

Multiplex Australasia

**UNSW Biological Sciences Project
Stage 2 (SSD7865)**

**Construction Traffic Management
Plan**

002

Rev A | 2 November 2016

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 238676

Arup
Arup Pty Ltd ABN 18 000 966 165



Arup
Level 10 201 Kent Street
PO Box 76 Millers Point
Sydney 2000
Australia
www.arup.com

ARUP

Document Verification

ARUP

Job title		UNSW Biological Sciences Project Stage 2 (SSD7865)		Job number		238676	
Document title		Construction Traffic Management Plan		File reference			
Document ref		002					
Revision	Date	Filename	Draft CTMP 20161004.docx				
Draft 1	4 Oct 2016	Description	Draft issue for client review				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
Issue	10 Oct 2016	Filename	Arup CTMP 20161010.docx				
		Description	Updated with comment from SG dated 6/10/16				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
Rev A	2 Nov 2016	Filename	Arup CTMP 20161102.docx				
		Description	Updated with comment from DC dated 31/10/16 and 2/11/16				
			Prepared by	Checked by	Approved by		
		Name	James Turner	Andrew Hulse	Andrew Hulse		
		Signature					
		Filename					
		Description					
			Prepared by	Checked by	Approved by		
		Name					
		Signature					
<div style="display: flex; justify-content: space-between; align-items: center;"> Issue Document Verification with Document <input checked="" type="checkbox"/> </div>							

Contents

	Page
1 Introduction	1
1.1 Location	1
2 Description of proposed works	2
2.1 Overview	2
2.2 Construction programme	2
2.3 Vehicle types expected	2
2.4 Proposed site access	2
2.5 Works zone	3
3 Impact of proposed measures	5
3.1 Truck routes and controls	5
3.2 Truck marshalling area	6
3.3 Construction traffic	7
3.4 Road network impacts	8
3.5 Parking	8
3.6 Pedestrians	8
4 Effects on existing and future developments	9
5 Details of provisions made for emergency vehicles, heavy vehicles, and cyclists	9
6 Measures to ameliorate impacts	10
6.1 Vehicle movements	10
6.2 Driver code of conduct	10
7 Public transport services affected	11
8 Public consultation	11

Tables

Table 1: Indicative construction staging and timing

Figures

Figure 1: Development Site Location

Figure 2: Existing Botany Street kerbside restrictions

Figure 3: Construction vehicle routes to/from the site

Figure 4: Truck marshalling area and truck routes

Appendices

Appendix A

Site Plans

Appendix B

Swept paths

1 Introduction

This report details the Construction Traffic Management Plan (CTMP) for the proposed works at University of New South Wales (UNSW) Biological Sciences Project (Stage 2). The plan has been created by Arup on behalf of Multiplex Australasia.

The purpose of the CTMP is to assess the proposed access and operation of construction traffic associated with the proposed development with respect to safety and capacity. The CTMP is to be submitted for approval by Randwick City Council.

This plan will detail the management needed to control construction traffic, while minimising effects on the surrounding developments and allowing for appropriate access at all times. The contractor (once appointed) will prepare an updated version of this plan, with detailed Traffic Control Plans detailing specific methods of safely managing construction vehicle traffic within the surrounding area as required.

1.1 Location

The site is situated on the Eastern side of the main UNSW Kensington campus on campus Grid D26. UNSW is located approximately six kilometres southeast of Sydney CBD.

The construction site is specifically located between the recently constructed Wallace Wurth Building, the Stage 1 Biological Sciences Building (under construction) and UNSW Gate 11 on Botany Street between Oval Lane and High Street, Kensington (see Figure 1).

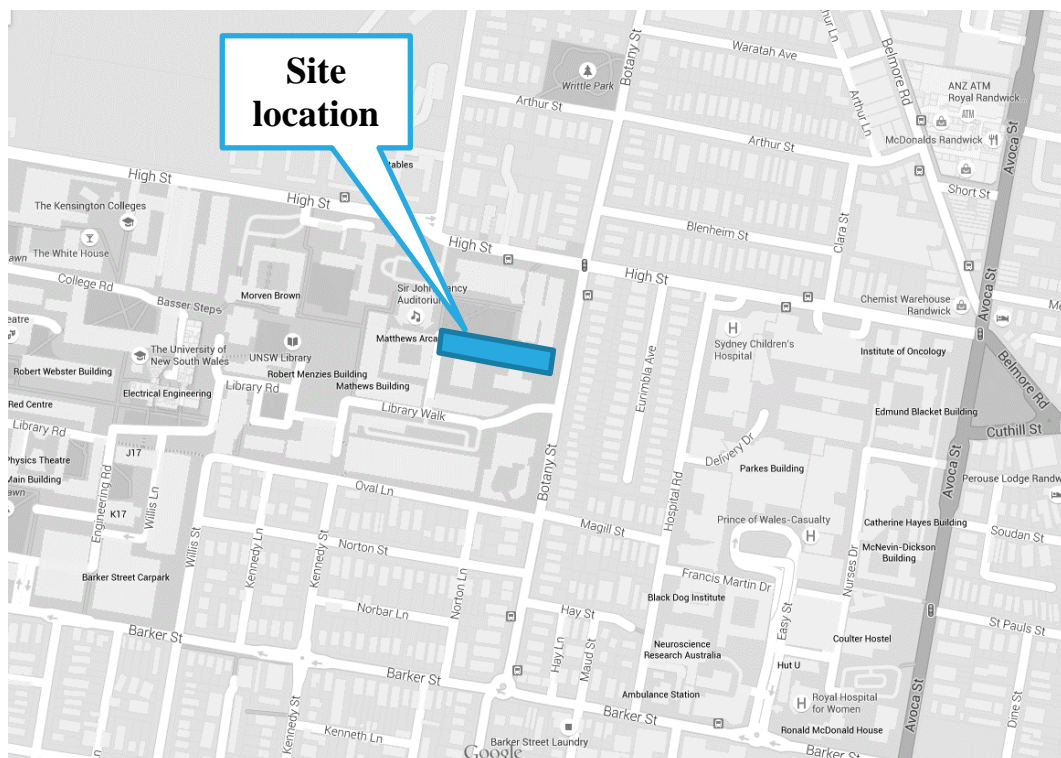


Figure 1: Development Site Location

2 Description of proposed works

2.1 Overview

The UNSW Biological Sciences Project – Stage 2 (BS2) comprises the refurbishment of D26. A site plan of the project are is shown in Appendix A.

