



Hamilton Harbour Transport Impact Assessment

Hamilton Harbour Unit Trust
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Document Issue

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BRISBANE PO Box 555 FORTITUDE VALLEY QLD 4006 AUSTRALIA • T 07 3113 5000 • F 07 3113 5010 • E brisbane@gta.com.au ABN 34 005 839 645

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www.gta.com.au

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1. Introduction

1.1 Background

Planning approval is currently being sought from the Urban Land Development Authority for a proposed mixed use development on land located at Kingsford Smith Drive, Hamilton (the subject site). The subject site is situated within the Northshore Hamilton Urban Development Area (UDA).

In accordance with the vision set for the Northshore Hamilton UDA, development in this area is intended to be based on transit oriented development principles and focussed on reclaiming the river and transforming this industrial area into a vibrant urban community. The aims of the Northshore Hamilton UDA are articulated as the need to facilitate development that will provide and improve access and views to the river, links between Brisbane City and Moreton Bay, useable public open space and vibrant mixed-use community development.

In keeping with the intents set for the Northshore Hamilton UDA, the proposed development incorporates office, retail and residential uses with associated car parking and access.

GTA Consultants was commissioned by Hamilton Harbour Unit Trust in July 2008 to undertake a transport impact assessment of the proposed development.

1.2 Purpose of This Report

This report sets out an assessment of the anticipated parking, traffic and transport implications of the proposed development, including consideration of the following:

- i The existing traffic and parking conditions surrounding the site;
- ii The parking demand likely to be generated by the proposed development;
- iii The suitability of the proposed parking in terms of supply (quantum) and layout;
- iv The servicing requirements of the development and appropriateness of proposed facilities in terms of quantum and accessibility;
- v The suitability of pedestrian and bicycle facilities within the proposed development;
- vi The traffic generation characteristics of the proposed development;
- vii The suitability of proposed access arrangements for the site;
- viii The transport impact of the development proposal on the surrounding road network; and
- ix A preliminary construction management plan, in terms of impact on the surrounding access network.

1.3 Referenced Documents

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

- Brisbane City Council's '*Transport, Access, Parking and Servicing Planning Scheme Policy*' (TAPS Policy);
- Brisbane City Council's '*Transport, Access, Parking and Servicing Code*' (TAPS Code);
- The Roads and Traffic Authority New South Wales (RTANSW), '*A Guide to Traffic Engineering Developments*', October 2002;
- Australian Standard/New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1-2004;
- Australian Standard, Parking Facilities, Part 2: Off-street Commercial Vehicle Facilities;
- '*Guide to Traffic Engineering Practice: Pedestrians*', AUSTRROADS 1995;
- Plans for the proposed development prepared by Cox Rayner Architects dated 29 November 2008;
- Traffic surveys undertaken by GTA Consultants as referenced in the context of this report;
- An inspection of the site and its surrounds;
- '*Northshore Hamilton Urban Development Area draft Development Scheme*', Urban Land Development Authority, dated October 2008; and
- Other documents as nominated.

2. Site Environs

2.1 Subject Site

The subject site is located on Kingsford Smith Drive, Hamilton and is situated some 5-6 km from the Brisbane CBD. The site is bound by Kingsford Smith Drive to the north, Harbour Road to the west, Hercules Street to the south, and a proposed road link to the east.

In March 2008 the subject site became part of the Northshore Hamilton Urban Development Area (UDA). The site is detailed by the Northshore Hamilton Interim Land Use Plan (NHILUP), as Precinct 2(2b) – Waterfront West sub-precinct. The NHILUP states that:

'Precinct 2 is a mixed use area containing residential accommodation (long and short term) and office development. Some small scale retail uses will support the mixed use nature of this precinct, such as restaurants, cafes, taverns, shops and indoor sport and recreation...

Sub-Precinct 2b will contain a mix of residential and office with some ground floor retail serving the daily convenience needs of workers and residents in the development. The ground floor retail will provide an active street frontage to Kingsford Smith Drive and links to sub-precinct 2a.'

The surrounding properties currently include a mix of residential, commercial and industrial uses. To the west of the site there are a number of existing medium to high density residential apartments. Directly north of the site on Kingsford Smith Drive there are a number of residential properties as well as a service station and motel accommodation. The majority of land to the east of the site is included in the Northshore Hamilton UDA and will be redeveloped over time.

The location of the subject site and the surrounding environs is shown in Figure 2.1. Figure 2.2 identifies the subject site in the context of the Northshore Hamilton Development Precincts and Boundary.

Figure 2.1: Subject Site and its Environs (Reproduced with Permission from Brisway Publishing Pty Ltd)

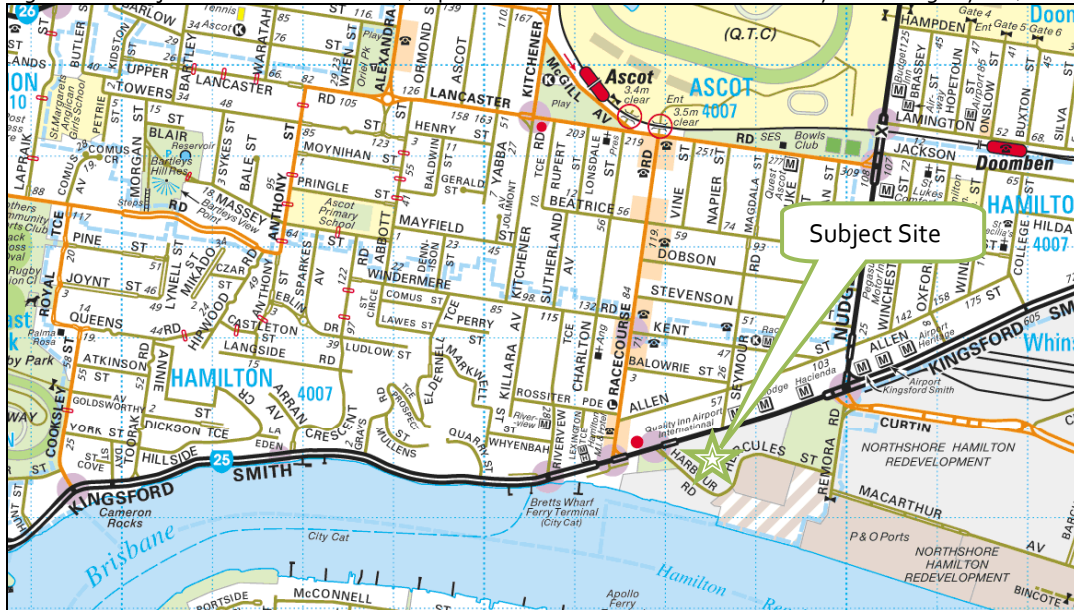
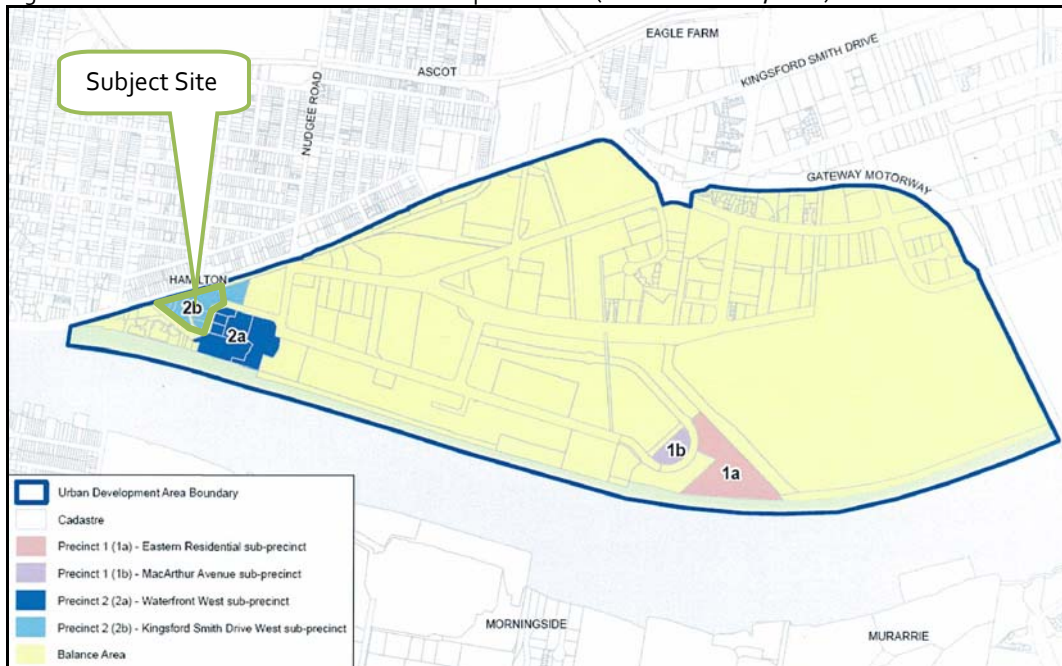


Figure 2.2: Northshore Hamilton Urban Development Area (Source: NHILUP, 2008)



2.2 Road Network

2.2.1 Adjoining Roads

Kingsford Smith Drive

Kingsford Smith Drive is identified by Brisbane City Council as an arterial route. It is aligned in the east-west direction and forms the northern boundary to the subject site. It is a two-way road configured with a four-lane, 15.5 metre wide carriageway set within a 25 metre wide road reserve (approx). Kerbside parking is not permitted.

In 2001, Kingsford Smith Drive carried approximately 31,000-32,000 vehicles per day¹. Kingsford Smith Drive is currently operating close to capacity and is planned to be upgraded to six traffic lanes. It is understood that, with forecast continued traffic growth (in part a result of the Northshore Hamilton UDA), Kingsford Smith Drive will remain capacity constrained in the area.

Harbour Road

Harbour Road is a local road which is generally aligned in an east-west direction. It extends between Kingsford Smith Drive and Hercules Street, forming the western boundary to the subject site. Harbour Road is a two-way road configured with a two-lane, 18 metre wide carriageway set within a 26.5 metre wide road reserve (approx). Unrestricted kerbside parking is permitted on both sides of Harbour Road.

Harbour Road carries approximately 3,600 – 3,650 vehicles per day².

Hercules Street

Hercules Street is a local road and is generally aligned in an east-west direction. It extends between Harbour Road and Remora Road, forming the southern boundary to the subject site. Hercules Street is a two-way road with a single lane in each direction. Unrestricted kerbside parking is permitted on Hercules Street in the vicinity of the subject site, however, to the east of the subject site car parking restrictions apply.

Kingsford Smith Drive, Harbour Road and Hercules Street are shown on Figures 2.3 to 2.8.

Figure 2.3: Kingsford Smith Drive Adjacent to Site (facing east)



Figure 2.4: Kingsford Smith Drive Adjacent to Site (facing west)



¹ Based on peak hour traffic counts undertaken by TTM Consulting in 2001 and assuming a peak-to-daily ratio of 10%.

² Based on peak hour traffic counts undertaken by GTA Consultants in August 2008 and assuming a 10% peak-to-daily ratio.

Figure 2.5: Harbour Road Adjacent to Site (facing north west)



Figure 2.6: Harbour Road Adjacent to Site (facing south east)



Figure 2.7: Hercules Street Adjacent to Site (facing east)



Figure 2.8: Hercules Street Adjacent to Site (facing west)



2.2.2 Surrounding Intersections

The following intersections currently exist in the vicinity of the site:

- Kingsford Smith Drive / Harbour Road (signalised);
- Hercules Street / Remora Road (unsignalised);
- Remora Road / Curtin Avenue (unsignalised); and
- Remora Road / Kingsford Smith Drive (signalised).

2.2.3 Traffic Volumes

GTA Consultants conducted a survey of peak hour traffic volumes on Thursday 28 August 2008, at the intersection of Harbour Road and the access to Brett's Wharf Apartment Complex (including Windermere and Sutherland Tower and Villas, Lancaster Tower). Counts were conducted for the following peak periods:

- 8:00am and 9:00am; and
- 5:00pm and 6:00pm.

The survey results show a low number of vehicles entering and exiting the apartment complex. A total of 44 traffic movements are generated by the apartment complex in the AM peak and 40 movements in the PM peak. The recorded AM and PM peak hour traffic volumes are shown in Figures 2.9 and 2.10, respectively.

Figure 2.9: AM Peak Hour Traffic Volumes at Harbour Road / Apartment Intersection

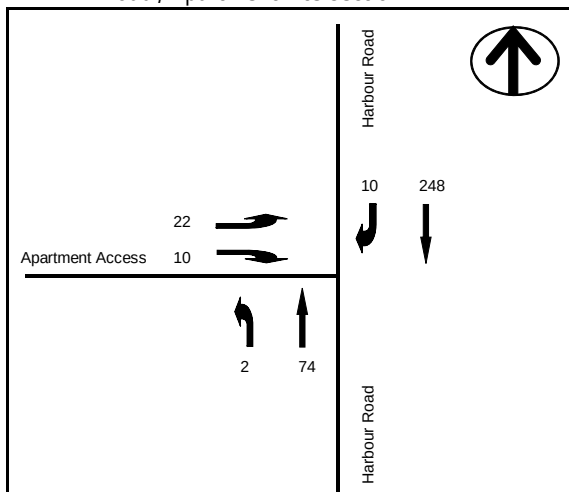
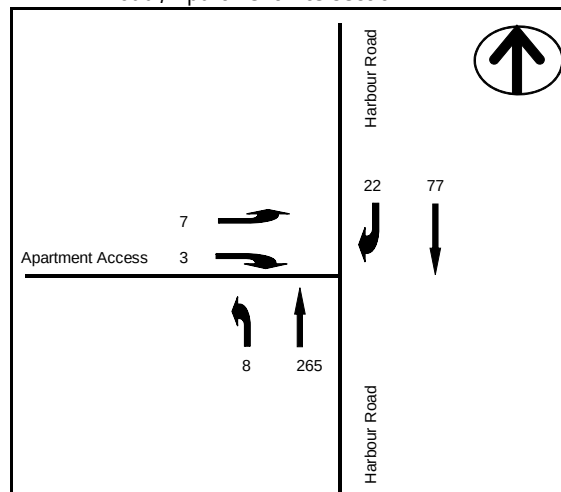


Figure 2.10: PM Peak Hour Traffic Volumes at Harbour Road / Apartment Intersection



2.3 Road Upgrades

It is understood that road works in the vicinity of the subject site are proposed by Brisbane City Council³. These works include upgrades to Kingsford Smith Drive and the construction of a new link road from Kingsford Smith Drive to Hercules Street at the eastern boundary of the site. Each of these upgrades will require land acquisition affecting the subject site.

