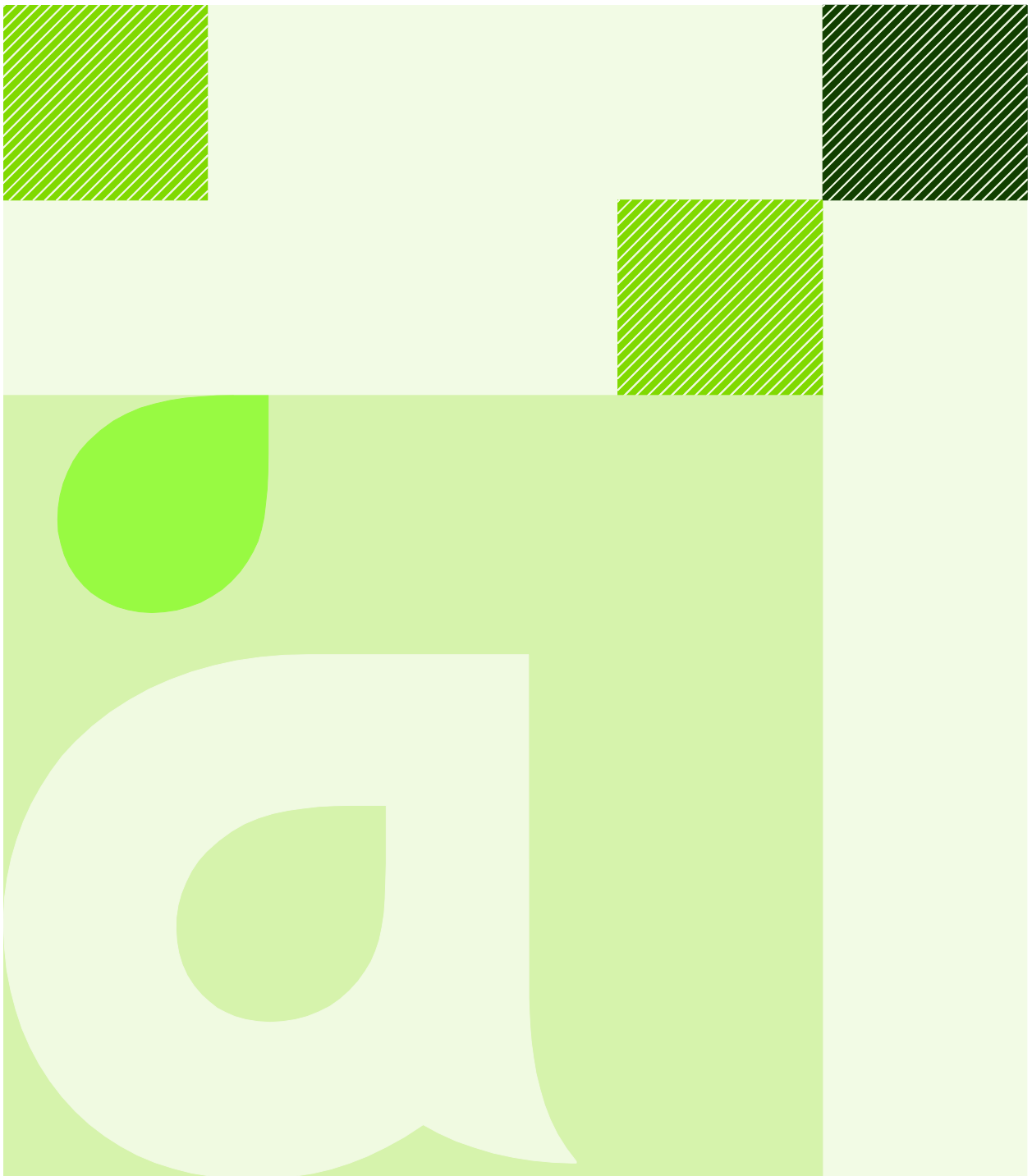




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Randwick NSW Comprehensive
Cancer & Blood Disorder Centre
Traffic and Transport Assessment -
Stage 1 Development**

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Contents

1. Introduction	3
1.1 Study area	3
1.2 Project background	4
2. Existing traffic and parking situation at Prince of Wales Hospital	6
2.1 Existing road network	6
2.2 Existing traffic volumes	7
2.3 Peak hour traffic volumes	7
2.4 Existing performance of intersections	8
2.5 Pedestrian and cyclists	9
2.6 Bus services	10
2.7 Existing access arrangement for the POWH	12
2.8 Existing parking situation	13
2.9 Adjacent landuses	14
3. Proposed Development	15
3.1 Proposed CCBDC	15
3.2 Swept path analysis	16
3.3 Future development proposals adjacent to the site	17
4. Future traffic and transport situation	18
4.1 Traffic generation	18
4.2 Future intersection performance	18
4.3 Pedestrian and cyclists	18
4.4 Bus services	19
4.5 Emergency vehicle access	19
4.6 Service vehicle access	19
5. Proposed traffic management measures	20
6. Car parking assessment	21
7. Traffic impact assessment	22
7.1 Road network	22
7.2 Pedestrian and cyclists	22
7.3 Bus services	22
7.4 Adjacent landuses	22
7.5 Car parking	23



8. Draft construction traffic management plan	24
8.1 Legislative requirements, guidelines and standards	24
8.2 Traffic management plan	25

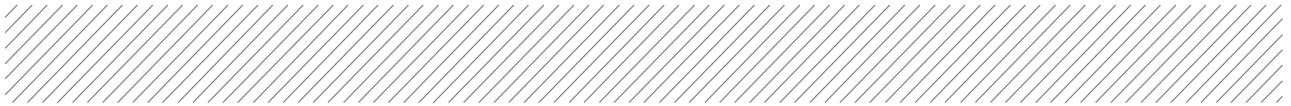
Appendices

Appendix A

Results of traffic surveys

Appendix B

Results of swept path analysis



1. Introduction

Aurecon has been engaged by NSW Health Infrastructure to prepare a traffic report for the proposed Comprehensive Cancer & Blood Disorder Centre (CCBDC) at Prince of Wales Hospital, Randwick. The proposed CCBDC will be constructed in two stages as follows:

- Stage 1 – Bulk excavation and construction of a lower ground treatment area, 4 underground radiotherapy bunkers, and a new underground tunnel connecting staff to the Building 3 and the hospital
- Stage 2 – Development of the remainder of the Comprehensive Cancer Care and Blood Order Centre

This traffic study has been undertaken as part of the development application for the Stage 1 of the proposed CCBDC to assess the traffic impacts of the proposed development on the roads located immediately adjacent to the proposed development and to provide traffic advice during design and construction stages of the project. This report specifically addresses the requirements for the construction and operation aspects of the Stage 1 development of the CCBDC.

1.1 Study area

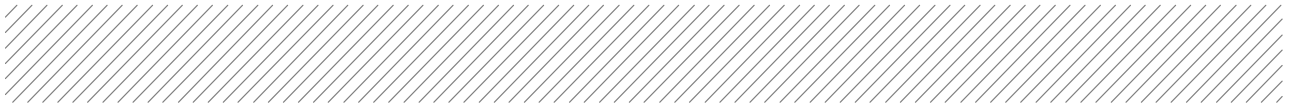
The proposed CCBDC site is located in the north east corner of the Prince of Wales Hospital Campus. Figure 1.1 shows the location of the proposed CCBDC site.



Figure 1.1 Site location

1.2 Project background

The Prince of Wales Hospital (POWH) is a tertiary referral teaching hospital and is located within the Randwick Health Campus. The POWH treats patients requiring specialised services for cancer through a referral pattern endorsed by NSW Health. The cancer services are currently provided for patients from the Northern Hospitals Network (NHN) of the South Eastern Sydney Illawarra Area Health Services (SESIAHS) which represent the primary catchment. Some services of the POWH are provided on a statewide level including Cancer Genetic Services.



The POWH needs to reconfigure and reorganise its services into a Comprehensive Cancer & Blood Disorder Centre (CCBDC) for the following reasons:

- Consolidate its services that are currently located in more than eight (8) separate locations across the Randwick Campus in buildings ranging in age from 1950 to 1970.
- Existing bunkers (which house the linear accelerators that provide radiotherapy services) need to be replaced due to severe cracking and problems with leakage.

In September 2009 it was decided to construct a new cancer facility by consolidating its facilities at one location within the Prince of Wales Hospital campus.

Director-General's Environment Assessment Requirements (DGEARs)

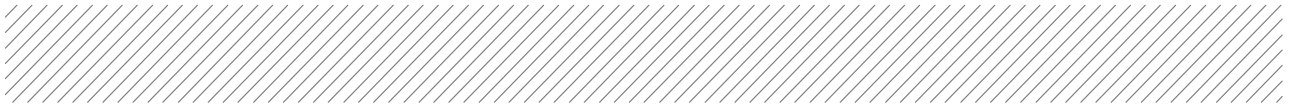
The following items in relation to traffic and transport assessment need to be addressed in the DGEARs for the Stage 1 development of the proposed CCBDC.

Item 6 of the DGEARs – Transport and Accessibility (Construction and Operation)

- Provide accurate details of daily vehicle movements including emergency vehicles (if applicable) and assess the impacts of this traffic on the local road network, including any impact on nearby intersections and the need for upgrading or road improvements.
- Detail access arrangements during construction and operation and address any impacts on the operation of Avoca Street, other local roads in the vicinity of the access point and vehicle movements within the hospital.
- Analyse the car parking requirements for the existing uses on the site and proposed Stage 1 development, including consideration of any loss of existing on-site parking and the need for compensatory parking elsewhere on site.
- Details of all service vehicle movements
- Provide a draft Construction Traffic Management Plan

Relevant Policies and Guidelines

- Guide to Traffic Generating Developments (RTA)
- Planning Guidelines for Walking and Cycling
- NSW 2021: A Plan to make NSW number one



2. Existing traffic and parking situation at Prince of Wales Hospital

2.1 Existing road network

Avoca Street

The section of Avoca Street between Cowper Street and Anzac Parade is a State Road and is under the care and control of Roads and Maritime services (RMS). Avoca Street carries approximately 23,000 vehicles per day south of High Street. Avoca Street is signposted for a 60km/h speed limit in the vicinity of the site.

