

Watermans Quay and Barangaroo Avenue Access Gates Construction Traffic Management Plan

Barangaroo South Stage 1B

Prepared for
Lendlease Building

06 December 2019



Contact Information

Cardno (NSW/ACT) Pty Ltd
ABN 95 001 145 035

Level 9 – The Forum
203 Pacific Highway
St Leonards NSW 2065

Telephone: 02 9496 7700
Facsimile: 02 9439 5170

www.cardno.com.au

Author(s):

Adrian Lu
Civil Engineer

Document Information

Prepared for	Lendlease Building
Project Name	Barangaroo South Stage 1B
File Reference	NA50613044 Watermans Quay and Barangaroo Avenue Access Gates CTMP v14.docx
Job Reference	NA50613044
Date	06 December 2019
Version Number	14

Effective Date 06 December 2019

Date Approved: 06 December 2019

Document History

Version	Effective Date	Description of Revision	Prepared by:	Reviewed by:
01	27/09/2017	Draft for Client Review	TIM	
02	11/10/2017	Minor Amendments	TIM	
03	13/10/2017	Minor Amendments	TIM	
04	16/11/2017	Minor Amendments	MKH	Michael Hodges
05	21/12/2017	Minor Amendments	TIM	Michael Hodges
06	05/03/2018	Amendments as requested by BDA	MKH	Michael Hodges
07	09/03/2018	Revised turning path sketches	TIM	Michael Hodges
08	16/04/2018	Section 8 Updated	MKH	Michael Hodges
09	26/11/2018	Additional gate and compound for Waterfront Structures included	TIM	Garry Neville
10	15/05/2019	Gate 1 allows construction vehicles entering and exiting the Stage 1B site	Nabil Rahman	Hamid Tashkhisi
11	01/07/2019	Report amended to include Gate 3	Adrian Lu	Garry Neville
12	31/07/2019	Gate 3 notation amendment	Adrian Lu	Garry Neville
13	13/11/2019	Gate 3 and Hickson Rd staging amendment	Adrian Lu	
14	06/12/2019	Rename gates and Hickson Rd gates H2 and H3 included	Adrian Lu	

© Cardno. Copyright in the whole and every part of this document belongs to Cardno and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person other than by agreement with Cardno.

This document is produced by Cardno solely for the benefit and use by the client in accordance with the terms of the engagement. Cardno does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by any third party on the content of this document.

Table of Contents

1	Introduction	1
1.1	Site Overview	1
1.2	Report Objective	1
1.3	Reference Documentation	1
2	Site Conditions	3
2.1	Access	3
2.1.1	Gate H5	3
2.1.2	Gate E	3
2.1.3	Gate H6	3
2.1.4	Gate H2 and H3	3
2.2	Road Network	3
2.2.1	Hickson Road	3
2.2.2	Watermans Quay	3
2.2.3	Barangaroo Avenue	4
3	Proposed Works	5
3.1	General	5
3.2	Concurrent Works	5
3.3	Program	6
4	Construction Vehicles	7
4.1	Principles	7
4.2	Access and Egress	8
4.3	Hours of Construction	10
4.4	Parking and Layover	10
4.5	Traffic Generation	10
5	Drivers Code of Conduct	12
6	Mitigation of Traffic Impacts	13
6.1	Sight Distances	13
6.2	Turning Paths	16
6.3	Traffic Control Plan – Watermans Quay access	17
7	Recommendations	18
8	Lendlease Commitments	19
9	Conclusion	20

Appendices

Appendix A	Watermans Quay Gate H5 Access Sketch Plan
Appendix B	Watermans Quay and Hickson Road Intersection Turning Path Diagram
Appendix C	Barangaroo Avenue Gate E Access Sketch Plan and Turning Path Diagram
Appendix D	Watermans Quay Gate H6 Access Sketch Plan and Turning Path Diagram
Appendix E	Hickson Rd Construction Zone Gate H2 and H3 Access Sketch and Turning Path Diagram
Appendix F	Construction Green Travel Plan
Appendix G	Traffic Control Plan – Watermans Quay Access

Tables

Table 3-1	Indicative Program for Stage 1B works	6
Table 4-1	Forecast Two-Way Hourly Traffic Volumes	9

Figures

Figure 1-1	Barangaroo South Stage 1B Site Overview	2
Figure 6-1	Gate H5 - Sightline for vehicles travelling north along Barangaroo Avenue	13
Figure 6-2	Gate E - Sightline for vehicles exiting the proposed access point	14
Figure 6-3	Gate E - Sightline for vehicles travelling north along Barangaroo Avenue	15
Figure 6-4	Gate H6 - Sightline for vehicles exiting the proposed access point	15

1 Introduction

This report outlines a Construction Traffic Management Plan (CTMP) in support of five (5) proposed temporary access gates off Hickson Road, Watermans Quay and Barangaroo Avenue, adjacent to the north-western corner of Tower One International Towers Sydney.

The proposed temporary access gates would be utilised as alternative points of access for construction vehicles during the completion of site remediation works, basement construction works, demolition and construction of waterfront structures and construction of public domain works within the Barangaroo South Stage 1B site.

1.1 Site Overview

The Barangaroo South Stage 1B site is generally bound by the future Central Barangaroo development to the north, Hickson Road to the east, Watermans Quay to the south and Darling Harbour to the west. An overview of the site including three proposed gates is presented overleaf in **Figure 1-1**.

1.2 Report Objective

This CTMP has been prepared to document traffic management requirements for the proposed temporary access gate, including:

- > Construction vehicle routes;
- > Construction vehicle traffic generation;
- > Operating hours;
- > Access arrangements;
- > Likely impacts of the proposed access gates on the existing road network and pedestrian routes; and
- > Proposed mitigation measures to address any traffic impacts identified.

1.3 Reference Documentation

- > Arup, *Barangaroo Hickson Road Remediation, Traffic Impact Assessment (Rev B)*, 18 August 2015;
- > Arup, *Barangaroo Stage 1B Public Domain, Transport Assessment and Construction Traffic Management Strategy (Rev. B)*, 1 May 2017;
- > Arup, *Crown Sydney Hotel Resort, Construction Traffic Management Report*, Revision B, June 2015;
- > Ventia, *Traffic Management Plan, One Sydney Harbour, Blocks 4 & 5 Remediation*, Revision 0, August 2017;
- > Lendlease, *Environmental Health and Safety (EHS) Requirements*;
- > Lendlease, *Global Minimum Requirements (GMR)*, February 2016 (GMRs 4.3 and 4.14);
- > *Work Health and Safety Act 2011*;
- > *Work Health and Safety Regulation 2017*; and
- > Australian Standard *AS1742 Manual of uniform traffic devices*.

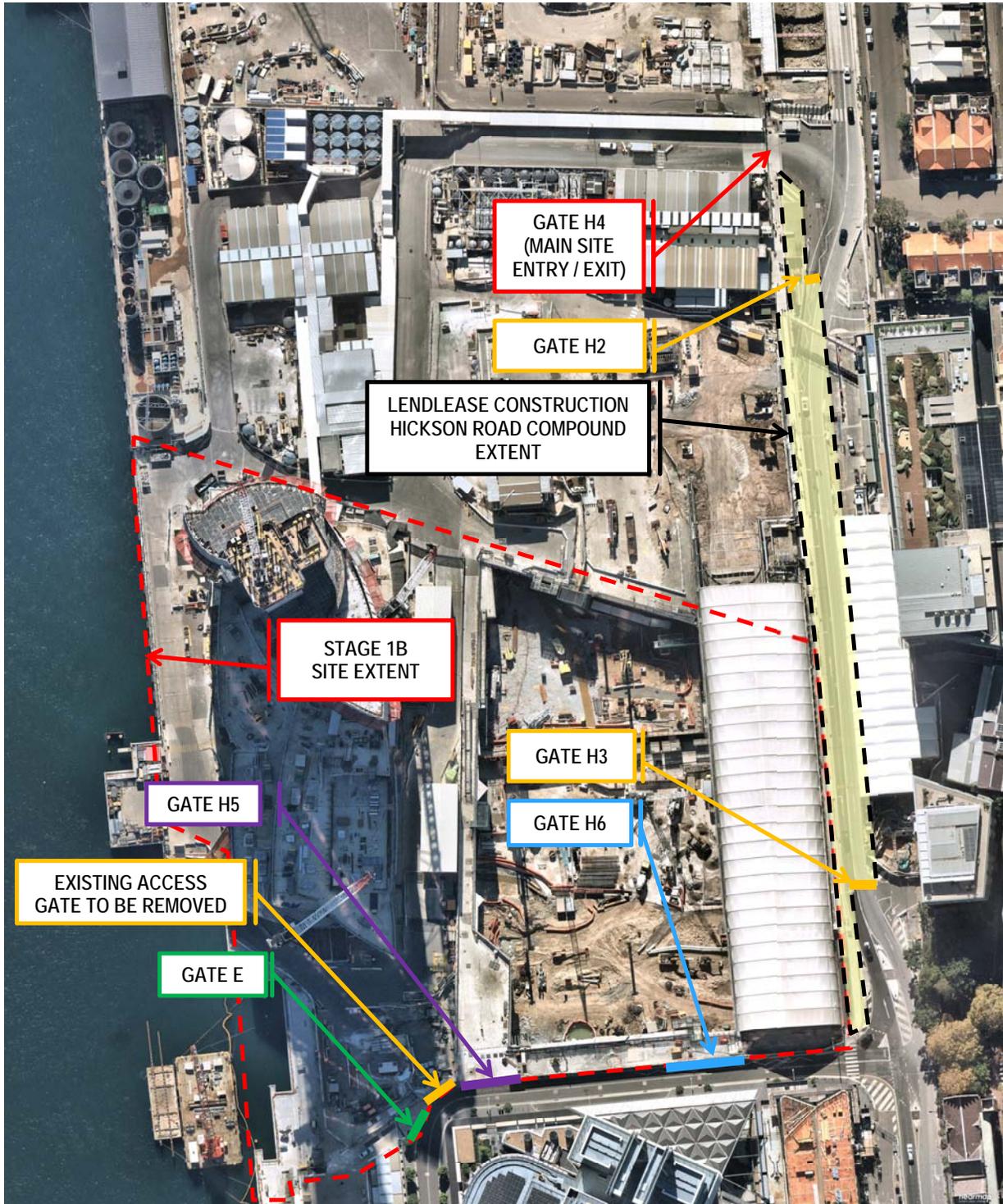


Figure 1-1 Barangaroo South Stage 1B Site Overview

Source: nearmap (image dated 23/10/2018)

2 Site Conditions

2.1 Access

The main construction access to the Stage 1B site is via the H4 gate off Hickson Road, approximately 260 metres north of Watermans Quay. The majority of construction traffic generated by the works on the Stage 1B site will enter and exit the site via H4 gate.

2.1.1 Gate H5

The proposed Gate H5 is located near the corner of Watermans Quay and Barangaroo Ave and is intended to be utilised as a tertiary point of access for construction vehicles entering and exiting the Stage 1B site.

2.1.2 Gate E

The proposed Gate E is located off Barangaroo Avenue is intended to be utilised as a tertiary entry/exit point for demolition and construction of Waterfront Structures (works approved under SSD 7944).

2.1.3 Gate H6

The proposed Gate H6 is located in the middle of Watermans Quay. The primary strategy is to utilise Gate H4 and H5 in-conjunction with Gate H6 as entry and egress access points respectively for construction traffic within the Stage 1b site and parallel to Watermans Quay.

2.1.4 Gate H2 and H3

The proposed Gates H3 and H2 are located on Hickson Road and within close proximity of the Hickson Road/ Watermans Quay intersection and Gate H4. The gates are intended to be utilised as a tertiary entry/egress point respectively for construction vehicles travelling northbound along Hickson Road.

2.2 Road Network

Classifications for the existing roads near the Stage 1B site are described in the following sections.

2.2.1 Hickson Road

Hickson Road is a local road and the principal access road for the Barangaroo South precinct. It spans the length of the Barangaroo Precinct, starting at Napoleon Street and extending through to Millers Point and The Rocks as far as the Overseas Passenger Terminal, a distance of approximately 2 kilometres. Hickson Road is a two-way two-lane carriageway (one lane in each direction). Hickson Road provides direct access to a number of commercial premises including the Sydney Theatre Company and the Pier One Sydney Harbour Hotel, as well as a number of cafés and restaurants. Pedestrian facilities are provided along the length of Hickson Road with the carriageway width also allowing sufficient space for on-street parking. A posted speed limit of 40 km/h applies to Hickson Road, due to current roadworks.

Hickson Road is currently subject to temporary lane realignments due to two projects currently underway:

- > Hickson Road / Sussex Street Upgrade Works, between Watermans Quay and the Wynyard Walk pedestrian bridge crossing over Sussex Street; and
- > Hickson Road Remediation Works, which will extend along the entire frontage of the Stage 1B site to Hickson Road.

Two lanes of traffic will be maintained at all times during these works.

2.2.2 Watermans Quay

Watermans Quay is a local road that runs east-west through the Barangaroo South precinct, perpendicular to Hickson Road. It connects to Barangaroo Avenue, which becomes Lime Street to the south, providing pedestrian access to International Towers Sydney Tower One and vehicular access to the basement that services the Barangaroo South commercial precinct. Watermans Quay is a two-way street with one lane in

each direction. A footpath is present on the south side only. A concrete barrier wall extends along with the majority of the northern side of Watermans Quay. A posted speed limit of 40 km/h applies to Watermans Quay.

Due to the road and lane widths at the intersection of Watermans Quay and Barangaroo Avenue, no left turn for vehicles over 12.5 metres are permitted from Hickson Road onto Watermans Quay. This limit will need to be amended to permit vehicles up to a 19m articulated truck to turn left from Hickson Road onto Watermans Quay and onwards to the proposed Watermans Quay access.

The Watermans Quay road pavement has been designed for T44 traffic loadings and there are no specific weight limits applicable to the road.

2.2.3 Barangaroo Avenue

Barangaroo Avenue is a local road that runs north-south through the Barangaroo South precinct. It extends between Watermans Quay and Lime Street, providing access to commercial premises within the Barangaroo South precinct and vehicular access to the basement that services the two residential apartment buildings adjacent to Wulugul Walk / Darling Harbour. Barangaroo Avenue is a two-way street with one lane in each direction. Footpaths are present on both sides of the road. A posted speed limit of 40 km/h applies to Barangaroo Avenue.