Council's Concept Design Plan demonstrates the intent to widen Kingsford Smith Drive from four to six lanes, impacting on the northern boundary of the subject site. In addition to increasing the number of lanes, the works will also involve the construction of medians in the Kingsford Smith Road carriageway and localised flaring to provide right turn lanes at all signalised intersections. These works will require an 11.5m widening of the existing carriageway at the north of the subject site.

Improvements to Kingsford Smith Drive in the vicinity of the subject site will also incorporate a reconfiguration of the Kingsford Smith Drive / Harbour Road intersection (located at the north-west corner of the subject site). This will involve the installation of a left turn slip lane into Harbour Road for westbound traffic. There will also be an alteration to the flared lane configuration of Harbour Road at the intersection. The present configuration will be converted to a left turn only bus lane, single left turn lane and single right turn short lane.

Under Council's proposal, Harbour Road and Hercules Street will be upgraded to include a westbound bus lane.

³ As per road network upgrade plans provided to GTA Consultants by John Winkler, Network Information Coordinator at Brisbane City Council, via email on 25 August 2008. The same plan was obtained by Devine Limited at the time an application for Preliminary Approval was lodged with Council.

In addition to the Kingsford Smith Drive upgrades, Council proposes a new link road that will join Kingsford Smith Drive to Hercules Street. This link will require the acquisition of land up to 20m along the site's eastern boundary. At the south-east corner of the subject site, the intersection of the link road and Hercules Street will be restricted to left turns only. The intersection of the new link road and Kingsford Smith Drive is to be signalised.

The proposed road works for Kingsford Smith Drive are shown on the Concept Design Plan (Ref. RPN381) prepared by Council, attached at Appendix A.

2.4 Integrated Transport Infrastructure

2.4.1 Public Transport

A review of public transport currently available in the vicinity of the site is summarised in Table 2.1.

Table 2.1: Summary of Public Transport Services

Service	Route #	Route Description	Distance to Nearest Stop	Frequency On/Off Peak
Bus	300	Toombul to City	200 m	10minutes peak / 20minutes off peak
	302	Pinkenba to City	Adjacent to site	15minutes peak / 30minutes off peak
	303	Myrtletown to Eagle Junction	Adjacent to site	20minutes peak / 35minutes off peak
	305	Hamilton to City	200 m	15minutes peak / 30minutes off peak
Ferry	Bretts Wharf Terminal	Bretts Wharf to UQ	500 m	20minutes peak / off peak
Train	Ascot Station	Ascot Line	1.4 km	30-50 minutes peak / off peak

Future public transport facilities expected to be provided in the vicinity of the subject site are further detailed at Section 5 of this report.

2.4.2 Pedestrian Infrastructure

Formal pedestrian paths are located as follows:

- Both sides of Kingsford Smith Drive;
- The western side of Harbour Road and southern side of Hercules Street; and
- Along the river from Riverview Terrace west towards the City.

In addition, signalised pedestrian crossings are provided at the following locations:

- Harbour Road / Kingsford Smith Drive intersection (southern and eastern legs); and
- Nudgee Road / Kingsford Smith Drive / Remora Road intersection (northern, eastern and southern legs).

3. Development Proposal

3.1 Land Uses

In line with the intent of the NHILUP, the development proposes to include office, residential, retail showroom and café / restaurant uses, within four multi-storey buildings (two commercial, two residential). The development uses and areas are summarised in Table 3.1.

Table 3.1: Development Schedule [1]

Use	Description	Size / Number of
Residential	Studio Apartment	70 Apartments
	1 Bedroom Apartment	126 Apartments
	2 Bedroom Apartment	215 Apartments
	3 Bedroom Apartment	21 Apartments
	TOTAL	432 Apartments
Office	Typical	34,226sq.m GFA
	Strata	609sq.m GFA
Retail	Cafe / Restaurant	112sq.m GFA
	Shop	427sq.m GFA
	Gymnasium	751sq.m GFA
	Showroom	4,096sq.m GFA

[1] As provided by Devine on 5 December 2008 and further clarified via email on 8 December 2008.

Plans detailing the proposed ground plan and basement levels are provided at Appendix B to this report.

3.2 Vehicle Access

The development proposes two access points, one to Harbour Road and a second to Hercules Street from here on referred to as the western access point and eastern access point, respectively.

The eastern site access point is located some 40m from the proposed intersection of Hercules Street with the new link road. It will form a priority controlled intersection with Hercules Street and include a right turn lane of some 15m in length.

The western access point is located some 60m to the south of the Harbour Road / Kingsford Smith Drive intersection, opposite an existing private access. This access point will operate as a two-way road, with full turning movements, controlled by a roundabout style treatment.

3.3 Car Parking

A total of 834 car parking spaces are proposed for the development. This includes 68 spaces at the ground level, 373 spaces at the first level basement and 393 spaces at the second basement.

Of note, the car parking provision includes seven spaces for users with a disability, 86 small car spaces and 148 tandem car spaces (74 tandem pairs).

It is noted that recommendations within this report will result in the provision of 97 small car spaces. This report therefore hereafter refers to a total supply of 97 small car parking spaces.

Further details regarding the parking provision and its suitability is provided at Section 4 of this report.

3.4 Bicycle Facilities

Bicycle facilities are incorporated in the proposed development, with the following provisions:

- 168 resident bicycle spaces at B1;
- 108 secure bicycle parking spaces, 104 lockers and 10 showers at B2 for employee use; and
- Bike rails for 70 bikes for visitors and customers at ground level.

Further details on bicycle end-of-trip facilities are provided at Section 5 of this report.

3.5 Pedestrian Facilities

Pedestrian connections for the site are proposed to Kingsford Smith Drive, Harbour Road and Hercules Street. In addition, pedestrian connections are facilitated within the site adjacent to buildings and dedicated crossing points are proposed within the at-grade car park.

Further details on the suitability of pedestrian provisions is provided at Section 5 of this report.

3.6 Loading Areas

A central loading area with two loading docks is provided at ground level. The loading docks are accessible by vehicles up to and including a 12.5m long large rigid vehicle.

In addition, two car / van spaces are provided within the loading area for use by delivery vehicles.

Further details on the loading provision are provided at Section 6 of this report.

4. Car Parking

4.1 Preamble

According to the vision set for the Northshore Hamilton UDA, development in this area is intended to be based on transit oriented development (TOD) principles. Essentially a TOD is an environmentally responsive approach to development that seeks to create mixed-use, higher density communities in close proximity to public transportation in order to reduce dependency on private vehicle travel. To help facilitate its aim of reduced car travel, two of the key features of a TOD include reduced parking provision and encouragement of alternative transport modes (i.e. other than private car).

In addition to the TOD principles, the restricted capacity of Kingsford Smith Drive contributes to a need to minimise any increase in car travel resulting from the development of the Northshore Hamilton UDA.

4.2 Requirement

The *Northshore Hamilton Urban Development Area draft Development Scheme*, dated October 2008 at Table 1 includes car parking rates to be provided for new developments.

This document includes 'Interim Period' and 'Long Term' car parking rates (i.e. those that could be provided prior to the provision of the first fixed public transport service and those that should be provided once fixed public transport comes on-line). The following provision for car parking in the long term is recommended:

- 1 car space per dwelling, inclusive of visitor demands; and
- 1 car space per 100sq.m GFA of commercial or retail space.

Application of these rates to the proposed development of 432 apartments and 40,221sq.m GFA of commercial / retail space results in 432 resident and 402 commercial / retail spaces, or a total of 834 spaces.

It is understood that the Interim Period car parking rates listed in the *Northshore Hamilton Urban Development Area draft Development Scheme* are for the benefit of developers who are unwilling to construct developments with 'Long Term' car parking rates whilst travel behaviour changes are still being realised. The provision of car parking at the 'Long Term' rates for this development from the outset goes hand-in-hand with the intent to set the correct travel behaviour from day one of the development's operation.

4.3 Appropriateness of Parking Provision

In considering the appropriateness of the car parking provision, it is important to note that car parking demand is, to a large extent, a function of supply. That is, the car parking demands at an unconstrained site will be different (typically higher) in comparison to the demands where there is a limited supply. This is due, in part, to an adaptive change in travel behaviour which occurs by patrons of the associated land uses.

The proposed development provides 834 car parking spaces in accordance with the 'Long Term' rate specified by the *Northshore Hamilton Urban Development draft Proposed Development Scheme*.

It is the Consultant's view that the provision of car parking at this rate is appropriate given the vision set for the Northshore Hamilton UDA.

4.4 Measures to Support Car Parking Limitation Policy

4.4.1 Green Travel Plans

A Green Travel Plan should be a requirement of every business taking occupancy within the development. Such a travel plan should seek to encourage alternate forms of transport to the private car including public transport, car pooling, walk and cycle trips. The plan should detail and promote to employees the available public transport facilities in close proximity of the site.

Consideration could also be given by employers to subsidising, to some degree, public transport trips by employees to encourage a travel mode shift from the private car.

4.4.2 Signage of Public Transport

Wayfinding signage within the proposed development should be provided to highlight the location of nearby public transport facilities. Signage would promote the proximity, regularity and ease of accessibility of public transport and include timetable information and directions to pedestrian routes which lead to public transport facilities.

This signage could be provided on key internal paths and also within foyers of the residential buildings.

4.4.3 Car Sharing Clubs

Car sharing clubs have recently been developed to provide accessibility to a motor car for those who occasionally need to use a vehicle, but do not need a car all the time or cannot afford to own / maintain one.

Car sharing clubs should be encouraged within this development to reduce reliance on motor vehicles and encourage alternate transport methods where appropriate, while also facilitating motor car use when essential.

As one method to support reduced car ownership, a car share scheme could be operated from the site. As such, a number of readily accessible car parking bays could be allocated for this purpose (i.e. two-three bays).

4.4.4 Shuttle Bus

Provision within the site has been made which would allow a shuttle bus to be provided between the site and nearby railway stations. This would be relevant until such time that public transport facilities are provided to Hamilton Northshore.

4.4.5 Pedestrian and Cyclist Facilities

In addition to the above, appropriate and attractive pedestrian and cyclist facilities should be provided. The appropriateness of the currently proposed facilities are discussed in more detail in Section 5 of this report.

4.5 Car Parking Management

4.5.1 External to Site

If the intended reduced car parking demands are not realised, there are a number of additional (reactive) management tools which may need to progress. By way of example, it could be possible for Council to restrict the on-street car parking supply within adjacent residential areas by creating residential permit parking zones, or time-restricting supply such that it is not attractive to users of the development (noting that users of this development should not be capable of qualifying for a parking permit)⁴.

In addition, the possibility exists for the ULDA to secure a central site within the Northshore Hamilton area, which is provided as a public off-street car parking station until such time that future public transport facilities are provided.

4.5.2 Internal to Site

The on-site car parking is to be, for the most part, allocated to specific users. To ensure that the available car parking is appropriately utilised, the following management techniques are recommended:

- To ensure that the ground level car parking is available for visitors to the development, restriction of ground level car parking to 2 hour parking, with the exception of six bays which are to be restricted to 15 minute parking;
- Reservation of Basement 1 level for residents only;
- Reservation of Basement 2 level for residents and employees during typical business hours (7:00am – 7:00pm, Monday to Friday);
- Provision of some 290 spaces at Basement 2 level for public and visitor use after typical business hours, as defined above; and
- Separation of part of the Basement 2 level, which will be maintained at all times for residents and some employees.

⁴ The political viability of such a scheme has not been tested with Council and could be resisted.

As the nominated section of the Basement 2 car parking will be shared between public and employees, an appropriate pricing strategy will be implemented to significantly deter public vehicles from leaving vehicles on-site overnight. The ability to park on-site after typical business hours provides additional parking for retail and restaurant / café uses on the site.

The above management of car parking is considered appropriate.

4.6 Car Parking Layout

The proposed parking layout has been checked against Australian Standard / New Zealand Standard for Off-Street Car Parking (AS/NZS2890.1-2004) and a summary of that review is provided below. This assessment includes a review of the following:

- Space dimensions and aisle widths;
- Dead end aisles;
- Adjacent structures;
- Access and crossover widths;
- Parking for persons with a disability;
- Use of tandem parking;
- Ramp grades and transitions;
- Height clearances; and
- Curved roadway ramp.

The review indicates that, subject to adoption of recommendations contained below and at Appendix C, the car park is expected to operate satisfactorily.

4.6.1 Car Parking Dimensions

The car parking dimensions at the ground level, for 90 degree parking bays, are a minimum of 2.6m wide by 5.4m long with an aisle width of 7.5m. This meets the requirement of AS/NZS 2890.1–2004 for high turnover parking.

A number of parallel parking bays are located in the at-grade car park, these bays are 2.4m wide by 6m long. Given an access aisle of 7.5m (two-way), these spaces meet AS/NZS 2890.1–2004 with regard to width and length.

Typical car parking dimensions on basement levels are 2.5m wide, 5.4m long with 6.2m aisles. This meets the requirements of AS/NZS 2890.1–2004 for medium-term parking. This is appropriate for employee, resident and commercially operated car parking. In addition, AS/NZS2890.1-2004 nominates minimum dimensions for small car bays of 2.3m wide and 5.0m long.

In order for all spaces in the basement car parks to be either 2.5m wide, as above, or 2.3m wide in accordance with the requirements for small car bays, a number of minor modifications are required, these are contained at Appendix C to this report. It is considered that these modifications could be a condition of approval.

