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Central Village Master Plan
+ Revised Phase 2 Development Approval
332-342 Water Street, Fortitude Valley

Traffic Engineering Report

PLANS AND DOCUMENTS
referred to in the PDA APPROVAL

18 FEB 2016

MEDQ

Metro Property Developments Pty Ltd

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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 Central Village development, and specifically the revised Phase 2 of the wider site. It is understood that this report will be submitted in support of a development application to the Department of State Development, Infrastructure & Planning (Economic Development Queensland (EDQ)).

As a background, Phase 2 of the master plan was previously approved by EDQ in June 2015 under a previous development application (EDQ. Ref DEV2014/630). Subsequent to this approval, there have been modifications to the development scheme which have come about in response to the approval for the adjacent site at 527 Gregory Terrace for a new mixed use (residential, office and retail) development. The modifications to the Phase 2 scheme include rationalising the buildings/towers and internal public realm to allow for improved integration of the two sites. In addition, modifications to the building staging have been made through refinement of the construction methodology based on site specific constraints. These changes have resulted in modifications to the internal traffic arrangements including car park provisions/layouts, access arrangements and servicing provisions.

As such, this report reflects the traffic engineering aspects of the revised Phase 2 scheme, with reference to the previous approved scheme and requirements of EDQ.

1.2. Summary of Revisions to EDQ Further Issues

The contents of this version of the report also reflect subsequent changes to the development scheme in response to ongoing design development and in response to the further issues noted by EDQ in correspondence dated 23rd November 2015.

For ease of reference, the following further issues identified by EDQ have been reviewed and addressed as follows.

Manoeuvring of an MRV within the podium level 1 urban common whilst the drop off is zone is occupied by another MRV.

It is proposed that MRV access to the podium level 1 urban common will be facilitated only as a temporary solution for Stage 4 (prior to completion of the Stage 5 loading dock). Based on the current construction timeframes there is likely to be only a 6 to 12-month period between when Stage 4 is completed and Stage 5 is completed, so this temporary solution is considered primarily a short term management consideration rather than a major factor which would essentially dictate the whole urban common design. At the completion of Stage 4, service vehicle demands will be primarily accommodated within the Phase 1 loading dock.

Access to the urban common for service vehicles will occur only on a very occasional basis and will be done so in a strictly controlled manner (i.e. scheduled through the building manager) such that there will not be situations of multiple service vehicles needing to access the urban common at the same time. As a temporary solution, not all of the parking spaces within the urban common will be designated at the completion of Stage 4. This will provide sufficient space for two MRVs to park clear of the circulation roadway of the urban common. Refer to Section 7.3.2 of this report for further details.

Manoeuvring of B99 vehicles around central island in podium level 1 urban common in single movement.

Revised swept path assessment has been completed to show that a B99 vehicle can turnaround within the urban common in a single movement clear of all parking spaces. Refer to Section 6 of this report for further details.

Updated provisions for internal car park height clearances.

Table 4.5 has been updated to confirm that the minimum required height clearances within the internal car parking areas for the respective vehicular access needs.

Sight Distances at the Trinity Street access

It has been confirmed that minimum sight distances in compliance with Australian Standards is available at the Trinity Street access. Refer to Section 5.3 of this report for further details.

Consideration for car park counters for the urban common parking spaces

It is proposed that a vehicle counting system will be incorporated into the design of the urban common and access driveway to allow identification of the number of vacant parking spaces at a given time. Refer to Section 6 for further details.

Confirmation that minimum parking aisle widths in accordance with Australian Standards

The revised development plans provide absolute minimum 5.8m parking aisles (although typically 6.2m) complying with Australian Standards requirements. Refer to Section 4.4 of this report for further details.

1.3. Scope

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

- Parking supply
- Parking layout
- Access locations and designs
- Surrounding road layout and site accessibility

- Traffic generation and distribution
- Development impacts on the 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:

- EDQ 'Bowen Hills Urban Development Area Development Scheme', specifically;
  - 3.0 Land Use Plan: UDA-Wide Development Criteria
  - 3.0 Lane Use Plan: Precincts (Precinct 4: Water Street Precinct)
- Australian Standard for Parking Facilities (AS2890)
- Austroads Guide to Traffic Management

In addition, guidance on particular design issues has been sourced from sections of the Brisbane City Council (BCC) Brisbane City Plan 2014.

1.4. Site Location

The Central Village Master Plan 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), formerly under the development jurisdiction of the Urban Land Development Authority (ULDA). This area has now been renamed as the Bowen Hills Priority Development Area (PDA).

Phase 2 of the development relates to the portion of the development located on western side of the wider site. It has road frontages onto both Water Street to the south and Brunswick Street to the west.

