

# HARBOURSIDE SHOPPING CENTRE

## Traffic and Transport Impact Assessment

28 SEPTEMBER 2020

Incorporating



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# MIRVAC PROJECTS PTY LTD HARBOURSIDE SHOPPING CENTRE

## Traffic and Transport Impact Assessment

Stage 1 DA – Amended Concept Proposal

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# 1 INTRODUCTION

This report provides a response to submissions (as relevant) and assessment of the proposed amended Concept Proposal in relation to the State Significant Development (SSD) Development Application (DA) for the redevelopment of the Harbourside Shopping Centre (Harbourside) (SSD 7874).

The SSD DA was publicly exhibited for a second time from 2 April to 29 April 2020. During this time, six (6) submissions were received from government agencies and City of Sydney Council and 57 submissions were received from the general public and organisations.

This report should be read in conjunction with the previous assessments prepared by Arcadis dated 28th September 2016 and dated 18<sup>th</sup> February 2020 to support the Harbourside Concept Proposal.

## 1.1 Background

Mirvac acquired Harbourside, a key location within the Darling Harbour precinct, in November 2013. Harbourside, which was opened in 1988 as part of the Bicentennial Program, has played a key role to the success of Darling Harbour as Australia's premier gathering and entertainment precinct.

Despite its success, with an annual pedestrian visitation of around 13 million people, Harbourside is now outdated and in decline. The building lacks a quality interface to the Darling Harbour public domain and Cockle Bay and does not integrate well with the major transformation projects underway and planned for across Darling Harbour.

Harbourside is at risk of being left behind and undermining the significant investment being made in Darling Harbour that will see it return to the world stage as a destination for events and entertainment.

Accordingly, Mirvac are taking a carefully considered and staged approach to the complete revitalisation of the site and its surrounds.

## 1.2 Site Description

The Site is located within Darling Harbour. Darling Harbour is a 60-hectare waterfront precinct on the south-western edge of the Sydney CBD that provides a mix of functions including recreational, tourist, entertainment and business.

More generally the site is bound by Pyrmont Bridge to the north, the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP) to the south, Darling Drive and the alignment of the Light Rail to the west and Cockle Bay to the east.

A locational context area plan and location plan are provided in **Figure 1** and **Figure 2**, respectively.

The Darling Harbour precinct is undergoing significant redevelopment as part of the SICEEP, Darling Square, and IMAX renewal projects. The urban, built form and public transport / pedestrian context for Harbourside will fundamentally change as these developments are progressively completed.

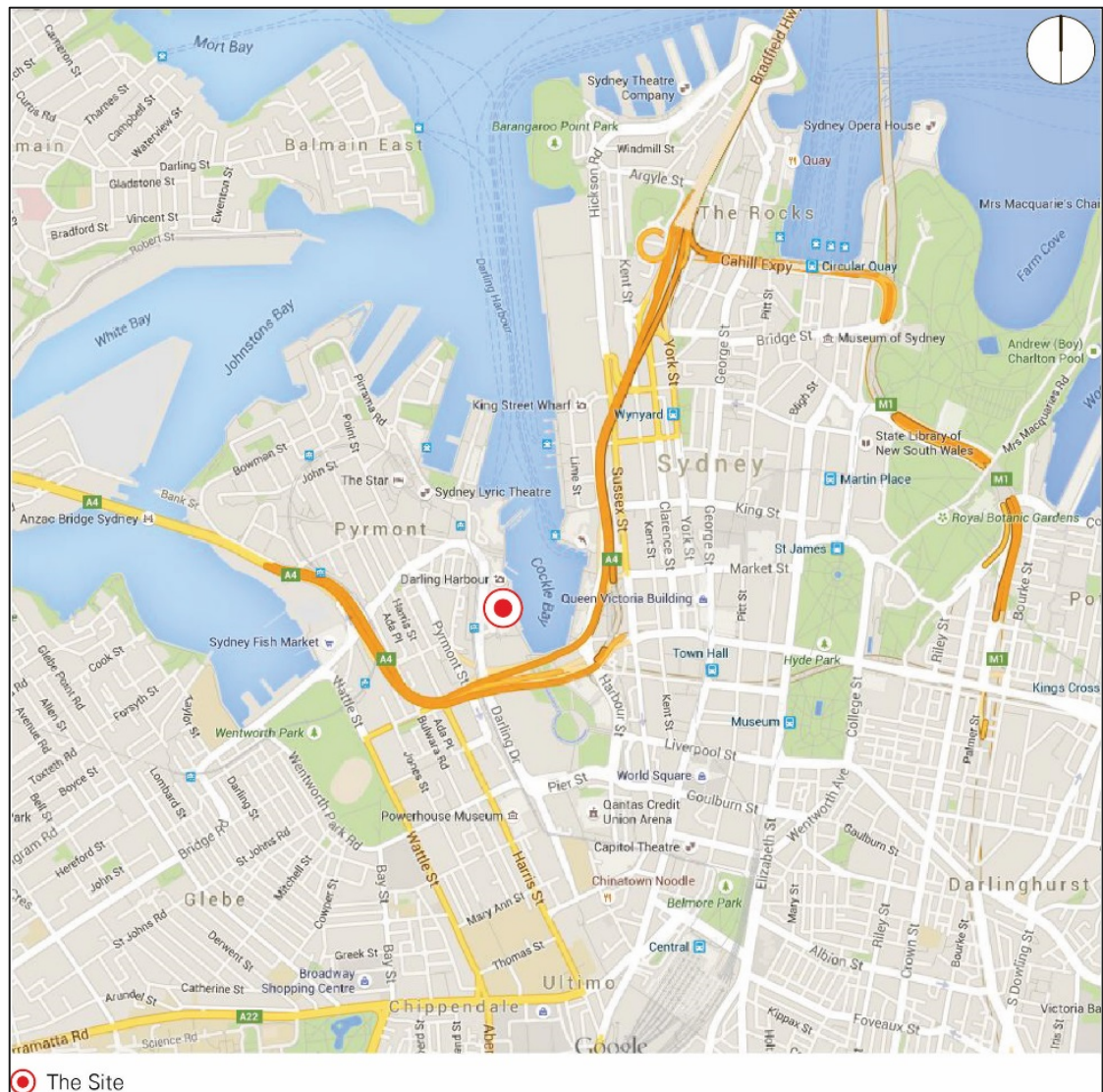
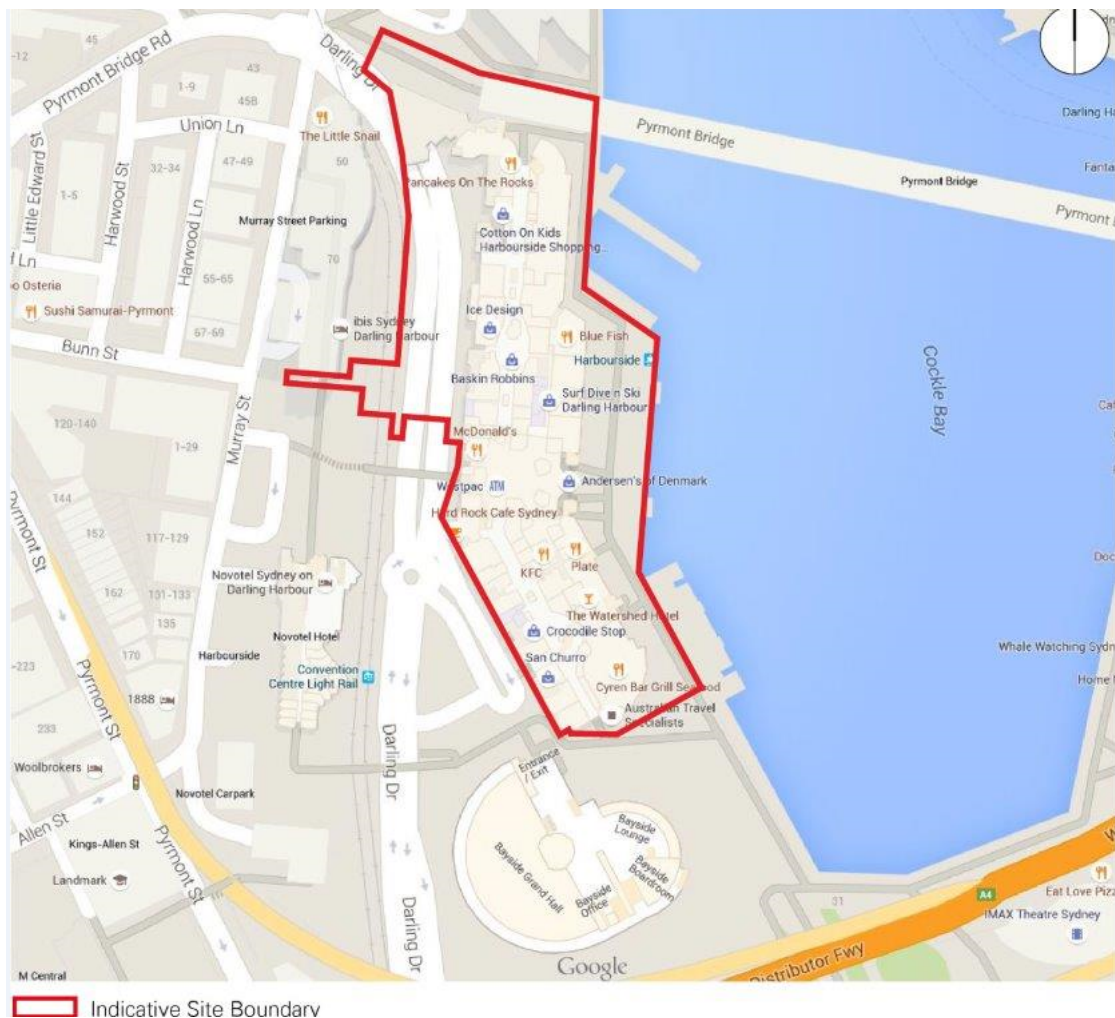


Figure 1 – Location Context Area Plan



**Figure 2 – Site Location Plan**

### 1.3 Planning Approvals Strategy

The Site is located within the Darling Harbour precinct, which is identified as a State Significant Site in Schedule 2 of *State Environmental Planning Policy (State and Regional Development) 2011*. As the proposed development will have a capital investment exceeding \$10 million, it is declared to be State Significant Development (SSD) for the purposes of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with the Minister for Planning the consent authority for the project.

This State Significant Development Application (DA) is a staged development application made under section 83B of the EP&A Act. It seeks approval for the concept proposal for the entire site and its surrounds.

More specifically this staged DA includes establishing land uses, gross floor area, building envelopes, public domain concept, pedestrian and vehicle access and circulation arrangements and associated car parking provision.

Detailed development application/s (Stage 2 DAs) will accordingly follow seeking approval for the detailed design and construction of all or specific aspects of the proposal in accordance with the approved staged development application.

The Department of Planning and Environment provided the Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development on 3 August 2016. This report has been prepared having regard to the SEARs as relevant.

## 2 PURPOSE OF THIS REPORT

### 2.1 Secretary's Environmental Assessment Requirements (SEARs)

This report has been prepared to accompany the Stage 1 DA for Harbourside. It addresses the relevant requirements of the Draft SEARs for the project, issued on the 30 August 2016. A summary of the relevant SEARs is listed below.

**Table 1 Secretary's Environmental Assessment Requirements (SEARs)**

SEARs Reference	Key Assessment Requirement	Relevant Section in This Report	Comment
6, Transport & Accessibility (Construction and Operation)	Current daily and peak hour vehicle, public transport, pedestrian, and bicycle movements, together with the cumulative impacts of existing, proposed and approved developments in the area, and existing traffic and transport infrastructure provided adjacent to the proposed development.	3 & 5	
6, Transport & Accessibility (Construction and Operation)	Operation of existing and future transport networks, including the light rail, ferry and bus networks and the CBD and South East Light Rail (CSELR), and their ability to accommodate the forecast number of trips to and from the development.	3	
6, Transport & Accessibility (Construction and Operation)	Existing and future performance of key intersections providing access to the site and any road/intersection upgrades required to accommodate the development. The assessment needs to be supported by appropriate modelling and analysis to the satisfaction of the Roads and Maritime Services (RMS). Existing and future performance of key intersections providing access to the site and any road/intersection upgrades required to accommodate development, using modelling and analysis supported by RMS	3 & 5	Existing baseline traffic intersection performance was based on original traffic surveys undertaken in March 2016.  To support the current development proposal updated traffic surveys were undertaken in January 2020. The updated traffic surveys have allowed for a comparative review of existing traffic conditions for 2016 and current.
6, Transport & Accessibility	Measures to be implemented to encourage users of the	4 & 5	

SEARs Reference	Key Assessment Requirement	Relevant Section in This Report	Comment
(Construction and Operation)	development to make sustainable travel choices, including walking, cycling, public transport and car sharing, such as the provision of end of trip facilities.		
6, Transport & Accessibility (Construction and Operation)	Appropriate provision, design and location of on-site bicycle parking, and how bicycle provision will be integrated with the existing cycle network.	4	
6, Transport & Accessibility (Construction and Operation)	Existing and proposed vehicle access (such as onto Bunn Street and Pyrmont Bridge) and parking arrangements (car, coaches/buses, taxi) for residents, employees and visitors, including compliance with appropriate parking controls.	3	
6, Transport & Accessibility (Construction and Operation)	The proposed loading dock and servicing provisions, including access arrangements to the loading docks.	4	
6, Transport & Accessibility (Construction and Operation)	Detail potential impacts of the development on the capacity and operation of the light rail and ferry network and modelling of the impacts of key pedestrian routes on nearby light rail and ferry stops.	5	
6, Transport & Accessibility (Construction and Operation)	Likely impacts of the proposal during construction.	6	
6, Transport & Accessibility (Construction and Operation)	Likely future service requirements.	4	

## 2.2 Response to Submissions

This report provides a Response to Submissions to submissions received on the Stage 1 DA that was exhibited in April 2020. **Table 2** below provides a summary of the relevant agency submissions received, and corresponding references to how they have been responded to

within the Report. **Appendix A** of this report contains a copy of the received agency submissions relevant to this report.

**Table 2 Agency Response to Submissions**

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
1. Sydney Light Rail — Inner West Line (TfNSW)	<p>It is requested that the applicant be conditioned to the following:</p> <p>The applicant shall undertake the following as part of any Stage 2 development application:</p> <p>Consult with TfNSW, Sydney Light Rail Operator and Sydney Trains with regard to the details of the required documentation and all design elements of the proposed development that interface with the light rail corridor, in particular, demolition of and construction of the new pedestrian bridge links over the light rail corridor; and</p> <p>Prepare a report on how the development complies Asset Standards Authority (ASA) standard - External Developments - T HR CI 12080 ST and Development Near Rail Corridors and Busy Roads – Interim Guideline (NSW Department of Planning, 2008)</p>	Section 4.13.6 and Appendix F	<p>Noted. Consultation has already taken place to outline the proposal. Meetings with Transport for NSW South Wales (TfNSW) and TransDev were held to discuss the development proposal.</p> <p>It was noted in meetings held to date that the development project was supported in principle.</p> <p>Furthermore, previous development schemes have already been placed on Public Exhibition.</p> <p>Further consultation will be undertaken with the relevant stakeholders as detailed design progresses.</p>
2. Construction Pedestrian and Traffic Management (TfNSW)	<p>It is requested that the applicant be conditioned to the following:</p> <p>The applicant shall prepare a draft Construction Pedestrian and Traffic Management Plan in consultation with Sydney Coordination Office within TfNSW and the Sydney Light Rail Operator as part of preparation of any Stage 2 development application.</p>	Section 6 & Appendix I	<p>Noted. A Construction Management Plan has been prepared.</p> <p>A draft Construction Pedestrian and Traffic Management Plan will be prepared as part of the Stage 2 application.</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
3. Vehicular Management (TfNSW)	<p>It is requested that the applicant be conditioned to the following:</p> <p>The applicant shall undertake the following as part of any Stage 2 development application:</p> <p>Queuing analysis and/ or traffic modelling to demonstrate the drop off area has adequate capacity and propose mitigation measures to ensure queuing on Darling Drive does not occur, to the satisfaction of TfNSW; and</p> <p>Prepare a draft drop off zone management plan to manage vehicles accessing the site and a draft car park and loading dock management plan.</p>	Sections 4.13.1	<p>The vehicular drop-off on the elevated down ramp section of Darling Drive has been removed from the concept design. This drop-off facility has been relocated so that entry to it is from the bottom of the down ramp, and egress from it is via the existing roadway adjacent to the Sofitel hotel.</p> <p>The new location for this drop-off facility has much less potential to impact Darling Drive and has considered the submissions raised to date.</p> <p>Further assessment of queueing will be assessed in the Stage 2 DA to ensure no impact on the operation of Darling Drive from vehicle queueing.</p> <p>A draft drop-off zone management plan to manage vehicles accessing the site and a draft car park and loading dock management plan will be prepared during future detailed design phases.</p>
4. Coach Parking (TfNSW)	<p>It is requested that the applicant be conditioned to the following:</p>	Sections 3.10 and 4.13.2	<p>Noted. However, it is not anticipated that coach parking</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
	The applicant shall assess the likely cumulative future demand for the SICEEP development and the Harbourside development and identify alternative locations for coach parking if required, in consultation with the Sydney Coordination Office within TfNSW, as part of any Stage 2 development application.		will be required for the proposed retail element of the development, particularly as the current proposal results in a significantly smaller retail area.  If required, this will be assessed in the Stage 2 DA.
5. Pedestrian Network (TfNSW)	<p>It is requested that the applicant be conditioned to the following:</p> <p>The applicant shall undertake pedestrian modelling of the pedestrian network surrounding the proposed development, in consultation with Sydney Coordination Office within TfNSW, to demonstrate adequate capacity for pedestrian movements is provided with the proposed development, as part of any stage 2 development application.</p>	Section 4.11	A more detailed response to pedestrian modelling is contained in the Urbis report.
6. Darling Drive Cycleway (TfNSW)	<p>It is requested that the applicant be conditioned to the following:</p> <p>As part of any Stage 2 development application, the applicant shall undertake a Road Safety Audit for the concept proposal to the cycleway/ drop off area, in accordance with Austroads Guide to Road Safety Part 6: Managing Road Safety Audits and Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits by an independent TfNSW accredited road safety auditor. Based on the results of the road safety audit, the applicant shall review the design drawings and implement safety measures if required, in consultation with the Sydney Coordination Office within TfNSW.</p>	Section 4.12	Noted. A road safety audit will be undertaken during the Stage 2 DA regarding the interface with existing cycleways to ensure safety of cyclists is assessed and maintained.
7. Wayfinding Strategies (TfNSW)	It is requested that the applicant be conditioned to the following:	Section 4.11	Noted. A wayfinding strategy will be developed and

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
	The applicant shall develop wayfinding strategies and travel access guides to assist with increasing the mode share of walking and cycling as part of any Stage 2 development application.		included in the Stage 2 DA.
8. Transport and Access (Department of Planning & Environment)	Provide further justification for the proposed car parking rate and how this aligns with strategic policy directions to encourage active transport and reduce reliance on private vehicle trips, particularly given the availability of public transport in the surrounding area	Sections 3.5, 4.10.1 & 4.14	<p>Parking provision for the residential development is in accordance with the Sydney LEP 2012 parking rates for land use classification and transport integration Type B, which can be found in Section 4.10. Allowances have been shown based on the indicative development scheme, which are subject to the Stage 2 Development Application submission.</p> <p>Parking is included for car share spaces and accessible spaces in accordance with the City of Sydney Development Control Plan 2012.</p> <p>It is proposed that the retail and commercial uses will utilise the existing 255 car parking spaces located below the Novotel Hotel.</p> <p>The existing site is well serviced with sustainable transport facilities.</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
			<p>The proposed development will include provision of bicycle parking and end of trip facilities.</p> <p>The development proposal includes a widened waterfront Boulevard.</p> <p>The development proposal results in preservation of existing cycleways and includes a new pedestrian bridge link at Bunn Street.</p>
9. Transport and Access (Department of Planning & Environment)	Clarify the proposed bicycle parking provision.	Section 4.10.4	<p>Bicycle parking and end of trip facilities are proposed within the L1 basement area and the L2 commercial area.</p> <p>End of trip facilities have been sized to suit the indicative yield of 28,000 m2 NLA commercial. This will be assessed further in the Stage 2 DA.</p>
10. Transport and Access (Department of Planning & Environment)	Confirm the pedestrian capacity of the Bunn Street connection and strategies to ensure the connection can accommodate the proposed pedestrian volumes.	Section 4.11	A more detailed response to pedestrian modelling is contained in the Urbis report.
11. Transport and Access (Department of Planning & Environment)	Update the revised Transport Impact Assessment to include a comparison of existing and proposed vehicle trips to and from the site during peak periods.	Section 5	<p>This comparison is now included.</p> <p>This comparison indicates that there is an overall reduction in the number of traffic generated trips</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
			when comparing existing development conditions to the proposed development scheme.
12. Access (City of Sydney)	<p>The RTS provides no ability for the City to assess the number of driveway locations, distance of driveways from main street thoroughfares to confirm risks of queuing, driveway widths and impacts on pedestrian amenity and safety. It appears that access to the loading dock of the development is via truck hoist only, which is not supported.</p> <p>The City can only make assumptions with the information provided in the RTS. For instance, an indication on the loading and drop off/pick up arrangements is contained in the submitted 'Harbourside Pedestrian Study' as well as the 'Traffic and Transport Impact Assessment', which indicate two loading areas with the southern one accessed via a hoist, as previously mentioned. The lack of information for a development of this scale is unacceptable and is poor planning practice. There is no clear indication about how this proposal will be accessed and serviced. The site's constrained nature and the reliance on Darling Drive to provide access, means it is critical that careful consideration of the transport and access related impacts are made to reduce the cumulative impacts and traffic generation that the proposal would have to the local road network.</p>	Sections 4.10.3, 4.13.1 & 4.13.3 & Appendix E	<p>There are no driveways located directly onto Darling Drive.</p> <p>Access to the loading docks and basement car park is via the existing entry and exit roads that service the existing loading dock.</p> <p>In response to submissions the lift hoists have been removed from the basement loading dock. Egress from this loading dock will now be via the basement access ramp, with larger vehicles using the turning plate at the top of the basement access ramp to then egress via the existing loading dock laneway onto Darling Drive</p> <p>A drop-off facility is provided with the entrance located at the base of the Darling Drive southbound down ramp and egress via the roadway located between the Sofitel Hotel and the</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
			<p>proposed development.</p> <p>Figures are contained within the report outlining these locations, along with swept path figures contained in Appendix E.</p>
13. Car Parking (City of Sydney)	<p>The submitted Traffic and Transport Impact Assessment', prepared by Arcadis, outlines that the current Harbourside Shopping Centre operator leases car parking for the existing retail patrons from the Novotel Hotel car parking. It is proposed that this existing retail parking arrangement will continue in which patrons will park and access the new Harbourside Shopping Centre via the new Bunn Street bridge. The Report also describes the connectedness of the site to public and active transport and the large availability of car parking at adjacent sites. Collectively, there is an existing number of 5,373 spaces available within walking distance to the site.</p> <p>The proposal seeks to provide 306 car parking spaces within 3 basement levels. The number of car parking spaces proposed is unsupportable. There is no justification provided for the significant increase in parking from the existing parking provisions. Further, no justification is provided on how this level of parking can promote sustainable transport over a car-orientated development.</p> <p>A realistic consideration of the impact of parking and the traffic generation from the site on the Central Sydney is not made. The provision of additional car parking spaces is at odds to the contents of the Traffic Report, which highlight the locality's existing parking and transport arrangements. A zero increase in private</p>	<p>Sections 3.5, 4.10.1 &amp; 4.14</p>	<p>Parking provision for the residential development is in accordance with the Sydney LEP 2012 parking rates for land use classification and transport integration type B. The basement car parking is proposed for residential use only.</p> <p>It is proposed that the retail and commercial uses will utilise the existing 255 car parking spaces located below the Novotel Hotel.</p> <p>Section 3.5 outlines the numerous existing sustainable travel options available for the development site.</p> <p>The development proposal includes a widened waterfront Boulevard.</p> <p>The development proposal results in preservation of existing cycleways</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
	<p>parking should be mandated with appropriate parking for servicing and drop off/pick up.</p> <p>Overall, the parking supply for the development must be constrained to encourage sustainable transport such as public transport and active transport, including cycling and walking. Moreover, the development should seek to encourage sustainable and active transport in a matter that aligns with the targets and objectives set out under Sustainable Sydney 2030.</p>		<p>and includes a new pedestrian bridge link at Bunn Street.</p> <p>Section 4.14 discusses the Green Travel Plan which will be undertaken during the Stage 2 DA.</p> <p>Bicycle parking and end of trip facilities have been provided for within the development proposal.</p>
14. Traffic Generation (City of Sydney)	<p>The concept proposal provides excessive parking numbers with a cumulative impact to the traffic generation of the site and local road network. It is anticipated that more than 1,035 vehicles will be generated in the PM peak with the existing design. This would have a considerable consequence on amenity across Central Sydney and surrounding precincts.</p> <p>Consideration to the traffic generation impacts of the development is unsatisfactory. Some limited modelling has been undertaken and detailed in the Traffic Report. The modelling relates to a few intersections with concerning results, that overall, do not consider the impact on road space as well as impacts on pedestrian safety and amenity. This is not consistent with the TFNSW movement and place principles. Further, no information is provided on the impact of the development on the public domain and road network during peak event periods of adjacent facilities such as Darling Harbour and ICC.</p>	Sections 4.10.1 and 5	<p>Preliminary traffic modelling has been undertaken, which indicates no significant change to traffic conditions from existing conditions.</p> <p>Calculated traffic generated trips from the proposed development has decreased from the previous scheme, which is predominately a result in the decrease of retail use in the overall development scheme.</p> <p>A comparison of trip generated rates from existing development conditions to proposed development indicates a decrease in overall generated trips.</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
			Additional traffic modelling will be undertaken as part of the Stage 2 DA.
15. Sustainable Transport (City of Sydney)	<p>As previously stated, the development should seek to encourage sustainable and active transport in a manner which aligns with the targets and objectives set out in Sustainable Sydney 2030. Further, the development should also align with other strategies including the City's Cycling Strategy and Action Plan 2007/2017, Walking Strategy and Action Plan 2014-2030, Connecting our City Transport Strategies and Actions (2012) and the Sydney City Centre Access Strategy (TfNSW 2013).</p> <p>The development does not support the TfNSW goals of balancing movement and placement. Instead, the development provides excess parking at the expense of place making as well as pedestrian safety and amenity with considerably negative impacts on the public domain and urban environment throughout the City centre. No Green Travel Plan (GTP) has been submitted for the development, which at a minimum, demonstrates to a degree that consideration to sustainable transport has been made. The high trip generation of the development challenges the modal targets for the site with an emphasis on car orientated development. The 666 retail trips at the PM peak hour is clearly unacceptable.</p>	3.5, 4.10.1 & 4.14 and Section 5	<p>A comparison of trip generated rates from existing development conditions to proposed development indicates a decrease in overall generated trips.</p> <p>Section 3.5 outlines the numerous existing sustainable travel options available for the development site.</p> <p>The development proposal includes a widened waterfront Boulevard.</p> <p>The development proposal results in preservation of existing cycleways and includes a new pedestrian bridge link at Bunn Street.</p> <p>Section 4.14 discusses the Green Travel Plan which will be undertaken during the Stage 2 DA.</p> <p>Bicycle parking and end of trip facilities have been provided for within the development proposal.</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
16. Bicycle Lanes and Connections (City of Sydney)	<p>The City's comments regarding bicycle lanes in the previous submission has not been adequately addressed in the RTS, nor is there an indication provided in with respect to the overall commitment to cycling. No cycleway connection improvements are proposed as part of the application and reliance is made on the improvements already made by other developments along Darling Drive.</p> <p>The City would expect an upgraded and separated cycleway connection from Murray Street/Union Street intersection (major cycleway) to the roundabout adjacent the site that is consistent with the design of the cycleway built south of the roundabout. Access is strongly preferred through an arrangement, which provides a dedicated bicycle entry/exit arrangement without stair access.</p> <p>The City considers that upgrades to all pedestrian access points should include the provision for bicycle users also. This includes but it not limited to the following:</p> <ul style="list-style-type: none"> <li>• Route 1 – CBD to Pyrmont Bridge</li> <li>• Route 2 – CBD to Cockle Bay Wharf (north bridge)</li> <li>• Route 3 – CBD to Cockle Bay Wharf (central bridge)</li> <li>• Route 4 – Druiett Street Bridge</li> </ul> <p>The City encourages the provision of innovative bicycle parking solutions in new development and recommends that the development provide a breakthrough in first class visitor/public bicycle facilities. These include providing a range of Class 2 and Class 3 visitor facilities with some showers and lockers to be located within the building face rather than the public domain with wayfinding signage to support these.</p> <p>Overall, it is disappointing that so little effort is made to encourage and provide</p>	Sections 4.10.4, 4.12 and 4.14	<p>Section 4.14 discusses the Green Travel Plan which will be undertaken during the Stage 2 DA.</p> <p>Bicycle parking and end of trip facilities have been provided for within the development proposal.</p> <p>End of trip facilities have been sized to suit the indicative yield of 28,000 m2 NLA commercial. This will be assessed further in the Stage 2 DA.</p>

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
	bicycle facilities for a development of this scale.		
17. Bicycle Parking and End of Trip Facilities (City of Sydney)	<p>No commitment to bicycle parking and end of trip facilities or design is made, which is a disappointing and unacceptable. The rates in accordance with Sydney DCP 2012 should be used, which would require at least 532 x Class 2 bicycle parking as well as 88 x Class 3 bicycle parking to be provided.</p> <p>Lockers and showers should also meet the City's Sydney DCP 2012 requirements, estimating a minimum of 175 lockers and 20 showers. However, this is up to the proponent to be clarified and justified.</p>	4.10.4	<p>Bicycle parking and end of trips facilities have been provisioned. Final numbers will be confirmed in the Stage 2 DA</p> <p>End of trip facilities have been sized to suit the indicative yield of 28,000 m2 NLA commercial. This will be assessed further in the Stage 2 DA.</p>
18. Pedestrian Connections (City of Sydney)	<p>The pedestrian through-site links are not detailed sufficiently in order to assess appropriate design or capacity to provide pedestrian amenity between the site and Pyrmont Bridge, Darling Harbour and Pyrmont.</p> <p>Pedestrian modelling is required for the site to improve pedestrian access given the significant constraints and barriers to access the sight, such as the light rail. Pedestrian links along the foreshore are not detailed to assess the capacity and amenity to cater for the proposed development. Width along the foreshore should be increased even more to accommodate additional pedestrian attraction as well as accommodating for cycling. This is consistent with the requirements of the Darling Harbour precinct under the Sydney Regional Environmental Plan No. 26 – City West.</p> <p>Pedestrian access must meet the requirements of the Disability Discrimination Act 1992 and avoid lift and stair access wherever possible.</p>	4.11	A more detailed response to pedestrian modelling is contained in the Urbis report.

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
19. Servicing and Coach parkin (City of Sydney)	<p>The burden of loading should not be left to the public domain. 15 spaces are proposed in the loading dock, which is an underestimation based on the rates of Sydney DCP 2012. In this light, it is estimated that a total of approximately 34 spaces is required as follows:</p> <ul style="list-style-type: none"> <li>• Residential – 5 bays</li> <li>• Retail – 22 bays</li> <li>• Commercial – 7 bays</li> </ul> <p>Significant concern is raised regarding the queuing impact and impacts on pedestrian amenity, notably if a hoist is involved to access the loading dock. It is noted that coach parking will not be provided on-site but will co-utilise the coach parking of the ICC if required. There is no confirmation provided if this would be acceptable to the ICC.</p>	4.13.3	<p>Mirvac will be the future operator of the development, and they believe the number of loading dock bays are adequate.</p> <p>The current loading dock provides 15 bays, and it is anticipated that 17 will be provided in the future retail loading dock. There will be a reduction of GFA of the retail element of the development, from the current situation.</p> <p>In response to submissions the lift hoist has been removed from the concept design plans. Vehicles exiting the basement loading dock will now egress via the basement access ramp, utilise the turning plate at the top of the ramp, and then egress via the existing loading dock accessway.</p> <p>Adequate queuing for the loading docks is provided within the access lane to the loading docks.</p>
19. Construction Pedestrian Traffic Management Plan	The preparation of a CPTMP in consultation with the City and the CBD Coordination Office with TfNSW will be	Section 6 and Appendix I	A Construction Pedestrian Traffic Management Plan

Agency Response to Submission Reference	Agency Response to Submission	Relevant Section in This Report	Comment
(CPTMP) (City of Sydney)	crucial to addressing efficient functioning of business in the area surrounding the site, particularly due to the proximity of the site to existing motorways, pedestrian and cycling routes and adjacent to the ICC and other Darling Harbour sites		(CPTMP) will be undertaken in future development stages of the development.
Existing High Voltage Infrastructure (Sydney Trains)	<p>Sydney Trains requests that construction and operational activities associated with the proposed development do not impact on the existing 'in service' 33kV High Voltage cable located west of the subject site. It is requested that ongoing consultation is required between the Applicant and Sydney Trains during the life of the project to ensure the continued protection of the subject cable at each stage of the development.</p> <p>This submission is in addition to the comments and conditions provided as part of the Transport for NSW response for SSD 7874 in letter dated 27 April 2020.</p>	Section 4.13.6 and Appendix F	<p>Meetings have been held with TrNSW and TransDev to discuss the development proposal.</p> <p>Further information is also outlined in the SSDA1 Utilities Report, with regard to this existing HV.</p>

## 3 EXISTING TRANSPORT CONDITIONS

This section of this Report establishes the existing transport network conditions in the study area around the Harbourside development. An investigation of existing network capacity is being undertaken to identify key issues with regard to network deficiencies at key roads and intersections.

### 3.1 Background and Project History

Previous traffic and transport reports for the Redevelopment of the Harbourside Shopping Centre were undertaken to support the initial Development Applications in 2016.

This section of this Report outlines the existing baseline traffic conditions based on traffic surveys undertaken in March 2013 for the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP), and on traffic surveys undertaken in March 2016 specifically in relation to the proposed Harbourside mixed use retail and residential development, and outlined in the traffic report dated 28<sup>th</sup> September 2016.

A comparison of the traffic count data collected for this project with traffic count data from 2013 SICEEP project revealed that overall the total traffic volume based on 2016 survey counts is approximately 90% of that obtained in 2013.

Following an update of the land use mix at the development to include a new commercial area, Arcadis initiated an updated traffic and transport study highlighting the likely impacts of the development on the road network. To capture the changes of the traffic patterns in the road network surrounding Harbourside, a new set of traffic surveys and classified intersection counts were commissioned in January 2020 at four key intersections expected to be impacted by the development.

### 3.2 Road Network

The key roads that provide access to the development site include:

1. Pyrmont Street – is a north-south road parallel to Murray Street to the east and Harris Street to the west, running one-way southbound.
2. Pyrmont Bridge Road – is a State Road (west of Harris Street) connecting the Glebe area to Darling Drive near the western end of Pyrmont Bridge.
3. Harris Street - is a 50 km/h State Road (south of Pyrmont Bridge Street) running parallel to Pyrmont Street. Parking is permitted on both sides of the street and regulated through parking ticket meters. During peak hour, no parking zones operate.
4. Darling Drive – is the main arterial road that the development is accessed from; and
5. Harbour Street – is classified as a State Road aligned in the north-south direction, parallel to Darling Drive and to the east of Darling Harbour

**Figure 3** below outlines the above five key road locations.

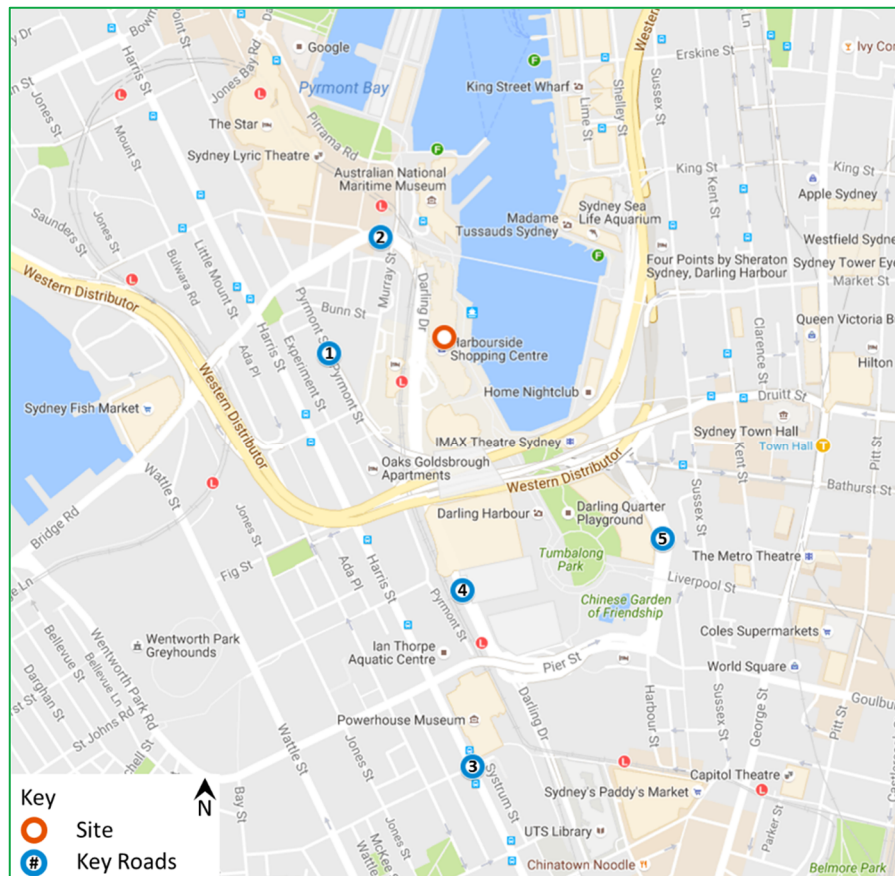


Figure 3 – Key Roads Location Plan

### 3.3 Traffic and Pedestrian Volumes

Traffic surveys were undertaken to collect new traffic data for key intersections and road corridors in the vicinity of the site. Intersection turning movement counts and mid-block surveys were carried out on the second week of February 2016, which were undertaken for the purpose of the original Harbourside Development Application.

Intersection turning movement counts and pedestrian counts were undertaken at three key intersections for a three-hour AM (6:00-9:00 a.m.) and PM (4:00-7:00 p.m.) period. These intersections are located on the direct access routes to the site. The survey locations include:

- Pyrmont Bridge Road / Darling Drive / Murray Street intersection.
- Harbour Street / Pier Street intersection; and
- Darling Drive / Ultimo Road intersection.

Mid-block counts were also undertaken for a seven-day period (24/7) along key road corridors leading to the site. The locations include:

- Pyrmont Bridge Road (west of Murray Street).
- Harbour Street (north of Pier Street); and
- Darling Drive (south of Pier Street).

It should be noted that surveys along Darling Drive between Pier Street and Murray Street were excluded due to the ongoing construction of the Sydney International Convention Exhibition &

Entertainment Precinct (SICEEP) development, which at the time of undertaking the February 2016 traffic surveys, was still in the construction phase. At the time of the 2016 traffic survey there were road/lane closures north of Pier Street with restricted access to construction zones for construction related traffic. As such, the traffic volumes on that section of Darling Drive were not representative of regular weekday or weekend traffic.

Additional traffic surveys were undertaken in January 2020 to understand current baseline traffic conditions. The SICEEP development is now fully operational and there were no road/lane closures in place during the 2020 traffic surveys.

Traffic surveys were undertaken over three days, from Wednesday 29 January to Friday 31 January 2020 at four key intersections expected to be impacted by the development, including:

- (I-1) Murray Street/ Darling Drive (traffic signals)
- (I-2) Darling Drive/ Pier Street (roundabout)
- (I-3) Harbour Street/ Pier Street/ Goulburn Street (traffic signals)
- (I-4) Darling Drive/ Ultimo Road (traffic signals).

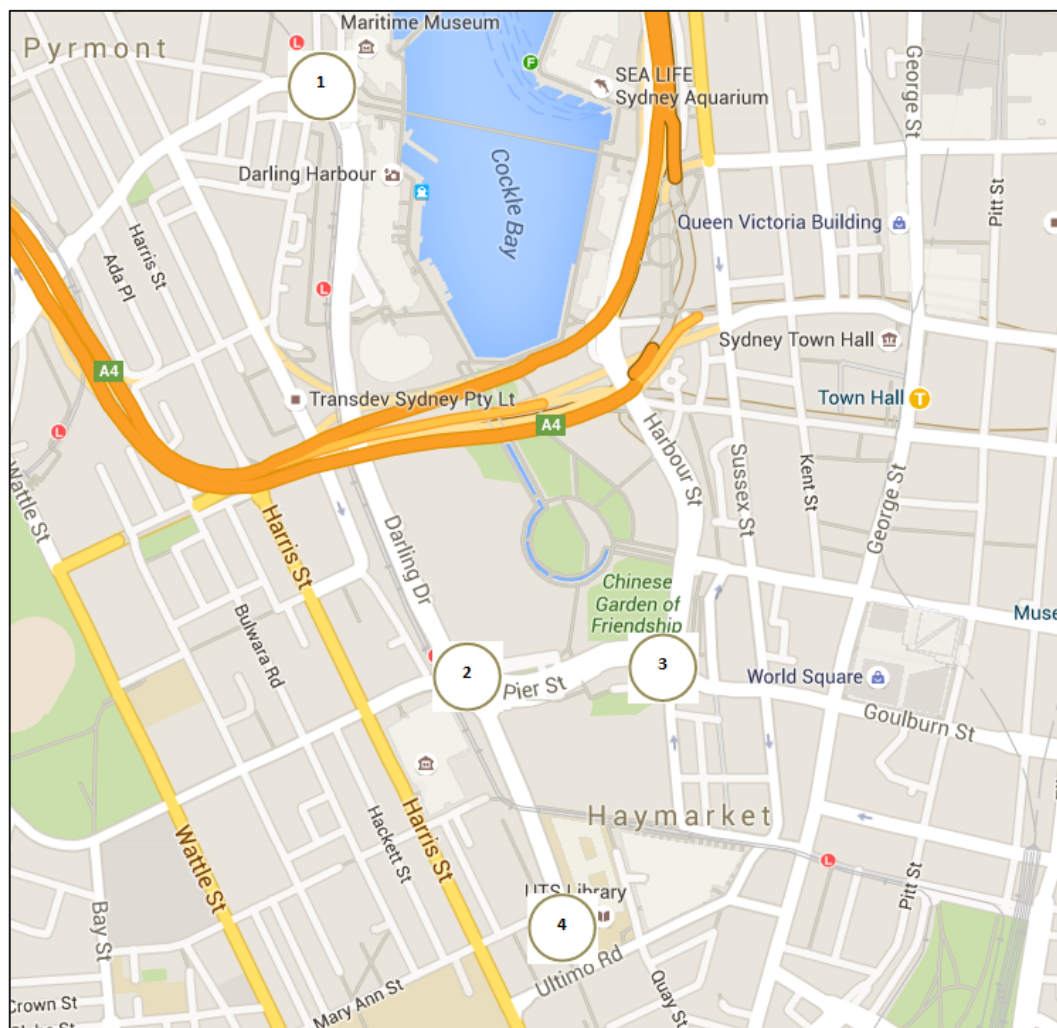


Figure 4 – Jan 2020 Traffic Survey Locations

### 3.3.1 Observed Peak Periods at Intersections

For each of the three intersections, peak one-hour periods were identified. The intersection turning movement data was used to identify the current capacity problems during the peak hour at key intersections. **Table 3** summarises the highest peak hour observed at each of the surveyed intersections.

**Table 3** Observed AM and PM Peak Periods at the Key Intersections

Intersection	Control Type	AM Peak Hour	PM Peak Hour
Pymont Bridge Road / Murray Street / Darling Drive	Traffic Signal	8:00 – 9:00	17:45 – 18:45
Harbour Street / Pier Street	Traffic Signal	8:00 – 9:00	17:45 – 18:45
Darling Drive / Ultimo Road	Traffic Signal	8:00 – 9:00	17:00 – 18:00

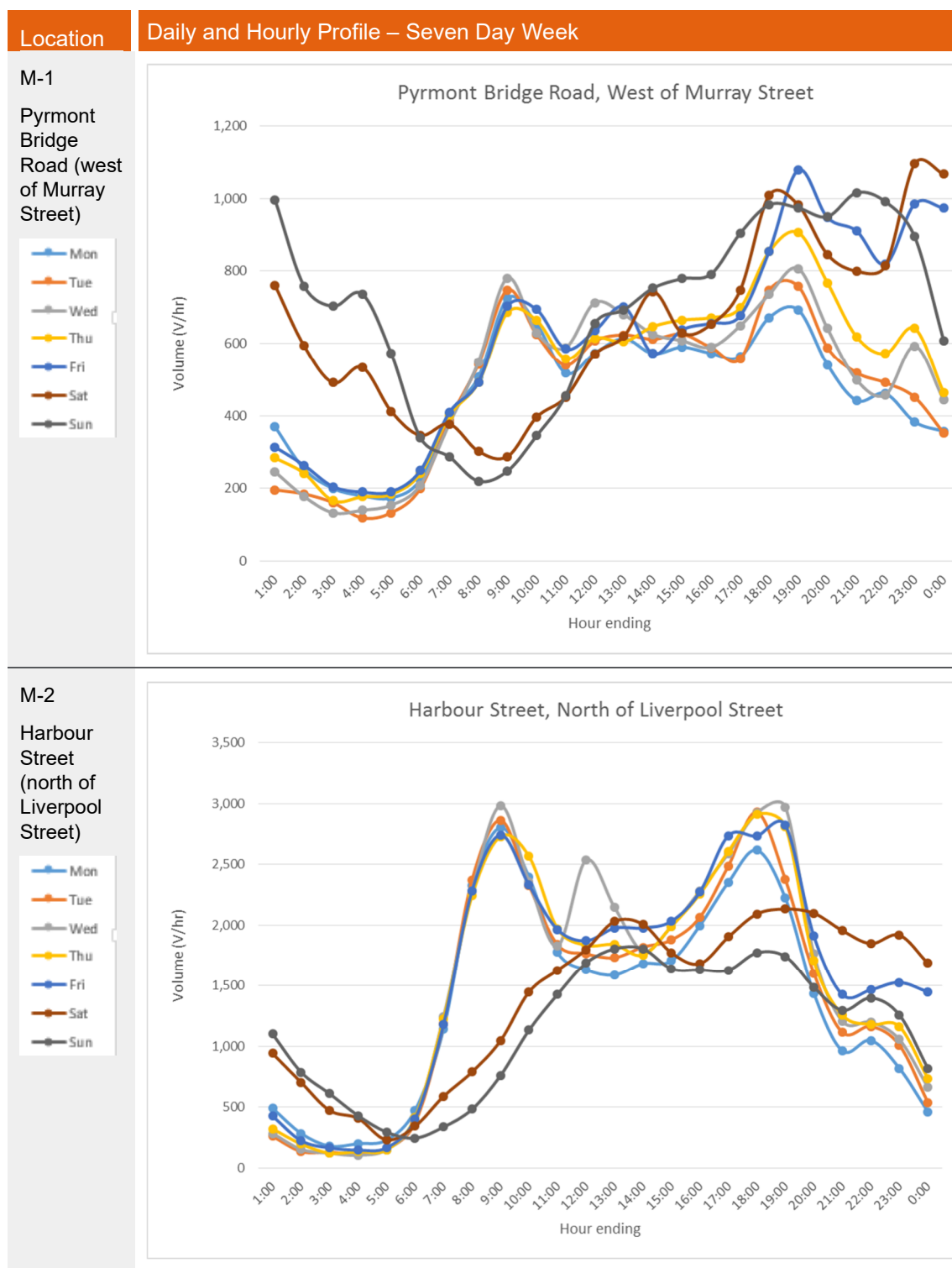
### 3.3.2 Traffic volume trends

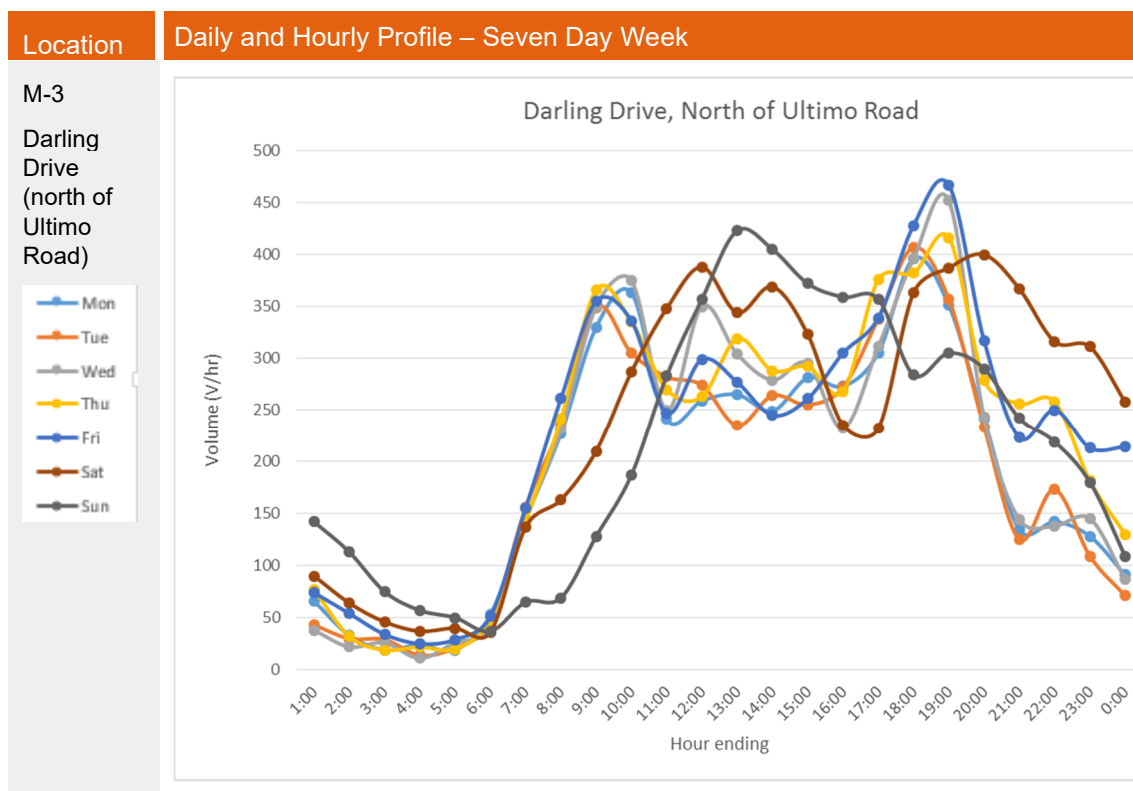
The 2016 mid-block counts showed the following trends:

- Monday to Thursday follow similar trends and volume profiles throughout the day with the Friday afternoon peak manifesting the highest weekday peak volumes at Pymont Bridge Road and Darling Drive
- Morning peak hour is generally between 8:00-9:00 a.m.
- The weekday evening peak was observed to generally occur between 6:00-7:00 pm
- Midnight traffic volumes are highest at Pymont Bridge Road on a Friday and Saturday
- Weekend traffic volumes have mid-day and evening peaks.

Daily and hourly vehicle profiles at key mid-block Locations (2016 surveys) are outlined in **Figure 5** below.

Figure 5 Daily and Hourly Vehicle Profile at key Mid-Block Locations (2016 surveys)





### 3.3.3 Peak Hour Traffic Volumes at Key Roads

The four key intersections identified in **Figure 4** were modelled using SIDRA Intersection (version 8.0.7.7948) for the existing condition in 2020. The data collected over the three days were analysed, and the periods with the highest traffic volumes across the three days formed the basis for the morning and afternoon peak hour models. The results of the traffic surveys are attached in **Appendix B** of this report.

A comparison of the traffic counts undertaken in 2016 and the recent 2020 surveys is shown in **Appendix C**. The results indicate minimal changes to traffic volumes and flows across the four intersections. For the Pier Street/Darling Drive roundabout, the north-east leg of Zollner Crescent was included as part of the 2020 survey and analysed in the SIDRA analysis.

## 3.4 Parking

There are several public car parks located within walking distance to the Harbourside development. The six car parks listed in the table have a total capacity of approximately 5,373 parking bays. Refer to **Table 4** for details.

**Table 4**      **Carpark Availability**

Public Carpark	Location	Distance	Bays
1- Wilson Parking - Harbourside	100 Murray Street, Pyrmont	120 metres west	1,387
Harbourside Carpark	117 Murray Street, Pyrmont	180 metres west	
2- Secure Parking - Harris Street	300 Harris Street	350 metres south west	260
3- InterPark – Edward Street	Edward Street	300 metres north west	2,500
4 – ICC Exhibition Centre (SICEEP)	Darling Drive	300m south	719
5 – ICC Theatre (SICEEP)	Darling Drive	650m south	107
6 – Darling Square Haymarket (SICEEP)	Darling Drive	750m south	400
Total			5,373

Although the SICEEP car parks will likely be at capacity during events, there will likely be spare parking capacity during non-event times.

**Figure 6** below outlines the location of the above car parks. The dashed circles represent 5 and 10-minute walking distances.

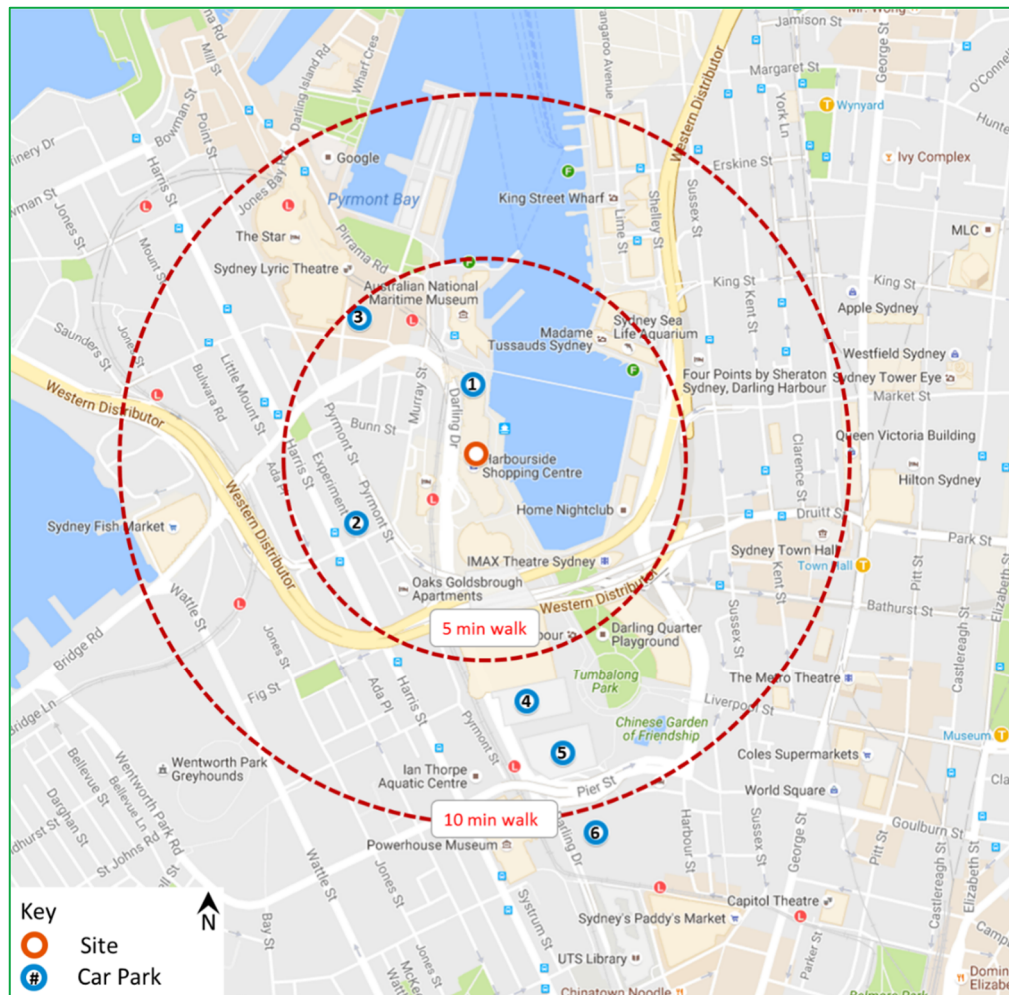


Figure 6 – Locations of Car Parking in the vicinity of the Harbourside Development

## 3.5 Green Travel Plan and Existing Conditions

### 3.5.1 Introduction

A Green Travel Plan is a package intended to inform and encourage the use of sustainable transport options for travel to and from the development site, taking into consideration location and accessibility to alternative transport modes. It promotes the use of active transport modes such as walking and cycling, and public transport options that service the area. As well as delivering better environmental outcomes, the promotion of sustainable travel options will provide both health and social benefits to the community.

### 3.5.2 City of Sydney Policy

The City of Sydney promotes the use of sustainable transport modes through its policies, strategies, and initiatives. These include, but are not limited to:

- Completing the Cycling Strategy and Action Plan, including connecting the gaps in the existing local bicycle network, and encouraging cycling as a mode of transport for trips under five kilometres.
- Achieving the goals set out in the Walking Strategy and Action Plan including increasing walking mode share and improving pedestrian amenity by 2030
- Improving the pedestrian safety and priority within the Local Government Area (LGA) through introducing a speed limit within the city centre of 40 km/h, as well as making adjustments to the traffic signal timings and providing wider footpaths
- Increasing the use of car sharing through providing sufficient car-share spaces and promoting it as a sustainable, affordable and convenient transport option
- Implementing the Liveable Green Network, which aims to improve pedestrian and cyclist connectivity ▪ Implementing the Inner Sydney Regional Bike Network with the goal of delivering a regional connected cycle network

### 3.5.3 Existing Transport Provision

There is a wide range of sustainable transport options including both active and public transport, available to the residents and visitors of the Darling Square site, including:

- Train services
- Light rail services
- Bus services
- Ferry Services
- Walking and cycling
- Car share

## 3.6 Public Transport

### 3.6.1 CityRail Suburban Rail Services

The site is within close proximity to public transport and is within walking distance to the rail network serving the Sydney CBD. Town Hall Station (approximately 500 m) is a 15-minute walk via Cockle Bay Wharf and Central Station (approximately 1 km) can be reached in 25 minutes by walking from the site.

### 3.6.2 Light Rail

The closest public transport service is the light rail station at Convention Centre, which is a two to three-minute walk away, providing a direct connection from both the Inner West and Central railway station to Darling Harbour South. The light rail provides transport solutions for commuters travelling to and from the CBD and the inner southern and eastern suburbs. **Figure 7** contains a map of the Sydney light rail coverage for the development area.

