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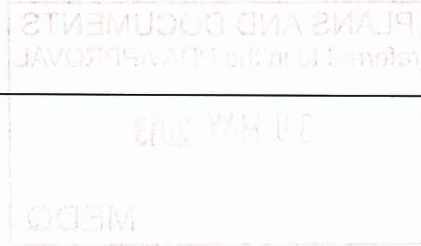


Portside Wharf Development

Building 20

Traffic Engineering Report

Prepared for:
Brookfield Residential Properties



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1. Introduction

1.1 Background

TTM Consulting Pty Ltd (TTM) has been engaged by Brookfield Residential Properties to prepare a traffic engineering report for the proposed Building 20 within the Portside Wharf development. It is understood that this report will form part of the submission to the Urban Land Development Authority (ULDA).

The scope of this assessment includes investigating:

- ▶ Access arrangements;
- ▶ Parking supply;
- ▶ Basement car park design, including integration with wider Portside Wharf basement car park;
- ▶ Road network impacts; and
- ▶ Servicing arrangements.

To assess the proposed transport arrangements, the development plans have been assessed against the following guidelines and planning documents:

- ▶ Northshore Hamilton UDA Development Scheme
- ▶ Australian Standard for Parking Facilities (AS2890:2004)

1.2 Site Location

The site is located within the Portside Wharf development on Hercules Street, Hamilton on what is defined as Precinct 3c of the Northshore Hamilton Urban Development Area (UDA). The location of Building 20 in the context of the wider Portside Wharf area is shown in Figure 1.1. The site is currently used as a bus stop/terminal and public parking area for the Portside Wharf 'Brisbane Cruise Terminal'.

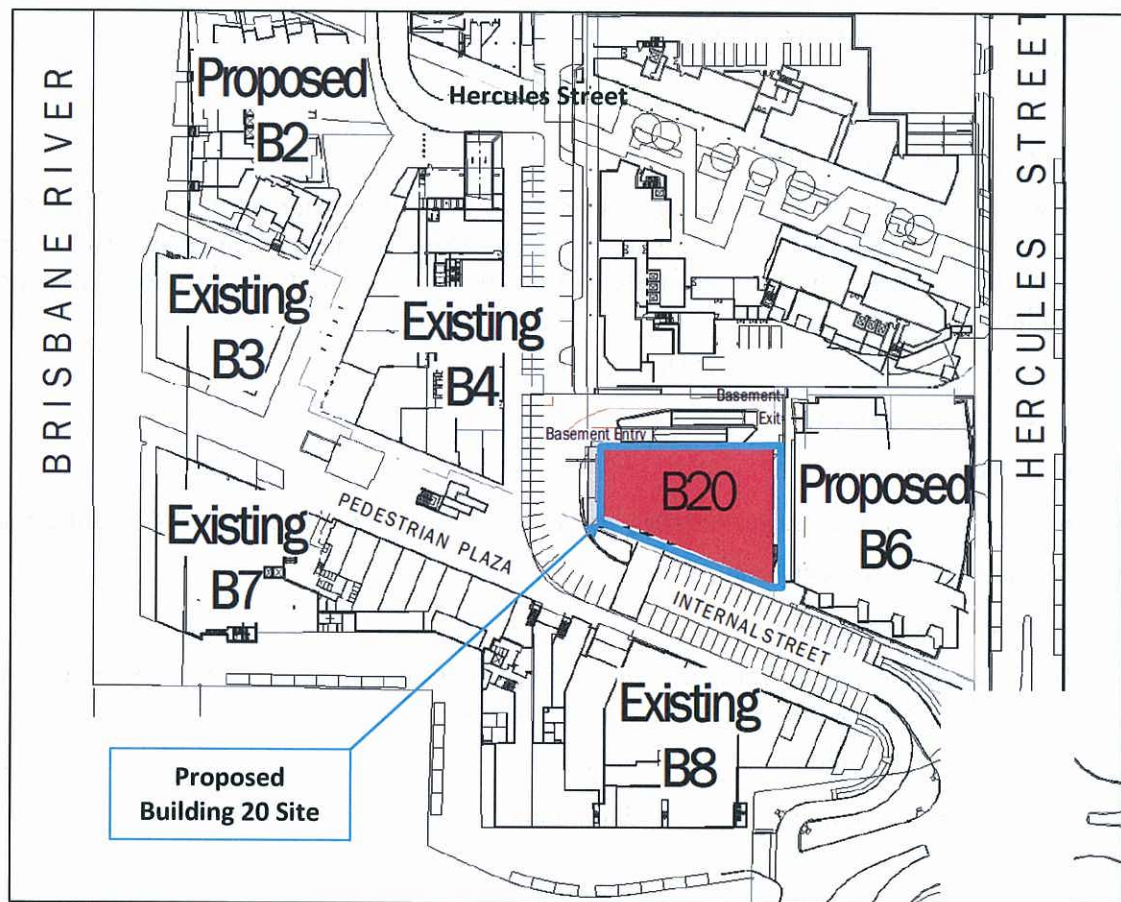


Figure 1.1: Site Location

1.3 Proposed Development Profile

The proposed development will incorporate a 4 level shared residential/retail building, comprising 31 units (all one bedroom) and 523m² GFA of retail space.

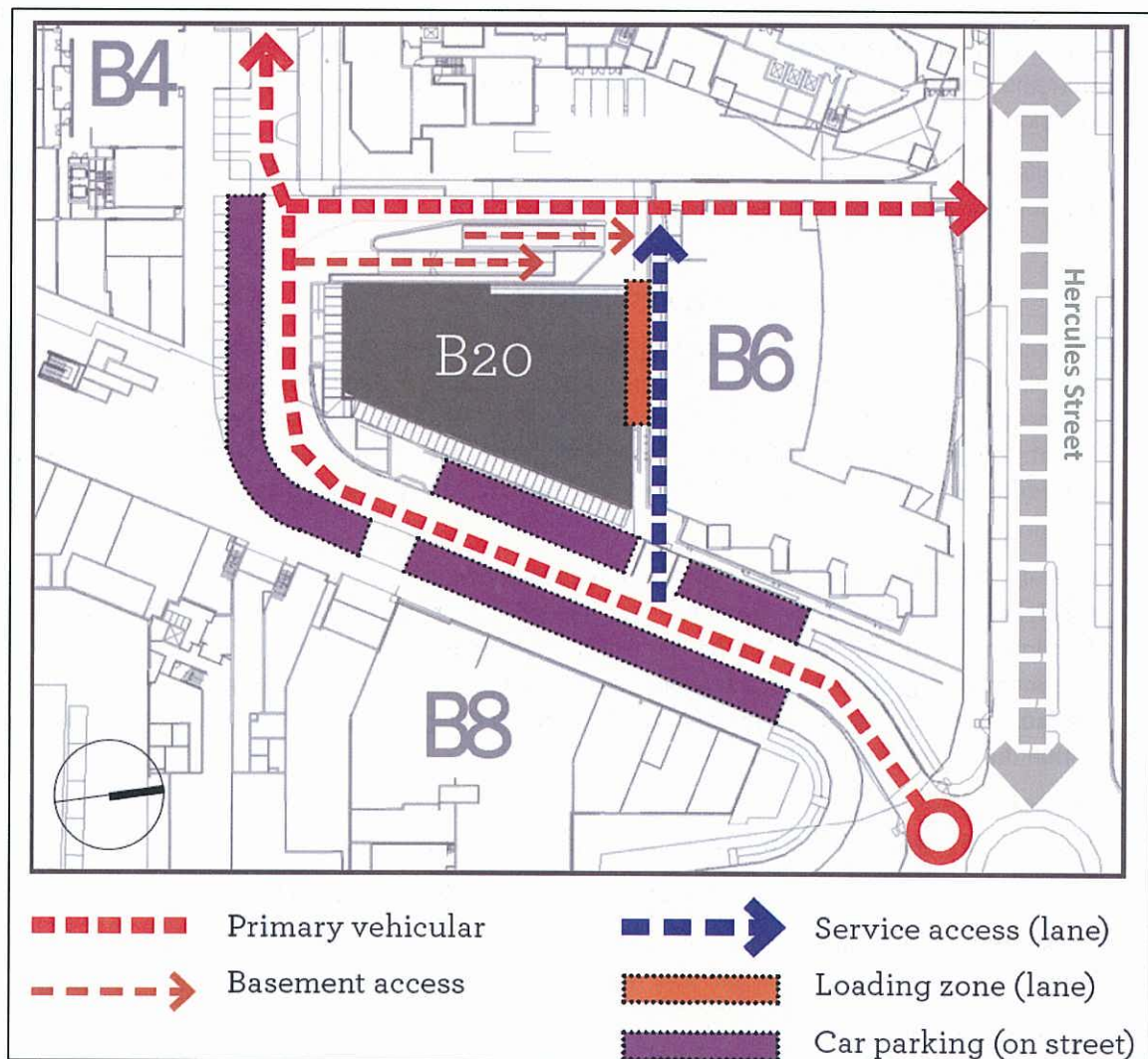
The proposed development plans are included in Appendix A.