2.2 Construction programme

The indicative construction programme is shown in Table 1. There may be a requirement for these timeframes to be adjusted as the construction programme is not yet finalised.

Table 1: Indicative construction staging and timing

Construction Stage	Commencement
Early works	May 2017
Main construction	Sep 2017
Relocations and completion	Jan 2019

2.3 Vehicle types expected

The following types of 2890.2 Australian Standard trucks are proposed to be used during the project:

- Medium Rigid Vehicles (MRVs) – includes concrete agitators and pumps
- Articulated Vehicles (AVs)

Most of the large construction materials are proposed to be transported via truck. The maximum truck size that will likely utilise the site is a 19m Articulated Vehicle. These will be required to access the proposed Works zone on Botany Street given there is no provision on site to turn around. SRVs and small utes/vans will still be required to access buildings within UNSW via Gate 11 during construction activities.

All heavy goods such as machinery plant will need to be delivered outside of peak traffic hours. It is envisaged that a number of mobile crane days will be required during the construction stage of the program, with limited lifting operations on weekends. These operations will be subject to a separate application for partial road closure with the Roads and Maritime Services and Randwick City Council as required.

2.4 Proposed site access

It is proposed to primarily access the site from Gate 11 of UNSW from Botany Street. Secondary access is proposed by Gate 9 of UNSW from High Street. Refer also to Chapter 4 for effects on existing and future developments.

Only left turns will be permitted into and out of the site accesses. A concrete mobile pump and agitator vehicles will be required to drive into the site. The

access to the site will permit manoeuvres from the public roads in forwards direction only. No reverse manoeuvres will be permitted to and from the site on public roads such as Botany Street or High Street.

Controls at the site access will ensure priority is given to entering construction traffic as opposed to exiting vehicles which will be held on-site until cleared to exit. The site access will be controlled by qualified traffic controllers who will communicate with approaching and exiting drivers using two-way radios. Vehicles will only be permitted to exit when no vehicles are entering. Adequate queuing space will be provided at a remote external site prior to vehicles accessing the site (see Section 3.2).

Pedestrian controls are proposed to be provided via the traffic controllers. Pedestrians will have priority at the access when construction vehicles are not entering or exiting the access.

2.5 Works zone

Construction activities will utilise the approved works zone (ie a construction zone) from Stage 1. This zone will be proposed to remain for the entire duration of construction activities on the Western side of Botany Street. This zone will accommodate deliveries of larger construction materials to be craned onto the site during various stages of the construction.

The 50m long Works zone will be utilised to maximise flexibility of vehicle operations. The design of the Works zone allows the construction vehicles to drive forwards directly into the zone where they can be loaded/unloaded via crane.

The existing No Stopping zones outside this zone will be retained in their entirety during the works for movements into and out of UNSW, and shall not allow for construction vehicles to queue or stand in these zones. Traffic controllers should move vehicles on if they park within the zone.

The proposed operating times of the Works zone are per the DA approved hours for the entire duration of the proposed works. The Local Traffic Committee reserves the right to amend the operation times if it is observed to create excessive delays in Botany Street during peak times. Trucks entering or using the zone should pull in their side mirrors so they do not encroach into adjacent travel lanes.

B-class hoarding will be provided on Botany Street to protect pedestrians from construction activities during the various phases of construction. At times, the on-street Works zone will be heavily utilised with deliveries being craned across the footpath. A plan of the Works zone is shown in Appendix B.

See Figure 2 for existing on-street kerbside restrictions on Botany Street.



Figure 2: Existing Botany Street kerbside restrictions

3 Impact of proposed measures

3.1 Truck routes and controls

To keep construction related traffic to a minimum on the surrounding roads, it is necessary to define a route for the holding circulation and access into the site from the main access points such as Anzac Parade and Gardeners Road. The routes will be clearly marked by traffic control signage to ensure construction vehicles are following the correct route.

Figure 3 describes the inbound and outbound routes to the construction site. It is understood High Street will be one way (westbound) for light rail works by 2017. To avoid congestion, construction traffic will continue straight on Botany Street to Alison Road when existing Botany Street work zone. All vehicles accessing Gate 11 will be required to turn left into the site and left out of the site. This will help ensure safety and maintain minimal conflicts to other road users.

