

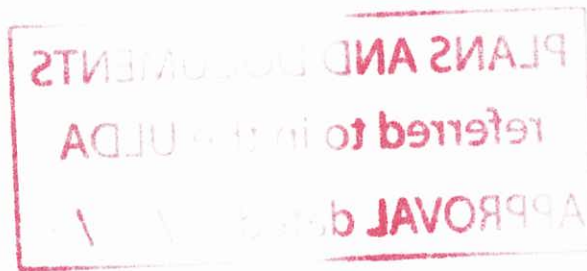
Portside Wharf Development Building 2 – Residential

Prepared for:
Brookfield Multiplex Developments

Traffic Engineering Report

PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 25 / 5 / 2012

Reference: 27485Trep.docx



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ABN 65 010 868 621

Level 1/129 Logan Road, Woolloongabba
PO Box 1310 Coorparoo BC QLD 4151

T: (07) 3327 9500 F: (07) 3327 9501 E: ttmbris@ttmgroup.com.au

Document Status

Rev No.	Author	Reviewed / Approved		Description	Date
		Name	Signature		
1	C. Morahan	B. Camilleri	BC	Final Report	21/12/11

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Appendices

- A Development Layout

1. Introduction

1.1 Background

TTM Consulting (Qld) Pty Ltd has been engaged by Brookfield Multiplex Developments to prepare a traffic engineering report for the proposed Building 2 within the Portside Wharf development. It is understood that this report will form part of the submission to the ULDA.

The scope of this assessment includes investigating:

- ▶ Access arrangements;
- ▶ Parking supply;
- ▶ Basement car park design, including integration with Building 4 basement car park; &
- ▶ Servicing arrangements.

1.2 Site Location

The site is within the Portside Wharf development on Hercules Street, Hamilton. The location of Building 2 is shown in Figure 1.1

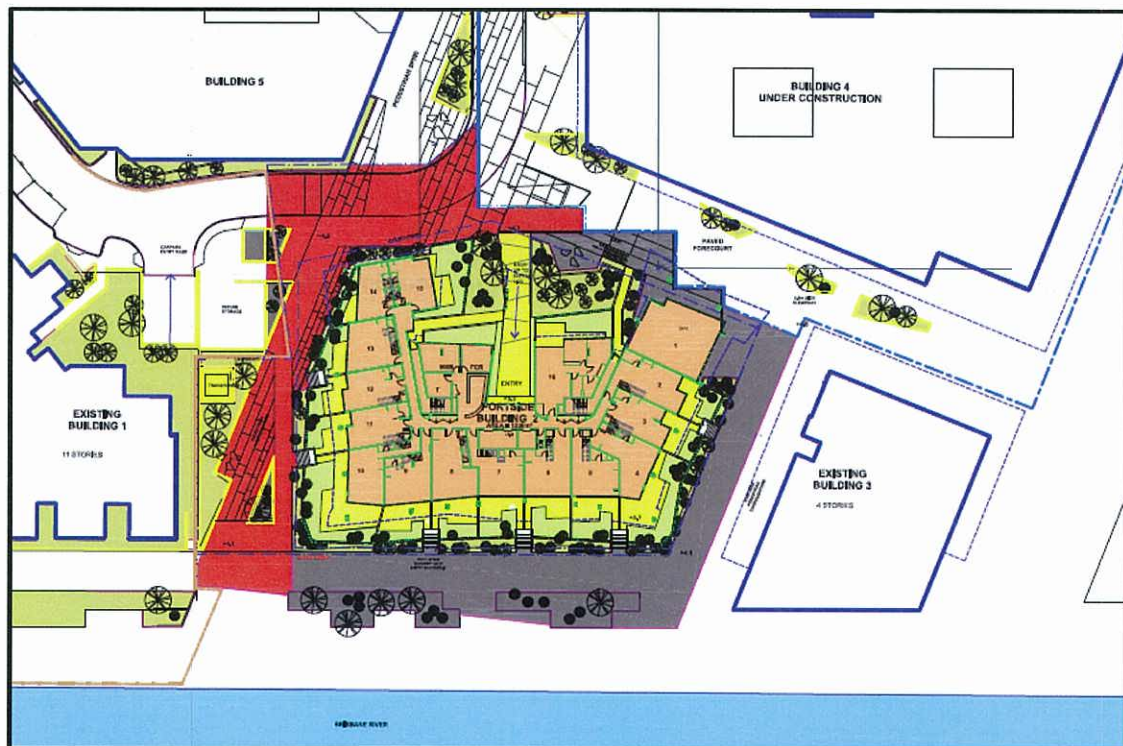


Figure 1.1: Site Location

2. The Proposed Development

2.1 Development Description

The development plan proposes a 16 level predominantly residential building. The schedule of accommodation is included in Table 2.1 below.

Table 2.1: Proposed Development Schedule

Land-Use	GFA (m ²) / No.
Apartments: 1 bedroom	25
2 bedroom	126
3 bedroom	17
Total	168
Cafe	92m ²

The proposed development plans relevant to this report are contained in Appendix A.

2.2 Proposed Car Parking

The development plan includes a total of 228 car parking spaces including 41 tandem bays located at basement level. Part of the basement carpark to be used in this proposal has already been assessed and approved under development applications for the adjacent buildings. These areas will not be assessed in this report.

