

332-342 Water Street, Fortitude Valley

Project Waters Master Plan + Stage 1

Development Approval

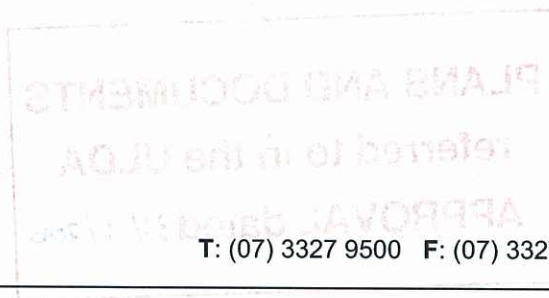
## Traffic Engineering Report

**PLANS AND DOCUMENTS**  
referred to in the ULDA  
**APPROVAL** dated 31/ 1 / 2013

*Prepared for:*  
Metro Property Developments Pty Ltd

*January 2013*

Reference: 27703



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# 1. Introduction

## 1.1 Background

TTM Consulting Pty Ltd (TTM) has been engaged by Metro Property Development Pty Ltd to prepare a traffic engineering report investigating the proposed master plan of the Project Waters development, including a preliminary development application for Stages 1 and 2. It is understood that this report will be provided in support of a revised Development Approval to the Urban Land Development Authority (ULDA).

## 1.2 Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- ▶ Parking supply
- ▶ Parking layout
- ▶ Surrounding road layout and site accessibility
- ▶ Access locations and designs
- ▶ Traffic generation and distribution
- ▶ Development impacts on surrounding road network
- ▶ Service vehicle operation
- ▶ Public transport accessibility
- ▶ Bicycle provisions

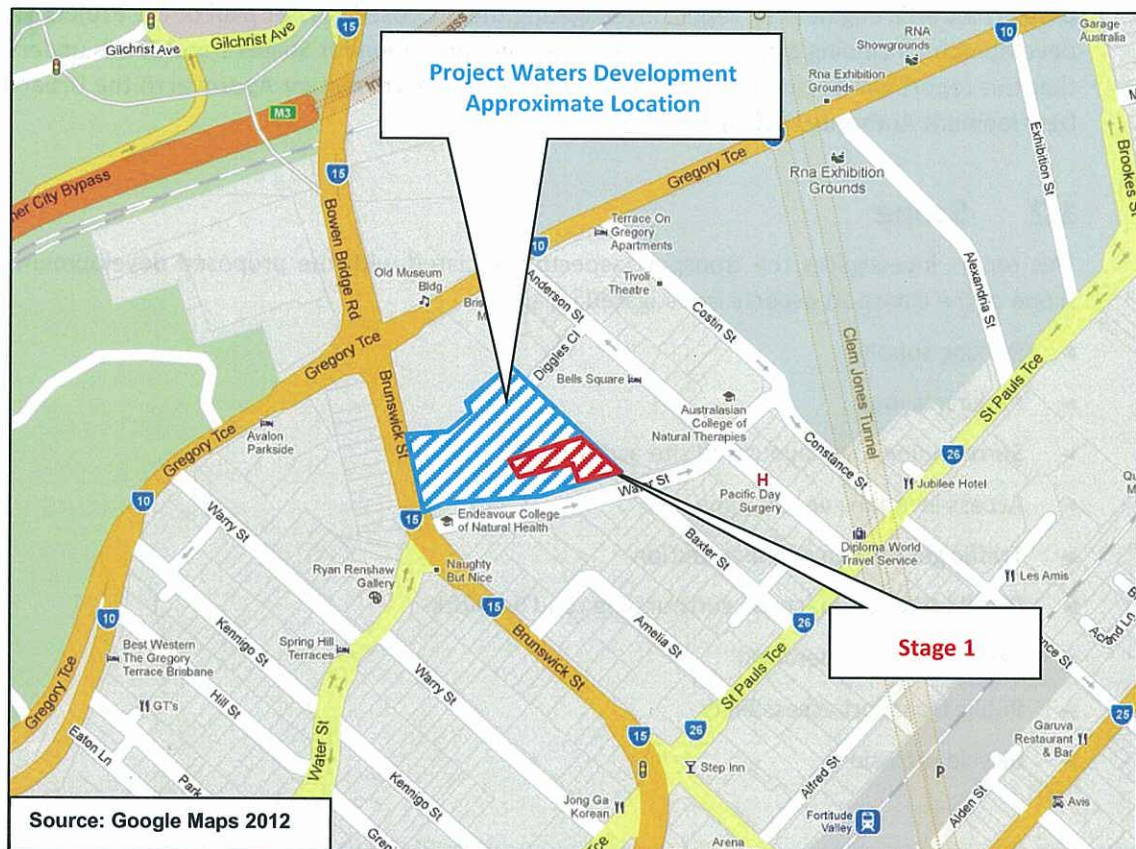
To assess the proposed transport arrangements, the development plans have been assessed against the following guidelines and planning documents:

- ▶ ULDA Planning Scheme, specifically;
  - 3.0 Land Use Plan for Precinct 4: Water Street Precinct
- ▶ Australian Standard for Parking Facilities (AS2890)
- ▶ Queensland Complete Streets
- ▶ Austroads Guide to Traffic Management

In addition, guidance on particular design issues has been taken from sections of the Brisbane City Council (BCC) City Plan 2000.

### 1.3 Site Location

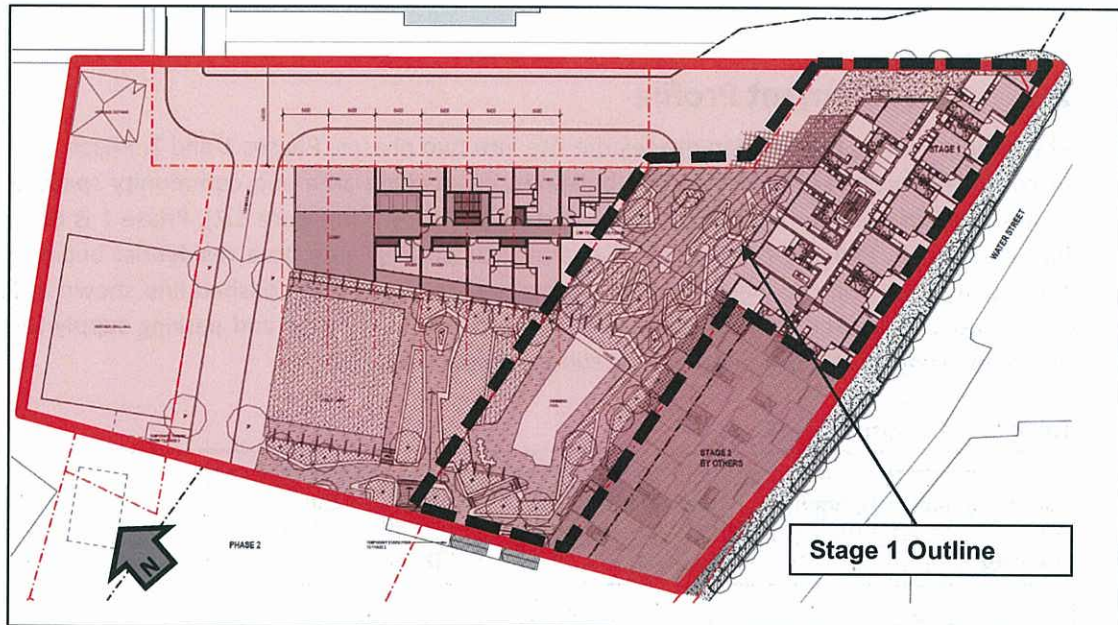
The Project Waters site is located at 62-68 Brunswick Street and 332-342 Water Street, Fortitude Valley, as shown in Figure 1.1. The site has road frontages onto Brunswick Street and Water Street. The site forms part of Precinct 4 (Water Street Precinct) of the Bowen Hills Urban Development Area (UDA).



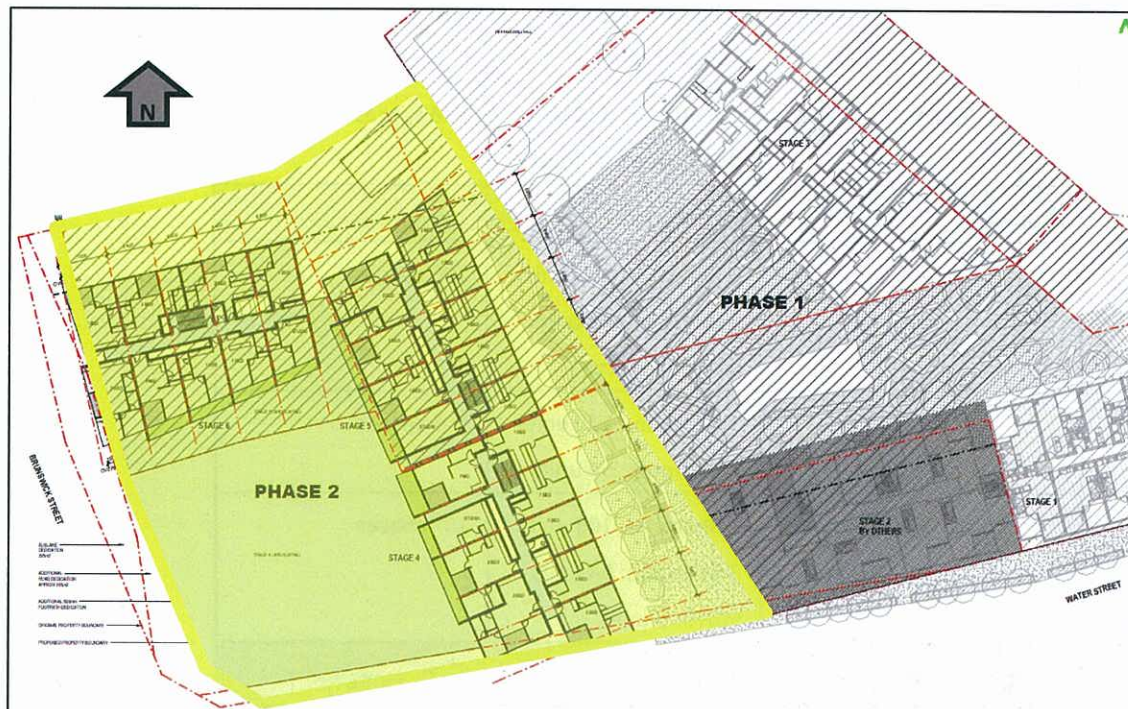
**Figure 1.1: Site Location**

Stage 1 of the development relates to the portion of the development located on the south-east corner of the wider site. Stage 1 has a road frontage to Water Street and is currently occupied with narrow verges/pedestrian paths and on-street car parking.

Figures 1.2 and 1.3 show the extent of Phases 1 and 2, respectively. The extent of Stage 1 within Phase 1 is shown highlighted in Figure 1.2.



**Figure 1.2: Phase 1 Site Boundary**



**Figure 1.3: Phase 2 Site Boundary**

## 2. The Proposed Development

### 2.1 Development Profile

The Project Waters master plan divides the site into two phases; Phases 1 and 2. Phase 1 consists of construction of the two residential buildings, car parking area and community space on the eastern side of the site (right of the black dashed line shown in Figure 1.2). Phase 1 is broken up into Stages 1-3. Phase 2 consists of a separate car parking area, two residential buildings and community space on the western side of the site (left of the black dashed line shown in Figure 1.2). Phase 2 is broken up into Stages 4-6. The proposed land uses and parking supply for each phase and stage of this development are summarised in Table 2.1.

**Table 2.1: Proposed Land Uses**

| Development Component    | Area/Quantity                                                | Parking Supply    |
|--------------------------|--------------------------------------------------------------|-------------------|
| <b>Phase 1</b>           | <b>526 units</b>                                             | <b>331 spaces</b> |
| - Stage 1                | 1 Bedroom: 115 units<br>2 Bedroom: 46 units<br>SOHO: 4 units | 105 spaces        |
| - Stage 2                | 1 Bedroom: 114 units<br>2 Bedroom: 45 units<br>SOHO: 2 units | 100 spaces        |
| - Stage 3                | 1 Bedroom: 135 units<br>2 Bedroom: 65 units                  | 126 spaces        |
| <b>Phase 2</b>           | <b>485 units</b>                                             | <b>313 spaces</b> |
| - Stage 4                | 1 Bedroom: 100 units<br>2 Bedroom: 48 units<br>SOHO: 8 units | 100 spaces        |
| - Stage 5                | 1 Bedroom: 110 units<br>2 Bedroom: 54 units                  | 106 spaces        |
| - Stage 6                | 1 Bedroom: 108 units<br>2 Bedroom: 54 units<br>SOHO: 3 units | 107 spaces        |
| <b>Total Development</b> | <b>1011 units</b>                                            | <b>644 spaces</b> |

\*SOHO = Single Occupancy / Home Office (1 bedroom unit equivalent).

The concept development plans showing the basement and podium parking levels for the wider site (separate set of plans for each phases) is included in Appendix A. Detailed design plans related to Stage 1 are also included in Appendix B

It should be noted that the development yield and parking supply details listed in Table 2.1 are specified based on preliminary development designs and are subject to change during the progression of the project and detailed design of each subsequent stage.

## **2.2 Access**

The Project Waters development contains three proposed access points; one for the Phase 1 precincts and two for the Phase 2 precincts. The Phase 1 access will be provided onto the proposed "Baxter Street Extension" (running along the north-eastern boundary of the site). The Phase 2 accesses will consist of an access onto Water Street and another onto a new internal access, running along the north side of Phase 1, which extends off from the Diggles Close / Baxter Street Extension intersection.

The Phase 1 access onto the new "Baxter Street Extension" will allow entry/exit in all directions. Assuming that Water Street remains a one-way road, the access provided for Phase 2 onto Water Street will be a 'Left-In/Left-out' only, while the second access from the new internal road will allow entry/exit in all directions.

Vehicular access to basement parking and service area of Stages 1 and 2 will be via the 'Baxter Street Extension' Road access.

Further details on the proposed access arrangements are provided in Section 5.

## **2.3 Parking**

The development plan includes a total of 644 car parking spaces, as outlined in Table 2.1 above, and 1173 bicycle parking spaces.

Stage 1 provides a total of 105 car parking spaces and 191 bicycle parking spaces.

Further details of the car parking provisions are provided in Section 4 and bicycle parking provisions in Section 8.

## 3. Existing Transport Infrastructure

### 3.1 The Road Network

All roads in the immediate vicinity of the site are administered by Brisbane City Council. The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 3.1.

**Table 3.1: Local Road Hierarchy**

| Road               | Speed Limit | Carriageway |                                | Road Reserve Width | Classification | Road Authority |
|--------------------|-------------|-------------|--------------------------------|--------------------|----------------|----------------|
|                    |             | Width       | Lanes                          |                    |                |                |
| ► Water Street     | 50 km/h     | 6m          | 1 (one-way)                    | 13m                | Local access   | BCC            |
| ► Brunswick Street | 60 km/h     | 15m         | 5 (2 northbound, 3 southbound) | 22m                | Arterial route | BCC            |
| ► Diggles Close    | 50 km/h     | 5m          | 1 (plus parking on 1 side)     | 11m                | Local access   | BCC            |
| ► Anderson Street  | 50 km/h     | 7m          | 2 (plus parking on 1 side)     | 14m                | Local access   | BCC            |
| ► Baxter Street    | 50 km/h     | 13m         | 2 (plus parking on both sides) | 20m                | Local access   | BCC            |

Water Street is a one-way street allowing only eastbound traffic. It is 6m wide where the main building of Stages 1 and 2 fronts onto it, but widens to 10m just west of it to provide a small number of parking spaces on both sides of the road. The intersection of Water Street / Baxter Street is priority controlled, while the intersection of Brunswick Street / Water Street is signalised.

### 3.2 Road Planning

The concept development plans provided in Appendix A incorporate the following resumptions/land dedications to facilitate planned road network improvements:

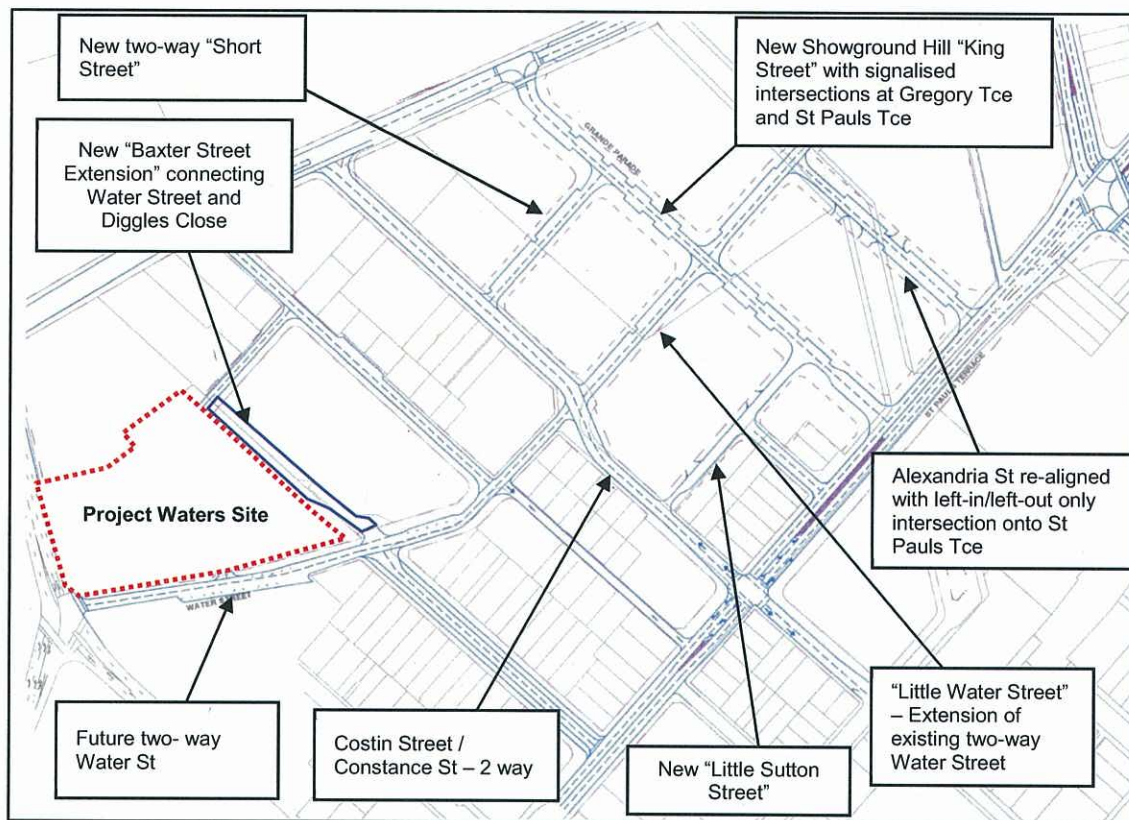
- A minimum 5.25-5.6m road dedication on the western property boundary of the Project Waters site, on the Phase 2 Brunswick Street frontage, to allow for future widening of Brunswick Street and upgrading of the Brunswick Street / Water Street signalised intersection. This allowance is consistent with road dedication/land requirements proposed to be imposed on the subject site, as outlined in the roadworks concept design prepared by Brisbane City Council (Drawing RPN677). A copy of this drawing is provided in Appendix C.
- A 168m<sup>2</sup> road dedication on the southern property boundary of the Project Waters site, on the Water Street frontage primarily along the Phase 2 section, to allow for future footpath widening on the north side of Water Street.