4.6.2 Dead End Aisles

There are a number of locations within the basement car parking levels where blind (or dead end) aisles are provided. In this regard, it is noted that car parking within these levels will be allocated to particular users. As such, their use is considered appropriate, subject to deletion of one car parking bay at B1 and reallocation of some bays at Level B2 to smaller car bays as noted at Appendix C.

In areas which will be available to the public on Basement 2, the maximum length of blind aisles will be six car bays in accordance with AS/NZS 2890.1–2004. This will be managed by use of security control boom gates, with a minor amendment to their location as noted at Appendix C.

Adoption of the above would result in an appropriate car parking layout and the recommendations are considered capable of being placed as a condition of approval.

4.6.3 Adjacent Structures

The proposed development has been reviewed in terms of the requirements of AS/NZS 2890.1–2004 with regard to structures adjacent to car bays (including walls and columns). This Standard requires that where a space is impacted by an obstruction adjacent to the space within the door opening clearance, the space is to be widened as follows:

- Where obstructed on one side, the space needs to be widened by 300mm (to minimum 2.7m for a typical low turnover car bay, or 2.6m for a small car bay); and
- Where obstructed on both sides, the space needs to be widened by 600mm (to minimum 3.0m for a typical low turnover car bay, or 2.9m for a small car bay).

A number of spaces are affected, however the majority of which have been appropriately widened. There are a number of further minor amendments required, as noted at Appendix C, which could be a condition of approval.

4.6.4 Motorcycle / Motor Scooter Parking

Brisbane City Council's TAPS Code requires 2% of the total parking provision of car parking to be provided as motorcycle / motor scooter parking. This standard provides a useful guide for this development.

There are several locations marked locations within Basement 2 where motorcycle parking is to be accommodated. Noting that motorcycles can also use typical car parking bays, this is considered appropriate.

4.6.5 Parking for Persons with a Disability

The plans currently show three car parking spaces (4%) of the car parking at ground level and four spaces at Basement 2 (1%) as parking for users with a disability. It is GTA Consultants' opinion that this is an appropriate provision for residents and the commercial users, noting that the disabled car parking can be allocated / titled where there is a need for such parking.

4.6.6 Use of Tandem Parking

The proposed car parking arrangement includes 31 tandem pairs at Basement 1 (62 tandem spaces) and 43 tandem pairs at Basement 2 (86 tandem spaces). Whilst the use of tandem parking is appropriate for residents and employees, it is noted that both of the tandem spaces in a pair need to be assigned to the same unit / tenancy. This means that a number of residential dwellings will be assigned two car parking spaces, with others to be assigned no car space.

4.6.7 Ramp Grades and Transitions

Ramp grades at the ground plane do not exceed 1:25 (5%) which is appropriate for manoeuvring of commercial vehicles (in accordance with AS2890.2-2002) for pedestrians.

The ramps to the basement car parking levels are a maximum of 1:5 (20%) with transitions of a minimum of 2m in length at grades of 1:10 (10%). The length of ramp has correctly been measured as to the inside curve of the ramps. These grades are in accordance with the Australian Standard (AS/NZS2890.1-2004) and are therefore appropriate.

4.6.8 Height Clearances

A minimum height clearance of 2.3m is required within the basement and for any section of roadway leading to a car parking space. The plans indicate that this is achieved within, and on entry to, the basement areas.

4.6.9 Curved Roadway / Ramp

To ensure the curved sections of ramp are in accordance with the Australian Standard (AS/NZS2890.1-2004), recommendations are provided at Appendix C. These modifications are relatively minor and could be a condition of approval.

5. Integrated Transport Infrastructure

5.1 General

Section 2 of this report sets out the existing adjoining public transport facilities. There are numerous plans to upgrade and improve the existing public transport facilities in the vicinity of the site noting that part of the vision of the Northshore Hamilton UDA is to accommodate, promote and optimise use of public transport, walking and cycling. Future plans regarding alternative transport services and facilities are presented below.

5.2 Public Transport

5.2.1 Ferry Services

It is understood that the CityCat ferry terminal is proposed to be relocated from its present location to the end of Racecourse Road, bringing it to within 300m of the site⁵. In addition, the establishment of a new ferry stop is understood to be proposed at the centre of Hamilton Northshore⁶.

5.2.2 Bus Services

High quality bus based public transport facilities are proposed in close proximity to the development. These facilities will include an “interchange” or “terminal” like node, i.e. a higher quality facility than a “bus stop”. In particular a bus terminal is proposed adjacent to the site in the new road link and in Harbour Road providing more direct and convenient access to bus services⁷.

Furthermore, it is understood that in previous discussions Queensland Transport has advised that as demand increases, more services will be brought on-line. One suggestion has been the potential to extend the current service between Racecourse Road and the City to service the site⁸. It is also understood that the ULDA is in discussions with Queensland Transport regarding the future form of mass transit in the area.

5.2.3 On-Site Facilities

The development has been designed to accommodate a potential shuttle bus service to the nearby Doomben or Ascot railway stations.

⁵ Information provided to GTA Consultants by Devine Limited, understood to be based on previous discussions between the project team, Brisbane City Council and Queensland Transport.

⁶ As above.

⁷ As above.

⁸ As above.

5.3 Pedestrian Infrastructure

The internal layout of the site is designed to primarily accommodate the needs of pedestrians, with connectivity proposed to the Hamilton Northshore area. Within the site, pedestrian connectivity is achieved by pedestrian paths along both sides of the internal roadway at the building line, in addition to pedestrian crossings of the internal roadway at key locations.

Pedestrian paths are a minimum of 1.8m wide to cater for predicted pedestrian demands. The requirements of AUSTROADS Part 13 (Pedestrians) for pedestrian facilities are as follows:

- Preferred minimum width: 2.4m; and
- Absolute minimum width: 1.8m.

As such, the provisions are appropriate. The internal pedestrian paths connect the site to Harbour Road and Hercules Street.

In addition to the above and the existing signalised pedestrian crossing locations in the vicinity of the site, signalised pedestrian crossings will be provided at the intersections of:

- Kingsford Smith Drive with the new link road; and
- The new link road and Hercules Street.

These facilities will provide further opportunities for pedestrians to cross key roads in the vicinity of the site and maintain safe connectivity to surrounding public transport opportunities and nearby parklands.

For persons accessing the residential lift core from the Basement 1 car park, these people are required to cross the vehicle access ramp. The design of this crossing has considered the sight lines available for pedestrians and is considered appropriate, noting that there is an appropriate area for a vehicle to prop on a flat gradient to allow a pedestrian to cross the ramp.

Furthermore, the preferred and recommended pedestrian route through the site is on the northern side of the internal street. As such, the addition of a pedestrian crossing at the basement entrance's intersection with the internal street is not required.

In summary, noting that pedestrians could cross at any location and low vehicle speeds anticipated on the internal street, the crossing provisions within the site represent logical desire lines and conflict points have been appropriately addressed.

5.4 Bicycle Infrastructure

5.4.1 End of Trip Requirements

The *Northshore Hamilton Urban Development Area draft Development Scheme* sets targets for bicycle provision. In this instance, however, guidance on the appropriate provision of bicycle end-of-trip facilities has been sourced from Brisbane City Council's (BCC's) *Transport, Access, Parking and Servicing Code* (TAPS Code). Performance Criteria P10 and P11 of this document detail the bicycle end-of-trip facilities recommended for new developments.

There is no statutory requirement to provide bicycle facilities for a residential uses based on BCC's TAPS Code. The TAPS Code does, however, require shop or office developments with a GFA over 2,500sq.m provide adequate bicycle parking, shower cubicles and lockers.

Table 5.1 sets out the required facilities for cyclists associated with the proposed development, based on reference to the TAPS Code at Acceptable Solutions A11.1 – 11.3.

Table 5.1: Bicycle Parking Requirements (based on P11 of BCC's TAPS Code)

Use	Size	Rate of Requirement		Calculated Requirement	
		Employee	Visitor / Customer	Employee	Visitor / Customer
Residential	432 Apartments	None	None	None	None
Office	34,835sq.m	1 space / 500sq.m GFA	1 space / 750sq.m GFA	70 spaces	47 spaces
Shop / Gym	5,386sq.m [2]	1 space / 500sq.m GFA	1 space / 500sq.m GFA [1]	11 spaces	11 spaces
Total				81 spaces	58 spaces

[1] With a minimum of 10 spaces.

[2] Includes restaurant area.

Table 5.1 indicates that the proposed development requires a provision of:

- 81 employee bicycle spaces; and
- 58 visitor / customer bicycle spaces.

Further to the above, Chapter 5 of the Brisbane City Plan requires the provision of 1 storage locker per two employee bicycle spaces and one shower cubicle (with change room) per 10 bicycle spaces for employees of an office or shop. This equates to a requirement of some 40 lockers and eight shower cubicles for the proposed development.

The bicycle end-of-trip requirements summarised above were viewed as a minimum in this instance, noting that the provision of bicycle facilities could assist in reducing car parking demands generated by the site.

5.4.2 Connection to the External Network

Within the development, access to the bicycle facilities is proposed as follows:

- Employees will catch the lift from the ground level to the Basement 2 level for access to the bicycle end-of-trip facilities;
- Residents will catch the lift from the lobby of their building to the Basement 1 level for access to the bicycle parking facilities; and
- Visitors will access the bicycle rails provided at ground level.

5.4.3 Suitability of Provision for Cyclists

The current provision for bicycles shown on the plans include:

- 168 resident bicycle spaces (approximately 2 spaces for every 5 apartments) at B1;
- 108 secure bicycle parking spaces, 104 lockers and 10 showers at B2 level for employee use; and
- 70 at-grade visitor bicycle parking rails.

The proposed bicycle end-of-trip provisions appropriately exceeds the minimum required by the TAPS Code.

The proposed provision of bicycle end-of-trip facilities for the commercial development has also been set in consideration of the Green Star building rating points. In this regard, one point can be awarded where the following is provided:

- Secure bicycle storage for 5% of building staff (based on one person per 15sq.m of NLA);
- Accessible showers (based on one per 10 bicycle spaces provided or part thereof);
- Changing facilities adjacent to showers; and
- One secure locker per bicycle space in the changing facilities.

In the case of this development, the applicable NLA has been calculated based on the NLA being 90% of the GFA. Given this assumption, the development has an estimated NLA of 31,352sq.m (i.e. on the basis of 34,835sq.m GFA).

Based on the above Green Star rating criteria, a NLA of 31,352sq.m requires the provision of 105 bicycle spaces to earn one building point. The proposed provision of 108 secure bicycle spaces exceeds this Green Star measure.

The security of resident bicycle spaces will be ensured by secure entry arrangements and other safety measures planned for access from the parking areas to the residential lift entry.

5.4.4 Cyclist Parking Design

The secure bicycle spaces at Basement 2 have been designed as '*Ned Kelly bicycle parking rails*' in accordance with '*The Bicycle Parking Handbook*' produced by Bicycle Victoria. Given that Bicycle Victoria is regarded as an expert authority in bicycle infrastructure and facilities, adoption of this bicycle storage design is considered a suitable alternative to the relevant Australian Standard.

6. Loading Facilities

6.1 Requirements

To determine the likely loading demand of the proposed development, considering its mix of retail and commercial uses, surveys were undertaken at a similar development known as Freshwater Place in Southbank, Melbourne.

In selecting a comparable facility for surveying the anticipated loading requirements, a Brisbane based development of a similar development mix, intensity and location to that of the proposed development could not be found. As such, the most comparable development known to GTA Consultants was in Melbourne. For this reason, Freshwater Place was selected as a reference for the purpose of determining loading facility requirements for Hamilton Harbour, which is considered appropriate.

The Freshwater Place development includes the following uses:

- 55,000sq.m of office development;
- 3,500sq.m of retail uses; and
- 530 residential units.

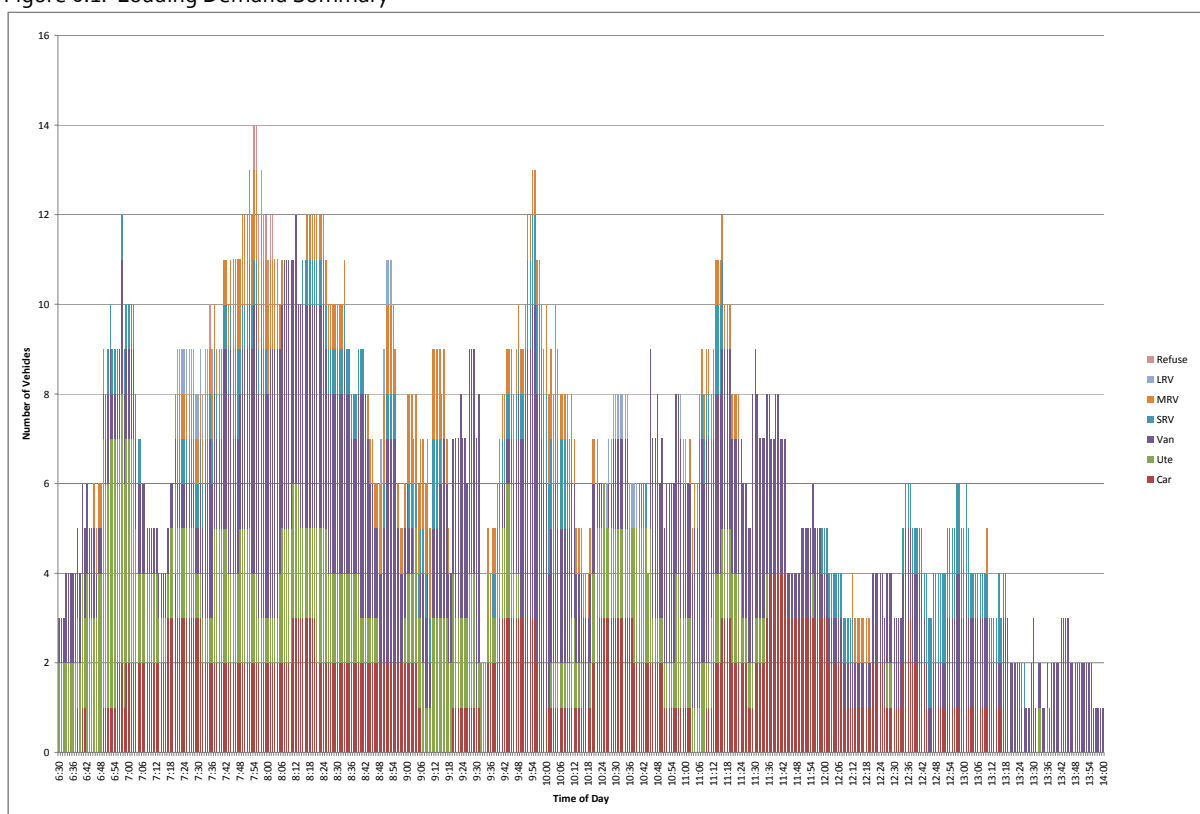
On the basis of the above, the loading demands generated by Freshwater Place are considered to be an appropriate comparison from which to determine the loading demands for Hamilton Harbour. It is, however, important to note that Freshwater Place is some 40%-50% larger than the proposed development.

