carbon footprint. The Project will develop a design response to these building emissions impacts.

The carbon life cycle also recognises the emissions impact of:

1. Building water use and wastewater treatment
   - To support water resilience, the Project will integrate water efficiency measures and make use of alternative water sources to reduce the demand for potable water
2. Waste
   - During design and delivery, the Project will focus on circular economy principles (See Figure 3.4). Avoided demolition and extending the lifespan of building components is a key Project design driver. At least 80% of construction and demolition waste will be diverted from landfill.
   - In operation, the Project will recover > 50% of its waste streams, including food organics, to convert them to valuable resources
3. Refrigerant plant and equipment
   - Current refrigerant plant and equipment contain HFC refrigerants, which are potent greenhouse gases with a high global warming potential (GWP) and long lifetime. HFC refrigerants are set for eventual phase out by 2035.
   - HFO and natural refrigerant plant and equipment (zero ODP and GWP < 10) will be selected, wherever possible
4. Movement and transport of Canvanaughts, workers, and visitors to support building/organisation operations
   - The Project will leverage the high quality public transport infrastructure available by implementing a range of Project-specific sustainable transport measures that will minimise private vehicle use

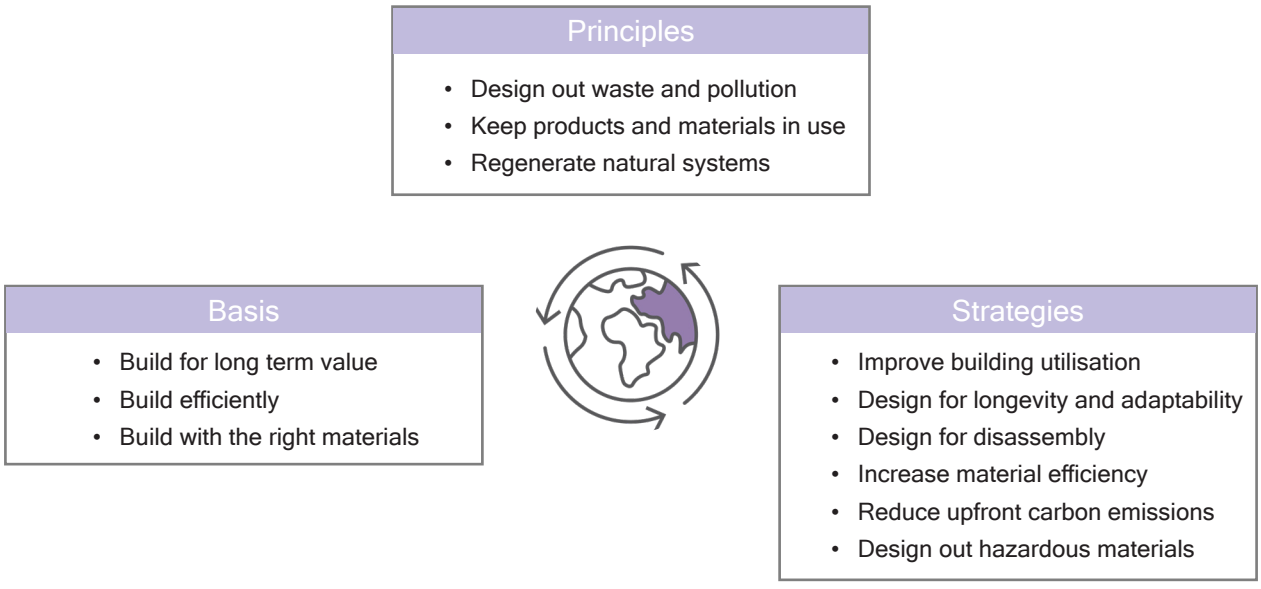


Figure 3.4 Circular design response

3.3.4 Running on Renewables

Canva already powers its Australian operations with renewable energy and recognises that, by working to match building energy demand to grid-scale renewable energy generation, further operational carbon reductions are achievable, and running cost relief for renewable firming can be realised.

The ability to flexibly shift the time of use of a building's energy demand is critical in supporting further decarbonisation by dynamically responding to favourable grid conditions.

The Project will pursue a smart building design response, coupled with on-site solar photovoltaic (PV) systems, to drive grid resilience and demand management outcomes (see Figure 3.5).

This sustainability practice will be further explored and expanded during design development.

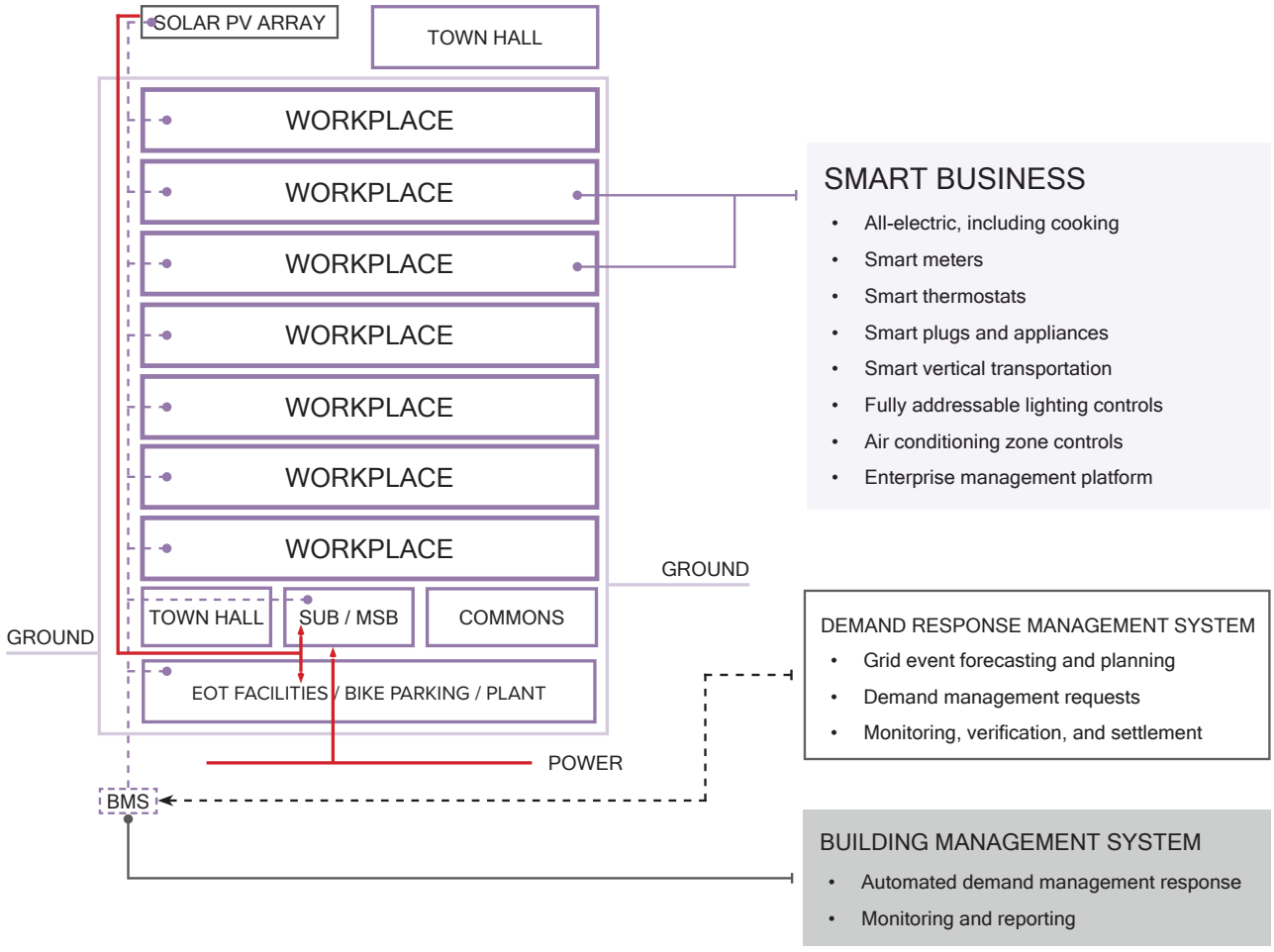
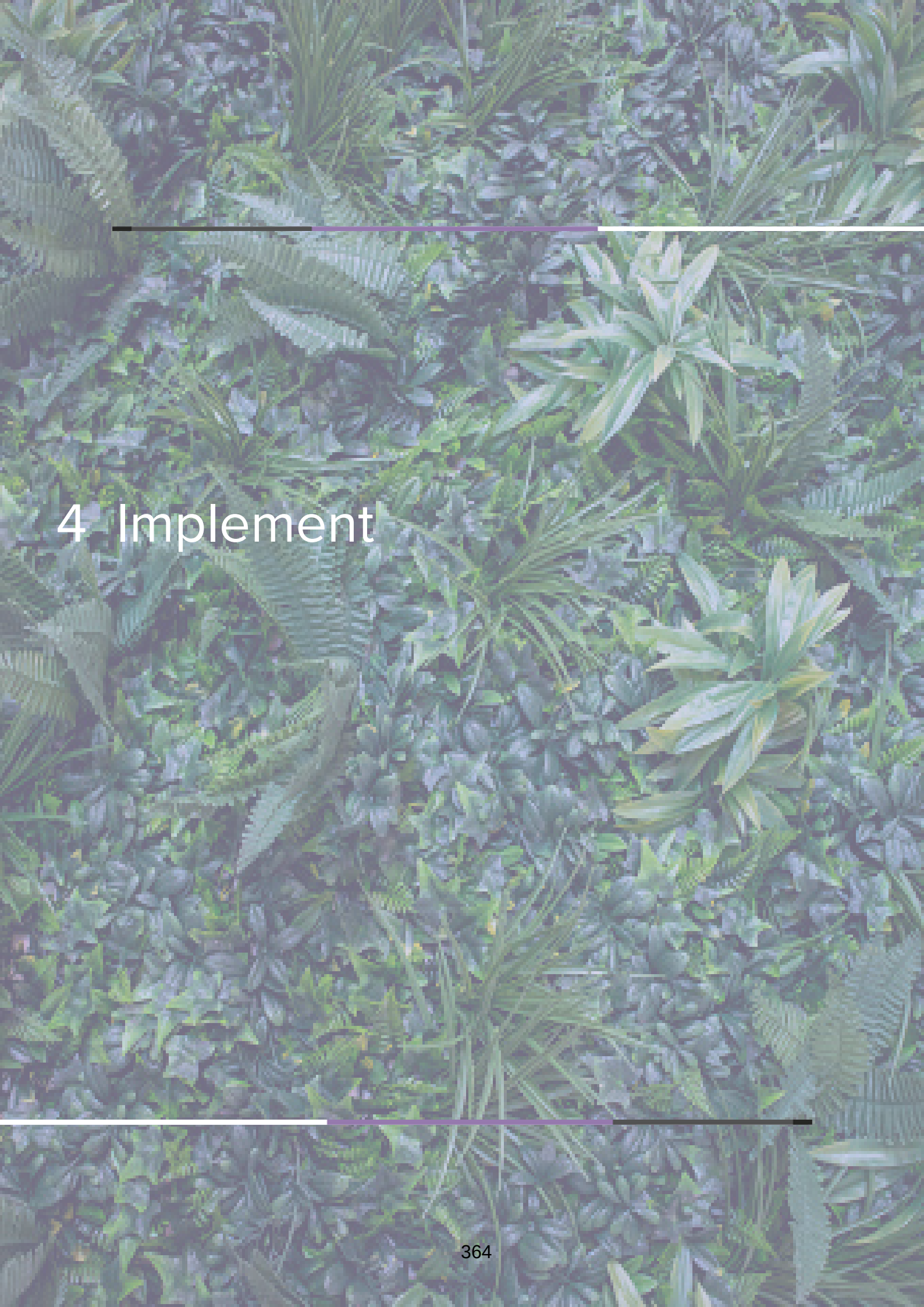


Figure 3.5 Smart building design configuration



4 Implement

4.1 Governance

4.1.1 Collective Impact

The concept of collective impact focuses on shaping the necessary leadership, collaboration, and decision-making governance to support effective action through all phases of the design and delivery, and operation of the Project to achieve social change.

This calls for a shared vision and common agenda, established targets, and investment.

The collective formation of a range of Project stakeholders is required. The Project stakeholders, and their roles and responsibilities are outlined in Figure 4.1.



Figure 4.1 Stakeholder roles and responsibilities

4.1.2 Assurance Framework

The built environment is and must rapidly transform and shift to a whole life net zero economy (see Figure 4.2).

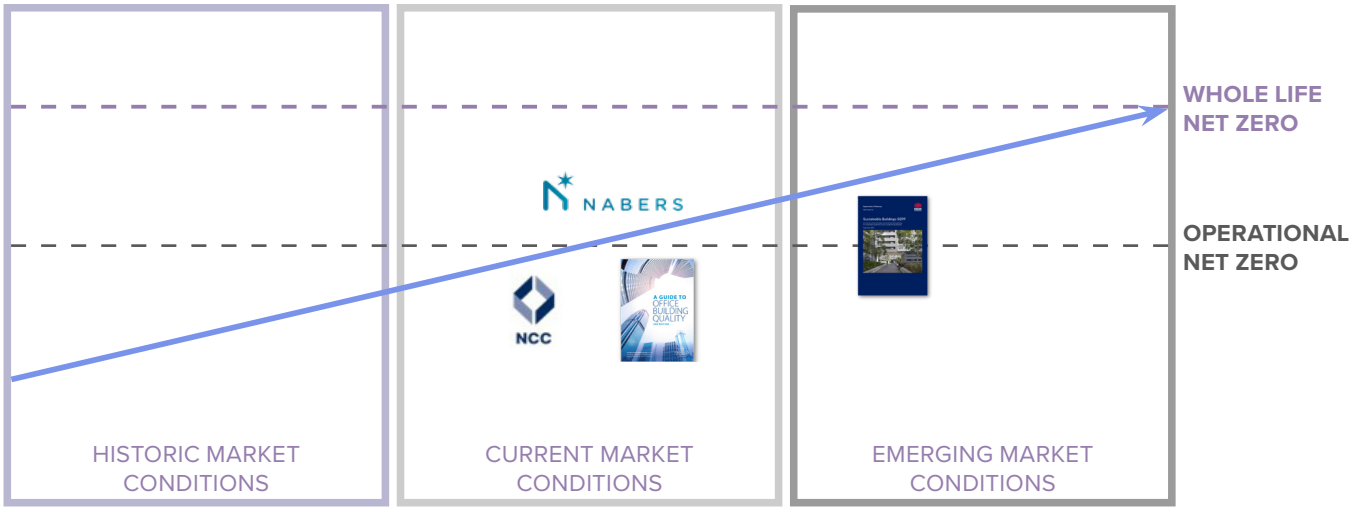


Figure 4.2 Market transformation

An assurance framework is required for the Project to present credible climate action in the design and delivery, and operation of the building. Table 4.1 sets out the assurance framework, and the alignment with inter-connected controls, policies, guidelines, and tools.

Ultimately, the assurance framework presented will ensure the market perceives the building as a high quality, high value asset.

Table 4.1 Assurance framework

Standard	Assurance Framework	Alignment
NABERS	• 5.5 star NABERS Energy for Offices (base building) (Commitment Agreement) (without GreenPower) • 3 star NABERS Water for Offices (Agreement to Rate) • NABERS Embodied Carbon* (equivalent to a benchmark performance of 600 kgCO2e/m^2)	• Sydney DCP 2012 • NSW Sustainable Buildings SEPP, Energy and Water Standard • Grade A office environmental parameter • NCC 2022 Section J, J1V1 NABERS
Climate Pledge	• Whole Life Net Zero Ready: - At least a 20% reduction in upfront carbon - At least a 20% reduction in energy use - All-electric, fossil fuel-free operations - 100% renewable electricity - Low impact refrigerant systems	• Climate Pledge

* An Agreement to Rate will be considered upon release of the tool in mid-2024

4.2 Climate Action

4.2.1 Passive Design Response

Urban Heat Island Effect

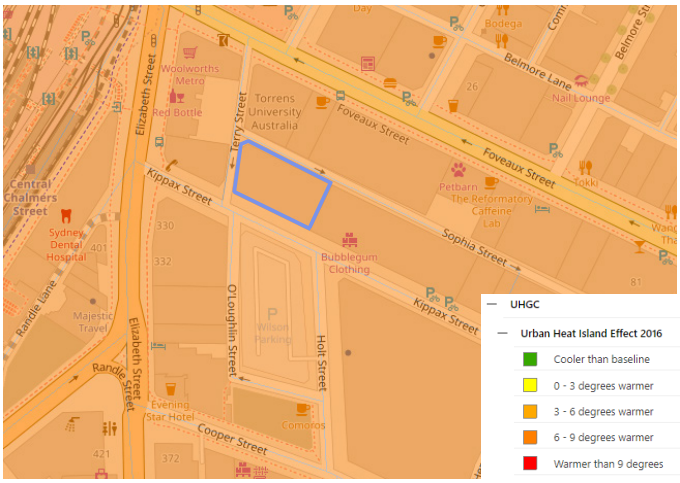


Figure 4.3 Project site UHIE

The urban heat island effect (UHIE) occurs when natural land cover is replaced with dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat. Ambient temperatures in urban areas can be up to 10°C warmer than rural areas. This effect acts to increase energy costs, air pollution levels, and heat-related illness and mortality.

The site and surrounding Surry Hills community generally experience temperatures that are 3-6°C warmer than rural areas, exacerbated by the UHIE (see Figure 4.3; source: The SEED Initiative).

Mitigation measures to reduce the UHIE include:

- External shading (see Proposed Performance)
- External planter boxes for the wintergardens on Levels 1 to 9 to provide an evaporative cooling and shading effect (see Wintergarden Performance)
- A biosolar green roof, combining solar PV and green roof technology, extensive rooftop landscaping, and a solar canopy to the roof terrace (see Section 4.2.3) reduce the heat absorptance of the site

Sun Hours Analysis

A sun hours analysis has been conducted to quantify solar exposure to the building envelope (see Figure 4.4).

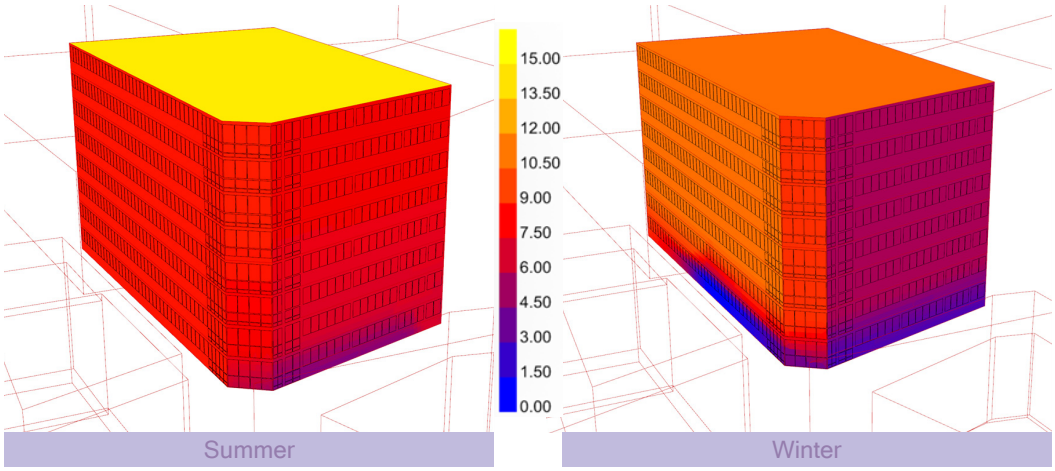


Figure 4.4 Sun hours analysis - NW perspective

The north and west façade from Level 1 and above see a consistent solar exposure in summer and winter, i.e., limited overshadowing is observed that would influence the façade design on the north and west façade at the typical workplace levels (Levels 2 to 9).

The façade design response at Lower Ground, Ground, and Level 1 to increase transparency and maximise activation is reinforced through good overshadowing being observed to the west façade in summer, and north and west façade in winter.

Parametric Design

A parametric design process was implemented to optimise the building fabric performance for the typical workplace levels (Levels 2 to 9). This included establishing baseline building fabric performance inputs, and evaluating indoor environment quality, load and energy use, and embodied carbon performance outputs for a range of alternative design scenarios.

Over 100 façade design scenarios were analysed and compared to the baseline performance, applying a multi-criteria analysis of modelled data (see Figure 4.5). This process facilitated stakeholder engagement that assisted in balancing architectural and aesthetic drivers with workplace function and sustainability performance requirements.

Baseline Performance

- Baseline building fabric inputs:
  - Window-to-wall ratio (WWR) - north (60%), south (50%), east (0%; party wall), and west (55%)
  - Glazing - triple silver clear DGU; system U 3.1 (DTS*); system SHGC 0.28 (DTS), system VLT 60%
  - Wall (incl. party wall) - system R 1.4 (DTS)
  - Spandrel - system R 0.6
  - Exposed slab edge; all elevations
  - Exposed column edge; west and south façade
  - Shading - none

- Performance outputs:
  - Indoor Environment Quality (IEQ) | Daylight availability [% floor area meeting the Green Star Buildings Daylight criteria]
  - IEQ | Visual comfort [% floor area exceeding good practice Annual Sunlight Exposure (ASE) criteria]
  - IEQ | Thermal comfort [% occupied hours meeting ASHRAE Standard 55]
  - Load | Peak cooling load [W/m²]
  - Energy use | Energy consumption [kWh/m²]
  - Embodied carbon | Area of shading [m²]



Figure 4.5 Baseline performance

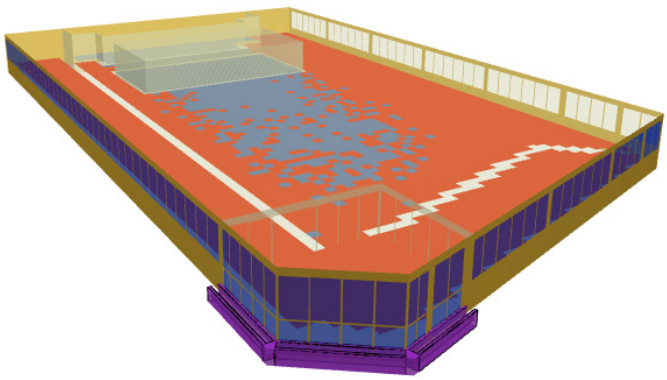


Figure 4.6 Baseline façade configuration

- Baseline performance (see Figures 4.5 and 4.6):
  - Low embodied carbon (no shading)
  - Good daylight availability; poor visual comfort performance
  - Poor energy use and cooling load performance
  - Good thermal comfort performance

* DTS = meets the deemed to satisfy provisions of NCC 2022 Section J Energy efficiency, Part J4D6 Walls and glazing

- Proposed building fabric inputs:
  - All parameters as per baseline, excluding glazing and shading
  - Shading - north
    1 x 450mm deep horizontal shade fixed at exposed slab edge
    1 x 450mm deep horizontal shade at 450mm separation
  - Shading - west
    1 x 450mm deep vertical shade fixed at column edge
  - Glazing - two (2) glazing selections were proposed
    1. Clear - As per baseline (see Figure 4.7)
    2. Neutral - Triple silver neutral DGU; U 3.1; SHGC 0.23; VLT 45% (see Figure 4.8)

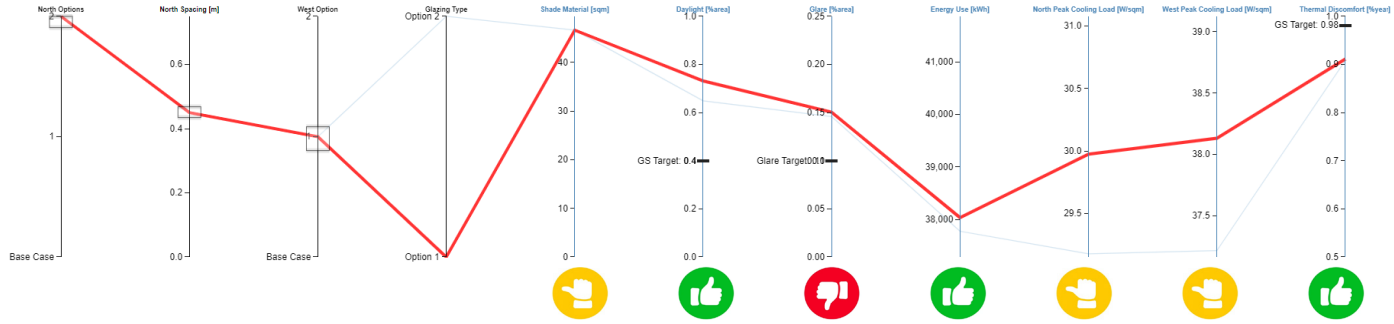


Figure 4.7 Proposed performance - Clear glazing

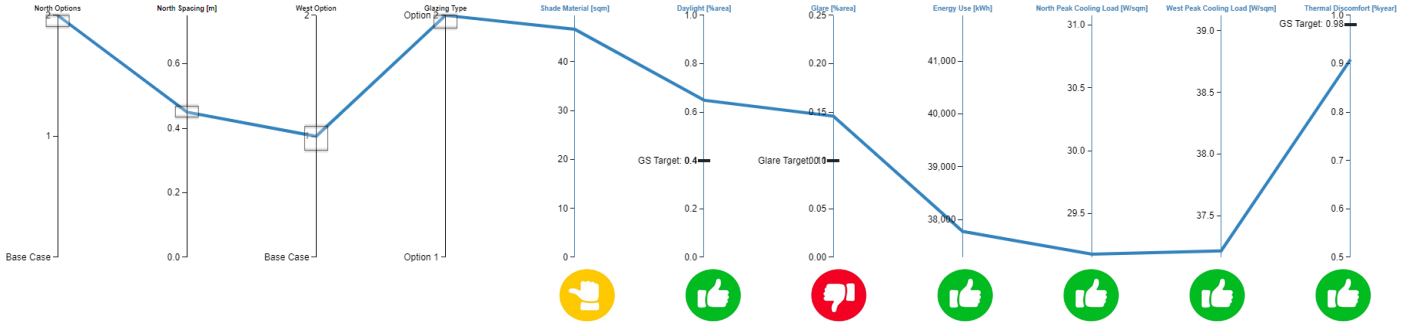


Figure 4.8 Proposed performance - Neutral glazing

- Shading design response (see Figure 4.9)
  - Improvement in the energy use and cooling load performance is observed when compared to the baseline performance (see Figures 4.5 and 4.7)
  - An embodied carbon impact is also observed due to the extent of shading
  - Detailed energy analysis undertaken to determine the predicted NABERS Energy performance (see Section 4.2.2) confirmed that the shading proposed to the west façade offered negligible improvement due to the horizontal separation distance (column-to-column). These shades have been omitted, reducing the embodied carbon impact.
- Glazing design response
  - When neutral glazing is applied, a further improvement in cooling load performance is observed (see Figure 4.8), driven by the high solar control characteristics of the glazing
  - Neutral glazing has been adopted to support reduced loads and improved energy use, and a high indoor environment quality

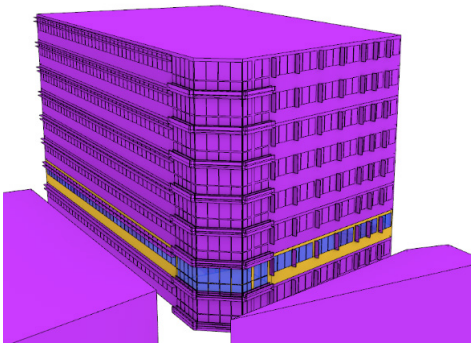


Figure 4.9 Proposed façade configuration

Wintergarden Performance

The wintergardens created in the north west corner of the building floor plate (Levels 1 to 9; see Figure 4.10) has been optimised for natural ventilation, informed by adaptive thermal comfort analysis.

Table 4.2 details the performance optimisation initiatives, including:

1. Manually operated glazed louvres (clear glazing); baseline performance
2. Actuated glazed louvres (clear glazing) that progressively open for optimal natural ventilation of the wintergardens
3. Actuated glazed louvres (neutral glazing) that progressively open for optimal natural ventilation of the wintergardens



Figure 4.10 Wintergarden concept

Table 4.2 Wintergarden thermal performance

	Configuration	Comfortable [days]	Hot Discomfort [days]	Cold Discomfort [days]
1.	Manually operated glazed louvres (clear glazing)	139	21	56
2.	Actuated glazed louvres (clear glazing)	189	25	2
3.	Actuated glazed louvres (neutral glazing)	193	21	2

The baseline glazing performance (clear glazing) is based on single laminated glazing (system U 4.5; system SHGC 0.65; system VLT 80%). The neutral glazing (light grey) performance is based on single laminated glazing (system U 4.5; system SHGC 0.5; system VLT 55%).

Additional performance optimisation initiatives include:

1. The adoption of external planter boxes to provide an evaporative cooling and shading effect
2. Providing 'spill air' to the wintergardens from the conditioned workplace to temper the space during hot and cold periods (glazed louvres are closed)

Through the progressive implementation of these performance optimisation initiatives, the number of comfortable days for the wintergardens increased from 139 to 193 days per year.

4.2.2 Active Design Response

Predicted Performance

In coordination with a leading passive design response established in Section 4.2.1, an advanced active design response has been developed that addresses the NABERS Energy for Offices performance target.

The following active design measures have been integrated:

1. All-electric; no residual fossil fuel-based systems
2. No car parking
3. A chilled beam system, including fan coil units (FCUs) to support workplace function
4. Automated internal blinds, in combination with the shading and glazing design response (see Figure 4.8), to dynamically manage glare and solar gain
5. Increased outdoor air supply to the west perimeter air conditioning zones to supplement the cooling capacity of the chilled beam system
6. Direct outdoor air handling systems with heat recovery and demand control ventilation
7. High efficiency water-cooled chillers and air-cooled heat pumps for space cooling, and space and hot water heating, respectively
8. Fully addressable LED lighting system with advanced controls
9. Metering all major energy uses to provide greater visibility on energy use trends and anomalies

A predicted NABERS Energy assessment has been undertaken. Table 4.3 details the energy use intensity (EUI) breakdown for the Project based on net lettable area (NLA).

The established passive and active design response collectively delivers a 5.5 star performance with a margin of 10%. This acts to verify that the Project is capable of meeting the 5.5 star NABERS Energy (base building) performance target.

Table 4.3 Energy use intensity breakdown

Energy Use		EUI [kWh/m^2.year NLA]
Base Building Air Conditioning	AHU fans	4.4
	FCU fans	1.9
	Chillers	9.2
	Heat pumps	1.0
	Heat rejection	2.8
	Ventilation fans	3.8
	Pumps	1.5
Supplementary Air Conditioning	Heat rejection	3.3
Base Building Lighting	Common areas	3.6
	External	2.4
Vertical Transportation	Passenger lifts	10.8
Hot Water	Heat pumps	2.3
	Pumps	3.0
Other	Miscellaneous	5.7
	TOTAL	55.8
	5.5 STAR NABERS ENERGY BUDGET	62.1
	MARGIN	10%

Advanced Building Services

To demonstrate credible climate action, the Project requires the integration of advanced building services to deliver a highly energy efficient building. However, the complexity of integrating these services as part of an adaptive reuse development poses major constraints and challenges for the Project. Any solution must also balance architectural and aesthetic drivers with workplace function and sustainability performance requirements.

The floor-to-floor height of the existing building doesn't reflect modern commercial office buildings, with inherent ceiling height constraints for reticulating building services and meeting office quality guidelines.

The workplace design concept embraces an exposed ceiling and chilled beam configuration to minimise services reticulation and finishes products. The design intent is to illuminate the exposed ceiling and spaces with high quality internal lighting so that building occupants perceive the space as 'open' and comfortable.

Spatially accommodating central cooling and heating plant and equipment, and ventilation systems required extensive and progressive design coordination to achieve the Project's functional and spatial requirements.

The Level 11 design response is directly driven by this plant spatial coordination process; accommodating cooling towers, air-source heat pumps, and air handling units, which all require adequate natural ventilation for efficient operations (see Figure 4.11).

The Project design principles (see Section 1.3) reinforce a design response that realises a well-resolved balance of architectural and aesthetic drivers with workplace function and sustainability performance requirements, and addresses the many constraints and challenges posed by an adaptive reuse development.

The Level 11 roof terrrace amenity realises significant co-benefits for the Canva Community by:

- Tuning the space mix needs, operations, and policies to achieve a common culture
- Creating an opportunity to address accessible design, and design for neurodiversity and sensory sensitivity in a workplace context
- Integrating nature-based solutions to create a connection to nature and visual interest in the workplace

Together, the solar canopy and biosolar green roof, and roof terrace landscaping offer an effective design response to reduce the urban heat island effect.

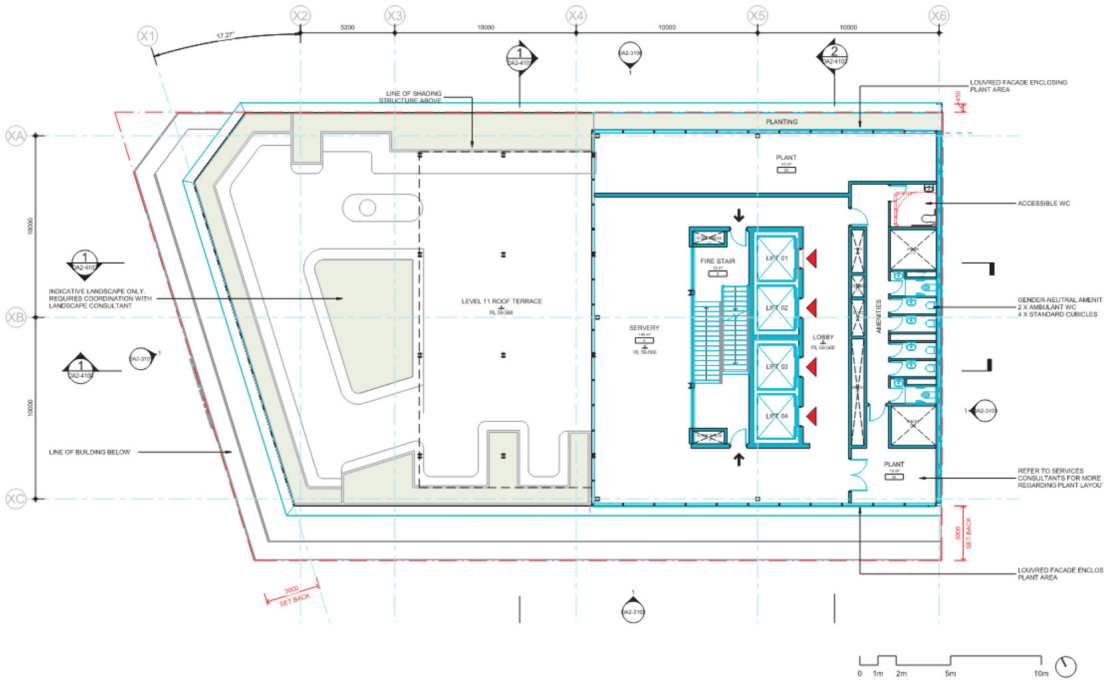


Figure 4.11 Level 11 Plan

4.2.3 On-Site Active Generation Systems

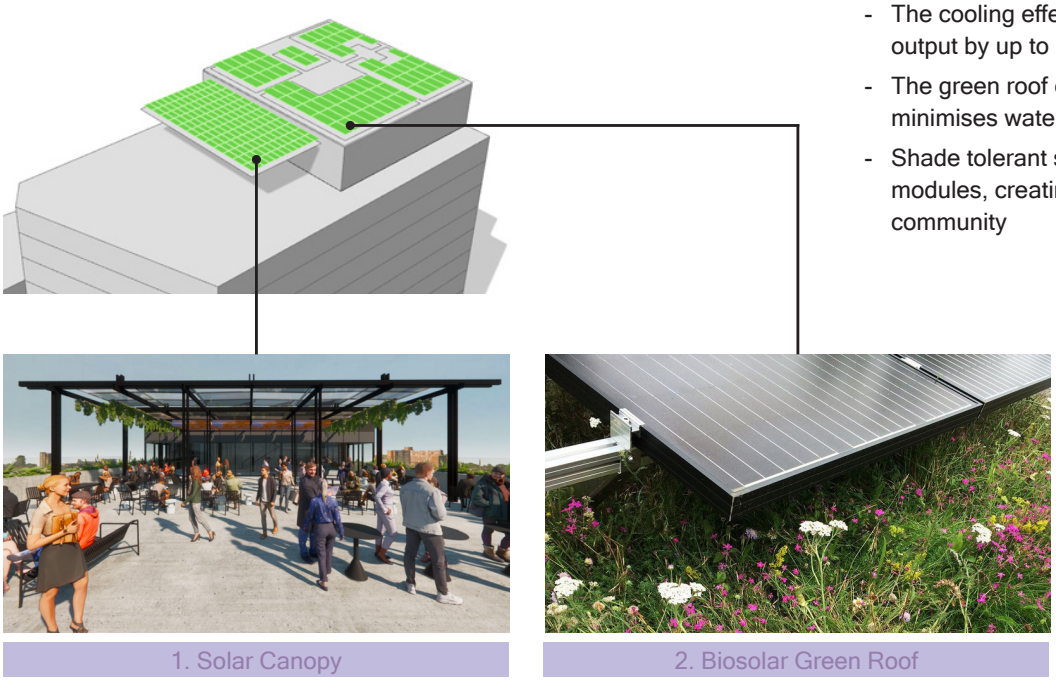
Innovative Technology Applications

The passive and active design response established in Sections 4.2.1 and 4.2.2 delivers an energy efficient outcome whilst balancing architectural and aesthetic drivers with workplace function and sustainability performance requirements. This outcome ensures that on-site active generation systems can be impactful in further reducing energy use.

To be credible, it is recognised that the Project must add 'new' renewable energy generation to collectively support replacing fossil fuel-based energy generation as quickly as possible in response to global heating.

