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Portside Wharf Development

Building 5 – Residential

Traffic Engineering Report

Prepared for:
Brookfield Multiplex Developments

Reference: 27486Trep.docx

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1	C. Morahan	B. Camilleri	BC	Final Report	21/12/11

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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 5 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 5 is shown in Figure 1.1

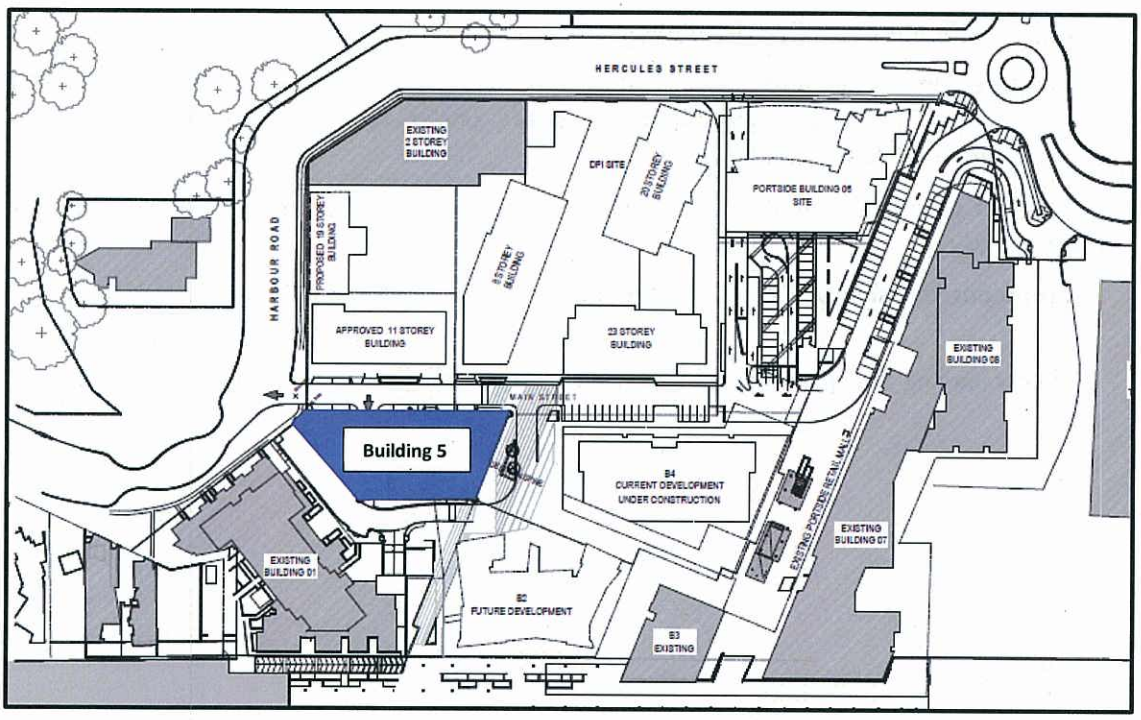


Figure 1.1: Site Location

2. The Proposed Development

2.1 Development Description

The development plan proposes a 15 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	75
2 bedroom	50
Total	125
Cafe	49m^2

The development of Building 5 also incorporates the extension of Main Street through to Harbour Road and the subsequent closure of the existing driveway servicing Infinity.

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 131 parking spaces spread across 4 parking levels in addition to 7 on-street public parking spaces (including 1 PWD space) adjacent to the development on Main Street.

It is also noted that Building 5 displaces 9 temporary parking spaces on the existing Infinity driveway.

It is proposed that bicycle parking for residents will be provided within the carparking levels 1 and 2.

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

3. Access Arrangements

3.1 Introduction

The development has two separate parking areas. Vehicular access to the carparking provided at ground level up to level 2 will be achieved via Main Street.

The basement level parking to be provided under Building 5 will be integrated with the existing car park via new parking being constructed under Building 4.

3.2 Ground Level Access

Vehicular access to the carparking provided at ground level up to level 2 will be achieved via Main Street, which will be extended through to Harbour Road. Residents parking at these levels will therefore be able to access Building 5 via the existing roundabout at the intersection of Hercules Street and MacArthur Avenue or via the Harbour Road/Main Street intersection. The routing options for residents parking at ground level up to level 2 are shown in Figure 3.1.

