

WALSH BAY ARTS AND CULTURAL PRECINCT

RESPONSE TO SUBMISSIONS

SSDA 8671

APPENDIX 5:

UPDATED CONSTRUCTION PEDESTRIAN AND TRAFFIC MANAGEMENT PLAN



State Significant Development Application Construction Pedestrian and Traffic Management Plan

Client //	Infrastructure NSW
Office //	NSW
Reference //	N133680
Date //	12/01/18

Walsh Bay Arts and Cultural Precinct

State Significant Development Application

Construction Pedestrian and Traffic Management Plan

Issue: C 12/01/18

Client: Infrastructure NSW
Reference: N133680
GTA Consultants Office: NSW

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1. Introduction

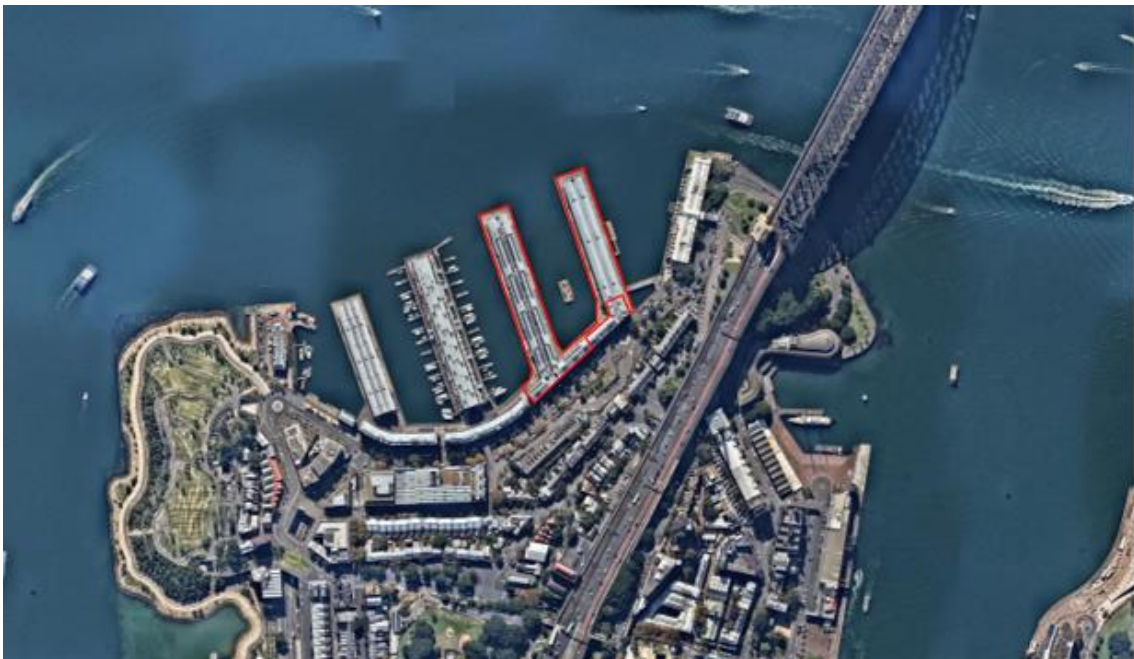
1.1 The Project

The NSW Government is committed to development of a public arts and cultural precinct at Walsh Bay. Infrastructure NSW is acting on behalf of the client, Arts, Screen and Culture Division in preparing this State Significant Development Application for the Walsh Bay project.

This State Significant Development Application (SSDA) will seek approval for the construction and operation of Pier 2/3 and Wharf 4/5 for arts and cultural uses with complementary commercial and retail offerings to activate the precinct.

The site generally comprises Pier 2/3, Wharf 4/5, and Wharf 4/5 Shore Sheds. The site has a street frontage to Hickson Road as shown in Figure 1.1. The site is part of the Walsh Bay area, which is located adjacent to Sydney Harbour within the suburb of Dawes Point.

Figure 1.1: The site



Source: Provided

The scope of the Walsh Bay Arts and Cultural Precinct (WBACP) project is described in the following subsections.

Pier 2/3

The works proposed for Pier 2/3 will include:

- The adaptive re-use providing for new arts facilities including performance venues for the Australian Chamber Orchestra (ACO), Bell Shakespeare and Australian Theatre for Young People (ATYP).
- Retaining a large heritage commercial events/art space for events such as Sydney Writers Festival, Biennale of Sydney and a wide range of commercial and artistic events.
- A series of stairs, external lift and balconies designed as a contemporary interpretation of the original gantries reflecting the precinct's former industrial heritage.

- Modifications to the roof.

Wharf 4/5 (including Shore Sheds)

The works proposed for Wharf 4/5 include:

- Refurbishment of the ground floor arts facilities and its associated Shore Sheds for Bangarra Dance Theatre, Sydney Dance Company (SDC), Sydney Philharmonia, Gondwana and Song Company.
- New commercial retail opportunities.
- A series of stairs, external lifts and balconies designed as a contemporary interpretation of the original gantries reflecting the precinct's former industrial heritage.
- Modifications to the roof.

1.2 Purpose of this Report

GTA Consultants (GTA) was commissioned by Infrastructure NSW to provide transport advice and documentation for the SSDA, including a Construction Pedestrian and Traffic Management Plan (CPTMP) for the WBACP.

This CPTMP and accompanying Traffic Control Plan (TCP) have been prepared to appropriately address the construction traffic related impacts associated with the redevelopment of the WBACP.

This CPTMP has been prepared in accordance with the City of Sydney Standard Requirements for Construction Traffic Management Plans and the Transport for NSW CPTMP Checklist. The appointed contractor would undertake all works in accordance with this CPTMP. The requirements are attached in Appendix A.

The overall principles of traffic management during the construction activity include:

- Provide an appropriate and convenient environment for pedestrians
- Minimise the impact on pedestrian and cyclist movements
- Maintain appropriate capacity for pedestrians on footpaths around the site
- Maintain appropriate public transport access
- Minimise the loss of parking
- Maintain access to/ from adjacent properties
- Restrict construction vehicle movements to designated routes to/ from the site
- Manage and control construction vehicle activity near the site
- Carry out construction activity in accordance with the approved hours of works.

This CPTMP has been prepared and checked by engineers who hold the Roads and Maritime Services (Roads and Maritime) Prepare Work Zone Traffic Management Plan accreditation.

This study has been prepared in response to the Secretary's Environmental Assessment Requirements (SEARs) issued on 1 September 2017 (SSD 8671) for the WBACP. The operational impact of the proposed development has been addressed in a separate Transport Impact Assessment report, which was also prepared by GTA as part of this SSDA. A Green Travel Plan has also been prepared by GTA, which details the sustainable travel initiatives for the proposed development.

The construction transport requirements set out in the SEARs are detailed in Table 1.1.

Table 1.1: Transport SEARs (construction) requirements

Consent description	Relevant sections of this report
An assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrians, cyclists, harbour vessel movements, and public transport operations, including the preparation of a draft Construction Pedestrian Traffic Management Plan. This Plan shall include vehicle routes, truck numbers, hours of operation, access arrangements and traffic control measures for all works.	Sections 3 and 4
An assessment of cumulative impacts associated with other construction activities, including the construction of the Sydney Metro and Southwest project and other transport projects.	Section 3.6
Details of construction vehicle routes, peak hour and daily truck movements, hours of operation, access arrangements at all stages of construction, and traffic control measures for all works.	Section 3.8
An assessment of construction impacts on road safety at key intersections and locations for potential pedestrian, vehicle and bicycle conflicts.	Sections 3.3, 3.5 and 4.2
Details of any temporary cycling and pedestrian access during construction.	Section 4.2
Detail access arrangements for workers, emergency services and the provision of safe and efficient access for loading and deliveries.	Sections 3.3, 3.4, 3.7 and 4.4

1.3 References

In preparing this report, reference has been made to the following:

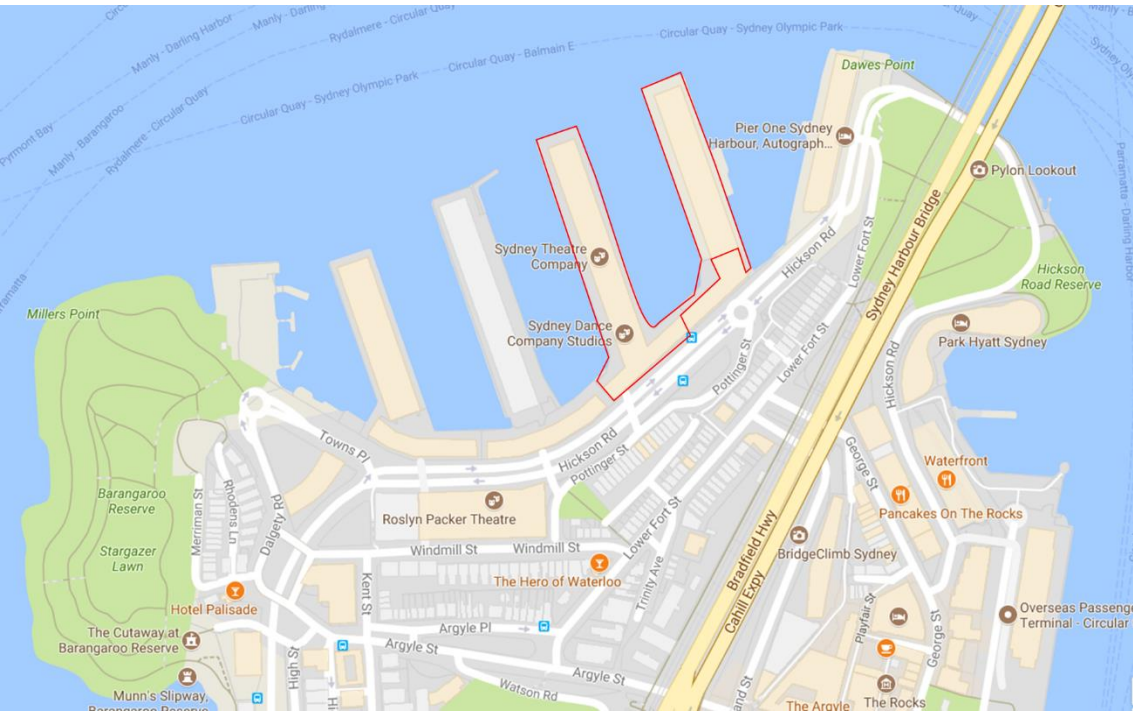
- An inspection of the site and its surrounds
- *Walsh Bay Arts Precinct Traffic Management and Accessibility Plan*, GTA Consultants 14 January 2015
- *Traffic Control at Work Sites* manual, Version 4, Roads and Maritime, June 2010
- Australian Standard AS1742.3:2009 *Manual of Uniform Traffic Control Devices – Part 3: Traffic control for works on roads*
- Other documents and data as referenced in this report.

2. Existing Conditions

The Walsh Bay Arts and Cultural Precinct (WBACP, referred to as the site) generally comprises Pier 2/3, Pier 4/5 and its shore sheds (Wharf 4/5). The site has a street frontage to Hickson Road, as shown in Figure 2.1 and Figure 2.2. The site is part of the Walsh Bay area, which is located adjacent to Sydney Harbour within the suburb of Dawes Point. The site is located within the City of Sydney Local Government Area.