The Project has integrated two (2) innovative solar photovoltaic (PV) system applications (see Figure 4.12):

1. Solar canopy
   - 10 kWp crystalline silicon PV glass
2. Biosolar green roof
   - Roof mounted 40 kWp monocrystalline PV array (flat module configuration)
   - Combines a green roof and PV array into one system
   - The cooling effect of vegetation increases solar output by up to 5%
   - The green roof element acts as ballast, which minimises waterproofing penetrations
   - Shade tolerant species thrive under the PV modules, creating a more diverse flora and fauna community



1. Solar Canopy

2. Biosolar Green Roof

Figure 4.12 Solar PV technology applications

Table 4.4 details the total installed solar PV capacity, annual yield, percentage of annual energy use met by the solar PV array, and margin gained against the 5.5 star NABERS Energy budget.

The established passive and active design response, and on-site active generation systems collectively delivers a 5.5 star performance with a margin of 25%. This acts to further verify that the Project is capable of meeting the 5.5 star NABERS Energy (base building) performance target.

Table 4.4 On-site active generation systems

Solar PV Array	
1. Solar Canopy - capacity [kWp]	10
2. Biosolar Green Roof - capacity [kWp]	40
TOTAL [kWp]	50
Estimated annual yield [kWh/year]	67,500
EUI reduction [kWh/m^2.year NLA]	9.0
Energy use met [%]	16%
Adjusted EUI [kWh/m^2.year NLA]	46.8
Adjusted margin [%]	25%

4.2.4 Upfront Carbon Emissions

Adaptive Reuse

The Project inherently responds to a whole life carbon shift in the built environment - minimising embodied carbon and capturing sequestered carbon through the adaptive reuse and relifing of existing buildings. This 'never demolish' mindset is a core tenet of the whole life net zero ready design response.

Through the sensitive integration of a modern workplace that reinforces the Canva Community, a high proportion of the structure and envelope has been retained in-situ where not impacted by fundamental functional adjustments, including:

- Double brick cavity upstands on Levels 1 - 9 on north, and Levels 2 - 9 on west and south (subject to strengthening and internally lined)
- Party wall on east (subject to strengthening and internally lined)
- Columns and beams
- Suspended floors
- Existing pad footings to be retained and strengthened for re-use, where practicable

New construction works include:

- Relocating the core to the east to maximise daylight access, and high quality external and internal views to the floor plates, and position rooftop plant and equipment to be less visible
- Infilling columns, beams, and suspended floors in the current core location
- Reinforcing the existing structure to accommodate a new core, rooftop terrace, and plant and equipment
- Relocating and upgrading the transformer chamber substation on Sophia Street
- Demolition and reinstatement of the basement ground slab to support infrastructure augmentation
- Introducing wintergardens to the north-west corner of the floor plates on Levels 1 to 9 to create a connection to nature

Target Setting

The scope of upfront carbon considers construction materials [A1-A3] and construction activities [A4-A5] is illustrated in Figure 4.13, which sets our the carbon life cycle of a building.

Research by the London Energy Transformation Initiative (LETI), a network of over 200 built environment professionals, shows that buildings must reduce embodied carbon if we are to achieve credible whole life net zero outcomes. LETI has proposed a 2020-2030 embodied carbon budget of 600 $kgCO2e/m^2$ for commercial office buildings (see Figure 4.14), which is a stringent target given that a typical commercial building can emit over 1,000 $kgCO2e/m^2$ in its construction. This represents a 40% upfront carbon reduction when compared to 'business as usual', which is in line with the Climate Positive Pathway established in the Green Star Buildings tool (see Section 3.3.1).

Figure 4.15 clearly shows how building emissions are front-loaded for new buildings. A deep refurbishment of an existing building that adaptively reuses and retains the structure offers an opportunity to sequester the embodied carbon present in the existing building, thus avoiding new upfront carbon emissions.

The Project will seek to achieve an upfront carbon emissions benchmark performance of not more than 600 $kgCO2e/m^2$ GFA. Upon the planned release of the NABERS Embodied Carbon tool in mid-2024, the Project will seek to target an appropriate rating level.

This assurance framework offers whole life carbon certification for the Project, i.e., certification under both NABERS Energy (operational carbon) + NABERS Embodied Carbon (upfront carbon) (see Table 4.1). In implementing a credible whole life carbon design response, the Project will be perceived by the market as a high quality, high value asset.

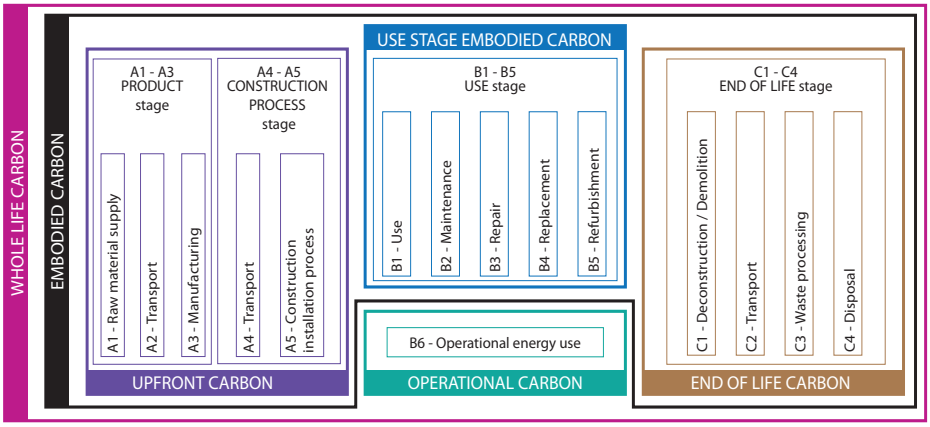


Figure 4.13 Carbon life cycle



Figure 4.14 LETI 2020 - 2030 target

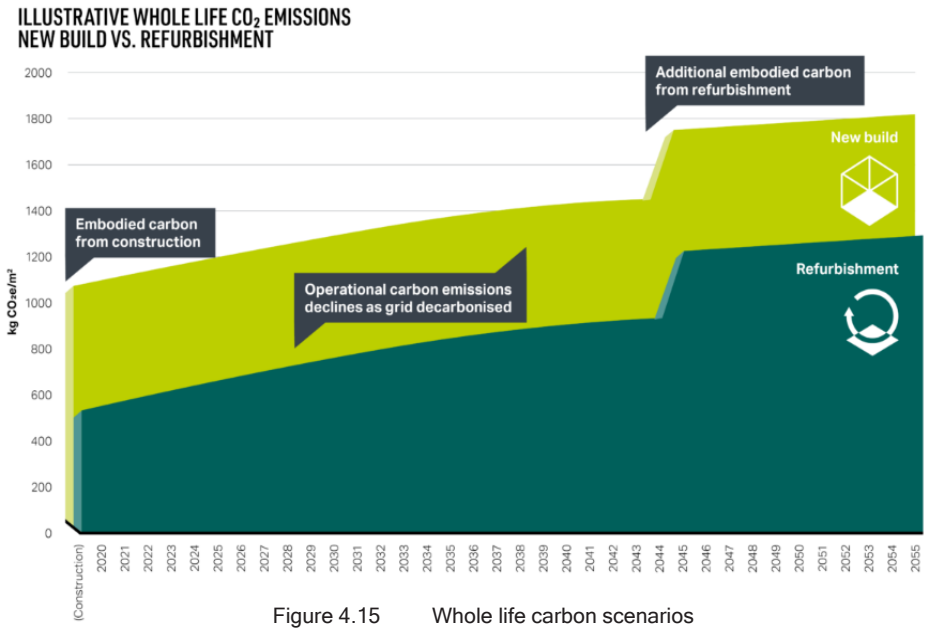


Figure 4.15 Whole life carbon scenarios

Design Response

Achieving credible reductions in upfront carbon when compared to 'business as usual' is a given for the Project.

Through the sensitive integration of a modern workplace that reinforces the Canva Community, a high proportion of the structure and envelope has been retained in-situ where not impacted by fundamental functional adjustments.

Materials substitutions are proposed, including achieving an average cement replacement of 30% across all new concrete and masonry products.

Dematerialisation principles have been adopted to minimise the quantity of construction materials, e.g., exposed ceilings (see Section 4.2.2).

Primary construction materials with product-specific (industry-specific, where not available) Environmental Product Declarations (EPDs) will be procured, where practicable

The supply chain will be engaged to demonstrate third-party certification schemes and independent verification methods for their products, and be pre-approved under the Responsible Products Framework developed by the GBCA, where practicable.

Products with a high recycled content (e.g., reinforcing and structural steel, aluminium, fibre cement sheet, etc.) will be sourced, where practicable.

The following initiatives will be adopted to drive upfront carbon reductions for construction-related activities.

- 20% of high emitting construction equipment will be fossil fuel-free
- Site offices will be all-electric and powered by 100% renewable electricity
- All electricity used by the construction site will be 100% renewable electricity

Predicted Performance

Drawing on the Embodied Emissions Materials Form (or bill of quantities - BOQ) prepared by the Quantity Surveyor in support of DA1 [NSW Sustainable Buildings SEPP], and applying the EPiC Database, Upfront Carbon Emissions calculation guide – interim (developed by the GBCA in coordination with NABERS), and leading embodied carbon research, the GWP [kgCO2e] of the Project has been determined.

Table 4.5 and Figure 4.16 detail the predicted upfront carbon emissions performance of the Project, broken down into typical building elements.

The predicted performance demonstrates a world leading embodied carbon benchmark performance. This acts to verify that the Project is capable of meeting an upfront carbon emissions benchmark performance of not more than 600 kgCO2e/m² GFA required under a credible whole life net zero ready strategy (see Table 4.7).

Table 4.5 Building element breakdown

Building Element	GWP [kgCO2e]
Structure	3,183,070
Envelope	570,631
Interior	143,258
External works	256,032
Building services	1,161,990
Construction	274,236
TOTAL	5,589,218
kgCO2e/m² GFA	432.90

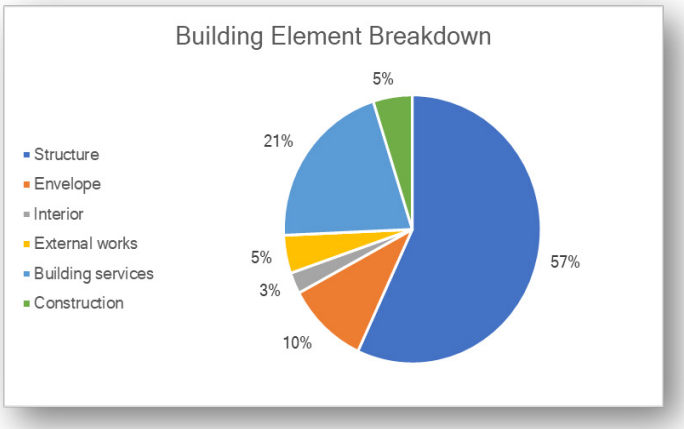


Figure 4.16 Building element breakdown

4.2.5 Whole Life Net Zero Ready

Operational Carbon Performance

The passive and active design response established in Sections 4.2.1 and 4.2.2, and the innovative application of on-site active generation systems outlined in Section 4.2.3, delivers highly enery efficient operations (see Figure 4.17).

With Canva's fossil fuel-free operational commitments (full building electrification; 100% renewable electricity supply), an operational net zero outcome is achievable for the Project (see Table 4.6).

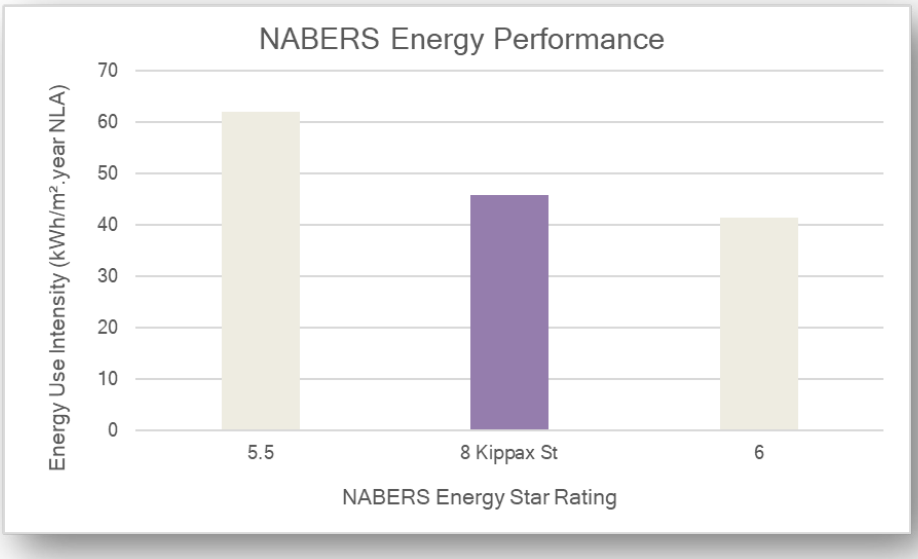


Figure 4.17 NABERS Energy benchmarking

Table 4.6 Summary - Operational Net Zero

Predicted Operational Performance

Estimated annual fossil fuel consumption* [kWh/year]	-
Estimated annual electricity consumption [kWh/year]	350,658
Total estimated annual energy consumption [kWh/m^2.year GFA]	33.0
Estimated annual direct (scope 1) GHG emissions [kgCO_2/year]	-
Estimated annual indirect (scope 2) GHG emissions** [kgCO_2/year]	-
Total estimated annual GHG emissions [kgCO_2/m^2.year GFA]	-

* Full building electrification; no residual fossil fuel-based systems

** 100% renewable electricity supply - Operational Net Zero

Upfront Carbon Performance

The predicted upfront carbon performance represents a world leading design response. This acts to verify that the Project is capable of meeting an upfront carbon emissions benchmark performance of not more than 600 kgCO2e/m^2 GFA required under a credible whole life net zero ready strategy.

Whole Life Carbon Performance

Table 4.7 summarises the design response to deliver a Whole Life Net Zero Ready outcome for the Project. This is aligned with the Climate Positive Pathway (see Section 3.3.1).

Table 4.7 Summary - Whole Life Net Zero Ready

Requirement		Met	Design Response
1.	Highly energy efficient - 20% reduction in energy use	Yes Sections 4.2.1 - 4.2.3	• Established passive and active design response, and on-site active generation systems • Predicted 5.5 star NABERS Energy performance with a margin of not less than 25% (see Figure 4.12) • Operational net zero
2.	Low environmental impact - 20% reduction in upfront carbon	Yes Section 4.2.4 Embodied Emissions Materials Form (by others)	• Established design response for primary construction materials and construction-related activities • NABERS Embodied Carbon performance (equivalent to a benchmark performance of 600 kgCO2e/m^2)
3.	Fossil fuel-free - all-electric + 100% renewable electricity	Yes Section 4.2.2	• Full building electrification, including commercial kitchen use; no natural gas connection • No residual fossil fuel-based systems; no diesel emergency standby generator plant and equipment • 100% renewable electricity supply to all Canva workplaces in Australia (existing and ongoing energy procurement commitment)
4.	Address high impact refrigerant systems	Chillers - Yes Heat pumps - Future ready Section 4.3.4	• HFO refrigerant-based chillers (zero ODP; GWP < 10) • HFC refrigerant-based heat pumps (zero ODP; GWP > 1,000) • HFC refrigerant volume is minimised through the selection of air-to-water heat pump systems, which do not circulate refrigerants • Future ready for phase out of HFC refrigerants by 2035

4.3 Sustainable Offices

Building Strong Communities

The Project utilises the existing nine-storey building façade + two (2) additional storeys incorporating a new function/meeting level and terrace access, with associated advanced building services plant and equipment. Both function/meeting level and roof terrace are for use by Canvanaughts and invited guests.

Ground, accessed from Kippax Street, will connect to Lower Ground, accessed from Sophia Street, visually linking the two streets.

The public domain around the site consists mainly of narrow streets with limited pedestrian access due to narrow footpaths.

A Shared Zone along Terry Street, between Foveaux and Kippax Streets, is proposed by the City of Sydney to address this poor street condition and create a more functional public realm (see Figure 4.18).

The Project offers opportunity to deliver a good working environment to Canva's employees and will encourage the use of public transport due to the site's prime location.

The addition of a function room level and terrace will provide opportunity to invigorate the currently underutilised rooftop space through outdoor, undercover seating areas, with iconic views towards the City and surrounds.



Figure 4.18 A functional public realm

Nutritional Support

Canva's hospitality program offers Canvanaughts breakfast and lunch daily. With fresh food sourced from farms that practice regenerative agriculture, and packaged food and amenities supplied by businesses that are either social enterprises or have a positive social impact, Canva ensures good healthy food availability and nutritional education is weaved into the fabric of the workplace.

Biophilic Design

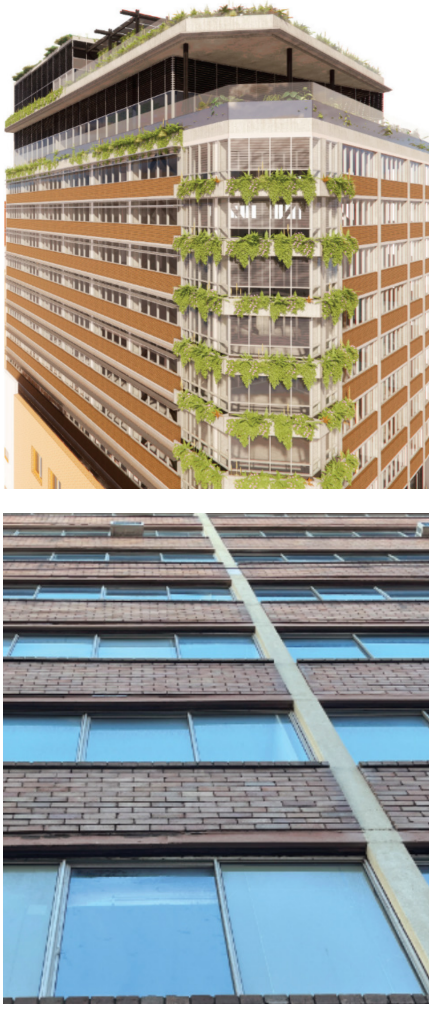


Figure 4.19 Nature-inspired design

A range of nature-inspired design interventions have been identified and fundamentally integrated within the workplace aesthetic and function, including:

- Adaptive reuse of the existing double brick cavity upstands on Levels 1 - 9 on north, and Levels 2 - 9 on west and south (see Figure 4.19). The natural material form and appearance of the brickwork offers a sensory experience that fits within the surrounding context.
- Combining a solar PV array and green roof, a biosolar green roof offers the following benefits:
  - The cooling effect of vegetation increases solar output by up to 5%
  - The green roof element acts as ballast, which minimises waterproofing penetrations
  - Shade tolerant species thrive under the PV modules, creating a more diverse flora and fauna community
- Extensive landscaping to the Level 11 roof terrace is provided to create a welcoming and engaging space that reinforces the Canva Community
- Wintergardens to the north-west corner of the floor plates on Levels 1 to 9 to create a connection to nature; reinforced with significant planters at each level (see Figure 4.19). These naturally ventilated and tempered spaces offers workplace choice and a range of workplace experiences for Canvanaughts.

Overall, through the integration of a solar canopy and biosolar green roof, extensive roof terrace landscaping and wintergardens, the Project offers a leading design response to reduce the urban heat island effect.



4.4 Beyond Net Zero

4.4.1 ESD Principles

The principles of ecologically sustainable development are detailed in Table 4.8. A design excellence response is presented to demonstrate how these ESD principles are incorporated in the design and delivery, and operation of the Project.

Table 4.8 ESD design excellence response

Principle	Design Excellence Response
The precautionary principle - The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. (3) In applying the precautionary principle, public and private decisions should be guided by - (a) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and (b) an assessment of the risk-weighted consequences of various options.	• Predicted 5.5 star NABERS Energy performance with a margin of not less than 25% • NABERS Embodied Carbon performance (equivalent to a benchmark performance of 600 kgCO2e/m^2) • Full building electrification, including commercial kitchen use; no natural gas connection • No residual fossil fuel-based systems; no diesel emergency standby generator plant and equipment • 100% renewable electricity supply; operational net zero • HFO refrigerant-based chillers (zero ODP; GWP < 10) • HFC refrigerant-based heat pumps (zero ODP; GWP > 1,000) • HFC refrigerant volume is minimised through the selection of air-to-water heat pump systems, which do not circulate refrigerants • Future ready for phase out of HFC refrigerants by 2035
Intergenerational equity - The principle of intergenerational equity is that the present generation should ensure the health, diversity, and productivity of the environment are maintained or enhanced for the benefit of future generations.	• The Project will be a force for good → acting on climate change by going beyond net zero + building social cohesion through the Canva Community • The established passive and active design response, and on-site active generation systems collectively delivers a 5.5 star performance with a margin of 25%. This acts to verify that the Project is capable of meeting the 5.5 star NABERS Energy (base building) performance target. • The established water strategy is capable of meeting the minimum 3 star NABERS Water performance target. Where the commercial kitchen can be excluded (separate public access), the Project will seek to achieve a 4 star NABERS Water performance. • At least 80% of construction and demolition waste will be diverted from landfill. An estimated landfill diversion rate of 50-75% for operational waste will be pursued, based on implementing leading waste and circular practices in operation.

Principle	Design Excellence Response
Conservation of biological diversity and ecological integrity - The conservation of biological diversity and ecological integrity should be a fundamental consideration.	• Canva's aspirations of 'being a force for good", and the principle to "do more with less", have been embraced, with the proposed rooftop additions retaining as much of the existing building as possible and only making pragmatic interventions where it improves functional planning or sustainability initiatives • Biosolar green roof • Extensive landscaping to the Level 11 roof terrace • Wintergardens to the north-west corner of the floor plates on Levels 1 to 9 to create a connection to nature; reinforced with planters at each level • Solar canopy and biosolar green roof, and roof terrace landscaping, offer an effective design response to reduce the urban heat island effect • Integration of green roof and planter beds to re-introduce flora to site whilst providing habitat for insects, birds and other fauna.
Improved valuation, pricing and incentive mechanisms - The principle of improved valuation, pricing and incentive mechanisms is that environmental factors should be included in the valuation of assets and services, such as - (a) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement, and (b) the users of goods and services should pay prices based on the full life cycle of the costs of providing the goods and services, including the use of natural resources and assets and the ultimate disposal of waste, and (c) established environmental goals should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.	• A circular economy focus through avoided demolition and extending the lifespan of building components • Dematerialisation principles adopted to minimise the quantity of construction materials • Primary construction materials with product-specific (industry-specific, where not available) Environmental Product Declaration (EPD), where practicable • Manufacturers and suppliers that demonstrate third-party certification schemes and independent verification methods for their products, and are pre-approved under the Responsible Products Framework developed by the Green Building Council of Australia (GBCA), where practicable • Products with a high recycled content (e.g., reinforcing and structural steel, alumimium, etc.), where practicable

4.4.2 Water Use

Predicted Performance

A predicted NABERS Water (see Figure 4.21) assessment has been undertaken that utilised historic water consumption data for Canva's current workplace (110 Kippax St) and included a water balance analysis (see Figure 4.20) of the Project.

The Project will integrate the following water use reduction design response:

1. Reduce air conditioning loads to minimise heat rejection and cooling tower water use
2. Specify fixtures and fittings with the highest WELS star rating available at the time of development
3. Integrate high water efficiency commercial appliances (e.g., for use in the commercial kitchen)
4. Provide an innovative biosolar green roof to minimise landscape irrigation demand
5. Provide a 6 kL rainwater tank to serve the landscape irrigation demand
6. Install fire protection systems that do not expel water during testing
7. Meter all major water uses to provide greater visibility on water use trends and anomalies

The water reduction design response delivers a 3 star and 4 star NABERS Water performance with and without the inclusion of the food preparation water use, respectively. Food preparation water use increases the total water use by approximately 60%.

This acts to verify that the Project is capable of meeting the minimum 3 star NABERS Water performance target. Where the commercial kitchen can be excluded (separate public access), the Project will seek to achieve a 4 star NABERS Water performance.

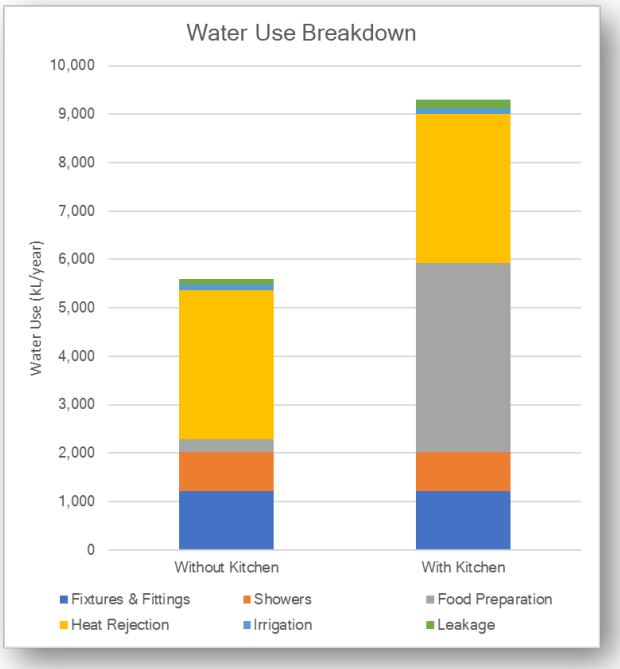


Figure 4.20 Annual water use breakdown

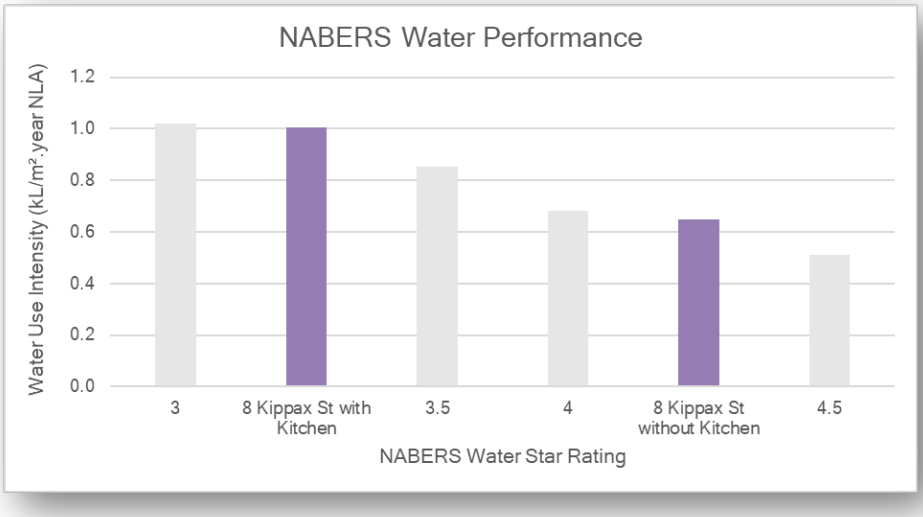


Figure 4.21 NABERS Water benchmarking

4.4.3 Waste Management

Responsible Construction

The Project will:

1. Actively seek to minimise demolition works, where practical
2. Put in place an environmental management system to manage environmental impacts on site during construction
3. Implement an environmental management plan to cover the scope of construction activities
4. Divert at least 80% of construction and demolition waste from landfill
5. Utilise certified waste contractors and certified waste processing facilities to handle construction and demolition waste
6. Implement a construction and demolition waste management plan for the Project

Responsible Operations

The Project will:

1. Be designed for the effective separation and collection of operational waste streams, including general waste, co-mingled recycling, cardboard and paper, and food organics (see Table 4.9)
2. Provide a dedicated and adequately sized waste and resource storage area based on the waste collection frequency
3. Ensure safe and efficient access to waste and resource storage areas for both occupants and waste and resource collection contractors
4. Evaluate a range carboard compactors, balers, or shredders, alongside composting or food macerators, where appropriate. Utilising on-site waste treatment methods can reduce the space required for waste storage, encourage resource separation, and mitigate the environmental impact from operation of the Project.
5. Implement sound building management practices to prevent pollution and reduce litter when handling waste
6. Apply leading commercial kitchen waste practices, including on-site food production/edible planting

Table 4.9 Operational waste streams

Operational Waste Generation

General Waste [L/day]	1,803
Co-mingled Recycling [L/day]	2,231
Cardboard & Paper [L/day]	2,231
Food Organics [L/day]	868
Total [L/day]	7,133
Estimated landfill diversion rate* [%]	75%

* Including food organics

4.4.4 Sustainable Transport

Active Mode Facilities

To encourage staff, workers, and visitors to use active, low carbon, and public transport options instead of private vehicles, the Project has implemented a range of sustainable transport initiatives that will leverage the high quality public transport infrastructure available.

This includes:

1. Based on an estimated 1,043 regular occupants, the end-of-trip (EOT) facilities have been sized to accommodate at least eight (8) showers and 131 lockers [meets and exceeds Sydney DCP 2012, 3.11.3(8)]
2. 65 bicycle parking spaces for regular occupants, and 24 bicycle parking spaces for visitors will be provided (a total of 89 bicycle parking spaces) [meets Sydney DCP 2012, 3.11 Transport & Parking, Table 3.5]
3. The EOT facilities and bicycle parking are accessible, inclusive, and safe [meets Sydney DCP 2012, 3.11.3(3) - (7)]
4. No car parking is provided

Private Vehicle Use Reduction

The Green Star Movement and Place calculator was applied to evaluate the private vehicle use reduction performance of the Project. A proposed mode share was developed in coordination with the Traffic Engineer and compared to a reference mode share [2011 Census data] (see Table 4.10).

Table 4.11 details the performance of the Project against a range of private vehicle use reduction metrics. The vehicle kilometres travelled (VKT) reduction performance significantly exceeds the Green Star reduction target (20%).

Table 4.10 Transport mode share

Mode	Reference	Proposed
Train (incl. metro)	34%	45%
Bus	14%	15%
Ferry	-	-
Tram*	-	5%
Car (driver)	30%	-
Car (passenger)	4%	10%
Motorbike	2%	7%
Bicycle	3%	5%
Walk	13%	13%
Total	100%	100%

* 100% renewable electricity

Table 4.11 Private vehicle use reduction

Private Vehicle Use Reduction	
Active Mode Encouragement [%]	11%
Emissions Reduction [%]	34%
VKT reduction [%]	100%

4.4.5 Materials

Refrigerant Plant & Equipment

The Project will:

1. Space cooling - Install HFO refrigerant-based chillers (zero ODP; GWP < 10)
2. Space and hot water heating - For HFC refrigerant-based heat pumps (zero ODP; GWP > 1,000), minimise the HFC refrigerant volume through the selection of air-to-water heat pump systems, which do not circulate refrigerants (e.g., a variable refrigerant flow - VRF - system)
3. The air conditioning plant selection facilitates any transition required to respond to the planned phase out of HFC refrigerants. Water-based systems can readily integrate alternative technology without having to replace pipework reticulation. This infrastructure has a longer design life than the air-to-water heat pumps.

Responsible Practices

The Project will:

1. Focus on circular economy principles through avoided demolition and extending the lifespan of building components
2. Select paints, carpets, adhesives, sealants, and floor coverings with low or ultra low volatile organic compounds (VOCs)
3. Select engineered wood products with low or no formaldehyde levels
4. Select best-practice PVC products for cables, pipes, flooring, blinds, etc.
5. Achieve an average cement replacement of 30% across all concrete and masonry products
6. Adopt dematerialisation principles to minimise the quantity of construction materials, e.g., exposed ceilings (see Section 4.2.2)
7. Procure primary construction materials with product-specific (industry-specific, where not available) Environmental Product Declaration (EPD), where practicable
8. Engage with manufacturers and suppliers that demonstrate third-party certification schemes and independent verification methods for their products, and are pre-approved under the Responsible Products Framework developed by the GBCA, where practicable
9. Source products with a high recycled content (e.g., reinforcing and structural steel, aluminium, fibre cement sheet, etc.), where practicable

5 Conclude

5.1 Design Response

Table 5.1 summarises the Project's design response to the statutory drivers and market context outlined in Section 2. The Project is capable of achieving:

- Design excellence in sustainable development, in line with the ESD principles of the Sydney LEP 2012
- ESD objectives and controls of the Sydney DCP 2012
- Energy and water standards, and net zero provisions (see Appendix A) of the NSW Sustainable Buildings SEPP
- Embodied emissions reporting requirements of the NSW Sustainable Buildings SEPP (by others)

Table 5.1 Design response

Driver	Requirements	Section	Design Response
Sydney LEP 2012, cl. 6.21C Sydney DCP 2012, Section 3.6 Ecologically Sustainability Development	• Reduce the need for active heating and cooling by incorporating passive design measures • Improve indoor environment quality	• Passive design response - see Section 4.2.1	• Glazing - triple silver neutral DGU; U 3.1; SHGC 0.23; VLT 45% • Shading on north - 1 x 450mm deep horizontal shade fixed at exposed slab edge + 1 x 450mm deep horizontal shade at 450mm separation • Automated internal blinds to dynamically manage glare and solar gain • Wintergardens - connection to nature; actuated glazed louvres to provide effective natural ventilation; 'spill air' provided from the conditioned workplace to temper the space during hot and cold periods (glazed louvres are closed)
Sydney LEP 2012, cl. 6.21C Sydney DCP 2012, Section 3.6 NSW Sustainable Buildings SEPP (Energy standard)	• Target 5.5 star (+25% margin) NABERS Energy (Commitment Agreement) • Reduce operational carbon emissions • Replace intensive carbon power sources with low carbon and renewable energy • Improve indoor environment quality	• NABERS Energy - see Sections 4.2.2 - 4.2.3 and 4.2.5	• 100% electric; no residual fossil fuel-based systems • No car parking • A chilled beam system, including fan coil units (FCUs) to support workplace function • Increased outdoor air supply to the west perimeter air conditioning zones to supplement the cooling capacity of the chilled beam system • Direct outdoor air handling systems with heat recovery and demand control ventilation • High efficiency water-cooled chillers and air-cooled heat pumps for space cooling, and space and hot water heating, respectively • Fully addressable LED lighting system with advanced controls • 50 kWp solar PV array integrated across a solar canopy on the Level 11 roof terrace, and a biosolar green roof above the rooftop plant and equipment • Capable of meeting the 5.5 star NABERS Energy (base building) performance target with a margin of not less than 25%
Sydney DCP 2012, Section 3.6	• Install adequate energy and water metering, and sub-metering to support monitoring and reporting for efficient building operations	• Metering - see Sections 4.2.2 and 4.4.2	• Metering of all major energy and water uses to provide greater visibility on energy and water use trends and anomalies
Sydney DCP 2012, Section 3.6	• Specify non-toxic interior finishes, including paints, adhesives, sealants, carpets, and engineered wood products	• Materials - see Section 4.4.5	• Paints, carpets, adhesives, sealants, and floor coverings with low or ultra low volatile organic compounds (VOCs) • Engineered wood products with low or no formaldehyde levels • Best-practice PVC products for cables, pipes, flooring, blinds, etc.