It is proposed that bicycle parking for residents will be provided within the basement carpark whilst visitor cycle parking will be facilitated at ground level.

The car parking arrangements are discussed in greater detail in Section 4.0.

3. Access Arrangements

3.1 Vehicular Access

Vehicular access to the basement carpark will be achieved through the existing ramp located under Building 1, adjacent to the site. This ramp also services the basement carpark for Building 1.

The ramp is 6.8m wide and has a grade of 1:6, with transitions of 1:12.

This ramp is considered adequate to provide access to the basement carpark for Building 2.

4. Car Park Supply and Design

4.1 Car Parking Supply

Section 3.8 of the *'Northshore Hamilton Urban Development Area – Development Scheme'* stipulates that the on-site parking requirement for residential developments to be constructed within the UDA is 1 space per unit, including visitor parking.

This equates to a total requirement of 168 spaces for the residential component of the development.

The proposal provides 228 parking spaces, at a rate of 1.36 spaces per apartment (including visitor parking). As intimated previously, 41 of these are tandem spaces located behind other spaces, and will need to be allocated to the same apartment as the space which is blocking them.

Whilst the parking provision exceeds the prescribed rate for the UDA this rate is still lower than that used for residential developments located under the jurisdiction of Brisbane City council, which specifies a rate of 1.5 spaces per unit for 2 or 3 bedroom apartments, and 1.25 spaces per unit for 1 bedroom apartments. With the application of Council's rates the required parking provision for the development would be circa 247 spaces.

The development also contains a high proportion of 2 and 3 bedroom apartments (143 of the 168 apartments), and only a small number 1 bedroom apartments (25 apartments). With a higher number of people living in each apartment than would normally be expected, it is considered that a higher number of carparks for each apartment is a reasonable approach. In addition, the target market for the proposed development is higher end occupants who would expect at least one resident's carpark per apartment.

For these reasons, the provision of 228 spaces at a rate of 1.36 spaces per unit is considered appropriate in this instance for the residential component.

The parking requirements of the café will be served within the shared retail basement carpark.

4.2 Car Park Design

As intimated previously parts of the carpark have been assessed and approved under development applications for neighbouring buildings, and some areas are currently under construction or have already been constructed. These areas have therefore have not been considered as part of this assessment. The basement carpark layout is shown on the plans included in Appendix A, which highlights the area under consideration in this application.

'AS2890.1:2004 *Parking Facilities: Part 1 – Off-Street Parking*' is adopted as a reference for car parking design. The key design parameters in accordance with 'AS 2890.1' are set out in Table 4.1 below.

Table 4.1: Car Park Design Requirements

Criteria	Minimum Required	Proposed	Comply (Yes or No)
Residential Car Parking Spaces	2.4m x 5.4m	2.4m x 5.4m (minimum)	Yes
Small Car Parking Spaces	2.3m x 5.0m	2.3m x 5.0m	Yes
Spaces Abutting Walls	0.3m widening	0.3m widening	Yes
Parking Aisle	5.8m	5.8m	Yes
Blind Aisle Extension	1.0m	1.2m	Yes
Circulation Road	5.5m	6.1m-6.6m	Yes
Ramp Grades	1:4 (up to 20m) or 1:5 (over 20m)	1:6	Yes

Inspection of the development plans indicates that column encroachment is evident at a number of locations. For example, it is apparent that minor encroachment is evident spaces 29, 31, 32 and 33 adjacent to the refuse room. Whilst this level of encroachment will only have a slight impact on rear driver side door opening it is considered that this issue will be resolved at the detailed design stage.

It has been demonstrated that the proposed car park design generally complies with the requirements set out in 'AS2890.1'.

5. Traffic Impact

5.1 Development Traffic Generation and Distribution

To assess the impact of the proposed development on the adjacent road network it is necessary to predict the likely number of vehicles that will be generated by the proposal.

The traffic generation of the proposed development has been assessed taking cognisance of the information provided in the Department of Transport and Main Road's *'Road Planning and Design Manual'*.

Table 5.1 below indicates the predicted peak-hour generation rates and the generated peak-hour traffic volumes for the proposed development.

Table 5.1: Predicted Peak-Hour Traffic Generation on a Typical Weekday

Land-Use	Number	Trip Rate Per Unit	Peak-Hour Traffic Flows
High Density Residential	168	0.4	68

The subject site is ideally positioned to take advantage of nearby connections to the major road network. For instance, the slip roads to/from the Gateway Motorway are situated approximately 2km to the east of the development on Kingsford Smith Drive. Similarly the portal to Inner City Bypass (ICB) is located roughly 1.7km to the west of the subject site.

The traffic generated by the proposed development is likely to be distributed in accordance with the attraction of employment hubs within a reasonable drive time of the subject site. For the purposes of this assessment it has been assumed, not unreasonably, that there will be a relatively even geographic distribution of development related traffic.

It should be noted that it has been assumed that residents employed in the CBD are likely to utilise public transport or potentially cycle whilst travelling to/from work as opposed to travelling by private motor vehicle given the constrained parking opportunities available within the CBD.

The assumed trip distribution methodology is set out below.