High Street

High Street is classified as a Regional Road and carries approximately 6,700 vehicles per day west of Avoca Street. High Street is a two way, two lane road. High Street provides access to the Prince of Wales Hospital, University of New South Wales and Randwick Racecourse. High Street connects Anzac Parade and Avoca Street. High Street is signposted for a 50km/h speed limit. Parking is currently allowed on both sides of High Street.

Cuthill Street

Cuthill Street is classified as a Regional Road and carries approximately 7,300 vehicles per day east of Avoca Street. Cuthill Street is a one-way street and allows westbound movements only for from Coogee Bay Road to Avoca Street and Belmore Road and is signposted for a 50km/h speed limit. Parking is allowed on both sides of Cuthill St.

Belmore Road

Belmore Road west of Avoca Street is classified as a collector road and carries approximately 6,800 vehicles per day west of Avoca Street on a two-way road. Belmore Road is signposted for a 50km/h posted speed limit. The Randwick shopping centre is located on either side of Belmore Road between the High Street/Avoca Street intersection and Allison Road. Belmore Road east of Avoca Street is classified as a Regional Road and carries approximately 5,300 vehicles east of Avoca Street on a one-way road (eastbound movements are allowed).

Avoca Street/ High Street/Belmore Road intersection

Avoca Street/High Street/Belmore Road intersection is a signalised intersection and all movements are allowed at this intersection except the following movements.

- Avoca Street (north) to Belmore Street (north)
- Avoca Street (south) to Belmore Street (south)
- Avoca Street (north) to High Street (7am-9am & 4pm-6pm)

Avoca Street/Cuthill Street intersection

Avoca Street/Cuthill Street intersection is a signalised intersection. Cuthill Street provides two right turn lanes and a left turn lane at the intersection with Avoca Street. There is a 'No Right Turn' restriction in Avoca Street at the intersection with Cuthill Street with the one way westbound operation of Cuthill Street.

2.2 Existing traffic volumes

Daily traffic volumes and growth rates

Based on the RTA Traffic Volume Data – 2005, the Annual Average Daily Traffic (AADT) volumes recorded on the roads located within the road network adjacent to the study area are provided in Table 2.1.

Table 2.1 Annual average daily traffic volumes and growth rates

Station number	Location	Annual Average Daily Traffic Volume (AADT)				
		1996	1999	2002	2005	Growth rate per annum (1996-2005)*
13.174	Avoca Street, MR660-Kingsford-North of MR661, Anzac Parade	18309	19178	17804	17450	-0.5%
12.012	Anzac Parade, MR171-Kingsford-North of Day Avenue	40954	41947	40395	38793	-0.6%
13.099	Rainbow Street, MR183-Kingsford-West of Willis Street	14693	17176	14561	13799	-0.7%

* Note – Linear growth rate

Based on Table 2.1, it is evident that no growth in traffic occurred for the roads in the road network located immediately adjacent to the study area.

2.3 Peak hour traffic volumes

The peak hour traffic volumes along Avoca Street, High Street, Belmore Road and Cuthill Street are provided in Table 2.2. The peak hour traffic volumes are based on the results of the morning and afternoon peak hour traffic surveys undertaken on Wednesday 12 October 2011 at the Avoca Street/High Street/Belmore Road and Avoca Street/Cuthill Street intersections. The summary results of the traffic surveys are attached in Appendix A.

Table 2.2 Existing peak hour traffic volumes (2011)

Location	Direction	Peak hour traffic volumes (veh/h)	
		AM peak	PM peak
Avoca Street – North of High Street	NB	881	857
	SB	733	716
Avoca Street – South of High Street	NB	1627	1331
	SB	660	708
High Street – West of Avoca Street	EB	275	481
	WB	398	258
Belmore Road – West of Avoca Street	NB	433	355
	SB	250	337
Belmore Road – East of Avoca Street	SB	513	687
Cuthill Street – East of Avoca Street	WB	734	529

2.4 Existing performance of intersections

The level of service analysis of the intersections was undertaken based on the Level of Service (LOS) criteria for intersections specified in the RMS Guide to Traffic Generating Developments. Table 2.3 provides the descriptions of the level of service.

Table 2.3 Level of Service Criteria for Intersections

Level of service	Average delay per vehicle (secs/veh)	Traffic signals, Roundabout	Give way & Stop signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study is required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode

The existing performance of the key intersections in the study area for the morning and afternoon peak hour traffic volumes has been assessed using the SIDRA intersection analysis software. The traffic volumes that were used for the intersection analysis are provided in Appendix A. The results of the analysis are summarised in Table 2.4.

Table 2.4 Existing intersection performance – 2011

Intersection with Avoca Street	Type of Control	Peak Hour	Degree of Saturation (DS)	Average Delay (secs/veh)	Level of Service (LOS)
High Street/Belmore Road	Signal	AM	0.589	24.6	B
		PM	0.628	33.1	C
Cuthill Street	Signal	AM	0.568	24.0	B
		PM	0.498	19.9	B

From Table 2.4, it can be seen that the existing performance of the intersections that are situated within the study area is generally assessed as being acceptable (LOS C or better) during the morning and afternoon peak hour periods.

2.5 Pedestrian and cyclists

Pedestrians

The POWH is located in a high pedestrian activity area due to the adjacent land uses such as UNSW and Randwick Shopping area. A traffic survey was undertaken at the intersections and pedestrian access locations from 6.00am to 10.00am and from 3.00pm to 7.00pm on Wednesday 12 October 2011 immediately adjacent to the POWH. The summary results of the pedestrian surveys are provided in Table 2.5. The gates surveyed included Gate 6, the entrance located on Avoca Street just south of the Cuthill Street intersection, the Heritage Gate located in front of the Edmund Blackett Building on Avoca Street and the pedestrian entry to Building 3 on High Street.

Table 2.5 Number of pedestrian movements at the POWH accesses

Location	Number of pedestrian movements	
	AM Peak Period (6.00am-10.00am)	PM Peak Period (3.00pm-7.00pm)
Gate No 6 of the POWH located on Avoca Street	265	228
Heritage Gate located north of Cuthill St on Avoca St	132	187
Gate west of Avoca Street on High Street	3	2

From Table 2.5, a high number of pedestrian movements are currently occurring at Gate No 6 and Heritage Gate. Pedestrian movement at the gate located west of Avoca Street on High Street are low since this access has not been designated as a pedestrian access point by POWH.

Cyclists

A high number of cyclist movements are currently occurring along Avoca Street and High Street. The summary results of the cyclist surveys undertaken on Wednesday 12 October 2011 are provided in Table 2.6.

Table 2.6 Number of cyclist movements

Location	Number of cyclist movements	
	AM peak period (6.00am-10.00am)	PM peak period (3.00pm-7.00pm)
Avoca Street – South of High Street	220	78
High Street – West of Avoca Street	56	61
Gate No 6 of the POWH located on Avoca Street	9	17

From Table 2.6, it is evident that a high number of cyclist movements are currently occurring on the road network located immediately adjacent to the POWH. A few cyclists are currently using Gate No 6.

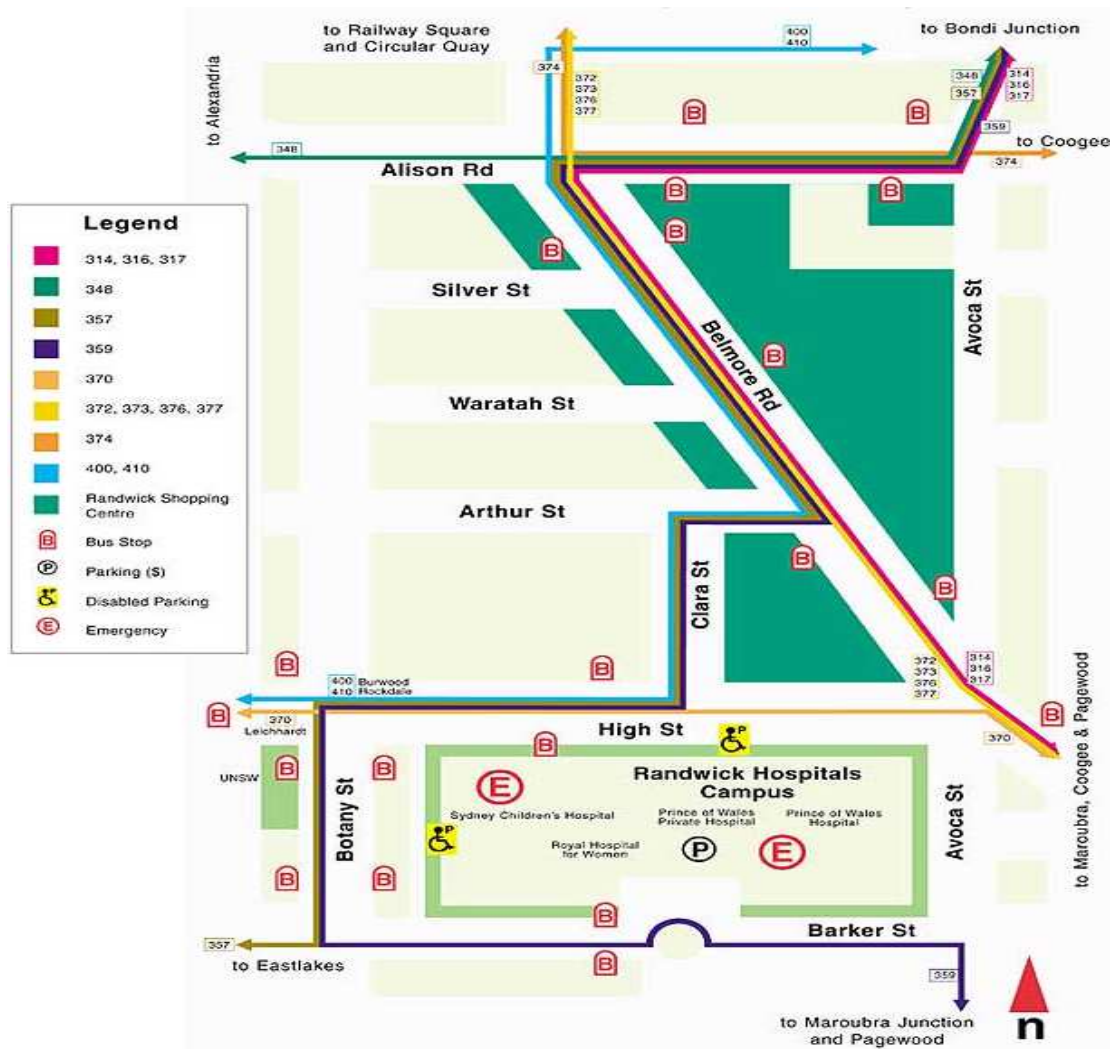
2.6 Bus services

The POWH is currently well served by bus services to the City and other parts of the eastern suburbs of the Sydney Region. The details of the bus services are provided below:

- Route No 314 – Coogee-Randwick-Bondi Junction
- Route No 316/317 – Eastgardens-Randwick-Bondi Junction
- Route No 357 – Sydenham-Eastlakes-Bondi Junction
- Route No 370 – Leichhardt-Glebe-Newtown-UNSW-Coogee
- Route No 372 – Coogee-Randwick Junction-Railway Square
- Route No 373 - Coogee-Randwick Junction-Circular Quay
- Route No 376 – Maroubra Beach-Randwick Junction-Central-City
- Route No 377 – Maroubra Beach-Randwick Junction-City
- Route No 400 – Burwood-Mascot-Airport-Eastgardens-UNSW-Bondi Junction
- Route No 410 - Rockdale-Mascot-Eastgardens-UNSW-Bondi Junction

Bus Stops

Bus stops are located on High Street, Belmore Road, Barker Street and Botany Road as Shown Figure 2.1. Bus stops are located in High Street just west of Clara Street, Belmore Road north of Avoca Street and Barker Street west of Easy Street.



Source: SESIAHS

Figure 2.1 Bus stop locations

2.7 Existing access arrangement for the POWH

The existing vehicle access arrangements for the POWH Randwick Health Campus are via High Street, Avoca Street, Barker Street and Hospital Road as shown in Figure 2.2.

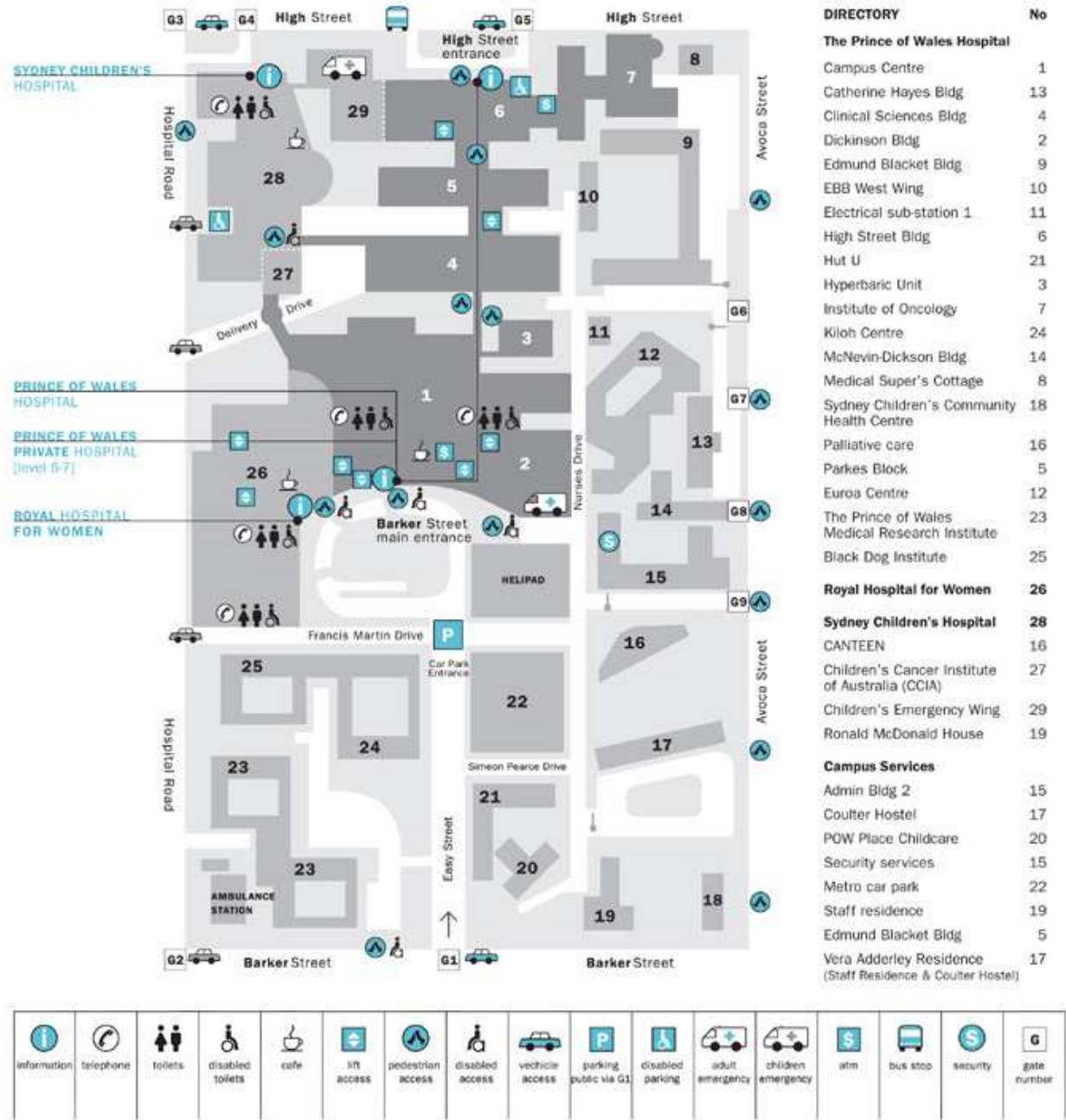
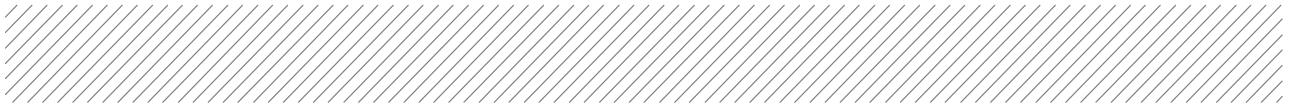


Figure 2.2 Existing Access Arrangement



The following access arrangements are provided via Avoca Street

- Vehicular and pedestrian access at Gate No 6 – This gate provides access for staff and the vehicles operated by the POWH. A concrete central median is provided on Avoca Street to restrict left in/left out movements to/from Avoca Street at this gate.
- Pedestrian access – a total of 7 pedestrian accesses are provided along Avoca Street including a pedestrian access (Heritage Gate access) which is located north of Cuthill Road.

The following access arrangements are provided via High Street

- Vehicular and pedestrian access at Gate No 5 – This gate provides access to emergency vehicles and other vehicles.
- Vehicular access at Gate No 4

2.8 Existing parking situation

POWH car parking

The following information in relation to the existing car parking was provided by Health Infrastructure.

- Number of car parking spaces provided on-site is approximately 2240.
- Only staff exit the main car park onto Hospital Road
- Patient/visitor traffic enters and leaves the site via Easy Street Only
- Hospital Road at the intersection with Barker Street is restricted to left in/left out
- Entry at Gate 6 (off Avoca) is restricted to left in/left out only.
- Car parking facilities within the POWH campus are operated under Licence to a third party (International Parking Group) managed by Metro Parking Management.
- Edmund Blackett Building parking is not included in Metro's managed spaces but is part of the total number of Car Spaces on site

There is an existing car park located immediately adjacent to Edmund Blackett Building with access off Avoca Street. This parking area is designated as staff car park and most of the cars parked at this location are owned by the hospital. It appears that vehicles are parked overnight and staff use the vehicles to undertake their work. Most of the staff arrive at the car park and leave the car park for outside works after a short period of time.

A car park utilisation survey was carried out at the Edmund Blackett Building car park at 1 hour intervals from 7.00am to 6.00pm on Wednesday 12 October 2011. Table 7 shows the available parking spaces during the parking survey period.

Table 2.7 Available Parking Spaces

Time	Capacity of the Car Park	Demand	Available parking spaces
7.00am	59	47	12
8.00am	59	53	6
9.00am	59	50	9
10.00am	59	48	11
11.00am	59	51	8
12.00am	59	51	8
1.00pm	59	55	4
2.00pm	59	53	6
3.00pm	59	58	1
4.00pm	59	58	1
5.00pm	59	56	3
6.00pm	59	51	8

From Table 2.7, the car park utilisation is high during most of the survey period and the peak car parking demand occurs between 3.00pm and 4.00pm. Maximum car parking demand is 58 spaces with the existing car park having a capacity of 59 spaces.

On-street car parking

Parking demand is also high on the roads located immediately adjacent to the POWH. A car parking utilisation survey has been undertaken from 7.00am to 6.00pm on High Street, between Avoca Street and Hospital Road. The results of the survey indicated that the utilisation of on-street car parking spaces is high during the entire survey period.

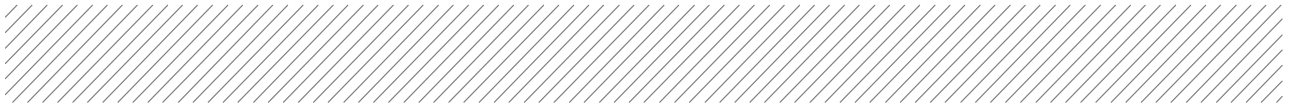
2.9 Adjacent landuses

University of New South Wales

The University of New South Wales (UNSW) is located west of POWH on High Street. Bus services are exclusively provided for university students only from Central station and Green Square station during morning and afternoon peak hour periods. Therefore, the bus services that are currently servicing to POWH are not impacted by the operation of the UNSW.

Randwick Racecourse

The Randwick Racecourse is located opposite to UNSW and the car park access to the racecourse is provided via High Street. A total of 9 race meetings are currently being scheduled for first half of 2012.