Driver	Requirements	Section	Design Response
Sydney LEP 2012, cl. 6.21C Sydney DCP 2012, Section 3.6 NSW Sustainable Buildings SEPP (Water standard)	• Develop a robust water strategy, including water efficient fixtures and fittings, and rainwater harvesting and reuse for landscape irrigation • Target minimum 3 star NABERS Water (Agreement to Rate)	• Water use - see Section 4.4.2	• Air conditioning loads reduced to minimise heat rejection and cooling tower water use • Radiant-based mechanical services that can operate at a wider comfort temperature band to reduce cooling water use • Fixtures and fittings with the highest WELS star rating available at the time of development • High water efficiency commercial appliances (e.g., for use in the commercial kitchen) • Innovative biosolar green roof to minimise landscape irrigation demand • 6 kL rainwater tank to serve the landscape irrigation demand • Fire protection systems do not expel water during testing • Capable of meeting the minimum 3 star NABERS Water performance target. Where the commercial kitchen can be excluded (separate public access), the Project will seek to achieve a 4 star NABERS Water performance.
Sydney LEP 2012, cl. 6.21C Sydney DCP 2012, Section 3.11	• Promote active movement and low carbon transport options • Address the pedestrian, cycle, vehicular, and service access and circulation requirements, including the permeability of any pedestrian network	• Sustainable transport - see Section 4.4.4	• EOT facilities sized to accommodate at least eight (8) showers and 131 lockers • 65 bicycle parking spaces for regular occupants, and 24 bicycle parking spaces for visitors (a total of 89 bicycle parking spaces) • EOT facilities and bicycle parking are accessible, inclusive, and safe • No car parking is provided • A VKT reduction of 100% is achieved based on the proposed transport mode share • A Shared Zone along Terry Street, between Foveaux and Kippax Streets, to address the poor street condition and create a more functional public realm • Ground, accessed from Kippax Street, will connect to Lower Ground, accessed from Sophia Street, visually linking the two streets
Sydney LEP 2012, cl. 6.21C Sydney DCP 2012, Section 3.6	• Improve biodiversity • Reduce the cause and impacts of the urban heat island effect • Integrate a high quality landscape design	• Heat resilience - see Sections 4.2.1, 4.2.3, and 4.3	• Biosolar green roof • Extensive landscaping to the Level 11 roof terrace • Wintergardens to the north-west corner of the floor plates on Levels 1 to 9 to create a connection to nature; reinforced with planters at each level • Solar canopy and biosolar green roof, and roof terrace landscaping, offer an effective design response to reduce the urban heat island effect

Driver	Requirements	Section	Design Response
Sydney DCP 2012, Section 3.6	• Procure responsible building materials and products to support a supply chain transformation • Increase the use of products from recycled sources	• Responsible materials practices - see Section 4.4.5	• Focus on circular economy principles through avoided demolition and extending the lifespan of building components • An average cement replacement of 30% across all concrete and masonry products will be targeted • Dematerialisation principles adopted to minimise the quantity of construction materials, e.g., exposed ceilings (see Section 4.2.2) • Procure primary construction materials with product-specific (industry-specific, where not available) Environmental Product Declaration (EPD), where practicable • Engage with manufacturers and suppliers that demonstrate third-party certification schemes and independent verification methods for their products, and are pre-approved under the Responsible Products Framework developed by the GBCA, where practicable • Source products with a high recycled content (e.g., reinforcing and structural steel, aluminium, fibre cement sheet, etc.), where practicable
Sydney DCP 2012, Section 3.6	• Reduce demolition and construction, and operational waste • Reduce the use of resources in development and by development over its effective life • Reduce the impacts from development on the environment	• Responsible construction and operations practices - see Section 4.4.3	• Demolition works minimsed through an adaptive reuse strategy • Environmental management system to manage environmental impacts on site during construction • Environmental management plan to cover the scope of construction activities • At least 80% of construction and demolition waste to be diverted from landfill • Certified waste contractors and certified waste processing facilities to handle construction and demolition waste • Construction and demolition waste management plan • Effective separation and collection of operational waste streams, including general waste, co-mingled recycling, cardboard and paper, and food organics • Dedicated and adequately sized waste and resource storage area based on the waste collection frequency • Safe and efficient access to waste and resource storage areas for both occupants and waste and resource collection contractors • Carboard compactors, balers, or shredders, alongside composting or food macerators, where appropriate • Building management practices to prevent pollution and reduce litter when handling waste • Apply leading commercial kitchen waste practices, including on-site food production/edible planting

Appendix A Net Zero Statement

Details and Overview

1. 8-24 Kippax Street, Surry Hills, comprises a basement, lower ground, ground, and nine (9) levels of commercial office space totalling approximately 8,500m² NLA
2. The Project will involve undertaking a comprehensive refurbishment (adaptive reuse) and fit out of the existing building

On-Site Fossil Fuel Usage

1. The Project has been designed to be fossil fuel-free and net zero in operations
2. Full building electrification, including commercial kitchen use; no natural gas connection
3. No residual fossil fuel-based systems; no diesel emergency standby generator plant and equipment
4. 100% renewable electricity supply to all Canva workplaces in Australia (existing and ongoing energy procurement commitment)
5. Operational net zero
6. Evidence includes:
   a. ESD Report (DA1), Sections 4.2.2 and 4.2.5

Energy Efficiency

1. The Project is highly energy efficient; establishing a passive and active design response that is capable of achieving a 5.5 star NABERS Energy performance with a margin of 10%.
2. Evidence includes:
   a. ESD Report (DA1), Sections 4.2.1 and 4.2.2

Renewable Energy Generation

1. The Project will integrate a 50 kWp solar PV array across a solar canopy on the Level 10 roof terrace, and a biosolar green roof above the Level 10 plant and equipment
2. The solar PV array will meet 16% of the annual energy use; the solar PV assists in demonstrating that the Project is capable of achieving a 5.5 star NABERS Energy performance with a margin of not less than 25%
3. Evidence includes:
   a. ESD Report (DA1), Section 4.2.2

Estimated Energy Use and Operational Carbon

Table A.1 Summary - Operational Net Zero

Predicted Operational Performance

Estimated annual fossil fuel consumption* [kWh/year]	-
Estimated annual electricity consumption [kWh/year]	350,658
Total estimated annual energy consumption [kWh/m².year GFA]	33.0
Estimated annual scope 1 and 2 GHG emissions** [$kgCO_2$/year]	-
Estimated annual scope 3 GHG emissions [$kgCO_2$/year]	21,105
Total estimated annual GHG emissions [$kgCO_2$/m².year GFA]	2.0

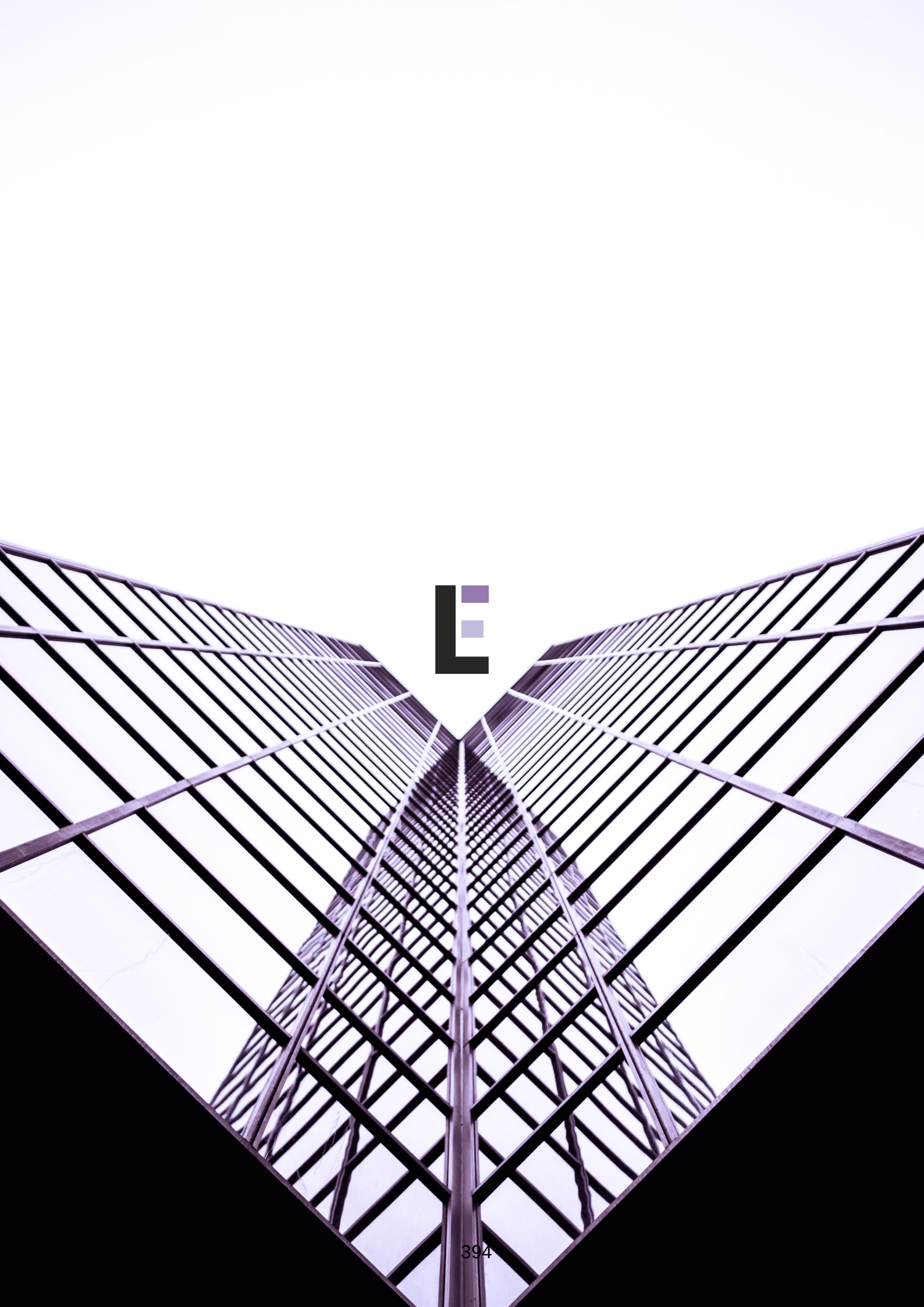
* Full building electrification; no residual fossil fuel-based systems

** 100% renewable electricity supply

This Net Zero Statement has prepared and certified by Alex Kobler, Director, Sustainability at E-LAB Consulting (CPEng) (NER) (RPEQ). With almost two decades of experience in driving sustainable engineering in the built environment, Alex has been successful in leading several of Sydney's most sustainable and recognisable building development projects, including WSU Bankstown, Younghusband Woolstore Redevelopment, and Liverpool City Centre.



Alex Kobler | Director, Sustainability
E-LAB Consulting
CPEng, NER, RPEQ



Attachment A11

Structural Statement

4th December 2023

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Project reference: CANVA – 8-24 Kippax St, Surry Hills - Project No:131006 – Planning Proposal

Dear Stephen,

Meinhardt (NSW) Pty Ltd have been engaged by Canva for the structural design documentation of the proposed redevelopment of the abovementioned project.

The existing building is a 10 storey reinforced concrete building with two levels of basement. The building is believed to be founded on extremely low rock. The existing footings are composed of piled and pad footings as indicated on the existing drawings. This is based on the desk top geotechnical study undertaken for the site but is to be confirmed.

The proposed structural alteration and strengthening works to the building include, but are not limited to:

- Demolition of the existing stair & lift cores and shear walls. The construction of a relocated lift and stair core within the building;
- Relocation of the existing substation;
- 2No new levels on the roof which include commercial office floor, rooftop terrace and plant space;
- Steel transfer truss at Level 01'
- Strengthening of the existing concrete columns via new reinforced concrete (RC) "jacketing";
- Additional steel K-bracing. Together with the new lift and stair core, these will provide overall lateral stability to the building;
- New RC and steel columns to support the slabs for the revised architectural layouts. These will be founded on new pad and piled foundations;
- Strengthening of the existing footings;
- A new "Town Hall" stair way linking the Kippax St and Sophia Lane streetscapes.

Meinhardt have assessed the existing building and the proposed structural development works as indicated on the architectural plans and we confirm that the building will be designed in accordance with the relevant standards such that the existing structure together with the new structural elements will be able to support the proposed new loads.

Our design relies upon the acceptance of the list of non-compliance issues and assumptions as discussed below.

Our assessment of the existing structure is based on the following information provided to us:

- Existing structural drawings by V.A. Lamaro dated 1969
- Existing architectural drawings by L.A. Kubany dated 1969
- "Report on Concrete Testing Investigation – 8-24 Kippax St, Surry Hills" by Mahaffey Associates dated 23 October 2023 (Ref: 20475)

*Meinhardt (NSW) Pty Ltd (ABN: 98051627591) is a fully owned subsidiary of Meinhardt Australia Pty Ltd.

The structural design of the new structural elements will comply with the Structural Provisions of Part B1 (Volume 1) of the Building Code of Australia, subject to the list of non-compliance issues and assumptions discussed below.

In addition, the capacity of the existing structure will be assessed such that the additional loads and/or alterations will not cause a decrease in its structural performance in comparison to the original design.

List Of Non-Compliances and Assumptions

It is noted that the existing structure was constructed in 1969. The building codes and standards of that time would typically have been used as a basis for the design of the existing structure by the original structural designer.

There will be requirements in the current day codes that the existing structure will not have been designed for nor will be able to comply with now.

In addition, there are assumptions that we have made in our design to date.

A list of these items is included in Appendix A at the rear of this letter. It should be noted that this list is not exhaustive and may be added to as the structural design develops.

Yours sincerely,



Neal Foye

Associate Director

Meinhardt (NSW) Pty Ltd
E: Neal.Foye@meinhardtgroup.com

Appendix 1

– List of Structural Non-Compliances and Assumptions List

LIST OF CODE NON-COMPLIANCES AND ASSUMPTIONS ADOPTED IN DESIGN

No:	Non-compliance / Assumption	Comments	Current Day Standards/ Code Reference	Method for Compliance/Assumption Adopted	
				Methodology	Notes
1	Pounding	Requirement to setback adjacent building between each other such that there is no contact between the buildings in the event of an earthquake. Given that 8-24 Kippax St and the neighbouring 26 Kippax St are existing building, it is unlikely that the two will have sufficient clearance between each other to satisfy this clause. This will need to be confirmed via investigation through local removal of the boundary wall of 8-24 Kippax St. Note that this item is made on the assumption that there is little or no gap between the existing buildings. This will have to be confirmed by investigation of the existing building. Namely local removal of the existing masonry along the party wall. Our preliminary structural analysis is that a gap between the existing buildings of 40mm of more would be required to comply with code requirement. If this gap did not existing, the alternative paths of dispensation or significant remedial works would then apply.	AS 1170.4 Clause 5.4.5	Dispensation of the clause by PCA and Council	Given that this is an existing condition which is very difficult to rectify and which is an inherent condition that will exist in nearly all existing buildings within the City of Sydney, a dispensation of the clause may be acceptable to the PCA and Council.
2	Adoption of existing structural drawings for use as a basis of design for the redevelopment	Existing drawings dated 1969 and 1970 have been obtained from City of Sydney Council archives. Meinhardt intend to use these drawings as a basis of the existing structure to be incorporated in the design of the redevelopment.	n/a	An investigation of the existing concrete structure will be undertaken on site by a concrete testing company. This investigation will include: taking sample concrete cores for testing, scanning of existing reinforcement and measurement of existing structural elements on site. A cross check of the results of the investigation report against the existing structural drawings will be undertaken in order to provide a level of confidence that the existing structural drawings are suitably reliable for this use.	It should be noted that the concrete testing will be undertaken at a number of locations and will be a reasonable sample representation. It is not intended to test every structural element or every assumed concrete pour which would have been poured at the time of construction. It is believed that taking such a sample investigation is a reasonable approach to provide a sufficient level of comfort to allow the use of the existing drawings
3	Geotechnical Investigation	Existing drawings dated 1969 and 1970 have been obtained from City of Sydney Council archives. These drawings indicate a mix of piled and pad footings for the existing building. It is intended to use these existing pad and piled foundations to support the proposed building loads including an increase in loads in some cases. Strengthening of the foundations will be undertaken where required. It is intended to use the foundations noted on the existing structural drawings as a basis of the design for the redevelopment.	n/a	It is intended to undertake sample investigation of the existing pad footings and piled foundations by a geotechnical investigation company. The investigation will take the form of local excavation adjacent to a sample number of existing pad foundations to confirm their size, depth and founding strata. Investigation of the existing piles will be undertaken by drilling boreholes to a sample number of piles and use magnetic gradiometry testing (or other similar methodology) to confirm the depth of those existing piles. Once the sample testing of existing pad and pile information is confirmed, this will be cross checked against the existing drawings in order to provide a level of confidence that the existing drawings are suitable to be used as a basis of the design. An assessment of the capacity of the existing piles and pad footings will then be undertaken by the geotechnical engineer and their performance under the proposed increased loads assessed.	The level of testing to be undertaken will be as required by the geotechnical to achieve a reasonable level of confidence in the existing structural drawings and investigation findings on site.
4	Ongoing Durability & Design life of the existing structure	Compliance to AS 3600 provides a design life of 50 years (+/- 20%) for new structures. Any existing structure is at the end of its design life and AS 3600 section 4 for durability and design life will not apply.	AS 3600 Section 4	The concrete investigation of the building will include sample testing of the concrete structure for chloride ingress, reinforcement corrosion, etc (more commonly given the umbrella reference of "concrete cancer". Where any such defects are found in the building, rectification works as advised by the concrete testing specialist will be undertaken.	It is intended that the concrete testing report, once complete, will be able to state that there will be no significant risk of reinforcement corrosion or concrete deterioration for a further 40-50 years once any advised rectification works (if required and as stated in the concrete testing report) are undertaken and provided reasonable maintenance of the existing building is provided during that period.
5	Restraint of longitudinal reinforcement in existing concrete columns	Horizontal column ties are required to restrain main vertical column reinforcement. These prevent the vertical main bars from breaking out of the column under high bar stresses. While the existing structural drawings indicate that ties have been provided in the existing concrete columns, the tie diameters and spacing may not comply with current day codes	AS 3600 Clause 10.7.4	For the restrain of main vertical column bars in existing columns is required, an assessment of the restraint bars forces and ties provided as noted on the structural drawings will be undertaken. These will be assessed from first principles of the stresses in the columns in order to provide a performance solution compliance rather than a deemed to comply approach as provided in AS 3600.	Where restraint stresses are found to exceed the tie capacities, strengthening works to the existing columns will be documented.
6	Restraint of longitudinal reinforcement in proposed concrete column strengthening "jacketing"	Horizontal column ties are required to restrain main vertical column reinforcement. These prevent the vertical main bars from breaking out of the column under high bar stresses. Internal ties will not be able to be provided in column "jacketing" due to the existing column being in place. Hence the deemed to comply requirement of the provision for retaining ties can not be achieved.	AS 3600 Clause 10.7.4	An assessment of the restrain forces required for the main bars will be undertaken. Hook bars dowelled into the existing columns with chemical anchors will be provided to restrain these bars in this condition. Hence a performance solution compliance will be provided rather than a deemed to comply approach as provided in AS 3600.	n/a
7	Ductility of the existing reinforcement	The ductility of the existing reinforcement may not be compliant with the adjacent code clauses	AS 3600 Clause 1.1.2 and clause 3.2.1	Testing will be undertaken to confirm the ductility of the existing reinforcement. This testing may find that the existing reinforcement is complaint to AS 3600 with respect to ductility. If the testing determines that the existing reinforcement does not comply in this respect, a dispensation of these clauses will be required.	n/a
8	Deflection	Measured deflections in the existing slabs may exceed the "guidelines for serviceability limit states" provided in the codes	AS 1170.0 Appendix C	A visual inspection of the existing building will be undertaken once all existing intnernal finishes are removed. An assessment of the slab deflections provided in the building topographocal survey will be reviewed also. A comparison will then be made with suggested deflection limits provided in codes e.g. AS 1170.0	If excessive deflections are discovered in the existing slabs, strengthening works can be provided.
9	Detailing of the reinforcement in the existing flat plate slabs	Flat plates require certain deemed to comply detailing of lengths and spacing of bars in the code. The existing slabs will not comply with this in many locations.	AS 3600 Clause 9.1.2 & Clause 9.1.3	A finite element (FE) computer analysis of the existing slabs will be undertaken to confirm if the reinforcement as noted on the existing structural drawings is sufficient as per the outputs of the analysis. Hence a performance solution is proposed in lieu of the deemed to comply approach of the code.	Where existing reinforcement is found to be insufficient, for minimum strength requirements, strengthening of the slab will be provided.
10	Structural integrity reinforcement	Bottom reinforcement is required in the code in order to increase the resistance of progressive collapse of the slabs at its connections to columns. It is noted that this requirement was not included in the concrete code until 2018. Structural integrity reinforcement was not required before this. The clause requires a minimum amount of bottom reinforcement be provided within a flat plate slab and for this reinforcement to be continuous over the supporting column. This is not how reinforcement in slabs was typically detailed in Australia prior to 2018 and this is not what is provided in the existing slabs at 8-24 Kippax St as shown on the existing drawings.	AS 3600 Clause 9.2	A dispensation of this clause is required as there is no alternative solution method of achieving this within the existing slabs in order to comply with the deemed to comply clause. The justification of any dispensation would rely on the fact that this is a relatively new clause that was not required prior to a new revision of AS 3600 in 2018. The clause is intended as a back up to punching shear failure of the slabs. Punching shear failure of the existing slabs will still be checked to AS 3600 Clause 9.3 and strengthening of the slabs provided where required	n/a

List of Codes:
AS 1170.0 - Structural Design Actions - Part 0 : General Principles
AS 1170.4 - Structural Design Actions - Part 4 : Earthquake Actions in Australia
AS 3600 - Concrete Structures

Attachment A12

Civil Engineering Statement

enstruct

Canva

8-24 KIPPAX STREET, SURRY HILLS

CIVIL ENGINEERING DEVELOPMENT APPLICATION REPORT



401

Prepared for: Canva
By: **en**struct group pty ltd
Revision: 02
December 2023

8-24 KIPPAX STREET, SURRY HILLS

CIVIL ENGINEERING DEVELOPMENT APPLICATION REPORT

ISSUE AUTHORISATION

PROJECT: 8-24 Kippax Street, Surry Hills
Project No: 7039

Rev	Date	Purpose of Issue / Nature of Revision	Prepared by	Reviewed by	Issue Authorise by
01	01/12/23	Draft Issue for DA	MZV	PAL	PAL
02	07/12/23	Issue for DA	MZV	PAL	PAL

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Executive Summary

This Development Application Civil Engineering report has been prepared by **en**struct Group to accompany the Development Application (DA) for a comprehensive refurbishment and fit out of the building located at 8-24 Kippax Street, Surry Hills (the site). The development will result in a commercial office space for Canva, the client.

This report has been prepared to address various aspects of civil design, including stormwater discharge quality and quantity including Onsite Stormwater Detention (OSD), flood planning, and erosion and sedimentation control.

This report concludes that the proposed mixed use commercial development is suitable and warrants approval subject to the implementation of the following mitigation measures:

- Erosion and sediment control measures,
- Stormwater quality measures, and
- Adopting a flood planning level in line with City of Sydney's Interim Flood Management Plan.

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APPENDIX A 1

APPENDIX B 2

APPENDIX C 3

APPENDIX D 4

1 Introduction

enstruct Group have been engaged by Canva as Civil engineering consultants for the refurbishment works at 8-24 Kippax Street, Surry Hills. The upgrade and refurbishment works may include but are not limited to:

- Strip out of the existing fit out back to cold shell,
- Loading Dock relocation,
- External upgrades, including façade,
- Rooftop terrace,
- New End Of Trip (EOT) facility,
- Base building services upgrades including fire safety, central MEP, lift replacement, structural enhancements, security upgrades etc., and

1.1 Design Standards

The civil design shall be in accordance with the latest revision of all relevant civil Australian Standards, relevant civil sections of the BCA and other statutory requirements.

Particularly, the civil design will be in accordance with the following relevant Australian Standards:

- Sydney Development Control Plan (DCP) 2012
- Sydney Local Environmental Plan (LEP) 2012
- City of Sydney Interim Floodplain Management Policy (2014)
- Austroads: Guide to Pavement Technology
- AS1428.1 Design for Access & Mobility
- AS/NZS 2890 Parking facilities
- AS/NZS 3500.3 (2021) – Plumbing and Drainage Part 3: Stormwater Drainage
- AS 3600 (2018) – Concrete Structures
- AS 3700 (2011) – Masonry Code
- Australian Rainfall and Runoff (ARR 2019)
- Managing Urban Stormwater: Soils and construction - Volume 1 4th edition (Landcom)

2 Site Description

The subject site is located 8-24 Kippax Street, Surry Hills, and falls within the Local Government Area (LGA) of City of Sydney (CoS). The site is bound by Sophia Street to the north, Terry Street to the west, Kippax Street to the south, and a commercial building to the east. The site is approximately 100m from Central Station. The Terry Street frontage grades steeply to the north, and Kippax Street and Sophia Street grade to the west.

The existing building consists of a nine-storey commercial building with an additional two basement levels. It was built in the 1960's and last underwent refurbishment in the 1990's. The site area is approximately 1,034m^2, however, the commercial office space totals around 8,500m^2.



Figure 1: Subject Site (Source: NearMaps)

2.2 *Existing Stormwater Drainage*

City of Sydney stormwater mapping provided through Dial Before You Dig indicates the Council stormwater network surrounding the site. The Council network run through both Kippax Street and Sophia Street, adjacent to the site. There is an existing stormwater pit at the north-west corner of the site. Refer to **Figure 2**.



Figure 2: City of Sydney Council Stormwater Network (Source: City of Sydney Council)

3 *Stormwater Drainage Design*

The stormwater design has been prepared in accordance with Australian Standards, Sydney Development Control Plan, and Australian Rainfall and Runoff (2019). In general, drainage is designed to ensure that site facilities are available for visitors and staff to use in all weather conditions up to the 1% Annual Exceedance Probability (AEP) storm event. All new roof stormwater will be collected in roof gutters and downpipes and conveyed to the water quality control tank.

Pipes and pits have been designed to satisfy the minimum provisions of AS 3500.3. They have been designed to convey, at least, the 5% AEP flows. Where pipe capacity is exceeded i.e., greater than 5% AEP, stormwater will be conveyed as overland flow.

Overland flow paths are designed to convey at the minimum 1% AEP stormwater flows with a Velocity x Depth to be less than 0.4m^2/s.

Class D pits have been specified in accordance with AS 3996.

3.1 *On-site Stormwater Detention (OSD)*

Correspondence with Sydney Water on 16th of October 2023has indicated no OSD is required for any development at the site. Refer to **Appendix A** for this correspondence.

3.2 *Flooding*

The site is in the CoS Darling Harbour catchment as per **Figure 3**.CoS Council have undertaken a flood study covering the Darling Harbour Catchment. The flood study, including the TuFLOW model, has been obtained by enstruct in order to identify the Flood Planning Levels for the site.

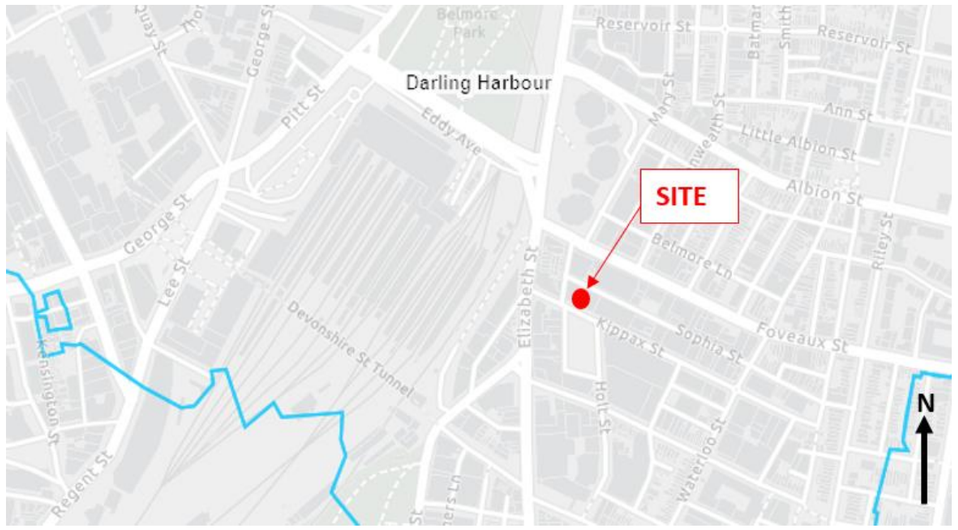


Figure 3: City of Sydney Flood Catchment Mapping (Source: City of Sydney)

The flood study and TuFLOW model show the site is flood affected in the 1% Annual Exceedance Probability (AEP) and Permissible Maximum Flood (PMF) events. The TuFLOW model was updated to use the 2019 ARR Rainfall Data. The model indicates flood depths between 100mm-500mm surrounding the property in the 1% AEP event, and flood depths between 200mm-800mm in the PMF event. Refer to the figures below.

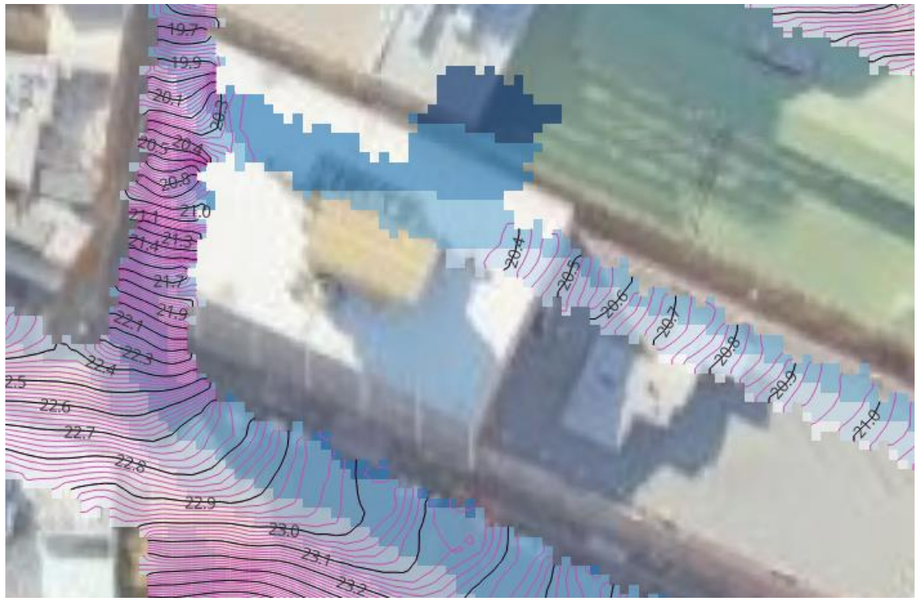


Figure 4: Site Flood Map 1% AEP (2019 ARR Rainfall Data)



Figure 5: Site Flood Maps PMF

The site is classed as a “business” development type and hence, the flood planning levels described in **Table 1** apply. The entries marked in orange in indicate a basement ingress point, and the entries marked in purple indicate all other building entries.

Table 1: City of Sydney Flood Planning Levels

Development	Type of Flooding	Flood Planning Level
Business Floor Levels	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood level
Below Ground Car Park	Mainstream or local drainage flooding	1% AEP flood level + 0.5m or the PMF (whichever is higher) *

***** The below ground car park level applies to all possible ingress points to the car park such as vehicle entrances and exits, ventilation ducts, windows, light wells, lift shaft openings, risers, and stairwells.

All points of entry on the lower ground level, as per **Figure 6**, and on the ground level as per **Figure 7**, have sought to meet the Flood Planning Levels (FPL) described in **Table 1**. **Table 2** shows a summary of the FPLs, flood levels, and proposed design at each entry point.

Table 2: Flood Planning Level Comparison

Entry Point	1% AEP Level (AHD)	1% AEP Level + 500mm (AHD)	PMF Level (AHD)	FPL (AHD)	Proposal
1	20.52m	21.02m	20.88m	21.02m	Flood Door
2	20.50m			20.50m	FFL: 20.515m
3	20.46m			20.46m	FFL: 20.495m
4	20.42m			20.42m	FFL: 20.495m
5	20.40m			20.40m	FFL: 20.405m
6	20.40m			20.40m	FFL: 20.405m
7	20.38m			20.38m	FFL: 20.403m
8	20.38m			20.38m	FFL: 20.398m
9	20.38m			20.38m	FFL: 20.393m
10	20.38m			20.38m	FFL: 20.385m
11	20.38m			20.37m	FFL: 20.377m
12	20.38m			20.37m	FFL: 20.371m
13	20.34m			20.34m	FFL: 20.218m
14	23.15m			23.15m	FFL: 23.282m
15	23.15m	23.65m	23.38m	23.65m	Flood Door
16	23.12m			23.12m	FFL: 23.400m

At entry point 13 it is unfeasible to raise the floor level to the FPL, however, as this is the existing condition there is no proposed adverse effects to the site, its neighbouring properties, or any increased risk to life. Further, the floor level steps up above the FPL within the first room. All flooring below the FPL will be constructed of flood compatible materials, and any hazards, such as electrical sockets, will be located above the FPL.

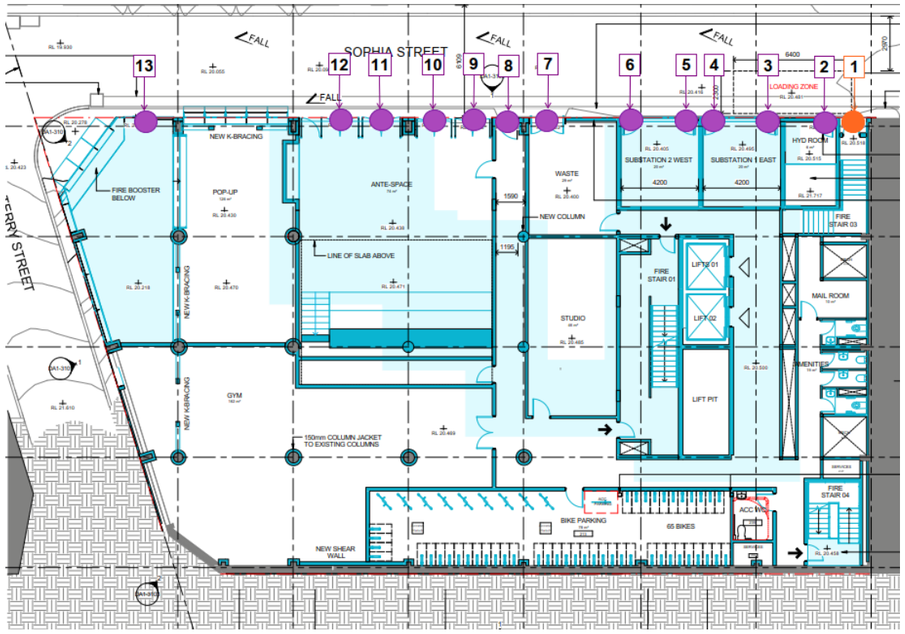


Figure 6: Lower Ground Entry Point Map (Source: COX)

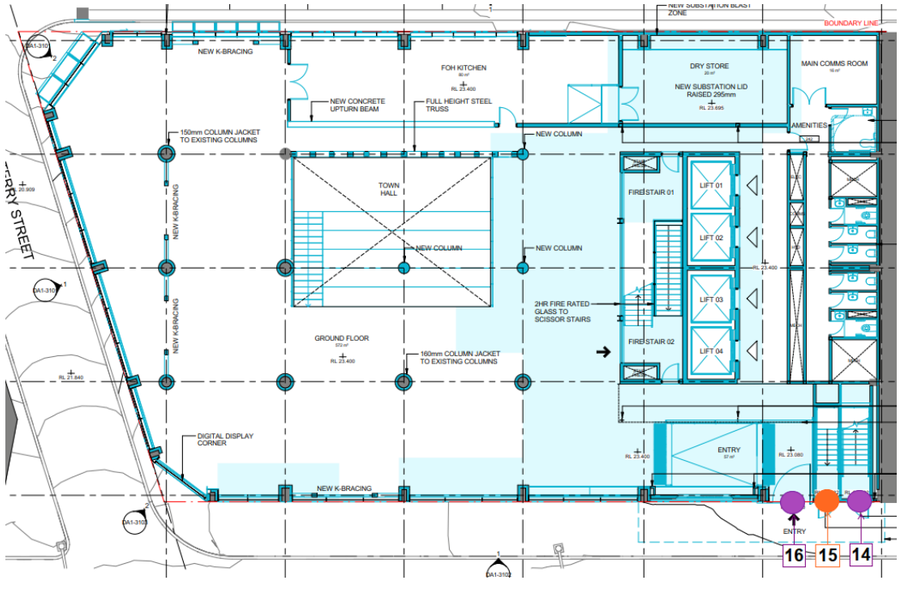


Figure 7: Upper Ground Entry Point Map (Source: COX)

Overall, the development meets the performance criteria described in the CoS Interim Flood Management Plan. The development is compatible with the established flood hazard of the land, will not significantly adversely affect flood behaviour, the environment, or cause avoidable erosion, incorporates appropriate measures to manage risk to life, is not likely to result in great costs, is consistent with the principles of Ecologically Sustainable Development, and adequately considers the impact of climate change.

Additional sketches of the flood levels around the site are available in **Appendix C**.

3.3 *Overland Flow Paths*

If the piped in-ground stormwater system proposed in Sophia Street fails due to blockage or other obstruction, or in an event larger than the 20-year ARI event, stormwater flows will be required to be conveyed as overland flow. The overland flow is to be directed away from buildings and downstream along Council's system.

Overland flow paths will be sized to accommodate the 1% AEP storm flows and not exceed safe Depth x Velocity products of 0.4m^2/s for pedestrians and vehicles.

3.4 *Stormwater Quality*

City of Sydney's DCP Part 3 describes the provisions for Water Sensitive Urban Design (WSUD), including water quality. Part 3 of the DCP requires all commercial developments of sites greater than 1,000m^2 to demonstrate that the development will achieve the post-development pollutant load standards described in **Table 3** below.

Table 3: Pollutant Load Reduction Requirements (Source: City of Sydney DCP)

Pollutant	Post-development reduction of Baseline Annual Pollutant Load
Gross pollutants	90%
Total suspended solids	85%
Total phosphorus	65%
Total nitrogen	45%

3.4.1 MUSIC Model

A MUSIC model was developed in accordance with the City of Sydney WSUD MUSIC Technical Guideline to indicate the suitability of the proposed WSUD measures on the site. The MUSIC model was set up using the City of Sydney MUSIC-Link with clay soil type as per the soil map provided by City of Sydney, **Figure 8**.

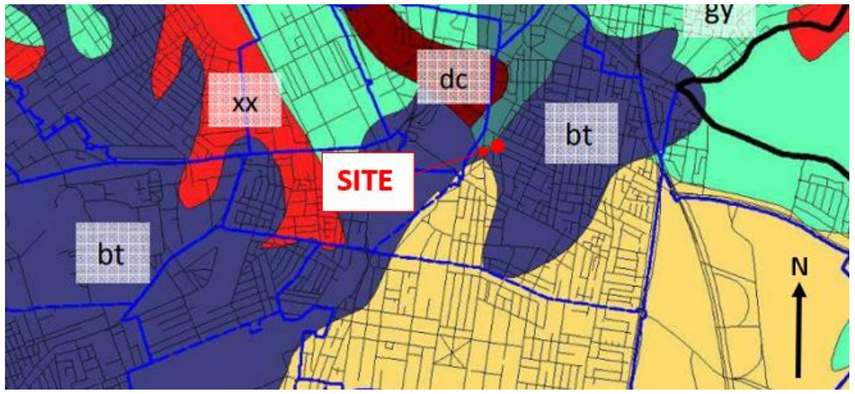


Figure 8: City of Sydney Soil Types (Source: City of Sydney WSUD MUSIC Technical Guideline)

The MUSIC model sought to decrease the annual pollutant load discharged from the site to the values described in **Table 3**. A comparison on the achieved reduction rates compared to the objectives is available in **Table 4** and further detail of the model is available in **Appendix B**. To achieve these reductions, the following water quality devices are proposed:

- A stormwater quality tank containing:
    - 1 x OceanGuard pit insert, and
    - 2 x 690mm StormFilters.
- A 6kL rainwater tank.

Table 4: Pollutant Reduction MUSIC Results Comparison

Pollutant	Post-development reduction of Baseline Annual Pollutant Load	Post-development reduction of Baseline Annual Pollutant Load result
Gross pollutants	90%	99%
Total suspended solids	85%	85.4%
Total phosphorus	65%	72.4%
Total nitrogen	45%	54.4%

4 Erosion and Sediment Control

During construction and while the site is disturbed, erosion prevention and sediment control measures will be required. Erosion prevention generally involves managing stormwater by diverting overland flow around construction areas as well as collecting stormwater within the construction zone and directing to sediment control devices. Devices likely to be incorporated are silt removal fences, catch drains, and water flow dissipation and discharge control devices such as sandbags, pollution mattresses and basins.