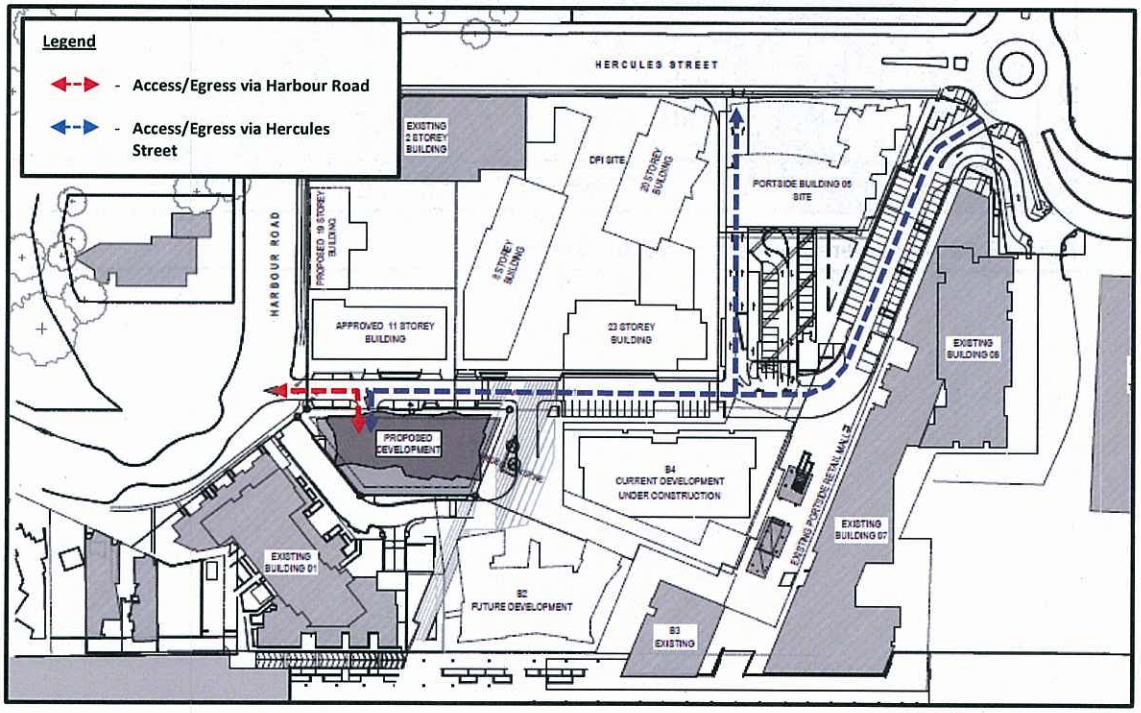


Figure 3.1: Access/Egress Options

This access is located approximately 25m from Harbour Road, which satisfies the minimum intersection separation requirements specified in *'AS2890.1'*, which is a minimum of 6.0m from the tangent point of the intersection.

'AS2890.1' specifies a Category 2 driveway in accordance with Table 3.1 of the standard requires a width ranging from 6.0-9.0m. The proposed driveway is 6.5m, which satisfies *'AS2890.1'*.

3.3 Basement Access

The basement level parking provided under building 5 will be integrated with the existing car park via new parking being constructed under Building 4. Access and egress to this parking area will be achieved via the existing arrangements which are highlighted in Figure 3.2a and b.

