



F23 Administrative Building
The University of Sydney, Camperdown Campus
Transport Impact Assessment

Client // The University of Sydney
Office // NSW
Reference // 16S1133200
Date // 11/04/16

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1. Introduction

1.1 Background & Proposal

The University of Sydney is proposing to develop a new Gateway to Eastern Avenue and the entry to the University's Camperdown Campus from along its frontage to City Road.

The new proposal includes the F23 Administration Building site).

The site area is shown in Figure 1.1.

Figure 1.1: Gateway Development Site Along City Road: F23 Administration



Basemap Source: Nearmaps

The transport and accessibility assessment contained within this report addresses the F23 Administration Building site. Notwithstanding this, the transport assessment has had due regard to both projects along with the broader University travel demands.

The F23 Administration Building development proposal seeks approval to construct a new Administrative Building on the F23 site to allow consolidation of various University professional service units into one building. These units are currently fragmented and spread across various buildings and campuses.

While it is recognised that the primary purpose of the F23 Building is to facilitate the consolidation of the University's professional services unit, the F23 Building project and the associated campus domain works offers the ability to improve the gateway functionality and pedestrian environment at this location by addressing several of the existing constraints and issues associated with the existing vehicle access arrangements.

Currently the existing vehicle access to and from the Camperdown Campus provided via the signalised 4-way intersection at City Road / Butlin Avenue / Fisher Road dominates the gateway location.

This vehicle dominated function conflicts with the significant pedestrian demands at the same location. The vehicle / pedestrian interaction at the gateway is further complicated by vehicles

rat running through the University via the City Road / Butlin Avenue / Eastern Avenue intersection to reach Parramatta Road.

The F23 Building project, through the design of modified vehicle access arrangements at City Road, seeks to readdress these issues.

1.2 Purpose of this Report

The purpose of this report is to present the findings and recommendations of the transport and accessibility assessment of the proposed F23 Building Project.

Specifically the assessment has considered and addressed the *Secretary's Environmental Assessment Requirements* (SEARs) issued 28 May 2015.

The SEARs for the preparation of an EIS was issued by the Department of Planning and Environment (DoPE) on 28 May 2015.

GTA was commissioned by the University of Sydney to undertake a Transport Impact Assessment to include in the EIS and in particular to address the SEARs related to Transport and Accessibility. Table 1.1 lists the SEAR's requirements and the corresponding sections of the report where these are addressed.

Table 1.1: SEAR's and Relevant Report Sections

Transport, Access and Parking	Addressed in
Details of the existing and proposed pedestrian and cycle movements within the vicinity of the site;	Section 3.1.2 Section 3.1.3 Section 3.1.4 Section 3.4.1 Section 3.4.2 Section 3.3.2
An estimate of the total daily and peak hour trips likely to be generated by the proposal, including vehicle, public transport, pedestrian and cycle trips;	Section 3.3.3 Section 3.4.1
The adequacy of public transport to meet the likely future demand of the proposed development;	Section 2.1 Section 3.1.1 Section 3.5.1
Measure to promote travel choices for students, staff and visitors that support the achievement of State targets, such as a location-specific sustainable travel plan, development of wayfinding strategies and end of trip facilities for pedestrians and bicycle riders;	Section 3.1.4 Section 3.3.2 Section 3.4.1 Section 3.6
The daily and peak vehicle movements impact on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/associated funding for upgrading or road improvement works (if required);	Section 3.3
The proposed access arrangements and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and cycle networks, including the existing City Road Footbridge;	Section 3.1.4 Section 3.3 Section 3.3.3 Section 3.4
Proposed car and bicycle parking provision, including consideration of the availability of public transport and the requirements of the relevant parking codes and Australian Standards;	Section 3.1.2 Section 3.2.1 Section 3.2.2
Proposed location of pedestrian and bicycle facilities, accessible areas close to main entrances that incorporate lighting and passive surveillance;	Section 3.1.2 Section 3.4.1
Service vehicles access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times);	Section 3.7
An assessment of traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact. This plan shall include details of vehicle routes, number of trucks, hours of operation, access arrangements and traffic control measures for all demolition/construction activities.	Section 3.8 Section 3.8.1 Section 3.8.2

2. Overview of F23 Building Proposal

2.1 Site Location

The proposed F23 Building site is located within the Camperdown Campus of the University of Sydney. The site is effectively bounded by roads on all sides, with the City Road forming the site's southern boundary and Fisher Road form the other frontages of the site.

The site of the F23 Building is an existing at grade car park and internal access roads.

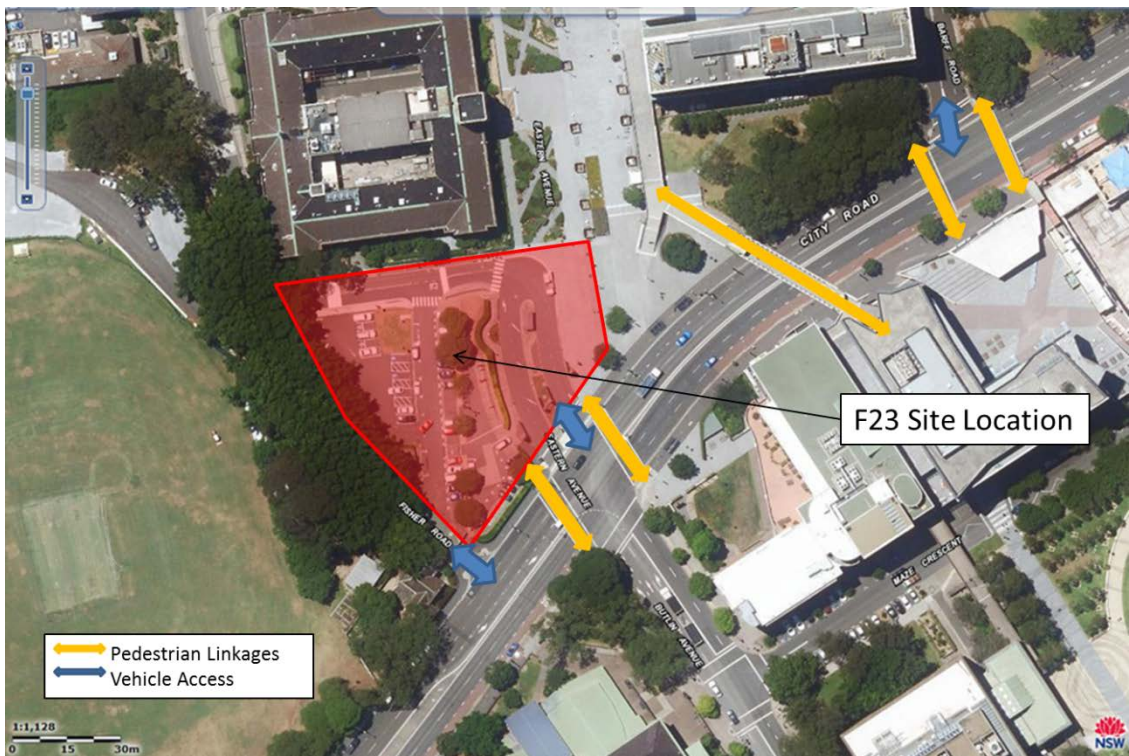
The site location within the context of the University is shown in Figure 2.1 and in more detail in Figure 2.2.

Figure 2.1: Site Location within the University



The F23 Building site is located at an important junction point for the movement of pedestrians and vehicles as they cross City Road between the Camperdown and Darlington Campuses. Furthermore the location of the City Road bus stops between Butlin Avenue / Eastern Avenue and Barff Road create a key arrival and departure point for University students, staff and visitors.

Figure 2.2: F23 Site Location



The F23 Building site is well connected with public transport.

Redfern Railway Station is located a 10-minute walk (1km) south-east of the subject site. The station is serviced by all suburban train lines that operate from the Sydney CBD as well as the intercity lines to Central Coast, Newcastle, the Blue Mountains and the South Coast.

Sydney Buses operate nine services along City Road, including six regular services, two limited stops services and one metro service. Bus stops located on City Road between the Fisher Road and Barff Road intersections. The services link the site with the Inner South-East, Inner Western, South-Western Sydney suburbs as well as the Sydney CBD. A further 12 services are available along Parramatta Road linking the site with the Inner West, South-West, Eastern Suburbs and Sydney CBD.

2.2 Overview of Proposal

As described in the introduction, the F23 Building is proposed to be constructed to facilitate the consolidation of existing administrative services to a single central location. The consolidation of services to one area will not increase the parking demand or traffic generation but instead centralise it to the F23 building.

However, the F23 Building project does seek to modify the existing vehicle access arrangements at City Road to facilitate the location of an efficient building footprint and to create pedestrian access to the building and the key pedestrian routes through the University in a manner which is free of conflict with vehicles.

With regard to traffic and transport, the F23 Building will include the following works and modifications:

- Removal of existing at grade parking (63 car spaces).

- Construction of the F23 Building with two basement levels of car, motor cycle and bicycle parking facilities:
 - 96 car parking spaces (including 2 accessible spaces and 16 small car spaces)
 - 21 Motorcycle spaces
 - 76 secure bicycle parking spaces;
 - End of trip shower, toilet and change facilities.
- Removal of Fisher Road internal roads along the northern side of the site boundary (adjacent to Madsen Building).
- The City Road / Butlin Avenue / Eastern Avenue intersection to be reconfigured such that vehicles can only ENTER the Camperdown campus only.
- The existing Fisher Road entry to be retained and accessible for left in / left out vehicle movements at City Road.
- There will be limited vehicle access from the City Road / Eastern Avenue / Butlin Street intersection to Fisher Road for emergency service vehicles only.

3. Transport Implications of Proposed F23 Building Project

3.1 Consistency with Strategic Planning Objectives

There are a number of NSW State Government and City of Sydney transport related policies which set out key strategic transport objectives for new developments. Furthermore, the University of Sydney has its own site specific transport objectives.

The City of Sydney LEP (2012) requires 64 car parking spaces for a development of 8000 sqm GFA. The proposed development intends to provide 96 car parking spaces that complies with the City of Sydney LEP.

3.1.1 NSW Long Term Transport Master Plan 2012

The Master Plan presents the NSW Government's 20-year vision for the delivery of public transport, roads and freight network to the State.

While very much the big picture policy for the State, the Long Term Master Plan at its heart seeks to plan and fund an efficient, sustainable and safe transport network.

The F23 Building project is consistent with these objectives.

3.1.2 Sydney's Cycling Future 2013 (TfNSW)

The overarching goal of Sydney's Cycling Future is to make cycling a safe, convenient and enjoyable transport option for short trips.

This strategy identifies numerous opportunities for growing the number of people riding bikes and growing the frequency with which people ride.

The University of Sydney in general has site specific policies and measures to promote and achieve a mode shifts to cycling.

These are reflected in the University's promotion of bicycle usage on their website which includes details on:

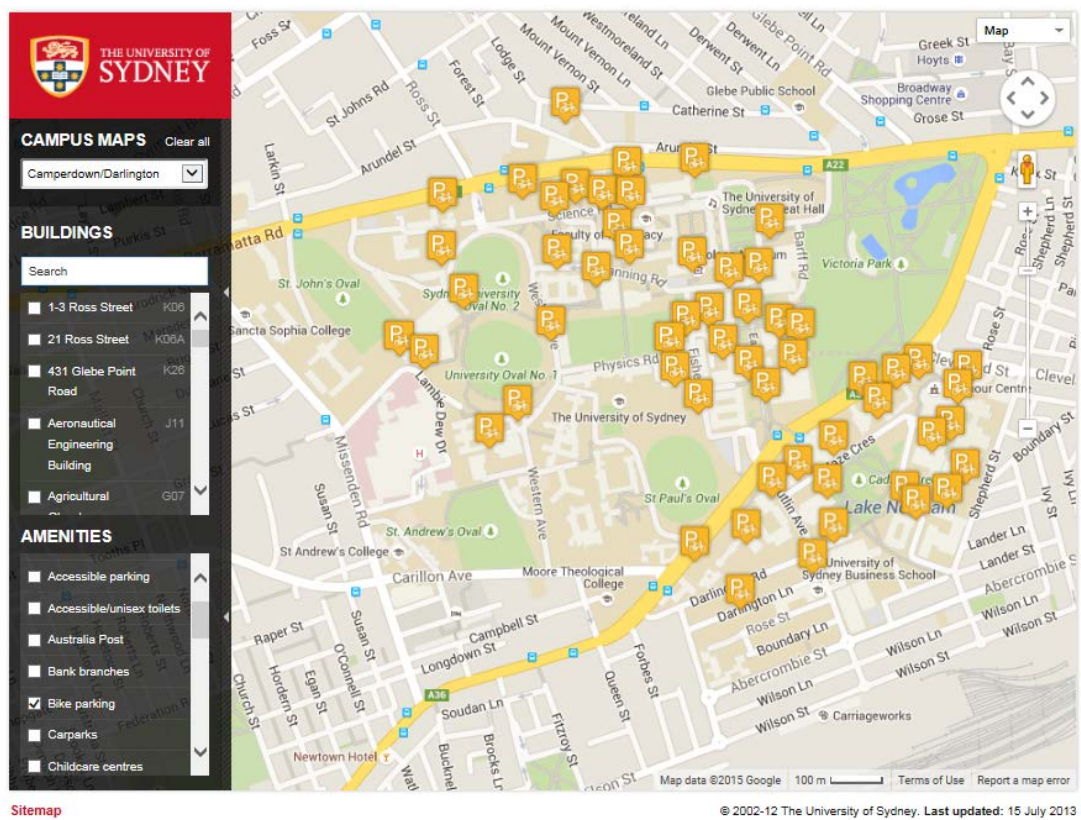
- Where to ride
- How to ride safely
- Where to park
- Where to shower and change
- Discounts for Bicycle usage.