Erosion prevention and sediment removal strategies need to be inspected regularly during construction works, cleaned, and maintained after storm events, and modified to suit construction work progress, decanting, and demolition.

Erosion and sediment controls are to be maintained until the site is fully stabilised to prevent pollution of the receiving environment. The controls are to be designed, constructed, and installed in accordance with Managing Urban Stormwater: Soils and Construction Volume 1 and 2 (Blue Book Vol. 1 and 2), and North Sydney DCP.

5 Conclusion

The civil works associated with the refurbishment of Canva, Surry Hills will be carried out in accordance with normal engineering practice and will meet the requirements of relevant standards.

After correspondence with Sydney Water, the site will require not OSD. The site will however require stormwater quality control measures. The site will utilise a preliminary a combined tank including one pit insert and two StormFilter cartridges to reduce pollutants before discharge. This tank will work to remove pollutant loads alongside a rainwater tank, assumed to be 6kL in volume.

Due to the flood affectation of the property in both the 1% AEP and PMF flood events, Flood Planning Levels apply to floor levels and basement ingress points along the property frontages. Some areas have met the FPL; however, some areas require alternative methods such as flood barriers. Overall, the development meets the performance criteria required by CoS regarding flood management.

Erosion and sediment control measures are to be in place during construction to prevent contamination of the downstream stormwater system and tracking of grit and sediment onto the roadway.

APPENDIX A

Sydney Water Correspondence

Veitch, Mia

From: Jeya Jeyadevan <JEYA.JEYADEVAN@sydneywater.com.au>
Sent: Monday, 16 October 2023 1:40 PM
To: Mia Veitch
Cc: Phillip Lambley
Subject: RE: [External] 8-24 Kippax Street OSD Requirement

Mia,

Please ensure all future correspondence in relation to all stormwater enquires including On Site Detention requirements are sent to the following address:
stormwater@sydneywater.com.au

On Site Detention is not required for any development at this property 8-24 Kippax Street, Surry Hills.

Best Regards

Jeya Jeyadevan
Senior Capability Assessor
Business Development
Sydney Water, Level 13, 1 Smith Street, Parramatta NSW 2150

Sydney WATER

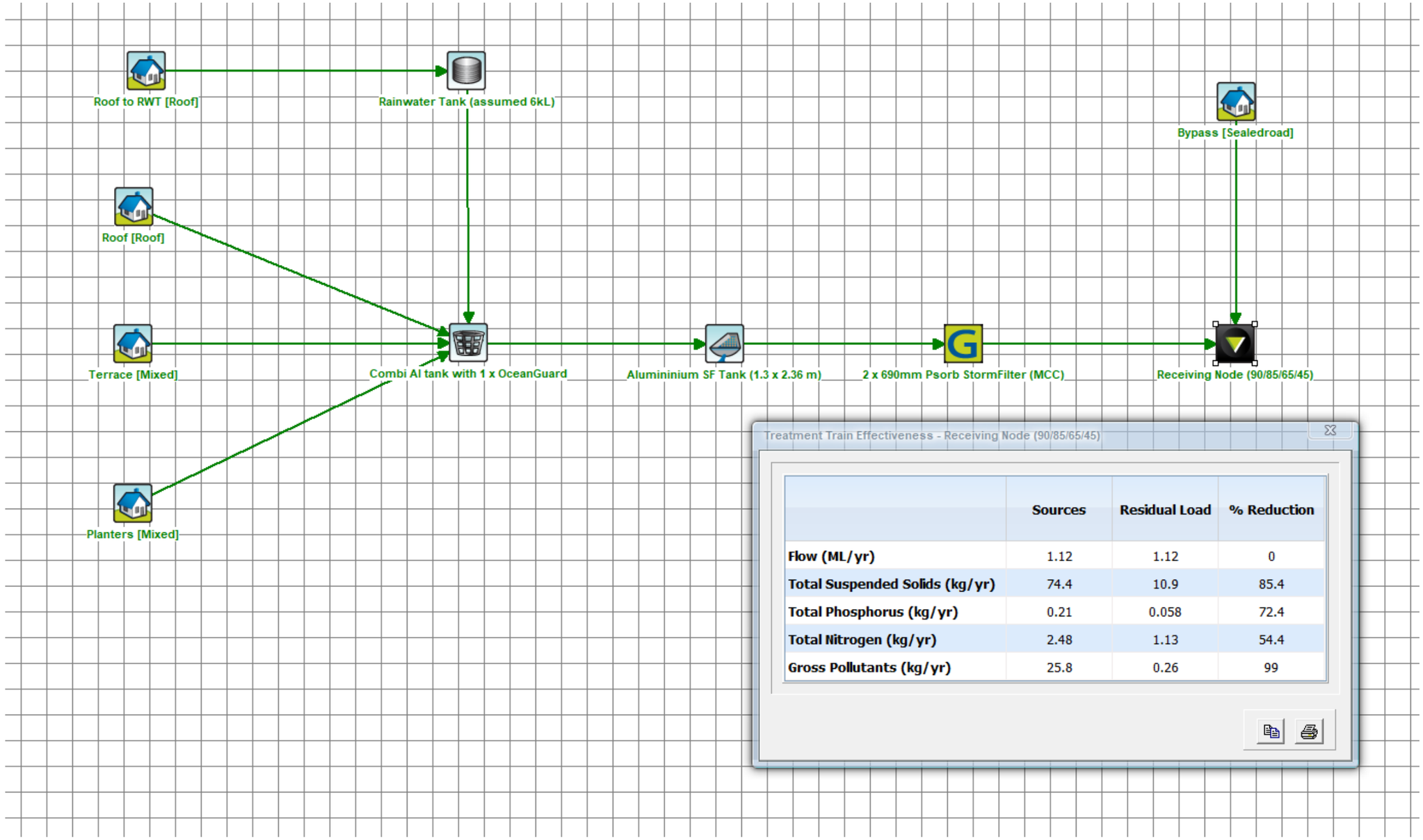
Phone: 8849 6118
Mobile: 0409 318 827
jeya.jeyadevan@sydneywater.com.au





APPENDIX B

MUSIC Model & Outputs



Treatment Train Effectiveness - Receiving Node (90/85/65/45)

	Sources	Residual Load	% Reduction
Flow (ML/yr)	1.12	1.12	0
Total Suspended Solids (kg/yr)	74.4	10.9	85.4
Total Phosphorus (kg/yr)	0.21	0.058	72.4
Total Nitrogen (kg/yr)	2.48	1.13	54.4
Gross Pollutants (kg/yr)	25.8	0.26	99

MUSIC-*link* Report

Project Details		Company Details	
Project:	8-24 Kippax Street, Surry Hills	**Company:**	enstruct
Report Export Date:	1/12/2023	**Contact:**	Mia Veitch
Catchment Name:	231201 - MUSIC Model - MZV	**Address:**	Level 4/2 Glen St, Milsons Point NSW 2061
Catchment Area:	0.103ha	**Phone:**	(02) 8904 1444
Impervious Area*:	84.46%	**Email:**	Mia.Veitch@wsp.com
Rainfall Station:	66062 SYDNEY		
Modelling Time-step:	6 Minutes		
Modelling Period:	1/01/1982 - 31/12/1986 11:54:00 PM		
Mean Annual Rainfall:	1278mm		
Evapotranspiration:	1265mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	City of Sydney Clay Soil		
Scenario:	City Of Sydney Development		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness

Node: Receiving Node (90/85/65/45)	Reduction
Flow	0.00018%
TSS	85.4%
TP	72.4%
TN	54.4%
GP	99%

Treatment Nodes

Node Type	Number
Sedimentation Basin Node	1
Rain Water Tank Node	1
GPT Node	1
Generic Node	1

Source Nodes

Node Type	Number
Urban Source Node	5

Comments

The aluminium SF tank inputs are as per manufacturers (OceanProtect) specification. For enquires please contact OceanProtect on 1300 354 722.

NOTE: A successful self-validation check of your model does not constitute an approved model by City of Sydney
MUSIC-*link* now in MUSIC by eWater – leading software for modelling stormwater solutions

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	Combi Al tank with 1 x OceanGuard	Hi-flow bypass rate (cum/sec)	None	99	0.04
Rain	Rainwater Tank (assumed 6kL)	% Reuse Demand Met	None	None	0
Receiving	Receiving Node (90/85/65/45)	% Load Reduction	None	None	0.00018
Receiving	Receiving Node (90/85/65/45)	GP % Load Reduction	90	None	99
Receiving	Receiving Node (90/85/65/45)	TN % Load Reduction	45	None	54.4
Receiving	Receiving Node (90/85/65/45)	TP % Load Reduction	65	None	72.4
Receiving	Receiving Node (90/85/65/45)	TSS % Load Reduction	85	None	85.4
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	% Reuse Demand Met	None	None	0
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	Exfiltration Rate (mm/hr)	0	0	0
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	Extended detention depth (m)	0.25	1	0.77
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Bypass	Area Impervious (ha)	None	None	0.001
Urban	Bypass	Area Pervious (ha)	None	None	0
Urban	Bypass	Total Area (ha)	None	None	0.001
Urban	Planters	Area Impervious (ha)	None	None	0
Urban	Planters	Area Pervious (ha)	None	None	0.016
Urban	Planters	Total Area (ha)	None	None	0.016
Urban	Roof	Area Impervious (ha)	None	None	0.034
Urban	Roof	Area Pervious (ha)	None	None	0
Urban	Roof	Total Area (ha)	None	None	0.034
Urban	Roof to RWT	Area Impervious (ha)	None	None	0.034
Urban	Roof to RWT	Area Pervious (ha)	None	None	0
Urban	Roof to RWT	Total Area (ha)	None	None	0.034
Urban	Terrace	Area Impervious (ha)	None	None	0.018
Urban	Terrace	Area Pervious (ha)	None	None	0
Urban	Terrace	Total Area (ha)	None	None	0.018

Only certain parameters are reported when they pass validation

Failing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	Notional Detention Time (hrs)	8	12	0.0708
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	Alumininium SF Tank (1.3 x 2.36 m)	Total Suspended Solids - k (m/yr)	8000	8000	1

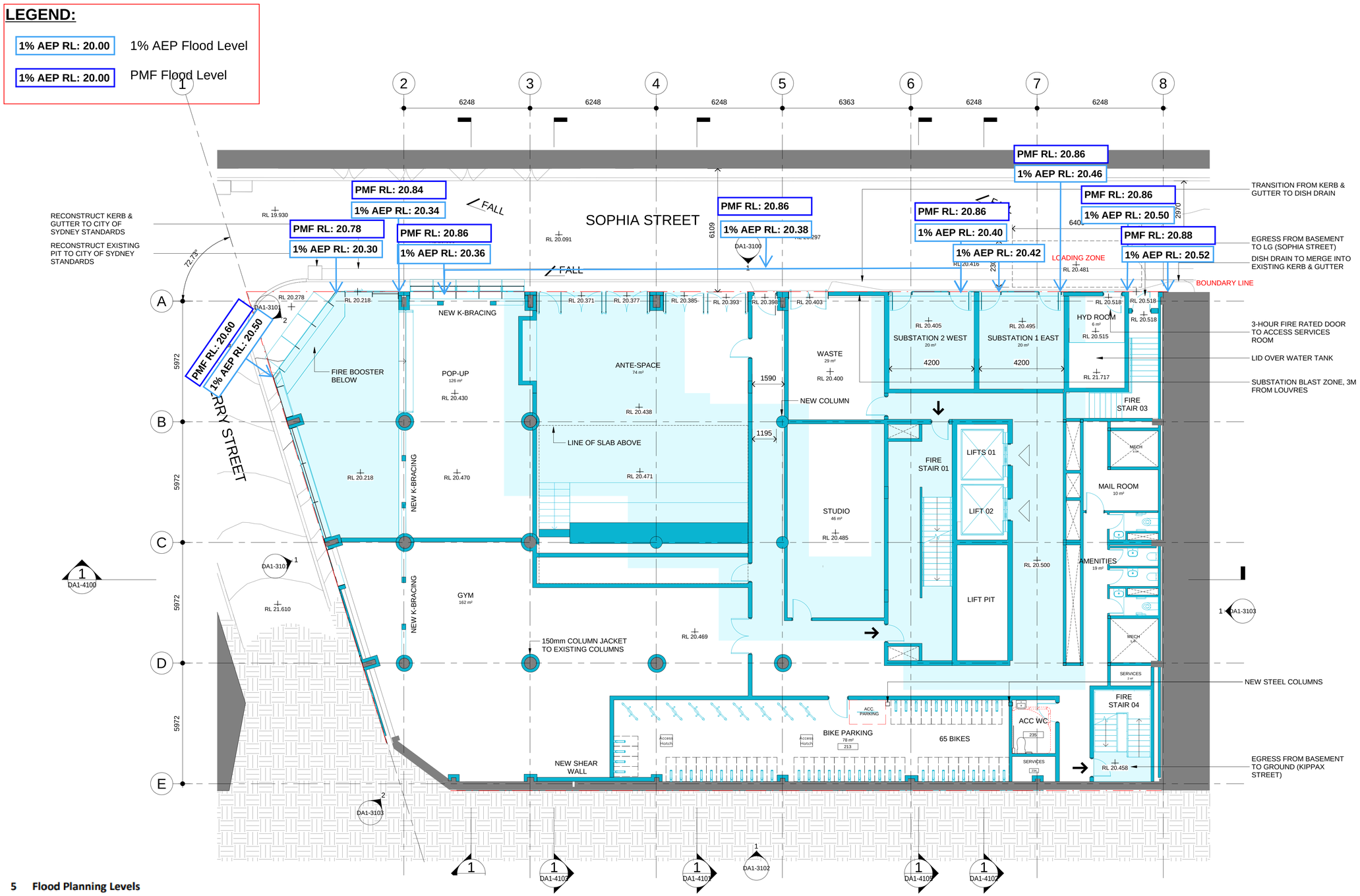
Only certain parameters are reported when they pass validation

APPENDIX C

Flood Level Sketches

LEGEND:

1% AEP RL: 20.00	1% AEP Flood Level
1% AEP RL: 20.00	PMF Flood Level



5 Flood Planning Levels

A Flood Planning Level refers to the permissible minimum building floor levels. For below-ground parking or other forms of below-ground development, the Flood Planning Level refers to the minimum level at each access point. Where more than one flood planning level is applicable the higher of the applicable Flood Planning Levels shall prevail.

Development		Type of flooding	Flood Planning Level
Industrial or Commercial	Business	Mainstream or local drainage flooding	Merits approach presented by the applicant with a minimum of the 1% AEP flood level
Below-ground garage/ car park	All other below-ground car parks	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m or the PMF (whichever is the higher) See Note 1

Scale 1:100

0 1m 2m 5m 10m

enstruct

Status	FOR INFORMATION
Job Title	8-24 Kippax Street, Surry Hills - Canva
Drawing Title	SITE FLOOD LEVELS
Scales	File Ref.
Drn MZV	Date. 07/12/23 Chd. PAL
Job No. 7039	Dwg No. CV-SK-001 Rev C

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Rev	Description	By	Date
1	Issue For DA1 Submission	LV	05/12/2023

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SPECIALIST FIRE ENGINEER / ESD E-LAB CONSULTING
Level 11, 10 Carrington Street, Sydney, NSW, 2000
+61 447 343 458

BCA CONSULTANT JENSEN HUGHES
Suite 302, Level 3, 151 Castlereagh Street
+61 2 9411 5360

LEGEND

- EXISTING BUILDING FABRIC
- NEW BUILDING FABRIC
- NEW SLAB INFILL AREA
- DEMOLISHED BUILDING FABRIC
- EXTENT OF SLAB DEMOLISHED
- EXTENT OF FACADE DEMOLISHED
- BOUNDARY LINE
- INDICATIVE SERVICES ZONE

GENERAL NOTES

DRAWINGS TO BE READ IN CONJUNCTION WITH REPORTS PREPARED FOR THE PURPOSE OF THIS DEVELOPMENT APPLICATION.
BASE BUILT INFORMATION BASED ON SURVEY MODEL PROVIDED BY SURVEYOR.

Cox Architecture
70 George Street
The Rocks NSW 2000
Australia

T + 61 2 9267 9599
coxarchitecture.com.au

Nominated Architects:
Joe Agius no. 6491
Russell Lee no. 6367

COX

Client
CANVA

Project No.
22058.0

Project
CANVA
8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title
GA PLAN - LOWER GROUND

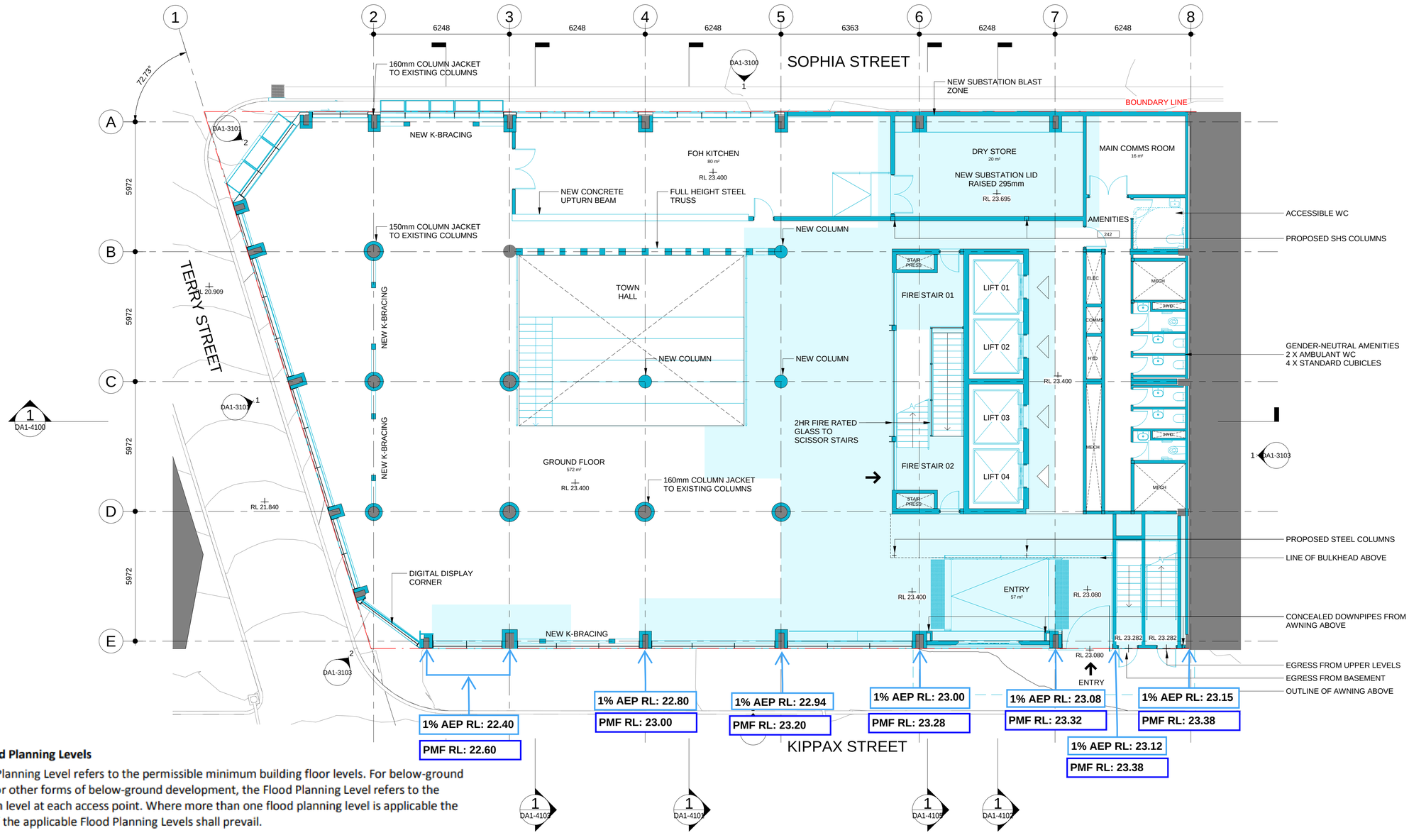
Document Control Status:
DEVELOPMENT APPLICATION

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** 1 : 100 @ A1
Project Director: RJ	**Date:** 05/12/2023
Drawing Number: DA1-2101	**Revision:** 1

PLOT STAMP DATE: 5/12/2023 2:39:24 PM

LEGEND:

1% AEP RL: 20.00	1% AEP Flood Level
1% AEP RL: 20.00	PMF Flood Level



5 Flood Planning Levels

A Flood Planning Level refers to the permissible minimum building floor levels. For below-ground parking or other forms of below-ground development, the Flood Planning Level refers to the minimum level at each access point. Where more than one flood planning level is applicable the higher of the applicable Flood Planning Levels shall prevail.

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Below-ground garage/ car park	All other below-ground car parks	Mainstream or local drainage flooding	1% AEP flood level + 0.5 m or the PMF (whichever is the higher) See Note 1

Scale 1:100

0 1m 2m 5m 10m

enstruct

Status	FOR INFORMATION
Job Title	8-24 Kippax Street, Surry Hills - Canva
Drawing Title	SITE FLOOD LEVELS
Scales	File Ref.
Drn. MZV	Date. 07/12/23 Chd. PAL
Job No. 7039	Dwg No. CV-SK-001 Rev C

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Rev	Description	By	Date
1	Issue For DA1 Submission	LV	05/12/2023

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Suite 302, Level 3, 151 Castlereagh Street
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LEGEND

- EXISTING BUILDING FABRIC
- NEW BUILDING FABRIC
- NEW SLAB INFILL AREA
- DEMOLISHED BUILDING FABRIC
- EXTENT OF SLAB DEMOLISHED
- EXTENT OF FACADE DEMOLISHED
- BOUNDARY LINE
- INDICATIVE SERVICES ZONE

GENERAL NOTES

DRAWINGS TO BE READ IN CONJUNCTION WITH REPORTS PREPARED FOR THE PURPOSE OF THIS DEVELOPMENT APPLICATION.
BASE BUILT INFORMATION BASED ON SURVEY MODEL PROVIDED BY SURVEYOR.

Cox Architecture
70 George Street
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coxarchitecture.com.au

Nominated Architects:
Joe Agius no. 6491
Russell Lee no. 6367

COX

Client CANVA

Project No. 22058.0

Project CANVA
8-24 KIPPAX STREET, SURRY HILLS

Acknowledgement
In the language of the Eora Nation people, this site is known as Gadigal land.

Drawing Title GA PLAN - GROUND LEVEL

Document Control Status: DEVELOPMENT APPLICATION

Co-ordinated: LV	**Drawn:** HC
Project Architect: LV	**Scale:** 1 : 100 @ A1
Project Director: RJ	**Date:** 05/12/2023
Drawing Number: DA1-2102	**Revision:** 1

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417

APPENDIX D

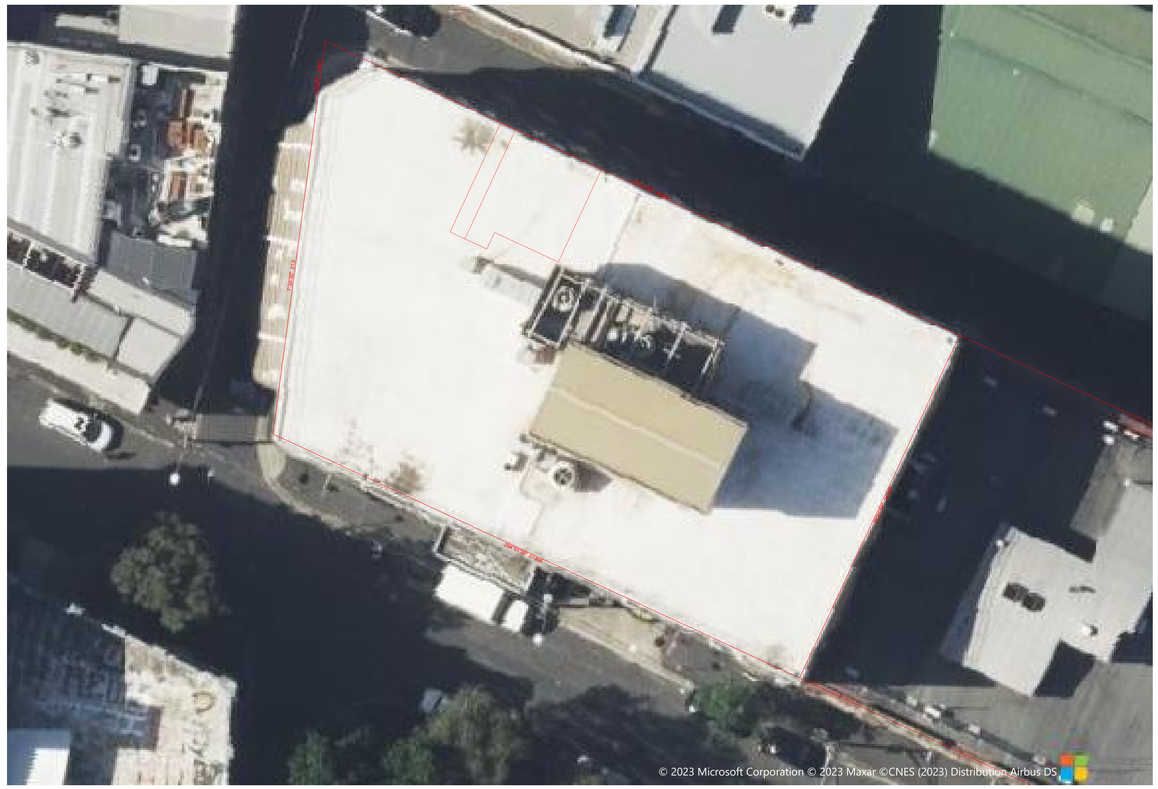
Civil Drawings

enstruct

CIVIL ENGINEERING WORKS

CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010



LOCALITY PLAN
SCALE: 1:200

CIVIL ENGINEERING WORKS DRAWING LIST:

7039-CV-0001	COVER SHEET, LOCALITY PLAN AND DRAWING LIST
7039-CV-0002	NOTES SHEET
7039-CV-2001	SITEWORKS PLAN
7039-CV-3001	STORMWATER PLAN
7039-CV-3051	STORMWATER CATCHMENT PLAN
7039-CV-3501	DETAILS SHEET 1

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rev	date	description	drn	ch'k
01	01/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL

rev	date	description	drn	ch'k

Canva

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project: CANVA - SURRY HILLS
8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: COVER SHEET, LOCALITY PLAN AND DRAWING LIST

status: FOR INFORMATION ONLY

scale at A1	drawn	checked	approved
N.T.S	MZV	PAL	DEC-23

project no.	sheet	rev.
7039	7039-CV-0001	01

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SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : PM53243 - 18.302m AHD
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : MGA-56
Survey prepared by : C & A SURVEYORS
Setout Points : CONTACT THE SURVEYOR

enstruct does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on enstruct drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

enstruct does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.

enstruct plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified dry density in accordance with AS 1289 5.2.1.
2. All trench backfill material shall be compacted to the same density as the adjacent material.
3. All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1

DBYD SERVICES NOTE

"Public Service Utility information shown on plan has been complied from information received from Dial Before You Dig inquiry, reference Number 35269078, which was obtained on 17/10/2023.
Unless specifically shown otherwise, this location and depth of services shown on this plan have not been verified.

The location of services shown on this drawing have been plotted as accurately as possible from diagrams provided by service authorities and should be confirmed by site inspection."

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Superintendent
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority; the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site.
6. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
7. For all temporary batters refer to geotechnical recommendations.
8. The approval of a substation shall be sought from the superintendant but is not an authorisation of a cost variation. The superintendant must approve any cost variation before any work starts

REFERENCE DRAWINGS

1. These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
COX	General Arrangement Plan	DA1-2100	1	05/12/23
		DA1-2101	1	05/12/23
		DA1-2102	1	05/12/23
		DA1-2106	1	05/12/23

STORMWATER DRAINAGE NOTES

1. Stormwater Design Criteria :
(A) Average exceedance probability -
1% AEP for roof drainage to first external pit
(B) Rainfall intensities -
Time of concentration: 5 minutes
1% AEP = 260 mm/hr
5% AEP = 200 mm/hr
(C) Rainfall losses -
Impervious areas: IL= 1.0 mm , CL = 0 mm/hr
Pervious areas: IL= 28mm , CL = 1.6 mm/hr
2. Pipes up to 225 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer
3. Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
4. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
5. Pit grates and covers shall conform with AS3996-2006, and AS1428.1 for access requirements.

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
(A) Local authority requirements,
(B) EPA - Pollution control manual for urban stormwater,
(C) LANDCOM NSW - Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.
The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. Minimise the area of site being disturbed at any one time.
5. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
6. Control water from upstream of the site such that it does not enter the disturbed site.
7. All vehicles leaving the site shall be cleaned and inspected before leaving.
8. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
9. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed:
1.1. Construct silt fences below the site and across all potential runoff sites.
1.2. Construct measures to divert upstream clean flows into existing stormwater system.
1.3. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all existing pits and proposed pits as they are constructed.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

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02	07/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL
01	01/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL

rev	date	description	drn	ch'k

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www.enstruct.com.au

project: CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

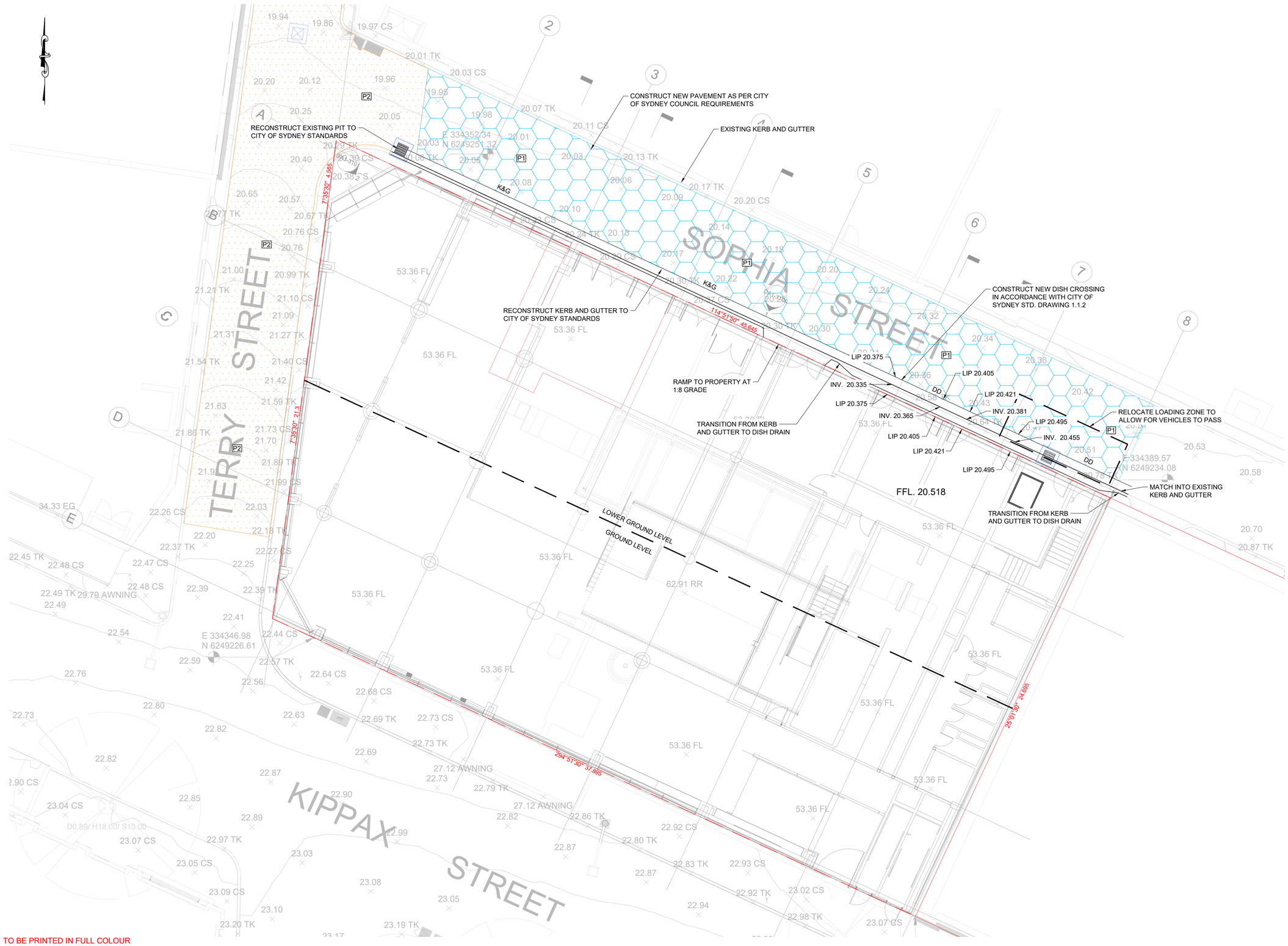
drawing title: NOTES SHEET

status: FOR INFORMATION ONLY

scale at A1	drawn	checked	approved
N.T.S	MZV	PAL	DEC-23

project no.	sheet	rev.
7039	7039-CV-0002	02

A1



PAVEMENT LEGEND

- P1 — Pavement Type 1: Pavers to City of Sydney Specification.
- P2 — Pavement Type 2: Pavers to City of Sydney Specification. Pavement constructed as a part of City of Sydney Terry Street Shared Zone.
- KG — PROPOSED KERB AND GUTTER
- DD — PROPOSED DISH DRAIN

SCALE 1:100

0 1 2 3 4 5 m

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rev	date	description	drn	ch'k
03	07/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL
02	01/12/23	ISSUE FOR DEVELOPMENT APPLICATION	BEJ	PAL
01	27/11/23	ISSUE FOR INFORMATION	BEJ	PAL

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www.enstruct.com.au

project: CANVA - SURRY HILLS
8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: SITE WORKS PLAN

status: FOR INFORMATION ONLY

scale at A1	drawn	checked	approved
1:100	MZV	PAL	NOV-23

project no.	sheet	rev.
7039	7039-CV-2001	03

421

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A1



SITEWORKS LEGEND

- Property boundary
- DD — Dish drain
- SW — Proposed stormwater line and stormwater pit
- Concrete encased stormwater line
- ExSW — Existing stormwater line
- Overland flow path

SCALE 1:100

0 1 2 3 4 5 m

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422

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02	01/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL
01	27/11/23	ISSUE FOR INFORMATION	BEJ	PAL

rev	date	description	drn	ch'k

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project: CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: STORMWATER PLAN

status: FOR INFORMATION ONLY

scale at A1	drawn	checked	approved
1:100	MZV	PAL	NOV-23

project no.	sheet	rev.
7039	7039-CV-3001	03

A1

CATCHMENT LEGEND

- Roof Area
  Total Area = 680m²
- Terrace Footpath Area
  Total Area = 178m²
- Landscaping/Planters Area
  Total Area = 170m²
- Bypass Area
  Total Area = 6m²

Total Catchment Area = 1,034m²

SCALE 1:100

0 1 2 3 4 5 m

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rev	date	description	drn	ch'k
01	01/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL

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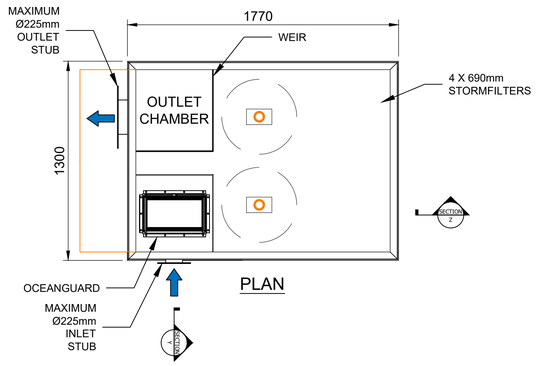
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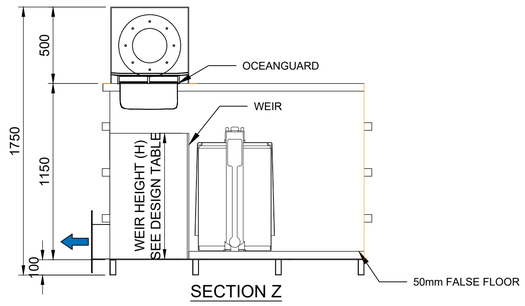
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status	FOR INFORMATION ONLY
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checked	PAL
approved	DEC-23
project no.	7039
sheet	7039-CV-3101
rev.	01

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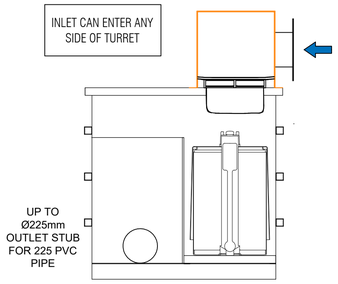
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PLAN



SECTION Z



SECTION Y

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project
CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title
DETAILS SHEET 1

status
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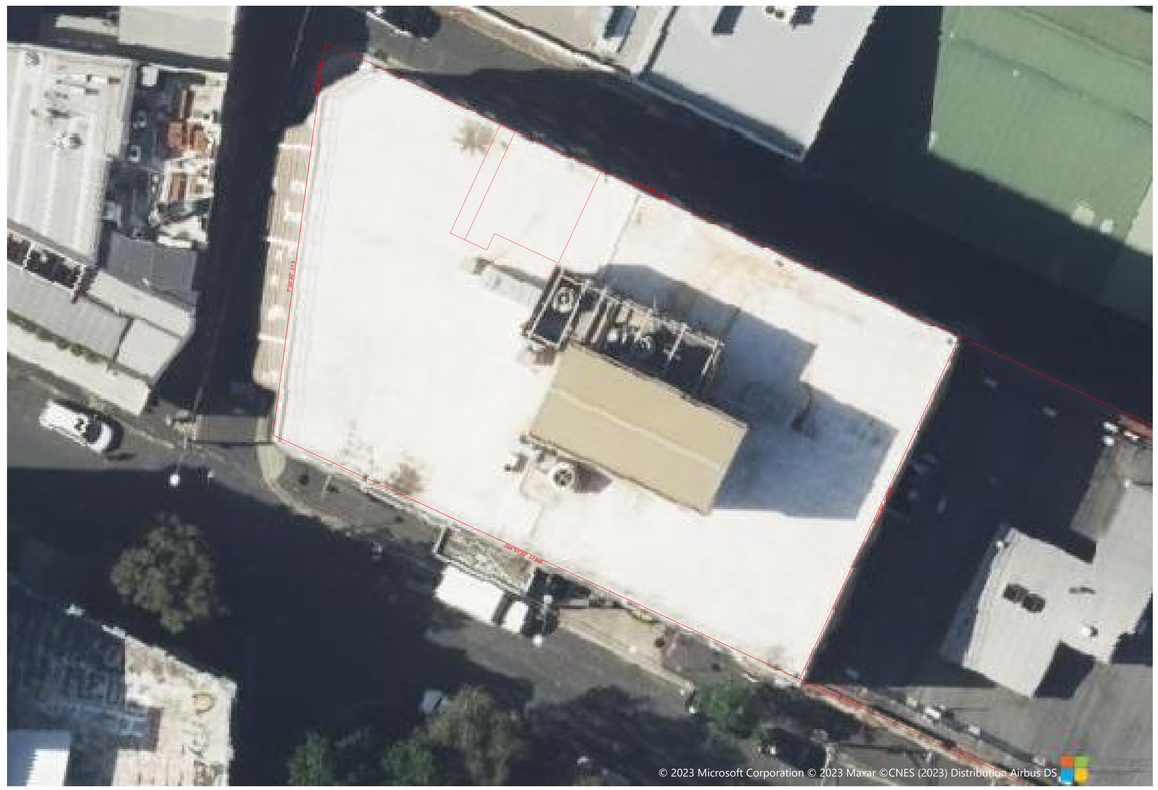
424

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CIVIL ENGINEERING WORKS

CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010



LOCALITY PLAN
SCALE: 1:200

CIVIL ENGINEERING WORKS DRAWING LIST:

7039-CV-0001	COVER SHEET, LOCALITY PLAN AND DRAWING LIST
7039-CV-0002	NOTES SHEET
7039-CV-2001	SITEWORKS PLAN
7039-CV-3001	STORMWATER PLAN
7039-CV-3051	STORMWATER CATCHMENT PLAN
7039-CV-3501	DETAILS SHEET 1

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rev	date	description	drn	ch'k

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project: CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: COVER SHEET, LOCALITY PLAN AND DRAWING LIST

status: FOR INFORMATION ONLY

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SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : PM53243 - 18.302m AHD
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM
Coordinate system : MGA-56
Survey prepared by : C & A SURVEYORS
Setout Points : CONTACT THE SURVEYOR

enstruct does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

UNDERGROUND SERVICES - WARNING

The locations of underground services shown on enstruct drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

enstruct does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.

enstruct plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified dry density in accordance with AS 1289 5.2.1.
2. All trench backfill material shall be compacted to the same density as the adjacent material.
3. All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1

DBYD SERVICES NOTE

"Public Service Utility information shown on plan has been complied from information received from Dial Before You Dig inquiry, reference Number 35269078, which was obtained on 17/10/2023.
Unless specifically shown otherwise, this location and depth of services shown on this plan have not been verified.