3 Proposed Works

3.1 General

There are various phases of works for which the proposed Gate H6 will be in place:

- > Remediation of the Stage 1B site (also referred to as Block 4), for which approval was granted under SSD 5897. These remediation works are currently being undertaken by Ventia;
- > Construction of a four-level basement (up to 18 metres below existing ground level), for which approval was granted under SSD 6960; and
- > Construction of public domain works within the Stage 1B site, including (among other works) widening of Watermans Quay, extension of Barangaroo Avenue, and construction of Hickson Park above the Stage 1B basement. These works are currently being assessed and are subject to approval under SSD 7944.

Gate E will be used during below works:

- > Demolition of parts of the existing wharf slab; and
- > Construction of new sections of wharf slab and pier structures.

Gate H2, H3 and H6 will be used during the following phases of works:

- > Excavation and construction of the four-level basement (up to 18 metres below existing ground level); and
- > Construction of public domain works within the Stage 1B site.

3.2 Concurrent Works

A number of other projects that are being or will be undertaken concurrently to the works on the Stage 1B site. These include:

- > C1 Building works on the south-western corner of Watermans Quay and Hickson Road.
- > Block 5 Remediation Works (within the Central Barangaroo development site, directly north of Block 4);
- > Stage 1C Remediation and Earthworks (the site of the proposed Crown Sydney Hotel), located directly west of the Stage 1B site;
- > Crown Sydney Hotel;
- > Hickson Road / Sussex Street upgrade works; and
- > Sydney Metro works between Barangaroo Reserve and Central Barangaroo.

The loading dock/basement entry driveway for International Towers Sydney (ITS) is located off Watermans Quay and will remain operational throughout the duration of the proposed works. All construction traffic entering Watermans Quay would need to avoid queueing across the driveway to minimise the impact on traffic that utilises the basement. This could be achieved by 'Keep Clear' linemarking on Watermans Quay adjacent to the driveway, signage or traffic management.

3.3 Program

An indicative program for the proposed works on the Stage 1B site is outlined below:

Table 3-1 Indicative Program for Stage 1B works

Scope	Indicative Timing ¹
Block 4 & 5 Remediation Works (including the construction of diaphragm and jet grout walls around the perimeter of the works)	April 2016 to June 2019 (36 months total)
Hickson Road Remediation Works	February 2017 to May 2020 (39 months total)
Stage 1B Basement Early Works > constructed of accelerated slab adjacent to western diaphragm wall	October 2017 to August 2018 (10 months total)
Stage 1B Basement Works	June 2019 to December 2020 (17 months total)
Stage 1B Public Domain Works	June 2019 to February 2021 (19 months total)
Crown Sydney Hotel Resort	June 2017 to February 2021 (32 months total)
Waterfront Structures (CC1 under SSD 7944)	November 2018 to November 2019
Public Domain (CC2 under SSD 7944)	December 2019 to December 2020

¹ The above dates are indicative only and subject to change

4 Construction Vehicles

4.1 Principles

The following overall construction traffic management principles would apply to the proposed access gates:

- > When in use, the access gate would be managed and controlled by site personnel at all times;
- > The safety of the public in the vicinity of the gate (vehicular, cyclist and pedestrian traffic) is to be maintained at all times;
- > A safe and convenient environment is established and maintained at all times for pedestrians along the southern side of Watermans Quay opposite the proposed access gate. No pedestrian access currently exists on the north side of Watermans Quay; and
- > The existing gate at the corner of Watermans Quay and Barangaroo Avenue between Gates H5 and E (as shown in **Figure 1-1**) will be removed once the proposed gates have been installed.

The following specific principles will apply to the gates:

- > Gate H5 will be used as an access point only for 'clean' (uncontaminated) vehicles and designed to allow trucks (up to 19m articulated vehicles) to enter and exit in a forward direction. The intent is to use Gate H5 as a point of access once the ground plane slab within the south-western portion of the Stage 1B Basement is complete. The gate would be used under the following conditions:
 1. Support a second load-out point during the Block 4 Remediation works;
 2. For staging of anchoring works and associated deliveries; and
 3. For basement structure works including concrete pumps and concrete deliveries.

All usage of Gate H5 will be subject to the loading constraints on the western deck and the public road network.

- > Gate E is designed to allow cars/utility vehicles (B99) and trucks up to 8.8m (MRV) to enter and exit in a forward direction via Watermans Quay. All trucks up to 8.8m can perform a U turn inside the proposed access area to allow for egress onto Watermans Quay in a forward direction. Refer to **Section 6** of this Report for traffic impact and mitigation measures.

The majority of the proposed driveway off Gate E has a load limit of 5 kPa, which will restrict the gross mass of vehicles that can utilise the gate to no more than 5 tonnes.

The seawater intake pit lids within the extent of the proposed driveway are Class D and will therefore not need to be upgraded to be able to cater for the maximum vehicle load.

- > The primary strategy is to utilise Gate H5 in-conjunction with Gate H6 as entry and egress access points respectively for construction traffic travelling parallel to Waterman Quay. Gate H6 is designed to allow trucks (up to 19m articulated vehicles) to exit in a forward direction onto Watermans Quay before the intersection of Watermans Quay and Hickson Road. All relevant construction vehicles, such as a 19m semi-trailer, can adequately manoeuvre through Gate H6 without significantly affecting the Watermans Quay/ Hickson Road intersection. Refer to **Section 6** of this Report for traffic impact and mitigation measures. All usage of Gate H6 will be subject to the loading constraints of the Western Deck, the adjacent access sliver above the shoring pile and the public road network.

Gate H6 can also operate as a tertiary entry point for construction traffic during non-peak hours if concurrent construction works dictate the requirement. Refer to **Section 4.3** for construction operation hours. Gate H6 allows for light vehicles (up to a 10m concrete truck) to enter westbound from Watermans Quay.

- > Gates H2 and H3 are designed for trucks (up to 19m articulated vehicles) travelling northbound along Hickson Road. Gate H2 and H3's is mainly used as a point of access once the ground plane slab within the western portion of the Stage 1B Basement is complete. All relevant construction vehicles, up to and including 19m articulated vehicles, can adequately manoeuvre through Gate H3 without requiring local traffic control,

affecting Hickson Road traffic and the Watermans Quay/ Hickson Road intersection. Similarly, these construction vehicles will have the same impact when turning out of Gate H2 and into Gate H4.

4.2 Access and Egress

Throughout the duration of the works within Stage 1B, construction vehicles will enter and egress the site primarily through the H4 gate off Hickson Road. The intent of Gate H5, Gate E and Gate H6 is to provide secondary points of entry to the site while maintaining the total forecast truck movements to the site. The H4 gate would remain the main point of entry and exit to the site.

The following daily two-way vehicle volumes are expected during the remediation and construction works:

- > Block 4 & 5 Remediation Works ¹
 - Vehicle movements per hour: between 14 and 22
- > Stage 1B Basement Works ²
 - Vehicle movements per hour: between 23 and 50
- > Stage 1B Public Domain Works ³
 - Vehicle movements per hour: up to 8
- > Crown Sydney Hotel Resort
 - Vehicle movements per hour: between 6 and 10⁴
- > Waterfront Structure
 - Vehicle movements per hour: approximately 1 to 2

A breakdown of the forecast hourly two-way traffic volumes towards the existing H4 gate off Hickson Road, as well as the forecast movements apportioned between the H4 gate and proposed gates, are presented below in **Table 4-1**.

Table 4-1 Forecast Two-Way Hourly Traffic Volumes

Timeframe	Total Forecast Hourly Traffic Volume (H4 Gate) Lendlease and Crown	Apportioned Forecast Hourly Traffic Volume					
		H4 Gate Lendlease and Crown	Gate H5 Lendlease Traffic Only*	Gate E Lendlease Traffic Only	Gate H6 Lendlease Traffic Only	Gate H2 Lendlease Traffic Only	Gate H3 Lendlease Traffic Only
January 2018 – May 2018	32	25	7	-	-	-	-
June 2018 – December 2018	32	25	7	-	-	-	-
January 2019 – May 2019	32	25	6	1	-	-	-
June 2019 – December 2019	60	45	14	1	1	<1	<1
January 2020 – December 2020	68	51	16	1	1	<1	<1

* Entering Vehicles only. All exit movements are via Gate H4

¹ Arup, *Barangaroo South (Block 4) – Remediation and Landforming (SSD 5897-2013)*, Traffic Impact Assessment, Revision D, November 2013

² Arup, *One Sydney Harbour SSD 6960, Stage 1B Basement Transport Management and Accessibility Plan*, Revision E, February 2016

³ Arup, *Barangaroo Stage 1B Public Domain, Transport Assessment and Construction Traffic Management Strategy*, Revision B, May 2017

⁴ Arup, *Crown Sydney Hotel Resort, Construction Traffic Management Report*, Revision B, June 2015

Vehicle movements via the proposed Gate H5 are expected to include (but may not be limited to):

- > Mobilisation/demobilisation deliveries;
- > Delivery of equipment and materials (in particular concrete and steel);
- > Waste collection; and
- > Empty vehicles that will be loaded with contaminated material to be exported off-site.

It is anticipated that approximately 30% of construction traffic entering the Lendlease site (excluding Crown movements) will utilise the Gate H5.

Vehicle movements via Gate H2, H3 and E are expected to include the following:

- > Mobilisation/demobilisation deliveries;
- > Delivery of equipment and materials (in particular concrete, steel and timber); and
- > Waste collection

Vehicle movements via the proposed Gate H6 are expected to include the following:

- > Mobilisation/demobilisation deliveries;
- > Delivery of equipment and materials (in particular concrete, steel and timber);
- > Secondary excavation spoil load out and removal; and

- > Waste collection.

Access routes to and from the site will be consistent with the CTMP for the Stage 1B Remediation Works. In general, access and exit routes for the Stage 1B site will be along the following routes:

- > Access from the north via York Street, Erskine Street and Sussex Street / Hickson Road;
- > Exit towards the north along Hickson Road and Kent Street, then onto the Bradfield Highway;
- > Access from the south and east via the Cross City Tunnel, Harbour Street, Wheat Road, Shelley Street, Erskine Street and Sussex Street;
- > Exit towards the south via Sussex Street, Bathurst Street, Elizabeth Street and towards Anzac Parade;
- > Access from the west via the Western Distributor, Wheat Road, Shelley Street, Erskine Street and Sussex Street; and
- > Exit towards the west via Hickson Road, Kent Street, Erskine Street, Sussex Street, Market Street and onto the Western Distributor.

4.3 Hours of Construction

The construction hours proposed, during which the proposed gates may be in use, will be as follows:

- > Monday to Friday: 7 am to 6 pm;
- > Saturday: 7 am to 5 pm;
- > Sunday / Public Holidays: Closed (no construction work).

In addition, the following restrictions during the hours of construction should apply:

- > No Stop / Slow signage during peak traffic periods Monday to Friday (7 am to 9 am and 4 pm to 7 pm);
- > No truck movements via York Street during heavy traffic periods Monday to Friday (6 am to 10 am and 2 pm to 8 pm); and
- > No use of Gate H6 for site entry purposes during peak traffic periods Monday to Friday (7 am to 9 am and 4 pm to 7 pm);

4.4 Parking and Layover

If there are delays and congestion within the Stage 1B site and the site is unable to continue accepting construction vehicles, an area within the site should be identified where heavy vehicles may park. When the Stage 1B site cannot accommodate additional construction vehicles, layover areas such as relevant supplier's depots or contractor's stabling areas outside the city centre are identified where trucks can wait until called to the site.

4.5 Traffic Generation

- > Heavy Vehicles
 - Daily truck movements would be timed to avoid morning and evening peak periods when vehicular and pedestrian traffic along Watermans Quay is greatest.
 - Entry only to Gate H5, all exit movement will be via the H4 gate off Hickson Road.
- > Light Vehicles
 - There will be minimal impact associated with light vehicles. Generally, light vehicles will enter the site before the morning peak and exit the site before the evening peak.
- > Parking

- As there is no parking on Watermans Quay, there will be no impact associated with loss of parking as a result of the proposed access gate.
- > Cyclists
 - There will be a negligible impact on cyclists, as Barangaroo Avenue and Watermans Quay is not a major cycling route. The majority of cyclists utilise Hickson Road.
- > Pedestrians
 - As there is no pedestrian path on the northern side of Watermans Quay, there will no impacts associated with pedestrian movements.
 - Pedestrians will continue to utilise the existing footpath on the southern side of Watermans Quay. Wayfinding signage will be installed on the hoarding adjacent to the northern end of Wulugul Walk to direct pedestrians across Barangaroo Avenue at Shipwright Walk and north towards Watermans Quay.

5 Drivers Code of Conduct

Management of vehicular access to and from the site is essential to maintain the safety of the general public as well as the labour force within the Stage 1B site. The following code is recommended as a preliminary measure to inform safety standards:

- > Utilisation of only the designated transport routes into and out of the Stage 1B site;
- > Haulage/construction vehicle movements are to abide by the requirements of the development consents for the various work packages, as well as requirements of BDA / Council and RMS.;
- > Lendlease / Ventia will have specific site access requirements including truck access induction.

Specific requirements for vehicles entering the Watermans Quay access gate are outlined below:

- > Noise Minimisation
 - Compression braking should be avoided in the vicinity of the Stage 1B site;
 - Given the existing signposted speeds on Hickson Road, Watermans Quay and Barangaroo Avenue, no further reduction in speed limit is proposed.
- > Delivery Standards
 - While no overflow is anticipated, vehicles arriving at the site are not permitted to park/queue on Watermans Quay, Barangaroo Avenue or Hickson Road at any time.;
 - All trucks delivering to the site are required to have an effective load covering;
 - All trucks are to utilise the shakedown or wash areas before leaving the site.
- > Transporting Materials
 - All materials transported to the site need to be managed relevant to what is being transported. If there is potential for an object to fall while being transported then this object must be appropriately secured;
 - Requirements for vehicles exiting the site will not apply, as the access gate will be for entries only.

In the case that a breach of conduct needs to be reported (e.g. a truck exceeding the speed limit, a spilt load), the following person should be contacted:

Murray Graham

Senior Site Manager

Lendlease

0438 839 444

Murray.Graham@lendlease.com

6 Mitigation of Traffic Impacts

This CTMP proposes to mitigate potential traffic impacts in the following ways:

- > Provision of signage recommendations to guide and warn motorists, cyclists and pedestrians of vehicles entering the proposed access gate. This would be incorporated into a Traffic Control Plan (TCP) that would be prepared by an appropriately qualified Traffic Controller; and
- > Provision of traffic control for northbound traffic on Barangaroo Avenue near the intersection of Watermans Quay.
- > Prohibit queuing along Watermans Quay. Lendlease to provide adequate on-site layover area within the development site to ensure no construction vehicles queue on Watermans Quay. Also, refer to section 4.4 for additional parking and layover information.

6.1 Sight Distances

The line of sight to Watermans Quay for northbound vehicles on Barangaroo Avenue is restricted by the façade of the Tower One podium building, as shown in **Figure 6-1** and **Figure 6-2**.