- ▶ 25% to/from the northern suburbs;
- ▶ 25% to/from the eastern suburbs;
- ▶ 25% to/from the southern suburbs; &
- ▶ 25% to/from the western suburbs.

In terms of routing it is expected that traffic to/from the northern suburbs is likely to utilise Hercules Road followed by Remora Road and then Nudgee Road. It is expected that traffic to/from the eastern and southern suburbs will utilise Hercules Road followed by Remora Road, Kingsford Smith Drive and the Gateway Motorway. It is anticipated that traffic to/from the western suburbs will utilise Harbour Road followed by Kingsford Smith Drive and the ICB.

The assumed trip distribution methodology is indicatively shown in Figure 5.1 below.

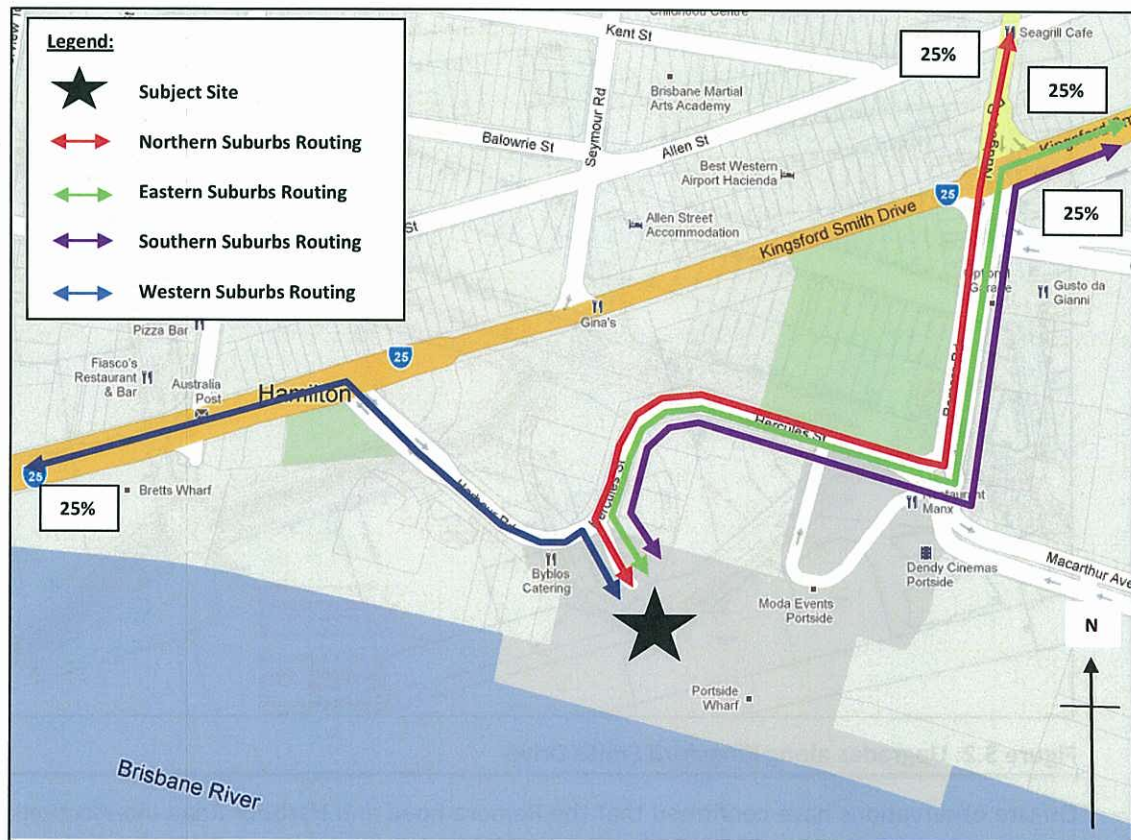


Figure 5.1: Trip Distribution Methodology

Notwithstanding the above, proposed development traffic has not been assigned to the adjoining road network as it is not deemed to have significant volume to do so.

Given the volume of traffic generated by the proposed development and the routing options available for residents it is not anticipated that there will be any noticeable deterioration of intersection performance in the vicinity of the subject site.

5.2 External Road Network

Whilst it is highlighted above that the proposed development in isolation will not have a significant impact on the adjoining road network it is acknowledged that collectively the various developments proposed for the wider site will have a perceptible impact on intersection performance in the vicinity of the UDA.

The Traffic Impact Assessment (TIA) prepared in conjunction with the Masterplan application included an assessment of the traffic impacts of the overall Portside Wharf development on the external road network. It was concluded that due to the extensive development in the wider Northshore Hamilton Precinct that a wider area traffic study was required to assess the impact on the existing road network and particularly on the operation performance Kingsford Smith Drive.

Brisbane City Council conducted the traffic study, and recommended a strategy to upgrade the Kingsford Smith Drive corridor in order to facilitate future development to the south of Kingsford Smith Drive from Racecourse Road through to the Gateway. Figure 5.2 below shows the upgrades anticipated along Kingsford Smith Drive in order to facilitate development related traffic.