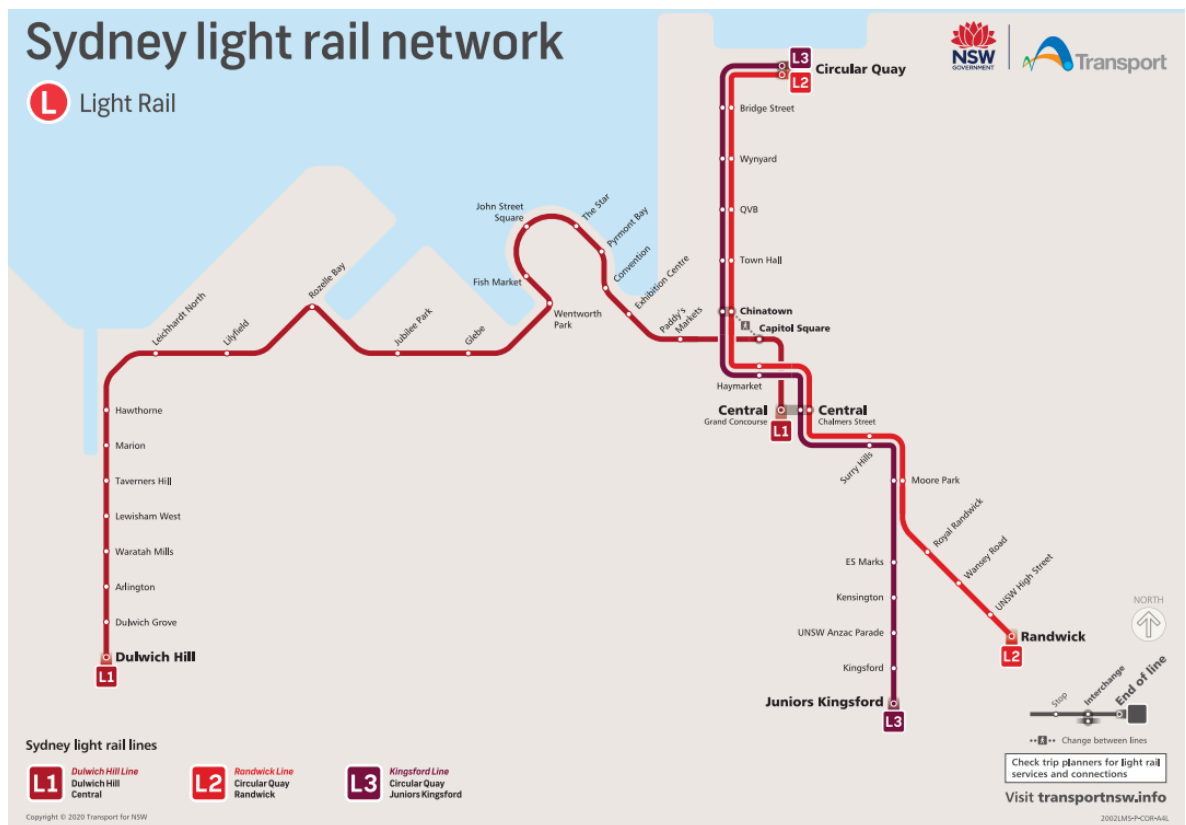


Figure 7: Sydney Light Rail Coverage Map (Source: [www.sydneylightrail.transport.nsw.gov.au](https://www.sydneylightrail.transport.nsw.gov.au))

The light rail operates from 6am to 11pm daily between Central Station and Lilyfield with a service frequency of 8 minutes during the peak periods on weekdays (7-9am and 5-7pm) and 15-minute intervals during the off-peak and inter-peak periods. The light rail operates 24hrs daily between Central Station and Star Casino with a night service operating at 30-minute intervals. Extended hours are also observed on the Central Station to Lilyfield route during Fridays and Saturdays.

Both the existing Convention Centre and Exhibition Centre light rail stops were upgraded with longer platforms to accommodate the new longer light rail trains, which has helped to increase capacity at both of these stops.

The CBD and South East Light Rail is a new light rail network for Sydney, with passenger services now operating on both the L2 Randwick Line and L3 Kingsford Line

The 12km route features 19 stops, extending from Circular Quay along George Street to Central Station, through Surry Hills to Moore Park, then to Kensington and Kingsford via Anzac Parade and Randwick via Alison Road and High Street.

Regular services running around every 4 minutes between Circular Quay and Moore Park, and around every 8 minutes between Moore Park and Randwick and Kingsford in the 7am-7pm peak on weekdays.

### 3.6.3 Sydney Metro West

The planned new Sydney Metro West line is proposed to start construction in the final quarter of 2021 and is estimated to be completed in 2030. This new transport facility will link Westmead with the Sydney CBD and infrastructure investment will double the rail capacity of the Parramatta to Sydney CBD corridor with a travel time target between the two centres of about 20 minutes.

A potential Metro station has been identified at Pyrmont. If included in the planning of Sydney Metro West, this future Metro station could be located within a 5-15 minute walking distance to the Harbourside development.



**Figure 8: Proposed Sydney Metro West Map (Source: Sydney Metro)**

**Figure 8** above indicates the proposed route and stations as outlining in the Sydney Metro West map, including the proposed potential location of the Pyrmont Metro Station.

The exact location of the Pyrmont Metro Station is not yet finalised. The Sydney Metro West online portal currently indicates a location in the vicinity of the John Street Square light rail stop, while the map outlined in **Figure 8** shows it located in the triangular shaped parcel of land near Pyrmont Bridge Road intersection. **Figure 9** outlines the close proximity of these potential locations relative to the Harbourside development site.



Figure 9: Proposed Potential Sydney Metro West Pyrmont Station Locations (Source: Sydney Metro)

### 3.6.4 Existing Public Bus Services

The closest bus stop is located at the Maritime Museum approximately a 5 minutes walking distance from the Harbourside site and it is being serviced by bus route 389, which operates between Pyrmont and North Bondi via the City, Paddington and Bondi junction. **Figure 10** outlines the bus service and coverage area map adjacent to the development site.

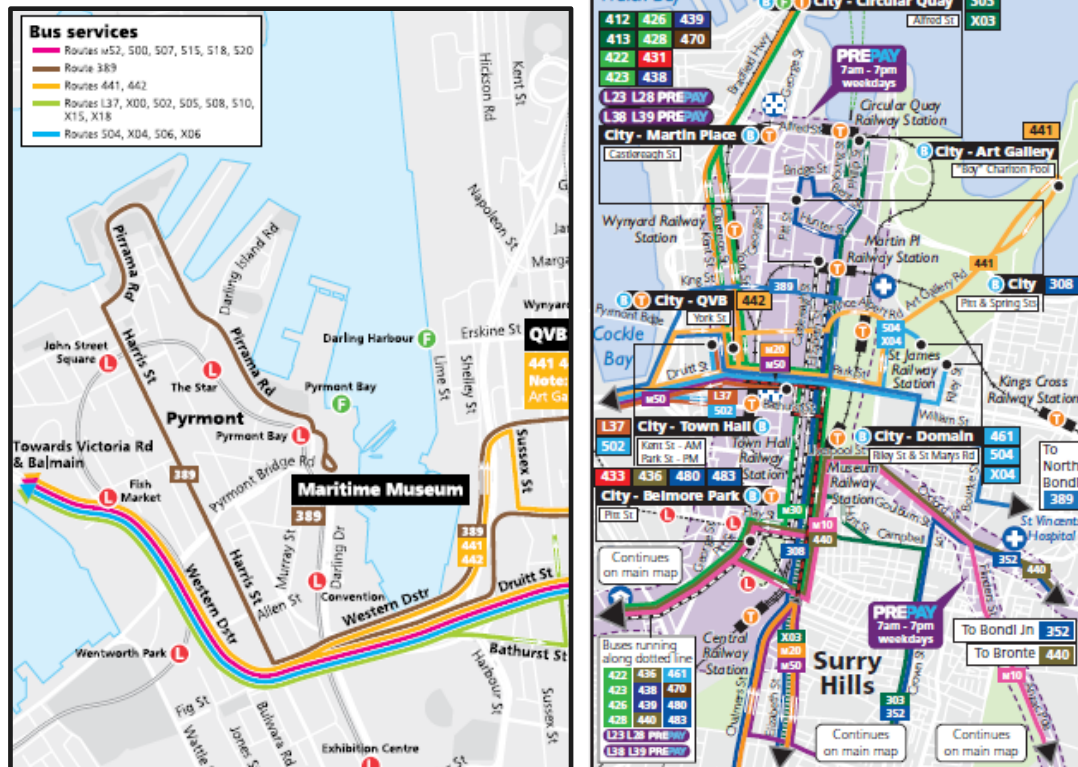


Figure 10: Bus Service Coverage Map adjacent to the site and in Sydney CBD (Source: Sydney Buses)

### 3.6.5 Ferry Services

Sydney Ferries operates ferry services between Circular Quay and Darling Harbour via Milson Point, McMahon's Point, Balmain East and stops at Sydney Aquarium and Pyrmont Bay. Both stops are approximately 5-10 minutes walking distance to the Harbourside development. The ferry services at Pyrmont Bay Wharf has a service frequency of every 30 minutes and operates from 6:30 AM to 8:00 PM. **Figure 11** below contains a coverage map of ferry services adjacent to the site and in the CDB district.

In addition, water taxis operate in Sydney Harbour and provide pickup or drop off at any accessible wharf or waterfront location.

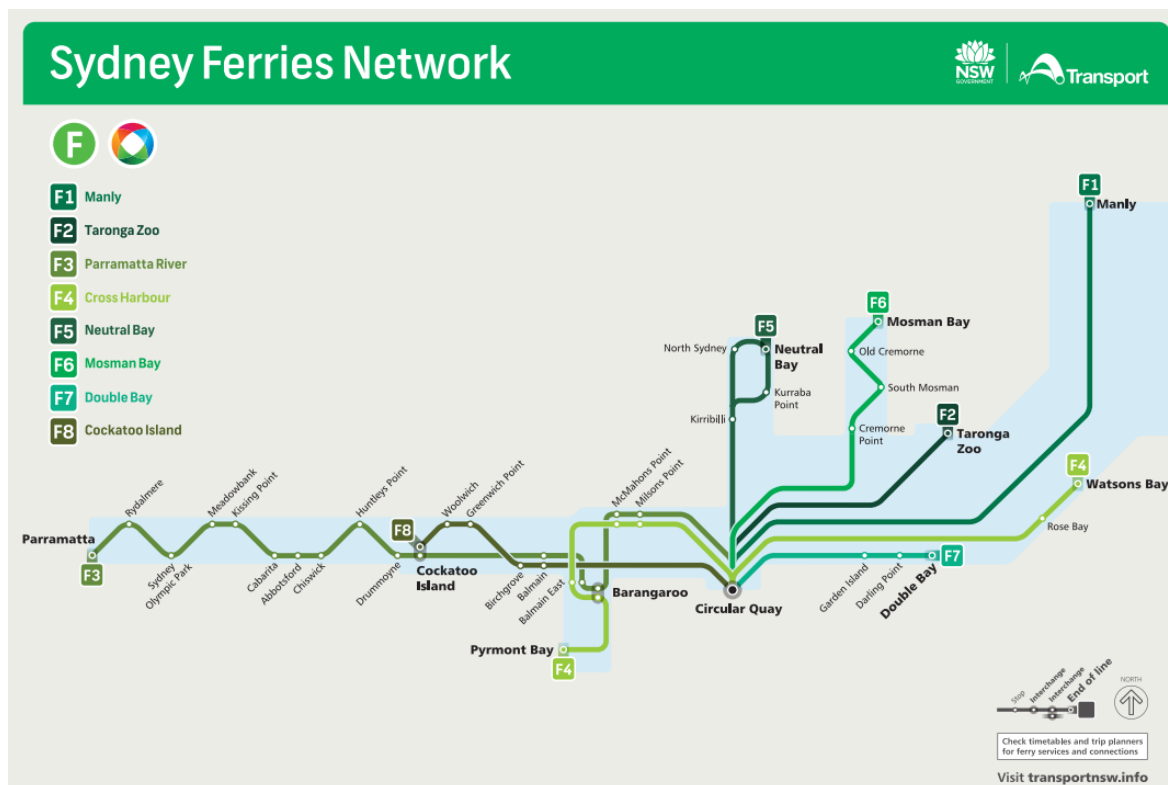


Figure 11: Ferry Service Coverage Map adjacent to the site and in Sydney CBD (Source: Sydney Ferries)

### 3.7 Pedestrian Network

The area surrounding the site has a well-established pedestrian network and is characterised with high levels of pedestrian activity as a result of the commercial, retail and tourist land uses. The pedestrian network consists of footpaths alongside major roads and multiple road crossings or overhead walkways including steps, ramps or lifts. There are a number of pedestrian access routes to and from the site. These routes are linked to the public domain areas within Tumbalong Park and Darling Harbour and to the various trip attractors within Darling Harbour and surrounding the site.

The major pedestrian links to the Harbourside site include connections to Sydney CBD, Town Hall and Central Station and adjacent areas via Pyrmont Pedestrian Bridge, pedestrian overpasses, footpaths along major roads and at-grade pedestrian crossings. The principal routes to and from Town Hall are Druiett Street and Bathurst Street. From Central Station, a direct route exists along Quay Street and through the Darling Harbour precinct. In addition, the Ultimo Pedestrian Network transformed the Goods Line into an active transport link, connecting cultural and educational institutions, and improving pedestrian access from Central Station and Railway Square through to Pyrmont and Darling Harbour. The Goods Line opened in August 2015.

From Central Station, a direct route exists along Quay Street but is under-utilised as linkages close to Central Station are poor. The Goods Line provides the alternate and improved route linking Central Station to Darling Harbour and Pyrmont.

The SICEEP development also includes a new nominally 20m wide pedestrian Boulevard, linking Chinatown to Darling Harbour, the proposed Harbourside Development and Cockle Bay Wharf.

### 3.8 Cycle Network

The Sydney CBD Cycleway network consists of on-street marked cycle lanes and separated at-grade cycleways. However, the majority of the routes in the Sydney CBD are shared routes on roads containing medium to high levels of vehicular traffic.

The north-south off road cycle path along Darling Drive provides access to the broader cycling network. North of the Darling Drive / Pier Street roundabout a new dual lane two-way segregated cycleway is provided along the western side of Darling Drive up to a proposed signalised scramble crossing in the northern sector by the ICC and ICC Hotel. At this junction the cycleway utilises the signalised scramble crossing to allow a safe connection to the existing single lane, one-way cycle way network, on the eastern side of Darling Drive.



Figure 12: Existing cycle network ([www.sydneycycleways.net](http://www.sydneycycleways.net))

The improved dual lane two-way segregated cycle path on the west side of Darling Drive ties into a shared space zone, in the southern sector, south of the Darling Drive / Pier Street roundabout. Within this shared space zone, the dual cycle way splits and links into the existing single lane, one-way cycle way network, on either side of Darling Drive.

The enhancement of the cycle network along Darling Drive and provision of end-of-trip facilities in the form of bike racks was part of the SICEEP development and was aimed at encouraging the use of cycling and to increase the cycle mode share in accordance with current targets for sustainable transport.


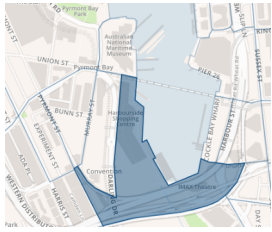
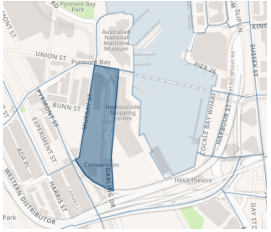
**Figure 12** contains a plan of the existing Sydney CBD cycleway network in the vicinity of the Harbourside development.

The peak hour traffic count undertaken at the intersection of Pyrmont Bridge Road/Murray Street/Darling Drive revealed there is a heavy influx of cyclists eastbound towards the city along Pyrmont Bridge Road in the AM peak. A total of 727 cyclists were counted over a three-hour period from 6:00 AM to 9:00 AM with 406 cyclists observed during the peak hour. In the PM peak, the opposite flow (westbound) was heavier with 519 cyclists counted over the three-hour period from 4:00 PM to 7:00 PM with 252 cyclists observed during the peak hour.

### 3.9 Mode Share

The existing mode share distribution within the surrounding road network was analysed by referencing the 2011 Census Journey to Work (JTW) data obtained from the Bureau of Transport Statistics, 2013. The JTW data provides information relating to the origin and destination of journeys to and from work for a travel zone, including modes of travel.

To understand the current mode share for trips to work in the study area, travel to and from the existing Harbourside development and to the adjacent zones were analysed.

Travel Mode	Zone 89	Zone 88	Zone 78
			
Train	35%	43%	40%
Vehicle driver	31%	32%	23%
Walk	15%	9%	7%
Bus	14%	5%	18%
Vehicle passenger	2%	7%	-
Ferry	1%	4%	7%
Other mode	1%	-	4%
Not stated	1%	-	1%

**Table 5** Travel Modes

The above data revealed that the dominant modes of travel to work on the site and for areas immediately adjacent to the site are train (35-43%), car (23-32%), bus (5-18%) and walk (7-15%). Public transport accounts for approximately 50% of the trips. Walking trips are also observed to be relatively high.

On Census Day 2016 in the Sydney CBD and Harbour Village Area, 16.7% of people travelled to work in a private car, 22.7% took public transport and 45.4% rode a bike or walked. 6.1% worked at home, which indicates an increase in sustainable transport methods and a decrease in private car use. **Table 6** outlines the method of travel to work in 2016 in the Sydney CBD and Harbour Village Area.

## Method of travel to work, 2016

Total employed persons

■ CBD and Harbour Village Area   ■ Greater Sydney

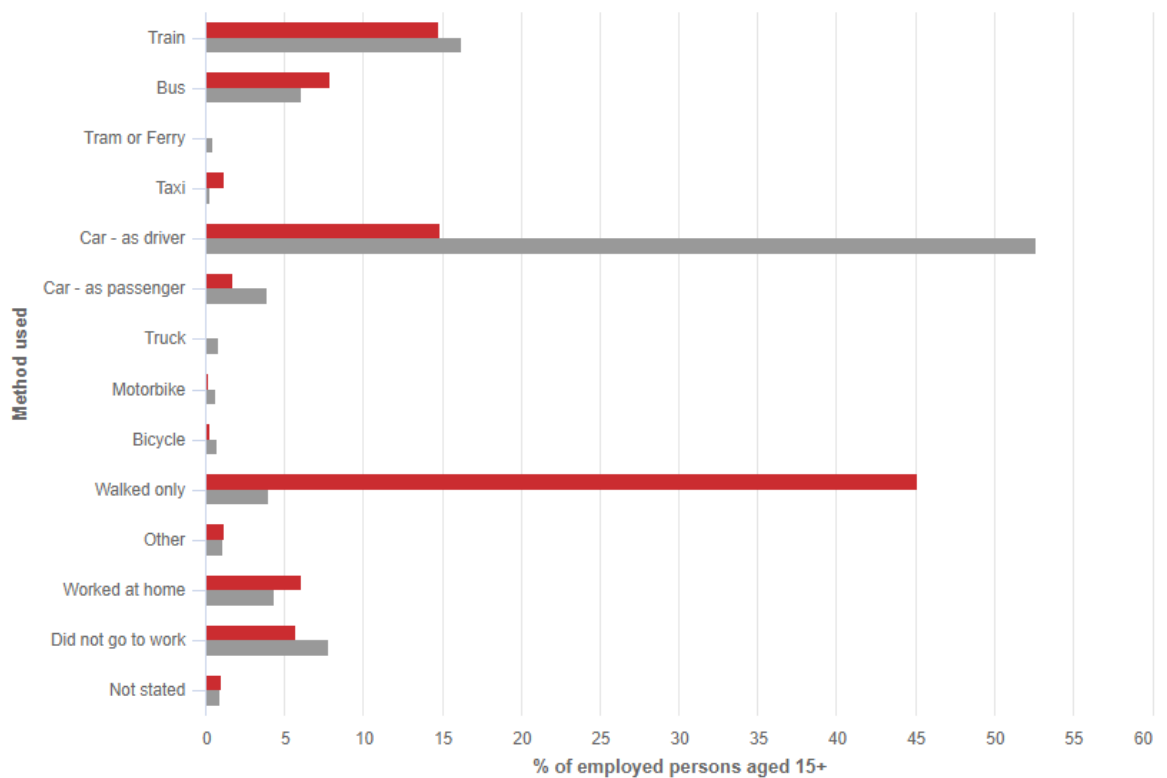


Table 6      Method of Travel to Work 2016

### 3.10 Private Coach Access

The proposed SICEEP development was completed in September 2016, provided new on-street bus parking drop-off bays, which are located along the southbound lane of Darling Drive, north of the proposed signalised Convention Centre scramble crossing. This zone can accommodate two 14.5m private coaches and is located adjacent to the proposed ICC Hotel and Harbourside development. Another bus bay is provided on the opposite side of Darling Drive on the northbound lane.

Furthermore, the proposed shared space zone that is located within the SICEEP development, between the ICC Convention Centre and the ICC Hotel has been designed to allow access for 14.5m coaches, for pick-up and drop-off purposes. This shared zone area has the capacity to accommodate up to eight 14.5m coaches at any one time, and it is also located adjacent to the Harbourside development.

**Figure 13** contains a key plan of adjacent transport facilities to the Harbourside development.

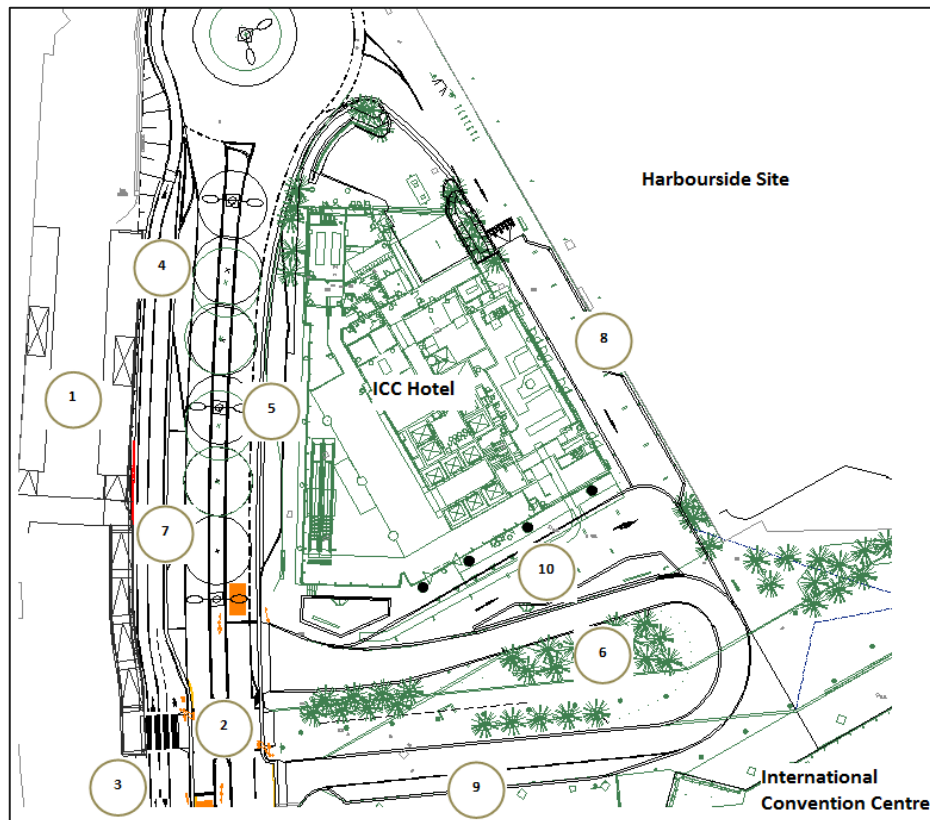


Figure 13: Key plan of adjacent transport facilities

Key Reference No.	Transport Facility
1	Improved Convention Light Rail Stop Platforms
2	Signalised Scramble Crossing
3	Dual segregated cycleway
4	1 x 14.5m coach bay
5	2 x 14.5m Coach bays
6	Harbourside Place Shared Zone – Coach drop-off and pick-up
7	Taxi Zone
8	Taxi Zone
9	Taxi drop-off and pick-up
10	Porte Cohere

Table 7: Key transport facilities adjacent to Harbourside

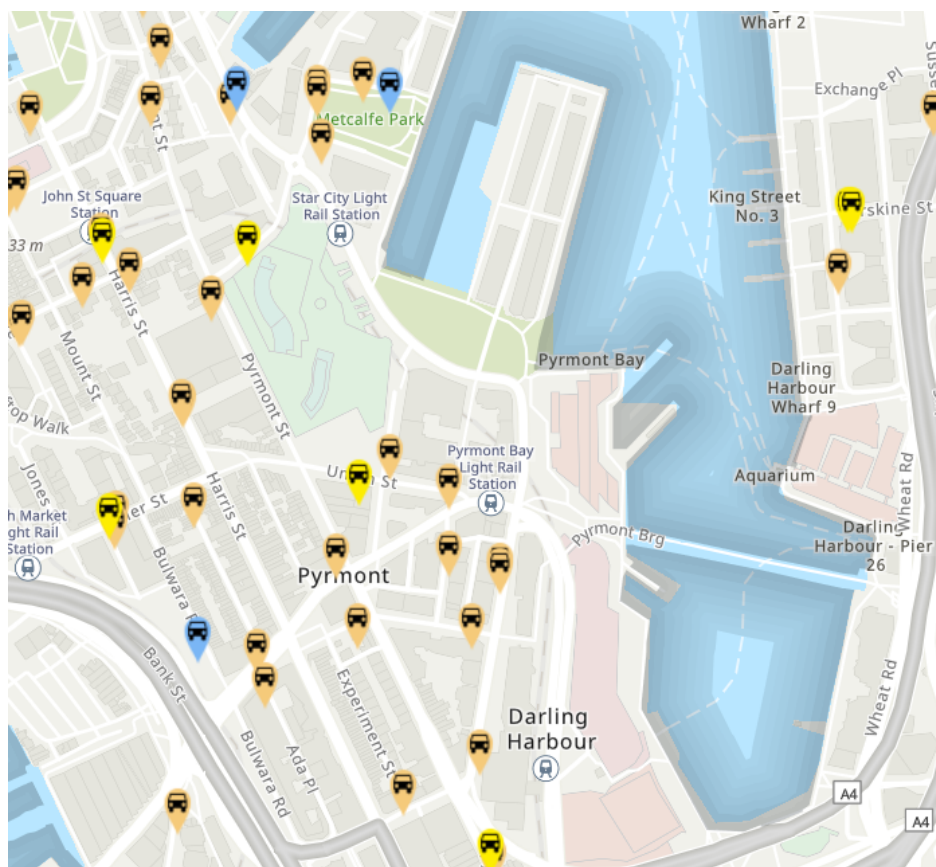
### 3.11 Taxi Zones

The SICEEP development contains multiple taxi zones within the development, which are located adjacent to the Harbourside development. These include new taxi zones located.

- Along the northbound lane of Darling Drive (5 spaces).
- Within the shared zone (Harbourside Place) located between the ICC Convention Centre and the ICC hotel – drop-off and pick-up (5 spaces)
- A porte cohere located as part of the ICC Hotel – drop-off and pick-up; and
- Along the access lane located between the ICC Hotel and the Harbourside development – 5 spaces

### 3.12 Car Share

**Figure 14** shows the car share vehicle pods in the vicinity of the Harbourside development site. It can be seen from the map that there is convenient access to car share services within walking distance of the site.



**Figure 14: Car share locations surrounding site**

Source: <https://www.cityofsydney.nsw.gov.au/live/residents/car-sharing>, accessed Sept 2020

## **4 PROPOSED AMENDED DEVELOPMENT**

### **4.1 Introduction**

This letter/report provides a response to submissions (as relevant) and assessment of the proposed amended Concept Proposal in relation to the State Significant Development (SSD) Development Application (DA) for the redevelopment of the Harbourside Shopping Centre (SSD 7874).

The SSD DA was publicly exhibited for a second time from 2 April to 29 April 2020. During this time, six (6) submissions were received from government agencies and City of Sydney Council and 57 submissions were received from the general public and organisations.

This letter/report should be read in conjunction with previous assessments prepared by Arcadis Consulting and dated 18<sup>th</sup> March 2016 and 16<sup>th</sup> February 2020 to support the Harbourside Concept Proposal.

### **4.2 Proposed Amended Development**

Following the second exhibition of the proposal in April 2020 and given the nature and range of submissions made from agencies and the public, Mirvac has again reviewed the overall approach and elements of the Concept Proposal. This has accordingly led to developing a Further Amended Concept Proposal. This further and final Concept Proposal therefore includes amendments made by Mirvac pursuant to Clause 55 of the Environmental Planning & Assessment Regulation, in the main to address matters raised in the submissions and deliver an overall significantly improved outcome on the site and for the broader Darling Harbour precinct and Pyrmont Peninsula.

In addition to the further amendments made to the Concept Proposal, Mirvac are also now including detailed Stage 1 Early Works, comprising demolition of existing site improvements down to ground slab level (no ground disturbance). Revised SEARs were accordingly issued by the Department on 12 May 2020.

The following further key amendments have been made to the Concept Proposal since its April 2020 public exhibition:

### **4.3 Increase in Height of the Tower**

The height of the tower has been increased to be consistent with the height originally proposed (from RL 153.75 to RL 166.95). The tower height has been increased in order to better align with the place outcomes identified within the Draft Pyrmont Place Strategy for Harbourside. This opportunity for additional height is supported with the provision of additional public benefit through the creation of a new significant public accessible area of open space on the northern podium rooftop.

### **4.4 Reduction in Height of Northern Podium**

A portion of the podium height at its northern extent has been further reduced from RL 25 to part RL 17.6 and part 13.75. The reduction in height provides for an improved relationship to the state heritage listed Pyrmont Bridge, further improve view sharing from 50 Murray Street, along with providing an opportunity to create a new publicly accessible open space area.

## 4.5 Gross Floor Area / Land Use Mix

The amended proposal retains the same overall 87,000sqm of GFA, however there is a minor adjustment in the split between non-residential and residential. The final proposal now includes:

- Non-residential uses floor space – 45,000sqm; and
- Residential uses floor space – 42,000sqm

In response to market demand and the focus of local and regional strategic planning policies, it is proposed for the podium to now include predominantly commercial land uses along with supporting retail. Indicatively, comprising ~28,000sqm net lettable area of commercial office and ~8,500sqm gross lettable area of retail.

The podium enables large campus sized commercial floor plates that are favoured by large multinational tech, media, finance, and professional services companies.

## 4.6 Apartment Numbers

No change is proposed to the indicative number of apartments (357), with the minor increase in the tower height resulting in a review of the mix and sizing of apartments. Note, this yield is on the 'Indicative Design' only and will be subject to future design development and a Stage 2 DA. This Stage 1 DA only seeks approval for land uses and the building envelope comprising a total of 87,000sqm GFA.

## 4.7 Car Parking

The overall footprint of the basement has been reduced, but there is proposed to be an additional basement level of parking (increase from 3 levels to 4 levels). There is no change to proposed indicative parking spaces, remaining at 306 spaces. As above, this is based on the 'Indicative Design' only.

## 4.8 Landscaped Open Space and Public Domain

The key concepts and public benefits as originally proposed are retained under the amended Concept Proposal, with the addition of a new significant area of publicly accessible open space created on the rooftop of the northern podium (referred to as "Guardian Square").

## 4.9 Final Description of Development

The Harbourside Shopping Centre Redevelopment application will include a Concept Proposal and detailed Stage 1 Early Works.

The final Concept Proposal seeks approval for the following key components and development parameters:

- A network of open space areas and links generally as shown within the Public Domain Concept Proposal, to facilitate re-integration of the site into the wider urban context;
- Building envelopes;
- Land uses across the site, non-residential and residential uses;
- A maximum total Gross Floor Area (GFA) across the Harbourside site of 87,000sqm for mixed use development (45,000sqm non-residential and 42,000sqm residential development);
- Basement car parking;

- Car parking rates to be utilised in subsequent detailed (Stage 2) Development Applications);
- Urban Design and Public Realm Guidelines to guide future development and the public domain; and
- Strategies for utilities and services provision, drainage and flooding, and ecological sustainable development.

The Stage 1 Early Works comprises:

- Demolition of the existing site improvements, including the Harbourside Shopping Centre, obsolete monorail infrastructure, and associated tree removal.

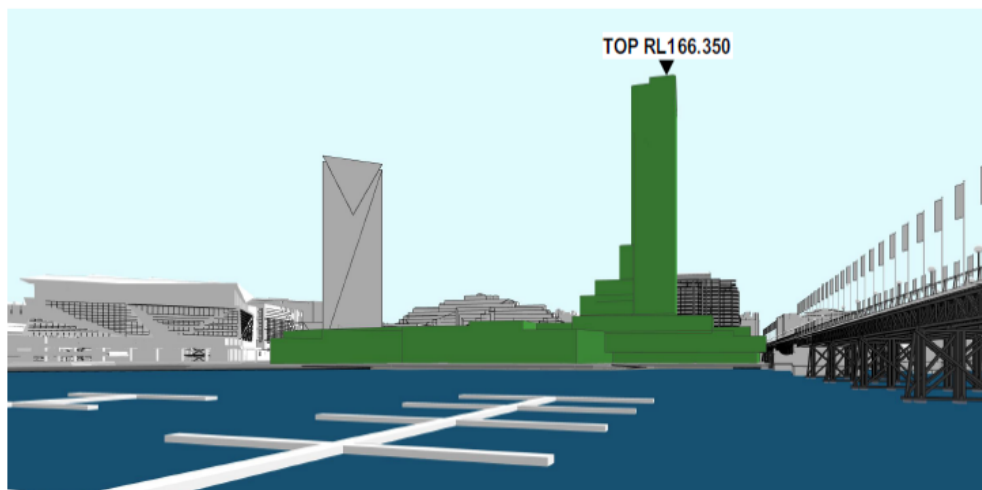


Figure 15: Original Submitted Concept Proposal

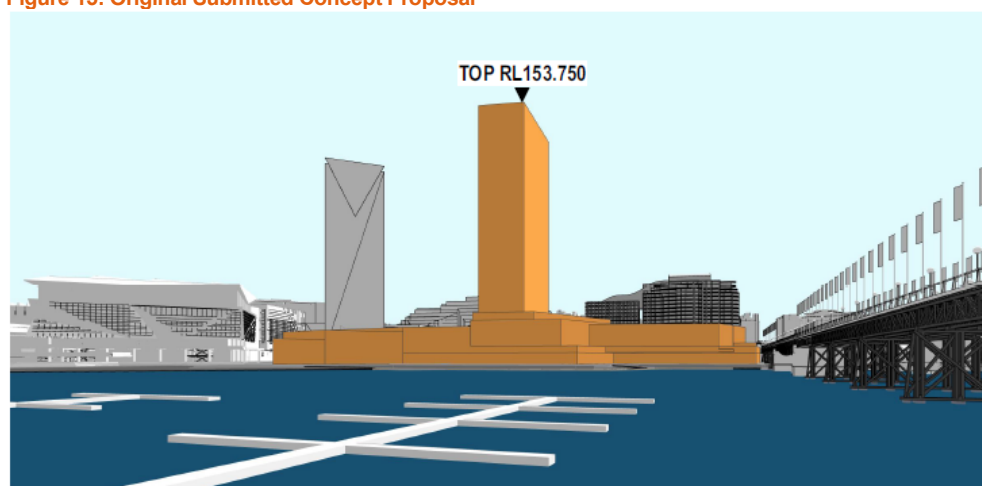
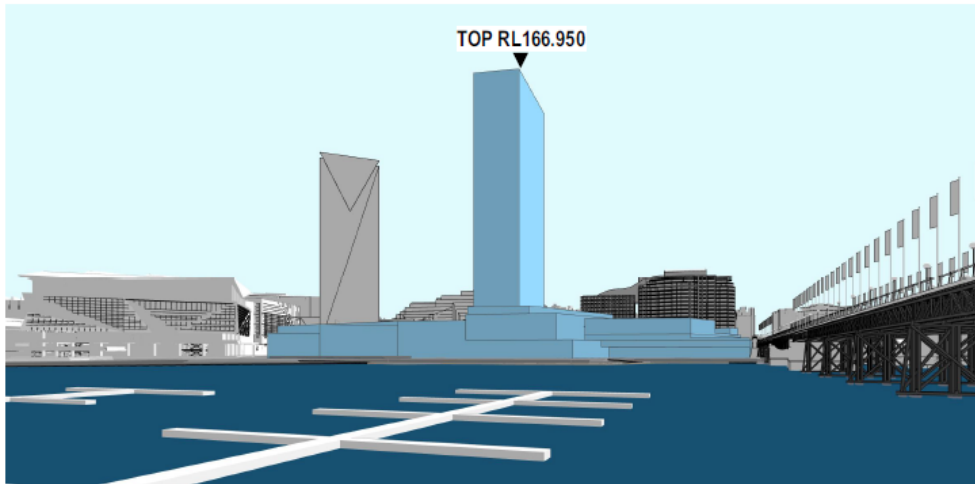


Figure 16: Amended Concept Proposal



**Figure 17: Further and Final Amended Concept Proposal**

The proposed development indicative design plans are contained in **Appendix D** of this report.

## **4.10 Parking Provision**

### **4.10.1 Residential Parking Rates**

As provided to the Sydney Local Environmental Plan (LEP) (2012) mapping (**Figure 15**), the subject site does not provide a 'Category' for residential parking rates. Land Category A is typically for buildings within the CBD (which are served by train stations). A review of the buildings located on the eastern side of Darling Harbour and directly adjacent to the harbour, indicates that these developments are all typically classified as Category B, for their residential parking rates.

All relevant sites within proximity to the subject site are provided with the Category B rates: SLEP 2012 Cat B rates are defined as follows:

*The maximum number of car parking spaces for residential flat buildings, dual occupancies and multi dwelling housing is as follows:*

*(b) on land in category B—*

*(i) for each studio dwelling—0.2 spaces, and*

*(ii) for each 1 bedroom dwelling—0.4 spaces, and*

*(iii) for each 2 bedroom dwelling—0.8 spaces, and*

*(iv) for each 3 or more bedroom dwelling—1.1 spaces, and*

*(v) for each dwelling up to 30 dwellings—0.167 spaces, and*

*(vi) for each dwelling more than 30 and up to 70 dwellings—0.1 spaces, and*

*(vii) for each dwelling more than 70 dwellings—0.05 spaces,*

*(2) Development consent must not be granted to development that includes car parking spaces referred to in subclause (1)(b)(v)–(vii) or (c)(v)–(vii) unless the consent authority is satisfied that those car parking spaces will be used for the purposes of providing parking for visitors to the*

buildings to which those parking spaces relate and not for the purposes of providing parking for any resident of those buildings.

As such, Harbourside would be classified as Category B in line with our understanding of surrounding land uses and public transport options in the area (light rail, ferries) as opposite to Category A (trains, light rail, ferries, and buses).



Figure 18: Sydney LEP (2012) Land use and Transport Integration Map

Applying the SLEP Category B parking rates to the indicative proposed development residential yield, results in the maximum permissible parking provision outlined in **Table 8** below:

Dwelling Type	Quantity	Parking Rate	Car Parking No.
Studio	0	0.2 spaces	0
1 bedroom dwelling	64	0.4 spaces	25.6
2 bedroom dwelling	210	0.8 spaces	168
3 or more bedroom dwelling	83	1.1 spaces	91.3
Up to 30 dwellings	30	0.167 (Visitor)	5.01
30 to 70 dwellings	40	0.1 (visitor)	4
More than 70 dwellings	287	0.05 (Visitor)	14.35
<b>Total</b>			<b>308.26</b>

Table 8: Development Parking Rates and Provision

Whilst all parking allowances are indicative and will be confirmed within the Stage 2 Development Application submission, the indicative proposed development results in the following:

A maximum permissible parking provision of 285 parking spaces for the residential apartments aligning with the SLEP (2012).

Car sharing parking requirements are defined in the City of Sydney DCP (2012), which stipulates the following:

- A minimum car share rate of 1 car share space per 60 car spaces for Category B.

This equates to 5 car share spaces for the indicative proposed development scheme.

Accessible car parking requirements are also defined in the City of Sydney DCP (2012), which stipulates a parking requirement of:

- One accessible space per adaptable residential unit.

Based on the indicative proposed development scheme's apartment mix, 54 apartments will be adaptable units resulting in 54 accessible car parking spaces.

It is not proposed to provide any visitor parking, which aligns with the SLEP (2012).

#### 4.10.1.1 Car ownership census data

As outlined above, the proposed Harbourside development proposes to adopt the SLEP (2012) Category B parking rates.

To provide further and secondary justification of the proposed development use of the SLEP (2012) Category B residential car parking rates, a review of existing and current publicly available census data from 2016 was undertaken. This assessment included a review of residential data in the Pyrmont area. The key findings of this 2016 census data review are that:

- For Pyrmont, approximately 27.2% of dwellings do not own a motor vehicle
- For Pyrmont, approximately 62.2% own one or more motor vehicles
- The remainder is unstated.

Consideration of including yearly income per dwelling was also assessed as part of the 2016 census data review. This indicated an increase in motor vehicle ownership, when only assessing higher yearly incomes per dwelling. When considering higher annual income per dwelling, the following key findings are noted:

- For Pyrmont, approximately 90% of dwellings of higher annual incomes per dwelling, own one motor vehicle or more
- For Pyrmont, approximately 55% of dwellings of higher annual incomes per dwelling own two vehicles
- For Ultimo, approximately 87% of dwellings of higher annual incomes per dwelling own one motor vehicle or more
- For Sydney, approximately 71% of dwellings of higher annual incomes per dwelling own one motor vehicle or more

#### 4.10.2 Existing Car Parking

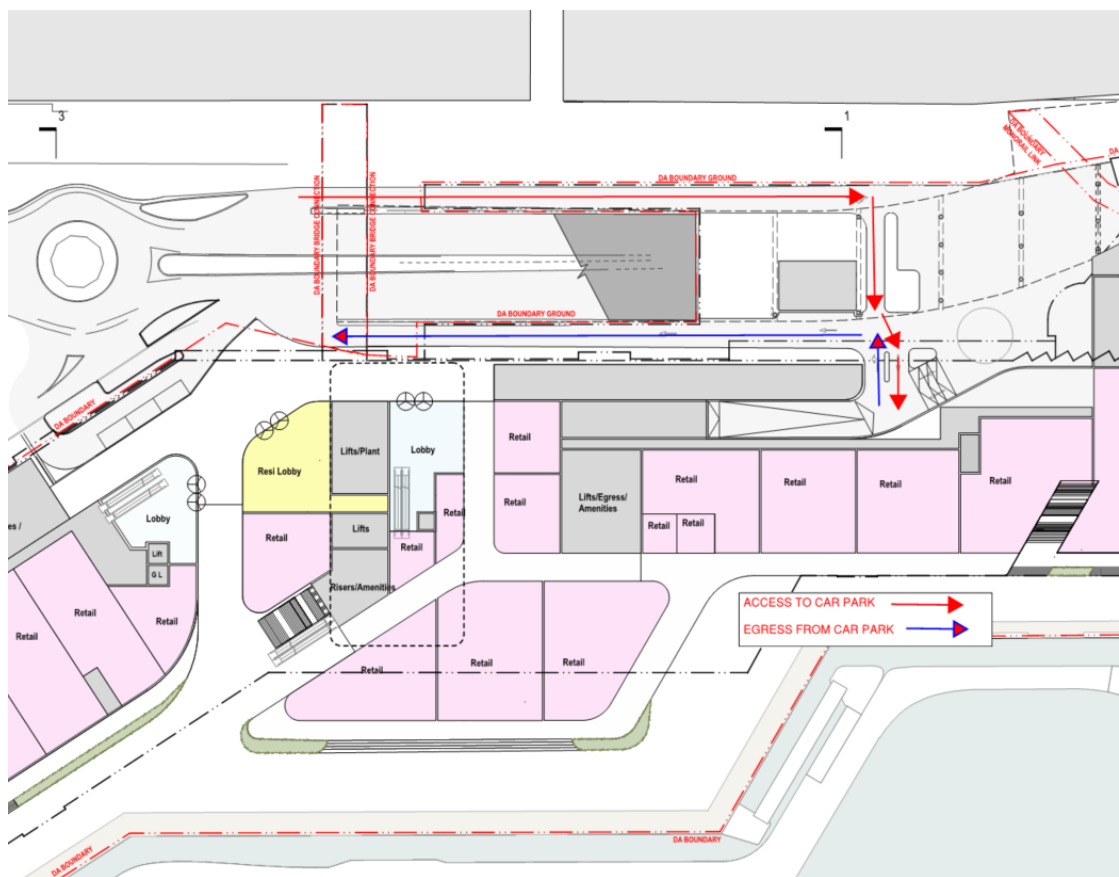
The current Harbourside Shopping Centre operator leases car parking for the existing retail patrons from the Novotel hotel car park. It is proposed that this current retail parking provision arrangement will continue for the proposed development. It is proposed that 255 spaces within

this car park will be used by the retail patrons and commercial tenants associated with the proposed Harbourside Development.

Patrons will park here and then access the new Harbourside Shopping Centre via the new Bunn St bridge.

### 4.10.3 Basement Parking

The proposed development will provide approximately 306 car parking spaces in the basement, which will be provided for over four basement levels. Final car parking provision will be determined at the detailed design stage. The four levels of basement car parking are for residential parking only. The basement car park and loading access location is outlined in **Figure 19** below.



**Figure 19: Basement Car Park access and egress location**

The entrance and exit from the proposed basement car park are not directly located along Darling Drive. Vehicles will enter and leave the basement car park via the existing access roads that service the existing Harbourside loading dock, which are located at the existing Darling Drive roundabout by the ICC Hotel. The length of the entry access road to the basement car park is approximately 150m from the car park entry to the interface with Darling Drive.

Table 3.3 of AS:2890.1 Off-Street Car Parking outlines peak hourly in-flow of traffic and queue areas required for car parks with boom gates and ticket issuing devices at entry points. Applying

the criteria outlined in that table would require a vehicle queue storage allocation of 19 vehicles. Applying 6m for a vehicle footprint would equate to a queue storage length of 114m, which is less than the 150m provided. This assessment is a robust assessment and detailed modelling would likely reduce this number.

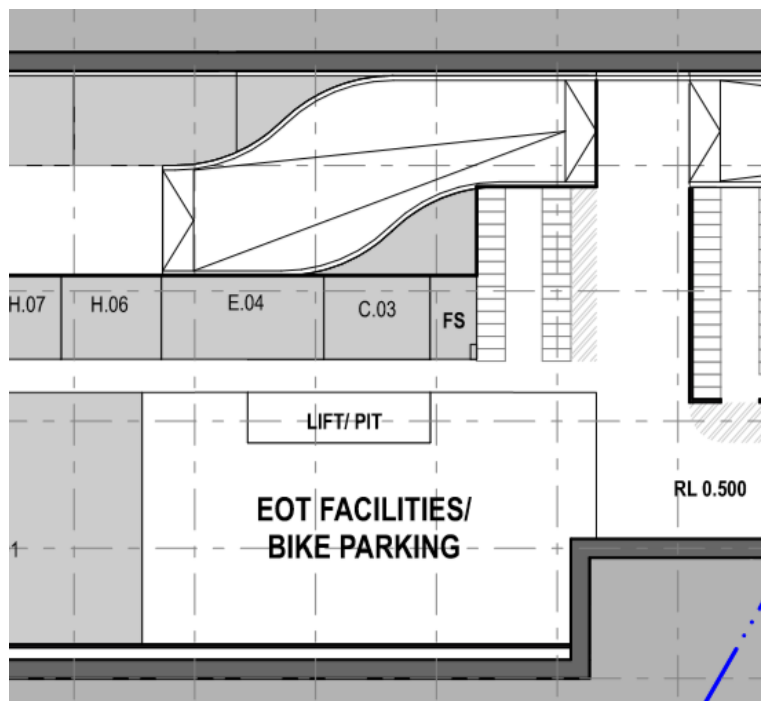
As such, traffic queued entering the basement car park is unlikely to impact the operation of traffic on Darling Drive.

**Appendix E** of the Report outlines vehicle swept paths using industry standard software (AutoTrack) for vehicle entering and egressing the basement car park.

#### 4.10.4 Bicycle Parking and End of Trip Facilities

Bicycle parking facilities are proposed and will be confirmed during the detailed design stage of the proposed development. These will likely be provided in the basement level 1 area.

End of trip facilities will be provided within the basement level 1 area of the proposed development, and the northern end of the commercial level 2 area. Please refer to **Figure 20** for an indicative location of the proposed bicycle and end of trips facilities, located in the basement L1 area. While space has been provisioned, the final number of bicycle parking and end of trip facilities is to be confirm in the Stage 2 Development Application.



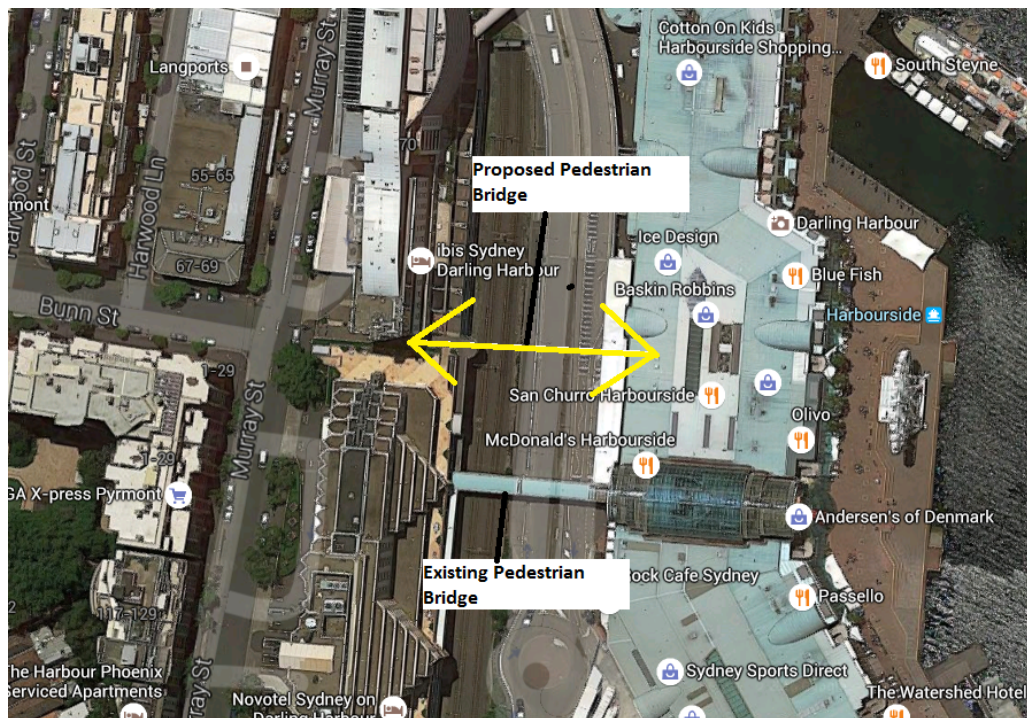
**Figure 20: Indicative Bicycle and End of Trip Facilities**

#### 4.11 Pedestrian Network

The proposed pedestrian network will link up with the existing pedestrian network and the initiatives developed under the SICEEP development mainly consisting of the main boulevard that will be up to 20m wide and will have sufficient capacity to cater for peak pedestrian demand anticipated during events at the precinct. The main boulevard will provide the main linkage from

the south between Chinatown and Darling Square in Haymarket, Darling Central and Bayside within the SICEEP development and the Harbourside development and Cockle Bay, in the north.

Pedestrian linkages to the west of Harbourside will be improved by the relocation of the pedestrian bridge connecting the now closed Convention Centre monorail station to the Novotel Hotel carpark to an improved connection from the Harbourside development with Bunn Street. Connectivity to the Sydney CBD to the east of Harbourside will be maintained via Pyrmont Bridge Road, the existing pedestrian overpasses and at-grade pedestrian crossings. Please refer to **Figure 21** for a location plan of the existing and proposed pedestrian bridge over Darling Drive and the light rail. The new pedestrian bridge will consider all relevant limited in height stratum associated with the light rail catenary infrastructure.



**Figure 21: Proposed Pedestrian Bridge Location Plan**

Arcadis consulted with TfNSW and the light rail operator (TransDev) in February 2016 and outlined the concept proposal.

Ongoing consultation will be undertaken between the applicant, TfNSW, the light rail operator, and if required, Sydney Trains during the design and construction of the proposed development, with regard to all design elements of the proposed development that interface with the light rail corridor. In particular, this relates to the demolition and construction of the new pedestrian bridge links over the light rail corridor.

Pedestrian modelling will be undertaken during future design stages to ensure that adequate capacity for pedestrian movements is provided at critical locations within the proposed development footprint and surroundings.

Wayfinding strategies and travel access guides to assist with increasing the mode share of walking and cycling will be developed during future design stages of the development.

## **4.12 Cycle Network**

The cycle network will be consistent with the existing cycle network together with the improved network provided with the SICEEP development. The proposed cycle access for the Harbourside development will include the Darling Drive cycle network and the internal cycle route within the Darling Harbour Precinct via Tumbalong Park. Access to the development will be enhanced at key entry points for cyclists with facilities provided where necessary. No new cycle routes will be developed.

There will be no impacts to any existing cycle routes as a result of the development. A Road Safety Audit will be undertaken in future detailed design stages to ensure mitigation of any potential risks to bicycle users.

## **4.13 Servicing**

### **4.13.1 Kiss & Ride Facilities**

A new Kiss & Ride drop-off facility is proposed that will provide a car and taxi drop-off facility to the proposed Harbourside development, which will be provided in the vicinity of the Darling Drive roundabout located near the Sofitel Hotel. Vehicles will enter this drop as they exit the down ramp from the Pyrmont Bridge intersection, and egress via the roadway located between the development and the Sofitel Hotel. This drop-off facility will be designed in accordance with best practice road design guidelines and it will accommodate a travel through lane separate to the three drop-off bays.

Please refer to **Figure 22** for an indicative location of this drop-off facility. This vehicular Kiss and Ride drop-off facility is proposed to be shared across the proposed uses of the development, including the residential, retail and commercial uses.

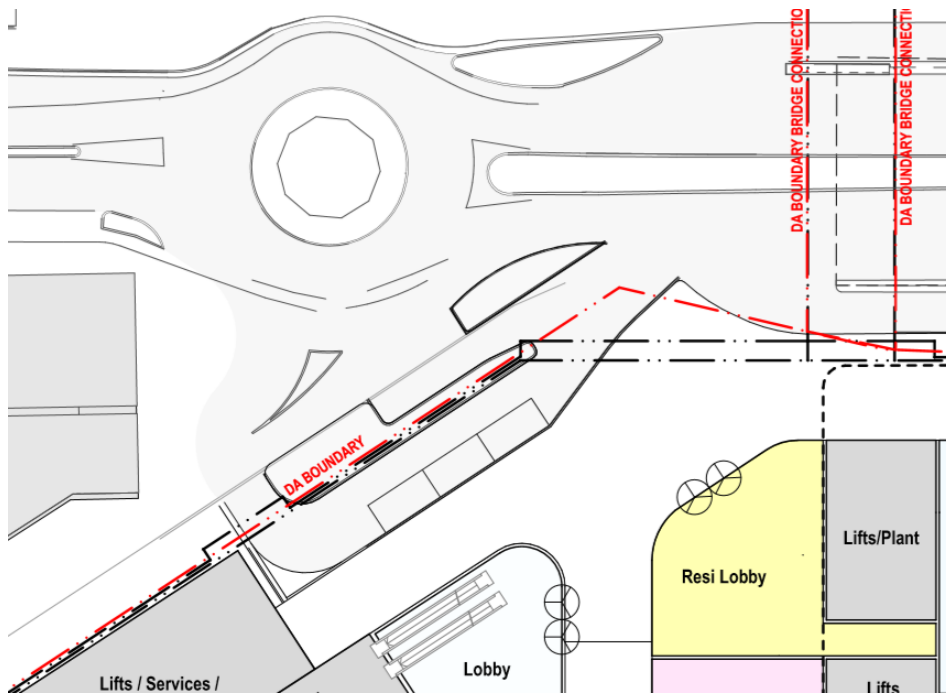


Figure 22: Indicative Plan of Retail Drop-off Facility

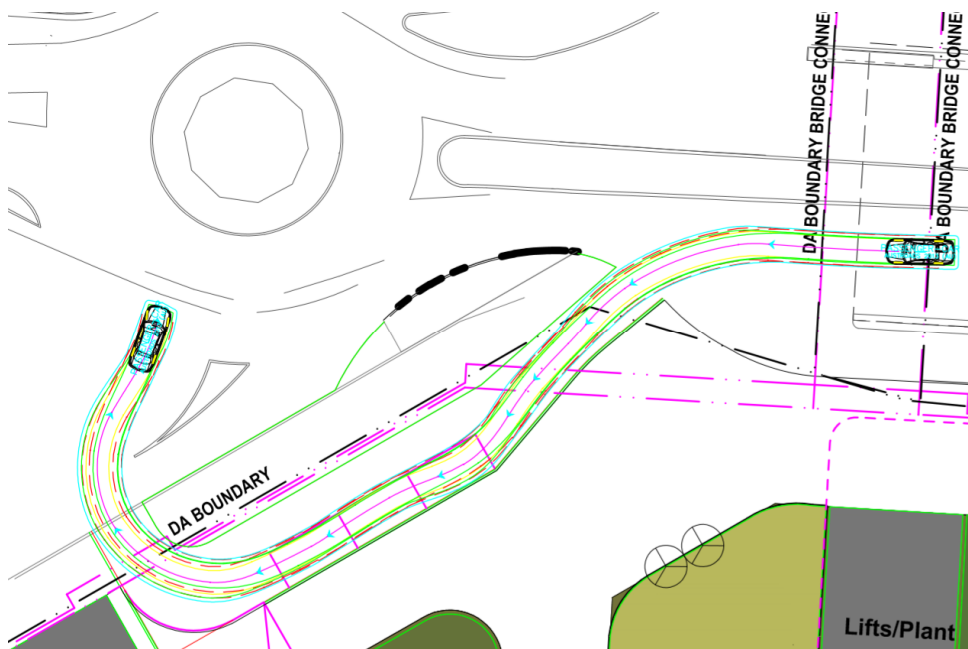


Figure 23: 5.2m Car Swept Path at Indicative Plan of Drop-off facility

**Figure 23** outlines the vehicle swept path of a 5.2m car. This swept path demonstrates that the proposed drop-off can accommodate this movement.

A draft drop-off zone management plan to manage vehicles accessing the site will be prepared in future design stages of the development.

There is an existing cycleway that is located on both the northbound and southbound side of Darling Drive. The southbound lane is located along the section of Darling Drive where the proposed vehicular drop-off access and egress location points are proposed. As such, vehicles entering this drop-off will need to cross the existing cycleway.

This design interface will be considered in the future design development stages to consider cyclist safety. Design measures such as road line markings and road traffic signs will be considered in the future design to inform drivers of the potential presence of cyclists for vehicles entering the drop-off area. Road line marking, road traffic signs and consideration of appropriate sightlines will be considered for vehicles entering and egressing from the Kiss and Ride drop-off area.

The road geometry and layout of this drop-off facility is only at concept design phase. The road geometry and layout of this drop-off facility, and approach road line marking will be developed during the detailed design stages, to accommodate a drop off facility that is compliant with relevant design codes.

Consultation with the Transport for New South Wales and City of Sydney is recommended during the design development phase with regard to the drop-off facility.

### **4.13.2 Bus Parking Provision**

It is not anticipated that there will be a requirement for bus parking for the retail use of the development. As such, dedicated bus parking is not proposed as part of this development proposal.

However, should a bus need to drop off or pick up from the development, it is proposed that the existing bus drop-off and pick up provision that is located on both the northbound and southbound side of Darling Drive, opposite the Sofitel Hotel is used. It is also understood that Harbourside Place, which is located between the ICC Convention Centre and the Sofitel Hotel, was designed to accommodate bus turning movements, to further allow bus drop off and pick up. All of these bus drop-off and pick up facilities are in very close proximity of the proposed development.

### **4.13.3 Loading Dock**

The current Harbourside Shopping Centre development contains the following capacity within its loading dock, which is located to rear of the development under the Darling Drive road ramp.

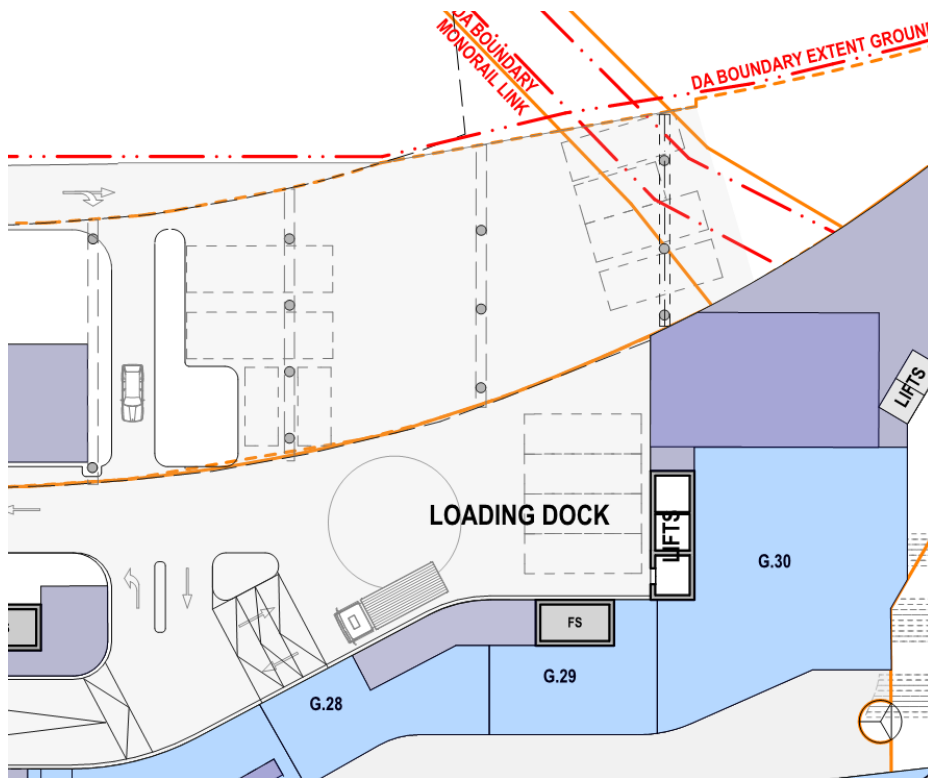
- 7 x HRV bays
- 3 x MRV bays
- 5 x Small service vehicle bays

The proposed development will contain two separate loading docks, which are to be shared across all components of the proposed development.