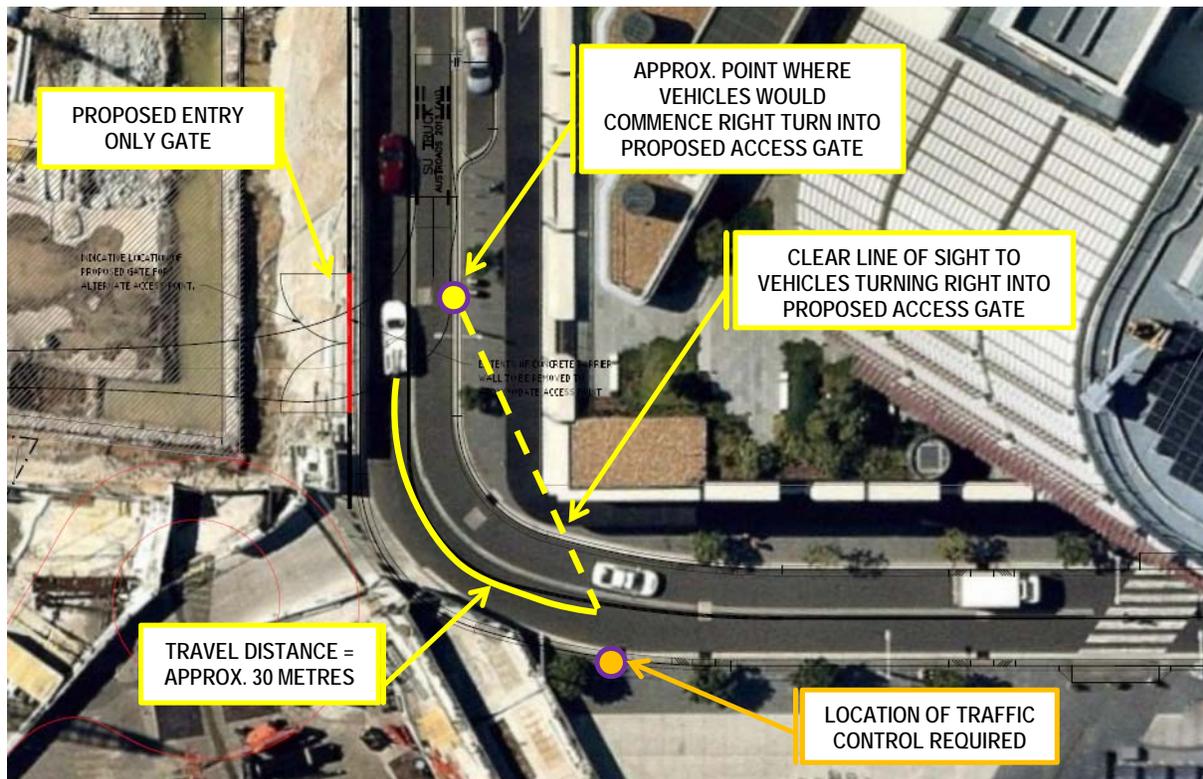


Figure 6-1 Gate H5 - Sightline for vehicles travelling north along Barangaroo Avenue

In order to reduce the risk of potential collision between trucks entering Gate H5 and vehicles or cyclists travelling north, traffic control will be required on the western side of Barangaroo Avenue to warn vehicles and cyclists of turning movements into the Stage 1B site.

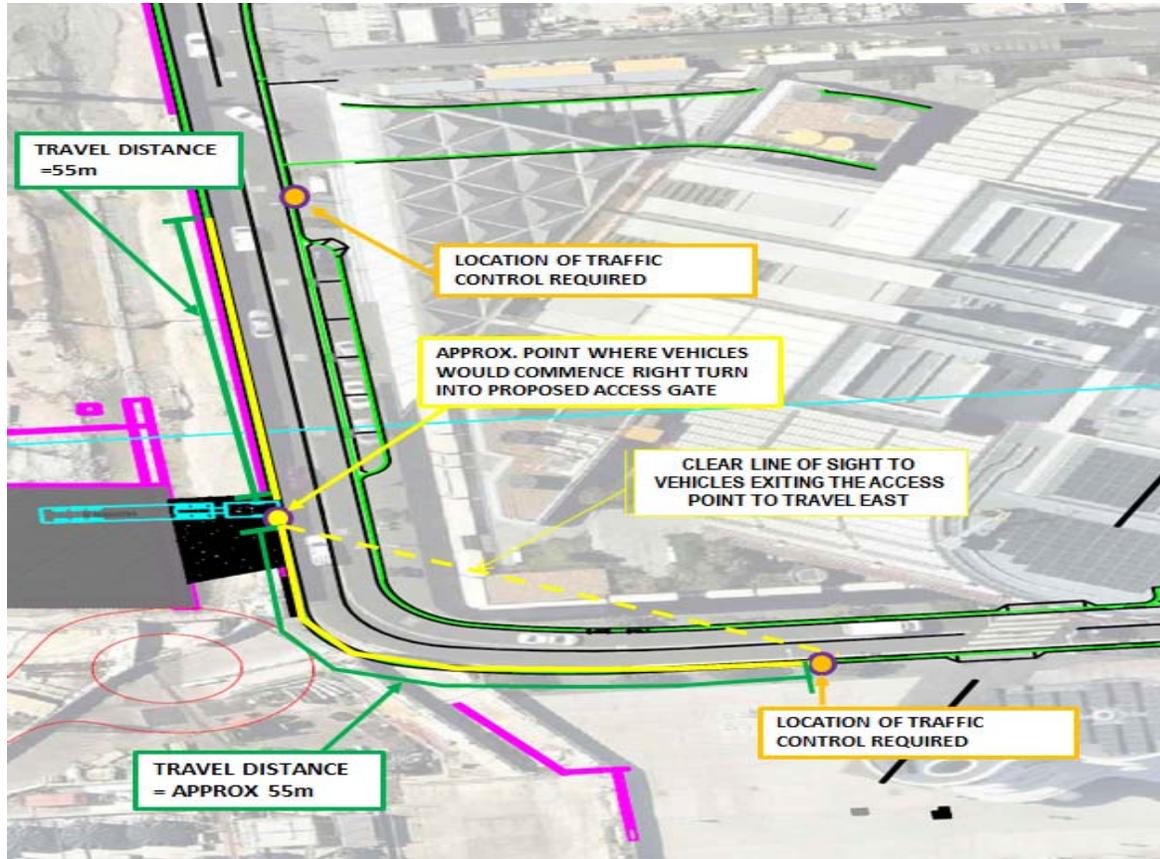


Figure 6-2 Gate E - Sightline for vehicles exiting the proposed access point

In order to reduce the risk of potential collision between trucks exiting Gate H5, traffic control will be required on both sides of Barangaroo Avenue / Watermans Quay to warn vehicles and cyclists of turning movements into the Stage 1B site.

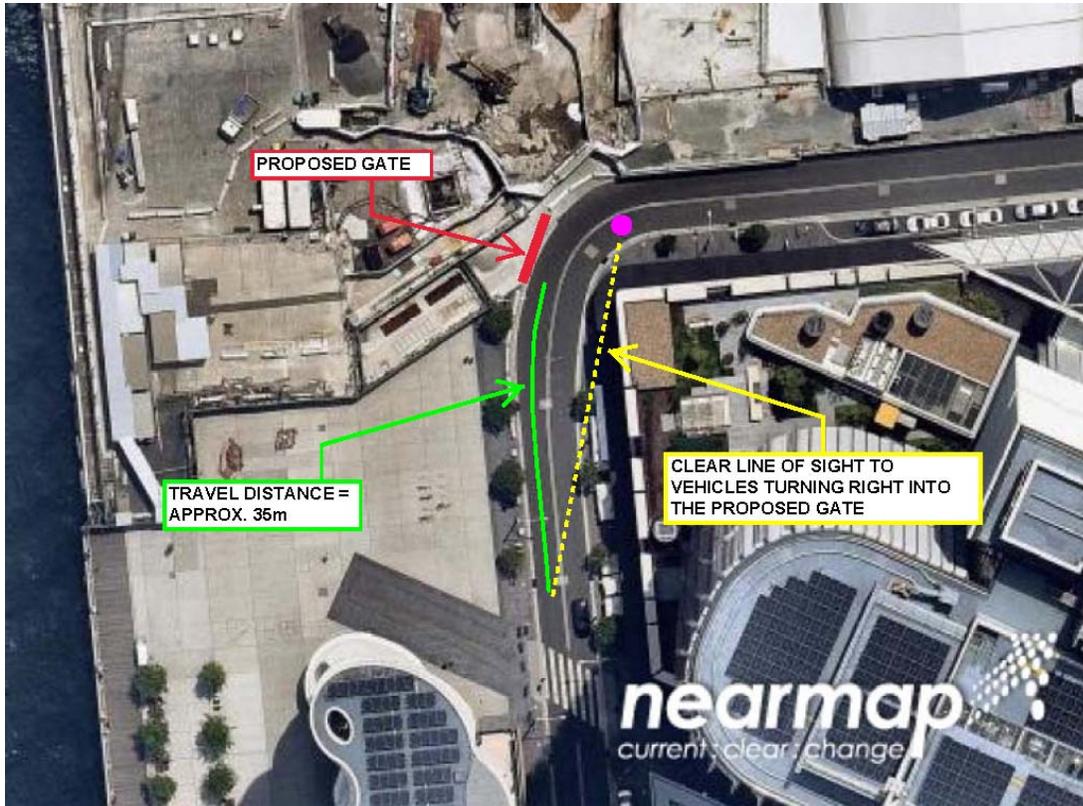


Figure 6-3 Gate E - Sightline for vehicles travelling north along Barangaroo Avenue

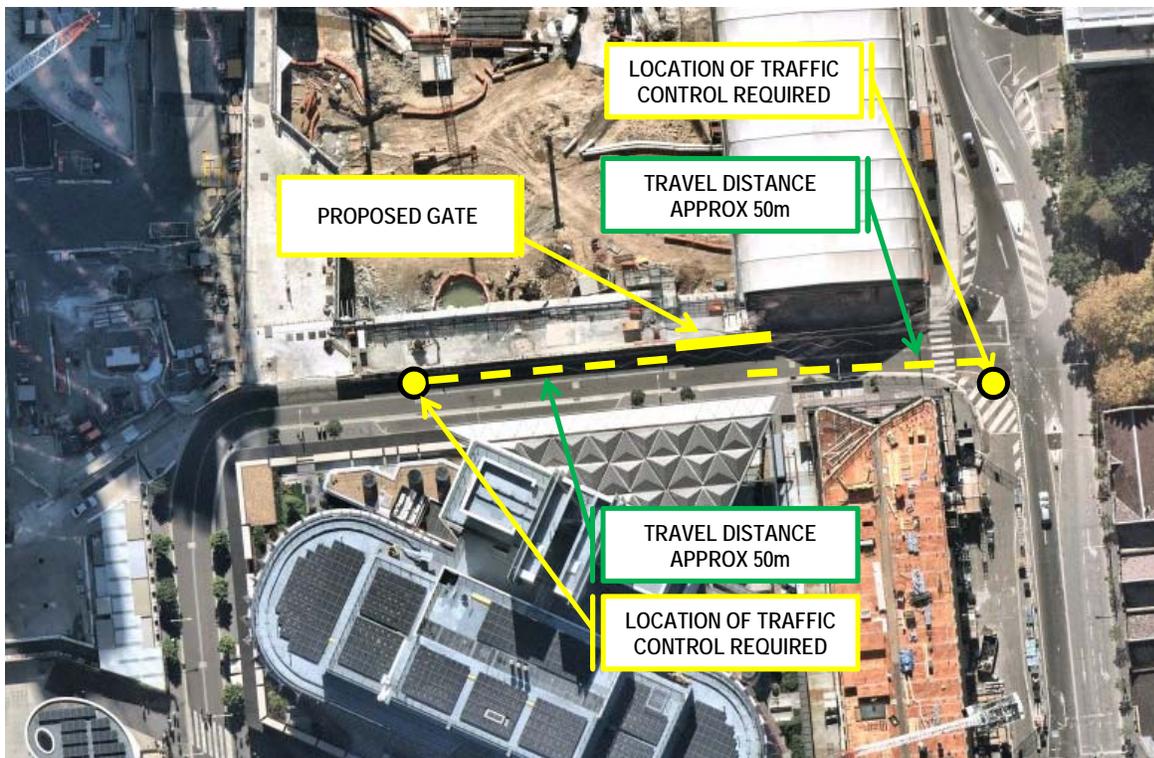


Figure 6-4 Gate H6 - Sightline for vehicles exiting the proposed access point

In order to reduce the risk of potential collision with construction traffic using Gate H6, traffic control will be required on both sides of Watermans Quay and the intersection of Hickson Road/ Watermans Quay to warn vehicles and cyclists within close proximity to Gate H6 when in operation.

6.2 Turning Paths

The swept path of a 19m Articulated Vehicle (AV) turning right from Watermans Quay towards Gate H5 is presented on drawing CTMP-SKC014, refer to **Appendix A**. This drawing shows the width of gate required to accommodate 19m AV.

The right turn movement for a 19m AV into the gate would need to commence adjacent to the existing taxi rank that is located on the southern side of Watermans Quay. The swept path of 19m AV would not encroach upon the taxi rank.

The swept path of a 19m Articulated Vehicle (AV) and a 12.5m rigid vehicle turning left from Hickson Road into Watermans Quay are presented on drawings CTMP-SKC400 and CTMP-SKC401, refer to **Appendix B**. These drawings demonstrate a 12.5m vehicle can turn left without crossing the centrelines of Hickson Road and Watermans Quay.

It is possible that over the duration of the works within the Stage 1B site, right turn movements from Watermans Quay into Gate H5 could cause some damage or deflection to the road pavement. The condition of the road pavement would need to be monitored periodically, and any damage would need to be rectified. It is noted that the road pavement will ultimately be reconstructed as part of the future Stage 1B Public Domain works (currently scheduled for completion by the end of 2020 / early 2021).

The swept path for an 8.8m rigid truck entering Gate E off Watermans Quay is included in **Appendix C**. This shows trucks up to 8.8m are able to enter and egress in a forward position.

The swept path of various design vehicles using Gate H6 is shown on drawing CTMP-SKC403, refer to **Appendix D**. This drawings show the width and location of the gate required to accommodate the various vehicles in a forward direction, such as a 19m AV. The gate also accommodate the various Hickson Road temporary lane realignments and intersection arrangements. These drawings show the vehicles crossing the centreline of Watermans Quay. These movements will require local traffic control for the low frequency tertiary usage of Gate H6.