The location of services shown on this drawing have been plotted as accurately as possible from diagrams provided by service authorities and should be confirmed by site inspection."

GENERAL NOTES

1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Superintendent
2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
3. Make smooth connection with all existing works.
4. Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
5. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority; the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site.
6. All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
7. For all temporary batters refer to geotechnical recommendations.
8. The approval of a substation shall be sought from the superintendant but is not an authorisation of a cost variation. The superintendant must approve any cost variation before any work starts

REFERENCE DRAWINGS

1. These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
COX	General Arrangement Plan	DA1-2100	1	05/12/23
		DA1-2101	1	05/12/23
		DA1-2102	1	05/12/23
		DA1-2106	1	05/12/23

STORMWATER DRAINAGE NOTES

1. Stormwater Design Criteria :
(A) Average exceedance probability -
1% AEP for roof drainage to first external pit
(B) Rainfall intensities -
Time of concentration: 5 minutes
1% AEP = 260 mm/hr
5% AEP = 200 mm/hr
(C) Rainfall losses -
Impervious areas: IL= 1.0 mm , CL = 0 mm/hr
Pervious areas: IL= 28mm , CL = 1.6 mm/hr
2. Pipes up to 225 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer
3. Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
4. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
5. Pit grates and covers shall conform with AS3996-2006, and AS1428.1 for access requirements.

EROSION AND SEDIMENT CONTROL NOTES

1. All work shall be generally carried out in accordance with
(A) Local authority requirements,
(B) EPA - Pollution control manual for urban stormwater,
(C) LANDCOM NSW - Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.
The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. Minimise the area of site being disturbed at any one time.
5. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
6. Control water from upstream of the site such that it does not enter the disturbed site.
7. All vehicles leaving the site shall be cleaned and inspected before leaving.
8. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
9. Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

1. Prior to commencement of excavation the following soil management devices must be installed:
1.1. Construct silt fences below the site and across all potential runoff sites.
1.2. Construct measures to divert upstream clean flows into existing stormwater system.
1.3. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all existing pits and proposed pits as they are constructed.

WATER QUALITY TESTING REQUIREMENTS

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.This should include comments from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

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01	01/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL

rev	date	description	drn	ch'k

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project: CANVA - SURRY HILLS
8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: NOTES SHEET

status: FOR INFORMATION ONLY

scale at A1	drawn	checked	approved
N.T.S	MZV	PAL	DEC-23

project no.	sheet	rev.
7039	7039-CV-0002	02

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A1



PAVEMENT LEGEND

- P1 — Pavement Type 1: Pavers to City of Sydney Specification.
- P2 — Pavement Type 2: Pavers to City of Sydney Specification. Pavement constructed as a part of City of Sydney Terry Street Shared Zone.
- KG — PROPOSED KERB AND GUTTER
- DD — PROPOSED DISH DRAIN

SCALE 1:100

0 1 2 3 4 5 m

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03	07/12/23	ISSUE FOR DEVELOPMENT APPLICATION	MZV	PAL
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01	27/11/23	ISSUE FOR INFORMATION	BEJ	PAL

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project: CANVA - SURRY HILLS
8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: SITE WORKS PLAN

status: FOR INFORMATION ONLY

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A1



SITEWORKS LEGEND

- Property boundary
- Dish drain
- Proposed stormwater line and stormwater pit
- Concrete encased stormwater line
- Existing stormwater line
- Overland flow path

SCALE 1:100

0 1 2 3 4 5 m

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project: CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: STORMWATER PLAN

status: FOR INFORMATION ONLY

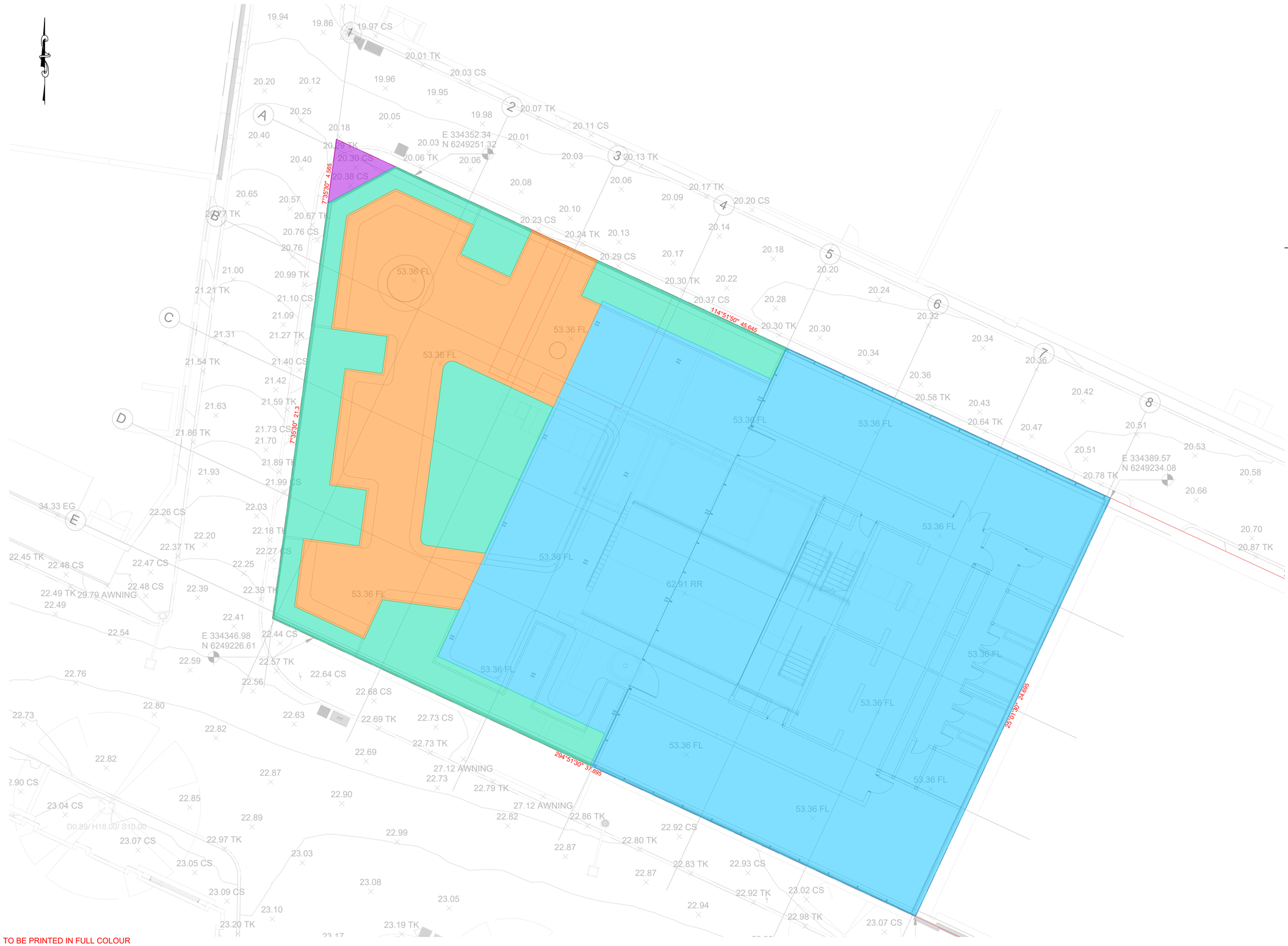
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rev	date	description	drn	ch'k

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project: CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title: STORMWATER CATCHMENT PLAN

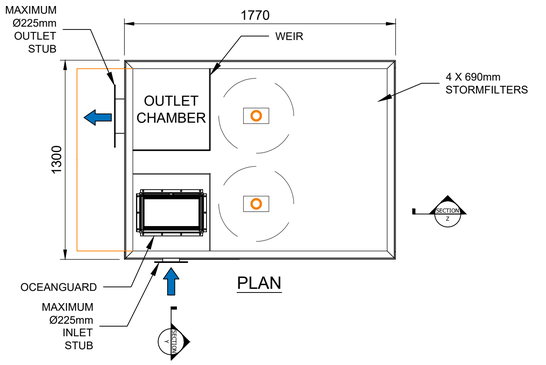
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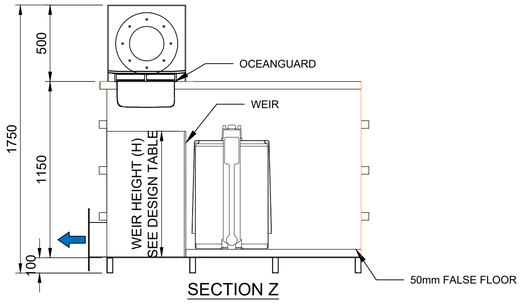
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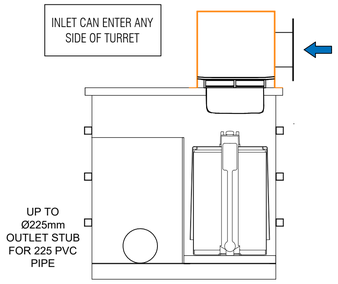
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PLAN



SECTION Z



SECTION Y

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project
CANVA - SURRY HILLS

8-24 KIPPAX STREET, SURRY HILLS 2010

drawing title
DETAILS SHEET 1

status
FOR INFORMATION ONLY

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430

Attachment B

Draft Sydney Development Control Plan - 8-24 Kippax Street, Surry Hills

CITY OF SYDNEY

Development Control Plan – 8-24 Kippax Street, Surry Hills



Purpose of this Development Control Plan

The purpose of this Development Control Plan (DCP) is to amend *Sydney Development Control Plan 2012*, which was adopted by Council on 14 May 2012 and came into effect on 14 December 2012.

The amendment provides objectives and provisions to inform future development at 8-24 Kippax Street, Surry Hills.

This plan is to be read in conjunction with draft Planning Proposal – 8-24 Kippax Street, Surry Hills.

Citation

This amendment may be referred to as *Sydney Development Control Plan 2012 – 8-24 Kippax Street, Surry Hills*.

Land covered by this plan

This plan applies to that land identified as 8-24 Kippax Street, Surry Hills – which is Lot 3 DP 547558.

Relationship of this plan to Sydney Development Control Plan 2012

This plan amends the Sydney Development Control Plan 2012 in the manner set out in Schedule 1 below.

Amendments to Sydney Development Control Plan 2012

This plan amends Sydney Development Control Plan 2012 by:

1. Amending Figure 6.1 Specific maps to include 8-24 Kippax Street, Surry Hills
2. Inserting a new section 6.3.X 8-24 Kippax Street, Surry Hills
3. Updating figure numbers as required.

Schedule 1 – Amendment to Sydney Development Control Plan 2012

Figure 6.1 Specific sites map

Amend Figure 6.1: Specific sites map to include 8-24 Kippax Street, Surry Hills.

Amendment to Section 6.3

6.3.# 8-24 Kippax Street, Surry Hills

If a development at 8-24 Kippax Street, Surry Hills (as shown in Figure 6.1 Specific sites map) seeks to utilise additional height or floor space ratio permitted by clause 6.## of the LEP, then the provisions in this section also apply to the proposed development and override other provisions in the DCP where there is an inconsistency.

Objectives

a. Deliver a high-quality urban form that:
    i. ensures the existing building is retained and appropriately adapted;
    ii. comprises accessible rooftop spaces for occupants and to support landscaping, planting and canopy coverage;
    iii. includes active uses at street level to provide increased passive surveillance of the public domain; and
    iv. provides for on-site loading and servicing and does not include any on-site private vehicle parking; and
b. Define the building envelope, including heights, setbacks and external terraces that respects the local context and minimises amenity, overshadowing and acoustic impacts.

Provisions

6.3.X.1 Built form

1. Building massing, height, footprint and minimum setbacks are to be consistent with the following:
    a. ‘Figure 6.xx 8-24 Kippax Street, Surry Hills – envelope elevations’; and
    b. ‘Figure 6.xx 8-24 Kippax Street, Surry Hills – envelope setbacks’.
2. The building is to include photovoltaic systems and a rainwater harvesting and storage system.
3. The existing building is to be retained and adapted.

6.3.X.2 Public domain, servicing and access

1. Section 3.2.3 Active Frontages applies to all street frontages.
2. Incorporate high quality public art in publicly accessible areas on site to contribute to the identity and amenity of the place.
3. Vehicle access, site servicing, loading and delivery shall be as follows:
    a. no private vehicle parking is to be provided, due to the site’s high level of accessibility by public transport services and active transport.
    b. with the exception of waste collection, all site servicing, loading and delivery shall be accommodated wholly within the site:

i. a minimum of two (2) loading vehicle spaces provided;

ii. no vehicle access from Kippax Street is permitted

c. waste collection may take place from Sophia Street directly adjacent to the waste storage room; and

d. a transport management plan incorporating all operations and servicing shall be submitted with the future development application.

6.3.X.3 External terraces and landscaping

1. New additions to the building shall feature landscaping and planting as follows:
   a. in the locations indicated in Figure 6.xx 8-24 Kippax Street, Surry Hills – Indicative envelope setbacks'
   b. a perimeter zone of planting of at least 1m width is required on Level 10;
   c. planting to the Level 11 external terrace is to have a canopy of not less than 10% of the site area and may exceed the maximum building height control once mature;
   d. a green roof is to be incorporated to the rooftop, including beneath any photovoltaic cells; and
   e. any landscaping must be designed so as to be capable of maintenance from within the site.
2. The proposed upper level external terraces are not to be enclosed or serve as an extension of the building envelope, with the exception of an awning as shown in 'Figure 6.xx 8-24 Kippax Street, Surry Hills – Indicative envelope elevations' and 'Figure 6.xx 8-24 Kippax Street, Surry Hills – Indicative envelope setbacks'.

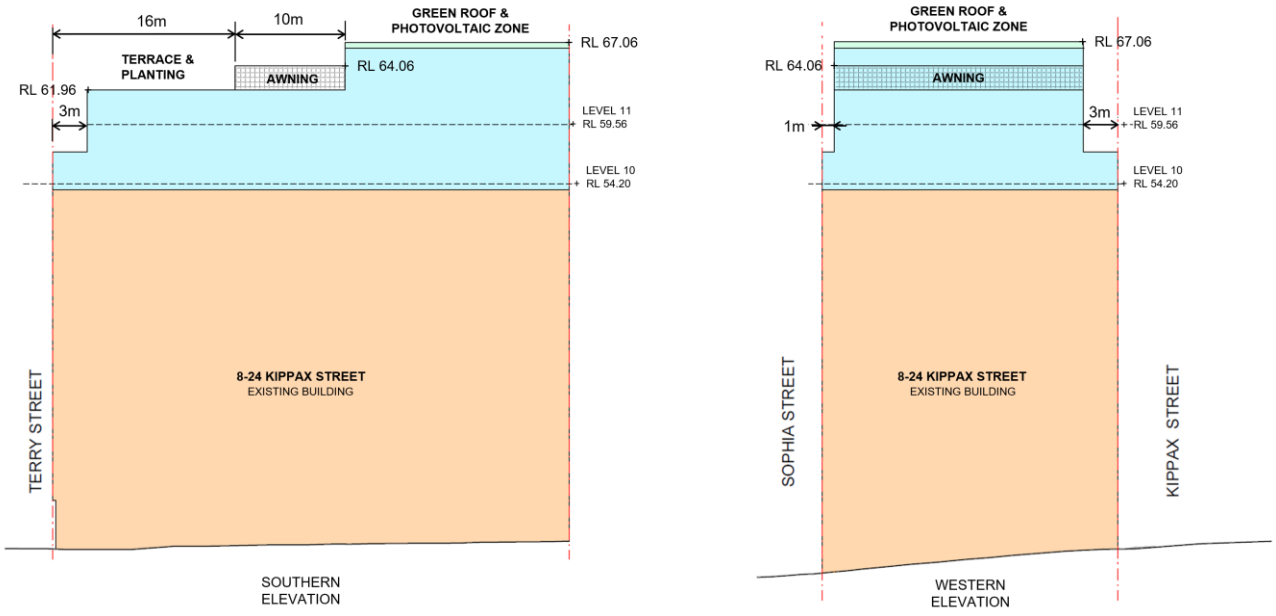


Figure 6.xx 8-24 Kippax Street, Surry Hills – envelope elevations

Insert new figure: 8-24 Kippax Street, Surry Hills – envelope elevations

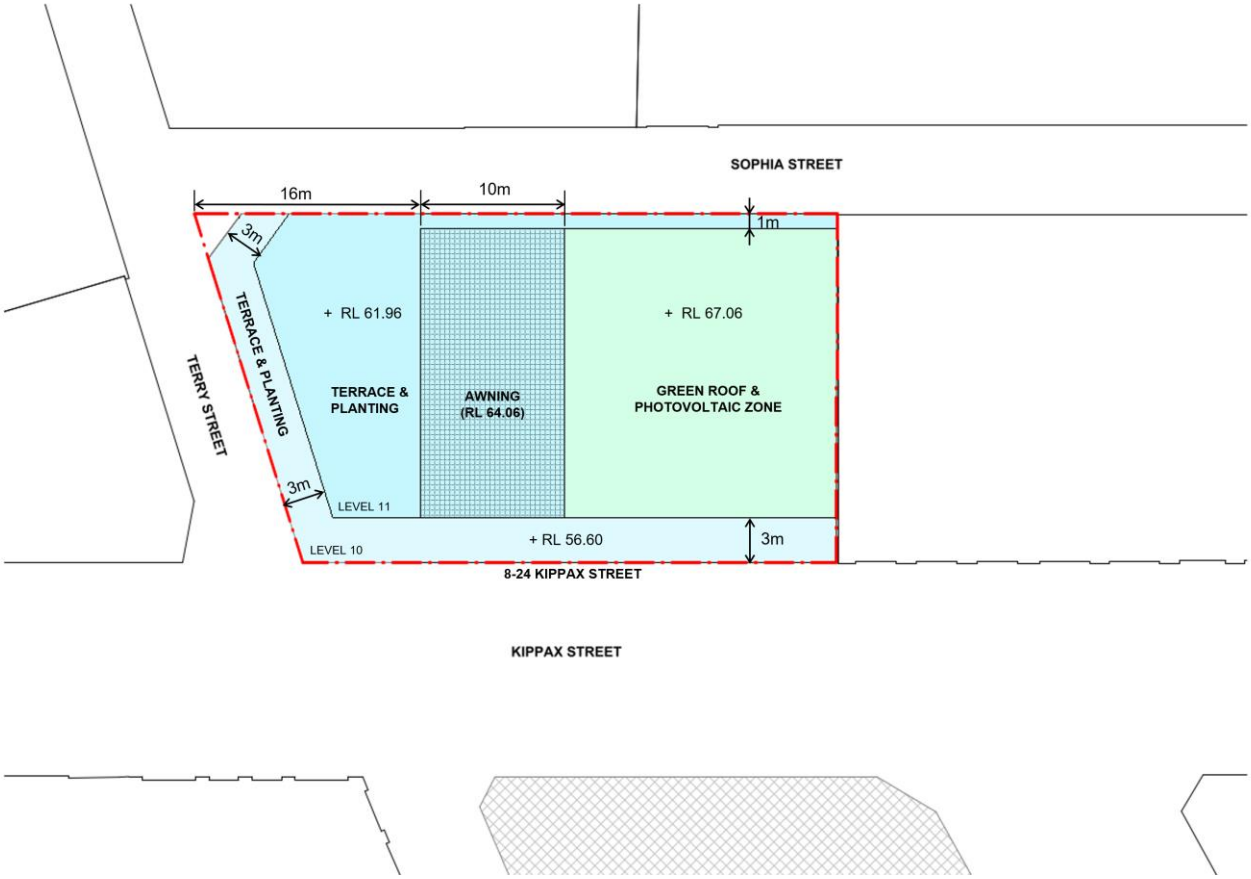


Figure 6.xx 8-24 Kippax Street, Surry Hills – envelope setbacks

Insert new figure: 8-24 Kippax Street, Surry Hills – envelope setbacks

Item 6.

Local Planning Panel - Appointment of Members

Document to Follow

Item 7.

Fire Safety Reports

File No: S105001.002

Summary

The City of Sydney regularly receives building reports from Fire and Rescue NSW in relation to inspections carried out by Fire and Rescue NSW Authorised Officers. These inspection reports are to be reported to Council and Council is required to determine whether to exercise its power to issue fire safety orders under Division 9.3 and Schedule 5 of the Environmental Planning and Assessment Act 1979 (the Act).

In response to Fire and Rescue NSW reports City staff undertake inspections to ensure fire safety measures are in full operation and that building exits are clear and unimpeded. Fire and Rescue NSW inspections revealed fire safety concerns that require Council as the appropriate regulatory authority to use its discretion and address the concerns observed at the time of the inspection.

Fire and Rescue NSW has powers under the Act to carry out inspections of buildings and it is required to forward its findings to the City.

Fire and Rescue NSW reports received by the City are required to be tabled before Council. Attached are details of eight reports received by the City from Fire and Rescue NSW. The attachments deal with seven properties and includes the Fire and Rescue NSW report and the findings (preliminary or final) by the City's Officer, along with other documentation relevant to that property.

Recommendation

It is resolved that:

(A) note the contents of the Fire Safety Report Summary Sheet, as shown at Attachment A to the subject report;

(B) note the inspection reports by Fire and Rescue NSW, as shown at Attachments B to H of the subject report;

(C) note the contents of Attachment B and not exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 359-361 Pitt Street, Sydney at this time;

(D) note the contents of Attachment C and not exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 156-160 Goulburn Street, Surry Hills at this time;

(E) note the contents of Attachment D and not exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 405-411 Sussex Street, Haymarket at this time;

(F) note the contents of Attachment E and exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 301 Kent Street, Sydney;

(G) note the contents of Attachment F and exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 782 Bourke Road, Waterloo;

(H) note the contents of Attachment G and not exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 252 Botany Road Alexandria at this time; and

(I) note the contents of Attachment H and exercise its power under the Environmental Planning and Assessment Act 1979 to issue a Fire Safety Order at 33-35A York Street, Sydney

Attachments

Attachment A. Fire Safety Report Summary Sheet

Attachment B. Inspection Report - 359-361 Pitt Street, Sydney

Attachment C. Inspection Report - 156-160 Goulburn Street, Surry Hills

Attachment D. Inspection Report - 405-411 Sussex Street, Haymarket

Attachment E. Inspection Report - 301 Kent Street, Sydney

Attachment F. Inspection Report - 782 Bourke Road, Waterloo

Attachment G. Inspection Report - 252 Botany Road Alexandria

Attachment H. Inspection Report - 33-35A York Street, Sydney

Attachment I. Inspection Report - 33-35A York Street, Sydney (Confidential)

Background

1. The City receives inspection reports and recommendations from Fire and Rescue NSW in relation to inspections carried out on buildings located within the City's local government area.

2. Under the Environmental Planning and Assessment Act 1979, (the Act), Fire and Rescue NSW has the power to carry out inspections of buildings to determine if the building has adequate provision for fire safety and/or is compliant with legislation.

3. On average, the City receives approximately 50 such reports each year. They can be prompted by reports from the Police or others who have a concern relating to fire safety in a building.

4. The inspection was undertaken to ensure fire safety measures were in full operation and that building exits were clear and unimpeded.

5. When Fire and Rescue NSW carries out such an inspection, a report and any recommendations must be provided to the City.

6. Under the Act, Council is then required to table the report and make a determination as to whether it will exercise its power to issue a Fire Safety Order 1 or 2 in Schedule 5, Part 2 of the Act. Fire Safety Order 1 requires a person to do or stop doing certain specified things to improve fire safety; Fire Safety Order 2 requires a person to cease conducting an activity on premises where that activity constitutes, or is likely to constitute, a life-threatening hazard or a threat to public health or public safety.

7. Attached are the details of eight reports received from Fire and Rescue NSW, including recommendations for further action, relating to seven properties. The properties have also been reviewed by a City Officer.

Relevant Legislation

8. Environmental Planning and Assessment Act 1979.

9. Local Government Act 1993 - Section 10A provides that a council may close to the public so much of its meeting as comprises the discussion of information that would, if disclosed, prejudice the maintenance of law.

GRAHAM JAHN, AM

Director City Planning, Development and Transport

Andrew Thomas, Executive Manager Planning and Development

Attachment A

Fire Safety Report Summary Sheet

Fire Safety Report Summary Sheet
Cl.17, Schedule 5 of the Environmental Planning and Assessment Act 1979, reports to Council, S105001.002

Total number of properties tabled: 7

Report – June 2024

Summary table

Att. (A-H)	Premises Specifics	Actions/ Recommendation
A	Not applicable – Summary Sheet	Summary of clause 17, Schedule 5 matters tabled at Council meeting.
B	359-361 Pitt Street, Sydney	Premises inspected; owners have been issued with corrective action correspondence; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.
C	156-160 Goulburn Street, Surry Hills	Premises inspected; owners have been issued with corrective action correspondence; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.
D	405-411 Sussex Street, Haymarket	Premises inspected; owners have been issued with corrective action correspondence; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.
E	301 Kent Street, Sydney	Premises inspected; owners have been issued with a Notice of Intention to give a Fire Safety Order; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.
F	782 Bourke Road, Waterloo	Premises inspected; owners have been issued with a Notice of Intention to give a Fire Safety Order; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.
G	252 Botany Road Alexandria	Premises inspected; owners have previously been issued with a Fire Safety Order; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.
H	33-35A York Street, Sydney	Premises inspected; owners have been issued with a Notice of Intention to give a Fire Safety Order; follow up compliance site inspections are to be undertaken to ensure fire safety works are satisfactorily completed.

Attachment B

Inspection Report
359-361 Pitt Street, Sydney


359-361 Pitt Street, Sydney
CITY OF SYDNEY
339
Wilmot Street
7-9
343-357
308
310-322
Central Street
Sydney
359-361
363-367
369
371
373-375
377
379-383
Pitt Street
324-330
332-336
338-348
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Notes
9/04/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: CSM 3155337 **Officer:** Luke Jeffree **Date:** 1 May 2024

Premises: 359-361 Pitt Street, Sydney

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) in relation to the subject premises on 11 March 2024 and 5 April 2024 with respect to matters of fire safety.

The premises consists of nine storey strata titled residential apartment building with ground floor shop/café and vacant basement level located on the southwestern corner at the intersection of Pitt Street and Central Street, Sydney.

An inspection of the premises undertaken by a Council investigation officer in the presence of the strata manager and the owner's construction codes consultant revealed there were no significant fire safety issues occurring within the building.

The premises are equipped with numerous fire safety systems (both active and passive) that would provide adequate provision for fire safety for occupants in the event of a fire.

Council investigations have revealed that whilst there remains several minor fire safety "maintenance and management" works to attend to (such as fixing a minor faults to the automatic smoke detection and alarm system, exit signs and emergency lighting, provision of maintenance logbooks) the overall fire safety systems provided within the subject premises are considered adequate in the circumstances.

It is considered that the above fire safety works are of a degree which can be addressed by routine preventative and corrective maintenance actions undertaken by the owner's fire service contractor(s) through written instruction from Council.

Observation of the external features of the building did not identify the existence of any potential combustible composite cladding on the façade of the building.

Chronology:

Date	Event
11/03/2024	FRNSW correspondence received regarding The Regent at 359-361 Pitt Street, Sydney.
13/03/2024	A review of Council records confirmed: - a Fire Safety Order [FIRE/2013/10] is currently active which requires amongst other things a full fire safety audit, upgrade of the automatic smoke detection and alarm system & building occupant warning system and a partial upgrade of the fire hydrant system. The works associated with the terms of the Order are required to be completed on or before 15 September 2024. - a maintenance company is engaged by the owner's corporation for ongoing maintenance of essential fire safety measures. - an Annual Fire Safety Statement is not required while the upgrade works are underway as directed under the Fire Safety Order.

Date	Event
05/04/2024	Further FRNSW correspondence received regarding The Regent 359-361 Pitt Street, Sydney.
09/04/2024	An inspection of the subject premises was undertaken by a Council officer in the presence of the strata manager and owner's building codes consultant for the Fire Safety Order. The inspection revealed the following; • Basement level was vacant and that it was previously used as a bar. Council officer noted that basement level required extensive cleaning and had the aroma of mould as mentioned in FRNSW correspondence dated 4 March 2024. • All detectors located in vacant basement level were identified as multi-criteria detectors. The detectors were set to smoke detection in accordance with the National Construction Code (NCC). Also, contrary to FRNSW's correspondence dated 4 March 2024 there were no actual heat detectors located in the basement. • Inspection verified the presence of an Earth Fault on the Fire Detection Control and Indicating Equipment (FDCIE) relating to the vacant basement level. • Project manager advised Council officer that appointed maintenance company may be utilising an electronic log (not written logbook) for the maintenance of Smoke Detection and Alarm System. With respect to the mention in FRNSW's correspondence regarding multiple detectors being covered with cling wrap, latex gloves or similar material, the Council officer identified one. multi-criteria detector in the vacant basement level with a latex glove covering it. The officer gave a verbal instruction/warning to the strata manager to remove the glove from detector which was immediately complied with.
12/04/2024	A separate health investigation initiated by Council's Health & Building Unit to address unhealthy condition of vacant basement level - Ref: CSM 3170164
01/05/2024	Corrective action letter sent – TRIM Ref: 2024/264930

FIRE AND RESCUE NSW REPORT:

References: [BFS24/198 (33101) D24/26336, 2024/172674; BFS24/901 (33759) D2024/035360, 2024/220088)

Fire and Rescue NSW conducted an inspection on 21 February 2024 & 23 February 2024 of the subject premises after receiving correspondence concerning the provision for fire safety in connection with the premises.

Issues . The reports from FRNSW detailed a number of issues, in particular:

Ref.	Issue (FRNSW Report dated 4 March 2024)	City response
1. Certification		
1A	The Annual Fire Safety Statement (AFSS) displayed at the building was dated 2017. A current AFSS was not displayed nor has FRNSW received a copy of the statement contrary to the requirements of Section 89 of the Environmental	This is consistent with Council's findings on day of the inspection. However, the requirement to provide & display a current AFSS is suspended whilst the Fire Order is in

Ref.	Issue (FRNSW Report dated 4 March 2024)	City response
	Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (EPAR 21).	place and fire safety systems are being rectified/upgraded in accordance with the Order & the City's procedures.
2.	**Essential Fire Safety Measures**	
2A.	Fire Hydrant System	
A.	The minimum standard of performance on the 2017 AFSS states fire hydrant system is installed to Ordinance 70 Ministerial Spec. 10. Visually, the hydrant system meets the AFSS.	This is consistent with Council's findings on day of the inspection. Also, the fire hydrant system is in the process of being rectified/partially upgraded under Terms 5.02, 5.03 of the Fire Safety Order dated 29 August 2013 [Ref: FIRE/2013/10] & Term M1.01 Fire Order Modification dated 1 June 2021 [Ref: FIRE/2013/10]
B.	FRNSW are of the opinion that the fire hydrant pump set is designed to achieve 275 kPa at the most hydraulically disadvantaged hydrant.	In the process of being addressed/tested under Term M1.01 Fire Order Modification dated 1 June 2021 [Ref: FIRE/2013/10]
C.	The fire brigade boost assembly comprises two boost inlet connections. No feed hydrants provided.	This is consistent with Council's findings on day of the inspection and Council officer noted that feed hydrants were not required under the applicable installation standard of performance
2B.	Smoke Detection and Alarm System (SDAS)	
A.	The maintenance logbook was last updated 25 October 2023.	A hard copy of maintenance logbook could not be located during Council inspection. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter
B.	One loop fault appeared on the Fire Detection Control and Indicating Equipment (FDCIE). FRNSW were advised that the fault related to the unoccupied basement occupancy.	Councils' inspection revealed that the fault on the FDCIE is actually an earth fault. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter
C.	Multiple detectors in the basement level occupancy appeared to be heat detectors contrary to the requirements of Specification 20 of the National Construction Code 2022, Volume 1 Building Code of Australia (NCC).	No action required by the City. Councils' inspection revealed the detectors in the basement are actually multi-criteria detectors set to smoke detection in compliance with the NCC
D.	Multiple detectors were covered with cling wrap, latex gloves or similar material which will delay the detection of smoke within the basement.	No action required by the City. During Councils inspection officer noted one detector covered with a

Ref.	Issue (FRNSW Report dated 4 March 2024)	City response
	contrary to the requirements of Clause S20C4 of the NCC.	latex glove. The officer gave a verbal instruction warning to strata manager to remove the glove. The manager complied immediately with officer's instruction
E.	FRNSW are of the opinion that the basement smoke detection is not being maintained in accordance with Section 81 of the EPAR 21.	Corrective action letter sent (TRIM Ref: 2024/264930) to address fault associated with the smoke detection and alarm system
2C. Access and Egress		
A.	Exit lights within the basement level were not illuminated contrary to the requirements of Clause E4D5, E4D6 and E4D8 of the NCC.	Consistent with Council's findings on day of the inspection. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter
B.	A manual test of multiple emergency lights revealed they were non-operational contrary to the requirements of Clause E4D2 of the NCC.	Consistent with Council's findings on day of the inspection. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter

Ref.	Issue (FRNSW Report dated 5 April 2024)	City response
1. Essential Fire Safety Measures		
1A.	Maintenance – Clause 81 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (the DCFS Regulation) requires that an Essential Fire Safety Measure must be maintained to a standard no less than when it was first installed. At the time of the inspection the following was noted:	
A.	Fire Detection Control and Indicating Equipment (FDCIE) – An 'Earth Fault" was displayed on the FDCIE. At the time of the inspection, management were advised of the issue with the FDCIE and agreed to engage a Service Technician to rectify the fault. A follow up inspection was carried out by FRNSW on 26 March 2024, confirming that the fault had been removed and the system had been returned to normal.	Councils' inspection revealed that an Earth Fault was displayed on the FDCIE. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter
B.	The maintenance logbook for the Smoke Detection and Alarm System, showed that the last routine servicing of the system was on 25 October 2023, indicating that the system is not being inspected and tested on a monthly basis.	Maintenance logbook could not be located during Council inspection. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter
1B.	Zone Block Plan – A Zone Block Plan was not provided at the Fire Brigade Panel, contrary to the requirements of Clause 3.10 of AS1670.1-2018.	This is consistent with Council's findings on day of the inspection. Corrective action letter sent (TRIM Ref: 2024/264930) to address this matter.
C**.**	Fire Hydrant System	
A.	The hydrant booster assembly is directly adjacent to the external wall of the building and is not separated from the building by a construction with a fire resistance rating of not less than FRL 90/90/90 for a distance of not less than 2m each side and 3m above the upper hose connections, contrary to the requirements of Clause 7.3 of AS2419.1-2005.	No action required by the City. Inspection verified the existing hydrant booster assembly was found to be compliant with the original installation standard after having been adjusted/partially upgraded to conform to Term 5.02 and 5.03 of the Fire Safety Order dated 29 August 2013 [Ref: FIRE/2013/10] Furthermore, Council's officer noted there is no requirement under the original installation standard for the booster assembly to be fire separated from the building

Ref.	Issue (FRNSW Report dated 5 April 2024)	City response
B.	Electrical/communication cabling and pipework was installed in the internal fire hydrant cabinets, as well as stored non-firefighting equipment, contrary to the requirements of Clause 3.6.1 of AS2419.1–2005.	In the process of being addressed/tested under Term M1.06,M1.07 of Fire Order Modification dated 1 June 2021 [Ref: FIRE/2013/10]
1D.	Annual Fire Safety Statement (AFSS) – Section 88 of the DCFS Regulation, requires the AFSS be updated annually. At the time of the inspection, the AFSS that was displayed was not up to date.	This is consistent with Council's findings on day of the inspection. However, the requirement to provide & display a current AFSS is suspended whilst the Fire Order is in place and fire safety systems are being rectified/upgraded in accordance with the Order & the City's procedures.
1E.	Sprinkler System - The premises has a rise in storeys of more than 4 and is not sprinkler protected, contrary to the requirements of Clauses E1D4 and E1D6 of the NCC.	No action required by the City. The premises was approved on the basis that its effective height was not more than 42 metres and was not required to be sprinkler protected. Furthermore, it is considered that the current fire upgrade under Fire Order dated 29 August 2013 [Ref: FIRE/2013/10] and Order Modification dated 1 June 2021 [Ref: FIRE/2013/10] will enable sufficient fire safety provisions for the building occupants

FRNSW is therefore of the opinion that there are inadequate provisions for fire safety within the building.