An example of the bicycle parking facilities is shown in Figure 3.1.

Specifically, the F23 Building project will increase the availability of secure bicycle parking with the provision of an additional 76 bicycle spaces in the basement levels along with end of trip shower and change facilities.

It is considered that the F23 Building project is consistent with and enhances the strategic objectives set to be achieved by Sydney's Cycling Future 2013.

Figure 3.1: The University of Sydney Camperdown Campus Bicycle Parking Map



Source: <http://sydney.edu.au/maps/campuses/?area=CAMDAR>

3.1.3 Sydney's Walking Future 2013 (TfNSW)

Sydney's Walking Future 2013 seeks to encourage walking as a healthy and viable mode of transport.

Walking is a key mode of transport for the University, not just to and from but also within the University.

The F23 Building project will through its public domain and pedestrian amenity improvements significantly enhance the status of pedestrians at a key gateway for the Camperdown Campus. This is consistent with the objectives of *Sydney's Walking Future 2013*.

3.1.4 University of Sydney, Campus Improvement Program (2014-2020) Access Strategy

The University's Access Strategy has a number of guiding transport principles as measure to achieve its sustainable approach to travel demand for future University developments. These principles include:

- Car parking to be relocated to peripheral locations within basements to reduce the need for vehicle intrusions into the Campus centres and facilitate car free pedestrian zones.
- Car parking within the University to be generally capped at agreed levels by relevant authorities. As per the Universities Campus Improvement Program (CIP) which states that parking will be provided over the course of the CIP2020) rather than rates and

provisions for each building. Additional travel demands to be accommodated by non-private vehicle modes of transport.

By providing additional bicycle facilities and end of trip facilities, the CIP will be based on the principles of reducing the use of private vehicles. The realignment of Fisher Road to become a shared pedestrian zone is consistent with these principles.

3.1.5 Parking Provisions

The proposed F23 Building development will remove the existing 63 at grade car parking spaces currently provided on the F23 Building site, relocating them to the basement levels within the proposed 96 car parking space facility accessed via an internal access driveway to Fisher Road.

These car parking spaces are currently paid parking spaces with pay and display parking stickers distributed by meters. It is understood that a similar number of paid parking spaces will be provided in the new basement parking area.

The provision of 96 car parking spaces within the F23 Building will allow the relocation of another 38 at grade parking spaces currently distributed around the University Campus, thereby reducing the demand for vehicle intrusions into the Campus. The relocation of existing car parking from scattered locations within the Campuses to the periphery basement locations is a core transport principle of the University's Access Strategy.

The provision of 76 secure bicycle parking spaces and 21 motor cycle parking spaces exceeds the minimum requirements of the City of Sydney LEP / DCP requirements of 8 motorcycle parking spaces and is consistent with the objective of encouraging alternate mode of transport to and from the University.

3.1.6 Car Parking Layout

The proposed basement car parking layout has been designed and set out in accordance with the design requirements of Australian Standard AS2890.1 and 2. As such the layout is considered to be an efficient layout which will facilitate satisfactory vehicle access to and from the basement parking area. Some typical swept paths are shown at Appendix B.

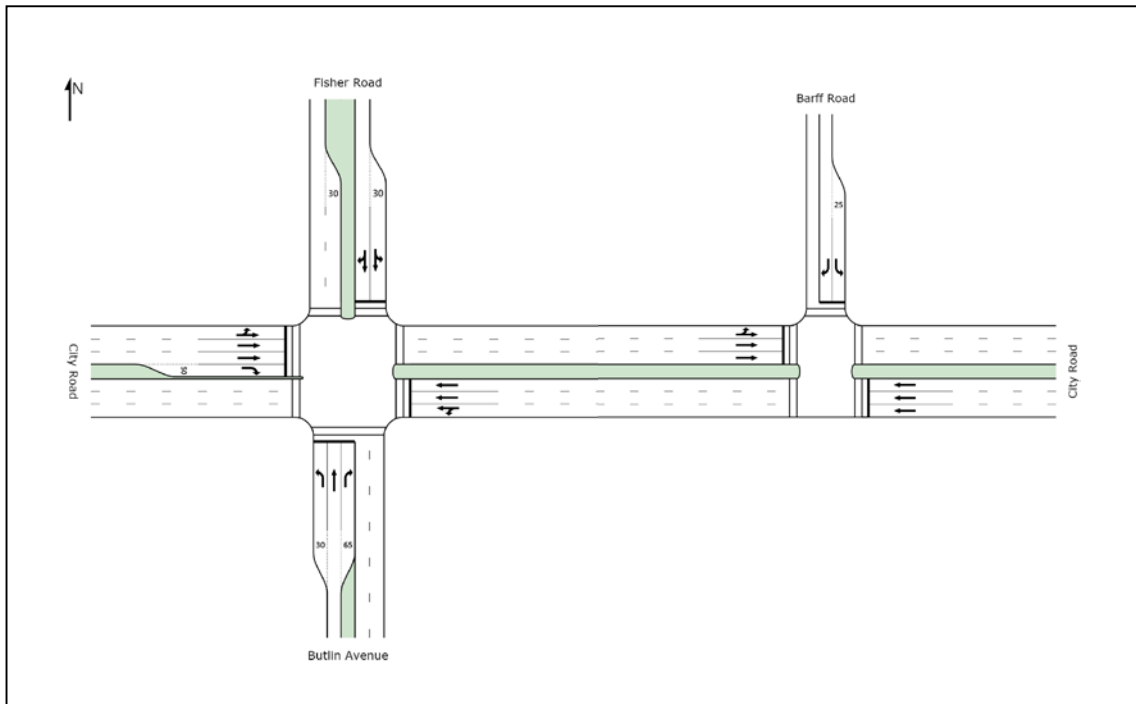
3.2 Implications of Modified Vehicle Access Arrangements

3.2.1 Operation of Existing Vehicle Access Arrangements

To ascertain the current vehicle demands at the University's vehicle accesses along City Road, peak period traffic surveys were undertaken on Thursday 31 March 2015.

The layouts of the existing City Road accesses are shown in Figure 3.2.

Figure 3.2: Existing Site Access Arrangements (City Road)



The existing traffic survey results for the peak AM and PM period are presented in Figure 3.3 and Figure 3.4.

Figure 3.3: Existing Traffic Flows (2015) – AM Peak Hour

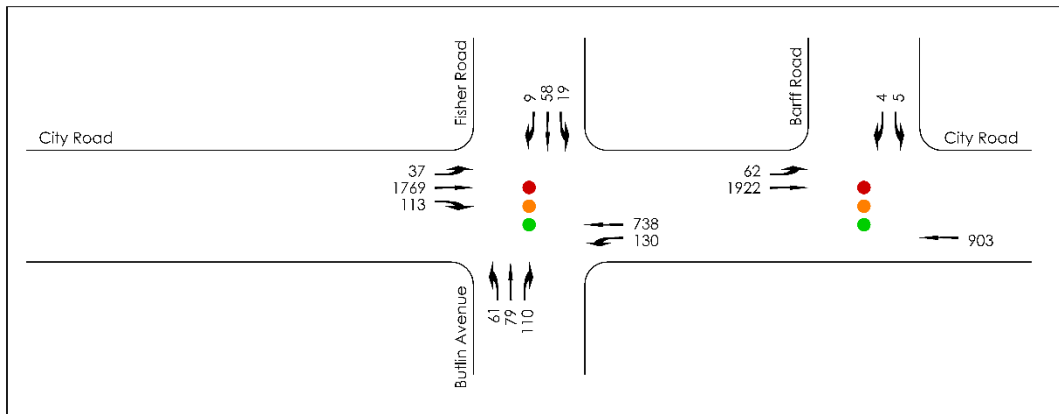
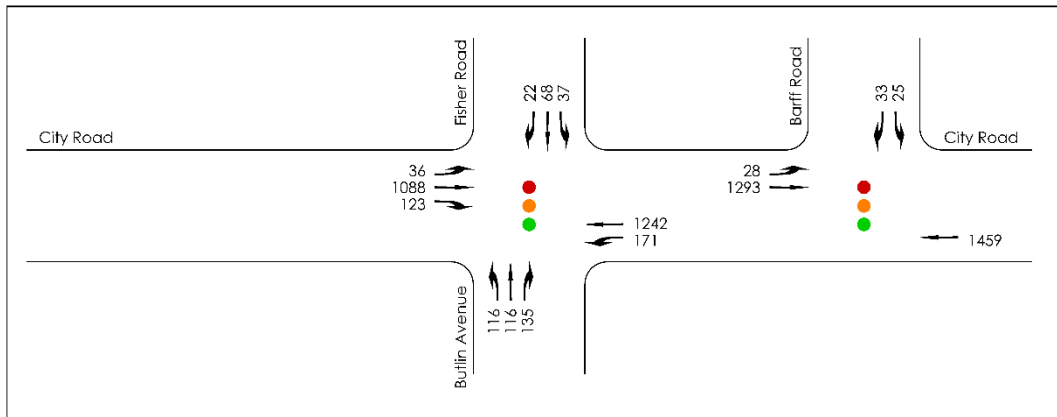


Figure 3.4: Existing Traffic Flows (2015) – PM Peak Hour



The operation of the City Road site accesses was modelled for the existing conditions with the surveyed traffic flows using the Sidra modelling software. Signal timings and vehicle queues were calibrated with on-site observations.

The results of the analysis are presented in Table 3.1.

Table 3.1: Existing Intersection Operation

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
City Road/ Barff Road	AM	0.76	2	76	A
	PM	0.57	2	35	A
City Road/ Bultin Avenue/ Fisher Road	AM	0.77	8	73	A
	PM	0.74	11	53	A
City Road / Fisher Road	This is currently a private driveway with little traffic so it was not modelled.				

With the surveyed demands and observed signal timings the results presented in Table 3.1 indicate that the site accesses operate satisfactorily.

Notwithstanding the above, it is noted that these site access intersections operate as part of a co-ordinated traffic signal network along City Road. Vehicle congestion does occur during peak periods both towards the City in the morning (i.e. Cleveland Street) and towards Newtown in the afternoon / evening. While broader network congestion does occur this section of City Road operates relatively efficiently with vehicles able to enter and exit City Road from both the Camperdown and Darlington Campuses.

3.2.2 Existing Rat Run Movements through the University

Campus Infrastructure & Services (CIS) has been aware anecdotally of the presence of vehicles rat running through the University's Camperdown Campus, namely cutting through the Campus between Parramatta Road and City Road.

The presence of rat running through the University unnecessarily vehicle movements through what could otherwise be pedestrian priority areas. Furthermore it unnecessarily increases the demand for vehicle turning movements at City Road and Parramatta Road site access intersections.

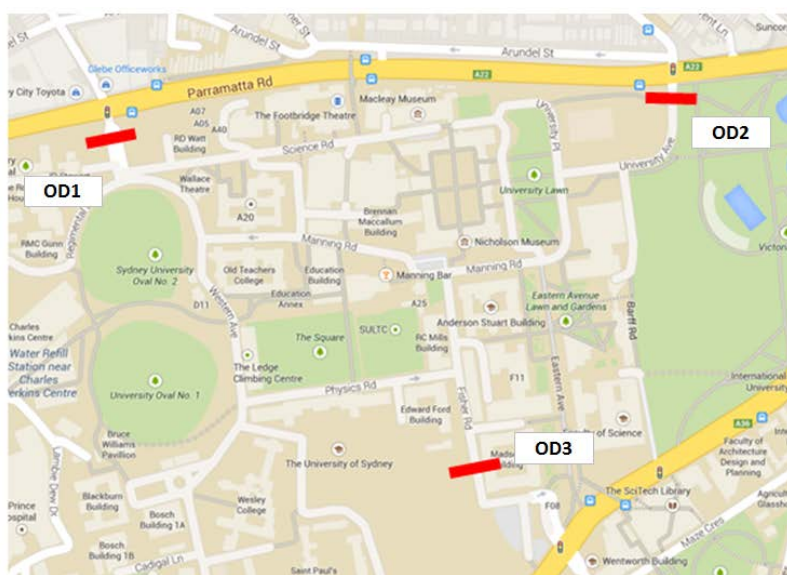
As part of the assessment for the F23 Building, GTA were asked by CIS to quantify the extent of rat running through the Camperdown Campus.

To quantify the extent of rat running origin / destination surveys were undertaken through number plate recording at the following site access locations for AM, Midday and PM peak periods on a typical weekday:

- Fisher Road (accessed via City Road) (OD3)
- Parramatta Road / Ross Street (OD2)
- Parramatta Road / University Avenue (OD1)

The locations are shown in Figure 3.5.

Figure 3.5: Origin / Destination Survey Locations



- OD 1 - Uni Access off Parramatta Rd
- OD 2 - University Ave
- OD 3 - Fisher Rd

The survey times enabled identification of vehicles that travelled through between Parramatta Road and City Road within a 5 minute period. Vehicles that travelled through the Campus within 5 minutes were considered to have no purpose to being within the campus.