1. Retail ground level loading dock
2. Basement Level 1 loading dock

It should be noted that the overall GFA of the retail element will be reduced as result of the proposed development, relative to existing.

#### **Ground Level Loading Dock**



**Figure 24: Ground Level Loading Dock Indicative Concept Design**

**Figure 24** above outlines the layout of this loading dock.

The proposed loading dock will be accessed via the access road from Darling Drive roundabout that is currently used by the existing loading dock. A turning plate within the loading dock will be provided if required. This will be assessed during the detailed design phase of the loading dock.

It is anticipated that the proposed loading dock will cater for the following:

- 2 x HRV bays.
- 7 x MRV bays; and
- 3 x Small service vehicle bays

However, numbers are subject to change in the detailed design stage.

The expected percentage usage of the loading dock is split as follows:

- 20% HRV;
- 60% MRV; and
- 20% SRV

The length of the proposed access road that links Darling Drive to the loading dock is approximately 100m. As such, this access road can accommodate up to seven queued 12.5m HGV on entry to the loading dock. As such, it is unlikely that queued vehicles entering the loading dock will impact on the operation of Darling Drive. It is recommended that a loading dock management plan is developed by the operator at a future date to ensure effective management of staged deliveries to not impact the operation of the loading dock or Darling Drive. A swept path assessment was undertaken to demonstrate access to and egress from this loading dock. The swept path diagrams are shown in **Appendix E**.

The final loading dock layout will be confirmed during future detailed design stages of the proposed development.

### **Basement Level 1 Loading Dock**

This loading dock will be located in the first basement level of the proposed development. Access to this basement loading dock will be via the same access ramp to the basement car park. The current concept design anticipates that vehicles requiring access to this loading dock will be limited in size to an 8.8m Medium Rigid Vehicle (MRV) and a 9.8m waste collection vehicle. However, swept path analysis has been undertaken that indicates that a 12.5m HGV can access this loading dock via the current basement ramp design. Egress from this loading dock will be the basement access ramp. Vehicles will utilize the turning plate at the top of the ramp in order to egress via the loading dock egress lane.

It is anticipated that the proposed loading dock will cater for the following in the proposed loading dock:

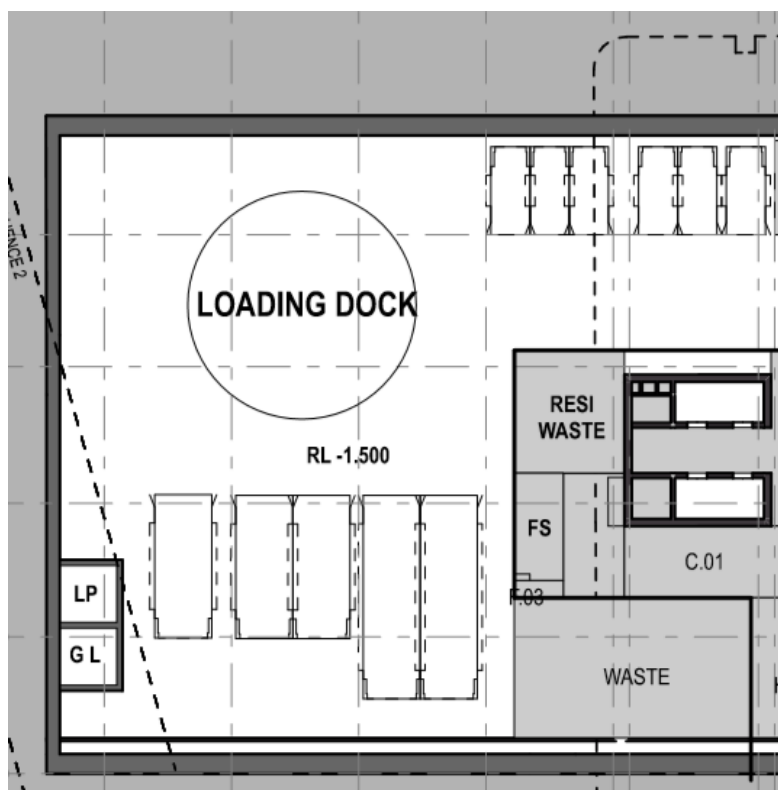
- 2 x HGV bays
- 3 x MRV bays

However, numbers are subject to change in the detailed design stage. The current concept design allows for two 12.5m HGV parking bays if they were required.

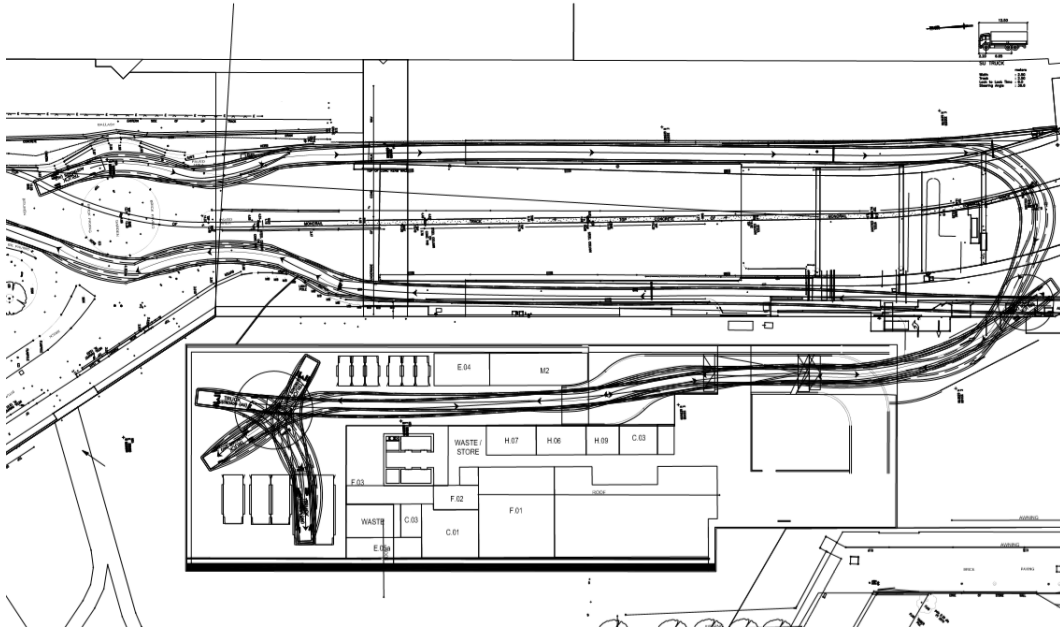
The expected percentage usage of the loading dock is split as follows:

- 60% MRV; and
- 40% HGV

**Figure 25** below outlines the layout of this loading dock.



**Figure 25: Basement Level 1 Loading Dock Indicative Concept Design**



**Figure 26: 12.5m HGV Swept Path into and from the Basement Level 1 Loading Dock**

A swept path assessment was undertaken to demonstrate access to and egress from this loading dock. The swept path diagrams are shown in **Appendix D** and **Figure 26** above outlines the swept path for a 12.5m HGV into and from the basement loading dock.

#### 4.13.4 Waste Management

The current waste management facility is provided within the service yard located adjacent to the existing loading dock. It is proposed that a similar arrangement will be maintained for the future operation mode of the proposed development, for the retail and commercial uses of the proposed development. A further waste facility is proposed on the first basement level for residential use. Waste collection vehicles will enter the basement level 1 area via the same access ramp as the car park and loading dock.

The typical maximum length of a waste collection vehicle within the City of Sydney is 9.8m. However, swept path analysis has been undertaken that indicates that a 12.5m HGV can access this loading dock via the current basement ramp design. Egress from this loading dock will be the basement access ramp. Vehicles will utilize the turning plate at the top of the ramp to egress via the loading dock egress lane.

A swept path assessment was undertaken to demonstrate access to and egress from this basement waste facility for a 2.5m HGV, which would be larger than the 9.8m waste collection vehicle. The swept path diagrams are shown in **Figure 26** and **Appendix E**.

#### 4.13.5 Emergency Vehicle Access

Emergency vehicle access will be provided for ambulance and aerial fire trucks to the proposed development, via:

- Darling Drive;

- Harbourside Place;
- the proposed access for the above ground loading dock; and,
- the proposed access lane located between the ICC Hotel and the Harbourside development.

#### 4.13.6 Light Rail interface

The proposed development will result in the demolition of the existing pedestrian walkways over the light rail corridor, and the construction of a new pedestrian walkway, linking the development directly to Bunn Street.

The new pedestrian bridges will fully span the light rail corridor. As such, no ground works are anticipated within the light rail corridor that might impact on the light rail above ground and below ground infrastructure. It is assumed that the existing 33 kV high voltage cables associated with the light rail are located within the light rail corridor property boundary. Any works associated with the development at ground level, adjacent to the light rail corridor will consider these existing conduits to ensure no damage to these HV conduits.

Consultation took place with TfNSW on the 12<sup>th</sup> February 2016, to outline the development proposal. There was no objection raised in principle at that meeting. **Appendix F** contains a copy of those meeting minutes.

Further consultation took place with TfNSW on the 03<sup>rd</sup> August 2018, whereby the new pedestrian bridge over the light rail was again discussed and welcomed by TfNSW.

Further ongoing consultation will be undertaken with TfNSW and TransDev during the design and construction phases of the proposed development, regarding any interface works with the light rail.

#### 4.14 Green Travel Plan

The 2016 CBD and Harbour Village census data and target mode split in 2030 for the full LGA are compared in **Table 9** below.

Mode of Transport for Site	2016 Census – CBD And Harbour Village	2030 – City of Sydney
Public transport	22.7%	47%
Private vehicle	16.7%	10%
Walk only	45%	33%
Bicycle	<1%	10%

**Table 9: 2016 Census and Target Mode of Transport**

A Green Travel Plan will be developed in the Stage 2 DA, as part of future design development stages.

To achieve the targets that align with the 2030 City of Sydney mode split, reducing private vehicle use for the Harbourside development, residents, tenants and employees of the site need

to be made aware of, and encouraged to use active and public transport services available within the vicinity of the site.

#### **4.14.1 Information and communication**

Residents, retail and commercial employees, and visitors to the site can be encouraged to adopt sustainable travel options through information on alternate transport options and end-of-trip facilities. Relevant information being made readily available leads to greater awareness and informed journey planning.

#### **4.14.2 Transport Access Guide**

A Transport Access Guide (TAG) is provided to users of a building or facility, intended to inform of ways to access the site through walking, cycling or public transport. The objective of the TAG is to simplify the process of trip planning for visitors and can assist in increasing the proportion of trips made to the site through public and active transport modes. The TAGs typically provide information on:

- The location of bicycle parking and end-of-trip facilities and how to access these facilities
- Nearest public transport stops and stations
- Bus routes and trains services to the site and the frequency of these services
- Useful applications and travel information websites
- Car share pods near the site. TAGs are generally updated annually to ensure the information is accurate and up-to-date.

## 5 TRAFFIC IMPACT ASSESSMENT

This section of this Report provides an assessment of the predicted traffic conditions based on the current proposed Harbourside development.

### 5.1 Harbourside Development

The proposed Harbourside development will consist of retail, commercial and residential land use and open space.

The updated land use mix for the development includes a 28,000m<sup>2</sup> commercial area; however, it should be noted that while the land use areas and categories have changed, the overall GFA of the development remains the same. **Tables 10 and 11** highlights the land use difference between the DA in March 2020 and the current land use mix. It is also noted that while the planning application is for an overall total GFA of 87,000m<sup>2</sup>, that the individual land use category areas are indicative at this stage.

Land Use Area	Area (March 2020)	Area (September 2020)
Residential	38,000 m <sup>2</sup> GFA	42,000 m <sup>2</sup> GFA
Non-Residential	49,000 m <sup>2</sup> GFA	45,000 m <sup>2</sup> GFA
Total	87,000 m <sup>2</sup> GFA	87,000 m <sup>2</sup> GFA
Car Parking	306	306

**Table 10** Development Components and GFA Comparison

Land Use Area	Area (March 2020)	Area (September 2020)
Residential	29,500m <sup>2</sup> NSA	32,500 m <sup>2</sup> NSA
Retail	15,800 m <sup>2</sup> GLA	8,500 m <sup>2</sup> GLA
Commercial	23,000 m <sup>2</sup> NLA	28,000 m <sup>2</sup> NLA

**Table 11** Development Components and Non-GFA Comparison

It is important to note that the Stage 1 SSDA approval is only for the GFA's noted in **Table 10** above and that the areas indicated in **Table 11** are indicative only, at this time.

It should also be noted that the site currently consists of an existing retail land use of approximately 21,000 m<sup>2</sup> GLA. The development proposes to reduce the existing retail land use resulting in a net decrease of approximately 12,500 m<sup>2</sup> GLA. The future retail land use is expected to be similar in purpose and intent.

### 5.2 Traffic Generation Rates

An indication of the peak hour traffic generation potential of the future development has been

The proposed Harbourside development will consist of residential, retail and commercial land use. A trip generation assessment was performed based on the net development increase indicated by the forecast land use data, which was then used to inform the SIDRA modelling and traffic impact assessment. Depending on the development type, trip generation is informed by the Gross Floor Area (GFA), Gross Leasable Floor Area (GLFA) or number of residential apartments provided.

The trip generation rates adopted for this assessment are based on the following sources:

- Traffic Generating Developments Updated Traffic Surveys (TDT 2018/04a) (Transport for New South Wales, August 2013)
- Harbourside Shopping Centre Traffic and Transport Impact Assessment (Arcadis, 16 August 2018).

### 5.2.1 Residential Trip Generation

The trip generation rates used in the previous traffic impact assessment undertaken by Arcadis for high density residential dwellings were adopted for this study. These rates are consistent with the *Traffic Generating Developments Updated Traffic Surveys (TDT 2018/04a)* (Transport for New South Wales, August 2013).

The trip generation rates adopted for high density residential land use were:

- AM peak – 0.19 vehicle trips per unit
- PM peak – 0.15 vehicle trips per unit.

A 20% discount is applied to the residential development traffic to further consider the close proximity to the light rail station and enhanced pedestrian and cycle connectivity of the site.

### 5.2.2 Retail Trip Generation

The trip generation rate adopted for retail developments such as shopping centres was informed by both the previous study of the area and *Traffic Generating Developments Updated Traffic Surveys (TDT 2018/04a)* (Transport for New South Wales, August 2013).

Recommended trip generation rates for shopping centres are based on surveys conducted in ten locations, seven of which are located within the Sydney Metropolitan Area, and three of which are in regional areas.

It is assumed that the traffic generated by a shopping centre in the morning peak hour is about 50 per cent of afternoon peak hour traffic, consistent with the average distribution observed in shopping centres located within the Sydney Metropolitan Area.

The trip generation rates adopted for retail land use were:

- AM peak – 3.1 trips per 100 m<sup>2</sup> GLFA
- PM peak – 6.2 trips per 100 m<sup>2</sup> GLFA.

These trip generation rates assume that each land use is independent of the other and that the activities of the site are not linked to adjacent development. However, in practice, the incidence of linked and multi-purpose trips will reduce the overall trip generation. A linked trip is a trip taken as a side-track from another trip while a multi-purpose trip is where more than one facility is visited. A 25% discount is therefore applied to trip generation rates for retail development, considering that the trips to and from the retail component will generally attract patronage from visitors already within the Darling Harbour precinct.

### 5.2.3 Commercial Trip Generation

The trip generation rate adopted for commercial developments such as office blocks is based on *Traffic Generating Developments Updated Traffic Surveys (TDT 2018/04a)* (Transport for New South Wales, August 2013).

Recommended trip generation rates for the general office building are based on surveys conducted in ten locations. Eight of the surveys were conducted within the Sydney urban area (two inner ring sites, four middle ring sites and two outer ring sites), and one each in Newcastle and Wollongong.

Due to the location of the proposed Harbourside development being situated within the CBD with close public transport access and limited parking available, and where few people commute to work by the private vehicle, it is expected that the proportion of commuters who choose to drive to work would be lower than the Sydney urban average. Of the areas surveyed, North Sydney, Chatswood and Parramatta represent the most comparative conditions, and an average of those rates were therefore adopted for the Harbourside development.

**Table 12** shows the trip generation rates adopted for the Harbourside development for each peak period.

Trips generated per 100 m <sup>2</sup> of GFA				
Peak hour	North Sydney	Chatswood	Parramatta	Adopted for Darling Harbour
AM peak	0.17	1.03	0.69	0.63
PM peak	0.14	0.84	0.61	0.53

**Table 12 Commercial Trip Generation Rates**

### 5.3 Peak Hour Trip Distribution

The peak hour distribution of trips into and out of the proposed development site are considered separated for each land use type and varies between the morning and afternoon peak periods.

**Table 13** shows the peak hour distribution of trips.

Development type	AM peak		PM peak	
	Trips in	Trips out	Trips in	Trips out
Residential	25%	75%	60%	40%
Retail	60%	40%	50%	50%
Commercial	75%	25%	25%	75%

**Table 13 Peak Hour Distribution**

### 5.4 Existing Peak Hour Vehicle Trips

The existing Harbourside consists of retail, commercial and open space. It should be noted that the site currently consists of an existing land use of approximately 19,700 m<sup>2</sup> GLA of retail and 1,140 m<sup>2</sup> GLA of office and other uses.

Application of the traffic generation rates, trip discounts and hourly distributions on the existing development yields a weekday peak period total traffic generation potential of 280 trips in/ 185

trips out during the morning peak hour, and 460 trips in/ 463 trips out in the afternoon peak hour. **Table 14** shows the trip generation potential for each land use type and peak period.

Development type	AM peak		PM peak	
	Trips in	Trips out	Trips in	Trips out
Retail	275	183	458	458
Commercial	5	2	2	5
<b>Total peak hour generation</b>	<b>280</b>	<b>185</b>	<b>460</b>	<b>463</b>

**Table 14 Existing Trip Generation**

## 5.5 Proposed Peak Hour Vehicle Trips

Application of the traffic generation rates, trip discounts and hourly distributions on the proposed development yields a weekday peak period total traffic generation potential of 264 trips in/ 164 trips out during the morning peak hour, and 260 trips in/ 326 trips out in the afternoon peak hour. **Table 15** shows the trip generation potential for each land use type and peak period.

Development type	AM peak		PM peak	
	Trips in	Trips out	Trips in	Trips out
Residential	14	41	26	17
Retail	119	79	198	198
Commercial	132	44	37	111
<b>Total peak hour generation</b>	<b>264</b>	<b>164</b>	<b>260</b>	<b>326</b>

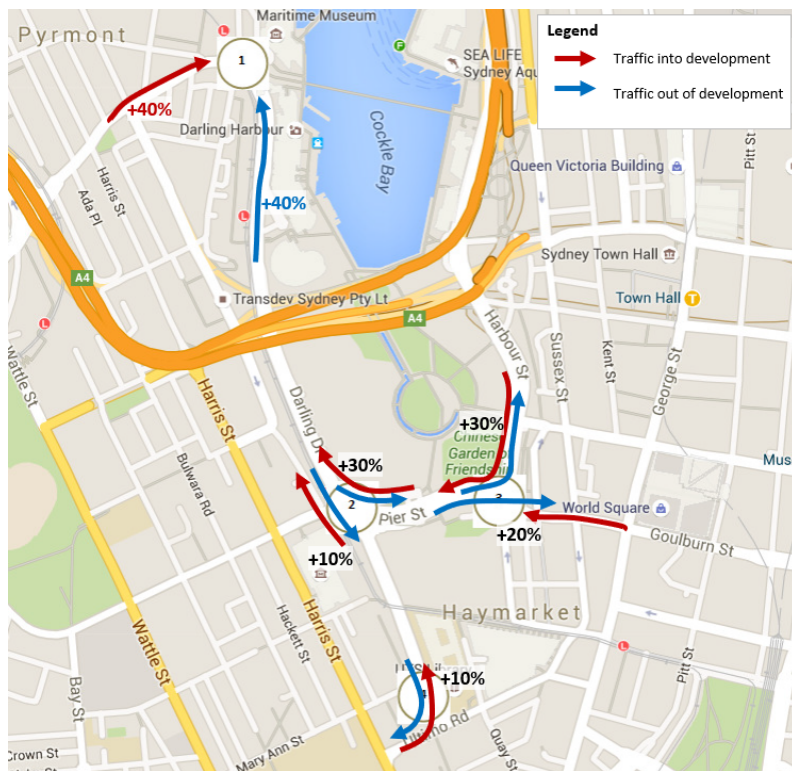
**Table 15 Trip Generation Potential**

The significant reduction in retail space from 19,700 m2 GLA for the existing condition to 8,500 m2 GLA accounts for the significant drop in traffic generated for the proposed Harbourside development.

## 5.6 Network Trip Distribution

For the assessment, the following traffic distribution was assumed:

- 30% trips anticipated to arrive from western suburbs via M4 Western Distributor
- 10% trips anticipated to arrive from western suburbs via Great Western Highway
- 30% trips anticipated to arrive from northern suburbs via M4 Western Distributor and then through Harbour Street and Pier Street
- 20% trips anticipated to arrive from southern suburbs by using Eastern Distributor and then through Goulburn Street and Pier Street
- 10% trips anticipated to arrive from southern suburbs by using Great Western Highway and then through Ultimo Road.



**Figure 27: Development Trip Distribution on Surrounding Road Network**

These assumptions inform the intersection modelling of the post-development scenario. 2 shows the development trip distribution on the surrounding road network.

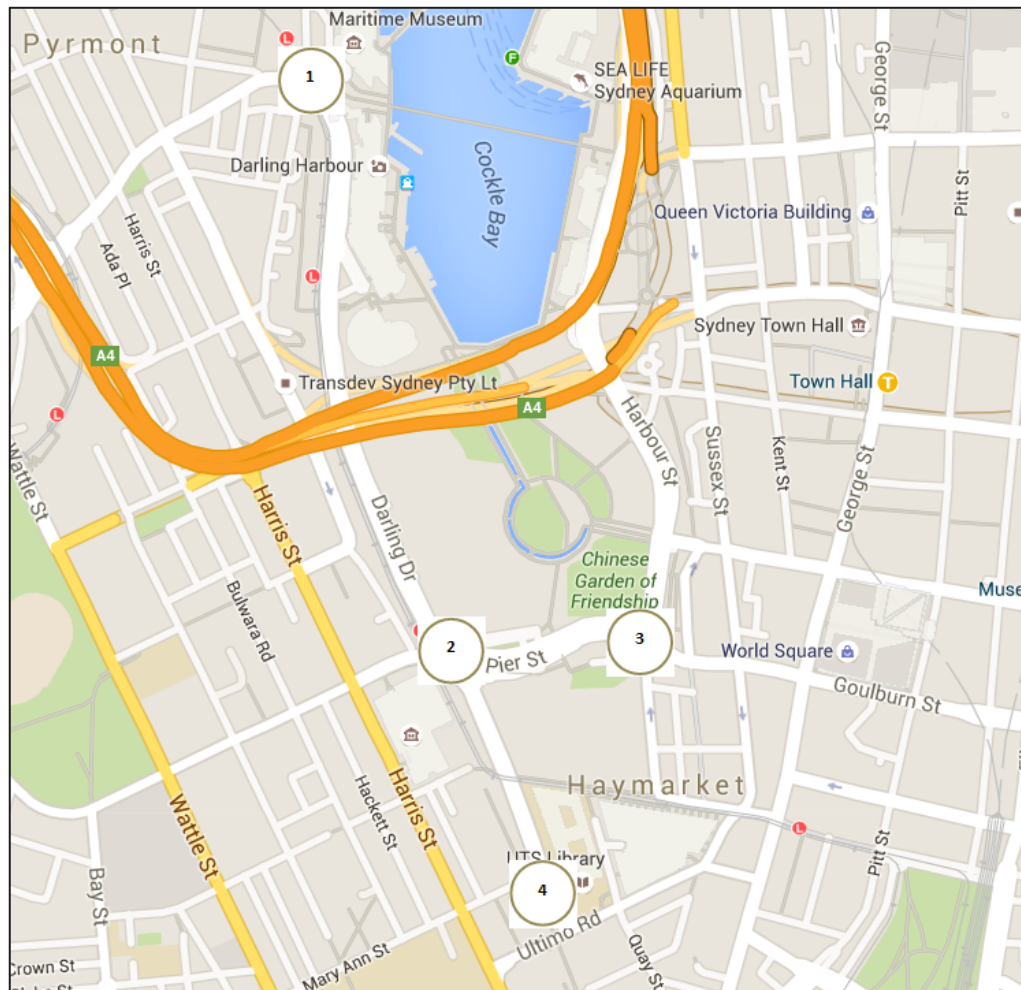
## 5.7 Network Capacity and Level of Service

### 5.7.1 Traffic Surveys

Traffic surveys were undertaken over three days, from Wednesday 29 January to Friday 31 January 2020 at four key intersections expected to be impacted by the development, including:

- (I-1) Murray Street/ Darling Drive (traffic signals)
- (I-2) Darling Drive/ Pier Street (roundabout)
- (I-3) Harbour Street/ Pier Street/ Goulburn Street (traffic signals)
- (I-4) Darling Drive/ Ultimo Road (traffic signals).

**Figure 28** shows the intersections at which classified intersection turn counts were surveyed.



**Figure 28: Jan 2020 Traffic Survey Locations**

These four key intersections were modelled using SIDRA Intersection (version 8.0.7.7948) for the existing condition in 2020. The data collected over the three days were analysed, and the periods with the highest traffic volumes across the three days formed the basis for the morning and afternoon peak hour models. The results of the traffic surveys are attached in **Appendix B** of this report.

A comparison of the traffic counts undertaken in 2016 and the recent 2020 surveys is shown in **Appendix C**. The results indicate minimal changes to traffic volumes and flows across the four intersections. For the Pier Street/Darling Drive roundabout, the north-east leg of Zollner Crescent was included as part of the 2020 survey and analysed in the SIDRA analysis.

## 5.7.2 Existing Intersection Operation

Intersection operational performance is evaluated by assessing the intersection turning volumes, vehicle delays and level of services (LOS). LOS is the measure used to determine the effectiveness of intersection operation and is most commonly used to analyse intersections by categorising traffic flow conditions.

LOS for this study is reported in accordance to the Transport for New South Wales (TfNSW) guidelines. It recommends that for priority intersections such as roundabout and sign controlled intersections, the LOS value is determined by the critical movement with the highest delay. With these types of intersection controls (roundabout, stop and give way sign controls), some movements may experience high levels of delay while other movements may experience minimal delay. For a signalised intersection, LOS measures the average intersection delay measured in seconds per vehicle.

**Table 16** summarises intersection LoS criteria used to assess the intersection performance.

**Table 16** LOS Criteria

Level of Service	Average delay per vehicle (secs/veh)	Performance
A	<14	Good operation
B	15 to 28	Good with acceptable delays & 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	>70	Unsatisfactory with excessive queuing

In general, SIDRA predicts intersection performance for the following key parameters:

- Degree of saturation (DoS).
- Average delays to intersection.
- Level of service (LoS) determined from LoS criteria; and
- Queue length.

Intersection analysis of the key intersections adjacent to the site was undertaken. The results of the modelling for existing traffic are shown in **Table 17**, for the AM and PM peak periods, respectively. Modelling results indicate that all key intersections currently perform at an acceptable LoS during typical weekday peak hours. **Appendix G** of this Report contains a copy of the 2020 existing traffic condition SIDRA results.

ID	Intersection	AM peak		PM peak	
		Delay (s)	LOS	Delay (s)	LOS
I-1	Murray Street/ Darling Drive	51	D	50	D
I-2	Darling Drive/ Pier Street	11	A	10	A
I-3	Harbour Street/ Pier Street/ Goulburn Street	38	C	37	C
I-4	Darling Drive/ Ultimo Road	22	B	24	B

**Table 17 Existing Level of Service**

### 5.7.3 Future Operational Performance

The future network under the post-development scenario was modelled, based on the trip generation and distribution undertaken. **Table 18** shows the future LOS results of the intersection with 2020 traffic volumes for both morning and afternoon peak hours. **Appendix H** of this Report contains a copy of the 2020 future development predicted traffic condition SIDRA results.

ID	Intersection	AM peak		PM peak	
		Delay (s)	LOS	Delay (s)	LOS
I-1	Murray Street/ Darling Drive	49	D	48	D
I-2	Darling Drive/ Pier Street	13	A	12	A
I-3	Harbour Street/ Pier Street/ Goulburn Street	52	D	36	C
I-4	Darling Drive/ Ultimo Road	21	B	25	B

**Table 18 Future Level of Service**

### 5.7.4 Impact on Intersection Performance

Assessment of the four key intersections in the surrounding road network show that the traffic generated by the proposed development would not produce major traffic impacts on most intersections. Of the assessed sites, the Harbour Street/ Pier Street/ Goulburn Street intersection would experience the greatest impact to operational performance in the morning peak hour, operating at LOS D with 52 seconds of delay. We note that the analysis indicated right turning southbound movement on Harbour Street is currently operating at a level of service F.

A sensitivity analysis was undertaken to modify the phase time allocated to the movement from 37 seconds to 40 seconds. This analysis was found to improve the overall operation of the intersection from an LOS E to LOS D at 46 seconds of delay.

As such, we recommend monitoring the traffic operations at the intersection upon project completion with TfNSW and modify the signal timing in accordance with the observed traffic flows and volumes.

### 5.7.5 Conclusion

The analysis above indicates that the baseline conditions between 2016 and 2020, with the operation of SICEEP, have experienced minimal changes across the intersections focused on in this Report.

Moreover, it should be noted that while the land use categories of the proposed development at Harbourside have been amended, the overall traffic impact remains similar to the previous assessment.

A summary of the overall traffic impacts can be described as follows:

- The traffic analysis indicates that the baseline conditions between 2016 and 2020, with the operation of SICEEP, have experienced minimal changes across the intersections focused on in this Report.
- Moreover, it should be noted that while the land use categories of the proposed development at Harbourside have been amended, the overall traffic impact remains similar to the previous assessment.
- The updated current development mix results in a reduced volume of trip in peak hours, due to the significant reduction in the proposed retail area, which is now much smaller in area than the current development.
- The operational performances of the intersections relevant to the Harbourside development have been demonstrated to be satisfactory
- The results of modelling indicate that the impact of the Harbourside development does not impose conditions on the intersections worse than what would have otherwise occurred through existing traffic and modelled future traffic.

### 5.8 Impact on Light Rail and Ferry Operations

The Harbourside development is expected to introduce additional patronage for the Light Rail and Ferry Services adjacent to the development. The proximity of the Harbourside development to Pyrmont Bay and Convention Centre Light Rail stations and the Pyrmont Bay Wharf is anticipated to further encourage public transport usage among the future staff and visitors to the Harbourside development. Data from the journey to work data set revealed that approximately 60-65% currently use public transport (train, bus and ferry).

With the completion of the construction of the adjacent developments in the SICEEP, service frequency of the light rail was improved to approximately every 8 minutes initially during the peak travel hours but is also forecasted to eventually be operating at this frequency for the whole day. The increased service frequency is expected to provide additional capacity to cater to the increased demand in light rail ridership.

There are planned upgrades for the ferry wharves and ferry services as part of the NSW Government's Transport Access Program. The Pyrmont Bay Wharf is included in the wharf modernisation program. In the Sydney Ferries Future document of the NSW Government, it is also stated that there is an opportunity to link the Rose Bay / Watsons Bay route as part of a cross harbour service to Pyrmont and by extending the service to Manly in the off-peak weekdays and on weekends, as part of the expansion of services to provide for growth.

With the planned upgrade of the Pyrmont Bay Wharf, it is anticipated that additional capacity will be available to cater to any increase in ferry usage and patronage at the wharf. This improvement will benefit the Harbourside development and encourage additional patronage in the future.

Wayfinding strategies and travel access guides to assist with increasing the mode share of walking and cycling will be developed during future design stages of the development, with regard to providing information to passengers arriving by public transport.

## 6 CONSTRUCTION TRAFFIC IMPACT AND MANAGEMENT

### 6.1 Background

A Preliminary Construction & Environment Management Plan (CEMP) has been prepared by Mirvac (**Appendix I**). The document outlines the indicative management plans relating to the construction works associated with the Harbourside development.

A Construction Pedestrian Traffic Management Plan (CPTMP) will be undertaken in future development stages of the development

This section presents excerpts from the above document relevant to Traffic and Pedestrian Management during construction of the Harbourside development, including description and layouts of the planned mitigation arrangements demonstrating how, during the development, the pedestrian and vehicular movements will be addressed to minimise impact.

### 6.2 Site Boundary

**Figure 29** below depicts the various hoarding locations proposed for the Harbourside development site.

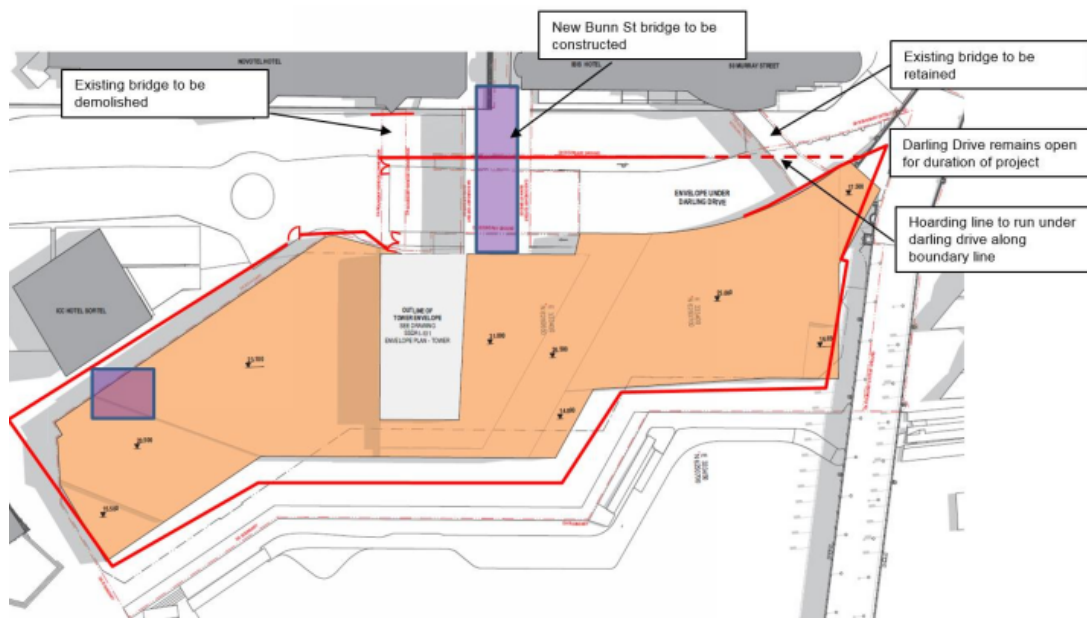


Figure 29: Site Development Plan

### 6.3 Construction Staging

#### 6.3.1 Site Establishment

To maintain safe public egress between the Maritime Museum and Darling Harbour, a “B” class hoarding will be erected on the eastern perimeter of the site along Cockle Bay. Pedestrians will be able to walk under the hoarding in this location.

Type “A” Hoardings will be erected along the other site boundaries to fully segregate the site from the public.

## 6.4 Construction Works

For details of the Construction activities refer to the Construction & Environment Management Plan that forms part of the Stage 1 DA submission.

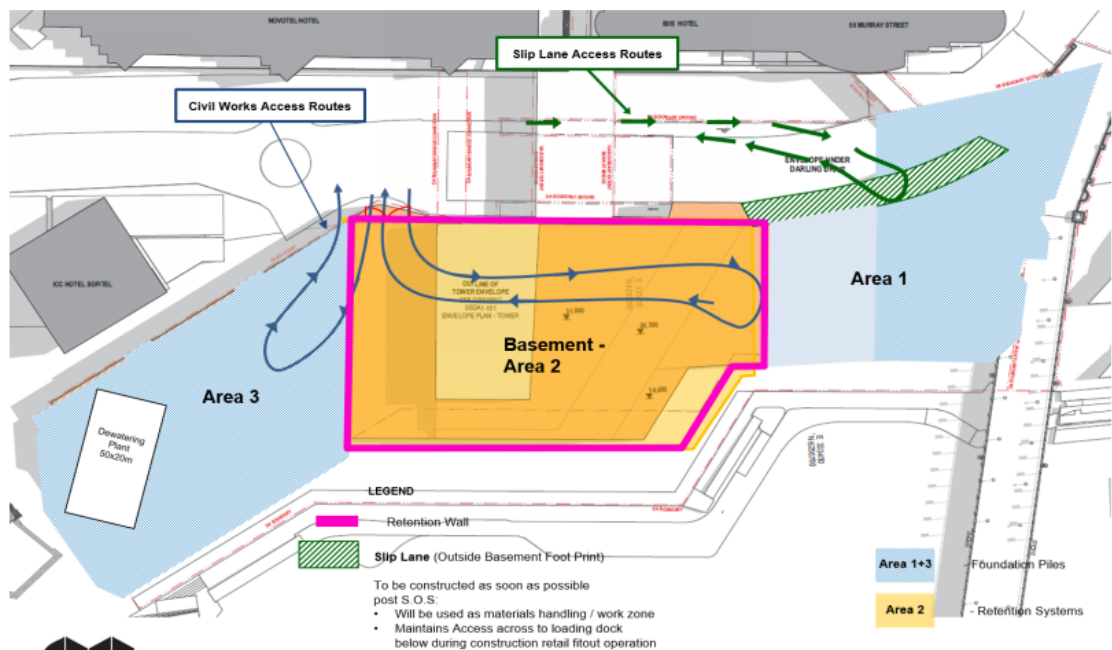
Following site establishment and demolition / removal of existing fixtures or services, the construction sequence will entail retention piling, bulk excavation of basement, trenching and establishment of essential services followed by building construction works, fit-out and external / landscaping works.

## 6.5 Construction Vehicle Access

The primary construction heavy vehicle access and egress will be via the Darling Drive network to the west of the development. This will involve vehicles accessing Darling Drive from the North using Pyrmont Bridge Road, Pyrmont and vehicles accessing Darling Drive from the South using Ultimo Road and Harris Street, Ultimo.

The main entry for construction materials and vehicles shall be from the north, off Darling Drive, and exit from the southwest corner of the site onto Darling Drive (heading south only).

**Figure 30** below depicts the construction access locations.



**Figure 30: Construction routes and access locations**

It is anticipated that the construction works will not prevent Darling Drive from remaining operational at all times during the construction phase of the development.

On site construction access routes will be established, within the construction boundary, to facilitate materials handling for tower/crawler cranes and forklifts. Hoists will transport personnel and lighter materials within the building.

It is advised that traffic to Darling Drive and the surrounding road network as a result of construction activities would be best suited to non-peak hour times. This will be reviewed during further detailed design stages of the project.

All vehicles accessing the site will conform to the "Traffic controls at work sites" manual, and Australian Standard 1742 – Traffic control, and only certified traffic controllers shall be used to direct vehicles outside of the construction boundaries. The main access for construction deliveries shall be the entry and exit gates as illustrated in **Figure 30..**

On site construction access routes will be established within the construction boundaries with hoists transporting personnel and materials within the building.

The truck movements anticipated will be spread evenly throughout the construction programme. During the course of the development we anticipate vehicle movements for such trades as Demolition, Civil, Piling, Detail Excavation, Structure, Facade, Internal Finishes & Public Domain works.

Based on the programme and volume of materials required, it is estimated that approximately 3-4 trucks per hour will access the site for the duration of the development. In such instances such as concrete pours, this volume will increase, but shall be controlled to alleviate any congestion to the surrounding traffic network.

It is noted, however, that the construction vehicle movements will not exceed the recent construction vehicular movements associated from the recent development of the Sydney International Convention Exhibition & Entertainment Precinct (SICEEP), which adopted similar construction access traffic routes and used Darling Drive for access.

The control of vehicle logistics to and from the site shall be managed as follows:

- Traffic Management Plan to form part of tender documents and ultimately part of the Subcontract &/or Supplier Agreements
- Traffic Management Plan will form part of the subcontractor inductions, both on site and in some instances held in the Subcontractor / Supplier place of business.
- Subcontractors / Suppliers will be required to submit a formal delivery booking request 5 business days prior to delivery. All bookings will be registered and controlled by the various manned gates. Predetermined routes and times shall be agreed as part of this process to ensure non congestion of traffic.
- Established holding areas for urgent & emergency vehicles within the development.

## 6.6 Parking

Onsite parking will not be encouraged during construction. Measures will be implemented to encourage the use of good public transport systems already in place for construction staff and workers. This will be conveyed through all subcontract documentation and site inductions. Timetables shall be provided for all bus routes and the three closest railway stations serviced by bus routes.

## 6.7 Pedestrian Access

Pedestrian access during construction will generally be adopting the following principles:

- Hoardings will be erected to prevent public entry into constructions areas;
- Public access along existing desire lines around construction areas will maintained where possible;
- Pedestrian access along Darling Drive will be controlled (and may need to be limited periodically) during demolition and services relocation works to ensure public safety;
- Pedestrian movement diversions as detailed shall be in place to ensure that the Public are diverted safely around the site; and,
- “B” Class hoardings shall provide overhead protection where the general public come into close contact with construction activities. Pedestrians will be able to walk under this type of hoarding.

## 6.8 Traffic Management Measures

Appropriate directional signage and traffic control will be provided to ensure vehicles enter and leave the site with minimal disturbance to other road users and so they are advised of any changes in road conditions.

Temporary road closures, single lane access and relocations during the construction period will be subject to coordination with the appropriate authorities. All traffic related issues and changes shall also be presented to Stakeholders as part of the consultation process. These will, wherever and whenever possible, are carried out in non-peak periods.

The traffic and pedestrian management plan outlined in the Construction and Environment Management Plan is generally aimed at mitigating any potential impacts that may be attributed to the construction works. Risks to the public and the construction crew would be minimised through the implementation of the construction management plans specifically prepared for the Harbourside development. The Plan will be regularly updated to address any new outcomes identified through constant monitoring as the works progress.

## 6.9 Cumulative Construction Traffic Impacts

The Core Facilities of the SICEEP development are now complete and this development was fully opened to the public in December 2016. The ICC Hotel was also completed and opened in December 2016, and construction of the Darling Square development located in the Haymarket was recently completed.

The redevelopment of the IMAX site commenced in 2017, and it is anticipated to reopen in 2020. As such, works are anticipated to be completed prior to construction commencing at the Harbourside development.

The Star Casino in Pyrmont is proposed to be redeveloped and this development is currently in the planning stages of the development. It is understood that the proposed construction traffic route proposed for that development is via the A4, Pyrmont Bridge Road, Edward Street, Pirrama Road and Jones Bay Road. As such, it is not anticipated that the cumulative construction traffic impact will be significant from this development and the Harbourside development should the construction phases overlap each other.

Ongoing consultation will be undertaken between the applicant and the CBD Coordination Office within TfNSW during the design and construction of the proposed development with regard to an assessment of other potential cumulative construction activities that may be relevant at the time of the Harbourside development construction program.

## 7 SUMMARY

### 7.1 Conclusions

This transport assessment of the Harbourside development focusses on access and the connectivity of the site with the external network for all modes of transport and cites the key features of the development that will contribute to this. Key elements of the proposal include:

#### Public Transport

- The location of the Harbourside site is accessible by public transport (particularly the light rail) via the pedestrian linkages between the public transport nodes and the development
- The design generally provides enhanced access to the public transport services through the creation of more direct pedestrian access walkways.
- The development will benefit from the proposed Pyrmont Metro Station

#### Parking Provision

- Parking provision for residential use within Harbourside will be provided within a four-level basement carpark, and it based on the City of Sydney LEP Parking Rate for Land Use Classification B
- The existing retail parking provision of 255 spaces below the Novotel hotel will be retained for the proposed retail patrons and commercial tenant use of the development.

#### Road Network/Intersection Operational Performance

- The traffic analysis indicates that the baseline conditions between 2016 and 2020, with the operation of SICEEP, have experienced minimal changes across the intersections focused on in this Report.
- Moreover, it should be noted that while the land use categories of the proposed development at Harbourside have been amended, the overall traffic impact remains similar to the previous assessment.
- The updated current development mix results in a reduced volume of trip in peak hours, due to the significant reduction in the proposed retail area, which is now much smaller in area than the current development.
- The operational performances of the intersections relevant to the Harbourside development have been demonstrated to be satisfactory
- The results of modelling indicate that the impact of the Harbourside development does not impose conditions on the intersections worse than what would have otherwise occurred through existing traffic and modelled future traffic.

#### Pedestrian

- The development will provide improved pedestrian linkages within the Public Realm linking the development to the Darling Harbour Live precinct to the south and Sydney CBD to the east.
- The improved pedestrian linkages via the shared zone and the signalised pedestrian crossing on Darling Drive cater for pedestrian desire lines from the west of Darling Drive.

### Cycleway

- Cycle connections are available to Harbourside via the existing cycleways on Darling Drive, the improved new cycleway on the west side of Darling Drive, new east-west linkages and completion of the new boulevard running north-south through the precinct, developed as part of the SICEEP.

### SEARs

- The requirements of the SEARs have been adequately assessed in the overall Transport and Traffic Impact Assessments for the Harbourside development.

**APPENDIX A– AGENCY RESPONSE TO SUBMISSIONS**

Our ref: SSD 7874

Mr David Hogendijk  
Project Director  
Mirvac  
200 George Street  
SYDNEY NSW 2000

11 August 2020

Dear Mr Hogendijk,

**Harbourside Shopping Centre Redevelopment (SSD 7874)  
Request for Response to Submissions**

I refer to the Department's previous letter dated 11 May 2020, which included a request for a response to issues raised in submissions received during the re-exhibition of the Harbourside Shopping Centre redevelopment proposal.

I also refer to the meetings held in June and July 2020 between yourself, Department staff and the Department's independent design advisor where the proposal was refined to provide a lowered northern podium with publicly accessible rooftop open space and improved views for 50 Murray Street. The Department notes that a reduction in commercial floor space in the northern podium is proposed to be offset by an increase in residential floor space in the tower and associated increase in height.

The Department considers the issues associated with the original scheme have largely been addressed and the revised proposal would result in an improved outcome for the site. However, the Department considers it is critical that your proposal:

- includes clear justification for reinstating the height originally proposed in the EIS
- demonstrates that a sufficient area of quality public open space can be delivered on the lowered northern podium
- provides a detailed assessment of view impacts to 50 Murray Street in response to the concerns raised in public submissions.

You are requested to provide a response to the issues raised in submissions and the Department's key issues as outlined in **Schedule 1** of this letter by 8 September 2020.

If you have any questions, please contact David Glasgow on (02) 8275 1182 or via email at [david.glasgow@planning.nsw.gov.au](mailto:david.glasgow@planning.nsw.gov.au)

Yours sincerely,



Anthony Witherdin  
**Director**  
**Key Sites Assessments**

## **SCHEDULE 1**

### **A - Department's Key Issues**

#### **Northern Podium**

1. The Department supports lowering the height and increasing the setbacks of the northern podium as presented to the Department at the meeting of 28 July 2020 to:
  - improve its relationship with Pyrmont Bridge
  - provide the opportunity for a significant area of publicly accessible and useable open space on the podium roof
  - reduce view impacts to 50 Murray Street.

The Department notes this space is set out over a number of levels and includes stairs, ramps and the like which may limit its function as quality public open space. The Department requests that you demonstrate that a sufficient area of functional and useable public open space can be delivered on the lowered northern podium.

The Department also requests that you demonstrate that view impacts to 50 Murray Street are equivalent to that shown at the second meeting on 7 July 2020.

#### **Residential tower**

2. The Department notes that the proposal presented at the meeting of 28 July 2020 seeks to increase the height of the residential tower to RL 166.25 m, which generally aligns with the height of the originally exhibited proposal in the EIS.

Your RtS must include urban design justification for the increase in height having regard to the existing character of Darling Harbour set by existing and approved towers around Cockle Bay as well as the future character within the draft Pyrmont Peninsula Place Strategy dated July 2020.

3. Further consideration should be given to how the future building within the proposed envelope will address the concerns raised by the Department's independent design advisor about the potential visual bulk caused by the width of the tower. This should include the proposed maximum volumetric fill of the envelope and built form controls to ensure an appropriate design is achieved.

#### **Public benefits/**

4. Confirm the public benefits that will be secured by the Concept Proposal, including commitments in relation to the amount, design and function of the publicly accessible open space at the northern podium.

### **B - Additional information required**

#### **Pyrmont Peninsula Place Strategy**

5. Address how the proposal is consistent with the vision, directions, opportunities for public benefits and specific considerations for Harbourside set out in the draft Pyrmont Peninsula Place Strategy dated July 2020.

#### **Design Guidelines and Indicative Scheme**

6. Provide updated design guidelines and an updated indicative scheme for the proposed tower, podium and open space areas

### **Design Excellence**

7. Provide an amended Design Excellence Strategy addressing the Government Architect NSW comments on the proposal.

### **Overshadowing impacts**

8. Provide an updated solar analysis of private residential properties to the west and south west affected by the revised proposal against the Apartment Design Guide (ADG) minimum solar access guidelines.
9. Provide a detailed overshadowing analysis of the Darling Harbour foreshore/ promenade in 15-minute intervals.

### **Private view impacts**

10. Provide additional analysis of the view impacts to 50 Murray Street (ONE Darling Harbour) and the Novotel hotel including:
  - a) identification of levels and units at 50 Murray Street where water view and views to Pyrmont bridge will be affected by the proposal, including additional view analysis assessment against the principles established in *Tenacity Consulting v Warringah Council* (2004) NSWLEC 140
  - b) a detailed response to the submission received from ONE Darling Harbour and associated view analysis
  - c) additional view analysis from Novotel hotel rooms including north-east and east facing rooms at lower, middle and upper levels within the northern and central sections of the building.

### **Open Space/Public domain**

11. Provide the area breakdown of proposed additional on-site and off-site public domain /accessible open space provision
12. Provide further clarification regarding the proposed access restrictions to podium roof levels including the amenity impacts to both on-site and surrounding residential apartments.
13. Clarify the location and extent of external awnings, outdoor dining/seating areas and planting barriers shown in the indicative proposal, in relation to the concept envelope, waterfront promenade and existing lease boundary (including additional sections).
14. Clarify the width of the proposed promenade, free of all encroaching uses and structures.
15. Review the design guidelines to provide more specific consideration to achieving the proposed open space outcomes and waterfront setbacks along the length of the promenade.

### **Land Use**

16. Clarify how the proposed residential use will not prejudice the 24-hour operation of the public domain and wider precinct, or special events at Darling Harbour. This should include consideration of potential light and noise associated with special events (including Vivid, fireworks and other events within the SICEEP).
17. Clarify the potential future noise mitigation strategies/ measures and provide details of the proposed alternative noise criteria.
18. Demonstrate the types and effectiveness of potential façade and acoustic treatments available and how effective mitigation measures can align with ADG requirements for natural ventilation.

### **Wind Impacts**

19. Provide a wind impact assessment including a wind tunnel assessment or detailed computer modelling, clearly demonstrating the wind impacts of the proposal and likely mitigation requirements.

### **Transport and Access**

20. Provide further justification for the proposed car parking rate and how this aligns with strategic policy directions to encourage active transport and reduce reliance on private vehicle trips, particularly given the availability of public transport in the surrounding area.
21. Clarify the proposed bicycle parking provision.
22. Confirm the pedestrian capacity of the Bunn Street connection and strategies to ensure the connection can accommodate the proposed pedestrian volumes.
23. Update the revised Transport Impact Assessment to include a comparison of existing and proposed vehicle trips to and from the site during peak periods.

### **Other matters**

- Revise Plan No. SSDA 1-105 to show the proposed basement depth RL.
- Provide a breakdown of the proposed floor space (GFA) of the indicative scheme.
- Provide an accurate axonometric view of the proposed envelope to match the proposed envelope plans (images 77 & 78 in Amended Design Report).
- Clarify the proposed public views and viewing platforms to be provided in the proposal.
- Clarify how the proposed affordable housing contribution has been calculated.
- Confirm the proposed mechanism to secure the public benefits proposed, including public access to open spaces, through site links and event steps.
- Clarify the proposed amount of communal open space provided for residential apartments in the indicative proposal.

Mr David Glasgow  
Principal Planning Officer  
Key Sites Assessments  
Department of Planning, Industry and Environment  
GPO Box 39  
Sydney NSW 2001

Dear Mr Glasgow

**Redevelopment of Harbourside Shopping Centre, Darling Harbour  
Response to Submissions (SSD 7874)**

Thank you for your correspondence via Major Projects Portal on 1 April 2020, requesting Transport for NSW (TfNSW) to comment on the above.

Suggested draft conditions as part of any Stage 2 development for the protection of Inner West Light Rail corridor and the Construction Pedestrian and Traffic Management are included in **TAB A**. Additional conditions will be suggested following the review of any Stage 2 development application.

**Sydney Light Rail – Inner West Line**

Comment

The revised proposal refers to Light Rail services operating at predominantly 8 minute interval all day. It is advised that Light Rail only currently operates at 8 minute intervals during peak periods on weekdays (7-9am and 3-7pm).

The applicant's Response to Submission states the following:

*"Ongoing consultation will be undertaken between the applicant, TfNSW, the light rail operator, and if required, Sydney Trains during the design and construction of the proposed development, with regard to all design elements of the proposed development that interface with the light rail corridor. In particular, this relates to the demolition and construction of the new pedestrian bridge links over the light rail corridor."*

Recommendation

It is requested that the applicant be conditioned to the following:

*The applicant shall undertake the following as part of any Stage 2 development application:*

- *Consult with TfNSW, Sydney Light Rail Operator and Sydney Trains with regard to the details of the required documentation and all design elements of the proposed development that interface with the light rail corridor, in particular, demolition of and construction of the new pedestrian bridge links over the light rail corridor; and*
- *Prepare a report on how the development complies Asset Standards Authority (ASA) standard - External Developments - T HR CI 12080 ST and Development Near Rail Corridors and Busy Roads – Interim Guideline (NSW Department of Planning, 2008)*

## **Construction Pedestrian and Traffic Management**

### Comment

The Response to Submission states the following:

*“Ongoing consultation will be undertaken between the applicant and the CBD Coordination Office within TfNSW during the design and construction of the proposed development with regard to an assessment of other potential cumulative construction activities that may be relevant at the time of the Harbourside development construction program.”*

### Recommendation

It is requested that the applicant be conditioned to the following:

*The applicant shall prepare a draft Construction Pedestrian and Traffic Management Plan in consultation with Sydney Coordination Office within TfNSW and the Sydney Light Rail Operator as part of preparation of any Stage 2 development application.*

## **Vehicular Management**

### Comment

The Response to Submission states the following:

*“Traffic flow on the approach to the drop-off facility exit is governed by the existing traffic signal controls at the Pyrmont Bridge Road intersection. This will allow for controlled egress movements from the drop-off zone, in conjunction with random egress movements in breaks of traffic. Detailed traffic modelling will be undertaken during future development stages to assess the operation of the drop-off facility with regard to queue lengths of departing traffic from the drop off facility.”*

It is advised that the vehicles queuing to access this drop off zone may cause delays and block vehicles on Darling Drive. In addition, any queuing due to vehicles accessing the car park and loading and servicing area may also cause delays and block vehicles on Darling Drive.

### Recommendation

It is requested that the applicant be conditioned to the following:

*The applicant shall undertake the following as part of any Stage 2 development application:*

- *Queuing analysis and/ or traffic modelling to demonstrate the drop off area has adequate capacity and propose mitigation measures to ensure queuing on Darling Drive does not occur, to the satisfaction of TfNSW; and*
- *Prepare a draft drop off zone management plan to manage vehicles accessing the site and a draft car park and loading dock management plan.*

## **Coach Parking**

### Comment

The Response to Submission states the following:

*“The cumulative future demand for coach parking for the SICEEP development and the Harbourside development and the identification of alternative locations for coach parking can be considered during the detailed design phase.”*

### Recommendation

It is requested that the applicant be conditioned to the following:

*The applicant shall assess the likely cumulative future demand for the SICEEP development and the Harbourside development and identify alternative locations for coach parking if required, in consultation with the Sydney Coordination Office within TfNSW, as part of any Stage 2 development application.*

### **Pedestrian Network**

#### Comment

The Response to Submission states the following:

*"Pedestrian modelling will be undertaken during future design stages to ensure that adequate capacity for pedestrian movements is provided at critical locations within the proposed development footprint and surroundings."*

### Recommendation

It is requested that the applicant be conditioned to the following:

*The applicant shall undertake pedestrian modelling of the pedestrian network surrounding the proposed development, in consultation with Sydney Coordination Office within TfNSW, to demonstrate adequate capacity for pedestrian movements is provided with the proposed development, as part of any stage 2 development application.*

### **Darling Drive Cycleway**

#### Comment

The Response to Submission states the following:

*"This design interface will be considered in the future design development stages to consider cyclist safety. Design measures such as road line markings and road traffic signs will be considered in the future design to inform drivers of the potential presence of cyclists for vehicles entering the drop-off area. Road line marking, road traffic signs and consideration of appropriate sightlines will be considered for vehicles egressing from the drop-off area."*

### Recommendation

It is requested that the applicant be conditioned to the following:

*As part of any Stage 2 development application, the applicant shall undertake a Road Safety Audit for the concept proposal to the cycleway/ drop off area, in accordance with Austroads Guide to Road Safety Part 6: Managing Road Safety Audits and Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits by an independent TfNSW accredited road safety auditor. Based on the results of the road safety audit, the applicant shall review the design drawings and implement safety measures if required, in consultation with the Sydney Coordination Office within TfNSW.*

### **Wayfinding Strategies**

#### Comment

The Response to Submission states the following:

*"Wayfinding strategies and travel access guides to assist with increasing the mode share of walking and cycling will be developed during future design stages of the development."*

### Recommendation

It is requested that the applicant be conditioned to the following:

*The applicant shall develop wayfinding strategies and travel access guides to assist with increasing the mode share of walking and cycling as part of any Stage 2 development application.*

Thank you again for the opportunity of providing advice for the above development application. If you require clarification of any issue raised, please don't hesitate to contact Mark Ozinga, Principal Manager Land Use Planning and Development on 0439 489 298.

Yours sincerely



27/04/2020

**Craig Moran**  
A/Coordinator General  
Transport Coordination

Objective Number – CD20/03035

## **TAB A – Suggested Draft Conditions for any Stage 2 Development Application Protection of Inner West Light Rail corridor and Construction Pedestrian and Traffic Management**

### **General**

- The applicant must comply with all Altrac Light Rail Partnership (Altrac) or any subsequent operator of Sydney Light Rail (Sydney Light Rail Operator) policies, rules and procedures when working in and about the Sydney Light Rail corridor;
- The applicant must comply with the requirements of T HR CI 12080 ST External Developments version 1.0 and Development Near Rail Corridors and Busy Roads- Interim Guidelines;
- Activities of the applicant must not affect and/or restrict Sydney Light Rail operations without prior written agreement between the applicant, Transport for NSW (TfNSW), Altrac, and the Sydney Light Rail Operator, and it is a condition precedent that such written agreement must be obtained no later than two (2) months prior to the activity. Any requests for agreement are to include as a minimum the proposed duration, location, scope of works, and other information as required by the Sydney Light Rail Operator;
- The applicant must apply to Altrac and the Sydney Light Rail Operator for any required network shutdowns four (4) months prior to each individual required network shutdown event. Each request for network shutdown must include as a minimum the proposed shutdown dates, duration, location, scope of works, and other information as required by the Sydney Light Rail Operator. The Sydney Light Rail Operator may grant or refuse a request for network shutdown at its discretion;
- The applicant shall provide safe and unimpeded access for Sydney Light Rail patrons traversing to and from the Sydney Light Rail stops at all times;
- TfNSW, and persons authorised by it for this purpose, are entitled to inspect the site of the approved development and all structures to enable it to consider whether those structures on that site have been or are being constructed and maintained in accordance with these conditions of consent, on giving reasonable notice to the principal contractor for the approved development or the owner or occupier of the part of the site to which access is sought;
- During all stages of the development extreme care shall be taken to prevent any form of pollution entering the light rail corridor. Any form of pollution that arises as a consequence of the development activities shall remain the full responsibility of the applicant; and
- All TfNSW, Altrac and Sydney Light Rail Operator's costs associated with review of plans, designs and legal must be borne by the applicant.