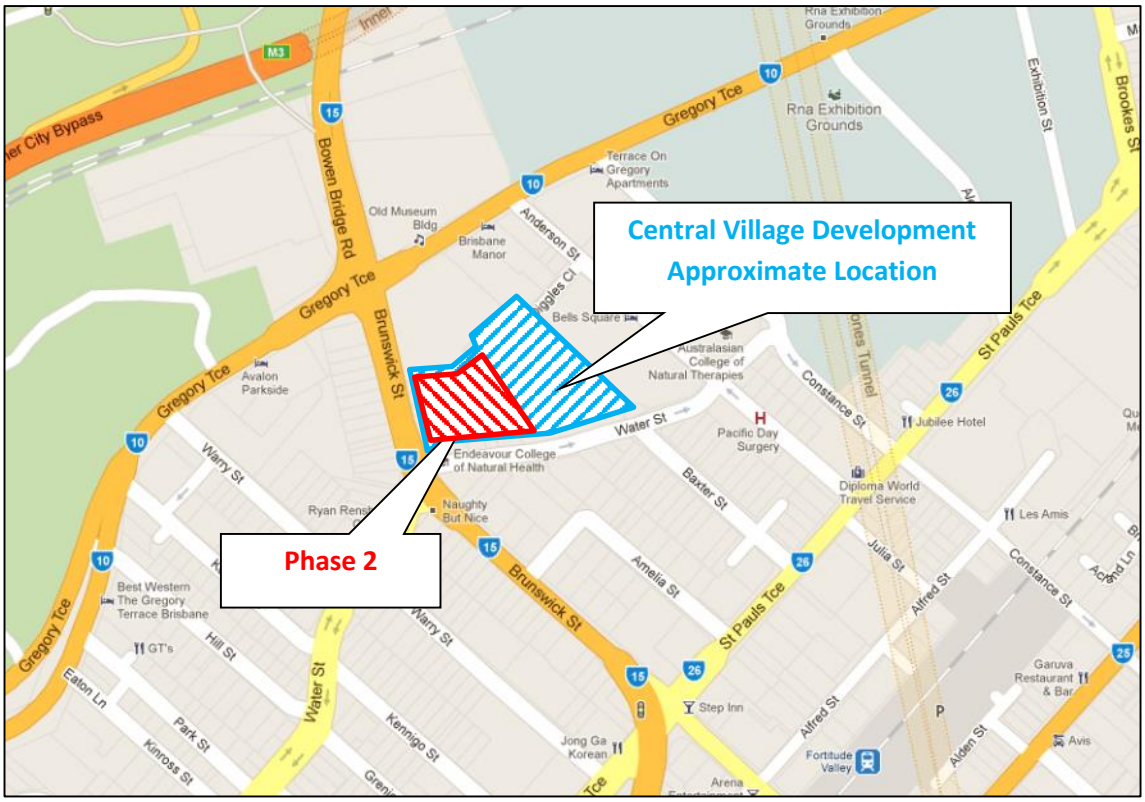


Figure 1.1: Site Location **Map Source: Google Maps 2015**

2. The Proposed Development

2.1. Development Profile

The Central Village Master Plan divides the site into two phases; Phase 1 and Phase 2.

Phase 1 is broken up into Stages 1, 2 and 3 and consists of three residential buildings (one for each stage), car parking area and podium public/activated spaces. Phase 1 is located on the eastern side of the site (right of the red dashed line shown in Figure 2.1). Stages 1 and 2 are complete and operating, whilst Stage 3 is current under construction and due for completion in early 2016.

Phase 2 is broken up into Stages 4 and 5 and consists of two residential towers and podium public/activated space. Phase 2 is located on the western side of the site (left of the red dashed line shown in Figure 2.1). An internal roadway is also provided through the wider site, running from Trinity Street (through Phase 1) and ending at an internal urban common (with parking and a setdown area) within Phase 2.

Figure 2.1 shows the extent of Phase 2, and the specific footprints of Stages 4 and 5 within the Central Village Master Plan. The roadway and urban common is represented by the green outline in Figure 2.1.