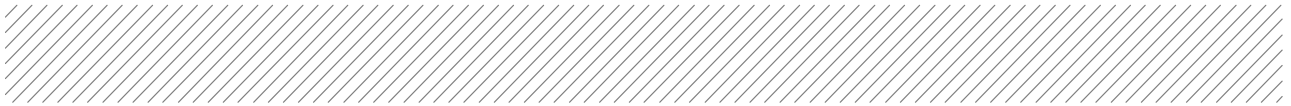
3. Proposed Development

3.1 Proposed CCBDC

The range of services proposed for the new CCBDC will include all of the following:

- Adolescent and Young Adult (AYA) Services for radiotherapy for patients of the Sydney Children's Hospital (SCH)
- Allied Health Services
- Breast Cancer Care Services
- Breast Screen Services
- Cancer Genetic Services – Statewide service
- Cancer Outreach Team
- Cancer Registry
- Clinical Trials
- Community and Outreach Services
- Diagnostic and interventional imaging provided by medical imaging and nuclear medicine services on site (including PET-CT)
- Gynaecological Oncology Services (from Rural Health Workforce)
- Haematology – malignant and non-malignant blood disorders.
- Inpatient services
- Integrated ambulatory services including chemotherapy, apheresis, infusions, biopsies, minor procedures and other treatments that may emerge over time.
- Medical Oncology Services
- Palliative Care Services
- Pathology Services provided by South Eastern Area Laboratory Services
- Patient and Carer Support Services
- Pharmaceutical Services provided by the POWH Pharmacy Department
- Radiation Oncology Services
- Surgical Cancer Services
- Thalassaemia Services

The proposed CCBDC includes the following traffic and parking arrangements during construction and operation of the Stage 1 development of the facility.



Construction

- Construction vehicle access will be provided via Gate No 6.
- All parking provided immediately adjacent to Edmund Blackett Building will be relocated to a nearby site and the car park area will be used for construction purposes.
- Pedestrian access via Heritage Gate will be closed. Pedestrians will be redirected to other Avoca Street or High Street entries to the hospital.

Operation

- Pedestrian access to the proposed CCBDC will be provided via existing Building 3 entry off High Street. This access will be provided by means of a tunnel between Building 3 and the proposed Stage 1 development of the CCBDC.
- All parking provided immediately adjacent to Edmund Blackett Building will be relocated to other locations on and off site and the car park area will be used for construction vehicle turnaround area for the Stage 1 development, and during construction of Stage 2.
- Existing emergency vehicles access arrangement for Cancer Patients will be maintained for the proposed CCBDC via High Street.

3.2 Swept path analysis

A swept path analysis has been undertaken to check heavy vehicle movements at the following critical locations of the construction vehicle route.

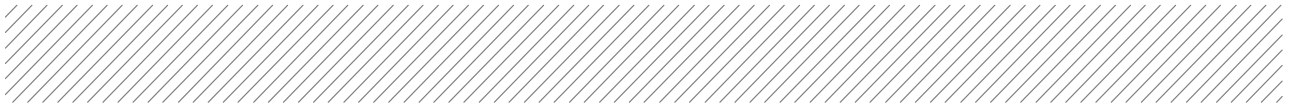
- Left/left out movements at the at the Avoca Street access (Gate No 6)
- Turnaround movements at the carpark

Appendix B provides drawings (Figures B1 to B4) illustrating the swept path analyses for an 8.8m Medium Rigid Vehicle (MRV) and 12.5m Heavy Rigid Vehicle (HRV).

Some basic features of the swept paths for each of the figures in Appendix B are as follows:

- The path of the blue line for each vehicle indicates the swept path of the vehicle body.
- The path of the purple line for each vehicle indicates the swept path for the low speed manoeuvring clearance of 300 mm on both sides.
- The swept path analyses were assessed at a design speed of 5 km/h, which is the standard recommended low speed manoeuvring turn speed.

The swept path analyses were performed in accordance with the Australian Standards AS 2890.2–2002 Parking facilities Part 2: Off-street commercial vehicle facilities.



Left in/left out movements at the Avoca Street access (Gate No 6) during construction and operation

The existing Avoca Street access arrangement would be able to accommodate MRV swept paths (Figures B1 and B2) whilst removal of central median and gatehouse located on the hospital access and boom gate access for the Edmund Blackett Building parking are required to accommodate the turning path of a HRV (Figures B3 and B4). Traffic controllers would be used to manage traffic movements/pedestrians along Avoca Street and within the hospital when HRVs enter and leave Gate 6.

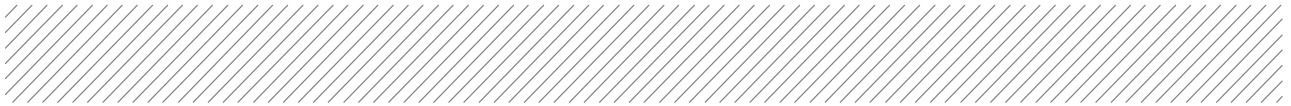
Turnaround movements in the existing car park area south of the Heritage Gate during construction.

The swept path analysis has been undertaken assuming that heavy vehicles need to turnaround south of the Heritage Gate in the existing car park area during construction.

The existing car park area located south of the Heritage Gate would be able to accommodate a MRV vehicle swept path (Figure B1). Since a HRV requires multiple turns (Figure B4) to turnaround within the car park, a HRV will need to reverse within the site and leave the site in a forward direction (Figure B3). A traffic controller would be used to manage traffic movements entering the hospital via Gate 6 on Avoca Street when a HRV vehicle is required to reverse within the site.

3.3 Future development proposals adjacent to the site

The proposed Australian Advanced Treatment Centre at the UNSW would supplement the CCBDC. Therefore, the proposed development at UNSW would not have an impact on CCBDC.



4. Future traffic and transport situation

This section provides the details on relation to the traffic and transport operation during the operation and construction of the Stage 1 development of the CCBDC.

4.1 Traffic generation

Construction

It is estimated that less than five construction vehicle movements are expected to occur during peak periods. These traffic movements do not include site staff who will be encouraged use public transport due to the non-availability of parking on the site and immediately adjacent to the site. Site staff traffic movements would be minimal during the peak hour as most will arrive prior to 7.00am and depart after 5.00pm. It is expected that any movements would be less than five trips during the peaks.

Operation

Since the proposed centre is aimed to consolidate existing Cancer services and with only a small growth in patient numbers identified, no expansion of staffing is anticipated. The additional patients using the POWH would arrive and depart throughout the day (not necessarily during peak hour periods).

4.2 Future intersection performance

Construction

The existing performance of the intersections is acceptable and is expected to continue with an acceptable level during the construction since a small number of construction vehicles is anticipated to access the site during the peak periods.

Operation

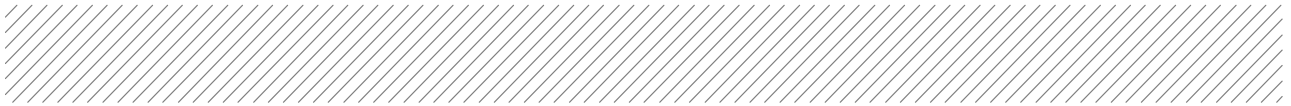
The existing performance of the intersections is acceptable and is expected to continue with an acceptable level since the traffic growth is not anticipated in the roads located immediately adjacent to the POWH based on the historical traffic growth and a small growth in patient numbers identified and no expansion of staffing is anticipated.

4.3 Pedestrian and cyclists

Construction and operation

There will be minor changes to the pedestrian and cyclist movements during the construction and the operation of the Stage 1 development of the CCBDC. The pedestrian access at the Heritage Gate on Avoca Street will be closed and pedestrians redirected to other pedestrian accesses on Avoca Street and High Street. Cycle access will also be redirected to Gate 7.

Pedestrian and cycle access along Avoca Street will be maintained during construction and operation of Stage 1.



4.4 Bus services

Construction and operation

No changes to the bus services are required or anticipated during the construction and the operation of the Stage 1 development of the CCBDC. None of the bus stops that are located immediately adjacent to the POWH will be affected during the construction and operation of the CCBDC.

4.5 Emergency vehicle access

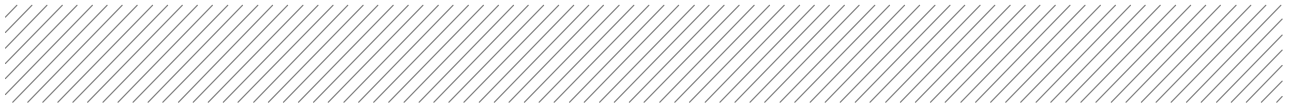
Construction and operation

No changes to the emergency vehicle access during the construction and the operation of the Stage 1 development of the CCBDC. Existing emergency vehicle access via High Street will be used and patients will be transported via the proposed tunnel connecting Building 3 and the Stage 1 development.

4.6 Service vehicle access

Construction and operation

No loading dock will be provided in the proposed CCBDC and existing cancer service vehicle movements/arrangements via Hospital Road will be maintained during the construction and operation of the Stage 1 development of the CCBDC. The existing loading docks will be used for the new facility. No increase in service vehicle movements is expected.



5. Proposed traffic management measures

The following traffic management measures are recommended for the safety of staff, road users and visitors to the PWOH for the Construction and operation of Stage 1.

Construction

The following traffic management measures are proposed during the construction:

- A RMS certified Traffic Controller be present to manage traffic when trucks are reversing within the site and when entering or exiting the site off Avoca Street.
- A sign posting plan needs to be developed to ensure pedestrians, construction vehicles, hospital traffic and other traffic are kept away from the construction area and to avoid unnecessary reversing manoeuvres into traffic and pedestrian areas.
- The transporting of excavation materials using tipper trucks (bogie) as these would be able to turn around within the site and access the site without significant delays to other vehicles
- Remove the median and gatehouse located on the Gate 6 access of the POWH and replace with painted median to accommodate the turning paths of construction vehicles. Removal of the boom gate at the entrance to the car park in front of the Edmund Blackett Building is also required.

Operation

- A RMS certified Traffic Controller be present to manage traffic when trucks are reversing within the site and at the access to the site off Avoca Street.
- A sign posting plan needs to be developed to guide pedestrian, hospital traffic and other traffic to avoid accessing the construction area of Stage 2 and to prevent reversing out of the accesses.