The swept path of a 19m AV travelling northbound along Hickson Road into Gate H3 and out of H2 presented on drawings CTMP-SKC408 and CTMP-SKC409, refer to **Appendix E**. These drawings demonstrate both a 19m rigid vehicle can enter and exit the Lendlease Hickson Road construction compound in a forward direction without requiring traffic control and impacting nearby traffic on Hickson Road and the Watermans Quay/ Hickson Road intersection.

6.3 Traffic Control Plan – Watermans Quay access

TCP 01, 03 and 04 has been prepared to facilitate safe movement for construction vehicles to/from the site, using the proposed gates on Watermans Quay. Where vehicles are utilising the proposed access point, it is recommended that TCP be implemented to ensure safety is maintained. Two controllers will be required to control pedestrian movements around the site during the manoeuvring. Details of each TCP plan can be found in **Appendix G**.

7 Recommendations

There are a number of recommendations that should be implemented in order to effectively manage potential impacts associated with the proposed access gates:

- > Ensure appropriate traffic management procedures are in place at the gates and along Barangaroo Avenue while the gate is in operation;
- > Ensure signage is put in place to inform vehicles and pedestrians of the gate while it is in place;
- > No special provisions will be required for cyclists or buses; and
- > A Traffic Control Plan (TCP) will need to be prepared by an appropriately qualified Traffic Controller and will need to include a Traffic Control Diagram (TCD).

8 Lendlease Commitments

Lendlease is committed to providing a safe environment for all road users including cyclists, pedestrians, motorists and construction workers. To minimise disruption to the surrounding road network, existing basement access to Barangaroo South Stage 1A, existing taxi zones located on Watermans Quay, Lendlease commits to:

1. Minimise the use of Gate H5 to an agreed apportionment of vehicular movements only;
2. Prohibit the use of Gate H6 as a site entry point during peak traffic hours Monday to Friday (7 am to 9 am and 4 pm to 7 pm);
3. Provide operational controls at the gates to ensure no vehicles queue on Watermans Quay;
4. Where the number of vehicles dictates and there is potential traffic congestion on Watermans Quay, operational controls will be provided at the Hickson Rd & Watermans Quay intersection. These will be coordinated with C1 (when in construction);
5. Utilise construction traffic counts at the gates to allow assessment of forecast truck movements and entry times against actual; and
6. Updating this Traffic Management Plan and any Traffic Control Plans as required to maintain and improve the management of vehicles and pedestrian movements.

9 Conclusion

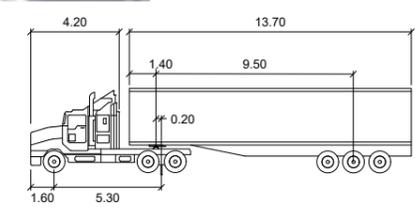
This CTMP provides guidance to ensure effective management of vehicles, pedestrians and other road users during operation of the proposed access gates to the Stage 1B site off Watermans Quay.

The remainder of the proposed works within the Stage 1B site is currently scheduled to be undertaken until December 2020 and will include completion of site remediation works, basement construction works and public domain works.

Proposed Gates H2, H3 H5, H6 and E can be installed and operated as an alternate point of access to the Stage 1B site, pending implementation of measures to mitigate potential risks to vehicle and pedestrian safety at Hickson Road, Watermans Quay and Barangaroo Avenue.

APPENDIX A

WATERMANS QUAY GATE H5 ACCESS SKETCH PLAN

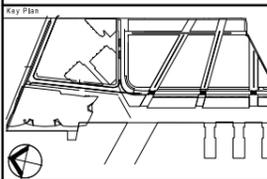


PM S 19M

Tractor Width	2.50 meters	Lock to Lock Time	6.0
Trailer Width	2.50	Steering Angle	27.8
Tractor Track	2.50	Articulating Angle	70.0
Trailer Track	2.50		



NOT TO BE USED FOR CONSTRUCTION PURPOSES



Rev.	Issue Description	Date	Rev.	Issue Description	Date
3	ISSUE FOR INFORMATION	06.12.15			
2	ISSUE FOR INFORMATION	28.09.17			
1	ISSUE FOR INFORMATION	31.08.17			

© Cardno Limited All Rights Reserved.
 This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

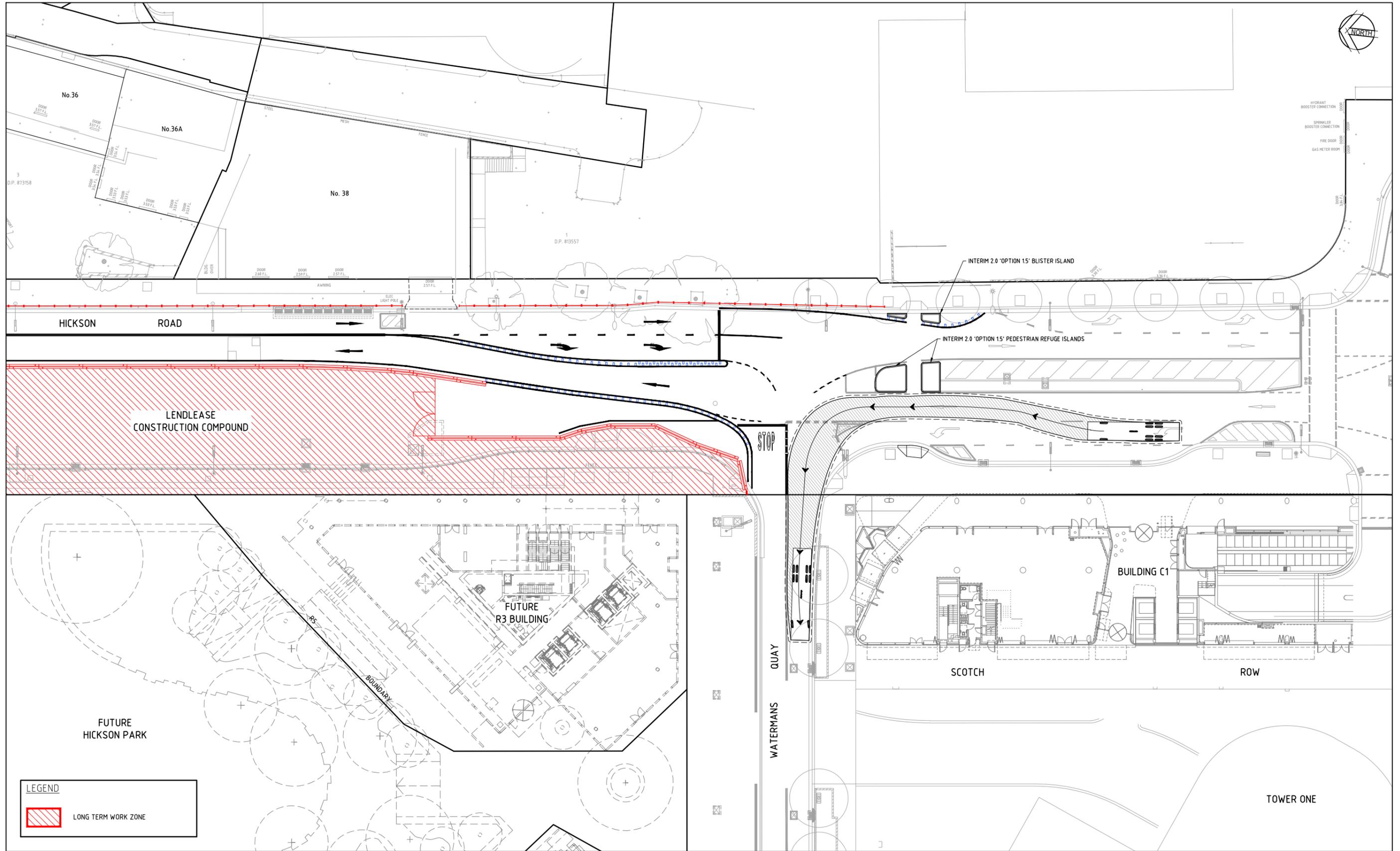
Cardno (NSWIACT) Pty Ltd | ABN 95 001 145 035
 Level 9, The Forum, 203 Pacific Highway
 St Leonards, NSW 2065
 Tel: 02 9496 7700 Fax: 02 9493 5170
 Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Evan Harcourt Principal Architect RAIA NSW AIB 8484 Sydney NSW 2000	Principal	
Collaborating Architects	Lend Lease Graham W. Jones Principal Architect FKAIA NSW AIB 4009 AIB 97 050 288 922	Developer	Lend Lease
Consultant		Project Management & Construction	Lend Lease
		Design	Lend Lease
		30 The Bond 30 Wilson Road Millsers Point NSW 2000	www.lendlease.com

Project	BARANGAROO SOUTH	Title	BARANGAROO SOUTH STAGE 1B WATERMANS QUAY GATE H5 ACCESS SKETCH
Drawn by	MP	Designed	TM
RT		Approved by	
Scale	1:200	Date	AUG'17
Project No.	161804CTMP-SKC014	Issue No.	3

APPENDIX B

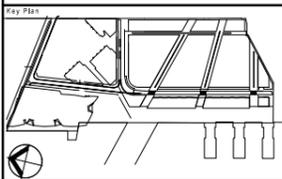
WATERMANS QUAY AND HICKSON ROAD INTERSECTION TURNING PATH DIAGRAMS



LEGEND

 LONG TERM WORK ZONE

0 5 10 15 20m
SCALE 1:200 @B1 NOT TO BE USED FOR CONSTRUCTION PURPOSES



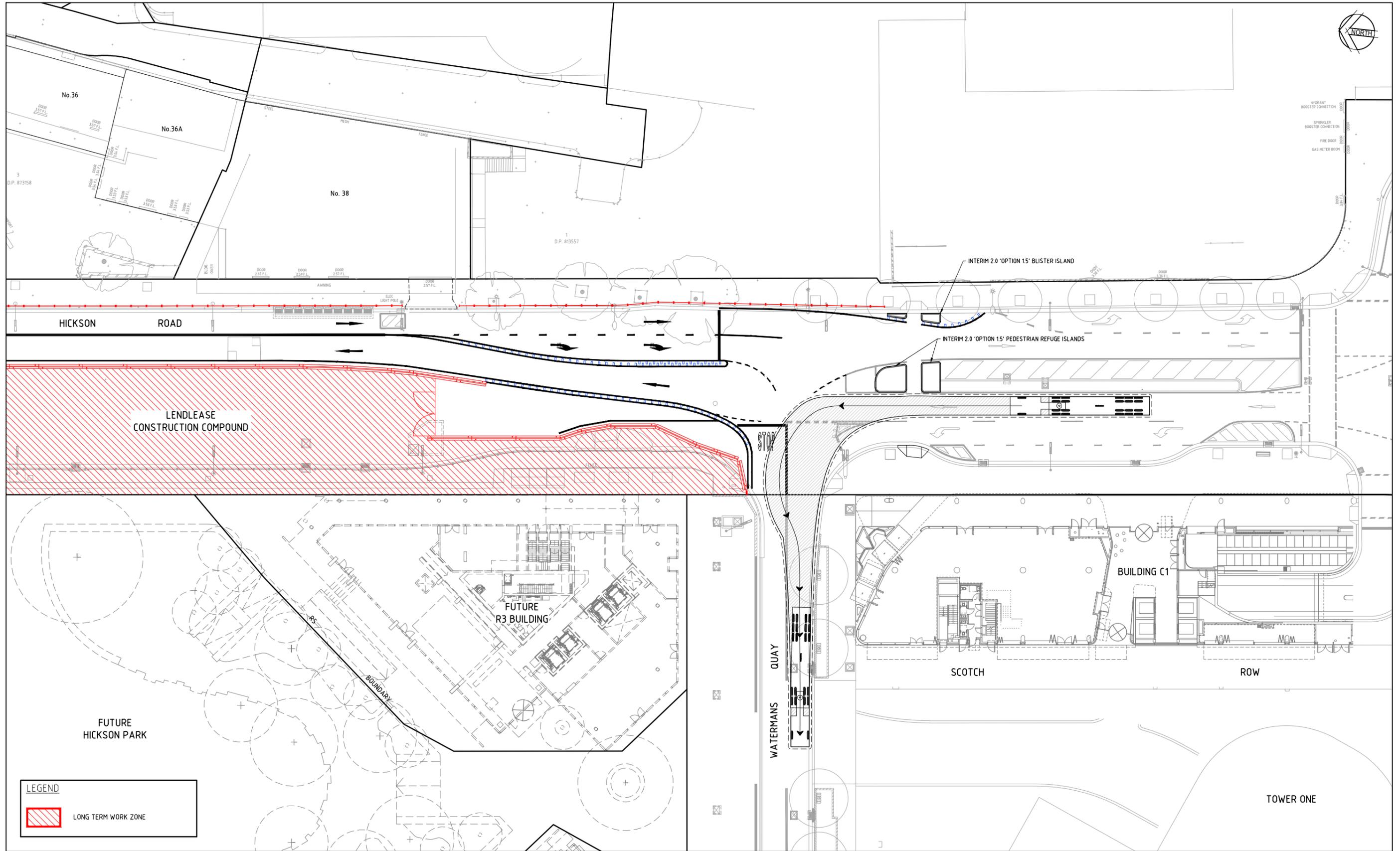
Rev. No.	Revision Description	Date
3	RE-ISSUED FOR INFORMATION	06.12.19
2	ISSUED FOR INFORMATION	13.11.19
1	ISSUED FOR INFORMATION	05.03.19

© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

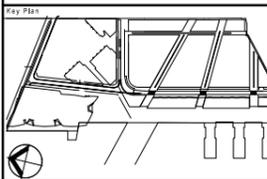
Cardno
Shaping the Future
Cardno (NSWIACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2065
Tel: 02 9496 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Ben Harbour Principal Architect RAM NSW ARB 8484 Sydney NSW 2000	Principal	
Collaborating Architects	Lend Lease Graham W. Jones Principal Architect FEMA NSW ARB 4005 ABN 97 020 288 162	Developer	Lend Lease
Consultant		Project Management & Construction	Lend Lease
		Design	Lend Lease
		30 The Bend 30 Hickson Road Millers Point NSW 2000	www.lendlease.com

Project		Title	
BARANGAROO SOUTH		BARANGAROO COORDINATED CONSTRUCTION CTMP HICKSON ROAD INTERIM 2.0 (OPTION 15) 12.5m HEAVY RIGID VEHICLE TURNING PATH	
Drawn by	Designed	Checked	Approved by
MDH	MDH	MKH	
Scale	1:200	Project No.	161804
		Title No.	CTMP-SK400
		Ordering No.	
		Revision	3