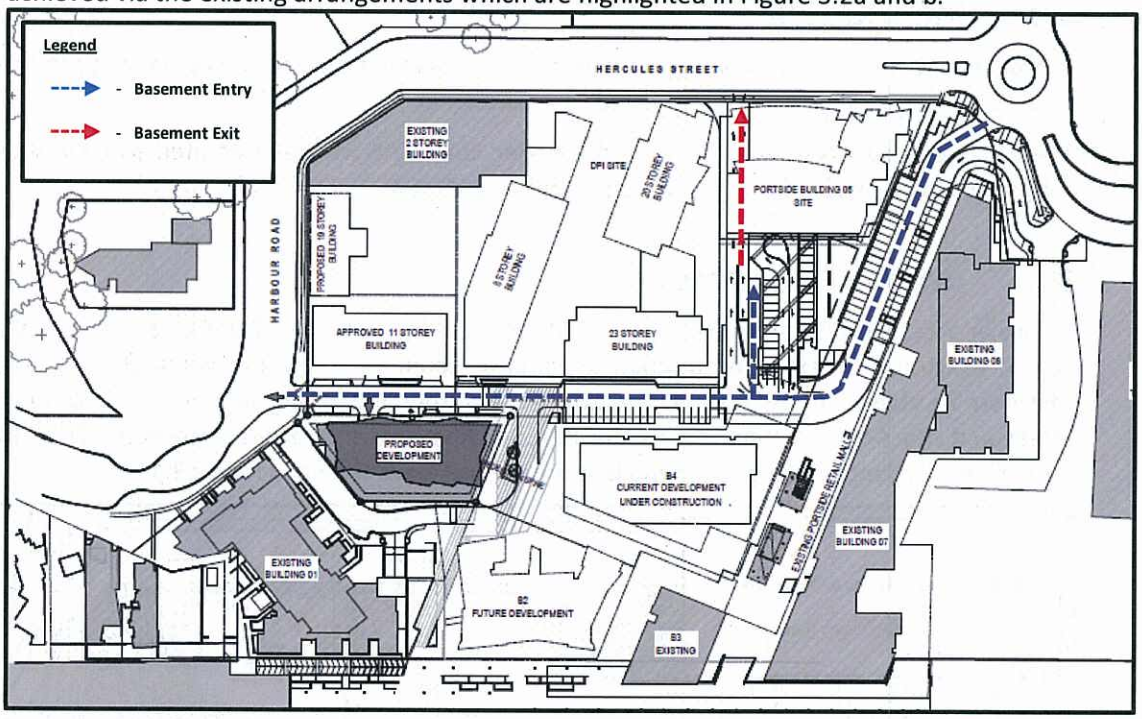


Figure 3.2a: Basement Car Park Entry and Exit Routes

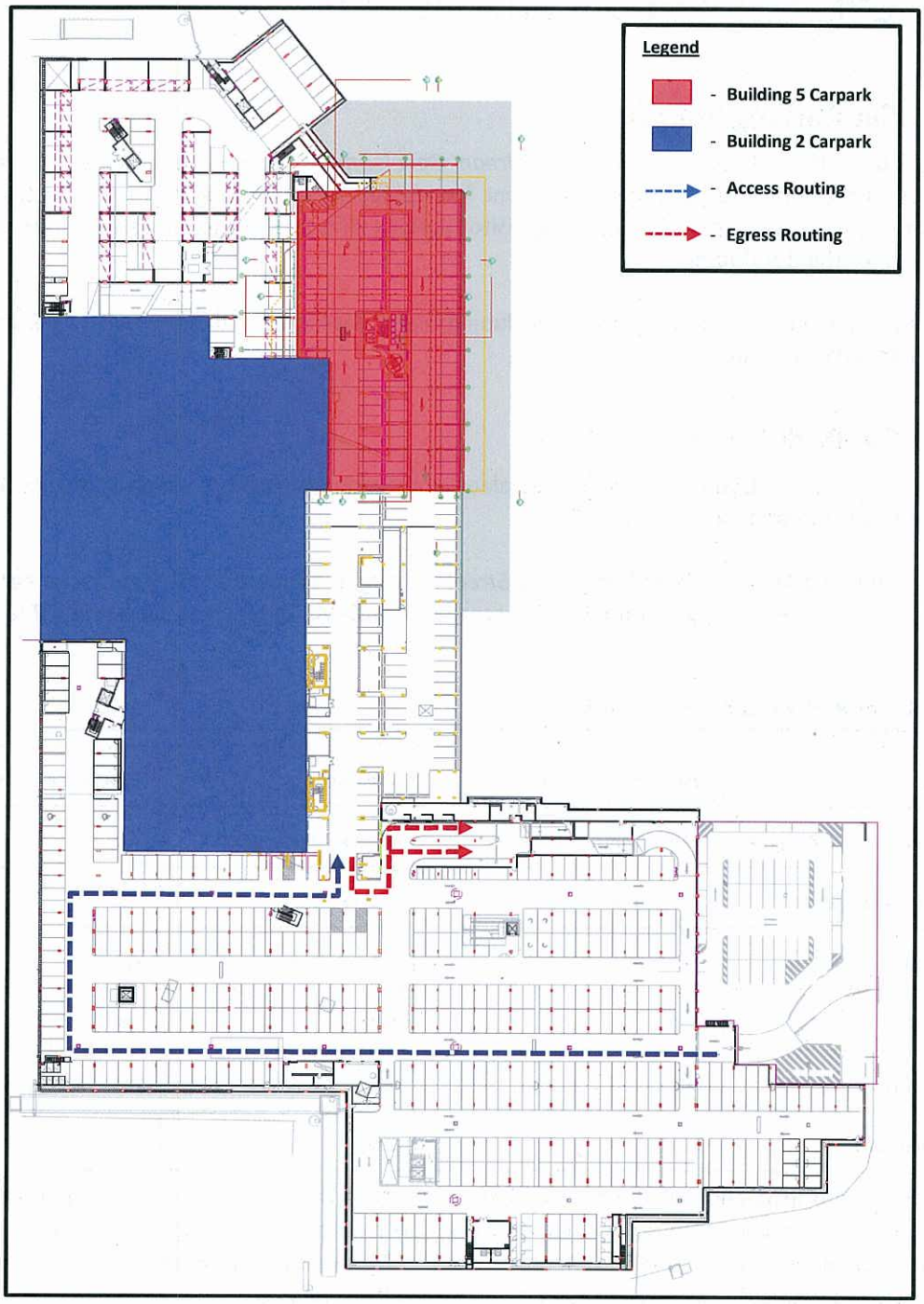


Figure 3.2b: Basement Circulation Routes

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 125 spaces for the development.

The proposal provides 131 parking spaces (including visitor parking). As such the ULDA's parking requirements are satisfied.

4.2 Car Park Design

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 5.4 (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	5.9m	**Yes**
Blind Aisle Extension	1.0m	1.0m	**Yes**
Circulation Road	5.5m	5.5m	**Yes**

It is evident from inspection of the development plans that the columns adjacent to small car space 18 on parking level 1 and small car space 23 on parking level 2 slightly encroaches the respective parking envelopes. It is considered given the alignment of the spaces in relation to the parking aisle that vehicular access/egress to the spaces will not be impacted.

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

5. Traffic Impacts

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	125	0.4	50

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 Nudgee Road. It is expected that traffic to/from the eastern and southern suburbs will utilise Kingsford Smith Drive followed by the Gateway Motorway. It is anticipated that traffic to/from the western suburbs will utilise Kingsford Smith Drive followed by the ICB.