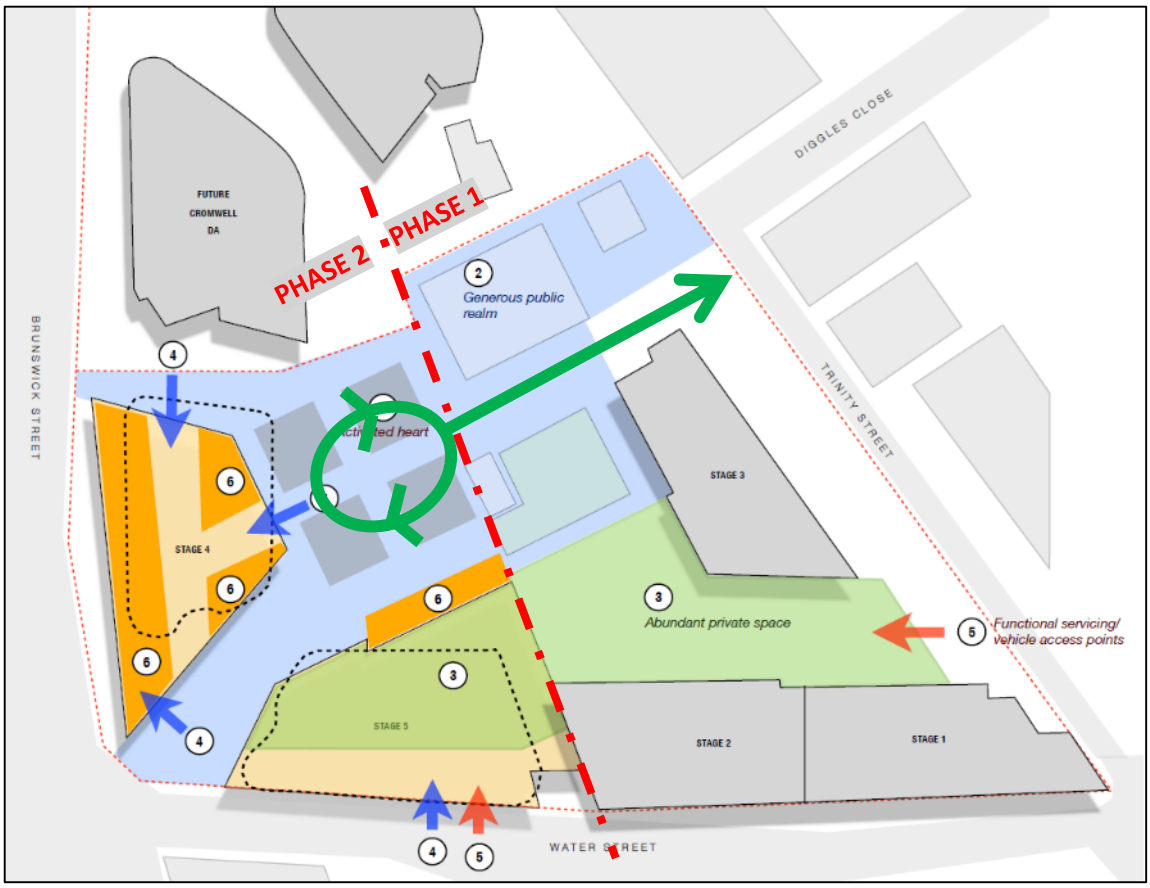


Figure 2.1: Central Village Master Plan – Stages 4 and 5 within Phase 2

The proposed land uses and parking supply for each phase and stage of this development are summarised in Table 2.1.

Table 2.1 : Central Village Master Plan Proposed Land Uses

Development Component	Area/Quantity	Parking Supply
Phase 1	**520 units**	**370 spaces**
Stage 1 (complete) Residential Dwellings:	1 Bedroom: 115 units 2 Bedroom: 46 units SOHO*: 4 units TOTAL: 165 units	105 spaces, as approved and constructed
Stage 2 (complete) Residential Dwellings:	1 Bedroom: 113 units 2 Bedroom: 45 units SOHO*: 2 units TOTAL: 160 units	101 spaces, as approved and constructed
Stage 3 (under construction) Residential Dwellings: Retail Use: Commercial/Office Use: Indoor Sport and Recreation Use:	1 Bedroom: 85 units 2 Bedroom: 108 units 3 Bedroom: 2 units TOTAL: 195 units 57m² GFA 71m² GFA (Cottage) 420m² GFA (Drill Hall)	161 spaces, as approved 1 space 2 spaces
Development Component	**Area/Quantity**	**Parking Supply**
Phase 2	**535 units**	**578 spaces**
Stage 4 Residential Dwellings: Retail/Centre Activities Use:	1 Bedroom: 150 units 2 Bedroom: 145 units 3 Bedroom: 6 units TOTAL: 301 units 447.5m² GFA	302 spaces 20 spaces
Stage 5 Residential Dwellings: Retail/Centre Activities Use:	1 Bedroom: 117 units 2 Bedroom: 109 units 3 Bedroom: 8 units TOTAL: 234 units 142.5m² GFA	249 spaces 7 spaces
Total Development	**1,055 units** **1,138m² GFA** **(non-residential)**	**948 spaces**

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

Detailed design plans relating to the Phase 2 parking area, inclusive of the specific parking provisions for Stages 4 and 5 assessed as part of this report, is included in Appendix A.