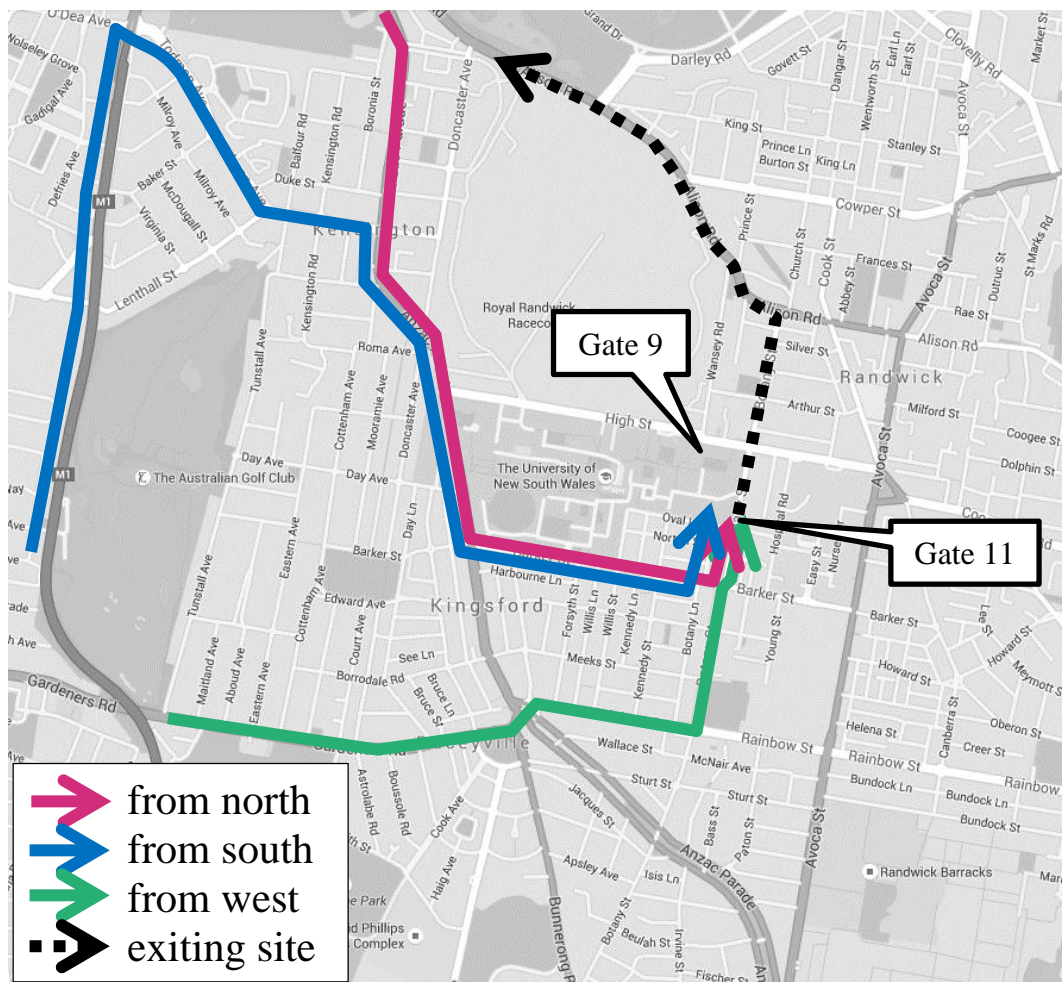


Figure 3: Construction vehicle routes to/from the site

Proposed access to and from Gate 9 will be discussed in further consultation meetings with Sydney Light Rail project and task force team along with Arup, Multiplex and client representatives.

All vehicles accessing the site from the North will likely be using the Eastern Distributor and use either the Anzac Parade or Dacey Avenue off-ramp. To access the site, vehicles will need to continue down Anzac Parade and use Barker Street to access the site.

All vehicles accessing from the South will likely be using the M5-Southern Cross Drive. If they continue onto the Eastern Distributor, they will need to use the Todman Avenue off-ramp, and proceed onto Anzac Parade and Barker Street to access the site.

All vehicles accessing from the West will likely be using Gardeners Road. Vehicles will proceed via Nine Ways and Rainbow Street to Botany Street.

All vehicles exiting the site will proceed down Botany Street and turn left into High Street and continue along the same approach routes once on Anzac Parade. Alternatively, at times when access to High Street may be limited by Sydney Light Rail construction, vehicles would continue North on Botany Street to access Alison Road for westbound travel.

The deliveries of larger vehicles will need to be considered when accessing the site. These large vehicles will be delivering goods/materials at greater intervals to a set programme, outside of peak periods and on wider roads only. This will minimise the impact to the surrounding local road network.

3.2 Truck marshalling area

As a contingency, a marshalling area may be nominated at Bunnerong Road (Northbound), North of Prince Edward Circuit is the best option for marshalling trucks as this is located away from homes and generally has unrestricted parking available. A radio set-up will manage multiple vehicle arrivals and direct vehicles to the marshalling area if the works zone or site has no room for additional vehicles. Vehicles will be instructed to wait at the nominated marshalling area and only proceed when the site is clear. The routes and marshalling area are shown in Figure 4.