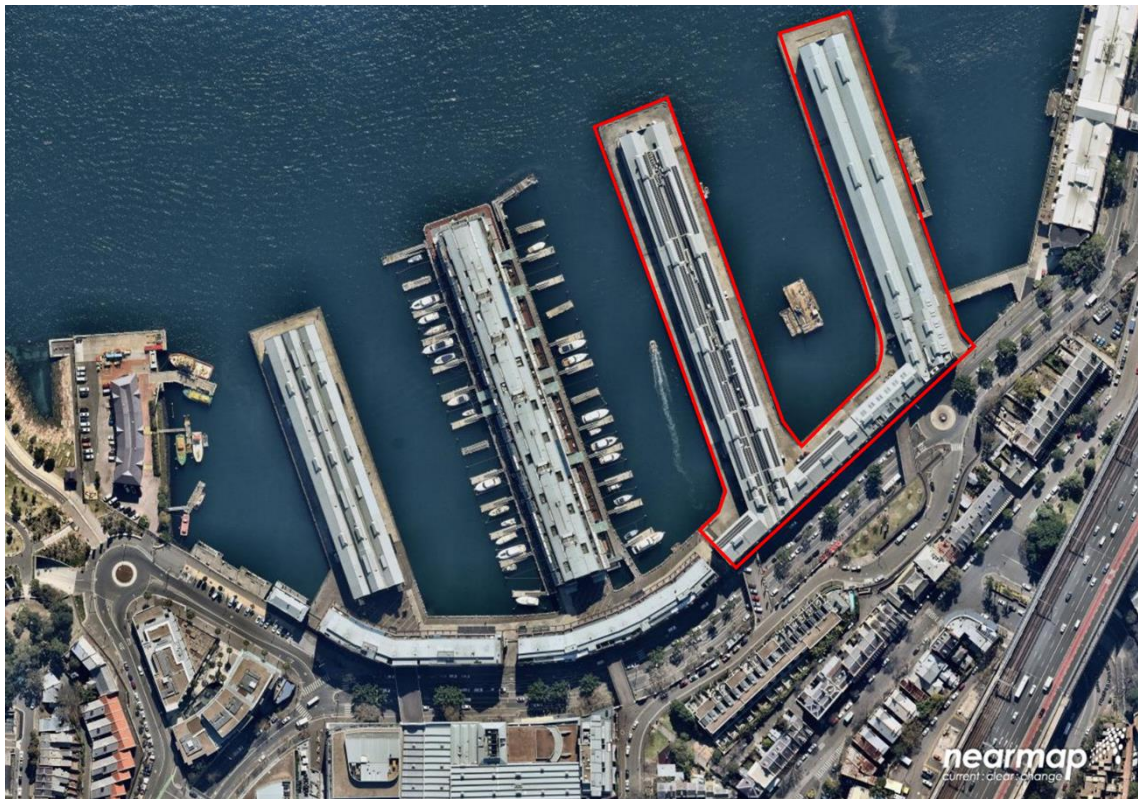
Walsh Bay is located to the north of Sydney's CBD near major tourist destinations including the Sydney Harbour Bridge, the historic areas of Millers Point and The Rocks, Circular Quay and the Sydney Opera House. The Barangaroo redevelopment precinct is located immediately to the south-west of the site.

Figure 2.1: Site location



Source: Google Maps

Figure 2.2: Aerial view



Source: Nearmap

Pier 2/3 is officially described as Lot 11 in DP 1138931 and Wharf 4/5 is officially described as Lot 65 in DP 1048377. The total area for these lots is 18,090 square metres.

The land owner of the site is the Roads and Maritime Services (Roads and Maritime). Both Pier 2/3 and Wharf 4/5 are occupied under various lease arrangements with Arts NSW, Department of Justice, primarily for arts and cultural uses.

Walsh Bay comprises 10 berths constructed between 1908 and 1922 for international and interstate shipping. These are collectively known as the Walsh Bay Wharves. The Walsh Bay Wharves Precinct is listed as an item on the State Heritage Register.

The Walsh Bay Wharves comprise the following:

- Pier One which contains the Sebel Pier One Sydney Hotel
- Pier 2/3 the last remaining undeveloped pier (it has previously received approval for cultural uses, temporary arts events and some commercial events)
- Wharf 4/5 which is occupied by the Sydney Theatre Company (STC), ATYP, SDC, Bangarra Dance Theatre and the choirs comprising Gondwana, the Song Company and Sydney Philharmonia
- Pier 6/7 which has been redeveloped for residential apartments and associated marina
- Pier 8/9 which has been redeveloped for office uses
- Shore sheds aligning Hickson Road which contain a range of commercial activities, including restaurants, bars, shops and offices.

2.1 Road Network

2.1.1 Adjoining Roads

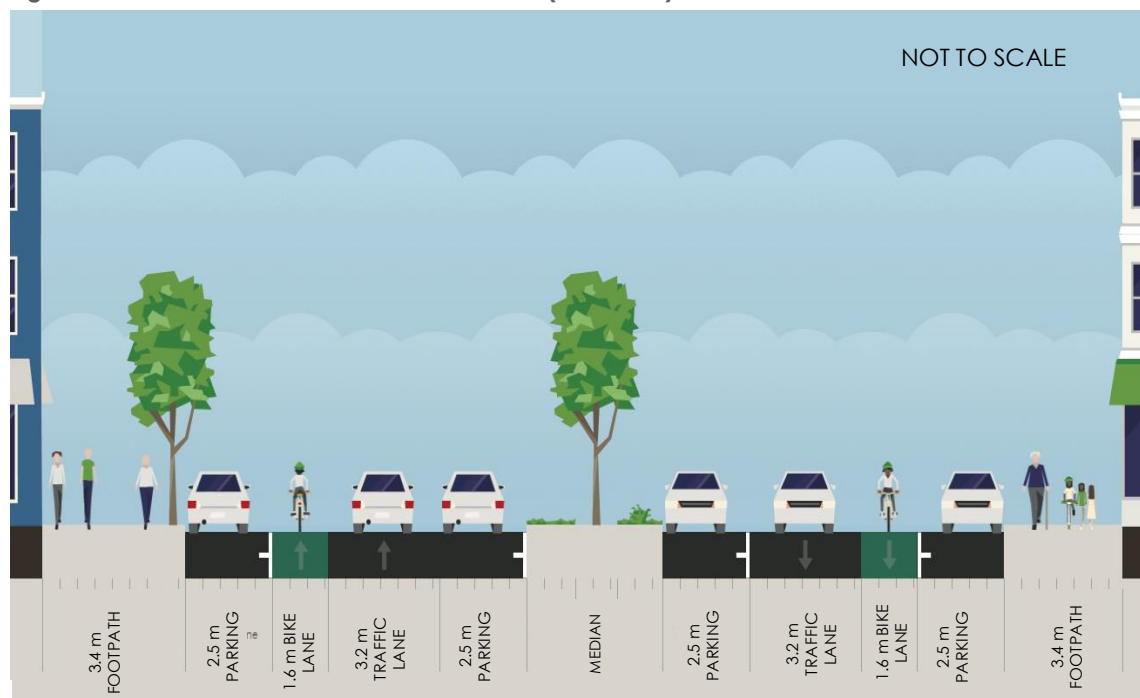
Hickson Road

Hickson Road is designated as a regional route (7312) and is classified to its intersection with Lower Fort Street adjacent to Pier 1. Hickson Road carries approximately 6,500 vehicles per day¹.

Hickson Road is closed between Pottinger Street and Alfred Street (adjacent to Circular Quay) between 10pm and 3am on Friday and Saturday, with local access only for residents within The Rocks and Dawes Point.

Near the site, Hickson Road is a dual carriageway road with a central median and three lanes in each direction. There are parking lanes either side of a single traffic lane. From boundary to boundary, there is a corridor of approximately 31 metres. The indicative configuration of Hickson Road is shown in Figure 2.3.

Figure 2.3: Hickson Road cross section near site (indicative)



Source: <http://streetmix.net/-/419497>, accessed 31 August 2016

There are varying parking restrictions along Hickson Road, and these have been fully recorded in a parking survey attached in Appendix D.

2.1.2 Surrounding Intersections

The following intersections are the major intersections near the precinct:

- Hickson Road and Pottinger Street (roundabout)
- Hickson Road and Lower Fort Street (unsignalised)
- Hickson Road and Towns Place (unsignalised).

¹ Based on 24-hour surveys undertaken for the week of 27 August to 2 September 2016.

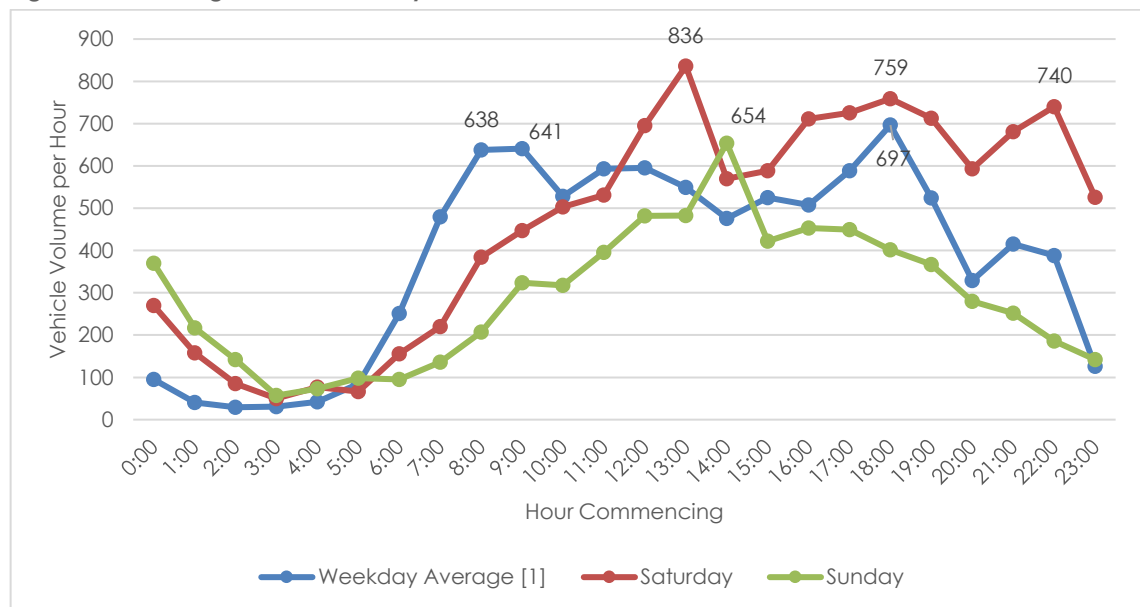
2.2 Traffic Volume Profiles

GTA commissioned a range of traffic movement surveys near the WBACP site on during the week beginning 22 August 2016, including:

- An automatic tube count, which recorded traffic volumes for seven consecutive days adjacent to Pier 4 commencing 27 August 2016.
- The usage of the two vehicular accesses to the Wharf 4/5 loading dock (on Hickson Road and the overpass bridge from Pottinger Street) was counted from 7am to 10am on Wednesday 31 August 2016.

The results of the seven-day automatic tube count survey are summarised in Figure 2.4, which represents two-way vehicle movement data on Hickson Road, adjacent to Wharf 4/5. The result indicates a road peak period of 8am to 10am and 6pm to 7pm on weekdays and 1pm to 3pm on a weekend. Peak vehicle volumes were observed on the Saturday with a peak of 836 vehicle movements per hour along Hickson Road at 1pm.