- A 1337m<sup>2</sup> road dedication on the eastern property boundary of the Project Waters site to allow for the "Baxter Street Extension" from Water Street through to Diggles Close.
- A 34m<sup>2</sup> road dedication on the eastern most corner of the site (by tapering the existing pointed end of the property) to facilitate footpath widening on the corner of Water Street.

The UDA Land Use Plan for Precinct 4 (Water Street Precinct) indicates that a road is to be constructed connecting Baxter Street with Diggles Close. The ULDA have also undertaken the Bowen Hills Traffic Study with the objective of identifying ultimate road requirements and intersection configurations to accommodate the total development in accordance with the Bowen Hills UDA development Scheme.

Also, the RNA redevelopment (renamed the "Showground Hill" project) to the east of the subject site will include a new internal local road that will influence the operation of the wider road network in the vicinity of the subject site.

Figure 3.1 indicates the proposed road network upgrades in the immediate area.



**Figure 3.1: Future Road Network Configuration**

### **3.3 Public Transport and Pedestrian Facilities**

Fortitude Valley train station is located approximately 550m to the south of the site, and provides access to all train lines going through the central city.

On-street bus stops are located on Brunswick Street adjacent to the site, as well as on Gregory Terrace some 250m walk from the site.

The Riverside Citycat stop is located approximately 1.5km to the south of the site.

Most of the streets in the area provide footpaths on both sides of the road, with the exception of Diggles Close which provides a footpath on the south side only. The signalised intersection of Brunswick Street / Bowen Bridge Road / Gregory Terrace provides pedestrian crossings on all approaches, while the signalised intersection of Brunswick Street / Water Street provides crossings on three of the four approaches.

No dedicated cycle lanes are provided in the immediate vicinity of the site, the nearest being provided on Gregory Terrace beginning some 300m west of the intersection with Brunswick Street. The nearest CityCycle station is 360m walk from the site at the intersection of Constance Street and St Pauls Terrace.

## 4. Car Parking Arrangements

### 4.1 ULDA Requirement for Car Parking

The 'Bowen Hills Urban Development Area Development Scheme' stipulates that a **maximum** rate of 1 car parking space (inclusive of visitor car parking) be provided per unit. Based on this requirement, the overall development can have at most 1011 car parking spaces.

### 4.2 Proposed Car Parking Supply

The total proposed on-site parking supply for the development is 644 parking spaces, including 105 spaces as part of Stage 1.

The proposed parking supply rate is based on constraining the commuter traffic generated by the development, which is consistent with Transport-Orientated-Development (TOD) principles. The UDA Development Criteria states:

*"In support of TOD principles priority should be given to pedestrian, cycle and public transport modes, over private vehicle use".*

As mentioned previously the site enjoys a high level of connectivity to the public transport network and therefore it is considered appropriate, in terms of travel demand management strategies, to reduce the overall parking supply and encourage residents to use alternative modes of transport. The site is also located within walking distance of the key centres of Fortitude Valley, Royal Brisbane Hospital and Brisbane CBD.

The parking supply has been derived based on applying the rates of 0.4 spaces per one bedroom unit (so only 40% of the 1 bedroom units will have a dedicated parking space), 1 space per two bedroom unit and an additional 1 visitor space per 20 units. These rates, aside from the rate for one bedroom units, are consistent with the BCC recommended rates for CBD residential developments. The BCC rate is 0.5 spaces for one bedroom units, as opposed to the 0.4 spaces adopted for this development.

TTM considers that 0.4 spaces per one bedroom unit is an acceptable rate based on the following factors:

- TTM has previously prepared a 'Parking Supply Analysis' letter in support of the proposed 'per bedroom' parking rates, based on the results of surveys conducted at high-density residential units in the CBD fringe area. The purpose of these surveys was to identifying practical parking demands for residents and visitors. In particular, this study focuses on the demands associated with one bedroom "investor" style units. The results of these surveys indicate that a parking rate of 0.4 spaces for one bedroom units is acceptable. A revised copy of the 'Parking Summary Analysis' letter (TTM Ref. '27703let130116', Dated 16<sup>th</sup> January 2013) reflecting the revised scheme for this development is provided in Appendix D.
- Metro Property Developments has extensive experience in developing high density investor orientated residential developments. This experience indicates that the market would accept a rate of 0.4 spaces per one bedroom unit.

Regardless of this lower rate of parking for one bedroom units, there is limited potential for vehicle parking 'overflow' onto the surrounding street due to the limited amount of on-street parking and this developments location within "Brisbane Central Traffic Area". The traffic area comprises 2hr limits and paid parking zones on all on-street parking spaces. Given the fact then that there is limited ability to park on the streets for an extended period of time, this factor plays a significant role in the consideration of prospective residents. Buyers/renters who own cars are extremely unlikely to purchase/rent a unit without a dedicated parking space in the CBD/fringe area, given there is no alternative location for their vehicle to be housed. Therefore, there will be limited adverse effects on the surrounding area as a result of the reduced onsite parking supply.

### 4.3 Stage 1 Parking Supply

Based on the accepted parking rates outlined in Section 4.2, the suitability of the parking supply specifically related to Stage 1 of the development is summarised in Table 4.1.

**Table 4.1: Stage 1 Parking Supply Summary**

| Residential Parking Component | Number of Units | Parking Supply Rate | Parking Supply Required | Proposed Provision |
|-------------------------------|-----------------|---------------------|-------------------------|--------------------|
| Residential Units:            | 165 units       | -                   | 94 spaces               | 96 spaces          |
| • 1 Bedroom (inc. SOHO)       | 119 units       | 0.4 spaces/unit     | 48 spaces               |                    |
| • 2 Bedroom                   | 46 units        | 1.0 spaces/unit     | 46 spaces               |                    |
| Residential Visitors          | 165 units       | 0.05 spaces/unit    | 8 spaces                | 9 spaces           |
| <b>Total</b>                  |                 |                     | <b>102 spaces</b>       | <b>105 spaces</b>  |

As outlined in Table 4.1, the proposed parking supply of 105 spaces for Stage 1 exceeds the parking supply requirement of 102 spaces and is therefore considered acceptable.

### 4.4 Proposed Car Park Design

Australian Standard for Parking Facilities – Part 1: Off-Street Car Parking (AS2890.1:2004) is adopted as the design standard for car parks in developments under the assessment of the ULDA. The key design parameters in accordance with AS 2890.1 are set out in Table 4.2.

**Table 4.2: Car Park Design Criteria**

| Design Aspect                                                                                  | AS2890.1 Requirement                                                                                                                              |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Parking Spaces (Class 1A)                                                                      | 2.4m x 5.4m minimum                                                                                                                               |
| Motorcycle Spaces                                                                              | 1.2m x 2.5m minimum                                                                                                                               |
| Parking Aisle                                                                                  | 5.8m minimum width                                                                                                                                |
| Circulation Road <ul style="list-style-type: none"><li>• Two-lane</li><li>• One-lane</li></ul> | 5.5m minimum width<br>3.0m minimum width                                                                                                          |
| Ramp Grades                                                                                    | Maximum 1:4 (25%) (up to 20m)<br>Maximum 1:5 (20%) (over 20m)<br>Maximum Transitions of up to 1:8 (12.5%)<br>On parking aisles up to 1:16 (6.25%) |

Detailed basement plans for Stage 1 are included in Appendix B. The car parking provisions of Stage 1 complies with all the design aspects outlined in Table 4.2.

It should be noted that the current basement and parking layouts plans provided for the remainder of the site (Appendix A) are concept designs only. As such, the compliance of basement car park designs cannot be explicitly confirmed at this time. Further detailed designs of future stages will be developed ensuring that compliance with all Australian Standards design requirements are met.

## 5. Site Access Arrangements

Given the size of the whole Project Waters Development, it was considered necessary that there be multiple accesses fronting onto different roads surrounding the site. Not only would this provide maximum flexibility to assist in the staging of the development, but it would also help cater for the travel movement desires of the development related traffic and would avoid congestion by efficiently distributing the development traffic on the surrounding roads. It was considered that direct access onto Brunswick Street would be unachievable given the current traffic volumes using the road and topography of the site. Therefore, an alternative to construct a new road fronting the site was considered as multiple access points could then be incorporated on both this new road and the existing Water Street.

### 5.1 New “Baxter Street Extension” and Road Design

The precinct outcomes in the Precinct 4 (Water Street Precinct) Land Use Plan of the Bowen Hills UDA identify a “new road” through the site along the eastern boundary connecting Water Street to Diggles Close. This is the proposed “Baxter Street Extension” referenced in this report. Taking into account the potential for two access points onto this new “Baxter Street Extension” (one for Phase 1 and an internal road connecting to the Phase 2 parking area), it was therefore assumed that up to 75% of the development traffic could theoretically use this new road. As outlined in Section 6 below, the peak hour generation rate of the development is expected to be up to 237vph. Assuming this equates to 10% of the daily development traffic generation, and applying the 75% factor, it is expected that the volumes of traffic on this new road attributed to this development could be up to 1800vpd. Given the existing ‘grid’ style of the surrounding network, this new road is not expected to significantly change the flow of the existing traffic movements throughout and into/out of the catchment. As such, the traffic volumes using this new road can be expected to be primarily related to this development, with a minimal amount of additional residential traffic for the dwellings in the immediate area (i.e. on Diggles Close). For this purpose then, it can be assumed the daily traffic volumes on the new “Baxter Street Extension” will not exceed 2000vpd.

The new Baxter Street Extension has been designed to the standard of a ‘Neighbourhood Access’ (non-bus route) road, in accordance with the requirements of the BCC Brisbane City Plan 2000 *Transport and Traffic Facilities Planning Scheme Policy*. As outlined in the policy, a Neighbourhood Access road is suitable to carry traffic volumes of up to 3000vpd, above the daily volumes expected to use the new “Baxter Street Extension”. A 14m wide road reserve has been dedicated for this new road, and the proposed cross section incorporates a 7.5m carriageway, 3.5m open verge on the western side and a 1.5m undercroft, giving a total verge width adjacent to the development of 5.0m. The proposed layout and design of the new “Baxter Street Extension”, is included in the concept development design plans provided in Appendix A. Specific design of the intersection with Water Street / Baxter Street (assuming one-way flow continues to the west of Baxter Street) is included in Appendix E.

It is anticipated that volumetric dedications will be required along the eastern side, and south-eastern most corner, of the Phase 1 area as the footprint of the upper levels of the Phase 1 buildings will encroach over the verge/footpath of the new “Baxter Street Extension”. All of the building overhangs, however, will remain clear of the road carriageway.

Overall, the design of the new “Baxter Road Extension” is consistent with the requirements of the Bowen Hills UDA development scheme and is considered suitable.

## 5.2 Access to Phase 1 of Development

Vehicular access to Phase 1 (and Stage 1 by association) will be gained through an all-movements access onto the new “Baxter Street Extension” and will be located approximately 45m north of Water Street. As with the car park, AS2890 is adopted as a suitable reference for access design. The key design parameters in accordance with AS 2890 are set out in Table 5.1 below.

**Table 5.1: Phase 1 “Baxter Street Extension” Access Characteristics**

| Design Aspect                                 | AS 2890 Requirement                                                           | Proposed Provision                                                          | Comply (Yes or No) |
|-----------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------|
| Crossover width                               | Category 3<br>6m entry width<br>and 4.0-6.0 exit<br>width                     | 10.0m entry width<br>and 6.0m exit width<br>(plus central median<br>island) | Yes                |
| Minimum distance to<br>adjacent intersections | 6m from tangent<br>point on kerb                                              | 45m north of Water<br>Street / Baxter Street<br>Intersection                | Yes                |
| Sight distance                                | Ideally 69m,<br>minimum of 45m                                                | 50m to south and<br>70m to the north                                        | Yes                |
| Exit queue capacity                           | 5 vehicles (30m)<br>for Stage 1 & 2<br><br>7 vehicles (42m)<br>for Stages 3-4 | 3 vehicles (18m)                                                            | No                 |
| Gradient of first 6m                          | 1:20 (5%)                                                                     | 1:20 (5%) max                                                               | Yes                |

With respect to exit queue capacity, it is noted that the basement will service low-turnover residential parking spaces and, as detailed further in Section 6.0, it is expected that the peak outflow from the access will be at most 92 vph when Stages 1 to 3 are fully operational. The probability of more than 3 vehicles exiting the site at the same time (or say within a 30 second period) and all requiring to queue within the site, extending into the visitor parking area, is no more than 4%. The proposed internal exit queuing capacity is sufficient to cater for the 95<sup>th</sup> percentile exit queue of the site, and is therefore considered acceptable.

### 5.3 Access to Phase 2 of Development

Vehicular access to Phase 2 will be gained through two points; a Left-in/Left-Out access onto the existing one-way Water Street and an all movements access onto the new "Baxter Street Extension".

The Water Street access will be located approximately 50m east of Brunswick Street. TTM understands there are future plans to potentially convert Water Street into a two-way road (east of Brunswick Street). Should this occur, there is the ability for this access to be converted to an all-movements access. The key design parameters in accordance with AS 2890 are set out in Table 5.2 below.

**Table 5.2: Phase 2 Water Street Access Characteristics**

| Design Aspect                 | AS 2890 Requirement           | Proposed Provision                                                                     | Comply (Yes or No)                     |
|-------------------------------|-------------------------------|----------------------------------------------------------------------------------------|----------------------------------------|
| Crossover width               | 6.0-9.0m<br>Category 2 Access | 7.0m Category 2 Access                                                                 | Yes                                    |
| Minimum distance intersection | 6m from tangent point on kerb | 50m from Brunswick Street                                                              | Yes                                    |
| Sight distance                | Ideally 69m, minimum of 45m   | 60m to the west to the Brunswick Street / Water Street intersection, +100m to the east | Yes                                    |
| Exit queue capacity           | 4 vehicles (24m)              | 3 vehicles (18m)                                                                       | No. Refer to discussion in Section 5.2 |
| Gradient of first 6m          | 1:20 (5%)                     | Access yet to be designed                                                              | -                                      |

A detailed design of this access and parking area has yet to be undertaken, however, preliminary concept sketches provided have been used to determine that most aspects will accord with the requirements of the Australian Standards. Subsequent detailed design will be undertaken to ensure compliance with all Australian Standards requirements.

The new internal road extending off from the "Baxter Street Extension" will be provided, connecting onto the new road just south of the corner where it matches into Diggles Close. The site access onto "Baxter Street Extension" will be provided in the form of an at grade intersection leg/approach, providing all-movement entry and exit. The internal road itself will be designated as a slow speed 'shared' zone and treated as to appear as a private road. The key design parameters in accordance with AS 2890 are set out in Table 5.3 below.

**Table 5.3: Phase 2 “Baxter Street Extension” Access Characteristics**

| Design Aspect                    | AS 2890 Requirement              | Proposed Provision                                                                                   | Comply (Yes or No) |
|----------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------|--------------------|
| Crossover width                  | 6.0-9.0m<br>Category 2 Access    | Intersection leg,<br>designed to cater for<br>swept path of largest<br>vehicle                       | Yes                |
| Minimum distance<br>intersection | 6m from tangent<br>point on kerb | Incorporated as<br>approach leg to<br>intersection.                                                  | Yes                |
| Sight distance                   | Ideally 69m,<br>minimum of 45m   | +75m to the south<br>towards Water<br>Street and +50m to<br>the north looking<br>along Diggles Close | Yes                |
| Exit queue capacity              | 4 vehicles (24m)                 | + 6 vehicles (+36m)                                                                                  | Yes                |
| Gradient of first 6m             | 1:20 (5%)                        | 1:20 (5%) max                                                                                        | Yes                |

Although detailed design of this access/intersection has yet to be undertaken, preliminary concept sketches provided have been used to determine that most aspects will accord with the requirements of the Australian Standards. Subsequent detailed design will be undertaken to ensure compliance with all Australian Standards requirements.

## 6. Road Network Performance

### 6.1 Traffic Generation & Distribution

The RTA *Guide to Traffic Generating Developments* indicates that the peak hour trip generation characteristics of medium to high density residential developments is between 0.25 - 0.4 trips/unit. Considering that in this proposed development not all units have a car parking space, it can be assumed that these units will not contribute to the total traffic generation of the development. Based on this, the development traffic generation can be expected to be as shown in Table 6.1 below.

**Table 6.1: Project Waters Peak Hour Traffic Generation**

| Development Component         | Number of Units | Traffic Generation Rate | Peak Hour Trips      |
|-------------------------------|-----------------|-------------------------|----------------------|
| <b>Phase 1</b>                |                 |                         | <b>76 – 122 vph</b>  |
| - 1 Bedroom with no car space | 222 units       | 0 trips/unit            | 0 vph                |
| - 1 Bedroom with car space    | 148 units       | 0.25-0.4 trips/unit     | 37 -60 vph           |
| - 2 Bedroom with car space    | 156 units       | 0.25-0.4 trips/unit     | 39 – 62 vph          |
| <b>Phase 2</b>                |                 |                         | <b>72 – 115 vph</b>  |
| - 1 Bedroom with no car space | 197 units       | 0 trips/unit            | 0 vph                |
| - 1 Bedroom with car space    | 132 units       | 0.25-0.4 trips/unit     | 33 - 53 vph          |
| - 2 Bedroom with car space    | 156 units       | 0.25-0.4 trips/unit     | 39 – 62 vph          |
| <b>Total Development</b>      |                 |                         | <b>148 – 237 vph</b> |

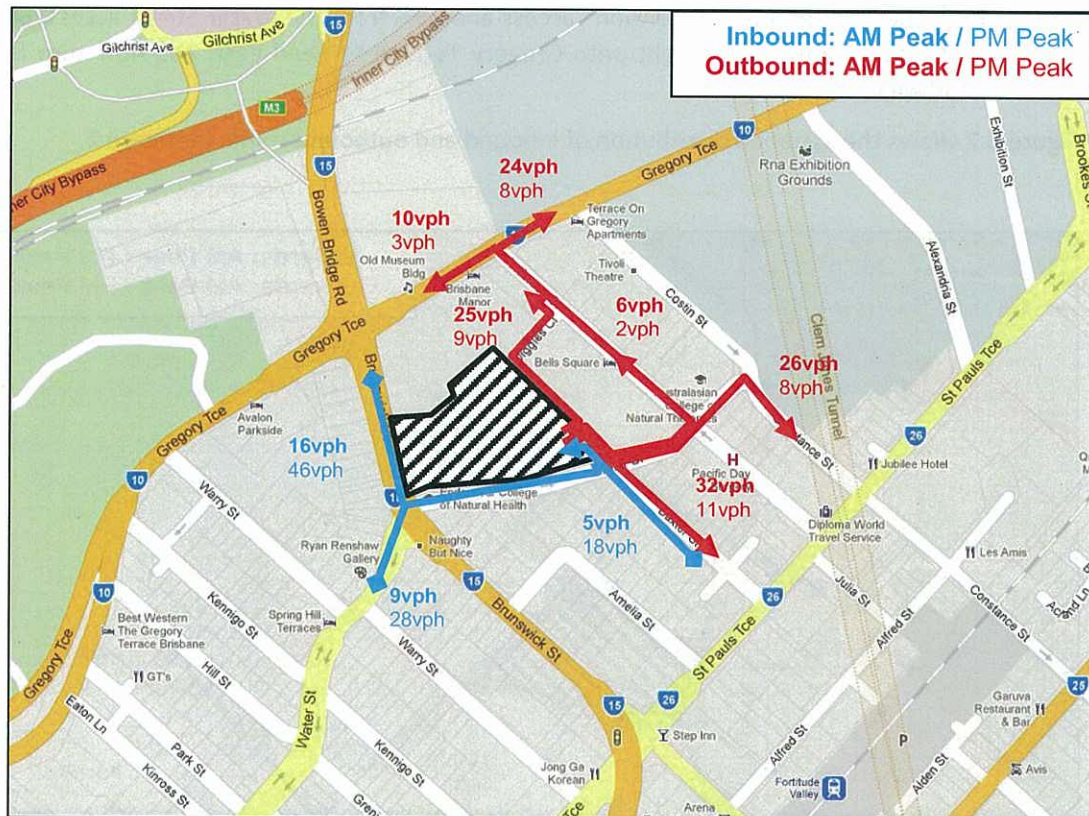
The development peak hour traffic distribution on the surrounding road network was determined for each of the Phases 1 and 2, using the following generic assumptions:

- The higher end of the traffic generation range (0.4 trips/unit) has been adopted as a worst case scenario when calculating the intersection movement volumes shown
- The in/out split development traffic is 25%/75% in the AM Peak and 75%/25% in the PM Peak.