## **Prior to the Issue of the Construction Certificate**

### Review and endorsement of documents

Prior to the issue of any construction certificate or any preparatory, demolition or excavation works, whichever is the earlier, the applicant should consult with TfNSW, Altrac and the Sydney Light Rail Operator to confirm the timing of the each construction certificate and associated documentation and activities prior to preparation of requested documentation. The applicant should provide the information to TfNSW for review and endorsement. The Principal Certifying Authority (PCA) is not to issue the relevant Construction Certificate until received written confirmation from TfNSW that the following conditions have been complied with.

- Prior to the issue of any Construction Certificates, the applicant is to confirm in writing with TfNSW what each Construction Certificate stage will involve;
- Prior to the issue of the relevant Construction Certificate, the applicant shall liaise with TfNSW to ascertain its requirements in relation to the protection of TfNSW's infrastructure. The applicant is to submit to TfNSW all relevant documentation as requested by TfNSW and obtain TfNSW's written endorsement; and
- Prior to the issue of any construction certificate or any preparatory, demolition or excavation works, whichever is the earlier, the following documentation shall be provided for the TfNSW endorsement:
  - Final geo-technical and structural report / drawings. Geotechnical reports should include any potential impact on the light rail corridor located adjacent to the subject development site, easement and substratum;
  - Final construction methodology with construction details pertaining to structural support during excavation or ground penetration;
  - Details of the vibration and movement monitoring system that will be in place before excavation commences;
  - Final cross sectional drawings showing ground surface, rail tracks, sub soil profile, proposed basement excavation and structural design of sub ground support adjacent to the Rail Corridor located adjacent to the subject development site. Cross sectional drawings should also include the accurate RL depths and horizontal distances from assets (tracks, overhead lines, structures and cables) to the nearest point of excavation or ground penetration works. All measurements are to be verified by a Registered Surveyor; and
  - Detailed survey plan.

### Pre-construction Work Dilapidation Report

A pre-construction work Dilapidation Report of the Sydney Light Rail and its assets shall be prepared by a qualified structural engineer. The dilapidation survey shall be undertaken via a joint site inspection by the representatives of the Sydney Light Rail Operator, TfNSW and the applicant. These dilapidation surveys will establish the extent of existing damage and enable any deterioration during construction to be observed

### Acoustic Assessment

Prior to the issue of the relevant Construction Certificate, the final acoustic assessment is to be submitted to PCA demonstrating how the proposed development will comply with the Department of Planning's document titled "Development Near Rail Corridors and Busy Roads- Interim Guidelines". All recommendations of the acoustic assessment are to be incorporated in the construction documentation.

### Electrolysis Analysis

Prior to the issue of the relevant Construction Certificate, the applicant is to engage an Electrolysis Consultant to prepare a report on the Electrolysis Risk to the development from stray currents. The applicant must incorporate in the development all the measures recommended in the report to control that risk. A copy of the report is to be provided to the PCA with the application for the relevant Construction Certificate.

### Reflectivity Report

Prior to the issue of the relevant Construction Certificate, the applicant shall design lighting, signs and surfaces with reflective materials, whether permanent or temporary, which are (or from which reflected light might be) visible from the rail corridor limiting glare and reflectivity to the satisfaction of Altrac, TfNSW and the Sydney Light Rail Operator.

### Consultation Regime

Prior to the issue of the relevant Construction Certificate, a detailed regime is to be prepared for consultation with and approval by TfNSW for the excavation of the site and the construction of the building foundations (including ground anchors) for the approved development, which may include geotechnical and structural certification in the form required by TfNSW.

### Insurance Requirements

Prior to the issue of the relevant Construction Certificate, the applicant must hold current public liability insurance cover for a sum acceptable to TfNSW. This insurance shall not contain any exclusion in relation to works on or near the rail corridor, rail infrastructure. The applicant is to contact TfNSW to obtain the level of insurance required for this particular proposal. Prior to issuing the relevant Construction Certificate the PCA must witness written proof of this insurance in conjunction with TfNSW's written advice to the applicant on the level of insurance required.

### Works Deed / Agreements

Prior to the issue of any construction certificate or any preparatory, demolition or excavation works, whichever is the earlier, if required by TfNSW, Works Deed (s) between the applicant, TfNSW and/or Altrac and the Sydney Light Rail Operator must be agreed and executed by the parties. These agreements may deal with matters including, but not limited to, the following:

- Sydney Light Rail Operational requirements;
- Sydney Light Rail access requirements;
- Altrac and Sydney Light Rail Operator policies, rules and procedures compliance requirements;
- Indemnities and releases;
- Security of costs;
- Insurance requirements and conditions;

- TfNSW, Altrac and the Sydney Light Rail Operator's recovery of costs from the applicant for costs incurred by these parties in relation to the development (e.g. review of designs and reports, legal, shutdown /power outages costs including alternative transport, customer communications, loss of revenue etc) risk assessments and configuration change processes;
- Interface coordination between the Sydney Light Rail Operator and the subject development construction works, including safety interface;
  - A Safety Interface Agreement between the applicant and the Sydney Light Rail Operator must be agreed and executed by the parties. This agreement may deal with matters including, but not limited to, the following:
    - Pre and post construction dilapidation reports;
    - The need for track possessions;
    - Review of the machinery to be used during excavation/ground penetration / construction works;
    - The need for track monitoring;
    - Design and installation of lights, signs and reflective material;
    - Endorsement of Risk Assessment/Management Plan and Safe Work Method Statements (SWMS);
    - Endorsement of plans regarding proposed craneage and other aerial operations;
    - Erection of scaffolding/hoarding;
    - Light Rail Operator's rules and procedures; and
    - Alteration of rail assets such as the OHW along of track and associated hoarding demarcation system, if undertaken by the applicant.
- Altrac and the Sydney Light Rail Operator's reviews and impact assessment of the applicant's proposal, engineering design and construction works methodology on Sydney Light Rail Operations and assets;
- Attendance and participation in the construction works risk assessment of construction activities to be performed in, above, about, and/or below the Sydney Light Rail Corridor;
- Arrangements for shutdowns and Sydney Light Rail restricted operations related costs attributed to the applicant; and
- Sydney Light Rail site works access approval and access permit to work.

#### Construction Pedestrian and Traffic Management

- Prior to the issue of any construction certificate or any preparatory, demolition or excavation works, whichever is the earlier, the applicant shall:
  - Prepare a Construction Pedestrian and Traffic Management Plan (CPTMP) in consultation with the Sydney Coordination Office within TfNSW and the Sydney Light Rail Operator. The CPTMP needs to specify matters including, but not limited to, the following:
    - A description of the development;
    - Location of any proposed work zone(s), noting Darling Drive is not a suitable location;

- Details of crane arrangements including location of any crane(s) (if any);
  - Haulage routes;
  - Proposed construction hours;
  - Predicted number of construction vehicle movements and detail of vehicle types, noting that vehicle movements are to be minimised during peak periods;
  - Details of specific measures to ensure that closure pedestrian bridges during the construction does not cause pedestrian/passenger safety issues at the light rail stop with increased pedestrian movements at the light rail stop;
  - Pedestrian and traffic management measures;
  - Construction program and construction methodology;
  - A detailed plan of any proposed hoarding and/or scaffolding;
  - Measures to avoid construction worker vehicle movements within the CBD;
  - Consultation strategy for liaison with surrounding stakeholders, including other developments under construction;
  - Any potential impacts to general traffic, cyclists, pedestrians and light rail and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works;
  - Cumulative construction impacts of projects including Sydney Metro City and South West. Existing CPTMPs for developments within or around the development site should be referenced in the CPTMP to ensure that coordination of work activities are managed to minimise impacts on the surrounding road network; and
  - Proposed mitigation measures. Should any impacts be identified, the duration of the impacts and measures proposed to mitigate any associated general traffic, public transport, pedestrian and cyclist impacts should be clearly identified and included in the CPTMP.
- Submit a copy of the final plan to the Coordinator General, Transport Coordination within TfNSW for endorsement; and
  - Provide the builder's direct contact number to small businesses adjoining or impacted by the construction work and the Transport Management Centre and Sydney Coordination Office within Transport for NSW to resolve issues relating to traffic, public transport, freight, servicing and pedestrian access during construction in real time. The applicant is responsible for ensuring the builder's direct contact number is current during any stage of construction.

### **During Construction**

- All piling and excavation works are to be supervised by a geotechnical engineer experienced with such excavation projects;
- No rock anchors/bolts (temporary or permanent) are to be installed into the light rail corridor;
- No metal ladders, tapes and plant/machinery, or conductive material are to be used within 6 horizontal metres of any live electrical equipment unless a physical barrier such as a hoarding or structure provides separation;

- During all stages of the development extreme care shall be taken to prevent any form of pollution entering the light rail corridor. Any form of pollution that arises as a consequence of the development activities shall remain the full responsibility of the applicant;
- The applicant must mitigate all noise and vibration to the extent possible and provide vibration monitoring equipment and provide the results to the Sydney Light Rail Operator at intervals required by TfNSW and the Sydney Light Rail Operator, and immediately implement corrective actions in the event that the noise or vibration exceeds acceptable limits;
- Rainwater from the roof must not be projected and/or falling into the rail corridor/assets and must be piped down the face of the building which faces the rail corridor. Given the site's location next to the rail property, drainage from the development must be adequately disposed of/managed and not allowed to be discharged into the corridor unless prior approval has been obtained from TfNSW and the Sydney Light Rail Operator (or the delegated authority); and
- No scaffolding is to be used within 6 horizontal metres of the rail corridor unless prior written approval has been obtained from the Sydney Light Rail Operator and TfNSW and a physical barrier such as a hoarding or structure provides separation. To obtain approval the applicant will be required to submit details of the scaffolding, the means of erecting and securing this scaffolding, the material to be used, and the type of screening to be installed to prevent objects falling onto the rail corridor.

### **Prior to the Issue of the Occupation Certificate**

#### **Post--construction Dilapidation Report**

Prior to the Issue of the Occupation Certificate, a post-construction dilapidation survey shall be undertaken via a joint inspection with representatives from TfNSW, Altrac, the Sydney Light Rail Operator and the applicant. The dilapidation survey will be undertaken on the rail infrastructure and property in the vicinity of the project. These dilapidation surveys will establish the extent of any existing damage and enable any deterioration during construction to be observed. The submission of a detailed dilapidation report to TfNSW and the Sydney Light Rail Operator will be required unless otherwise notified by TfNSW. The applicant needs to undertake rectification of any damage to the satisfaction of TfNSW and the Sydney Light Rail Operator and if applicable the local council.

#### **Reflectivity Report**

Prior to the Issue of the Occupation Certificate, the applicant shall demonstrate that lights, signs and reflective materials, whether permanent or temporary, which are (or from which reflected light might be) visible from the rail corridor were installed limiting glare and reflectivity to the satisfaction of TfNSW, Altrac and the Sydney Light Rail Operator.

7 May 2020

Our Ref: R/2016/41/A  
File No: 2020/180939  
Your Ref: SSD-7874

David Glasgow  
Principal Planning Officer  
Department of Planning, Industry and Environment  
12 Darcy Street, Parramatta NSW 2150

By Planning Portal

Dear David

**Response to Submissions – Stage 1 Concept Proposal for the Harbourside Shopping Centre Redevelopment – SSD-7874**

Thank you for your correspondence dated 1 April 2020 requesting City of Sydney Council's ("the City") comments on the Response to Submissions (RTS) for this State Significant Development (SSD) application. The proposal involves the staged development application and concept approval for a new retail shopping centre, residential apartment tower and public domain improvements.

It is acknowledged that since the last submission in 2017, the proposal has undergone several iterative design workshops with key stakeholders to change and improve certain aspects of the development. The changes reflected in the RTS include built form improvements to the tower, podium and public domain.

The City has reviewed the information submitted with the RTS and acknowledges that changes to the building envelope and relocation of the tower are an improvement to the previous scheme.

Notwithstanding this, the amended concept proposal does not address the City's key concerns of the effective privatisation of public land with cumulative environmental impacts not adequately considered. The amended proposal presents significant new issues in addition to those raised in previous correspondence, dated 10 February 2017.

In consideration of the above, the proposal as it stands is not in the public interest and accordingly, the City ***maintains objection*** to the application for the following reasons:

**1. Land Use – Residential Accommodation**

The RTS presents a minor reduction of residential apartments compared to the first iteration of the scheme. The proponent asserts that the residential component of the proposal will contribute towards the State's 20-year housing target of 725,000 additional homes by 2036. The residential apartments are also asserted to provide a variety of housing types that will help with affordability.

The City reiterates that Darling Harbour is a precinct for all of greater Sydney with a network of open spaces that encourage various leisure activities within the harbour

foreshore. The assertions made for the provision of residential accommodation are not meaningfully substantiated and do not warrant the conversion of public land for private use. As stated in our previous response, the development contradicts the principles of the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* in recognising that Sydney Harbour is a public resource, owned by the public and is to be protected for the public good. Further, it is also stipulated in the SREP that the public good has precedence over the private good and whatever change is proposed for Sydney Harbour or its foreshores.

It is acknowledged that residential accommodation is permitted on the site under the *Darling Harbour Development Plan No. 1 1985*. Notwithstanding this, the permissibility cannot be solely relied upon to permit the use and development of the site for residential purposes. The concept proposal is inconsistent with the objectives of the Plan, which is “to encourage the development of a variety of tourist, educational, recreational, entertainment, cultural and commercial facilities within that area”.

Irrespective of the above and as stated in our previous response, the City submits that the *Darling Harbour Development Plan No. 1 1985* fails the contemporary test by virtue of its age and lack of strategic alignment with the Greater Sydney Commission’s District Plan. Further, it fails to respond to and address the contemporary land use and planning issues of Central Sydney, notably strategic goals contained within the draft Central Sydney Planning Strategy and targets stipulated by Sustainable Sydney 2030.

The City emphasises that consideration of the development should be made against the priorities relevant to Central Sydney under the District Plan as well as other City related strategies. Particularly with respect to housing, housing targets and housing supply within the City of Sydney LGA, as envisioned under the Eastern City District Plan and Sustainable Sydney 2030, have targeted for at least 138,000 dwellings to be provided. In accordance with the City’s Housing Audit for the financial year of June 2019, there were 116,868 (private) dwellings audited in the City of Sydney local area, which equates to 84.7% of the dwelling target for 2030.

These figures demonstrate that 56.2% of target dwellings had been added, after 52.2% of the timeframe (12 of 23 years). The highest number of private dwellings is located in the Green Square and City South village (20,139). Overall, the figures verify that the City is well positioned to meet the NSW Government’s housing targets for residential dwellings without the provision of housing on this site.

In relation to the economic priorities of Central Sydney, the draft Central Sydney Planning Strategy and Sustainable Sydney 2030 recognise the role of Central Sydney, including Darling Harbour, in contributing towards Sydney being a global city with a commercial core to support and protect economic and employment growth opportunities. These priorities are also derived from the economic targets prescribed by the District Plan. Specifically, the Central Sydney Planning Strategy sets out visions and aims for the efficient use of land with floor space that is not committed to residential uses. This is to ensure that planning for job growth in Central Sydney is protected from the overwhelming residential demand to access jobs and services.

The Strategy also sets out key actions, which include limiting access to strategic floor space to key productive sites, to office premises, business premises, retail premises, hotel accommodation and community and cultural facilities. Other key actions include ensuring proposals that allow for additional height for employment related development does not result in additional overshadowing of protected places.

In light above, it is reiterated from the City's previous response that the District Plan and the Central Sydney Planning Strategy suggest that the site should be reserved for employment related land uses that consider the long term public benefit and longevity of Sydney as a global city with a strong economic core. Introducing residential development results in short-term financial gain that is contrary to the priorities the Strategy and Plan More importantly, permitting residential accommodation in public land of Darling Harbour is a direct contravention to the objects of the *Environmental Planning and Assessment Act (EPA Act) 1979*, in that:

- The proposal does not promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources. The residential use is significantly incompatible with the historic and ongoing uses of Darling Harbour. The enjoyment of the foreshore and Darling Harbour as a precinct and public asset for leisure, recreation, entertainment, culture, education, commerce would be completely hindered by the development.
- The proposal does not facilitate ecologically sustainable development by integrating relevant economic, environmental, and social considerations in decision making about environmental planning and assessment. Allowing residential uses in a public environment is poor decision making and jeopardises a highly used public asset that encourages enjoyment of the harbour foreshore. The proposal does not consider the social and environmental repercussions of residential uses in the Darling Harbour precinct that is frequently noisy and hosts major city and State significant events. There are other areas within the City of Sydney LGA that are better suited for residential uses, such as Green Square and Ashmore Precinct, with new and existing infrastructure and services that can accommodate any uplift and density for the provision of additional housing that do not need to compete with amenity concerns.
- In light of the above, the proposal does not constitute and promote the orderly and economic use and development of land in Darling Harbour.
- The proposal does not adequately demonstrated how it is to provide, deliver and maintain affordable housing. This is detailed later in this response.
- The proposal does not protect the environment and promote the sustainable management of built and cultural heritage. The amenity of the built environmental is compromised as a result of the cumulative environmental impacts resulting from the development. This is also detailed later in this response.

Accordingly, the City rejects the proponent's overarching supposition and reliance on the State's housing targets to justify the residential use. Whilst an imperative priority to achieve the strategic objectives for the State, it should not be at the detriment of public land. As previously stated, there are other and more suitable locations in the Sydney LGA that can provide additional housing without compromising the housing targets envisioned by the NSW Government.

A balance must be struck in ensuring that commercial core areas, particularly within the City Centre and moreover in Darling Harbour, be maintained and realise other strategic priorities of the State. Darling Harbour has long been a precinct for the public and should remain so. The proposed residential use would diminish the enjoyment of the foreshore

and Darling Harbour as a public asset and precinct for leisure, recreation, entertainment, culture, education and commerce, which is not in the public interest.

## 2. Affordable Housing and Public Benefit Offer

Noting that the City does not support the provision of residential accommodation on the site, this submission will address the proponent's public benefit offer and the issue of affordable housing, respectively.

The RTS outlines that the residential component of the development will provide affordable housing as well as a public benefit offer for a monetary contribution of \$5,200,000 towards affordable rental housing.

Providing for affordable housing is a positive aspect, the RTS provides no reference to the percentage of the 357 apartments to be dedicated for affordable housing. It is stated that the 357 apartments and their residents will not have an adverse impact on community facilities and infrastructure. The RTS highlights that the new Ultimo Public School and associated facilities including childcare are the main reasons for this. However, the RTS is not accompanied with a Social Impact Assessment or social infrastructure analysis to demonstrate and support this claim.

There is no explanation or justification for the affordable housing contribution amount, particularly with reference to whether the affordable housing is adequate in the context of the City's resolution on housing on Government land under the Local Strategic Planning Statement (LSPS). The City's GSC and City endorsed LSPS indicates that 25% of housing on state owned sites should be affordable. This is because state own land needs to do the heavy lifting to address the chronic shortage of affordable housing. For the case of this proposal, approximately 9,500sqm or 111 apartments at 85sqm each, are to be dedicated for affordable housing.

Further, it should be noted that the City has adopted a planning proposal that extends the affordable housing levy across the LGA that requires a contribution of up to 12% of new floor space achieved through a change to the planning controls. These controls are currently being drafted for the Sydney LEP. It is acknowledged that this application would not be subject to these planning controls. However, it is reasonable to provide an estimate in accordance with the City's rates, which would require a contribution rate of 1.5% to residential floor space and 0.5% to non-residential floor space from June 2020. These rates will increase to 3% and 1% respectively from June 2022.

The current equivalent monetary contribution is \$11,340.92. Accordingly, the monetary contribution towards affordable housing based on the above is approximately **\$18.5 million** when applying the rates as detailed below:

$$(3\% \times 38,000\text{sqm} \times \$11,340.92) + (1\% \times 49,000 \times \$11,340.92)$$

This figure assumes that the proposal does not exceed the FSR controls. The monetary contribution will be half if the June 2020 rate is applied.

Overall, the RTS makes an unsubstantiated claim to provide affordable housing that does not address relevant strategic documents. Based on the insufficient details provided, the City has no confidence that affordable housing will be provided for this development.

### **3. Urban Design**

#### **3.1. Wind Impacts**

The submitted Wind Assessment Report, prepared by CPP, is an opinion-based report that assesses the wind impacts by benchmarking against the original, rather than against the delivery of quantified wind speeds to ensure comfort levels for different activities. The Report concludes that wind tunnel testing is not considered essential for the building envelope but for the future design development to establish local wind and mitigation areas intended for outdoor seating.

As stated in previous correspondence, wind tunnel testing is critical and necessary for this development. The wind impacts to the public domain, notably the through-site links as a public benefit must be identified and fit for purpose as part of any concept plan and not left to be solved at a later stage. Assertions regarding the suitability of wind speeds along the waterfront need to be quantified.

Consideration of the wind impacts must not be limited to outdoor seating associated with retail, but also include impacts to residential balconies, include measures to minimise downwash from the tower to pedestrian comfort on Darling Drive as well as impacts within the through-site link, courtyards and green roofs.

The Report deems wind speeds along the waterfront to be suitable as a public accessway and for short term stationary activities. However, the claim is not quantified.

#### **3.2. Design Excellence**

The RTS outlines that the proponent has elected to carry out an invited single stage competitive design process with a minimum of three invited competitors/design teams.

The City recommends that a full competition be carried out to commensurate with the scale, value and impacts of the development.

#### **3.3. Public Domain Interface**

Insufficient and inconsistent information is provided for existing ground levels including the foreshore promenade and surrounding streets to adequately understand the relationship of the development and immediate context. Specifically, the anomalies include the kiss-and-ride on Level 1 associated with a commercial lobby located on Level 2. This lobby appears to be at the same level as the top of the existing stairs located south of the Pyrmont Bridge.

The levels of the southern through-site link and Bunn Street are also missing and there is no indication of levels the Pyrmont Bridge stairs. Clarity is sought as to what is the driver of the southern through-site link, which is not indicated in the concept building envelopes as a deliverable public domain element. The plans also indicate that the proposed Ribbon Stairs are within the development boundaries and privatised with access via the southern podium. It should be public and connect the foreshore promenade to the corner of Darling Drive and Murray Street.

Whilst the proposal includes a consistent width of 20m along the foreshore, the 519sqm increase to the existing 4,470sqm is not a substantive increase to the foreshore promenade. The existing foreshore provides an area with a width of up to 25m which enables different spaces to be created to accommodate different programs.

### **3.4. Building Envelope**

Additional information is required regarding the setbacks to Darling Drive. The existing building is setback from the western boundary to allow for vehicular access. However, the proposed building envelope is almost the full length of Darling Drive from the Bunn Street connection going northwards. The building envelope implies that this area can be built from ground level to RL 26.5, 25 and 17.5. It is recommended that the podium height be lowered with an increased setback at this location to give a clear sightline to the existing stairs adjacent to the Pyrmont Bridge.

The building envelope tower footprint is excessive for a residential tower. The dimensions are approximately 53m in length with a varied width between 27m and 29m. There appears to be no rationale as to why the depth tapers and overall, the dimensions imply non-compliances with the required building depths under the Apartment Design Guide (ADG).

The location of the tower in the centre of the site is an improvement. However, the view analysis should be expanded and include the view corridors from streets in the CBD as well as Pyrmont.

No tower setback is provided along Darling Drive. Effectively, this brings the tower to the ground and result in severe wind impacts to pedestrian safety along Darling Drive and the future through-site links.

### **3.5. Overshadowing**

The revised shadow diagrams illustrate that the overshadowing of the foreshore is significant between 12-2pm. Whilst relocating the tower to the centre of site reduces the overshadowing to the foreshore, The City requires updated shadow diagrams at 15-minute intervals to be submitted to determine the degree and percentage of the foreshore promenade affected by the development. This is to ensure that the public realm receives solar access at the highly sought lunchtime hours.

### **3.6. Indicative Podium and Tower Design**

The concept podium design is dissected by the southern through-site link. However, this link is not indicated as a deliverable in the concept building envelope. The southern podium is almost exclusively retail. At ground level, there is a retail street connecting the foreshore promenade to the southern through site link and either back to the foreshore or to the northern podium. The retail street is not open to the sky.

Additionally, the RTS is unclear as to which level the residential use commences. More importantly, the tower envelope indicates non-compliances with the ADG with respect to the building depth and natural ventilation of lower floor apartments (indicated to be 57%). The indicative typical apartment floor plans suggest that there is a strategy to locate larger and fewer apartments on

the three lower levels and up to 12 apartments on upper levels. This is contrary to the ADG design requirement of a maximum of 8 apartments off a circulation core. Solar access to the apartments must be confirmed through a sun's eye analysis.

### **3.7. Pedestrian Amenity**

The RTS stresses the need for the through-site links. If this is to be the case, they must be fit for purpose. As such, safe and comfortable wind conditions are paramount. Further, it appears that the southern through-site link is to connect to a porte cochere drop off to the foreshore. These drop offs are often used by people who are not as mobile including the elderly and children.

### **3.8. View Impacts**

The view impacts of the development must be expanded to include view catchment of the proposed building at Cockle Bay. It is also recommended that the vista along Market Street is clear for its width and not encroached by the development.

## **4. Heritage**

The heritage concerns initially raised by the City include insufficient setbacks of the tower and podium to the heritage listed Pyrmont Bridge, the pedestrian footbridge connection from the Pyrmont Bridge and proposed podium, visual impact on the former Goldsborough Mort Woolstore and lack of detail on the conservation works to the Bridge. The City also suggested a 30-degree angle sightline/separation of the podium from the southern side of the Bridge be cast to establish the setbacks and that should be no more than a 5m setback of the proposed stairs.

Notwithstanding the general improvement to the building envelope, the concern of the podium envelope remains from a heritage perspective. Whilst the amended design provides increased setbacks to the Bridge and a rationalised northern edge/sightline, the modifications to the podium and underbridge stairs are tokenistic and does nothing to ameliorate the unacceptable visual impact and curtilage to the Pyrmont Bridge.

It is noted that the previous Goods Line Workshop Shed located at the southern side of the Bridge was only slightly higher than the Bridge surface. The extant Harbourside Shopping Centre height of RL 17.4 largely reflects the former Shed's height. The visual prominence of the Bridge as viewed from the west are not significantly affected. The proposed podium has a height of RL 24, which is 7.5m taller than the extent structure and approximately 13-14m taller than the Bridge surface at RL 11.5. The significant increase of the new structure's height warrants a larger setback from the Bridge to reduce its imposing impact.

Following a 30 degree vertical visual angle, a RL25 structure needs to have a 25m setback from the southern edge of the Bridge. The portions of the northern end of the podium whose RL is lower than RL 25 may have a reduced setback less than 25m. A tiered form of the podium has the benefit to make the green roofs of the lowered podium visible from the Bridge. If a universal 25m setback is not made to the RL25 podium, the setbacks and a 30 degree slant sightline should be adopted as previously recommended.

The amended proposal provides an opportunity to improve the setting of the Bridge, particularly its presentation at its western end. The podium design should make reference to the northern side of the Maritime Museum with respect to its separation, height and lightweight form. The southwest edge of the Bridge could be better defined than the existing from the top of the Bridge and the promenade under the Bridge.

The introduction of the monorail stop and Harbourside centre in the 1980s were intrusive to the Bridge. The integrity of the Bridge was unduly affected. This occurred at the junction of the Bridge and the centre at the south-west corner of the Bridge. The work resulted in a location of a portion of the Bridge balustrades at the south-west to the edge of Darling Drive and obscuring the south-west pylon.

The development and design of the north podium should consider reinstating the relocated south-west balustrades. Consideration should also be made to improving and enhancing the south-west edge of the Bridge as being viewed from the harbour promenade from the Bridge top. Whilst a large separation of the new podium from the Bridge is to be introduced the connection of the podium to the Bridge should be light and rigorous. The south-west pylon should be fully exposed.

Overall, the updated proposal makes some improvements in terms of its heritage impact to the Pyrmont Bridge. However, the podium envelope and the northern end is remains unsatisfactory and unaddressed.

## **5. Transport and Access**

Significant concern is raised regarding the little detail provided in the RTS regarding transport and access as follows:

### **5.1. Access**

The RTS provides no ability for the City to assess the number of driveway locations, distance of driveways from main street thoroughfares to confirm risks of queuing, driveway widths and impacts on pedestrian amenity and safety. It appears that access to the loading dock of the development is via truck hoist only, which is not supported.

The City can only make assumptions with the information provided in the RTS. For instance, an indication on the loading and drop off/pick up arrangements is contained in the submitted 'Harbourside Pedestrian Study' as well as the 'Traffic and Transport Impact Assessment', which indicate two loading areas with the southern one accessed via a hoist, as previously mentioned. The lack of information for a development of this scale is unacceptable and is poor planning practice. There is no clear indication about how this proposal will be accessed and serviced. The site's constrained nature and the reliance on Darling Drive to provide access, means it is critical that careful consideration of the transport and access related impacts are made to reduce the cumulative impacts and traffic generation that the proposal would have to the local road network.

### **5.2. Car Parking**

The submitted Traffic and Transport Impact Assessment', prepared by Arcadis, outlines that the current Harbourside Shopping Centre operator leases car parking for the existing retail patrons from the Novotel Hotel car parking. It is proposed that this existing retail parking arrangement will continue in which

patrons will park and access the new Harbourside Shopping Centre via the new Bunn Street bridge. The Report also describes the connectedness of the site to public and active transport and the large availability of car parking at adjacent sites. Collectively, there is an existing number of 5,373 spaces available within walking distance to the site.

The proposal seeks to provide 306 car parking spaces within 3 basement levels. The number of car parking spaces proposed is unsupportable. There is no justification provided for the significant increase in parking from the existing parking provisions. Further, no justification is provided on how this level of parking can promote sustainable transport over a car-orientated development.

A realistic consideration of the impact of parking and the traffic generation from the site on the Central Sydney is not made. The provision of additional car parking spaces is at odds to the contents of the Traffic Report, which highlight the locality's existing parking and transport arrangements. A zero increase in private parking should be mandated with appropriate parking for servicing and drop off/pick up.

Overall, the parking supply for the development must be constrained to encourage sustainable transport such as public transport and active transport, including cycling and walking. Moreover, the development should seek to encourage sustainable and active transport in a manner that aligns with the targets and objectives set out under Sustainable Sydney 2030.

### **5.3. Traffic Generation**

The concept proposal provides excessive parking numbers with a cumulative impact to the traffic generation of the site and local road network. It is anticipated that more than 1,035 vehicles will be generated in the PM peak with the existing design. This would have a considerable consequence on amenity across Central Sydney and surrounding precincts.

Consideration to the traffic generation impacts of the development is unsatisfactory. Some limited modelling has been undertaken and detailed in the Traffic Report. The modelling relates to a few intersections with concerning results, that overall, do not consider the impact on road space as well as impacts on pedestrian safety and amenity. This is not consistent with the TfNSW movement and place principles. Further, no information is provided on the impact of the development on the public domain and road network during peak event periods of adjacent facilities such as Darling Harbour and ICC.

### **5.4. Sustainable Transport**

As previously stated, the development should seek to encourage sustainable and active transport in a manner which aligns with the targets and objectives set out in Sustainable Sydney 2030. Further, the development should also align with other strategies including the City's *Cycling Strategy and Action Plan 2007-2017*, *Walking Strategy and Action Plan 2014-2030*, *Connecting our City Transport Strategies and Actions (2012)* and the *Sydney City Centre Access Strategy (TfNSW 2013)*.

The development does not support the TfNSW goals of balancing movement and placement. Instead, the development provides excess parking at the expense of place making as well as pedestrian safety and amenity with

considerably negative impacts on the public domain and urban environment throughout the City centre. No Green Travel Plan (GTP) has been submitted for the development, which at a minimum, demonstrates to a degree that consideration to sustainable transport has been made. The high trip generation of the development challenges the modal targets for the site with an emphasis on car orientated development. The 666 retail trips at the PM peak hour is clearly unacceptable.

### **5.5. Bicycle Lanes and Connections**

The City's comments regarding bicycle lanes in the previous submission has not been adequately addressed in the RTS, nor is there an indication provided in with respect to the overall commitment to cycling. No cycleway connection improvements are proposed as part of the application and reliance is made on the improvements already made by other developments along Darling Drive.

The City would expect an upgraded and separated cycleway connection from Murray Street/Union Street intersection (major cycleway) to the roundabout adjacent the site that is consistent with the design of the cycleway built south of the roundabout. Access is strongly preferred through an arrangement, which provides a dedicated bicycle entry/exit arrangement without stair access.

The City considers that upgrades to all pedestrian access points should include the provision for bicycle users also. This includes but it not limited to the following:

- Route 1 – CBD to Pyrmont Bridge
- Route 2 – CBD to Cockle Bay Wharf (north bridge)
- Route 3 – CBD to Cockle Bay Wharf (central bridge)
- Route 4 – Druitt Street Bridge

The City encourages the provision of innovative bicycle parking solutions in new development and recommends that the development provide a breakthrough in first class visitor/public bicycle facilities. These include providing a range of Class 2 and Class 3 visitor facilities with some showers and lockers to be located within the building face rather than the public domain with wayfinding signage to support these.

Overall, it is disappointing that so little effort is made to encourage and provide bicycle facilities for a development of this scale.

### **5.6. Bicycle Parking and End of Trip Facilities**

No commitment to bicycle parking and end of trip facilities or design is made, which is a disappointing and unacceptable. The rates in accordance with Sydney DCP 2012 should be used, which would require at least 532 x Class 2 bicycle parking as well as 88 x Class 3 bicycle parking to be provided.

Lockers and showers should also meet the City's Sydney DCP 2012 requirements, estimating a minimum of 175 lockers and 20 showers. However, this is up to the proponent to be clarified and justified.

### 5.7. Pedestrian Connections

The pedestrian through-site links are not detailed sufficiently in order to assess appropriate design or capacity to provide pedestrian amenity between the site and Pyrmont Bridge, Darling Harbour and Pyrmont.

Pedestrian modelling is required for the site to improve pedestrian access given the significant constraints and barriers to access the site, such as the light rail. Pedestrian links along the foreshore are not detailed to assess the capacity and amenity to cater for the proposed development. Width along the foreshore should be increased even more to accommodate additional pedestrian attraction as well as accommodating for cycling. This is consistent with the requirements of the Darling Harbour precinct under the *Sydney Regional Environmental Plan No. 26 – City West*.

Pedestrian access must meet the requirements of the *Disability Discrimination Act 1992* and avoid lift and stair access wherever possible.

### 5.8. Servicing and Coach parking

The burden of loading should not be left to the public domain. 15 spaces are proposed in the loading dock, which is an underestimation based on the rates of Sydney DCP 2012. In this light, it is estimated that a total of approximately 34 spaces is required as follows:

- Residential – 5 bays
- Retail – 22 bays
- Commercial – 7 bays

Significant concern is raised regarding the queuing impact and impacts on pedestrian amenity, notably if a hoist is involved to access the loading dock. It is noted that coach parking will not be provided on-site but will co-utilise the coach parking of the ICC if required. There is no confirmation provided if this would be acceptable to the ICC.

### 5.9. Construction Pedestrian Traffic Management Plan (CPTMP)

The preparation of a CPTMP in consultation with the City and the CBD Coordination Office with TfNSW will be crucial to addressing efficient functioning of business in the area surrounding the site, particularly due to the proximity of the site to existing motorways, pedestrian and cycling routes and adjacent to the ICC and other Darling Harbour sites.

## 6. Landscape

The amended proposal involves the provision of a substantial green roof coverage. Whilst a positive gesture, it represents a missed opportunity. The green roofs are described as being accessible in part, and the remainder is accessible for maintenance only. The latter forms most of the large flat roof to the north of the podium. While this is purported to be for biodiversity purposes, there is no information provided on the intended soil depth of the green roof. The indicative plant list includes 5 shallow-rooting species only. This will provide negligible ecological benefit and is likely to rely on a shallow soil profile that will allow limited variation in planting structure. The result will be an aesthetically 'green' roof that has limited value to the urban ecology of the city.

It is strongly recommended that the large extensive northern green roof be designed to allow for soil depths varying between 450mm to 1000mm with soil volumes in accordance with the Sydney Landscape Code Volume 2. It should also incorporate a diversity of plant species, forms, type and structure. The green roof should be designed by a landscape architect in conjunction with an ecologist. It should focus on understanding and achieving genuine ecological targets and seek to accommodate the canopy cover targets detailed below.

Overall, the City would support making this roof area publicly accessible, even in part. Whilst it may hinder the ability to achieve extensive ecological targets, it may help to justify greater soil depths and allow the public to enjoy the benefit of canopy trees and an urban park in the Darling Harbour precinct.

### 6.1. Tree Management

In addition to the green roof, the amended proposal includes the proposed planting of trees within the public domain, between the building and foreshore. The Darling Harbour foreshore currently contributes almost no canopy cover to the area. This proposal has the opportunity to contribute substantially to the NSW Government and City of Sydney canopy targets while providing increased amenity and usability to the harbour foreshore.

The extensive green roof indicated in the submitted public domain plans create a substantial area in which tree planting may occur. The detailed design must provide for small to medium trees on the green roof areas which will provide 35% canopy coverage of the building envelope area within 10 years from completion of the development. In order to ensure that these trees remain viable and provide the necessary canopy cover, they will require a detailed soil specification which must be included in the detailed green roof design. This design should also provide for species that will tolerate the site conditions whilst promoting biodiversity.

The indicative design within the interface with the ICC Plaza includes a row of trees along the public thoroughfare, however these trees are not included in the ground floor public domain plan. As these are high profile and well used public domain areas, it is required that a detailed public domain design provides for a minimum of 50% canopy cover within 10 years from completion of the development, using appropriate plantings of medium to large canopy trees.

The eastern side of the existing complex has a visually prominent row of *Livistona australis* (cabbage tree palm) that extends from the glass pavilion to the northern top of the building. The proposed removal of these trees in order to facilitate the development is not supported. Instead, the trees must be transplanted and included within the "Palm Grove" shown on the Public Domain Plan. A Transplanting Methodology Report prepared by a AQF5 Arborist with 10 years' experience transplant must be submitted.

### 6.2. Ecology and Biodiversity

As previously mentioned, the concept proposal suggests the green roof is expected to have ecological benefits and native planting mixes. However, the design is not reflective of this assertion. The aim of the green roof is to increase biodiversity. The suggested 5 species are completely inadequate to cover the roof of such as scale and should have a higher number of species and feature

indigenous vegetation to the local area. It must incorporate different vegetation layers and habitat features to increase opportunities for wildlife to feed and shelter. Habitat features include hollow logs, twig/stick bundles, rocks, areas of sand and rubble, roof tiles and nesting boxes or plants that have the capacity to support nests for shelter depending on what species the design is specific to. At a minimum, it is important to consider the provision of water and shelter if the green roof is to have ecological and habitat benefits. A minimum of 20-25 locally native species should be included.

Designing for biodiversity needs consideration of plant species, food sources as well as variable heights and layers. Plant species persistence can also be considered and improved through plants such as grasses and herbs that readily seed and self-sow or produce underground storage organs, such as bulbs or tuberous roots. The landscape design is unclear as to whether it is designed for a particular species of invertebrate, bird or plant. The design also omits any indication of access for maintenance.

In consideration of the scale of the development, it is recommended that the treatment of the future glazed facades of the building be highly considered in preventing bird strike for the protection of endangered and priority bird species as well as the general bird population.

## **7. Public Domain**

The amended proposal comprises of several modifications. Generally, the modifications are improvements to the public domain as initially proposed, notably the increased width of the foreshore 'Boulevard' to 20m as well as the inclusion of a new central through-site link that would provide pedestrian access from the waterfront through to the Bunn Street pedestrian bridge and wider Pyrmont and Bays Precinct.

The site is surrounded by a mix of heritage features such as the Pyrmont Bridge and a wider context that include red brick paving. It is crucial to the overall success of this proposal that all external finishes to the public domain are coordinated with those existing and proposed under the current Darling Harbour upgrade works.

The Public Domain Design Report, prepared by Aspect Studios, lists a range of materials proposed for the public domain. The use of Austral Verde and Sesame Grey granite for paving is not recommended due to the limits of supply of the stone. The City prefers Austral Black as a paving material in the CBD area as per the City of Sydney Streets Design Code. It should be noted that the recent upgrade works in Darling Harbour utilise Austral Black and Bluestone paving.

It is an important transition zone between areas and as such, the material selection should not seek to introduce new materials without careful consideration of the existing precinct. The introduction of timber at the same level as the proposed stone paving for a widened pathway is discouraged as a novel introduction of materials. It is not consistent with the material language of the Darling Harbour precinct.

Additionally, the Report provides a range of furnishings. Concern is raised for the climbable nature of furnishings located in areas adjacent the foreshore and its potential to encourage improper use of public spaces as well as safety concerns.

Whilst the scale of the public domain spaces appears appropriate, its usage may be over programmed. Special consideration should be made to the programming of the

public domain in ensuring that the areas are sufficient in accommodating the public and arrangement of public domain elements and planting are fit for purpose.

Connections from Darling Harbour will be apparent for most. However, the western side has more difficult connections that will require clarity for the public. Therefore, wayfinding signage should be incorporated that is consistent with the City's signage strategy for easy-to-follow routes for the public and visitors.

## **8. Noise**

The submitted Stage 1 DA Acoustic Report, prepared by Renzo Tonin and Associates, suggests that an 'alternative noise criteria' is to apply for the hours of operation of the future food and drink premises as well as for the residential uses. These details are not provided, and the applicant has not demonstrated the alternative noise criteria. This is unacceptable and is poor planning practice. As residential accommodation is proposed a similar approach should be taken to other State Significant Development sites such as Darling Square and Young and Loftus Precincts where a noise masterplan outlining acceptable noise levels was developed.

The RTS also advises that the noise and vibration assessment methodology and preliminary design considerations are to be outlined in the Stage 2 application. A detailed Demolition, Excavation Construction and Vibration Noise Management Plan is to be prepared to identify any construction activities likely to result in noise exceedances and provide mitigation strategies to minimise noise and vibration impacts.

Overall, the Acoustic Report does not quantify the external noise impacts and the amount of amelioration required to address the relevant noise standards for residential apartments. Recommendations to mitigate noise should be incorporated into the design competition brief. It is difficult and costlier to retrofit design solutions if apartments have already been designed.

## **9. Contamination**

The RTS was accompanied with a Preliminary Site Contamination Assessment (PSI), prepared by Coffey. The assessment is a desktop review, which identifies potential soil and ground contamination from fill materials remaining and historical contamination activities including the use as a railway and goods yard. The PSI concludes that detailed soil investigations are required to characterise contamination status through a Detailed Environmental Site Investigation (DESI), which should assess the suitability for the proposed land uses and inform any requirements for remediation. The requirement of a DESI was also specified in the City's previous response.

The RTS was not accompanied with a DESI. Instead, a preliminary Remedial Action Plan (RAP) was submitted. Given the absence of a DESI that is required to determine the extent of contamination prior to providing site-specific remedial options, the relevance of the preliminary RAP is questionable. The City is unable to rely on the preliminary RAP to confirm the suitability of site for development and there is no certainty that contamination of the site has been or can be adequately addressed.

## 10. Environmentally Sustainable Design (ESD)

Whilst the RTS has addressed some ESD concerns previously raised, the development must demonstrate best practice sustainable building principles showcase environmental performance, including energy and water efficient design and technology, use of renewable energy and best practice waste management. The ESD Statement, prepared by Cundall, sets different Green Star Targets for different parts of the development. The ESD strategies used for the entire building are to be considered as a whole and not in isolation to ensure ESD targets are achieved for the entire building. Overall, the proposed development is an significant opportunity to maximise efficiency, reduce waste and display innovative ways of ESD. This should be mandated in the any future design competition for the Stage 2 detailed proposal.

## 11. Public Art

The public domain concept design makes reference to the inclusion of temporary public art to activate the site during construction and to enliven the public domain once finalised as part of the ongoing programming of the completed development.

The RTS outlines that the proposal is consistent with the City's LSPS in creating and delivering significant public benefit including public art amongst other aspects. To realise this, a high-level Public Art Strategy is to be prepared to accompany the future design excellence process and ensure a cohesive approach commensurate to a development on this large scale. The Strategy should address:

- Precinct analysis, planning requirements and studies pertinent to the public art objectives.
- Temporary and permanent public art opportunities, and consider the relationship of any proposed works with existing artworks in the precinct.
- selection and commissioning method of artists and articulate how this aligns with the competitive design process as well as contain an indicative public art budget.

## 12. Waste

Having regard to the access and servicing issues raised above, the amended proposal does not demonstrate appropriate servicing arrangements for waste management.

Noting that the RTS relates to the concept proposal, it is recommended that the detailed application is to include detailed strategies and supporting facilities that support waste reduction measures, including for food scraps and or composting strategies. Sufficient waste and recycling management facilities and storage holding areas for servicing must also be demonstrated. The principles of the NSW EPA Better Practice Guide for Resource Recovery in New Developments as well as the City of Sydney Guidelines for Waste Management in New Developments 2018 are to be considered and incorporated.

Overall, the RTS presents significant unresolved issues and does not warrant the approval of the concept proposal. Fundamentally, the proposed residential land use is a manifest contravention to the objects of the *Environmental Planning and Assessment Act 1979* and is contrary to the spirit of the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005* in maintaining the Darling Harbour precinct as an uninterrupted public asset. The City implores that the land be maintained for the

purposes of tourist, educational, recreational, entertainment, cultural and commercial land uses.

Should you wish to speak with a Council officer about the above, please contact Reinah Urqueza, Specialist Planner, on 9265 9333 or at [rurqueza@cityofsydney.nsw.gov.au](mailto:rurqueza@cityofsydney.nsw.gov.au)

Yours sincerely,

A handwritten signature in black ink, appearing to be 'GJahn', written in a cursive style.

**Graham Jahn AM**  
**Director**  
City Planning | Development | Transport

## Submission for: Harbourside Shopping Centre Redevelopment

### Comments

# **SYDNEY TRAINS**

BURWOOD, New South Wales

## Message

- Sydney Trains requests that construction and operational activities associated with the proposed development do not impact on the existing 'in service' 33kV High Voltage cable located west of the subject site. It is requested that ongoing consultation is required between the Applicant and Sydney Trains during the life of the project to ensure the continued protection of the subject cable at each stage of the development.
- This submission is in addition to the comments and conditions provided as part of the Transport for NSW response for SSD 7874 in letter dated 27 April 2020.

The Department of Planning, Industry and Environment acknowledges the Traditional Custodians of the land and pays respect to all Elders past, present and future.

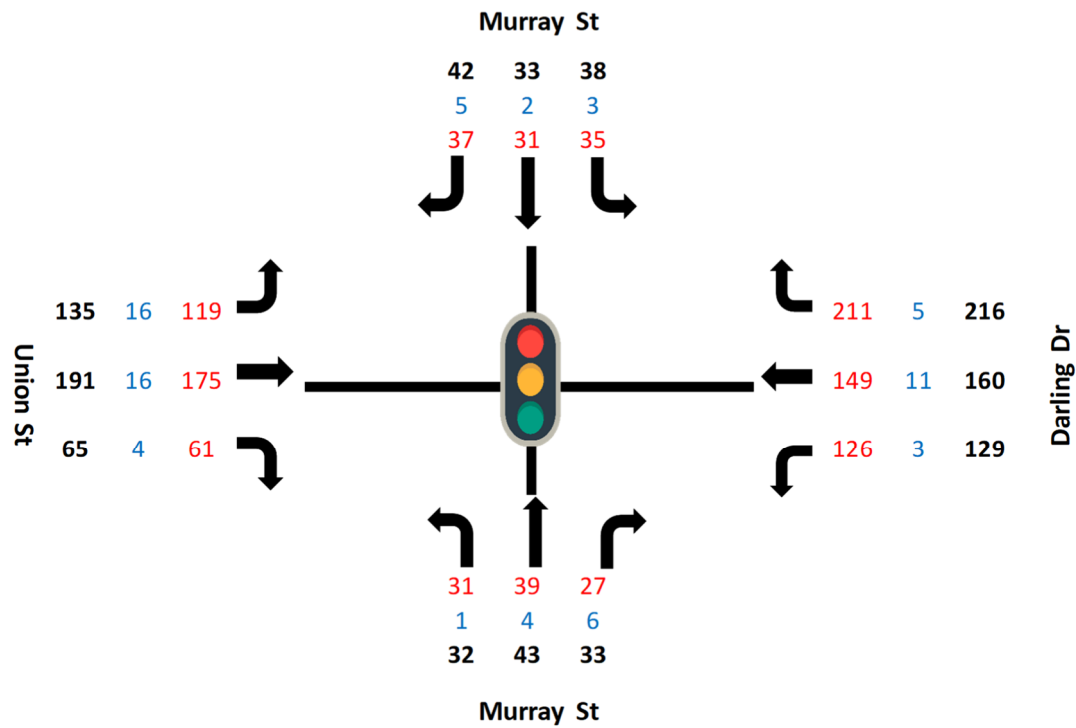
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Department of Planning, Industry and Environment  
NSW Government  
NSW Planning Portal

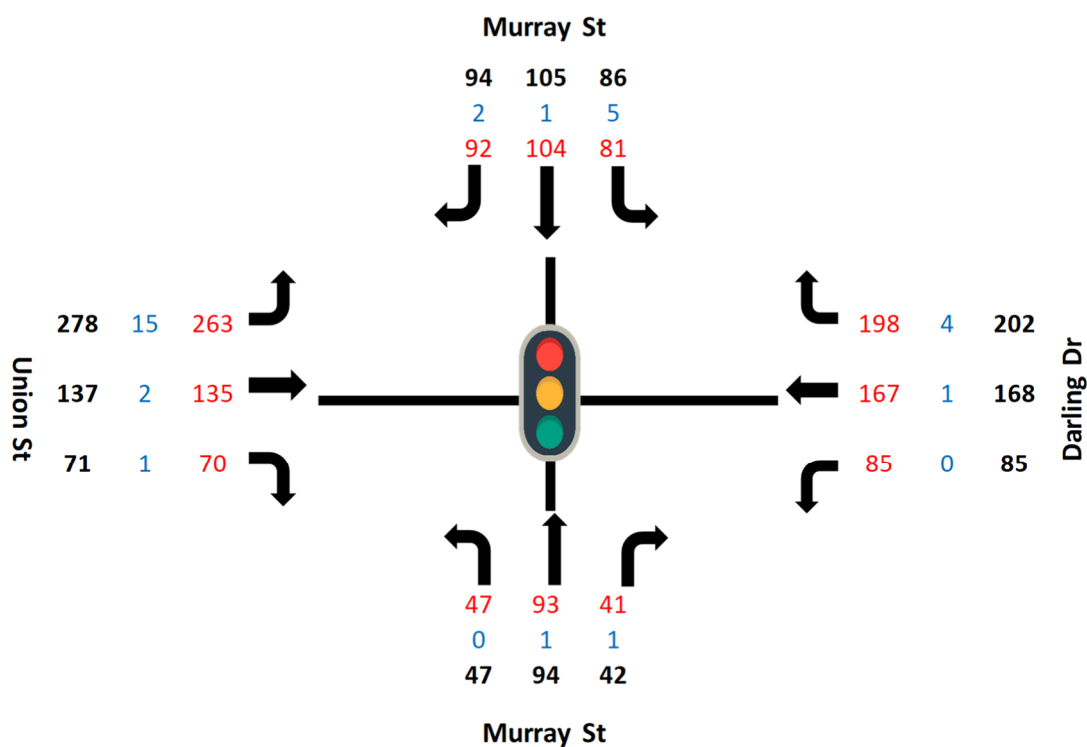
**APPENDIX B – JANUARY 2020 TRAFIC SURVEY VOLUMES**

Appendix B – Traffic volumes

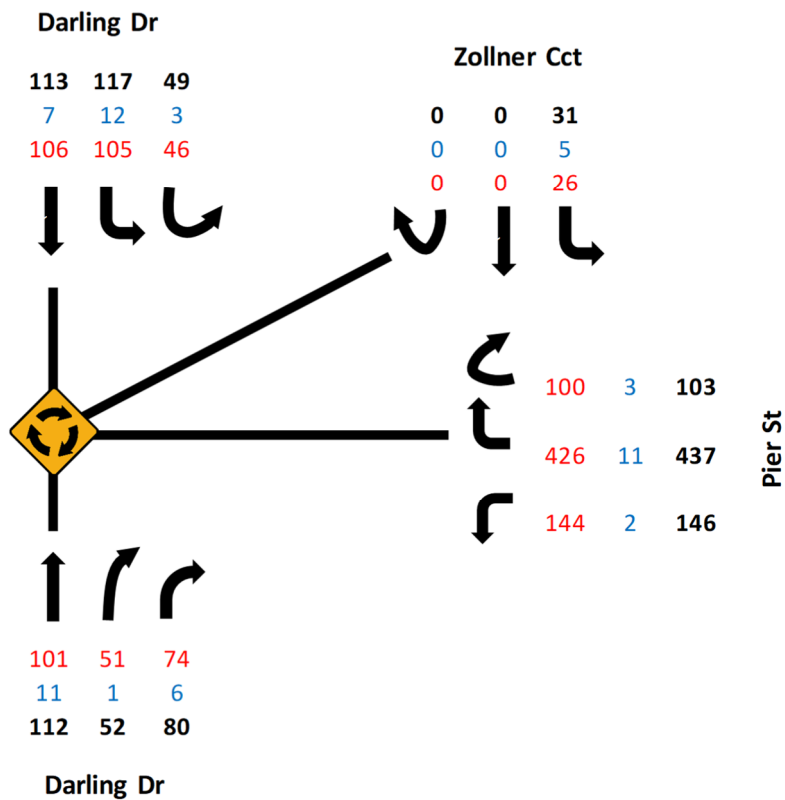
2020 Existing AM Peak  
(I-1) Murray Street/ Darling Drive



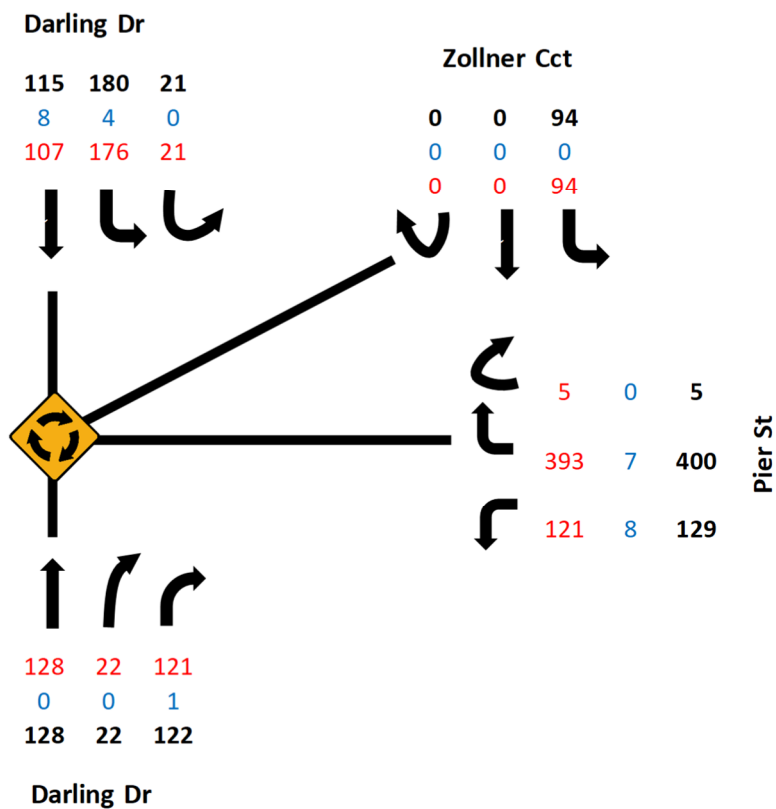
2020 Existing PM Peak  
(I-1) Murray Street/ Darling Drive



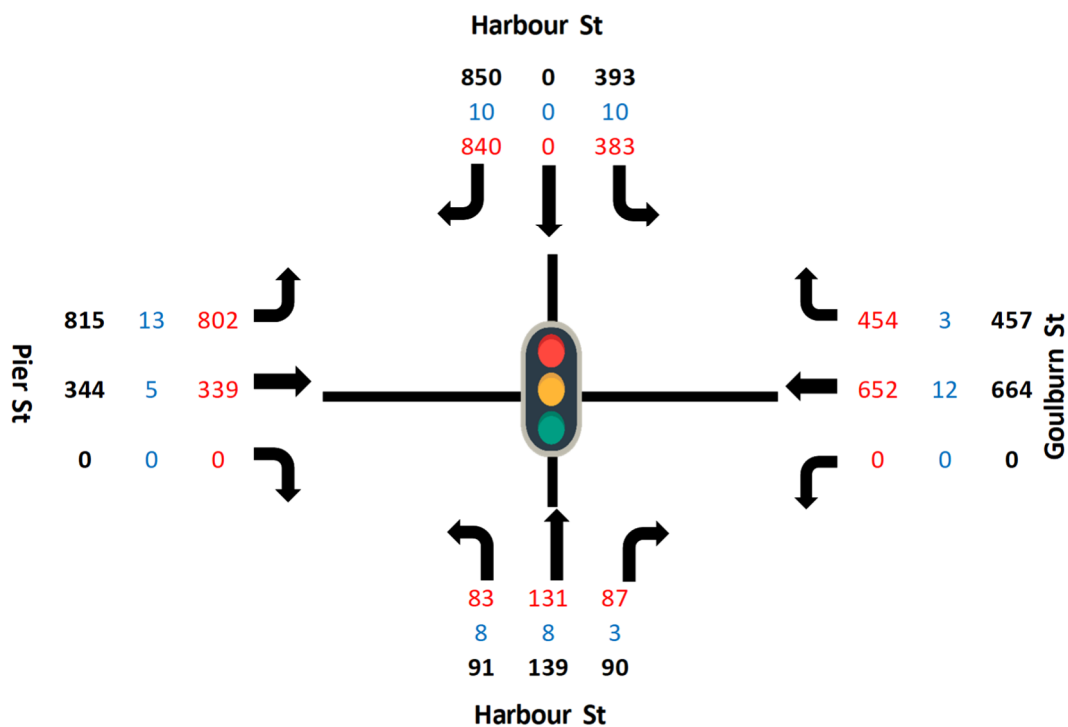
**2020 Existing AM Peak**  
**(I-2) Darling Drive/ Pier Street**



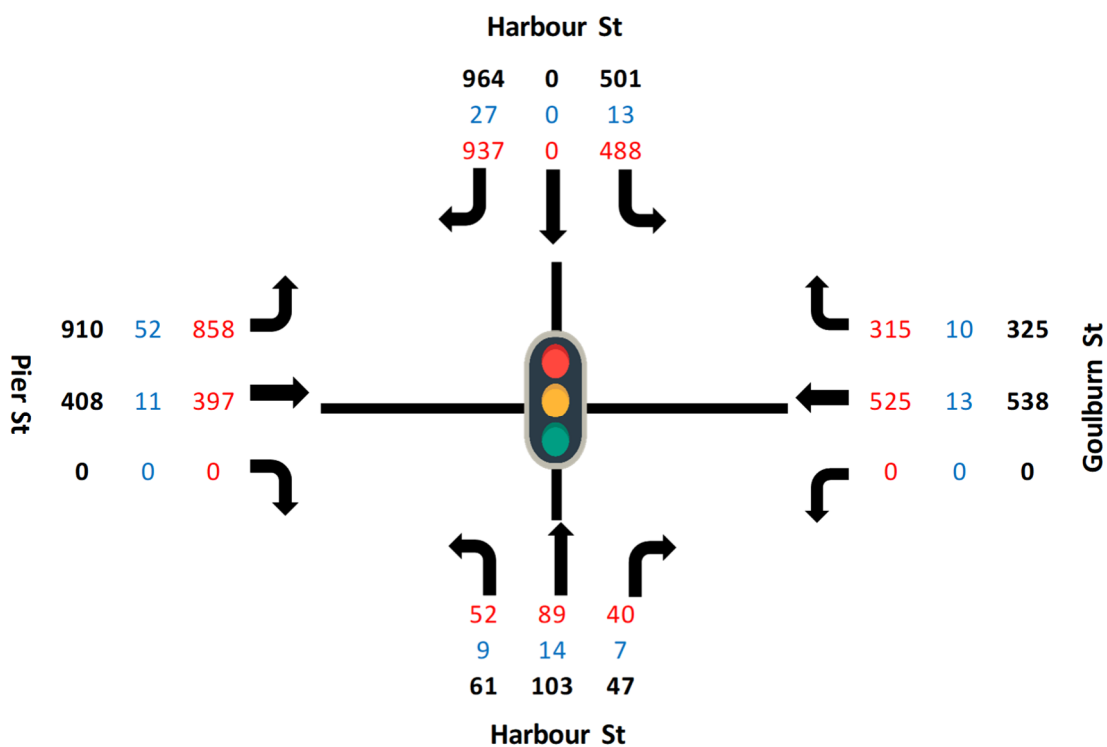
**2020 Existing PM Peak**  
**(I-2) Darling Drive/ Pier Street**