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

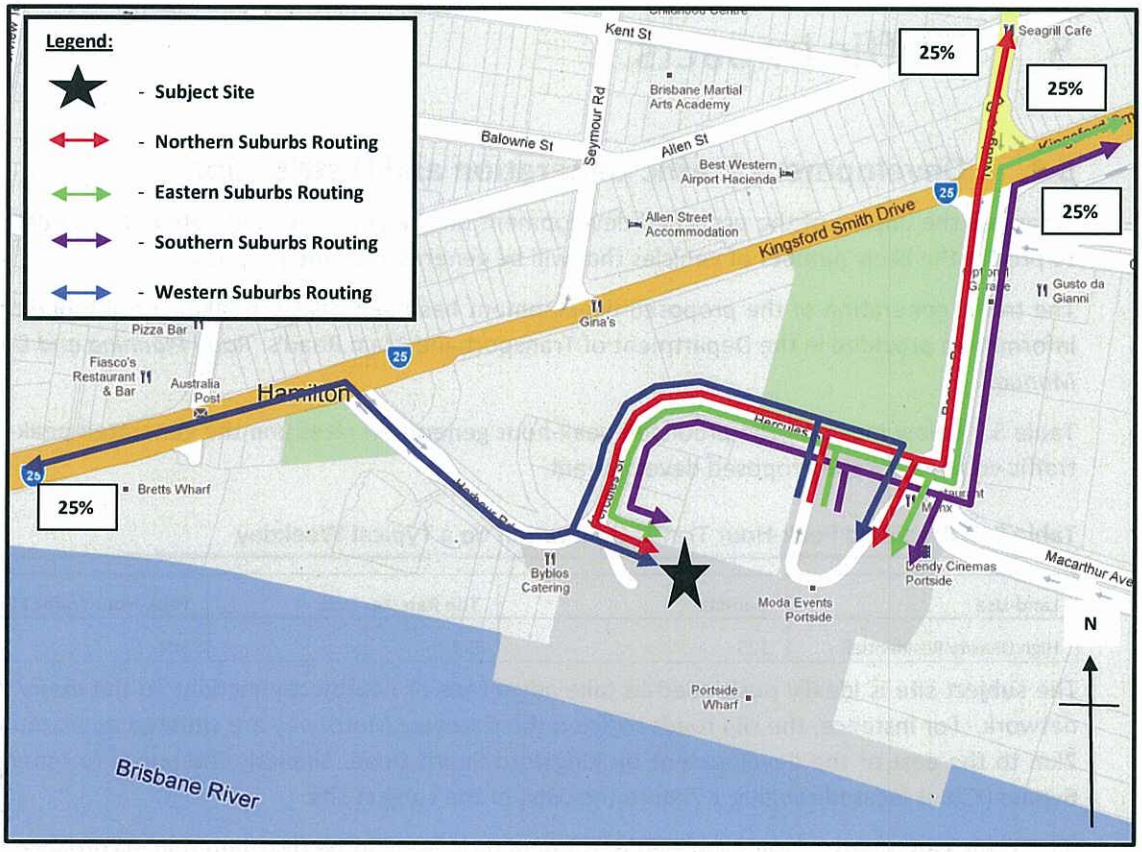


Figure 5.1: Trip Distribution

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.

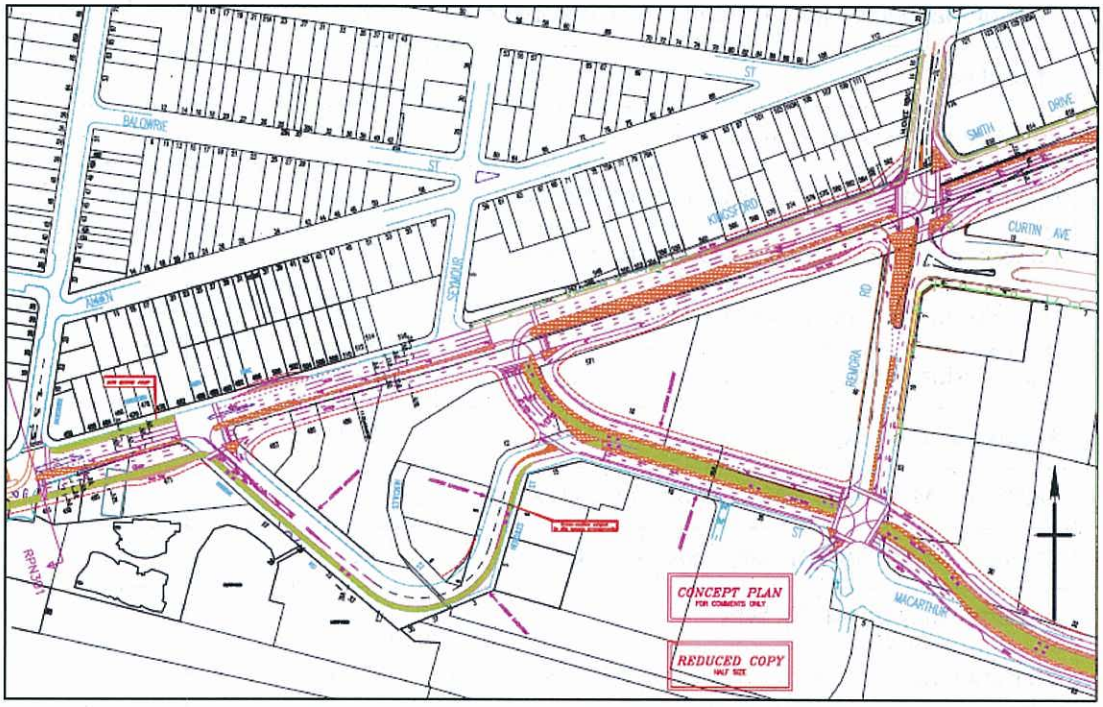


Figure 5.2: Upgrades along Kingsford Smith Drive

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.

With the extension of the internal road through to Hercules Street when Building 5 is developed, there will be a redistribution of traffic from the existing roundabout and Hercules Street exit driveway which would further increase the volumes at the intersection of the Main Street and Harbour Road. Traffic generated by Buildings 2 and 4 also needs to be considered. It is expected that the right turn into Main Street may increase to approximately 120vph in the PM peak-hour as a result of the redistribution of traffic and the other development within the precinct. The westbound traffic on Harbour Road is currently in the order of 350vph in the PM.

Provisional analysis of the Harbour Road/Main Street intersection using Austroads procedures indicates that the right turn into Main Street from Harbour Road will operate at a high level of service with average delays less than 2 seconds and queuing no greater than one vehicle. The results are shown in Table 5.2.

Table 5.2: Harbour Road/Main Street – Intersection Performance

Parameter	Right Turn Into Main Street
Type of Manoeuvre (Enter Number between 1 and 10)	9
Critical Acceptance	5
Follow-up Headway (secs), ta	3
Minor Stream Flow Rate per Lane (veh/hour), Qm	120
Minor Stream Flow Rate per Lane (veh/sec), qm	0.0333
Major (Priority) Stream Flow Rate (veh/hour), Qp	350
Major (Priority) Stream Flow Rate (veh/sec), qp	0.0972
Absorption Capacity (veh/hour), C	851
Right Turn Movement (Priority), Stream 3 Flow (vph), Q3	0
Practical Absorption Capacity (veh/hour), Cp	681
Average Delay (seconds), Wm	1.91
Utilisation Ratio (Ratio of Arrival Rate to Service Rate)	0.1410
Number of Storage Spaces Required, 95th percentile	1.00
Number of Storage Spaces Required, 98th percentile	2.00
Storage Length Required (metres), 95th percentile	8
Storage Length Required (metres), 98th percentile	16

Based on the analysis, it is not considered necessary to provide any dedicated turn treatments as the delays are typical of any urban local street.

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 the SRV bay to be provided between Buildings 2 and 4 will also facilitate the servicing of Building 5.

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 2-3m^3 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 5 waste will be towed to the collection point behind Building 7). 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 below, SRV's enter the bay in a reverse gear and exit in a forward gear.