The observed peak loading demand of the above development was a total of 14 vehicles, including the following vehicle types:

- One refuse collection vehicle;
- Two medium rigid vehicles;
- One small rigid vehicle;
- Six vans;
- Two standard cars; and
- Two utility vehicles.

The peak number of vehicles larger than a van (including small, medium and large rigid vehicles and refuse collection vehicles) was four vehicles. A graph of the variations in the loading demands over a typical day are shown in Figure 6.1.

Figure 6.1: Loading Demand Summary



The above Figure highlights that the peak loading demand occurs in the early morning.

Adjusting the peak demand to reflect the fact that Freshwater Place is some 1.4 times the size of the proposed development, the peak demand associated with the proposed development could be expected to be in the order of 10 vehicles.

6.2 Loading Provision

6.2.1 Quantum

On the basis of the surveys conducted at Freshwater Place, the current loading dock provision for four large rigid vehicles is expected to meet the demand for large vehicles generated by the development.

To accommodate the estimated peak demand of six additional van / passenger / utility vehicles (adjusting for the smaller size of the proposed development), there are two spaces within the loading area. In addition it is noted that the remaining vehicles are capable of utilising typical car parking spaces and the at-grade car park includes six spaces which are restricted to 15 minute parking for this purpose.

This restriction is expected to ensure a high turnover of these spaces, with the restriction suitable for the purpose of the majority of loading needs.

6.2.2 Accessibility

To confirm the accessibility of the central loading area by the various service vehicles, an assessment has been undertaken in AutoTURN. This assessment indicates that the dock is accessibly by four large rigid vehicles, independently of each other, whilst entering and exiting the site in a forward direction.

A copy of the swept path assessments are provided at Appendix D.

A minimum height clearance of 4.5m is provided in the loading docks. This is appropriate, noting that to enable overhead clearance for bin collection, vehicles will reverse to the open area behind the loading dock, where there is unrestricted height available.

It is also noted that each loading dock is connected to the lift core through a service corridor, which is considered appropriate.

6.3 Refuse Storage

Advice on waste storage requirements has been provided by WasteTech.

The residential waste will be stored in Basement 1 of the residential towers, near the lift lobbies. This waste will be transferred on tailor made bin transfer vehicles to the central loading area for collection.

Commercial waste will be stored and collected from the central loading area, where refuse storage areas are located adjacent to each dock.

7. Traffic Impact Assessment

7.1 Scope of Assessment

Due to the current planning for the Northshore Hamilton UDA, it is appropriate to have regard to the anticipated future (rather than current) traffic flows. To this end, advice has been sought from the transport consultant engaged on the Hamilton Northshore master planning project regarding future traffic flows on Harbour Road.

7.2 Base Traffic Flows

7.2.1 Through Traffic

Whilst the information is not yet finalised, GTA Consultants has been advised by Parsons Brinckerhoff⁹ that Hercules Street south of the new road link will carry some 1,700 vehicles per hour, with 1,000 vehicles per hour in the peak direction.

Assuming an equal split of traffic between the new road link and Harbour Road, it is reasonable to assume 500 vehicles per hour in the peak direction and 350 vehicles per hour in the non-peak direction on Harbour Road in each of the road network peak hours. This value includes traffic generated by the subject development and, as such, this has been considered in estimating the through traffic flows in the following assessment¹⁰.

7.2.2 Apartment Traffic: Western Access

The proposed western access to the development is located opposite an access to existing residential apartments. GTA Consultants conducted turning movement surveys at this location, as detailed in Section 2 of this report. These surveyed traffic volumes are considered in the following assessment of the site access operation.

7.3 Traffic Generation

7.3.1 Design Rates

Guidance on the likely traffic generation of the proposed development has generally been sourced from the Roads and Traffic Authority's '*Guide to Traffic Generation Developments*', the Department of Main Roads (DMR) '*Road Planning and Design Manual*' and traffic surveys undertaken by GTA Consultants and others at various developments.

⁹ Email from Les Chandra at Parsons Brinckerhoff to Beth Whelan of GTA Consultants on 20 August 2008.

¹⁰ The assumed traffic flows at the western site access are conservative and result in a minimum of 500 vehicles per hour in each direction to the north of the access point on Harbour Road.

traffic impact assessment

Given the proposed car parking provision, particularly the adoption of a parking limitation strategy, and considering that car parking provision and traffic generation are intrinsically linked, there was a need to reconsider typical traffic generation rates applicable to the proposed land uses of this development. In this regard, the abovementioned references were consulted to establish the traffic generation rates appropriate for each of the proposed land uses.

The traffic generation rates adopted were derived through consideration of the referenced sources, the overall car parking demand, and the number of trips reasonably expected to be generated by the development.

In summary, the traffic generation rates were adopted on the basis of GTA Consultants' engineering judgement. In particular the adopted generation rates give consideration to the ultimate road network within Hamilton Northshore, increased public transport accessibility, reduced car parking provision and reduced reliance on the private vehicle for travel to / from Hamilton Harbour¹¹.

7.3.2 Traffic Generation Estimate

An estimate of peak hour traffic volumes resulting from the proposal are set out in Table 7.1.

Table 7.1: Traffic Generation Estimates

Use	Size	Traffic Generation Rates		Volume	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Office	34,835sq.m GFA [1]	1 trip / 100sq.m	1 trip / 100sq.m	348 vph	348 vph
Residential	432 apartments	0.4 trips / dwelling	0.4 trips / dwelling	173 vph	173 vph
Shop	427sq.m GFA	1.25 trips / 100sq.m	5 trips / 100sq.m	5 vph	21 vph
Restricted Retail	4,096sq.m GFA	0.5 trips / 100sq.m	2 trips / 100sq.m	20 vph	82 vph
Gymnasium	751sq.m GFA	2 trips / 100sq.m	2 trips / 100sq.m	15 vph	15 vph
Restaurant	112sq.m GFA	1 trip / 100sq.m	5 trips / 100sq.m	1 vph	6 vph
Total				562 vph	645 vph

[1] Including strata titled office.

Table 7.1 indicates that the site could potentially generate some 560 and 645 vehicle movements in the AM and PM peak hour respectively.

It is noted that the following assessment is based on a previous schedule of uses, which resulted in a comparable traffic generation estimate, i.e. 559 vehicles and 678 vehicles movements in the AM and PM peak hours respectively. As these previously estimates are comparable, notably the current estimate is only three vehicles (0.5%) greater in the AM peak and notably less in the PM peak, the following assessment remains relevant.

¹¹ It has been considered that, as a maximum, each car parking space would generate one vehicle movement in the road network peak periods.

traffic impact assessment

7.3.3 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including:

- i The configuration of the arterial road network in the immediate vicinity of the site;
- ii The operation of intersections providing access between to the arterial road network;
- iii The distribution of households in the vicinity of the site;
- iv The surrounding employment centres in relation to the site;
- v The likely distribution of employees residences in relation to the site; and
- vi The configuration of access points to the site.

Having consideration to the above, for the purpose of estimating vehicle movements the following directional distributions have been assumed:

- 40% of traffic will be to / from the north;
- 40% of traffic will be to / from the south; and
- 20% of traffic will be to / from the west.

These directions are broad directions, relating to location of suburbs of origin / destination. Further discussion on how this relates to movements is provided below.

Based on the above distributions, and consideration of the external road network connections to the above origins / destinations, Table 7.2 sets out the traffic distribution adopted for the development.

Table 7.2: Adopted Traffic Distribution at the Site Access Points

Origin / Destination	Western Access				Eastern Access			
	In		Out		In		Out	
	Left	Right	Left	Right	Left	Right	Left	Right
To / From East	95%	Nil	5%	15%	5%	Nil	80%	Nil
To / From West	95%	Nil	Nil	80%	5%	Nil	10%	10%

In addition, Table 7.3 illustrates the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) that have been adopted for each of the proposed uses.

Table 7.3: Adopted In / Out Split

Use	AM Peak Hour		PM Peak Hour	
	In	Out	In	Out
Office	95%	5%	10%	90%
Residential	20%	80%	60%	40%
Retail [1]	95%	5%	50%	50%
Restaurant	80%	20%	60%	40%

[1] Including showroom, noting this is based on a previous development without a gymnasium.

traffic impact assessment

Based on the above and by adding the development traffic to the base traffic flows, the post development traffic volumes have been calculated. These are outlined in Figures 7.1 to 7.4.

Figure 7.1: AM Peak Hour Traffic Volumes Eastern Access

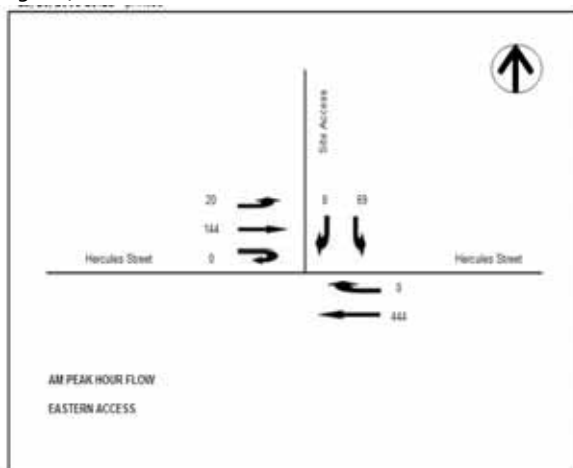


Figure 7.2: AM Peak Hour Traffic Volumes Western Access

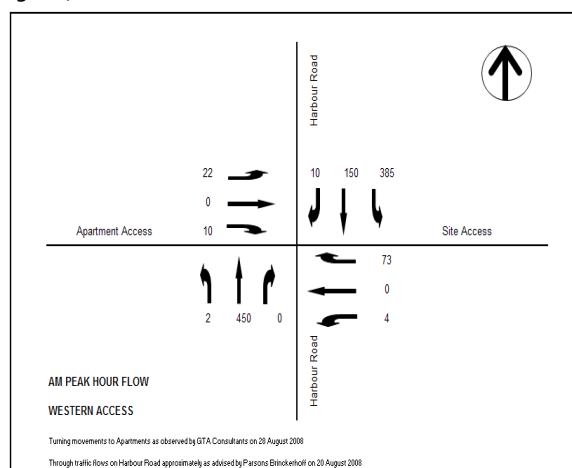


Figure 7.3: PM Peak Hour Traffic Volumes Eastern Access

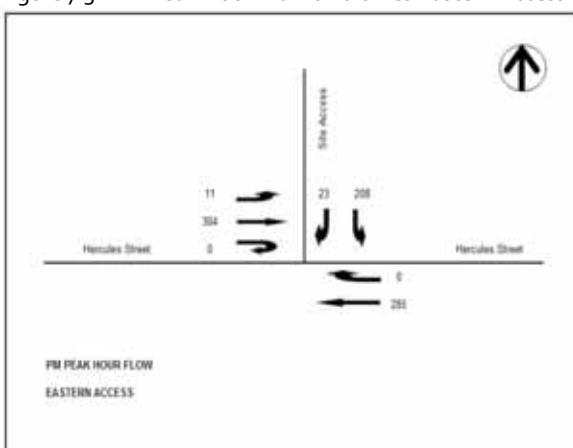
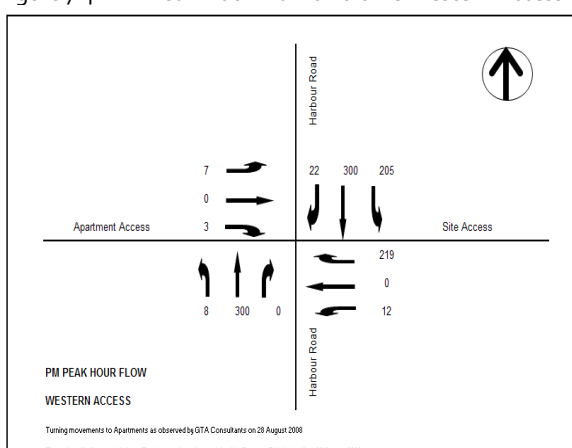


Figure 7.4: PM Peak Hour Traffic Volume Western Access



An assessment of the operation of the site access intersections, based on the above volumes and the suitability of the access design, is provided in the following Section of this report.

8. Access Design

8.1 Proposed Access Arrangements

The current plans (shown at Appendix B) include two access points, one to Harbour Road and one to Hercules Street. These accesses will connect the development to the surrounding arterial road network via signalised intersections of Kingsford Smith Drive / Harbour Road to the west and via Hercules Street and the new link road to Kingsford Smith Drive to the east.

Having reviewed the proposed access locations and based on the assessment below, the general location of each of the access points is considered appropriate. The operation of each of the proposed access points has been assessed in *SIDRA INTERSECTION 3.2*¹² (SIDRA), with consideration given to ultimate traffic flows as advised on Hercules Street and Harbour Road.

Further details on the suitability of the proposed access locations and their form are provided below.

8.2 Western Access Point

The western access point is located to ensure there is no impact on the Harbour Road / Kingsford Smith Drive intersection. It is noted that an access point to residential apartments exists opposite the subject site at the proposed access point, which needs to be taken into consideration in the design of site access from Harbour Road to avoid creating unnecessary conflicts.