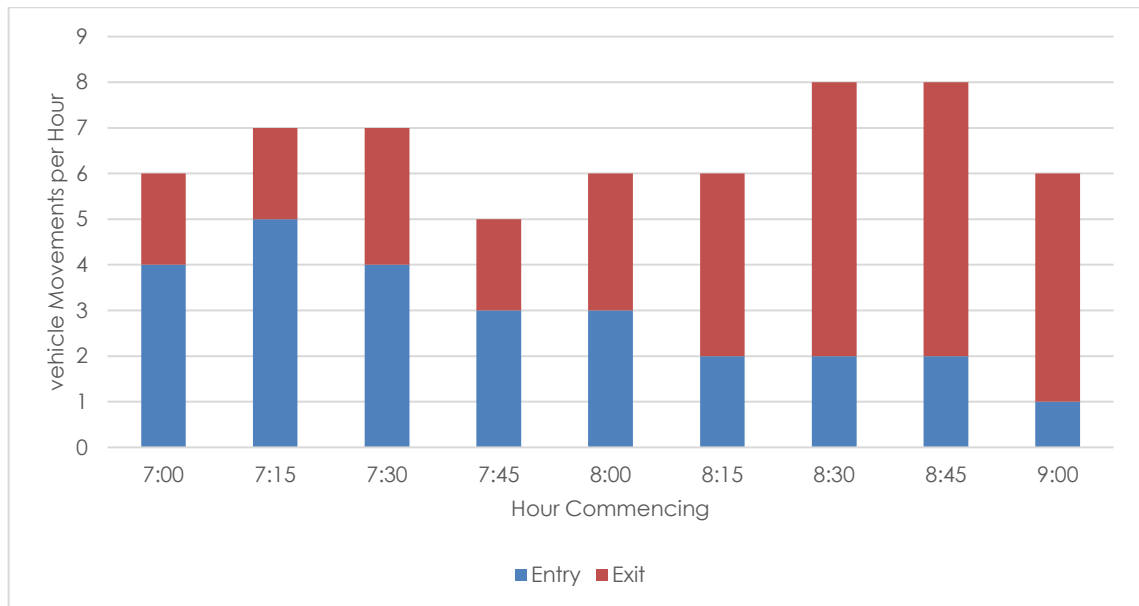
Figure 2.4: Existing traffic volumes by hour



[1] The weekday average includes only days Monday to Wednesday due to data errors present on the Thursday and Friday.

The results of the vehicle entry and exit counts into the Wharf 4/5 loading areas from Hickson Road and the Pottinger Street overpass are summarised in Figure 2.5, with full results provided in Appendix B.

Figure 2.5: Wharf 4/5 loading dock entry/ exit movements



2.3 Car Parking

Hickson Road is somewhat atypical with its street configuration, with three lanes in each direction, with a parking lane either side of each traffic lane. This substantially increases the parking availability compared to more typical road layouts.

On Hickson Road adjacent to the WBACP, there is the presence of service vehicle parking, with loading zones and taxi zones. There is also the provision of private vehicle parking which generally varies between two and four-hour paid parking.

Currently three existing commercial off-street car parks exist near the site, including:

- Barangaroo Point car park, accessed from Hickson Road south of Pier 8
- Barangaroo Reserve car park, located under the Headland Park at Towns Place
- Bond Store One car park, adjacent to the Roslyn Packer Theatre.

All three car parks are located along Hickson Road within 200 metres of the WBACP.

2.4 Public Transport

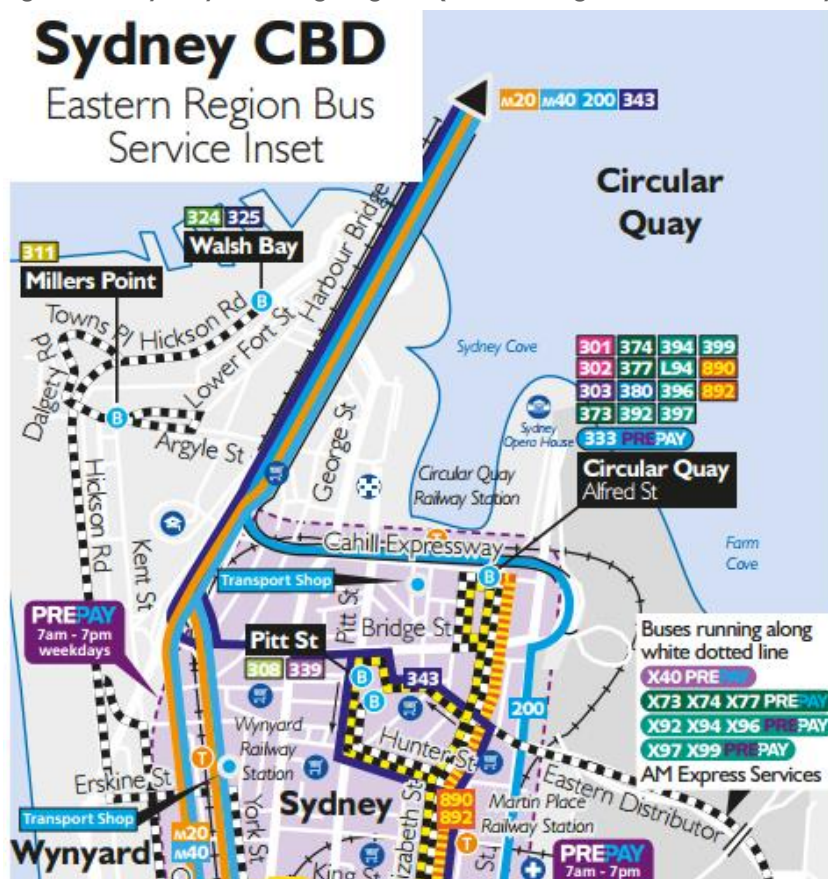
A review of the public transport available near the site is summarised in Table 2.1, noting that substantial changes will occur in the coming years. Public transport to the site was altered with the rerouting of buses in the Sydney CBD following the commencement of the construction of the CBD light rail in October 2015 (see Figure 2.6).

Table 2.1: Public transport provision

Service	Route number	Route description	Location of stop	Distance to nearest stop	Frequency on/ off peak
Bus	324, 325	Watsons Bay to Walsh Bay (different routes)	Hickson Road opposite Wharf Theatres (2000130)	20 m	10-15 mins/ 15-30 mins
Bus	311	Railway Square to Millers Point via Woolloomooloo	Barangaroo Reserve, Hickson Road (2000439)	250 m	15 mins / 30-45 mins

Service	Route number	Route description	Location of stop	Distance to nearest stop	Frequency on/ off peak
Train	T1 (Wynyard Only), T2, T3	Services to Hornsby, Richmond and Penrith (Wynyard Only), as well as Liverpool, Lidcombe via Bankstown, and Campbelltown via Clyde or East Hills	Circular Quay/ Wynyard	1.5 km	2 mins (combined)/ 10 mins (combined)
Ferry	All	All	Circular Quay	1.5 km	

Figure 2.6: Sydney Buses region guide (also showing train stations and ferry wharves)



Source: http://www.sydneybuses.info/routes/15326_STA_region_web_map_east_20160801.pdf, accessed 22 August 2016

2.5 Walking Facilities

George Street between Lower Fort Street and Circular Quay forms a pedestrian friendly environment, with low vehicle speeds and relatively generous footpath widths. The pedestrian route from the end of George Street to the site itself is somewhat circuitous and includes sets of stairs (i.e. non-Disability Discrimination Act [DDA] compliant) as the path negotiates the significant grade difference between Hickson Road and the areas further inland.

The Barangaroo Integrated Transport Plan outlines an objective of high levels of public transport use, high walking and cycling mode share and low levels of private vehicle usage. In terms of walking actions, upgrades and widening improvement works are outlined for Margaret Street, Gas Lane, Argyle Street, Napoleon Street and Erskine Street. Potential improvement works highlighted in the plan are shown in Figure 2.7.

Figure 2.7: Cycling and pedestrian upgrades



Source: Barangaroo Integrated Transport Plan, pg. 23

3. Overview of Construction Activities

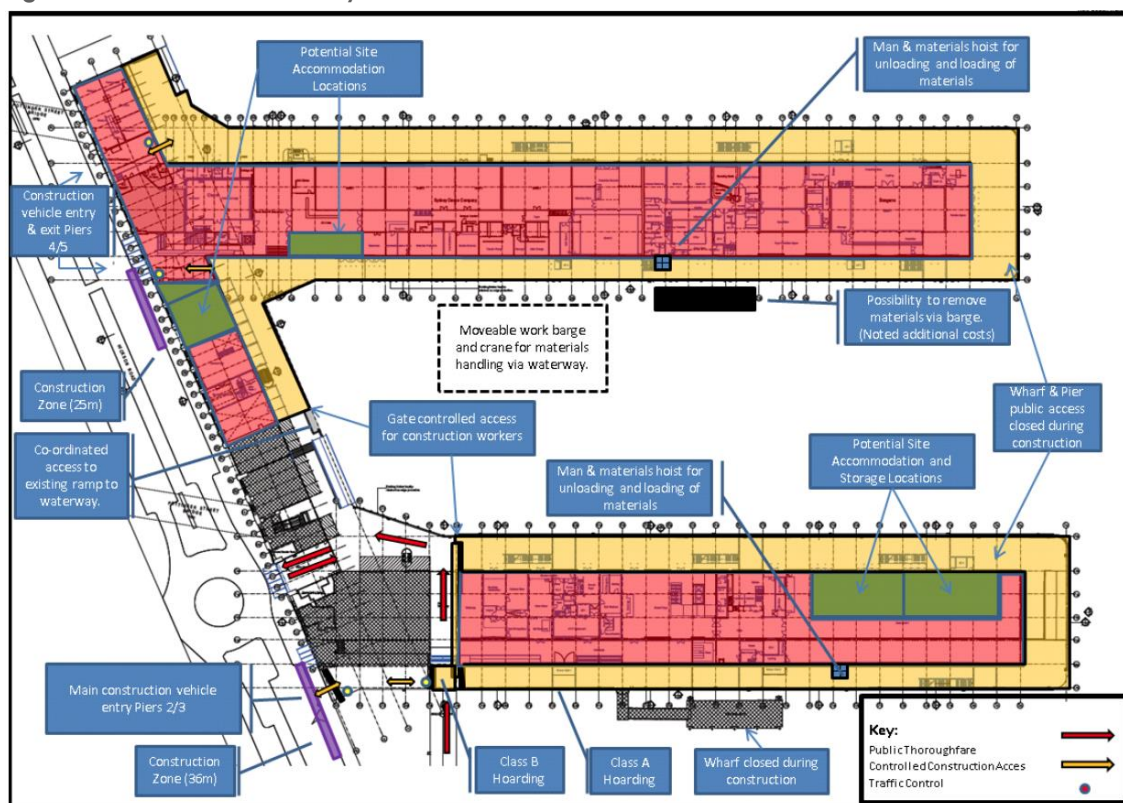
3.1 Description and Duration of Works

This project is to be carried out in one stage over the course of 24 months.

The main construction works would include the demolition and redevelopment of the internal building fabric, with the external structure to be maintained and improved. The main construction works are scheduled to be carried out in about 24 months between July 2018 and June 2020.

An indicative layout of the construction site is shown in Figure 3.1.

Figure 3.1: Construction site layout



Source: Cadence Australia, 26 August 2017.

3.2 Hours of Operation

The permitted hours of work would be set by the Department of Planning and Environment in the conditions of consent. However, at the time of preparing this CPTMP, the development has not yet been approved. Subject to further agency discussions, it is anticipated that approval would stipulate construction works to be carried out between the following typical CBD hours:

- Monday to Friday: 7am and 6pm
- Saturday: 8am and 1pm
- No work will be carried out on Sundays and public holidays.