A summary of the results is presented in Table 3.2. The results indicate that there is a significant proportion of rat running traffic through the Camperdown Campus.

Table 3.2: Summary of Vehicle Rat Running through Camperdown Campus

Period	Total Vehicles Entering	No. of Exits within 5 minutes	% Vehicles Rat Running
AM 7-9am	794	152	19%
Midday 11am-1pm	445	133	30%
PM 4-6pm	677	209	31%

Realigning and converting Fisher Road into a shared pedestrian zone reduces the impact of rat running within the university. The removal or reduction of rat running traffic would provide benefits in line with the University's broader transport objectives of decreasing the intrusion of vehicles into the core internal areas of the University.

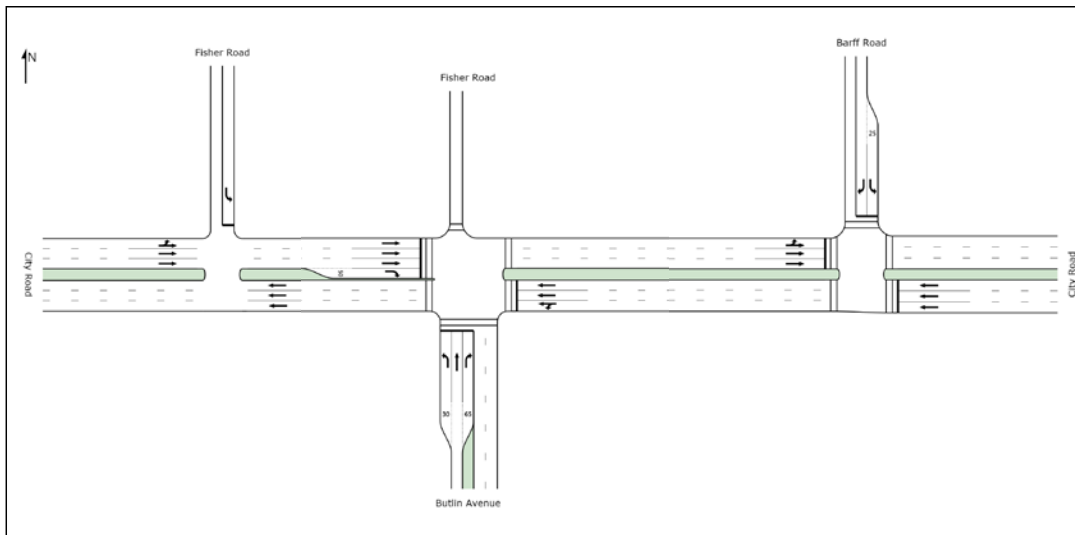
3.2.3 Operation of Proposed Vehicle Access Arrangements

As described above, the existing vehicle access arrangements at City Road to the F23 Building site and the Camperdown Campus will be modified such that:

- The signalised exit lanes from the site onto the City Road / Butlin Avenue intersection are removed.
- The City Road/Butlin Avenue signalised intersection becomes an entry only access for emergency vehicles accessed via a left turn from City Road and a through movement from Butlin Avenue.
- The existing driveway at City Road / Fisher Road to be widened to facilitate left in left out movements only.
- The existing arrangements at City Road / Barff Road to remain unchanged.

The layout of the modified vehicle access arrangements along City Road as modelled in Sidra are shown in Figure 3.6.

Figure 3.6: Proposed Modified Site Access Arrangements (City Road)



The purpose of the proposed modifications to vehicle access at City Road are to:

- Remove vehicle traffic flows from the primary pedestrian gateway area allowing the F23 site to be connected with Eastern Avenue and the Carlaw building with a dedicated pedestrian area.
- Reduce the vehicle activity in the site with the removal of the signalised intersection and providing a one-way entry configuration between the Camperdown Campus and City Road. This will also discourage rat running through the University while still maintaining access to and from on-site parking.

The operation of the modified City Road site accesses was modelled using the Sidra modelling software. Traffic flows were adjusted to reflect the following:

- Increase in parking provided on the F23 Building site (offsets to be achieved elsewhere on Campus).
- Modified traffic distribution to accommodate the restrictions to exit movements onto the Butlin Avenue / Eastern Avenue intersection.
- The removal of the signalised intersection and reconfiguration of the access results in the reduction of through traffic flows (rat runners).

The modelled traffic flows are shown in Figure 3.7 and Figure 3.8.

Figure 3.7: Future Traffic Flows (2015) – AM Peak Hour

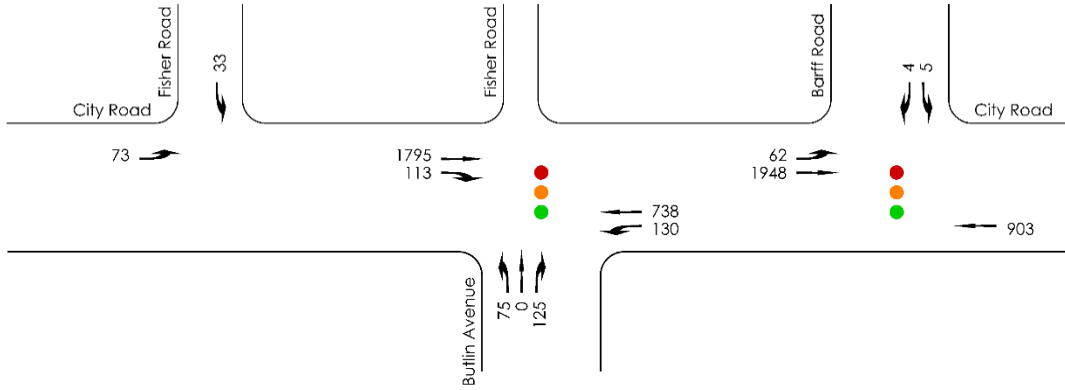
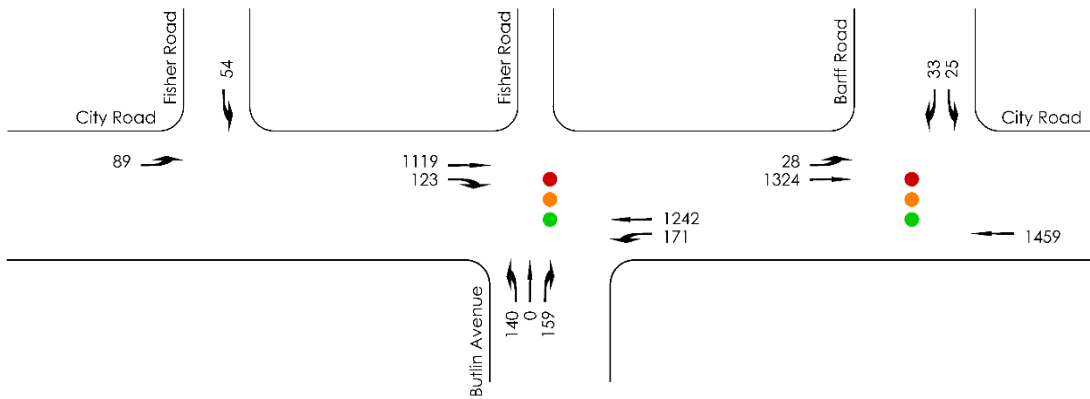


Figure 3.8: Future Traffic Flows (2015) – PM Peak Hour



The results of the Sidra modelling of modified access arrangements are presented in Table 3.3.

Table 3.3: Post Development Operating Conditions

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
City Road/ Barff Road	AM	0.77	2	80	A
	PM	0.57	2	35	A
City Road/ Bultin Avenue/ Signalised Intersection	AM	0.69	6	58	A
	PM	0.99	8	65	A
City Road / Fisher Road	AM	0.50	64	10	E
	PM	0.20	20	5	B

The results presented in Table 3.3 indicate that the modified vehicle access arrangements can satisfactorily accommodate the demands of the Camperdown Campus without impacting on City Road traffic flows.

It is noted that the Fisher Road exit would experience a LoS E during the AM Peak period, however this represents a 95th percentile queue length of 1-2 vehicles. This is consistent with the desire to reduce vehicular activity at this location and discourage through traffic flows.

It is noted that the modified access arrangements as modelled offers the ability to increase the green signal time allocation to City Road. The green time allocation to City Road (Phase A) was modelled as follows:

- Existing AM and PM peak = 61 % of 120 seconds
- Future (modified access)AM and PM Peak = 69 % of 120 seconds

The modified access arrangement therefore offers the ability to increase the capacity of traffic flows along City Road in the order of 8% or an additional 5 minutes per peak hour.

3.3 Pedestrian Accessibility and Facilities

3.3.1 Existing Pedestrian Flows across City Road

An existing footbridge provides an above grade separated crossing of City Road and connects the Wentworth Building, which is located on the Darlington Campus, with the Camperdown Campus landing at the end of Eastern Avenue adjacent to the Carlsaw Building.

The existing footbridge is located approximately 75 metres to the east of the City Road / Butlin Avenue / Eastern Avenue signalised intersection and 60 metres from the signalised City Road / Barff Road intersection.

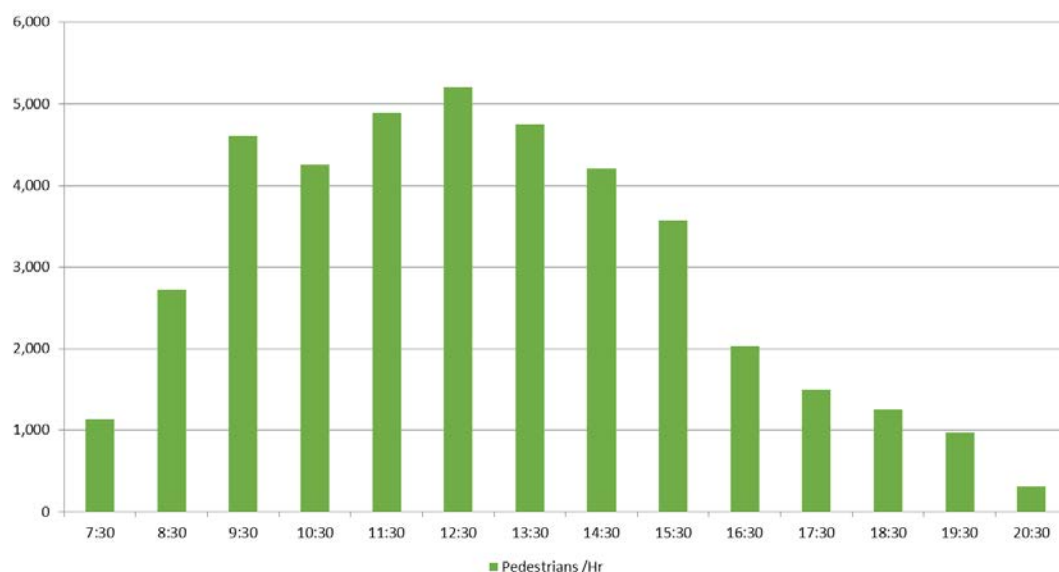
Full pedestrian crossing facilities are provided at grade on each leg of the signalised crossings.

Observations indicate that pedestrian flows across City Road are predominantly generated by University related activities. University generated flows crossing City Road consist of two basic types, namely:

- Internal campus flows - crossing between the Darlington and Camperdown campuses.
- External / Internal flows - flows between external origins / destinations (i.e. Redfern Railway Station and Parramatta Road) and the University.

Surveys were undertaken on March 2015 of the pedestrian flows crossing City Road via the pedestrian bridge. The results of the surveys are shown in Figure 3.9.

Figure 3.9: City Road Pedestrian Bridge – Surveyed Hourly Pedestrian Flows



The 2015 surveyed flows indicate a significant increase in recent years in pedestrian flows using an above grade crossing of City Road. Existing peak hourly flows of approximately 5,200 pedestrians per hour during the lunch time peak period. This is significantly higher than volumes recorded on the old bridge (circa 3400 peds per hour in 2004)

Notwithstanding the above, the demand for the at-grade crossings of City Road are significant and they play an important role in the existing (and future) movement of pedestrians across City Road between the Camperdown and Darlington Campuses.

The pedestrian crossing demands for at grade crossings are compared with the overhead foot bridge as shown in Figure 3.10 and Figure 3.11.

What is evident is the strong preference for the overhead foot bridge for the AM period over the at grade crossings. However, in the PM period the preference is not so strong. This reflects the strong connection to the overhead bridge along the path of travel from the Redfern Station transport hub. The reverse movement connections are not as similarly strong with pedestrians coming to the bridge from more diverse locations.