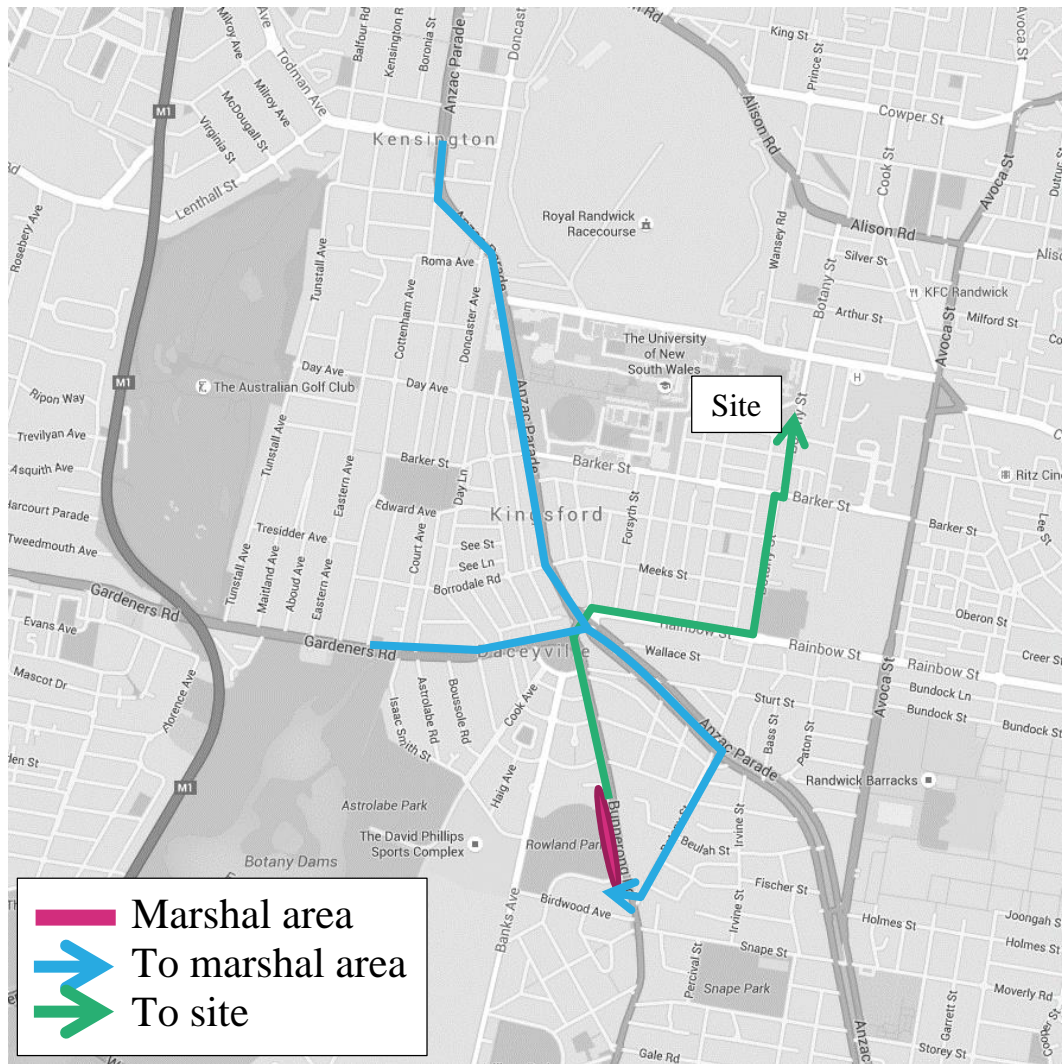


Figure 4: Truck marshalling area and truck routes

3.3 Construction traffic

Heavy vehicle trips generated are estimated to be in the order of approximately 30-45 truck movements per 10-hour work day or up to five trips per hour (including concrete pours). It may also be necessary for MRVs and AVs to access the site at the same time.

Workers may generate additional traffic to the site in the form of vans, utes and SRVs. A maximum workforce of approximately 240 personnel are forecast during Stage 2. Construction workers generally start earlier and finish earlier than the commuter peak periods, and would likely not coincide with the commuter and UNSW peak periods.

3.4 Road network impacts

The traffic generation of this magnitude is less than the amount of trips generated and assessed for the operational (existing and proposed) phases of the development and therefore the potential impacts are anticipated to be minimal. The largest number of truck movements associated with the site is in the order of five trips per hour, which is expected to have a minimal impact on surrounding roads and intersections. If queuing around the site becomes an issue, this will be managed by an off-site marshalling area described in Section 3.2.

3.5 Parking

No additional on-site car parking will be made available for construction vehicles; only parking will be available at the public parking stations on UNSW grounds. Given the cost of parking within the site and distance that unrestricted parking is available in surrounding streets, construction workers will most likely take public transport to the site and store tools on site.

3.6 Pedestrians

Pedestrians will be diverted and controlled by traffic controllers as necessary. They will control pedestrians as well as vehicles. Pedestrians will be directed through the B-class hoarding along the Botany Street frontage. When vehicles require access, pedestrians may be held for very short periods of time as trucks enter and exit the site.

Pedestrians will be managed by qualified traffic controllers so that they will not conflict with heavy vehicles accessing the site to maximise pedestrian safety. As a result, additional delays to pedestrians along Botany Street is expected to be minimal.

The footpaths around the site are heavily utilised throughout the day due to the activity from UNSW. Pedestrians on Botany Street may have a slightly reduced footpath width to utilise due to the B class Hoarding.

4 Effects on existing and future developments

There may be some delays to users of UNSW associated with the construction works. Construction vehicles will carefully enter the site, and turn in and out slowly. Suitably qualified traffic controllers will be present to ensure that traffic is safely and adequately managed around this access.

Early discussion between Multiplex and the Sydney Light Rail project team has occurred and will need to be ongoing in regards to construction access on High Street. It is understood that public road access is being maintained one way westbound along High Street throughout the project. Vehicles accessing Gate 9 will be discussed in detail with Sydney Light Rail as described in Section 3.1.

5 Details of provisions made for emergency vehicles, heavy vehicles, and cyclists

No special provisions are required or proposed for emergency vehicles and cyclists.

Construction activity is not expected to affect heavy vehicles travelling on surrounding roads not associated with this site. Garbage and delivery vehicles are proposed to continue accessing the site via Gate 11. Construction works and vehicle storage will be mainly confined to the site. As such, no additional specific provisions for emergency vehicles, heavy vehicles, cyclists or pedestrians have been identified on the surrounding road network.

A key requirement in the implementation of the Biological Sciences Project is to maintain continued vehicular access from Gate 11 to the new loading dock in E26 to service the buildings located off Samuels Ave and Library Walk. The service vehicles are generally in the range from utilities to 19-metre long articulated trucks which deliver liquid nitrogen to the bulk gas tanks, which are currently located in the existing temporary loading dock, but will be relocated to within the E26 footprint during the Stage 1 works.

Waste collection and Fire Brigade access is to be maintained at all times to existing buildings. Generally these vehicles are in the range of up to 12.5 metres in length.

The entrance into the Western compound (current temporary loading dock) has a vehicular height restriction of 3.7m, and vehicles which do not comply will be required to enter via Gate 9 on High Street (mobile cranes, and potentially concrete trucks).

6 Measures to ameliorate impacts

The measures proposed to ameliorate the impacts of the construction work are:

- The Works zone
- B Class hoarding

These measures are discussed in earlier sections of the report. Additionally, drivers wishing to access the site for any reason will need to report to the traffic controllers and receive instructions and guidance. Scheduling will be the main management method in ensuring minimal multi-vehicle arrivals. A radio set-up will manage multiple vehicle arrivals and direct vehicles to the marshalling area if the works zone or site has no room for additional vehicles.

The expected impact to traffic will be minimal on entry or exit unless a temporary partial road closure is in place during the few occasions of a Saturday that a mobile crane is required. Permission for these temporary road closures will be obtained through the normal approvals process.