2. Access Arrangements

The development plan includes the following access arrangements:

- a one-way 'active' laneway located directly to the north of Building 20 to facilitate service vehicle access to the site; and
- basement entry and exit ramps to the resident parking spaces, located directly to the west of the building.

Access to both the servicing laneway and basement car park entry ramp is facilitated by the one-way internal access road leading off the existing Hercules Street / Remora Road / Macarthur Avenue roundabout. An egress road runs from the exits of the service vehicle laneway and basement car park out to Hercules Street. Figure 2.1 below shows the proposed access arrangements for Building 20.



3. Car Parking Arrangements

3.1 ULDA Parking Requirements

Section 3.8 of the *'Northshore Hamilton Urban Development Area – Development Scheme'* stipulates that the long term on-site parking requirement for residential developments within the UDA is 1 space per dwelling unit, including visitor parking. This equates to a total requirement of 31 spaces for the residential component of the development.

Retail parking is to be provided at a rate of 1 space per 100m² GFA. This equates to a requirement of 6 spaces for retail use.

3.2 Portside Wharf Parking Masterplan

Brookfield has developed the 'Portside West Car Park Masterplan' which encompasses a consolidated basement parking level over the whole of Portside Wharf site, along with various ground level parking areas. This car park masterplan was designed to cater for the total parking demand related to the residential, office and retail components of the wider Portside Wharf development.

Details of the Portside West Car Park Masterplan, including locations and breakdown of resident/public parking spaces, is included in Appendix B.

3.3 Building 20 Parking Provisions

To accommodate the residential parking required for Building 20, it is proposed that an additional 6 parking bays will be added to the consolidated basement parking structure (allowable due to the proposed demolition of the existing ramp facility from the basement level to bus shelter) and 31 of the existing 'shared' parking spaces located under Building 4 will be re-allocated as residential spaces. No additional spaces are expected to be created for the retail uses of the building.

Overall, Building 20 will have a supply of 31 resident parking spaces, or 1 space/dwelling unit, satisfying the ULDA requirements. The provision for the retail spaces required for the development will be included as part of the existing 'shared' parking areas located in the basement and ground levels. Section 3.4 shows that the overall parking demand of the site (including the parking demand generated by the Building 20 retail uses) can be accommodated within the total supply of the site

To facilitate the construction of Building 20, it is also expected that 31 'shared' parking spaces will be removed at ground level from the original car park masterplan, including:

- 27 parking spaces on ground level on the site of Building 20, and
- 4 on-street parking spaces on the ground level (on the internal one-way access road) to facilitate access to the laneway running along the north side of the site.

The proposed amendments to the car park masterplan are shown in the development plan basement drawing included in Appendix A.

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

3.4 Suitability of Parking Supply

The original car park masterplan provided a parking supply of 1477 spaces, including 1007 resident designated spaces and 470 shared spaces. Once the alterations to the basement and ground level parking areas are made to accommodate Building 20, the revised parking supply will be 1,452 spaces; with 1,038 dedicated residential spaces and 414 shared spaces. 15 PWD spaces are included in the shared parking supply.

To determine whether there is still sufficient parking supply to meet the practical demand of the Portside Wharf precinct, the peak parking demand was assessed in the same manner as was undertaken by TTM in response to the ULDA's Information Request issued for the Portside Wharf Buildings 2 and 5 Development Applications (TTM Letter 27486Let3, Dated 24th February 2011). The peak parking demand analysis has been updated to reflect the new precinct yield (additional 30 residential units and 511m² GFA retail space from Building 20) and subsequent reallocation of parking spaces. The same parking demand reductions identified in the original parking analysis have been adopted for this analysis.

This includes:

- A 25% reduction in parking demand for restaurant use given that the majority of trade will be 'walk in' from surrounding residents.
- A 10% reduction in the parking demand for the retail use, as most of the retail will be ancillary to the residential and commercial components of the precinct.
- A 10% reduction in the parking demand for the cinema use, given the expected occurrence of 'linked trips' at the precinct (i.e. cinema patrons will also do some shopping or eat at one of the restaurants) and proportion of patrons from the residential components of the precinct.
- The gymnasium will draw all of its clients from the surrounding residential uses of the precinct so it is reasonable to assume there will be no parking demand.
- The function centre will be primarily used at times when much of the retail and office uses will be closed (usually in the evenings).

The original TTM response letter details more information about these assumed parking reductions and has been included in Appendix C for reference.

The new parking demand for the precinct during the Saturday Lunchtime, Weekday Lunchtime and Weekday Afternoon is shown in Tables 3.1 to 3.3.

Table 3.1: Practical Peak Parking Demand – Saturday Lunchtime

Use	Area / Qty	Parking Rate Adopted	Parking Required	Reduced Parking Req.	Peak Factor	Peak Parking Demand
Residential Visitor	877 apt	0.14 spaces per unit*	123 spaces	123 spaces	1.0	123 spaces
Restaurants	4090m ²	1 space per 30m ²	136 spaces	102 spaces	1.0	102 spaces
Food Retail	1811m ²	1 space per 30m ²	61 spaces	55 spaces	1.0	55 spaces
Non-Food Retail	1765m ²	1 space per 30m ²	59 spaces	53 spaces	1.0	53 spaces
Office	8282m ²	1 space per 50m ²	165 spaces	165 spaces	0.1	17 space
Cinema	3194m ²	1 space per 30m ²	106 spaces	95 spaces	0.5	48 spaces
Gym	544m ²	1 space per 30m ²	18 spaces	N/A	0.0	0 spaces
Function Centre	834m ²	1 space per 30m ²	28 spaces	N/A	0.0	0 spaces
Sub Total – Public Parking						398 spaces
Resident						1038 spaces
Total						1436 spaces

**The rate of 0.14 spaces per unit for residential visitor parking demand is consistent with previous data provided to the ULDA for similar building Development Applications in the Portside Wharf Precinct.*

Table 3.2: Practical Peak Parking Demand – Weekday Lunchtime

Use	Area / Qty	Parking Rate Adopted	Parking Required	Reduced Parking Req.	Peak Factor	Peak Parking Demand
Residential Visitor	877 apt	0.14 spaces per unit	123 spaces	123 spaces	0.1	12 spaces
Restaurants	4090m ²	1 space per 30m ²	136 spaces	102 spaces	1.0	102 spaces
Food Retail	1811m ²	1 space per 30m ²	61 spaces	55 spaces	0.3	17 spaces
Non-Food Retail	1765m ²	1 space per 30m ²	59 spaces	53 spaces	0.3	16 spaces
Office	8282m ²	1 space per 50m ²	165 spaces	165 spaces	1.0	165 spaces
Cinema	3194m ²	1 space per 30m ²	106 spaces	95 spaces	0.5	48 spaces
Gym	544m ²	1 space per 30m ²	18 spaces	N/A	0.0	0 spaces
Function Centre	834m ²	1 space per 30m ²	28 spaces	N/A	0.0	0 spaces
Sub Total – Public Parking						360 spaces
Resident						1038 spaces
Total						1398 spaces

Table 3.3: Practical Peak Parking Demand – Weekday Afternoon (4:00-5:00pm Retail Peak)

Use	Area / Qty	Parking Rate Adopted	Parking Required	Reduced Parking Req.	Peak Factor	Peak Parking Demand
Residential Visitor	877 apt	0.14 spaces per unit	123 spaces	123 spaces	0.1	12 spaces
Restaurants	4090m ²	1 space per 30m ²	136 spaces	102 spaces	0.3	31 spaces
Food Retail	1811m ²	1 space per 30m ²	61 spaces	55 spaces	1.0	55 spaces
Non-Food Retail	1765m ²	1 space per 30m ²	59 spaces	53 spaces	1.0	53 spaces
Office	8282m ²	1 space per 50m ²	165 spaces	165 spaces	1.0	165 spaces
Cinema	3194m ²	1 space per 30m ²	106 spaces	95 spaces	0.5	48 spaces
Gym	544m ²	1 space per 30m ²	18 spaces	N/A	0.0	0 spaces
Function Centre	834m ²	1 space per 30m ²	28 spaces	N/A	0.0	0 spaces
Sub Total – Public Parking						364 spaces
Resident						1038 spaces
Total						1402 spaces

Based on the tables above, it is apparent that the parking provision of 1452 spaces across the whole precinct can accommodate the peak parking demand of 1436 parking spaces (during Saturday lunchtime). Therefore, TTM considers the car parking supply is sufficient.

3.5 Car Park Layout

As indicated in Section 3.2, the proposed resident parking spaces for Building 20 are included in the consolidated Portside Wharf basement parking area. A number of the sections of this basement area have previously been assessed and approved by the ULDA under development applications for the neighbouring buildings. Some sections of the basement area are currently under construction or have already been constructed. These areas have not been considered as part of this assessment. The revised Portside West Car Park Masterplan provided in Appendix B highlights the proposed location of the Building 20 resident parking spaces.