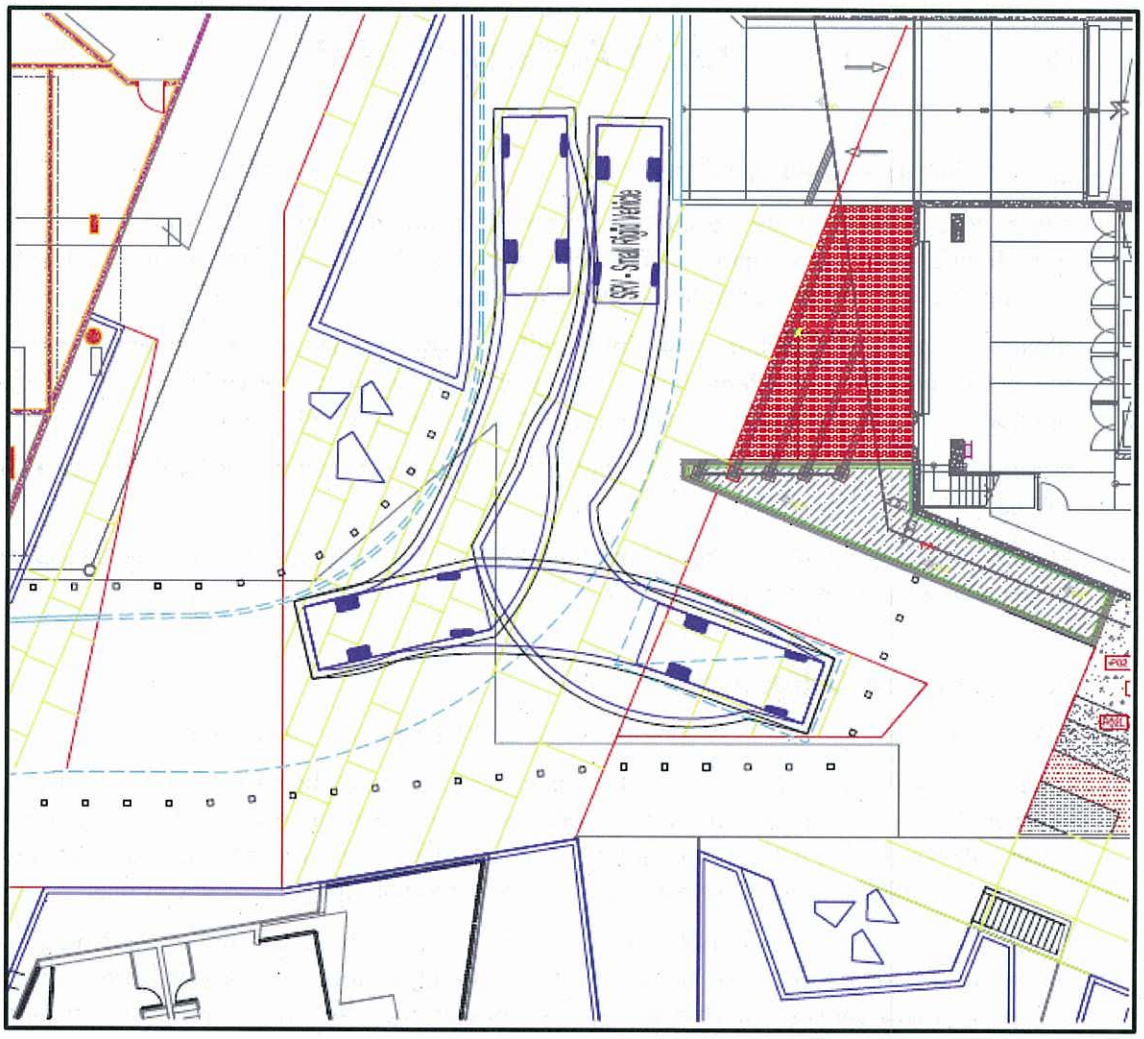


Figure 6.1: SRV Swept Path for Buildings 2/4/5

7. Bicycle Provisions

7.1 Bicycle Parking

It is proposed that 54 bicycle spaces will be provided within levels 1 and 2 of the carpark. It is anticipated that visitor cycle parking at Building 5 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 400m^2 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	32
	Visitor	1.0 space per 16 units	8
Total			40

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

The development has two separate parking areas. Vehicular access to the carparking provided at ground level up to level 2 will be achieved via Main Street.

The basement level parking to be provided under Building 5 will be integrated with the existing car park via new parking to be constructed under Building 4.

8.2 Car Parking Arrangements

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 125 spaces for the development.

The proposal provides 131 parking spaces (including visitor parking). As such the ULDA's parking requirements are satisfied.

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.

It is proposed that the SRV bay to be provided between Buildings 2 and 4 will also facilitate the servicing of Building 5.