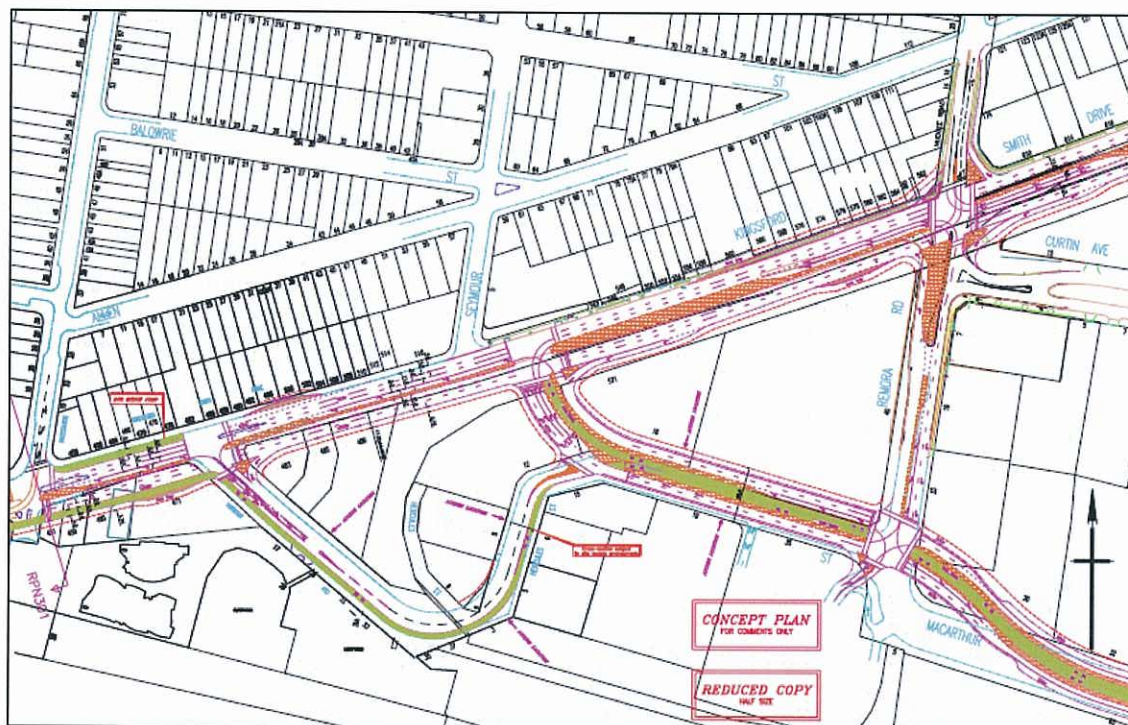


Figure 5.2: Upgrades along Kingsford Smith Drive

On-site observations have confirmed that the Remora Road and Harbour Road intersections with Kingsford Smith Drive have already been constructed. It is understood that the Hercules Road intersection with Kingsford Smith Drive will be constructed as part of the works associated with the development of lands adjacent to Macarthur Avenue.

As shown on the plan above it is proposed that a busway will ultimately be constructed along both Hercules Road and Macarthur Avenue. Furthermore it is proposed that a bus lane will be introduced along Harbour Road.

6. Service Vehicle Arrangements

6.1 Service Vehicle Bays

The service vehicle facility needs to accommodate the demands generated by the various components of the development. It is proposed that 1 SRV bay will be provided between Buildings 2 and 4 to facilitate the servicing of the development.

Discussions with management at Portside Wharf have confirmed that a Service Management Plan has been successfully implemented at the wider site whereby deliveries to the residential components of the precinct are restricted to small rigid vehicles (SRV's) and utes.

In respect to the café the ability to schedule the timing of the trucks allows for the dual use of the SRV bay.

As such it is considered that the provision of 1 SRV space is sufficient to ensure the adequate servicing of the proposed development.

6.2 Refuse Collection

A Waste Management Plan has been developed by EnviroCom for the wider site.

The Plan recommended that all general waste is to be disposed of via the garbage chute on each level within the development and will be collected in the basement level waste storage rooms in 2-3m³ bulk bins (2 bins will be required to rotate for servicing ensuring a bin is under the chute at all times). Each floor level will have access to the rubbish chute for general wastes only.

Recycling waste is to be collected within bulk bins located adjacent to the waste storage room within the basement level. Clear signage on each floor adjacent to the chute will direct tenants to use the recycling service available, giving directions on recyclable items and where to find the disposal point.

The property manager will be responsible for towing the general waste and recycling bins from the waste storage room to the service point (Building 2 waste will be towed to the service point located between Buildings 1 and 2). The property manager will also be responsible for moving bulk bins back to the individual waste storage rooms once emptied.

6.3 Vehicle Manoeuvrability

As shown in Figure 6.1 on the following page, SRV's enter the bay in a reverse gear and exit in a forward gear.