As can be seen, these parking spaces will be located underneath the existing Building 4 precinct, and will be separated from the surrounding public and resident parking areas by means of remote controlled roller doors. The locations of these doors will not impact on the manoeuvrability into/out of the public parking spaces and will not adversely impact on the circulation of traffic throughout the basement car park area.

'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 3.4 below. The last column identifies the compliance of each design aspect.

Table 3.4: Parking Area Design Requirements

Design Aspect	Australian Standards Requirement	Proposed Provision	Compliance
Parking space length: ► Standard bay (Class 1A)	5.4m (min)	5.4m	Australian Standards Compliant Solution
Parking space width: ► Standard bay (Class 1A)	2.4m (min)	2.6m	Australian Standards Compliant Solution
Aisle Width: ► Parking aisle	5.8m (min)	6.2m	Australian Standards Compliant Solution
Parking envelope clearance - Column adjacent to bay	Located between 0.75m and 1.75m of aisle	Located between 0.8m and 1.4m of aisle	Australian Standards Compliant Solution
Parking envelope clearance – space adjacent to wall	Space 0.3m clear of wall	Space 0.3m clear of wall	Australian Standards Compliant Solution
Height Clearance ► General Min. ► Over PWD bay	2.2m (2.3m PWD) 2.5m	2.8m (min) clearance	Australian Standards Compliant Solution

The proposed carpark layout complies with all the requirements of AS2890 and is therefore considered suitable.

4. Service Vehicle Arrangements

4.1 Service Vehicle Bays

The expected service vehicle uses of the proposed development are as follows:

- MRV/SRV sized furniture removals trucks servicing the residential apartments, accessing the site occasionally (once/week at most)
- MRV/SRV sized deliveries trucks servicing the retail uses of the site, accessing the site daily (1-2 times/day)
- VAN deliveries and maintenance contractors for both residential/retail uses, access the site regularly (multiple times/day)

To cater for the expected service vehicle sizes and frequency, it is proposed that a parallel parking loading zone with 1 SRV bay and 2 VAN bays will be provided on the laneway on the north side of the building. The 2 VAN bays will also double as an MRV bay to be used for occasional MRV deliveries. This loading zone will allow for the following combination of vehicles to service the site at the same time:

- 3 VANS
- 2 VANS and 1 SRV
- 1 SRV/VAN and 1 MRV

TTM considers that this arrangement will be flexible enough to accommodate the expected service vehicle demands of the Building 20 site, and is therefore acceptable.

4.2 Servicing Area Layout

'AS2890.2:2002 Parking Facilities: Part 2 – Off-Street Commercial Vehicle Facilities' is adopted as a reference for provisions and design of the servicing area. The key design parameters in accordance with 'AS 2890.2' are set out in Table 4.1 below. The last column identifies the compliance of each design aspect. Where alternative solutions are proposed, further information is provided below the table.

Table 4.1: Servicing Area Requirements

Design Aspect	Australian Standards Requirement	Proposed Provision	Compliance
Service bay length: ► VAN Bay ► SRV Bay ► MRV Bay	5.4m 6.4m 8.8m	5.65m 6.4m 11.3m (2xVAN bays)	Australian Standards Compliant Solution
Service bay width (Parallel Parking)	3.0m	3.0m	Australian Standards Compliant Solution
Circulation Aisle/Laneway Width	3.5m	3.0m	Alternative Solution
Height Clearance	4.5m	4.1m	Alternative Solution
Access Driveway Crossover width	7.0m (for a one-way entry)	7.5m	Australian Standards Compliant Solution
Maximum Gradient: ► Roadway ► Rate of Change in grade	Max 1:6.5 (15.4%) Max 1:16 (6.25%)	Flat 1:50 (2.0%)	Australian Standards Compliant Solution

The following servicing design aspects have been resolved with alternative solutions:

Circulation Aisle/Laneway Width

AS2890.2 indicates that a minimum one-way aisle width (kerb to kerb) of 3.5m is required for roads providing access for vehicles up to MRV size. The proposed service laneway will be a uniform surface (i.e. no kerbs between traffic lanes and pedestrian areas) with a total width of 7.2m from wall to wall. The roadway will only be delineated from the pedestrian areas by use of RRPMs and steel bollards. The width designated as roadway for service vehicles is 3.0m.

Although this is below the required 3.5m lane width, TTM considers this is acceptable given that this laneway only be used infrequently by service vehicles – with through access from private vehicles prohibited – and the open nature of the laneway. The fact that the laneway will also be designed to have the appearance of a shared zone, and that it will be frequently trafficked by pedestrians, will ensure that the speeds of any service vehicles using the lane will be low. The laneway drawing and service vehicle swept paths included in Appendix E shows that there is sufficient roadway width for an MRV to travel through the laneway, and manoeuvre into the parallel loading bays, while maintaining the required 300mm clearance to vertical obstructions at all times.

Height Clearance

The plans submitted with the development application for the proposed Citimark Building 6 (located directly to the north of Building 20) show that the podium level car park will overhang the laneway, resulting in an effective height clearance of approximately 4.1m. This height clearance was measured from the effective ground level of the building site (RL 4.7) to the underside of the podium façade and concrete beams (approximate RL 8.8). Refer to the marked-up west elevation view for the proposed Building 6 included in Appendix F.

This is slightly below the height clearance of 4.5m required for an MRV in AS2890.2. It should be noted that a 4.5m height clearance is specified in Australian Standards to satisfy the absolute maximum allowable height of MRV sized vehicles currently in operation in Australia. The typical MRV vehicles servicing this site will be furniture and goods delivery trucks. Inspection of vehicle specifications for common furniture and delivery vehicles reveals that most MRV sized vehicles have lower vehicle heights. In general, the maximum vehicle height is up to 3.8m. It should also be noted that lower height clearances, down to 4.0m, have previously been accepted by Brisbane City Council in servicing areas for similar developments - specifically in the Brisbane CBD and fringe areas where there are significant space and height constraints – on the basis that most MRV vehicles servicing retail/residential buildings are below 4.0m in height.

As detailed in Section 6.3 below, the refuse collection functions for the building (which generally requires a larger height clearance given the swinging arms/operating envelopes of the vehicles) will not be performed in the servicing laneway.

It is proposed that highly visible minimum height clearance markers and signs will be installed at the entry to the servicing laneway indicating the appropriate height clearance of 4.1m, to ensure all drivers are aware of the reduced height clearance. In addition, effective screening and management of servicing for the residential/retail components Building 20 will be implemented to ensure that service operators are aware of the lower height clearances prior to arriving on site.

Based on these facts, TTM considers that the reduced height clearance of 4.1m in the laneway is acceptable for this development.

4.3 Refuse Collection

A Waste Management Plan has been developed by EnviroCom for the wider Portside Wharf 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 room in 2-3m³ bulk bins. 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. The waste storage room is located directly opposite the elevator, as shown on basement level development plans included in Appendix A.

The property manager will be responsible for towing the general waste and recycling bins from the waste storage room to the respective service points, where it will be collected along with the bins for other buildings in the Portside Wharf site. The common residential waste collection point is located at the rear of Building 7 and the common commercial/retail waste collection point is located at the Building 4 loading dock. The property manager will then return the bulk bins for Building 20 back to the waste storage room once emptied.

4.4 Vehicle Manoeuvrability

Service vehicles will enter the site from the Remora Road / Hercules Street / Macarthur Parade roundabout and proceed down the one-way internal road. They will then turn into the one-way servicing laneway running along the north side of the building and manoeuvre into the marked MRV/SRV parallel loading bays. Once servicing is complete, the vehicles will continue forwards directly out of the bays and turn right to join onto the main exit lanes (from the basement car park ramp) that exit the site onto Hercules Street.

The travel movement and swept path of a MRV servicing the site is included in Appendix E.

5. Servicing Laneway

The one-way servicing laneway on the north side of Building 20 will be designed as an 'active laneway' consisting of shared pedestrian and service vehicle areas. It is intended that this laneway will be used only for service vehicles accessing the Building 20 site, and there will be no through access for standard/private vehicles. This will be achieved by appropriate signage and delineation at the entry point from the main internal road leading off the Remora Road / Hercules Street / Macarthur Avenue roundabout. It is anticipated that this signage and appropriate landscaping design give the laneway the appearance of a private driveway and not a through road.

The cross section of the laneway itself will show a consistent road profile (i.e. no kerbs separating the through lanes from the pedestrian footpaths) and will be approximately 7.2m in width. The laneway will consist of a 3.0m wide (one-way) traffic lane extending off the main internal road of the Portside Wharf, and an 18m long parallel parking/loading zone at the western end of the laneway. The vehicular path and loading zones will be delineated from the pedestrian zones using Raised Retro-reflective Pavement Markers (RRPMs) and metal bollards placed along the edge of the traffic lanes.

The development plans included in Appendix A show the proposed cross section of the laneway.

6. Traffic Impacts

6.1 Estimated Development Traffic Generation

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 into consideration the information provided in the Department of Transport and Main Road's '*Road Planning and Design Manual*'.