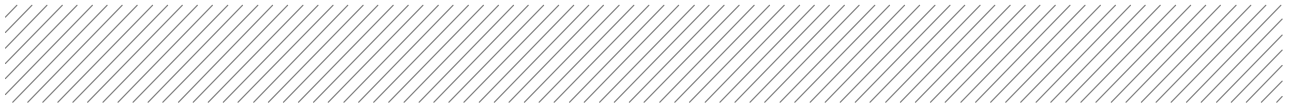
6. Car parking assessment

Parking assessment has been undertaken to determine the parking loss during the construction and operation of the Stage 1 development of the proposed CCBDC. No cars will be allowed in the car park adjacent to the Edmund Blackett Building (EBB) during the construction and operation of the Stage 1 development. Table 6.1 shows the estimated parking loss during the construction and operation of the Stage 1 development.

Table 6.1 Estimated parking loss

Stage	Available parking at the EBB car park	Number of parking spaces at the EBB car park	Parking loss
Construction and operation	0	59	59

Based on Table 6.1 it is evident that the proposed construction and operation activities of the proposed CCBDC will remove available parking in the order of 59 parking spaces at the front of the Edmund Blackett Building during the construction periods for Stage 1 and Stage 2. This car parking is proposed to be relocated to a nearby site, subject to agreements being in place.



7. Traffic impact assessment

7.1 Road network

Construction

The increase in construction traffic movements (5 veh/h) during the peak periods compared to northbound traffic movements on Avoca Street (more than 800 veh/h during the morning and afternoon peak periods) is minimal. Therefore the impact on nearby intersections is marginal. As a result of this upgrading or road improvements are not required during construction.

Operation

The proposed CCBDC is expected to slightly increase traffic movements to/from the Prince of Wales Hospital and the road network located immediately adjacent to the hospital. This increase will occur due to the patient drop and pick up activities which are anticipated to occur during off-peak periods at the existing building 3 entry and the public car park located within the Hospital. This volume is not quantified at this time. However, it is estimated that it would be less than 10 movements per hour. Therefore the impact on nearby intersections is minimal. As a result of this upgrading or road improvements are not required during operation.

7.2 Pedestrian and cyclists

Construction and operation

The pedestrian access via the Heritage Gate at the Edmund Blackett Building will be closed for the duration of the construction works and pedestrians redirected to other nearby entries. The proposed construction and operation activities would not cause extensive delays and would not affect pedestrian and cyclist movements along Avoca Street and High Street. Traffic control measures will be provided if any heavy vehicle requires reversing in/reversing out movements. Therefore the proposed construction and operation would have minimal impacts on pedestrian and cyclists.

7.3 Bus services

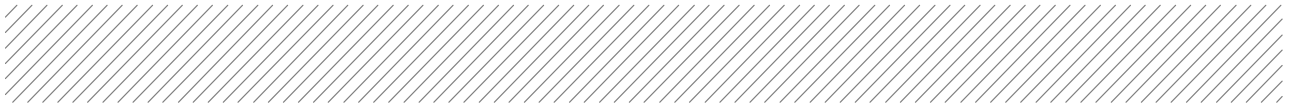
Construction and operation

Since the increase in traffic movements is predicted to be marginal during the construction and operation of the CCBDC and no changes to the existing access arrangements to POWH, the proposed construction and operation activities would not cause extensive delays and would not affect bus services in the vicinity of the POWH. Therefore the proposed construction and operation would have minimal impacts on public transport operations.

7.4 Adjacent landuses

Construction and operation

Since the increase in traffic movements is predicted to be marginal during the construction and operation of the CCBDC, the impact on adjacent landuses is marginal.



7.5 Car parking

Construction

It is proposed to establish a construction zone on the southern side of High Street west of Avoca Street. This will require the removal of approximately five short term parking spaces along this section of road.

Construction and operation

The proposed construction and operation of the Stage 1 development of the CCBDC would have an impact on the Edmund Blakett Building parking. This area is designated as staff car park and most of the cars parked at this location are owned by the hospital. It appears that vehicles are parked overnight and staff use the vehicles to undertake their work. Most of the staff arrive at the car park and leave the car park for outside works after a short period of time. The estimated parking loss is 59 spaces during the construction and operation of the Stage 1 development of the CCBDC at this location. However, this parking loss is minimal compared to overall parking (approximately 2240 spaces) provided within the POWH Campus and parking spaces affected are staff vehicles, public car parking would not be affected. The following measures are recommended to reduce the impact on car parking.

- POWH could provide parking at other locations for these vehicles. The POWH is currently negotiating to provide an alternative site for these vehicles.
- Allow staff to park these cars at their home overnight
- Undertake a detailed car parking study to assess the car park utilisation and to identify the locations where the removed parking spaces due to the construction and operation of the facility could be replaced

8. Draft construction traffic management plan

8.1 Legislative requirements, guidelines and standards

In order to identify and assess the requirements for the traffic management associated with the construction of the CCBDC, there are a number of guidelines and standards that are applicable. These documents identify a number of requirements for managing the traffic generated by the works.

Table 8.1 below outlines the relevantly applicable acts, guidelines and standards that have been considered for the preparation of this traffic management plan.

Table 8.1 Legislative and guideline requirements

Relevant guidelines (author)	Summary of guidelines	Approvals/Permits or licences required
Roads Act 1993	Obtaining a Road Occupancy Licence (ROL) for the specified activities is a legal requirement under Section 138 of the Roads Act.	For all occupancies that are on or may impact upon a classified road (State Road/Regional Road), applications for a ROL are to be made to the RMS's Planned Incident Unit. For occupancies that impact solely on unclassified (Council) roads, applications for a ROL are to be made to the relevant Council.
Occupational Health and Safety Act 2000	Preparation of a Traffic Control Plan (TCP) is an OHS requirement of a work site, and a TCP must comply with AS 1742.3 to comply with the OHS Act.	Preparation of a Traffic Control Plan by appropriately qualified personnel.
Australian Standard 1742-2009: Manual of uniform traffic control devices – Part 3, Traffic control for works on roads, Standards Australia.	Refer to Part 3: Traffic Control Devices for Works on Roads to ensure the safety of the construction work site staff undertaking construction works in/near roads, and the safety of road users while road construction work is being undertaken.	Any new or temporary traffic control device must be installed in accordance with AS 1742.3-2009.

Relevant guidelines (author)	Summary of guidelines	Approvals/Permits or licences required
Traffic Control at Work Sites manual - Version 4, Issue 1, June 2010, RMS	Must be used on all RMS road work sites. Its use is also encouraged on non-RMS sites where practitioners are responsible for the control of traffic at work sites. Contains standard TCPs which can be used at work sites for which the plan meets all requirements. Where a standard plan does not meet the traffic control needs of a particular site, the manual provides procedures for the design of a new or site specific plan. If the manual does not contain advice on a particular aspect of traffic control, then AS 1742.3-2009 must be consulted and its advice adopted, if such advice exists.	Works approval required from RMS for RMS controlled roads. Approval required from the relevant Local Council's Traffic Committee for local (non-RMS) roads. Traffic control and the selection or designing of TCP's must only be undertaken by persons who are qualified, authorised, and have passed RMS-approved training courses.

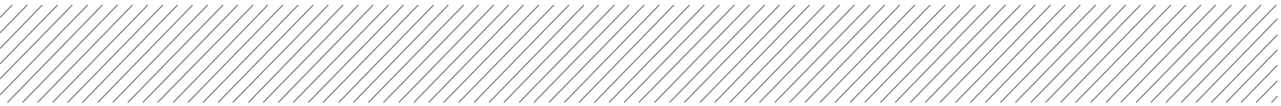
8.2 Traffic management plan

Proposed construction activities

It is proposed that the construction activities will occur within the north eastern corner of the POWH campus. The TMP seeks to manage construction vehicles movements accessing and exiting the site throughout the day.

The following details of construction activities have been provided by Health Infrastructure:

- Construction vehicle access to the site would be via Gate No 6 on Avoca Street.
- A 'Construction Zone' restriction will be required to be implemented on the southern side of High Street, immediately west of Avoca Street. This will be subject to Randwick City Council approval.
- Construction activities will take approximately 14 months from December 2012.
- Car park area located adjacent to Edmund Blackett building will be used for the construction vehicle access to the site. During the construction period, the car park will be closed to hospital vehicle parking.
- The proposed working hours during the construction period are Monday to Friday 6.30 am to 6.00 pm and Saturday 7.00 am to 4.00 pm. Generally, no work will be undertaken on Sundays and public holidays however, there may be the need for works out of these hours for specific construction activities.

- 
- Approximately five deliveries of plant or materials will occur during the morning peak period and five deliveries are expected to occur during the afternoon peak period.
 - It is advised that some of the plant and/or material deliveries to the site will take approximately 30 minutes whereas others may require longer periods. Delivery vehicles will predominantly consist of medium rigid and concrete trucks.
 - It is recommended that construction staff use public transport to access the site since parking availability is limited within and immediately adjacent to the POWH. There will be no construction staff parking provided on-site.

The above activities will occur on a demand basis over the construction period. The number of movements per day will vary, however it is estimated that generally, it will not exceed 20 vehicle trips per day. It is expected there will be minimal impact on the operation of the traffic network.

Proposed construction haulage routes

It is recommended that all the delivery vehicles travel to and from the construction site by state and regional roads where possible. The following roads, as shown in Figure 8.1, are recommended for haulage activities based on the current road network restrictions:

- Inbound: via Anzac Parade – Rainbow Street – Avoca Street
- Outbound: via Avoca Street – High Street – Anzac Parade

The proposed haulage routes are classified as either State Road or Regional Road. A number of schools are located along the proposed haulage route. Therefore, construction vehicle movements need to be limited during the school opening and closing periods.