The contractor would be responsible for instructing and controlling all subcontractors regarding the hours of work. Any work (including oversized deliveries) outside the approved construction

hours would be subject to specific prior approval from the Department of Planning and Environment.

3.3 Site Access

Separate construction vehicle accesses would be provided for Pier 2/3 and for Wharf 4/5.

Pier 2/3 would be accessed from the ground level via the existing eastern vehicle access of the pier. Vehicles would be required to enter the wharf and undertake a three to five-point turn at the corner of the wharf, to exit the site. Swept paths of a 6.4-metre small rigid vehicle (SRV) and 8.8-metre medium rigid vehicle (MRV) carrying out the turning manoeuvre is provided in Appendix C. The existing Wharf 4/5 ground level access will be blocked during construction.

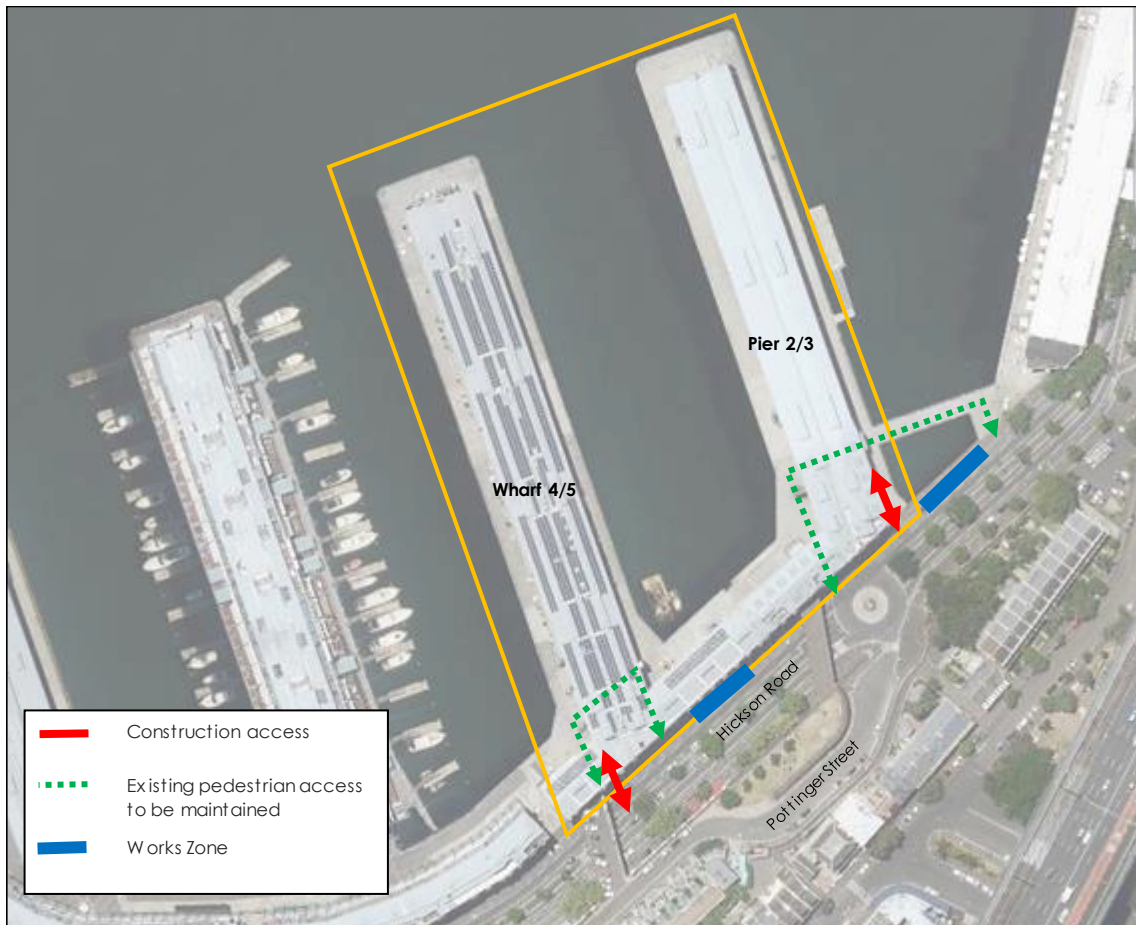
At Pier 2/3, the existing pedestrian entries would be maintained with Class B hoarding provided at the eastern pedestrian access, which would cross the proposed construction site. A traffic controller would be present during construction hours to manage pedestrian, cyclist and construction vehicle interaction and minimise potential conflicts.

Access into the site is only available by a left-in/ left-out manoeuvre due to the presence of the central median on Hickson Road.

The locations of the site accesses are shown in Figure 3.2.

It is noted that the loading of materials via a barge and barge based crane may be required on the waterway between Wharf 4/5 and Pier 2/3. Any marine approach routes would be addressed separately to this CPTMP by the main contractor and in consultation with the Harbour Master. Any impact on harbour vessels would be considered in the development of marine approach routes and placement of the barge based crane.

Figure 3.2: Site access locations



Basemap: Land and Property Information

3.4 Loading and On-Street Works Zones

Construction activities will involve the delivery of façade panels and construction materials and the removal of building waste. To facilitate the loading of construction materials and waste, two on-street works zones are proposed including:

- 24-metre works zone, east of Wharf 4/5
- 36-metre works zone, east of the Pier 2/3.

The length of the above works zones is constrained on either side. The works zone at Wharf 4/5 is located between an existing driveway to the site and an existing bus stop and at Pier 2/3, the works zone is located between two existing driveways.

The location of the proposed works zones is shown indicatively in Figure 3.2.

The proposed works zones will require the temporary removal of nine existing kerbside parking spaces including:

- Four car spaces at Wharf 4/5 which operate as a loading zone and four-hour time restricted parking
- Five car spaces at Pier 2/3 which operate with four-hour and two-hour time restrictions.

The removal of the above spaces is not anticipated to have an adverse impact to parking in the area, as there is a wide availability parking in the area (e.g. commercial off-street car parks) and the existing loading zone is serviced by the subject site.

3.5 Construction Traffic Volumes

Based on a preliminary assessment, the number of construction vehicle movements associated with proposed works has been estimated and is summarised in Table 3.1.

Table 3.1: Indicative two-way construction traffic movements

Construction stage	Average number of truck movements per day		Cumulative number of truck movements per day	Cumulative number of truck movements per hour
	Wharf 4/5	Pier 2/3		
Demolition	20	20	40	Up to 4
Construction	35	45	80	Up to 7

As shown in Table 3.1, the estimated cumulative impact of construction activities would generate up to seven two-way vehicle movements per hour. This would equate to approximately 80 cumulative vehicle movements per day. This peak volume of trucks is estimated for only four months of the construction period.

The largest truck proposed to be used for the works would be a 12.5-metre Large Rigid Vehicle (LRV).

At this level of heavy vehicle movements, minor impact on the surrounding road network is expected. However, further assessment would be undertaken prior to construction, with the cumulative impacts of other key construction sites (including Sydney Metro, Barangaroo and the Sydney Light Rail project) considered using available data at the time.

This number of construction vehicles is not expected to have an adverse impact on the safety and operation at the key intersections surrounding the site.

3.6 Existing and Future Developments

There are currently a number of significant developments under construction within the immediate local area. Traffic volumes for these developments have been determined in the transport assessment developed by Arup on behalf of Lend Lease dated 18 October 2017. To GTA's knowledge, such projects include:

- CBD and South East Light Rail (CSELR)
- Sydney Metro
- Barangaroo precinct redevelopment, specifically the C1 building.

It is not anticipated that the cumulative traffic impacts of the various work sites, with the addition of the WBACP, would have adverse impacts to the surrounding local area given that peak activities would mostly occur outside road network peak periods and given the low volume of construction vehicles anticipated for the development.

It is recommended that the contractor liaises with the other sites to avoid duplication or conflicting messages of traffic control signs near the site. In particular, consultation would be required with City of Sydney Council and the CBD Coordination Office to ensure appropriate coordination with other works and events in the area.

A review of the potential construction related impacts from key nearby developments is detailed in the following subsections.

3.6.1 Sydney Metro

The closest proposed Metro station to the WBACP is Barangaroo, which is to be located along Hickson Road, south of Argyle Street. Construction of the Barangaroo Metro station is anticipated to occur between 2017 and 2022.

The Environmental Impact Statement (Transport for NSW, May to June 2016, page 325-326) for the project indicates that during the AM and PM road network peak periods (7am to 10am, 4pm to 7pm), the construction works would generate up to:

- Six heavy vehicles per hour
- Two light vehicles per hour.

Between the peak periods, the construction works would generate up to:

- 26 heavy vehicles per hour
- 10 light vehicles per hour.

Construction vehicles would enter the construction site from the south via Hickson Road, from the Western Distributor and the Bradfield Highway as shown in Figure 3.3.

To facilitate the works, on-street parking spaces along Hickson Road would be removed, however, one traffic lane in each direction would be maintained during the day. During the launch and retrieval of tunnel boring machines, there may be a requirement for a temporary closure of Hickson Road however this is likely to occur at night and would be coordinated with the CBD Coordination Office.

Figure 3.3: Barangaroo Metro station construction routes



Source: Sydney Metro Chatswood to Sydenham EIS

More recently, Transport for NSW has announced that, "[f]ollowing community consultation, crushed rock will be removed by barges for the excavation work that takes place at Blues Point, Barangaroo and under Sydney Harbour – reducing impacts to the road network and cutting truck movements²." The significance of this is that the cumulative construction traffic impacts of multiple concurrent projects on the road network would be reduced as a result.

3.6.2 CBD and South East Light Rail

Construction of northern stations (The Rocks Precinct) of the CSELR would require some construction vehicles to use Hickson Road for both entry and exit movements as shown in the construction route diagram in Figure 3.4.

² <https://www.transport.nsw.gov.au/newsroom-and-events/media-releases/new-harbour-metro-crossing-underway>, accessed 27 September 2017

Figure 3.4: CSELR construction routes



Source: CBD and South East Light Rail Project Environmental Impact Statement Volume 2 Technical Papers Construction Traffic Management Plan prepared by Booz & Co./AECOM dated 7 November 2013

The estimated volume of construction traffic generated by the CSELR works is summarised in Table 3.2. The table indicates, that a construction site would generate an average of up to six heavy vehicle trips per day on average, to George Street and Alfred Street, which at some stage, would be accessed via Hickson Road. Six vehicle trips per day is a negligible increase to traffic and includes approximately up to one vehicle trip per hour.

Peak construction volume to George Street and Alfred Street would occur during concrete delivery and CSR (Cyclic Stress Ratio) backfill, with a peak of 86 heavy vehicle trips per day. This peak volume is to occur for a short duration of the overall project timeline and would not necessarily use Hickson Road as the construction vehicle route.

It is noted that detailed dates and durations of specific CSELR construction works are unknown and therefore the potential extent of works overlapping with the WBACP redevelopment is undetermined.

Coordination with the CBD Coordination Office would be required in this instance to identify whether the WBACP construction vehicles would share a traffic route with peak CSELR construction traffic.

It would be expected that the light rail project would be operational by early 2019, largely preceding proposed construction activity at the WBACP.

Table 3.2: Construction heavy vehicle volumes

CBD Route							
Route	Street Start	Street End	Total Duration *	Average Daily Heavy Vehicle Trips * (Day)	Peak Daily Heavy Vehicle Trips* (Day)	Total Number of Peak Activity Shifts	Peak Activity
George Street	Market Street	King Street	5 months	4	87	3	Concrete delivery
George Street	King Street	Margaret Street	9 months	4	95	1	Concrete delivery & CSR backfill
George Street	Margaret Street	Grosvenor Street	9 months	2	96	1	Concrete delivery & CSR backfill
George Street / Alfred Street	Grosvenor Street	Loftus Street	9 months	6	86	4	Concrete delivery & CSR backfill

* Average / Peak Daily Heavy Vehicle Trips represent the total inbound and outbound truck movements of the worksite (construction works only; therefore excludes all early works, and systems construction component of civil works, rolling stock & rail systems contract component).