Table 6.1 below indicates the predicted peak-hour generation rates and the generated peak-hour traffic volumes for the proposed development.

Table 6.1: Development Traffic Generation

Building Use	Size/Area	Traffic Generation Rate	Traffic Generated
Residential	31 units (1 bedroom)	0.4 vph/unit	13 vph (two-way)
Retail	523m ² GFA	12 vph/100m ² GFA	63 vph (two-way)
Total			76 vph (two-way)

6.2 Road Network Upgrades

An area wide traffic study was commissioned by the ULDA to determine the road upgrades required to cater for the increased traffic demands of the wider Northshore Hamilton UDA. This study was undertaken based on the assumed land uses and allowable development sizes specified in the UDA Development Scheme. It is understood that the ULDA also requested Parsons Brinckerhoff undertake an additional study in September 2011 to develop road concept layouts for the Northshore Hamilton UDA. The results of the study suggest that the road network in the area will undergo significant changes/realignments as a result of the continued development in the UDA.

Figure 6.1 outlines the key upgrade components identified in the study.

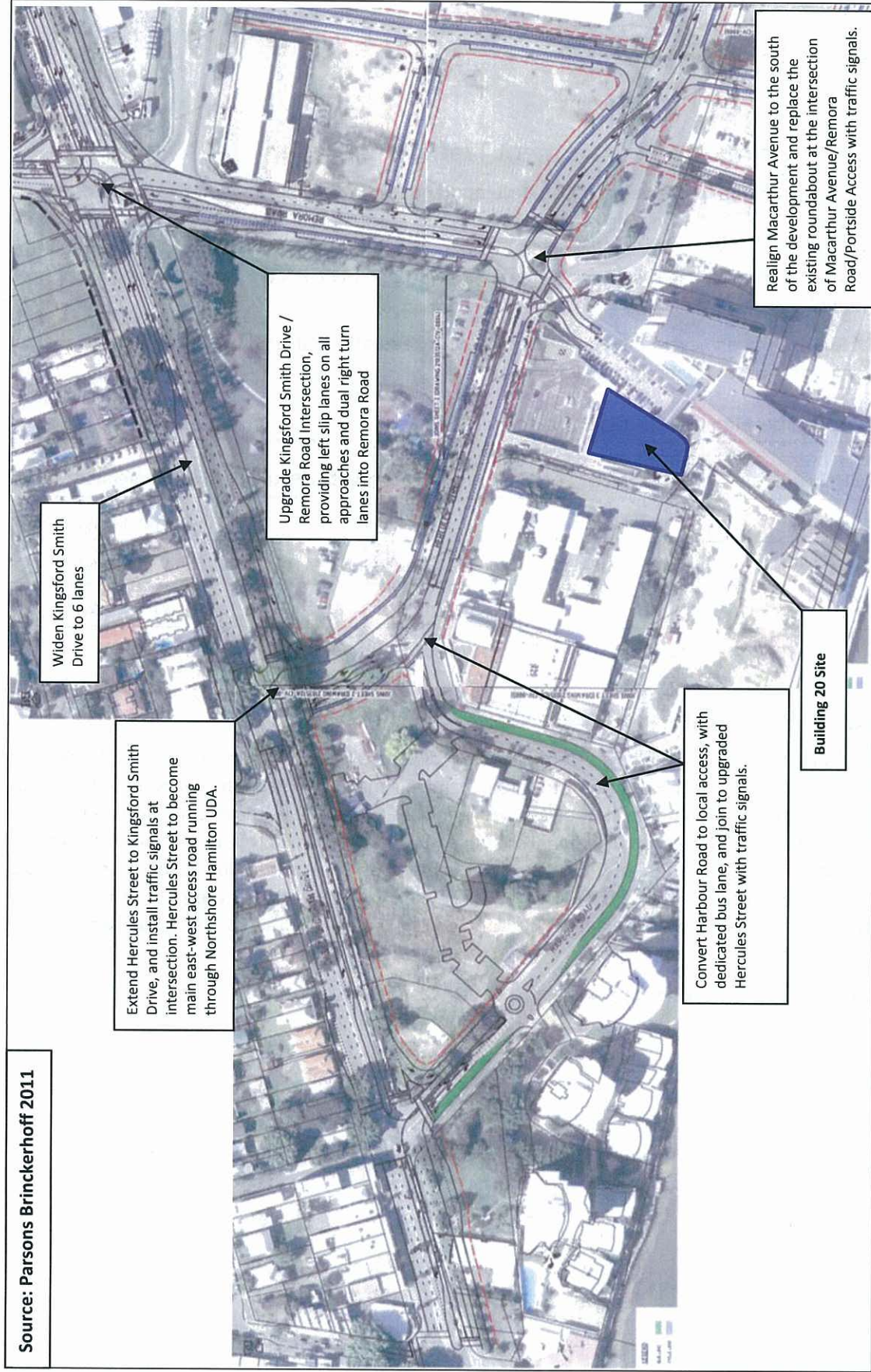


Figure 6.1: Proposed Road Network Upgrades

6.3 Development Traffic Impacts

The inclusion of Building 20 in the wider Portside Wharf site increases the overall precinct yield above the maximum allowable amount specified in the Northshore Hamilton UDA Development Scheme. The updated Portside Wharf Precinct 3c GFA summary table is included in Appendix D.

The Development of Precinct 3c will provide 158,542m² GFA of space, which is 7,542m² (or 4.99%) above the allowable 151,000m² GFA. It should be noted, however, that this exceedance is primarily related to increased residential space and the recent approval of the Mirvac development with a significant amount of commercial/office space. The overall retail GFA proposed for the Precinct is still below the amount allowable under the UDA Development Scheme.

In terms of the traffic volume increases/impacts resulting from the proposed Building 20, the 63vph retail related traffic for Building 20 (as outlined in Table 6.1) has in effect been accounted for in the ULDA traffic studies of the Northshore Hamilton UDA.

The exceedance in the residential GFA of the sub-precinct by 12,094m² GFA (or 9.68%) is considered very minor given the scale of approved buildings within the area, such as the Citimark and Mirvac developments. The additional 12,094m² GFA for the residential component of the precinct equates to approximately an additional 161 units/dwellings based on an average GFA of 75m² per unit. Using the traffic generation rate of 0.4vph/dwelling, this results in an additional 64vph in both peak-hour periods. Of these additional 64vph (precinct wide), at most only 13vph of these trips could be directly attributed to the proposed Building 20 (as shown in Table 6.1).

As previously identified in Section 6.2, the ULDA has already completed a network study for the area and identified upgrades to roads and key intersections in the area. These upgrades have been designed to cater for the future traffic demand generated by the whole of the Northshore Hamilton UDA once completely developed. The traffic volume increases related to the proposed Building 20 is negligible in the context of the overall traffic network and therefore the proposed upgrades outlined in the original traffic network studies will still be sufficient.

7. Bicycle Provisions

The UDA development criteria specifies bicycle parking requirements for residential and retail developments as follows:

- ▶ Residents: One secure bicycle space per unit.
- ▶ Residential Visitors: One space per 400m² of GFA.
- ▶ Non Residential: One space per 200m² NLA for workers
One space per 1000m² NLA for visitors

It is proposed that 31 bicycle spaces will be provided within the basement car park. 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.

An additional 3 staff/worker bicycle spaces will be provided on the ground level for the retail components of Building 20.

Combined residential and retail visitor cycle parking at Building 20 will be facilitated at ground level in the active laneway and will include a total of 6 parking spaces.

8. Recommendations

8.1 Development Access

Vehicular access to the basement parking area will be achieved through the existing ramps located directly to the west of Building 20. Access to the one-way service vehicle Laneway running along the north side of Building 20 will be provided via the existing internal road leading off from Hercules Street. Egress from both the basement and laneway will be facilities by the existing one-way road running from the north-west corner of the site thorough to Hercules Street.

8.2 Car Parking Arrangements

It is proposed that the resident parking spaces for this development will be provided by redesignating a proportion of the existing shared parking spaces in the consolidated Portside Wharf basement parking area. The parking demand for the retail component of Building 20 will be accommodated in the existing shared parking supply of the Portside Wharf precinct. The construction of Building 20 will require removal of a number of shared parking spaces on the ground level. The revised parking supply of the Portside Wharf precinct will be 1452 spaces, including 1038 resident parking spaces and 414 shared parking spaces. Overall, it is shown that the revised Portside Wharf Car Park Masterplan provides sufficient parking supply to cater for the peak parking demands of the wider site.

8.3 Impact on Surrounding Road Network

The ULDA and BCC currently have plans for significant upgrade to the road network in the Northshore Hamilton UDA and on Kingsford Smith Drive. The traffic generated by this development has been accommodated in the design of the road upgrades and, as such, there will be no adverse impacts on the surrounding road network.