6.1 Vehicle movements

Mitigation measures will be adopted during the construction phase to ensure traffic movements have minimal impact on surrounding land uses and the community in general, and will include the following:

- Truck loads will be covered during transportation off-site
- Establishment and enforcement of appropriate on-site vehicle speed limits (20km/h), which can be reviewed depending on weather conditions or safety requirements
- Neighbouring properties would be notified of construction works and timing. Any comments would be recorded and taken into consideration when planning construction activities.
- All activities, including the delivery of materials are not expected to impede traffic flow along local roads and highways
- Materials will be delivered and spoil removed during standard construction hours
- Avoid idling trucks alongside sensitive receivers
- Deliveries would be planned to ensure a consistent and minimal number of trucks arriving at site at any one time
- UNSW will be notified of any future disruption to roadways and footpaths

6.2 Driver code of conduct

No queuing or marshalling of trucks is permitted on a public road marked as No Stopping or No Parking. All vehicles must enter and exit the site from Botany Street in a forward direction. 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.

Vehicles entering, exiting and driving around the site will be required to give way to pedestrians at all times.

7 Public transport services affected

No bus services are expected to be impacted by construction traffic as the work will be confined to the Works zone and off-street within the site. All construction vehicles will be traffic controlled to ensure minimal impacts on surrounding traffic and pedestrian flows.

8 Public consultation

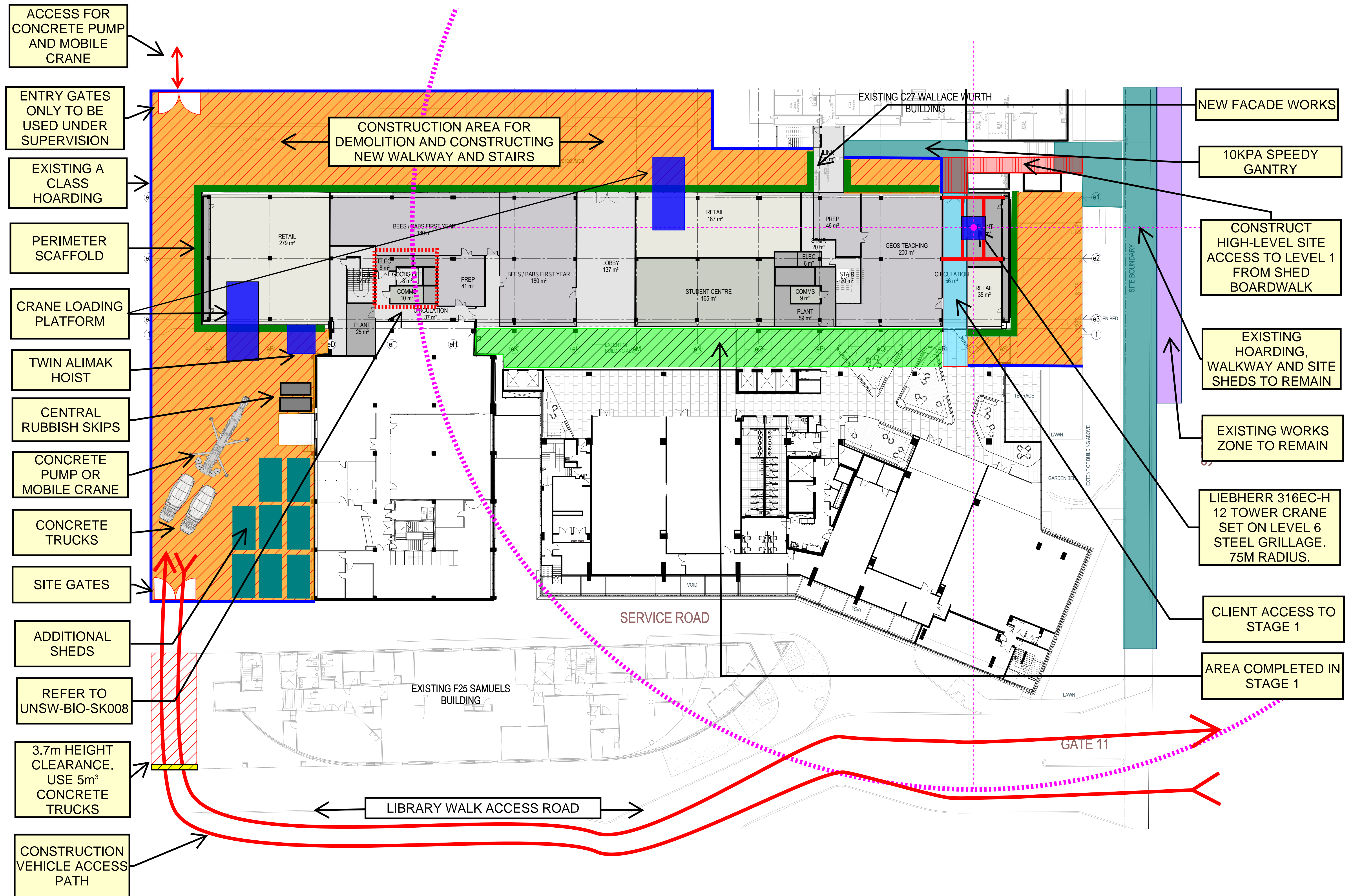
Randwick City Council, Sydney Buses and Roads and Maritime Services are given the opportunity to contribute to this report on submission of this plan to Local Area Traffic Committee.

Should temporary road closures be required at any stage during the construction period, they will be obtained separately through the normal approvals process.

Ongoing consultation will be conducted with UNSW and the Construction Contractor to ensure building occupants are updated on the construction works.