* In the Total Duration, the number of days for overlapping sections of work would not be added separately, only the first and last date of that whole section of overlapping works is allowed for when calculating average truck movement.

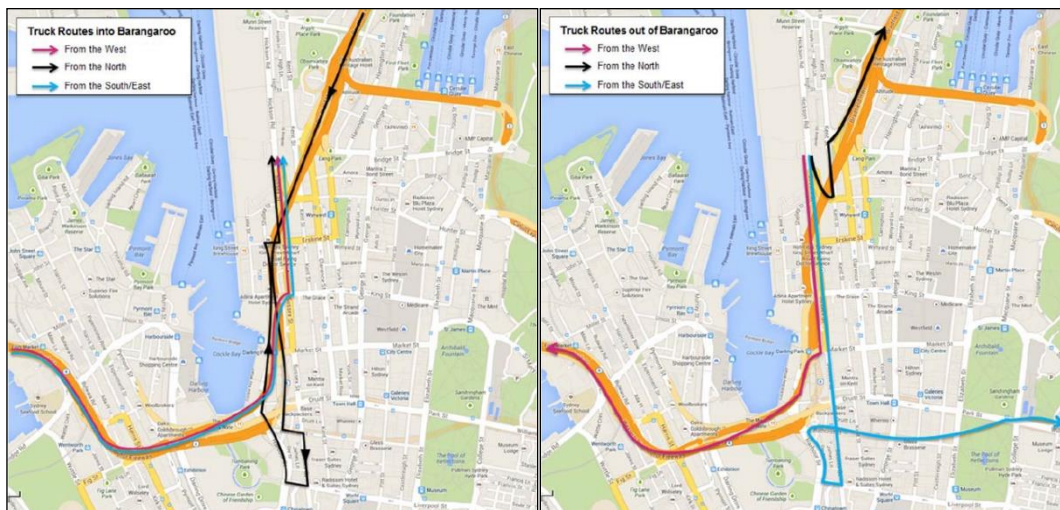
* Average / Peak Daily Heavy Vehicle Trips does not include the cumulative truck movements; shows only single site movements

Source: CBD and South East Light Rail Project Environmental Impact Statement Volume 2 Technical Papers Construction Traffic Management Plan prepared by Booz & Co./AECOM dated 7 November 2013

3.6.3 Barangaroo

The Barangaroo precinct would include various development projects of varying duration, intensity and access requirements. Nonetheless, generally construction access into the precinct would utilise the site from the south, via Hickson Road, as shown in Figure 3.5.

Figure 3.5: Barangaroo construction vehicle routes



Source: Arup, 2015, Barangaroo Hickson Road Remediation, Traffic Impact Assessment, Rev B

A previous forecast of cumulative construction vehicle movements indicates that from 2017 to 2018, the Barangaroo precinct would generate approximately 50 to 80 construction vehicle movements per hour during the morning peak period (8am to 9am)³. Updated month-by-month forecasts have been documented in Arup's Barangaroo C1 Transport Assessment⁴ dated 18 October 2017. The traffic forecast estimates are shown in Table 3.3.

3.6.4 Cumulative Impact

Based on the previously mentioned Arup report, the summary shown in Table 3.3 outlines indicative cumulative month-by-month peak hour traffic volumes.

³ Arup Pty Ltd, 18 August 2015, *Barangaroo Hickson Road Remediation, Traffic Impact Assessment*, Rev B

⁴ Arup Pty Ltd, 18 October 2017, *Barangaroo Building C1 Transport Assessment*

Table 3.3: Cumulative peak hour traffic generation* (in addition to existing traffic)

	2018						2019												2020					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Barangaroo operational traffic movements	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	280	280	280	280	280	280	280
Operational Traffic sub-total	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	270	280	280	280	280	280	280	280
Barangaroo South	97	105	100	100	100	95	95	95	96	74	74	74	74	74	74	74	68	84	84	84	84	84	84	84
Sydney Metro	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*	24*
CBD Light Rail	1	1	1	1	1	1	1	1~	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WBACP@	4	4	4	4	4	4	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Construction traffic sub-total	126	134	129	129	129	124	127	127	127	105	105	105	105	105	105	105	99	115	115	115	115	115	115	115
Total new Traffic	396	404	399	399	399	394	397	397	397	375	375	375	375	375	375	375	369	395	395	395	395	395	395	395

* As previously noted in Section 3.6.1, a decision has been made for the use of barges to remove some construction spoil. As a consequence, the construction traffic associated with the Sydney Metro is likely to be less than the number quoted in the 2017 Arup report. Therefore, this assessment can be considered a worst-case scenario. In any event, as the forecast construction traffic for WBACP is less than Sydney Metro, intersection operation can be expected to operate at a level between the assessments shown in Table 3.4.

~ Assuming an opening date of early 2019 consistent with the project timeline

@ Assuming a six-month demolition and 18 month construction phase

Source: Modified from Barangaroo C1 Traffic Assessment, pg. 15-16, dated 18 October 2017

The traffic attributable to the construction activities contributes less than two per cent of additional traffic generation forecast along Hickson Road. Arup undertook LinSig modelling for intersections around Barangaroo in a forecast AM peak hour. Excluding the potential WBACP traffic, the most constrained intersection modelled was Hickson Road/ Napoleon Street which would operate at a level of service E with all development approved. Other intersections modelled operate at a Level of Service C or better as shown in Table 3.4.

Table 3.4: Intersection Analysis

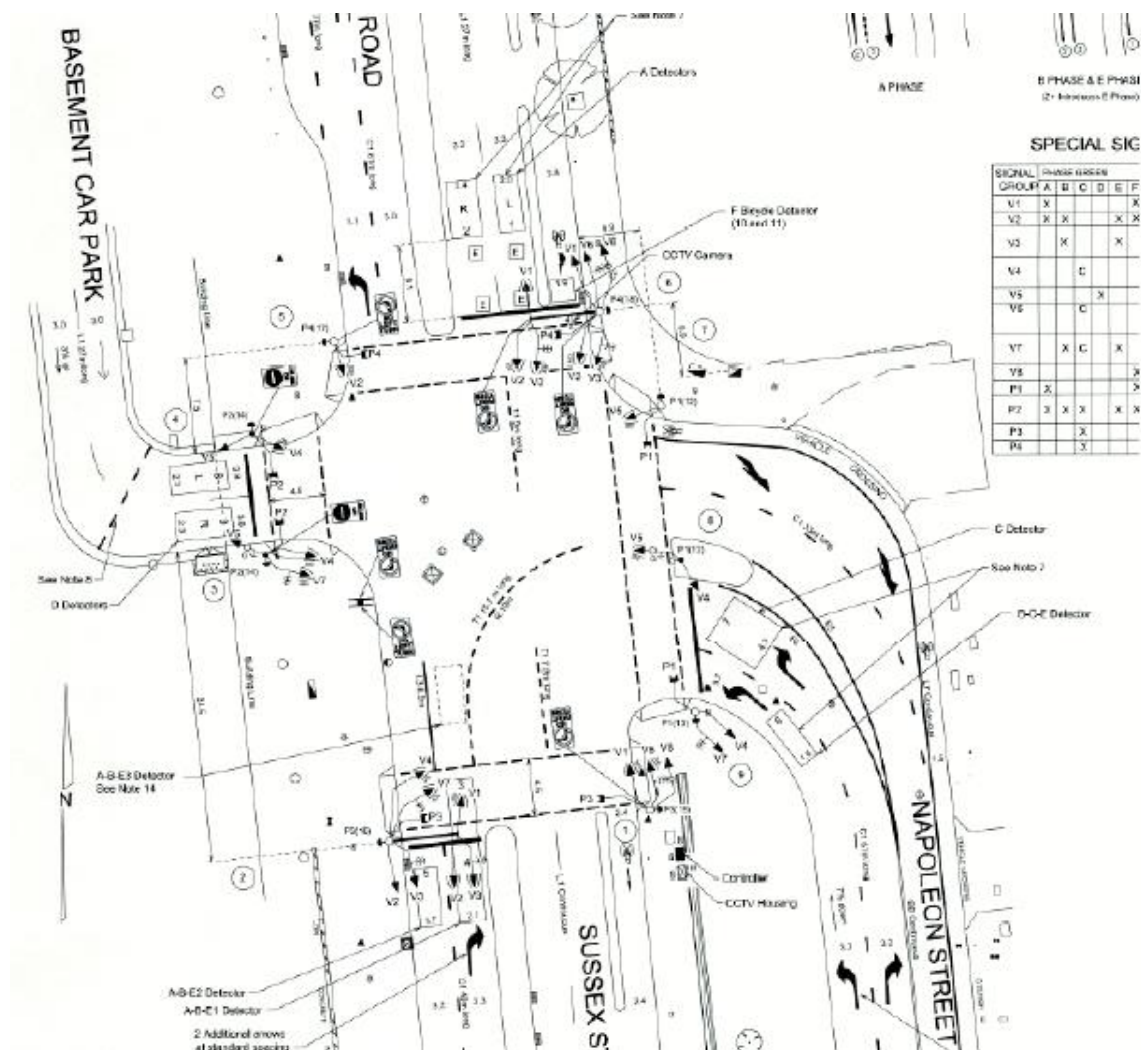
Peak	Intersection	Future Traffic Peak, 2020 (Excluding C1 Building works)			Future Traffic Peak, 2020, (Including C1 Building works)		
		LOS	DOS	AVD (sec)	LOS	DOS	AVD (sec)
AM	Sussex St / Erskine St	C	0.91	37	C	0.91	36
	Hickson Rd / Napoleon St	E	0.94	58	E	0.95	61
	Kent St / Margaret St	B	0.61	21	B	0.62	21
	Hickson Rd / Globe St	A	0.49	2	A	0.51	2

LOS - Intersection Traffic Level of Service, DOS - Degree of Saturation, AVD - Average Delay per vehicle

Source: Barangaroo C1 Traffic Assessment, pg. 19 (Table 7), dated 18 October 2017

A level of service E is indicative of an intersection approaching capacity. Subsequently, a modified layout for the Hickson Road and Napoleon Street intersection was developed and has been approved. The updated intersection layout is shown in Figure 3.6.

Figure 3.6: Approved intersection layout



Source: Barangaroo C1 Traffic Assessment, pg. 20, dated 18 October 2017

The addition of up to seven vehicles per peak hour in addition to the other surrounding developments is considered minor, and with consideration to work undertaken by others, would not be expected to be adversely detrimental to the level of service, safety or function of the intersections assessed by Arup, or indeed the broader road network.

3.7 Construction Worker Parking

It is not proposed to provide any designated on-site staff car parking for workers due to site constraints, noting that the proposed works involve an internal redevelopment and external refurbishment only. All staff would be encouraged to utilise public transport to access the site so as not to impact resident and commercial parking near the site.

A bus stop is located at the frontage of the site servicing two bus routes. Bus services are available at 20-minute intervals in the morning before 7am (anticipated start of construction hours) and 30-minute intervals in the evening after 7pm (anticipated end of construction hours).