8.4 Service Vehicle Arrangements

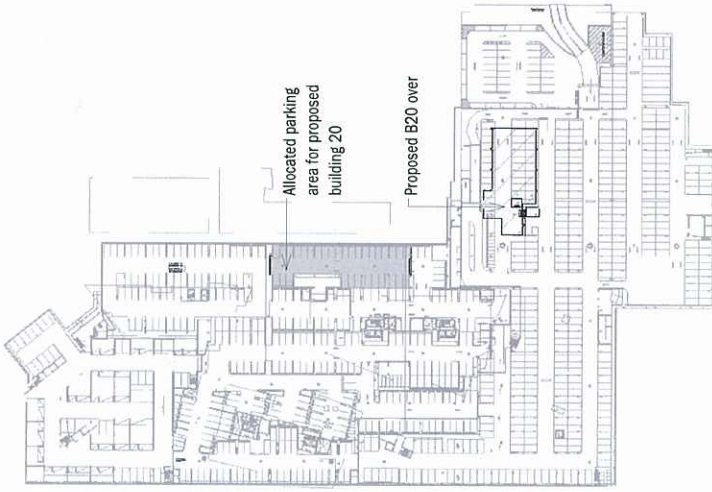
Refuse collection for the Building 20 site will be undertaken in the common areas of the wider Portside Wharf site. Delivery and furniture trucks will access Building 20 from the servicing laneway located on the north side of the site. There is suitable provision for on-site manoeuvring for regular service vehicles into and out of this laneway. Although the laneway has a slightly lower height clearance than the Australian Standards requirements, effective screening of service vehicles accessing the site and appropriate height clearance signage will be used to ensure this slight reduction is acceptable. Overall, the service vehicle arrangements are considered adequate for the proposed development.

8.5 Bicycle Provisions

The proposed bicycle parking provisions of 31 resident spaces, 3 staff/worker spaces and 6 public spaces satisfies the minimum requirements outlined in the Northshore Hamilton UDA Development Scheme.