With respect to the more specific characteristics of the distributions, the following assumptions were made for the Phase 1 development generated traffic:

- All vehicles entering the Phase 1 access on the new “Baxter Street Extension” come from Water Street and Baxter Street. No traffic enters from the north (i.e. via Diggles Close). Assumed 40% will come from Baxter Street and 60% from Water Street.
- 70% of vehicles exit to the south from the “Baxter Street Extension” access, and 30% to the north. Out of all the vehicles exiting to the south, 50% head south along Baxter Street, 10% turn left into Anderson Street and 40% turn right into Constance Street.
- Out of all the vehicles exiting to the north from the Phase 1 access, 70% turn right onto Gregory Terrace to head east, and 30% turn left to head west.

Figure 6.1 shows the assumed distribution of inbound and outbound traffic for Phase 1.



**Figure 6.1: AM/PM Movements Peak Hour Traffic Volumes to/from Phase 1 Access**

With respect to the more specific characteristics of the distributions, the following assumptions were made for the Phase 2 development generated traffic:

- 50% of vehicles entering Phase 2 will do so via that Water Street access; with 50% coming from the north (via Bowen Bridge Road) and 50% from the east (from the east side of Water Street).
- The remaining 50% of vehicles entering Phase 2 will do so via the access onto the new "Baxter Street Extension"; with 70% of the traffic coming from the south (via Baxter Street) and 30% from the north (via Gregory Terrace).
- Phase 2 traffic exiting the site is split evenly between 50% north (towards Gregory Terrace) and 50% south (towards St Pauls Terrace). All the vehicles exiting to the south exit via the Water Street access, with 40% turn right into Baxter Street and 60% turn right into Constance Street.
- For vehicles exiting to the north from Phase 2 access (toward Gregory Terrace), 75% exit from the "Baxter Street Extension" access and 25% from the Water Street access. 60% of northbound traffic turns right onto Gregory Terrace to head east, and 40% turn left to head west.

Figure 6.2 shows the assumed distribution of inbound and outbound traffic for Phase 2.

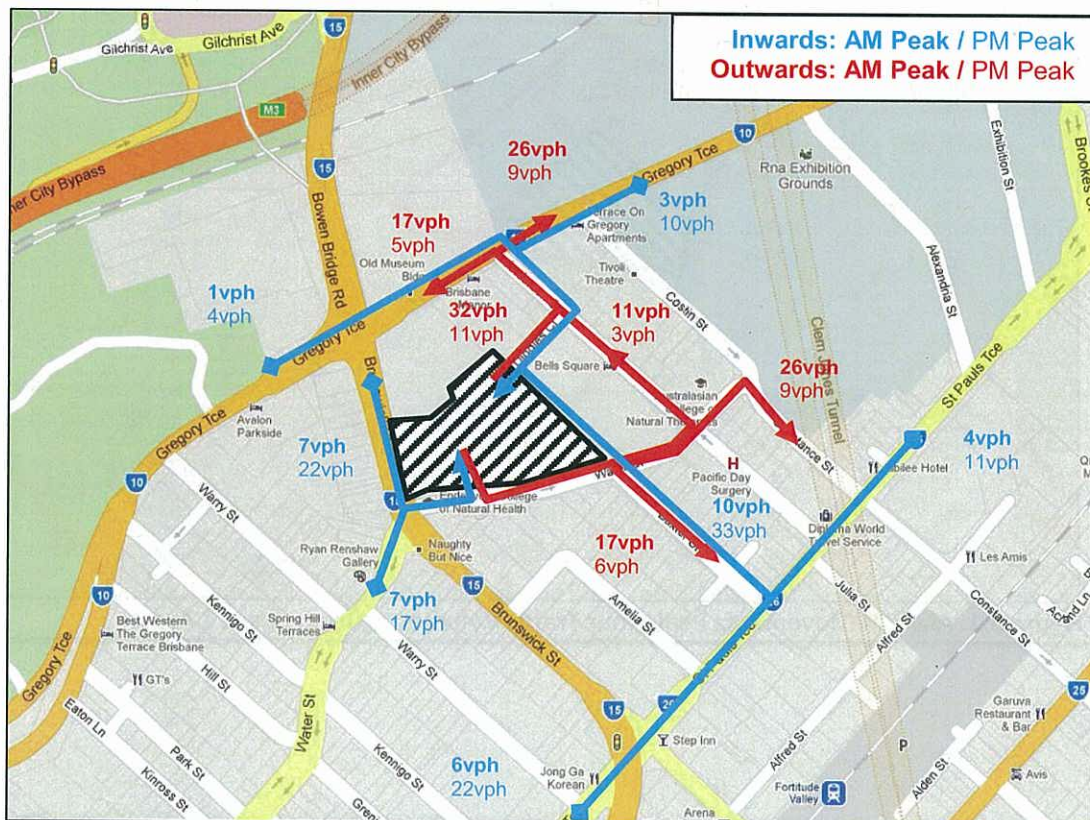


Figure 6.2: AM/PM Movements Peak Hour Traffic Volumes to/from Phase 2 Access

## 6.2 Development Impacts

It should be noted the 'Bowen Hills Traffic Model' – which was developed by TTM for the ULDA to assess the area wide road network performance and impacts of the various development projects within the Bowen Hills Urban Development Area (UDA) – previously used generic traffic generation rates for the site of the proposed Project Waters development. This was based on assumed land redevelopment yields and maximum plot ratios specified in the Bowen Hills UDA Development Scheme.

The outputs of the model show the traffic generation estimated from this site was 174vph in the AM Peak and 173vph in the PM Peak. These peak hour volumes are within the expected development traffic generation range shown in Table 6.1, although slightly at the lower end of the range. In light of this fact, TTM previously prepared a letter in June 2012 comparing the proposed development generated traffic on roads surrounding the site for both the original 'Bowen Hills Traffic model' and revised model with development yield of 1038 units (and peak hour generation of 244vph). As the proposed revised scheme provides 1011 units total, 28 units less or 7vph less than was tested in the revised model, TTM considers the results of this comparison are still valid and if not now more conservative. The results of the comparisons documented in June 2012 showed that the effects of the revised yield (compared to the original model) would be negligible. TTM considers this will still be the case for the new development size of 1011 units and that overall impacts of this development have already been considered in the planning of future road infrastructure for Bowen Hills UDA, as per the "Bowen Hills Network Analysis Report" submitted to ULDA.

A copy of the Road Modelling and Impacts Analysis Letter prepared by TTM (TTM Ref. '27703let\_traffic model update', Dated 20<sup>th</sup> June 2012) is included for reference in Appendix F.

## 6.3 Two-Way Conversion of Water Street

The future road planning activities summarised in Figure 3.1 show a conversion of Water Street and to two-way flow is proposed between Brunswick Street and Misterton Street. Road widening and two-way conversion works on the section between Brunswick Street and Baxter Street is unable to be performed until the property on the south corner of the Brunswick Street / Water Street intersection is redeveloped, and rededication of land for road reserve (for facilitate two lanes at the intersection approach). Regardless, the proposed development will not provide access onto Water Street along this section until Phase 2 is constructed.

With respect to the other section of Water Street, between Baxter Street and Misterton Street, it should be noted that the need to widen and convert this section to two-way is not a capacity driven requirement. That is, there is no trigger related to traffic generation from the subject site. The purpose of two-way conversion of this section is to improve accessibility to the site from the north-east. With the current directional flow on the surrounding streets, it can be circuitous to access the site, particularly from Gregory Terrace. The full benefit of converting this section of Water Street to two-way, however, will not be realised until Costin Street is also converted to two-way and Water Street is extended through to King Street (the new road being constructed as part of the RNA showgrounds development 'Showground Hill'). Both of these roadwork activities are largely dependent on the progress of this development.

If the section of Water Street between Baxter Street and Misterton Street is not converted to two-way, traffic entering the site would be diverted to enter via Brunswick Street, Baxter Street or Diggles Close. The traffic generated by Phase 1 will be at most 122vph, which when distributed on the roads surrounding the site as shown in Figure 6.1 (which reflects the existing one-way access on Water Street) overall results in minimal traffic volumes increases. The additional traffic on these routes is therefore considered negligible and would not create an adverse impact on safety or amenity.

It is TTM's view that, from a traffic engineering perspective, the two – way of Water Street could be delayed until Phase 2 of the project when direct access on to Water Street from the car park is provided to the west of Baxter Street.

## 7. Service Vehicle Arrangements

The service vehicle facility needs to accommodate the demands generated by the residential components of the development. Although the development also incorporates a small amount of retail space and a number of Sole Occupancy/Home Office (SOHO) uses, the service vehicle size and general demand generated by these uses is not likely to be larger than the residential component.

It is noted that all of the residential apartments within the development are one or two bedroom units and are targeted at the investor market, which relates to a high proportion of rental units. Whilst this may relate to a higher turn-over of tenants, most tenants typically have less furniture to move in/out of the unit and so utes or vans will more typically be expected for furniture removals, with the occasional larger furniture trucks. With respect to furniture trucks, it is expected that smaller MRV sized trucks would service the small units for this site as opposed to traditional LRVs used for larger units and houses where the volume of furniture being relocated is greater.

Given the size of each Phase of this project, it is expected that there will be frequent furniture vehicle access to the site. To accommodate this expected vehicle demand, it is proposed that a management strategy will be implemented to control the timing of furniture/removals vehicles accessing the site. This will involve the building manager allocating a specific time period for residents to move in/out, by providing access to the service area and priority over an elevator/lift to transport goods to the respective units. On this basis, it is TTM's view that the ability to schedule the timing of the trucks will allow for appropriate sharing of the service vehicle area and as such a single MRV bay is considered acceptable. Given the number of units in each of the Phases, regular refuse collection is likely to be needed and so TTM feels a dedicated RCV bay is warranted.

The proposal provides two separate service areas; one area each for both Phase 1 and 2 of the development. Each service area will consist of two dedicated VAN bays, one MRV bay and one RCV bay. Preliminary service vehicle swept path analysis of the Phase 1 service area (incorporating Stage 1 servicing) is included in Appendix G to show that manoeuvring up to an MRV is expected to be possible. The arrangement of the Phase 2 service area is yet to be determined, however, it shall be designed to ensure manoeuvring up to an MRV size vehicle is possible.

## 8. Public Transport, Pedestrians and Cyclists

### 8.1 Public Transport

As indicated previously the subject site enjoys a high level of connectivity to the public transport network. The master plan allows for the inclusion of an indented bus bay which is consistent with BCC planning outcomes.

It has been demonstrated that the proposed development accords with Translink's requirements whereby public transport can be accessed within a 5 minute (400m) walk of the site. The fact that there is an indented bus bay also being constructed on the Brunswick Street frontage of the site is likely to allow for increased frequency and an expanded range of services to be added in the future, improving the overall public transport serviceability and connectivity of the site

### 8.2 Pedestrians and Cyclists

It is proposed that the "Baxter Street Extension" be designed as a space shared by pedestrians and vehicles. Through the use of contrasting paving materials, planting, street furniture and outdoor seating an environment will be achieved where drivers understand intuitively to maintain low speeds and be aware that other people will be using the space.

ULDA requires 1 resident's bicycle space per apartment equating to 1011 spaces over the whole Project Waters site, plus 1 visitor's space per 400m<sup>2</sup> GFA. The wider site provides approximately 64,700m<sup>2</sup> GFA, which equates to a visitor bicycle parking requirement of 162 spaces. The overall proposal will reflect this total required supply of 1173 bicycle parking spaces. The majority of the bicycle spaces (resident and visitor) will be located in the basement car park areas, spread across the different levels and building stages, and a small number of the visitor spaces will be located in public areas (such as in the Baxter Street Extension or Water Street road verges/building frontage) to allow for convenient parking for the small amount of retail and SOHO components of the development.

With respect to Stage 1, the total development yield 10,589m<sup>2</sup> GFA or 165 units equates to a ULDA parking requirement of 165 resident bicycle parking spaces and 26 visitor bicycle parking spaces. The proposed design will incorporate this supply of bicycle parking spaces, totalling 191 bicycle parking spaces.

## **9. Recommendations**

### **9.1 Impact on Surrounding Road Network**

The impact of the whole Project Waters development has effectively been accounted for in the original Bowen Hills Traffic Model established for the wider Bowen Hills UDA. Any road network impacts and proposed improvements are detailed in the original Bowen Hills Network Analysis Report provided to the ULDA.

### **9.2 Development Access**

The Project Waters development is planned to include three accesses; one onto the new “Baxter Street Extension” for Phase 1 buildings and two for the Phase 2 buildings on both Water Street and the new “Baxter Street Extension”. These arrangements are considered satisfactory in providing a high level of accessibility to the site and cater to the movement/trip demands of the development. Detailed design of the respective accesses will be undertaken in accordance with the requirements of AS2890.

### **9.3 Car Parking Arrangements**

The proposal includes 644 parking spaces distributed over the two basement car park areas (one in Phase 1, and another in Phase 2). Stage 1 will provide 105 parking spaces, meeting the minimum parking supply required for the site of 102 spaces. The additional 3 spaces provided in excess of the minimum requirement may be dedicated to a parking allocation associated with future Stages 2 and 3 depending on the final design of those stages. All parking provided is intended for the residential component, with no parking allocation for small amount of retail space in the development.

The proposed parking supply is based on constraining the commuter traffic generated by the subject site and is generally consistent with TOD principles. Although the parking rate adopted for the one bedroom units is below BCC recommendations, TTM feels this slight reduction is justified and therefore the parking arrangements are considered acceptable. Detailed design of the basement car parks will be undertaken in accordance with the requirements of AS2890.1.

### **9.4 Service Vehicle Arrangements**

The proposal provides two VAN bays, one MRV bay and one RCV bay for each of the service areas for Phases 1 and 2. These service vehicle facilities are considered to be sufficient to service the demands of the development.

### **9.5 Public Transport and Bicycle / Pedestrian Facilities**

The site is well located in terms of providing a high level of accessibility to public transport, with the Fortitude Valley train station within easy walking distance of the site. This reinforces the proposal to constrain resident car parking and encourage residents to use public transport.

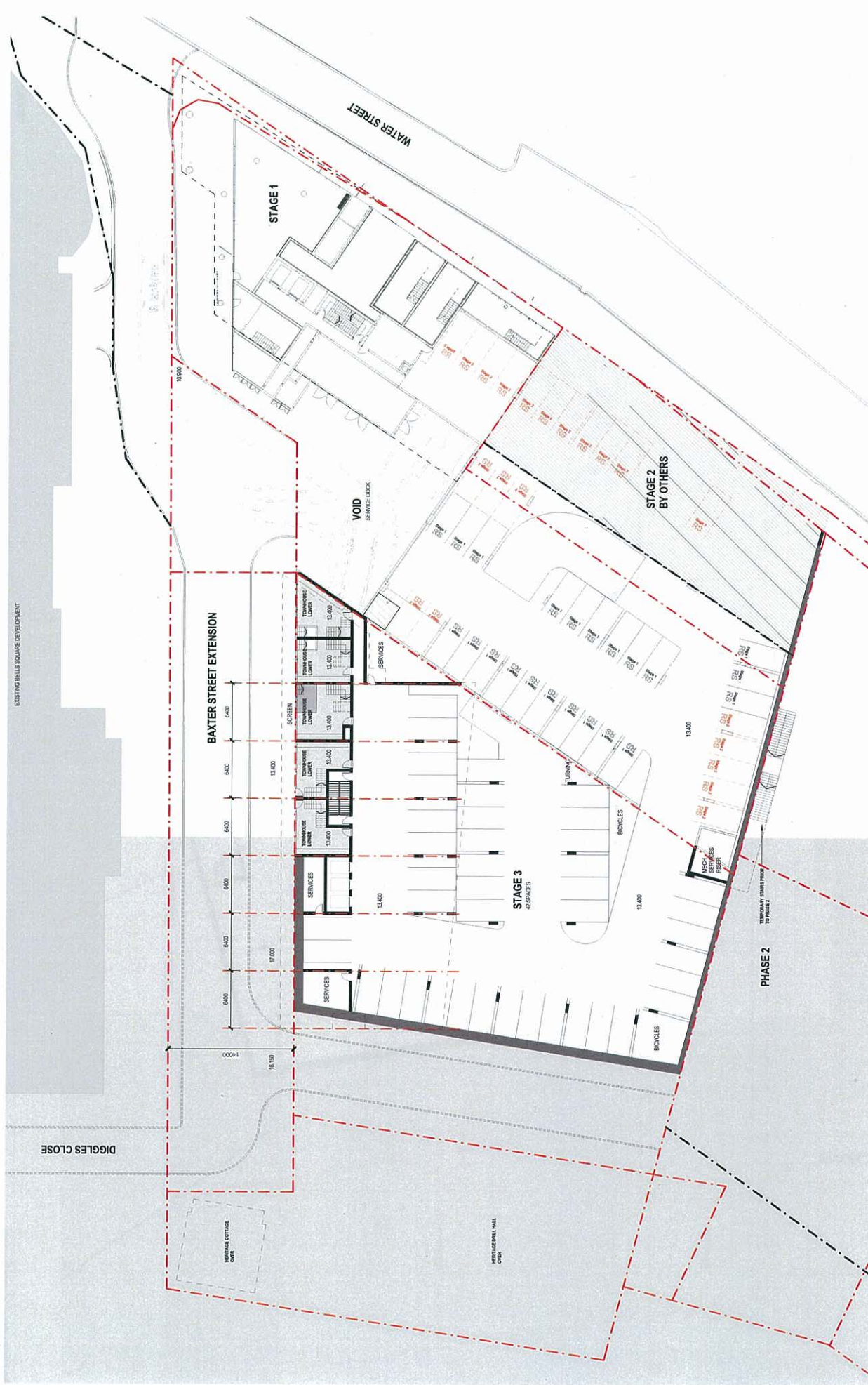
1173 bicycle spaces are provided in the proposal, comprising primarily secure spaces located in the basement parking area and a small number of public spaces in communal areas of the site.

Stage 1 provides a total of 191 bicycle parking spaces, split between resident and visitor use, in line with ULDA requirements.