Figure 3.10: City Road Pedestrian Crossing – 15 minute periods (AM Peak)

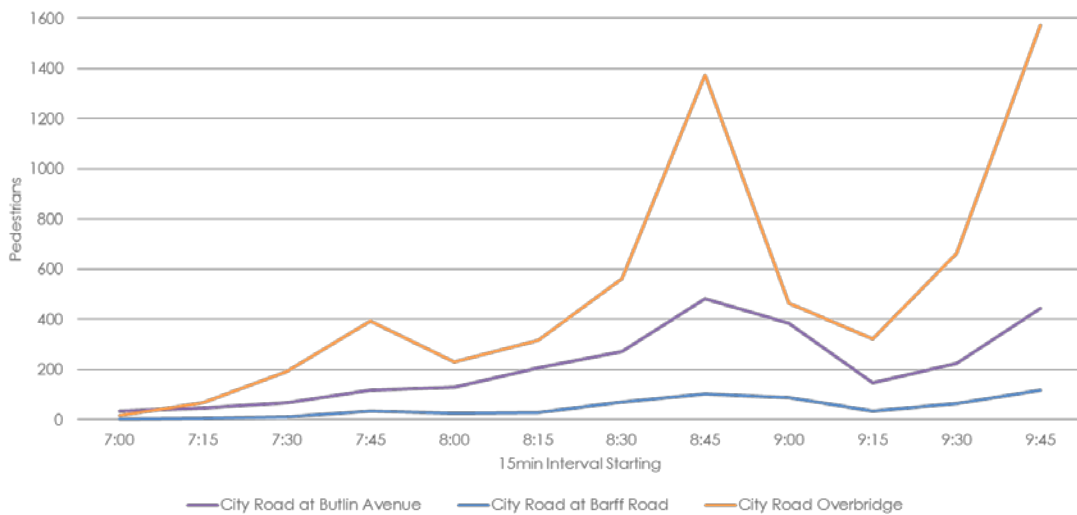
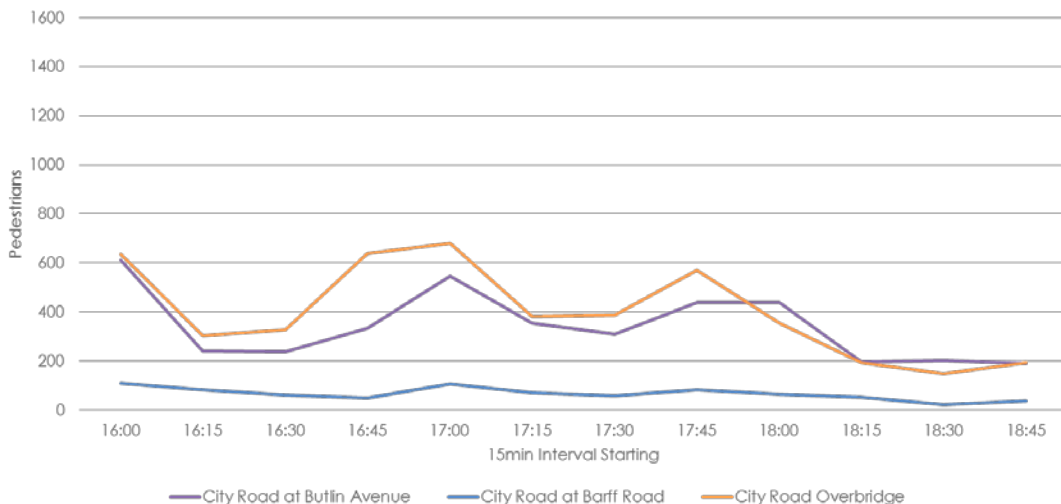


Figure 3.11: City Road Pedestrian Crossing – 15 minute periods (PM Peak)



3.3.2 Implications of F23 Building Proposal

During the development of the proposed vehicle access arrangements associated with the F23 Building proposal, the potential to remove or modify the existing at grade pedestrian crossings of City Road were explored.

However, the assessment determined that the existing location and alignment of the at grade pedestrian crossing combined with the pedestrian bridge, were appropriate and required to service the pedestrian demands at City Road.

As such the existing arrangements have been retained in their current form and capacity.

The removal of the Eastern Avenue vehicle exit and realignment of the entry road will increase the area available at the Eastern Avenue gateway to the Camperdown Campus. This will however provide no vehicular access and a fully dedicated pedestrian realm with only Fire Brigade access allowed. The new alignment of the shared way will have a significant improvement to pedestrian movements along the northern axis to the central spine of Eastern Avenue.

3.4 Public Transport Facilities and Services

3.4.1 Demand for Public Transport

As described above, the F23 Building project will not necessarily lead to an increase of University's population and associated travel demands as the population to be contained in the F23 Building are currently located elsewhere across the University.

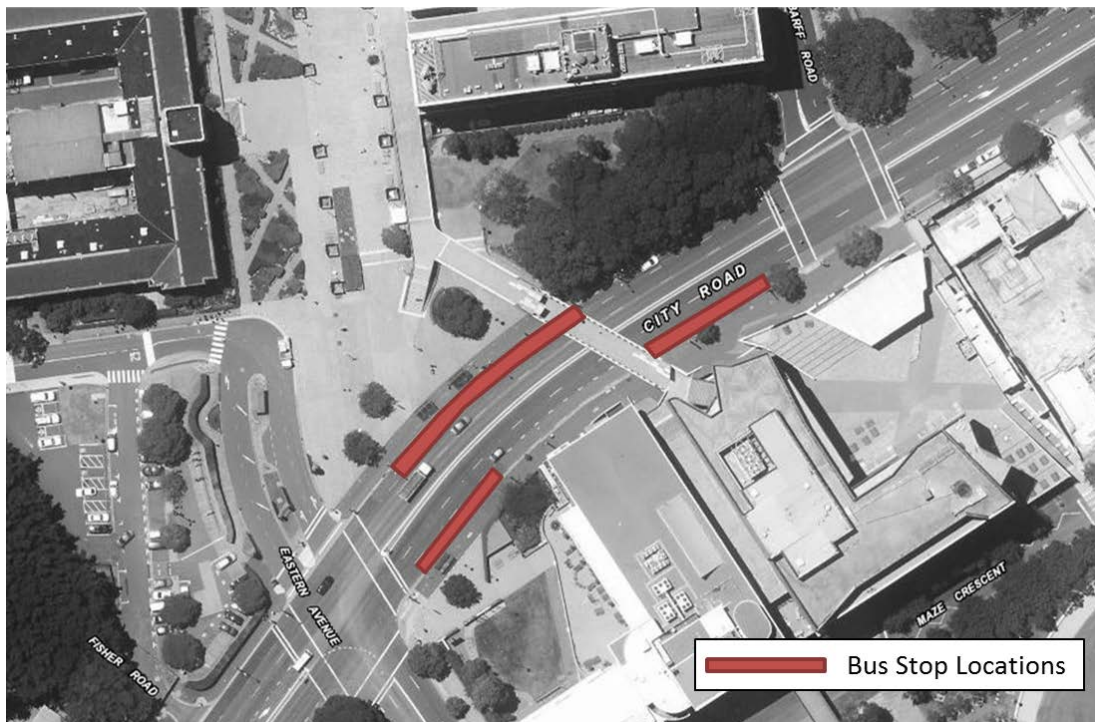
Therefore, the demand for public transport services is unlikely to change significantly as a result of the F23 Building development proposal.

3.4.2 City Road Bus Stop Operation

Buses operating along City Road stopping at the University play a significant role in the management of the University's travel demands.

As shown in Figure 3.12 a significant proportion of the Camperdown Campus frontage to City Road is occupied by bus stop facilities. Similarly bus stops are located along the Darlington Campus's frontage to City Road.

Figure 3.12: Existing Bus Stop Locations



The operation of the existing bus stops was reviewed with the view to consideration of bus stop relocation to improve operational efficiency.

Observations of the city bound stops on City Road indicated that during AM peak periods, buses did on occasion extend across the Eastern Avenue / Butlin Avenue intersection. This was observed to be a function of the number of buses arriving in a short period of time and the dwell time at the kerb.

In summary the existing physical arrangements for the bus stops are proposed to be retained.

3.5 Travel Demand Management

The University of Sydney is considered to be very pro-active with regard to travel demand management and undertakes the task on a University wide approach. The travel demands associated with the F23 Building will be included in and addressed by the University's broader travel demand management policies and plans rather than a location specific sustainable travel plan.

The University, through its website provides a wealth of up to date transport information.

3.6 Service Vehicle Access Arrangements

The proposed F23 Building will essentially be an office type land use with a small food offering located at the ground floor. The service vehicle activities associated with the F23 Building are therefore likely to be similar to an office building.

Therefore, it is expected that the F23 will generate the following service vehicle movements:

- Removal of waste and recycling materials
- Delivery of office supplies

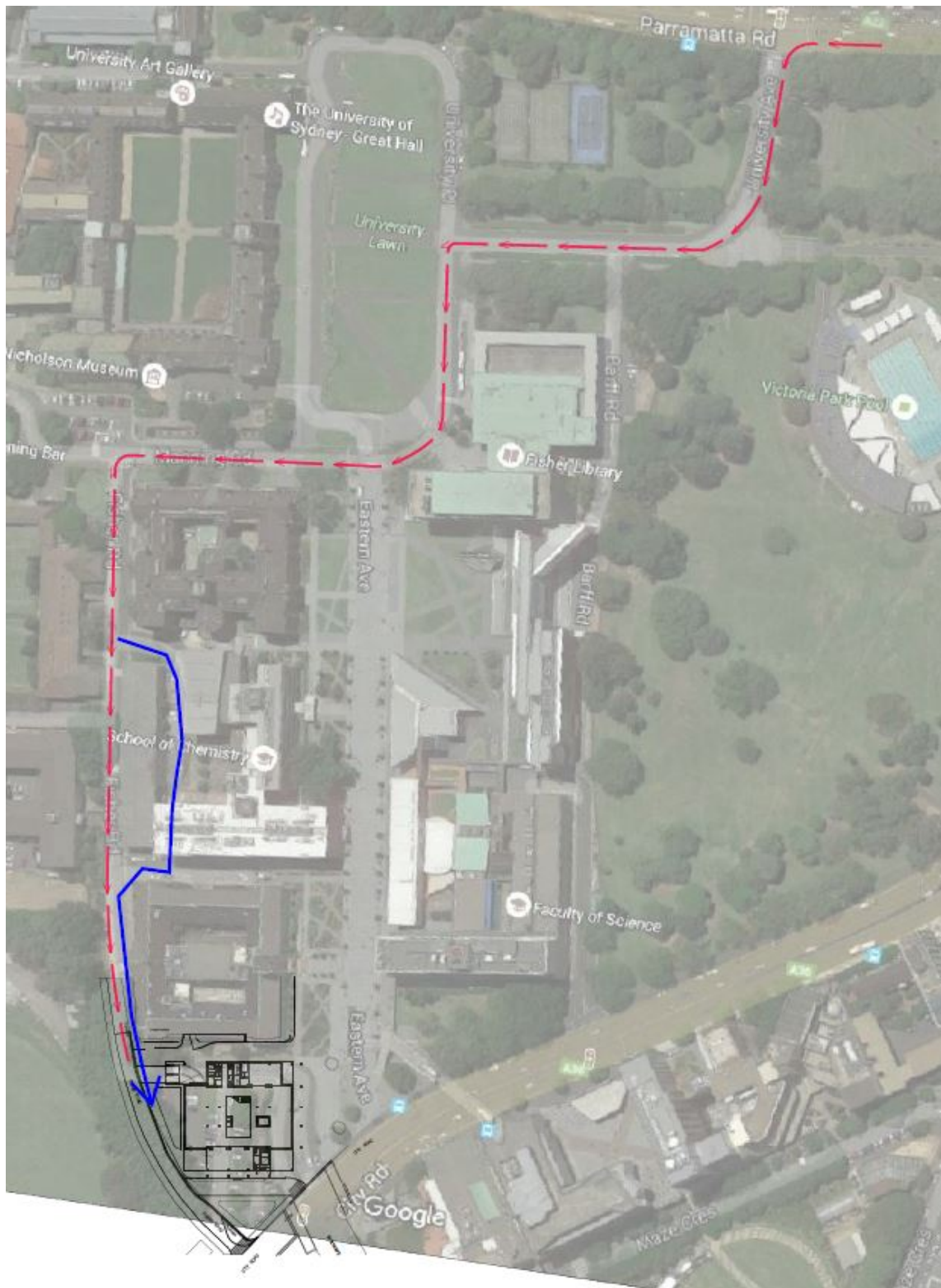
- Delivery of food and beverage to the small café style facility
- Couriers
- Maintenance and security (generally University vehicles).

The collection of waste across the University is co-ordinated through a private contractor with building specific requirements considered in the selection of the vehicle type used to service individual buildings.

On the basis of the above, it is proposed that the largest vehicle accessing the F23 building would be a Medium Rigid Vehicle (MRV- 8.8m long). This type of vehicle would be accommodated at the ground floor in the loading area located adjacent to the basement car parking access ramp.