The unit numbers and parking supply for Stages 1, 2 and 3 in Table 2.1 are based on the previous approvals issued by the former ULDA for Stage 1 (Decision Notice dated 31st January 2013, DEV2012/289) and EDQ for Stages 2 (Decision Notice dated 8th August 2013, DEV2012/392) and Stage 3 (Decision Notice dated 27th July 2014, DEV2012/387).

2.2. Parking

The development plan includes a total of 948 car parking spaces and 1,258 bicycle spaces.

The total proposed on-site parking supply for the development is 948 parking spaces, inclusive of 370 parking spaces as part of Phase 1 and 578 parking spaces as part of Phase 2.

Phase 1 of the master plan provides 370 parking spaces, inclusive of 336 resident spaces (incl. 6 PWD spaces), 29 visitor spaces and 5 non-resident spaces.

Phase 2 of the master plan provides 578 parking spaces, inclusive of 524 resident spaces (incl. 6 PWD spaces), 27 visitor spaces (incl. 2 PWD spaces) and 27 non-resident spaces (incl. 1 PWD space).

The breakdown between different stages within Phase 2 is as follows:

- The Stage 4 proposes a total parking supply of 322 spaces; inclusive of 287 resident spaces (incl. 4 PWD spaces), 15 visitor spaces (incl. 1 PWD space) and 20 non-residential spaces.
- The Stage 5 proposes a total parking supply of 256 spaces; inclusive of 237 resident spaces (incl. 2 PWD spaces), 12 visitor spaces (incl. 1 PWD space) and 7 non-residential spaces (incl. 1 PWD space)

Further details of the car parking provisions are provided in Section 4 and bicycle parking provisions in Section 8.2.

2.3. Access

The revisions to Phase 2 result in the wider Central Village Master Plan providing a total of three access points onto the external road network; two for the Phase 1 precinct and one for the Phase 2 precinct. Phase 1 provides a main car park access onto the “Baxter Street Extension” (recently renamed Trinity Street). This will facilitate entry/exit movements in all directions. A second all-movements access onto Trinity Street, located near the intersection with Diggles Close, is also provided which serves the new internal roadway which extends west towards the Phase 2 site.

Phase 2 will provide a single main car park access onto Water Street, located mid-way along the site frontage between the intersections with Brunswick Street and Baxter Street. The Phase 1 and 2 car parks will become fully interconnected ultimately, providing two access points for a combined internal car park.

Assuming that Water Street remains a one-way road, the car park access provided for Phase 2 onto Water Street will be a left-in/left-out only. Prior to the completion of Stage 5, Stage 4 will provide interim access through the existing Phase 1 car park only, with vehicular entry and exit from the main car park entry to Trinity Street.

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

2.4. Servicing

The Phase 1 service area provides 2 VAN bays, 1 MRV bay and 1 RCV bay for the shared use by Phase 1. The Phase 2 service area also provides a dedicated service area with an additional 2 VAN bays, 1 MRV bay and 1 RCV bay for the shared use by Phase 2. The Phase 2 service area will be delivered as part of the Stage 5 building construction, so in the interim all servicing functions for Stage 4 will be facilitated through the existing Phase 1 service area and also the at-grade urban common on Level 1.

Further details of the servicing provisions are provided in Section 7.

3. Existing Transport Infrastructure

3.1. The Road Network

All roads in the immediate vicinity of the site are administered by Brisbane City Council (BCC). The hierarchy and characteristics of these roads is shown in Table 3.1.

Table 3.1: Local Road Hierarchy

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

Water Street is a one-way street allowing only eastbound traffic. It is generally 6m although it widens to 10m along part of the site frontage to provide a number of on-street 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 B incorporate the following resumptions/land dedications to facilitate planned road network improvements:

- A minimum 5.25-5.6m dedication on the western property boundary of the Central Village 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 imposed on the subject site, as outlined in the road works concept design prepared by Brisbane City Council (Drawing RPN677). A copy of this drawing is provided in Appendix B.
- An ~ 2.1m dedication on the southern property boundary of Phase 2, on the Water Street frontage, to allow for footpath widening on the north side of Water Street to a minimum width of 3.75m
- A new 6m three chord truncation on the south-west corner of the property where Brunswick Street intersects Water Street.

In addition to the above planned land dedications, land has been dedicated as part of previous stages for truncating the corner of Water Street and Baxter Street of the site frontage and also for the construction of the new Trinity Street connecting Water Street to Diggles Close. A section of Trinity Street has been completed as part of Stage 1 works (up to the Phase 1 main car park entry), with the remaining portion of Trinity Street to be completed (and connected to Diggles Close) as part of Stage 3 which is currently under construction.