The following measures would be in place to encourage staff to use public transport:

- During the induction and regular management/ site meetings, staff would be informed of restricted parking conditions on site and would be instructed that they are not to park on the surrounding road network (existing on-street parking restrictions and charges will support this).
- Staff would be instructed to use public transport to access the site and public transport timetable information would be made available and displayed at prominent locations.

The above measures would be included in contract documents between Infrastructure NSW and the head contractor.

As such, it is not expected there would be any staff generated traffic during the construction of proposed development.

3.8 Construction Vehicle Routes

Truck movements would be restricted to designated routes and confined to State roads in the broader road network. Truck routes to/ from the site, as indicated below, have been identified with the aim of minimising the impact of construction traffic on roads near the site.

The directional distribution and assignment of traffic generated by the development will be influenced by a number of factors, most notably the origin/ destination of materials and the configuration of the arterial road network in the immediate vicinity of the site. Ongoing changes to routing may be required due to the impacts from the construction of the CSELR and Barangaroo development, as well as the proposed Sydney Metro construction.

Feasible approach and departure routes are detailed as follows:

Arrival Routes

- From north:
 - Harbour Bridge, York Street, Margaret Street, Napoleon Street, Hickson Road.
- From south:
 - Southern Cross Drive, Eastern Distributor, Cross City Tunnel, Wheat Road, Shelley Street, Erskine Street, Sussex Street/ Hickson Road.
- From west:
 - ANZAC Bridge, Western Distributor, Sussex Street/ Hickson Road.

Departure Routes

- To north:
 - Hickson Road, Towns Place, Dalgety Road, Argyle Place, Kent Street, Sydney Harbour Bridge.
- To south:
 - Hickson Road/ Sussex Street, King Street, Elizabeth Street, William Street/ Park Street, Bourke Street, Eastern Distributor
 - An unmapped alternative is Hickson Road/ Sussex Street, Liverpool Street, Harbour Street, Cross City Tunnel.
- To west:
 - Hickson Road/ Sussex Street, Western Distributor.

Truck drivers would be advised of the designated truck routes to/ from the site. The truck routes are shown in Figure 3.7 and Figure 3.8.

Figure 3.7: Truck approach routes

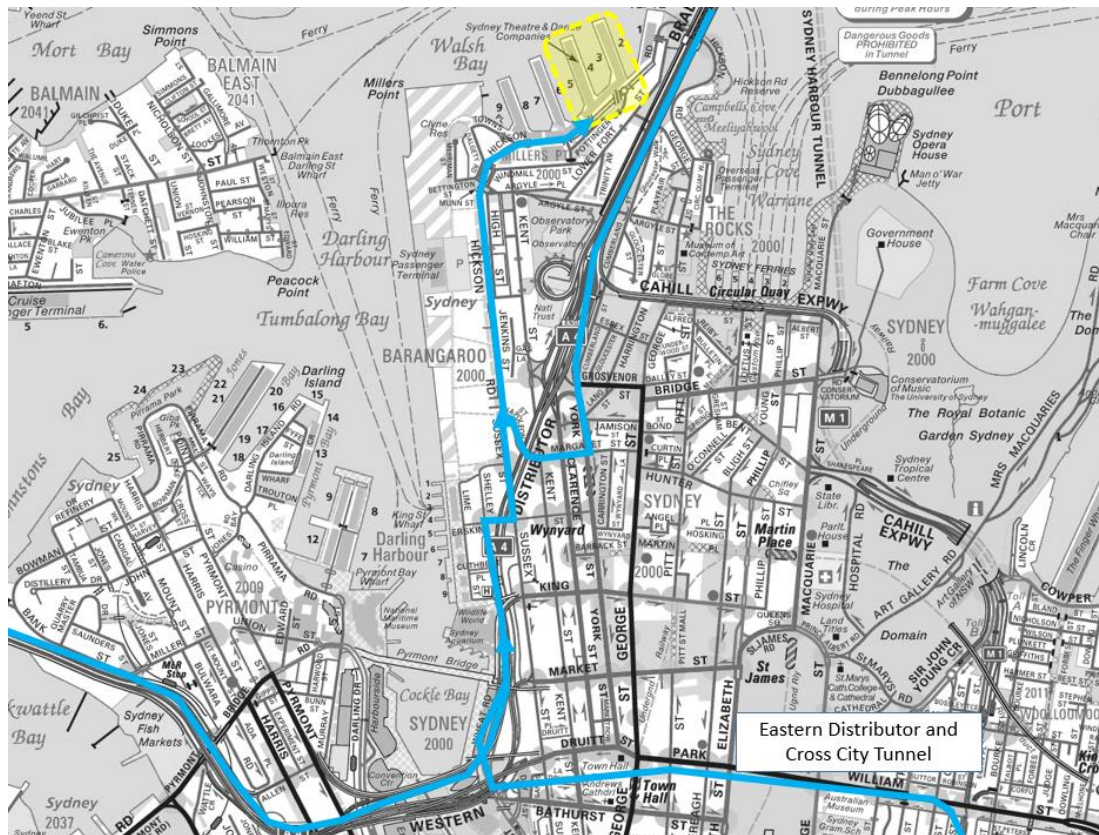
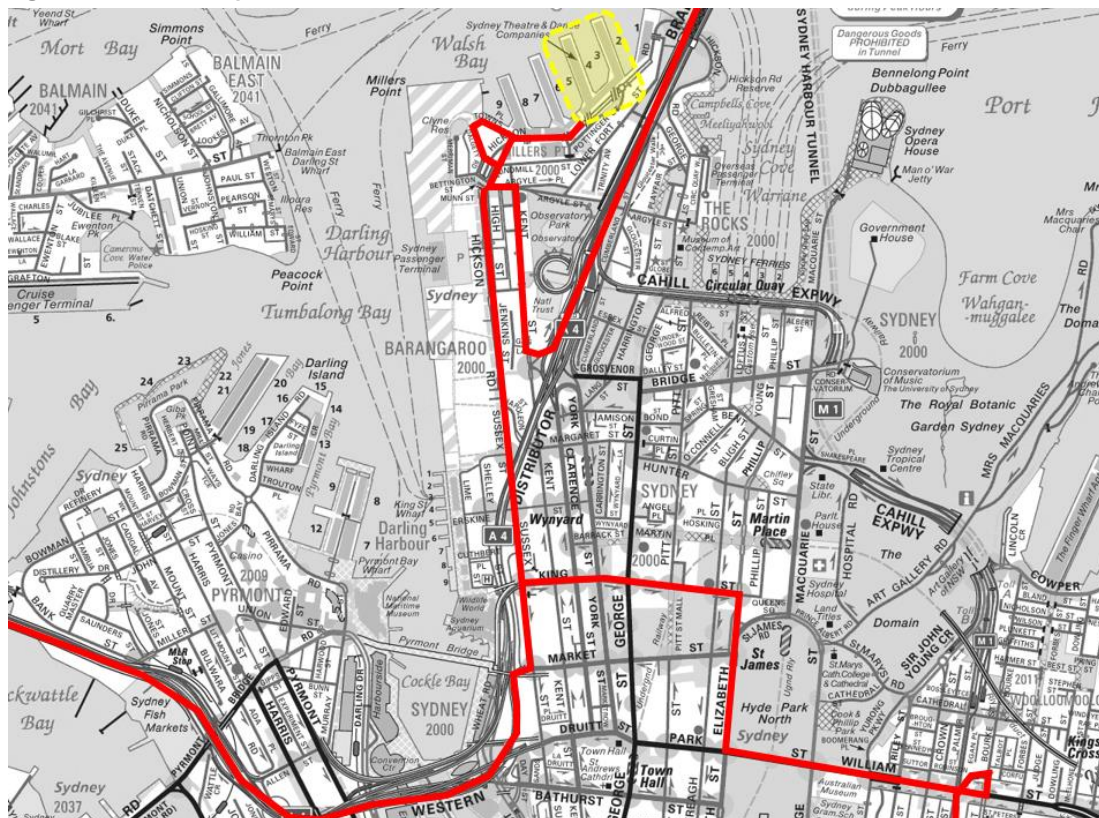


Figure 3.8: Truck departure routes



4. Construction Traffic Management

4.1 Traffic Guidance Scheme

An overview Traffic Guidance Scheme (TGS) for the construction works has been prepared and is provided in Appendix B. The plan presents the principles of traffic management and is subject to WorkCover requirements.

Detailed information for work site operations is contained in the Roads and Maritime Traffic Control at Work Sites manual. The control of traffic at work sites must be undertaken with reference to WorkCover requirements and the contractor/ builders own Workplace Health and Safety Manuals.

The TGS details the following considerations:

- Construction vehicle activity, including the loading/ unloading of trucks and all materials handling to be provided within the construction site boundaries or within the proposed works zones (if required) at all times.
- The movement of trucks to/ from the construction site is to be managed and controlled by accredited site personnel.
- Pedestrian safety to be maintained at all times.
- Pedestrian wayfinding signage to be provided where an existing pathway is closed.

4.2 Pedestrian and Cyclist Management

During construction, pedestrian and cyclist movements should be maintained wherever possible.

The bicycle shoulder lane and pedestrian footpath along Hickson Road is to operate and be maintained as existing. Along the harbour, the pedestrian connection between the piers would be closed for construction. As such, wayfinding signage would be implemented at key locations to direct pedestrians to the alternative route, such as the footpath on Hickson Road.

Class A construction fencing would be erected around the perimeter of the site.

As discussed in Section 3.3, Class B hoarding would be provided at the eastern pedestrian access at Pier 2/3. A traffic controller would be present during construction hours to manage construction vehicle entry and exit at this access, noting that pedestrian priority would be given. Outside of construction hours, barriers would be installed to prevent pedestrians from entering the construction site.

The pedestrian management plan is shown in the TGS in Appendix B.

Should any unforeseen activities require the temporary closure of any additional pedestrian access, a TGS should be developed and implemented by the contractor/ builder to ensure a safe alternative for pedestrians traversing these routes near the site.

4.3 Public Transport

As discussed, a bus stop is available at the frontage of the site, between Pier 2/3 and Wharf 4/5. The stop is a terminus point, with buses utilising the roundabout to the east to turn around. This bus stop is to be maintained as is and is anticipated to operate as existing conditions.

4.4 Emergency Vehicle Access

Access to the neighbouring sites by emergency vehicles would not be affected by the works as the road and footpath frontages would be unaffected.

Emergency vehicle access would be maintained to the site at all times.

Emergency protocols on the site would include a requirement for traffic controllers to assist with emergency access from the street. All truck movements to the site and/ or incident point would be suspended and cleared. Consequently, any potential impacts on emergency access would be effectively managed throughout the works. Any accredited traffic controllers on-site would also be made available to assist should an incident occur on Hickson Road in the immediate vicinity of the site.

Liaison would be ongoing with the police and emergency services agencies throughout the construction period and a 24-hour contact would be made available for 'out-of-hours' emergencies and access.

Thus, there would be no adverse impacts on the provision of existing emergency vehicle access to other neighbouring properties as a result of the proposed construction activities.

4.5 Traffic Movements in Adjoining Council Areas

No adverse effects are expected from the movement of heavy vehicles through adjacent council areas.

5. Mitigation Measures

The principal contractor shall develop a detailed CPTMP in consultation with the Sydney Coordination Office, TfNSW, Roads and Maritime, Barangaroo Development Authority and the City of Sydney Council prior to construction commencing. This CPTMP will be prepared in accordance with the City of Sydney Council's standard requirements for a Construction Traffic Management Plan, which is included in Appendix A and *Traffic Control at Worksites* (Roads and Maritime, version 4, June 2010). The detailed CPTMP would include confirmation of:

- Hours of specific construction activities to minimise impact on the surrounding transport network and local residents and tenants
- Haulage routes
- Sequence for implementing traffic management devices
- Induction requirements for construction, supervisory and management personnel
- Procedure for inspections and record keeping for maintaining traffic control measures
- Provisions for maintaining safe access for pedestrians and cyclists throughout construction.