Appendix A

DEVELOPMENT LAYOUT

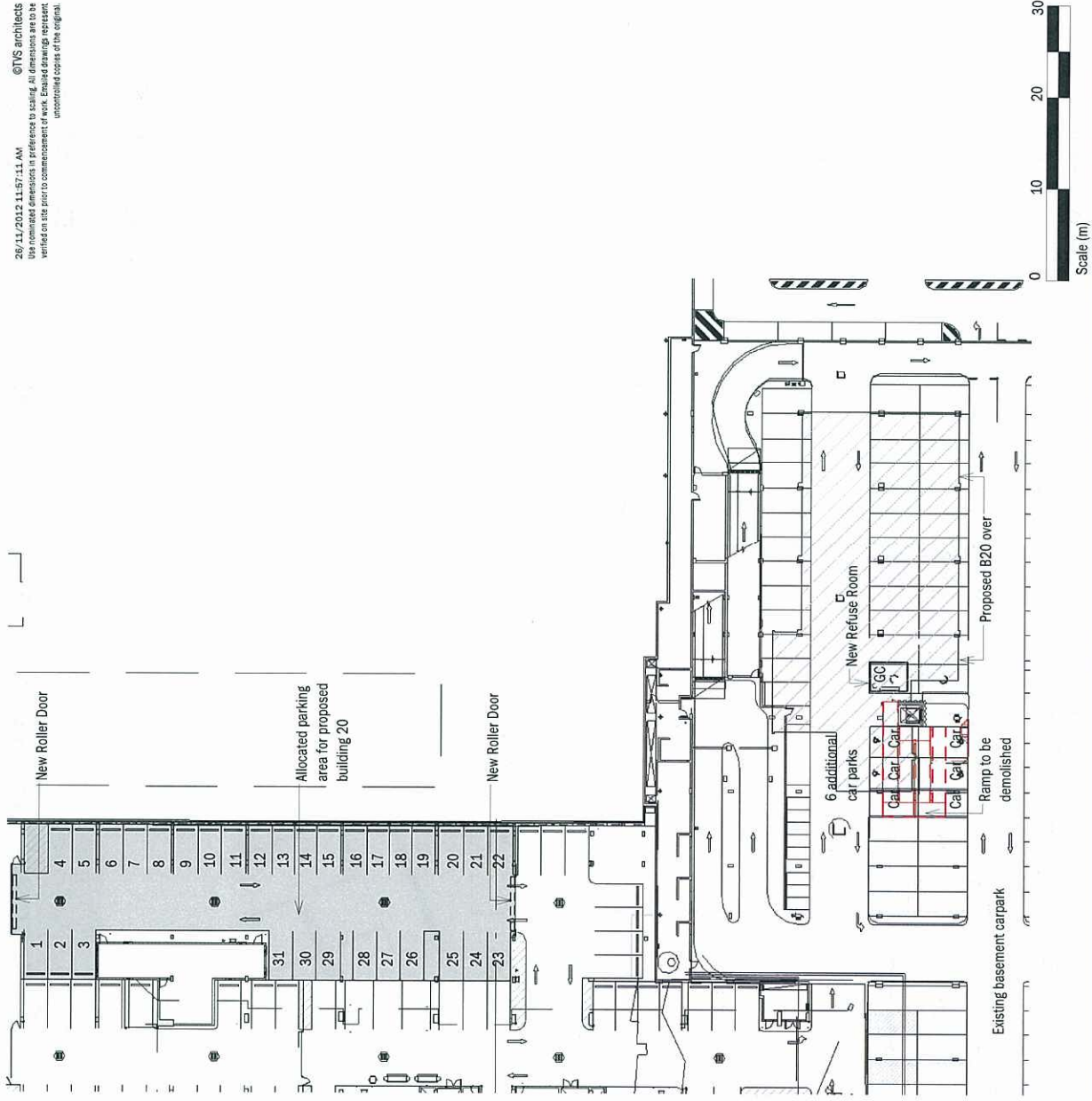


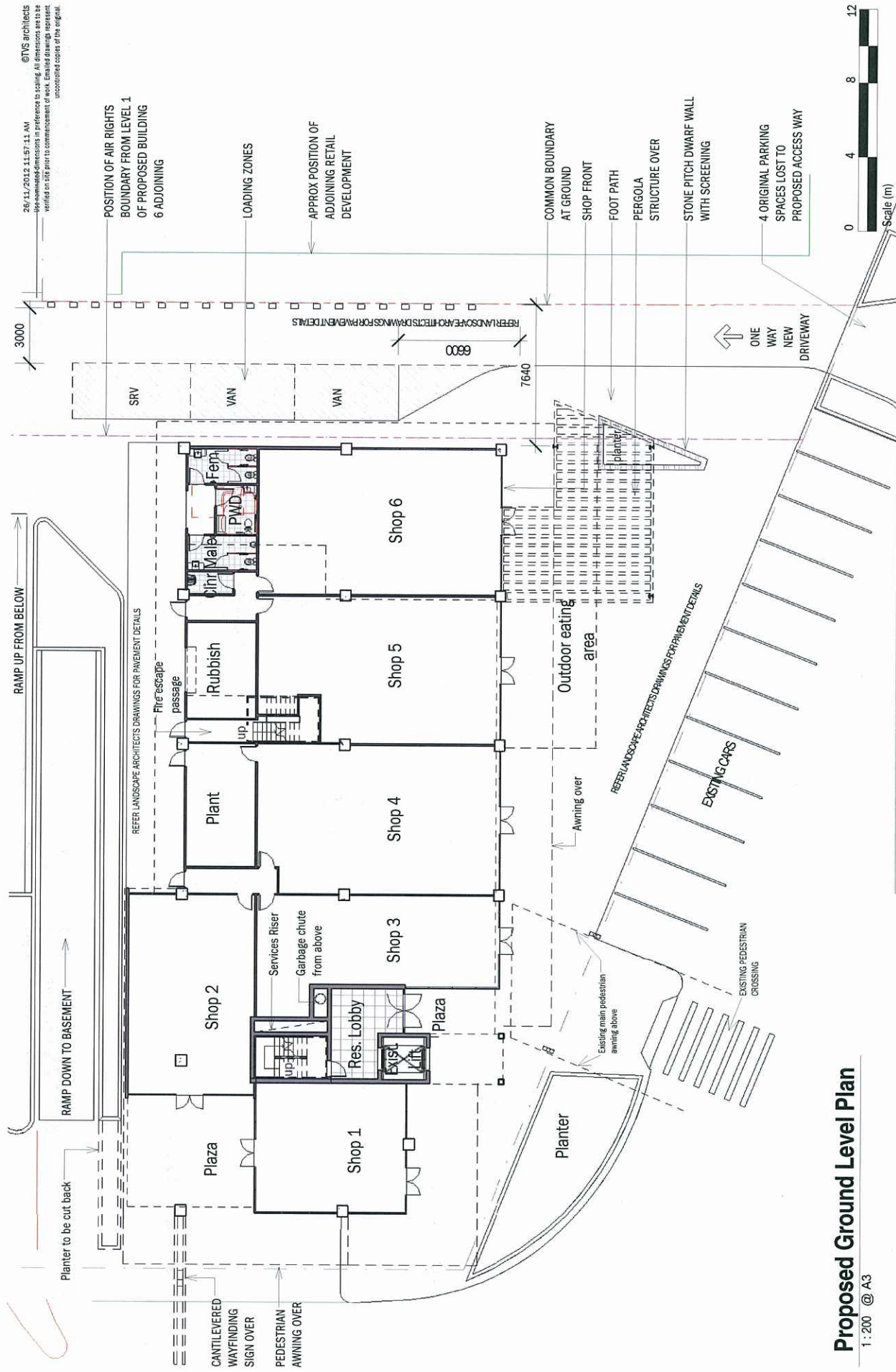
Basement Legend

1:2000 @ A3

Part Basement Level Plan

1:500 @ A3





Proposed Ground Level Plan

1:200 @ A3



Appendix B

PORTSIDE WEST CARPARK MASTERPLAN

PORTSIDE WEST CARPARK MASTERPLAN BASEMENT

LEGEND

BUILDING 1 RESIDENTIAL CARPARKS

BUILDING 2 RESIDENTIAL CARPARKS

BUILDING 3 RESIDENTIAL CARPARKS

BUILDING 4 RESIDENTIAL CARPARKS

BUILDING 5 RESIDENTIAL CARPARKS

BUILDING 6 RETAIL CARPARKS

BUILDING 6 RESIDENTIAL CARPARKS

BUILDING 6 RESIDENTIAL VISITORS CARPARK

BUILDING 8 RESIDENTIAL CARPARKS

BUILDING 20 RESIDENTIAL CARPARKS

SHARED USED CARPARKS (RETAIL/COMMERCIAL)

PWD CARPARKS

BUILDING 6
BASEMENT

62 RESIDENTIAL CAR SPACES

8 RESIDENTIAL VISITORS

6 RETAIL CAR SPACES

BUILDING 20
BASEMENT

32 RESIDENTIAL CAR SPACES

BUILDING 8
BASEMENT

95 RESIDENTIAL CAR SPACES + 20 TANDEM

BUILDING 5
BASEMENT

68 RESIDENTIAL CAR SPACES

BUILDING 7 / SHARED
BASEMENT

279 RETAIL/ COMMERCIAL/ VISITORS CAR SPACES

PWD PUBLIC

8 PWD CAR SPACES

BUILDING 1
BASEMENT 01 AND 02

130 RESIDENTIAL CAR SPACES

BUILDING 2
BASEMENT

187 RESIDENTIAL CAR SPACES + 41 TANDEMS

BUILDING 4
BASEMENT

19 RESIDENTIAL CAR SPACES

BUILDING 3
BASEMENT

17 RESIDENTIAL CAR SPACES



1

BASEMENT 01

SCALE 1:500 @ A1

SCALE 1:100 @ A3

0 5 10 15 20 25 30 35 40 45 50 metres

Schematic

PORTSIDE WEST CARPARK MASTERPLAN

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10/01/2012 11:12 AM

Brookfield
Residential Properties



Amendments	Date	By
C - FOR APPROVAL	27/11/12	LM
B - FOR APPROVAL	23/01/12	LM
A - FOR COORDINATION	15/01/12	LM
1 - FOR APPROVAL	15/01/12	LM

Client	BROOKFIELD MULTIPLEX
Project Name and Location	PORTSIDE WEST CARPARK MASTERPLAN, HERCULES ST, BRISBANE
Drawing Title	PORTSIDE WEST SITE PLAN BASEMENT

Scale	As Shown	Drawn	LM	Checked	SB	Approved	SB	Job no.	4486
Drawing no.	SD 1001	Issue	C						

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COTTEE PARKER

Appendix C

ORIGINAL TTM LETTER 27486LET3 (24/02/2011)

24 February 2011

Our Ref: 27486Let3

Your Ref: ULDA Information Request

Attention: Darren McKenzie

Brookfield
Level 1, Flare Building,
39 Hercules Street, Hamilton,
QLD, 4007

Dear Darren,

RE: INFORMATION REQUEST FOR FURTHER DETAILS NORTHSORE HAMILTON URBAN DEVELOPMENT AREA (UDA) DEVELOPMENT APPLICATION FOR MATERIAL CHANGE OF USE FOR MULTIPLE RESIDENTIAL (127 UNITS) AND SHOP AT 37B HARBOUR ROAD, HAMILTON.

This letter forms TTM's response to the traffic engineering issues noted in the Information Request issued by the ULDA dated 7 February 2012. The issues are addressed as followed:

Traffic, Transport & Servicing

1. *Servicing Arrangements - A copy of the Service Management Plan referenced by TTM in the submitted application was requested; however the response only referenced the Waste Management Plan. A copy of the Service Management Plan is required to be submitted and should address the issues raised in the Information Request.*

As intimated in TTM's initial response to the ULDA the reference to the Service Management Plan alludes to the requirements set out in the Portside Wharf Community Management Statement. As a requirement of this statement the driving and parking of vehicles is limited to a maximum of 2 tonnes tare on principle common party.

The Waste Management Plan for Portside has also been amended to sufficiently address refuse collection for Building 5.

It is intended that the servicing requirements for Building 5 in terms of furniture deliveries, etc. will be facilitated via the service vehicle bay positioned between Buildings 2 and 4 as shown in Figure 1 below.

Given the standard of apartments in this precinct, the turnover of tenants is expected to be minimal, hence the demand for furniture deliveries to Building 5 is expected to be infrequent. It is TTM's view that the estimated demand of 1 furniture truck per week is a reasonable expectation for Building 5.

The Portside Wharf Community Management Statement also provides the ability for the timing of tenants moving in / out of an apartment to be scheduled in a manner that does

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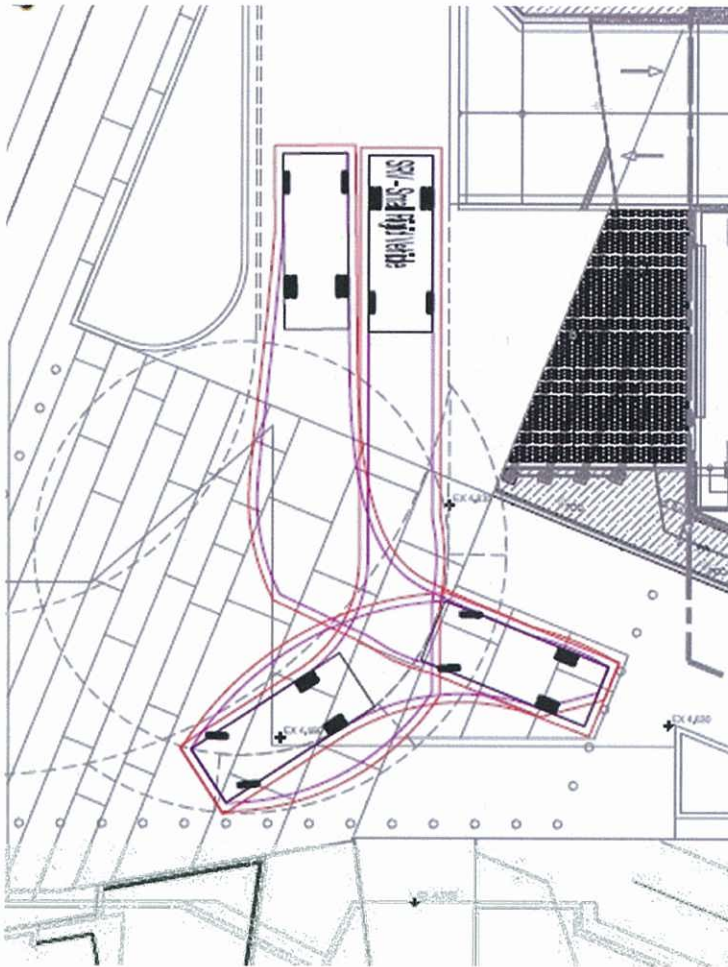
e ttmbris@ttmgroup.com.au

not conflict with peak traffic or pedestrian movements adjacent to the proposed loading area.

Given the restriction of vehicle size, the infrequency of deliveries and the ability to schedule the deliveries outside of peak periods, it is concluded that the proposed service vehicle area between Buildings 2 and 4 will operate in a safe and efficient manner without impacting on the vehicular and pedestrian safety and amenity within the surrounding public realm.

The design of the service area, as shown in Figure 1, has been designed to allow a Small Rigid Vehicle (2t) to park clear of the internal roadway whilst also allowing the passenger set down facility to continue to operate.

Figure 1 - SRV Manoeuvrability



As shown in Figure 1, SRV's enter the bay in a reverse gear and exit in a forward gear.