FRNSW Recommendations

FRNSW have made three recommendations within each of their reports. In general, FRNSW have requested that Council:

1. Inspect and appropriately address any other deficiencies identified on 'the premises' and require item 1 through to 2 of their report dated 4 March 2024 & item 1A to 1E of their report dated 5 April 2024 to be reviewed.

2. Recommends any fire hydrant system installed in accordance with the provisions of Ordinance 70 and Ministerial Specification 10 (or earlier) should be upgraded to meet the requirements of the current Australian Standard AS 2419.1 for an equivalent new building, as these older fire hydrant systems no longer meet the operational needs of FRNSW.

3. Advise them in writing of its determination in relation to this matter in accordance with the provisions of clause 17(4) of Schedule 5 of the Environmental Planning and Assessment Act 1979.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS:

~~Issue Order (NOI)~~	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	~~Continue to undertake compliance action in response to issued Council correspondence~~	Continue with compliance actions under the current Council Order & Corrective Action Letter	~~Other (to specify)~~

As a result of a site inspection undertaken by Council's investigation officers it is recommended that the building owners continue to comply with the terms of the existing Fire Safety Order issued under Schedule 5 of the Environmental Planning and Assessment Act, 1979 and comply with requirements of Corrective Action Letter to address the fire safety deficiencies identified by FRNSW and Council's building officer.

Follow-up compliance inspections are currently being undertaken and will continue to be undertaken by a Council investigation officer to ensure already identified fire safety matters are suitably addressed and that compliance with the terms of Councils existing Fire Safety Order + Corrective Action Letter and the recommendations of FRNSW occur.

That the Commissioner of FRNSW be advised of Council's actions and determination.

Referenced/Attached Documents:

2024-263625-01	Copy of current Fire Safety Order
2024/263625-02	Copy of Order Modification
2024/263625-03	Corrective action letter

Trim Reference: 2024/263625 **CSM reference No#:** 3155337

File Ref. No: BFS24/198 (33101)
TRIM Ref. No: D24/26336
Contact: Inspector Paul Scott

4 March 2024

General Manager
City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear Sir/Madam,

Re: INSPECTION REPORT
THE REGENT
359-361 PITT STREET SYDNEY ("the premises")

Fire and Rescue NSW (FRNSW) received correspondence concerning the adequacy of the provision for fire safety in connection with 'the premises'.

The correspondence stated in part that:

- *The Smoke Detection and Alarm System (SDAS) did not activate the building occupant warning system or the alarm signalling equipment.*

Pursuant to Section 9.32(1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Authorised Fire Officers from the Fire Safety Compliance Unit of FRNSW inspected 'the premises' on 23 February 2024.

On behalf of the Commissioner of FRNSW, the comments in this report are provided under Section 9.32(4) and Schedule 5, Part 8, Section 17(1) of the EP&A Act.

The items listed in the comments of this report are based on the following limitations:

- A general overview of the building was obtained without using the development consent conditions or approved floor plans as a reference.
- Details of the Provisions for Fire Safety and Fire Fighting Equipment are limited to a visual inspection of the parts in the building accessed and the fire safety measures observed at the time.

COMMENTS

Following discussions with the attending fire crews, it would appear that there may not have been sufficient smoke reach the smoke detector in the common area in order to activate the additional fire safety measures detailed in the fire safety complaint.

The following items were identified during the inspection:

A letter, dated June 2023, was displayed in the display cabinet in the entry foyer which indicated Council have a fire safety order issued against the Owners of the Premises.

The basement level part did not appear to have been occupied for a substantial period and had the aroma of mould. Due to the black ceiling, wall, and floor, FRNSW were unable to determine the extent of mould in the basement.

1. Certification

   1A. The Annual Fire Safety Statement (AFSS) displayed at the building was dated 2017. A current AFSS was not displayed nor has FRNSW received a copy of the statement contrary to the requirements of Section 89 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (EPAR 21).

2. Essential Fire Safety Measures

   2A. Fire Hydrant System

      A. The minimum standard of performance on the 2017 AFSS states fire hydrant system is installed to Ordinance 70 Ministerial Spec. 10. Visually, the hydrant system meets the AFSS.

      B. FRNSW are of the opinion that the fire hydrant pumpset is designed to achieve 275 kPa at the most hydraulically disadvantaged hydrant.

      C. The fire brigade boost assembly comprises two boost inlet connections. No feed hydrants provided.

   2B. Smoke Detection and Alarm System (SDAS)

      A. The maintenance logbook was last updated 25 October 2023.

      B. One loop fault appeared on the Fire Detection Control and Indicating Equipment (FDCIE). FRNSW were advised that the fault related to the unoccupied basement occupancy.

      C. Multiple detectors in the basement level occupancy appeared to be heat detectors contrary to the requirements of Specification 20 of the National Construction Code 2022, Volume 1 Building Code of Australia (NCC).

      D. Multiple detectors were covered with cling wrap, latex gloves or similar material which will delay the detection of smoke within the basement. contrary to the requirements of Clause S20C4 of the NCC.

E. FRNSW are of the opinion that the basement smoke detection is not being maintained in accordance with Section 81 of the EPAR 21.

2C. Access and Egress

A. Exit lights within the basement level were not illuminated contrary to the requirements of Clause E4D5, E4D6 and E4D8 of the NCC.

B. A manual test of multiple emergency lights revealed they were non-operational contrary to the requirements of Clause E4D2 of the NCC.

FRNSW believes that there are inadequate provisions for fire safety within the building.

RECOMMENDATIONS

FRNSW recommends that Council:

a. Review items 1 to 2 of this report and conduct an inspection.

b. FRNSW recommends any fire hydrant system installed in accordance with the provisions of Ordinance 70 and Ministerial Specification 10 (or earlier) should be upgraded to meet the requirements of the current Australian Standard AS 2419.1 for an equivalent new building, as these older fire hydrant systems no longer meet the operational needs of FRNSW.

c. Address any other deficiencies identified on "the premises".

Please be advised that Schedule 5, Part 8, Section 17(2) requires any report or recommendation from the Commissioner of FRNSW to be tabled at a Council meeting. This matter is referred to Council as the appropriate regulatory authority. FRNSW awaits the Council's advice regarding its determination under Schedule 5, Part 8, Section 17 (4) of the EP&A Act.

Please do not hesitate to contact Inspector Paul Scott of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if there are any questions or concerns about the above matters. Please refer to file reference BFS24/198 (33101) regarding any correspondence concerning this matter.

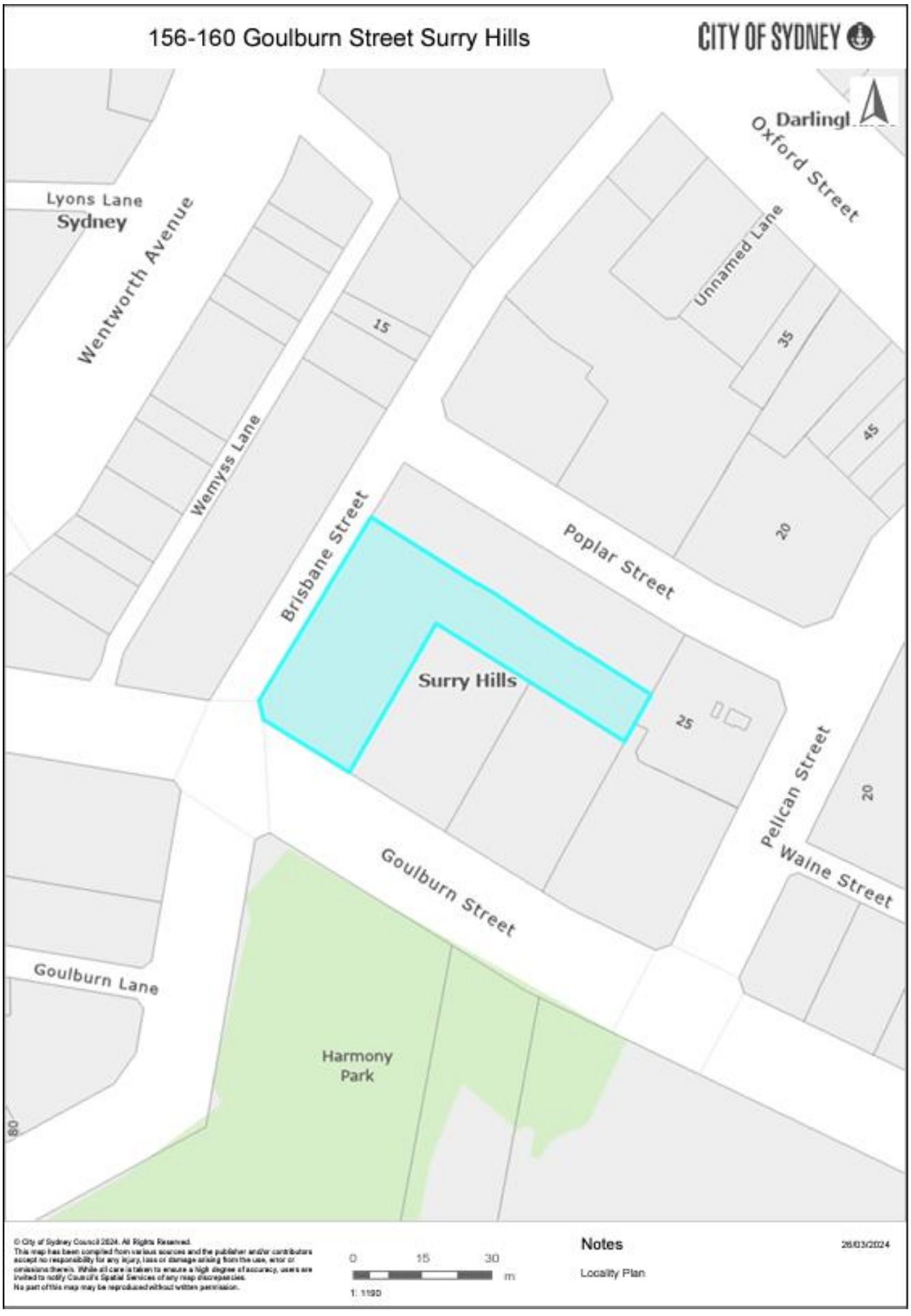
Yours faithfully



Paul Scott
Team Leader
Fire Safety Compliance Unit

Attachment C

Inspection Report
156-160 Goulburn Street, Surry Hills


156-160 Goulburn Street Surry Hills
CITY OF SYDNEY
Darlingl
Oxford Street
Lyons Lane
Sydney
Wentworth Avenue
Unnamed Lane
15
35
45
Wemyss Lane
Brisbane Street
Poplar Street
20
Surry Hills
25
Pelican Street
20
Goulburn Street
Waine Street
Goulburn Lane
Harmony
Park
60
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Notes
Locality Plan
28/03/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: CSM 3154846 **Officer: B. Badyari** **Date: 27 March 2024**

Premises: 156-160 Goulburn Street, Surry Hills

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) in relation to the subject premises with respect to matters of fire safety.

The premises is irregular in shape, with an area of 1768m^2. Primary street frontage is to Goulburn Street and Brisbane Street. A sixteen (16) storey residential/commercial building is contained within the site.

The primary use of the building is commercial with basement carpark, ground floor retail tenancies and fifteen (15) upper floors used for residential flat building.

An inspection of the premises was undertaken in the presence of the building manager which revealed that there were no significant fire safety issues occurring within the building.

The premises are equipped with numerous fire safety systems (both active and passive) that would provide adequate provision for fire safety for occupants in the event of a fire. A fire safety statement for the premises has been provided and is displayed prominently within the building, as required by the Environmental Planning and Assessment Regulation 2000.

Council investigations have revealed that whilst there remains several fire safety "maintenance and management" works to attend to, including warning and operational signage, self-closing doors and faults displayed on the fire indicating panel, the overall fire safety systems provided within the subject premises are considered adequate in the circumstances.

It is considered that the above fire safety works are of a degree which can be addressed by routine preventative and corrective maintenance actions undertaken by the owner's fire service contractor(s) through written instruction from Council.

Observation of the external features of the building did not identify the existence of any potential combustible composite cladding on the façade of the building.

Chronology:

Date	Event
27/02/2024	FRNSW correspondence received regarding premises Belvedere 160 Goulburn Street Surry Hills, in relation to a complaint and inspection in January 2024
25/03/2024	A review of City records shows: - The site comprises the 'Belvedere' a 16-storey apartment tower with basement carpark, ground floor retail and upper 15 storey of residential flat building. -The fire safety schedule for the premises contains eleven (11) fire safety measures, including an automatic fire detection system, automatic fire suppression

Date	Event
	(sprinkler) system carpark and ground floor only, hydrant system, and other fire safety measures typical for a high-rise building - A compliant fire safety statement dated 27 September 2023 has been provided certifying 11 fire safety measures
26/03/2024	An inspection of the subject premises with the building manager revealed: -FIP had 22 faults displayed, however, the owner is in the process of removing all the faults from panel; -EP&A warning signs missing on fire doors on ground level; -fire exit door on level 16 not self-closing; -other fire safety measures adequately maintained -fire safety statement prominently displayed -exits clear and unobstructed
27/03/2024	Corrective action letter issued 2024/204702

FIRE AND RESCUE NSW REPORT:

References: [BFS22/5509 (24499); D24/024485]
Fire and Rescue NSW conducted an inspection of the subject premises after receiving complaint in relations to mobility issues from upper level of the building.

Issues

The report from FRNSW detailed a number of issues, in particular noting:

Issue	City response
1. Egress 1A. the discharge doors of the fire-isolated exits to open space were noted as being clear and incorporating the required warning and operational signage.	To be rectified through corrective action letter
2. Essential Fire Safety Measures 2A. Access to the fire control room is not readily available to FRNSW, contrary to the intent of Clause 10.5.1 FRNSW's fire safety guideline. In this regard, the door providing access to the fire control room was not operable with a 003 key.	Rectified, inspection revealed that owner has replaced the lock with 003 key requirements.
2B. the fire hydrant booster assembly could not be accessed because the lock could not be opened with a 003 key.	Rectified, inspection revealed that owner has replace the lock with 003 key requirements.

FRNSW is therefore of the opinion that there are inadequate provisions for fire safety within the building.

FRNSW Recommendations

FRNSW have made recommendations within their report:

a. Review item no. 1 and 2 of this report and conduct an inspection.

b. Address any other deficiencies identified on the premises.

This matter is referred to Council as the appropriate regulatory authority. FRNSW therefore awaits Council's advice regarding its determination in accordance with Schedule 5, Part 8, Section 17 (4) of the *Environmental Planning and Assessment Act 1979*.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS

~~Issue Order (NOI)~~	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	Continue to undertake compliance action in response to issued Council correspondence	~~Continue with compliance actions under the current Council Order~~	~~Other (to specify)~~

As a result of site inspection undertaken by Council's investigation officers it was determined to issue the owners of the building a compliance letter of instruction to rectify the identified fire safety deficiencies noted by Council and FRNSW.

The above correspondence requests building management to carry out remedial works to existing fire systems to cause compliance with required standards of performance.

Follow-up compliance inspections are currently being undertaken and will continue to be undertaken by a Council investigation officer to ensure already identified fire safety matters are suitably addressed and that compliance with the terms of Councils correspondence and the recommendations of FRNSW occur.

It is recommended that Council not exercise its powers to give a fire safety order at this time.

Referenced/Attached Documents:

2024/166283	Fire & Rescue NSW letter dated 27 February 2024

Trim Reference: 2024/205078 **CSM reference No: 3154846**

File Ref. No: BFS22/5509 (24499)
TRIM Ref. No: D24/024485
Contact: Ryan Maestri

27 February 2024

General Manager
Council of the City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear Sir / Madam

Re: INSPECTION REPORT
BELVEDERE
160 GOULBURN STREET, SURRY HILLS ("the premises")

Fire and Rescue NSW (FRNSW) received correspondence concerning the adequacy of the provision for fire safety in connection with 'the premises'.

The correspondence stated that:

- *In January I got a severe injury to my right knee (in addition to not being able to use my right arm) which means I cannot go down stairs and I live on the 11th floor. In the event of a fire you cannot use the elevator; and it is physically impossible for me to descend or ascend flights of stairs (I struggle going up and down 4 steps), I have chronic pain and my knee is bone on bone.*

- *As there were a number of residents last year with mobility issues I kept flagging each evacuation that I was part of ,that there were residents that could not 'escape' and I asked the fire teams what could be done to ensure they were not burnt if a real fire; they said (in front of owner/occupiers) to me that the building manager/strata needed to put a list of the names, unit numbers and floors of up to 6 units of those who could not physically evacuate so if there was a real threat the fire teams could do a welfare check and get them out. This list they said is to be placed inside the control room where they go which apparently shows them which unit/floor the 'threat' is on so they can see and action. This has never happened.*

Pursuant to Section 9.32(1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Authorised Fire Officers from the Fire Safety Compliance Unit of FRNSW inspected 'the premises' on 16 January 2024.

On behalf of the Commissioner of FRNSW, the comments in this report are provided under Section 9.32(4) and Schedule 5, Part 8, Section 17(1) of the EP&A Act.

The items listed in the comments of this report are based on the following limitations:

- A general overview of the building was obtained without using the development consent conditions or approved floor plans as a reference.
- Details of the Provisions for Fire Safety and Fire Fighting Equipment are limited to a visual inspection of the parts in the building accessed and the fire safety measures observed at the time.

COMMENTS

At the time of the inspection, access to the internal parts of the building was not available. FRNSW is, therefore, unable to provide any advice regarding the evacuation procedures for the building. It would be at the Council's discretion to investigate whether the evacuation procedures for the building comply with the development consent or present a fire safety issue.

The following items were identified during the inspection:

1. Egress

   1A. The discharge doors of the fire-isolated exits to open space were noted as being clear and incorporating the required warning and operational signage per Clause D3D28 of the NCC.

2. Essential Fire Safety Measures

   2A. Access to the fire control room is not readily available to FRNSW personnel, contrary to the intent of Clause 10.5.1 FRNSW's Fire safety guideline – Access for fire brigade vehicles and firefighters dated 4 October 2019. In this regard, the door providing access to the fire control room was not operable with a 003 key.

   2B. The fire hydrant booster assembly could not be accessed because the lock could not be opened with a 003 key. Hence, it is incompatible with fire brigade operational procedures per Clause 7.9.1 of AS 2419.1-2005.

FRNSW believes that there are inadequate provisions for fire safety within the building.

RECOMMENDATIONS

FRNSW recommends that the Council:

a. Review items 1 and 2 of this report and conduct an inspection.

b. Address any other deficiencies identified on "the premises".

Please be advised that Schedule 5, Part 8, Section 17(2) requires any report or recommendation from the Commissioner of FRNSW to be tabled at a Council meeting. This matter is referred to the Council as the appropriate regulatory authority. FRNSW awaits the Council's advice regarding its determination under Schedule 5, Part 8, Section 17 (4) of the EP&A Act.

Please do not hesitate to contact Ryan Maestri of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if there are any questions or concerns about the above matters. Please refer to file reference BFS22/5509 (24499) regarding any correspondence concerning this matter.

Yours faithfully



Ryan Maestri
Senior Building Surveyor
Fire Safety Compliance Unit

Attachment D

Inspection Report
405-411 Sussex Street, Haymarket


405-411 Sussex Street, Haymarket
CITY OF SYDNEY
Chinese Garden of Friendship
Tumbalong Park
Pier Street
Little Pier Street
75
Trades Hall
Sydney
380
Eagar Lane
20
Goulburn Street
15
Factory Street
Harbour Street
Kimber Lane
Dixon Street
Sussex Street
George Street
10
70
Little Hay Street
Haymarket
Kimber Lane
90
100
Chinatown Light Rail
Hay Street
Capitol Square Light Rail
Paddy's Markets
Thomas Street
Haymarket Library
Parker Lane
Notes
0
25
50
m
1: 1796
4/04/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: CSM 3162433 **Officer: G. Scotton** **Date: 4 April 2024**

Premises: 405-411 Sussex Street, Haymarket

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) on 22 March 2024 in relation to the premises with respect to matters of fire safety.

The premises contains an eight (8) storey commercial building know as *Chinatown Central*, comprising a basement parking level, a lower ground floor loading dock, ground floor level retail shops, levels 1/2 restaurants, level 2-7 including office uses, with plant rooms at roof level. A plaque at the entrance of the building indicates it was completed in the year 2010.

An inspection of the premises undertaken by a Council investigation officer in the presence of the building manager, revealed there were no significant fire safety issues occurring within the building.

The premises are equipped with numerous fire safety systems, both active and passive, that would provide adequate provision for fire safety for occupants in the event of a fire. The annual fire safety statement is current and displayed within the building.

Observation of the external features of the building identified the existence of potential combustible composite cladding on the façade of the building. The City's cladding compliance team have requested the building owners provide an expert assessment of the external cladding to determine the risk posed.

Chronology:

Date	**Event**
22/03/2024	FRNSW correspondence received concerning correspondence dated 26/1/24 relating to fire safety at the premises
28/03/2024	A review of City records found: -A current fire safety statement dated 17/12/2023 provided for the premises -The fire safety schedule for the premises contains thirty-seven (37) fire safety measures, including: automatic fail safe devices to operate exits in fire alarm mode, an automatic fire detection and alarm system, automatic fire suppression system, building occupant warning system, emergency warning and intercommunication system, pressurising systems, and fire engineered performance solutions relating to a number of fire safety measures -Building completion records in 2010
28/03/2024	FRNSW correspondenceraised with strata manager, who subsequently responded to advise that arrangements are/will be put in place to address the issues
16/04/2024	Inspection of premises revealed: -Fire safety measures as per fire safety schedule generally appeared adequately maintained, subject to some routine maintenance already scheduled and/or agreed to be carried out

	-Maintenance logbooks for fire safety measures were found to be onsite and up to date -Fire doors were readily openable self-closing, self-latching, and were not chocked open -Paths of travel to exits, and exits were unobstructed, with required warning notices in place
18/04/2024	Correspondence was issued to the owner requiring maintenance of fire safety measures (2024/198157-12) as outlined in the issues table on page 4 of this report.
3 June 2024	A reinspection is to be conducted the week ending 7 June 2024. Failure to conduct the maintenance in a reasonable timeframe may lead to the issue of one or more penalty notices

FIRE AND RESCUE NSW REPORT:

References: [BFS24/387; 2024/198157-10]

Fire and Rescue NSW conducted an inspection of the subject premises after receiving correspondence alleging blocked/locked exits and an emergency warning system not operational.

Issues

The report from FRNSW detailed the following alleged issues:

Ref.	Issue	City response
1.	**Essential Fire Safety Measures**	
1A.	Automatic Fire Detection and Alarm System	
A.	The Fire Brigade Panel (FBP) indicated a total of 15 isolations and 30 faults relating to the automatic fire detection and alarm system.	-An inspection revealed faults/isolations, a number relating to vacant tenancies -Building manager advised he is awaiting rectification by the fire safety practitioner, expected shortly - correspondence requires rectification of this item
1B.	Automatic Fire Suppression System (Sprinklers)	
A.	The sprinkler control valve assemblies were not readily accessible by FRNSW, contrary to the requirements of clause 8.1.1 of AS2118.1-2017. In this regard, access to the control assemblies required travel through a locked door to a fire-isolated passageway that did not incorporate a 003 keyed lock.	-An inspection revealed access by 003 key -Signage present but requires some maintenance - correspondence requires rectification of this item
B.	The sprinkler booster assembly and the fire hydrant booster assembly are contained within the same enclosure. The signage provided does not clearly distinguish between the location of the sprinkler booster assembly with relation to the fire hydrant booster assembly within the enclosure, contrary to the intent of Clause 4.14.1 of AS2118.1-2017.	An inspection revealed hydrant/sprinkler boosters in same cabinet, but this is not considered a serious fire safety risk - correspondence requires rectification of this item
1C.	Emergency Warning and Intercommunication System (EWIS)	
A.	The EWIS Panel indicated an audio line fault on level 1 relating to the EWIS.	An inspection revealed one fault in one zone (level 1) -Building manager advised he is awaiting rectification by the fire safety practitioner, expected shortly

Ref.	Issue	City response
		- correspondence requires rectification of this item
1D.	Fire Hydrant System	
A.	Signage indicating the test pressure was not located at the fire hydrant booster assembly, contrary to the requirements of Clause 11.3.4.1 of AS2419.1-2021.	-An inspection revealed signage is provided but of small font -Building manager agreed to address these items - correspondence requires rectification of items
B.	Signage indicating the number of storeys and booster pressure was not located at the fire hydrant booster assembly, contrary to the requirements of Clause 11.3.4.2 of AS2419-2021.	-An inspection revealed signage is provided but of small font* -Building manager agreed to address these items - correspondence requires rectification of items
C.	The hydrant booster assembly and sprinkler booster assembly are contained within the same enclosure. The signage provided does not clearly distinguish between the location of fire hydrant booster assembly with relation to the sprinkler booster assembly within the enclosure, contrary to the intent of Clause 11.3.1 of AS2419.1-2021.	-An inspection revealed hydrant/sprinkler boosters in same cabinet, but this is not considered a serious fire safety risk - correspondence requires rectification of this item
D.	The doors to the fire hydrant cabinet are not capable of being held in the open position, contrary to the requirements of Clause 11.2.2 of AS2419.1-2021.	An inspection revealed cabinet doors cannot be held open. -This requirement relates to the latest Australian Standard. -Matter is considered a technical non-compliance, and not a serious risk to fire safety which is prerequisite to service of any Notice of intended fire safety Order -Building manager agreed to address this item - correspondence requires rectification of items
2.	**Egress**	
2A.	All paths of travel and exit doors on level 2 were clear at the time of the inspection. Notwithstanding, the tenants were spoken to about the importance of keeping paths of travel and exits clear at all times.	An inspection revealed: -No egress pathways obstructed at the time of inspection -No action required on this item

Ref.	Issue	City response
2B.	The exit door leading from the first-floor kitchen area to the foyer was blocked on both sides with store objects that prevented access to the door and prevented the door from fully opening. The objects were cleared in the presence of FRNSW officers during the inspection and the tenants spoken to about the importance of keeping exits clear.	An inspection revealed: -Exit doors found maintained/readily openable -No action required on this item
2C.	The latch to the left-hand leaf of the double doors leading from the level 1 restaurant to the lift lobby area was noted as being damaged. A bike chain was also noted as being padlocked to one of the door handles. Restaurant staff advised that the bike chain is used to lock the doors after hours due to the damaged latch. Although the staff advised that the doors are only locked in this manner after the restaurant is closed and does not contain members of the public, such a method of locking the doors does not comply with Clause D2D26 of the NCC and may impede the evacuation of staff in an emergency.	-An inspection revealed: -Exit doors found maintained/readily openable -No action required on this item
2D.	Egress from the lift lobby on level 7 is not available without passing through another sole occupancy unit (SOU), contrary to the requirements of Clause D2D3 of the NCC.	-An inspection revealed: -No egress pathways obstructed at the time of inspection -No action required on this item
2E.	The fire-isolated stairs were not provided with re-entry onto floors. Contrary to the requirements of Clause D3D27 of the NCC. In this regard, the doors appeared to be provided with fail-safe devices as per Subclause (2) of D3D27, however:	-An inspection revealed: -Doors on automatic fail safe as per fire safety schedule -No action required on this item
A.	Re-entry was not available on at least every fourth storey and appropriate signage was not provided.	An inspection revealed: -Doors on automatic fail safe as per fire safety schedule -No action required on this item
B.	Visual alarm devices were provided, however, the switches to operate these devices were damaged and non-operation on some levels.	-An inspection revealed: -Exit doors found maintained/readily openable -Doors on automatic fail safe as per fire safety schedule -Building manager agreed to remove redundant switches

Ref.	Issue	City response
		- correspondence requires rectification of this item
3.	**Compartmentation and Separation**	
3A.	The fire door providing access to the fire-isolated stairs located in the vicinity of tenancy 601 on level 6 becomes wedged against the floor when opened, preventing it from self-closing contrary to C4D9 of NCC and AS1905.1-2015.	An inspection revealed: -Exit doors found maintained/readily openable -Doors on automatic fail safe as per fire safety schedule -Fire door minor scraping on the floor, but otherwise fully self-closing and latching - correspondence requires rectification of this item
4.	**Maintenance**	
4A.	The maintenance logbook for the automatic fire detection and alarm system indicated that monthly maintenance had not been undertaken, with the last maintenance inspection being completed in October 2023, contrary to the requirements of Clause 6.4 of AS1851-2012. A lack of regular maintenance increases the likelihood that the system will fail to perform to the standard of performance required by the Fire Safety Schedule for the building, contrary to the requirements of section 81 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (EPAR 2021).	An inspection revealed: The annual fire safety statement is current and displayed within the building. Therefore, the system appears adequately maintained. No action required on this item.
4B.	A number of portable fire extinguishers were tagged as having last been maintained in November 2022, contrary to the requirements of Clause 10.4 of AS1851-2012. A lack of regular maintenance increases the likelihood that the portable fire extinguishers will fail to perform the standard of performance required by the fire Safety Schedule for the building, contrary to the requirements of section 81 of the EPAR 2021.	-An inspection revealed extinguishers are provided with current maintenance date tags, and appear adequately maintained -No action required on this item

FRNSW Recommendations

The officer of Fire & Rescue NSW recommended that Council review the items in his report, that Council conduct an inspection of the premises, and address any other deficiencies identified at the premises.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS:

~~Issue Order (NOI)~~	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	Continue to undertake compliance action in response to issued Council correspondence	~~Continue with compliance actions under the current Council Order~~	~~Other (to specify)~~

As a result of site inspection undertaken by Council's investigation officer it was determined to issue the owners of the building a compliance letter of instruction to rectify the identified fire safety deficiencies noted by Council and FRNSW.

The above correspondence has requested that building management carry out remedial works to existing fire systems to cause compliance with required standards of performance.

Follow-up compliance inspections are currently being undertaken and will continue to be undertaken by a Council investigation officer to ensure that identified fire safety matters are suitably addressed and that compliance with the terms of Council's correspondence and the recommendations of FRNSW occur.

It is recommended that Council not exercise its powers to give a fire safety order.

That the Commissioner of FRNSW be advised of Council's actions and determination.

Referenced/Attached Documents:

2024/198157-10	Fire & Rescue NSW letter dated 22/3/24

Trim Reference: 2024/198157-09 **CSM reference No:** 3162433

File Ref. No: BFS24/387 (33290)
TRIM Ref. No: D24/02863
Contact: Ryan Maestri

22 March 2024

General Manager
Council of the City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear Sir / Madam

Re: INSPECTION REPORT
CHINATOWN CENTRE
405-411 SUSSEX STREET, HAYMARKET ("the premises")

Fire and Rescue NSW (FRNSW) received correspondence on 26 January 2024 concerning the adequacy of the provision for fire safety in connection with 'the premises'.

The correspondence stated that:

- *EWIS system did not operate even though the system was in 'Auto' mode.*
- *Fire exit from kitchen to foyer area on level 2 was blocked with boxes and the door screwed closed.*
- *Another marked fire exit on level two was secured with a thick gauge bike chain and lock to prevent ingress and egress.*
- *Internal fire escape doors in kitchen level two were chocked open with foam produce boxes.*

Pursuant to Section 9.32(1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Authorised Fire Officers from the Fire Safety Compliance Unit of FRNSW inspected 'the premises' on 7 February 2024.

On behalf of the Commissioner of FRNSW, the comments in this report are provided under Section 9.32(4) and Schedule 5, Part 8, Section 17(1) of the EP&A Act.

The items listed in the comments of this report are based on the following limitations:

- A general overview of the building was obtained without using the development consent conditions or approved floor plans as a reference.
- Details of the Provisions for Fire Safety and Fire Fighting Equipment are limited to a visual inspection of the parts in the building accessed and the fire safety measures observed at the time.

COMMENTS

The following items were identified during the inspection:

1. Essential Fire Safety Measures

1A. Automatic Fire Detection and Alarm System

A. The Fire Brigade Panel (FBP) indicated a total of 15 isolations and 30 faults relating to the automatic fire detection and alarm system.

1B. Automatic Fire Suppression System (Sprinkler)

A. The sprinkler control valve assemblies were not readily accessible by FRNSW, contrary to the requirements of Clause 8.1.1 of AS 2118.1-2017. In this regard, access to the control assemblies required travel through a locked door to a fire-isolated passageway that did not incorporate a 003 keyed lock.

B. The sprinkler booster assembly and the fire hydrant booster assembly are contained within the same enclosure. The signage provided does not clearly distinguish between the location of the sprinkler booster assembly with relation to the fire hydrant booster assembly within the enclosure, contrary to the intent of Clause 4.14.1 of AS 2118.1-2017.

1C. Emergency Warning and Intercommunication System (EWIS)

A. The EWIS Panel indicated an audio line fault on level 1 relating to the EWIS.

1D. Fire Hydrant System

A. Signage indicating the test pressure was not located at the fire hydrant booster assembly, contrary to the requirements of Clause 11.3.4.1 of AS 2419.1-2021.

B. Signage indicating the number of storeys and boost pressure was not located at the fire hydrant booster assembly, contrary to the requirements of Clause 11.3.4.2 of AS 2419.1-2021.

C. The fire hydrant booster assembly and the sprinkler booster assembly are contained within the same enclosure. The signage provided does not clearly distinguish between the location of the fire hydrant booster assembly with relation to the sprinkler booster assembly within the enclosure, contrary to the intent of Clause 11.3.1 of AS 2419.1-2021.

D. The doors to the fire hydrant cabinet are not capable of being held in the open position, contrary to the requirements of Clause 11.2.2 of AS 2419.1-2021.

2. Egress

2A. All paths of travel and exit doors on level 2 were clear at the time of the inspection. Notwithstanding, the tenants were spoken to about the importance of keeping paths of travel and exits clear at all times.

2B. The exit door leading from the first floor kitchen area to the foyer was blocked on both sides with stored objects that prevent access to the door and prevented the door from fully opening. The objects were cleared in the presence of FRNSW officers during the inspection and the tenants spoken to about the importance of keeping exits clear.

2C. The latch to the left-hand leaf of the double doors leading from the level 1 restaurant to the lift lobby area was noted as being damaged. A bike chain was also noted as being padlocked to one of the door handles. Restaurant staff advised that the bike chain is used to lock the doors after hours due to the damaged latch. Although the staff advised that the doors are only locked in this manner after the restaurant is closed and does not contain members of the public, such a method of locking the doors does not comply with Clause D2D26 of the NCC and may impede the evacuation of staff in any emergency.

2D. Egress from the lift lobby on level 7 is not available without passing through another sole-occupancy unit (SOU), contrary to the requirements of Clause D2D3 of the NCC.

2E. The fire-isolated stairs were not provided with re-entry onto floors, contrary to the requirements of Clause D3D27 of the NCC. In this regard, the doors appeared to be provided with fail-safe devices as pre Subclause (2) of D3D27, however:

A. Re-entry was not available on at least every fourth storey and appropriate signage was not provided.

B. Visual alarm devices were provided, however, the switches to operated these devices were damaged and non-operation on some levels.

3. Compartmentation and Separation

3A. The fire door providing access to the fire-isolated stairs located in the vicinity of tenancy 601 on level 6 becomes wedged against the floor when opened, preventing it from self-closing contrary to C4D9 of the NCC and AS 1905.1-2015.

4. Maintenance

4A. The maintenance logbook for the automatic fire detection and alarm system indicated that monthly maintenance had not been undertaken, with the last maintenance inspection being completed in October 2023, contrary to the requirements of Clause 6.4 of AS 1851-2012. A lack of regular maintenance increases the likelihood that the system will fail to perform to the standard of performance required by the Fire Safety Schedule for the building, contrary to the requirements of Section 81 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (EPAR 2021).