0 5 10 15 20m
SCALE 1:200 @01 NOT TO BE USED FOR CONSTRUCTION PURPOSES



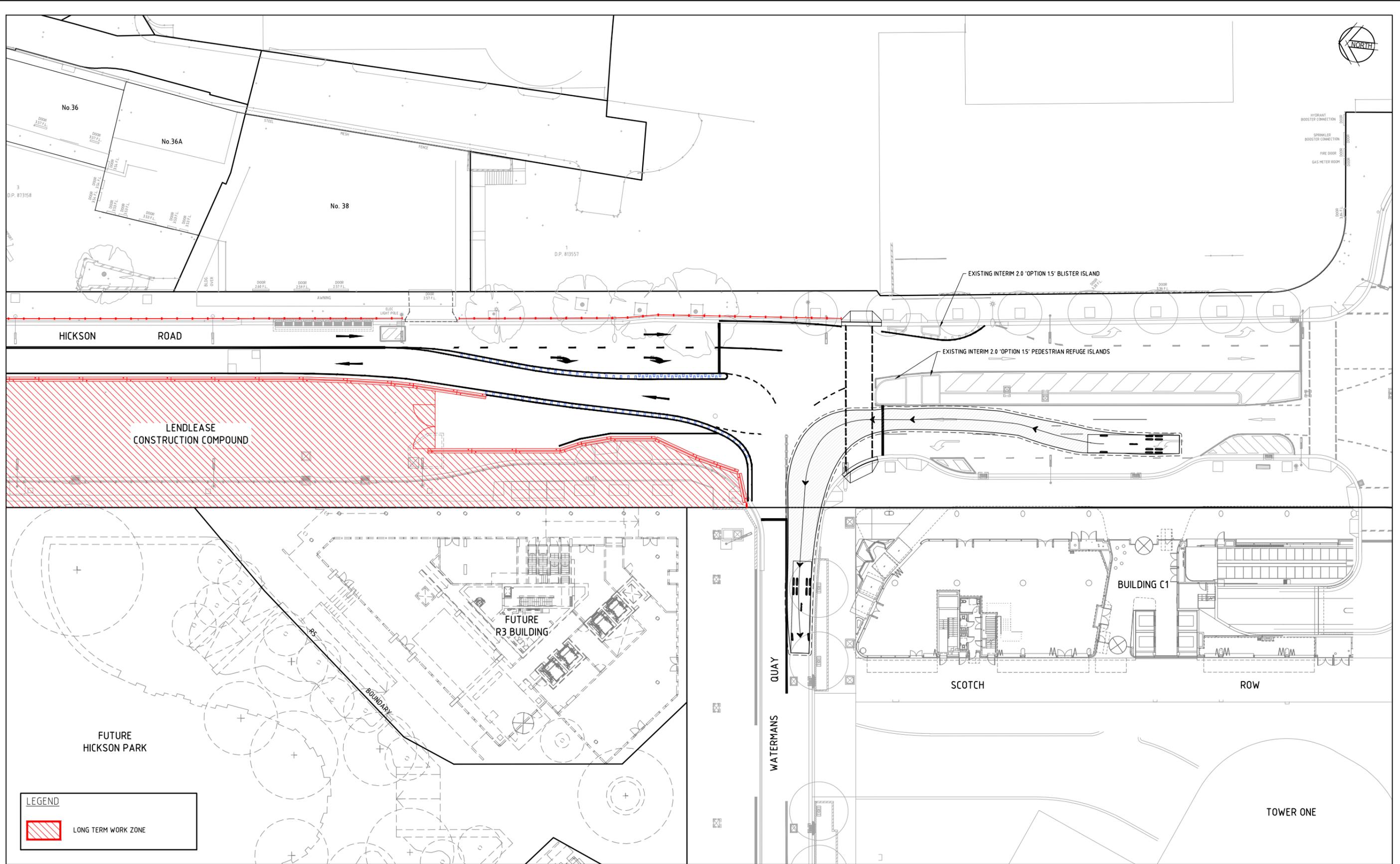
Rev. No.	Revision Description	Date
3	RE-ISSUED FOR INFORMATION	06.12.19
2	ISSUED FOR INFORMATION	13.11.19
1	ISSUED FOR INFORMATION	05.03.19

© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno
Shaping the Future
Cardno (NSWIACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2065
Tel: 02 9496 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Ben Harbour Principal Architect RAM NSW ARB 8484 Sydney NSW 2000	Principal	
Collaborating Architects	Lend Lease Graham W Jones Principal Architect FEMA NSW ARB 4005 ABN 97 020 288 162	Developer	Lend Lease
Consultant		Project Management & Construction	Lend Lease
		Design	Lend Lease
		30 The Bend 30 Hickson Road Millers Point NSW 2000	www.lendlease.com

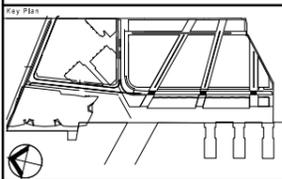
Project		Title	
BARANGAROO SOUTH		BARANGAROO COORDINATED CONSTRUCTION CTMP HICKSON ROAD INTERIM 2.0 (OPTION 15) 19m SEMI-TRAILER VEHICLE TURNING PATH	
Drawn by	Designed	Checked	Approved by
MDH	MKH	MKH	
Scale	1:200	Project No.	161804
		Site No.	CTMP-SK401
		Ordering No.	
		Revision	3



LEGEND

 LONG TERM WORK ZONE

0 5 10 15 20m
SCALE 1:200 @B1 NOT TO BE USED FOR CONSTRUCTION PURPOSES



Rev. No.	Revision Description	Date	Rev. Item	Revision Description	Date
2	RE ISSUED FOR INFORMATION	06.12.13			
1	ISSUED FOR INFORMATION	03.11.13			

© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.



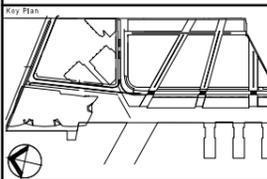
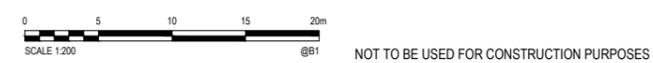
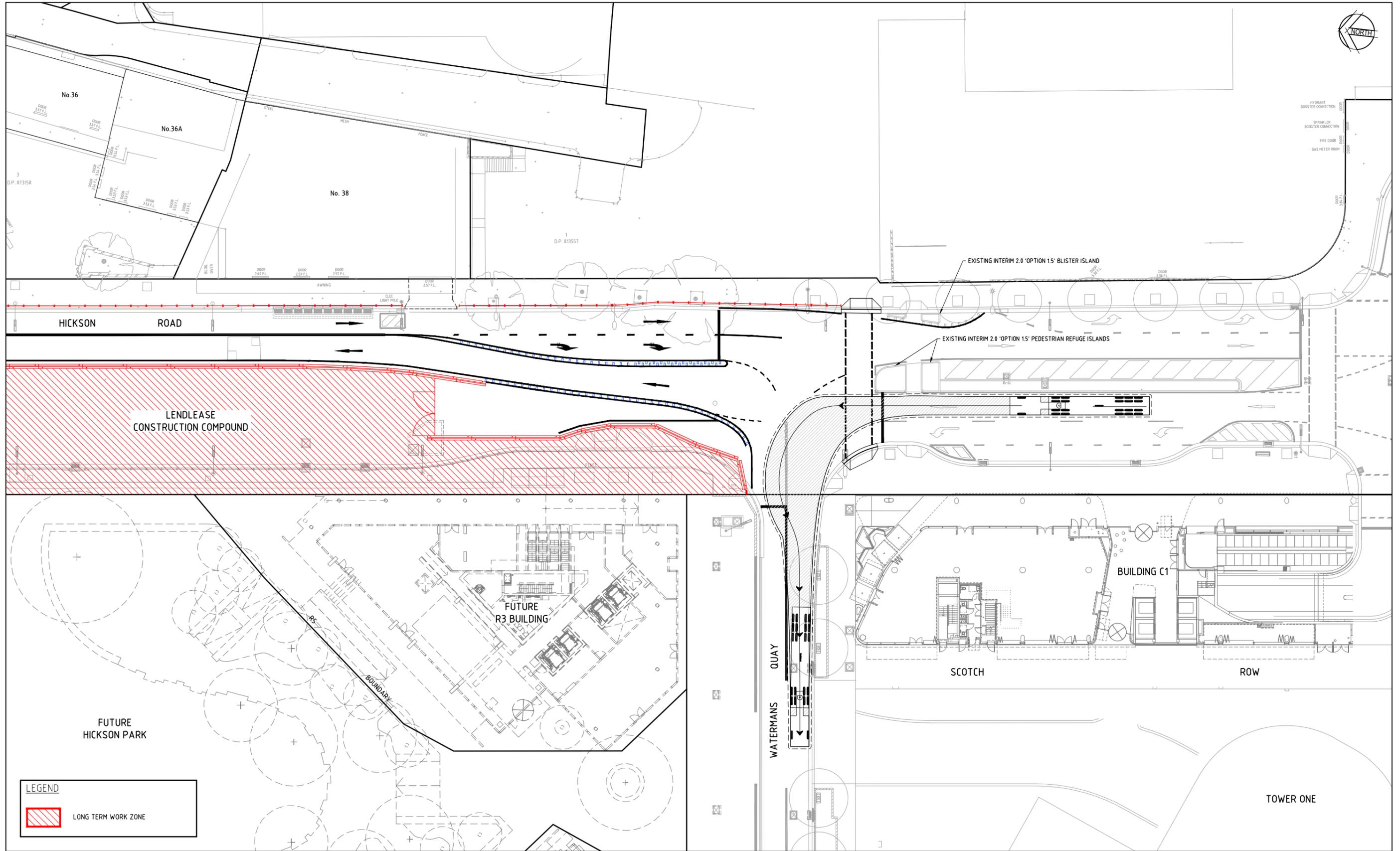
Cardno
Shaping the Future

Cardno (NSWI/ACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2065
Tel: 02 9496 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Ben Harbour Principal Architect RAMA NSW ARB 8484 Sydney NSW 2000
Collaborating Architects	Lend Lease Graham W. Jones Principal Architect FEMA NSW ARB 4005 ABN 97 020 288 162
Consultant	

Principal	
Developer	Lend Lease
Project Management & Construction	Lend Lease
Design	Lend Lease
30 The Bond 30 Hickson Road Millers Point NSW 2000	www.lendlease.com

Project	BARANGAROO SOUTH	
MP		
Title	BARANGAROO COORDINATED CONSTRUCTION CTMP HICKSON ROAD INTERIM 2.0 12.5m HEAVY RIGID VEHICLE TURNING PATH	
Drawn By	MDH	Checked By
Designed	MDH	Approved By
Scale	1:200	Date
Project No.	161804	Ordering No.
	CTMP-SK406	Revision
		2



Rev. Item	Revision Description	Date	Rev. Item	Revision Description	Date
3	RE-ISSUED FOR INFORMATION	06.12.19			
2	ISSUED FOR INFORMATION	13.11.19			
1	ISSUE FOR INFORMATION	09.03.19			

© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno
Shaping the Future

Cardno (NSWIACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2065
Tel: 02 9496 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

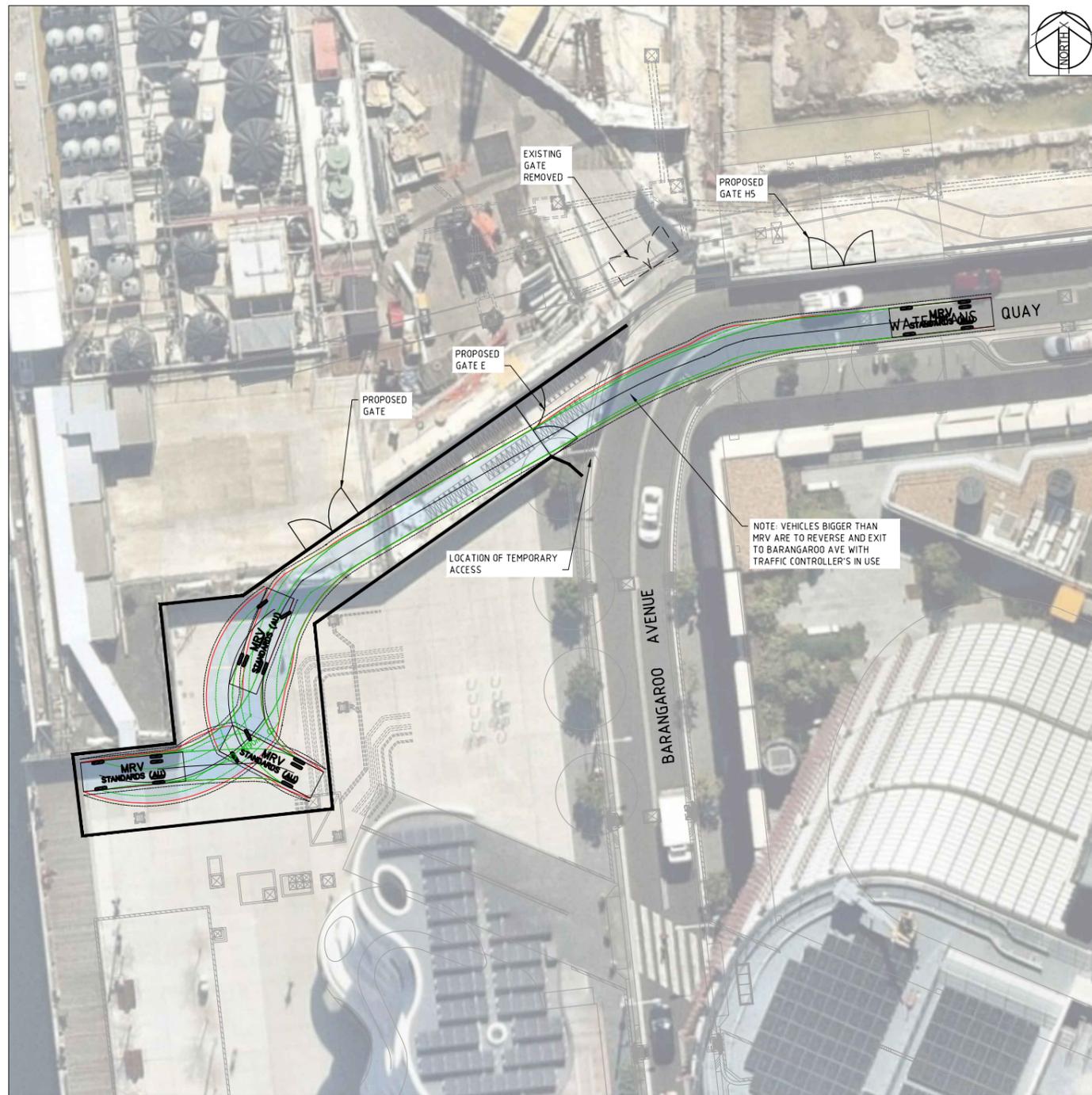
Lead Architects	RSHP Australia Pty Ltd Evan Harbort Principal Architect RSHA NSW ARB 8484 Sydney NSW 2000
Collaborating Architects	Lend Lease Graham W Jones Principal Architect FXHA NSW ARB 4000 Adm 97 000 988 982
Consultant	