2. *In relation to TTM's response dated 2 February 2012 to Item 2a of the Information request, the ULDA advise that the strategy "of providing no dedicated visitor parking..." is not supported for the following reasons.*
 - a) *"one-bedroom tenants would not own a car... it is quite common for these residents with spare parking spaces to allow their visitors to park in their designated space". If it is the case that tenants of one bedroom units do not have cars, the car spaces assigned to these units could be designated as visitor spaces for the whole development.*
 - b) *"probability of visitors to small units is less than what would be expected for the more traditional two and three bedroom units". This statement has no factual weight and is not based on any studies that have been provided to the ULDA to accept this as a legitimate argument. In addition, the development proposes 49 two bedroom units which, by the logic of the above argument, would require designated visitor spaces.*
 - c) *'The proposed development is in close proximity to existing public transport provisions... a residential development of this nature in this location, is considered ideal opportunity for the ULDA to promote 'car less' communities from a travel demand management". Whilst the ULDA supports this argument as it is in line with the Development Scheme, the proposed Building 5 provides for 131 car parking spaces which exceeds the maximum Development Scheme requirements of 1 space per dwelling including visitor spaces. This statement by TTM does not align with the proposed request for car parking exceeding the Development Scheme requirements.*
 - d) *"Proposed on-street parking provisions in the vicinity of the development." The ULDA have asked for a plan identifying the breakup of car parking across the whole Portside development to gain an understanding of how the basement parking and on street parking is assigned to each Stage and use. We have consistently received complaints from residents in the area that there is inadequate visitor spaces and that the spaces provided to them as part of their approval are continually being ebbed away by new development. In order to make an informed decision on a Precinct wide parking scheme, a plan identifying all parking spaces (resident, visitor and commercial) and how they relate to each approved and future development site needs to be provided. The request of this plan is in accordance with the meeting dated 24 January 2012.*

As per the ULDA's request Cottee Park have prepared plans, included in Appendix A, identifying the allocation of car parking across the wider precinct. These plans identify that 1477 car parking spaces will be ultimately provided within the precinct to facilitate the car parking demands associated with the land-uses provided for Buildings 1-8 (it is noted that other sites within the precinct will have separate parking facilities not linked to the common basement associated with Building 1 – 8). Of these, 1007 spaces will be allocated as "private" residential parking and 470 shared "public" spaces to be utilised for retail, commercial and residential visitor parking.

This is consistent with the parking philosophy adopted in when the original master plan was prepared and approved. This assertion is reinforced by the '*Development Scheme*' which encourages co-location of uses and sharing of car parking spaces to maximise efficiency.

TTM provided supporting information for the Masterplan approval, which indicated that there were opportunities to rationalise the parking supply on the basis of shared and consolidated parking areas. Furthermore the operational characteristics associated with the types of uses either provided or proposed within the precinct allow the parking to be rationalised.

Similar to the methodology adopted to assess the parking supply as part of the original Masterplan approval, TTM's assessment of potential reductions in the parking supply at the precinct are summarised as follows:

Restaurant

It is understood that the restaurants currently attract, and will continue in the future following the release of additional apartments, a proportion of trade from the residential developments within the precinct. Given that 846 apartments will be provided between Buildings 1-8, it is not unreasonable to suggest that up to 25% of the trade generated by the restaurants will be walk in trade.

Furthermore it is considered that the Movenpick café and takeaway is complimentary to other uses provided within the precinct, e.g. the cinema and restaurants, and is likely to draw the majority of its customer base from individuals visiting other uses within the precinct.

Retail

It is considered that the food retail tenancies in particular (i.e. bakery) are ancillary to the residential and commercial components provided and as such will attract a proportion of internal trade. A 10% reduction factor is considered acceptable for the food retail component.

Cinema

It is considered a proportion of patrons at the cinema will link trips at the precinct whereby following a meal at one of the many of the restaurants provided they will visit the cinema. Furthermore it is considered that a proportion of trade generated by the cinema is walk in originating from the residential developments within the precinct. A 10% reduction factor is considered acceptable for the cinema, which is viewed as a conservative estimate.

Gymnasium

It is understood that the gymnasium currently attracts a significant proportion of its members from the existing residential developments within the precinct. It is considered that this will be more pronounced in the future following the release of additional apartments. Consequently it is not unreasonable to suggest that the customer base at the gymnasium will be entirely drawn from the residential developments within the wider site.

Function Centre

It is understood that the function centre is primarily utilised on weekends during the evening when the majority of retail uses with the exception of the supermarket are closed.

Apart from the potential parking reduction relative to the characteristics of each individual land-use with the precinct, there is also potential for a reduction relative to the different peak periods associated with each land-use. That is, several of the uses will generate peak parking demands during the day, whilst other uses will peak during the evening. Tables 1, 2 and 3 below identify the parking reductions as described above and the peak factor associated with each use.

The peak parking demand is expected to occur on a Saturday at lunchtime due to the retail, restaurants and residential visitor parking demands. It should be noted that this does not reflect the findings of the practical peak parking demand exercise undertaken as part of the Masterplan approval, which identified that the peak parking demand would occur during the day as a result of the retail and office components.

The peak demand for the proposed uses for the wider precinct (inclusive of Buildings 1-8), excluding the resident parking requirement are summarised in the tables below.

It should be noted that the residential visitor parking requirements have been based on the results of extensive surveys undertaken by TTM at high density residential buildings around the city fringe.

The split in terms of GFA for the retail and commercial land-uses has been estimated based on information provided by Brookfield.

Table 1 - Practical Peak Parking Demand (Buildings 1-8) – Saturday Lunch

Use	Area / Qty	ULDA – Parking Rate	ULDA Req.	Reduced Req.	Peak Factor	Peak Parking Demand
Residential Visitor	846 apt	0.12 spaces per unit	101 spaces	101 spaces	1.0	101 spaces
Restaurants	4074m ²	1 space per 30m ²	136 spaces	102 spaces	1.0	102 spaces
Food Retail	1984m ²	1 space per 30m ²	66 spaces	60 spaces	1.0	60 spaces
Non-Food Retail	1085m ²	1 space per 30m ²	36 spaces	36 spaces	1.0	36 spaces
Office	8282m ²	1 space per 50m ²	165 spaces	165 spaces	0.1	17 space
Cinema	3194m ²	1 space per 30m ²	106 spaces	95 spaces	0.5	48 spaces
Gym	544m ²	1 space per 30m ²	18 spaces	N/A	0.0	0 spaces
Function Centre	834m ²	1 space per 30m ²	28 spaces	N/A	0.0	0 spaces
Sub Total – Public Parking						364 spaces
Resident						981 spaces
Total						1346 spaces

Table 2 - Practical Peak Parking Demand (Buildings 1-8) – Weekday Lunch

Use	Area / Qty	ULDA – Parking Rate	BCC Req.	Reduced Req.	Peak Factor	Peak Parking Demand
Residential Visitor	845 apt	0.12 spaces per unit	101 spaces	101 spaces	0.1	10 spaces
Restaurants	4074m ²	1 space per 30m ²	136 spaces	102 spaces	1.0	102 spaces
Food Retail	1984m ²	1 space per 30m ²	66 spaces	60 spaces	0.3	18 spaces
Non-Food Retail	1085m ²	1 space per 30m ²	36 spaces	36 spaces	0.3	11 spaces
Office	8282m ²	1 space per 50m ²	165 spaces	165 spaces	1.0	165 spaces
Cinema	3194m ²	1 space per 30m ²	106 spaces	95 spaces	0.5	48 spaces
Gym	544m ²	1 space per 30m ²	18 spaces	N/A	0.0	0 spaces
Function Centre	834m ²	1 space per 30m ²	28 spaces	N/A	0.0	0 spaces
Sub Total – Public Parking						354 spaces
Resident						981 spaces
Total						1335 spaces

Table 3 - Practical Peak Parking Demand (Buildings 1-8) – Weekday Afternoon (16:00-17:00, i.e. traditional retail peak)

Use	Area / Qty	ULDA – Parking Rate	BCC Req.	Reduced Req.	Peak Factor	Peak Parking Demand
Residential Visitor	845 apt	0.12 spaces per unit	101 spaces	101 spaces	0.1	10 spaces
Restaurants	4074m ²	1 space per 30m ²	136 spaces	102 spaces	0.3	31 spaces
Food Retail	1984m ²	1 space per 30m ²	66 spaces	60 spaces	1.0	60 spaces
Non-Food Retail	1085m ²	1 space per 30m ²	36 spaces	36 spaces	1.0	36 spaces
Office	8282m ²	1 space per 50m ²	165 spaces	165 spaces	1.0	165 spaces
Cinema	3194m ²	1 space per 30m ²	106 spaces	95 spaces	0.5	48 spaces
Gym	544m ²	1 space per 30m ²	18 spaces	N/A	0.0	0 spaces
Function Centre	834m ²	1 space per 30m ²	28 spaces	N/A	0.0	0 spaces
Sub Total – Public Parking						350 spaces
Resident						981 spaces
Total						1331spaces

As result of the above it is considered that the parking provision of 1477 spaces across the precinct can facilitate the parking demands associated with the various existing and proposed land-uses between Buildings 1-8. Furthermore it has been demonstrated through the practical peak parking demand exercise that residential visitor parking can be facilitated at the shared parking areas.