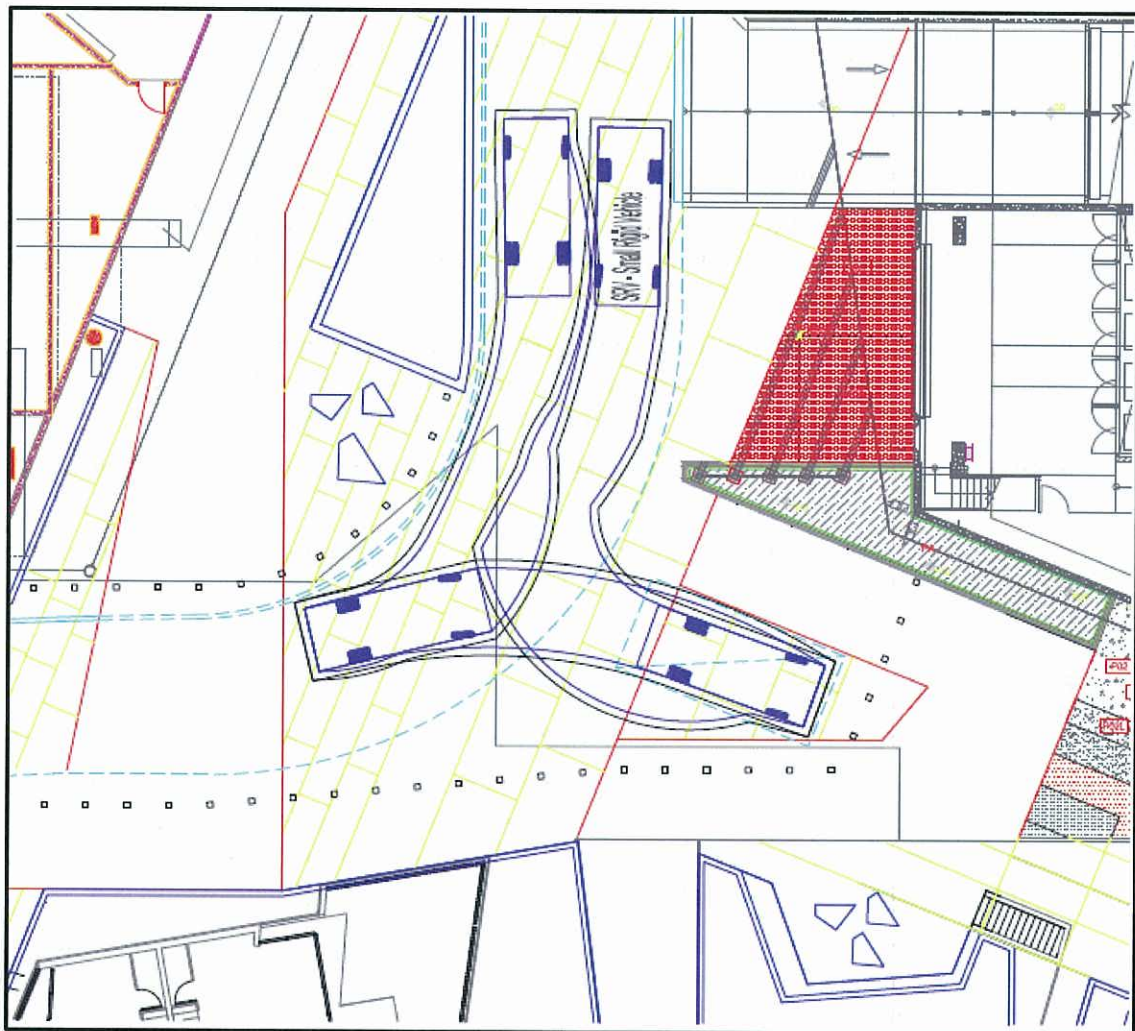


Figure 6.1: SRV Swept Path for Building 2

As shown in Figure 6.2 below, RCV's enter the refuse collection area in a reverse gear and exit in a forward gear.