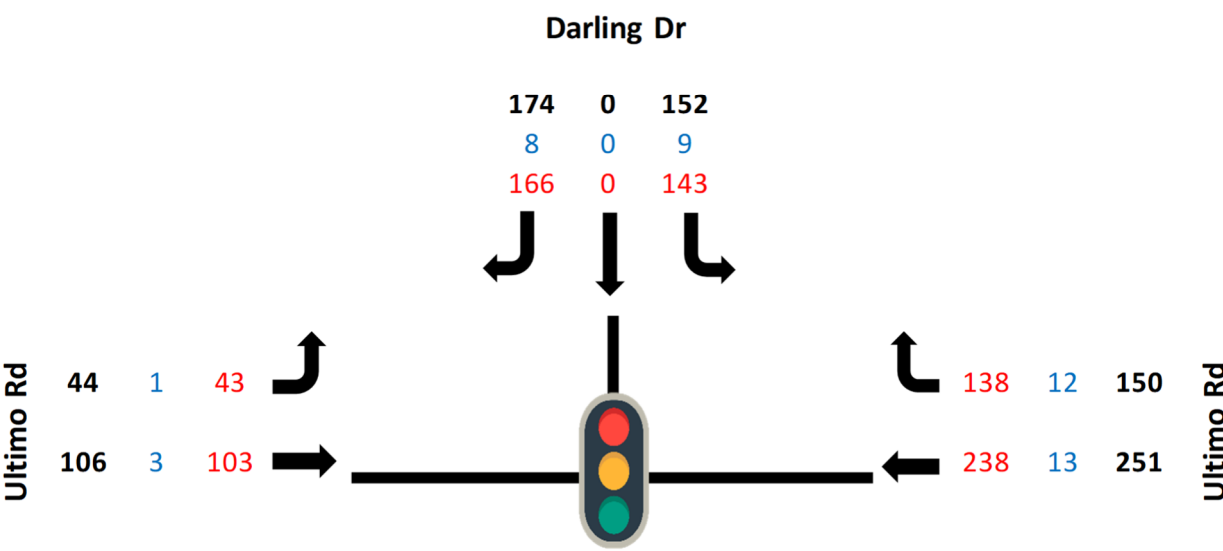
**2020 Existing PM Peak**  
**(I-3) Harbour Street/ Pier Street/ Goulburn Street**



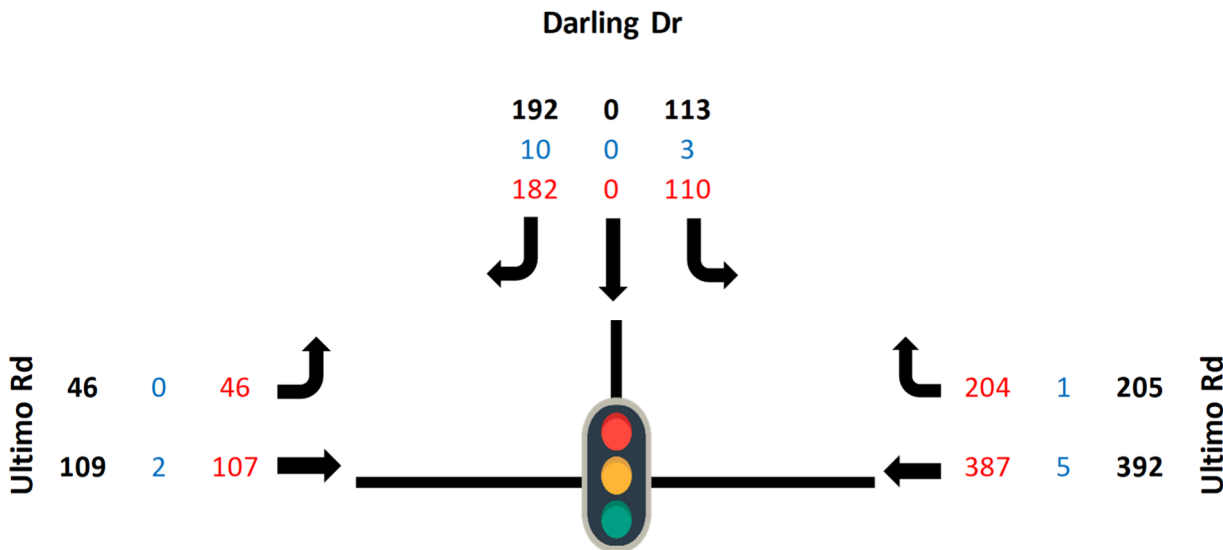
**2020 Existing AM Peak**  
**(I-3) Harbour Street/ Pier Street/ Goulburn Street**



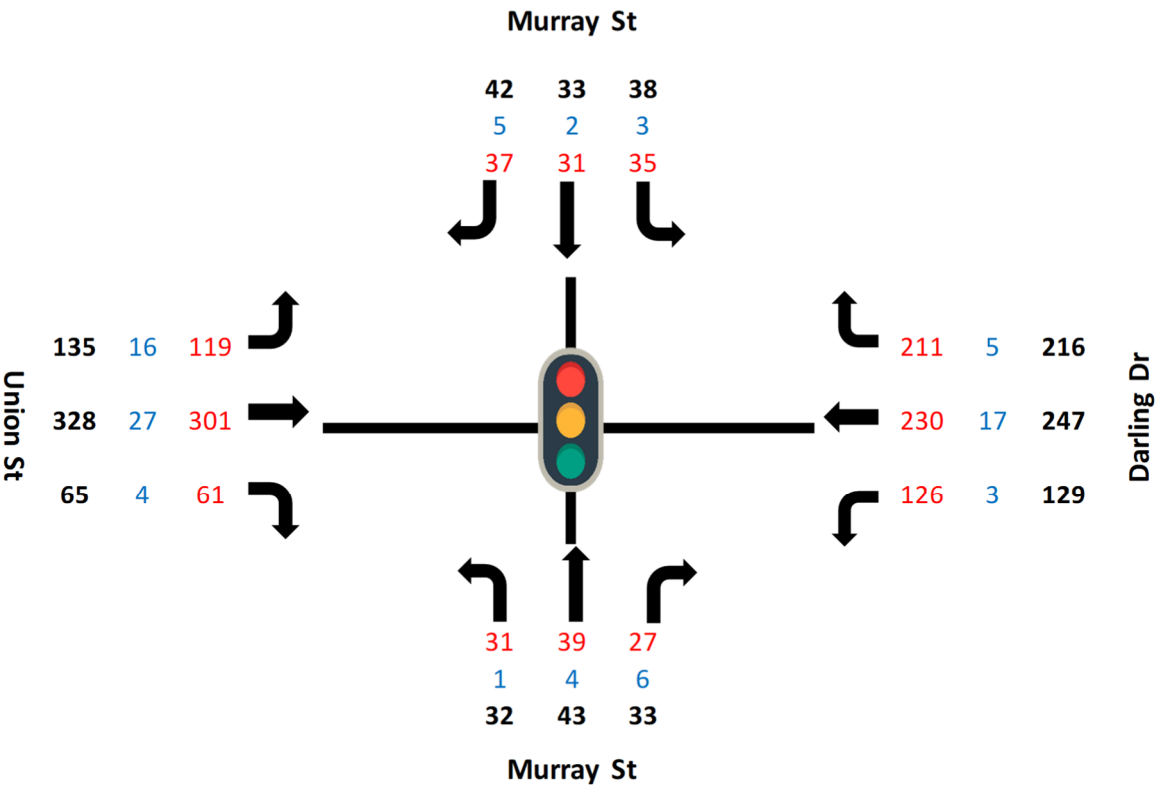
2020 Existing AM Peak  
(I-4) Darling Drive/ Ultimo Road



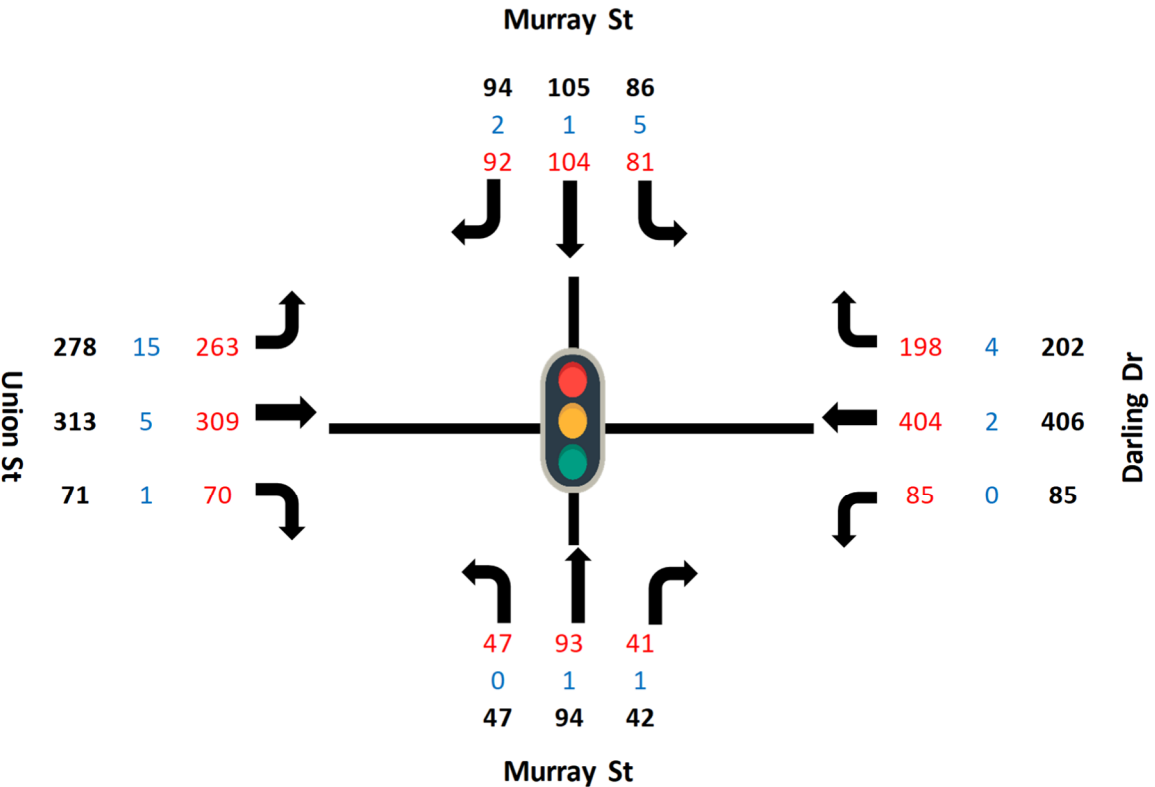
2020 Existing PM Peak  
(I-4) Darling Drive/ Ultimo Road



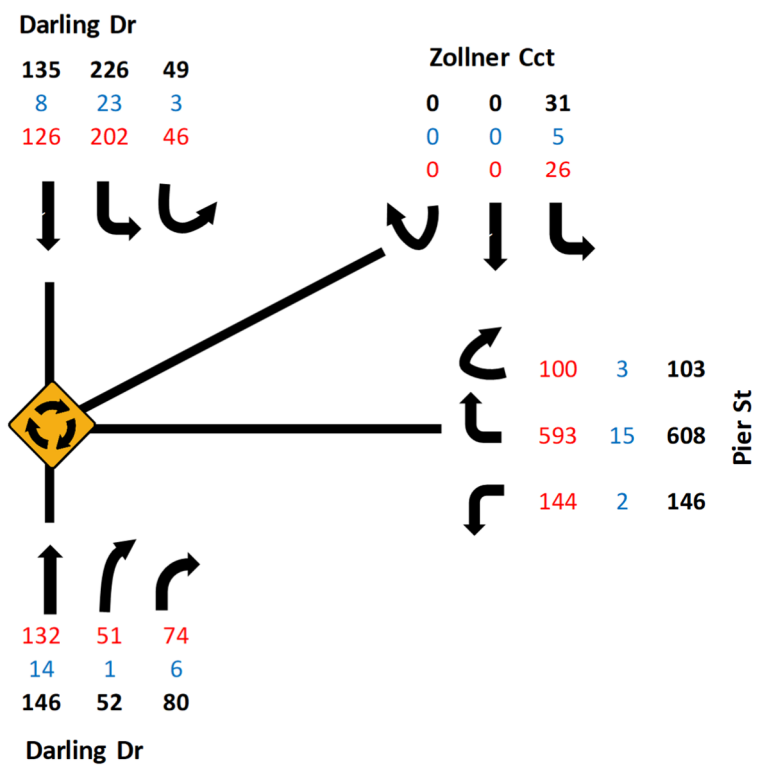
Post-Development AM Peak  
(I-1) Murray Street/ Darling Drive



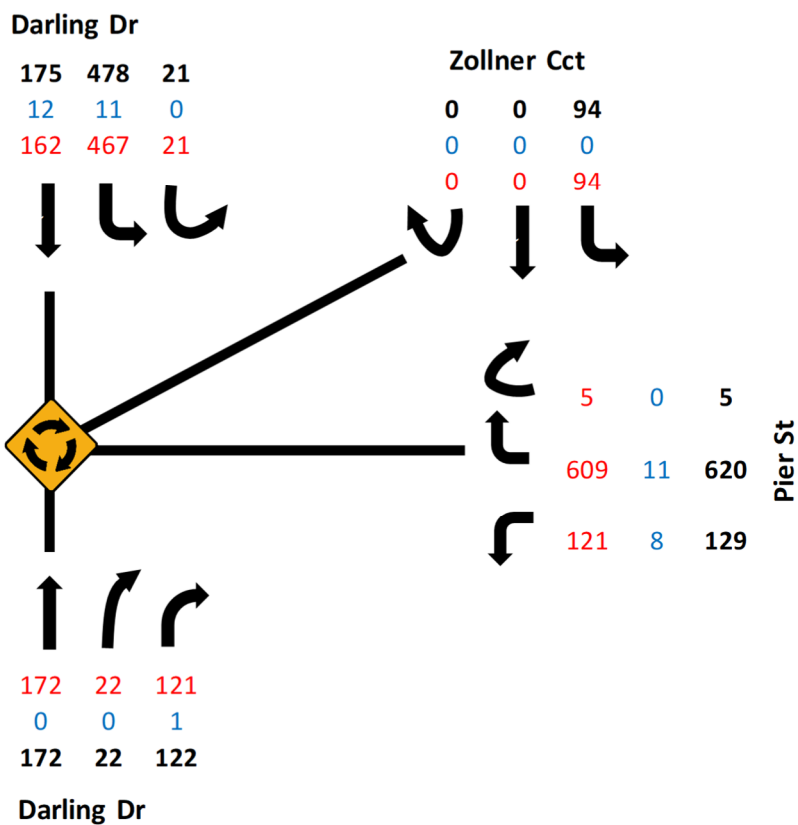
Post-Development PM Peak  
(I-1) Murray Street/ Darling Drive



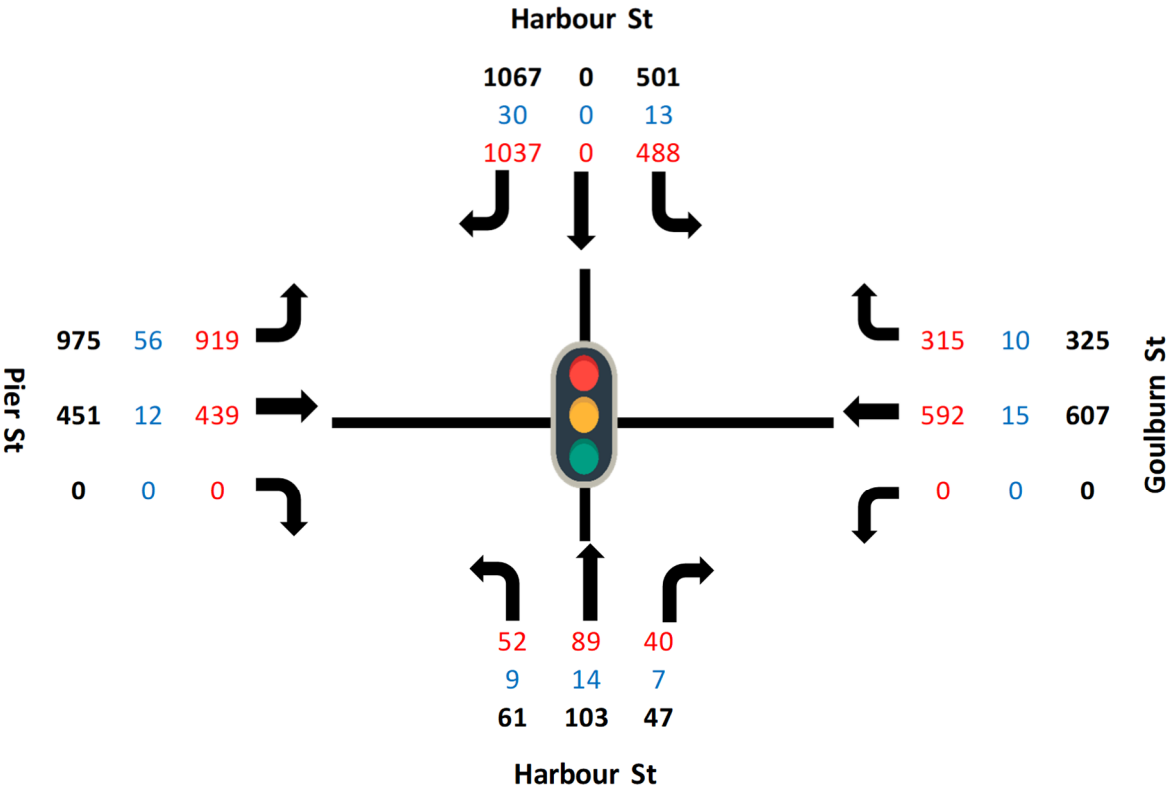
**Post-Development AM Peak  
(I-2) Darling Drive/ Pier Street**



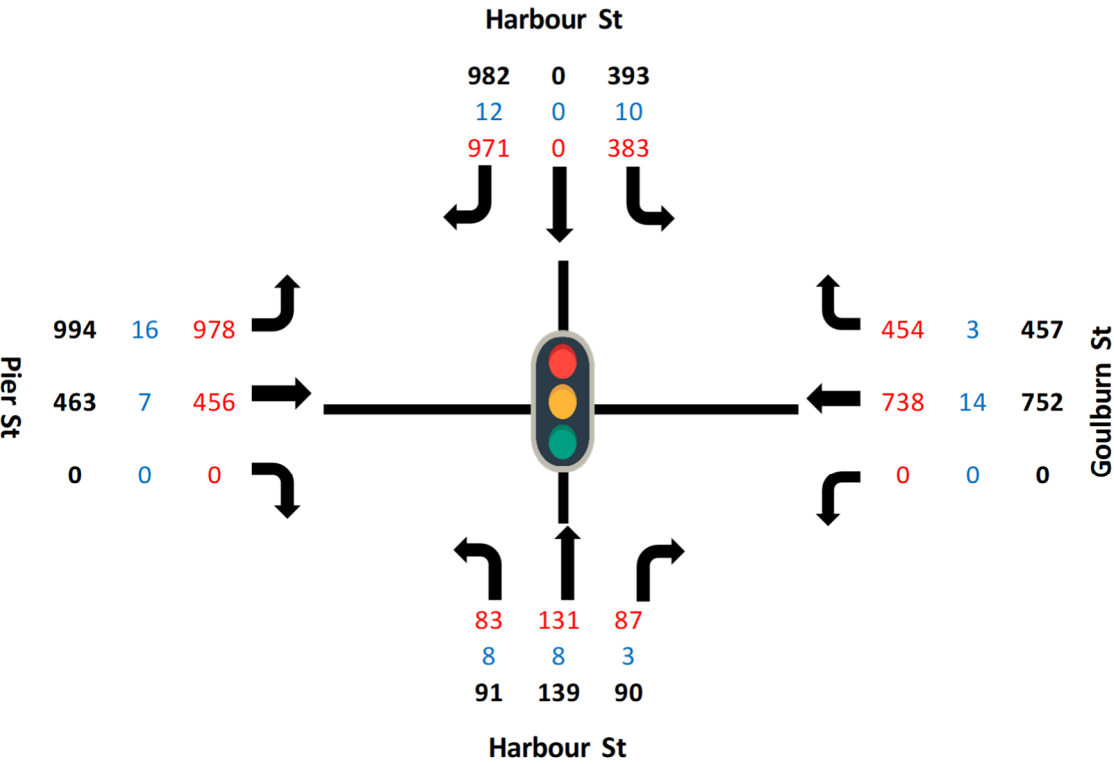
**Post-Development PM Peak  
(I-2) Darling Drive/ Pier Street**



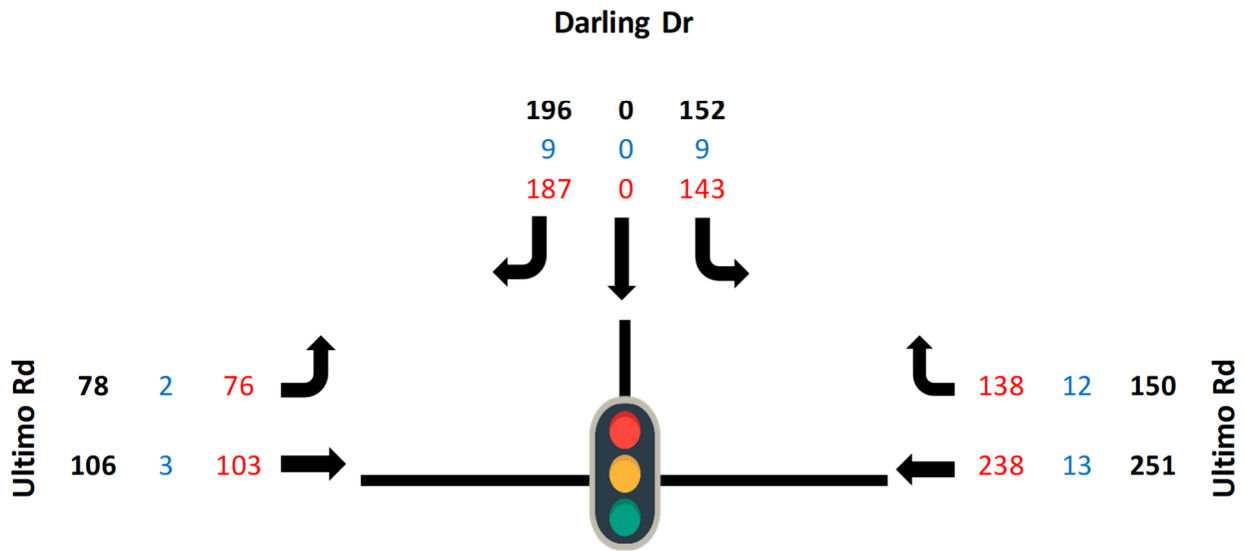
Post-Development AM Peak  
(I-3) Harbour Street/ Pier Street/ Goulburn Street



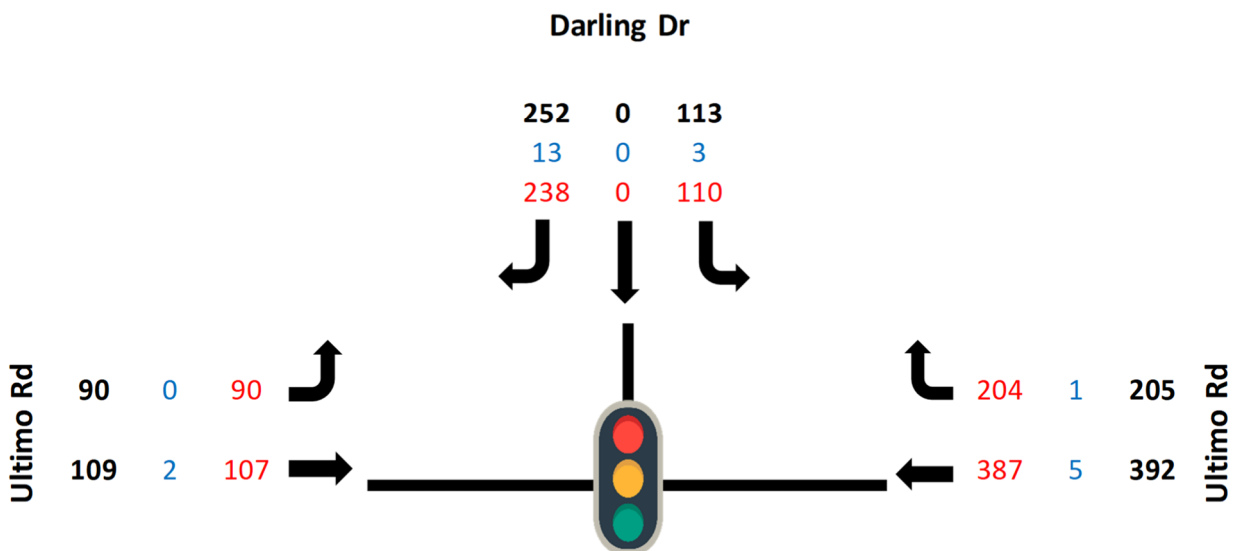
Post-Development PM Peak  
(I-3) Harbour Street/ Pier Street/ Goulburn Street



Post-Development AM Peak  
(I-4) Darling Drive/ Ultimo Road



Post-Development PM Peak  
(I-4) Darling Drive/ Ultimo Road



## **APPENDIX C – VEHICLE SURVEY COMPARISON (FEBRUARY 2016 VS JANUARY 2020)**

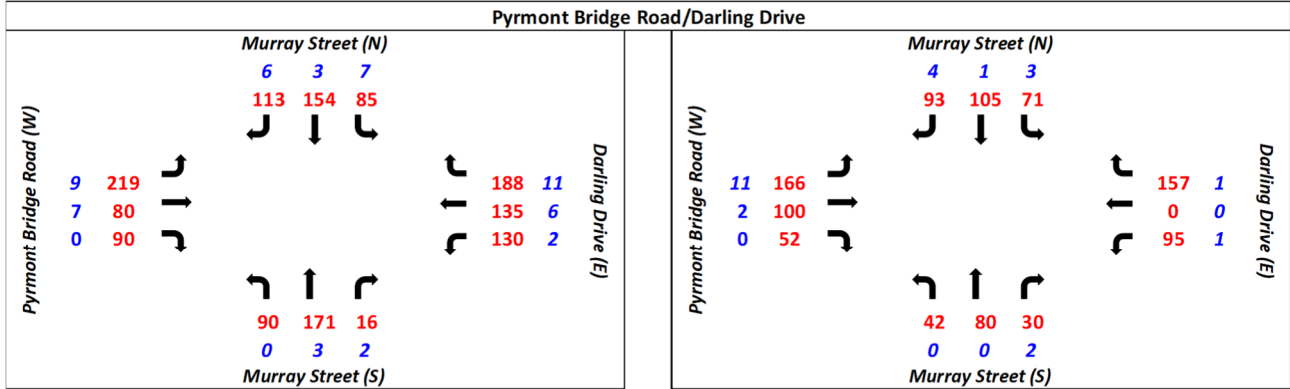
## Appendix C – Volume comparisons

2016 AM peak				2020 AM peak							
Pymont Bridge Road/Darling Drive											
Pymont Bridge Road (W)	Murray Street (N)			Darling Drive (E)			Murray Street (N)				
	1	3	5				5	3	11		
	25	56	21				32	58	49		
	↓						↓				
8	153	↓	168	2	176	10					
20	72	↓	83	17	123	7					
3	101	↓	129	2	105	9					
↓			↓			↓					
Murray Street (S)						Murray Street (S)					
30			95	8	30			65	33		
3			5	4	7			2	4		
Darling Drive/Ultimo Road											
Ultimo Road (W)	Darling Drive (N)			Ultimo Road (E)			Darling Drive (N)				
	14	0	11				10	3			
	58	0	96				162	100			
	↓						↓				
1	21	↓	124	10	157	9					
7	107	↓	269	24	154	16					
↓			4			0					
2			0	0	2			58	↓		
0			0	0	3			45	↓		
Car Park Access (S)											
Harbour Street/Pier Street											
Pier Street (W)	Harbour Street (N)			Goulburn Street (E)			Harbour Street (N)				
	24		4				18	5			
	658		631				891	458			
	↓						↓				
36	727	↓	365	6	255	15					
11	477	↓	430	7	481	28					
↓			↓			↓					
29			250	33	69			136	72		
11			33	5	13			10	9		
Harbour Street (S)						Harbour Street (S)					
Darling Drive/Pier Street											
Darling Drive (N)	Darling Drive (N)			Pier Street (E)			Zollner CCT (NE)				
	10	3	0				0	5			
	166	192	0				0	26			
	↓						↓				
452			9	100			3				
106			1	426			11				
194			120	144			2				
2			2								
Darling Drive (S)						Darling Drive (S)					
101			51	74	101			51	74		
11			1	6	11			1	6		

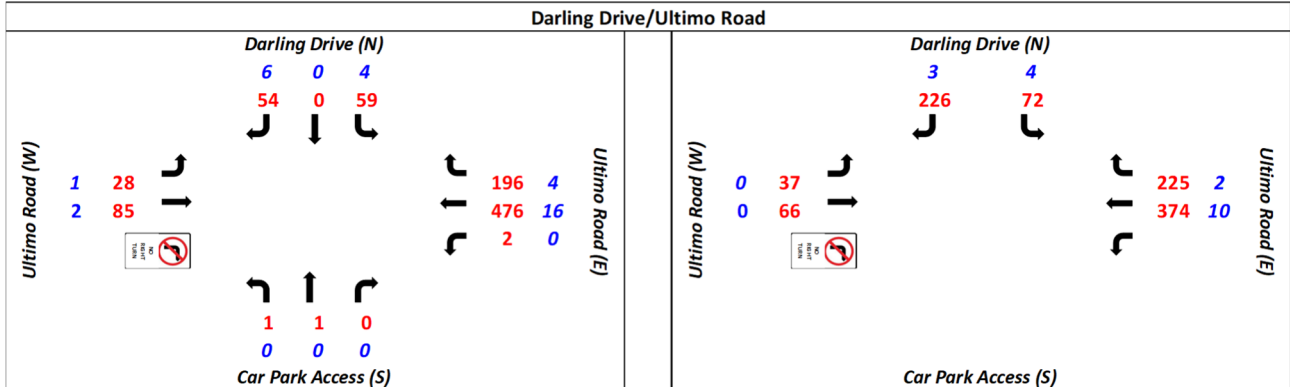
2016 PM peak

2020 PM peak

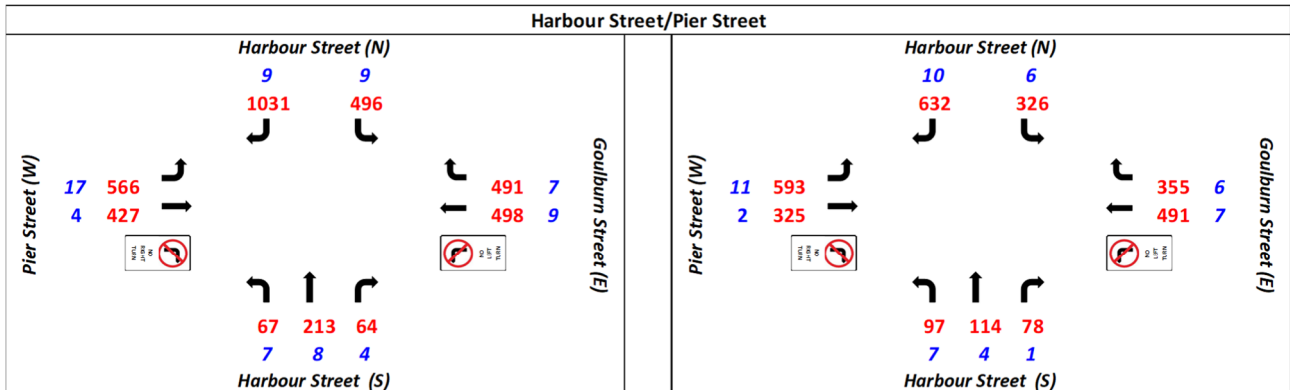
## Pymont Bridge Road/Darling Drive



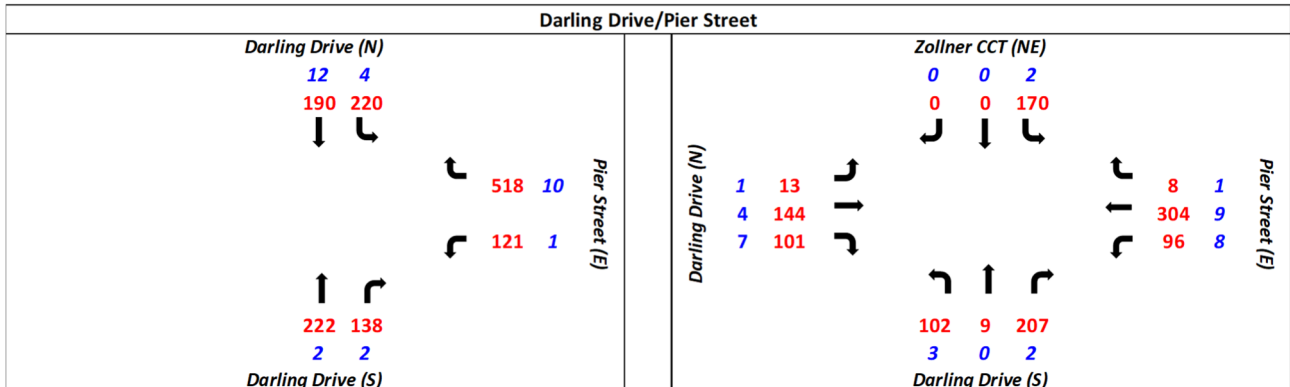
## Darling Drive/Ultimo Road



## Harbour Street/Pier Street

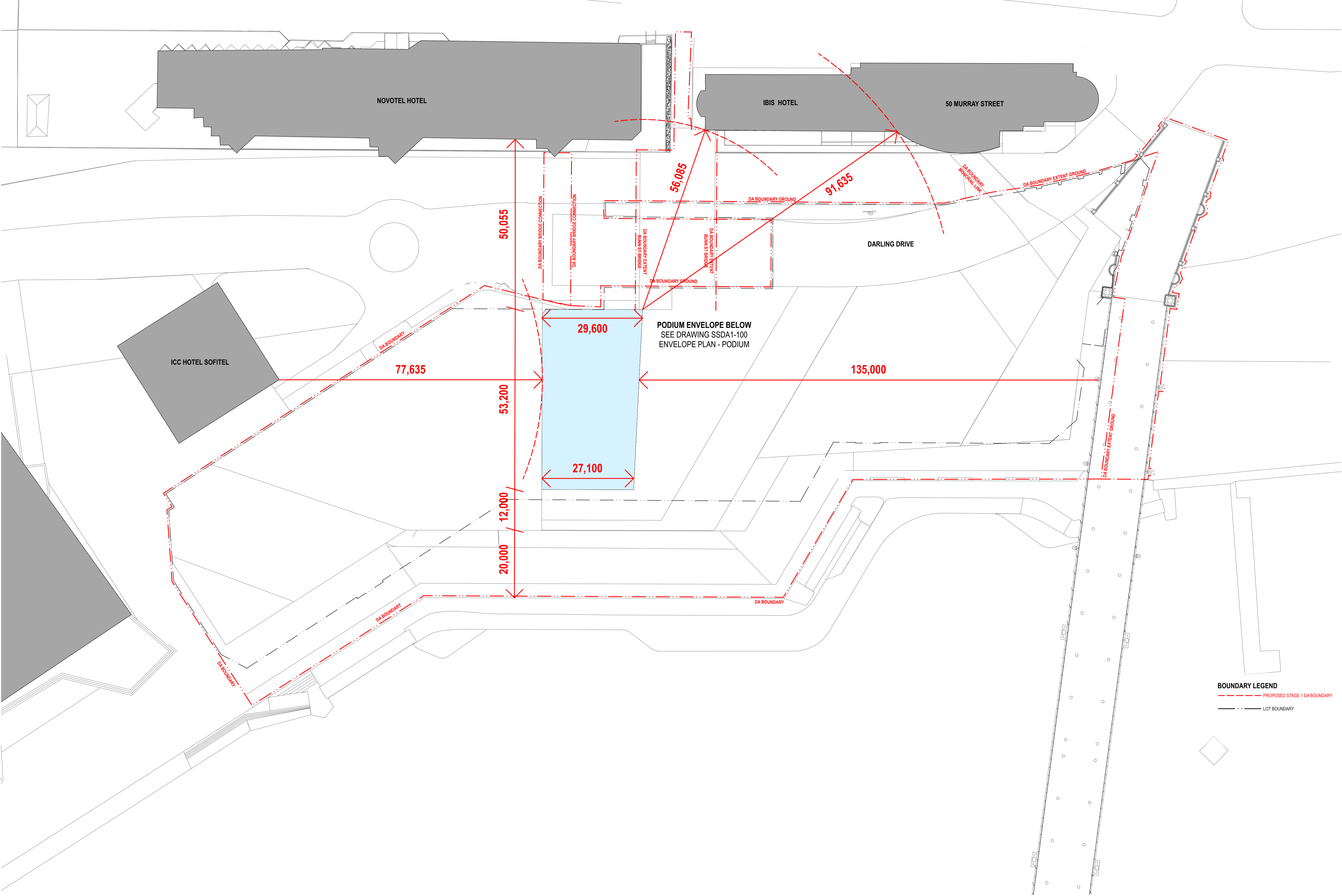


## Darling Drive/Pier Street



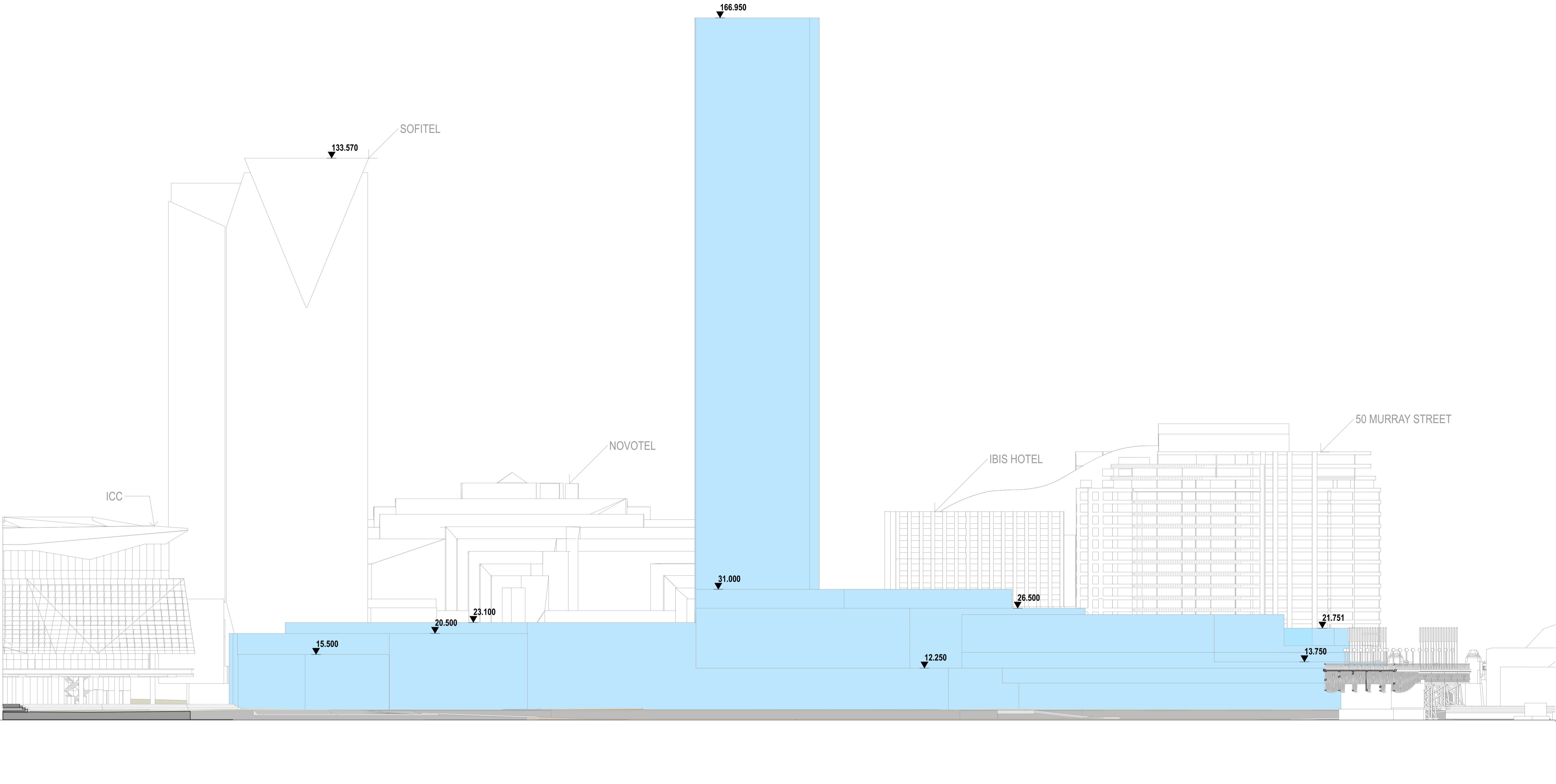
**APPENDIX D – PROPOSED DEVELOPMENT INDICATIVE PLAN**

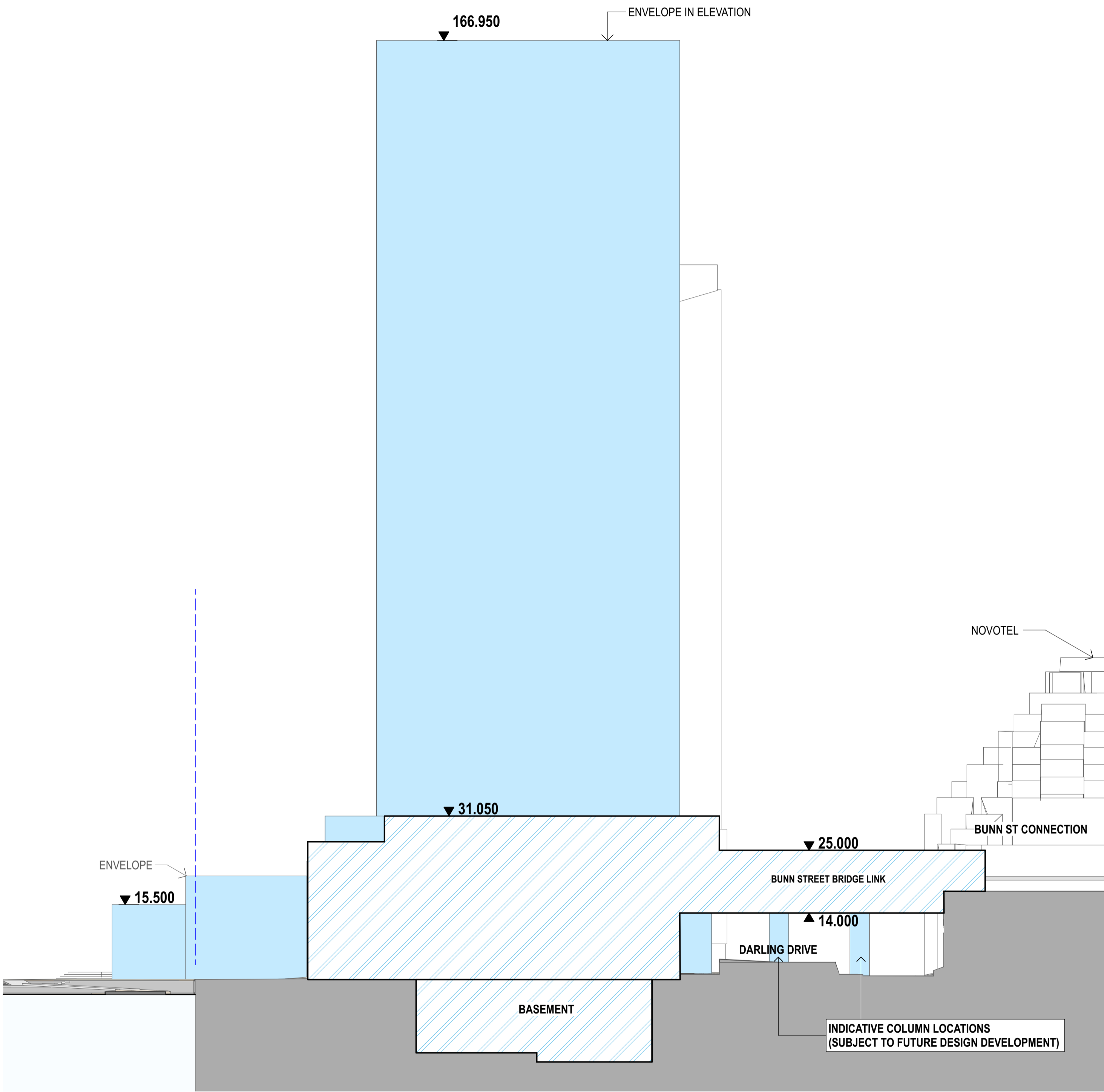




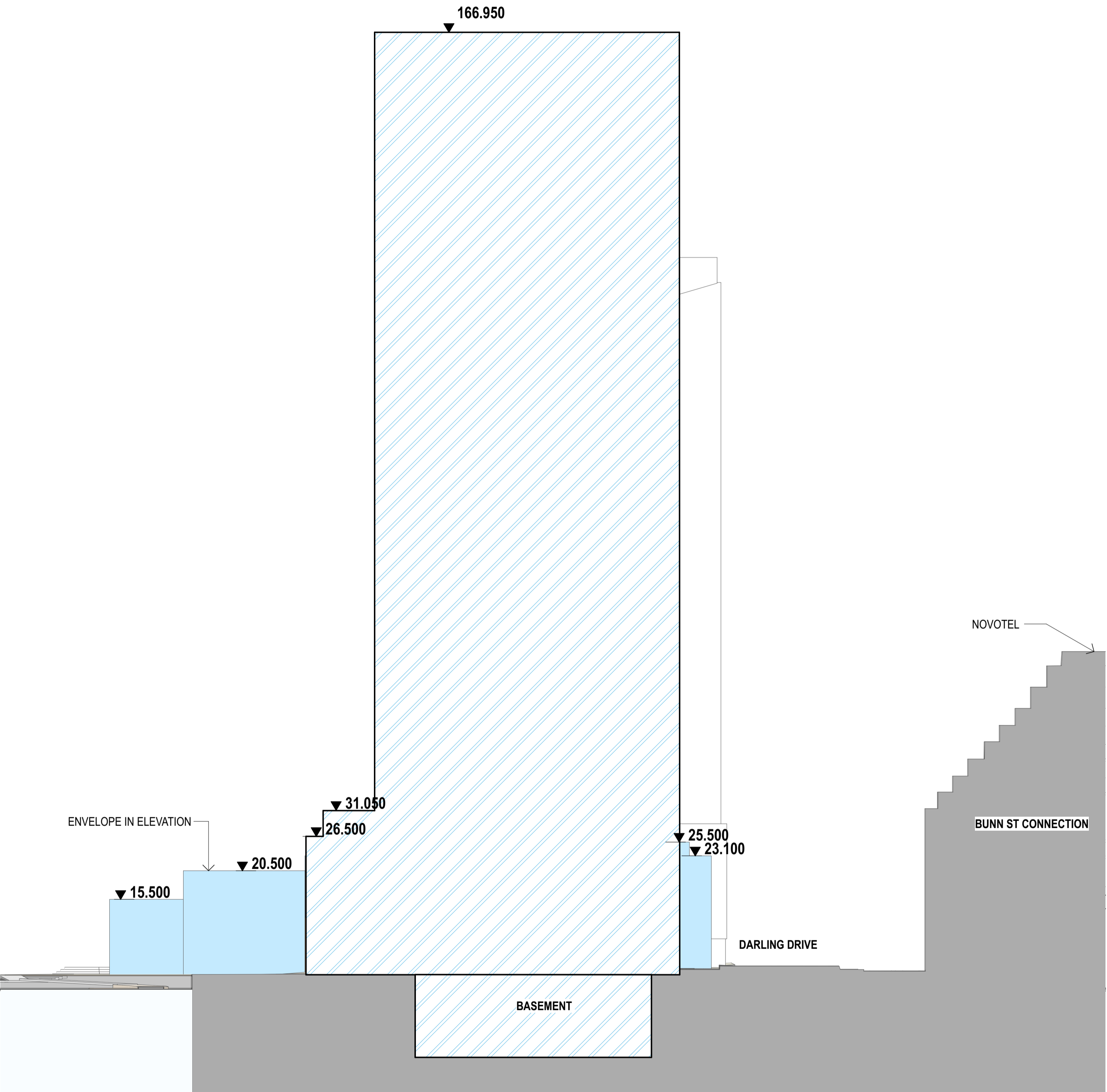
**BOUNDARY LEGEND**  
- - - PROPOSED STAGE 1 DA BOUNDARY  
... LOT BOUNDARY



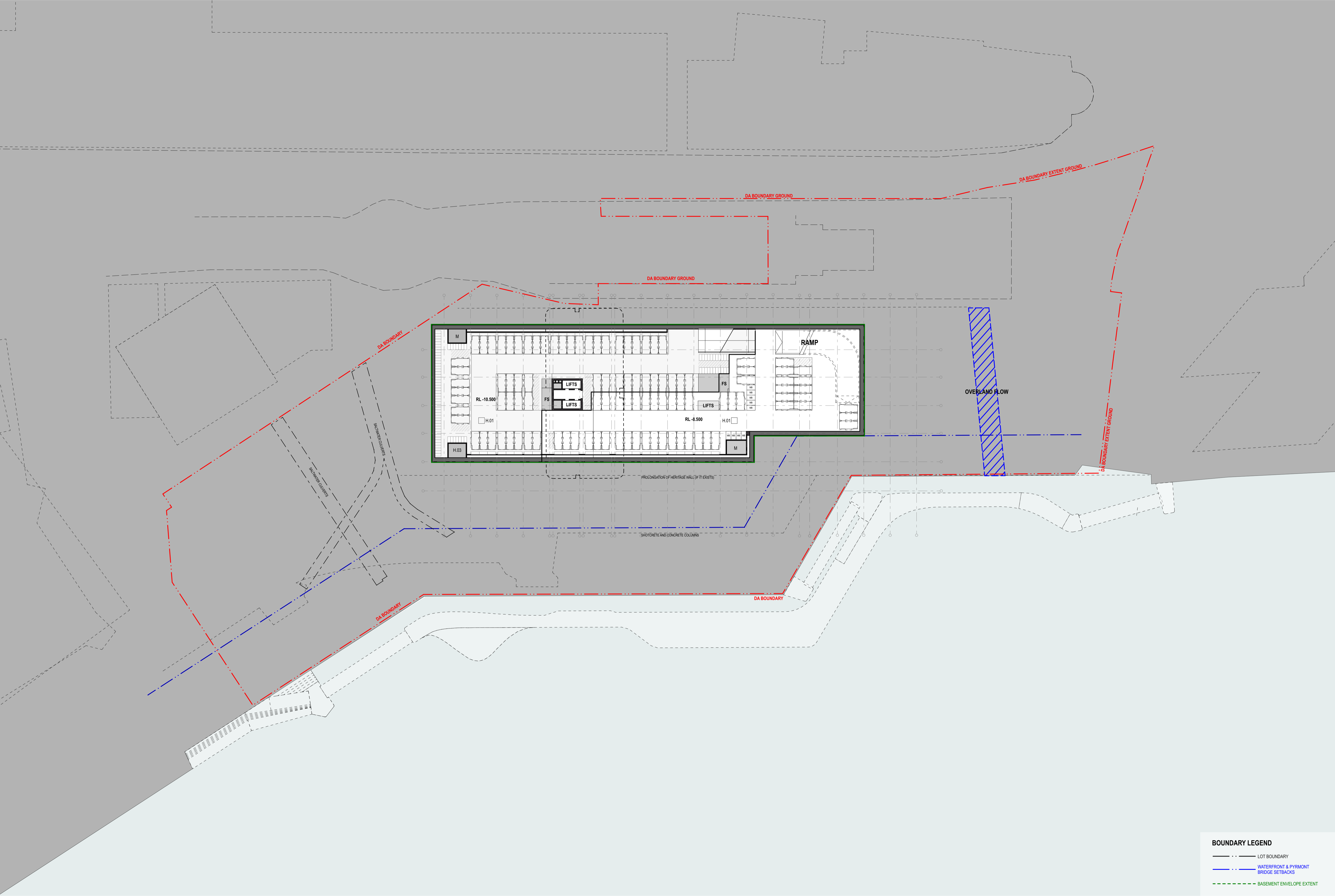




SECTION ENVELOPE Section 1  
1:500



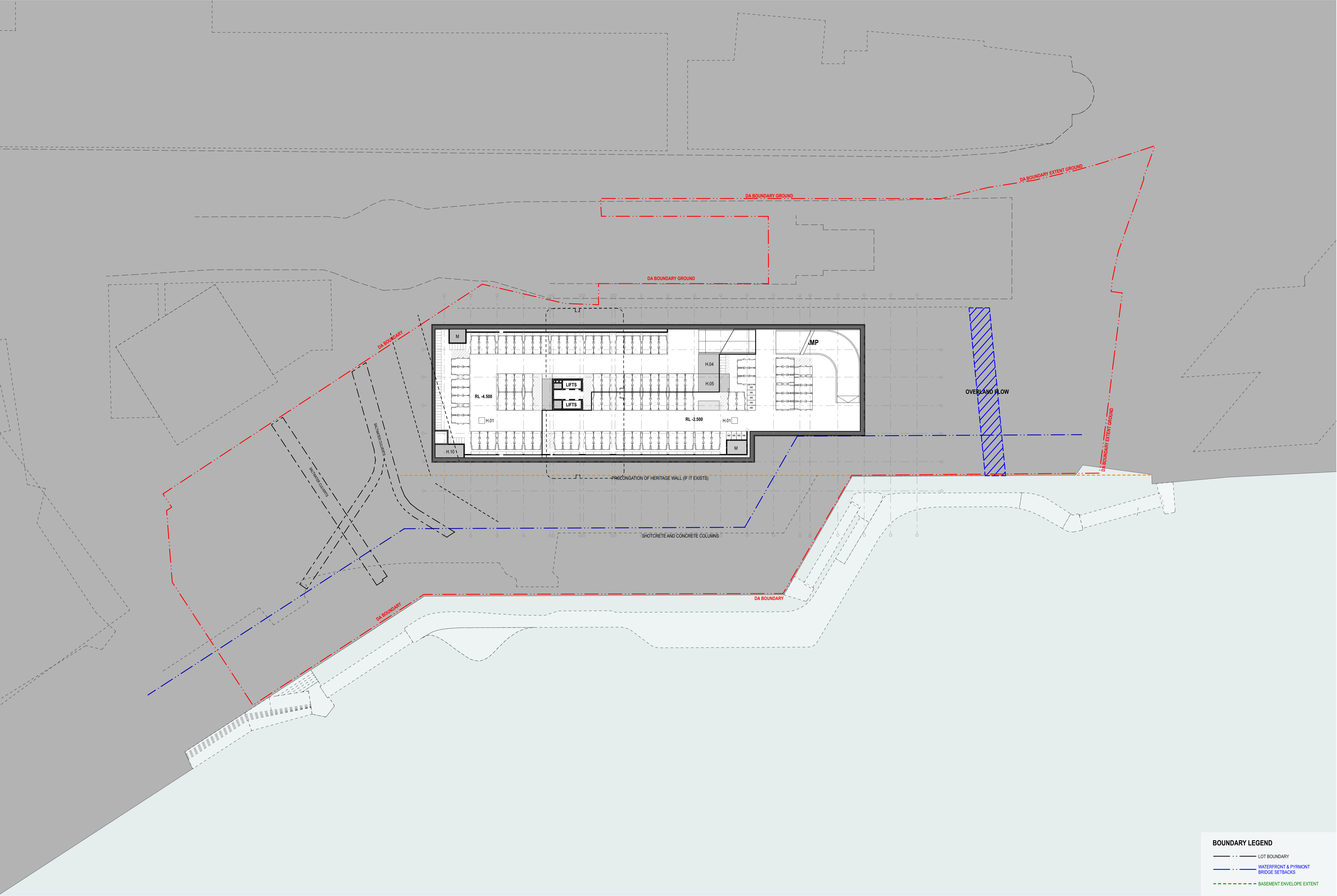
SECTION ENVELOPE SECTION 2  
1:500



**BOUNDARY LEGEND**

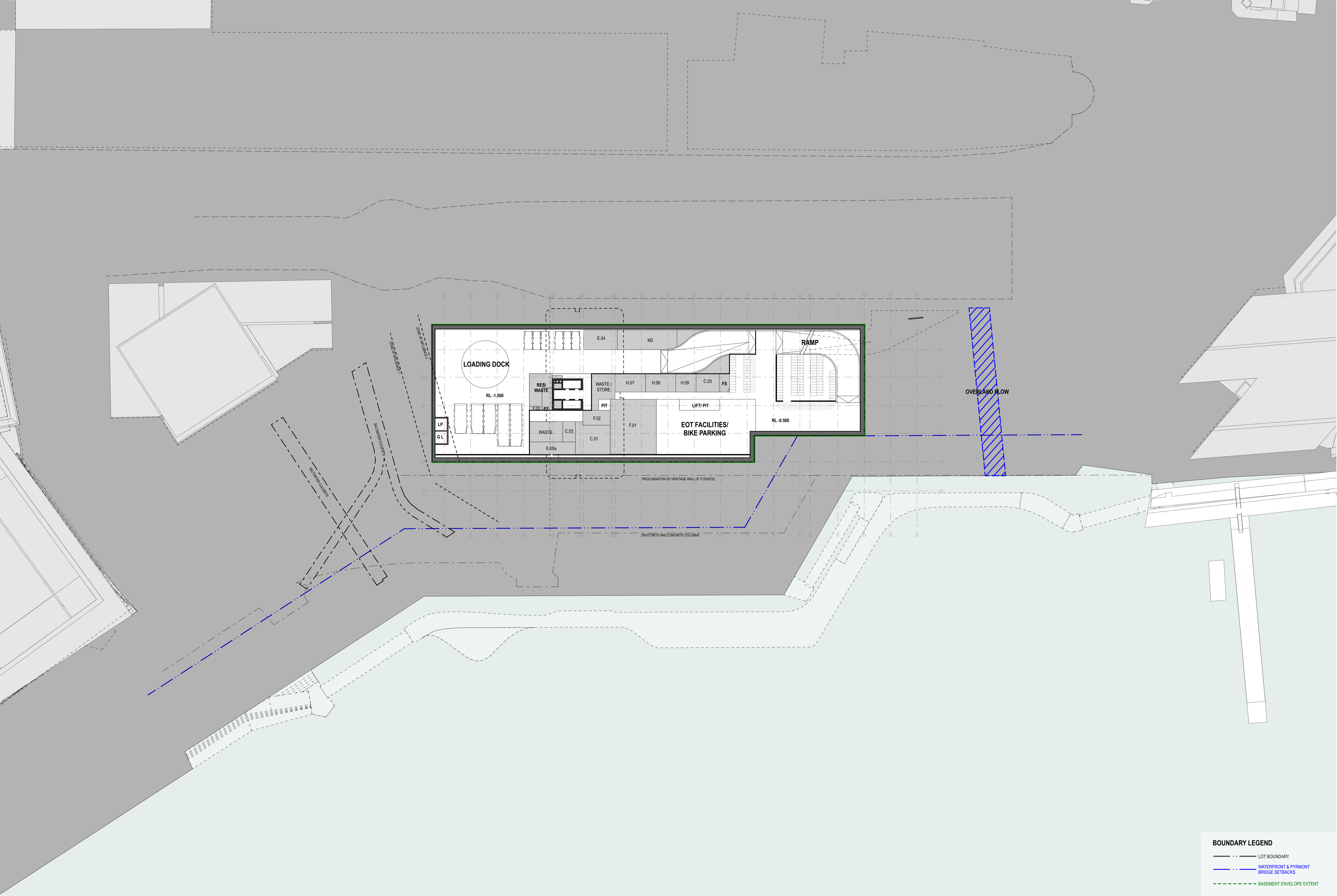
- LOT BOUNDARY
- WATERFRONT & PYRMONT BRIDGE SETBACKS
- BASEMENT ENVELOPE EXTENT