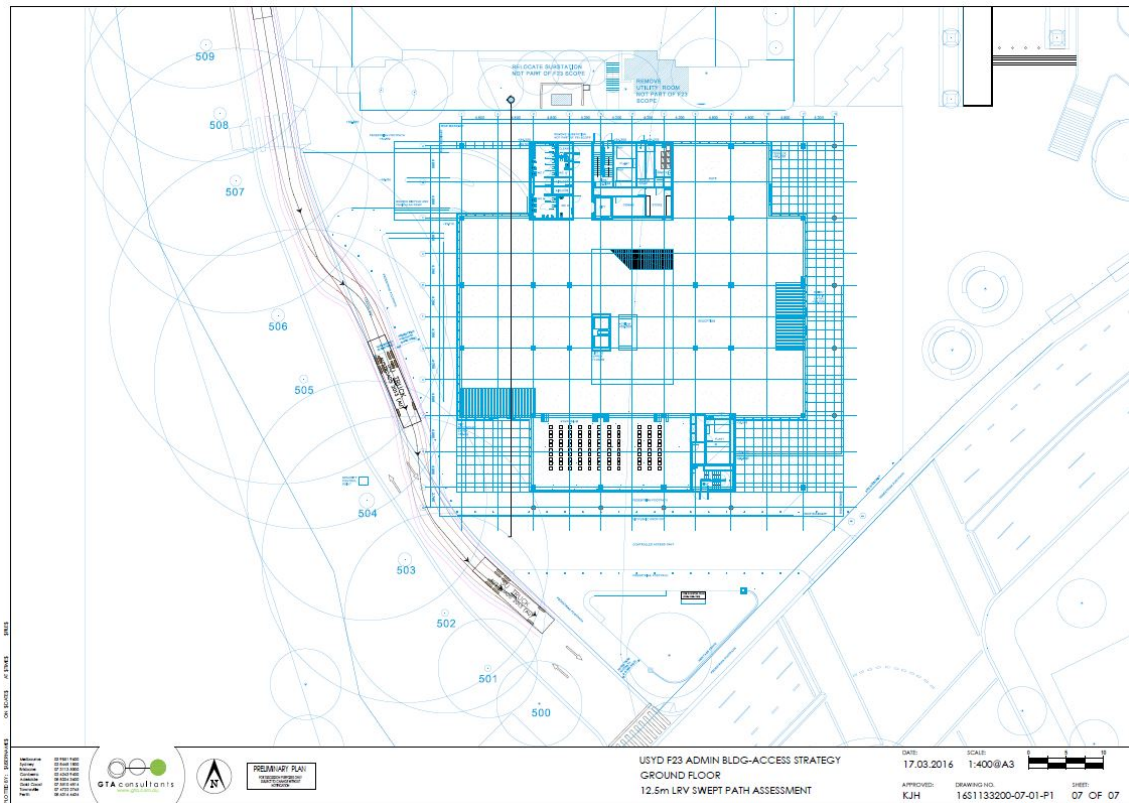
The majority of the MRV's accessing the loading bay are proposed to travel via Parramatta Road with the alternative option of turning around near the Chemistry Building as shown in Figure 3.13 below.

Figure 3.13: Service Vehicle Travel Routes



The MRV turning paths to access the loading bay are shown in Figure 3.14.

Figure 3.14: Loading Bay Access



Courier vans and other small delivery vehicles can be accommodated within the basement car parking area.

With regard to the likely number of service vehicles generated by the F23 building, it is noted that the existing Carlaw Building historically generated around 26 vehicles per day which were generally spread throughout the day.

As the Carlaw building accommodates service vehicles for other buildings it is likely that the number of large service vehicles using F23 is likely to be less than Carlaw.

3.7 Construction Traffic Management Arrangements

3.7.1 Construction Traffic Management Plan

A condition of project application consent will include a requirement to prepare a detailed Construction Traffic Management Plan (CTMP) prior to the commencement of construction activities on the site. The CTMP-F23 Administration Building (2015) has been prepared by Lend Lease.

The CTMP includes but is not be limited to the following:

- Identification of construction vehicle haulage routes to and from the site
- Development of construction vehicle driver management protocols
- Identification and control measures for vehicle site accesses
- Use of traffic controllers and appropriate warning signage (including TCPs)
- Separation of vehicle and pedestrian flows

- Site security, including site fencing and hoarding
- Hours of operation
- Use of On Street work zones (if required)
- Cumulative implication and co-ordination of construction activities across the University site.

Each of the above will need to be detailed once a building contractor has been appointed.

3.7.2 Overview of Construction Traffic Management Methodology

It is envisaged that the following general stages of construction works will be undertaken as part of the construction of the proposed building:

<i>Fisher Road Augmentation Works:</i>	<i>May 2016-July 2016</i>
<i>Erect Site Boundary Hoardings:</i>	<i>July 2016</i>
<i>Earthworks:</i>	<i>July 2016-September 2016</i>
<i>Sub Structure:</i>	<i>October 2016-November 2016</i>
<i>Structure:</i>	<i>November 2016-March 2017</i>
<i>Services & Finishes:</i>	<i>January 2017-September 2017</i>
<i>Façade and Roof:</i>	<i>February 2017-May 2017</i>
<i>External Works:</i>	<i>August 2017-November 2017</i>
<i>Practical completion:</i>	<i>December 2017.</i>

It is envisaged that a loop road through the site would be created utilising the Fisher Road access and the Eastern Avenue access at City Road. This would minimise the intrusion of construction vehicles into the Camperdown Campus.

Fisher Road will be closed for the first 6 months of construction with traffic control for construction vehicles, emergency vehicles and deliveries to the Madsen/ Chemistry Building.

4. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made with regard to the proposed F23 Building proposal within the Camperdown Campus of The University of Sydney:

- The proposed F23 Building will enable existing administrative services which are scattered across the University to be co-located within a new building located at the Gateway to the Camperdown Campus at City Road.
- The F23 Building will remove existing at grade car parking located within the Camperdown Campus and relocate them to a basement car parking facility located within close proximity to the external road network, namely City Road.
- The F23 Building as proposed will not necessarily increase the University's population, travel demand or traffic generation.
- The F23 Building proposal includes a number of modifications to the vehicle access arrangements to and from the Camperdown Campus at City Road. The modifications have been assessed and determined to provide satisfactorily capacity to accommodate the traffic and pedestrian movements to, from and across the University at City Road without adversely impacting traffic flows along City Road.
- The modified vehicle access arrangement will increase the area available to pedestrian activities and significantly enhance pedestrian linkages at the City Road / Eastern Avenue Gateway. The arrangements will also assist in discouraging through movements (rat running) through the University which has been quantified and demonstrated to be a real issue to be addressed.
- The F23 Building proposal which will be supported by the University's strong commitment to and application of travel demand management is considered to be consistent with broader transport objectives set out in the various State, Council and University policies.

Appendix A

Sidra Modelling Outputs

MOVEMENT SUMMARY

Site: City Road/ Barff Road - AM
Peak - Existing

City Road - Barff Road
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: City Road											
11	T	951	7.0	0.357	1.2	LOS A	2.1	15.3	0.08	0.07	57.7
Approach		951	7.0	0.357	1.2	LOS A	2.1	15.3	0.08	0.07	57.7
North: Barff Road											
1	L	5	20.0	0.054	47.1	LOS D	0.3	2.1	0.85	0.62	17.1
3	R	4	0.0	0.013	46.6	LOS D	0.2	1.4	0.85	0.62	17.1
Approach		9	11.1	0.054	46.9	LOS D	0.3	2.1	0.85	0.62	17.1
West: City Road											
4	L	65	0.0	0.077	9.1	LOS A	0.2	1.4	0.11	0.69	49.4
5	T	2023	6.4	0.757	1.9	LOS A	10.4	76.4	0.19	0.18	56.0
Approach		2088	6.2	0.757	2.2	LOS A	10.4	76.4	0.19	0.20	55.8
All Vehicles		3048	6.5	0.757	2.0	LOS A	10.4	76.4	0.16	0.16	56.0

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P7	Across E approach	72	51.3	LOS E	0.2	0.2	0.93	0.93
P1	Across N approach	77	6.7	LOS A	0.1	0.1	0.33	0.33
P3	Across W approach	72	51.3	LOS E	0.2	0.2	0.93	0.93
All Pedestrians		221	35.8	LOS D			0.72	0.72

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: City Road/ Barff Road - PM
Peak - Existing

City Road - Barff Road
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: City Road											
11	T	1536	4.2	0.567	1.5	LOS A	4.8	34.6	0.12	0.11	57.0
Approach		1536	4.2	0.567	1.5	LOS A	4.8	34.6	0.12	0.11	57.0
North: Barff Road											
1	L	26	4.0	0.241	47.8	LOS D	1.3	9.4	0.87	0.68	17.0
3	R	35	0.0	0.109	48.0	LOS D	1.7	12.0	0.87	0.70	16.9
Approach		61	1.7	0.241	47.9	LOS D	1.7	12.0	0.87	0.69	17.0
West: City Road											
4	L	29	3.6	0.036	9.2	LOS A	0.1	0.6	0.11	0.69	49.4
5	T	1361	3.2	0.499	1.4	LOS A	3.7	26.7	0.10	0.09	57.3
Approach		1391	3.2	0.499	1.5	LOS A	3.7	26.7	0.10	0.11	57.1
All Vehicles		2987	3.7	0.567	2.4	LOS A	4.8	34.6	0.13	0.12	54.4

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P7	Across E approach	112	51.3	LOS E	0.4	0.4	0.93	0.93
P1	Across N approach	177	6.7	LOS A	0.2	0.2	0.33	0.33
P3	Across W approach	72	51.3	LOS E	0.2	0.2	0.93	0.93
All Pedestrians		361	29.4	LOS C			0.63	0.63

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: City Road/ Fisher Road/
Butlin Avenue - AM Peak -
Existing

City Road/ Fisher Road/ Butlin Avenue

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

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Butlin Avenue											
1	L	64	6.6	0.401	31.0	LOS C	2.5	18.5	0.71	0.66	19.6
2	T	83	1.3	0.174	37.9	LOS C	3.8	26.9	0.82	0.65	16.5
3	R	116	5.5	0.449	45.0	LOS D	5.8	42.3	0.88	0.76	17.4
Approach		263	4.4	0.449	39.3	LOS C	5.8	42.3	0.82	0.70	17.6
East: City Road											
4	L	137	3.8	0.579	23.0	LOS B	3.7	26.6	0.55	0.75	36.4
5	T	777	7.6	0.379	1.8	LOS A	1.7	13.0	0.08	0.07	56.8
Approach		914	7.0	0.579	4.9	LOS A	3.7	26.6	0.15	0.17	52.9
North: Fisher Road											
7	L	20	5.3	0.154	39.4	LOS C	1.0	7.1	0.79	0.65	18.2
8	T	61	0.0	0.154	37.7	LOS C	3.1	21.9	0.82	0.64	17.7
9	R	9	0.0	0.154	40.3	LOS C	3.1	21.9	0.82	0.70	18.1
Approach		91	1.2	0.154	38.3	LOS C	3.1	21.9	0.81	0.65	17.9
West: City Road											
10	L	39	2.7	0.030	9.1	LOS A	0.1	0.7	0.09	0.69	49.5
11	T	1862	6.4	0.766	2.2	LOS A	9.9	72.8	0.20	0.19	55.6
12	R	119	6.2	0.481	25.4	LOS B	4.9	36.0	0.74	0.82	34.7
Approach		2020	6.4	0.766	3.7	LOS A	9.9	72.8	0.23	0.23	53.8
All Vehicles		3287	6.2	0.766	7.8	LOS A	9.9	72.8	0.27	0.27	44.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	86	17.1	LOS B	0.2	0.2	0.53	0.53
P3	Across E approach	360	45.1	LOS E	1.1	1.1	0.87	0.87
P5	Across N approach	121	11.7	LOS B	0.2	0.2	0.44	0.44
P7	Across W approach	193	46.8	LOS E	0.6	0.6	0.88	0.88
All Pedestrians		760	37.0	LOS D			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: City Road/ Fisher Road/
Butlin Avenue - PM Peak - Existing

City Road/ Fisher Road/ Butlin Avenue

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

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Butlin Avenue											
1	L	122	0.0	0.724	38.0	LOS C	5.5	38.7	0.73	0.84	18.4
2	T	122	1.7	0.256	38.8	LOS C	5.7	40.7	0.84	0.68	16.3
3	R	142	0.7	0.550	48.3	LOS D	7.5	52.6	0.93	0.79	16.9
Approach		386	0.8	0.724	42.0	LOS C	7.5	52.6	0.84	0.77	17.2
East: City Road											
4	L	180	0.0	0.738	35.1	LOS C	6.1	42.9	0.72	0.84	29.5
5	T	1307	4.7	0.626	2.1	LOS A	4.7	33.9	0.13	0.12	56.0
Approach		1487	4.1	0.738	6.1	LOS A	6.1	42.9	0.20	0.21	51.1
North: Fisher Road											
7	L	39	2.7	0.270	39.8	LOS C	1.7	12.4	0.80	0.67	18.1
8	T	72	1.5	0.244	40.5	LOS C	4.5	32.1	0.85	0.68	17.3
9	R	23	0.0	0.244	43.1	LOS D	4.5	32.1	0.85	0.73	17.7
Approach		134	1.6	0.270	40.8	LOS C	4.5	32.1	0.84	0.69	17.6
West: City Road											
10	L	38	0.0	0.029	9.0	LOS A	0.1	0.7	0.09	0.69	49.5
11	T	1145	3.3	0.462	1.5	LOS A	2.9	21.1	0.10	0.09	57.1
12	R	129	0.0	0.550	29.5	LOS C	6.5	45.7	0.89	0.86	32.2
Approach		1313	2.9	0.550	4.5	LOS A	6.5	45.7	0.17	0.18	53.3
All Vehicles		3320	3.1	0.738	11.1	LOS A	7.5	52.6	0.29	0.28	39.8

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	218	17.1	LOS B	0.4	0.4	0.53	0.53
P3	Across E approach	1120	45.1	LOS E	3.3	3.3	0.87	0.87
P5	Across N approach	294	11.7	LOS B	0.4	0.4	0.44	0.44
P7	Across W approach	501	46.8	LOS E	1.5	1.5	0.88	0.88
All Pedestrians		2133	38.0	LOS D			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: City Road/ Barff Road - AM
Peak - Post Development