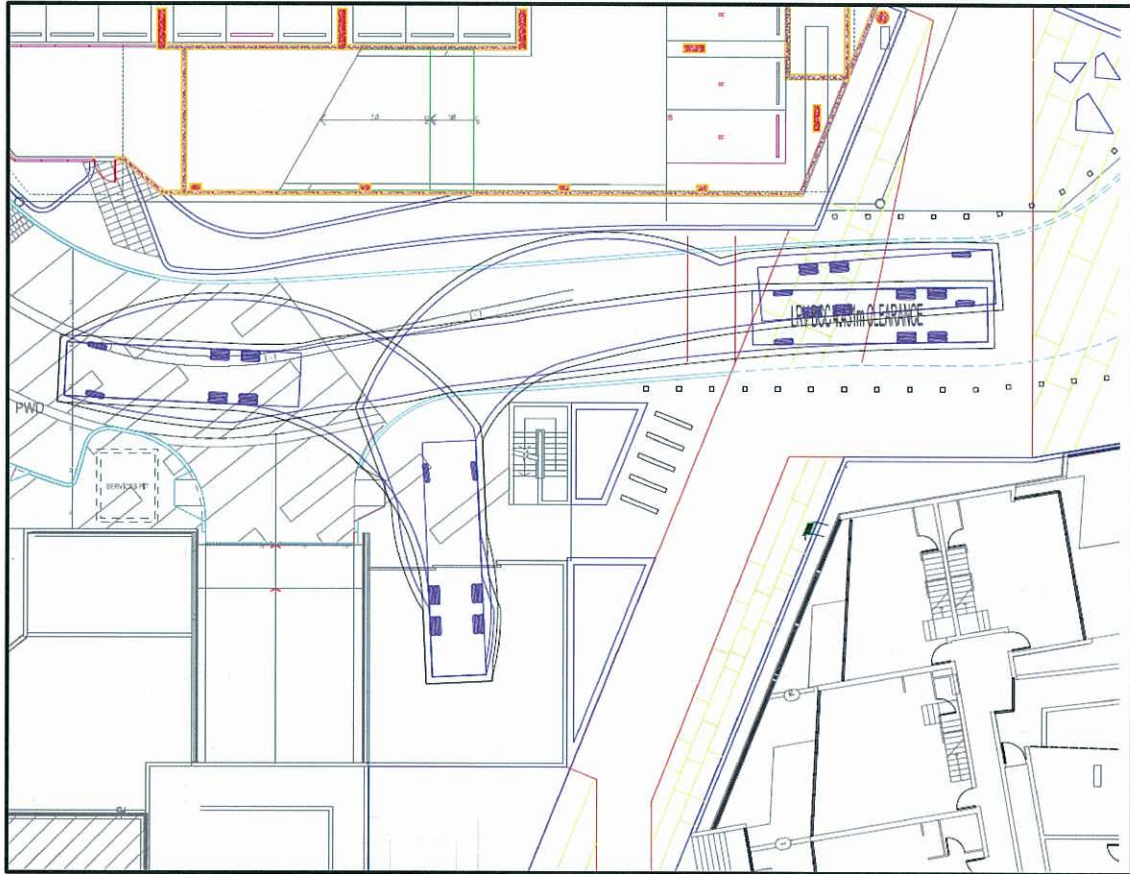


Figure 6.2: RCV Swept Path for Building 2

The swept analysis shown in Figure 6.2 above has confirmed that RCV's will run-over the proposed kerblines opposite when exiting the rubbish collection area in a forward gear. As such it is recommended that the kerbing opposite is mountable. It is also noted that vehicles will be required to reverse into the refuse collection area and within the path of traffic entering/exiting the basement carpark. It is, however, considered that the potential for conflict is minimal given the tidal flow of traffic and the infrequency of refuse collection function.

7. Bicycle Provisions

7.1 Bicycle Parking

It is proposed that 82 bicycle spaces will be provided within the basement carpark. Visitor cycle parking at Building 2 will be facilitated at ground level.

The UDA development criteria specifies bicycle parking requirements for residential development, which are as follows:

- ▶ Residents: One secure bicycle space per unit; &
- ▶ Visitors: One space per 400m² of GFA.

It is intimated in the 'Northshore Hamilton Urban Development Area – Development Scheme' that the bicycle parking requirements are based on that set out in 'AS2890.3, Parking Facilities, Part 3 Bicycle Parking Facilities'. Inspection of this document has confirmed that it does not specify parking rates for bicycles.

The generally accepted guide for determining bicycle facilities is 'AustRoads Part 14-Bicycles'. Table 7.1 summarises the AustRoads bicycle parking requirement.

Table 7.1: Bicycle Parking Provided as per AustRoads

Land Use	Category	Parking Requirements	No. of Spaces Required
Residential	Tenants	1.0 space per 4 units	42
	Visitor	1.0 space per 16 units	11
Total			53

As shown in Table 7.1 above the proposed cycle parking provision satisfies the minimum requirements set out by Austroads.

To minimise the space utilised by bicycle storage, and subsequently improve the efficiency of the building, a bicycle rack system utilising double height storage is recommended.

8. Recommendations

8.1 Development Access

Vehicular access to the basement carpark will be achieved through the existing ramp located under Building 1, adjacent to the subject site.

8.2 Car Parking Arrangements

The proposal provides 228 parking spaces, at a rate of 1.36 spaces per apartment (including visitor parking). As intimated previously 41 of these are tandem spaces located behind other spaces, and will need to be allocated to the same apartment as the space which is blocking them.

Whilst the parking provision exceeds the prescribed rate for the UDA this rate is still lower than that used for residential developments located under the jurisdiction of Brisbane City council, which specifies a rate of 1.5 spaces per unit for 2 or 3 bedroom apartments, and 1.25 spaces per unit for 1 bedroom apartments. With the application of Council's rates the required parking provision for the development would be circa 247 spaces.

The development also contains a high proportion of 2 and 3 bedroom apartments (143 of the 168 apartments), and only a small number 1 bedroom apartments (25 apartments). With a higher number of people living in each apartment than would normally be expected, it is considered that a higher number of carparks for each apartment is a reasonable approach. In addition, the target market for the proposed development is higher end occupants who would expect at least one resident's carpark per apartment.

For these reasons, the provision of 228 spaces at a rate of 1.36 spaces per unit is considered appropriate in this instance for the residential component.

The car park layout satisfies the minimum design requirements specified in 'AS2890.1:2004'.

8.3 Traffic Impact

Proposed development related traffic has not been assigned to the local road network as it is not deemed to have a significant volume to do so.

Given the volume of traffic generated by the proposed development and the routing options available for residents it is not anticipated that there will be any noticeable deterioration of intersection performance in the vicinity of the subject site.

8.4 Service Vehicle Arrangements

Discussions with management at Portside Wharf have confirmed that a Service Management Plan has been successfully implemented at the wider site whereby deliveries to the residential component of the development are restricted to small rigid vehicles (SRV's) and utes.

In respect to the café the ability to schedule the timing of the trucks allows for the dual use of the SRV bay.

As such it is considered that the provision of 1 SRV space is sufficient to ensure the adequate servicing of the proposed development.