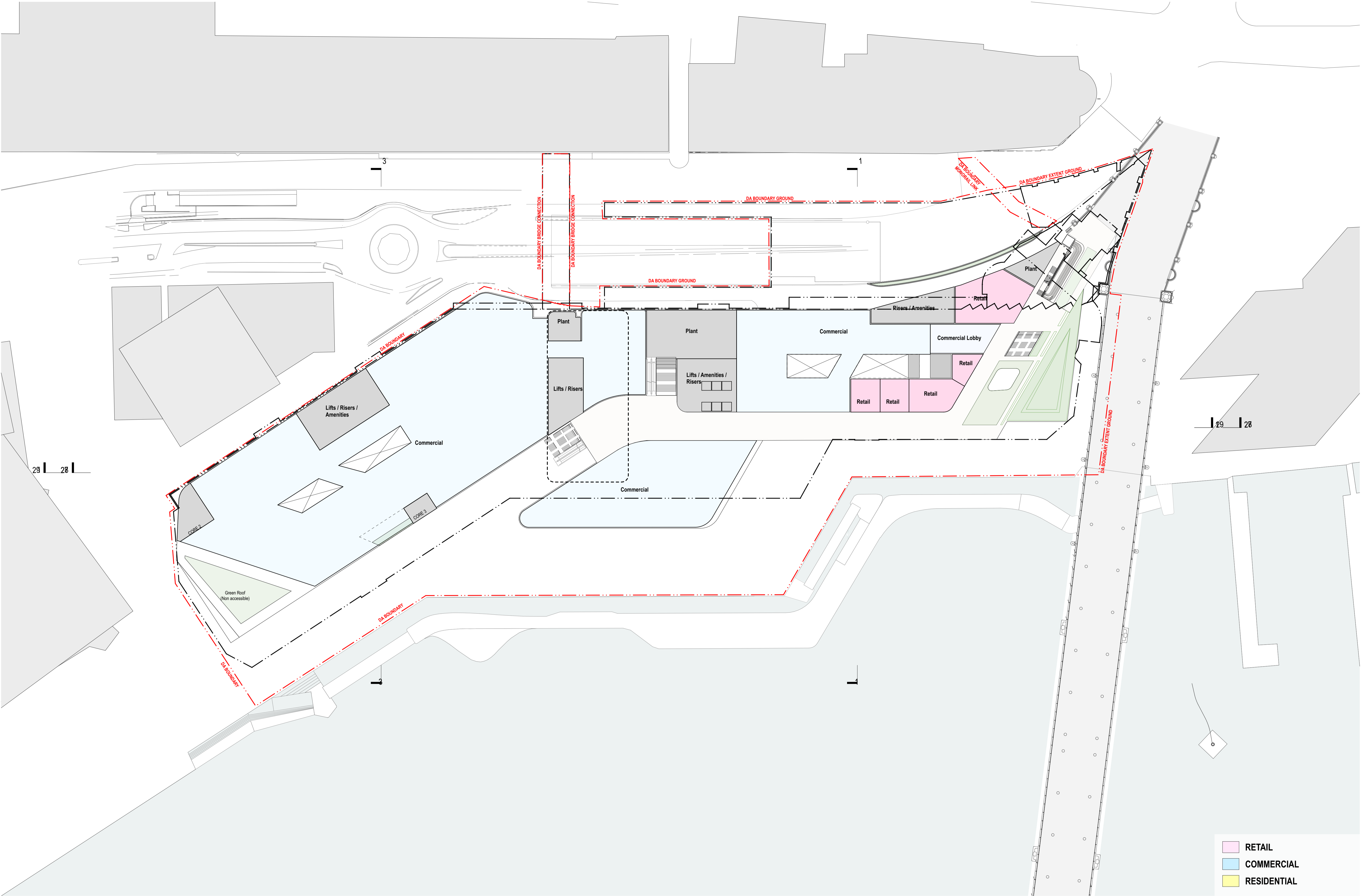
**BOUNDARY LEGEND**

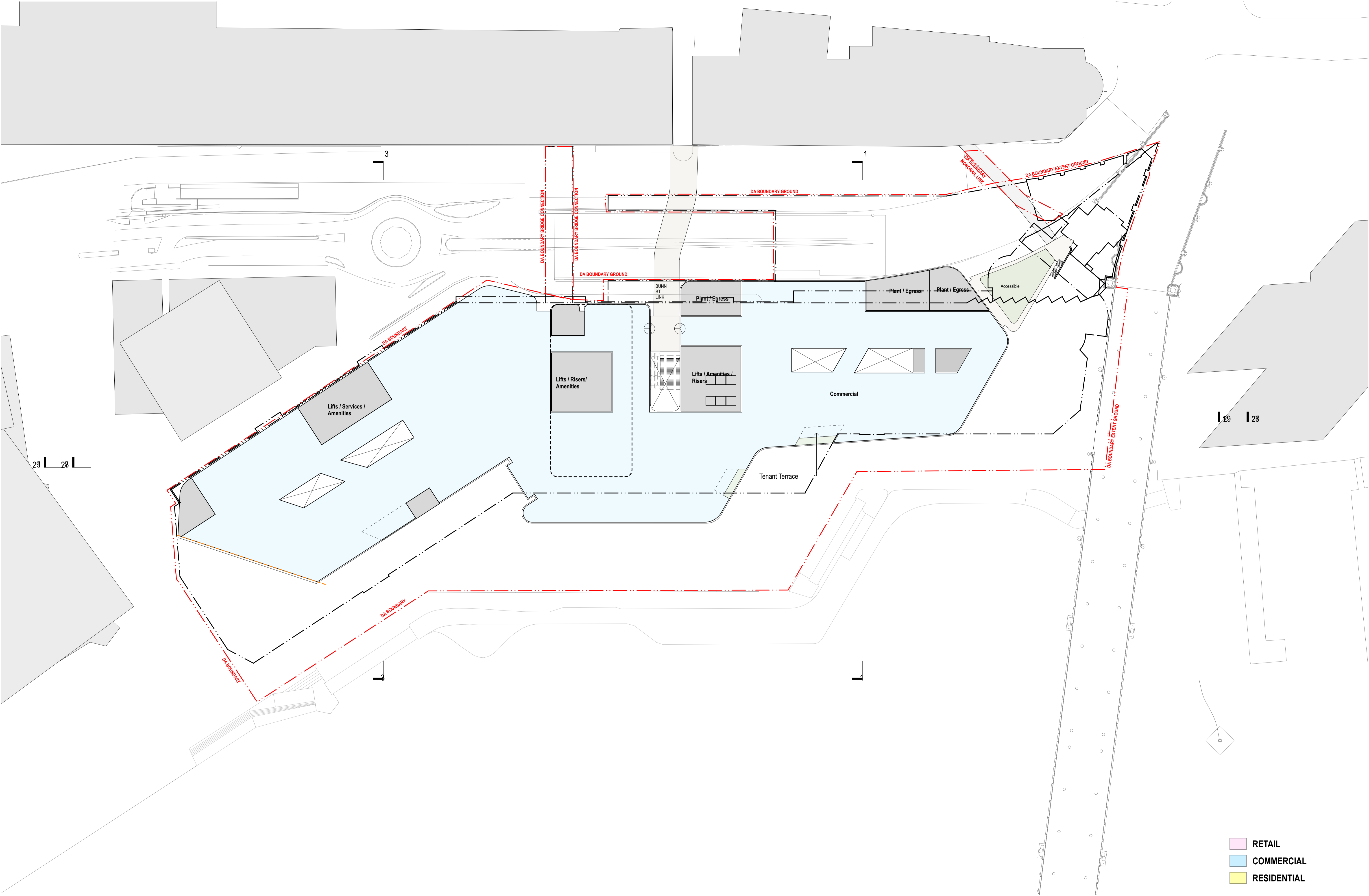
- LOT BOUNDARY
- WATERFRONT & PYRMONT BRIDGE SETBACKS
- BASEMENT ENVELOPE EXTENT

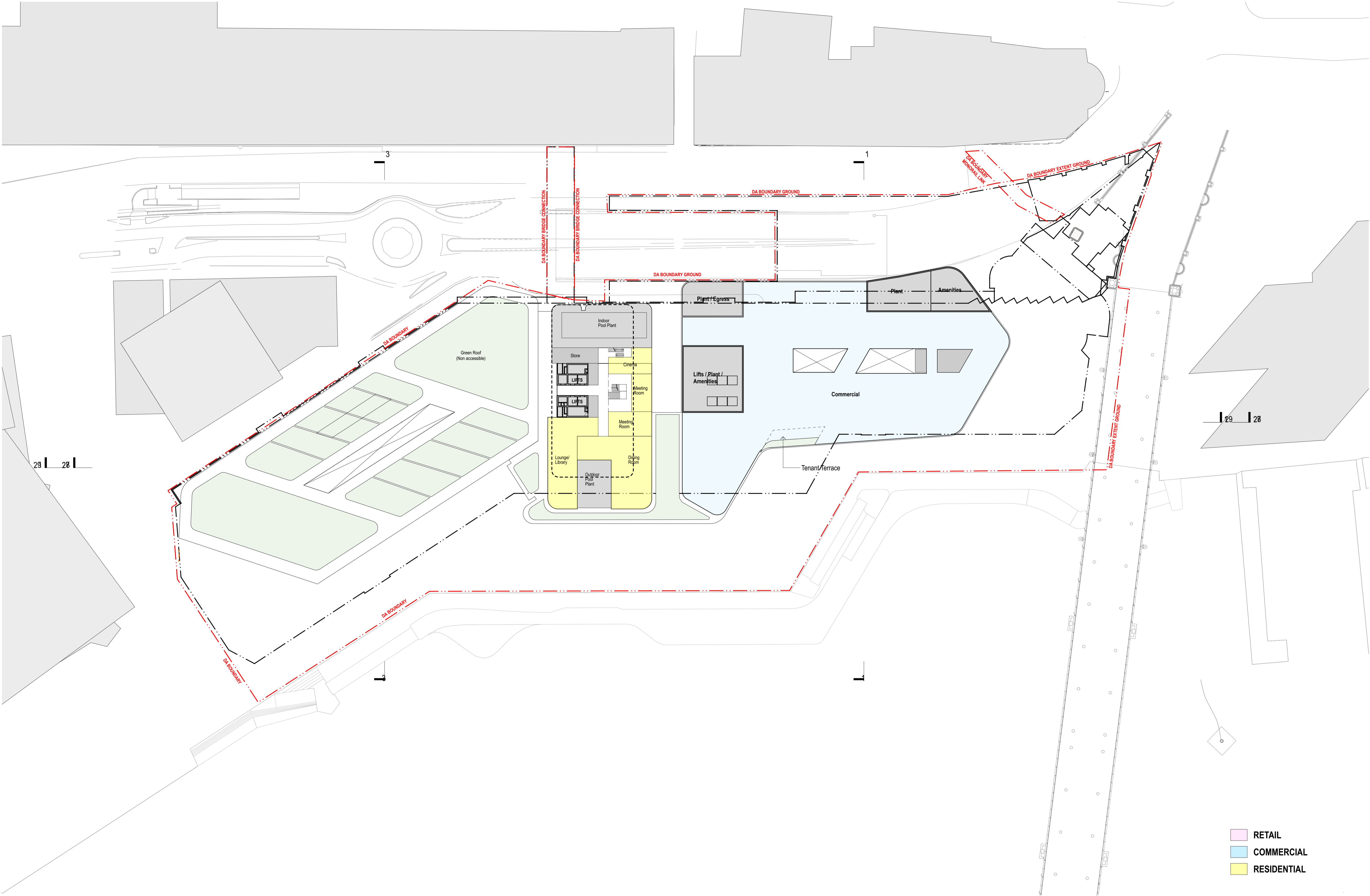


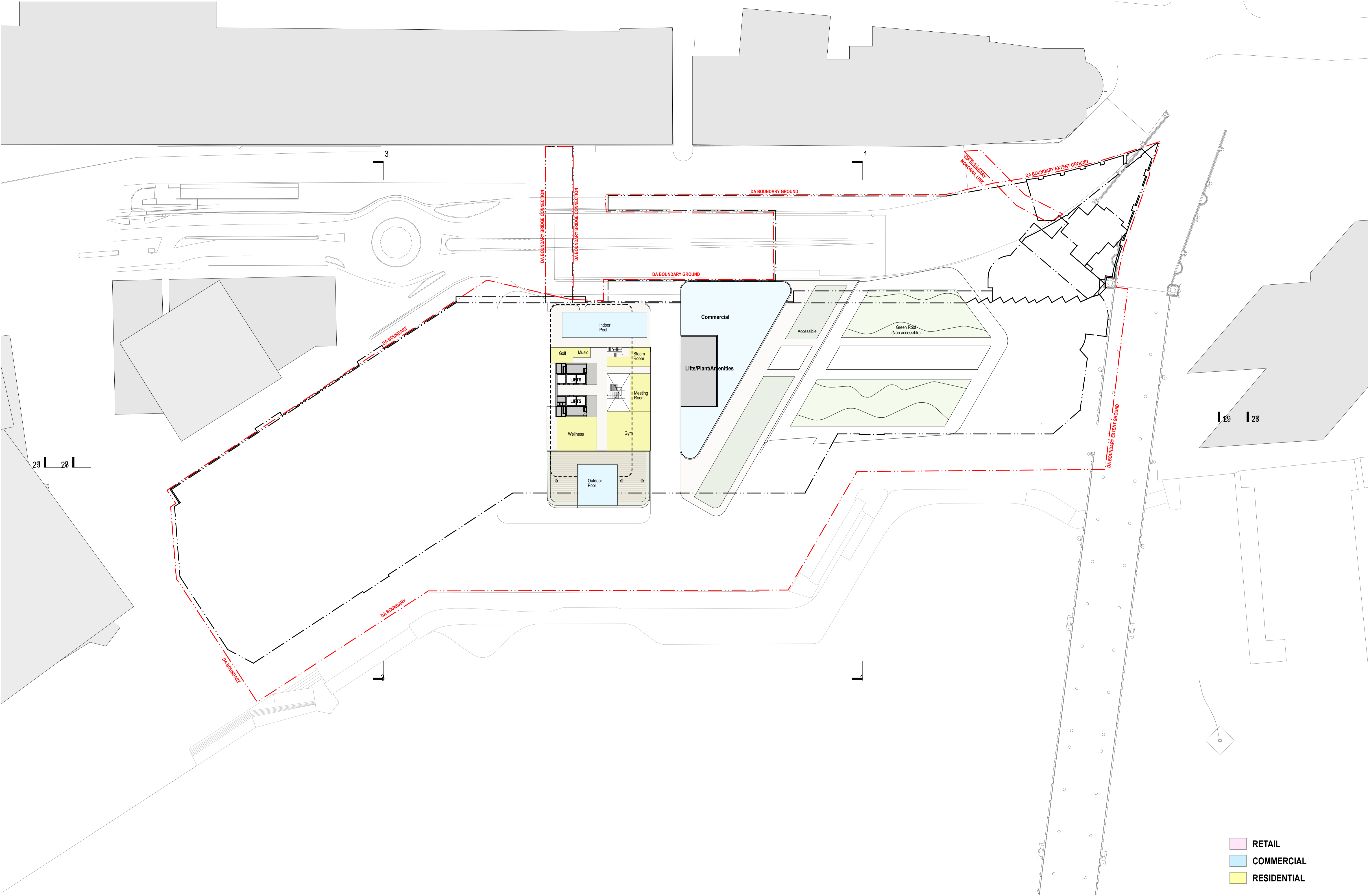


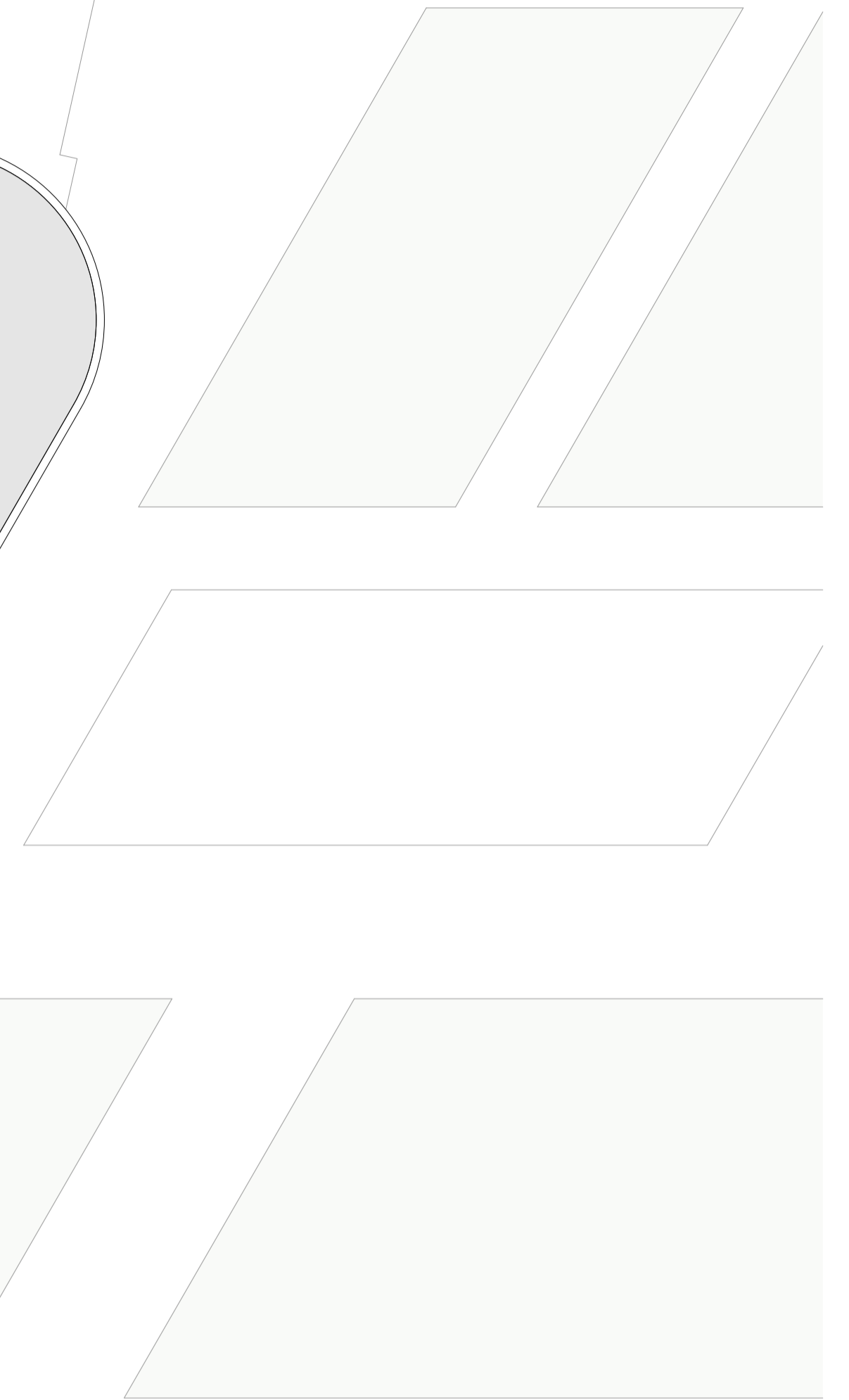
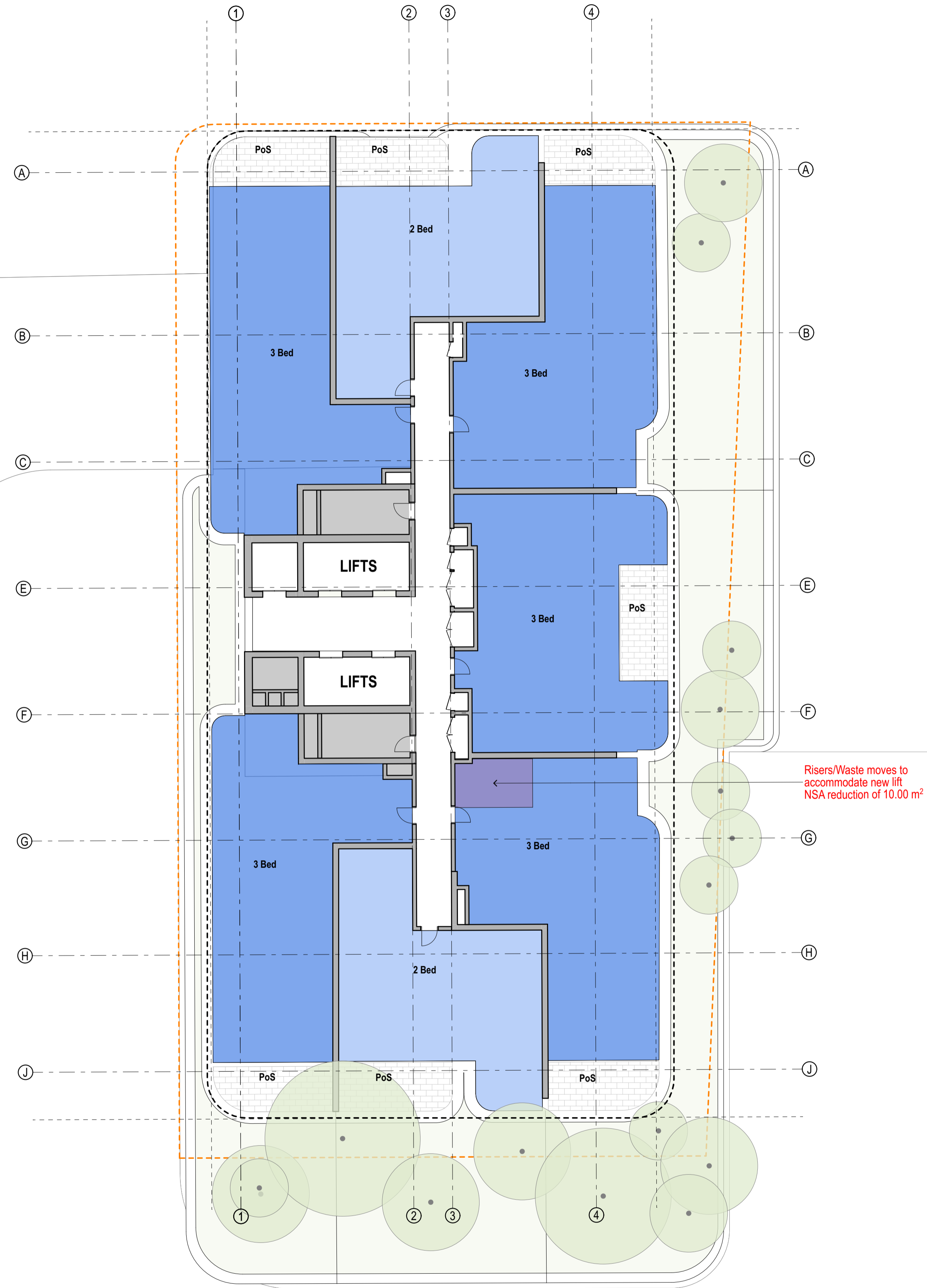


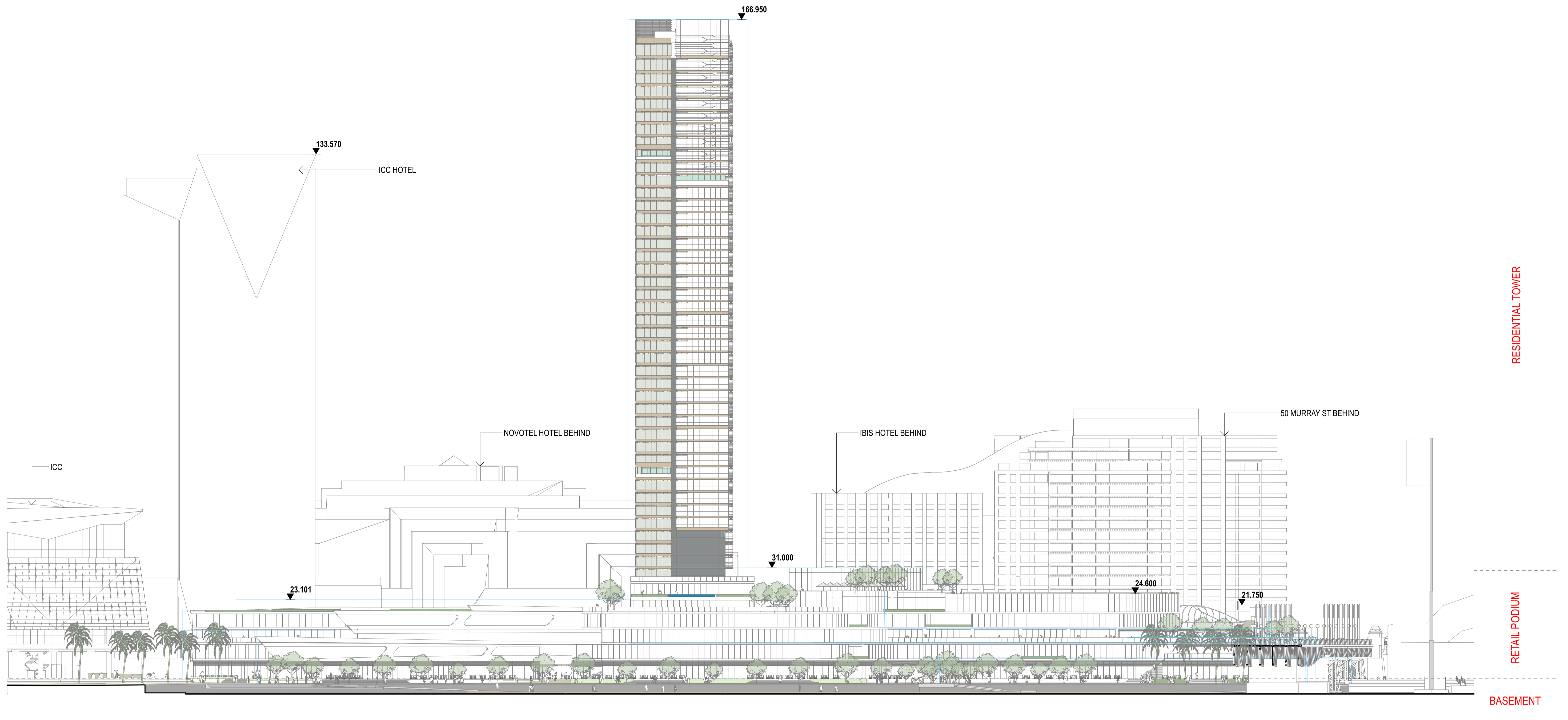


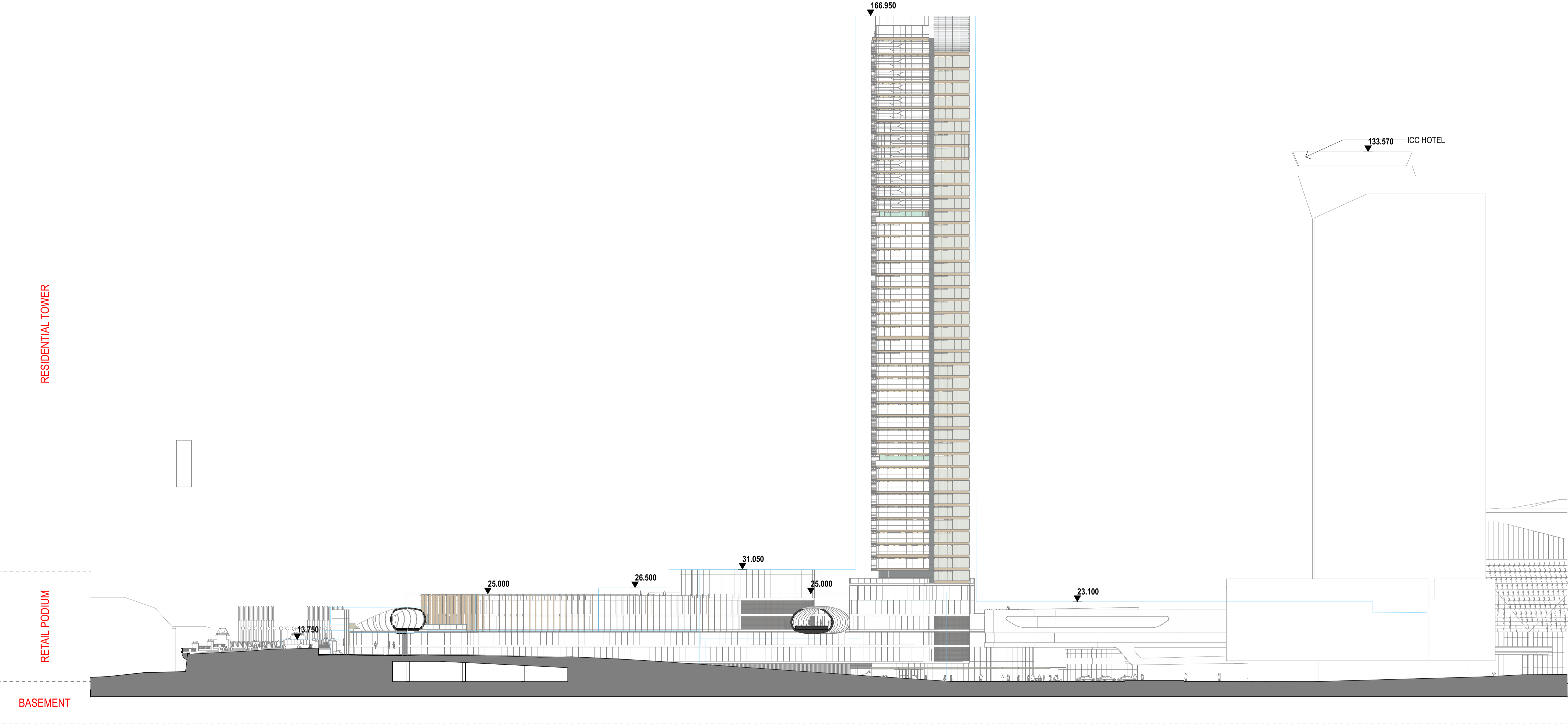


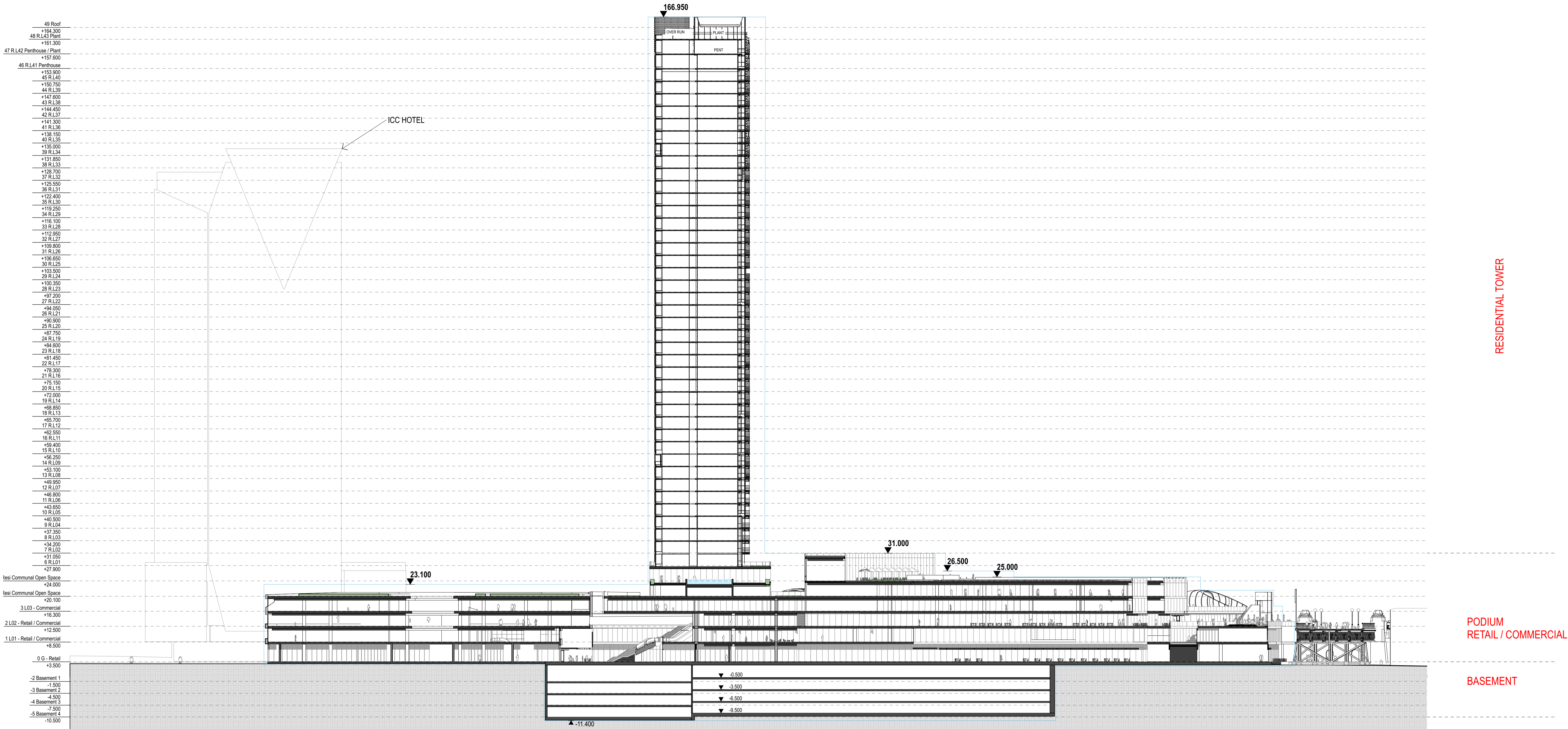








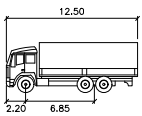
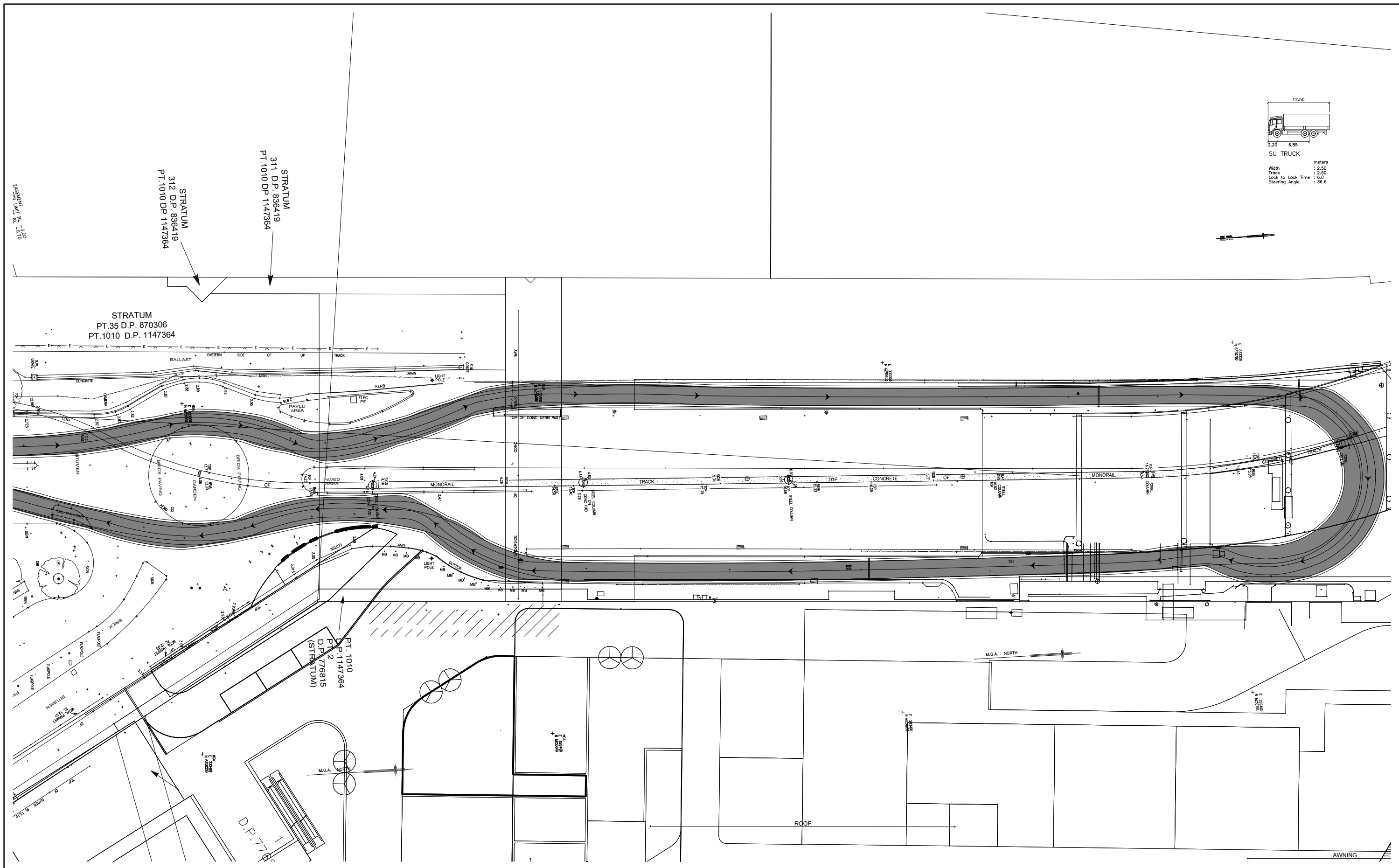




BOUNDARY LEGEND

ENVELOPE EXTENT

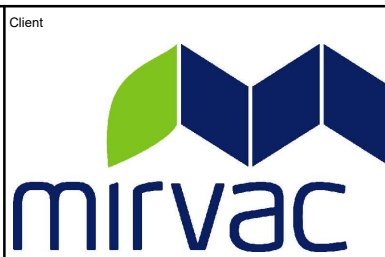
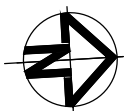
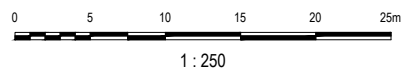
**APPENDIX E - VEHICLE SWEPT PATHS**



SU TRUCK  
Width : 2.50  
Truck : 2.50  
Lock to Lock Time : 6.0  
Steering Angle : 36.6



Issue	Description	Date
01	ISSUE FOR INFORMATION	13/02/20



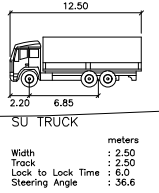
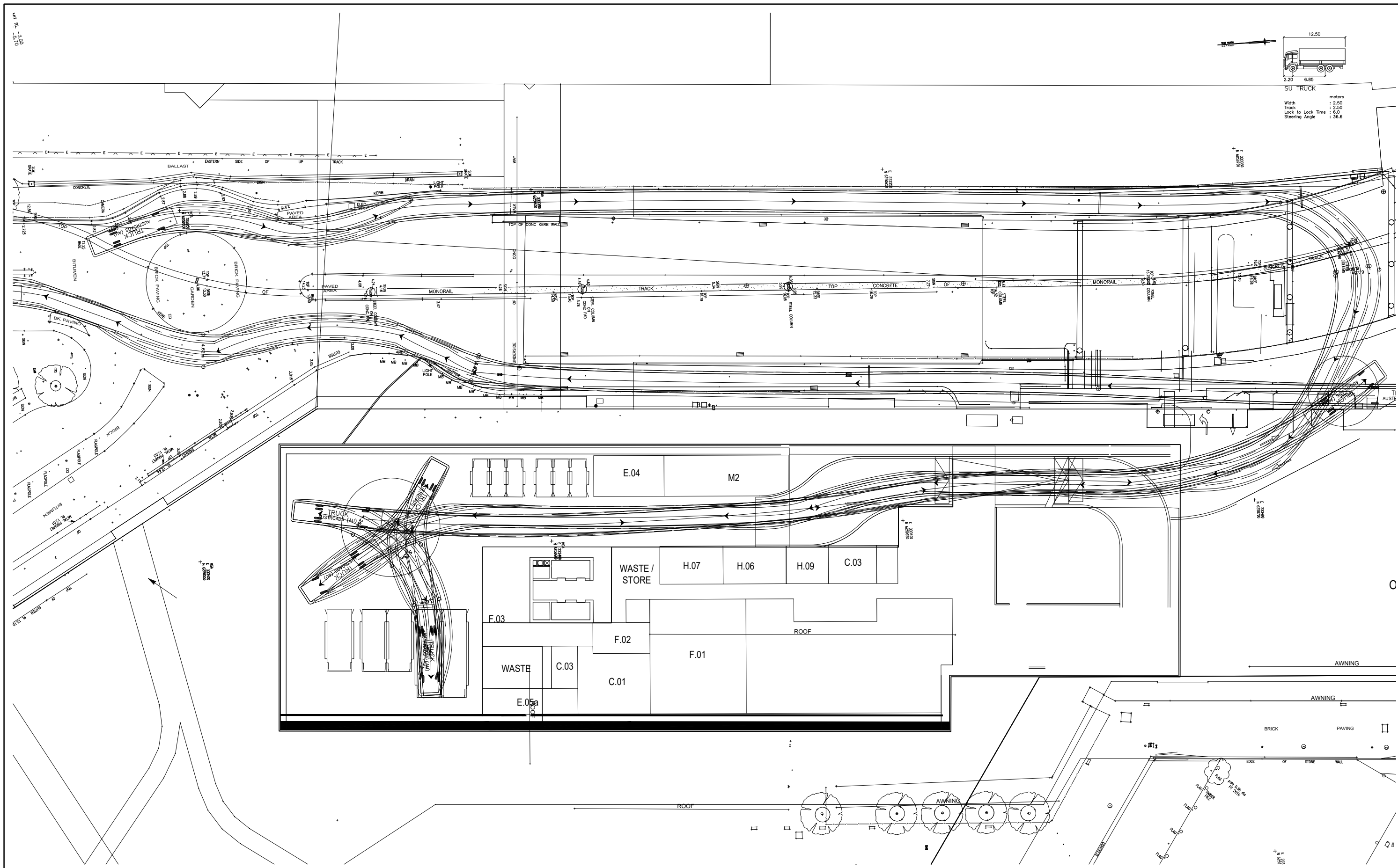
Status	PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION	
Scales	1 : 250	Current Issue Signatures
Original Size	A1	Drawn K.MCAREAVEY
Height	AHD	Designed
Datum	MGA	Checked J.HEYDON
Grid		Approved
Filename:	Skc-00-011-aa008883-LoadingDockTurningPaths.dwg	

Project	HARBOURSIDE SHOPPING CENTRE	
Title	12.5m HRV LOADING DOCK ACCESS TURNING PATHS	

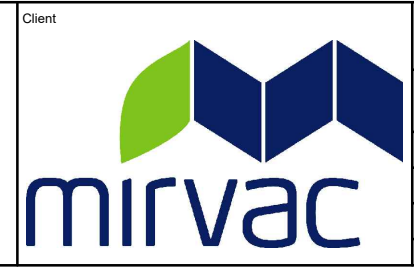
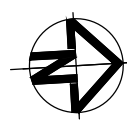
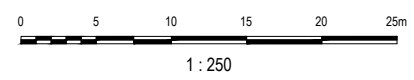


Arcadis Australia Pacific Pty Limited  
Level 5, 141 Walker St  
NORTH SYDNEY NSW 2060  
ABN 76 104 485 289  
Tel No: +61 2 8907 9000  
Fax No: +61 2 8907 9001  
arcadis.com

Drawing No.	Project No.	Issue
SKC-00-010	AA008883	01




Issue	Description	Date
01	ISSUE FOR INFORMATION	13/02/20



Status <b>PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION</b>	
Scales 1 : 250	Current Issue Signatures
Original Size <b>A1</b>	Drawn K.MCAREAVEY
Height Datum AHD	Designed J.HEYDON
Grid MGA	Approved
Filename: Skc-00-013-aa008883-LoadingDockTurningPaths.dwg	

Project <b>HARBOURSIDE SHOPPING CENTRE</b>	
Title <b>12.5m HGV VEHICLE TURNING PATH</b>	



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arcadis.com

Drawing No.	Project No.	Issue
<b>SKC-00-013</b>	<b>AA008883</b>	<b>01</b>

**APPENDIX F – LIGHT RAIL CONSULTATION**

**Issue date** 12/02/2016  
**Issue to** Lachlan Attiwell – Mirvac  
**Issued by** Joe Heydon – Arcadis (JH)  
**Subject** Harbourside Shopping Centre – Light Rail interface  
**Reference** Harbourside-MM-003  
**Client** Mirvac  
**Meeting date** 5/02/2016  
**Time** 14:00pm  
**Location** TransDev 220 Pyrmont Street, Sydney  
**Present** Joe Heydon (JH) – Arcadis  
Terry Brown (TB) – TfNSW  
Darren McDonald - TransDev

**Copy to**

---

ITEM	COMMENTS	ACTION
1	JH introduced the proposed development to TB	
2	JH informed TB of the interface of loading dock access road and demolition and construction of walkways over light rail	
3	TB advised that Bridge designer needs to be AEO (Authorised Engineer Organisation) accredited	
4	TB advised that a design review process would be required	
5	TB advised that Indemnity and insurance will be required	
6	TB advised that a weekend shut down is in order of \$250k	
7	TB advised that its best to coordinate works with scheduled TransDev shutdowns to share costs	
8	TB advised that dilapidation surveys may be required	
9	TB advised that noise and vibration modelling may be required	
10	TB advised he had no objections in principle but wouldn't be able to provide detailed comment until more information was provided	

**Issue date** 3/08/2018  
**Issue to** Lachlan Attiwill - Mirvac  
**Issued by** Joe Heydon - Arcadis  
**Subject** Harbourside – TfNSW CBD Office & RMS briefing  
**Reference** HSC-0002  
**Client** Mirvac  
**Meeting date** 3/08/2018  
**Time** 12:00 – 13:00  
**Location** Level 44, 680 George Street  
**Present** Lachlan Attiwill (LA) – Mirvac DM  
Joe Heydon (JH) – Arcadis (Civil)  
Mukit Rahman (MR) – Arcadis (Traffic)  
Katherine McCray (KMC) - TfNSW  
Lisa McGill (LMG) - TfNSW  
Robert Rutledge (RR) - RMS

**Copy to**

ITEM	COMMENTS
1	LMG explained why the TfNSW CBD coordination office was established.
2.	It was set up to minimize the impact of the light rail development, “keep Sydney moving”, review Development Applications and to review and approve Construction Traffic Management Plans (CTMP).
3.	LA presented the original and amended concept proposals and explained that the development is for a SSDA1 application, to establish land uses, gross floor area, building envelopes etc.
4.	LA outlined the major changes between the original and amended proposals.
5.	LA explained that the applicant and their team had received and reviewed all of the agency response to submissions, and that the relevant reports had been updated to respond to these agency comments.
6.	JH explained that the applicant had met with the light rail (TransDev and TfNSW) in 2016 and that there were no significant issues raised at that meeting.
5.	LMG suggested that the proposed loading dock needs to be increased to cater for the residential element of the proposal to allow for online shopping and grocery deliveries.
6.	LMG stated that the new proposed Bunn Street pedestrian bridge crossing was good and welcomed that proposal. LMG suggested that security / surveillance will need to be considered and asked if it will be accessible 24 hrs.

7.	LMG and KMC recommended that parking for coaches is provided within the development proposal.
8.	LMG stated that the new City of Sydney 2018 – 2030 city cycle strategy is due to be published soon and that the proposal needs to consider this document and to review relevant cycleway connections.
9.	KMC asked when Mirvac expected the SSDA1 to be granted approval. LA suggested that given it is a SSD it will be at least no sooner than end of 2018 to early 2019.
10.	RR stated that Mirvac needs to assess cumulative construction traffic including the proposed Star Casino.
11.	LA stated that this was reviewed as part of the updated traffic report.
12.	LA was unsure of exact timing of construction program but suggested it would be no earlier than 18 months time.

**APPENDIX G - 2020 EXISTING BASELINE TRAFFIC SIDRA  
RESULTS**

LANE SUMMARY

Site: 1 [Murray Street / Darling Drive - AM Peak\_2020]

Murray Street / Darling Drive - AM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 119 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Murray Street South													
Lane 1	34	3.1	504	0.067	100	38.3	LOS C	1.4	10.2	Full	500	0.0	0.0
Lane 2	80	13.2	279	0.287	100	50.3	LOS D	4.2	32.5	Full	500	0.0	0.0
Approach	114	10.2		0.287		46.8	LOS D	4.2	32.5				
East: Darling Drive													
Lane 1	136	2.3	1502	0.090	100	5.4	LOS A	0.9	6.1	Full	500	0.0	0.0
Lane 2	168	6.9	753	0.224	100	24.7	LOS B	6.3	47.0	Full	500	0.0	0.0
Lane 3	227	2.3	214 <sup>1</sup>	1.064	100	143.3	LOS F	22.4	160.2	Short	50	0.0	NA
Lane 4	1	0.0	521	0.002	100	51.9	LOS D	0.1	0.1	Full	500	0.0	0.0
Approach	533	3.8		1.064		70.5	LOS E	22.4	160.2				
North: Murray Street North													
Lane 1	40	7.9	369	0.108	100	28.9	LOS C	1.3	10.1	Full	500	0.0	0.0
Lane 2	79	9.3	239	0.330	100	54.1	LOS D	4.3	32.2	Full	500	0.0	0.0
Approach	119	8.8		0.330		45.6	LOS D	4.3	32.2				
West: Pyrmont Bridge Road													
Lane 1	1	0.0	521	0.002	100	51.9	LOS D	0.1	0.1	Full	500	0.0	0.0
Lane 2	178	11.1	808	0.221	100	23.5	LOS B	6.0	46.3	Full	500	0.0	0.0
Lane 3	165	8.4	746	0.221	100	24.7	LOS B	6.2	46.4	Full	500	0.0	0.0
Lane 4	68	6.2	209	0.327	100	58.1	LOS E	3.8	27.7	Short	40	0.0	NA
Approach	413	9.2		0.327		29.8	LOS C	6.2	46.4				
Intersection	1178	6.8		1.064		51.4	LOS D	22.4	160.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

MOVEMENT SUMMARY

Site: 1 [Murray Street / Darling Drive - AM Peak\_2020]

Murray Street / Darling Drive - AM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 119 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Murray Street South												
1	L2	34	3.1	0.067	38.3	LOS C	1.4	10.2	0.77	0.70	0.77	32.6
2	T1	45	9.3	0.287	48.3	LOS D	4.2	32.5	0.92	0.74	0.92	29.7
3	R2	35	18.2	0.287	53.0	LOS D	4.2	32.5	0.92	0.74	0.92	29.6
Approach		114	10.2	0.287	46.8	LOS D	4.2	32.5	0.88	0.73	0.88	30.5
East: Darling Drive												
4	L2	136	2.3	0.090	5.4	LOS A	0.9	6.1	0.17	0.55	0.17	46.6
5	T1	169	6.8	0.224	24.9	LOS B	6.3	47.0	0.70	0.58	0.70	37.3
6	R2	227	2.3	1.064	143.3	LOS F	22.4	160.2	1.00	1.32	2.02	16.6
Approach		533	3.8	1.064	70.5	LOS E	22.4	160.2	0.69	0.89	1.13	25.2
North: Murray Street North												
7	L2	40	7.9	0.108	28.9	LOS C	1.3	10.1	0.84	0.71	0.84	35.5
8	T1	35	6.1	0.330	51.5	LOS D	4.3	32.2	0.95	0.75	0.95	28.8
9	R2	44	11.9	0.330	56.1	LOS D	4.3	32.2	0.95	0.75	0.95	28.7
Approach		119	8.8	0.330	45.6	LOS D	4.3	32.2	0.91	0.74	0.91	30.7
West: Pyrmont Bridge Road												
10	L2	142	11.9	0.221	24.4	LOS B	6.0	46.3	0.63	0.68	0.63	37.5
11	T1	202	8.3	0.221	24.0	LOS B	6.2	46.4	0.68	0.60	0.68	37.4
12	R2	68	6.2	0.327	58.1	LOS E	3.8	27.7	0.96	0.76	0.96	27.8
Approach		413	9.2	0.327	29.8	LOS C	6.2	46.4	0.71	0.65	0.71	35.4
All Vehicles		1178	6.8	1.064	51.4	LOS D	22.4	160.2	0.74	0.77	0.93	29.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue	Prop. Queued	Effective Stop Rate		
		ped/h	sec		Pedestrian ped	Distance m			
P1	South Full Crossing	261	27.9	LOS C	0.6	0.6	0.69	0.69	
P2	East Full Crossing	475	54.7	LOS E	1.6	1.6	0.97	0.97	
P3	North Full Crossing	1943	27.8	LOS C	4.7	4.7	0.71	0.71	
P4	West Full Crossing	239	54.2	LOS E	0.8	0.8	0.96	0.96	
All Pedestrians		2918	34.4	LOS D			0.77	0.77	

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.

LANE SUMMARY

Site: 1 [Murray Street / Darling Drive - PM Peak \_2020]

Murray Street / Darling Drive - PM Peak \_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 120 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
								Veh	Dist m				
South: Murray Street South													
Lane 1	49	0.0	495	0.100	100	40.0	LOS C	2.2	15.2	Full	30	0.0	0.0
Lane 2	143	1.5	301	0.476	100	51.9	LOS D	7.8	55.1	Full	500	0.0	0.0
Approach	193	1.1		0.476		48.8	LOS D	7.8	55.1				
East: Darling Drive													
Lane 1	89	0.0	1446	0.062	100	5.9	LOS A	0.7	5.1	Full	500	0.0	0.0
Lane 2	177	0.6	712	0.248	100	28.2	LOS B	7.1	50.2	Full	500	0.0	0.0
Lane 3	213	2.0	198	1.072	100	149.1	LOS F	21.5	152.9	Short	50	0.0	NA
Lane 4	1	0.0	465	0.002	100	53.5	LOS D	0.1	0.1	Full	500	0.0	0.0
Approach	480	1.1		1.072		77.6	LOS F	21.5	152.9				
North: Murray Street North													
Lane 1	91	5.8	431	0.210	100	27.1	LOS B	2.9	21.4	Full	500	0.0	0.0
Lane 2	209	1.5	330	0.635	100	52.5	LOS D	11.6	82.3	Full	500	0.0	0.0
Approach	300	2.8		0.635		44.9	LOS D	11.6	82.3				
West: Pyrmont Bridge Road													
Lane 1	1	0.0	465	0.002	100	53.5	LOS D	0.1	0.1	Full	500	0.0	0.0
Lane 2	293	5.4	1058	0.277	100	17.2	LOS B	8.2	60.1	Full	500	0.0	0.0
Lane 3	144	1.5	708	0.204	74 <sup>5</sup>	27.7	LOS B	5.7	40.5	Full	500	0.0	0.0
Lane 4	75	1.4	199	0.375	100	59.9	LOS E	4.2	29.8	Short	40	0.0	NA
Approach	513	3.7		0.375		26.5	LOS B	8.2	60.1				
Intersection	1485	2.3		1.072		49.6	LOS D	21.5	152.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program

MOVEMENT SUMMARY

Site: 1 [Murray Street / Darling Drive - PM Peak \_2020]

Murray Street / Darling Drive - PM Peak \_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 120 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Murray Street South												
1	L2	49	0.0	0.100	40.0	LOS C	2.2	15.2	0.79	0.72	0.79	32.1
2	T1	99	1.1	0.476	50.4	LOS D	7.8	55.1	0.96	0.78	0.96	29.3
3	R2	44	2.4	0.476	55.0	LOS D	7.8	55.1	0.96	0.78	0.96	29.3
Approach		193	1.1	0.476	48.8	LOS D	7.8	55.1	0.91	0.76	0.91	30.0
East: Darling Drive												
4	L2	89	0.0	0.062	5.9	LOS A	0.7	5.1	0.20	0.56	0.20	46.4
5	T1	178	0.6	0.248	28.3	LOS B	7.1	50.2	0.74	0.61	0.74	36.1
6	R2	213	2.0	1.072	149.1	LOS F	21.5	152.9	1.00	1.33	2.06	16.1
Approach		480	1.1	1.072	77.6	LOS F	21.5	152.9	0.75	0.92	1.22	24.0
North: Murray Street North												
7	L2	91	5.8	0.210	27.1	LOS B	2.9	21.4	0.84	0.74	0.84	36.2
8	T1	111	1.0	0.635	50.4	LOS D	11.6	82.3	0.98	0.82	0.98	29.2
9	R2	99	2.1	0.635	55.0	LOS D	11.6	82.3	0.98	0.82	0.98	29.1
Approach		300	2.8	0.635	44.9	LOS D	11.6	82.3	0.94	0.79	0.94	30.9
West: Pyrmont Bridge Road												
10	L2	293	5.4	0.277	17.2	LOS B	8.2	60.1	0.52	0.70	0.52	40.1
11	T1	145	1.4	0.204	27.8	LOS B	5.7	40.5	0.73	0.59	0.73	36.2
12	R2	75	1.4	0.375	59.9	LOS E	4.2	29.8	0.97	0.76	0.97	27.4
Approach		513	3.7	0.375	26.5	LOS B	8.2	60.1	0.65	0.68	0.65	36.5
All Vehicles		1485	2.3	1.072	49.6	LOS D	21.5	152.9	0.77	0.79	0.93	29.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate	
		ped/h	sec		Pedestrian ped	Distance m			
P1	South Full Crossing	173	31.0	LOS D	0.4	0.4	0.72	0.72	
P2	East Full Crossing	388	55.0	LOS E	1.3	1.3	0.97	0.97	
P3	North Full Crossing	1847	31.1	LOS D	4.7	4.7	0.75	0.75	
P4	West Full Crossing	207	54.6	LOS E	0.7	0.7	0.96	0.96	
All Pedestrians		2616	36.5	LOS D			0.80	0.80	

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.