The former ULDA also undertook 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 former 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.

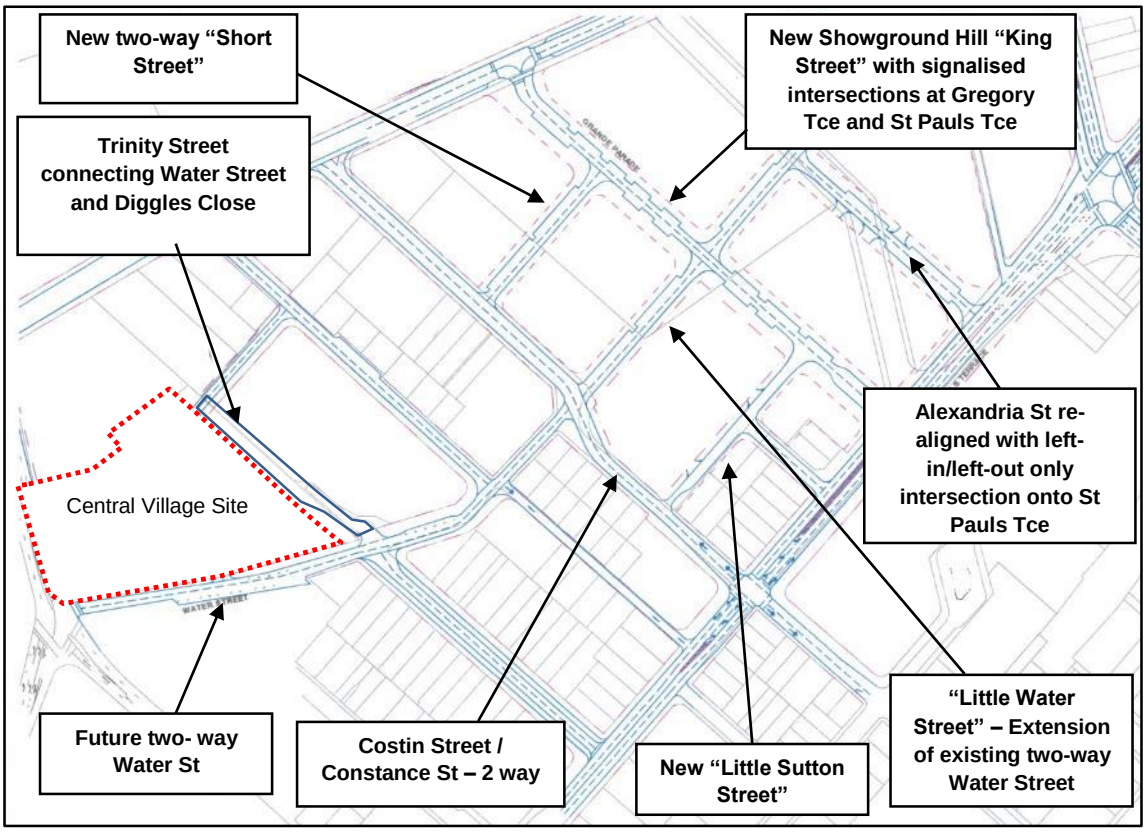


Figure 3.1: Future Road Network Configuration

3.3. Public Transport, Cyclist 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. EDQ Requirements for Car Parking

The Bowen Hills Urban Development Area (BHUDA) Development Scheme details the following parking provisions for the development uses of the site;

- For residential, on average of 1 space per dwelling (including visitor parking).
- For office, a maximum of 1 space per 100m² of floor space
- For other business and retail uses, a maximum of 1 space per 50m² of floor space.

4.2. Proposed Parking Provisions

4.2.1. Introduction

The total proposed on-site parking supply for the development is 948 parking spaces, inclusive of 370 parking spaces as part of Phase 1 and 578 parking spaces as part of Phase 2.

Phase 1 Parking Provisions

Phase 1 of the master plan provides 370 parking spaces, inclusive of 336 resident spaces (incl. 6 PWD spaces), 29 visitor spaces and 5 non-resident spaces.

These parking provisions were previously resolved based on consideration for the site's close proximity to surrounding public transport provisions and activity centres, and prevailing market conditions which indicated that reduced on-site parking would be accepted by prospective buyers. It was for this reason that the overall parking supply for Phase 1 represented a reduction from the BHUDA Development Scheme 'average' parking provision of 1 space per unit (including visitor parking); with parking rather allocated at a rate of 0.5 spaces per bedroom for resident parking plus 1 space per 20 units for residential visitor parking. These rates were consistent with the rates adopted in the BCC City Plan for CBD residential developments.