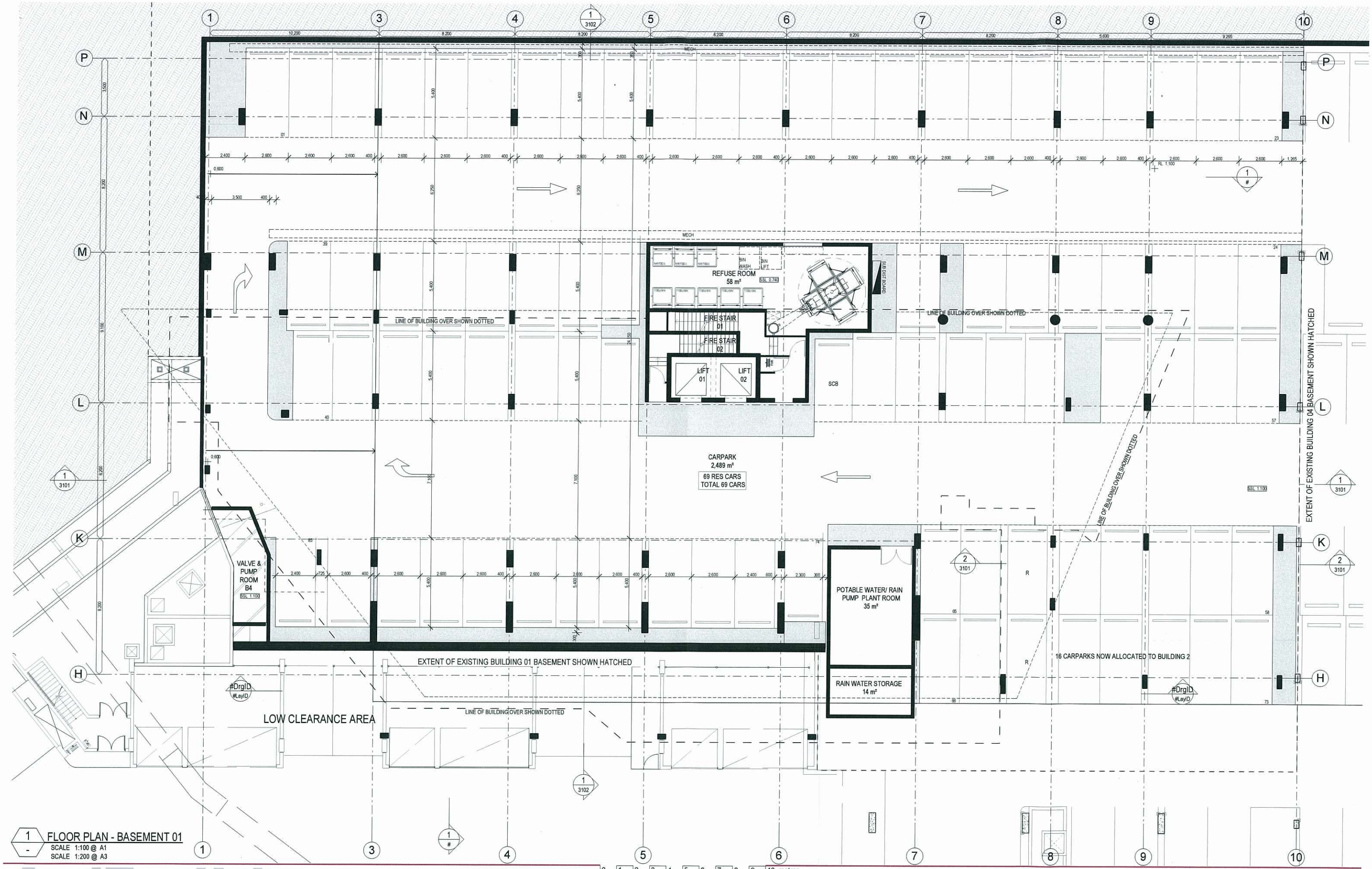
8.5 Bicycle Parking

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



1 FLOOR PLAN - BASEMENT 01
SCALE 1:100 @ A1
SCALE 1:200 @ A3

0 1 2 3 4 5 6 7 8 9 10 metres

Schematic

PORTSIDE WHARF BUILDING 5

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Brookfield MULTIPLEX

Issue	Revision	Date	In.
F	ULDA PRELODGEMENT MEETING	131211	LM
E	FOR COORDINATION	091111	LM
D	ULDA PRELODGEMENT MEETING	070511	LM
C	FOR CLIENT REVIEW	240811	LM
B	STRUCTURAL COORDINATION	040811	LM
A	FOR CLIENT REVIEW	241110	LM/SO

Amendments

Client
BROOKFIELD MULTIPLEX

Project Name and Location
PORTSIDE WHARF BUILDING 5, PORTSIDE WHARF, HAMILTON

Drawing Title
FLOOR PLAN - BASEMENT 01

Scale	Date	Job no.
As Shown	NOV 2010	3578B
Drawn	**Checked**	**Approved**
LM	SB	SB
Drawing no.		**Issue**
SD 2001		F

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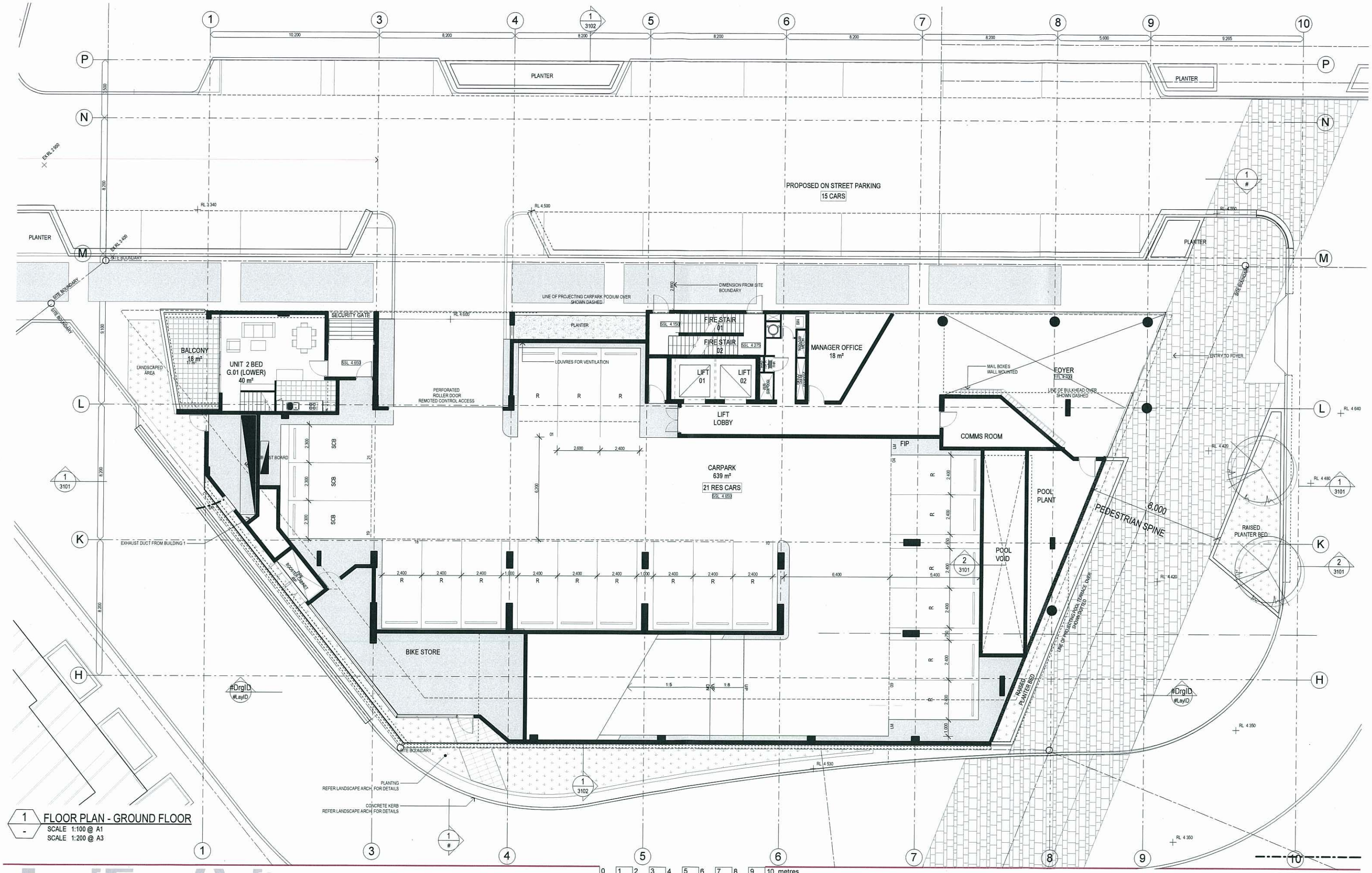