City Road - Barff Road
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: City Road											
11	T	951	7.0	0.357	1.2	LOS A	2.1	15.3	0.08	0.07	57.7
Approach		951	7.0	0.357	1.2	LOS A	2.1	15.3	0.08	0.07	57.7
North: Barff Road											
1	L	5	20.0	0.054	47.1	LOS D	0.3	2.1	0.85	0.62	17.1
3	R	4	0.0	0.013	46.6	LOS D	0.2	1.4	0.85	0.62	17.1
Approach		9	11.1	0.054	46.9	LOS D	0.3	2.1	0.85	0.62	17.1
West: City Road											
4	L	65	0.0	0.077	9.1	LOS A	0.2	1.4	0.11	0.69	49.4
5	T	2051	6.3	0.767	2.0	LOS A	10.9	80.1	0.20	0.19	55.9
Approach		2116	6.1	0.767	2.2	LOS A	10.9	80.1	0.20	0.20	55.7
All Vehicles		3076	6.4	0.767	2.0	LOS A	10.9	80.1	0.16	0.16	55.9

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P7	Across E approach	72	51.3	LOS E	0.2	0.2	0.93	0.93
P1	Across N approach	77	6.7	LOS A	0.1	0.1	0.33	0.33
P3	Across W approach	72	51.3	LOS E	0.2	0.2	0.93	0.93
All Pedestrians		221	35.8	LOS D			0.72	0.72

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: City Road/ Barff Road - PM
Peak - Post Development

City Road - Barff Road
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: City Road											
11	T	1536	4.2	0.567	1.5	LOS A	4.8	34.6	0.12	0.11	57.0
Approach		1536	4.2	0.567	1.5	LOS A	4.8	34.6	0.12	0.11	57.0
North: Barff Road											
1	L	26	4.0	0.241	47.8	LOS D	1.3	9.4	0.87	0.68	17.0
3	R	35	0.0	0.109	48.0	LOS D	1.7	12.0	0.87	0.70	16.9
Approach		61	1.7	0.241	47.9	LOS D	1.7	12.0	0.87	0.69	17.0
West: City Road											
4	L	29	3.6	0.036	9.2	LOS A	0.1	0.6	0.11	0.69	49.4
5	T	1394	3.1	0.511	1.4	LOS A	3.9	27.9	0.11	0.10	57.2
Approach		1423	3.1	0.511	1.5	LOS A	3.9	27.9	0.11	0.11	57.1
All Vehicles		3020	3.6	0.567	2.4	LOS A	4.8	34.6	0.13	0.12	54.5

Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P7	Across E approach	112	51.3	LOS E	0.4	0.4	0.93	0.93
P1	Across N approach	177	6.7	LOS A	0.2	0.2	0.33	0.33
P3	Across W approach	72	51.3	LOS E	0.2	0.2	0.93	0.93
All Pedestrians		361	29.4	LOS C			0.63	0.63

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: City Road/ Fisher Road/
Butlin Avenue - AM Peak- Post
Development - 120s

City Road/ Fisher Road/ Butlin Avenue

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

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Butlin Avenue											
1	L	79	5.3	0.550	39.3	LOS C	3.5	25.9	0.81	0.70	18.2
2	T	1	2.0	0.003	44.1	LOS D	0.1	0.4	0.85	0.51	15.6
3	R	132	4.8	0.524	52.3	LOS D	7.1	51.6	0.95	0.78	16.4
Approach		212	5.0	0.550	47.4	LOS D	7.1	51.6	0.89	0.75	17.0
East: City Road											
4	L	137	3.8	0.481	18.1	LOS B	3.0	21.4	0.44	0.74	40.2
5	T	777	7.6	0.330	1.4	LOS A	1.6	12.1	0.08	0.07	57.3
Approach		914	7.0	0.481	3.9	LOS A	3.0	21.4	0.13	0.17	54.3
West: City Road											
11	T	1889	6.4	0.691	1.6	LOS A	7.9	58.2	0.16	0.15	56.6
12	R	119	6.2	0.454	18.6	LOS B	3.8	28.3	0.59	0.79	39.7
Approach		2008	6.3	0.691	2.6	LOS A	7.9	58.2	0.18	0.19	55.4
All Vehicles		3134	6.5	0.691	6.0	LOS A	7.9	58.2	0.22	0.22	47.8

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	86	12.2	LOS B	0.1	0.1	0.45	0.45
P3	Across E approach	360	51.3	LOS E	1.1	1.1	0.93	0.93
P5	Across N approach	121	5.1	LOS A	0.1	0.1	0.29	0.29
P7	Across W approach	193	54.2	LOS E	0.6	0.6	0.95	0.95
All Pedestrians		760	40.3	LOS E			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Processed: Friday, 11 March 2016 4:51:05 PM

SIDRA INTERSECTION 5.1.13.2093

Project: P:\15S1300-1399\15S1373000 SYD Uni Bld F07 Carslaw Extension,F23 Admin Bld\Modelling
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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: City Road/ Fisher Road/
Butlin Avenue - PM Peak - Post
Development - 120s

City Road/ Fisher Road/ Butlin Avenue

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

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Butlin Avenue											
1	L	147	0.0	0.985	47.7	LOS D	7.0	49.0	0.96	0.80	17.0
2	T	1	2.9	0.003	44.1	LOS D	0.1	0.4	0.85	0.51	15.6
3	R	167	0.6	0.645	53.6	LOS D	9.2	65.0	0.97	0.82	16.3
Approach		316	0.3	0.985	50.8	LOS D	9.2	65.0	0.97	0.81	16.6
East: City Road											
4	L	180	0.0	0.613	20.8	LOS B	4.0	28.0	0.58	0.76	37.9
5	T	1307	4.7	0.546	1.7	LOS A	3.9	28.4	0.11	0.10	56.7
Approach		1487	4.1	0.613	4.0	LOS A	4.0	28.4	0.17	0.18	53.9
West: City Road											
11	T	1178	3.2	0.422	1.2	LOS A	2.8	20.2	0.09	0.08	57.7
12	R	129	0.0	0.523	21.5	LOS B	5.4	37.5	0.74	0.83	37.3
Approach		1307	2.9	0.523	3.2	LOS A	5.4	37.5	0.15	0.16	55.0
All Vehicles		3111	3.2	0.985	8.4	LOS A	9.2	65.0	0.24	0.23	44.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

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

SIDRA Standard Delay Model used.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	Across S approach	218	12.2	LOS B	0.3	0.3	0.45	0.45
P3	Across E approach	1120	51.3	LOS E	3.5	3.5	0.93	0.93
P5	Across N approach	294	5.1	LOS A	0.3	0.3	0.29	0.29
P7	Across W approach	501	54.2	LOS E	1.6	1.6	0.95	0.95
All Pedestrians		2133	41.6	LOS E			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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SIDRA INTERSECTION 5.1.13.2093

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: City Road/ Fisher Road - AM
Peak - Post Development

Three-way intersection with 2-lane major road (Stop control)
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h	
North: Fisher Road												
1	L	35	3.0	0.430	63.9	LOS E	1.3	9.5	0.96	1.09	15.3	
Approach		35	3.0	0.430	63.9	LOS E	1.3	9.5	0.96	1.09	15.3	
West: City Road												
4	L	53	4.3	0.029	8.9	LOS A	0.0	0.0	0.00	0.68	50.0	
5	T	1862	6.4	0.497	0.0	LOS A	0.0	0.0	0.00	0.00	60.0	
Approach		1915	6.4	0.497	0.2	NA	0.0	0.0	0.00	0.02	59.7	
All Vehicles		1949	6.3	0.497	1.4	NA	1.3	9.5	0.02	0.04	56.8	

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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SIDRA INTERSECTION 5.1.13.2093

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SIDRA
INTERSECTION

MOVEMENT SUMMARY

Site: City Road/ Fisher Road - PM
Peak - Post Development

Three-way intersection with 2-lane major road (Stop control)
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
North: Fisher Road											
1	L	57	3.7	0.204	19.7	LOS B	0.7	5.0	0.81	1.02	22.1
Approach		57	3.7	0.204	19.7	LOS B	0.7	5.0	0.81	1.02	22.1
West: City Road											
4	L	94	4.8	0.052	8.9	LOS A	0.0	0.0	0.00	0.68	50.0
5	T	1145	3.3	0.300	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1239	3.4	0.300	0.7	NA	0.0	0.0	0.00	0.05	59.2
All Vehicles		1296	3.4	0.300	1.5	NA	0.7	5.0	0.04	0.09	55.1

Level of Service (LOS) Method: Delay (RTA NSW).

Vehicle movement LOS values are based on average delay per movement

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model used.

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SIDRA
INTERSECTION

Appendix B

Loading Bay Access & Car Park

PLOTTED BY: \$USER\$ AT \$DATE\$ \$FILES

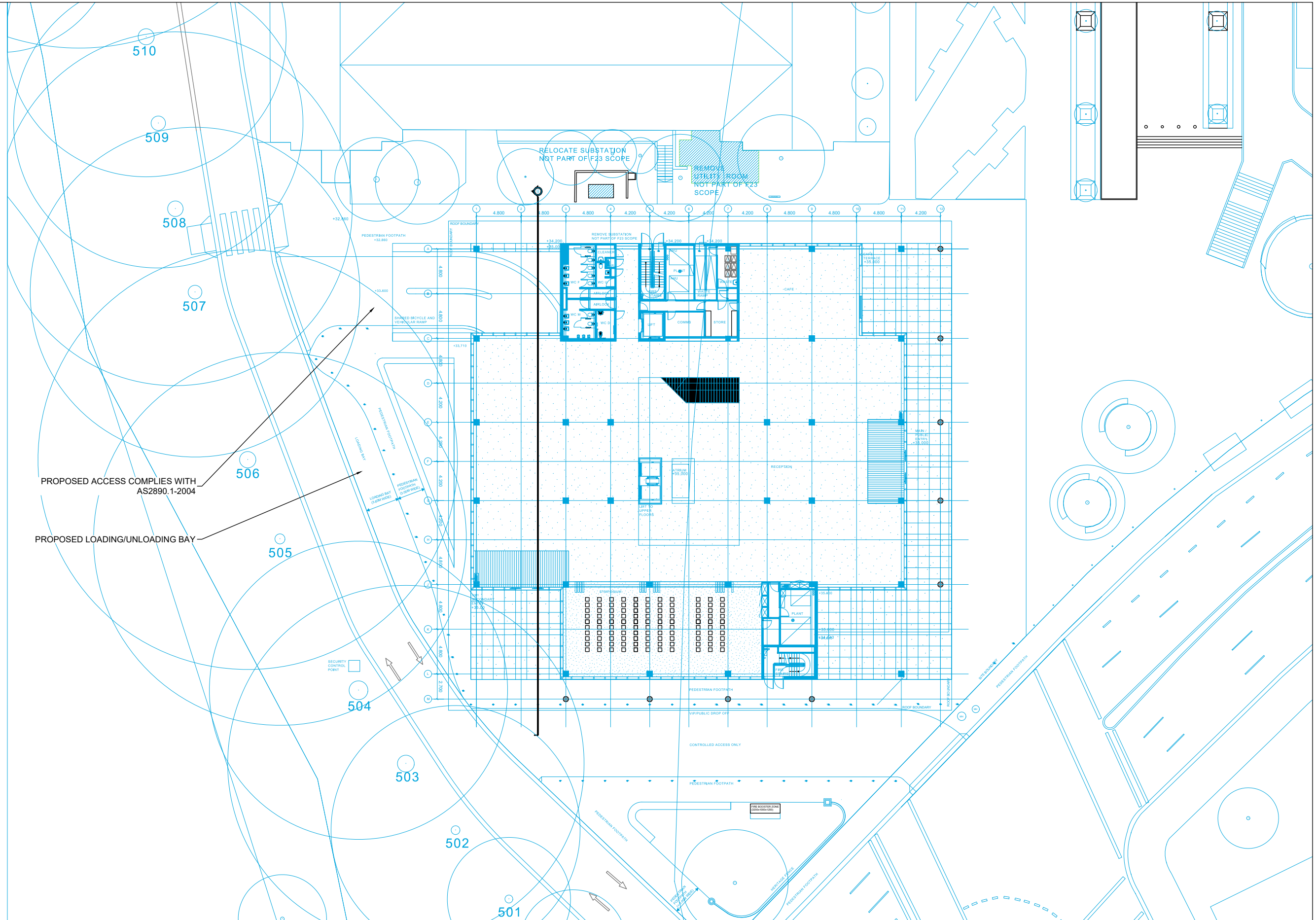
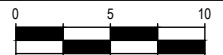
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Brisbane 07 3113 5000
Canberra 02 6243 9400
Adelaide 08 8334 3600
Gold Coast 07 5510 4814
Townsville 07 4722 2765
Perth 08 6316 4634



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

USYD F23 ADMIN BLDG-ACCESS STRATEGY
GROUND FLOOR
CAR PARK COMPLIANCE REVIEW

DATE: 05.04.2016 SCALE: 1:400@A3
APPROVED: KJH DRAWING NO. 16S1133200-01-01-P1 SHEET: 01 OF 07



PLOTTED BY : \$USER\$
ON \$DATES AT \$TIMES \$FILES

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Canberra 02 6243 9400
Adelaide 08 8334 3600
Gold Coast 07 5510 4814
Townsville 07 4722 2765
Perth 08 6316 4634