Nominal parking for the non-residential uses was also provided for in Phase 1, consistent with the maximum provisions of the BHUDA Development Scheme.

Phase 2 Parking Provisions

Phase 2 of the master plan provides 578 parking spaces, inclusive of 524 resident spaces (incl. 6 PWD spaces), 27 visitor spaces (incl. 2 PWD spaces) and 24 non-resident spaces (incl. 1 PWD space). The breakdown between different stages within Phase 2 is as follows:

- The Stage 4 proposes a total parking supply of 322 spaces; inclusive of 287 resident spaces (incl. 4 PWD spaces), 15 visitor spaces (incl. 1 PWD space) and 20 non-residential spaces.

- The Stage 5 proposes a total parking supply of 256 spaces; inclusive of 237 resident spaces (incl. 2 PWD spaces), 12 visitor spaces (incl. 1 PWD space) and 7 non-residential spaces (incl. 1 PWD space).

In contrast to the parking supply for Phase 1, the supply for the revised Phase 2 scheme has been adjusted to better suit current market expectations. The parking supply for Phase 2 has been generally derived based on provision for 1 space per unit for residents (although with 2 spaces per unit for larger 3 bedroom units) and 1 space per 20 units for residential visitors. Whilst this is slightly above the 'average' 1 space per unit provision under the BHUDA Development Scheme; overall given the reduced parking for Phase 1 the total parking supply for the site once complete will still generally be consistent with this provision.

The revised Phase 2 scheme has also evolved to provide greater emphasis on the urban common on Level 1 and activation of the site through retail/centre activity uses. As a result, to assist with the viability of the quantum of these non-residential uses in this site location a slightly higher level of parking has been allowed for these uses above what is specified in the BHUDA Development Scheme to be provided for both customers and retail tenancy owners/staff.

Further details in relation to the proposed parking provisions for Phase 2 is detailed in Sections 4.2.2 to 4.2.7.

4.2.2. Stage 4 Car Parking Supply

Based on the parking rates outlined in Section 4.2.1, the proposed parking supply for Stage 4 when considered in isolation is shown in Table 4.1.

Table 4.1: Stage 4 Parking Supply Summary

Parking Component	Extent	Proposed Parking Rate	Parking Supply	Actual Provision
Residential Units: – 1 Bedroom – 2 Bedroom – 3 Bedroom	301 units 150 units 145 units 6 units	- 1.0 space/unit 1.0 space/unit 2.0 spaces/unit	307 spaces 150 spaces 145 spaces 12 spaces	287 spaces (incl. 4 PWD spaces)
Residential Visitors	301 units	0.05 spaces/unit	15 spaces	14 spaces in podium level 2* 1 PWD space within the urban common
Retail/Centre Activities	447.5m²	1 space/50m² (maximum)	9 spaces (maximum)	8 customer spaces within urban common 12 staff spaces in podium level 2
Total			**331 spaces**	**322 spaces**

*Location of visitor spaces in podium level 2 will change between Stage 4 and Stage 5 completion. In addition, at completion of Stage 5 two of the Stage 4 visitor spaces will be relocated to the urban common; resulting in 12 Stage 4 visitor spaces in podium level 2 and 3 Stage 4 visitor spaces (incl. 1 PWD space) in the urban common.

As outlined in Table 4.1, the proposed parking supply of 322 spaces for Stage 4 is generally consistent with the proposed parking rates adopted. With respect to residential parking, Stage 4 proposes to provide 20 of the 1-bedroom units with no resident parking.

This results in a provision of 302 residential car spaces including visitors for 301 units (average of 1.01 space per unit), which is consistent with the BHUDA Development Scheme provision.

With respect to retail/centre activities parking, the proposed provision of 20 spaces is more than that detailed in the BHUDA Development Scheme. Regardless, these additional 11 spaces are not considered likely to have any significant consequence to traffic generation of the overall development. Provision for 8 customer spaces within the urban common is desired to provide a suitable quantum of parking support the active retail uses ensuring easy access for customers (and hence viability of retail uses in this location). It is also noted that EDQ have previously confirmed support for the proposed quantum of retail parking provision within the urban common. In addition, provision for 12 staff spaces is also desired from a leasing perspective for prospective retail tenants.

Overall, the parking supply for Stage 4 is considered acceptable.

4.2.3. Stage 5 Car Parking Supply

Based on the parking rates outlined in Section 4.2.1, the proposed parking supply for Stage 5 when considered in isolation is shown in Table 4.2.