LANE SUMMARY

Site: 2 [Darling Drive / Pier Street - AM Peak\_2020]

Darling Drive / Pier Street - AM Peak\_2020  
Site Category: (None)  
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Darling Drive South													
Lane 1 <sup>d</sup>	257	7.4	863	0.298	100	8.5	LOS A	1.9	14.2	Full	500	0.0	0.0
Approach	257	7.4		0.298		8.5	LOS A	1.9	14.2				
East: Pier Street													
Lane 1	154	1.4	1528	0.101	100	2.9	LOS A	0.6	4.0	Short	30	0.0	NA
Lane 2 <sup>d</sup>	568	2.6	1563	0.364	100	8.1	LOS A	2.7	19.0	Full	500	0.0	0.0
Approach	722	2.3		0.364		7.0	LOS A	2.7	19.0				
NorthEast: Zollner Circuit													
Lane 1 <sup>d</sup>	35	15.2	907	0.038	100	4.4	LOS A	0.2	1.3	Full	75	0.0	0.0
Approach	35	15.2		0.038		4.4	LOS A	0.2	1.3				
North: Darling Drive North													
Lane 1 <sup>d</sup>	294	7.9	1110	0.265	100	4.0	LOS A	1.6	12.1	Full	500	0.0	0.0
Approach	294	7.9		0.265		4.0	LOS A	1.6	12.1				
Intersection	1307	4.9		0.364		6.6	LOS A	2.7	19.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
Roundabout Capacity Model: SIDRA Standard.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# MOVEMENT SUMMARY

 **Site: 2 [Darling Drive / Pier Street - AM Peak\_2020]**

Darling Drive / Pier Street - AM Peak\_2020  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Drive South												
2	T1	118	9.8	0.298	6.1	LOS A	1.9	14.2	0.70	0.75	0.70	46.0
3a	R1	55	1.9	0.298	9.9	LOS A	1.9	14.2	0.70	0.75	0.70	29.2
3	R2	84	7.5	0.298	11.1	LOS A	1.9	14.2	0.70	0.75	0.70	46.3
Approach		257	7.4	0.298	8.5	LOS A	1.9	14.2	0.70	0.75	0.70	42.7
East: Pier Street												
4	L2	154	1.4	0.101	2.9	LOS A	0.6	4.0	0.28	0.39	0.28	47.8
6	R2	460	2.5	0.364	8.0	LOS A	2.7	19.0	0.36	0.58	0.36	46.2
6b	R3	108	2.9	0.364	8.9	LOS A	2.7	19.0	0.36	0.58	0.36	40.6
Approach		722	2.3	0.364	7.0	LOS A	2.7	19.0	0.34	0.54	0.34	45.9
NorthEast: Zollner Circuit												
24b	L3	33	16.1	0.038	4.3	LOS A	0.2	1.3	0.43	0.52	0.43	44.6
24a	L1	1	0.0	0.038	3.5	LOS A	0.2	1.3	0.43	0.52	0.43	46.9
26b	R3	1	0.0	0.038	9.7	LOS A	0.2	1.3	0.43	0.52	0.43	49.4
Approach		35	15.2	0.038	4.4	LOS A	0.2	1.3	0.43	0.52	0.43	44.8
North: Darling Drive North												
7b	L3	52	6.1	0.265	4.3	LOS A	1.6	12.1	0.48	0.49	0.48	44.3
7	L2	123	10.3	0.265	4.1	LOS A	1.6	12.1	0.48	0.49	0.48	47.0
8	T1	119	6.2	0.265	3.8	LOS A	1.6	12.1	0.48	0.49	0.48	48.3
Approach		294	7.9	0.265	4.0	LOS A	1.6	12.1	0.48	0.49	0.48	47.3
All Vehicles		1307	4.9	0.364	6.6	LOS A	2.7	19.0	0.45	0.57	0.45	45.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.  
Roundabout Capacity Model: SIDRA Standard.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 2 [Darling Drive / Pier Street - PM Peak\_2020]

Darling Drive / Pier Street - PM Peak\_2020  
Site Category: (None)  
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Darling Drive South													
Lane 1 <sup>d</sup>	286	0.4	1018	0.281	100	7.4	LOS A	1.8	12.3	Full	500	0.0	0.0
Approach	286	0.4		0.281		7.4	LOS A	1.8	12.3				
East: Pier Street													
Lane 1	136	6.2	1487	0.091	100	2.9	LOS A	0.5	3.7	Short	30	0.0	NA
Lane 2 <sup>d</sup>	426	1.7	1561	0.273	100	7.9	LOS A	1.8	12.6	Full	500	0.0	0.0
Approach	562	2.8		0.273		6.7	LOS A	1.8	12.6				
NorthEast: Zollner Circuit													
Lane 1 <sup>d</sup>	101	0.0	927	0.109	100	4.8	LOS A	0.5	3.6	Full	75	0.0	0.0
Approach	101	0.0		0.109		4.8	LOS A	0.5	3.6				
North: Darling Drive North													
Lane 1 <sup>d</sup>	333	3.8	1254	0.265	100	3.3	LOS A	1.7	12.5	Full	500	0.0	0.0
Approach	333	3.8		0.265		3.3	LOS A	1.7	12.5				
Intersection	1282	2.3		0.281		5.8	LOS A	1.8	12.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
Roundabout Capacity Model: SIDRA Standard.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# MOVEMENT SUMMARY

 **Site: 2 [Darling Drive / Pier Street - PM Peak\_2020]**

Darling Drive / Pier Street - PM Peak\_2020  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Drive South												
2	T1	135	0.0	0.281	4.8	LOS A	1.8	12.3	0.61	0.66	0.61	46.5
3a	R1	23	0.0	0.281	8.8	LOS A	1.8	12.3	0.61	0.66	0.61	29.5
3	R2	128	0.8	0.281	9.8	LOS A	1.8	12.3	0.61	0.66	0.61	46.9
Approach		286	0.4	0.281	7.4	LOS A	1.8	12.3	0.61	0.66	0.61	45.4
East: Pier Street												
4	L2	136	6.2	0.091	2.9	LOS A	0.5	3.7	0.28	0.39	0.28	47.8
6	R2	421	1.8	0.273	7.9	LOS A	1.8	12.6	0.32	0.58	0.32	46.4
6b	R3	5	0.0	0.273	8.8	LOS A	1.8	12.6	0.32	0.58	0.32	40.8
Approach		562	2.8	0.273	6.7	LOS A	1.8	12.6	0.31	0.53	0.31	46.7
NorthEast: Zollner Circuit												
24b	L3	99	0.0	0.109	4.7	LOS A	0.5	3.6	0.49	0.59	0.49	44.6
24a	L1	1	0.0	0.109	4.1	LOS A	0.5	3.6	0.49	0.59	0.49	46.7
26b	R3	1	0.0	0.109	10.3	LOS A	0.5	3.6	0.49	0.59	0.49	49.1
Approach		101	0.0	0.109	4.8	LOS A	0.5	3.6	0.49	0.59	0.49	44.7
North: Darling Drive North												
7b	L3	22	0.0	0.265	3.6	LOS A	1.7	12.5	0.40	0.42	0.40	44.9
7	L2	189	2.2	0.265	3.4	LOS A	1.7	12.5	0.40	0.42	0.40	47.4
8	T1	121	7.0	0.265	3.3	LOS A	1.7	12.5	0.40	0.42	0.40	48.6
Approach		333	3.8	0.265	3.3	LOS A	1.7	12.5	0.40	0.42	0.40	47.7
All Vehicles		1282	2.3	0.281	5.8	LOS A	1.8	12.6	0.42	0.54	0.42	46.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.  
Roundabout Capacity Model: SIDRA Standard.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 3 [Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020]

Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Coordinated    Cycle Time = 112 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Harbour Street South													
Lane 1	64	14.8	255	0.252	100	49.7	LOS D	3.2	25.0	Full	500	0.0	0.0
Lane 2	54	13.6	272	0.199	79 <sup>5</sup>	45.6	LOS D	2.6	20.6	Full	500	0.0	0.0
Lane 3	54	13.6	272	0.199	79 <sup>5</sup>	45.6	LOS D	2.6	20.6	Full	500	0.0	0.0
Lane 4	49	14.9	255	0.194	100	49.1	LOS D	2.4	19.1	Short	32	0.0	NA
Approach	222	14.2		0.252		47.5	LOS D	3.2	25.0				
East: Goulburn Street													
Lane 1	315	2.4	789	0.400	100	24.8	LOS B	12.0	86.0	Full	500	0.0	0.0
Lane 2	251	2.4	629 <sup>1</sup>	0.400	100	23.8	LOS B	9.2	65.9	Full	500	0.0	0.0
Lane 3	163	3.1	214 <sup>1</sup>	0.763	100	54.7	LOS D	8.9	63.8	Short	30	0.0	NA
Lane 4	179	3.1	235 <sup>1</sup>	0.763	100	54.9	LOS D	9.8	70.5	Short	28	0.0	NA
Approach	908	2.7		0.763		35.8	LOS C	12.0	86.0				
North: Harbour Street North													
Lane 1	527	2.6	842	0.627	100	23.1	LOS B	19.4	138.7	Full	500	0.0	0.0
Lane 2	517	0.0	514	1.007	100	59.2	LOS E	36.4	254.5	Full	500	0.0	0.0
Lane 3	497	5.7	494	1.007	100	59.6	LOS E	35.0	257.3	Full	500	0.0	0.0
Approach	1542	2.7		1.007		47.0	LOS D	36.4	257.3				
West: Pier Street													
Lane 1	319	5.7	940	0.340	100	20.8	LOS B	9.9	72.9	Full	500	0.0	0.0
Lane 2	319	5.7	940	0.340	100	20.8	LOS B	9.9	72.9	Short	90	0.0	NA
Lane 3	319	5.7	940	0.340	100	20.8	LOS B	9.9	72.9	Full	500	0.0	0.0
Lane 4	215	2.7	376	0.570	100	45.9	LOS D	10.8	77.3	Full	500	0.0	0.0
Lane 5	215	2.7	376	0.570	100	45.9	LOS D	10.8	77.3	Short	110	0.0	NA
Approach	1387	4.8		0.570		28.6	LOS C	10.8	77.3				
Intersection	4060	4.0		1.007		38.2	LOS C	36.4	257.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.  
5 Lane under-utilisation found by the program

## MOVEMENT SUMMARY

 **Site: 3 [Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020]**

Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 112 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbour Street South												
1	L2	64	14.8	0.252	49.7	LOS D	3.2	25.0	0.92	0.75	0.92	27.5
2	T1	108	13.6	0.199	45.6	LOS D	2.6	20.6	0.91	0.69	0.91	29.0
3	R2	49	14.9	0.194	49.1	LOS D	2.4	19.1	0.91	0.73	0.91	26.2
Approach		222	14.2	0.252	47.5	LOS D	3.2	25.0	0.91	0.72	0.91	27.9
East: Goulburn Street												
5	T1	566	2.4	0.400	24.4	LOS B	12.0	86.0	0.74	0.63	0.74	34.7
6	R2	342	3.1	0.763	54.8	LOS D	9.8	70.5	0.98	0.90	1.14	26.6
Approach		908	2.7	0.763	35.8	LOS C	12.0	86.0	0.83	0.73	0.89	31.1
North: Harbour Street North												
7	L2	527	2.6	0.627	23.1	LOS B	19.4	138.7	0.81	0.81	0.81	35.3
9	R2	1015	2.8	1.007	59.4	LOS E	36.4	254.5	1.00	1.07	1.34	27.8
Approach		1542	2.7	1.007	47.0	LOS D	36.4	257.3	0.93	0.98	1.16	29.9
West: Pier Street												
10	L2	958	5.7	0.340	20.8	LOS B	9.9	72.9	0.62	0.72	0.62	39.1
11	T1	429	2.7	0.570	45.9	LOS D	10.8	77.3	0.96	0.80	0.96	28.6
Approach		1387	4.8	0.570	28.6	LOS C	10.8	77.3	0.72	0.75	0.72	35.1
All Vehicles		4060	4.0	1.007	38.2	LOS C	36.4	257.3	0.84	0.83	0.94	31.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	222	6.9	LOS A	0.2	0.2	0.35	0.35	
P2	East Full Crossing	29	42.1	LOS E	0.1	0.1	0.87	0.87	
P3	North Full Crossing	7	48.3	LOS E	0.0	0.0	0.93	0.93	
P4	West Full Crossing	5	49.2	LOS E	0.0	0.0	0.94	0.94	
P4S	West Slip/Bypass Lane Crossing	5	27.2	LOS C	0.0	0.0	0.70	0.70	
All Pedestrians		269	13.1	LOS B			0.44	0.44	

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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## LANE SUMMARY

 **Site: 3 [Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020]**

Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 107 seconds (Site User-Given Cycle Time)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbour Street South													
Lane 1	96	8.8	131	0.733	100	61.1	LOS E	5.4	40.4	Full	500	0.0	0.0
Lane 2	73	5.8	193	0.379	52 <sup>5</sup>	50.2	LOS D	3.7	27.3	Full	500	0.0	0.0
Lane 3	73	5.8	193	0.379	52 <sup>5</sup>	50.2	LOS D	3.7	27.3	Full	500	0.0	0.0
Lane 4	95	3.3	186	0.508	100	54.5	LOS D	4.9	35.3	Short	32	0.0	NA
Approach	337	5.9		0.733		54.5	LOS D	5.4	40.4				
East: Goulburn Street													
Lane 1	399	1.8	811	0.492	100	24.2	LOS B	15.1	107.5	Full	500	0.0	0.0
Lane 2	300	1.8	609 <sup>1</sup>	0.492	100	22.7	LOS B	10.7	75.8	Full	500	0.0	0.0
Lane 3	234	0.7	304 <sup>1</sup>	0.768	100	45.5	LOS D	11.5	80.6	Short	30	0.0	NA
Lane 4	247	0.7	322 <sup>1</sup>	0.768	100	45.6	LOS D	12.2	85.7	Short	28	0.0	NA
Approach	1180	1.3		0.768		32.5	LOS C	15.1	107.5				
North: Harbour Street North													
Lane 1	414	2.5	663	0.624	100	32.9	LOS C	14.8	106.0	Full	500	0.0	0.0
Lane 2	451	0.0	573	0.788	100	43.8	LOS D	22.7	159.1	Full	500	0.0	0.0
Lane 3	444	2.4	563	0.788	100	43.9	LOS D	22.4	160.0	Full	500	0.0	0.0
Approach	1308	1.6		0.788		40.4	LOS C	22.7	160.0				
West: Pier Street													
Lane 1	286	1.6	892	0.320	100	22.3	LOS B	9.0	63.8	Full	500	0.0	0.0
Lane 2	286	1.6	892	0.320	100	22.3	LOS B	9.0	63.8	Short	90	0.0	NA
Lane 3	286	1.6	892	0.320	100	22.3	LOS B	9.0	63.8	Full	500	0.0	0.0
Lane 4	181	1.5	235	0.771	100	55.1	LOS D	9.9	70.2	Full	500	0.0	0.0
Lane 5	181	1.5	235	0.771	100	55.1	LOS D	9.9	70.2	Short	110	0.0	NA
Approach	1220	1.6		0.771		32.0	LOS C	9.9	70.2				
Intersection	4045	1.9		0.788		36.8	LOS C	22.7	160.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

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## MOVEMENT SUMMARY

 **Site: 3 [Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020]**

Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 107 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbour Street South												
1	L2	96	8.8	0.733	61.1	LOS E	5.4	40.4	1.00	0.89	1.20	25.3
2	T1	146	5.8	0.379	50.2	LOS D	3.7	27.3	0.97	0.75	0.97	28.0
3	R2	95	3.3	0.508	54.5	LOS D	4.9	35.3	0.99	0.78	0.99	25.2
Approach		337	5.9	0.733	54.5	LOS D	5.4	40.4	0.99	0.80	1.04	26.4
East: Goulburn Street												
5	T1	699	1.8	0.492	23.6	LOS B	15.1	107.5	0.76	0.66	0.76	35.0
6	R2	481	0.7	0.768	45.6	LOS D	12.2	85.7	0.92	0.88	1.06	28.5
Approach		1180	1.3	0.768	32.5	LOS C	15.1	107.5	0.83	0.75	0.88	32.0
North: Harbour Street North												
7	L2	414	2.5	0.624	32.9	LOS C	14.8	106.0	0.88	0.95	1.14	32.3
9	R2	895	1.2	0.788	43.9	LOS D	22.7	159.1	0.98	0.91	1.05	31.5
Approach		1308	1.6	0.788	40.4	LOS C	22.7	160.0	0.95	0.92	1.08	31.7
West: Pier Street												
10	L2	858	1.6	0.320	22.3	LOS B	9.0	63.8	0.65	0.73	0.65	38.4
11	T1	362	1.5	0.771	55.1	LOS D	9.9	70.2	1.00	0.91	1.17	26.7
Approach		1220	1.6	0.771	32.0	LOS C	9.9	70.2	0.75	0.79	0.80	34.0
All Vehicles		4045	1.9	0.788	36.8	LOS C	22.7	160.0	0.86	0.82	0.93	31.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	464	5.2	LOS A	0.4	0.4	0.31	0.31	
P2	East Full Crossing	56	37.9	LOS D	0.1	0.1	0.84	0.84	
P3	North Full Crossing	41	47.7	LOS E	0.1	0.1	0.95	0.95	
P4	West Full Crossing	48	47.8	LOS E	0.1	0.1	0.95	0.95	
P4S	West Slip/Bypass Lane Crossing	48	23.6	LOS C	0.1	0.1	0.66	0.66	
All Pedestrians		658	15.1	LOS B			0.47	0.47	

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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LANE SUMMARY

Site: 4 [Darling Drive / Ultimo Road - AM Peak\_2020]

Darling Drive / Ultimo Road - AM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 64 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Car Park Access													
Lane 1	4	0.0	382	0.011	100	23.8	LOS B	0.1	0.7	Full	500	0.0	0.0
Approach	4	0.0		0.011		23.8	LOS B	0.1	0.7				
East: Ultimo Road East													
Lane 1	133	5.1	1149	0.115	100	5.6	LOS A	1.7	12.6	Full	500	0.0	0.0
Lane 2	133	5.2	1150	0.115	100	5.6	LOS A	1.7	12.6	Full	500	0.0	0.0
Lane 3	158	8.0	275	0.575	100	32.2	LOS C	4.9	36.4	Short	24	0.0	NA
Approach	423	6.2		0.575		15.5	LOS B	4.9	36.4				
North: Darling Drive North													
Lane 1	160	5.9	278	0.575	100	33.3	LOS C	4.9	36.3	Full	500	0.0	0.0
Lane 2	184	4.6	352	0.523	100	29.5	LOS C	5.3	38.7	Full	500	0.0	0.0
Approach	344	5.2		0.575		31.3	LOS C	5.3	38.7				
West: Ultimo Road West													
Lane 1	70	2.5	549	0.128	100	20.2	LOS B	1.6	11.6	Full	500	0.0	0.0
Lane 2	88	2.8	688	0.128	100	14.9	LOS B	1.9	13.3	Full	500	0.0	0.0
Approach	158	2.7		0.128		17.3	LOS B	1.9	13.3				
Intersection	929	5.2		0.575		21.7	LOS B	5.3	38.7				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 4 [Darling Drive / Ultimo Road - AM Peak\_2020]

Darling Drive / Ultimo Road - AM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 64 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Car Park Access												
1	L2	2	0.0	0.011	24.6	LOS B	0.1	0.7	0.80	0.59	0.80	31.8
2	T1	1	0.0	0.011	21.2	LOS B	0.1	0.7	0.80	0.59	0.80	34.8
3	R2	1	0.0	0.011	24.6	LOS B	0.1	0.7	0.80	0.59	0.80	31.9
Approach		4	0.0	0.011	23.8	LOS B	0.1	0.7	0.80	0.59	0.80	32.5
East: Ultimo Road East												
4	L2	1	0.0	0.115	9.0	LOS A	1.7	12.6	0.44	0.36	0.44	37.8
5	T1	264	5.2	0.115	5.6	LOS A	1.7	12.6	0.44	0.36	0.44	37.7
6	R2	158	8.0	0.575	32.2	LOS C	4.9	36.4	0.97	0.81	0.99	31.7
Approach		423	6.2	0.575	15.5	LOS B	4.9	36.4	0.64	0.53	0.65	35.2
North: Darling Drive North												
7	L2	160	5.9	0.575	33.3	LOS C	4.9	36.3	0.97	0.81	0.99	31.8
8	T1	1	0.0	0.523	26.2	LOS B	5.3	38.7	0.93	0.80	0.93	32.8
9	R2	183	4.6	0.523	29.5	LOS C	5.3	38.7	0.93	0.80	0.93	32.9
Approach		344	5.2	0.575	31.3	LOS C	5.3	38.7	0.95	0.80	0.96	32.3
West: Ultimo Road West												
10	L2	46	2.3	0.128	21.4	LOS B	1.6	11.6	0.76	0.66	0.76	35.4
11	T1	112	2.8	0.128	15.6	LOS B	1.9	13.3	0.72	0.58	0.72	34.0
Approach		158	2.7	0.128	17.3	LOS B	1.9	13.3	0.73	0.60	0.73	34.4
All Vehicles		929	5.2	0.575	21.7	LOS B	5.3	38.7	0.77	0.64	0.78	33.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m		
P1	South Full Crossing	1	7.0	LOS A	0.0	0.0	0.47	0.47
P2	East Full Crossing	45	26.3	LOS C	0.1	0.1	0.91	0.91
P3	North Full Crossing	171	20.5	LOS C	0.2	0.2	0.80	0.80
All Pedestrians		217	21.6	LOS C			0.82	0.82

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.

LANE SUMMARY

Site: 4 [Darling Drive / Ultimo Road - PM Peak\_2020]

Darling Drive / Ultimo Road - PM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 82 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Flows			Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: Car Park Access													
Lane 1	3	0.0	315	0.010	100	31.9	LOS C	0.1	0.7	Full	500	0.0	0.0
Approach	3	0.0		0.010		31.9	LOS C	0.1	0.7				
East: Ultimo Road East													
Lane 1	207	1.3	1320	0.157	100	4.9	LOS A	2.9	20.4	Full	500	0.0	0.0
Lane 2	207	1.3	1321	0.157	100	4.9	LOS A	2.9	20.4	Full	500	0.0	0.0
Lane 3	216	0.5	281 <sup>1</sup>	0.768	100	39.3	LOS C	8.6	60.3	Short	24	0.0	NA
Approach	629	1.0		0.768		16.7	LOS B	8.6	60.3				
North: Darling Drive North													
Lane 1	119	2.7	378	0.315	100	35.0	LOS C	4.1	29.6	Full	500	0.0	0.0
Lane 2	203	5.2	291	0.699	100	41.3	LOS C	8.2	60.0	Full	500	0.0	0.0
Approach	322	4.2		0.699		39.0	LOS C	8.2	60.0				
West: Ultimo Road West													
Lane 1	72	0.6	617	0.117	100	22.9	LOS B	2.0	14.2	Full	500	0.0	0.0
Lane 2	91	1.8	776	0.117	100	16.4	LOS B	2.3	16.1	Full	500	0.0	0.0
Approach	163	1.3		0.117		19.3	LOS B	2.3	16.1				
Intersection	1118	2.0		0.768		23.5	LOS B	8.6	60.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).  
Lane LOS values are based on average delay per lane.  
Intersection and Approach LOS values are based on average delay for all lanes.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

MOVEMENT SUMMARY

Site: 4 [Darling Drive / Ultimo Road - PM Peak\_2020]

Darling Drive / Ultimo Road - PM Peak\_2020  
Site Category: (None)  
Signals - Fixed Time Isolated    Cycle Time = 82 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Car Park Access												
1	L2	1	0.0	0.010	33.0	LOS C	0.1	0.7	0.84	0.59	0.84	29.8
2	T1	1	0.0	0.010	29.6	LOS C	0.1	0.7	0.84	0.59	0.84	32.3
3	R2	1	0.0	0.010	33.0	LOS C	0.1	0.7	0.84	0.59	0.84	29.8
Approach		3	0.0	0.010	31.9	LOS C	0.1	0.7	0.84	0.59	0.84	30.6
East: Ultimo Road East												
4	L2	1	0.0	0.157	8.3	LOS A	2.9	20.4	0.38	0.32	0.38	38.1
5	T1	413	1.3	0.157	4.9	LOS A	2.9	20.4	0.38	0.32	0.38	38.0
6	R2	216	0.5	0.768	39.3	LOS C	8.6	60.3	0.95	0.91	1.14	29.8
Approach		629	1.0	0.768	16.7	LOS B	8.6	60.3	0.57	0.52	0.64	34.7
North: Darling Drive North												
7	L2	119	2.7	0.315	35.0	LOS C	4.1	29.6	0.89	0.77	0.89	31.3
8	T1	1	0.0	0.699	38.1	LOS C	8.2	60.0	0.99	0.87	1.09	29.6
9	R2	202	5.2	0.699	41.3	LOS C	8.2	60.0	0.99	0.87	1.09	29.7
Approach		322	4.2	0.699	39.0	LOS C	8.2	60.0	0.95	0.83	1.02	30.3
West: Ultimo Road West												
10	L2	48	0.0	0.117	24.1	LOS B	2.0	14.2	0.73	0.65	0.73	34.5
11	T1	115	1.8	0.117	17.3	LOS B	2.3	16.1	0.67	0.55	0.67	33.5
Approach		163	1.3	0.117	19.3	LOS B	2.3	16.1	0.69	0.58	0.69	33.8
All Vehicles		1118	2.0	0.768	23.5	LOS B	8.6	60.3	0.70	0.62	0.76	33.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow	Average Delay	Level of Service	Average Back of Queue		Prop. Queued	Effective Stop Rate
		ped/h	sec		Pedestrian ped	Distance m		
P1	South Full Crossing	1	5.9	LOS A	0.0	0.0	0.38	0.38
P2	East Full Crossing	55	35.3	LOS D	0.1	0.1	0.93	0.93
P3	North Full Crossing	167	21.4	LOS C	0.3	0.3	0.72	0.72
All Pedestrians		223	24.7	LOS C			0.77	0.77

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.

## **APPENDIX H – 2020 WITH DEVELOPMENT PREDICTED TRAFFIC SIDRA RESULTS**

# LANE SUMMARY

## Site: 1 [Murray Street / Darling Drive - AM Peak\_2020]

Murray Street / Darling Drive - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 119 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Murray Street South													
Lane 1	34	3.1	504	0.067	100	38.3	LOS C	1.4	10.2	Full	500	0.0	0.0
Lane 2	80	13.2	279	0.287	100	50.3	LOS D	4.2	32.5	Full	500	0.0	0.0
Approach	114	10.2		0.287		46.8	LOS D	4.2	32.5				
East: Darling Drive													
Lane 1	136	2.3	1502	0.090	100	5.4	LOS A	0.9	6.1	Full	500	0.0	0.0
Lane 2	238	7.1	752	0.316	100	25.9	LOS B	9.4	69.4	Full	500	0.0	0.0
Lane 3	227	2.3	213 <sup>1</sup>	1.065	100	144.2	LOS F	22.5	160.8	Short	50	0.0	NA
Lane 4	1	0.0	521	0.002	100	51.9	LOS D	0.1	0.1	Full	500	0.0	0.0
Approach	602	4.2		1.065		66.0	LOS E	22.5	160.8				
North: Murray Street North													
Lane 1	40	7.9	369	0.108	100	28.9	LOS C	1.3	10.1	Full	500	0.0	0.0
Lane 2	79	9.3	239	0.330	100	54.1	LOS D	4.3	32.2	Full	500	0.0	0.0
Approach	119	8.8		0.330		45.6	LOS D	4.3	32.2				
West: Pyrmont Bridge Road													
Lane 1	1	0.0	521	0.002	100	51.9	LOS D	0.1	0.1	Full	500	0.0	0.0
Lane 2	229	10.5	760	0.302	100	26.0	LOS B	8.6	65.3	Full	500	0.0	0.0
Lane 3	225	8.4	746	0.302	100	25.7	LOS B	8.8	66.0	Full	500	0.0	0.0
Lane 4	68	6.2	209	0.327	100	58.1	LOS E	3.8	27.7	Short	40	0.0	NA
Approach	524	9.0		0.327		30.1	LOS C	8.8	66.0				
Intersection	1359	7.0		1.065		48.8	LOS D	22.5	160.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

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# MOVEMENT SUMMARY

## Site: 1 [Murray Street / Darling Drive - AM Peak\_2020]

Murray Street / Darling Drive - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 119 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street South												
1	L2	34	3.1	0.067	38.3	LOS C	1.4	10.2	0.77	0.70	0.77	32.6
2	T1	45	9.3	0.287	48.3	LOS D	4.2	32.5	0.92	0.74	0.92	29.7
3	R2	35	18.2	0.287	53.0	LOS D	4.2	32.5	0.92	0.74	0.92	29.6
Approach		114	10.2	0.287	46.8	LOS D	4.2	32.5	0.88	0.73	0.88	30.5
East: Darling Drive												
4	L2	136	2.3	0.090	5.4	LOS A	0.9	6.1	0.17	0.55	0.17	46.6
5	T1	239	7.0	0.316	26.0	LOS B	9.4	69.4	0.73	0.62	0.73	36.9
6	R2	227	2.3	1.065	144.2	LOS F	22.5	160.8	1.00	1.32	2.02	16.5
Approach		602	4.2	1.065	66.0	LOS E	22.5	160.8	0.71	0.87	1.09	26.0
North: Murray Street North												
7	L2	40	7.9	0.108	28.9	LOS C	1.3	10.1	0.84	0.71	0.84	35.5
8	T1	35	6.1	0.330	51.5	LOS D	4.3	32.2	0.95	0.75	0.95	28.8
9	R2	44	11.9	0.330	56.1	LOS D	4.3	32.2	0.95	0.75	0.95	28.7
Approach		119	8.8	0.330	45.6	LOS D	4.3	32.2	0.91	0.74	0.91	30.7
West: Pyrmont Bridge Road												
10	L2	142	11.9	0.302	27.8	LOS B	8.6	65.3	0.69	0.69	0.69	36.5
11	T1	314	8.4	0.302	25.1	LOS B	8.8	66.0	0.71	0.63	0.71	37.0
12	R2	68	6.2	0.327	58.1	LOS E	3.8	27.7	0.96	0.76	0.96	27.8
Approach		524	9.0	0.327	30.1	LOS C	8.8	66.0	0.74	0.66	0.74	35.3
All Vehicles		1359	7.0	1.065	48.8	LOS D	22.5	160.8	0.75	0.77	0.92	29.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	261	27.9	LOS C	0.6	0.6	0.69	0.69	
P2	East Full Crossing	475	54.7	LOS E	1.6	1.6	0.97	0.97	
P3	North Full Crossing	1943	27.8	LOS C	4.7	4.7	0.71	0.71	
P4	West Full Crossing	239	54.2	LOS E	0.8	0.8	0.96	0.96	
All Pedestrians		2918	34.4	LOS D			0.77	0.77	

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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# LANE SUMMARY

## Site: 1 [Murray Street / Darling Drive - PM Peak \_2020]

Murray Street / Darling Drive - PM Peak \_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Murray Street South													
Lane 1	49	0.0	495	0.100	100	40.0	LOS C	2.2	15.2	Full	30	0.0	0.0
Lane 2	143	1.5	301	0.476	100	51.9	LOS D	7.8	55.1	Full	500	0.0	0.0
Approach	193	1.1		0.476		48.8	LOS D	7.8	55.1				
East: Darling Drive													
Lane 1	89	0.0	1446	0.062	100	5.9	LOS A	0.7	5.1	Full	500	0.0	0.0
Lane 2	315	0.7	547 <sup>1</sup>	0.575	100	30.7	LOS C	13.8	97.3	Full	500	0.0	0.0
Lane 3	213	2.0	198	1.072	100	149.1	LOS F	21.5	152.9	Short	50	0.0	NA
Lane 4	1	0.0	465	0.002	100	53.5	LOS D	0.1	0.1	Full	500	0.0	0.0
Approach	618	1.0		1.072		67.9	LOS E	21.5	152.9				
North: Murray Street North													
Lane 1	91	5.8	431	0.210	100	27.1	LOS B	2.9	21.4	Full	500	0.0	0.0
Lane 2	209	1.5	330	0.635	100	52.5	LOS D	11.6	82.3	Full	500	0.0	0.0
Approach	300	2.8		0.635		44.9	LOS D	11.6	82.3				
West: Pyrmont Bridge Road													
Lane 1	1	0.0	465	0.002	100	53.5	LOS D	0.1	0.1	Full	500	0.0	0.0
Lane 2	311	5.2	923	0.337	100	22.4	LOS B	10.5	76.9	Full	500	0.0	0.0
Lane 3	236	1.7	700 <sup>1</sup>	0.337	100	29.3	LOS C	9.9	70.2	Full	500	0.0	0.0
Lane 4	75	1.4	199	0.375	100	59.9	LOS E	4.2	29.8	Short	40	0.0	NA
Approach	623	3.4		0.375		29.5	LOS C	10.5	76.9				
Intersection	1734	2.2		1.072		48.0	LOS D	21.5	152.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

- <sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

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# MOVEMENT SUMMARY

## Site: 1 [Murray Street / Darling Drive - PM Peak \_2020]

Murray Street / Darling Drive - PM Peak \_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Murray Street South												
1	L2	49	0.0	0.100	40.0	LOS C	2.2	15.2	0.79	0.72	0.79	32.1
2	T1	99	1.1	0.476	50.4	LOS D	7.8	55.1	0.96	0.78	0.96	29.3
3	R2	44	2.4	0.476	55.0	LOS D	7.8	55.1	0.96	0.78	0.96	29.3
Approach		193	1.1	0.476	48.8	LOS D	7.8	55.1	0.91	0.76	0.91	30.0
East: Darling Drive												
4	L2	89	0.0	0.062	5.9	LOS A	0.7	5.1	0.20	0.56	0.20	46.4
5	T1	316	0.7	0.575	30.8	LOS C	13.8	97.3	0.81	0.69	0.81	35.2
6	R2	213	2.0	1.072	149.1	LOS F	21.5	152.9	1.00	1.33	2.06	16.1
Approach		618	1.0	1.072	67.9	LOS E	21.5	152.9	0.79	0.89	1.15	25.7
North: Murray Street North												
7	L2	91	5.8	0.210	27.1	LOS B	2.9	21.4	0.84	0.74	0.84	36.2
8	T1	111	1.0	0.635	50.4	LOS D	11.6	82.3	0.98	0.82	0.98	29.2
9	R2	99	2.1	0.635	55.0	LOS D	11.6	82.3	0.98	0.82	0.98	29.1
Approach		300	2.8	0.635	44.9	LOS D	11.6	82.3	0.94	0.79	0.94	30.9
West: Pyrmont Bridge Road												
10	L2	293	5.4	0.337	22.6	LOS B	10.5	76.9	0.63	0.73	0.63	38.0
11	T1	256	1.6	0.337	28.5	LOS C	10.5	76.9	0.76	0.65	0.76	35.9
12	R2	75	1.4	0.375	59.9	LOS E	4.2	29.8	0.97	0.76	0.97	27.4
Approach		623	3.4	0.375	29.5	LOS C	10.5	76.9	0.72	0.70	0.72	35.5
All Vehicles		1734	2.2	1.072	48.0	LOS D	21.5	152.9	0.80	0.79	0.93	30.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	173	31.0	LOS D	0.4	0.4	0.72	0.72	
P2	East Full Crossing	388	55.0	LOS E	1.3	1.3	0.97	0.97	
P3	North Full Crossing	1847	31.1	LOS D	4.7	4.7	0.75	0.75	
P4	West Full Crossing	207	54.6	LOS E	0.7	0.7	0.96	0.96	
All Pedestrians		2616	36.5	LOS D			0.80	0.80	

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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# LANE SUMMARY

## Site: 2 [Darling Drive / Pier Street - AM Peak\_2020]

Darling Drive / Pier Street - AM Peak\_2020  
Site Category: (None)  
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Darling Drive South													
Lane 1 <sup>d</sup>	285	7.7	744	0.383	100	9.7	LOS A	2.7	19.9	Full	500	0.0	0.0
Approach	285	7.7		0.383		9.7	LOS A	2.7	19.9				
East: Pier Street													
Lane 1	154	1.4	1502	0.102	100	3.0	LOS A	0.6	4.2	Short	30	0.0	NA
Lane 2 <sup>d</sup>	707	2.5	1542	0.459	100	8.3	LOS A	3.8	26.9	Full	500	0.0	0.0
Approach	861	2.3		0.459		7.3	LOS A	3.8	26.9				
NorthEast: Zollner Circuit													
Lane 1 <sup>d</sup>	35	15.2	827	0.042	100	5.0	LOS A	0.2	1.5	Full	75	0.0	0.0
Approach	35	15.2		0.042		5.0	LOS A	0.2	1.5				
North: Darling Drive North													
Lane 1 <sup>d</sup>	397	8.2	1117	0.355	100	4.1	LOS A	2.4	17.9	Full	500	0.0	0.0
Approach	397	8.2		0.355		4.1	LOS A	2.4	17.9				
Intersection	1578	5.1		0.459		6.9	LOS A	3.8	26.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

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# MOVEMENT SUMMARY

## Site: 2 [Darling Drive / Pier Street - AM Peak\_2020]

Darling Drive / Pier Street - AM Peak\_2020

Site Category: (None)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Drive South												
2	T1	146	10.1	0.383	7.6	LOS A	2.7	19.9	0.82	0.84	0.82	45.5
3a	R1	55	1.9	0.383	11.3	LOS A	2.7	19.9	0.82	0.84	0.82	28.8
3	R2	84	7.5	0.383	12.5	LOS A	2.7	19.9	0.82	0.84	0.82	45.8
Approach		285	7.7	0.383	9.7	LOS A	2.7	19.9	0.82	0.84	0.82	42.5
East: Pier Street												
4	L2	154	1.4	0.102	3.0	LOS A	0.6	4.2	0.31	0.40	0.31	47.7
6	R2	599	2.5	0.459	8.1	LOS A	3.8	26.9	0.43	0.59	0.43	46.0
6b	R3	108	2.9	0.459	9.1	LOS A	3.8	26.9	0.43	0.59	0.43	40.4
Approach		861	2.3	0.459	7.3	LOS A	3.8	26.9	0.41	0.55	0.41	45.8
NorthEast: Zollner Circuit												
24b	L3	33	16.1	0.042	4.9	LOS A	0.2	1.5	0.50	0.57	0.50	44.2
24a	L1	1	0.0	0.042	4.0	LOS A	0.2	1.5	0.50	0.57	0.50	46.4
26b	R3	1	0.0	0.042	10.2	LOS A	0.2	1.5	0.50	0.57	0.50	48.8
Approach		35	15.2	0.042	5.0	LOS A	0.2	1.5	0.50	0.57	0.50	44.4
North: Darling Drive North												
7b	L3	52	6.1	0.355	4.4	LOS A	2.4	17.9	0.53	0.52	0.53	44.1
7	L2	209	10.1	0.355	4.2	LOS A	2.4	17.9	0.53	0.52	0.53	46.9
8	T1	136	6.2	0.355	3.9	LOS A	2.4	17.9	0.53	0.52	0.53	48.2
Approach		397	8.2	0.355	4.1	LOS A	2.4	17.9	0.53	0.52	0.53	47.1
All Vehicles		1578	5.1	0.459	6.9	LOS A	3.8	26.9	0.51	0.60	0.51	45.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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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# LANE SUMMARY

## Site: 2 [Darling Drive / Pier Street - PM Peak\_2020]

Darling Drive / Pier Street - PM Peak\_2020  
Site Category: (None)  
Roundabout

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Darling Drive South													
Lane 1 <sup>d</sup>	314	0.3	899	0.349	100	8.2	LOS A	2.4	16.5	Full	500	0.0	0.0
Approach	314	0.3		0.349		8.2	LOS A	2.4	16.5				
East: Pier Street													
Lane 1	136	6.2	1445	0.094	100	3.1	LOS A	0.5	3.9	Short	30	0.0	NA
Lane 2 <sup>d</sup>	563	1.7	1517	0.371	100	8.1	LOS A	2.7	19.2	Full	500	0.0	0.0
Approach	699	2.6		0.371		7.1	LOS A	2.7	19.2				
NorthEast: Zollner Circuit													
Lane 1 <sup>d</sup>	101	0.0	773	0.131	100	6.1	LOS A	0.7	4.8	Full	75	0.0	0.0
Approach	101	0.0		0.131		6.1	LOS A	0.7	4.8				
North: Darling Drive North													
Lane 1 <sup>d</sup>	538	3.5	1277	0.421	100	3.5	LOS A	3.3	23.9	Full	500	0.0	0.0
Approach	538	3.5		0.421		3.5	LOS A	3.3	23.9				
Intersection	1652	2.3		0.421		6.1	LOS A	3.3	23.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

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# MOVEMENT SUMMARY

## Site: 2 [Darling Drive / Pier Street - PM Peak\_2020]

Darling Drive / Pier Street - PM Peak\_2020  
Site Category: (None)  
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Darling Drive South												
2	T1	162	0.0	0.349	5.9	LOS A	2.4	16.5	0.73	0.74	0.73	46.1
3a	R1	23	0.0	0.349	9.9	LOS A	2.4	16.5	0.73	0.74	0.73	29.2
3	R2	128	0.8	0.349	10.9	LOS A	2.4	16.5	0.73	0.74	0.73	46.5
Approach		314	0.3	0.349	8.2	LOS A	2.4	16.5	0.73	0.74	0.73	45.1
East: Pier Street												
4	L2	136	6.2	0.094	3.1	LOS A	0.5	3.9	0.33	0.41	0.33	47.7
6	R2	558	1.7	0.371	8.1	LOS A	2.7	19.2	0.41	0.59	0.41	46.2
6b	R3	5	0.0	0.371	9.1	LOS A	2.7	19.2	0.41	0.59	0.41	40.6
Approach		699	2.6	0.371	7.1	LOS A	2.7	19.2	0.39	0.56	0.39	46.4
NorthEast: Zollner Circuit												
24b	L3	99	0.0	0.131	6.1	LOS A	0.7	4.8	0.63	0.69	0.63	43.4
24a	L1	1	0.0	0.131	5.5	LOS A	0.7	4.8	0.63	0.69	0.63	45.3
26b	R3	1	0.0	0.131	11.7	LOS A	0.7	4.8	0.63	0.69	0.63	47.6
Approach		101	0.0	0.131	6.1	LOS A	0.7	4.8	0.63	0.69	0.63	43.4
North: Darling Drive North												
7b	L3	22	0.0	0.421	3.8	LOS A	3.3	23.9	0.48	0.45	0.48	44.6
7	L2	361	2.3	0.421	3.5	LOS A	3.3	23.9	0.48	0.45	0.48	47.2
8	T1	155	6.8	0.421	3.4	LOS A	3.3	23.9	0.48	0.45	0.48	48.4
Approach		538	3.5	0.421	3.5	LOS A	3.3	23.9	0.48	0.45	0.48	47.4
All Vehicles		1652	2.3	0.421	6.1	LOS A	3.3	23.9	0.50	0.57	0.50	46.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# LANE SUMMARY

## Site: 3 [Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020]

Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 112 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbour Street South													
Lane 1	64	14.8	255	0.252	100	49.7	LOS D	3.2	25.0	Full	500	0.0	0.0
Lane 2	54	13.6	272	0.199	79 <sup>5</sup>	45.6	LOS D	2.6	20.6	Full	500	0.0	0.0
Lane 3	54	13.6	272	0.199	79 <sup>5</sup>	45.6	LOS D	2.6	20.6	Full	500	0.0	0.0
Lane 4	49	14.9	255	0.194	100	49.1	LOS D	2.4	19.1	Short	32	0.0	NA
Approach	222	14.2		0.252		47.5	LOS D	3.2	25.0				
East: Goulburn Street													
Lane 1	349	2.4	789	0.443	100	25.4	LOS B	13.6	97.4	Full	500	0.0	0.0
Lane 2	273	2.4	617 <sup>1</sup>	0.443	100	24.2	LOS B	10.2	72.5	Full	500	0.0	0.0
Lane 3	161	3.1	208 <sup>1</sup>	0.773	100	55.1	LOS D	8.8	63.3	Short	30	0.0	NA
Lane 4	181	3.1	234 <sup>1</sup>	0.773	100	55.4	LOS D	10.0	71.8	Short	28	0.0	NA
Approach	964	2.6		0.773		35.6	LOS C	13.6	97.4				
North: Harbour Street North													
Lane 1	527	2.6	1326	0.398	100	7.2	LOS A	6.7	48.0	Full	500	0.0	0.0
Lane 2	560	0.0	514	1.089	100	118.8	LOS F	52.7	369.0	Full	500	0.0	0.0
Lane 3	538	5.7	494	1.089	100	119.1	LOS F	50.8	372.6	Full	500	0.0	0.0
Approach	1625	2.7		1.089		82.7	LOS F	52.7	372.6				
West: Pier Street													
Lane 1	336	5.7	940	0.358	100	21.0	LOS B	10.6	77.8	Full	500	0.0	0.0
Lane 2	336	5.7	940	0.358	100	21.0	LOS B	10.6	77.8	Short	90	0.0	NA
Lane 3	336	5.7	940	0.358	100	21.0	LOS B	10.6	77.8	Full	500	0.0	0.0
Lane 4	232	2.7	376	0.617	100	46.4	LOS D	11.8	84.5	Full	500	0.0	0.0
Lane 5	232	2.7	376	0.617	100	46.4	LOS D	11.8	84.5	Short	110	0.0	NA
Approach	1474	4.8		0.617		29.0	LOS C	11.8	84.5				
Intersection	4285	4.0		1.089		51.8	LOS D	52.7	372.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

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# MOVEMENT SUMMARY

## Site: 3 [Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020]

Harbour Street / Pier Street / Goulburn Street - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Coordinated Cycle Time = 112 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbour Street South												
1	L2	64	14.8	0.252	49.7	LOS D	3.2	25.0	0.92	0.75	0.92	27.5
2	T1	108	13.6	0.199	45.6	LOS D	2.6	20.6	0.91	0.69	0.91	29.0
3	R2	49	14.9	0.194	49.1	LOS D	2.4	19.1	0.91	0.73	0.91	26.2
Approach		222	14.2	0.252	47.5	LOS D	3.2	25.0	0.91	0.72	0.91	27.9
East: Goulburn Street												
5	T1	622	2.4	0.443	24.9	LOS B	13.6	97.4	0.75	0.65	0.75	34.6
6	R2	342	3.1	0.773	55.3	LOS D	10.0	71.8	0.98	0.91	1.16	26.5
Approach		964	2.6	0.773	35.6	LOS C	13.6	97.4	0.83	0.74	0.90	31.2
North: Harbour Street North												
7	L2	527	2.6	0.398	7.2	LOS A	6.7	48.0	0.36	0.64	0.36	41.6
9	R2	1098	2.8	1.089	118.9	LOS F	52.7	369.0	1.00	1.33	1.79	19.0
Approach		1625	2.7	1.089	82.7	LOS F	52.7	372.6	0.79	1.10	1.33	23.0
West: Pier Street												
10	L2	1009	5.7	0.358	21.0	LOS B	10.6	77.8	0.62	0.73	0.62	39.0
11	T1	464	2.7	0.617	46.4	LOS D	11.8	84.5	0.97	0.81	0.97	28.5
Approach		1474	4.8	0.617	29.0	LOS C	11.8	84.5	0.73	0.76	0.73	35.0
All Vehicles		4285	4.0	1.089	51.8	LOS D	52.7	372.6	0.79	0.88	1.00	28.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	222	6.9	LOS A	0.2	0.2	0.35	0.35	
P2	East Full Crossing	29	42.1	LOS E	0.1	0.1	0.87	0.87	
P3	North Full Crossing	7	48.3	LOS E	0.0	0.0	0.93	0.93	
P4	West Full Crossing	5	49.2	LOS E	0.0	0.0	0.94	0.94	
P4S	West Slip/Bypass Lane Crossing	5	27.2	LOS C	0.0	0.0	0.70	0.70	
All Pedestrians		269	13.1	LOS B			0.44	0.44	

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.



# LANE SUMMARY

 **Site: 3 [Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020]**

Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 107 seconds (Site User-Given Cycle Time)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Harbour Street South													
Lane 1	96	8.8	131	0.733	100	61.1	LOS E	5.4	40.4	Full	500	0.0	0.0
Lane 2	73	5.8	193	0.379	52 <sup>5</sup>	50.2	LOS D	3.7	27.3	Full	500	0.0	0.0
Lane 3	73	5.8	193	0.379	52 <sup>5</sup>	50.2	LOS D	3.7	27.3	Full	500	0.0	0.0
Lane 4	95	3.3	186	0.508	100	54.5	LOS D	4.9	35.3	Short	32	0.0	NA
Approach	337	5.9		0.733		54.5	LOS D	5.4	40.4				
East: Goulburn Street													
Lane 1	434	1.8	793	0.548	100	25.6	LOS B	17.1	121.9	Full	500	0.0	0.0
Lane 2	319	1.8	583 <sup>1</sup>	0.548	100	23.8	LOS B	11.7	83.1	Full	500	0.0	0.0
Lane 3	229	0.7	269 <sup>1</sup>	0.854	100	54.0	LOS D	12.5	87.8	Short	30	0.0	NA
Lane 4	252	0.7	295 <sup>1</sup>	0.854	100	53.9	LOS D	13.8	96.9	Short	28	0.0	NA
Approach	1235	1.4		0.854		36.2	LOS C	17.1	121.9				
North: Harbour Street North													
Lane 1	414	2.5	1195	0.346	100	7.1	LOS A	4.8	34.7	Full	500	0.0	0.0
Lane 2	493	0.0	590	0.835	100	46.8	LOS D	26.3	184.0	Full	500	0.0	0.0
Lane 3	484	2.4	580	0.835	100	46.9	LOS D	25.9	185.1	Full	500	0.0	0.0
Approach	1391	1.6		0.835		35.0	LOS C	26.3	185.1				
West: Pier Street													
Lane 1	320	1.6	926	0.346	100	21.4	LOS B	9.9	70.4	Full	500	0.0	0.0
Lane 2	320	1.6	926	0.346	100	21.4	LOS B	9.9	70.4	Short	90	0.0	NA
Lane 3	320	1.6	926	0.346	100	21.4	LOS B	9.9	70.4	Full	500	0.0	0.0
Lane 4	215	1.5	253	0.852	100	58.7	LOS E	12.4	87.9	Full	500	0.0	0.0
Lane 5	215	1.5	253	0.852	100	58.7	LOS E	12.4	87.9	Short	110	0.0	NA
Approach	1392	1.6		0.852		32.9	LOS C	12.4	87.9				
Intersection	4354	1.9		0.854		36.2	LOS C	26.3	185.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

<sup>5</sup> Lane under-utilisation found by the program

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# MOVEMENT SUMMARY



## Site: 3 [Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020]

Harbour Street / Pier Street / Goulburn Street - PM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 107 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbour Street South												
1	L2	96	8.8	0.733	61.1	LOS E	5.4	40.4	1.00	0.89	1.20	25.3
2	T1	146	5.8	0.379	50.2	LOS D	3.7	27.3	0.97	0.75	0.97	28.0
3	R2	95	3.3	0.508	54.5	LOS D	4.9	35.3	0.99	0.78	0.99	25.2
Approach		337	5.9	0.733	54.5	LOS D	5.4	40.4	0.99	0.80	1.04	26.4
East: Goulburn Street												
5	T1	754	1.8	0.548	24.8	LOS B	17.1	121.9	0.79	0.68	0.79	34.6
6	R2	481	0.7	0.854	54.0	LOS D	13.8	96.9	0.95	0.99	1.24	26.8
Approach		1235	1.4	0.854	36.2	LOS C	17.1	121.9	0.85	0.80	0.96	31.1
North: Harbour Street North												
7	L2	414	2.5	0.346	7.1	LOS A	4.8	34.7	0.36	0.63	0.36	41.7
9	R2	977	1.2	0.835	46.8	LOS D	26.3	184.0	0.99	0.95	1.12	30.7
Approach		1391	1.6	0.835	35.0	LOS C	26.3	185.1	0.80	0.85	0.89	33.3
West: Pier Street												
10	L2	961	1.6	0.346	21.4	LOS B	9.9	70.4	0.64	0.73	0.64	38.8
11	T1	431	1.5	0.852	58.7	LOS E	12.4	87.9	1.00	1.00	1.29	26.1
Approach		1392	1.6	0.852	32.9	LOS C	12.4	87.9	0.75	0.82	0.84	33.7
All Vehicles		4354	1.9	0.854	36.2	LOS C	26.3	185.1	0.81	0.82	0.91	32.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	464	5.2	LOS A	0.4	0.4	0.31	0.31	
P2	East Full Crossing	56	37.1	LOS D	0.1	0.1	0.83	0.83	
P3	North Full Crossing	41	47.7	LOS E	0.1	0.1	0.95	0.95	
P4	West Full Crossing	48	47.8	LOS E	0.1	0.1	0.95	0.95	
P4S	West Slip/Bypass Lane Crossing	48	25.0	LOS C	0.1	0.1	0.68	0.68	
All Pedestrians		658	15.1	LOS B			0.47	0.47	

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.



# LANE SUMMARY

## Site: 4 [Darling Drive / Ultimo Road - PM Peak\_2020]

Darling Drive / Ultimo Road - PM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 82 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Veh	Queue Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Car Park Access													
Lane 1	3	0.0	315	0.010	100	31.9	LOS C	0.1	0.7	Full	500	0.0	0.0
Approach	3	0.0		0.010		31.9	LOS C	0.1	0.7				
East: Ultimo Road East													
Lane 1	207	1.3	1320	0.157	100	4.9	LOS A	2.9	20.4	Full	500	0.0	0.0
Lane 2	207	1.3	1321	0.157	100	4.9	LOS A	2.9	20.4	Full	500	0.0	0.0
Lane 3	216	0.5	281 <sup>1</sup>	0.768	100	39.3	LOS C	8.6	60.3	Short	24	0.0	NA
Approach	629	1.0		0.768		16.7	LOS B	8.6	60.3				
North: Darling Drive North													
Lane 1	119	2.7	378	0.315	100	35.0	LOS C	4.1	29.6	Full	500	0.0	0.0
Lane 2	239	5.7	290	0.824	100	46.6	LOS D	10.6	77.9	Full	500	0.0	0.0
Approach	358	4.7		0.824		42.7	LOS D	10.6	77.9				
West: Ultimo Road West													
Lane 1	83	0.2	595	0.139	100	24.0	LOS B	2.3	16.4	Full	500	0.0	0.0
Lane 2	108	1.8	776	0.139	100	16.6	LOS B	2.7	19.3	Full	500	0.0	0.0
Approach	191	1.1		0.139		19.8	LOS B	2.7	19.3				
Intersection	1181	2.1		0.824		25.1	LOS B	10.6	77.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>1</sup> Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

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# LANE SUMMARY

## Site: 4 [Darling Drive / Ultimo Road - AM Peak\_2020]

Darling Drive / Ultimo Road - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 64 seconds (Site User-Given Phase Times)

Lane Use and Performance													
	Demand Total veh/h	Flows HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Car Park Access													
Lane 1	4	0.0	382	0.011	100	23.8	LOS B	0.1	0.7	Full	500	0.0	0.0
Approach	4	0.0		0.011		23.8	LOS B	0.1	0.7				
East: Ultimo Road East													
Lane 1	133	5.1	1149	0.115	100	5.6	LOS A	1.7	12.6	Full	500	0.0	0.0
Lane 2	133	5.2	1150	0.115	100	5.6	LOS A	1.7	12.6	Full	500	0.0	0.0
Lane 3	158	8.0	275	0.575	100	32.2	LOS C	4.9	36.4	Short	24	0.0	NA
Approach	423	6.2		0.575		15.5	LOS B	4.9	36.4				
North: Darling Drive North													
Lane 1	160	5.9	278	0.575	100	33.3	LOS C	4.9	36.3	Full	500	0.0	0.0
Lane 2	161	5.9	350	0.460	100	29.1	LOS C	4.6	33.7	Full	500	0.0	0.0
Approach	321	5.9		0.575		31.2	LOS C	4.9	36.3				
West: Ultimo Road West													
Lane 1	80	2.8	518	0.155	100	21.4	LOS B	1.9	13.4	Full	500	0.0	0.0
Lane 2	106	2.8	688	0.155	100	15.1	LOS B	2.3	16.3	Full	500	0.0	0.0
Approach	186	2.8		0.155		17.8	LOS B	2.3	16.3				
Intersection	935	5.4		0.575		21.4	LOS B	4.9	36.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Lane LOS values are based on average delay per lane.

Intersection and Approach LOS values are based on average delay for all lanes.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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: 4 [Darling Drive / Ultimo Road - AM Peak\_2020]

Darling Drive / Ultimo Road - AM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 64 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Car Park Access												
1	L2	2	0.0	0.011	24.6	LOS B	0.1	0.7	0.80	0.59	0.80	31.8
2	T1	1	0.0	0.011	21.2	LOS B	0.1	0.7	0.80	0.59	0.80	34.8
3	R2	1	0.0	0.011	24.6	LOS B	0.1	0.7	0.80	0.59	0.80	31.9
Approach		4	0.0	0.011	23.8	LOS B	0.1	0.7	0.80	0.59	0.80	32.5
East: Ultimo Road East												
4	L2	1	0.0	0.115	9.0	LOS A	1.7	12.6	0.44	0.36	0.44	37.8
5	T1	264	5.2	0.115	5.6	LOS A	1.7	12.6	0.44	0.36	0.44	37.7
6	R2	158	8.0	0.575	32.2	LOS C	4.9	36.4	0.97	0.81	0.99	31.7
Approach		423	6.2	0.575	15.5	LOS B	4.9	36.4	0.64	0.53	0.65	35.2
North: Darling Drive North												
7	L2	160	5.9	0.575	33.3	LOS C	4.9	36.3	0.97	0.81	0.99	31.8
8	T1	1	0.0	0.460	25.8	LOS B	4.6	33.7	0.91	0.79	0.91	32.9
9	R2	160	5.9	0.460	29.1	LOS C	4.6	33.7	0.91	0.79	0.91	33.0
Approach		321	5.9	0.575	31.2	LOS C	4.9	36.3	0.94	0.80	0.95	32.4
West: Ultimo Road West												
10	L2	75	2.8	0.155	21.6	LOS B	1.9	13.4	0.77	0.70	0.77	35.0
11	T1	112	2.8	0.155	15.2	LOS B	2.3	16.3	0.72	0.57	0.72	34.2
Approach		186	2.8	0.155	17.8	LOS B	2.3	16.3	0.74	0.62	0.74	34.5
All Vehicles		935	5.4	0.575	21.4	LOS B	4.9	36.4	0.77	0.64	0.77	34.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	1	7.0	LOS A	0.0	0.0	0.47	0.47	
P2	East Full Crossing	45	26.3	LOS C	0.1	0.1	0.91	0.91	
P3	North Full Crossing	171	20.5	LOS C	0.2	0.2	0.80	0.80	
All Pedestrians		217	21.6	LOS C			0.82	0.82	

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.



# MOVEMENT SUMMARY

## Site: 4 [Darling Drive / Ultimo Road - PM Peak\_2020]

Darling Drive / Ultimo Road - PM Peak\_2020

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 82 seconds (Site User-Given Phase Times)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Car Park Access												
1	L2	1	0.0	0.010	33.0	LOS C	0.1	0.7	0.84	0.59	0.84	29.8
2	T1	1	0.0	0.010	29.6	LOS C	0.1	0.7	0.84	0.59	0.84	32.3
3	R2	1	0.0	0.010	33.0	LOS C	0.1	0.7	0.84	0.59	0.84	29.8
Approach		3	0.0	0.010	31.9	LOS C	0.1	0.7	0.84	0.59	0.84	30.6
East: Ultimo Road East												
4	L2	1	0.0	0.157	8.3	LOS A	2.9	20.4	0.38	0.32	0.38	38.1
5	T1	413	1.3	0.157	4.9	LOS A	2.9	20.4	0.38	0.32	0.38	38.0
6	R2	216	0.5	0.768	39.3	LOS C	8.6	60.3	0.95	0.91	1.14	29.8
Approach		629	1.0	0.768	16.7	LOS B	8.6	60.3	0.57	0.52	0.64	34.7
North: Darling Drive North												
7	L2	119	2.7	0.315	35.0	LOS C	4.1	29.6	0.89	0.77	0.89	31.3
8	T1	1	0.0	0.824	43.3	LOS D	10.6	77.9	1.00	0.97	1.28	28.4
9	R2	238	5.8	0.824	46.6	LOS D	10.6	77.9	1.00	0.97	1.28	28.5
Approach		358	4.7	0.824	42.7	LOS D	10.6	77.9	0.96	0.90	1.15	29.4
West: Ultimo Road West												
10	L2	76	0.0	0.139	24.3	LOS B	2.3	16.4	0.74	0.69	0.74	34.1
11	T1	115	1.8	0.139	16.9	LOS B	2.7	19.3	0.67	0.54	0.67	33.7
Approach		191	1.1	0.139	19.8	LOS B	2.7	19.3	0.70	0.60	0.70	33.9
All Vehicles		1181	2.1	0.824	25.1	LOS B	10.6	77.9	0.71	0.65	0.81	32.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site 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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate	
P1	South Full Crossing	1	5.9	LOS A	0.0	0.0	0.38	0.38	
P2	East Full Crossing	55	35.3	LOS D	0.1	0.1	0.93	0.93	
P3	North Full Crossing	167	21.4	LOS C	0.3	0.3	0.72	0.72	
All Pedestrians		223	24.7	LOS C			0.77	0.77	

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.



**APPENDIX I - CONSTRUCTION TRAFFIC MANAGEMENT PLAN**



# **Construction & Environmental Management Plan**

Harbourside, Darling Drive, Sydney

Revision	Status	Date
1	FINAL	November 2016
2	Response to Submissions and Amended Proposal	August 2018
3	Updated Final	January 2020

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	General Terms
1.	Introduction
2.	CEMP 'Action List'
3.	Traffic Management Plan
4.	Noise and Vibration Management Plan
5.	Construction Waste Management Plan
6.	Erosion, Sediment Control and Soil Pollution
7.	Water <ul style="list-style-type: none"><li>- Stormwater Runoff</li><li>- Groundwater Seepage</li></ul>
8.	Air Quality and Odour Impacts
9.	Hazardous Materials
10.	Sustainability
11.	Workplace Risk Management
12.	Site Management Plan
	Appendix A: Location Plan
	Appendix B: Site Staging Plans
	Appendix C: Access and Egress Plan
	Appendix D: Traffic Management Plan
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[illegible]

# 1. Introduction

This Construction & Environmental Management Plan (CEMP) has been developed for inclusion in the State Significant Development Application (SSDA) to address the construction items related to the proposed development at Harbourside, Darling Drive, Sydney. In due course, the CEMP will address the Development Consent conditions in relation to construction and development works at Harbourside.