For comparative purposes, the parking analysis prepared for the original master plan approval is included in Appendix B, although it should be noted that BCC parking rates different to the ULDA rates, which are considered more representative of the practical parking demands for this precinct.

3. *In relation to Item 2b of the Information Request, provide confirmation that the 1 proposed PWD space "in the vicinity of Building 5" is in accordance with Australian Standards for disabled access. This space will need to be illustrated on the proposal plans.*

TTM can confirm that the on-street PWD space generally complies with the requirements set out in 'Australian Standard 2890.6:2009 Parking Facilities Part 6: Off-Street Parking for People with Disabilities'.

The on-street PWD space has been illustrated on the updated development plans accompanying the response to the ULDA.

4. *In regards to Issue 2c of the Information Request, the response provided by TTM which states that AS2890.3 does not specify bike parking rates, therefore the rates will be in accordance with AustRoads Part 14 – Bicycles is incorrect. Section 3.8 – End of Trip Facilities of the Northshore Hamilton Urban Development Area Development Scheme specifically sets out the requirement for the number of bicycle facilities for apartment developments. These rates are:*

- a) *Residents to have 1 secure space/ dwelling and;*
- b) *Visitors to have 1 secure space / 400m2.*

The reference to AS2890.3 within this section of the Development Scheme relates to "the layout, design and security of bicycle parking facilities", as defined in section 1.1 – Scope of Australian Standard AS2890.3-1993).

As such, provide amended plans that illustrate bicycle parking facilities in accordance with rates specified in the Development Scheme, being 1 space /unit (currently 125 spaces) and 1 space/ 400m2 of GFA being in the order of 25 spaces. Also ensure that the layout, design and security of the facilities are in accordance with the AS2890.3.

The development plans propose the following bicycle parking spaces

- 129 resident spaces
- 23 visitor spaces

This provision satisfies the ULDA requirements for bicycle parking.

If you have any queries with regards to this matter please feel free to contact me on (07) 3327 9500.

Yours faithfully,



Andrew Riddles
Senior Consultant

Appendix D

UPDATED PORTSIDE WHARF DEVELOPMENT SUMMARY

Gross Floor Area by Building																			
Building	B1 Infinity	B2 Hamilton	B3 Loft	B4 Promenade	B5 Main St W	B6 Main St E	B7 Terminal	B8 Flare	B10 DPI	B13 DPI	B15 DPI	5 - 9 Hercules - 1 CIP	5 - 9 Hercules - 2 Approved	B20 Apn Prep	Sammy's	TOTAL	MAXIMUM (m2)	REMAINING GFA (m2)	% Change from Planned
Stage of Development	Built	Approved	Built	Built	Approved	Approved	Built	Built	Approved	Approved	Approved	Approved	Approved						
ULDA Ref. No.		DEV2012/ 205		DEV000002- 09	DEV2012/20 6				DEV2010/091			PRE2012/ 064	DEV0000 14_09						
GFA																			
Retail - Bulk landscape supplies, fast food premises, food premises, market, produce store, shop, shopping centre, showroom		150m2	605m2	1,141m2	49m2	392m2	7,786m2		1,578m2	120m2	422m2	523m2	400m2	13,166m2	16,000m2	2,834m2		-17.71%	
Commercial - Office, Home Based Business, Medical Centre, Sales & Display Home, Veterinary clinic, Veterinary Clinic					7,750m2	532m2								8,282m2	10,000m2	1,718m2		-17.18%	
Display Dwelling, Multi-unit Dwelling & Short Term Accommodation	11,448m2	16,229m2	1,072m2	16,361m2	9,468m2	5,623m2	11,647m2		41,191m2	7,800m2	9,641m2	1,794m2	4,820m2	137,094m2	125,000m2	-12,094m2		9.68%	
TOTAL	11,448m2	16,379m2	1,677m2	17,502m2	9,517m2	13,765m2	8,318m2	11,647m2	42,769m2	7,920m2	10,063m2	2,317m2	5,220m2	158,542m2	151,000m2	-7,542m2		4.99%	
Unit Numbers																			
	63	168	12	172	127	208		96				31		877					
Car Parking																			
Allocated Car Parking (Residential)	130	228	17	188	124	205		115				31		1038					
Visitor / Commercial Cars						14	441					-56		399					
PWD Spaces							15					0		15					
TOTAL VISITOR / COMMERCIAL CARS						14	456					-56		414					
TOTAL	130	228	17	188	124	219	456	115				-25		1452					
Required Cars*	63.0	169.5	18.1	183.4	127.5	289.4	83.2	96.0				31.0		1061					

* Commercial
Retail
Residential

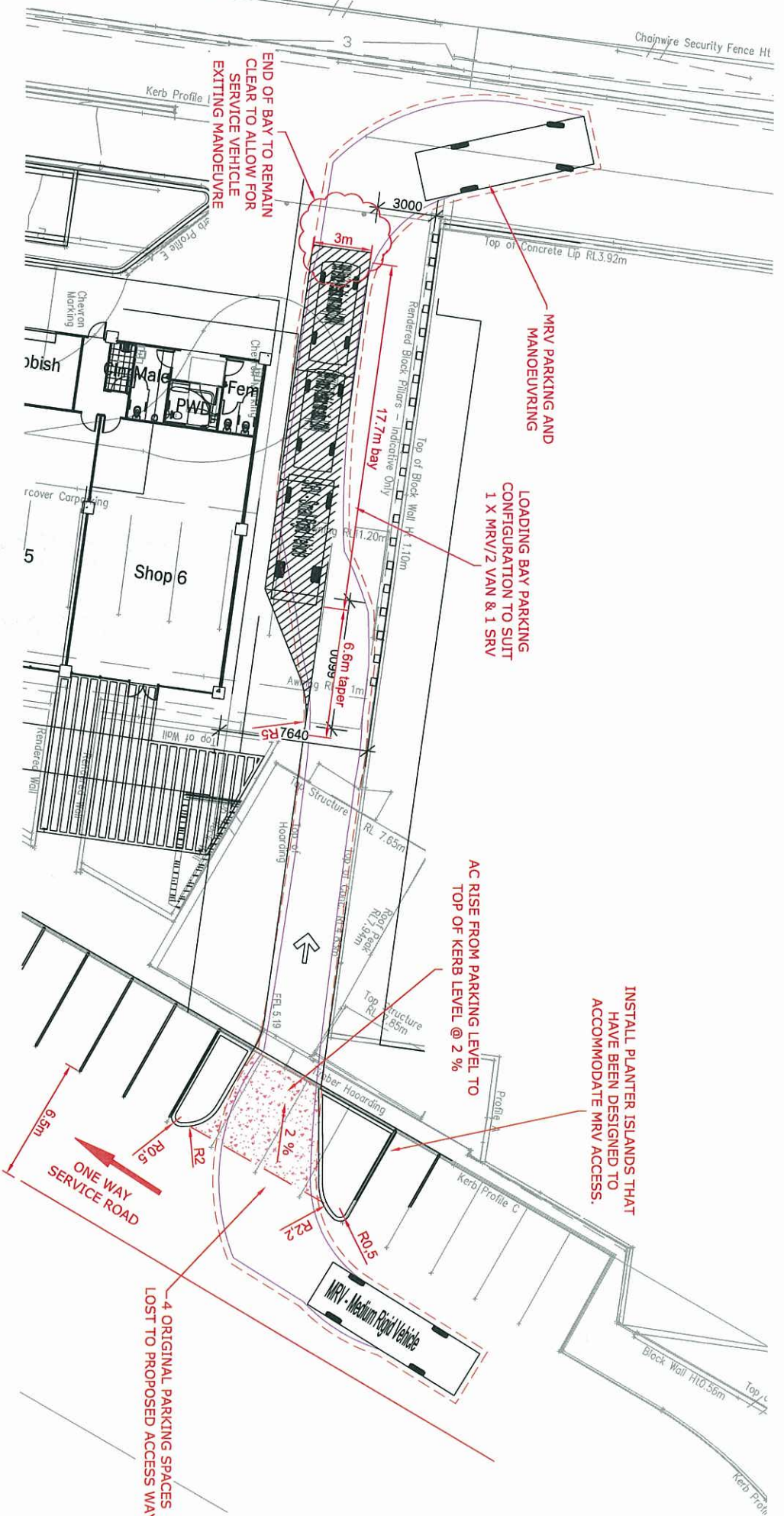
1 space per 100m2

1 space per 100m2

1 Space per dwelling

Appendix E

SERVICE VEHICLE MANOEUVRING



Appendix F

SERVICING LANEWAY HEIGHT CLEARANCE



Schematic
BUILDING 6 PORTSIDE HAMILTON
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Client CITIMARK	Project Name and Location BUILDING 6 PORTSIDE HAMILTON HERCULES ST, HAMILTON
Drawing Title WEST ELEVATION	

Scale As Shown	Date MAY 2010	Job no. 59004025
Drawn LM	Checked ND	Approved ND
Drawing no. SD 3004		Issue 00

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