8.5 Bicycle Parking

The proposed cycle parking provision satisfies the minimum requirements set out by Austroads.

To minimise the space utilised by bicycle storage, and subsequently improve the efficiency of the building, a bicycle rack system utilising double height storage is recommended.

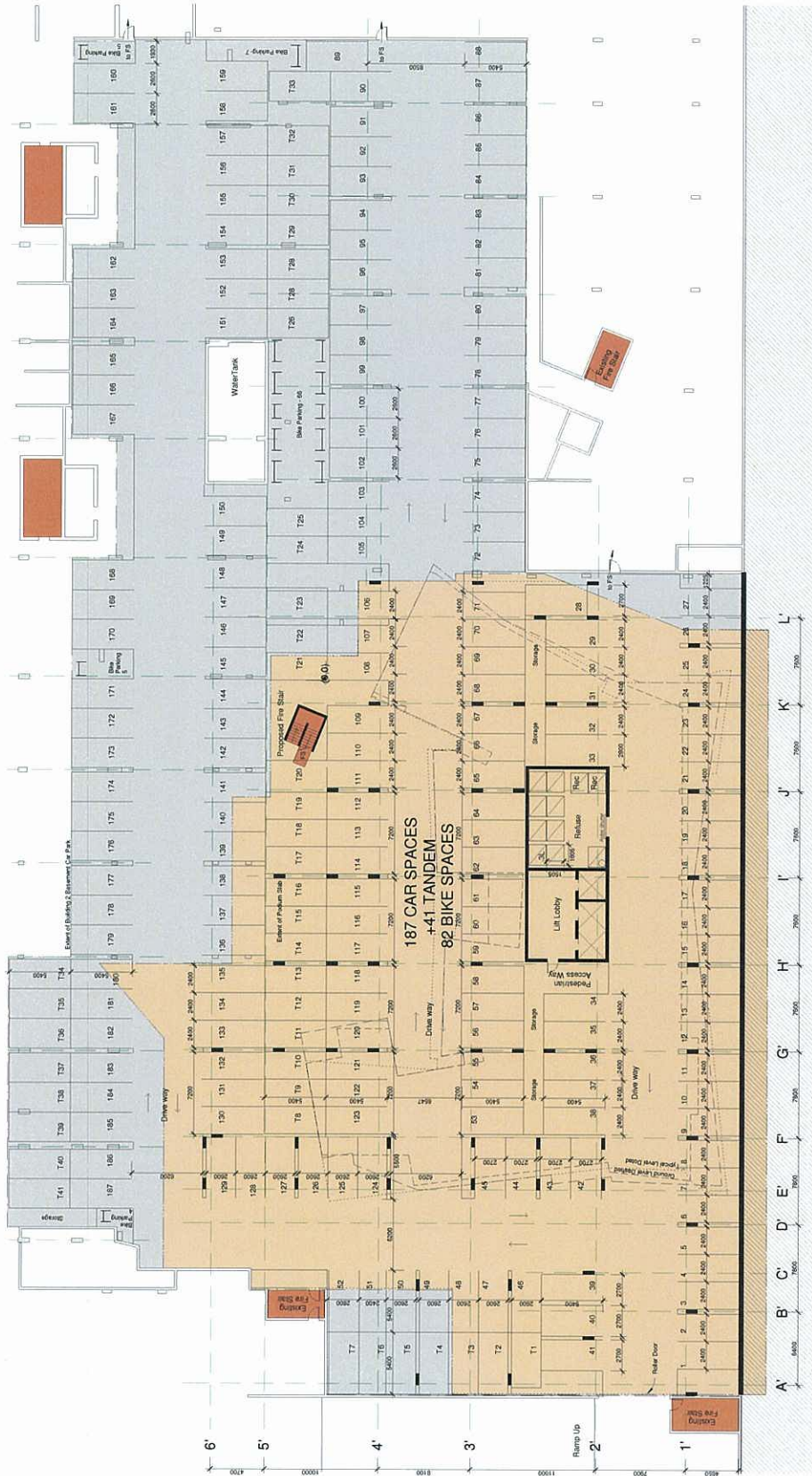
Appendix A

DEVELOPMENT LAYOUT

Ground Floor

Efficiency	87%
Internal Saleable	834 m ²
Circulation	127 m ²
GFA	961 m ²
Services	51 m ²
Entry	52 m ²





24 May 2012

Andrew Lamb
Urban Land Development Authority
Level 4
BRISBANE QLD 4001

Proposal for the supply of KarelCAD Design Solutions

Proposal No: Q38865

Dear Andrew

Thank you for the opportunity to provide your organisation with a Design Solution.

KarelCAD has worked hard since establishment in 1986, to build a strong service oriented business and culture with a sound financial base. Being Autodesk's largest partner in the region and the only one accredited to supply, train and support ALL Autodesk technology means we have the infrastructure to deliver to your requirements, irrespective of size.

Located across our five (5) Australian offices, our team of specialists delivers Design Technology, associated Hardware and Training solutions to all areas of the Manufacturing, Architectural, Engineering and Construction industries. In addition to our tailored training and Integration services, we offer approximately 40 scheduled Group courses on a monthly basis nationwide. All these are delivered by our Autodesk Certified and award winning Application Specialists.