1 - FLOOR PLAN - GROUND FLOOR
SCALE 1:100 @ A1
SCALE 1:200 @ A3

Schematic

PORTSIDE WHARF BUILDING 5

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Issue	Revision	Date	In.
F	ULDA PRELODGEMENT MEETING	131211	LM
E	ULDA PRELODGEMENT MEETING	070611	LM
D	FOR CLIENT REVIEW	240811	LM
C	STRUCTURAL COORDINATION	040811	LM
B	FOR CLIENT REVIEW	071210	LM
A	FOR CLIENT REVIEW	241110	LM/SO

Amendments

Client
BROOKFIELD MULTIPLEX

Project Name and Location
PORTSIDE WHARF BUILDING 5, PORTSIDE WHARF, HAMILTON

Drawing Title
FLOOR PLAN - GROUND FLOOR

Scale	Date	Job no.
As Shown	NOV 2010	3578B
Drawn	**Checked**	**Approved**
LM	SB	SB
Drawing no.		**Issue**
SD 2002		F

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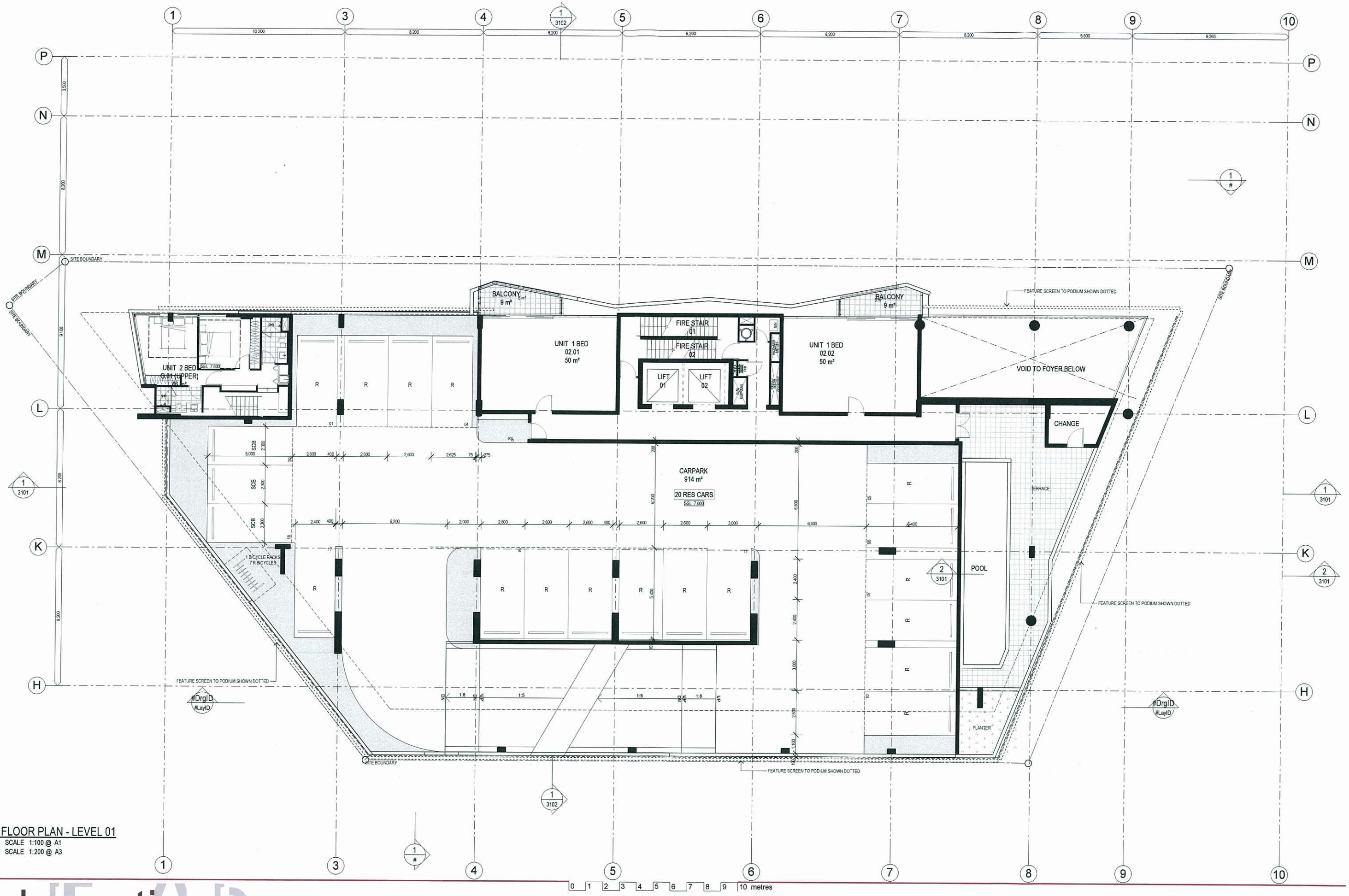