On the basis of managing the impacts of the western access point on the existing access opposite the site, a roundabout style treatment is recommended.

A concept sketch for the intersection as a roundabout is provided at Appendix E. This shows a treatment which is capable of accommodating the swept paths of 12.5m LRVs entering and exiting the east and west legs of the intersection.

A swept path assessment was also conducted to test the ability of a 19m articulated bus to traverse through the proposed roundabout style access treatment. This assessment is provided at Appendix E to this report. The results of this assessment demonstrate that a 19m articulated bus can appropriately traverse on Harbour Road through the treatment.

¹² SIDRA INTERSECTION 3.2 adopts the following criteria for Level of Service assessment:

Level of Service	Intersection Degree of Saturation (X)	
	Unsignalised Intersection	Signalised Intersection and Roundabout
A Excellent	<=0.50	<=0.60
B Very Good	0.50-0.70	0.60-0.75
C Good	0.70-0.80	0.75-0.90
D Acceptable	0.80-0.90	0.90-0.95
E Poor	0.90-1.00	0.95-1.00
F Very Poor	>=1.0	>=1.0

The operation of the access as a roundabout has been modelled in SIDRA, with particular attention given to the likely extent of queuing back to Kingsford Smith Drive. The results of the assessment are summarised in Table 8.1, with further details provided at Appendix F.

Table 8.1: Western Access Operation

Approach	AM Peak Hour			PM Peak Hour		
	DOS (X)	Average Delay (sec)	95 th %ile Queue (m)	DOS (X)	Average Delay (sec)	95 th %ile Queue (m)
Harbour Road (South)	0.33	5 sec	23m	0.28	6 sec	18m
Western Access (East)	0.08	11 sec	3m	0.25	13 sec	12m
Harbour Road (North)	0.37#	5 sec	23m	0.35#	5 sec	22m
Apartment Access (West)	0.05	9 sec	2m	0.02	9 sec	1m

DOS – Degree of Saturation, # - Intersection DOS

The above Table indicates that the roundabout will operate with acceptable levels of operation in both the road network AM and PM peak hour once the Hamilton Northshore area is fully developed. Importantly, the queue on the northern leg of the intersection is negligible and is not expected to result in queuing back to Kingsford Smith Drive (noting an available length of some 60m and a 95th percentile anticipated queue length of 23m).

It is noted that the extent of queuing on Harbour Road from the Kingsford Smith Road intersection is unknown. Based on site observations, it is possible that this queue will extend back past the site access in the road network peak periods.

8.3 Eastern Access Point

It is considered that by providing the proposed eastern access point some 40m west of the intersection with the new link road, the required sight distance for vehicles exiting the site will be achieved. The horizontal alignment of Hercules Street at this location sees the access point placed at a bend where sight distance is optimised. Maximising the distance from the new road link will avoid queuing from the access point extending to this link and allow for a right turn lane to be provided for movements into the subject site.

The eastern access point is proposed to be an all movement access. However, due to the restriction of turns at the Hercules Street / new link road intersection to left-in / left-out, use of this access is likely to be limited.

An assessment of the suitability of the currently proposed access operation is provided in Table 8.2. This is based on a priority controlled junction with a right turn lane. Further details of the operation of the site access are provided at Appendix F.

Table 8.2: Eastern Access Operation

Approach	AM Peak Hour			PM Peak Hour		
	DOS (X)	Average Delay (sec)	95 th %ile Queue (m)	DOS (X)	Average Delay (sec)	95 th %ile Queue (m)
Harbour Road (East)	0.25#	Nil	Nil	0.16	Nil	Nil
Eastern Access (North)	0.10	10 sec	3m	0.32#	11 sec	13m
Harbour Road (West)	0.09	1 sec	Nil	0.18	Nil	Nil

DOS – Degree of Saturation, # - Intersection DOS

The results from Table 8.2 indicate the proposed eastern access point (priority controlled) is expected to operate with an excellent level of service.

9. Preliminary Construction Management Plan

9.1 Background

As part of planning for the development, a Preliminary Construction Management Plan (PCMP) is being prepared. The purpose of the PCMP is to detail the following:

- i An overview of proposed works;
- ii The timing and staging of works;
- iii Construction traffic access and parking arrangements; and
- iv The impact of the construction process on the surrounding road network.

Details of this plan from a traffic engineering perspective are set out in the following sections. This information has largely been drawn from Devine Constructions, whom are responsible for overseeing the construction of numerous large scale developments.

9.2 Construction Timing and Management

Works on the site are anticipated to begin in December 2008 and continue until July 2011. These works will be conducted over three (3) main traffic management stages and involve the demolition of the existing buildings (December 2008), excavation of the site (April / May 2009) and construction of the proposed development (June 2009 – July 2011).

The traffic management strategy for the works associated with each of these construction stages is described below.

9.3 Demolition (December 2008)

9.3.1 Expected Traffic Volumes

During this period of works, there will be two trucks accessing the site daily (i.e. a total of 8 in and 8 out trips a day¹³) to remove materials from the site. Loading of these trucks will be completed from within the subject site.

In addition to the above, approximately 10 workers will attend the site on a daily basis.

¹³ Anticipated one truck trip per hour.

9.3.2 Construction Vehicle Access and Parking

Primary access for construction vehicles will be provided via Hercules Street. Access to the site will be required between 6:00am – 6:00pm six days a week. Loading of trucks will be undertaken on-site and parking for construction workers will be provided within the future road reserve.

9.3.3 Pedestrian Access

Pedestrian access will be required between Harbour Road / Hercules Street, the site (via the main entrance) and the site shed. The site shed is anticipated to be placed within the site boundary with the preferred location to be identified by the Principal Contractor at a later stage.

9.3.4 External Works

General pedestrian activity will not be permitted directly adjacent to the site in Hercules Street, Harbour Road or Kingsford Smith Drive. The footpath will be closed and pedestrians will be directed to use the footpath on the opposite side of the road.

It is noted that access to the subject site will be restricted through the use of two metre high, temporary fencing where needed.

9.4 Excavation (April / May 2009 – June 2009)

9.4.1 Expected Traffic Volumes

During this period of works, six-ten trucks will be accessing the site daily (i.e. a total of 180 trips per day¹⁴) to remove excavated materials from the site. In addition, a concrete pump will be placed on site to fill the necessary ground beams, which will be serviced by approximately six-ten concrete trucks per day. Furthermore, a piling rig will be on site for approximately three - four weeks and there will be delivery of approximately 500 precast piles during this time.

Loading and unloading of these trucks will be completed from within the subject site.

Once excavation is complete, construction will commence and tower cranes will be erected.

In addition, approximately 50 workers will attend the site on a daily basis.

9.4.2 Construction Vehicle Access and Parking

Access for construction vehicles will remain via Hercules Street with access also available to the site via Harbour Road. In the further planning for the construction, every effort will be made to restrict the need for access to Kingsford Smith Drive.

Access to the site will be required between 6:00am-6:00pm Monday to Saturday. Loading of trucks will be undertaken on-site, with parking for construction workers provided in the future road reserve.

¹⁴ On the basis of 50-90 loads per day.

9.4.3 Pedestrian Access

Pedestrian access will continue to be required between Harbour Road / Hercules Street, the site (via the main entrance) and the site shed.

9.4.4 External Works

No public pedestrian access will be permitted around the site, with a footpath closure proposed on Harbour Road, Hercules Street and Kingsford Smith Drive.

It is noted that access to the subject site will continue to be restricted through the use of two metre high temporary fencing where needed.

9.5 Construction (June 2009 – July 2011)

9.5.1 Expected Traffic Volumes

During this period of works, up to 20 trucks of various sizes will be accessing the site each day (i.e. up to 200 trips a day¹⁵). Loading and unloading of these trucks will be completed from within the subject site.

In addition, up to 300 workers will attend the site on a daily basis, with this number fluctuating from 100-300 workers dependent on the stage of construction.

9.5.2 Construction Vehicle Access and Parking

Access for construction vehicles will remain via Hercules Street. Access to the site will be required between 6:00am-6:00pm Monday to Saturday.

9.5.3 Pedestrian Access

Pedestrian access will continue to be required between Hercules Street, the site (via the main entrance) and the site shed.

9.5.4 External Works

Pedestrians will continue to be directed to use footpaths on the opposite side of the road.

9.6 Impact on Surrounding Road Network

As detailed above, during the planned works, the greatest number of vehicle movements to and from the site is anticipated to be up to 700 trips per day¹⁶.

This increase in traffic is not considered to adversely impact on the safety or operation of Harbour Road, Hercules Street or the surrounding road network.

¹⁵ Assuming each truck has a turnaround time of one hour, ten work hours per day.

¹⁶ Assuming 80% of workers drive to the site, 240 worker cars equals 480 trips, plus 200 truck trips during construction, say 700 trips.

9.7 Construction Worker Car Parking Management

As part of the construction of the proposed development, a number of workers may choose to drive to the site. Parking for construction workers will be provided within the future road link to the east of the subject site. It is intended that this area will be fenced and screened from the remainder of the site.

In the initial stages of the program (i.e. Demolition and Excavation), only a limited number of workers (between 10 and 50) will need to attend the site on a daily basis and could be accommodated within the future road reserve.

In the final phases (i.e. Construction) the number of workers on-site on a daily basis will vary from some 100 to 300 workers, with the latter number anticipated once building fit-out commences.

Assuming 80% of workers travel to work as a car driver, this anticipates 8-240 cars parking in the surrounds during the construction phases of the project. Whilst it is anticipated that a large number of construction workers can park within the future road reserve, there may be some overspill on-street car parking in the vicinity of the site at peak times.

As the construction vehicles will be parked informally within the future road reserve, the exact number of vehicles that will be accommodated in this area is unknown. Indeed, any attempt to estimate parking numbers would likely understate the reality. In addition to this on-site parking, it is noted that vehicles are able to park along Harbour Road and Hercules Street adjacent to the site.

Whilst the construction period is expected to last for two years, in considering the parking demands during construction, the peak car parking demands are anticipated to occur once a certain stage of each building has been completed and the fit-out of various tenancies commence. This is when the full complement of construction related vehicles will be on-site. Demand will then reduce once building construction is complete and only the building fit-out remains. Advice provided by Devine Constructions indicates that the peak staff demand represents approximately 30% - 40% of the total construction period (7-10 months).

In addition, it is standard practice for the construction management team to liaise with Brisbane City Council during the construction phases of a project. This typically ensures that the car parking demands associated with the construction of the site are not causing excessive impacts on the surrounding road network.

10. Conclusion

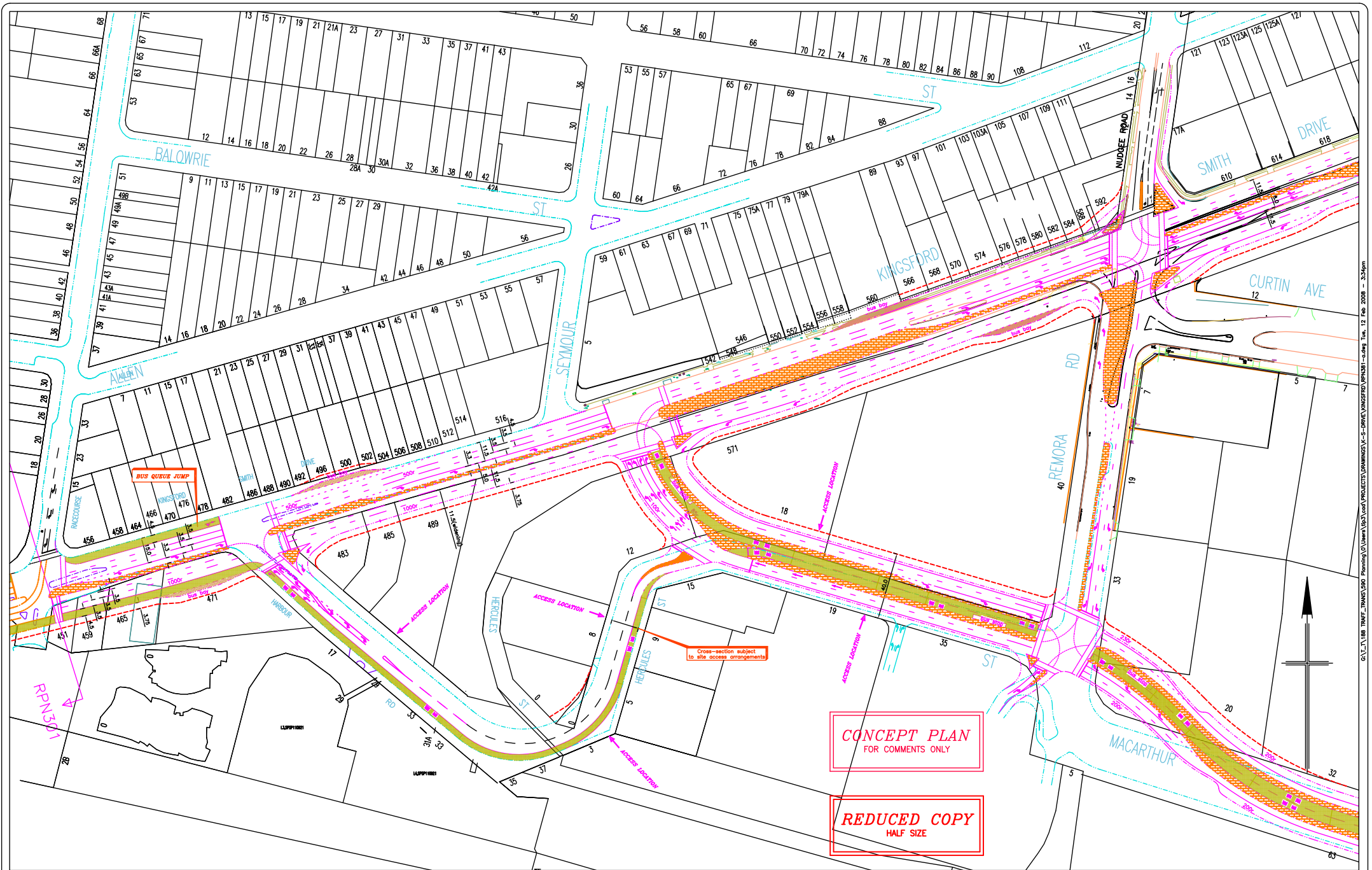
Based on the analysis and discussions presented within this report, the following conclusions are made:

- i The approach to the site's car parking provision, in restricting supply, is consistent with the principles of a TOD, the vision of the Northshore Hamilton UDA and the limited capacity on Kingsford Smith Drive;
- ii The proposed car parking provision of 834 spaces is in accordance with the *Northshore Hamilton Urban Development Area draft Development Scheme*;
- iii To support reduced car parking provisions and principles underlying development in the Northshore Hamilton UDA, provision is made for a potential temporary bus shuttle service to nearby train stations and the development provides appropriate bicycle facilities, an attractive pedestrian environment and green travel plans are recommended;
- iv Future improvements and upgrades to public transport facilities and services are expected to adequately support travel to the Hamilton Northshore UDA and this development;
- v The proposed parking layout is generally consistent with the dimensional requirements as set out in the Australian Standard / New Zealand Standard for Off Street Car Parking (AS/NZS2890.1-2004), with minor amendments at Appendix C to this report, which could be conditioned as part of an approval;
- vi The end-of-trip bicycle facilities exceed the typical requirements of Brisbane City Council's TAPS Code;
- vii Appropriate pedestrian footpaths are provided;
- viii The provision of loading of up to four large vehicles and two vans is appropriate, having consideration to demand surveys undertaken at a comparable facility, noting that six car parking bays at the ground plane are to be marked as 15 minute parking;
- ix The site is expected to generate up to some 560 and 645 vehicle movements in the road network AM and PM peak hours, respectively;
- x The transport planning being undertaken for the Hamilton Northshore area considers the traffic generated by the proposed Hamilton Harbour development in determining a suitable future road network in the vicinity of the site;
- xi Assessment of the site access intersections, based on a previous (comparable) traffic generation, including a priority controlled eastern access and roundabout style western access indicate that these accesses can operate satisfactorily in the short and long term; and
- xii A preliminary construction management plan is provided in this report, demonstrating the likely traffic impacts of the proposed development.

Appendix A

appendix a

Road Upgrade Plans



CONCEPT PLAN
FOR COMMENTS ONLY

REDUCED COPY
HALF SIZE

I	Altered to show access locations	CVT	12-2-08		
H	Xsection of 11.5m requirement only	5/2	8-07		
ISSUE	AMENDMENT	DRAWN DATE	CHECK'D DATE	APPR'D DATE	

CAD REF: G:\PROJECTS\DRAWINGS\RPN381-a.DWG

0 20 40 60 80

ORIGINAL SCALE 1:1000

FULL SIZE A1

DIVISIONAL MANAGER
CITY POLICY AND STRATEGY

MANAGER
TRANSPORT AND TRAFFIC

DESIGNED	CVT	FILE NO.
TRACED	16-4-99	
CHECKED		SURVEY NO.
		ASSOCIATED PLANS
PRINCIPAL ENGINEER TRANSPORT AND TRAFFIC		

 **City Policy
And Strategy**

BRISBANE CITY COUNCIL – CITY POLICY & STRATEGY

CONCEPT DESIGN
PROPOSED ROADWORKS
KINGSFORD SMITH DRIVE

NO. 1 IN SET OF 4
RPN381
KBBBFSH1

Appendix B

Development Plans

appendix b

Cox Rayner
Level 2, 2 Edward St, Brisbane QLD 4000 Australia
Tel: 617 3213 0644 Fax: 617 3213 0541
Email: info@brisbanecox.com.au
The Cox Group Pty Ltd ACN 302 539 891

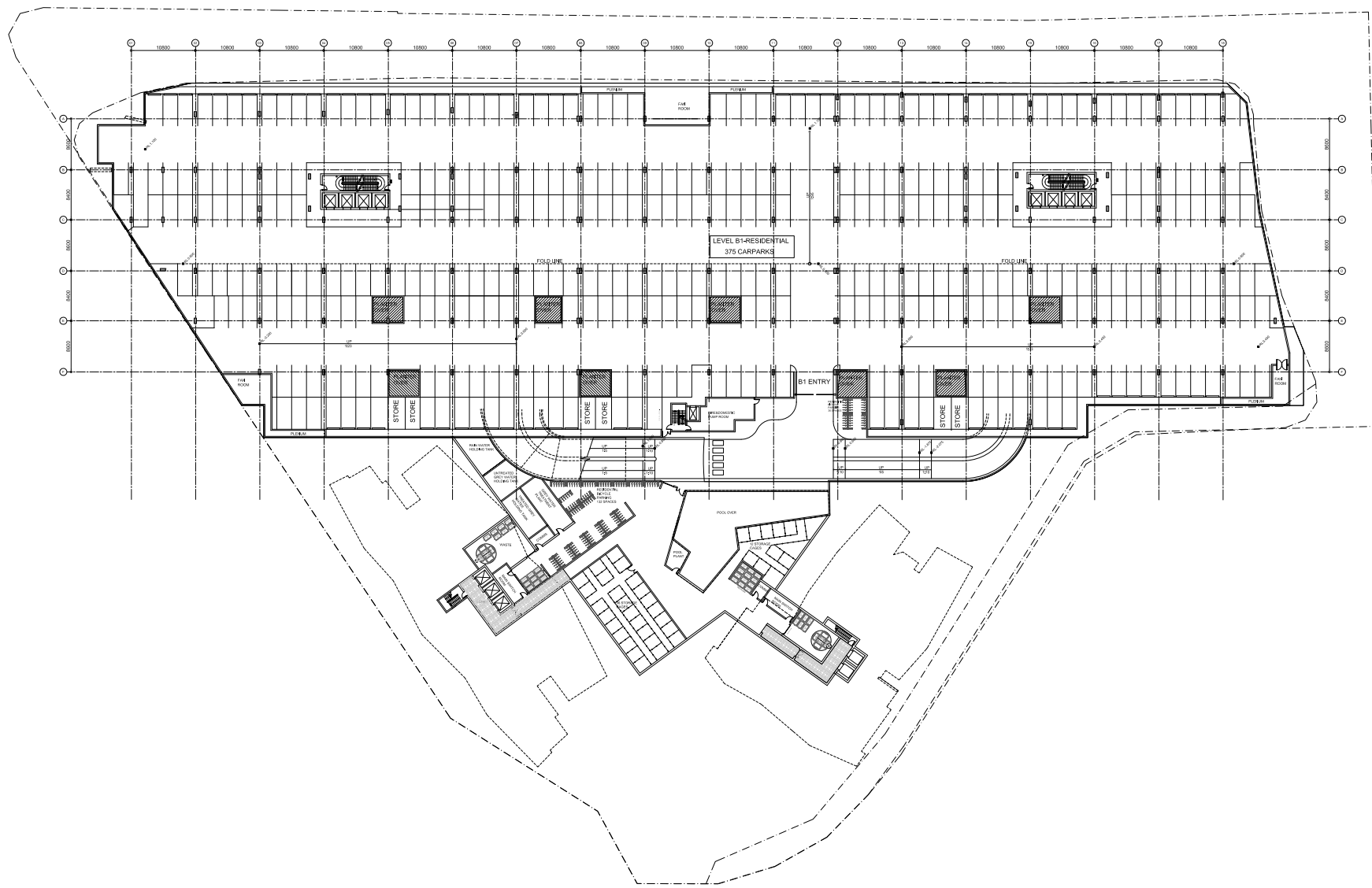
HAMILTON HARBOUR
KINGSFORD SMITH DRIVE
HAMILTON

Document Control Status

INFORMATION ONLY
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CAD File Name	JCL	
Drawn	SD	Date: SEPT 2006

Proj. Closure	Date:
Scored 1-200	Project File 408035



NO.	DESCRIPTION	REV.	DATE
1	ISSUED FOR INFORMATION	01	22/03/2018
2	FOR INFORMATION	02	22/03/2018
3	FOR INFORMATION	03	22/03/2018
4	FOR INFORMATION	04	22/03/2018
5	FOR INFORMATION	05	22/03/2018
6	FOR INFORMATION	06	22/03/2018
7	FOR INFORMATION	07	22/03/2018
8	FOR INFORMATION	08	22/03/2018
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15	FOR INFORMATION	15	22/03/2018
16	FOR INFORMATION	16	22/03/2018
17	FOR INFORMATION	17	22/03/2018
18	FOR INFORMATION	18	22/03/2018
19	FOR INFORMATION	19	22/03/2018
20	FOR INFORMATION	20	22/03/2018

COX

Devine LIMITED

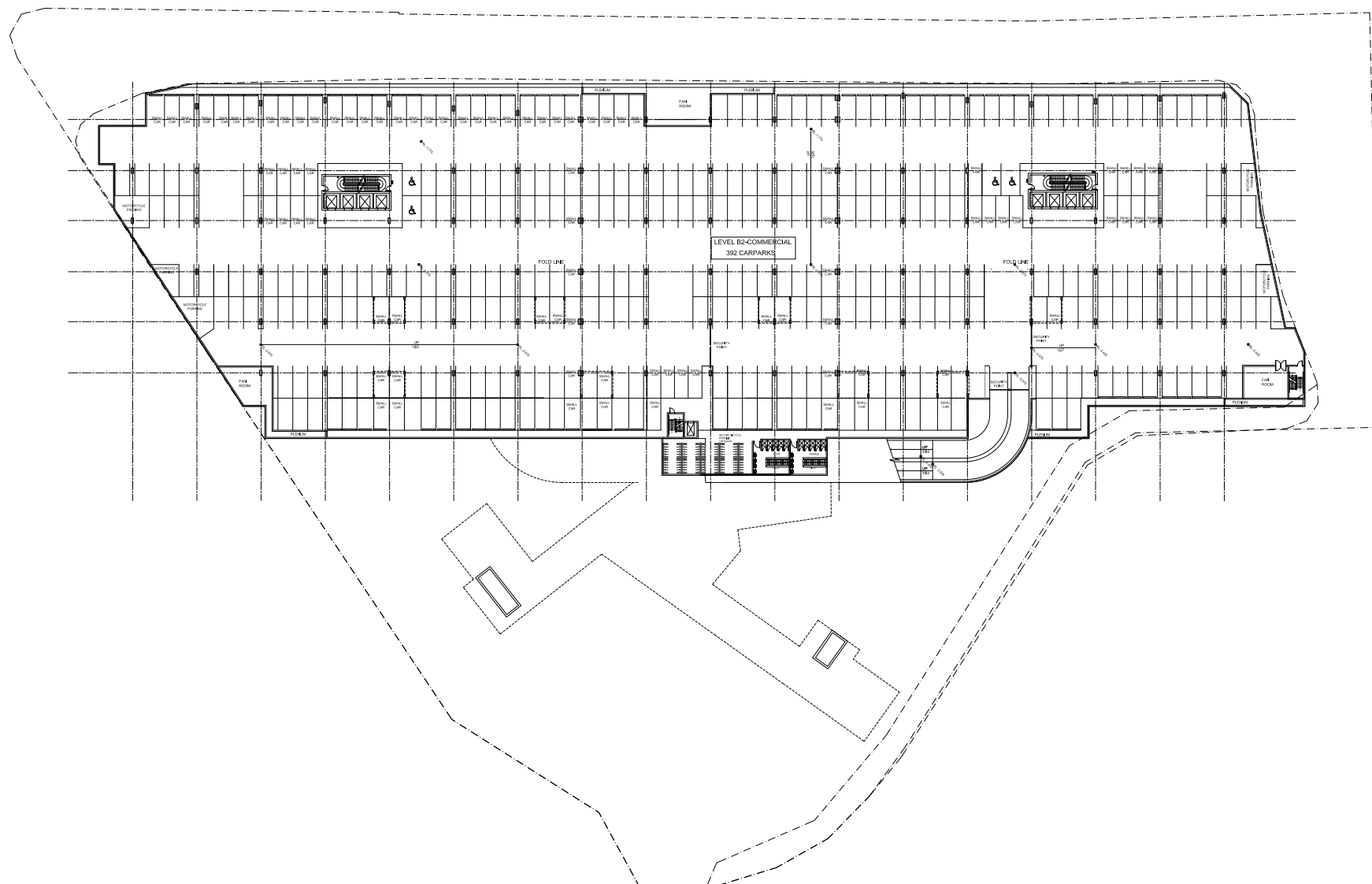
HAMILTON HARBOUR
KINGSFORD SMITH DRIVE
HAMILTON

BASEMENT LEVEL B1
FLOOR PLAN

INFORMATION ONLY
NOT FOR CONSTRUCTION

A-11-02

10



REVISIONS		
NO.	DESCRIPTION	DATE
1	ISSUED FOR INFORMATION	01/10/2018
2	FOR INFORMATION	01/10/2018
3	FOR INFORMATION	01/10/2018
4	FOR INFORMATION	01/10/2018
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22	FOR INFORMATION	01/10/2018
23	FOR INFORMATION	01/10/2018
24	FOR INFORMATION	01/10/2018
25	FOR INFORMATION	01/10/2018

COX

Architectural, Planning, Urban Design, Landscape Architecture, Engineering, Construction Management

Devine LIMITED

LIGHTSPEED PROPERTIES

HAMILTON HARBOUR
KINGSFORD SMITH DRIVE
HAMILTON

**BASEMENT LEVEL B2
FLOOR PLAN**

**INFORMATION ONLY
NOT FOR CONSTRUCTION**

Client: **Devine Limited**

Project: **HAMILTON HARBOUR**

Location: **KINGSFORD SMITH DRIVE, HAMILTON**

Scale: **1:500**

Drawn: **408035**

Check: **408035**

Rev: **9**

Appendix C

Car Park Layout Recommendations

appendix c

Cox Rayner
Level 2, 2 Edward St, Brisbane QLD 4000 Australia
Tel: 617 3210 0844 Fax: 617 3210 0541
Email: info@brisbane.coxrayner.com.au
The Cox Group Pty Ltd ACN 000 035 891