In addition, the CEMP outlines the actions and staging of construction deemed necessary to address the concerns of neighbouring properties, authorities and any other requirements, whilst maintaining a safe and productive construction site.

The CEMP is a commitment by Mirvac to ensure that the statutory obligations are fulfilled and that the project is delivered to the highest quality, safety and environmental standards.

The responsibility for the management of this document and the actions contained therein lies with the Construction Manager for the Project (name to be provided in due course). The CEMP will be monitored throughout the project construction phase until such time as all actions on the CEMP Action List are completed.

Since exhibition of the proposal and given the nature and range of submissions made from agencies and the public, Mirvac has been reviewing the overall approach and elements of the Concept Proposal. This has accordingly led to developing an Amended Concept Proposal. The final Concept Proposal therefore includes substantial amendments made by Mirvac pursuant to Clause 55 of the *Environmental Planning & Assessment Regulation*, in the main to address matters raised in the submissions and deliver an overall significantly improved outcome on the site and for the broader Darling Harbour precinct.

The following key amendments have been made to the proposal:

## **Relocation of the Tower**

The tower element of the Concept Proposal has been relocated from the north of the site to the centre of the site (the widest part of the site) to allow for an increased setback from the heritage listed Pyrmont Bridge, improved relationship to the waterfront and ICC Hotel, to minimise view impacts from 50 Murray Street, together with reducing overshadowing impacts on the public domain and improved solar amenity to the northern end of the retail centre.

## **Reduction in Height of the Tower**

The height of the tower has also been reduced from RL 166.35 to RL 153.75. The reduction in the height will minimise overshadowing impacts to the public domain as well better relate to the height of the ICC Hotel.

## **Reduction in Height of the Podium**

A portion of the podium height at its northern extent has been partly reduced from 30.5 RL to RL 25. The reduction in height provides for improved view sharing from 50 Murray Street.

## **Removal of Tower 'Tail' element**

As part of the relocation of the tower and refinement of the podium, the stepped form of the lower tower element has now been removed. This design move has been made in order to again improve views from adjacent buildings from the west.

## **Building Footprint of the Tower**

The building footprint of the tower has increased in width, to accommodate the floorspace from the reduction in height of the tower and removal of the 'tail'.

## **Gross Floor Area / Land Use Mix**

The amended proposal retains the same overall 87,000sqm of GFA, however there is a minor adjustment in the split between non-residential and residential:

Non-residential uses floor space – 49,000sqm; and

Residential uses floor space – 38,000sqm

In response to market demand and the focus of local and regional strategic planning policies, it is proposed for the podium to include both retail and commercial land uses. Indicatively, comprising ~23,000,000sqm lettable area of commercial and ~21,000sqm gross lettable area of retail.

The podium enables large campus sized commercial floor plates that are favoured by large multinational tech, finance and professional services companies.

### **Apartment numbers**

As a result of a review of the mix and sizing of apartments, there is a minor reduction in the indicative number of apartments, from 364 to 357. Note, this yield is on the 'Indicative Design' only and will be subject to future design development and a Stage 2 DA. This Stage 1 DA only seeks approval for land uses and the building envelope comprising a total of 87,000sqm GFA.

### **Car Parking Spaces**

The extent of the basement will remain the same, but there has been a minor increase of 11 car parking spaces from 295 spaces to 306 spaces. As above, this is based on the 'Indicative Design' only.

### **Landscaped Open Space and Public Domain**

All of the key concepts and public benefits as originally proposed are retained under the amended Concept Proposal, with the addition of further landscaping opportunities on the northern rooftop extent of the retail podium, further enhancing views and outlook from 50 Murray Street.

The final Concept Proposal seeks approval for the following key components and development parameters:

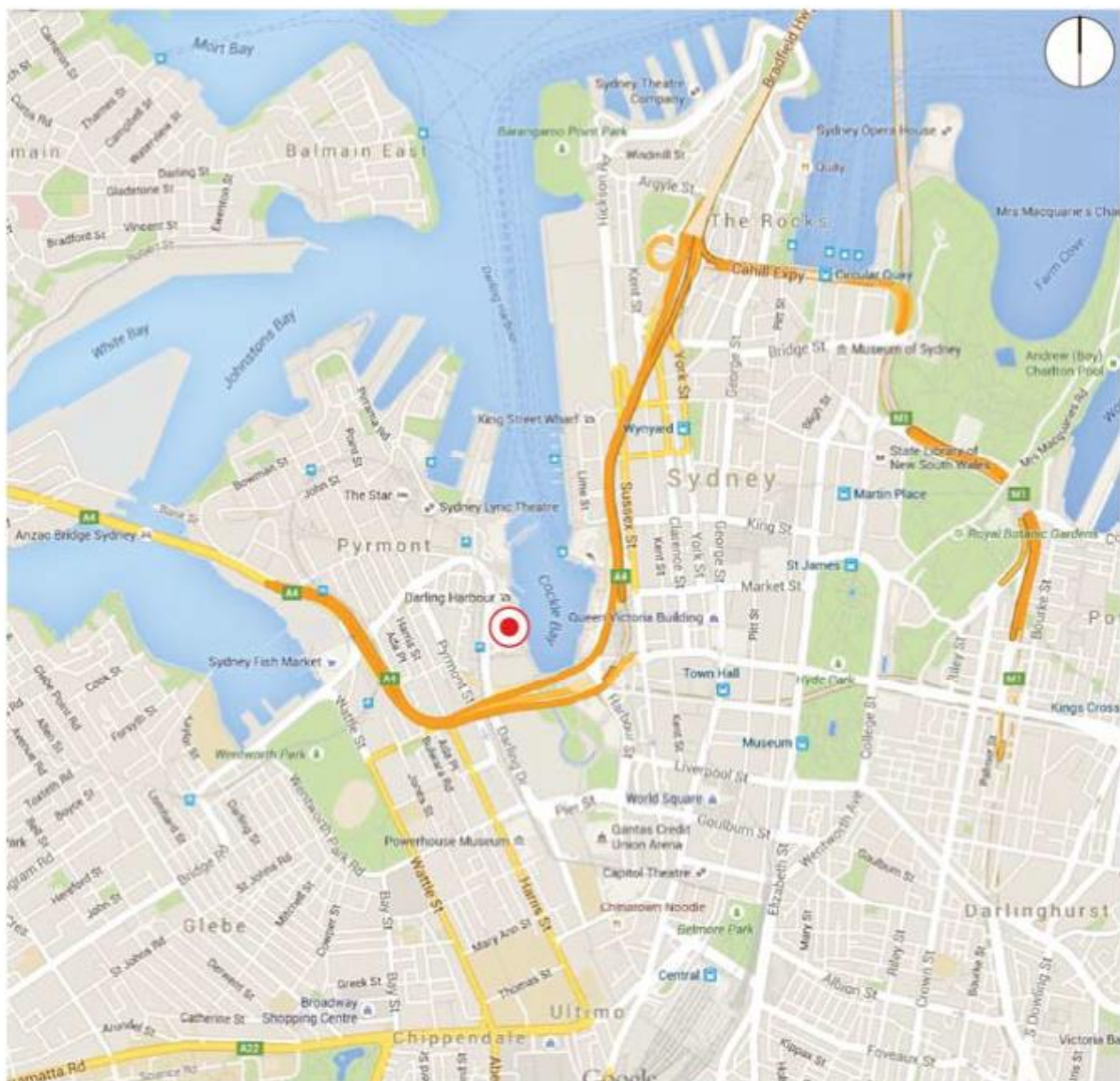
- Demolition of existing site improvements, including the Harbourside Shopping Centre, pedestrian bridge link across Darling Drive, obsolete monorail infrastructure, and associated tree removal;
- A network of open space areas and links generally as shown within the Public Domain Concept Proposal, to facilitate re-integration of the site into the wider urban context;
- Building envelopes;
- Land uses across the site, non-residential and residential uses;
- A maximum total Gross Floor Area (GFA) across the Harbourside site of 87,000sqm for mixed use development (49,000sqm non-residential and 38,000sqm residential development);
- Basement car parking;
- Car parking rates to be utilised in subsequent detailed (Stage 2) Development Applications);
- Urban Design and Public Realm Guidelines to guide future development and the public domain; and
- Strategies for utilities and services provision, drainage and flooding, and ecological sustainable development.

## 1.1 Project Overview

Harbourside is a Sydney shopping centre with a strong tourist and food catering focus, occupying a strategic harbour front location with unparalleled views east to Sydney CBD. The site is located within the Sydney CBD on the western side of the Darling Harbour precinct. It is located to the immediate south of Pyrmont Bridge and north of the Sydney International Convention, Entertainment and Exhibition Centre/ Sydney Sofitel Hotel. The site is bounded by Darling Harbour Drive and the alignment of the Light Rail to the west, and the waterfront promenade to Darling Harbour to the east.

The Site is located within the City of Sydney local government area (LGA). A locational context area plan and location plan are provided at Figures 1 and 2 below.

The Darling Harbour precinct is undergoing significant redevelopment as part of the SICEEP and Darling Square renewal project. The urban, built form and public transport / pedestrian context for Harbourside will fundamentally change as these developments are progressively completed.



● The Site

**Figure 1. Locational Context Area Plan.**

The Land is contained in Auto Consol 8663-98 (comprising Lots 1-10, 12-15 and 17 in Deposited Plan 776815). The Deposited Plans indicate the site comprises 15 adjoining lots which form an irregular shaped site with a frontage to Cockle Bay of approx. 270 metres and a total area of 20,542 square metres (2.054 hectares). The ground floor land footprint comprises around 18,425 square metres.

The site is generally inclusive of the shopping centre land itself, the loading dock area and associated driveways, the overhead vehicular bridge from level 3 of the centre to the car park, part of the entry area off Pyrmont Bridge and the former Monorail station (but not including the pedestrian bridge to the Ibis/Novotel Hotels). Figure 2 provides an aerial image identifying the Harbourside site.

A summary of the proposed development is detailed as follows:

- Demolition of existing Monorail Station
- Demolition of Novotel Bridge Link
- Retention of Ibis/ 50 Murray Street Bridge Link
- Demolition of existing Shopping Centre
- Construction of Bunn Street Bridge
- Construction of Basement Levels to suit 306 Car Parking spaces
- Construction of a Retail/ Commercial Podium comprising of approximately 49,000sqm of GFA.
- Construction of a Residential Tower comprising of approximately 38,000sqm of GFA.
- Public domain works that integrates with the Sofitel Sydney Darling Harbour and adjoining SICEEP facilities, revitalises the pedestrian interface to Darling Harbour and provides for new connections between Darling Harbour and both Pyrmont and the Sydney CBD (via Pyrmont Bridge)



**Figure 2:** Aerial View of the site

## 1.2 Hours of Work

The anticipated hours of work pending approval for construction works, including the delivery of materials to and from the sites within the precinct, are as follows:

- Between 7:00 am and 6:00 pm, Mondays to Fridays inclusive.
- Between 7:00 am and 5:00 pm, Saturdays.
- No work will be carried out on Sundays and Public Holidays.

Works outside these times are subject to agreement and approval by Council or the relevant approving authority, however noting that it is anticipated that the demolition of the Monorail Station and Novotel and IBIS bridges will require out of hours working.

### **1.3 Contact Details**

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The Construction Manager for the Project will be confirmed in due course.

## **2 CEMP ‘Action List’**

The “CEMP Action List” forms the basis of the Harbourside CEMP. The Action List responds to a series of anticipated DA conditions that are to be addressed prior to and during the construction phase of the project. They further address any Authority requirements as well as taking into consideration the concerns of neighbouring building occupiers.

The Action List provides a means by which responsibilities of the project team can be readily identified and monitored.

In addition to the Action List are a series of attachments which contain more detailed information in the form of checklists, registers, templates and reports. The attachments contain the information and tools that must be implemented during the construction phase in order to close out the specific items and ultimately satisfy the DA conditions associated with the project.

## 3 Traffic Management Plan

### 3.1 Introduction

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Mirvac have engaged Arcadis as the traffic management consultant for Stage 1 of the DA submission. Arcadis produced an initial high level report measuring the existing traffic flows and the anticipated increased traffic volumes as a result of the proposed redeveloped Harbourside. Pending the approval of the Stage 1 DA, Mirvac will prepare and issue a Stage 2 DA. A Traffic Management Consultant will be commissioned to develop a detailed Traffic Management Plan (TMP) for the Harbourside project – This will be contained within Appendix D.

The traffic management plan for the project shall deal with the issues of construction traffic, their effect on the surrounding environment and be prepared prior to the issue of the Construction Certificate.

### 3.2 Access and Egress to site

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#### Vehicles

During mobilisation, demolition, earthworks and construction the construction related traffic will enter the site off a road via Darling Drive. The temporary construction access route runs adjacent to the light rail line then under Darling Drive. By implementing this access system Darling Drive will remain open for the duration of the project (except potentially for the demolition of the Monorail Station and bridges).

Exit points on each site will be manned by qualified Traffic Controllers who will be responsible for managing both vehicular and pedestrian traffic movements.

A hoarding will be erected around the perimeter of the site and will be capable of having graphics installed.

#### Public Transport Access

All site workers and visitors to site shall be actively encouraged to take public transport to and from the Harbourside Site. Town Hall train station is located within 900 metres of the site and will enable the majority of site workers to travel by train. There are also bus services which run regularly from surrounding areas.

#### Pedestrians

All site workers and visitors shall enter and exit the sites via one of the following entry/exit points:

- Secured door on eastern side of Darling Drive adjacent to light rail line
- Secured door on western side of Darling Drive adjacent to current shopping centre site

### 3.3 Loading and Unloading of Materials

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There will be several designated areas for deliveries and the loading / unloading of materials on the sites. These will be further developed and detailed in an Access and Egress Plan which will form Appendix C. As a principal it is anticipated that the main unloading area will be under and adjacent to Darling Drive within the existing loading dock and traffic routes of the shopping centre. Other key principles will be as follows;

- All loading and unloading operations are to comply with statutory requirements;
- No materials will be stored on public footpaths or roads;
- All entering and exiting of vehicles to work zones shall be supervised by a Traffic Controller. Flow to all lanes of Traffic shall remain mostly unimpeded in accordance with Council and DA requirements.
- Should any lane closures be required, a relevant traffic management plan will be compiled along with any required permits and stakeholders / residents notified where required.
- As noted above, these points are all subject to Council and Authority approval and, these proposals may require amendment prior to the works being undertaken.

### 3.4 Truck and Vehicle Routes:

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The routes for all trucks and vehicles proceeding to and exiting from the site will be identified in Appendix B, construction staging plans and the TMP.

All major deliveries will enter and exit the Harbourside site via Darling Drive. Signage will be installed within the precinct to direct all deliveries to the correct sites. All vehicles upon entry to the precinct for the first time must complete a truck driver's declaration or complete a site induction to ensure compliance with the site rules.

### 3.5 Disruption to Traffic Flows

The primary goal of the TMP will be to mitigate any disruptions to traffic flow around the Harbourside site and in the surrounding areas. Trucks and vehicles using Darling Drive must be marshalled within the site boundaries and will not be permitted to stop or wait in Darling Drive prior to entering site.

All non-critical deliveries will be scheduled outside peak traffic periods where possible.

### 3.6 Pedestrian and Traffic Management

Signage will be established at the precinct entry and exit points to alert pedestrians and other drivers to the movement of construction traffic. Where required, traffic control personnel will control the movement of large vehicles to and from the sites.

Visitors to the sites will be escorted at all times by Mirvac Site Staff and will be provided with a defined entry path from the point of entry.

### 3.7 Site Safety Plan

A Mirvac Site Specific Workplace Risk Management Plan (WRMP), will be implemented prior to the commencement of construction and be updated from time to time to reflect the current stage of site works.

All works throughout the construction process will be required to comply with the TMP, statutory requirements, and the Mirvac WRMP.

### 3.8 Site Specific Issues

#### 3.8.1 *Public Pedestrian Access*

Pedestrian access and movement around the Harbourside site will be of high importance during all stages of construction, and is anticipated to change as surrounding construction works are completed i.e. ICC. Detailed pedestrian access routes will be identified and highlighted in the TMP, which will form Appendix B. All pedestrian routes shall be clearly defined with signage and delineated from vehicular traffic routes where required. Pedestrian access to adjacent buildings and sites will be maintained for the duration of construction works.

### 3.9 Construction Staging, Description and Duration

The following is a summary of the proposed construction staging and estimated durations for the project;

Element	Description	Duration
1. Site Establishment	Set up hoardings and site amenities	TBC, pending final Stage 2 DA approved design
2. Demolition	Demolition of Monorail Station, Novotel Bridge Link and Ibis Bridge Link and existing shopping centre	TBC, pending final Stage 2 DA approved design
3. Earthworks	Foundation Piling, bulk excavation, detailed excavation and in-ground services	TBC, pending final Stage 2 DA approved design
4. Construction	Substructure	TBC, pending final Stage 2 DA approved design
	Superstructure	TBC, pending final Stage 2 DA approved design
	Façade, Services, Finishes and Finalisation	19 M TBC, pending final Stage 2 DA approved design

### 3.10 Plant & Equipment

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The following is a summary of the types of plant and equipment that will be utilized on the project:

- Articulated flatbed truck for delivery of site sheds and hoarding materials.
- Articulated float / low loader for delivery of earth moving equipment such as excavators, dozers, dump trucks and piling rigs.
- Truck and trailers for the exportation of excavated material off site.
- Concrete trucks for delivery of ready mix concrete.
- Mobile cranes, of various size, for erection of site amenities, tower cranes and miscellaneous lifting.
- Prime mover and enclosed flatbed trailer for delivery of materials.
- Medium rigid vehicles, small rigid vehicles, vans and couriers to deliver smaller materials.
- Multiple tower cranes erected during the detailed excavation phase and early structure phase. Man / material hoists to be erected during the tower structure works.

### 3.11 Truck Movements

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A detailed analysis of truck movements will be established with numbers (at Stage 2 DA) to be finalised around the following activities;

- Demolition Waste – trucks per day
- Export off site of m3 / day by truck and trailer.
- Concrete trucks for piling
- Construction of foundation & sheet piles.
- Number of trucks per day during busiest concrete pour days

## 4 Noise and Vibration Management Plan

### 4.1 Introduction

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Renzo Tonin & Associates have been engaged to provide a high level acoustic report for the Stage 1 DA. For the Stage 2 DA an Acoustic Consultant will be engaged to prepare a detailed Construction Noise and Vibration Management Plan (NVMP) for the project, which will form Appendix E of this CEMP. The management plan provides guidelines to reduce noise and vibration impacts to nearby affected tenants, residents and asset owners during construction works. The NVMP primarily deals with the issues of vibration and noise generating activities and their locations.

The NVMP has been compiled in accordance with the NSW Interim Construction Noise Guideline (ICNG, 2009) and through consultation with neighbouring landowners.

Mirvac will comply with the obligations provided in the NVMP and also commits to the Noise and Vibration Control Measures detailed within this section of the CEMP.

### 4.2 Project Objective

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The principal objectives of the NVMP:

- Identification of the noise and vibration standards which will be applicable to this project.
- Formulation of a strategy for construction to comply with the standards identified in the NVMP.
- Development of a monitoring programme to measure and regulate noise and vibration at potentially affected locations if required.
- Liaise with neighbouring building owners.

### 4.3 Noise Criteria

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The criteria for noise from construction activities on this project will maintain reasonable levels within the site and surrounding buildings. The noise criteria is outlined in the NVMP.

Further to this, specific noise criteria relating to noise limits, the time and extent of works and monitoring shall be agreed between Mirvac and the adjacent landowners. This specific criteria shall be included within the Noise and Vibration Monitoring Plan.

#### **4.4 Vibration Criteria**

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The criteria for vibration from construction activities on this project will maintain reasonable levels within the site and surrounding buildings. The vibration criteria is outlined in the NVMP.

#### **4.5 Control of Construction Noise and Vibration**

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As part of the NVMP, a review will be undertaken of each of the proposed activities which will occur as a part of the construction works on this project. The execution of this work will confirm the effectiveness of ongoing noise control strategies for this project. In addition, the site working hours will be enforced and all works carried out in accordance with regulatory codes, practices and legislation.

#### **4.6 Noise and Vibration Control Methods**

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The following Noise Management Measures to reduce the impact of construction noise and vibration shall be implemented:

- Carry out community consultation;
- Noise barriers such as site hoarding to be erected as soon as practical; Establish background noise and vibration levels prior to any construction works commencing;
- Include relevant noise and vibration components within site inductions and pre-start meetings;
- Monitor behavioural practices;
- Carry out short-term attended noise and vibration measurement of key activities during works to evaluate emissions, the effectiveness of work practices and identify opportunities for additional mitigation measures;
- Establish and implement appropriate complaints handling procedures;
- Manage approved construction working hours;
- Where possible, select low noise and vibration emitting plant and equipment.
- Where possible, use silencing devices to reduce sound emission from plant and equipment that exceed noise criteria.
- Establish regular maintenance of plant and machinery to ensure operating at optimum levels.

Further details regarding the proposed noise controls and management measures will be contained within the Noise and Vibration Monitoring Plan in Appendix E.

#### **4.7 Establishment of Direct Communication with Affected Parties**

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Continual communication is required between all parties that may be affected by the development. A Community Liaison Officer shall form part of the project team and shall co-ordinate / communicate with all parties, stakeholders and residents. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

Informing local residents is typically a critical aspect in reducing complaints regarding construction noise. The objective in undertaking a consultation process is to:

- Inform and educate the groups about the project and the noise controls being implemented.
- Increase understanding of all acoustic issues related to the project and options available.
- Identify group concerns generated by the project, so that they can be addressed.
- Provide advice about the time and duration of potential noisy activities.

#### **4.8 Noise Complaint Procedure**

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Mirvac has in place a specific procedure in relation to the handling of noise related issues. When a noise related complaint is brought forward, the specific details will be recorded on the Mirvac community contact register form. The details will then be reviewed by the site manager. The site manager then makes an assessment of the complaint against our construction guidelines in relation to approved working hours, development consent conditions, noise levels and any other relevant items relating to the matter. Mirvac will close out accordingly within 48 hours.

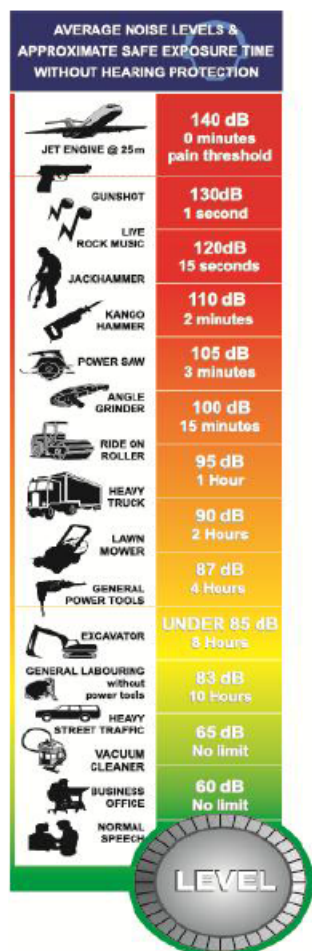
If a breach of the guidelines and restrictions is found then further action will be taken to resolve the issue. If a suitable outcome cannot be achieved then a suitable acoustic and vibration engineer will be consulted to review and respond to the noise complaint. Further notification will then be provided to the complainant of the course of action to be taken to resolve the matter. A copy of Mirvac's noise control policy can be found below.



## NOISE CONTROL POLICY

Mirvac is committed to ensuring that its workplaces are free from noise and vibration levels which have the potential to adversely affect human health. This includes the monitoring of noise exposure and peak noise levels at temporary, new or existing workplaces, where noise is identified as a risk and the implementation of noise control measures where adverse levels are identified.

Noise can result in hearing loss based on either the intensity of the noise level, i.e. a peak of more than 140dB(C); or noise levels which exceed an 8 hour noise level equivalent of 85dB(A). As an employer or controller at workplaces where these levels may be exceeded, Mirvac will instigate noise control measures that include:



- > the identification of actual and potential exposure to noise in the workplace by conducting noise assessments or monitoring where identified as a risk
- > assessment of the risks to health and safety of potential or actual exposure to noise
- > the potential impact of noisy works on nearby neighbours or the surrounding community, strict adherence to any hours of operation imposed by local government or other development condition
- > outline of the responsibilities for noise control and information on the risk of noise exposure in workplace inductions
- > procurement of plant and equipment which does not adversely impact on noise levels
- > wherever practicable the implementation of control measures such as encapsulation or isolation of noisy works or plant and equipment to minimise reliance on personal protective equipment and the impact of noise on surrounding workers or others
- > use of personal protective equipment by employees, workers, service providers, visitors, surrounding workers or others who undertake, or are situated close to noisy work
- > the identification of noisy areas or plant and equipment with warning signage to alert personnel of the requirement for the use of personal protective equipment
- > display of the Mirvac Sound Advice Poster at all workplaces where noise is identified in risk and opportunity planning
- > employees or other workers frequently required to use personal protective equipment to protect against the risk of hearing loss associated with noise that exceeds the exposure standard will be monitored by their employer through audiometric testing

Mirvac is committed to assisting industry sectors in which it operates to reduce the instance of noise related hearing loss through ongoing implementation of the Mirvac Group Noise Management Procedure at all Mirvac workplaces. Implementation of this policy and the Mirvac Group Noise Management Procedure by Mirvac personnel is unconditional.

*Susan Lloyd-Hurwitz*  
 Susan Lloyd-Hurwitz  
 CEO and Managing Director

### NOISE CONTROL POLICY

This policy is not intended to be contractual in nature and does not impose any contractual obligations on Mirvac. Mirvac reserves the right at its sole discretion to vary, replace or cancel this policy at any time.

Policy Authorised by: Executive Leadership Team	Date last amended: 23.01.2013 To be reviewed within three years of this date
Policy Maintained by: Corporate Services HSE Department	MG-CS-HSEPOL7.2-E 0113

## 5 Construction Waste Management Plan

A Waste Management Plan will be developed by a fully licensed Waste Contractor, for the removal of waste generated by construction works on site. Periodic review of this waste management plan will be undertaken to ensure continual compliance with environmental regulations and standards. Waste types likely to be generated on the site include the following:

- General Waste;
- Putrescible waste (lunch room waste from site personnel);
- Cardboard & White Paper (amended plans & drawings);
- Bottles, Cans & Plastics;
- Steel / Concrete / Bricks / Tiles / Timber & Gyprock.

The waste subcontractor will supply builder's waste bins for the onsite collection and storage of general waste material. It is required that the waste facility will recycle a minimum of 95% of the material brought to their recycling depot.

Upon arrival at the facility, the waste is sorted into various categories. Once the product has been sorted into its various categories, the facility then processes the individual recyclable waste streams into reusable products available for re-sale to the public as described below:

- Concrete is crushed, pulverized and sold as recycled aggregate;
- Bricks are also crushed, pulverized and sold as recycled road base;
- Timber is chipped and sold as mulch for garden beds and ground cover;
- Steel is sent to either Metalcorp or Simsmetal for recycling;
- Plasterboard is broken down to a gypsum product and sold to farmers as a soil additive;
- Cardboard & White Paper Recycling to Amcor for recycling;
- Bottles, Cans & Plastics Recycling to Visy for recycling.

Waste generated at the workplace shall be avoided or recycled wherever practical. Mirvac have implemented a Waste Management Plan and it is described as follows:

- material is reused wherever practicable, in particular top soil
- the establishment of a workplace waste management area(s) for sorting and segregating waste where available space allows;
- participation in waste minimisation training for all workplace personnel;
- recyclable materials are reprocessed wherever practicable, e.g. plasterboard off cuts, steel reinforcement and concrete;
- contractors identify areas where they can reduce waste and reuse materials in their respective trades ( waste avoidance initiatives to be provided by each Service Provider in the JSEA);
- prescribed waste, e.g. hazardous or contaminated material, asbestos, aqueous waste (paint washout residue/sludge), shall be removed by a licensed contractor and dockets retained at the workplace for audit verification purposes;
- pollution and damage to the environment is prevented; and
- The safety and health of employees, Service Providers and the public is protected.

The figure below details the general principles for prevention of waste.



**Figure 3:** Waste prevention principles

## 6 Erosion, Sediment Control and Soil Pollution

An Erosion and Sediment Control Plan will be implemented on the project. Below are items that as a minimum will be included in the Erosion and Sediment Control Plan:

- All stormwater pits around the perimeter of the site will be covered using filter fabric and sand bags.
- Filter fabric and sand bags shall also be installed around piling activities which are adjacent to public roadways or pedestrian footpaths in order to contain spoil arisings. These shall be regularly maintained to ensure no spoil or concrete migration onto public areas.
- During excavation, a wash down facility will be installed to wash down the tyres and wheel arches of any trucks exiting the excavation zone.
- All construction work zones and loading areas that are trafficked by vehicles are to be regularly swept / washed-down to maintain a clean surface and keep surrounding roads clean.
- Stockpiling of excavated material shall be carried out in a manner to limit sediment migration and water run-off. Stockpiled material to be appropriately covered where deemed necessary to prevent erosion and / or odour migration.
- The use of temporary sediment / silt fencing to ensure erosion and sediment particles do not enter public access ways or surrounding waterways.
- Vehicles leaving the site will secure and cover their loads. All trucks will be inspected prior to leaving the site (where applicable)
- All roads and pedestrian footways surrounding the site will be swept clean as required to remove any debris associated with the works on the site.
- A Dewatering Management Plan shall be compiled to outline the requirements for dewatering and any water treatment that may be required. Following any required treatment of water and verification testing, it shall be pumped to sewer and/or stormwater in accordance with Office of Water and Sydney Water requirements.

## 7 Water Quality

### General Water Quality inc; Groundwater Seepage

- During excavation, a wash down facility will be installed to wash down the tyres and wheel arches of any trucks exiting the excavation zone.
- A Dewatering Management Plan shall be compiled to outline the requirements for dewatering and any water treatment that may be required. Following any required treatment of water and verification testing, it shall be pumped to sewer and/or stormwater in accordance with Office of Water and Sydney Water requirements.
- Due to the location of Harbourside a detailed Dewatering Management Plan shall be prepared and implemented by a suitably qualified and experienced person (s) and include but not limited to addressing the following elements;
  1. Dewatering technique
  2. Profile and radius of the water table
  3. Quality of dewatering liquid
  4. Evaluation of the need for treatment of the extracted water and its viability before release to the environment
  5. Risks of disturbing acid sulfate soils
  6. Discharge consent conditions
  7. Results of consultation with any local residents and business affected.

### Stormwater Runoff

- Where required a Surface Water Quality Monitoring Program (SWQMP) shall be prepared and implemented to monitor impacts on surface water quality and resources during construction and operation. It shall be prepared by a suitably qualified and experienced person (s) and include but not limited to:
  - Identification of works and activities during construction which may have the highest risk of impacts on water quality (e.g. exposure of soils during earthworks, accidental leaks or spills of chemicals, disturbance of contaminated land, stormwater runoff).
- All stormwater pits around the perimeter of the site will be covered using filter fabric and sand bags.
- Management strategies will be put in place to address any environmental issues arising during the operation of the dewatering project. This should include design measures to minimise the impact of local stormwater on the dewatering operation.
- All construction work zones and loading areas that are trafficked by vehicles are to be regularly swept / washed-down to maintain a clean surface and keep surrounding roads clean.
- The use of temporary sediment / silt fencing to ensure erosion and sediment particles do not enter public access ways or surrounding waterways.

## 8 Air Quality and Odour Impacts

Air quality monitoring will be carried out throughout the excavation phase of the Project. This will be limited to excavation phases of the Project with additional monitoring required being assessed on a monthly basis.

Dust created by construction related activities, typically becomes more prominent during windy conditions, and will be dealt with by way of water suppression. Other measures for dust suppression include:

- Stockpiles of spoil to be covered and/or emulsion spray added to stockpile;
- In windy conditions, the frequency of water suppression will be increased;
- The construction site will be maintained and kept clean. Where suitable, the use of mechanical sweepers and covered waste bins will be utilised;
- Completed surfaces will be kept clean;
- Controlled site access will be maintained with vehicle wash down / clean down facilities to be established to maintain access roads;
- All materials transported from site in trucks will be appropriately covered.

Air quality monitoring devices will be installed to neighbouring buildings, or in sensitive areas, if required following consultation with stakeholders and assessment by suitably qualified professionals.

### Odour Impacts

Stockpiling of excavated material shall be carried out in a manner to limit sediment migration and water run-off. Stockpiled material to be appropriately covered where deemed necessary to prevent erosion and / or odour migration

## 9 Hazardous Materials

### 9.1 Existing Site Survey

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A hazardous material inspection survey and report shall be completed for all areas within the project boundary.

The survey shall involve a visual inspection of representative construction materials, on-site testing of suspected materials and the collection and analysis of additional unidentified suspected asbestos-containing materials (ACM) in order to update the hazardous materials register for the site.

### 9.2 Hazardous Materials Controls and Monitoring

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Prior to commencement, asbestos monitoring devices will be established to adjacent properties, in locations to be agreed with the building owner / manager.

Removal of any hazardous materials will be in strict accordance with Codes of Practice for the safe removal of the relevant hazardous materials. All hazardous materials removal works will be completed by licensed contractors.

All hazardous materials disposal will be recorded. All records will include vehicle details, material type, when it was removed, and where it was disposed.

### 9.3 Dust Emission's Monitoring

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Dust monitoring devices will be established to adjacent properties, in locations to be agreed with the building owner / manager.

### 9.4 Hazardous Materials Clearance

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Air monitoring results and clearance certificates shall be provided at regular intervals (minimum weekly) by Mirvac during any hazardous materials and remediation phases.

All certification shall be provided by a NATA accredited consultant.

Construction works will not commence until hazardous materials clearance has been received.

### 9.5 Ground Contamination

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Mirvac shall implement a Remedial Action Plan (RAP) to identify and manage the remediation process on site, obtain a Remediation and Validation Report and Site Auditor sign off prior to completion.

### 9.6 Goods Stored on Site During Construction

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During construction, Mirvac will implement as part of the Work Risk Management Plans and audit procedures, a hazardous materials register which will include the following materials / procedures:

- Fuels required for running of plant and equipment, these fuels will include: unleaded petrol, diesel and gas. All fuel will be contained and bounded as required under EPA guidelines, Department of Environment Climate Change and Work Cover requirements.
- Refuelling procedures and designated areas will be implemented and allocated to eliminate risks associated with spills and also identify procedures to contain spills.
- Spill kits and adequate training will be provided to relevant construction staff and at locations identified as storage and refuelling.

Dangerous goods to be stored on site will also include; oxyacetylene, bonding agents etc and as per the fuels listed above, these will also be stored as required under relevant Australian Standards, EPA guidelines, Department of Environment Climate Change and Water, Work Cover requirements and Industry codes of practice.

Hazardous substances and dangerous goods will be stored in secure well ventilated areas. At all times, Mirvac will have regard to the storage and hazardous materials and their proximity of neighbouring properties.

Mixed class gas cylinders, e.g. oxy and acetylene, will be separated from other hazardous substances or flammable goods by a minimum distance of 3 metres as detailed in AS4332 Storage and Handling of Gases in Cylinders. The exception to this requirement is minor storage situations (a total capacity of all cylinders in the store of less than 2,000 litres) where both oxygen and acetylene can be stored together.

Storage of dangerous goods that 'exceed' the amounts outlined in the Mirvac Group Dangerous Goods Storage Guidelines require the premises (workplace) to be licensed under dangerous goods legislation and associated regulations. To minimise workplace risk and eliminate the need for licensing, except in exceptional circumstances, it is a Mirvac Group requirement that maximum volumes of Dangerous Goods do not exceed those quantities outlined in the abovementioned guidelines.

The storage area for hazardous substances and dangerous goods shall be constructed with an impervious floor and bunded with a minimum capacity of 110% of the largest container in the store, e.g. a store consisting of a 20 litre substance container requires a bunding capacity of 22 litres.

Mirvac will maintain a dangerous goods register and material safety data sheets for each product listed as well as having a procedure to deal with spills.

All relevant firefighting equipment, first aid facilities and relevant authority contact details i.e. Fire, EPA will be displayed at prominent locations and included at site inductions.

# 10 SUSTAINABILITY

## 10.1 INTRODUCTION

Mirvac's target is to achieve a consistent level of environmental and social outcomes throughout the project by committing to establishing new initiatives where possible. Exploring alternative sustainable options outside of the legislative requirements and implementing them will make a significant contribution to the physical environment and the local community.

By exercising the sustainability values depicted in Figure 4 and recognising the benefits of social, environmental and economic sustainability, Harbourside will promote a balanced lifestyle for its future occupants and wider community which will be reflected in the development and throughout the construction phase.



Figure 4 – Mirvac's Sustainability Values

## 10.2 COMPANY STRATEGY

Adherent with Mirvac's commitment to sustainability, an integrated approach "This Changes Everything" is focused on the responsibility Mirvac has to the environment, wider community and to its investors. With the engagement from relevant stakeholders Mirvac seeks to deliver a culture that fosters sustainability and having a lasting impact. The four aspects of this strategy include:

- **Reimagining resources:** Mirvac aims to generate more water and energy than we consume and to find ways to capture and reduce waste beyond that we create. Through efficient use of resources, Mirvac will reduce consumption of natural resources and operate in a manner which will achieve a minimum 95% recycling. In management practices, Mirvac will invest in opportunities such as renewable energy onsite and assess suppliers in their involvement to sustainability.
- **Shaping the Future of Place:** To create a place where we live, work, shop and play utilising feedback from the community on past projects. Ongoing community engagement is necessary to predict future challenges while accepting information and boundaries will change over time. Implementation of utilities and infrastructures will be made in the design and construction to promote a sense of place.

- **Enriching Communities:** To improve the health and wellbeing within a community as well as strengthen social inclusion. Mirvac recognises “beyond boundaries” are what supports society as a whole and improves the places we create. Active participation from external stakeholders on sustainability issues will result in refining business operations and investing in the community.
- **Smarter Thinking:** Investing in assets designed to improve its own performance and ease of operation over its cycle. Financing in smart technology to become more efficient and effective in the delivery of the project while educating and informing the importance of sustainability.

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### 10.3 PROJECT SPECIFIC STRATEGY

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The following criteria will be monitored during construction to measure overall performance in addressing sustainability targets:

#### 10.3.1 Environmental Management System

Implement a Workplace Risk Management Plan that is certified to AS/NZS ISO 14001, which establishes clear environmental objectives & targets for the site works.

#### 10.3.2 Community / Schools

Provide opportunities for students and the local community to learn about the projects and the impact on the wider community. As well as this, hold information sessions on the health and safety programs to engage and build a rapport with the relevant agencies. Have email updates on the progress and any other media coverages.

#### 10.3.3 Energy

Examine opportunities to reduce electricity and water consumption and the use of alternative systems implemented for site amenities.

#### 10.3.4 Sustainability Induction

Construction staff will be educated on the sustainability initiatives planned for the project and encouraged to innovate and find sustainable solutions through site induction and tool box talk's process.

#### 10.3.5 Innovation

Review project planning and development to explore innovative options to promote sustainability on the project.

# 11 Workplace Risk Management

## 11.1 Introduction

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Mirvac is fully committed to providing a safe working environment. Each Work Place Risk Management Plan (WRMP) requires that equipment, workplaces and practices comply with relevant regulations and standards. Regular and ongoing reviews of these standards will be conducted and where higher standards are practical and desirable, they will be adopted. In addition the company will:

- Provide adequate resources to satisfy this policy.
- Identify, control and reduce work-related hazards and risks that may produce injury, illness or asset damage.
- Identify, quantify and control to safe levels, those chemicals and physical agents in the workplace capable of causing ill health.
- Promote environmental, health, safety and the welfare of employees and sub-contractors while respecting the privacy of individuals.
- Provide information, instruction and training for employees to increase their personal understanding of workplace hazards, promote safe working practices and ensure contractors are aware of and satisfy the Groups HSE expectations.
- Consult employees and contractors in environmental, health and safety to reduce workplace hazards and risks.
- Consult with clients, industry bodies and others in the development of appropriate standards, control strategies and monitoring techniques, which comply, with the requirements of statutory authorities.
- Set short and long term goals in occupational health and safety management, and review performance against these goals.

Mirvac Management is responsible for raising the awareness of the responsibilities of all workers on the site in regards to workplace safety and the role they play in achieving a safe and healthy work environment. Mirvac employees and all other workers on the premises or site are responsible for working towards achieving and maintaining a healthy and safe workplace. The intent of this policy is to foster a culture within Mirvac employees and its subcontractors, raising health and safety awareness, and promoting active participation in the Health Safety and Environment (HSE) program.

## 11.2 Workplace Risk Management Plans (WRMP) and Job Safety & Environment Analysis (JSEA)

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A key tool in the management of HSE on the project will be the continued improvement of both Mirvac's WRMP and each individual Job Safety & Environment Analysis (JSEA). This plan as a minimum includes the following:

- A description of the work to be undertaken;
- An identification of the foreseeable hazards associated with the works; and
- A description of the hazard control measures to be used.

A detailed site specific Workplace Risk Management Plan shall be developed and implemented by Mirvac prior to commencement of works and shall be updated as / when required.

## 12 Site Management Plan

### 12.1 Introduction

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A Site Management Plan will be developed to outline the proposed phases of the construction work on site, outline the order of works, and assess Mirvac's impact and interaction with the surrounding community.

### 12.2 Construction Phases

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The works have been broadly divided into the following phases:

- a. Site establishment;
- b. Demolition of Monorail Station and existing Bridges
- c. Demolition of existing shopping centre
- d. Civil – basement diameter wall, excavation, piling and ground retention works;
- e. Remediation works to site;
- f. Structure;
- g. Façade & atrium roof works;
- h. Building fit out and finishes;
- i. Commissioning & handover works;
- j. Landscaping and public domain works.

### 12.3 Construction Staging

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Proposed summary staging plans will be included within Appendix B of this document and will identify the key project stages and proposed phased handovers. Other construction staging items as follows:

- The demolition of the monorail station, and the footbridge to the Novotel will be undertaken on the weekends only.
- The demolition and removal of the shopping centre in one phase
- Basement Construction and Excavation and treatment of all associated material
- Construction adjacent to Pyrmont Bridge
- Construction staging around the shopping centre and commercial tower

### 12.4 Interaction with Surrounding Community

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The following actions will be implemented, which focus on minimising the impacts of construction activity to the community surrounding the Harbourside project.

- Hoarding around site;
- Monitor compliance of the Traffic Management Plan and Noise and Vibration Management Plan;
- Clear display of contact details on the hoarding for community information and contact in case of emergency;
- Make arrangements for the notification to surrounding properties of activities which may affect their amenity, including the provision of a 24-hour contact point;
- Close community liaison with neighbours
- Monthly Newsletter updating surrounding residents on construction works and upcoming activities or interactions;
- Monthly meetings to discuss the progress of works and to address any concerns raised by the surrounding community.

## 12.5 Dispute Resolution

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Mirvac acknowledges the potential for disruption as a result of the development, and proposes that the following measures be established:

- Complaint procedure / complaint register to be developed. Should a complaint or infringement occur, the following procedures are to be adopted:
  - All complaints and infringements are to be brought to the attention of the Mirvac Site Manager immediately upon receipt;  
The Mirvac Site Manager shall investigate the complaint and ensure appropriate action is taken to address the complaint or infringement within the time frame outlined in “HSE Objectives and Targets for Community Contact Issues”. This is detailed within the Mirvac Construction HSE Management Systems Manual;
  - A Community Contact Notification form shall also be completed for all complaints and enquiries (refer to following pages for this template);
  - A copy of this documentation is to be filed within the site office.

The contact details of the Site Manager will be permanently shown on the site notice to be displayed in a prominent location at site entries as an emergency 24 hour contact.

## 12.6 Fire Protection Measures During Construction

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Mirvac will comply with the requirements of the BCA and Australian standards during excavation and construction. Specifically, E1.9 of the BCA requires the following:

- not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each *storey* adjacent to each *required exit* or temporary stairway or *exit*; and
- after the building has reached an *effective height* of 12 m—
  - the *required* fire hydrants and fire hose reels must be operational in at least every *storey* that is covered by the roof or the floor structure above, except the 2 uppermost *storeys*.

## 12.7 Site Specific Issues

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### 12.7.1 Contamination

Mirvac shall implement the (RAP) to identify and manage the remediation process on site, obtain a Remediation and Validation Report and Site Auditor sign off prior to completion.

### 12.7.2 Heritage

A heritage consultant will be engaged by Mirvac to produce a report for the project as well as assist in the development and monitoring of design and construction works adjacent to the Pyrmont Bridge.

### 12.7.3 Infrastructure Assets

A number of existing services are present within the precinct. Mirvac shall liaise with the relevant Utility Providers throughout the design process and prior to construction for approval of the design and proposed construction methodology to ensure compliance with Health, Safety and Environmental requirements, Network Standards and Codes of Practice.

A detailed Risk and Opportunity Register and work method statements shall be completed following acceptance of the design principles.



## COMMUNITY CONTACT NOTIFICATION

### PURPOSE

Contact with the community is a means by which Mirvac can positively engage stakeholders and potential clients or customers by demonstrating sound management practices in resolving any concerns raised in a timely manner.

Community members that interface with Mirvac business undertakings present the opportunity for feedback and a positive response by Mirvac.

Any response shall be commensurate with Mirvac's high regard and sensitivity to social amenity and the lifestyle impacts of its business undertakings.

The details outlined below must be completed for all 'formal' (oral or written) representations to any Mirvac representative by a community member or on being directly informed of a concern by a third party and corrective (follow up) action undertaken within 48 hours of notification where required.

**WORKPLACE:** \_\_\_\_\_

### CONTACT DETAIL:

(1) How was the contact made?:

Telephone: ☐ Personal Contact: ☐ Written Letter: ☐ Email: ☐ Fax: ☐

Other [specify]: \_\_\_\_\_

(2) Date of contact: \_\_\_\_\_ Time of contact: \_\_\_\_\_ am ☐ or pm ☐

(3) Contact made by: [who made the contact?]

Name	Address	Phone

(4) Outline concerns/issues raised:

(5) Notification details recorded in the HSE Incident Reporting System by:

Name	Mirvac Division	Date recorded	Phone

(6) Has the contact been referred to another person? Yes ☐ No ☐

(7) If 'Yes' list the name and contact details of the person:

List Name	Mirvac Division	Time Referred	Phone

(8) Has the contact been 'formally' acknowledged to the complainant? Yes ☐ No ☐

[Note: mandatory within 48 hours of contact]

(9) How was the contact formally acknowledged?

Telephone: ☐ Personal Contact: ☐ Other: [specify] \_\_\_\_\_

(10) Is follow-up action required? Yes ☐ No ☐

#### COMMUNITY CONTACT NOTIFICATION

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(11) Outline follow-up action undertaken:

[Note: mandatory within 48 hours of contact]

(12) Date of follow-up action: \_\_\_\_\_ Time of action \_\_\_\_\_ am ☐ or pm ☐

(13) Date complainant was advised of the outcome/action undertaken as a result of the contact:  
Date \_\_\_\_\_ Time of action \_\_\_\_\_ am ☐ or pm ☐

[Note: mandatory within 48 hours of first contact]

(14) What were the 'Contributing Factors' and the 'Root cause' of the issue?

(Action/ inaction by persons, failure of tools/ machines or procedures not followed) (QUESTION THE CAUSE 5 TIMES)  
e.g. (the issue) Slurry on public road, splashing on passing cars. Q. 1 *Where did the slurry come from?* – From concrete cutting adjacent to road. Q. 2 *How did it get on the road?* – No effective barrier in place. Q. 3 *Why was there no barrier?* – Hazard of slurry splashing on cars not identified. Q. 4 *Why was this hazard/ control not identified?* – Location/task specific risk assessment not reviewed for location. Q. 5 *Why was the risk assessment not reviewed?* – Risk assessment not maintained or checked prior to activity or during daily pre-start meeting.

Insert main issue description

Q. 1?

Q. 2?

Q. 3?

Q. 4?

Q. 5?

(15) Identified 'long term' corrective action(s) required to prevent the issue re-occurring

\_\_\_\_\_

(16) Date 'long term' corrective action(s) implemented and R & O Register reviewed:

\_\_\_\_\_

(17) Date the corrective action(s) were monitored by a Mirvac representative and confirmed as having been effective:

\_\_\_\_\_

(18) Completion:

Person completing this report:

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Manager of person completing this report:

Name: \_\_\_\_\_

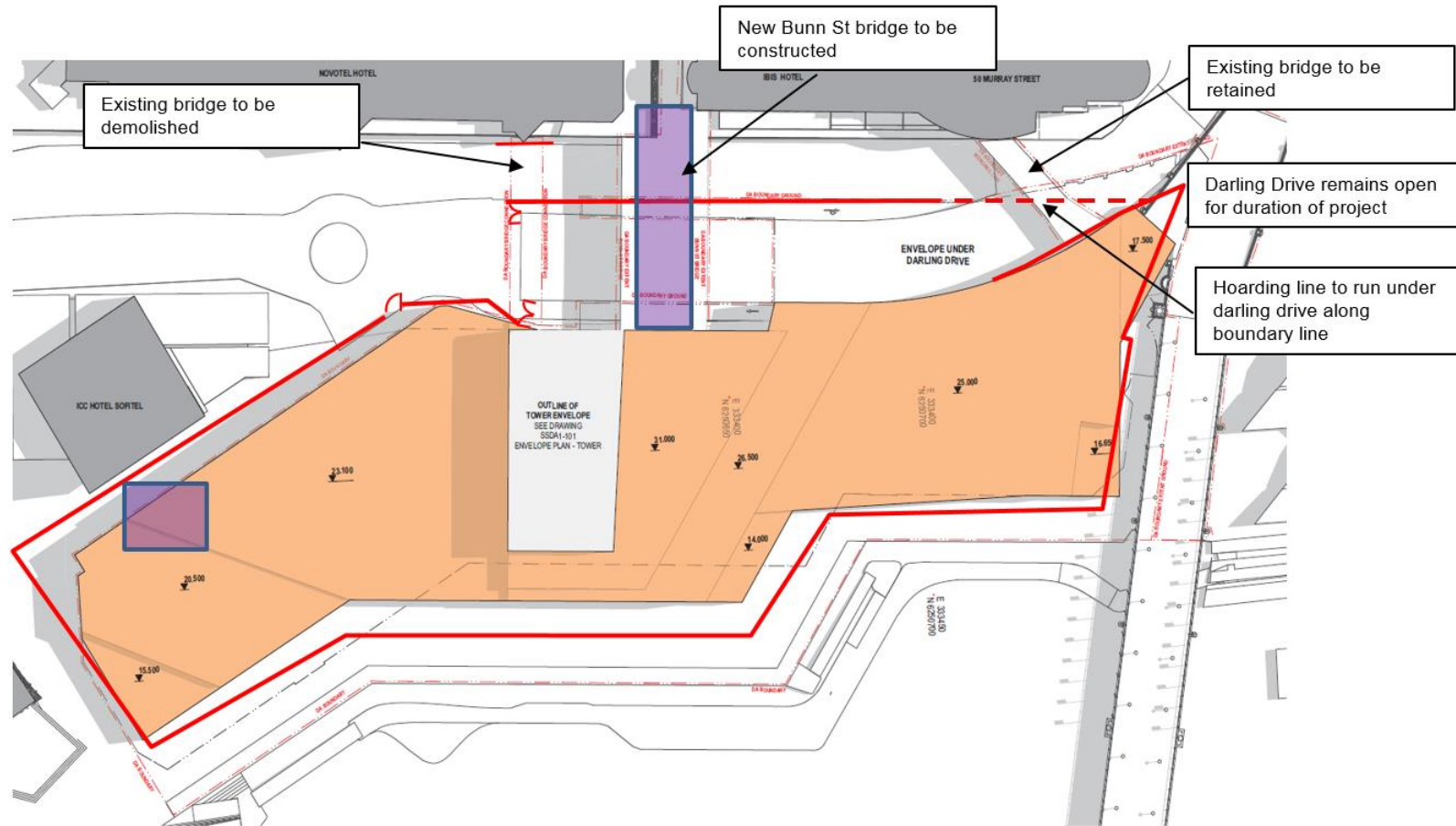
Signature: \_\_\_\_\_

Date: \_\_\_\_\_

COMMUNITY CONTACT NOTIFICATION

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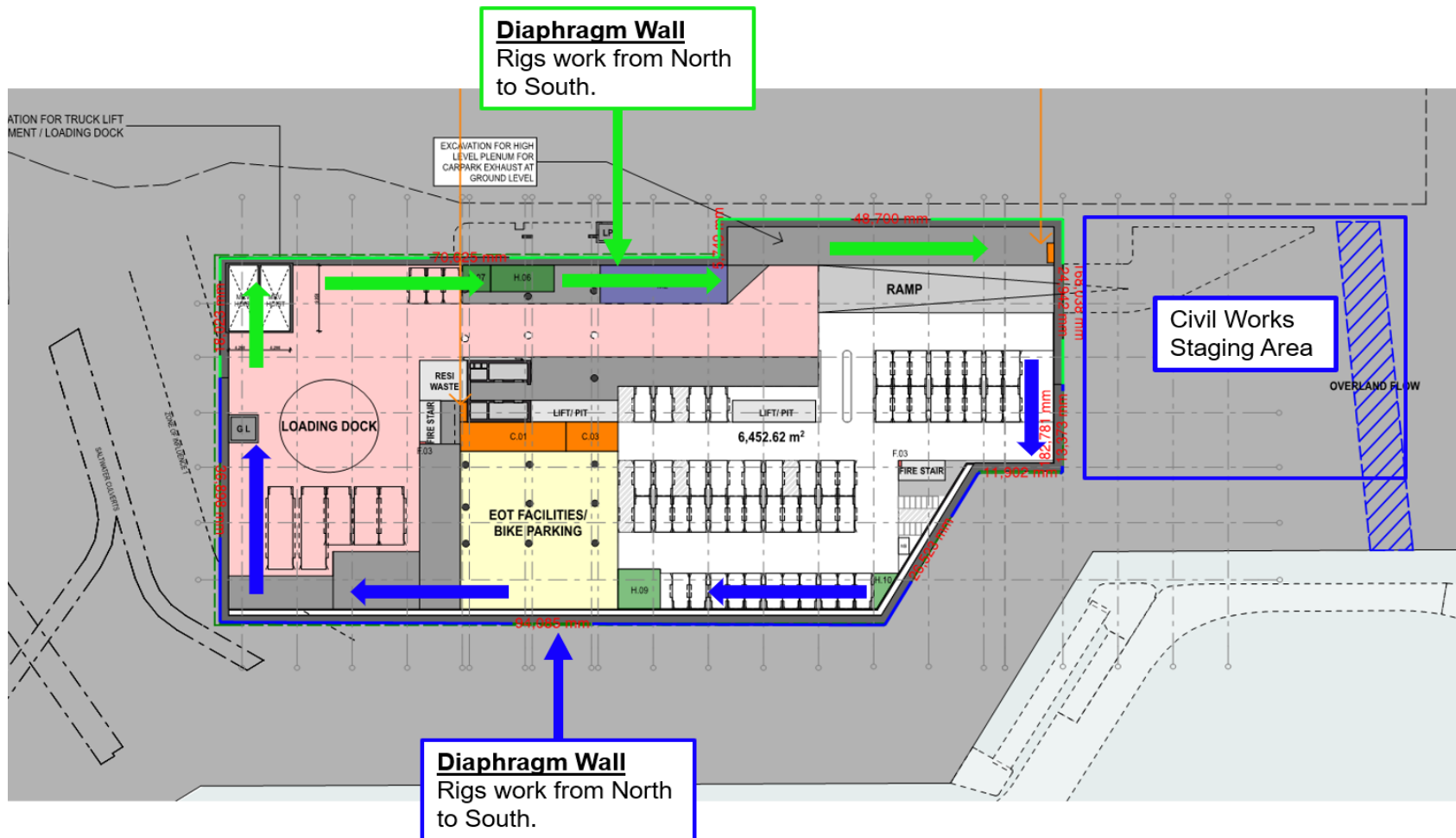
## Appendix A: Location Plan



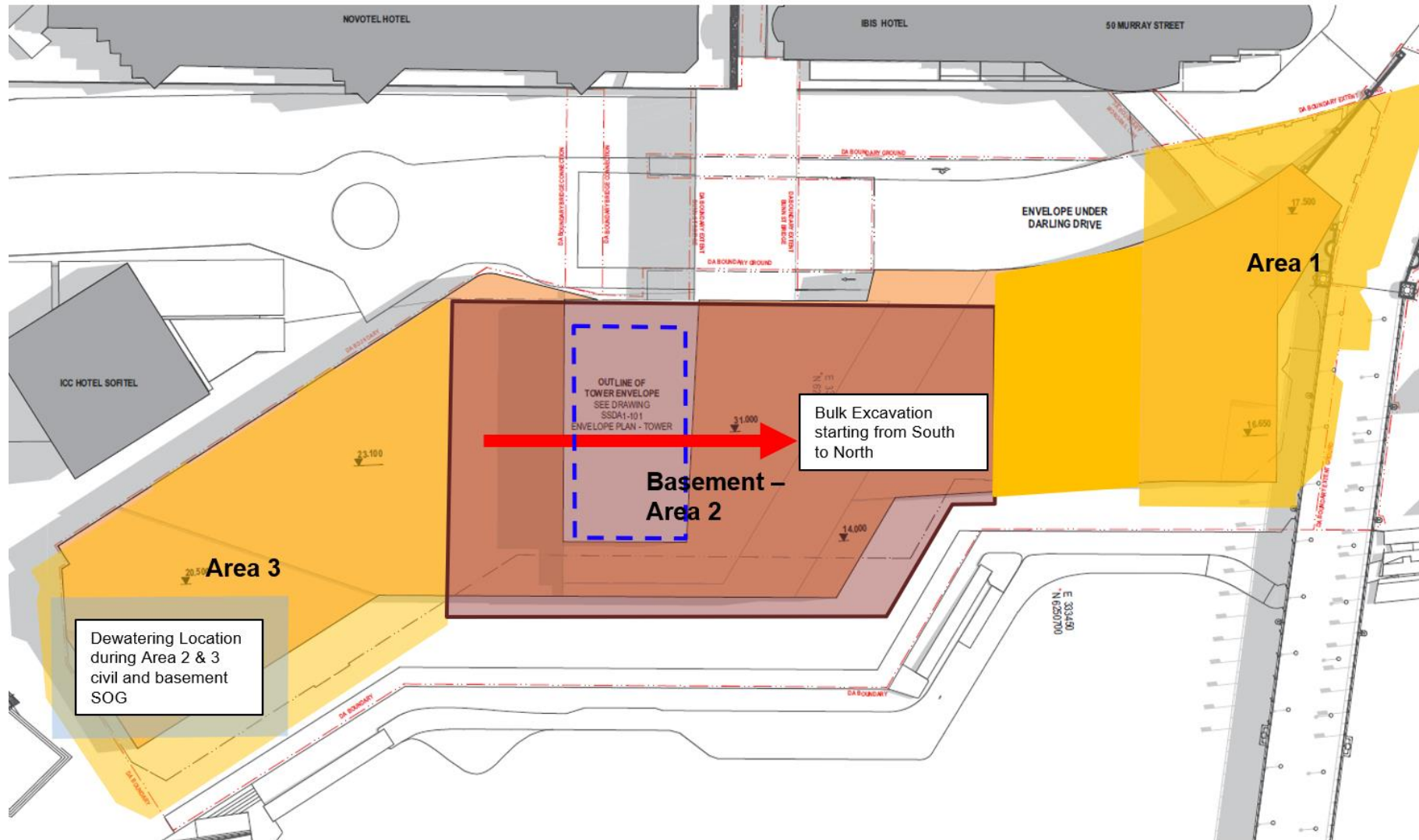
## Appendix B: Site Staging Plans

Prepared by: Mirvac

## Basement Excavation – Retention Wall Sequence



## Bulk Excavation



Prepared by: Mirvac