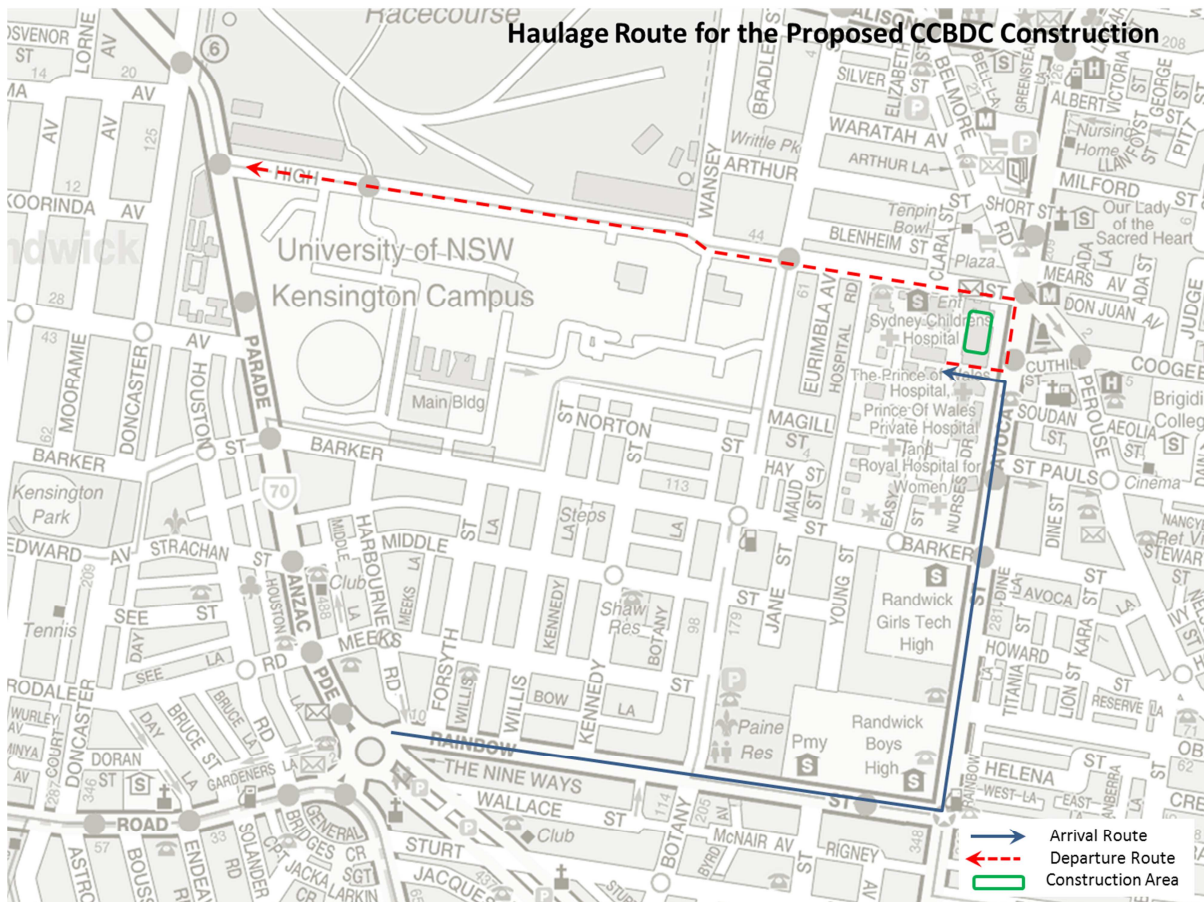


Figure 8.1 - Construction vehicle haulage routes

Marshalling of trucks shall be done to control construction vehicles entering and departing the site. This will be the responsibility of a RMS certified Traffic Controller.

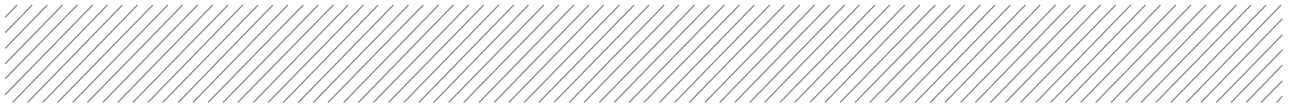
If there is to be any low loader activities (delivery of large/heavy equipment and/or material), they are recommended to occur outside of morning and afternoon peak periods. The time of operation for low loaders is based on the RMS permission to use state roads, which would require a Road Occupancy Licence (ROL). The application for a ROL will be lodged to RMS prior to the commencement of works. All low loader activities such as loading and unloading of plant are to occur within the site where possible.

Construction guidelines

The base information for the preparation of this CTMP may be summarised as follows:

Access and egress from the construction site is to be from Avoca Street as shown in Figure 8.1. It is important that no construction vehicles use streets that have not been approved for use by RMS and/or Council. Construction vehicles are to enter and leave the site in a forward direction.

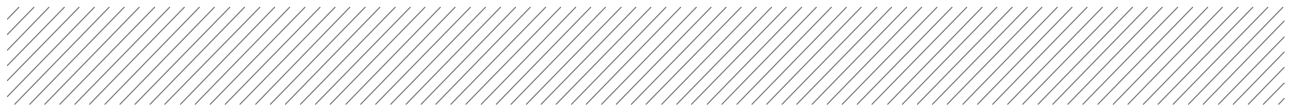
During the construction period where vehicles are required to cross over into the oncoming lane whilst manoeuvring into or out of the site transporting plant/material, it is required that a RMS certified Traffic Controller be present to manage traffic. The Traffic Controller must manage approaching vehicles adequately so queuing does not extend and block general traffic in the area.



During construction, it is a requirement that all neighbouring properties are to remain accessible for both vehicle and pedestrian activities. It is unlikely that construction vehicles will block neighbouring properties however, should this occur, the construction vehicles are to be relocated immediately to allow temporary access/egress for local residents.

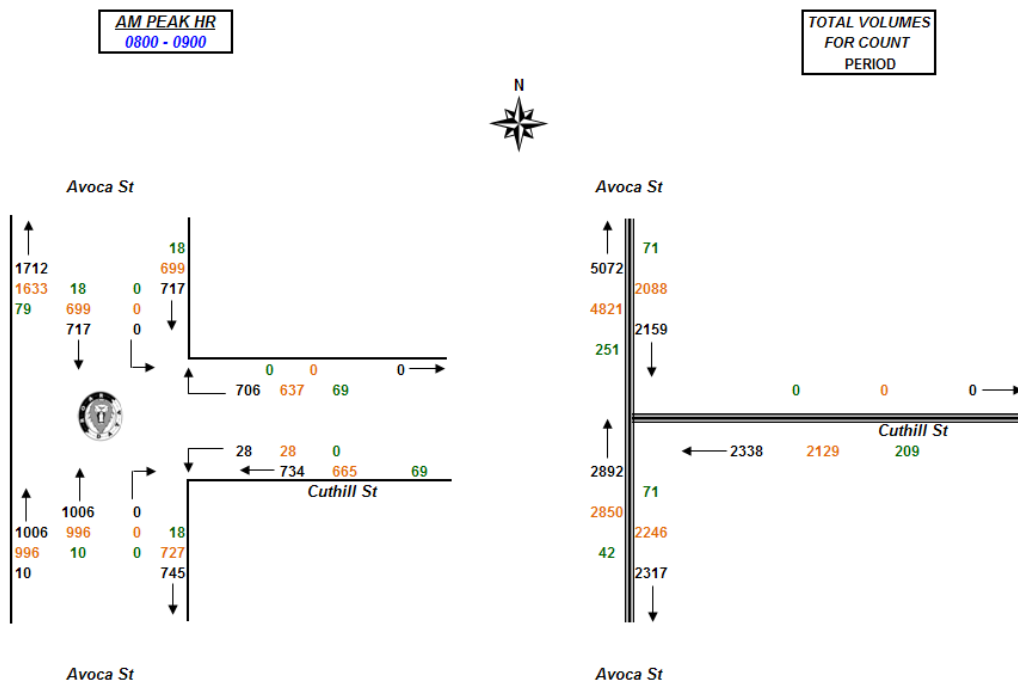
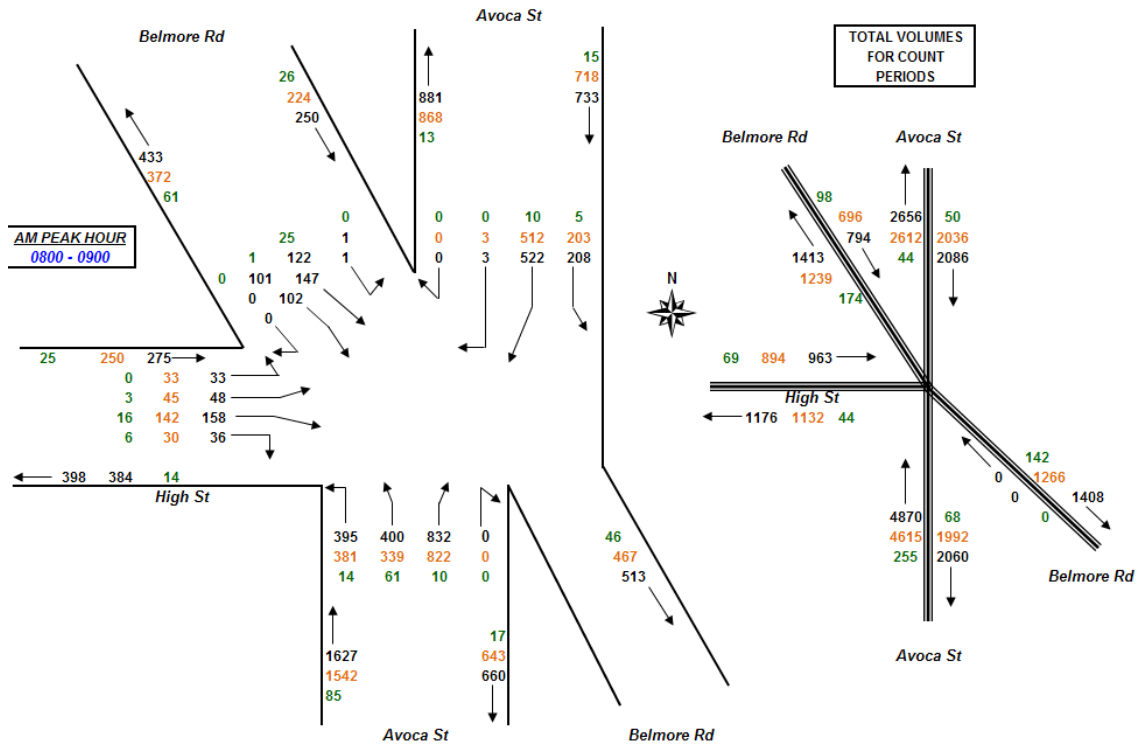
Any sections of the road, including kerb and footpath, which are damaged by construction vehicles, are required to be rectified at the cost of the contractor/developer following the completion of the construction period. It is recommended that a survey of the existing conditions be undertaken prior to commencement of works.