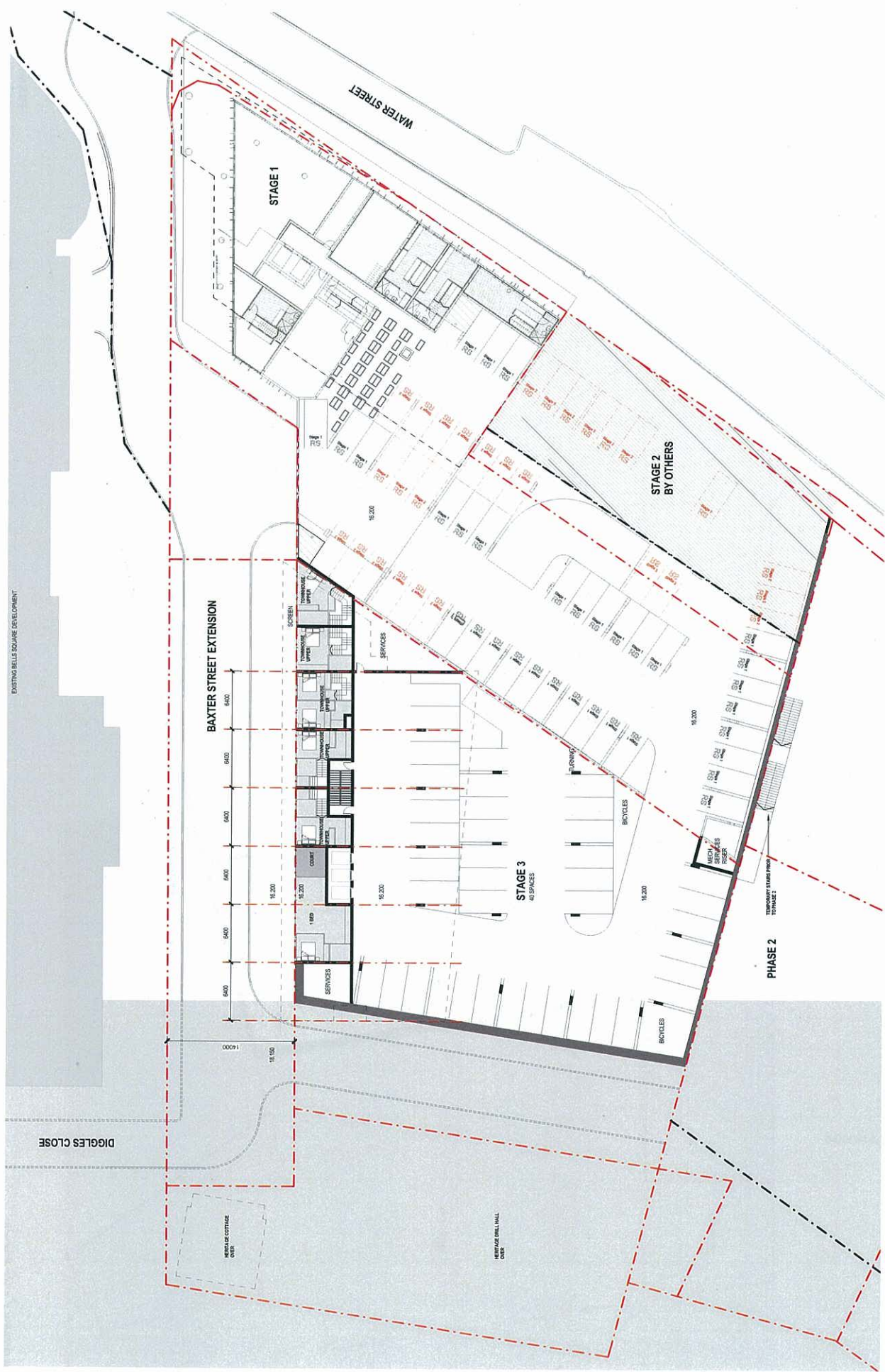
# *Appendix A*

## *PROJECT WATERS MASTERPLAN DEVELOPMENT ARCHITECTURAL PLANS*





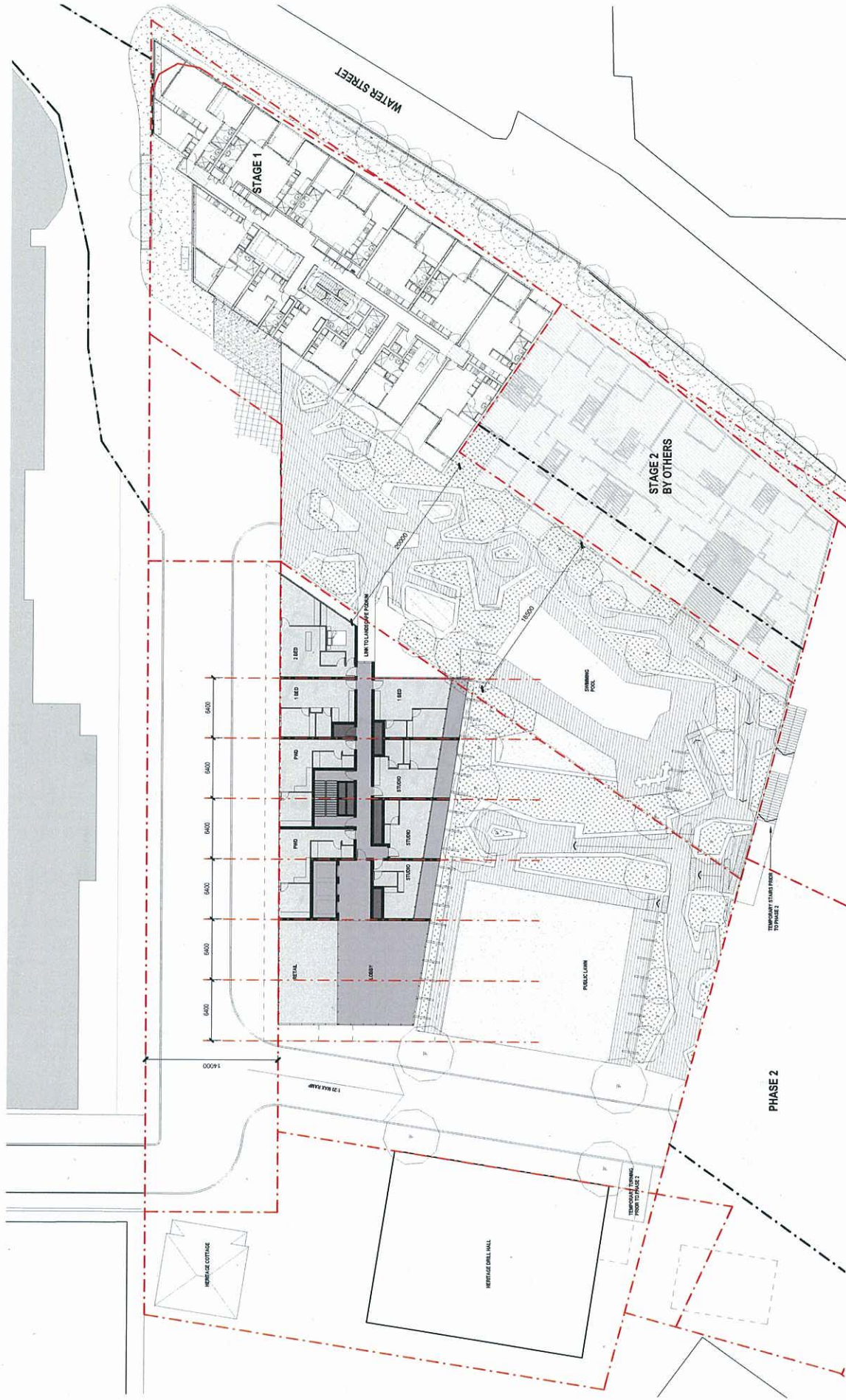
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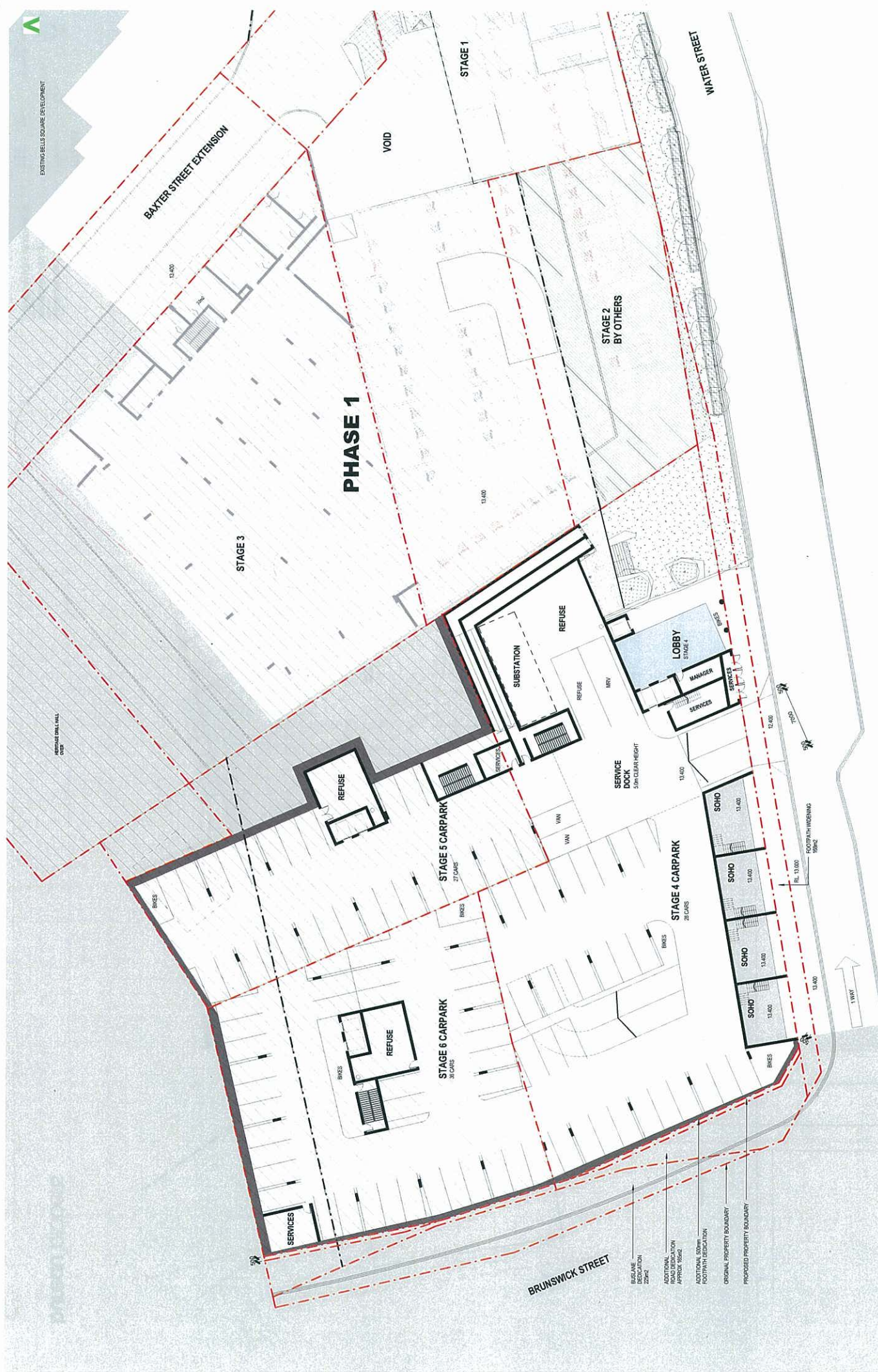


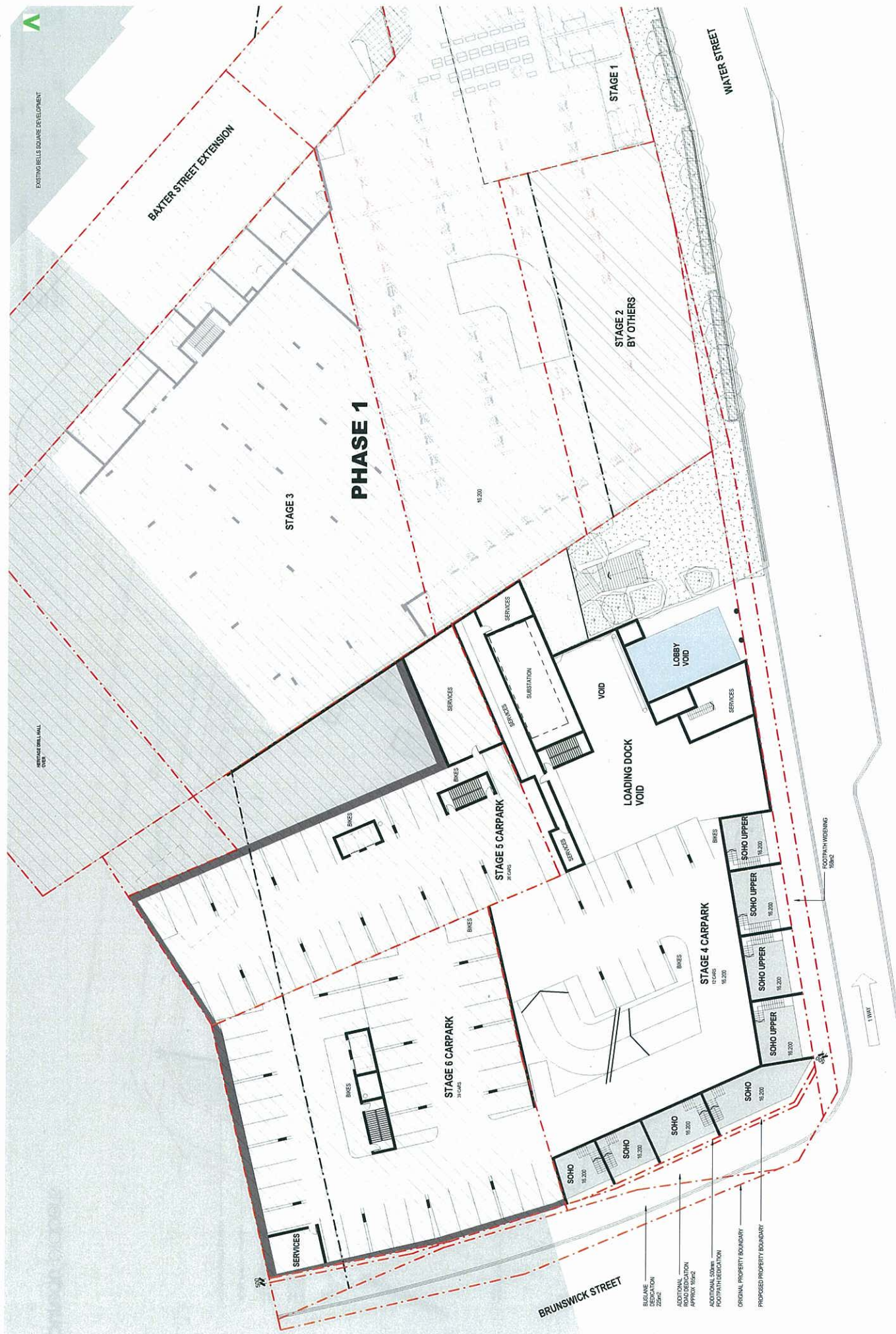
**PODIUM 2**

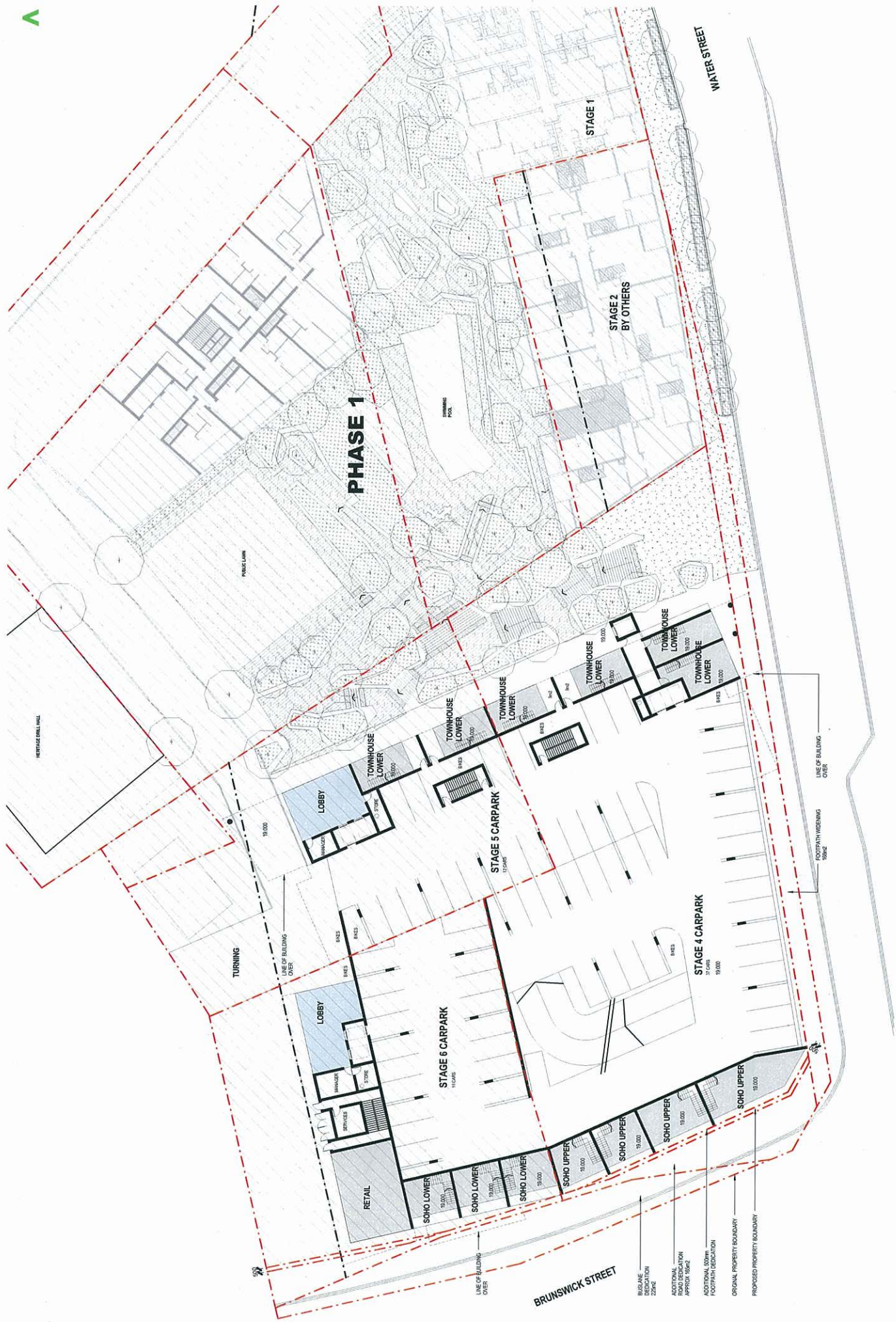
CLIENT: METRO PROPERTY DEVELOPMENT  
 PROJECT: WATERS - STAGE 3  
 ADDRESS: CORNER WATER & BRUNSWICK ST