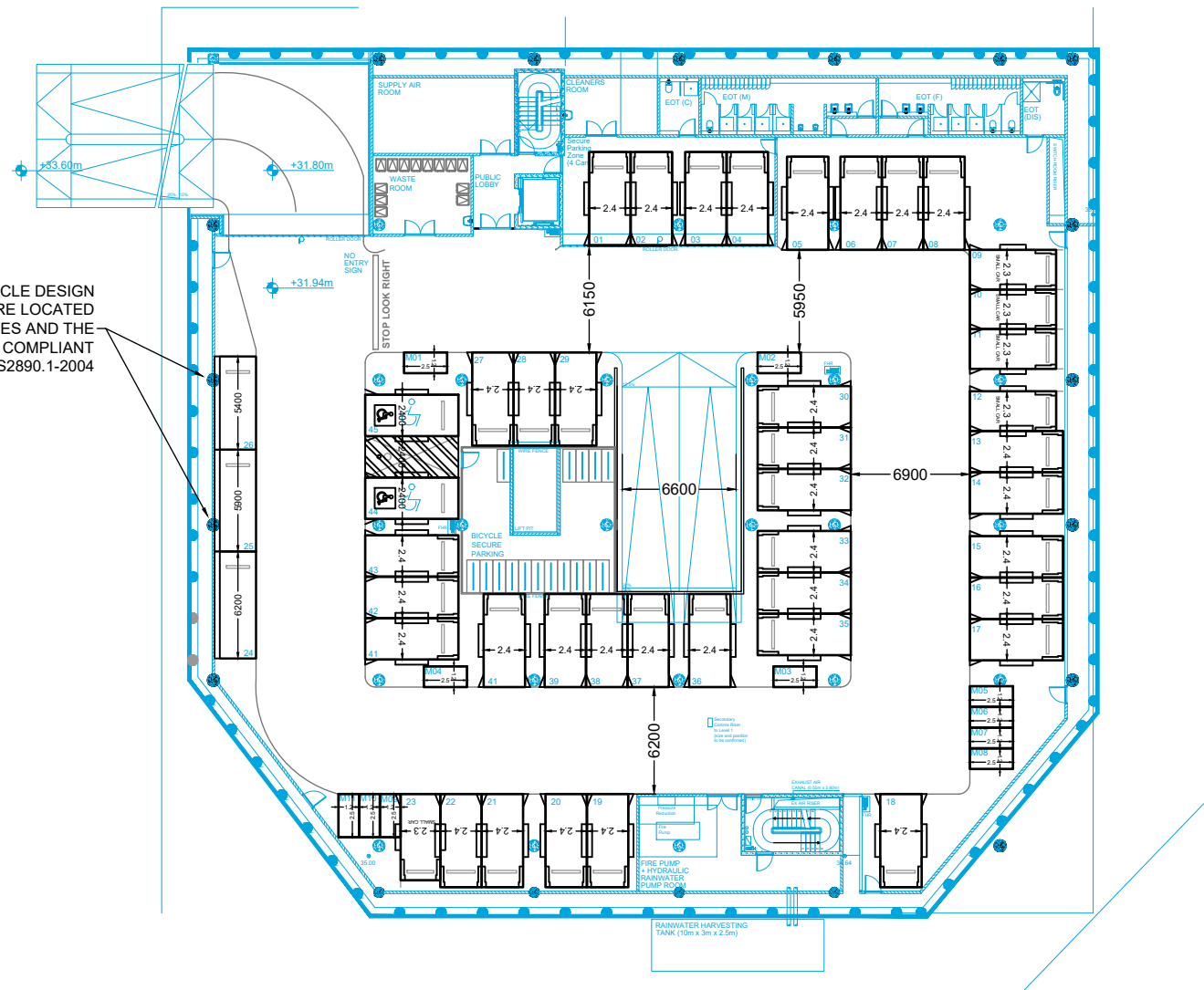
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

IDENTIFY AND LINEMARK SMALL CAR SPACES

MINIMUM HEIGHT CLEARANCE OF 2200mm (TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE CIRCULATION AND PARKING SPACES

MINIMUM HEIGHT CLEARANCE OF 2500mm (TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE DISABLED PARKING SPACES

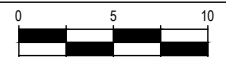
COLUMNS INTRUDE INTO VEHICLE DESIGN ENVELOPE. HOWEVER, THEY ARE LOCATED OUTSIDE DOOR OPENING ZONES AND THE SPACES ARE CONSIDERED COMPLIANT WITH THE INTENT OF AS2890.1-2004



USYD F23 ADMIN BLDG-ACCESS STRATEGY
BASEMENT LEVEL 1
CAR PARK COMPLIANCE REVIEW

DATE:
05.04.16

SCALE:
1:400@A3

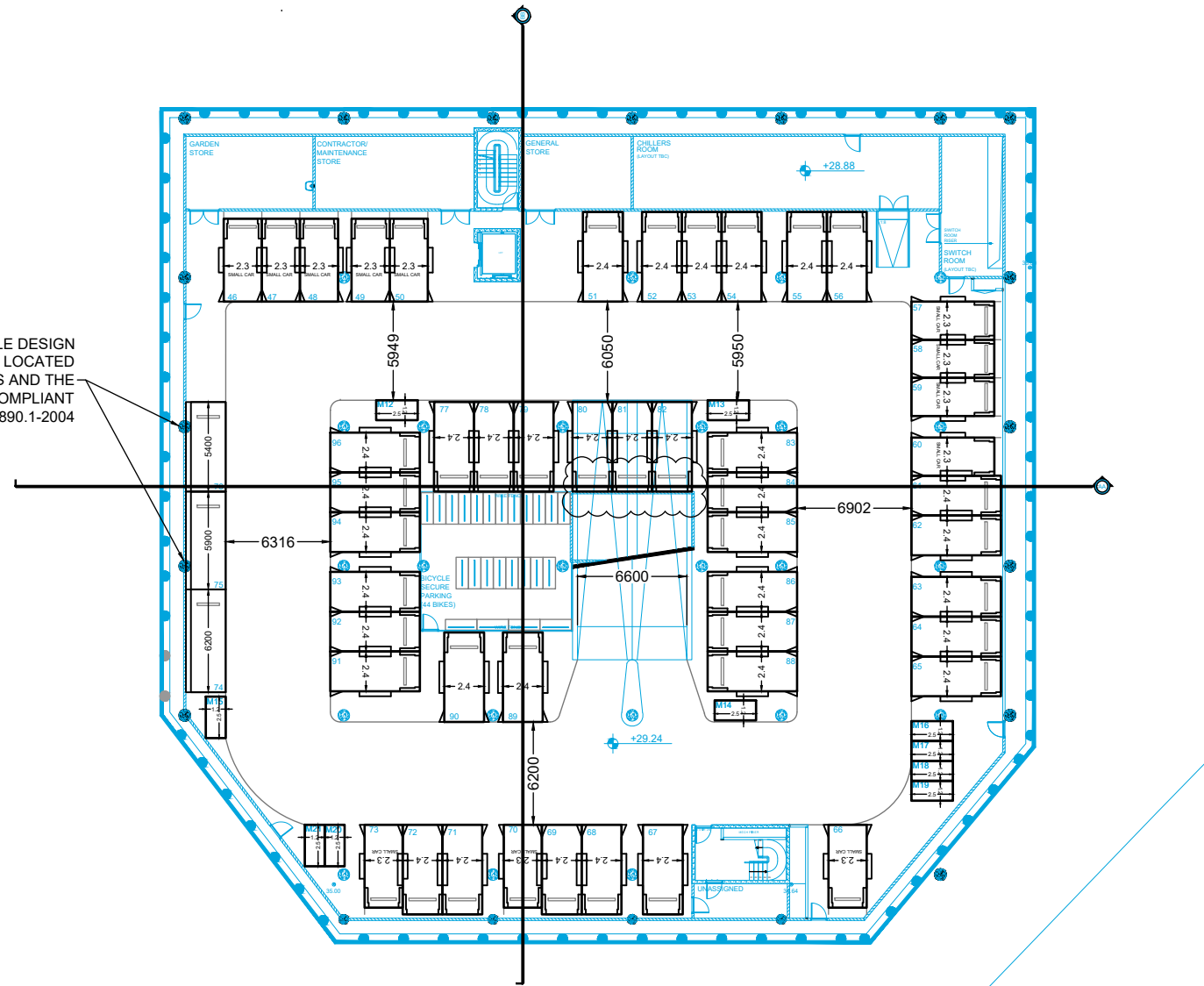


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KJH

DRAWING NO.
16S1133200-01-02-P2

SHEET:
02 OF 07

COLUMNS INTRUDE INTO VEHICLE DESIGN ENVELOPE. HOWEVER, THEY ARE LOCATED OUTSIDE DOOR OPENING ZONES AND THE SPACES ARE CONSIDERED COMPLIANT WITH THE INTENT OF AS2890.1-2004



IDENTIFY AND LINEMARK SMALL CAR SPACES

MINIMUM HEIGHT CLEARANCE OF 2200mm (TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE CIRCULATION AND PARKING SPACES

MINIMUM HEIGHT CLEARANCE OF 2500mm (TO SERVICES AND STRUCTURE) SHOULD BE PROVIDED ABOVE DISABLED PARKING SPACES

ON \$DATES AT \$TIMES \$FILES \$USERNAMES

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

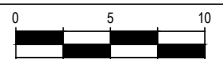


PRELIMINARY PLAN
 FOR DISCUSSION PURPOSES ONLY
 SUBJECT TO CHANGE WITHOUT
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USYD F23 ADMIN BLDG-ACCESS STRATEGY
 BASEMENT LEVEL 2
 CAR PARK COMPLIANCE REVIEW

DATE: 05.04.16

SCALE: 1:400@A3



APPROVED: KJH

DRAWING NO. 16S1133200-01-03-P2

SHEET: 03 OF 07

PLOTTED BY: \$USER\$ AT \$DATE\$ \$FILES\$

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Perth 08 6316 4634

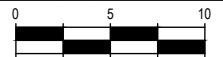


PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

USYD F23 ADMIN BLDG-ACCESS STRATEGY
GROUND FLOOR
B99 SWEEP PATH ASSESSMENT

DATE: 05.04.16

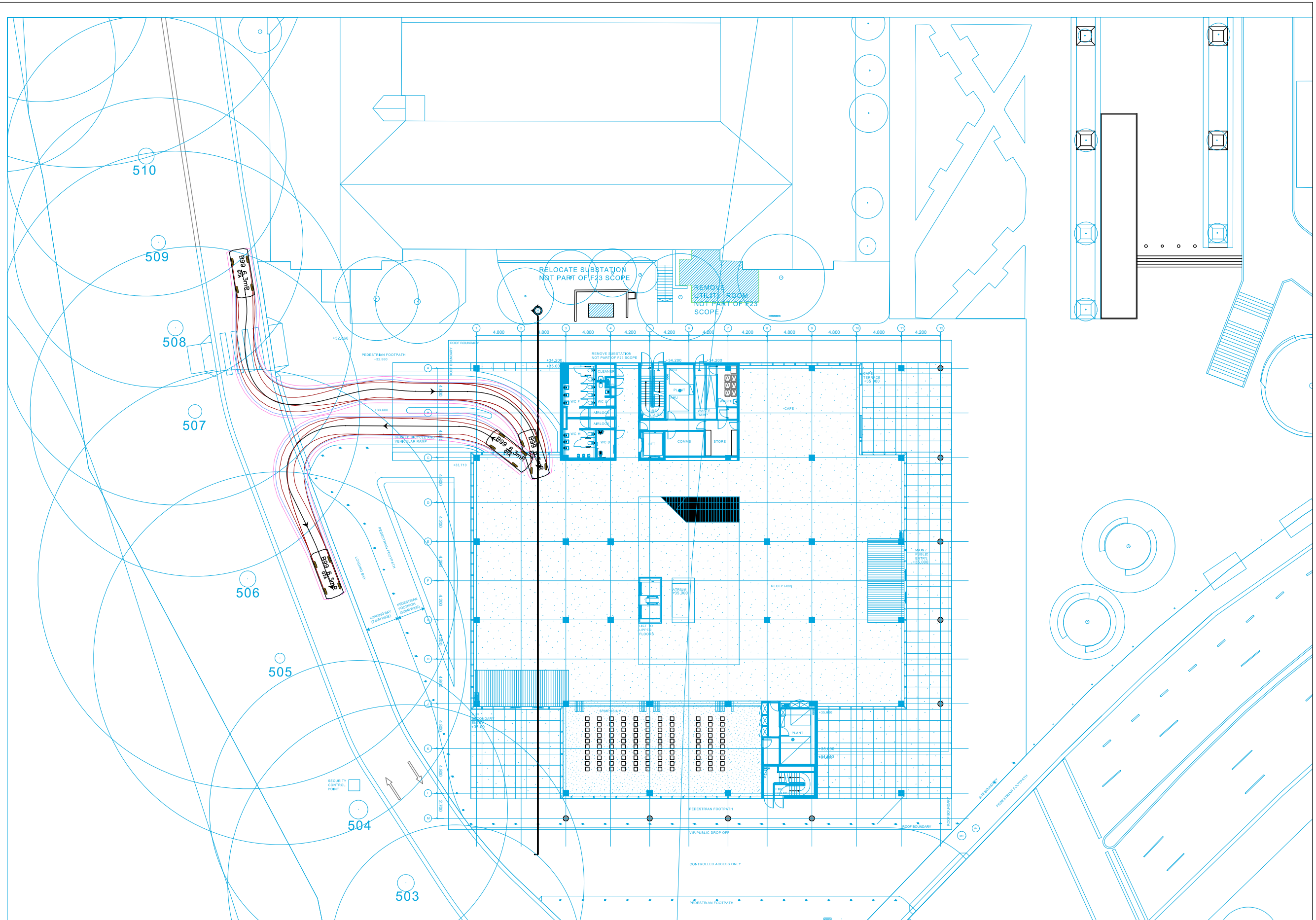
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APPROVED: KJH