4B. A number of portable fire extinguishers were tagged as having last been maintained in November 2022, contrary to the requirements of Clause 10.4 of AS 1851-2012. A lack of regular maintenance increases the likelihood that the portable fire extinguishers will fail to perform to the standard of performance required by the Fire Safety Schedule for the building, contrary to the requirements of Section 81 of the EPAR 2021.

FRNSW believes that there are inadequate provisions for fire safety within the building.

FIRE SAFETY ORDER NO. 1

Authorised Fire Officers' of FRNSW issued a Notice No. **1**, dated 19 March 2024, under the provisions of Section 9.34 of the EP&A Act. In this regard, Council is not presently required to act on item no. 1A of this report.

Under Schedule 5, Part 6, Section 12 of the EP&A Act, a copy of the Order is attached for your information. FRNSW will conduct further inspections of the building to assess compliance with the terms of this Order and advise Council accordingly.

RECOMMENDATIONS

FRNSW recommends that Council:

a. Review items 1 to 4 of this report and conduct an inspection.

b. Address any other deficiencies identified on "the premises".

Please be advised that Schedule 5, Part 8, Section 17(2) requires any report or recommendation from the Commissioner of FRNSW to be tabled at a Council meeting. This matter is referred to Council as the appropriate regulatory authority. FRNSW awaits the Council's advice regarding its determination under Schedule 5, Part 8, Section 17 (4) of the EP&A Act.

Please do not hesitate to contact Ryan Maestri of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if there are any questions or concerns about the above matters. Please refer to file reference BFS24/387 (33290) regarding any correspondence concerning this matter.

Yours faithfully



Ryan Maestri
Senior Building Surveyor
Fire Safety Compliance Unit

Attachments: Appendix 1 – Copy of Fire Safety Order

Appendix 1 – Copy of Fire Safety Order

OFFICIAL

File Ref. No: BFS24/387 (33290)
TRIM Ref. No: D24/032866
Contact: Ryan Maestri

19 March 2024

Fasako Pty Ltd
'Chinatown Centre'
Level 4 Suite 401
405-411 Sussex Street
SYDNEY NSW 2000

Dear Sir / Madam

Re: FIRE SAFETY ORDER – ORDER NO.1
CHINATOWN CENTRE
405-411 SUSSEX STREET, HAYMARKET('the premises')

Following the Notice of Intention to give a Proposed Fire Safety Order – Order No.1 ("the Notice"), dated 7 March 2024 issued on "the premises", Fire and Rescue NSW (FRNSW) has yet to receive representations in response to the Notice.

Given the circumstances of the fire safety concern and under Schedule 5, Part 7 (Section 14 and Section15) of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*, FRNSW has determined to issue the Fire Safety Order – Order No.1 based on the information available. I have attached a copy of the FRNSW Fire Safety Order – Order No.1 ("the Order") under Section 9.34 of the EP&A Act.

A copy of the Order will be forwarded to the Council of the City of Sydney, under Schedule 5, Part 6, Section 12 of the EP&A Act. Authorised Fire Officers will conduct inspections to assess compliance with the Order.

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Please do not hesitate to contact Ryan Maestri of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if there are any questions or concerns about the above matters. Please ensure that you refer to file reference BFS24/387 (33290) regarding any correspondence concerning this matter.

Yours faithfully,



Mark Knowles
Senior Building Surveyor
Fire Safety Compliance Unit

CC: Chris Marco
Building Operations Manager
Stanton Hillier Parker
christopher.marco@hillierparker.com

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NSW GOVERNMENT | FIRE + RESCUE

Fire Safety Order
ORDER No. 1

Under the *Environmental Planning and Assessment Act 1979 (EP&A Act)*
Part 9 Implementation and Enforcement – Division 9.3 Development Control Orders
Fire Safety Orders in accordance with the table to Part 2 - Schedule 5.
Give an Order in accordance with Section 9.34(1)(a)

I, **Mark Knowles** (name) **Senior Building Surveyor** (rank) **904279** (number)

being an authorised Fire Officer within the meaning of Schedule 5, Part 8, Section 16 of the *Environmental Planning and Assessment Act 1979*, and duly authorised for the purpose, I hereby order you

Fasako Pty Ltd (name of the person whom Order is served) **Owner** (position, i.e. owner, building manager)

with respect to the premise

CHINATOWN CENTRE
405-411 SUSSEX STREET, HAYMARKET ("the premises")
(name/address of premises to which Order is served)

to do or refrain from doing the following things:

1. Undertake all required works to the automatic fire detection and alarm system so that:
    a. All faults indicated on the Fire Brigade Panel (FBP) are rectified.
    b. All isolations indicated on the FBP are removed.
2. Undertake all required works to the Alarm Signalling Equipment (ASE) to so that there are no faults with the system.
3. Provide certification from the fire safety servicing company confirming that the Building Occupant Warning System (BOWS) operates correctly throughout all areas of the building.

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The reasons for the issue of this Fire Safety Order – Order No. 1 are:

1. The safety of persons in the event of a fire is not ensured or promoted in the event of a fire as a result of the following:
    a. At the time of the inspection on 7 February 2024, the building was occupied.
    b. At the time of the inspection on 7 February 2024:
        i. The FBP indicated a total of 30 faults relating to the automatic fire detection and alarm system.
        ii. The FBP indicated a total of 15 isolations relating to the automatic fire detection and alarm system.
        iii. The ASE indicated a fault within the system.
    c. Concerns were raised by FRNSW personnel indicating that the BOWS did not operate throughout all areas of the building upon a recent activation of the automatic fire detection and alarm system.
    d. Given the issues noted above, it cannot be ensured that the automatic fire detection and alarm system will operate correctly in the event of a fire.
    e. If the automatic fire detection alarm system does not operate correctly to provide early warning of a fire to occupants, the safety of occupants will likely be compromised.
    f. If the ASE does not operate correctly to initiate a response from FRNSW in the event of a fire, fire brigade intervention will likely be delayed, increasing the risk to the safety of the occupants.
2. Ensuring the correct operation of the automatic fire detection and alarm system, BOWS and ASE will likely safeguard occupants from injury by making the occupants aware of an emergency and ensuring prompt fire brigade intervention.
3. To ensure or promote the safety of persons in the event of fire by ensuring the correct operation of the automatic fire detection and alarm system, BOWS and ASE.
4. To do such things specified in the Order to ensure or promote adequate fire safety or awareness.

The terms of this Fire Safety Order – Order No. 1 are to be complied with:

By no later than **5.00 pm** on the **3 April 2024**.

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Appeals

Pursuant to Section 8.18 of the Environmental Planning & Assessment Act 1979 (EP&A Act), there is no right of appeal to the Court against this Fire Safety Order – Order 1 other than an order that prevents a person from using or entering premises.

Non-Compliance with Fire Safety Order – Order No.1

Failure to comply with this Fire Safety Order – Order No.1 may result in further Orders and/or fines being issued.

Substantial penalties may also be imposed under Section 9.37 of the EP&A Act for failure to comply with a Fire Safety Order – Order No.1.



Mark Knowles
Senior Building Surveyor
Fire Safety Compliance Unit

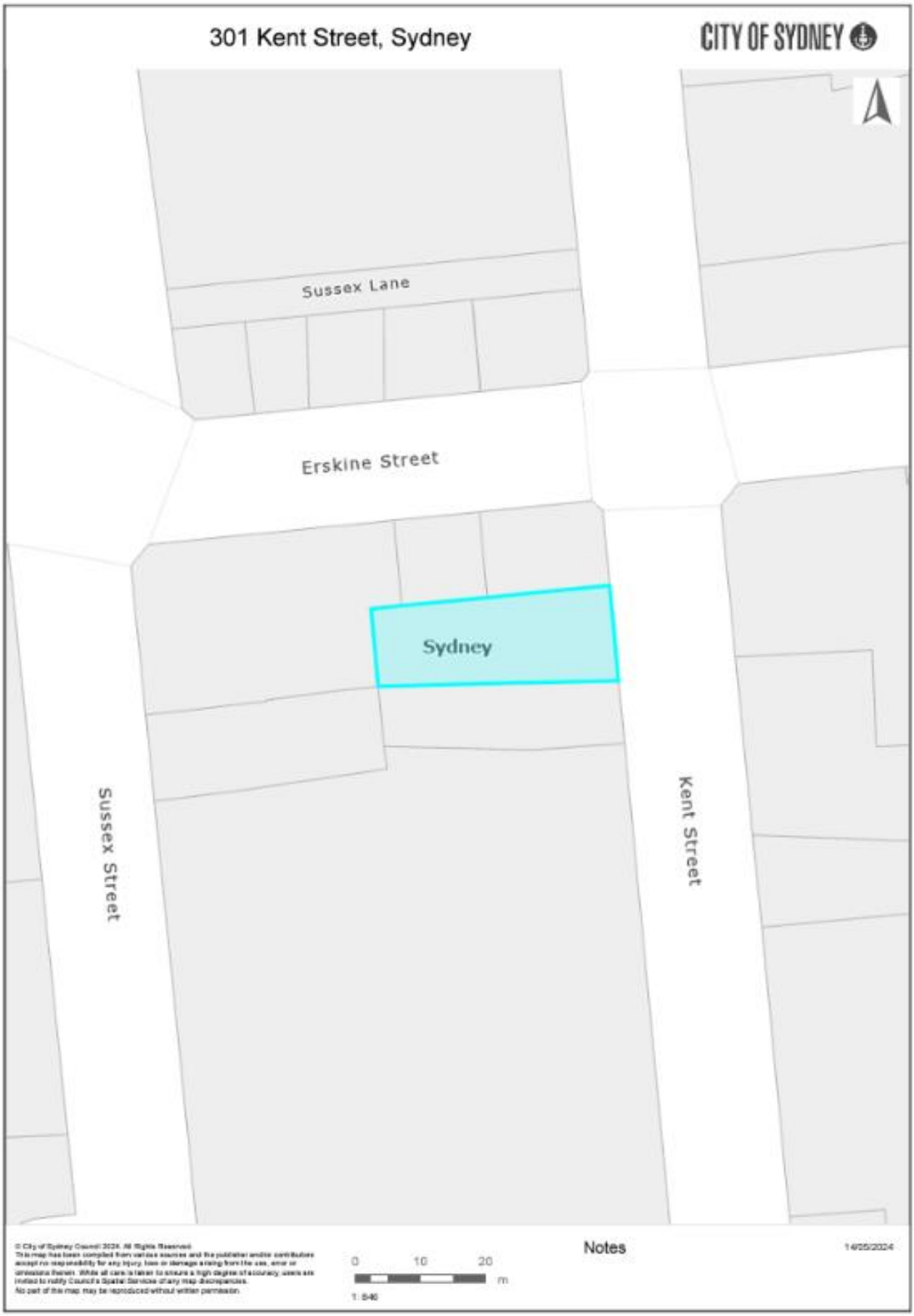
This Fire Safety Order - **Order No. 1** was mailed on **19 March 2024**.

OFFICIAL

OFFICIAL

Attachment E

Inspection Report
301 Kent Street, Sydney


301 Kent Street, Sydney
CITY OF SYDNEY
Sussex Lane
Erskine Street
Sydney
Sussex Street
Kent Street
Notes
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14/05/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: CSM 3163302 **Officer:** Andrew Manning **Date:** 14/05/2024

Premises: 301 Kent Street, Sydney

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) in relation to the subject premises on 25 March 2024 with respect to matters of fire safety.

The premises consists of a 5 storey building with one basement level.

The basement floor comprises a gym tenancy (class 9b) which is currently vacant with all other storeys being utilised as a backpackers.

An inspection of the premises undertaken by a Council investigation officer in the presence of the building manager which revealed that the premises are deficient in fire safety and egress provisions in the following areas:

(i) Suitable fire resisting construction to prevent the spread of fire;

(ii) Safe and dignified emergency egress for occupants to safety evacuate the building in the event of a fire

Council investigations have revealed that the premises are deficient in the provisions for fire safety and that a fire safety order is to be issued under Schedule 5 of the Environmental Planning and Assessment Act, 1979 so as to ensure and promote adequate facilities for fire safety/fire safety awareness.

The Notice of Intention to issue a fire safety order was issued on 15 May 2024.

Observation of the external features of the building did not identify the existence of any potential combustible composite cladding on the façade of the building.

Chronology:

Date	Event
25/03/2024	FRNSW correspondence received regarding premises Siesta Inn, 301 Kent Street, SYDNEY NSW 2000
3/04/2024	An inspection of the subject premises was undertaken by a Council officer. The basement tenancy (storage) has previously had its second exit to the ground floor sealed off, following a fire engineers' recommendation because of the effect on the fire isolated stair exit from the levels above ground floor. This is addressed in the Notice of Intention to Issue a Fire Safety Order. Signage and Block Plans were noted as not being present as outlined within the FRNSW report. The building was noted as being well maintained and fire services appeared to be in working order.

Date	Event
	A number of fire doors were chocked open and had broken self-closers at the time of the inspection. A verbal warning was issued.
04/04/2024	Discussed the building with a Senior Fire Officer to assist in determining an appropriate pathway to address the deficiencies in relation to the provision for escape given the vacant basement tenancy.
16/04/2024	Reinspected premises with second Council fire safety officer to further investigate the provision of escape for the rear fire-isolated stair.
15/05/2024	Notice of Intention issued (Trim: 2024/284315).

FIRE AND RESCUE NSW REPORT:

References: [BFS24/543 (33433), Trim D2024/028764; Council TRIM Ref 2024/202949]
Fire and Rescue NSW conducted an inspection of the subject premises after receiving an enquiry concerning the adequacy of the provision for fire safety.

Issues: The report from FRNSW detailed a number of issues, in particular:

Ref.	Issue	City response
1. Essential Fire Safety Measures		
1A	Maintenance of essential Fire Safety Measure	
A.	Automatic Fire Detection and Alarm System – An isolation was displayed on the Fire Indicator Panel (FIP), which was associated with the Automatic Fire Detection and Alarm System. At the time of the inspection, management were advised of the issue with the FIP and agreed to engage a service technician to rectify the isolation. On 7 February 2024 an email, including photographic evidence, was received from hotel staff confirming that a faulty detector had been replaced and the isolation removed from the system.	Faults were not present at the FIP at the time of Council inspection. Further investigation is to be undertaken under Term 1.01 of the Notice of Intention to issue a Fire Safety Order
B.	Fault to Sprinkler Pump – i. With regard to the initial fire safety concern, the manager confirmed that since the FRNSW crew had responded to the AFA, a technician had investigated the issue and repaired the pumps. Pump controllers appeared to indicate that the pumps were operational. ii. Clause 1.16.2 of AS1851 requires service logbooks to be left on site. At the time of the inspection, copies of current services records for the fire pump sets were unavailable. As a result, it was difficult to establish regular maintenance.	Faults were not present at the FIP at the time of Council inspection. Further investigation and maintenance is to be undertaken under Term 4.01 of the Notice of Intention to issue a Fire Safety Order
1B	Fire Hydrant System	

Ref.	Issue	City response
A.	The booster connections do not appear to achieve adequate clearances surrounding the feed fire hydrants and the inlet connections, contrary to the requirements of Clause 3.5.1. Furthermore, a car was parked in the driveway adjacent to the booster recess, reducing the clearance to the front of the assembly to less than 1m.	Addressed under Term 5.01 of the Notice of Intention to issue a Fire Safety Order
B	A pressure gauge is not installed at the hydraulically most disadvantaged fire hydrant, contrary to the requirements of Clause 9.3.2.	Addressed under Term 5.01 of the Notice of Intention to issue a Fire Safety Order
C.	The doors to the booster enclosure were not fitted with a device capable of securing the door in not less than a 90º open position, contrary to the requirements of Clause 7.9.2.	Addressed under Term 5.01 of the Notice of Intention to issue a Fire Safety Order
D.	The hydrant pump room is located within the building and is not provided with a door opening to a road or open space, or a door opening to a fire isolated passage or stair which leads to a road or open space, contrary to the requirements of Clause 6.4.2.	Addressed under Term 5.01 of the Notice of Intention to issue a Fire Safety Order
E.	A block plan of the fire hydrant system had not been provided within the pump room, contrary to the requirements of Clause 7.11.	Addressed under Term 5.01 of the Notice of Intention to issue a Fire Safety Order
1C	Fire Sprinkler System	
A.	A sign marked with the maximum allowable inlet pressure at the connection was not provided at the booster assembly, contrary to the requirements of Clause 4.4.3.	Addressed under Term 4.01 of the Notice of Intention to issue a Fire Safety Order
B.	A stock of spare sprinklers and spanner had not been provided at the sprinkler control valves, contrary to the requirements of Clause 6.7.	Addressed under Term 4.01 of the Notice of Intention to issue a Fire Safety Order
1D	Portable Fire Extinguishers (PFE)	
A.	Portable Fire Extinguishers (PFE) – A PFE adjacent to the ground floor lift was missing from its support fitting, contrary to the requirements of Clause 3.5 of AS2444-2001.	Addressed under Term 1.01 of the Notice of Intention to issue a Fire Safety Order
2. Access and Egress		
2A	Provisions for Escape/Exit Signs	
A.	No exit signage was apparent within the basement tenancy.	No exit signage was visible within the basement tenancy. Addressed under Term 1.02 and 1.03 of the Notice of Intention to issue a Fire Safety Order

Ref.	Issue	City response
B.	The path of travel to the exit from the basement to the ground floor, at the eastern side of the premises, has been permanently blocked with a gyprock wall. It is unclear if construction of this wall has been granted through any approvals associated with the basement tenancy	Inspection by Council Officer revealed the construction of the separation between basement stairs and ground floor was undertaken using 'Hebel' (light weight fire rated construction) under the provision of a Fire Engineering Report. No further action to be taken.
C.	In that regard, a review of the exit strategy of the tenancy is required to ensure that the exit system complies with the requirements of Clauses D2D3, E4D5 and E4D6 of the NCC. It is noted that the tenancy is currently vacant.	Addressed under Term 1.04 and 1.05 of the Notice of Intention to issue a Fire Safety Order
3. Compartmentation		
3A		
A.	The fire door to the basement pump room had a broken self-closing device.	Addressed under Term 4.02 of the Notice of Intention to issue a Fire Safety Order
B.	The fire door between the basement tenancy and the lobby at the bottom of the stair appeared to have a broken self-closing device.	Addressed under Term 4.02 of the Notice of Intention to issue a Fire Safety Order
C.	A door chock was holding open the laundry door on the fourth floor, preventing the door from self-closing.	A verbal warning was issued on site at the time of inspection. No further action to be taken.
3B	Penetrations	
A.	Service penetrations through the pump room fire wall did not appear to be adequately fire stopped in accordance the requirements of Clause C4D13, C4D15 & Specification 13 of the NCC.	Addressed under Term 4.03 of the Notice of Intention to issue a Fire Safety Order

FRNSW is therefore of the opinion that there are inadequate provisions for fire safety within the building.

FRNSW Recommendations
FRNSW recommended that Council inspect and address any other deficiencies identified on 'the premises' and require item no. 1 to 3 of their report to be appropriately addressed.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS:

Issue Order (NOI)	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	~~Continue to undertake compliance action in response to issued Council correspondence~~	~~Continue with compliance actions under the current Council Order~~	~~Other (to specify)~~

As a result of a site inspection undertaken by Council's investigation officers it is recommended that Council exercise its powers to give a notice of intention (NOI) for a fire safety order to be issued under Schedule 5 of the Environmental Planning and Assessment Act, 1979 to address the fire safety deficiencies identified by FRNSW and Council's building officer.

The issue of a fire safety order will ensure that suitable fire safety systems are in position throughout the building to provide improved and adequate provisions for fire safety

That the Commissioner of FRNSW be advised of Council's actions and determination.

Referenced/Attached Documents:

2024/284315	Notice of Intention to issue a Fire Safety Order issued 15 May 2024

Trim Reference: 2024/290938 **CSM reference No#:** 3163302

File Ref. No: BFS24/543 (33433)
TRIM Ref. No: D2024/028764
Contact: Conor Hackett

25 March 2024

General Manager
City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear Sir / Madam

Re: INSPECTION REPORT
SIESTA INN
301 KENT STREET, SYDNEY ("the premises")

Fire and Rescue NSW (FRNSW) received correspondence on 4 February 2024 concerning the adequacy of the provision for fire safety in connection with 'the premises'.

The correspondence stated that:

> *We attended and AFA at 0430hrs on 4 Feb 2024. All occupants had been evacuated and the occupant warning system was operating. The duty manager advise that a sprinkler head had operated on L1 bathroom at the rear of the premises. We drained the system, and replaced the head. When we went to re charge the system, both the sprinkler jacking pump nor the main pump increased the pressure. It remained on mains pressure.*
>
> *The manager advised there had previously been issues with pressure last time the system was drained.*
>
> *The concern mainly is around the operational readiness of the sprinkler pump and its inability to boost the pressure in the sprinkler system. This has been raised with the manager and he assured us that the fire company would attend to rectify. A handover form was completed and this advise was detailed in the form also. I am reporting this as it is an accommodation facility with transient occupants*

Pursuant to Section 9.32(1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Authorised Fire Officers from the Fire Safety Compliance Unit of FRNSW inspected 'the premises' on 7 February 2024.

On behalf of the Commissioner of FRNSW, the comments in this report are provided under Section 9.32(4) and Schedule 5, Part 8, Section 17(1) of the EP&A Act.

The items listed in the comments of this report are based on the following limitations:

- A general overview of the building was obtained without using the development consent conditions or approved floor plans as a reference.
- The Alternative Solution Report dated 22 September 2013, referred to in the Fire Safety Schedule, was not available for review.
- Details of the Provisions for Fire Safety and Fire Fighting Equipment are limited to a visual inspection of the parts in the building accessed and the fire safety measures observed at the time.

COMMENTS

This report is limited to observations and sections of the building accessed at the time of the inspection. As such, this report lists potential deviations from the National Construction Code 2022 Building Code of Australia – Volume One (NCC). Please be advised that whilst the report is not an exhaustive list of non-compliances, the items as listed may relate to the building's age or contradict development consent approval.

It is at council's discretion as the appropriate regulatory authority to consider the most appropriate action and determine whether an investigation is required.

The following items were identified during the inspection:

1. Essential Fire Safety Measures

1A. Maintenance – Clause 81 of the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 (the DCFS Regulation) requires that an Essential Fire Safety Measure must be maintained to a standard no less than when it was first installed.

A. Automatic Fire Detection and Alarm System – An isolation was displayed on the Fire Indicator Panel (FIP), which was associated with the Automatic Fire Detection and Alarm System.

At the time of the inspection, management were advised of the issue with the FIP and agreed to engage a service technician to rectify the isolation.

On 7 February 2024 an email, including photographic evidence, was received from hotel staff confirming that a faulty detector had been replaced and the isolation removed from the system.

B. Fault to Sprinkler Pump –

i. With regard to the initial fire safety concern, the manager confirmed that since the FRNSW crew had responded to the AFA, a technician had investigated the issue and repaired the pumps. Pump controllers appeared to indicate that the pumps were operational.

ii. Clause 1.16.2 of AS1851 requires service logbooks to be left on site. At the time of the inspection, copies of current services records for the fire pumpsets were unavailable. As a result, it was difficult to establish regular maintenance.

1B. Fire Hydrant System – Having regard to AS2419.1-2005, the following issues were noted at the time of the inspection:

A. The booster connections do not appear to achieve adequate clearances surrounding the feed fire hydrants and the inlet connections, contrary to the requirements of Clause 3.5.1. Furthermore, a car was parked in the driveway adjacent to the booster recess, reducing the clearance to the front of the assembly to less than 1m.

B. A pressure gauge is not installed at the hydraulically most disadvantaged fire hydrant, contrary to the requirements of Clause 9.3.2.

C. The doors to the booster enclosure were not fitted with a device capable of securing the door in not less than a 90º open position, contrary to the requirements of Clause 7.9.2.

D. The hydrant pump room is located within the building and is not provided with a door opening to a road or open space, or a door opening to a fire isolated passage or stair which leads to a road or open space, contrary to the requirements of Clause 6.4.2.

E. A block plan of the fire hydrant system had not been provided within the pump room, contrary to the requirements of Clause 7.11.

1C. Sprinkler System – Having regard to AS2118.1-1999, the following issues were noted at the time of the inspection:

A. A sign marked with the maximum allowable inlet pressure at the connection was not provided at the booster assembly, contrary to the requirements of Clause 4.4.3.

B. A stock of spare sprinklers and spanner had not been provided at the sprinkler control valves, contrary to the requirements of Clause 6.7.

1D. Portable Fire Extinguishers (PFE) – A PFE adjacent to the ground floor lift was missing from its support fitting, contrary to the requirements of Clause 3.5 of AS2444-2001.

2. *Access & Egress*

2A. Provisions for Escape/Exit Signs –

A. No exit signage was apparent within the basement tenancy.

B. The path of travel to the exit from the basement to the ground floor, at the eastern side of the premises, has been permanently blocked with a gyprock wall. It is unclear if construction of this wall has been granted through any approvals associated with the basement tenancy.

In that regard, a review of the exit strategy of the tenancy may be required to ensure that the exit system complies with the requirements of Clauses D2D3, E4D5 and E4D6 of the NCC. It is noted that the tenancy is currently vacant.

3. *Compartmentation*

3A. Regarding performance Clause C4D5, C4D8 of the NCC, the following items were observed as concerns in relation to maintaining tenable conditions for evacuation, to prevent the spread of fire to exits, SOUs, and public corridors:

A. The fire door to the basement pump room had a broken self-closing device.

B. The fire door between the basement tenancy and the lobby at the bottom of the stair appeared to have a broken self-closing device.

C. A door chock was holding open the laundry door on the fourth floor, preventing the door from self-closing.

3B. Penetrations – Service penetrations through the pump room fire wall did not appear to be adequately fire stopped in accordance the requirements of Clause C4D13, C4D15 & Specification 13 of the NCC.

FRNSW believes that there are inadequate provisions for fire safety within the building.

RECOMMENDATIONS

FRNSW recommends that Council:

a. Review items 1 to 3 of this report and conduct an inspection.

b. Address any other deficiencies identified on "the premises".

Please be advised that Schedule 5, Part 8, Section 17(2) requires any report or recommendation from the Commissioner of FRNSW to be tabled at a Council meeting. This matter is referred to Council as the appropriate regulatory authority. FRNSW awaits the Council's advice regarding its determination under Schedule 5, Part 8, Section 17 (4) of the EP&A Act.

Please do not hesitate to contact Conor Hackett of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if there are any questions or concerns about the above matters. Please refer to file reference BFS24/543 (33433) regarding any correspondence concerning this matter.

Yours faithfully



Conor Hackett
Senior Building Surveyor
Fire Safety Compliance Unit

Attachment F

Inspection Report
782 Bourke Street, Waterloo


782 Bourke Street Waterloo
CITY OF SYDNEY
Charles Street
Telopea Street
Thurlow Street
Marriott Street
Baptist Street
Young Street
Zamia Street
Redfern
Kepos Street
Bourke Street
Maddison Street
Eastern Distributor
Moore Park
Moore Park
Phillip Street
Crescent Street
South Dowling Street
Danks Street
Waterloo
Bourke Street
Crystal Street
Broome Street
Potter Street
Gadigal Avenue
Bourke Street
Waterloo
Sam Sing Street
Lachlan Street
Eastern Distributor
Moore Park
Moore Park
Dacey Avenue
Amelia Street
Murray Street
South Dowling Street
Archibald Avenue
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3/05/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: 2024/280664 **Officer:** Andrew Porter **Date:** 2 May 2024

Premises: 782 Bourke Road Waterloo

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) on 23 April 2024 and 1 May 2024 in relation to the premises with respect to matters of fire safety.

The site consists of 3 buildings of up to 15 storeys used for residential apartments, offices, retail and with all 3 buildings located over a common basement level carpark.

Inspections of the premises undertaken by a Council officer revealed that the premises are deficient in fire safety and egress provisions.

The annual fire safety statement for the buildings was due on 13 December 2023. Requests by the owners representatives have been made to obtain an extension of time to submit the Annual Fire Safety Statement with regard to requirement to rectify fire safety deficiencies in particular:

(i) Inadequate fire detection and emergency warning and intercom systems that require repairs/replacement of components.
(ii) Inadequate fire suppression systems, overhaul of system components urgently required and failing pump systems that require significant overhaul/replacement;
(iii) Damaged fire rated doors, associated hardware and frames that require repair/replacement;
(iv) Inadequate smoke control systems, system components have failed requiring urgent overhaul/replacement.

Council investigations have revealed that the premises are deficient in the provisions for fire safety and that a fire safety order is to be issued under Schedule 5 of the Environmental Planning and Assessment Act, 1979 to ensure and promote adequate facilities for fire safety/fire safety awareness.

Observation of the internal and external features of the building identified the existence of potential combustible composite cladding. The City's cladding compliance team are investigating this as a separate matter.

Chronology:

Date	Event
23/04/2024	FRNSW correspondence received concerning correspondence received by FRNSW on 30 January 2020 with relation to fire safety at the subject premises.
01/05/2024	Additional correspondence received concerning correspondence received by FRNSW on 13 March 2020 with relation to fire safety at the subject premises.
02/05/2024	An inspection of the subject premises was undertaken by a Council officer and confirmed that several fire safety deficiencies as mentioned above were occurring within the building that will require further action by Council.

21/5/2024	Notice of Intention to issue a fire safety Order served

FIRE AND RESCUE NSW REPORT:

References: [BFS20/270; 2024/280664-02 and BFS20/426; 2024/280664-01]

Fire and Rescue NSW conducted an inspection of the subject premises on 13 March 2024 after receiving two written concerns notices about egress and fire alarm deficiencies within the subject buildings.

Issues

Issue	City response
1. Occupant warning system logbook documents a previous line fault.	Observation of the emergency warning and intercom system during the inspection of 2 May 2024 identify faults with the system that require action by the owners accredited fire safety practitioner. Notice of intention to give a fire safety order requires these matters to be suitably addressed.
2. Final fire exit door on Danks Street has a peep hole drilled through the door so Coles staff can identify delivery drivers prior to opening the door.	Doorways that open to a road/open space from a fire isolated stair / passageway are not required to be provided with a fire resisting door set in accordance with C4D9 of the NCC 2022.Therefore the hole drilled through the door is not a fire safety concern.

FRNSW Recommendations

The officer of Fire & Rescue NSW recommended that Council review the items in his report, that Council conduct an inspection of the premises, and address any other deficiencies identified at the premises.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS:

Issue Order (NOI)	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	~~Continue to undertake compliance action in response to issued Council correspondence~~	~~Continue with compliance actions under the current Council Order~~	~~Other (to specify)~~

As a result of a site inspection undertaken by Council's investigation officers it is recommended that Council exercise its powers to give a notice of intention (NOI) for a fire safety order to be issued under Schedule 5 of the Environmental Planning and Assessment Act, 1979 to address the fire safety deficiencies identified by FRNSW and Council's building officer. The NOI was issued on 21 May 2024.

The issue of a fire safety order will ensure that suitable fire safety systems are in position throughout the building to provide improved and adequate provisions for fire safety.

That the Commissioner of FRNSW be advised of Council's actions and determination.

Referenced/Attached Documents:

2024/303438	Copy of proposed fire safety order (NOI)
2024/280664-02	FRNSW S9.32 report dated 23 April 2024
2024/280664-01	FRNSW S9.32 report dated 1 May 2024

Trim Reference: 2024/280664 **CSM reference No#:** CSM 3175892

File Ref. No: BFS20/270 (8000010336)
TRIM Ref. No: D24/42221
Contact: Edren Ravino

23 April 2024

General Manager
City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear General Manager

Re: SECTION 9.32(4) – INSPECTION REPORT

Pursuant to Section 9.32(4) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Fire and Rescue NSW (FRNSW) provides this report to the Council of the inspection conducted by Authorised Fire Officers under Section 9.32 of the EP&A Act.

The attached report relates to the fire safety concern only. It may include, amongst other observations, a brief list of building non-conformities relating to the fire safety concern that the Council may need to determine are of a nature or scale regarded as a significant fire safety issue warranting further investigation as part of the Council's Development Control Enforcement Policy.

Please do not hesitate to contact Edren Ravino of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if you have any questions or concerns regarding the above matters. Please refer to file reference BFS20/270 (8000010336) concerning this correspondence.

Yours faithfully

Edren Ravino
Senior Building Surveyor
Fire Safety Compliance Unit

Fire and Rescue NSW **ABN** 12 593 473 110 **www.fire.nsw.gov.au**
Community Safety Directorate 1 Amarina Ave **T** (02) 9742 7434
Fire Safety Compliance Unit Greenacre NSW 2190 **F** (02) 9742 7483
www.fire.nsw.gov.au

INSPECTION REPORT

Date	10 April 2024
Our Reference	BFS20/270 (8000010336)
Reason to Inspect	The Commissioner of FRNSW received a written concern [Section 9.32(2)(c) of the EP&A Act].
Details of Concern	A number of concerns relating to the fire stairs that exit at 24 Danks Street, the exit adjacent to the cafe. 1. The Milk Crate cafe's outdoor seating blocks the fire exit. Customers also often put luggage, bags and baby carriers in front of the fire exit doors, especially on weekends. 2. The fire stairs are slippery due to an accumulation of leaves and litter, particularly on the lower levels. They are not regularly swept or cleaned. 3. The Krystal nail salon business in the retail area, which shares the exit and has a door leading to the fire stairs, often uses the ground level exit corridor as a space to dry their towels. There are often two clothes airers put at the base of the stairs left to dry overnight which seriously restricts/blocks the exit. 4. The fire exit door at street level is often propped open using milk crates or other objects as the lift access is regularly broken, despite the door having a sign saying it must be kept shut at all times. This is done by management and security. Residents only access to the building is via the lift, so if the lift is broken they must use the fire stairs. However, residents are not given key fob access to the fire stairs (only building management and security) so in the regular event of the lift being broken the door is kept open using a milk crate.
Date Received	30 January 2020
Premises Address	20-26 Danks Street Waterloo (hereafter "the premises")
Name of Premises	Meriton Sovereign
Date of Inspection	Wednesday, 13 March 2024

1. Investigation Details

The following explains how an Authorised Fire Officer (AFO) may use an investigation officer's powers to report the inspection of the concern.

1A. An AFO may determine whether a breach exists in any codes, policies, or legislation. If the powers of an investigation officer are used, an AFO may assess – whether or not:

A. The Provisions for Fire Safety were present at the premises; OR

B. Regulation 112 of the Environmental Planning And Assessment (Development Certification And Fire Safety) Regulation 2021 (EPAR2021) was compliant.

1B. Based on the written concern, entry to the premises is for:

A. Part 15 of EPAR2021 regarding fire notices, fire exit areas, and doors.

1C. The AFO may report on the observed areas in the building accessed at the time. Photos may be taken of the areas, including photos of the essential fire safety measures in the areas accessed. The AFO may also note discussions with relevant people.

2. Fire Safety Investigation

The following is provided as part of the inspection:

2A. Evidence to Conduct an Investigation

A. Entry to the premises revealed that no exits were considered obstructed. As a result, there is insufficient evidence for FRNSW to investigate.

2B. Outcomes

A. As part of FRNSW's entry to the premises to determine whether an investigation is to be conducted, the following is provided:

i. The fire exit areas and doors identified in the concern were not obstructed.

ii. The inspection was conducted during business hours during the working week. The allegation that exits were blocked on the weekend could not be established.

iii. The concern about the door *"having a sign saying it must be kept shut at all times"* is inconclusive and is not considered an offence requiring enforcement.

B. There is insufficient evidence of a violation of the required standard of proof, and does not provide reasonable grounds for FRNSW to conduct an investigation.

3. Possible Non-Conformities

The following comments are provided to the Council for consideration:

3A. The following items relate to the exit door beside the café, identified as "Milk Crate" and faces Danks Street may require the Council's inspection and review:

A. The door was observed with a hole through the door.

B. The door appeared to be constructed with an FRL requiring certification by an accredited practitioner.

C. The occupier of the café advised that this was a "peephole" used by the staff at Coles so that delivery drivers could be identified before entry.

3B. Ensuring the exit areas are not obstructed and clean to prevent pedestrians from slipping and that the door and key fob are provided to the residents may be dealt with under a management plan or strata by-law (which includes the weekend).

3C. Ensure the owners maintain the essential fire safety systems and meet the local Council's obligations to regulate the development consent approval.

3D. Ensures that an accredited practitioner (fire safety) has assessed, inspected and verified the performance of each fire safety measure (including exits) that applies to the building. Furthermore, the owner submits an Annual Fire Safety Statement (AFSS) as part of their obligations under the EP&A Act.



Edren Ravino
Authorised Fire Officer

File Ref. No: BFS20/426 (SRID8000010489)
TRIM Ref. No: D24/49038
Contact: Edren Ravino

1 May 2024

General Manager
City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear General Manager

Re: SECTION 9.32(4) – INSPECTION REPORT

Pursuant to Section 9.32(4) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Fire and Rescue NSW (FRNSW) provides this report to the Council of the inspection conducted by Authorised Fire Officers under Section 9.32 of the EP&A Act.

The attached report relates to the fire safety concern only. It may include, amongst other observations, a brief list of building non-conformities relating to the fire safety concern that the Council may need to determine are of a nature or scale regarded as a significant fire safety issue warranting further investigation as part of the Council's Development Control Enforcement Policy.

Please do not hesitate to contact Edren Ravino of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if you have any questions or concerns regarding the above matters. Please refer to file reference BFS20/426 (SRID8000010489) concerning this correspondence.