Principal	
Developer	Lend Lease
Project Management & Construction	Lend Lease
Design	Lend Lease
30 The Road 38 Hickson Road Mills Point NSW 2000	www.lendlease.com

Project	BARANGAROO SOUTH	MP
Project No.	161804	CTMP-SK407
Issue No.		
Revision No.		3

APPENDIX C

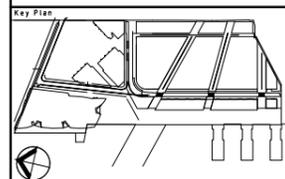
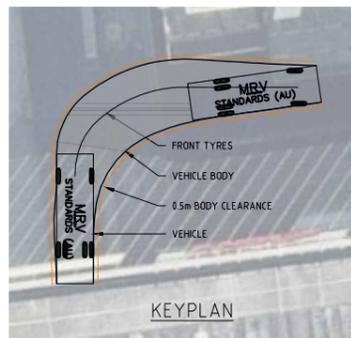
BARANGAROO AVENUE GATE E ACCESS SKETCH PLAN AND TURNING PATH DIAGRAM



MRV VEHICLE ENTRY TURN PATH
SCALE 1:200



MRV VEHICLE EXIT TURN PATH
SCALE 1:200



Rev. No.	Revision Description	Date	Rev. No.	Revision Description	Date
03	ISSUED FOR INFORMATION	06.12.19			
02	RE-ISSUED FOR REVIEW	23.11.18			
01	ISSUE FOR REVIEW	15.11.18			

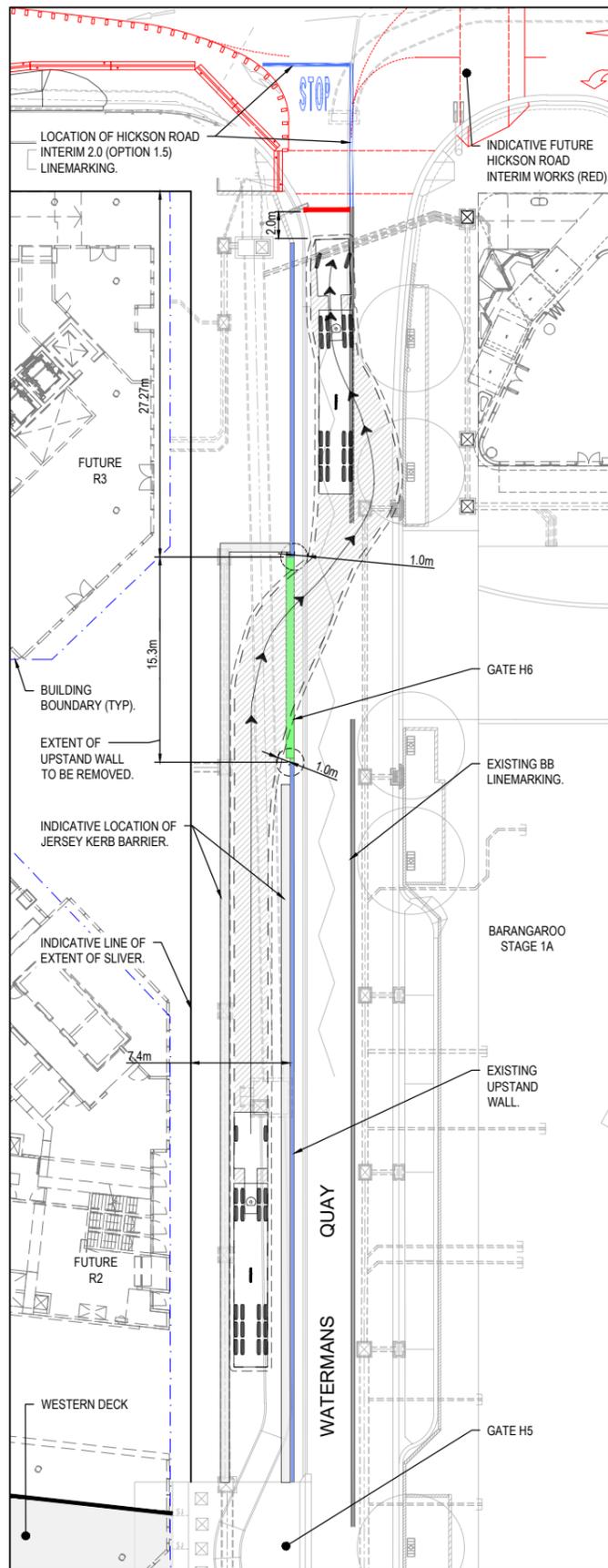
© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.



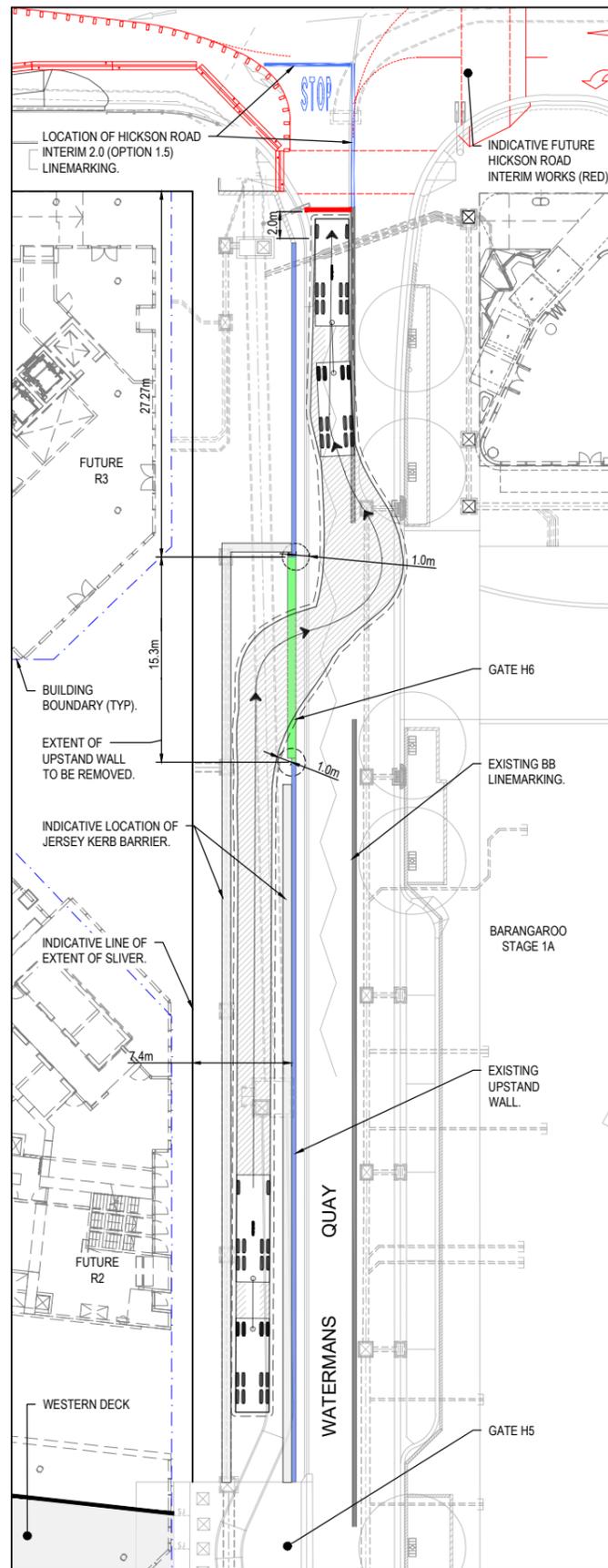
Lead Architects		Principal		Project		Title	
RSHP RSHP Australia Pty Ltd Ivan Harbour Principal Architect RAlA NSW ARB 8146 Sydney NSW 2000		Lend Lease Project Management & Construction Lend Lease Design Lend Lease		BARANGAROO SOUTH MP		STAGE 1B - INTERNAL WORKS PUBLIC DOMAIN WORKS BARANGAROO AVENUE GATE E ACCESS TURN PATH	
Collaborating Architects Lend Lease Graham W Jones Principal Architect RAlA NSW ARB 1495 ABN 97 088 098 162		Consultant 39 The Bend 36 Hickson Road Milers Point NSW 2188 www.lendlease.com		Drawn By: DJK Designed: HRT Checked: JIM Approved By: GJN Date: NOV-18 Scale: 1:200m		Project No: 161804 Title No.: B1B CD8900011 Drawing No.: 03	

APPENDIX D

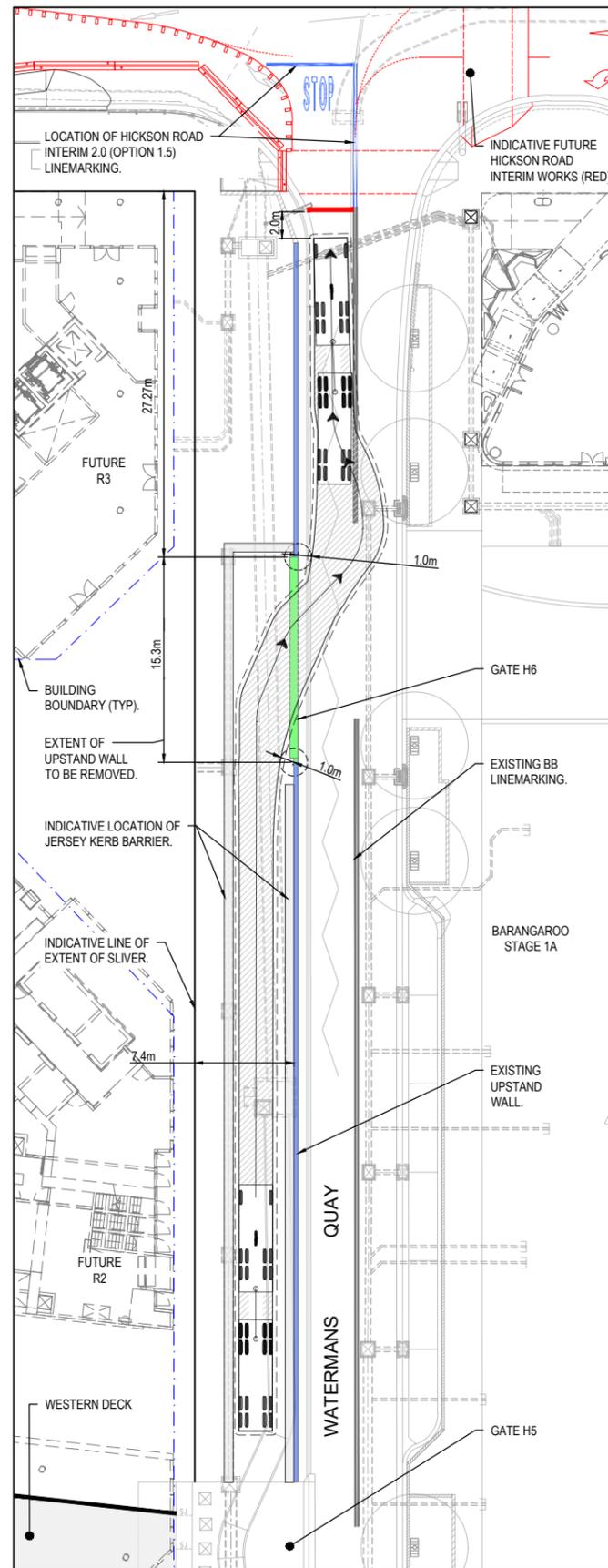
WATERMANS QUAY GATE H6 ACCESS SKETCH PLAN AND TURNING PATH DIAGRAM



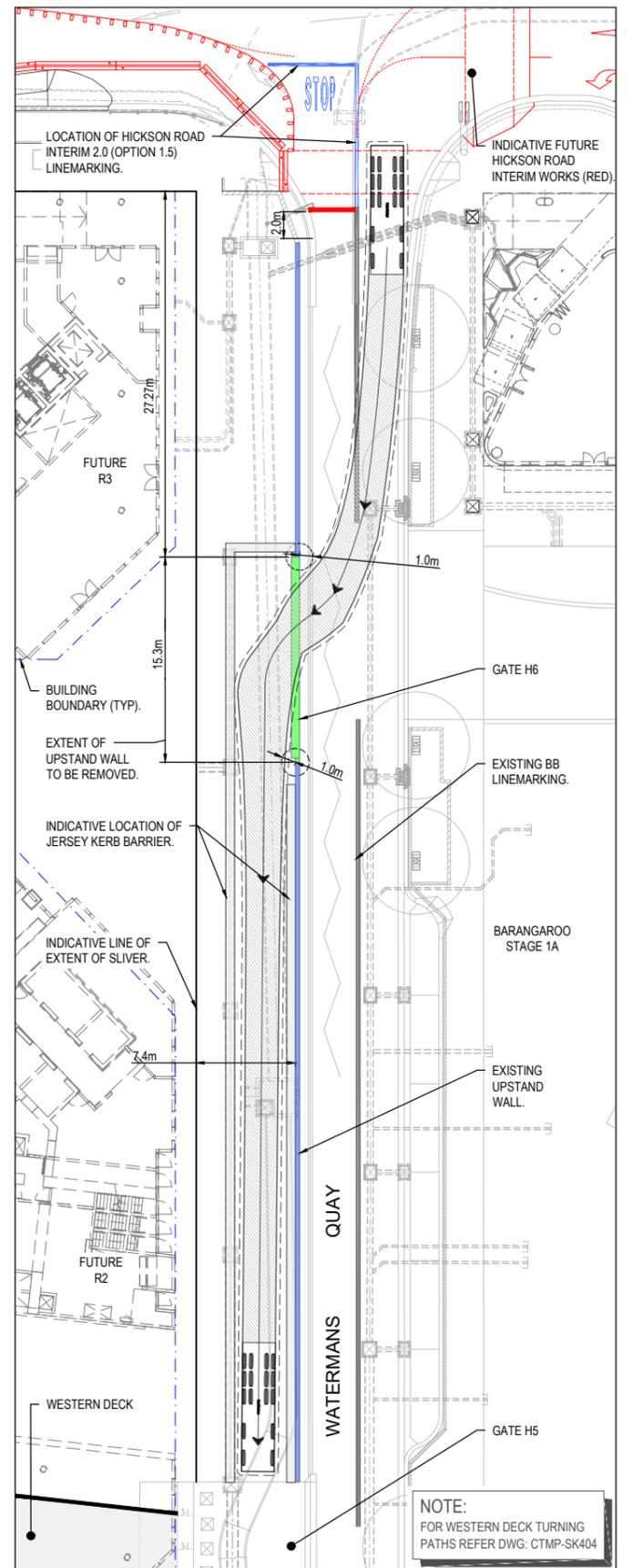
19m SEMI-TRAILER EXITING GATE ON TO WATERMANS QUAY