1 / - FLOOR PLAN - LEVEL 01
SCALE 1:100 @ A1
SCALE 1:200 @ A3

Schematic

PORTSIDE WHARF BUILDING 5

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A	FOR CLIENT REVIEW	241110	LM/SO
Amendments			

Client
BROOKFIELD MULTIPLEX

Project Name and Location
PORTSIDE WHARF BUILDING 5, PORTSIDE WHARF, HAMILTON

Drawing Title
FLOOR PLAN - LEVEL 01

Scale	Date	Job no.
As Shown	NOV 2010	3578B
Drawn	**Checked**	**Approved**
LM	SB	SB
Drawing no.		**Issue**
SD 2003		F

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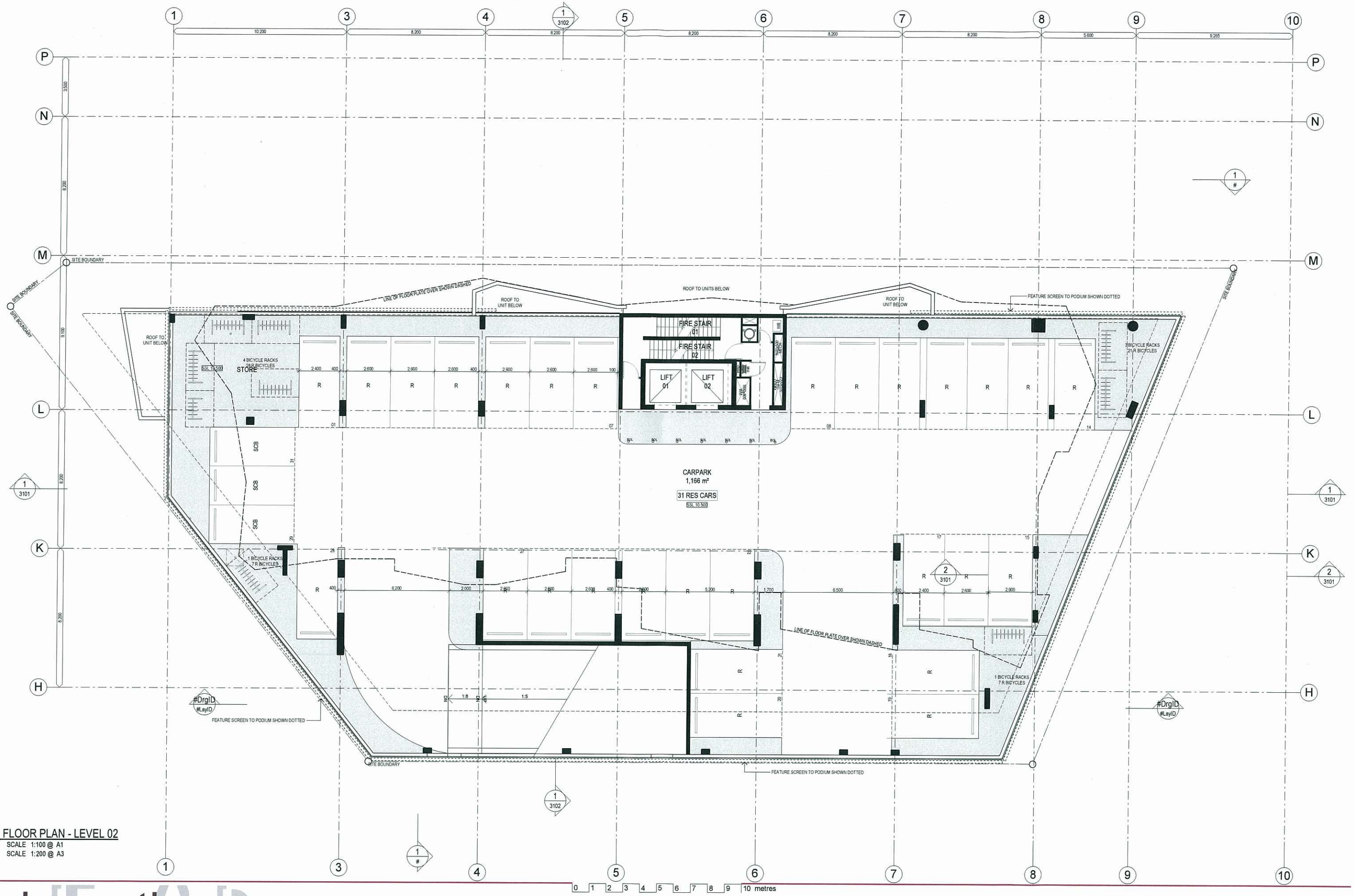

1 - FLOOR PLAN - LEVEL 02
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Schematic

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Drawing Title
FLOOR PLAN - LEVEL 02

Scale	Date	Job no.
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Drawn	**Checked**	**Approved**
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