SCALE: 1:200 (A1)  
 DATE: 14.11.12  
 PROJECTED: 11063  
 DRAWING NUMBER: 203  
 REVISION: 1







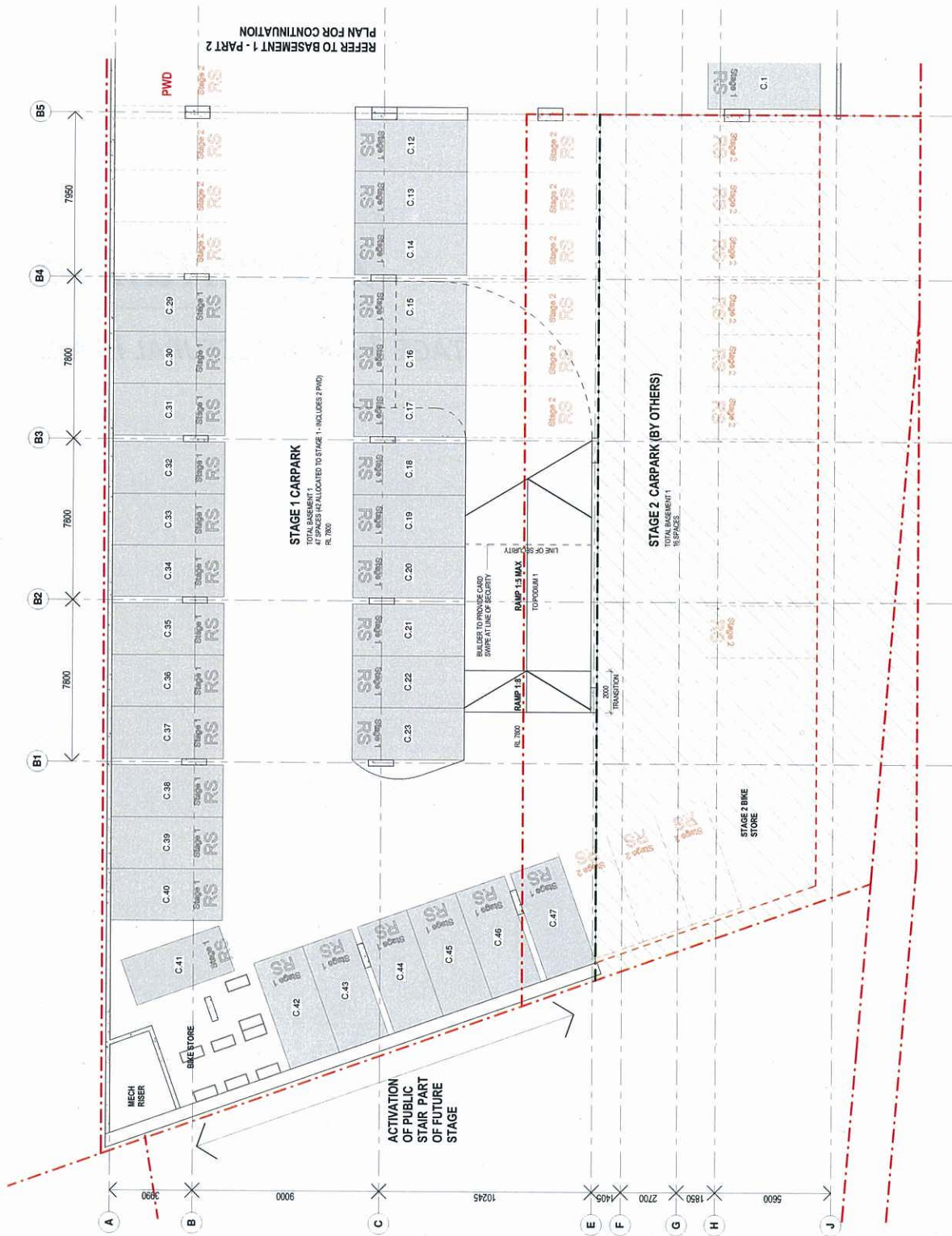






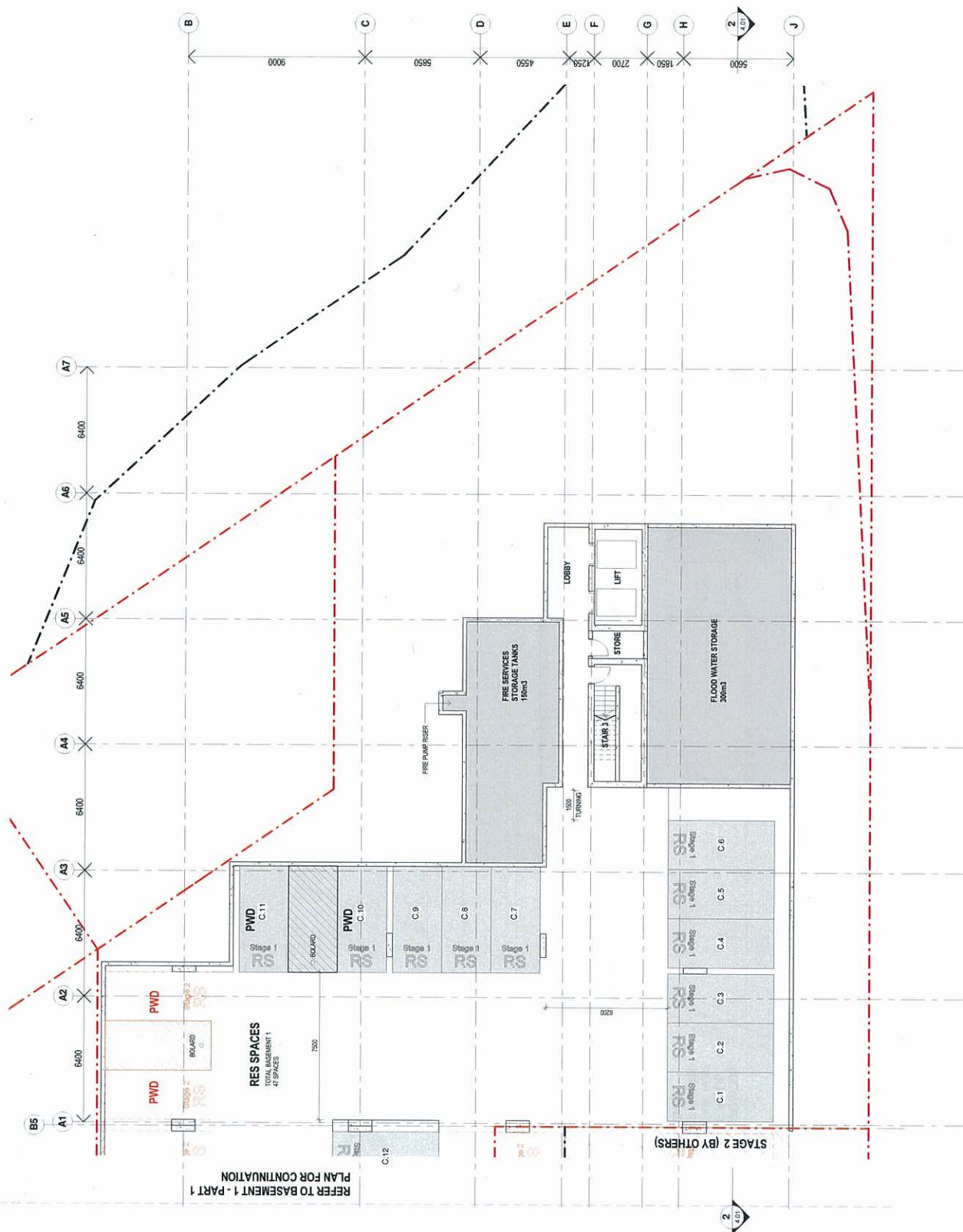
# *Appendix B*

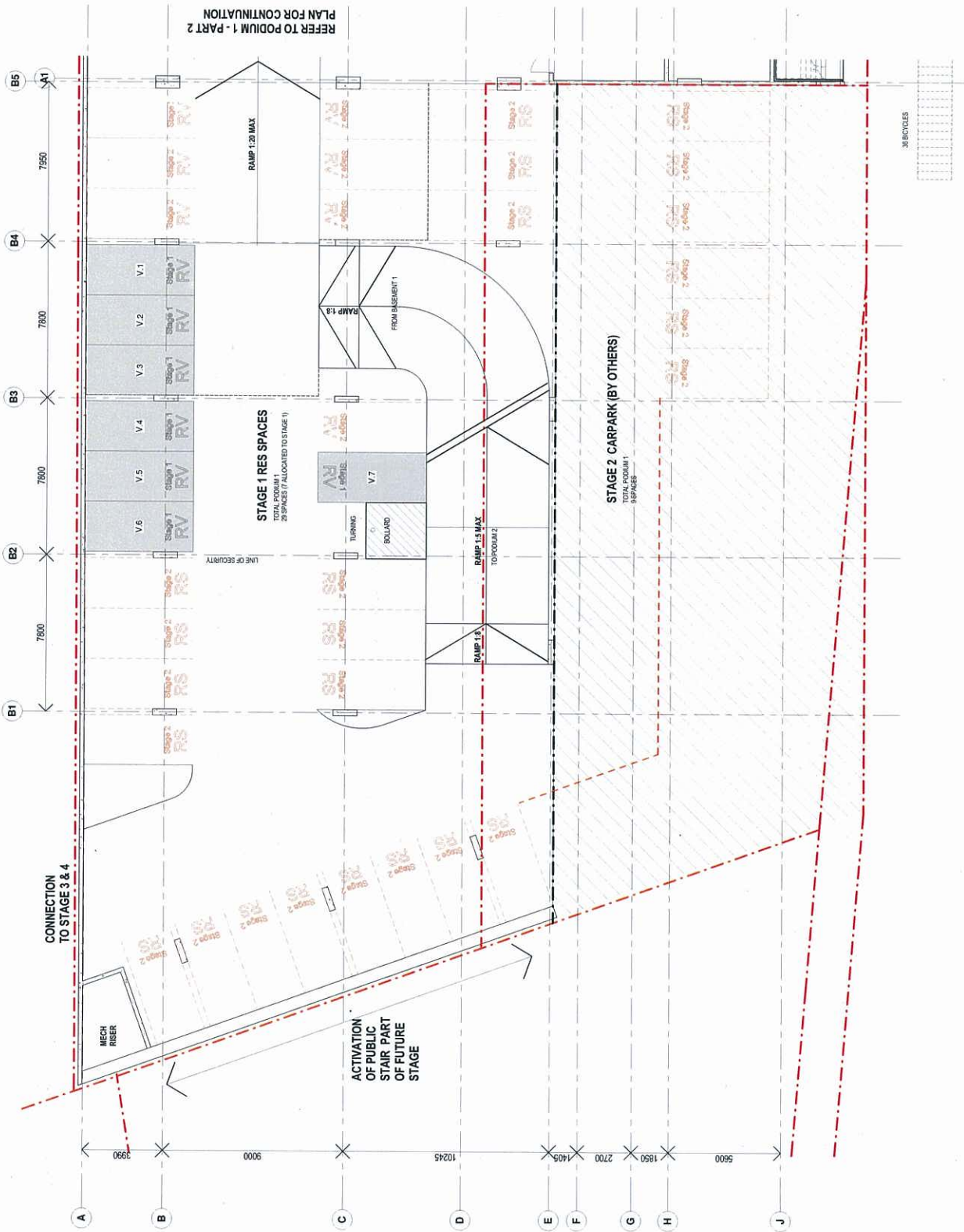
## *STAGE 1 ARCHITECTURAL PLANS*



| STAGE 1 - PARKING SUMMARY |             |         |       |  |
|---------------------------|-------------|---------|-------|--|
| Parking Type              | Size        | Code    | Total |  |
| Residential U/L           | 2500x5400mm | RS      | 18    |  |
| Visitor PWD               | 5000x5400mm | PWD     | 2     |  |
|                           |             |         |       |  |
| Podium 1 Visitor          | 2500x5400mm | RV      | 7     |  |
| Podium 2 Residential      | 2500x5400mm | RS      | 22    |  |
| Podium 3 Residential      | 2500x5400mm | RS      | 34    |  |
| Total                     |             |         | 105   |  |
|                           |             |         |       |  |
| Service                   | Size        | Code    | Total |  |
| Podium 1 Delivery         | 8500x5400mm | MPV/SRV | 2     |  |
| Service VAN               | 5400x3000mm | VAN     | 2     |  |
| Total                     |             |         | 4     |  |

REFER TO BASEMENT 1 - PART 2  
PLAN FOR CONTINUATION



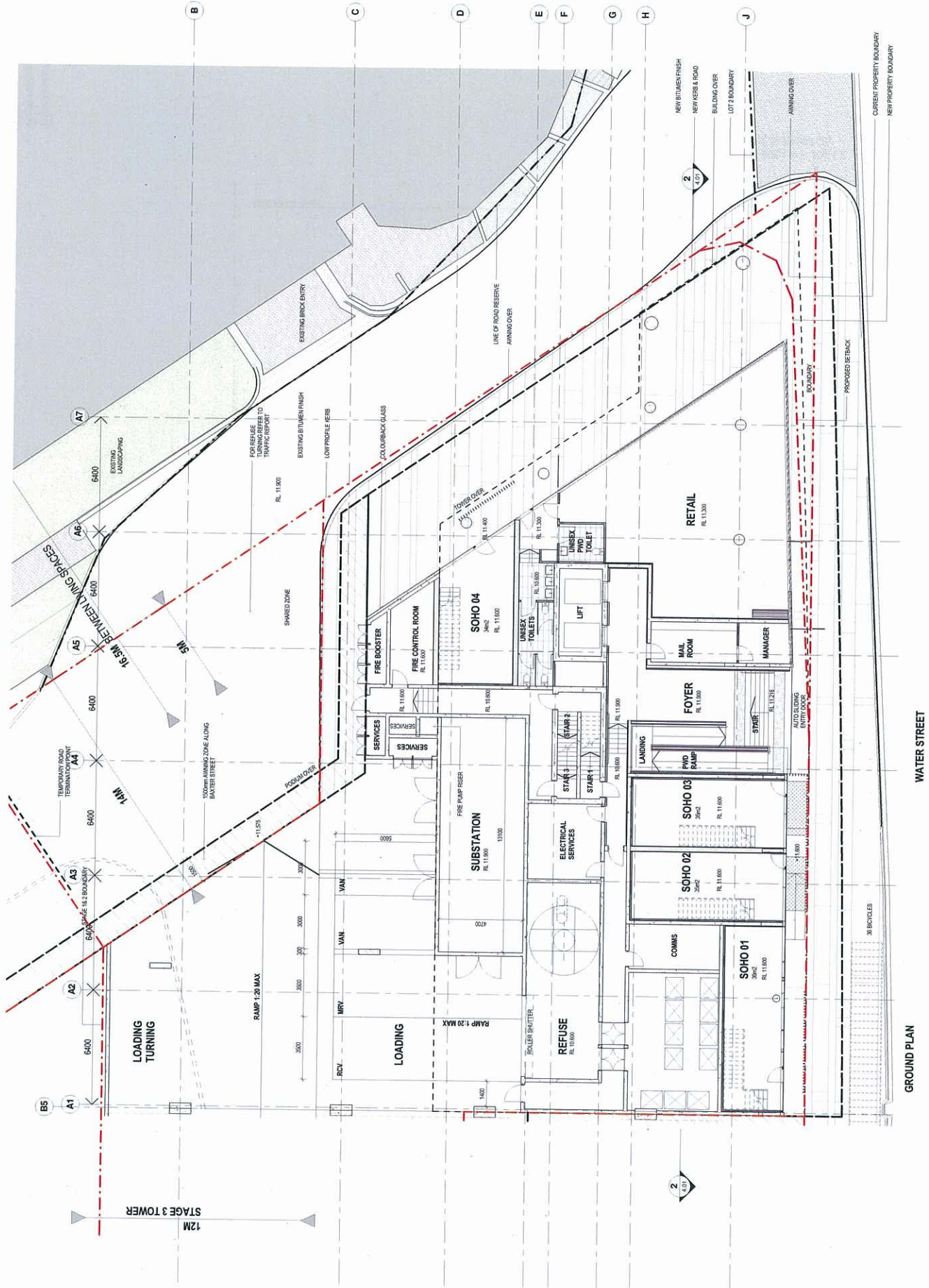


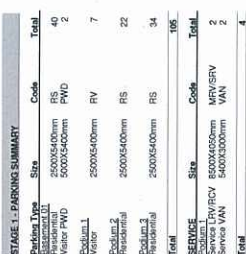
PLAN FOR CONTINUATION  
REFER TO PODIUM 1 - PART 2

| STAGE 1 - PARKING SUMMARY |              |        |       |
|---------------------------|--------------|--------|-------|
| Parking Type              | Size         | Code   | Total |
| Podium 1                  | 25000x5400mm | RS     | 40    |
| Visitor PWD               | 5000x5400mm  | PWD    | 2     |
| Podium 1                  | 25000x5400mm | RV     | 7     |
| Podium 2                  | 25000x5400mm | RS     | 22    |
| Podium 3                  | 25000x5400mm | RS     | 34    |
| Total                     |              |        | 105   |
| SERVICE                   |              |        |       |
| Podium 1                  | RV/PCV       | RV/PCV | 2     |
| Service VAN               | 5400x3000mm  | VAN    | 2     |
| Total                     |              |        | 4     |

| STAGE 1 - PAPERWORK SUMMARY |             |         |            |  |
|-----------------------------|-------------|---------|------------|--|
| Passing Type                | Size        | Code    | Total      |  |
| Receivers                   | 2500X5400mm | RS      | 40         |  |
| Vector PWD                  | 5000X5400mm | PWD     | 2          |  |
| Podium 1 Vector             | 2500X5400mm | RV      | 7          |  |
| Podium 3 Perispiral         | 2500X5400mm | RS      | 22         |  |
| Podium 3 Perispiral         | 2500X5400mm | RS      | 34         |  |
| Podium 3 Perispiral         | 2500X5400mm | RS      | 32         |  |
| <b>Total</b>                |             |         | <b>169</b> |  |
| Service                     | Size        | Code    | Total      |  |
| Service 15W/PCV             | 8000X950mm  | MSV SPV | 3          |  |
| Service Van                 | 5400X2000mm | VAN     | 2          |  |
| <b>Total</b>                |             |         | <b>5</b>   |  |