Table 4.2: Stage 5 Parking Supply Summary

Parking Component	Extent	Proposed Parking Rate	Parking Supply	Actual Provision
Residential Units: – 1 Bedroom – 2 Bedroom – 3 Bedroom	234 units 117 units 109 units 8 units	- 1.0 space/unit 1.0 space/unit 2.0 spaces/unit	242 spaces 117 spaces 109 spaces 16 spaces	237 spaces (incl. 2 PWD spaces)
Residential Visitors	234 units	0.05 spaces/unit	12 spaces	12 spaces (incl. 1 PWD space), all within podium level 2
Retail/Centre Activities	142.5m²	1 space/50m² (maximum)	3 spaces (maximum)	7 customer spaces (incl. 1 PWD space) within urban common
Total			**257 spaces**	**256 spaces**

As outlined in Table 4.2, the proposed parking supply of 256 spaces for Stage 5 is generally consistent with the proposed parking rates adopted. With respect to residential parking, Stage 5 proposes to provide 5 of the 1-bedroom units with no resident parking. This results in a provision of 249 residential car spaces including visitors for 234 units (average of 1.06 space per unit), which is generally consistent with the BHUDA Development Scheme provision.

The proposed 7 retail spaces, whilst again above the BHUDA Development Scheme provisions is considered acceptable given the supply within the urban common has previously been agreed with EDQ and is unlikely to result in any significantly greater traffic generation for the development.

Overall, the parking supply for Stage 5 is considered acceptable.

4.2.4. Overall Phase 2 Car Parking Supply

The overall parking supply for Phase 2 and comparison with the proposed rates detailed in Section 4.2.1 is shown in Table 4.3.

Table 4.3: Overall Phase 2 Parking Supply Summary

Parking Component	Extent	Proposed Parking Rate	Parking Supply	Actual Provision
Residential Units: – 1 Bedroom – 2 Bedroom – 3 Bedroom	535 units 267 units 254 units 14 units	- 1.0 space/unit 1.0 space/unit 2.0 spaces/unit	549 spaces 267 spaces 254 spaces 28 spaces	524 spaces (incl. 6 PWD spaces)
Residential Visitors	535 units	0.05 spaces/unit	27 spaces	27 spaces (incl. 2 PWD spaces)
Retail/Centre Activities	590m²	1 space/50m² (maximum)	12 spaces (maximum)	27 spaces (incl. 1 PWD space)
Total			**588 spaces**	**578 spaces**

The overall parking supply for Phase 2 is still generally consistent with the proposed parking rates adopted. The provision of 551 residential parking spaces including visitors for 535 units (average of 1.03 spaces per unit) is also generally consistent with the BHUDA Development Scheme provision. The slightly increased retail/centre activity parking is also considered acceptable to assist with improving amenity for these uses of the site and attracting customers.

Based on the above information, the parking supply for Phase 2 is considered acceptable.

4.2.5. Overall Central Village Parking Supply

A summary of the proposed parking provisions for the wider Central Village Master Plan (inclusive of Phase 1 and Phase 2 provisions) with respect to the parking provisions detailed in the BHUDA Development Scheme is shown in Table 4.4.

Table 4.4: Overall Central Village Master Plan Parking Supply Summary

Parking Component	Extent	BHUDA Dev Scheme Rate	BHUDA Provision	Actual Provision
Residential Units:	1,055 units	1 space per unit (incl. visitor), on average	1,055 spaces	918 spaces
Non-Residential Uses (Retail, office, sport & rec, centre activities)	1,138m²	1 space/50m² (maximum)	23 spaces	30 spaces
Total			**1,078 spaces**	**948 spaces**

Overall, the proposed parking provision of 948 spaces is generally consistent with the BHUDA Development Scheme provision of 1,078 spaces. As such, the parking supply for the wider Central Village Master Plan is considered acceptable.

4.2.6. Drop-Off Parking Provisions

The modified Phase 2 design incorporates a new two-way internal roadway leading up to the new urban common, which will also double as a setdown/drop-off area. Further details in relation to the function of this internal roadway and urban common is provided in Section 6. A dedicated drop-off zone will be provided adjacent to the Stage 4 building entry. This drop-off zone (measuring 7.4m long and 5.4m deep) is of sufficient size to accommodate multiple cars (including PWD vehicles) parking at angle or larger vehicles (such as Vans or small trucks) parking parallel across the zone. It is anticipated that this drop-off space will service any anticipated demands for visitors to the wider site, inclusive of Phase 2, given the limited ability for vehicles to temporarily stand on the external road frontages of the site.