COX

Architecture: Planning, Urban design, Interior design, Health facility design

Joint Venture Partners



Deville

LIMITED LEIGHTON PRO

[illegible][illegible]

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HAMILTON HARBOUR

HAMILTON HARBOUR
KINGSFORD SMITH DRIVE

HAMILTON

[illegible]

Drawing Title
BASEMENT LEVEL R1

BASEMENT LEVEL BT
FLOOR PLAN

	TEST PLAN
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INFORMATION ONLY

INFORMATION ONE
NOT FOR CONSTRUCTION

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Collected Samples: 10/20/00

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CRASH	6.0	Days since crash
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Co-ordinator:	Date:
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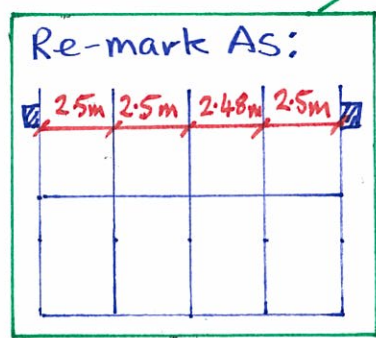
Proj. Architect.	Date:
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Proj. Director _____	Date: _____
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Drawing Number:	Revisão:

A-11-02	10
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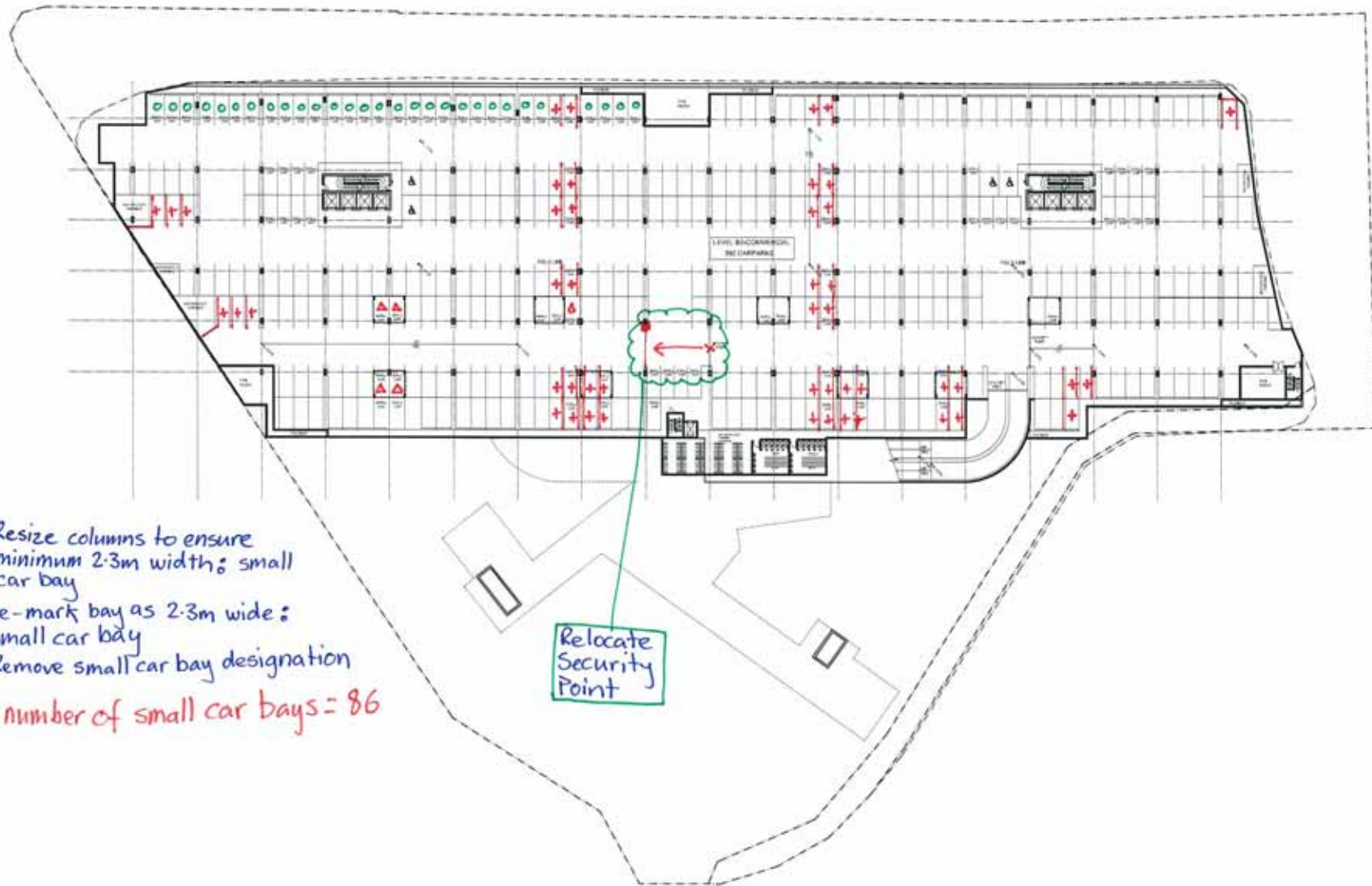


Key

- + = Re-mark bay as 2.3m wide : small car bay
- ▲ = Resize column to ensure minimum clearance width of 2.6m : small car bay

Total number of small car bays = 11

Item	Quantity	Unit	Notes
1. Steel reinforcement bars	120	kg	
2. Concrete	120	m³	
3. Formwork	120	m²	
4. Labour	120	hrs	
5. Transport	120	hrs	
6. Safety	120	hrs	
7. Materials	120	kg	
8. Tools	120	hrs	
9. Equipment	120	hrs	
10. Other	120	hrs	
11. Total	120	hrs	



Key

- △ = Resize columns to ensure minimum 2.3m width: small car bay
- + = Re-mark bay as 2.3m wide: small car bay
- = Remove small car bay designation

Total number of small car bays = 86

Relocate Security Point

PLAN-BASEMENT LEVEL 2

COX

Devine

HAMILTON HARBOUR
KINGSTON SMITH DRIVE
HAMILTON

BASEMENT LEVEL B2
FLOOR PLAN

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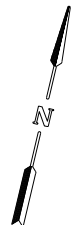
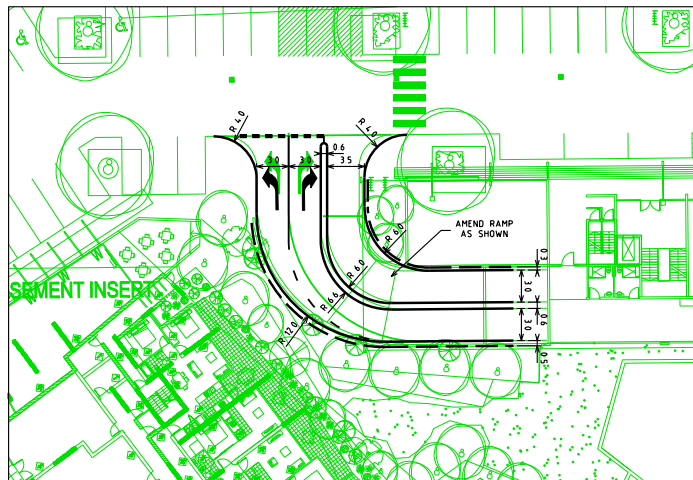
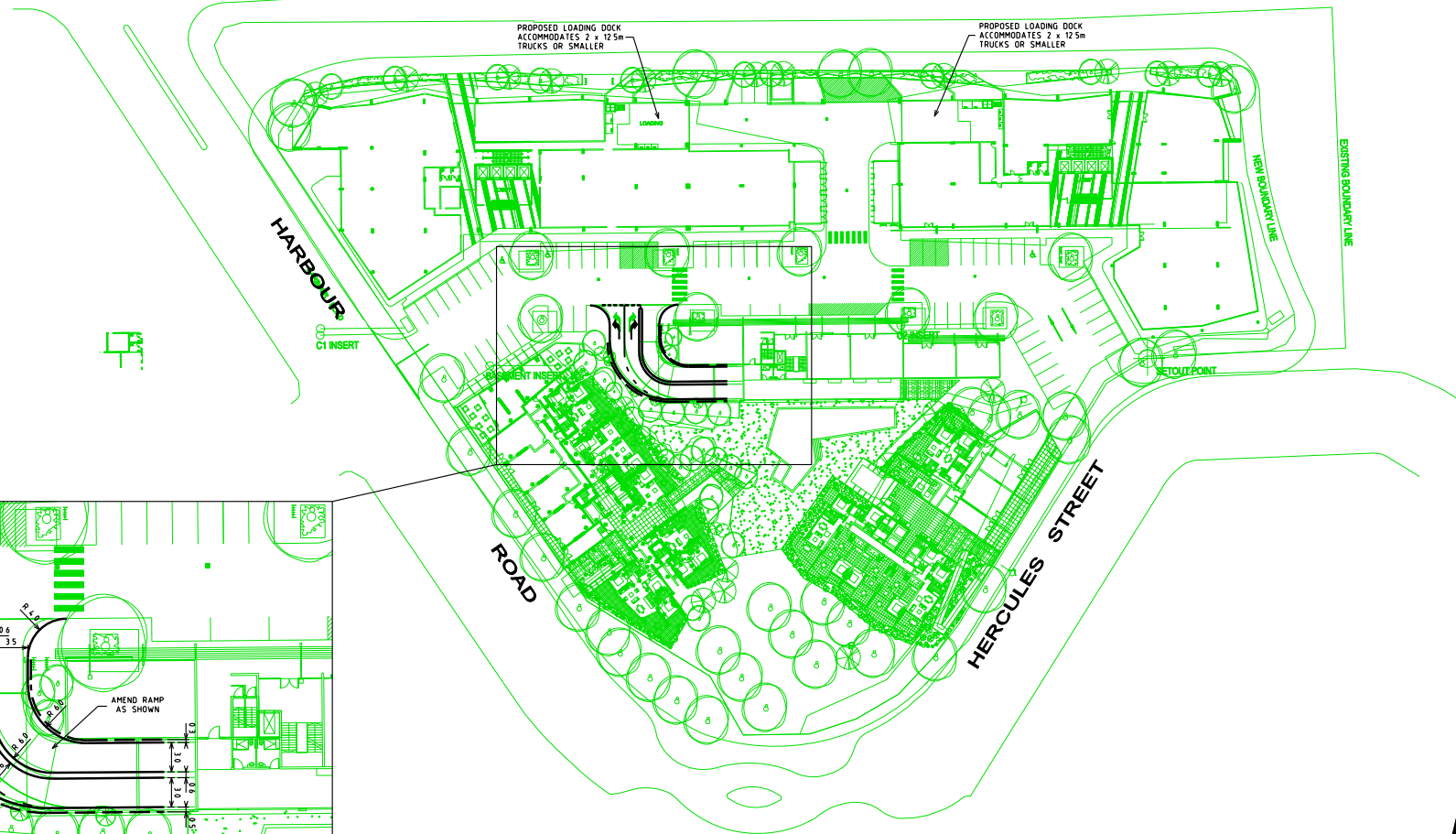
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FOR: [Signature]

NO. 11-03

9



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:.....

P6	08.02.08	BASE PLAN UPDATED - K W		B W
P5	15.02.08	BASE PLAN UPDATED AND MINOR AMEDMENTS - K W		B W
P4	26.09.08	BASE PLAN UPDATED - K W		B W
P3	11.09.08	RAMP DESIGN - K W		B W
P2	04.09.08	BASE PLAN UPDATED / RTL SHORTENED - K W		B W
P1	18.08.08	INITIAL ISSUE - K W		B W
ISSUE	DATE	DESCRIPTION		PAU

CAD FILE No.
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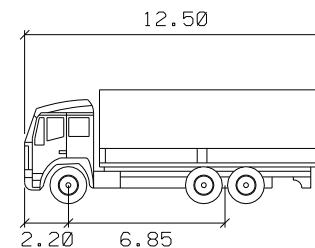
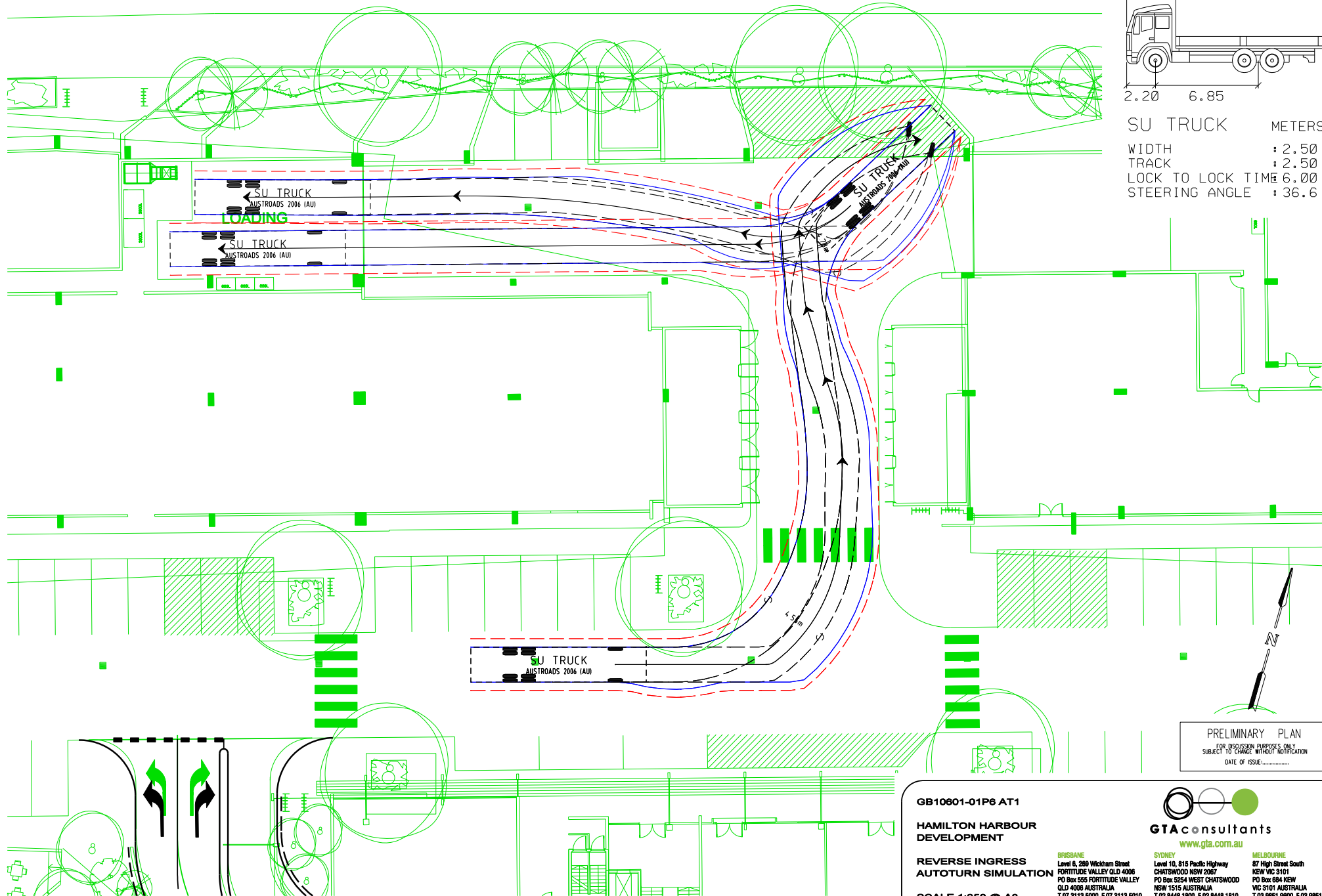