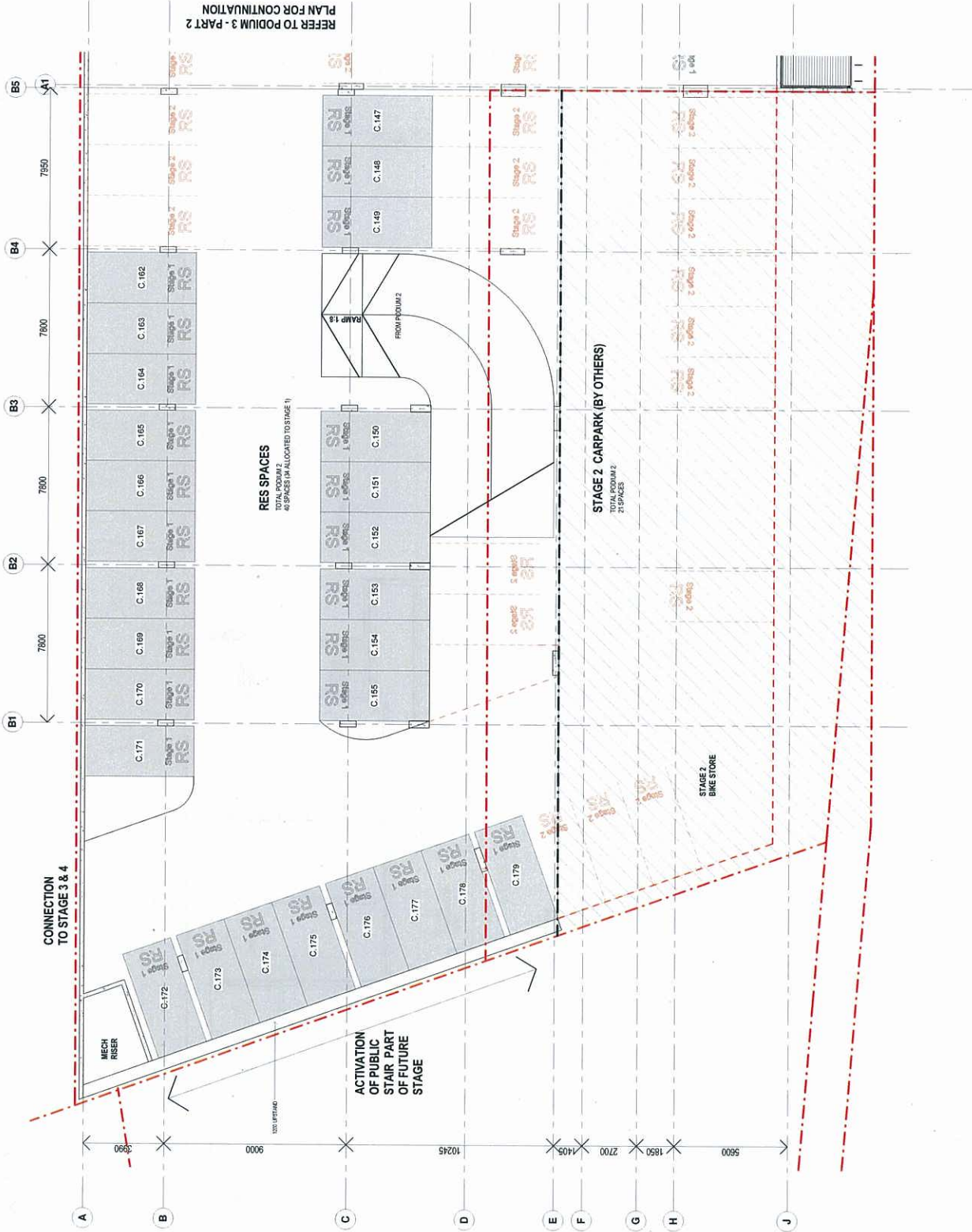
| SERVICE         | Size        | Code    | Total    |
|-----------------|-------------|---------|----------|
| Podium 1        |             |         |          |
| Service LRV/PCV | 8500X4050mm | MRV SRV | 2        |
| Service VAN     | 5400X3000mm | VAN     | 2        |
| <b>Total</b>    |             |         | <b>4</b> |







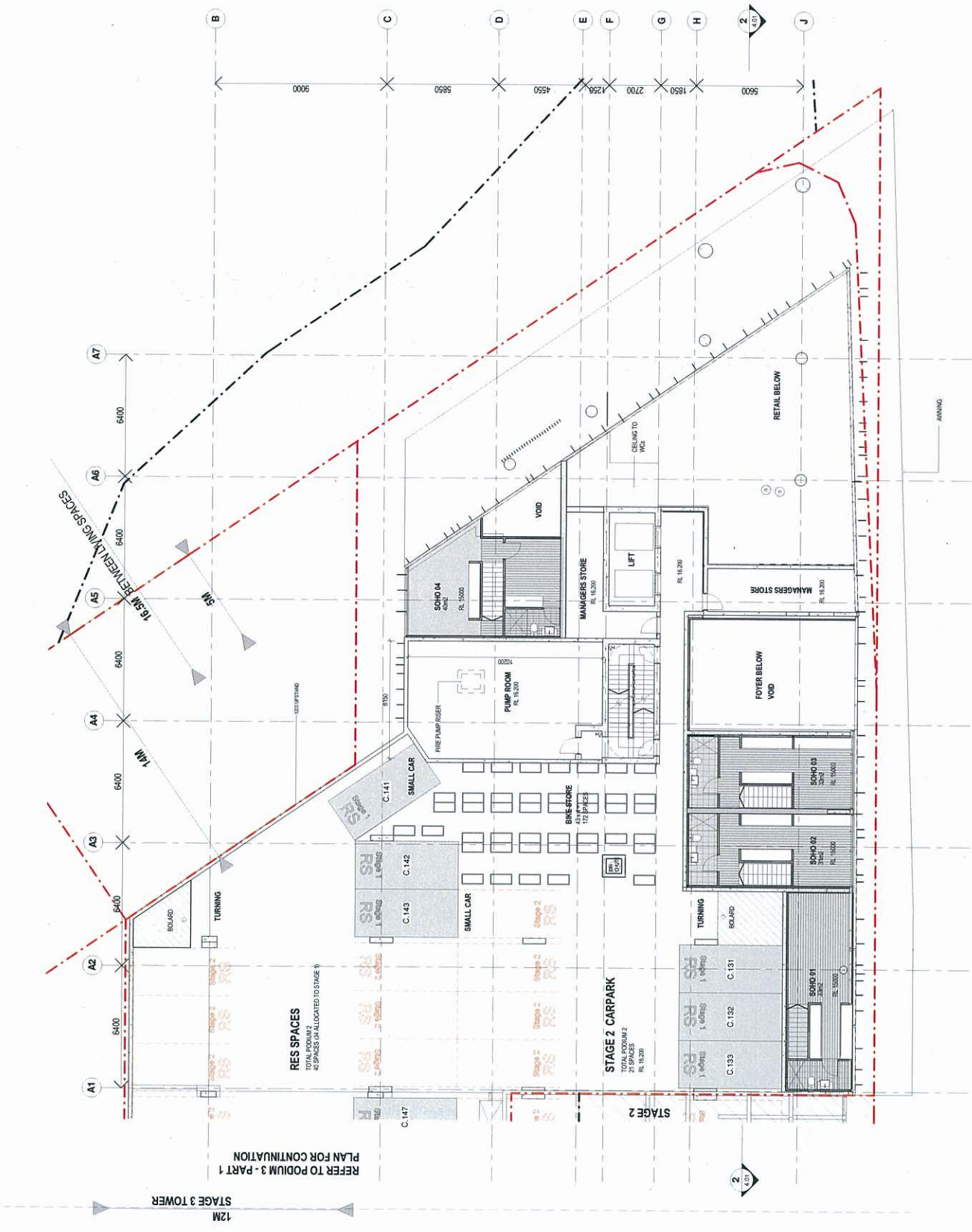
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PLAN FOR CONTINUATION  
REFER TO PODIUM 3 - PART 2

| STAGE 1 - PARKING SUMMARY |             |         |       |
|---------------------------|-------------|---------|-------|
| Parking Type              | Size        | Code    | Total |
| Residential               | 2500x5400mm | RS      | 40    |
| Visitor PWD               | 5000x5400mm | PWD     | 2     |
| Podium 1                  | 2500x5400mm | PV      | 7     |
| Podium 2                  | 2500x5400mm | RS      | 22    |
| Podium 3                  | 2500x5400mm | RS      | 34    |
| Total                     |             |         | 105   |
| STAGE 2 - PARKING SUMMARY |             |         |       |
| Parking Type              | Size        | Code    | Total |
| Service PWD               | 8000x5000mm | MPV/SPV | 2     |
| Service VAN               | 5400x3000mm | VAN     | 2     |
| Total                     |             |         | 4     |

| STAGE 1 - PARKING SUMMARY |             |      |            |  |
|---------------------------|-------------|------|------------|--|
| Parking Type              | Size        | Code | Total      |  |
| Podium 1                  | 2500x5400mm | RS   | 40         |  |
| Podium 2                  | 2500x5400mm | RV   | 7          |  |
| Podium 3                  | 2500x5400mm | RS   | 22         |  |
| Podium 4                  | 2500x5400mm | RS   | 34         |  |
| <b>Total</b>              |             |      | <b>103</b> |  |
| SERVICE                   |             |      |            |  |
| Podium 1                  | 2500x5400mm | RV   | 7          |  |
| Podium 2                  | 2500x5400mm | RS   | 22         |  |
| Podium 3                  | 2500x5400mm | RS   | 34         |  |
| <b>Total</b>              |             |      | <b>63</b>  |  |



# *Appendix C*

*BCC CONCEPT ROADWORKS DESIGN – BRUNSWICK  
STREET (DWG. RPN677)*



CONCEPT PLAN  
FOR COMMENTS ONLY

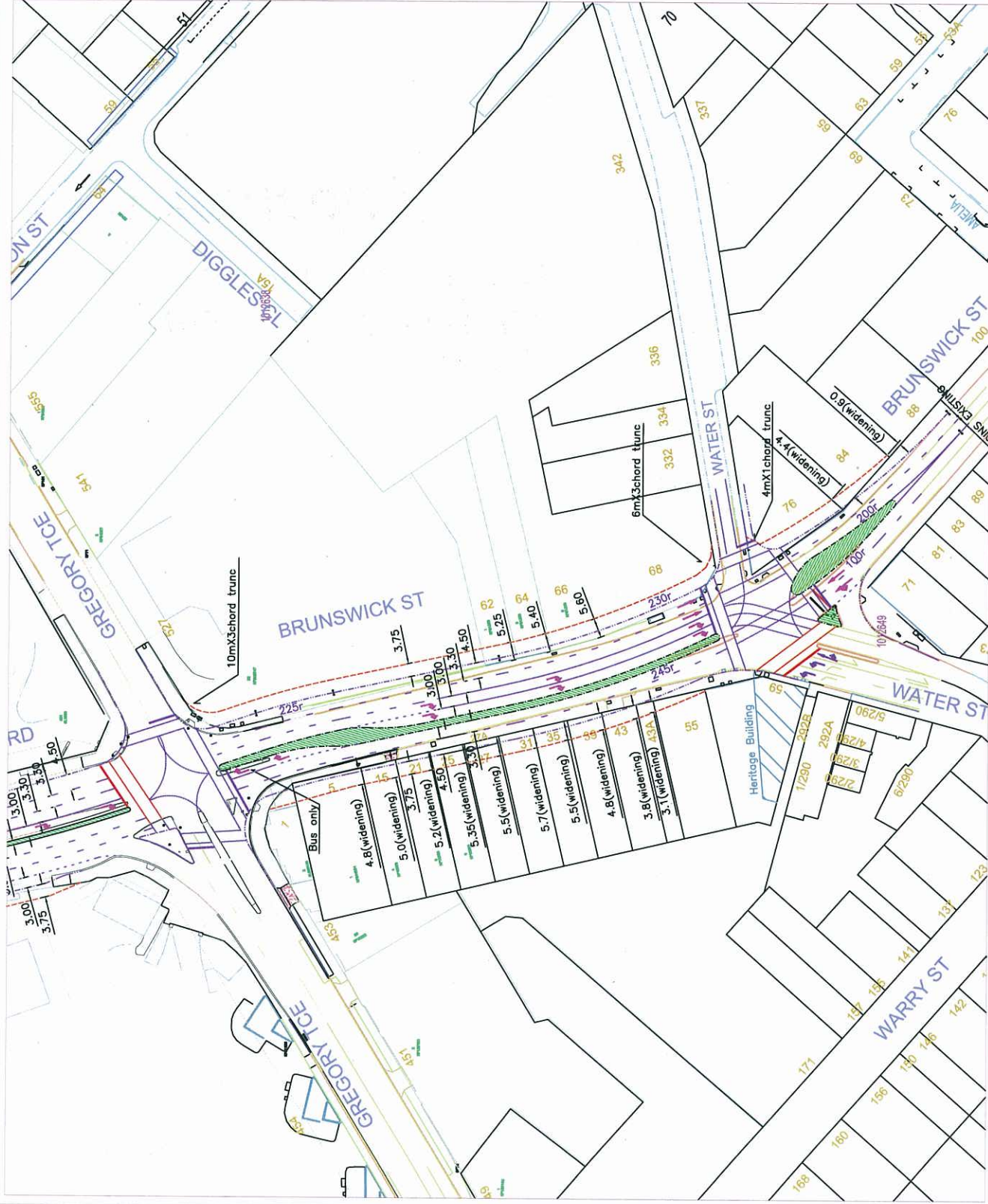
REDUCED COPY  
HALF SIZE

#### NOTE

THE REAL PROPERTY BOUNDARIES SHOWN ON THIS CONCEPT PLAN ARE INDICATIVE ONLY. EXTREME CARE SHOULD BE EXERCISED IN THE USE OF THIS INFORMATION. VARIATIONS IN CONCEPT TO BE APPROVED BY BCC TRANSPORT & TRAFFIC BRANCH (NETWORK INFORMATION). FINAL DESIGN PLANS MUST INDICATE THE LOCATION OF THE ACTUAL BOUNDARIES ON BOTH SIDES OF THE ROAD RESERVE, AFTER THEY HAVE BEEN IDENTIFIED BY A LICENSED SURVEYOR.

#### LEGEND

- EXISTING PROPERTY BOUNDARY
- KERB AND CHANNEL
- KERB ONLY
- PROPOSED PROPERTY REQUIREMENT



BRISBANE CITY COUNCIL - BRISBANE INFRASTRUCTURE

CONCEPT DESIGN

PROPOSED ROADWORKS

BRUNSWICK ST - FORTITUDE VALLEY



|          |            |
|----------|------------|
| DESIGNED | FILE NO.   |
| DRAWN    | SURVEY NO. |
| CHECKED  | APPROVED   |

|                                               |                                  |
|-----------------------------------------------|----------------------------------|
| DIVISIONAL MANAGER<br>BRISBANE INFRASTRUCTURE | MANAGER<br>TRANSPORT AND TRAFFIC |
|-----------------------------------------------|----------------------------------|

|                                             |              |
|---------------------------------------------|--------------|
| CAD REF: 6\PROJECTS\DRAWINGS\brwns-warrldwg | FULL SIZE A1 |
|---------------------------------------------|--------------|

| ISSUE            | DATE | BY | APP'D | DATE |
|------------------|------|----|-------|------|
| A Original Issue |      |    |       |      |

NO. 1 IN SET OF 1

RPN677

A

# *Appendix D*

*PARKING SUPPLY ANALYSIS LETTER  
(TTM REF. '27703LET130116')*

16 January 2013

Our Ref: 27703let130116  
Your Ref:

**Attention: Stephan Buhmann**

Metro Property Developments Pty Ltd  
C/- Brannock and Associates  
Level 16, Matisse Tower  
110 Mary Street  
BRISBANE QLD 4001

Dear Stephen,

**RE: Project Waters**

**332 - 342 Water Street, Fortitude Valley  
Parking Supply Analysis**

## 1. Introduction

The purpose of this letter is to justify the parking supply for resident and visitor parking provided for the proposed Project Waters development in Fortitude Valley. The justification is based in surveys conducted by TTM to determine parking demands associated with similar developments.

The proposed development consists of four residential towers, split between at total of 6 stages. A copy of the development master plan schedule by stage, including parking supply, is provided as an attachment to this letter. Table 1.1 summarises the key characteristics of the development yield and parking supply.

**Table 1.1: Summary of Development Yield and Parking Supply**

| Development Land Use    | Size / Quantity        | Parking Supply Rate                | Proposed Parking Provision |
|-------------------------|------------------------|------------------------------------|----------------------------|
| Residential Units       | 1011 units (total)     |                                    |                            |
| • 1 Bedroom (inc. SOHO) | 699 units              | 0.4 spaces / unit                  | 280 spaces                 |
| • 2 Bedroom             | 312 units              | 1.0 space / unit                   | 313 spaces                 |
| • Visitors              | 1011 units             | 1.0 space / 20 units               | 51 units                   |
| Retail                  | ~500m <sup>2</sup> GFA | 1.0 space / 50m <sup>2</sup> (max) | 0 spaces                   |
| <b>TOTAL</b>            |                        |                                    | <b>644 spaces</b>          |

The resident parking supply for the proposed development equates to 0.59 spaces / unit or conversely 0.45 spaces / bedroom.

## TTM Consulting Pty Ltd

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Melbourne | Sydney | Adelaide

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Coorparoo BC, QLD 4151

1/129 Logan Road  
Woolloongabba, QLD 4102

t (07) 3327 9500

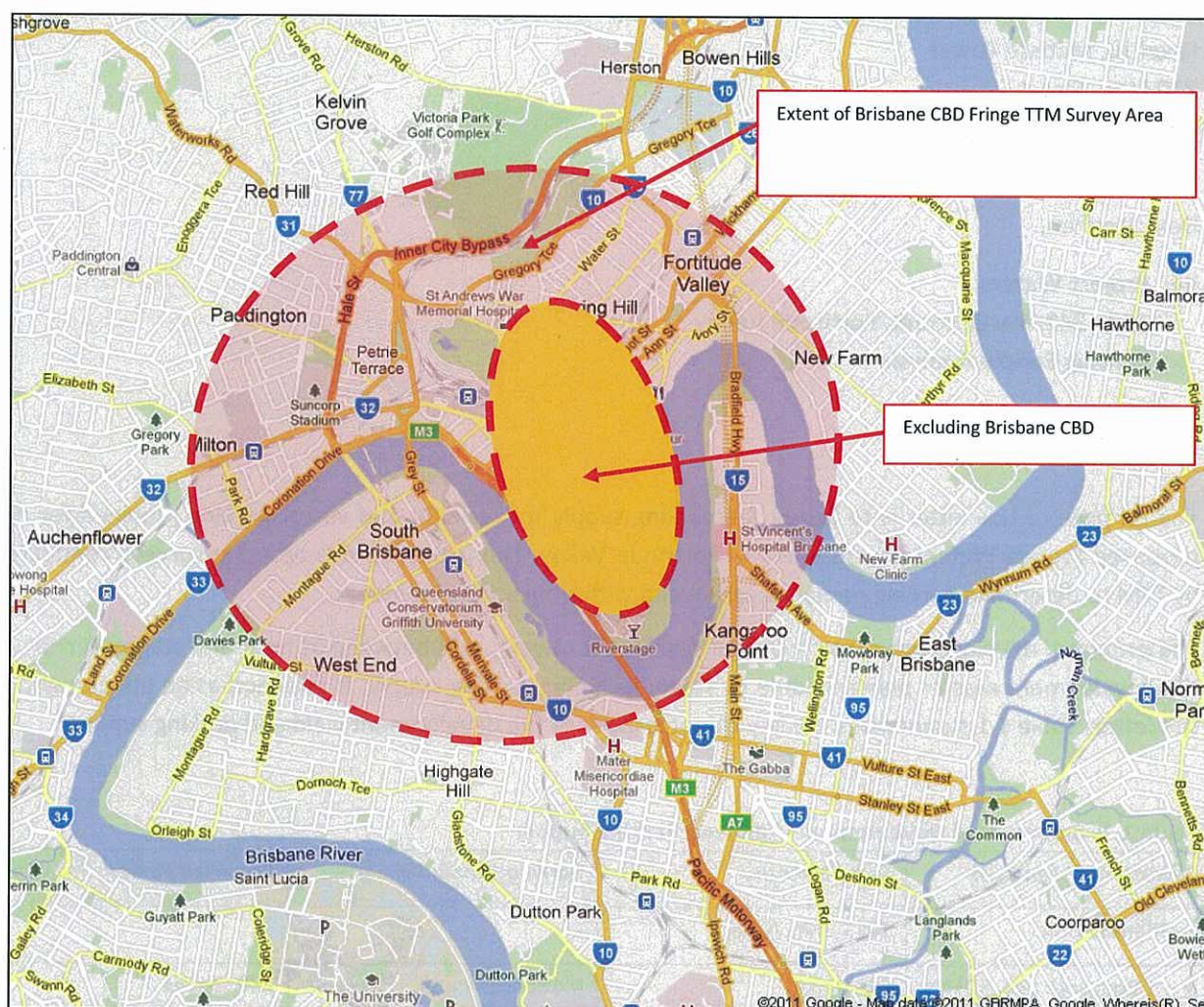
f (07) 3327 9501

ttmbris@ttmgroup.com.au  
www.ttmgroup.com.au

## 2. Parking Demand Surveys

### 2.1 Methodology & Site Details

TTM have surveyed the parking demands at nine (9) high density residential developments within the Brisbane CBD fringe, located in relatively close proximity to public transport. The catchment area considered relevant to the study is shown in Figure 2.1.