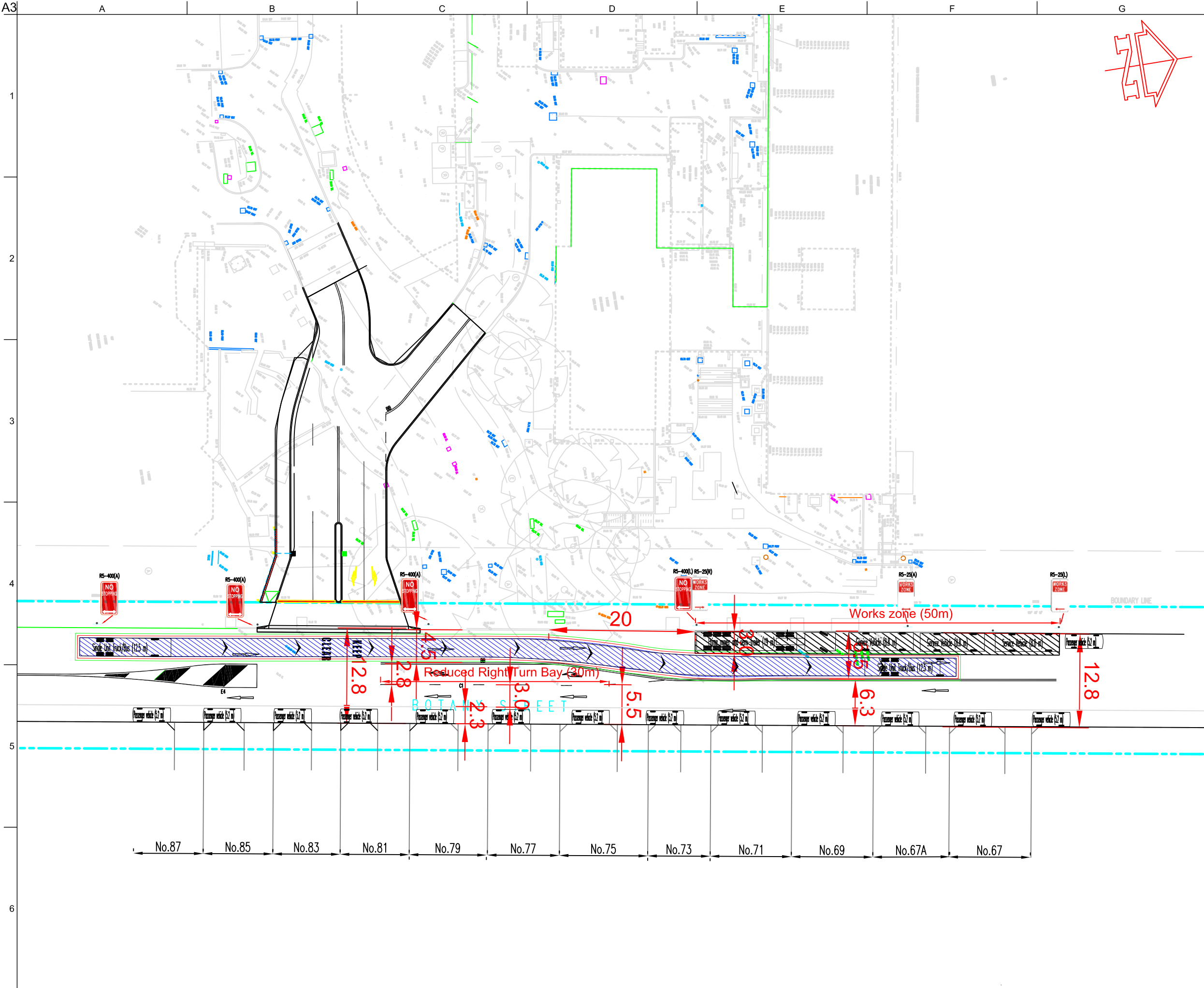
Appendix A

Site Plans



Appendix B

Swept paths



Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)

Single Unit Truck/Bus (12.5 m)
Overall Length 12.500m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.490m
Track Width 2.500m
Lock to Lock Time 6.00 sec
Curb to Curb Turning Radius 12.500m

B	28/08/15	JRT	AMH	AMH
Updated works zone				
A	24/08/15	JRT	AMH	AMH
For Information				
Issue	Date	By	Chkd	Appd

ARUP
Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client
Brookfield Multiplex