Yours faithfully

Edren Ravino
Senior Building Surveyor
Fire Safety Compliance Unit

Fire and Rescue NSW **ABN** 12 593 473 110 **www.fire.nsw.gov.au**
Community Safety Directorate 1 Amarina Ave **T** (02) 9742 7434
Fire Safety Compliance Unit Greenacre NSW 2190 **F** (02) 9742 7483
www.fire.nsw.gov.au

INSPECTION REPORT

Date	30 April 2024
Our Reference	BFS20/426 (SRID8000010489)
Reason to Inspect	The Commissioner of FRNSW received a written concern [Section 9.32(2)(c) of the EP&A Act].
Details of Concern	I wanted to report Meriton for failing to fix their emergency evacuation alarm. I am sure it is known to the fire department from the numerous amounts of times that it goes off and your time is wasted coming there. My concern whilst your time is important is more about the safety of the public IF there ever was an emergency. I think no better to the childhood story of the Boy Who Cried, Wolf. I can tell you first hand that the when the emergency alarm goes off most tenants lie in bed screaming at the ceiling rather than evacuating the building at all hours of the night. This alarm goes off so often and so frequently that it no longer serves its purpose of evacuating people and I fear that when something goes wrong this will be the reason for jeopardising the safety of many many people in the area. This alarm is connected to several buildings and could affect the safety of thousands of people. I am aware that each time your department goes out there unnecessarily you fine Meriton 2400. To them, this is pocket change and it is no surprise that they do nothing to fix the problem. I mean the fact that their lifts in our building have been broken for weeks on end is just another indicator of their lack of care for others.
Date Received	13 March 2020
Premises Address	22 Danks Street Waterloo (hereafter “the premises”)
Name of Premises	N/A
Date of Inspection	Wednesday, 13 March 2024

1. Investigation Details

The following explains how an Authorised Fire Officer (AFO) may use an investigation officer’s powers to report the inspection of the concern.

1A. While inspecting the concern, an AFO may obtain evidence at the premises to establish whether a breach exists in any codes, policies, or legislation.

1B. If an AFO uses the powers of investigation officer during the inspection, the use of the powers is to determine whether or not:

A. The Provisions for Fire Safety were present at the premises; OR

B. Regulation 112 of the Environmental Planning And Assessment (Development Certification And Fire Safety) Regulation 2021 (EPAR2021) was compliant.

1C. Based on the written concern, entry to the premises is for:

A. The safety of persons in the event of fire.

1D. The AFO may report on the observed areas in the building accessed at the time. Photos may be taken of the areas, including photos of the essential fire safety measures in the areas accessed. The AFO may also note discussions with relevant people.

2. Fire Safety Investigation

The following is provided as part of the inspection:

2A. Evidence to Conduct an Investigation

A. Entry to the premises revealed observations that provided no reasonable grounds to use the powers of an investigation officer.

B. The fire brigade panel displayed no faults or isolations for the smoke detection and alarm system. Moreover, the concern relating to occupant behaviour is inconclusive.

2B. Outcomes

A. As part of FRNSW's entry to the premises to determine whether an investigation is to be conducted, the following is provided:

i. While there were no faults or isolations, AFOs observed the Occupant Warning System (OWS) logbook, which identified a line fault.

ii. Based on the observations at the time, the fault does not:

a. Indicate there are false alarms, which is contrary to the concern.

b. The fault does not appear to prevent an automatic notification to emergency services in the event of a fire.

Nor does the fault prevent the activation of the smoke detection and alarm system.

iii. The line fault to the OWS does not appear to create false notifications, as indicated in the concern, as they are separate systems. As such, the Council has the discretion to maintain the OWS to a standard no less than that specified in the schedule.

B. There is insufficient evidence of a violation of the required standard of proof requiring FRNSW to use its enforcement powers regarding the concern. The Council has discretion over compliance with the development consent and maintenance of the essential fire safety measures to maintain the OWS.

3. Possible Non-Conformities

The following comments are provided to the Council for consideration:

3A. The Council may require a review under Regulation 81(1) of the EPAR2021 to determine whether there is a violation of the required standard of proof concerning the maintenance of the approved essential fire safety measures in the fire safety schedule. To ensure:

A. Each measure is maintained to a standard no less than that specified in the schedule. OR;

B. If no schedule exists, the "original measure" is maintained to a standard no less than originally designed and implemented.

3B. Ensure the owners maintain the essential fire safety systems and meet the local Council's obligations to regulate the development consent approval.

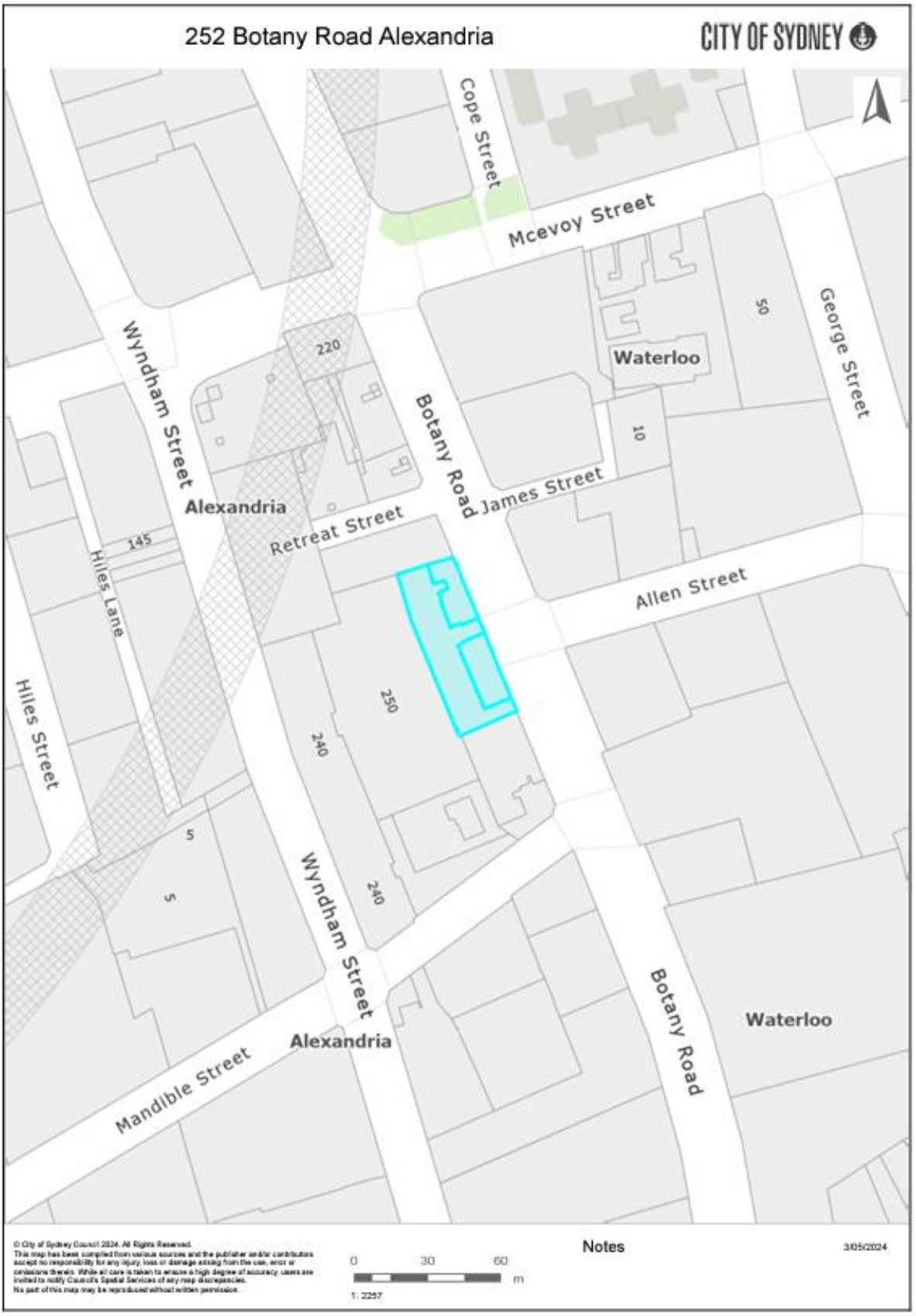
3C. Ensures that an accredited practitioner (fire safety) has assessed, inspected and verified the performance of each fire safety measure (including exits) that applies to the building. Furthermore, the owner submits an Annual Fire Safety Statement (AFSS) as part of their obligations under the EP&A Act.



Edren Ravino
Authorised Fire Officer

Attachment G

Inspection Report
252 Botany Road, Alexandria


252 Botany Road Alexandria
CITY OF SYDNEY
Cope Street
Mcevoy Street
Wyndham Street
220
Waterloo
50
George Street
Botany Road
10
James Street
Alexandria
Retreat Street
145
Hiles Lane
Allen Street
Hiles Street
250
240
5
5
240
Wyndham Street
Botany Road
Waterloo
Mandible Street
Alexandria
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3/05/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: 2024/277744 **Officer:** Andrew Porter **Date:** 7 May 2024

Premises: 252 Botany Road Alexandria

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) on 1 May 2024 in relation to the premises with respect to matters of fire safety.

The building consists of 8 storeys used for retail at ground level and residential apartments from levels 1-7. This building is part of a complex of 6 buildings constructed over a common basement level carpark.

An inspection of the premises undertaken by a Council investigation officer in the presence of the building manager, revealed there were no additional fire safety issues within the building.

The premises is subject of a Council issued fire safety order that requires upgrade of the building with respect of several fire safety deficiencies noted by Council investigation officers in 2019. The due date for compliance is February 2025 although a number of key matters have been addressed in the interim and appropriate progress is being made.

Observation of the external features of the building identified the existence of potential combustible composite cladding on the façade of the building which is subject of a separate investigation by the Council's cladding compliance team.

Chronology:

Date	Event
01/05/2024	FRNSW correspondence received by Council concerning correspondence received by FRNSW on 27 May 2021 with relation to fire safety at the subject premises.
03/05/2024	An inspection of the subject premises was undertaken by a Council investigation officer and revealed: -The fire alarm signalling equipment to Fire and Rescue NSW was operating normally and was without fault and isolation and -There were no further fire safety matters that have not been addressed by the current Council issued fire safety order.

FIRE AND RESCUE NSW REPORT:

References: [BFS21/1756; 2024/277744-02]

Fire and Rescue NSW conducted an inspection of the subject premises on 13 March 2024 after receiving a written concern notice about hazards within the fire hydrant pumproom such as exposed live wires, leaks in the main pump and blocked access. While those issues were not present FRNSW identified the following issue during the inspection.

Issues

Issue	City response
1. Alarm signalling equipment to Fire and Rescue NSW secondary communication link fault.	Observation of the alarm signalling equipment during the inspection of 3 May 2024 did not identify a continuing secondary communication link fault. Call with the service provider 'Chubb Fire Safety' confirmed no continuing fault.

FRNSW Recommendations

The officer of Fire and Rescue NSW recommended that Council review the items in the report, that Council conduct an inspection of the premises, and address any other deficiencies identified at the premises.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS:

~~Issue Order (NOI)~~	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	~~Continue to undertake compliance action in response to issued Council correspondence~~	Continue with compliance actions under the current Council Order	~~Other (to specify)~~

As a result of a site inspection undertaken by Council's investigation officers and that the owners have suitably addressed the issue identified by FRNSW, it is recommended that Council not exercise its powers to give a fire safety order at this time.

Council officers shall continue with compliance actions under the current Council Fire Safety Orders.

That the Commissioner of FRNSW be advised of Council's actions and determination.

Referenced/Attached Documents:

2024/277744-02	FRNSW S9.32 report dated 1 May 2024
2024/277744-01	Copy of current Council fire safety order dated 20 February 2020

Trim Reference: 2024/277744 **CSM reference No#:** CSM 3178533

File Ref. No: BFS21/1756 (8000015744)
TRIM Ref. No: D24/48070
Contact: Edren Ravino

1 May 2024

General Manager
City of Sydney
GPO Box 1591
SYDNEY NSW 2001

Email: council@cityofsydney.nsw.gov.au

Attention: Manager Compliance/Fire Safety

Dear General Manager

Re: SECTION 9.32(4) – INSPECTION REPORT

Pursuant to Section 9.32(4) of the *Environmental Planning and Assessment Act 1979* (EP&A Act), Fire and Rescue NSW (FRNSW) provides this report to the Council of the inspection conducted by Authorised Fire Officers under Section 9.32 of the EP&A Act.

The attached report relates to the fire safety concern only. It may include, amongst other observations, a brief list of building non-conformities relating to the fire safety concern that the Council may need to determine are of a nature or scale regarded as a significant fire safety issue warranting further investigation as part of the Council's Development Control Enforcement Policy.

Please do not hesitate to contact Edren Ravino of FRNSW's Fire Safety Compliance Unit at FireSafety@fire.nsw.gov.au or call (02) 9742 7434 if you have any questions or concerns regarding the above matters. Please refer to file reference BFS21/1756 (8000015744) concerning this correspondence.

Yours faithfully

Edren Ravino
Senior Building Surveyor
Fire Safety Compliance Unit

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INSPECTION REPORT

Date	24 April 2024
Our Reference	BFS21/1756 (8000015744)
Reason to Inspect	The Commissioner of FRNSW received a written concern [Section 9.32(2)(c) of the EP&A Act].
Details of Concern	Multiple hazards in the fire hydrant pump room, such as exposed live wires, leaks in the main pump, and somewhat blocked access
Date Received	27 May 2021
Premises Address	252 Botany Road Waterloo (hereafter "the premises")
Name of Premises	Astoria
Date of Inspection	Wednesday, 13 March 2024

1. Investigation Details

The following explains how an Authorised Fire Officer (AFO) may use an investigation officer's powers to report the inspection of the concern.

1A. While inspecting the concern, an AFO may obtain evidence at the premises to establish whether a breach exists in any codes, policies, or legislation.

1B. If an AFO uses the powers of investigation officer during the inspection, the use of the powers is to determine whether or not:

A. The Provisions for Fire Safety were present at the premises; OR

B. Regulation 112 of the Environmental Planning And Assessment (Development Certification And Fire Safety) Regulation 2021 (EPAR2021) was compliant.

1C. Based on the written concern, entry to the premises is for:

A. The safety of persons in the event of fire.

1D. The AFO may report on the observed areas in the building accessed at the time. Photos may be taken of the areas, including photos of the essential fire safety measures in the areas accessed. The AFO may also note discussions with relevant people.

2. Fire Safety Investigation

The following is provided as part of the inspection:

2A. Evidence to Conduct an Investigation

A. Entry to the premises revealed observations that provided no reasonable grounds to use the powers of an investigation officer.

B. During the inspection, observations of the fire hydrant pump room were inconsistent with the written concern.

2B. Outcomes

A. As part of FRNSW's entry to the premises to determine whether an investigation is to be conducted, the following is provided:

i. The maintenance manager provided entry to the pump room.

ii. At the time of the inspection, no issues were consistent with the concern. The logbook showed regular maintenance of the essential fire safety measures.

iii. The logbook included entries from June 2022 regarding 'a fault' in the Alarm Signalling Equipment (ASE).

iv. During the inspection, the primary communication link for the ASE showed normal operation. However, the secondary communication link indicated a fault.

v. Shortly after the inspection, FRNSW advised the strata manager of the issue surrounding the secondary communication link fault, which was addressed separately from the concern.

vi. The strata manager organised a reinspection on 11 April 2024, which confirmed that the secondary communications link's ASE displayed no fault. However, a call to the service provider revealed it was still at fault.

B. There is insufficient evidence of a violation of the required standard of proof requiring FRNSW to use its enforcement powers regarding the concern. Compliance with the development consent and maintenance of the essential fire safety measures are at the Council's discretion.

C. It is at the Council's discretion to address the anomaly regarding the Alarm Signalling Equipment by ensuring the owner maintains each measure to a standard no less than that specified in the schedule. As such, it does not provide reasonable grounds for FRNSW to investigate further.

3. Possible Non-Conformities

The following comments are provided to the Council for consideration:

3A. The Council may require a review under Regulation 81(1) of the EPAR2021 to determine whether there is a violation of the required

standard of proof concerning the maintenance of the approved essential fire safety measures in the fire safety schedule. To ensure:

A. Each measure is maintained to a standard no less than that specified in the schedule. OR;

B. If no schedule exists, the "original measure" is maintained to a standard no less than originally designed and implemented.

3B. Ensure the owners maintain the essential fire safety systems and meet the local Council's obligations to regulate the development consent approval.

3C. Ensures that an accredited practitioner (fire safety) has assessed, inspected and verified the performance of each fire safety measure (including exits) that applies to the building. Furthermore, the owner submits an Annual Fire Safety Statement (AFSS) as part of their obligations under the EP&A Act.



Edren Ravino
Authorised Fire Officer

Attachment H

Inspection Report
33-35A York Street, Sydney


33-35A York Street, Sydney
CITY OF SYDNEY
5030
26-38
50
56
60-62
64
25
19
York Lane
Clarence Street
95
97-105
105A
82
33-35A
Wynyard
York Street
37
39-41
43
Erskine Street
2G
2D
2E
2F
2H
Wynyard Park
2A
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4/04/2024

Council investigation officer Inspection and Recommendation Report
Clause 17(2), Part 8 of Schedule 5, of the Environmental Planning and Assessment Act 1979 (the Act)

File: CSM 3166307 **Officer:** Luke Jeffree **Date:** 13 May 2024

Premises: 33-35A York Street, Sydney

Executive Summary:

Council received correspondence from the Commissioner of Fire and Rescue NSW (FRNSW) in relation to the subject premises on 28 March 2024 with respect to matters of fire safety.

The premises consists of a 12-storey commercial office building formerly known as the 'Imperial Hotel' with ground floor retail use and basement carpark located opposite Wynyard Park in Sydney.

The building was constructed circa 1972 and has been subject to several conversions and fire safety upgrades over the years including in 1985 (Ref: D/1985/620, BA/1149/85 – conversion of club to office space) and a services upgrade in 2002 (Ref: D/01/00884,P/2002/266).

An inspection of the premises undertaken by a Council officer in the presence of the building manager, strata manager, accredited practitioner (fire safety) and chairperson of the strata which revealed that the premises are deficient in fire safety and egress provisions in the following areas:

(i) inadequate emergency warning and intercommunication systems (performance issues with current system);

(ii) a lack of adequate facilities for firefighting (FRNSW operational concerns regarding fire hydrant system);

(iii) a lack of fire stopping/sealant at service penetrations to prevent the spread of fire;

(iv) poor fire safety management systems (lack of block plans and identification signage); and

(v) facilities to allow re-entry into the building from fire stairs not provided.

Council investigations have revealed that the premises are deficient in the provisions for fire safety and that a fire safety order is to be issued under Schedule 5 of the Environmental Planning and Assessment Act, 1979 so as to ensure and promote adequate facilities for fire safety/fire safety awareness.

Observation of the external features of the building did not identify the existence of any combustible composite cladding on the façade of the building.

Chronology:

Date	Event
28/03/2024	FRNSW correspondence received regarding premises 33 York Street Sydney. The correspondence includes amongst other things reference to a letter (TRIM Ref: 2023/540836-04 dated 18 September 2023) sent to City concerning a number of maintenance and fire safety issues raised by the complainant. The complainant's letter included amongst other things allegations of non-maintenance of essential fire safety measures, mention of faults/defects displayed on the buildings fire indicator panel (FIP) and emergency warning and intercommunication system (EWIS) panel within the premises. After receiving the letter the City's Health and Building Unit took immediate compliance actions; reviewing Annual Fire Safety Statement (AFSS) submissions, auditing the building and requiring the property owner carry out interim remedial works - requiring repairs to the buildings automatic fire detection and alarm system and EWIS. These works were required and completed in October 2023. (Ref: Corrective Action letter Reference: 2023/567941).
16/04/2024	An inspection of the subject premises was undertaken by a Council officer in the presence of the building manager, strata manager, accredited practitioner (fire safety) and chairperson of the strata which revealed: • Annual Fire Safety Statement (AFSS) was current and on display; • Fire hydrant block plan was not displayed on the premises; • Some cabinets containing fire hydrant valves not in a readily accessible locations; • The height and angle of a number of fire hydrant valves not complying with applicable building regulation; • Fire brigade hydrant booster missing - not complying with applicable building regulation; • Fire seals/fire stopping missing to services at electrical/communications cupboards. The chairperson of strata showed Council officer documentary evidence of monthly testing and expenditure for essential fire safety measures carried out by various professionals. The Council officer noted that based on the applicable building regulations at the time of construction the premises was approved on the basis that its effective height was not more than 42 metres and so it was not required to be sprinkler protected to all levels. Furthermore, the officer noted that under the previous fire upgrades suitable alternative systems for fire protection were implemented throughout the building (in lieu of sprinklers) and endorsed by FRNSW.

FIRE AND RESCUE NSW REPORT:

References: [BFS24/326 (33229), D24/36228; 2024/208378]
Fire and Rescue NSW conducted an inspection of the subject premises on 24 January 2024 after receiving an enquiry concerning the adequacy of the provision of fire safety in connection with the premises.

Issues The report from FRNSW detailed a number of issues, in particular

Ref.	Issue	City response
1. Essential Fire Safety Measures		
1A.	**Automatic Fire Detection and Alarm System:**	
A.	At the time of the inspection the Fire Indicator Panel (FIP) was clear of any alarms, faults and isolations and the system appeared to be in normal operation.	Council's inspection revealed that the FIP displayed an audio/speaker fault on level 7. This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
B.	The smoke detector within the fire hose reel cupboard on Level 4 was missing from its installed location/mounting base and it appears the wiring had been disconnected.	No action required by the City Council inspection found that the smoke detector was redundant. Also an office fit out was occurring on level 4 under a Complying Development Certificate (CDC - TRIM Ref: P/2023/1945). The smoke detector locations have been modified under the CDC not requiring a smoke detector in fire hose reel cupboard.
C.	Coverage - It is noted that Level 7 was subject to a complete refurbishment/fit out and smoke detectors were not observed. It is assumed the works are covered under a building approval (Development Consent and Construction Certificate or Complying Development Certificate), to allow modification of the existing system. Coverage - It is noted that Level 7 was subject to a complete refurbishment/fit out and smoke detectors were not observed. It is assumed the works are covered under a building approval (Development Consent and Construction Certificate or Complying Development Certificate), to allow modification of the existing system.	No action required by the City. Council inspection found an office fit out had recently occurred on level 7 under a Complying Development Certificate (CDC - TRIM Ref: P/2023/1082). Furthermore, newly installed smoke detectors approved under the CDC were observed on level 7 by Council officer.
D.	Maintenance Records/Logbooks could not be located for the Automatic Fire Detection & Alarm System, contrary to the requirements of Clause 1.16.2 of AS	The Chairperson advised Council Officer that the logbooks had been recently stolen. Also, during the inspection the accredited practitioner provided new replacement

Ref.	Issue	City response
	1851-2012. In this regard, it appears that maintenance recording for 'the premise's is utilising electronic logs ['Uptick ID Digital Compliance Records' (with QR Code)], however a hardcopy of the service record has not been left on site at the completion of the test. A review of the digital logbooks following the inspection, revealed the last digital entry was completed on 1 September 2023, indicating the system may not be receiving the required monthly service check, contrary to the requirements of Section 6 of AS 1851-2012 and Section 81 of the EPAR 2021.	logbooks to cabinets under locked key within the premises and disagreed with FRNSW's advice about the system not receiving monthly service checks. However, hard copies of digital maintenance testing were not provided on site in accordance with AS 1851-2012. This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
1B.	**Emergency Warning & Intercom System (EWIS):**	
A.	The Evacuation System Control Panel was displaying:	
i.	One (x1) 'Audio line' fault identified as 'Zone 12 - 7th Floor'.	Council inspection verified that the 'Audio line' fault was still present on the Evacuation System Control Panel. This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
B.	Maintenance:	
i.	Maintenance Records/Logbooks could not be located for the EWIS, contrary to the requirements of Clause 1.16.2 of AS 1851-2012. Whilst electronic logs are available ['Uptick ID Digital Compliance Records' (with QR Code)], a hardcopy of the service record has not been left on site at the completion of the test. A review of the digital logbooks following the inspection, revealed the last digital entry was completed on 1 September 2023, indicating the system may not be receiving the required monthly service check, contrary to the requirements of Section 6 of AS 1851-2012 and Section 81 of the EPAR 2021. It is noted that the last entry identified the following issues: i. 'Level 2 goes into audio fault on alarm'.	The Chairperson advised Council Officer that the logbooks had been recently stolen. Also, during the inspection the accredited practitioner provided new replacement logbooks to cabinets under locked key within the premises & disagreed with FRNSW's advice about the system not receiving monthly service checks. However, hard copies of digital maintenance testing were not provided on site in accordance with AS 1851-2012 . This issue and the recurring level 7 fault on EWIS panel has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.

Ref.	Issue	City response
	ii. 'Level 7 has audio line fault'. The same issues were identified in the digital logbooks dating back to 8 May 2023 without resolution.	
1C.	**Alarm Signalling Equipment (ASE):**	
A.	The 'Primary Link Failed' LED was flashing, which typically indicates the secondary telephone line has failed. In this regard, the ASE was 'online' however the secondary PSTN telephone line had likely been disconnected, therefore leaving only the primary communications link.	Council inspection revealed no visible faut light on the ASE, it has recently been replaced but there is no fire safety certification on City's records for installation or maintenance of this fire safety measure. This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
1D.	**Fire Hydrant System – The fire hydrant system appears to be installed in accordance with Ordinance 70 and Ministerial Specification No.10. Notwithstanding this, the following deviations from AS 2419.1-2021 have been identified, along with other items of concern:**	
A.	The hydrant booster assembly:	
i.	Feed fire hydrants have not been installed onsite adjacent to the booster inlet connections, contrary to the requirements of Clauses 2.2.10 and 2.2.14 and Section 7 of AS 2419.1-2021.	This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
ii.	A block plan has not been provided at the booster assembly, contrary to the requirements of Clause 11.5 of AS 2419.1-2021.	This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
iii.	Test and boost pressure signage has not been provided at the booster assembly, contrary to the requirements of Clause 11.3.4 of AS 2419.1-2021.	This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
B.	Hydrant pump and pumproom:	
i.	FRNSW were unable to locate the hydrant pump and the pumproom. It is assumed that the pump is located on the roof plantroom level, however appropriate signage and 003 access keylock was not provided to the plantroom door, therefore access was not available at the time of the inspection.	Council's inspection verified that the existing hydrant pump is located on the roof plantroom level. This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
C.	Multiple fire hydrant valves throughout the premises appear to be located at a height less than 750mm from the floor and sloping	Council's inspection verified that multiple fire hydrant valves throughout the premises were located at a height

Ref.	Issue	City response
	more than 35° below the horizontal, contrary to the requirements of Clause 3.2.2.1 of AS 2419.1-2021.	less than 750mm from the floor and sloping more than 35°, contrary to the applicable building regulation. These issues have been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
D.	The internal hydrants throughout the premises are located in the public corridors and not within the required fire-isolated stairways, contrary to the requirements of Clause 3.6.2 of AS 2419.1-2021. In some instances, the hydrant valves were located within a locked commercial tenancy and access was unavailable (Level 1 and Level 5).	These issues have been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
E.	The building has an effective height in excess of 25m and it is unclear whether a ring main has been installed, in accordance with the requirements of Clause 8.6 of AS 2419.1-2021.	This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
F.	Storz couplings, compatible with FRNSW firefighting hose connections were not provided to the feed connections at the booster assembly and all internal hydrant valves throughout ‘the premises’, contrary to the requirements of Clauses 3.2, 7.1, 9.3 and 9.4 of AS2419.1-2021, Clauses 1.2 and 3.4 of AS 2419.2–2009, Clause 3.5 of AS 2419.3-2012, ‘and ‘FRNSW Fire safety guideline, Technical information – FRNSW compatible Storz hose connections – Document no. D15/45534 – Version 09 – Issued 10 January 2019’.	This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
G.	Maintenance:	
i.	The boost/inlet connections associated with the booster assembly, along with the internal hydrant valves throughout ‘the premises’, contained service labels/tags, indicating the hydrants had not received the required routine servicing, contrary to the requirements of Section 4 of AS 1851-2012 and Section 81 of the EPAR 2021. In this regard, multiple service labels/tags indicated the servicing of the hydrant valves was irregular and not occurring every 6 months, ranging in dates from October 2020 (at the boost connections) to June 2023 (internal hydrants).	Council inspection revealed that the booster assembly appears to service the automatic sprinkler system (not fire hydrant system) in the building. This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.

Ref.	Issue	City response
ii.	Maintenance Records/Logbooks could not be located for the hydrant pump, contrary to the requirements of Clause 1.16.2 of AS 1851-2012. Whilst electronic logs are available ['Uptick ID Digital Compliance Records' (with QR Code)], a hardcopy of the service record has not been left on site at the completion of the test. A review of the digital logbooks following the inspection, revealed the last digital entry was completed on 25 August 2023, indicating the system may not be receiving the required monthly service check, contrary to the requirements of Section 3 of AS 1851-2012 and Section 81 of the EPAR 2021. It is noted that the last entry identified the following issues: A. 'Item 1.6) CHECK General inspection – FAIL – 'Both pumps have multiple defects'. A. Item 1.7c) TEST Compression ignition (diesel) float charge – FAIL – 'Low charge on diesel'. A. Item 1.7f) CHECK Compression ignition (diesel) battery – FAIL. iv. Item 1.10b) CHECK Pump controller operation – FAIL. v. Item 1.14a) Run test checks – record pressures – FAIL. vi. Item 1.14b) Run test checks – gland and drain – FAIL vii. Item 1.14c) Run test checks – condition and abnormal noises – FAIL. viii. Item 1.14e) Run test checks – running speed – FAIL. ix. Item 1.14f) Run test checks – leaks – FAIL. x. Item 1.14g) Run test checks – charger or alternator/generator – FAIL.	The Chairperson advised Council Officer that the logbooks had been recently stolen. Also, during the inspection the accredited practitioner provided new replacement logbooks to cabinets under locked key within the premises. However, hard copies of digital maintenance testing were not provided on site in accordance with AS 1851-2012 . The fire hydrant system is required to be upgraded under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.

Ref.	Issue	City response
	xi. Item 1.14j) Run test checks – battery charger power failure – FAIL. xii. Item 1.14k) Run test checks – engine instrumentation – FAIL. xiii. Item 1.14l) Run test checks – flow at circulation relief valve – FAIL. xiv. Item 1.18b) Glands and mechanical seals – FAIL. xv. Item 1.19a) Check batteries comply – FAIL – 'Batteries out of date, but not to charge until other faults are rectified'. It is unclear whether the issues were resolved at the last monthly service. In light of the above, FRNSW brings to your attention a position statement published by FRNSW on 8 January 2019. The statement is shown below: ***Fire hydrant system in existing premises*** *When the consent authority (e.g. Council) is assessing the adequacy of an existing fire hydrant system installed in accordance with the provisions of Ordinance 70 and Ministerial Specification 10 (or earlier), FRNSW recommend that the system be upgraded to meet the requirements of the current Australian Standard AS 2419.1 to facilitate the operational needs of FRNSW.* *It may be appropriate for a partial upgrade of the existing fire hydrant system be undertaken. A partial upgrade may be proposed to address deficiencies in the design and/or performance of the existing fire hydrant system, when assessed against the requirements of Australian Standard AS 2419.1, so that the upgraded fire hydrant system will meet the operational needs of FRNSW.* *Where a hybrid fire hydrant system is proposed, which incorporates the design and performance requirements from two different standards, the proponent should consult with FRNSW on the requirements for the fire hydrant system.* It is recommended that the existing fire hydrant system be upgraded to meet the requirements of the current Australian Standard AS2419.1 for an equivalent new building, as the current system no longer suits the operational needs of FRNSW.	

Ref.	Issue	City response
1E.	**Automatic Fire Suppression System – The annual fire safety statement on display listed the standard of performance for the sprinkler system as being CA 16-1971 & AS 2118.1. Notwithstanding this, the following deviations from the NCC and AS 2118.1-2017 were observed which are of concern to FRNSW:**	
A.	Sprinkler booster – A fire brigade booster connection has not been provided for the sprinkler system, contrary to the requirements of Clause 4.14 of AS 2118.1-2017.	Council's inspection revealed that there is a fire brigade booster connection for the sprinkler system but not one for the fire hydrant system. An updated block plan is for the sprinkler system showing location of sprinkler booster assembly is required under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
B.	The sprinkler valves: i. The sprinkler alarm valves are not located in a room with direct egress to a road or open space, contrary to the requirements of Clause E1D5 and Specification 17 of the NCC. In this regard, the sprinkler valves are located within the carpark level on P1 level. ii. A complete stock of replacement sprinklers and a spanner had not been provided at the sprinkler control valves, contrary to the requirements of Clause 6.7 of AS 2118.1-2017.	These issues have been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.
C.	Maintenance: i. Maintenance Records/Logbooks could not be located for the Sprinkler System, contrary to the requirements of Clause 1.16.2 of AS 1851-2012. Whilst electronic logs are available ['Uptick ID Digital Compliance Records' (with QR Code)], a hardcopy of the service record has not been left on site at the completion of the test. A review of the digital logbooks following the inspection, revealed the last digital entry was completed on 17 October 2023, indicating the system may not be receiving the required monthly service check, contrary to the requirements of Section 2 of AS 1851-2012 and Section 81 of the EPAR 2021. It is noted that the last entry identified the following issues:	The Chairperson advised Council Officer that the logbooks had been recently stolen. Also, during the inspection the accredited practitioner provided new replacement logbooks to cabinets under locked key within the premises. However, hard copies of digital maintenance testing were not provided on site in accordance with AS 1851-2012 . These issues have been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.

Ref.	Issue	City response
	'Item 1.12b) RECORD time(s) to operation of alarm gong(s) and verify that the time does not exceed 180s (Alarm function test) – FAIL. The same issue was identified in the digital logbooks dating back to 24 December 2021 without resolution.	
D.	Sprinkler Coverage - The building has an effective height of more than 25m, as defined by the NCC and all parts of the building are not sprinkler protected, contrary to the requirements of Clause E1D5 and Specification 17 of the NCC. In this regard, the installed sprinkler system provides coverage to the carpark levels (P1 – P3), the ground level and the commercial levels (Levels 1-3) only and not to the commercial levels from Level 4 and above. It is recommended sprinkler system be upgraded to comply with Clause E1D5 and Specification 17 of the NCC and extend through all areas of the building.	Noted Council officer review and inspection confirms existing alternative systems of fire protection are implemented throughout the building in lieu of sprinklers
1F.	**Fire Hose Reels (FHR's):**	
A.	Maintenance – Multiple FHR's throughout 'the premises', contained service labels/tags, indicating the FHR's had not received any routine servicing since June 2023, contrary to the requirements of Section 9 of AS 1851-2012 and Section 81 of the EPAR 2021.	No action required by the City Council inspection revealed that service labels/tags indicate FHR's had in fact received routine servicing since June 2023
1G.	**Portable Fire Extinguishers (PFE's):**	
A.	Maintenance – Multiple PFE's throughout 'the premises', contained service labels/tags, indicating the PFE's had not received any routine servicing since May 2023, contrary to the requirements of Section 10 of AS 1851-2012 and Section 81 of the EPAR 2021.	No action required by the City Council inspection revealed that service labels/tags had in-fact received routine servicing since June 2023,
2.	**Access and Egress**	
2A.	Re-entry from fire-isolated exits – The doors to the fire-isolated stairways serving the commercial levels (effective height greater than 25m), were locked from the inside, re-entry was not available on every fourth floor and the doors on the other levels were not provided with a fail-safe device that automatically unlocks the door upon activation of a fire alarm, contrary to the requirements of Clause D3D27 of the NCC.	This issue has been addressed under the Notice of Intention to issue a Fire Safety Order issued on 13 May 2024.

Ref.	Issue	City response
3.	**Generally**	
3A.	Issues requiring further investigation – the written correspondence received by FRNSW on 22 January 2024 alleged there where a number of fire safety issues in the building, which FRNSW were unable to verify at the time of the inspection. In this regard, the issues relating to the certification, maintenance and annual testing of the essential fire safety measures in the building falls outside of FRNSW inspection powers and it would be at Council's discretion, as the appropriate regulatory authority, to review its own records, conduct its own inspection/investigation and make its own determination.	Noted. The Notice of Intention to issue a Fire Safety Order issued on 13 May 2024 includes amongst other things a number of requirements regarding certification of essential fire safety measures in the building

FRNSW is therefore of the opinion that there are inadequate provisions for fire safety within the building.

FRNSW Recommendations

FRNSW have made five recommendations within their report. In general FRNSW have requested that Council:

1. inspect and appropriately address any other deficiencies identified on 'the premises' and require items 1 through to 3 of their report to be reviewed;

2. ensure that the existing fire hydrant system is upgraded to meet the requirements of AS 2419.1-2021 for an equivalent new building or a hybrid system that suits the operational requirements of FRNSW;

3. ensure that the fire safety measures serving the premises are being regularly maintained; and

4. advise them in writing of its determination in relation to this matter in accordance with the provisions of clause 17(4) of Schedule 5 of the Environmental Planning and Assessment Act 1979.

COUNCIL INVESTIGATION OFFICER RECOMMENDATIONS:

Issue Order (NOI)	~~Issue emergency Order~~	~~Issue a compliance letter of instruction~~	~~Cited Matters rectified~~	~~Continue to undertake compliance action in response to issued Council correspondence~~	~~Continue with compliance actions under the current Notice of Intention to Give a Fire Safety Order~~	~~Other (to specify)~~

As a result of site inspections undertaken by a Council investigation officer it was determined that concern for public safety required the giving of a notice of intention (NOI) for a fire safety order to be issued under Part 2 of Schedule 5 of the Environmental Planning and Assessment Act, 1979 without any further delay.

It is recommended that Council note the exercise of powers by Council's investigation officer in issuing a NOI to give a fire safety order on 13 May 2024 in accordance with the above Act prior to the resolution of Council.

The issue of a Notice of Intention to Give an Order (NOI) prior to the resolution of Council will help to accelerate compliance response form building owners in rectifying fire safety deficiencies and will assist to ensure that occupants are not exposed to unnecessary fire safety risks.

That the Commissioner of FRNSW be advised of Council's actions and determination.

Referenced/Attached Documents:

2024/255151-01	Copy of Notice of Intention to issue a Fire Safety Order
2024/255151-02	Copy of corrective action letter

Trim Reference: 2024/255151 **CSM reference No#:** 3166307

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