**Figure 2.1: Extent of TTM Survey Area - Brisbane CBD Fringe**

The surveys were conducted over a two week period. TTM visited each of the nominated sites after 8pm and recorded the number of vehicles (residential and visitor) parked on site. The count was undertaken each weeknight and twice on weekends (AM and PM count), with the exception of Thursday evening.

The details of each residential development is summarised in Table 2.1.

**Table 2.1: Surveyed Site Details**

| Site | Address                    | Total Car Parks (res) | No of units | 1-bed | 2-bed | 3-bed |
|------|----------------------------|-----------------------|-------------|-------|-------|-------|
| 1    | Oxygen Apartments, Spring  | 147                   | 111         | 0     | 100   | 11    |
| 2    | Trilogy Apartments, Spring | 132                   | 121         | 50    | 71    | 0     |
| 3    | Universal, South Brisbane  | 95                    | 69          | 0     | 69    | 0     |
| 4    | Manning St, West End       | 97                    | 83          | 8     | 70    | 5     |
| 5    | The Village at West End    | 83                    | 68          | 10    | 52    | 6     |
| 6    | The Parc, Brisbane         | 126                   | 93          | 9     | 84    | 0     |
| 7    | The Vue, Brisbane          | 239                   | 185         | 1     | 132   | 52    |
| 8    | Elysees, Milton            | 46                    | 34          | 4     | 10    | 20    |
| 9    | The Edge, Milton           | 85                    | 72          | -     | -     | -     |

Unit size composition for values shown in red is assumed/approximate values based on preliminary research

Whilst the surveys were conducted on sites of similar characteristics with respect to location, it is noted that there are a few developments currently occupied that have as high a proportion of one (1) bedroom apartments as that proposed for Metro Property Developments. The developments surveyed have a high proportion of two (2) or three (3) bedroom units, therefore the analysis of the results includes a parking demand rate per bedroom.

## 2.2 Survey Results

The results of the parking demand surveys are presented on a "per unit" and "per bedroom" basis in Tables 2.2 and 2.3, respectively. It should be noted that the data provided is based on the 85th percentile parking demands, which is the standard design criteria adopted by the traffic engineering industry.

The survey data which forms the basis of the analysis is also attached to this letter.

**Table 2.2: Surveyed Parking Demands (Per Unit)**

| Site | Address                         | Total Car Parks (res) | No of units | Provision rate | Site Average Demand | Surveyed average demand per unit | 85th percentile | Overall 85th Percentile Demand |
|------|---------------------------------|-----------------------|-------------|----------------|---------------------|----------------------------------|-----------------|--------------------------------|
| 1    | Oxygen Apartments, Spring Hill  | 147                   | 111         | 1.32           | 73                  | 0.66                             | 0.68            | 0.77                           |
| 2    | Trilogy Apartments, Spring Hill | 132                   | 121         | 1.09           | 63                  | 0.52                             | 0.55            |                                |
| 3    | Universal, South Brisbane       | 95                    | 69          | 1.37           | 53                  | 0.76                             | 0.80            |                                |
| 4    | Manning St, West End            | 97                    | 83          | 1.17           | 59                  | 0.71                             | 0.79            |                                |
| 5    | The Village at West End         | 83                    | 68          | 1.22           | 52                  | 0.76                             | 0.79            |                                |
| 6    | The Parc, Brisbane              | 126                   | 93          | 1.35           | 48                  | 0.51                             | 0.52            |                                |
| 7    | The Vue, Brisbane               | 239                   | 185         | 1.3            | 121                 | 0.65                             | 0.68            |                                |
| 8    | Elysees, Milton                 | 46                    | 34          | 1.35           | 18                  | 0.54                             | 0.59            |                                |
| 9    | The Edge, Milton                | 85                    | 72          | 1.18           | 47                  | 0.65                             | 0.65            |                                |
|      |                                 | Total Units           | 764         |                |                     |                                  |                 |                                |

**Table 2.3: Surveyed Parking Demands (Per Bedroom)**

| Site | Address                         | Total Car Parks (res) | No of B'rooms | Provision rate | Site Average Demand | Surveyed average demand per bed | 85th percentile | Overall 85th Percentile Demand |
|------|---------------------------------|-----------------------|---------------|----------------|---------------------|---------------------------------|-----------------|--------------------------------|
| 1    | Oxygen Apartments, Spring Hill  | 147                   | 222           | 0.66           | 73                  | 0.33                            | 0.34            | 0.39                           |
| 2    | Trilogy Apartments, Spring Hill | 132                   | 192           | 0.69           | 63                  | 0.33                            | 0.34            |                                |
| 3    | Universal, South Brisbane       | 95                    | 138           | 0.69           | 53                  | 0.38                            | 0.40            |                                |
| 4    | Manning St, West End            | 97                    | 163           | 0.60           | 59                  | 0.36                            | 0.40            |                                |
| 5    | The Village at West End         | 83                    | 132           | 0.63           | 52                  | 0.39                            | 0.41            |                                |
| 6    | The Parc, Brisbane              | 126                   | 177           | 0.71           | 48                  | 0.27                            | 0.27            |                                |
| 7    | The Vue, Brisbane               | 239                   | 421           | 0.57           | 121                 | 0.29                            | 0.30            |                                |
| 8    | Elysees, Milton                 | 46                    | 84            | 0.55           | 18                  | 0.22                            | 0.24            |                                |
| 9    | The Edge, Milton                | 85                    | 137           | 0.62           | 47                  | 0.34                            | 0.34            |                                |
|      |                                 | Total Units           | 1529          |                |                     |                                 |                 |                                |

The key findings from the parking demand surveys and subsequent analysis of the data are summarised as follows:

- The data analysis clearly demonstrates that despite a parking provision of at least one (1) space per unit, the demands surveyed were 0.77 spaces per unit,
- The parking demand rate of 0.77 spaces per unit is based on a unit mix of 10% one (1) bedroom units / 80% two (2) bedroom units / 10% three (3) bedroom units, which significantly increases the potential resident population compared to the unit mix proposed by Metro Property Development for the subject site which relates to 70% one (1) bedroom / 30% two (2) bedroom.
- The data analysis indicates that the parking demand rate per bedroom, which essentially compensates for disproportionate unit mixes, is 0.39 spaces per bedroom

The only complex surveyed with a relatively high proportion of one (1) bedroom units (41%) was the Trilogy complex in Spring Hill. The surveyed peak parking demand for this complex was 0.55 spaces per unit and 0.34 spaces per bedroom.

### 3. Conclusion

The proposed development parking provision of 0.45 spaces per bedroom, exceeds the surveyed parking rate of 0.39 spaces per bedroom. The parking supply proposed is also consistent with the demands per unit surveyed for the Trilogy development at Spring Hill which has a relatively high proportion of one (1) bedroom units.

On the basis of the survey results, it is concluded that the proposed parking supply is adequate to accommodate the resident parking demands associated with the proposed development.

If you have any queries in relation to the information provided in this letter, contact Brian Camilleri on (07) 3327 9500.

Yours faithfully,



Brian Camilleri  
Principal Director  
**TTM Consulting Pty Ltd**

**Attachments**

- Project Waters Master Plan Schedule
- TTM CBD Fringe Residential Development Parking Survey Data

12027 Water Street Materplan  
Development Summary  
12.12.12

bureau\proberts

| SUMMARY   |            |       |      |               |       |      |               |      |        |                     |      |  |  |
|-----------|------------|-------|------|---------------|-------|------|---------------|------|--------|---------------------|------|--|--|
|           | APARTMENTS |       |      | CARS REQUIRED |       |      | CARS PROVIDED |      |        | OVERRUN / SHORTFALL |      |  |  |
|           | 1 BED      | 2 BED | SOHO | 1 BED         | 2 BED | SOHO | VISITORS      |      |        |                     |      |  |  |
| Phase 1   |            |       |      |               |       |      |               |      |        |                     |      |  |  |
| Stage 1   | 118        | 44    | 4    | 166           | 47.2  | 44   | 1.6           | 8.3  | 101.1  | 105                 | 3.9  |  |  |
| Stage 2   | 113        | 45    | 2    | 160           | 45.2  | 45   | 0.8           | 8    | 99     | 100                 | 1    |  |  |
| Stage 3   | 135        | 65    | 0    | 200           | 54    | 65   | 0             | 10   | 129    | 126                 | -3   |  |  |
|           |            |       |      |               |       |      |               |      |        |                     |      |  |  |
| SUB TOTAL | 366        | 154   | 6    | 526           |       |      |               |      | 329.1  | 331                 | 1.9  |  |  |
| Phase 2   |            |       |      |               |       |      |               |      |        |                     |      |  |  |
| Stage 4   | 100        | 48    | 8    | 156           | 40    | 48   | 3.2           | 7.8  | 99     | 100                 | 1    |  |  |
| Stage 5   | 110        | 54    | 0    | 164           | 44    | 54   | 0             | 8.2  | 106.2  | 106                 | -0.2 |  |  |
| Stage 6   | 108        | 54    | 3    | 165           | 43.2  | 54   | 1.2           | 8.25 | 106.65 | 107                 | 0.35 |  |  |
|           |            |       |      |               |       |      |               |      |        |                     |      |  |  |
|           |            |       |      |               |       |      |               |      |        |                     |      |  |  |
| SUB TOTAL | 318        | 156   | 11   | 485           |       |      |               |      | 311.85 | 313                 | 1.15 |  |  |
|           |            |       |      |               |       |      |               |      |        |                     |      |  |  |
| TOTAL     | 684        | 310   | 17   | 1011          |       |      |               |      | 640.95 | 644                 | 3.05 |  |  |

Attachment

RESIDENTS PARKING DEMAND (VEHICLES/UNIT) - SUMMARY TABLE

| Site | Address                         | Total no of units | Week 1 |         |           |        | Week 2 |         |           |        | Site Average | Site 85th percentile |
|------|---------------------------------|-------------------|--------|---------|-----------|--------|--------|---------|-----------|--------|--------------|----------------------|
|      |                                 |                   | Monday | Tuesday | Wednesday | Friday | Monday | Tuesday | Wednesday | Friday |              |                      |
| 1    | Oxygen Apartments, Spring Hill  | 111               | 0.64   | 0.66    | 0.68      | 0.63   | 0.68   | 0.62    | 0.70      | 0.66   | 0.66         | 0.68                 |
| 2    | Trilogy Apartments, Spring Hill | 121               | 0.53   | 0.50    | 0.53      | 0.46   | 0.55   | 0.55    | 0.54      | 0.55   | 0.52         | 0.55                 |
| 3    | Universal, South Brisbane       | 69                | 0.78   | 0.78    | 0.80      | 0.68   | 0.75   | 0.77    | 0.81      | 0.71   | 0.76         | 0.80                 |
| 4    | Manning St, West End            | 83                | 0.92   | 0.57    | 0.64      | 0.69   | 0.66   | 0.63    | 0.78      | 0.80   | 0.71         | 0.79                 |
| 5    | The Village at West End         | 68                | 0.78   | 0.74    | 0.81      | -      | 0.78   | -       | 0.76      | 0.69   | 0.76         | 0.79                 |
| 6    | The Parc, Brisbane              | 93                | 0.59   | 0.52    | 0.47      | 0.48   | 0.52   | 0.52    | 0.49      | 0.51   | 0.51         | 0.52                 |
| 7    | The Vue, Brisbane               | 185               | 0.62   | 0.65    | 0.61      | 0.68   | 0.68   | 0.64    | 0.68      | 0.67   | 0.65         | 0.68                 |
| 8    | Elysees, Milton                 | 34                | 0.56   | 0.53    | 0.47      | 0.56   | 0.59   | 0.59    | 0.41      | 0.59   | 0.54         | 0.59                 |
| 9    | The Edge, Milton                | 72                | 0.65   | -       | -         | 0.65   | 0.65   | -       | -         | -      | 0.65         | 0.65                 |

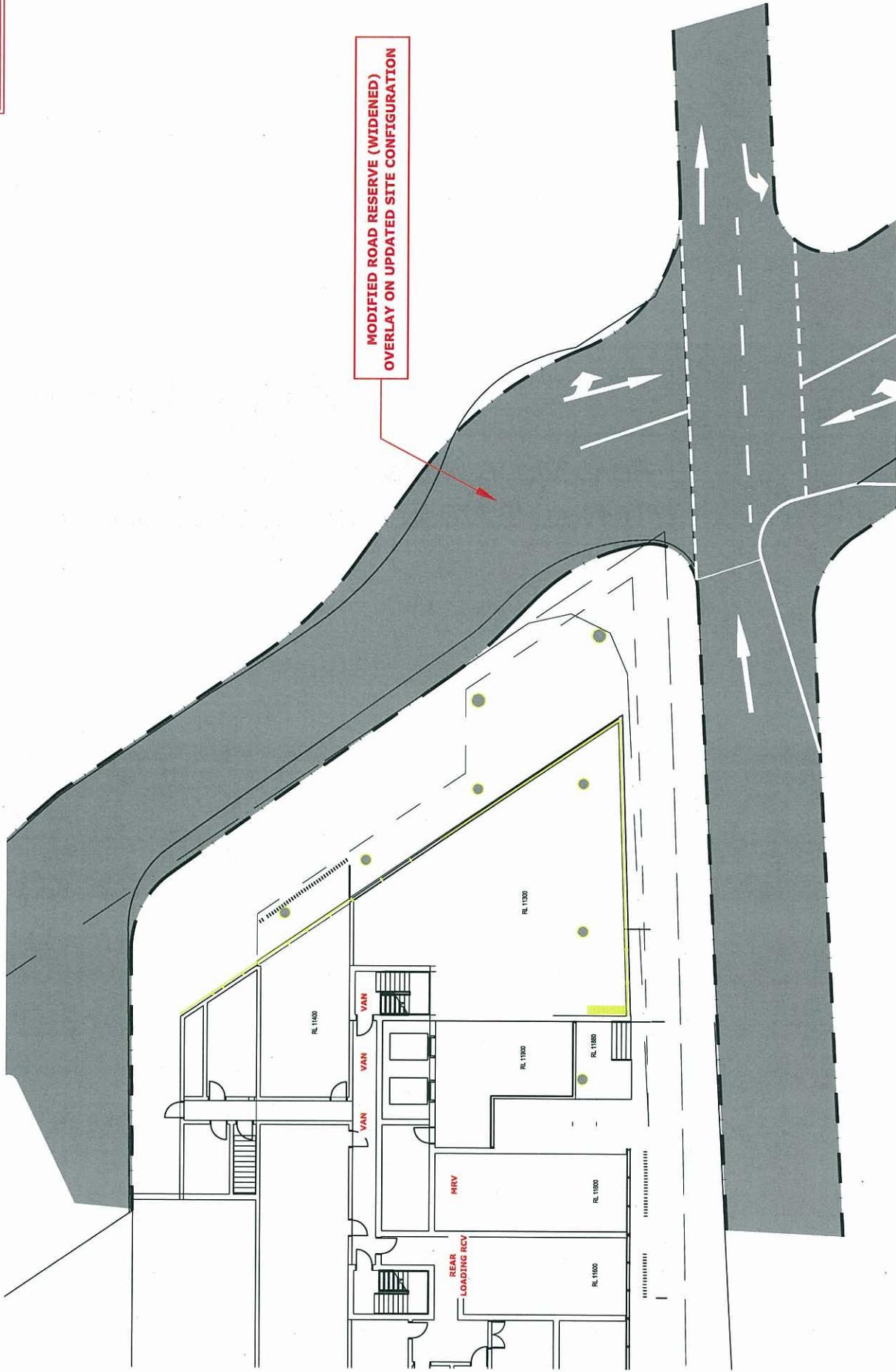
85th percentile overall (All Sites) = 0.77

RESIDENT PARKING DEMAND - RAW SURVEY/COUNT DATA

| Site | Address                         | Total no of units | Week 1 |         |           |        | Site Weekly Average | Week 2 |         |           |        | Site Weekly Average |
|------|---------------------------------|-------------------|--------|---------|-----------|--------|---------------------|--------|---------|-----------|--------|---------------------|
|      |                                 |                   | Monday | Tuesday | Wednesday | Friday |                     | Monday | Tuesday | Wednesday | Friday |                     |
| 1    | Oxygen Apartments, Spring Hill  | 111               | 71     | 73      | 76        | 70     | 73                  | 76     | 69      | 78        | 73     | 74                  |
| 2    | Trilogy Apartments, Spring Hill | 121               | 64     | 60      | 64        | 56     | 61                  | 66     | 66      | 65        | 66     | 66                  |
| 3    | Universal, South Brisbane       | 69                | 54     | 54      | 55        | 47     | 53                  | 52     | 53      | 56        | 49     | 53                  |
| 4    | Manning St, West End            | 83                | 76     | 47      | 53        | 57     | 58                  | 55     | 52      | 65        | 66     | 60                  |
| 5    | The Village at West End         | 68                | 53     | 50      | 55        | -      | 53                  | 53     | -       | 52        | 47     | 51                  |
| 6    | The Parc, Brisbane              | 93                | 55     | 48      | 44        | 45     | 48                  | 48     | 48      | 46        | 47     | 47                  |
| 7    | The Vue, Brisbane               | 185               | 115    | 121     | 113       | 126    | 119                 | 126    | 119     | 125       | 124    | 124                 |
| 8    | Elysees, Milton                 | 34                | 19     | 18      | 16        | 19     | 18                  | 20     | 20      | 14        | 20     | 19                  |
| 9    | The Edge, Milton                | 72                | 47     | -       | -         | 47     | 47                  | 47     | -       | -         | -      | 47                  |

# *Appendix E*

## *"BAXTER STREET EXTENSION" ROAD DESIGN*



27703-SK21

SCALE : 1:200 @ A3



**MODIFIED ROAD RESERVE OVERLAY**  
PROJECT WATERS

DRAWN: BW  
APPROVED: BC  
DATE: 11/07/12

# *Appendix F*

*ROAD MODELLING & IMPACTS ANALYSIS LETTER  
(TTM REF. '27703LET\_TRAFFIC MODEL UPDATE')*

**20 June 2012**

Our Ref: 27703

Your Ref:



**Attention: Stephen Buhmann**

**Metro Property Developments Pty Ltd  
C/- Brannock and Associates  
Level 16, Matisse Tower  
110 Mary Street  
Brisbane QLD 4001**

Dear Stephen,

**RE: Project Waters, 332-342 Water Street, Fortitude Valley  
Updated Road Network Traffic Volumes**

TTM Consulting has been engaged by Metro Property Development Pty Ltd to undertake traffic assessments for the proposed Project Waters development at 332-342 Water Street, Fortitude Valley. This letter outlines the expected changes in traffic volumes on the local roads surrounding the development site as a result of the updated development scheme and alterations to the internal road/access layouts. These proposed alterations were detailed in the revised Project Waters Master Plan + Stage 1 & 2 Preliminary Development Approval Traffic Engineering report prepared by TTM on 24<sup>th</sup> May 2012 (TTM Report: 27703Trep3).