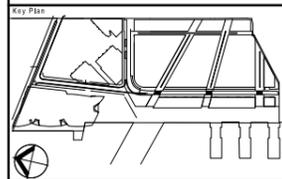
TRUCK AND DOG EXITING GATE ON TO WATERMANS QUAY



TRUCK AND SUPERDOG EXITING GATE ON TO WATERMANS QUAY



9.6m TWIN-STEER CONCRETE MIXER ENTERING GATE FROM WATERMANS QUAY



Rev.	Item	Revised Description	Date
3	RE-ISSUED FOR INFORMATION		06.12.19
2	ISSUED FOR INFORMATION		13.11.19
1	ISSUE FOR INFORMATION		25.06.19

© Cardno Limited All Rights Reserved.
 This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno
 Shaping the Future

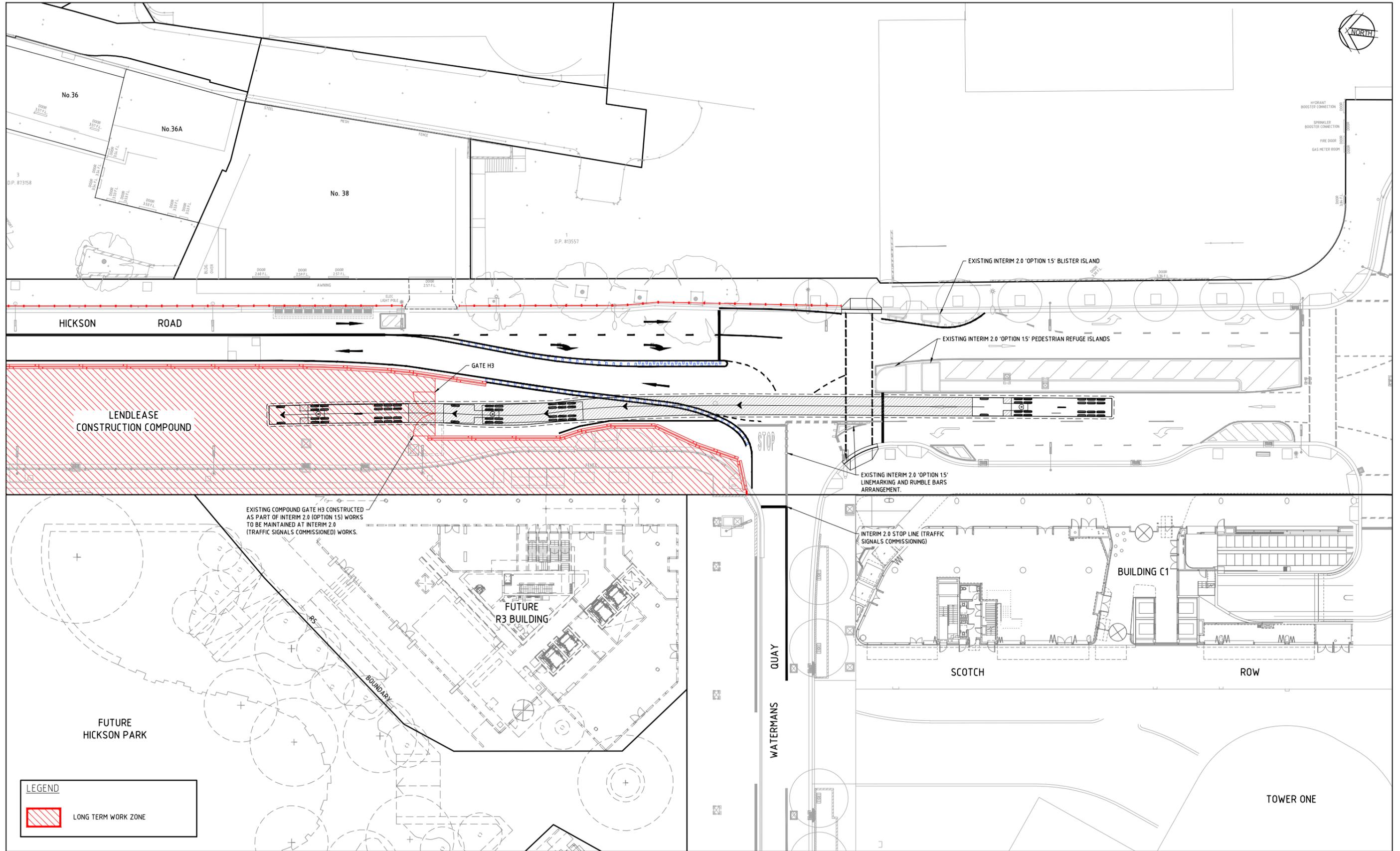
Cardno (NSWIACT) Pty Ltd | ABN 95 001 145 035
 Level 9, The Forum, 203 Pacific Highway
 St. Leonards, NSW 2065
 Tel: 02 9496 7700 Fax: 02 9439 5170
 Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Euan Harbort Principal Architect RASA, NSW ARB 8434 Sydney NSW 2000
Collaborating Architects	Lend Lease Graham W Jones Principal Architect PMAA NSW ARB 4005 Adm 97 030 288 -92
Consultant	

Principal	Developer	Lend Lease
Project Management & Construction	Lend Lease	
Design	Lend Lease	
30 The Road 30 Hickson Road Mildura Vic 3240	www.lendlease.com	
Project No.	161804	CTMP-SK403
Revision No.		3

APPENDIX E

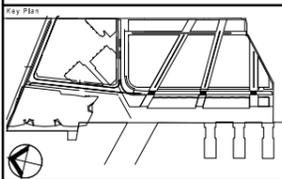
HICKSON ROAD CONSTRUCTION ZONE GATE H2 AND H3 ACCESS SKETCH PLAN AND TURNING PATH DIAGRAM



LEGEND

 LONG TERM WORK ZONE

0 5 10 15 20m
SCALE 1:200 @B1 NOT TO BE USED FOR CONSTRUCTION PURPOSES



Rev. Item	Revision Description	Date	Rev. Item	Revision Description	Date
1	ISSUED FOR INFORMATION	16.02.15			

© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno
Shaping the Future

Cardno (NSWI/ACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2065
Tel: 02 9496 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Ben Harbour Principal Architect RAM NSW ARB 8484 Sydney NSW 2000	Principal	
Collaborating Architects	Lend Lease Graham W. Jones Principal Architect FEMA NSW ARB 4005 ABN 97 020 288 162	Developer	Lend Lease
Consultant		Project Management & Construction	Lend Lease
		Design	Lend Lease
			30 The Bend 30 Hickson Road Millers Point NSW 2000 www.lendlease.com

BARANGAROO SOUTH

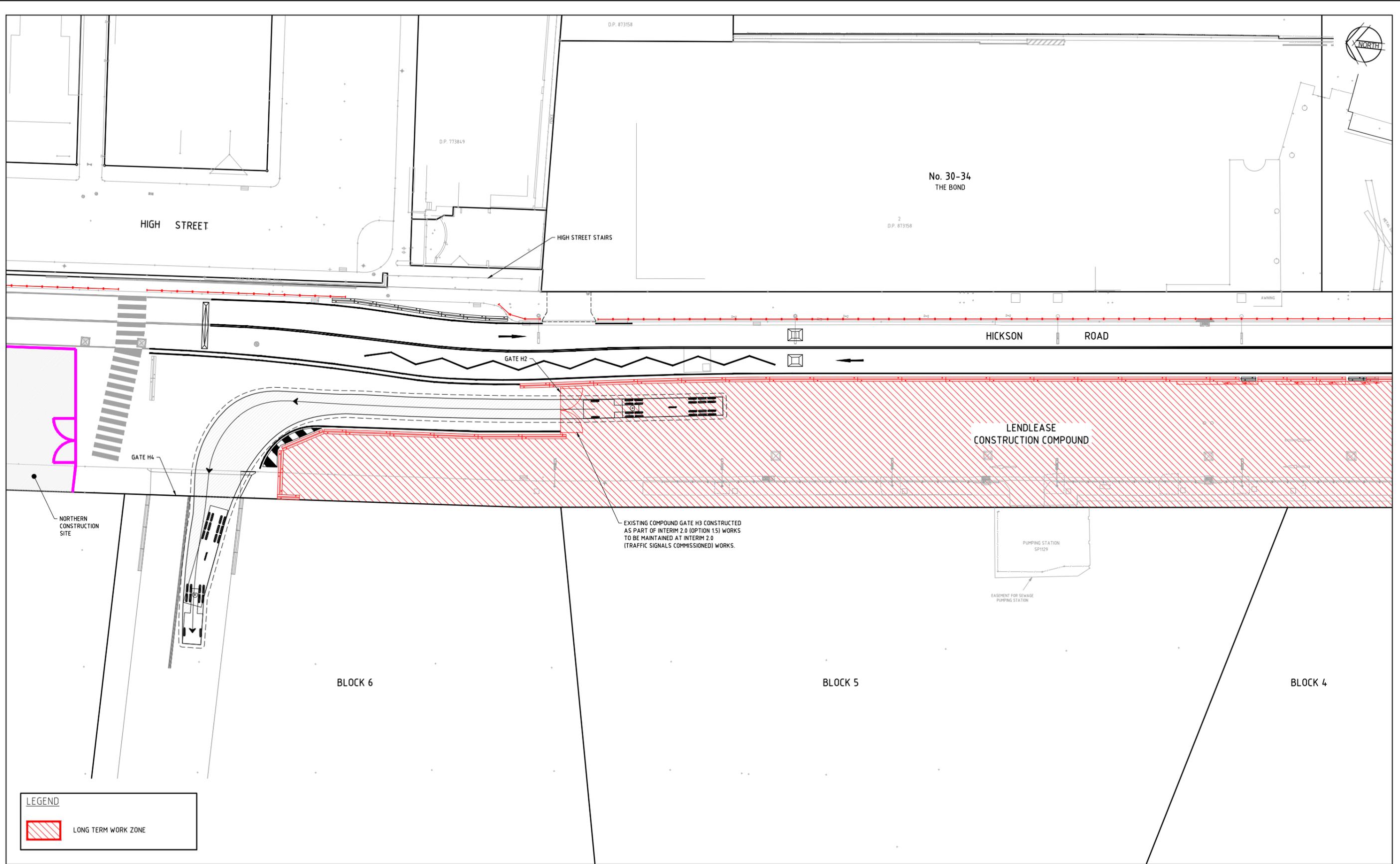
MP

THIS BARANGAROO COORDINATED CONSTRUCTION CTMP
HICKSON ROAD INTERIM 2.0 AND INTERIM 2.0 (OPTION 1.5)
GATE H3 - 19m SEMI TRAILER VEHICLE TURNING PATH

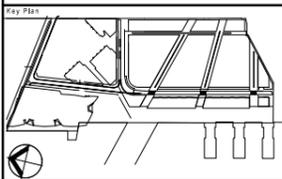
Drawn By: MDH
Designed By: MDH
Checked By: AL
Approved By: [Signature]
Date: [Date]

Scale: 1:200

Project No: 161804
Title No: CTMP-SK408
Revision: 1



0 5 10 15 20m
SCALE 1:200 @B1 NOT TO BE USED FOR CONSTRUCTION PURPOSES



Rev. Item	Revision Description	Date
1	ISSUED FOR INFORMATION	06.12.15

© Cardno Limited All Rights Reserved.
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

Cardno
Shaping the Future
Cardno (NSWI/ACT) Pty Ltd | ABN 95 001 145 035
Level 9, The Forum, 203 Pacific Highway
St. Leonards, NSW 2055
Tel: 02 9436 7700 Fax: 02 9439 5170
Web: www.cardno.com.au

Lead Architects	RSHP Australia Pty Ltd Ben Harbour Principal Architect RAMA NSW ARB 8484 Sydney NSW 2000	Principal	
Collaborating Architects	Lend Lease Graham W. Jones Principal Architect FKMA NSW ARB 4005 ABN 97 020 288 162	Developer	Lend Lease
Consultant		Project Management & Construction	Lend Lease
		Design	Lend Lease
		30 The Bond 30 Hickson Road Millers Point NSW 2000	www.lendlease.com

Project		Title	
BARANGAROO SOUTH		BARANGAROO COORDINATED CONSTRUCTION CTMP HICKSON ROAD INTERIM 2.0 AND INTERIM 2.0 (OPTION 1.5) GATE H2 - 19m SEMI TRAILER VEHICLE TURNING PATH	
Drawn by	Designed by	Checked by	Approved by
MDH	MDH	AL	
Scale	1:200	Project No.	161804
		Site No.	CTMP-SK409
		Revision No.	1

APPENDIX F

CONSTRUCTION GREEN TRAVEL PLAN



Barangaroo South Stage 1B Construction Green Travel Plan





Contents

	Contents	iv
1.0	Executive Summary	5
2.0	Definition and Objectives	6
3.0	Action Plan	8



1.0 Executive Summary

Barangaroo South aims to be a world leading example of sustainability in a mixed use development. The project aspires to achieve carbon neutral, zero waste and water positive outcomes, collectively known as the climate positive strategy.

The purpose of this Construction Green Travel Plan is to outline the steps taken to achieve a more sustainable outcome in relation to transportation of workers to and from the site during construction. The target for the Construction Green Travel Plan is that no workers will access the site with a private vehicle and that all access to the site will be by safe, sustainable transport modes.

A Green Travel plan will also be developed for the ongoing occupation and management of the site prior to operation. In addition, the travel of goods and materials to the site will be subject to further sustainability planning that will be conducted as part of each work package.

2.1 Definition and Objectives

Barangaroo South will be a world leading example of sustainability in an urban renewal project. The central location of the site affords numerous green travel options that may not be available on a typical construction site.

What is a Green Travel Plan?

A Green Travel Plan is a long-term management strategy which helps organisations to reach sustainable transport objectives. These objectives are achieved by identifying and implementing measures aimed at promoting sustainable travel, with an emphasis on reducing single-occupancy car journeys and increasing the proportion of trips made by walking, cycling and public transport. The various measures are co-ordinated through a clearly set out and regularly reviewed Travel Plan.