The following pages outline the solution as per our discussions. If you have any further questions please don't hesitate to contact me. Alternatively if this proposal addresses your expectations, please simply sign and return the order form and we can proceed with your solution. Thank you in advance for your custom.

Yours Sincerely

Mark Pearce

Option 1 - Building Design Suite Premium Standalone License

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Autodesk Building Design Suite Premium 2013 Commercial Standalone License including Subscription pro-rated 10 months. Adding to existing contract 110000494969; Expiry Date: 13 Mar 2013 Recommended Retail Price \$10,800 EX GST Each	\$8,800.00	\$8,800.00
1	Design Content Subscription Access for 36 Months for 1 User	\$189.95	\$189.95
		Freight (Ex GST)	\$25.00
		GST Component	\$901.50
		Grand Total including GST	\$9,916.45

Option 2 - Building Design Suite Premium Network License

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Autodesk Building Design Suite Premium 2013 Commercial Network License including Subscription pro-rated 10 months. Adding to existing contract 110000494969; Expiry Date: 13 Mar 2013 Recommended Retail Price \$10,800 EX GST Each	\$10,300.00	\$10,300.00
1	Design Content Subscription Access for 36 Months for 1 User	\$189.95	\$189.95
		Freight (Ex GST)	\$25.00
		GST Component	\$1,051.50
		Grand Total including GST	\$11,566.45

Option 3 - Revit Architecture Standalone License

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Autodesk Revit Architecture 2013 Commercial Standalone License including Subscription pro-rated 10 months. Adding to existing contract 110000494969; Expiry Date: 13 Mar 2013 Recommended Retail Price \$9,075 EX GST Each	\$8,250.00	\$8,250.00
1	Design Content Subscription Access for 36 Months for 1 User	\$189.95	\$189.95
		Freight (Ex GST)	\$25.00
		GST Component	\$846.50
		Grand Total including GST	\$9,311.45

Option 4 - Revit Architecture Network License

QTY	DESCRIPTION	UNIT PRICE	TOTAL PRICE
1	Autodesk Revit Architecture 2013 Commercial Network License including Subscription pro-rated 10 months. Adding to existing contract 110000494969; Expiry Date: 13 Mar 2013	\$10,100.00	\$10,100.00
	Recommended Retail Price \$11,125 EX GST Each		
1	Design Content Subscription Access for 36 Months for 1 User	\$189.95	\$189.95
		Freight (Ex GST)	\$25.00
		GST Component	\$1,031.50
		Grand Total including GST	\$11,346.45

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KarelCAD Terms & Conditions of Sale stated below.

This Proposal is strictly valid for seven (7) days only.

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- A partner committed to BIM, Digital Prototyping, Intelligent Utilisation of Data & Industry Collaboration.
- Pro-active participation in Key Industry Associations across all design disciplines, including the AIA, BDA and Engineers Australia.
- Full Autodesk Authorised Training Centre (ATC) accreditation, with multiple international awards.
- A partner recognised locally & globally for regular & successful implementations of Autodesk based technology.
- An extensive range of Scheduled Group training courses monthly.

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1	Pricing
1.1	Quoted prices are subject to variation by KarelCAD without notice.
1.2	Public distribution of KarelCAD's quoted prices render the pricing as void.
1.3	Pricing is only valid for the terms specified on the quote.
1.4	Accepted pricing must be ordered for by the customer and shall only bind when KarelCAD receives confirmation in writing.
2	Payment Terms
2.1	Payment terms are: payment before delivery of product, or in the case of Training - prior to commencement
2.2	Account payments must be remitted in accordance with the invoice instructions.
2.3	We Accept Visa / Mastercard / Bankcard.(1.5% surcharge applies to purchases on credit card)
3	Retention of Title
3.1	The licence to goods does not pass from KarelCAD to the customer until full payment is made to KarelCAD.
4	Loss or damage and risk
4.1	The liability for any loss or damage shall pass directly to the purchaser once the product has left KarelCAD's warehouse for delivery to the customer.
4.2	Any claim for damage or short delivery must be made in writing and addressed to KarelCAD and received by KarelCAD within seven (7) working days of delivery of the goods.
5	Cancellation of Order
5.1	Cancellation of software orders will incur a 20% restocking fee for the return of the product to the supplier.
5.2	Training course cancellations / deferments must be one week prior to course commencement date, to allow effective re-scheduling.
5.3	For any training cancelled by you the client within one week of commencement of said training, for which there is no intention of re-scheduling, will be refunded at 50% of the purchase amount.
6	Finance not Automatically Approved - additional information that may be requested by the Financier
6.1	Finance agreements are at the discretion of the finance company

Acceptance of Quotation

Proposal No:

Q38865

Client Purchase Order #:

(if applicable)

I, have read and agree to the terms and conditions outlined in the above mentioned quotation and I wish to accept this quotation for the following:

I also confirm that I am authorised to make this purchase on behalf of Urban Land Development Authority

KarelCAD Bank Account Details:

BSB: 484 799

A/c: 200 99 6823

.....
Andrew Lamb on behalf of Urban Land Development Authority

.....
Dated

This proposal is valid for seven (7) days only

Please read through the Terms & Conditions of Sale before signing this agreement