CONCEPTUAL LAYOUT

DRAWING NO.	ISSUE
GB10601-01	P6

Appendix D

Swept Path Assessments



SU TRUCK	METERS
WIDTH	: 2.50
TRACK	: 2.50
LOCK TO LOCK TIME	: 6.00
STEERING ANGLE	: 36.6

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT NOTIFICATION
DATE OF ISSUE:

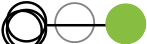
GB10801-01P6 AT1

HAMILTON HARBOUR
DEVELOPMENT

REVERSE INGRESS
AUTOTURN SIMULATION

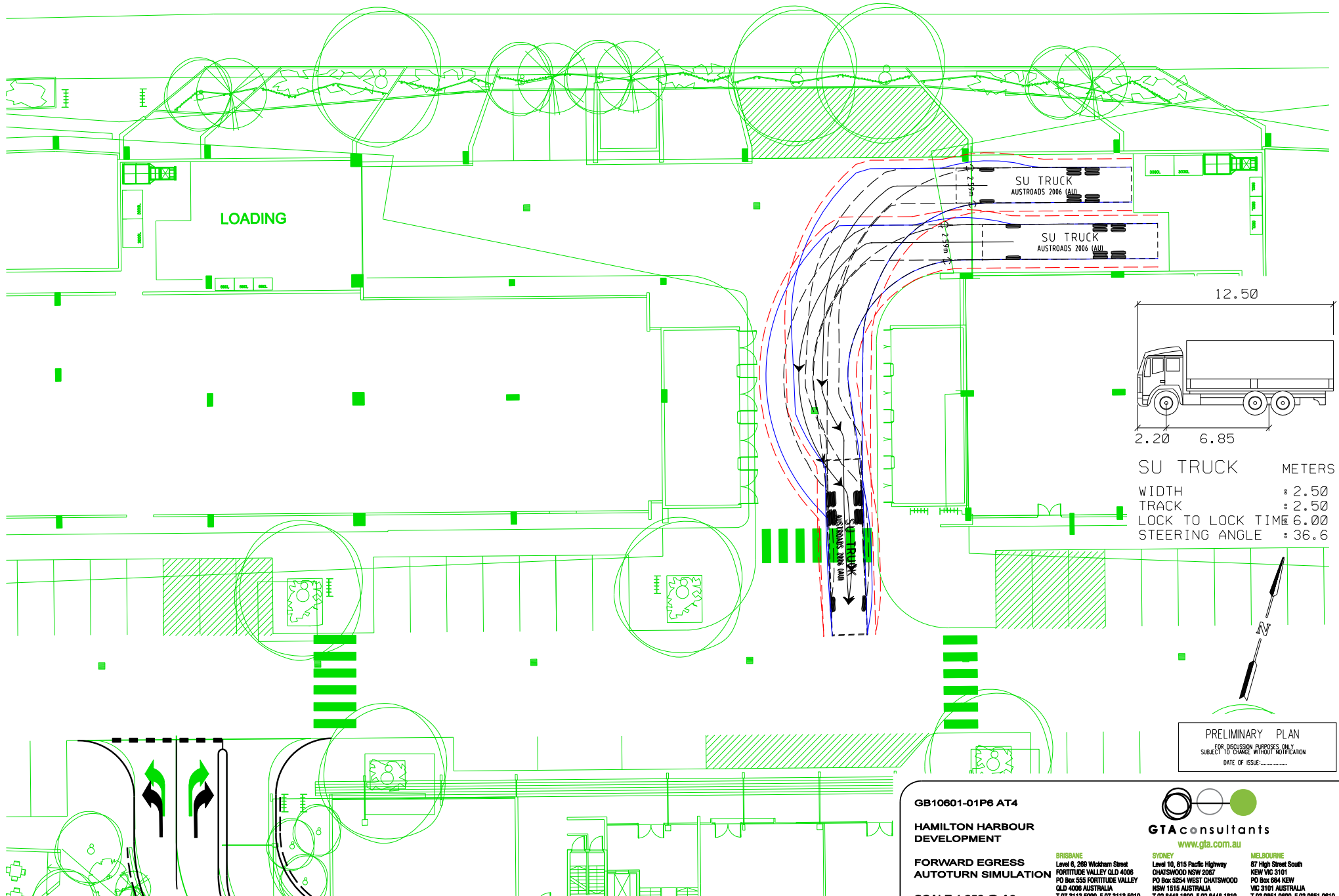
SCALE 1:250 @ A3

BRISBANE
Level 6, 268 Wickham Street
FORTITUDE VALLEY QLD 4006
PO Box 555 FORTITUDE VALLEY
QLD 4006 AUSTRALIA
T 07 3113 5000 F 07 3113 5010
E brisbane@gta.com.au


GTA consultants
www.gta.com.au

SYDNEY
Level 10, 815 Pacific Highway
CHATSWOOD NSW 2067
PO Box 5254 WEST CHATSWOOD
NSW 1515 AUSTRALIA
T 02 8448 1800 F 02 8448 1810
E sydney@gta.com.au

MELBOURNE
87 High Street South
KEW VIC 3101
PO Box 684 KEW
VIC 3101 AUSTRALIA
T 03 9851 9600 F 03 9851 9610
E melbourne@gta.com.au



GB10601-01P6 AT4

**HAMILTON HARBOUR
DEVELOPMENT**

**FORWARD EGRESS
AUTOTURN SIMULATION**

SCALE 1:250 @ A3

BRISBANE
Level 6, 288 Widdowson Street
FORTITUDE VALLEY QLD 4008
PO Box 555 FORTITUDE VALLEY
QLD 4008 AUSTRALIA
T 07 3113 5000 F 07 3113 5010
E brisbane@gta.com.au

SYDNEY
Level 10, 615 Pacific Highway
CHATSWOOD NSW 2067
PO Box 5254 WEST CHATSWOOD
NSW 1516 AUSTRALIA
T 02 8448 1800 F 02 8448 1810
E sydney@gta.com.au

MELBOURNE
87 High Street South
KEW VIC 3101
PO Box 684 KEW
VIC 3101 AUSTRALIA
T 03 9851 9600 F 03 9851 9610
E melbourne@gta.com.au



Appendix E

Concept Western Access Form

Appendix F

SIDRA Intersection Summary



Movement Summary

East Site Access

AM 2022

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Harbour Road										
5	T	467	4.9	0.247	0.0	LOS A	0	0.00	0.00	60.0
6	R	11	0.0	0.013	9.2	LOS A	0	0.27	0.64	47.6
Approach		478	4.8	0.247	0.2	LOS A	0	0.01	0.01	59.6
East Site Access										
7	L	73	0.0	0.100	9.8	LOS A	3	0.30	0.64	47.3
9	R	11	0.0	0.100	10.0	LOS B	3	0.30	0.79	46.9
Approach		84	0.0	0.100	9.8	LOS A	3	0.30	0.66	47.2
Harbour Road										
10	L	21	0.0	0.092	8.2	LOS A	0	0.00	0.67	49.0
11	T	152	5.3	0.092	0.0	LOS A	0	0.00	0.00	60.0
Approach		173	4.6	0.092	1.0	LOS A		0.00	0.08	58.4
All Vehicles		735	4.2	0.247	1.5	Not Applicable	3	0.04	0.10	57.6

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: East Site Access AM 2022 with dev't

P:\GB10000-GB11000\GB10601\Sidra\080805 East Site Access.aap

Processed Oct 15, 2008 01:42:14PM

A0121, GTA Consultants, Large Office

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Movement Summary

East Site Access

PM 2022

Give-way

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Harbour Road										
5	T	300	5.0	0.159	0.0	LOS A	0	0.00	0.00	60.0
6	R	11	0.0	0.013	10.2	LOS B	0	0.40	0.68	46.8
Approach		311	4.8	0.159	0.4	LOS A	0	0.01	0.02	59.4
East Site Access										
7	L	219	0.0	0.324	11.3	LOS B	13	0.50	0.79	45.7
9	R	24	0.0	0.324	11.6	LOS B	13	0.50	0.87	45.4
Approach		243	0.0	0.324	11.3	LOS B	13	0.50	0.80	45.7
Harbour Road										
10	L	12	0.0	0.176	8.2	LOS A	0	0.00	0.67	49.0
11	T	320	5.0	0.176	0.0	LOS A	0	0.00	0.00	60.0
Approach		332	4.8	0.176	0.3	LOS A		0.00	0.02	59.5
All Vehicles		886	3.5	0.324	3.3	Not Applicable	13	0.14	0.24	54.9

Symbols which may appear in this table:

Following Degree of Saturation

x = 1.00 for Short Lane with resulting Excess Flow

* x = 1.00 due to minimum capacity

Following LOS

- Based on density for continuous movements

Following Queue

- Density for continuous movement



Site: East Site Access PM 2022 with dev't

P:\GB10000-GB11000\GB10601\Sidra\080805 East Site Access.aap

Processed Oct 15, 2008 01:42:15PM

A0121, GTA Consultants, Large Office

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Movement Summary

West Site Access / Apartment Access

AM 2022

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Harbour Road										
1	L	5	0.0	0.333	5.8	LOS A	23	0.33	0.47	50.1
2	T	474	5.1	0.332	5.0	LOS A	23	0.33	0.42	51.0
3	R	5	0.0	0.333	11.8	LOS B	23	0.33	0.62	45.3
Approach		484	5.0	0.332	5.1	LOS A	23	0.33	0.42	50.9
West Site Access										
4	L	5	0.0	0.078	6.1	LOS A	3	0.33	0.50	50.0
5	T	5	0.0	0.078	5.2	LOS A	3	0.33	0.45	50.9
6	R	77	0.0	0.078	12.1	LOS B	3	0.33	0.64	45.3
Approach		87	0.0	0.078	11.3	LOS B	3	0.33	0.62	45.8
Harbour Road										
7	L	405	0.0	0.370	5.4	LOS A	23	0.14	0.44	51.4
8	T	158	5.1	0.370	4.6	LOS A	23	0.14	0.38	52.5
9	R	11	0.0	0.367	11.3	LOS B	23	0.14	0.64	46.1
Approach		574	1.4	0.370	5.3	LOS A	23	0.14	0.43	51.6
Apartment Access										
10	L	23	0.0	0.044	7.7	LOS A	2	0.53	0.61	48.6
11	T	5	0.0	0.045	6.7	LOS A	2	0.53	0.57	49.4
12	R	11	0.0	0.045	13.6	LOS B	2	0.53	0.68	44.4
Approach		39	0.0	0.045	9.2	LOS A	2	0.53	0.62	47.4
All Vehicles		1184	2.7	0.370	5.8	LOS A	23	0.24	0.45	50.7

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Following LOS

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Following Queue

- Density for continuous movement



Movement Summary

West Site Access / Harbour Road

PM 2022

Roundabout

Vehicle Movements

Mov ID	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
Harbour Road										
1	L	8	0.0	0.276	6.9	LOS A	18	0.54	0.58	48.7
2	T	316	5.1	0.280	6.0	LOS A	18	0.54	0.54	49.4
3	R	5	0.0	0.278	12.8	LOS B	18	0.54	0.66	44.4
Approach		329	4.9	0.280	6.2	LOS A	18	0.54	0.54	49.3
West Site Access										
4	L	13	0.0	0.255	7.4	LOS A	12	0.52	0.62	48.8
5	T	5	0.0	0.250	6.4	LOS A	12	0.52	0.59	49.5
6	R	231	0.0	0.252	13.3	LOS B	12	0.52	0.70	44.5
Approach		249	0.0	0.252	12.8	LOS B	12	0.52	0.70	44.8
Harbour Road										
7	L	216	0.0	0.352	5.3	LOS A	22	0.11	0.44	51.6
8	T	316	5.1	0.352	4.5	LOS A	22	0.11	0.38	52.7
9	R	23	0.0	0.354	11.3	LOS B	22	0.11	0.65	46.3
Approach		555	2.9	0.352	5.1	LOS A	22	0.11	0.41	52.0
Apartment Access										
10	L	7	0.0	0.019	7.6	LOS A	1	0.53	0.57	48.7
11	T	5	0.0	0.019	6.6	LOS A	1	0.53	0.54	49.4
12	R	5	0.0	0.019	13.5	LOS B	1	0.53	0.65	44.5
Approach		17	0.0	0.019	9.0	LOS A	1	0.53	0.59	47.5
All Vehicles		1150	2.8	0.354	7.2	LOS A	22	0.33	0.52	49.3

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Following Degree of Saturation

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Following LOS

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Following Queue

- Density for continuous movement