Job Title
UNSW Biological Sciences Building

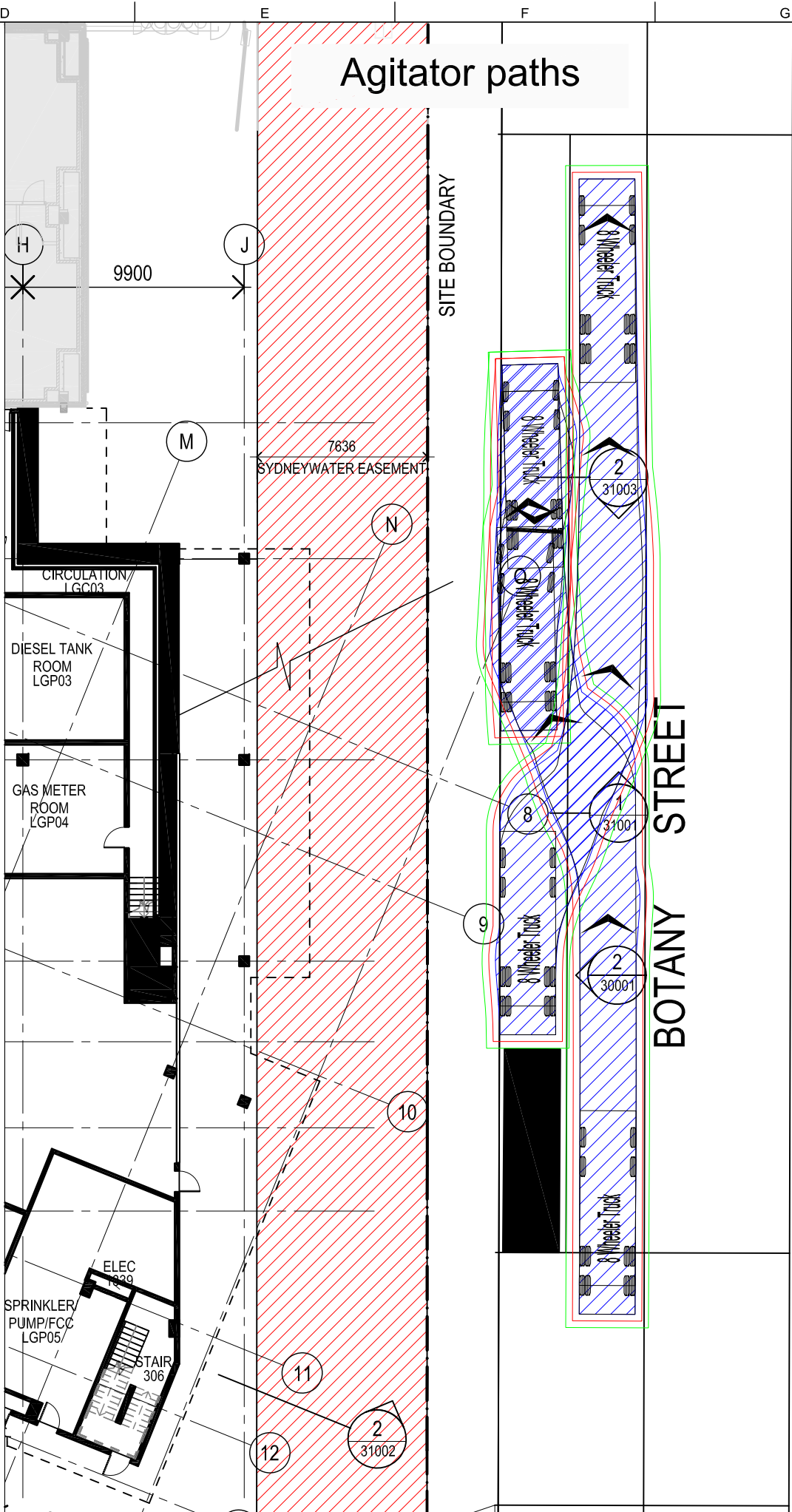
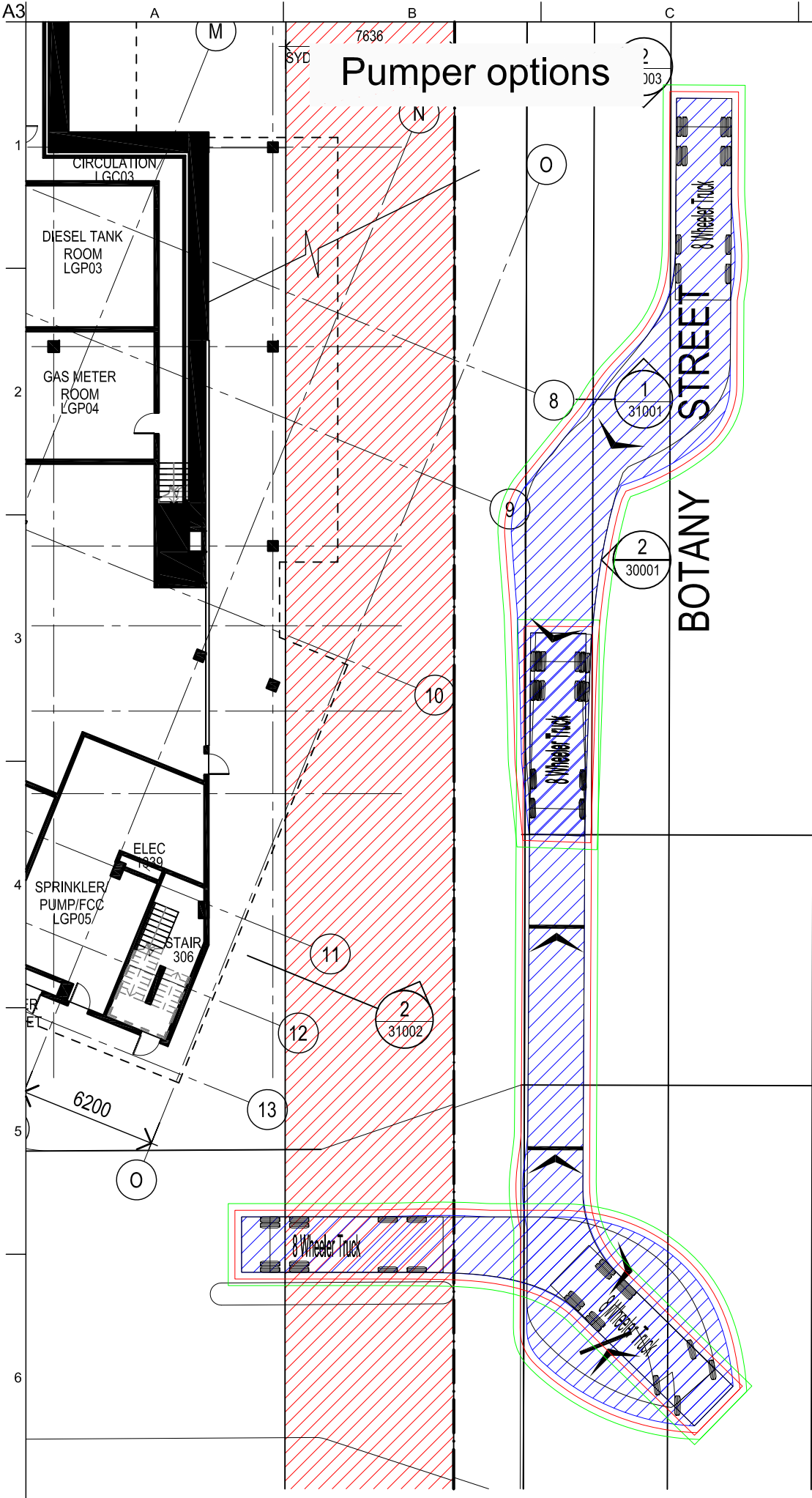
Drawing Title
**Turning Paths
Gate 11 Botany Street**

Scale at A3
1:500

Discipline
Transport

Drawing Status
Draft

Job No 238676-00	Drawing No SKT200	Issue B
----------------------------	-----------------------------	-------------------