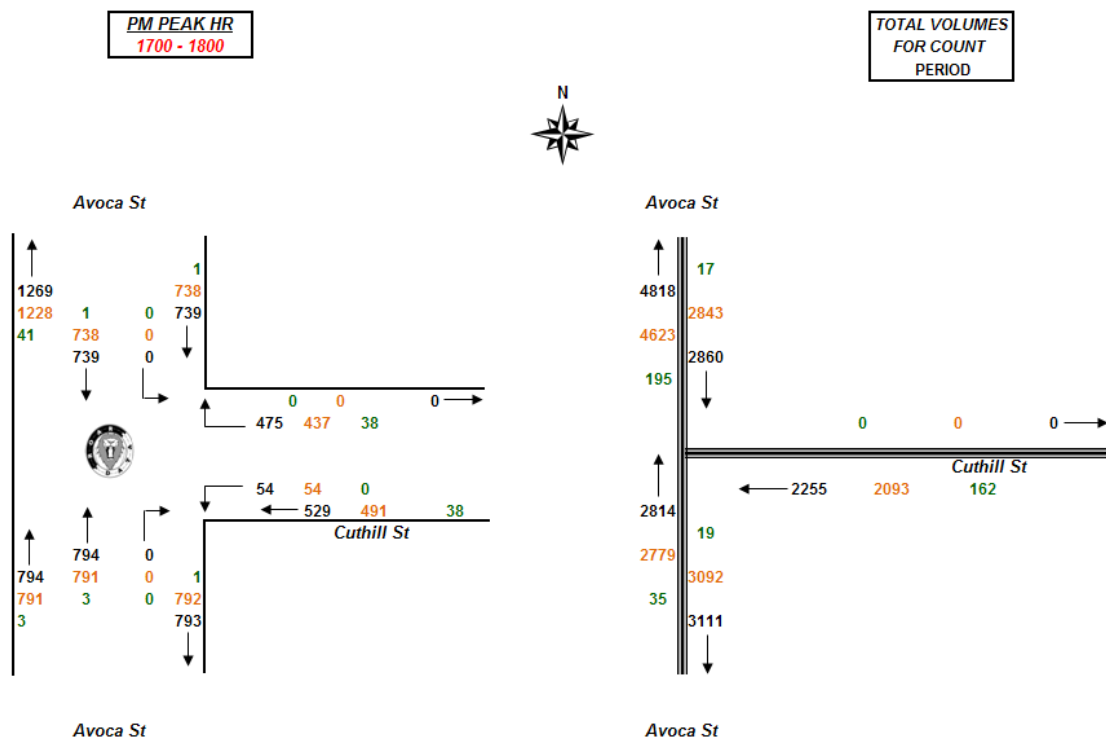
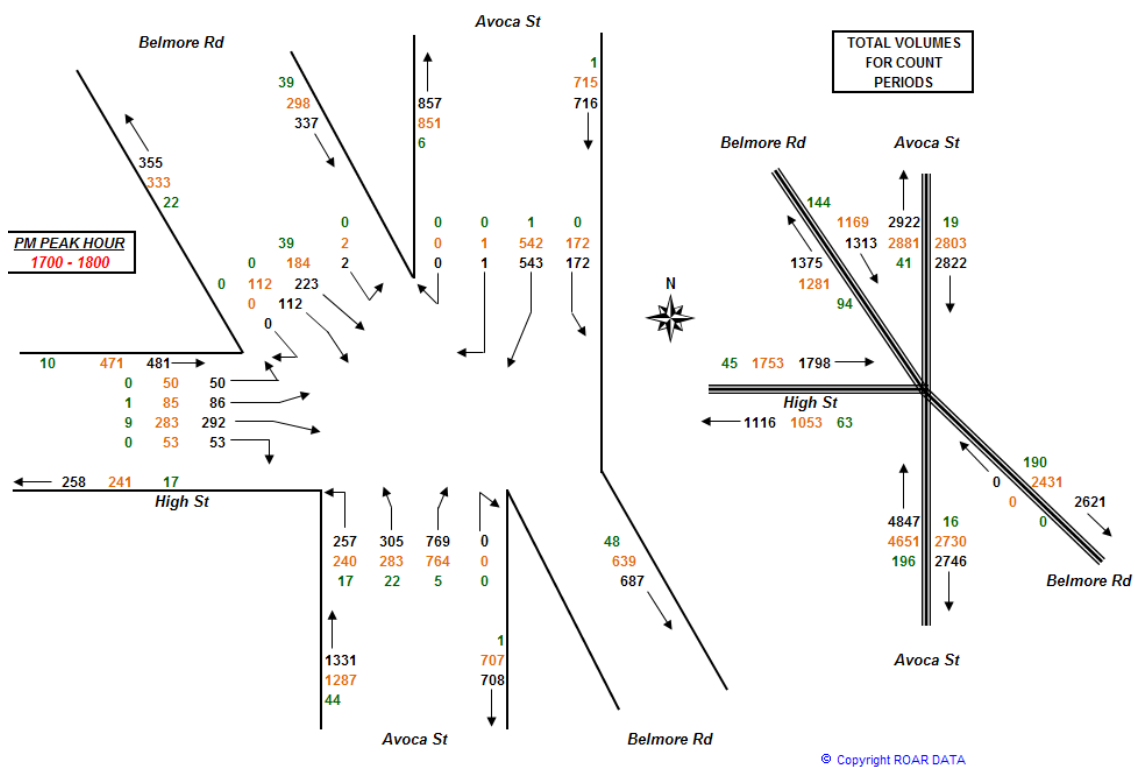
Construction vehicles movements should be minimised during the morning and afternoon peak periods, where possible, to reduce the impacts on road network located immediately adjacent to the POWH.