Appendix A

City of Sydney Standard Requirements and TfNSW CPTMP Checklist

The City of Sydney Standard Requirements for Construction Traffic Management Plan

The Applicant or contractor undertakes to follow and abide by the following requirements at all times during the demolition, excavation and construction works at **(Please Insert site address and DA No here)**

1. Details of routes to and from site and entry and exit points from site – site specific
2. Details of roads that may be excluded from use by construction traffic i.e. roads with load limits, quiet residential streets or access/turn restricted streets – site specific
3. The approved truck route plan shall form part of the contract and must be distributed to all truck drivers.
4. All vehicles must enter and exit the site in a forward direction (unless specific approval for a **one-off occasion** is obtained from the City's Construction Regulation Unit).
5. Trucks are not allowed to reverse into the site from the road (unless specific approval for a **one-off occasion** is obtained from the City's Construction Regulation Unit).
6. The Applicant must provide the City with details of the largest truck that will be used during the demolition, excavation and construction.

NOTE: No dog trailers or articulated vehicles (AV) to be used on local roads (unless specific approval for a **one-off occasion** is obtained from the City's Construction Regulation Unit).

7. Oversize and over-mass vehicles are not allowed to travel on Local Roads (unless approval for a **one-off occasion** is obtained from the City's Traffic Operations Unit). Requests to use these vehicles must be submitted to the City 28 days prior to the vehicle's scheduled travel date. For more information please contact the National Heavy Vehicle Regulator (NHVR) on 1300 696 487 or www.nhvr.gov.au.
8. No queuing or marshalling of trucks is permitted on any public road.
9. Any temporary adjustment to Bus Stops or Traffic Signals will require the Applicant to obtain approval from the STA and RMS respectively prior to commencement of works.
10. All vehicles associated with the development shall be parked wholly within the site. All site staff related with the works are to park in a designated off street area or be encouraged to use public transport and not park on the public road.
11. All loading and unloading must be within the development site or at an approved "Works Zone".

12. The Applicant must apply to the City's Traffic Works Co-ordinator to organise appropriate approvals for Work Zones and road closures.
13. The Applicant must apply to the City's Construction Regulations Unit to organise appropriate approvals for partial road closures.
14. The Applicant must apply to the Transport for NSW's Transport Management Centre for approval of any road works on State Roads or within 100m of Traffic Signals and receive an approved Road Occupancy Licence (ROL). A copy of the ROL must be provided to the City.
15. The Applicant must apply to the City's Construction Regulations Unit to organise appropriate approvals for temporary driveways, cranes and barricades etc.
16. The Applicant must comply with development consent for hours of construction.
17. All Traffic Control Plans associated with the CTMP must comply with the Australian Standards and Roads and Maritime Services (RMS) Traffic Control At Work Sites Guidelines.
18. Traffic Controllers are NOT to stop traffic on the public street(s) to allow trucks to enter or leave the site. They MUST wait until a suitable gap in traffic allows them to assist trucks to enter or exit the site. The Roads Act does not give any special treatment to trucks leaving a construction site - **the vehicles already on the road have right-of-way.**
19. Pedestrians may be held only for very short periods to ensure safety when trucks are leaving or entering BUT you must NOT stop pedestrians in anticipation i.e. **at all times the pedestrians have right-of-way on the footpath not the trucks.**
20. Physical barriers to control pedestrian or traffic movements need to be determined by the City's Construction Regulations Unit prior to commencement of work.
21. The Applicant must obtain a permit from the City's Construction Regulation Unit regarding the placing of any plant/equipment on public ways.
22. The Applicant must apply to the City's Building Approvals Unit to organise appropriate approvals for hoarding prior to commencement of works.
23. The CTMP is for the excavation, demolition and construction of building works, not for road works (if required) associated with the development. Any road works will require the Applicant or the contractor to separately seek approval from the City and/or RMS for consideration. Also WorkCover requires that Traffic Control Plans must comply with Australian Standards 1742.3 and must be prepared by a Certified Traffic Controller (under RMS regulations).
24. Please note that the provision of any information in this CTMP will not exempt the Applicant from correctly fulfilling all other conditions relevant to the development consent for the above site.

Appendix B

Traffic Guidance Scheme



NOTES

LEGEND


CERTIFICATION



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

[illegible]

GENERAL NOTES

DESIGNED W. ZHENG	DESIGN CHECK N. VUKIC
DRAWN W. ZHENG	DRAFTING CHECK W. ZHENG
APPROVED BY B. MAYNARD	DATE APPROVED FOR INITIAL ISSUE 28 SEPTEMBER 2017
SCALE A3 	CAD FILE NO. 1:800 N133680-01-P1.dgn



CLIENT ARTS NSW

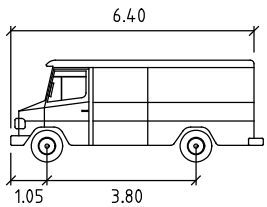
Appendix C

Swept Paths

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - - 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



SRV metres

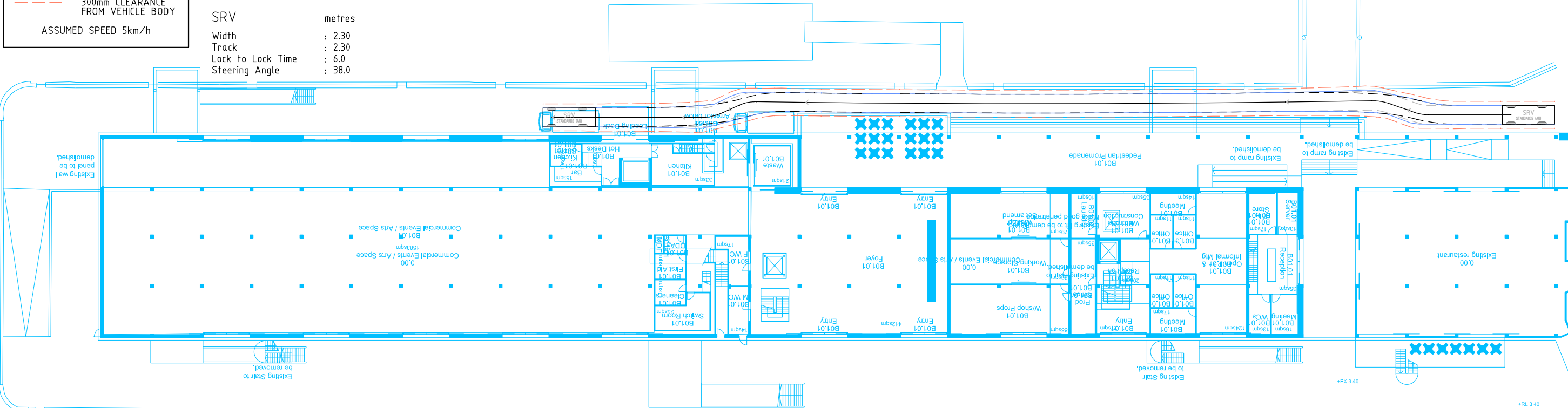
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Track : 2.30

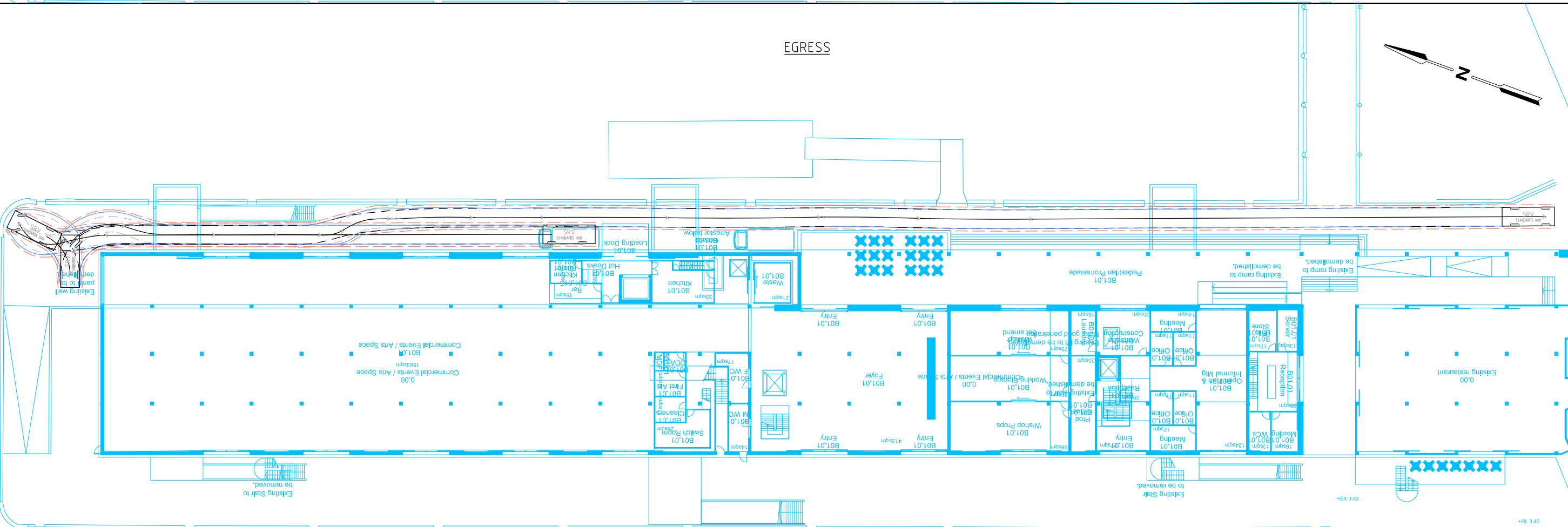
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Steering Angle : 38.0

INGRESS



EGRESS



WALSH BAY ARTS PRECINCT
LOADING DOCK - SWEPT PATH ASSESSMENT
6.4m SRV

DATE: 02.04.2014 SCALE: 1:500@A3

APPROVED: BDM DRAWING NO. 14S1131000-06-01-P2 SHEET: 01 OF 02

Melbourne 03 9851 9600
Sydney 02 8448 1800
Brisbane 07 3113 5000
Canberra 02 6263 9400
Adelaide 08 8334 3600

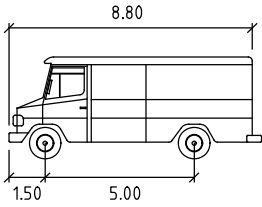


PLOTTED BY: Barry Li ON: 2/04/2014 AT 3:41:48 PM 14S1131000-06-P2.dgn

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - - 500mm CLEARANCE FROM VEHICLE BODY