DRAWING NO. 16S1133200-04-01-P1

SHEET: 04 OF 07

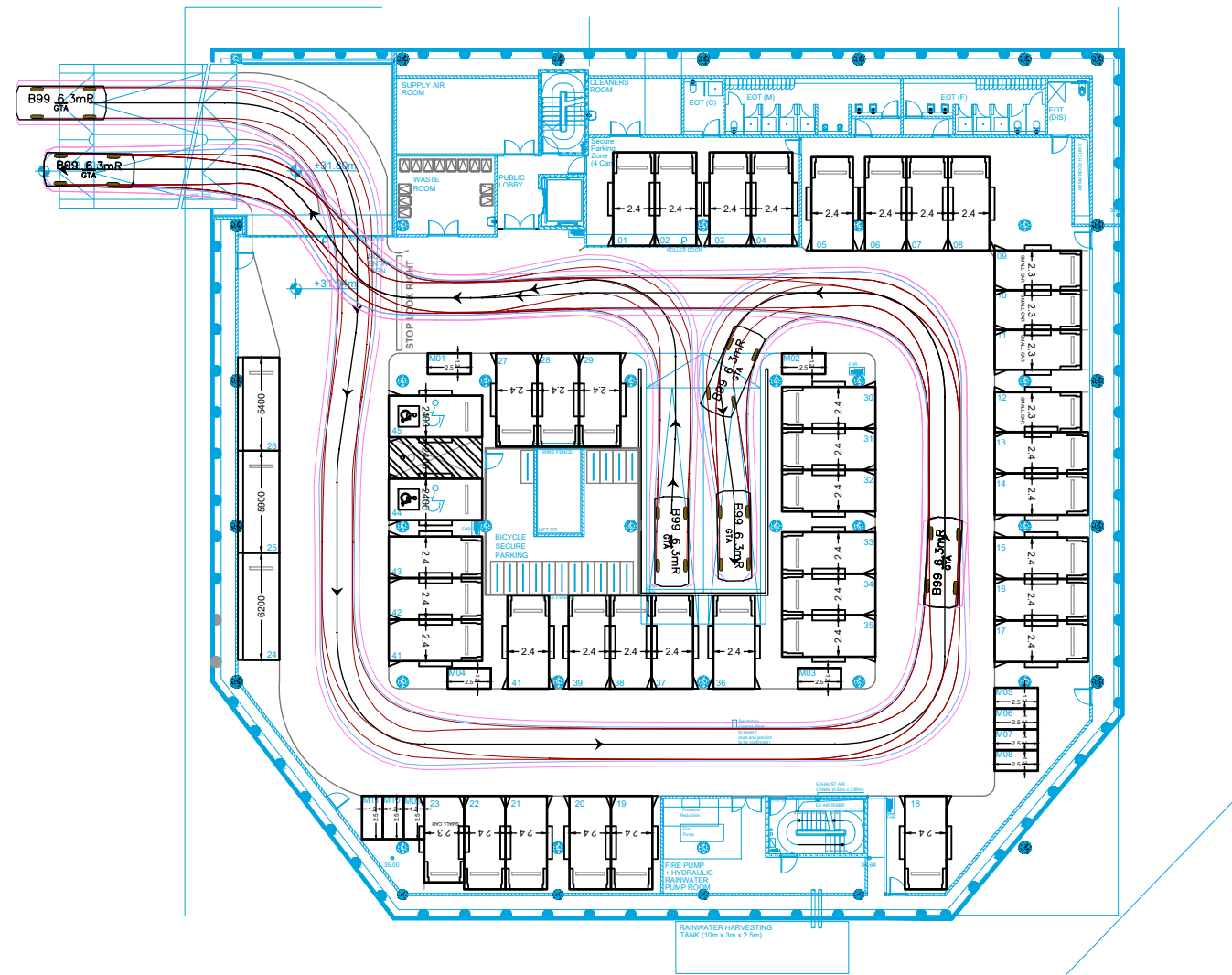


PLOTTED BY: \$USER\$ ON \$DATE\$ AT \$TIME\$ \$FILES

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Perth 08 6316 4634



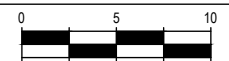
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION



USYD F23 ADMIN BLDG-ACCESS STRATEGY
BASEMENT LEVEL 1
B99 SWEEP PATH ASSESSMENT

DATE: 05.04.16

SCALE: 1:400@A3



APPROVED: KJH

DRAWING NO. 16S1133200-01-05-P2

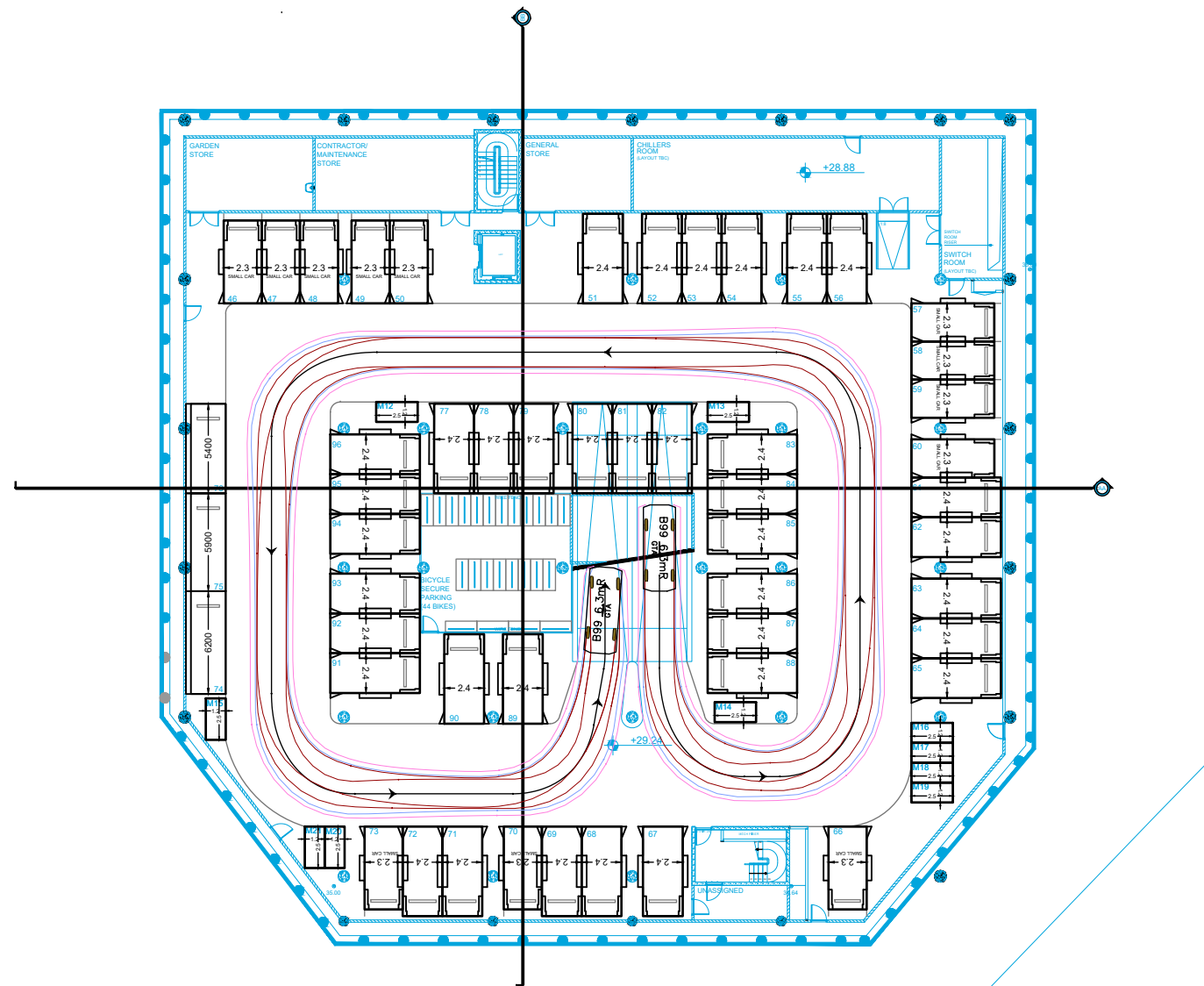
SHEET: 05 OF 07

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Gold Coast 07 5510 4814
Townsville 07 4722 2765
Perth 08 6316 4634



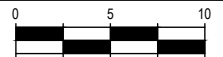
PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION



USYD F23 ADMIN BLDG-ACCESS STRATEGY
BASEMENT LEVEL 2
CAR PARK COMPLIANCE REVIEW

DATE: 05.04.16

SCALE: 1:400@A3



APPROVED: KJH

DRAWING NO. 16S1133200-01-06-P2

SHEET: 06 OF 07

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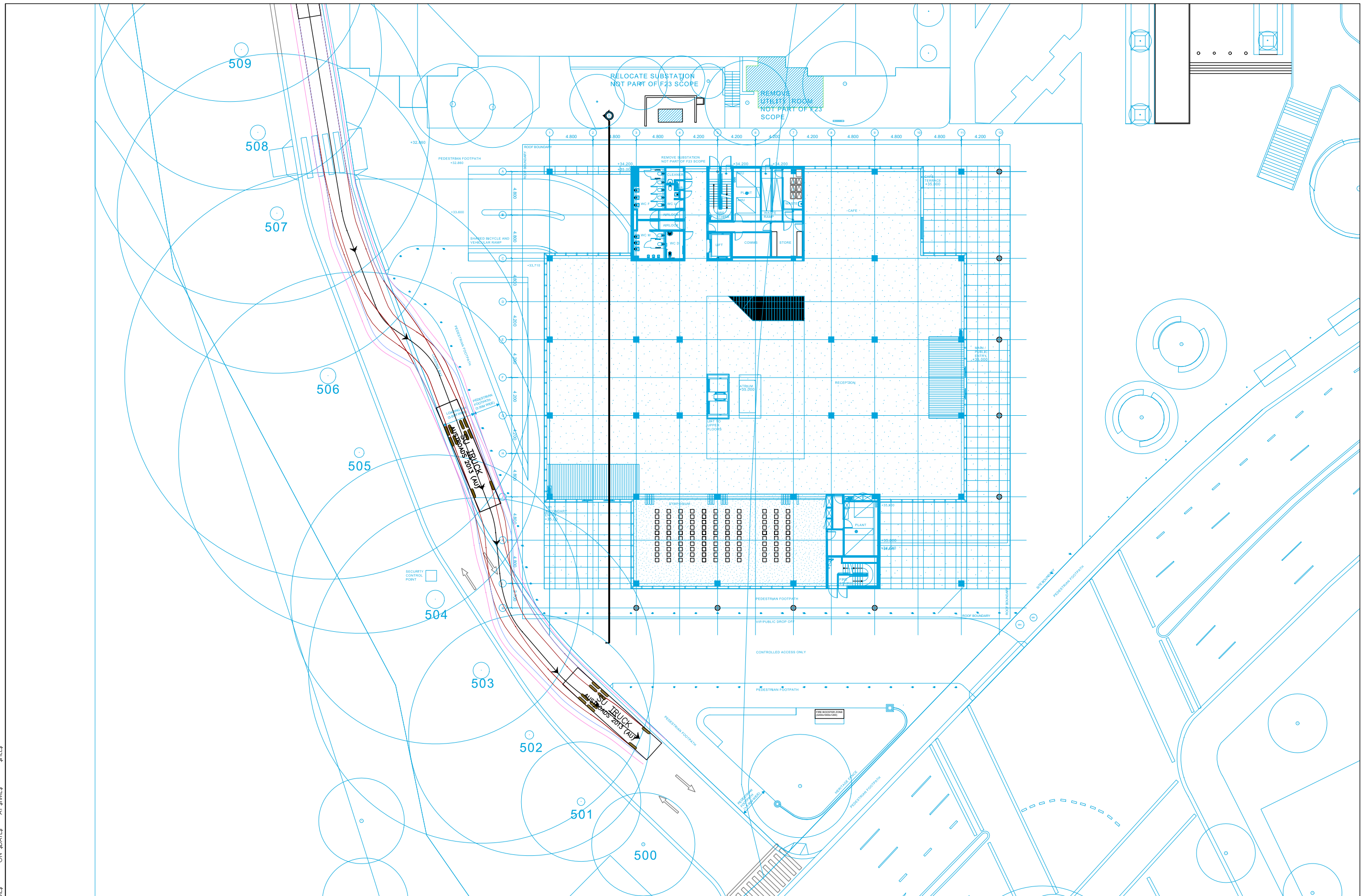
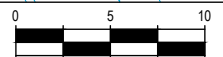
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Brisbane 07 3113 5000
Canberra 02 6243 9400
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Gold Coast 07 5510 4814
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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

USYD F23 ADMIN BLDG-ACCESS STRATEGY
GROUND FLOOR
12.5m LRV SWEPT PATH ASSESSMENT

DATE: 17.03.2016 SCALE: 1:400@A3
APPROVED: KJH DRAWING NO. 16S1133200-07-01-P1 SHEET: 07 OF 07



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