Appendix A

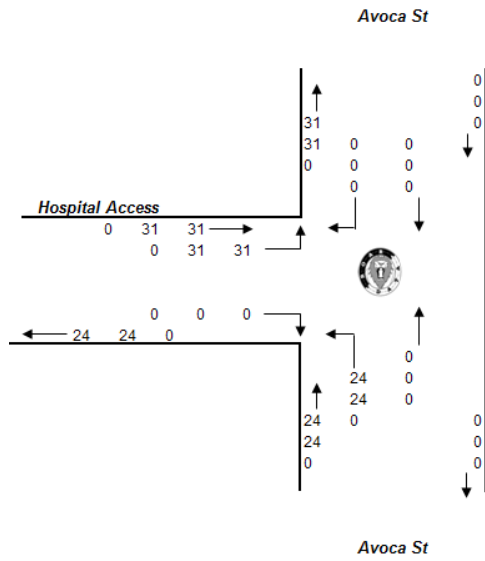
Results of traffic surveys



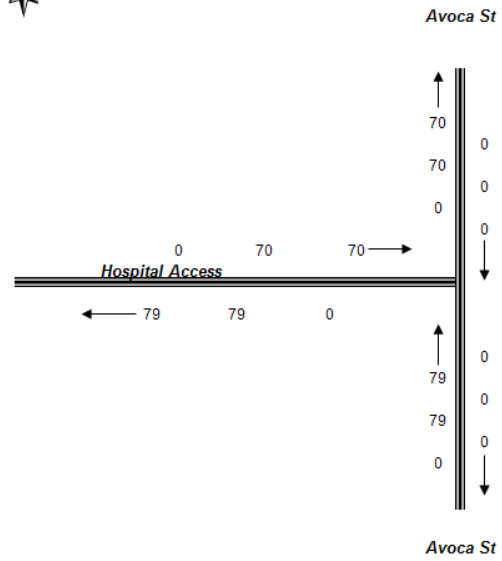




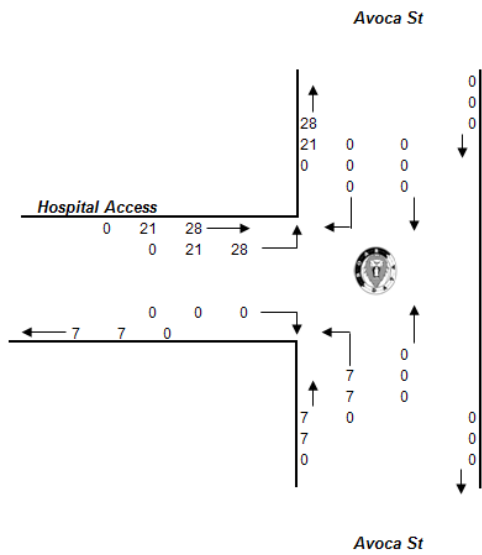
AM PEAK
0815 - 0915



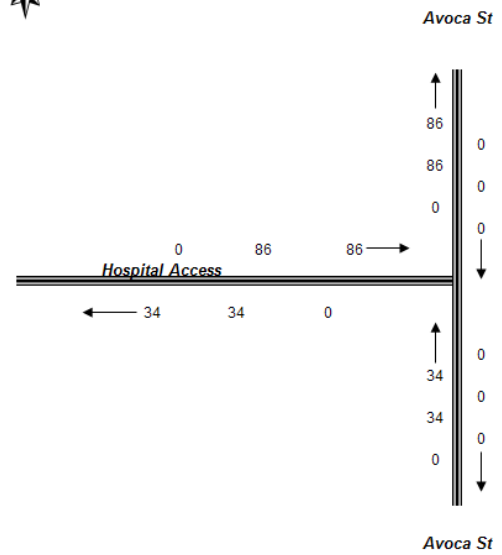
**TOTAL VOLUMES
FOR COUNT
PERIOD**

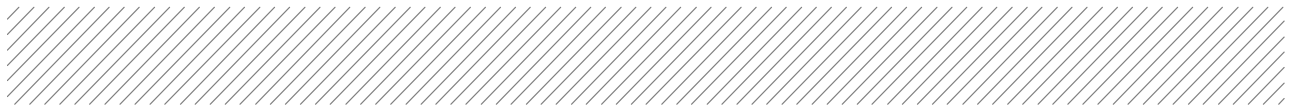


PM PEAK
1500 - 1600



**TOTAL VOLUMES
FOR COUNT
PERIOD**





Appendix B

Results of swept path analysis

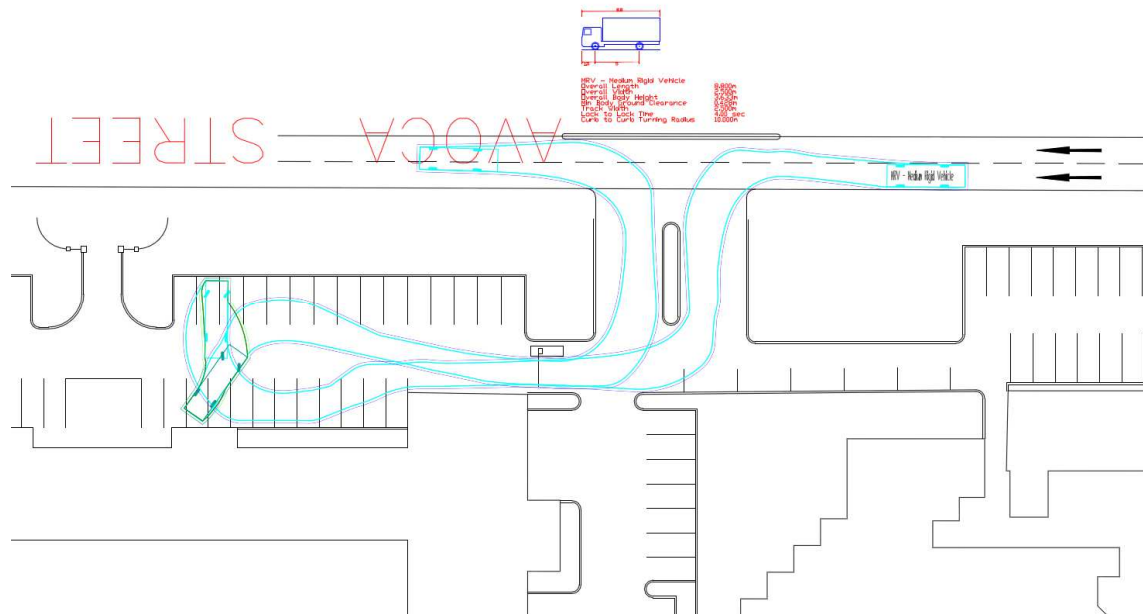
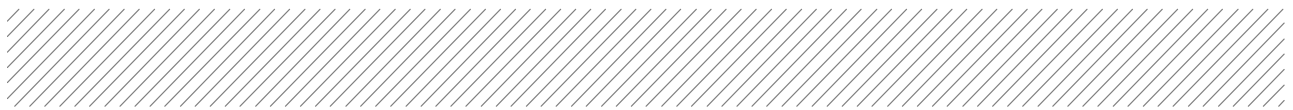


Figure B1 – Medium Rigid Truck movement at Gate No 6 and inside the car park south of the Heritage Gate

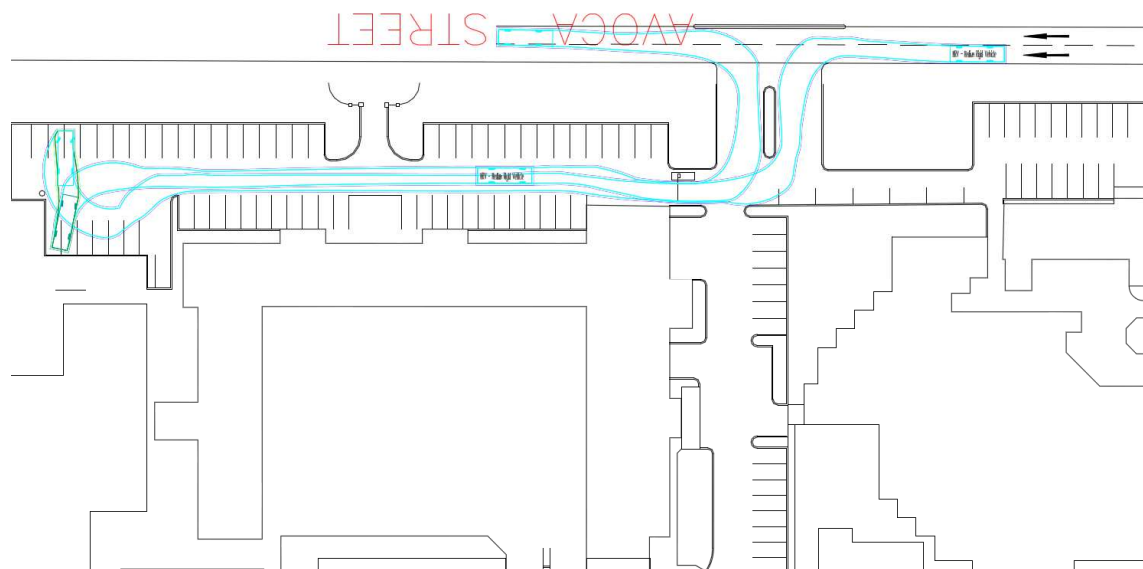


Figure B2 – Medium Rigid Truck movement at Gate No 6 and northern end of the car park

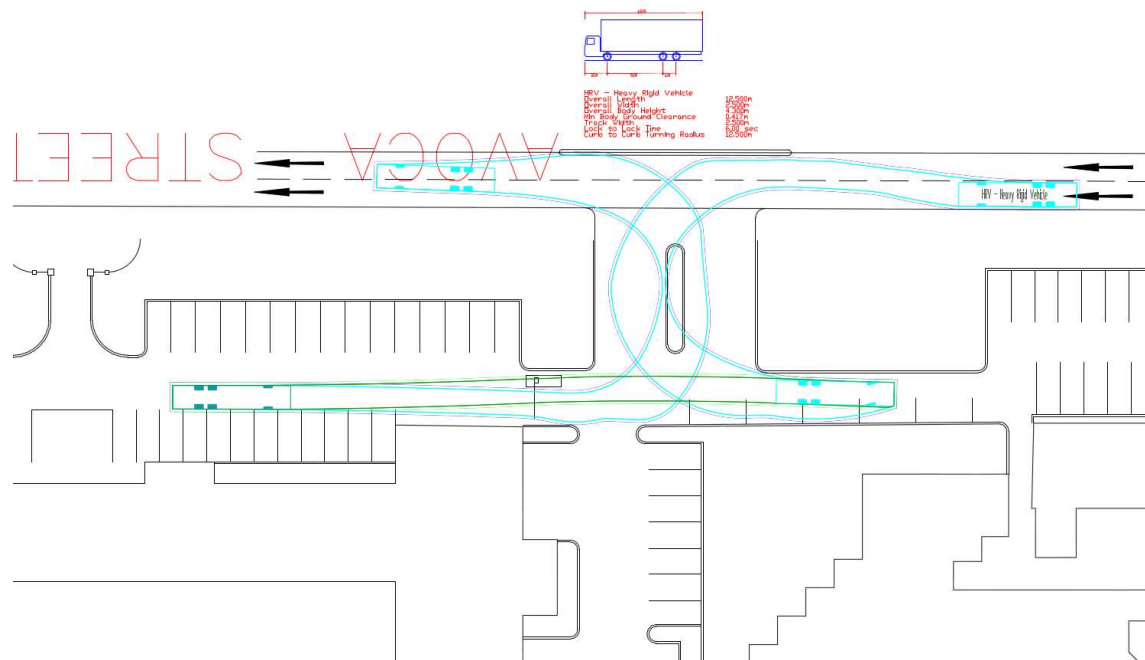
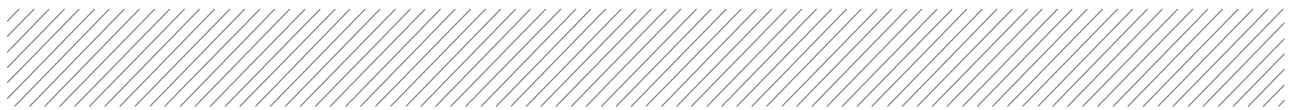


Figure B3 – Heavy Rigid Truck movement at Gate No 6 and the reversing into EBB car park

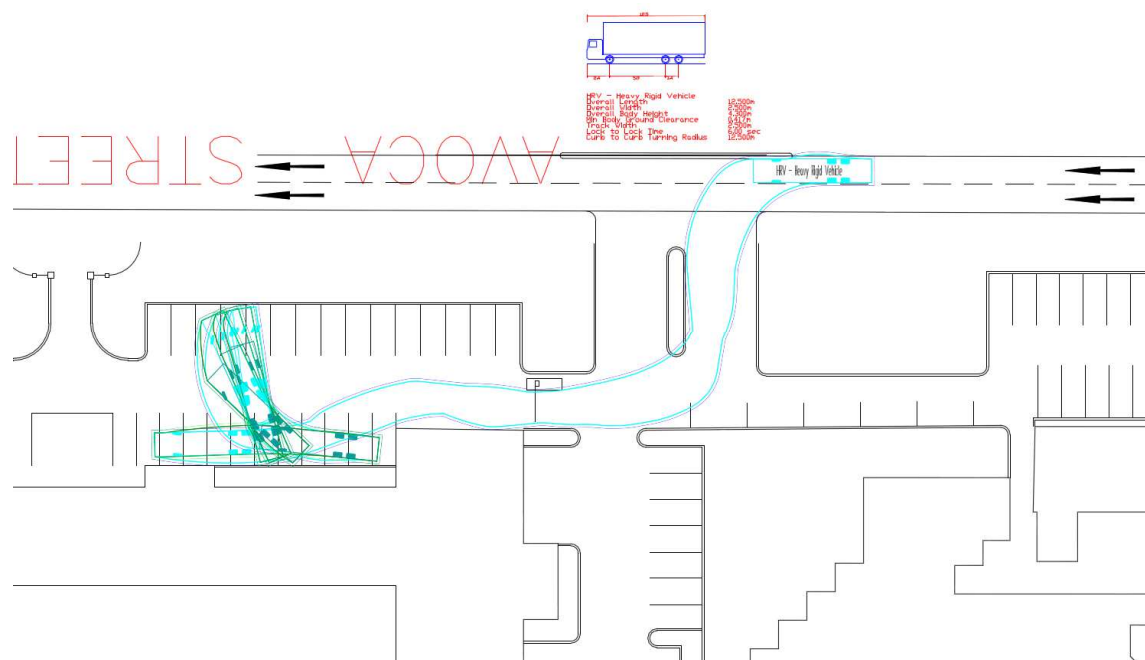


Figure B4 – Heavy Rigid Truck movement at Gate No 6 and multiple turns within EBB car park



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