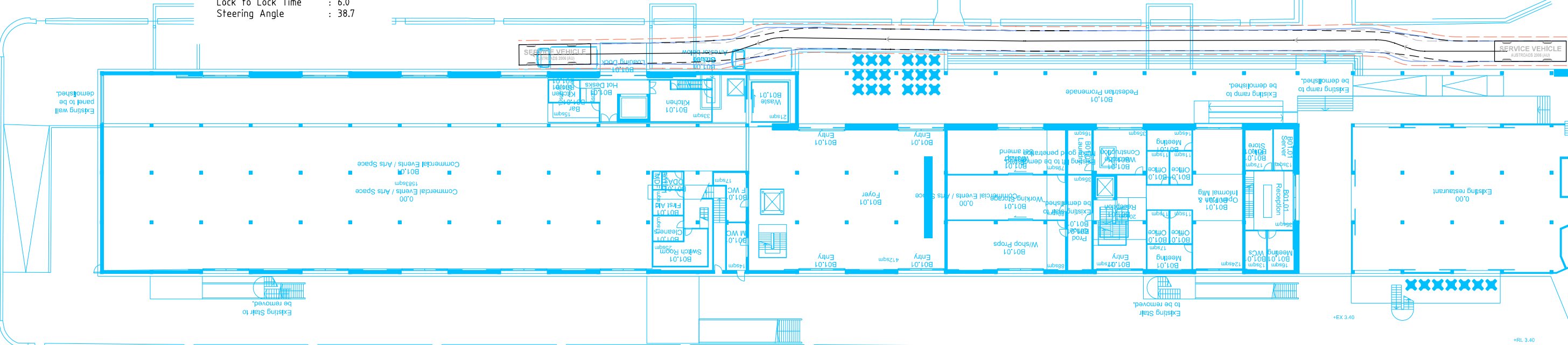
ASSUMED SPEED 5km/h



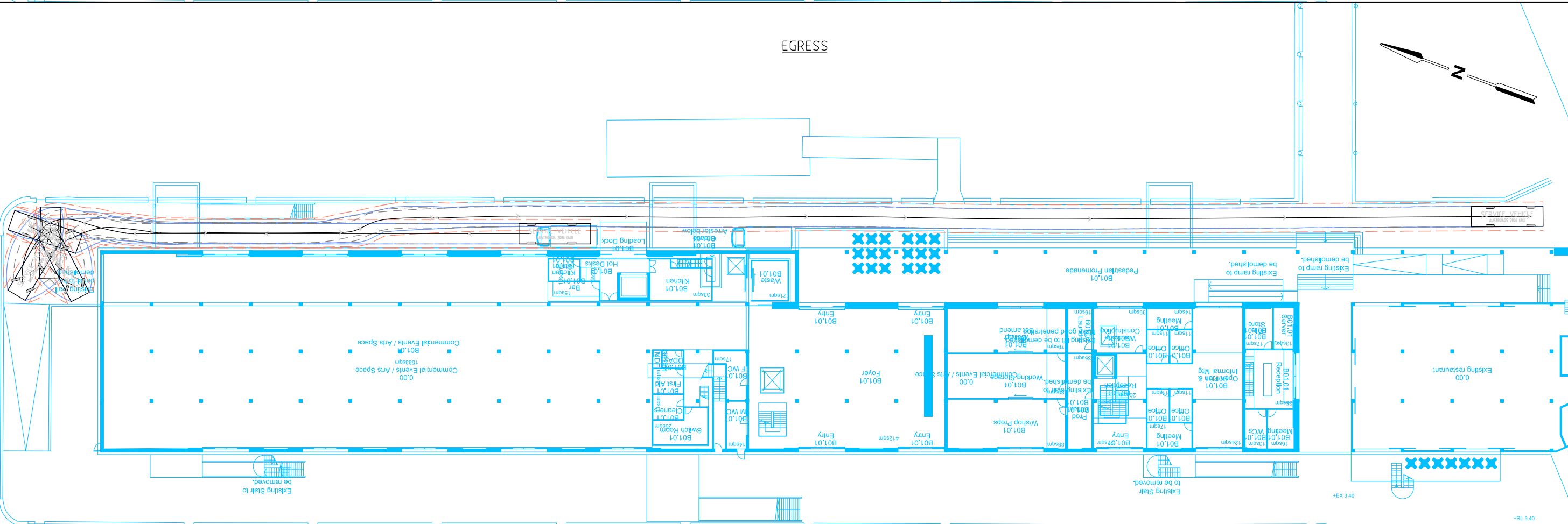
SERVICE VEHICLE metres

Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 38.7

INGRESS



EGRESS



WALSH BAY ARTS PRECINCT
LOADING DOCK - SWEPT PATH ASSESSMENT
8.8m MRV

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APPROVED: BDM
DRAWING NO. 14S1131000-06-02-P2
SHEET: 02 OF 02

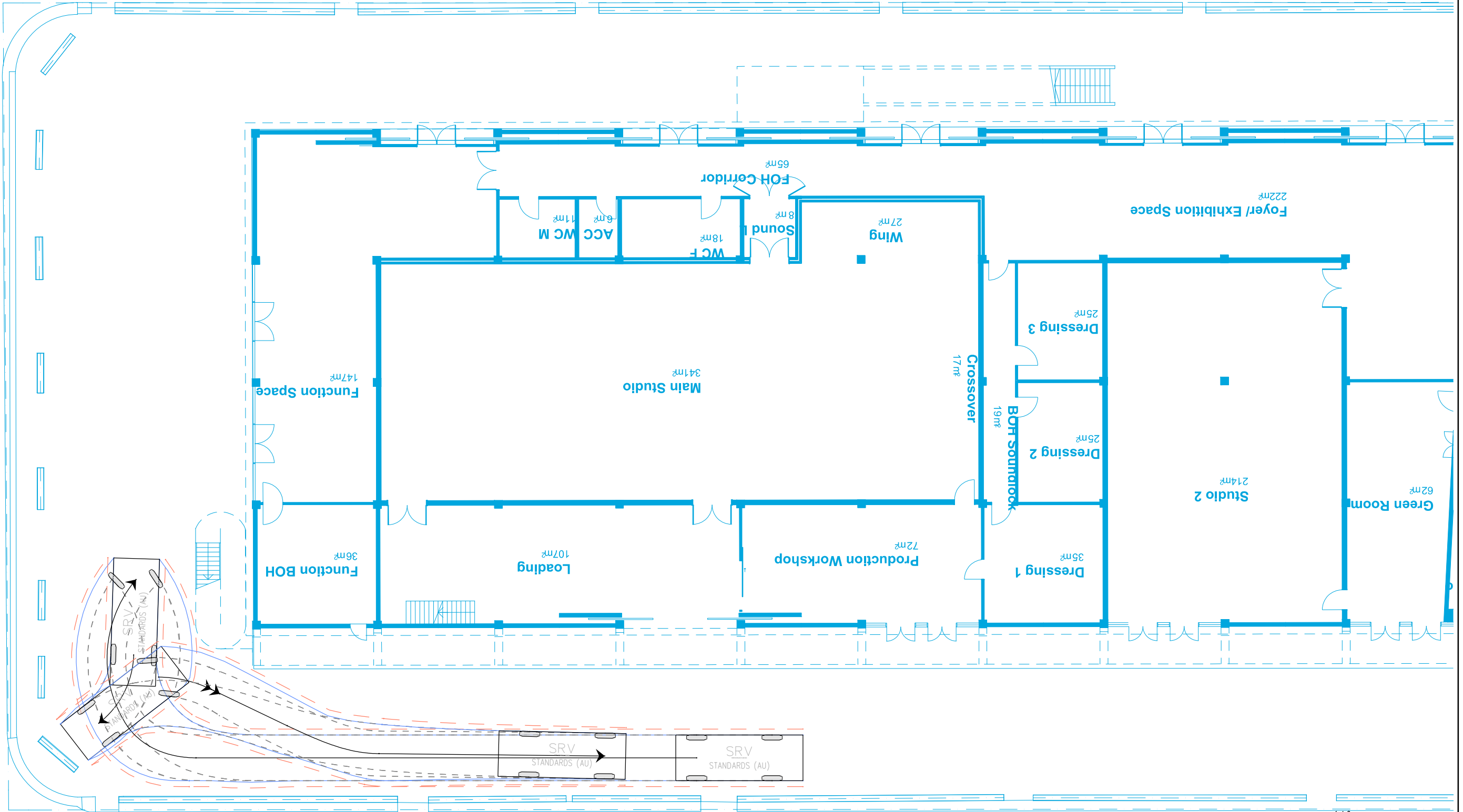
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Brisbane 07 3113 5000
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Adelaide 08 8334 3600

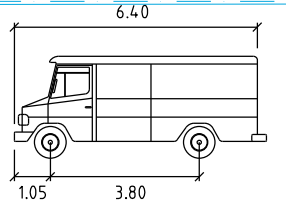


GTA consultants
www.gta.com.au

16S1426000-01-P1.dgn 16S1426000-01-P1.dgn ON 13/05/2016 AT 10:49:51 AM PLOTTED BY : Heiko Obermaier



SWEPT PATH KEY	
	VEHICLE CENTRE LINE
	VEHICLE TYRE PATH
	VEHICLE BODY PATH
	300mm CLEARANCE FROM VEHICLE BODY
ASSUMED SPEED 5km/h	



SRV	metres
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

Melbourne 03 9851 9600
Sydney 02 8448 1800
Brisbane 07 3113 5000
Canberra 02 6243 9400
Adelaide 08 8334 3600
Gold Coast 07 5510 4814
Townsville 07 4722 2765
Perth 08 6316 4634



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

WALSH BAY ARTS PRECINCT
SRV SWEEP PATH ASSESSMENT

DATE: 13/05/2016
SCALE: 1:200@A3
APPROVED: BDM
DRAWING NO. 16S1426000-01-01-P1

SHEET: 01 OF 01

Appendix D

Parking Survey

Client GTA

Location Hickson Road, Dawes Point

Date Saturday, 27th August 2016

Description Parking Occupancy Survey



Area	Spaces	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
North Side (KERB)	52	28	37	39	43	42	39	38	29	34	43	47	47
South Side (KERB)	30	10	10	12	11	17	20	15	4	8	17	24	24
North Side (MEDIAN)	75	49	54	59	68	70	63	59	44	60	67	67	67
South Side (MEDIAN)	76	28	43	42	52	56	55	37	28	36	57	65	65
Total	233	115	144	152	174	185	177	149	105	138	184	203	203
% Capacity		49%	62%	65%	75%	79%	76%	64%	45%	59%	79%	87%	87%

Client GTA

Location Hickson Road, Dawes Point

Date Wednesday, 31st August 2016

Description Parking Occupancy Survey



Area	Spaces	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00
North Side (KERB)	52	24	24	31	29	28	18	18	18	26	36	47	43
South Side (KERB)	30	8	7	7	11	12	11	7	12	14	15	18	13
North Side (MEDIAN)	75	32	40	42	52	41	22	25	32	39	64	63	55
South Side (MEDIAN)	76	26	31	34	48	44	27	27	36	40	48	50	47
Total	233	90	102	114	140	125	78	77	98	119	163	178	158
% Capacity		39%	44%	49%	60%	54%	33%	33%	42%	51%	70%	76%	68%

Melbourne

A Level 25, 55 Collins Street
PO Box 24055
MELBOURNE VIC 3000
P +613 9851 9600
E melbourne@gta.com.au

Sydney

A Level 6, 15 Help Street
CHATSWOOD NSW 2067
PO Box 5254
WEST CHATSWOOD NSW 1515
P +612 8448 1800
E sydney@gta.com.au

Brisbane

A Ground Floor, 283 Elizabeth Street
BRISBANE QLD 4000
GPO Box 115
BRISBANE QLD 4001
P +617 3113 5000
E brisbane@gta.com.au

Canberra

A Level 4, 15 Moore Street
CANBERRA ACT 2600
P +612 6243 4826
E canberra@gta.com.au

Adelaide

A Suite 4, Level 1, 136 The Parade
PO Box 3421
NORWOOD SA 5067
P +618 8334 3600
E adelaide@gta.com.au

Perth

A Level 2, 5 Mill Street
PERTH WA 6000
PO Box 7025, Cloisters Square
PERTH WA 6850
P +618 6169 1000
E perth@gta.com.au