Prior to undertaking this development application, TTM was engaged by the Urban Land Development Authority (ULDA) to prepare a traffic model of the wider Bowen Hills Urban Development Area (UDA) to estimate future traffic volumes and road upgrades required. The traffic generated by the Project Waters site (Precinct 4: Water Street Precinct of the Bowen Hills UDA) was originally determined in the Bowen Hills Model by applying generation rates to the site based on the assumed land use and maximum plot ratios. The original generation rate adopted for the Project Waters site in the original Bowen Hills Model was derived as being 174vph in the AM/PM weekday peak hours. As outlined in the TTM report, the revised Project Waters development is expected to generate between 154 – 244 vph during the weekday AM/PM peak hour periods. It can therefore be seen that there is only a slight difference in the traffic generation assumptions made for the original Bowen Hills model compared to what is actually expected from the Project Waters site.

The effects that this slight traffic generation increase will have with respect to the peak hour volumes on the roads surrounding the Project Waters site was therefore determined by comparing the outputs of the original Bowen Hills UDA model with the outputs of an updated model assuming a traffic generation rate of 244vph from Precinct 4. This traffic generation value represents the upper limit of the expected range for the Project Waters site to give a conservative estimate of traffic volume increases on the surrounding roads.

It should be noted that the original Bowen Hills Model assumed there was a "New Road" linking from Diggles Close through to Water Street (midblock between Brunswick Street and Baxter Street). The revised development master plan, however, shows this link is planned to connect to the existing Baxter Street / Water Street "T" intersection (named the "Baxter Street Extension"). As such, it is expected that there will be slight changes to traffic volumes on the surround roads as a result of the changed network and redistribution of trips. This fact should be considered when comparing the outputs of the old and new Bowen Hills Models.

Figures 1 to 4 show the outputs of the Bowen Hills Model for the 2026 AM/PM scenarios, for the old and new model iterations.

## **TTM Consulting (Qld) Pty Ltd**

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ttmbris@ttmgroup.com.au  
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Figure 1: 2026 AM Peak – Original Bowen Hills Model Outputs

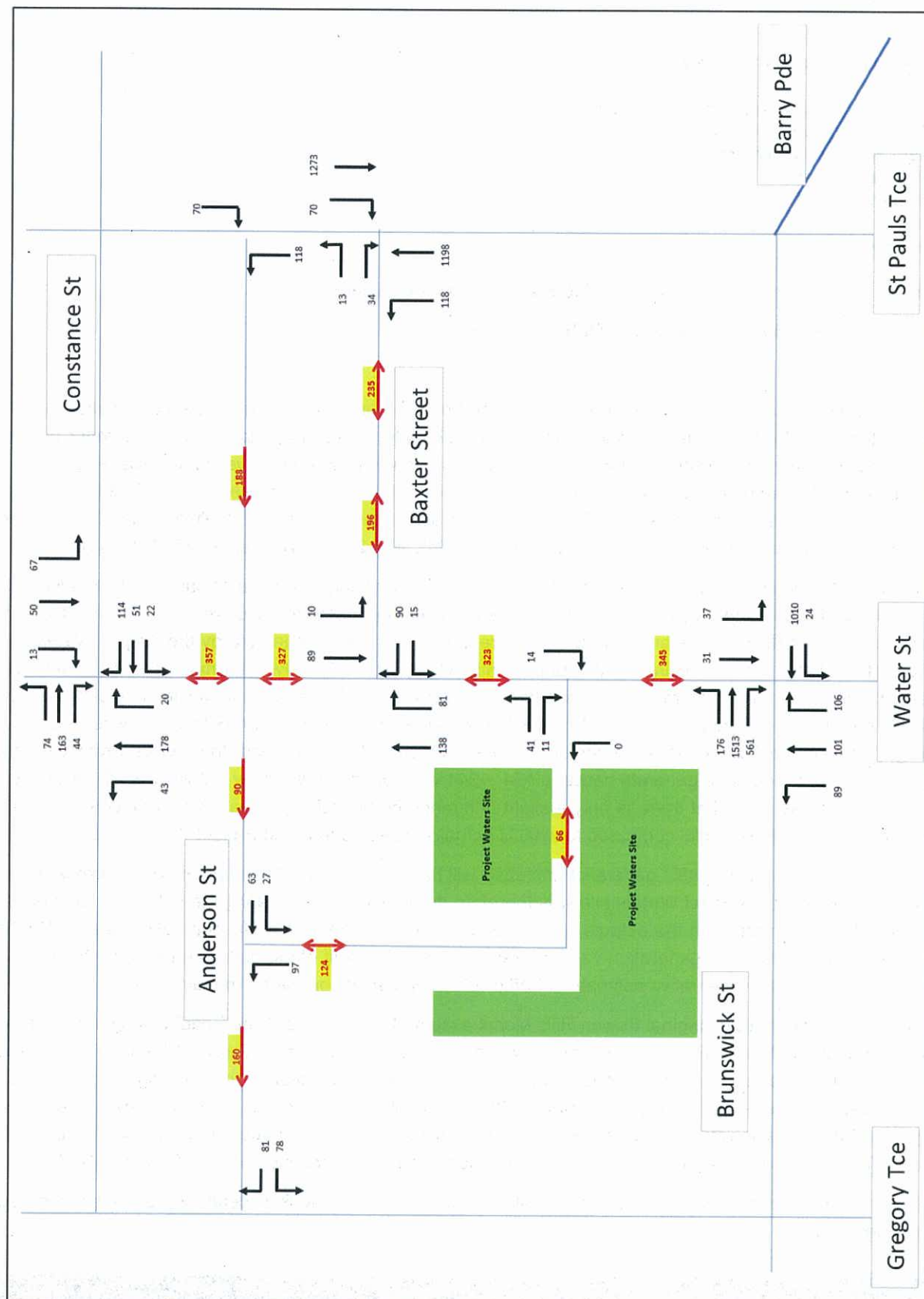


Figure 2: 2026 AM Peak – New Bowen Hills Model Outputs (Updated Project Waters Scheme)

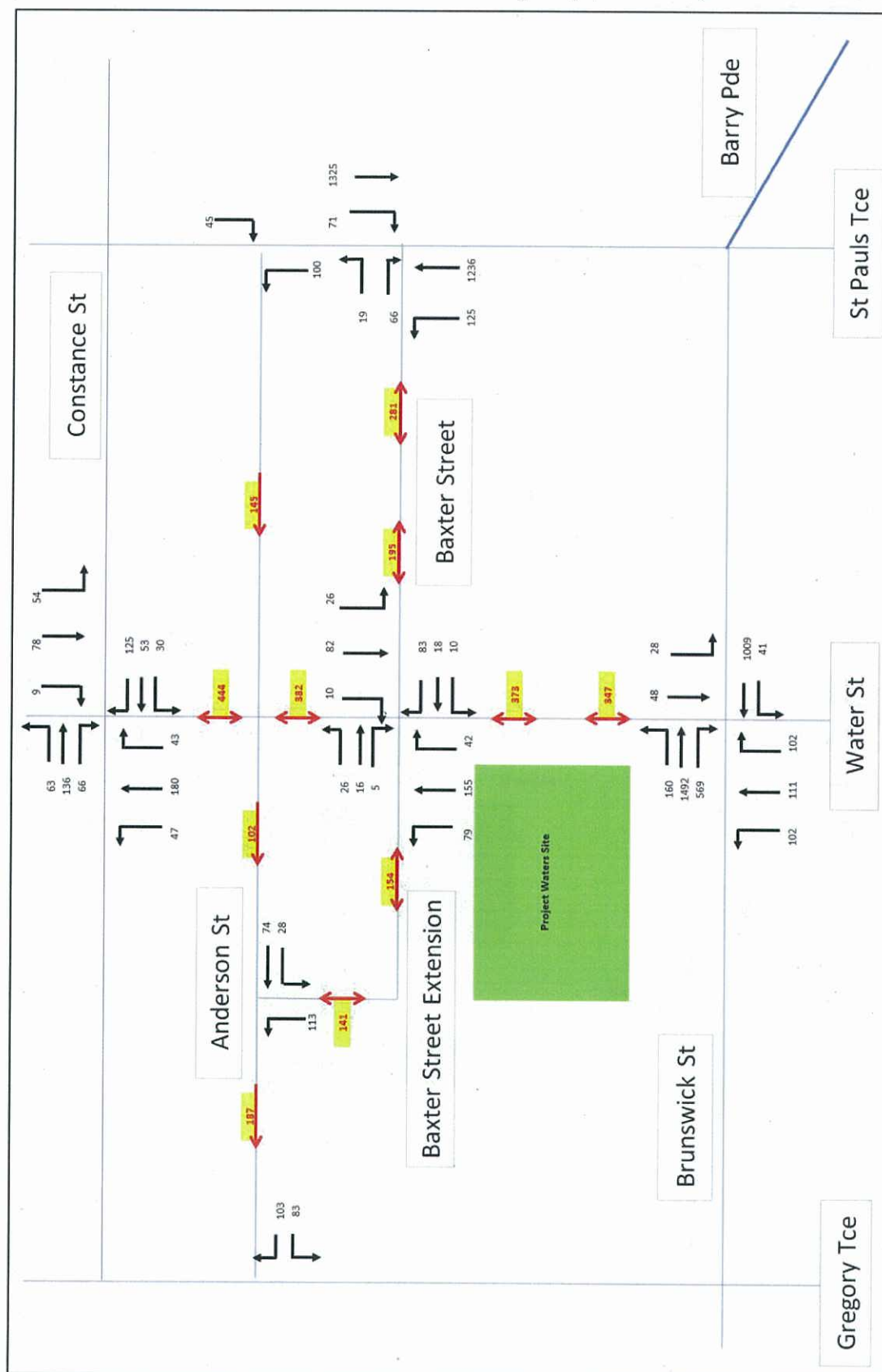


Figure 3: 2026 PM Peak – Original Bowen Hills Model Outputs

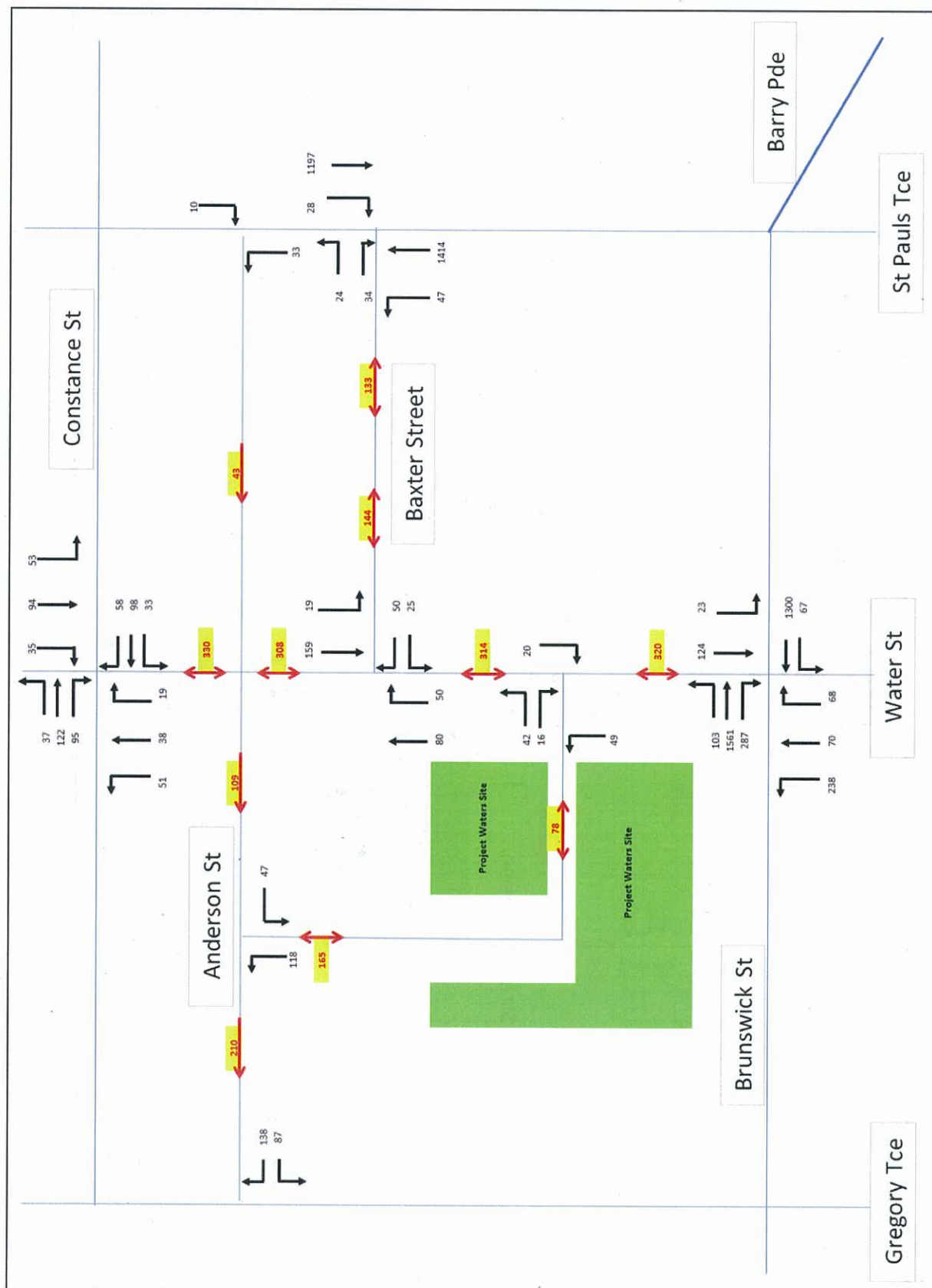
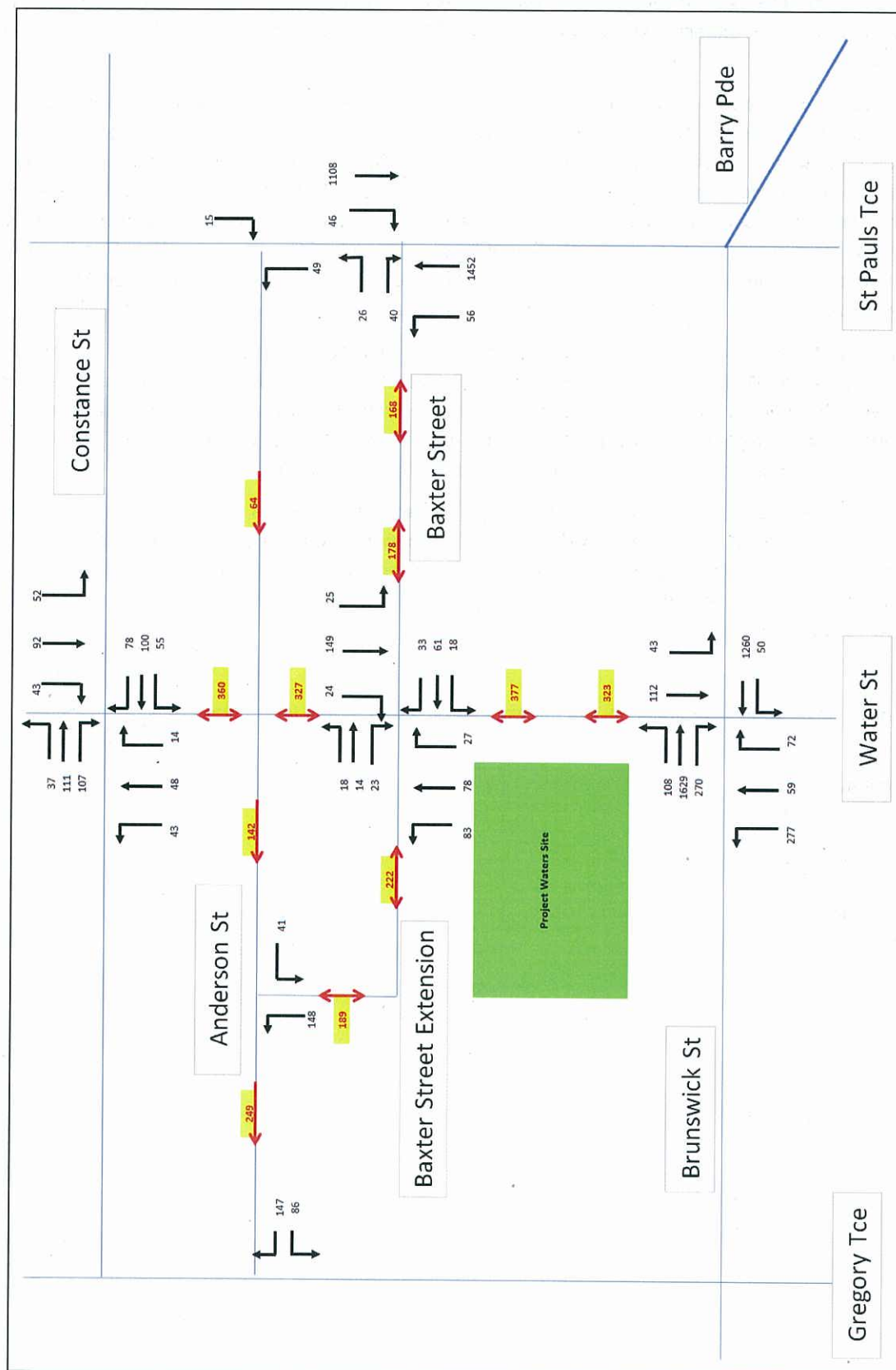


Figure 4: 2026 PM Peak – New Bowen Hills Model Outputs (Updated Project Waters Scheme)



Although the relocation of the "New Road" servicing the Project Waters development causes some redistribution of trips around the site (notably on Baxter and Andersons Street), it can be seen from the above figures that the expected link volumes for the AM/PM scenarios are quite similar between the old and new model.

During the AM Peak hour, the greatest change in through volume traffic is apparent on Water Street (to the east of the site), where the through volumes between Anderson Street and Constance Street are expected to increase from 357vph to 444vph (87vph or 25% increase). The other roads, however, are expected to have minimal traffic volume increases, generally up to 20vph. It should be noted that although the values on Baxter Street and Anderson Street (south of the Project Waters site) are quite different between the new and old model, this is more due to the redistribution of trips as a result of the relocated "New Road" servicing the Project waters development. The combined traffic using both Baxter Street and Anderson Street is 592vph (two way) in the old model, and this has only slightly increased to 621vph in the new model.

During the PM peak hour, the greatest change in through volumes is 63vph which occurs on Water Street (outside the Project Waters site just west of Baxter Street). This is also, however, an effect of the relocation of the "New Road" to the eastern boundary of the site as all vehicles accessing Project Waters from the "New Road" were not originally included in the through volumes on Water Street. Apart from this, the traffic volume increases on the other roads surrounding in the surrounding area is at most 39vph.

Based on the outputs of the Bowen Hills Model, it is apparent that the changes to Project Waters site proposed in the revised masterplan development approval will have negligible effects on the traffic volumes using the surrounding road up to the 2026 design horizon. As such, no additional road upgrades – or changes to the road planning layouts developed by TTM as part of the original Bowen Hills modelling exercise - are warranted.

If you have any queries in relation to the information provided in this letter, contact Brian Camilleri on 3327 9500.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Brian Camilleri', is written over a light blue circular stamp.

**Brian Camilleri**  
Principal Director

# *Appendix G*

## *SERVICE VEHICLE SWEEP PATHS*