Legend

Body Envelope

300mm Envelope

600mm Envelope

Wheel Envelope

Design Vehicle(s)

8 Wheeler Truck

Overall Length

Overall Width

Overall Body Height

Min Body Ground Clearance

Track Width

Lock to Lock Time

Curb to Curb Turning Radius

9.100m

2.500m

3.633m

0.428m

2.500m

4.00s

10.000m

A	10/08/15	JRT	AMH	AMH
For Information				
Issue	Date	By	Chkd	Appd

ARUP

Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client

UNSW

Job Title

UNSW Biological Sciences

Drawing Title

Turning Paths
Concrete Vehicle Options
9.1m 8 Wheeler Truck
Test Orientation

Scale at A3

1:250

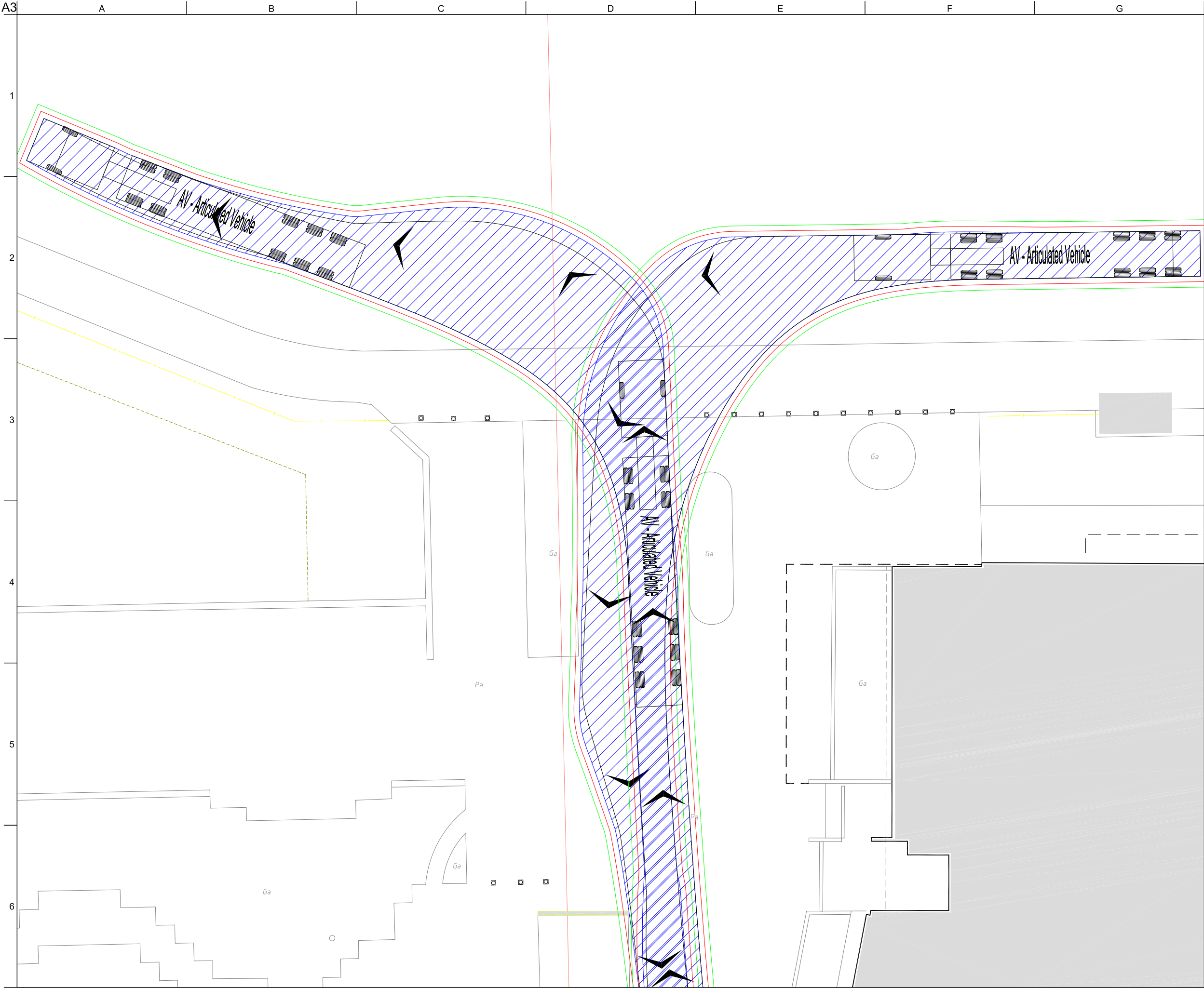
Discipline

Transport

Drawing Status

Draft

Job No	Drawing No	Issue
238676-00	SKT008	A

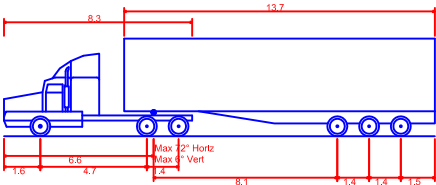


Do not scale

Legend

- Body Envelope
- 300mm Envelope
- 600mm Envelope
- Wheel Envelope

Design Vehicle(s)



AV - Articulated Vehicle
Overall Length 19.000m
Overall Width 2.500m
Overall Body Height 4.301m
Min Body Ground Clearance 0.418m
Track Width 2.500m
Lock to Lock Time 6.00 sec
Curb to Curb Turning Radius 12.500m

A	14/10/16	JRT	AMH	AMH
For Information				
Issue	Date	By	Chkd	Appd

ARUP

Arup, Level 10, 201 Kent St
Sydney, NSW, 2000
Tel +61(02)9320 9320 Fax +61(02)9320 9321
www.arup.com.au

Client

UNSW

Job Title

UNSW Biological Sciences

Drawing Title

Turning Paths
Articulated Vehicle
Gate 9

Scale at A3 1:200

Discipline Transport

Drawing Status

Draft

Job No	Drawing No	Issue
238676-00	SKT011	A