Travel Related Carbon Emissions Comparison

As part of the Lend Lease bid proposal for Barangaroo, a detailed carbon footprint calculation was undertaken. As shown in the table below, walking and cycling have the lowest carbon footprint, public transport has a moderate carbon footprint while private car has the highest carbon footprint.

Australian Average Emission Factors for Transportation Options

Walk	0 g CO ₂ /pass.km
Bicycle	0 g CO ₂ /pass.km
Ferry	47 g CO ₂ /pass.km
Bus	93 g CO ₂ /pass.km
Motorcycle	117 g CO ₂ /pass.km
Train	139 g CO ₂ /pass.km
Car	230 g CO ₂ /pass.km

Notes: The Australian average emission factors come from table 4-11 from "Analysis of Recent Trends and Greenhouse Indicators 1990 to 2005"

Australian Greenhouse Office, Department of the Environment and Water Resources, 2007 <http://www.climatechange.gov.au/inventory/2005/trends.html>
apart from emission factors for ferry

Emissions from ferries have been estimated using fuel consumption, speed and capacity data from the Sydney Ferries website (<http://www.sydneyferries.info/about-us/7-15-Fleet-Facts.htm>) and diesel conversion factor from <http://www.climatechange.gov.au/workbook/pubs/workbook-oct2008.pdf>. The figure above is based on a load factor of 0.75 and can be altered according to the following equation: Emissions Factor (g CO₂e/ passenger km) = 35.4/ Load Factor

Objective of the Stage 1B Construction Green Travel Plan

The objective of this travel plan is to encourage the use of safe and sustainable transport for travel to and from work and within work time. Initiatives will be implemented to:

- to reduce our carbon footprint
- to relieve congestion, reduce pollution and limit impact on neighbours
- to reduce the demand for access to limited on street parking
- to improve staff fitness levels through encouraging the use of more active forms of transport
- to enable construction workers to access public travel information and fare details
- to provide onsite parking for visitors and workers with a mobility disability, and
- reduce local congestion, air pollution, greenhouse gases and noise pollution.

Resources

- For public transport trip planning and advice on fares visit: <http://www.131500.com.au/>. These details will be provided in all tender documents as part of encouraging worker transport to the Barangaroo South Stage 1B work site. These details will also be posted on site amenities notice boards
- Details of green car sharing websites and company information will be readily available and posted on site amenities notice boards.
- Construction workers will be inducted into the Green Travel Plan during the formal Site / Project inductions with public transport links and bike transport routes clearly provided.
- Project health and wellbeing programs will incorporate sustainable transport initiatives and information.

3.0 Action Plan

Target	Action	When	Who
Increase Journeys to Site by Bicycle	Provide on-site bike parking facilities including onsite safe bike route to secure bike storage and shower facilities.	Site establishment	Lend Lease
	Encourage bike transport at site inductions and publish maps of local cycle routes onsite.	Site occupation / ongoing	Lend Lease
	Promote and encourage participation in ride to work day	Ongoing	Lend Lease
	Look at other financial incentives for example subsidised membership of Bicycle NSW for own employees (Lend Lease and Subcontractors responsible for their own respective staff)	Ongoing	Lend Lease / Subcontractors
	Encourage community programs and site engagement (e.g. Bikes for Humanity)	Ongoing	Lend Lease / Subcontractors
Encourage Private Bus Services	Work with subcontractors who want to provide private transport to the site to pick up other contractors / organise collective bus services for large volumes of employees coming from a central depot / site. Review options for sponsoring / pooling of funds.	At start of works packages	Lend Lease to coordinate with subcontractors
Increase Journeys to Work by Public Transport	Encourage sub-contractors to review subsidised or pay for public transport passes.	Ongoing	Subcontractors
	No vehicle parking will be allowed onsite	Site Establishment	Lend Lease
	At time of tender provide clear information on alternate transport options and encourage use of public transport.	Ongoing	Lend lease
	Provide up to date public transport timetable and route information including live feeds / internet access for route planning.	Site establishment / ongoing	Lend Lease
	Ensure safe access and lighting for employees coming to site early/late.	Site establishment / ongoing	Lend Lease
Reduce car journeys to site	No provision for parking on site – can be reviewed on an as needs basis if disabled employees need to access the site.	Site establishment	Lend Lease
	Provide details of local car share options in place of pool vehicles e.g. green car share and go get style schemes	Site occupation / ongoing	Lend Lease
	Examine provision of plant hire services and maintenance onsite.	Site establishment	Lend Lease

Target	Action	When	Who
	Provide storage areas for subcontractors to secure materials, tools and personal belongings overnight.	Site establishment	Lend Lease to provide space, subcontractors to provide storage
Increase journeys to Site by Walking	Produce map showing safe routes, including safe access routes into the site, with distances and times to common destinations.	Site occupation	Lend Lease
	Provide onsite shower facilities.	Site establishment	Lend Lease
	Investigate the provision of pedometers to enable employees to see the impact of healthy commuting options – encourage competitions to increase daily exercise	Ongoing	Lend Lease / Subcontractors
	Investigate periodic health / fitness checks to enable employees to see the benefit of healthy commuting options	Ongoing	Lend Lease / Subcontractors



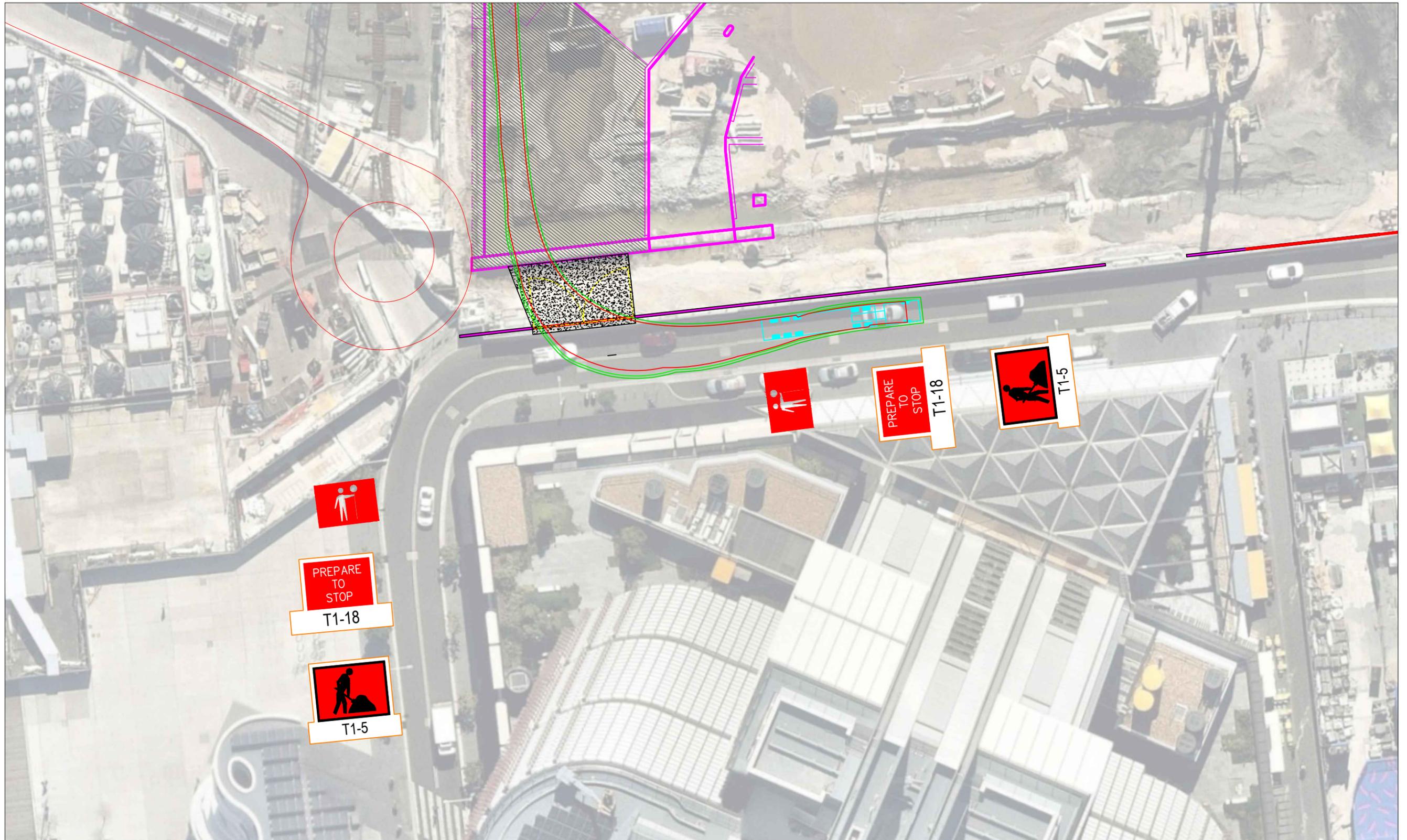
4.0 Monitoring & Review

The Barangaroo South Stage 1B Construction Green Travel Plan will be monitored by the Lend Lease project management team with construction worker feedback encouraged and new initiative implemented where demand and opportunities present.

Surveys of staff coming to the site as part of the construction (including regular reporting by subcontractors) will assist in informing further iterations of this plan which will be updated at least annually.

APPENDIX G

TRAFFIC CONTROL PLAN – WATERMANS QUAY ACCESS



Notes:

- All traffic controllers are to be RMS Accredited
- Priority is not to be given to construction vehicles entering/exiting the site
- Signs to be removed / covered when not in use
- TCP can be modified by suitably qualified (RMS Accredited) author
- Not to scale

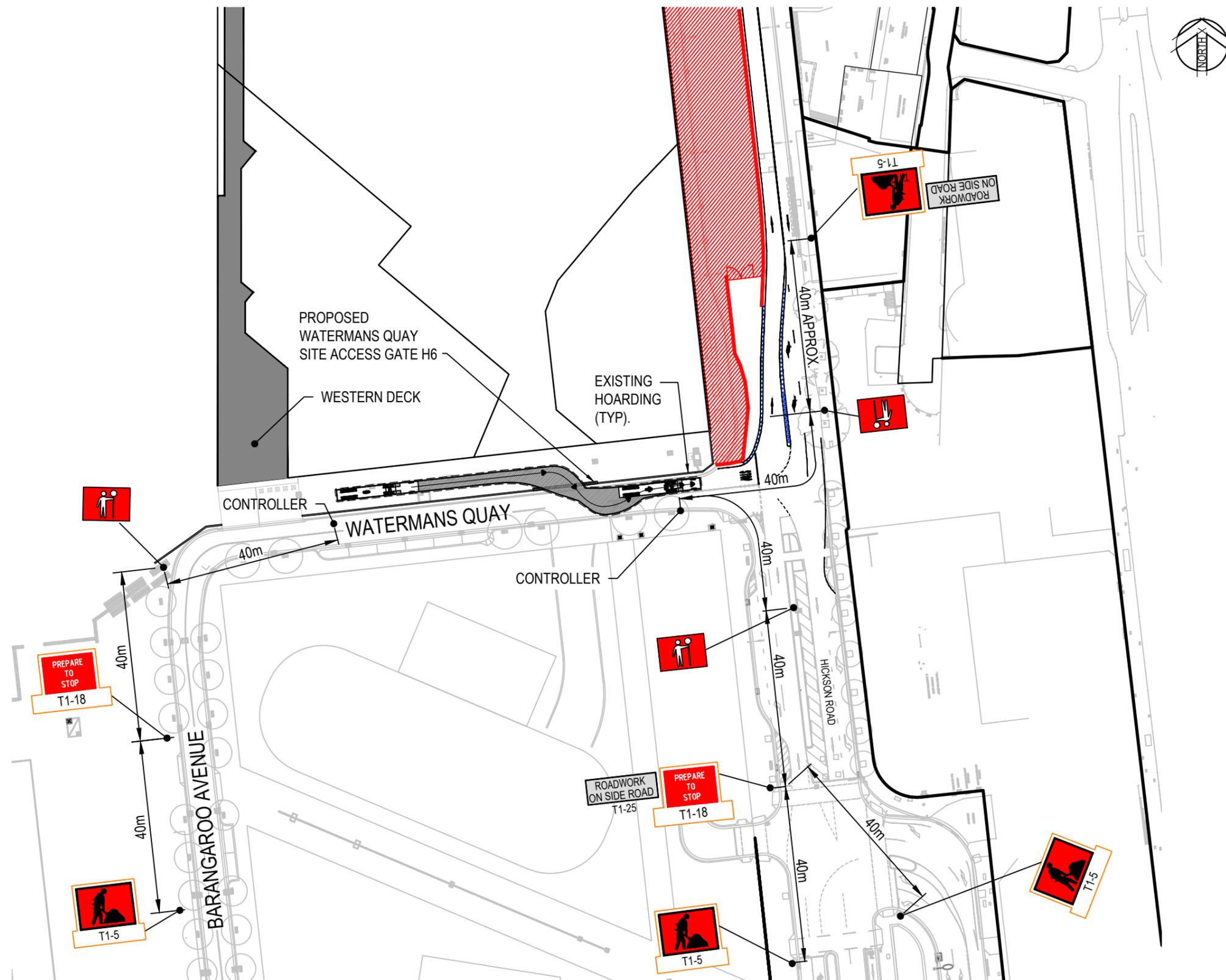
TCP 01
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE
WITHOUT NOTIFICATION

© Cardno Limited
 All Rights Reserved.
 This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.


Cardno
 Shaping the Future
 Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
 Level 9, The Forum, 203 Pacific Highway
 St. Leonards, NSW 2065
 Tel: 02 9496 7700 Fax: 02 9439 5170
 Web: www.cardno.com.au

Client **Lendlease**
 Project **Watermans Quay TCP**

Title **TCP 01 - General Site Access**
 15/05/2019



Notes:

- All traffic controllers are to be RMS Accredited
- Priority is not to be given to construction vehicles entering/exiting the site
- Signs to be removed / covered when not in use
- TCP can be modified by suitably qualified (RMS Accredited) author
- Not to scale

RMS LICENSE

DESIGNER *Aaron Pau*
 LICENCE NUMBER 0052047533
 LICENCE EXPIRY 19/06/2022
 NAME Aaron Pau

TCP 03

FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE
 WITHOUT NOTIFICATION

© Cardno Limited
 All Rights Reserved.

This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.



Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035
 Level 9, The Forum, 203 Pacific Highway
 St. Leonards, NSW 2065
 Tel: 02 9496 7700 Fax: 02 9439 5170
 Web: www.cardno.com.au

Client Lendlease

Project Watermans Quay TCP

Title TCP 03 - General Site Access Gate H6
 UNSIGNALISED INTERSECTION