4.2.7. PWD Parking Supply

It is noted that the BHUDA Development Scheme does not specify minimum provisions for PWD parking. In addition, the Building Code of Australia (BCA) has no specific requirements for PWD parking for residential (Class 2) buildings. Regardless, the development proposal provides a total of 9 PWD spaces for the uses of Phase 2; allocated as follows:

- 4 PWD spaces for Stage 4 residents
- 2 PWD spaces for Stage 5 residents
- 1 PWD space for Stage 4 residential visitors (located in urban common)
- 1 PWD space for Stage 5 residential visitors (located on podium level 2 car park)
- 1 PWD space for retail/centre activity customers (located within urban common).

For the total parking supply of 524 resident spaces for Phase 2, the provision of 6 PWD spaces equates to a provision of 1 space per 87 standard spaces. This is consistent with the provisions for other comparable BCA Class buildings (i.e. for example Class 3 which incorporates other kinds of residential type uses), which requires a provision of 1 space per 100 standard spaces. It is also noted that Phase 2 provides a number of PWD accessible units, which will allow for PWD spaces to be allocated should a purchaser of one of these units require a dedicated PWD space. The 4 PWD spaces for Stage 4 are located in close proximity to the Stage 4 lifts on podium level 2, whilst the 2 PWD spaces for Stage 5 are located in close proximity to the Stage 5 lifts on podium level 1; both locations providing convenient and equitable access for residents.

The Stage 4 visitor PWD space is proposed to be located on the Level 1 urban common (along with the other customer parking spaces) in close proximity to the Stage 4 main entry point. This PWD space is provided in this location given in the interim situation (i.e. before Stage 5 building is completed) with all access to the internal car parking areas provided via the Phase 1 access, it was considered more reasonable to locate the Stage 4 visitor PWD space in a more easily identifiable/accessible area and then retain in this location once Stage 5 is completed.

The Stage 5 PWD space is located along with all other Stage 5 visitor spaces on the podium level 2 level directly inside the Water Street access point. From here the visitor PWDs can directly access the rear entry to the Stage 5 tower lifts. The retail/centre activity PWD space is located in the Level 1 urban common area in close proximity to all retail/centre activity tenancies.

The provision of 3 PWD spaces for the total 42 'public spaces' (i.e. visitor and customer) exceeds even the most generous requirements for PWD parking for any building class as detailed in the BCA (i.e. 1 space per 50 standard spaces). A PWD space is also provided in all locations where other standard public parking is available providing equality for all users.

Based on the above information, the PWD provisions for Phase 2 are considered acceptable.

4.2.8. Conclusion

Overall, the proposed on-site car parking provisions for Phase 2 in the context of the wider Central Village Master Plan are considered acceptable.

4.3. Visitor Parking Strategy

4.3.1. Phase 1 Visitor Parking Arrangements

The currently completed and operating Stages 1 and 2 provide a total of 16 visitor parking spaces (8 spaces provided as part of Stage 1, and then additional 8 spaces as part of Stage 2). These parking spaces are located on the first parking aisle within the site on podium level 1 (east portion of wider site), with direct access from the main site entry from Trinity Street. Currently two of the visitor spaces are provided in front of the security gate and the remaining 16 spaces behind the security gate. An intercom is provided in the median island at the main entry, with visitors using this to contact the respective unit they are visiting and gain access to the visitor parking spaces located behind the security gate. For visitors exiting the car park, a second intercom is provided inside the car park with users requiring to be 'let-out' by the resident they were visiting when exiting.

As part of the Stage 3 approval, an additional 13 visitor parking spaces are to be provided which were to be located along the north wall of the Stage 3 car park. To facilitate future connection of the Stage 3 car park with the new Stage 4 car park, the approved location of the Stage 3 visitor spaces will need to be amended as part of this new visitor parking strategy. This will involve an interim solution with 9 of the visitor spaces being relocated from the approved location (all provided on podium 1 level east) to provide 3 visitor spaces each on the 4 car parking levels, generally in the location of the future connection point to the Stage 4 car park. The relocation of visitor parking spaces in this manner is dictated by requirements of the Community Management Scheme for Stage 3, with the constraints and reasoning behind the proposed visitor parking space reallocation detailed in the summary brief from HWL Lawyers included in Appendix C.

As part of these modifications to Stage 3 parking it is proposed that the 1 of the PWD spaces within Stage 3 will be converted to the Heritage Cottage space and the remaining PWD space retained as a visitor space. Provision for 1 PWD space for the 13 Stage 3 visitor spaces is considered an acceptable supply, and will remain in the approved location adjacent to the Stage 3 lift in the podium level 1 (east) to allow easy access to the Stage 3 tower.

Figure 4.1 shows the location of the visitor parking spaces on podium level 1 (east), typical location of relocated Stage 3 visitor spaces on the upper levels, respective vehicle access/circulation routes (red dashed line) for visitor cars and security gate/intercom locations. The detailed car park allocation plans are also included in Appendix A.

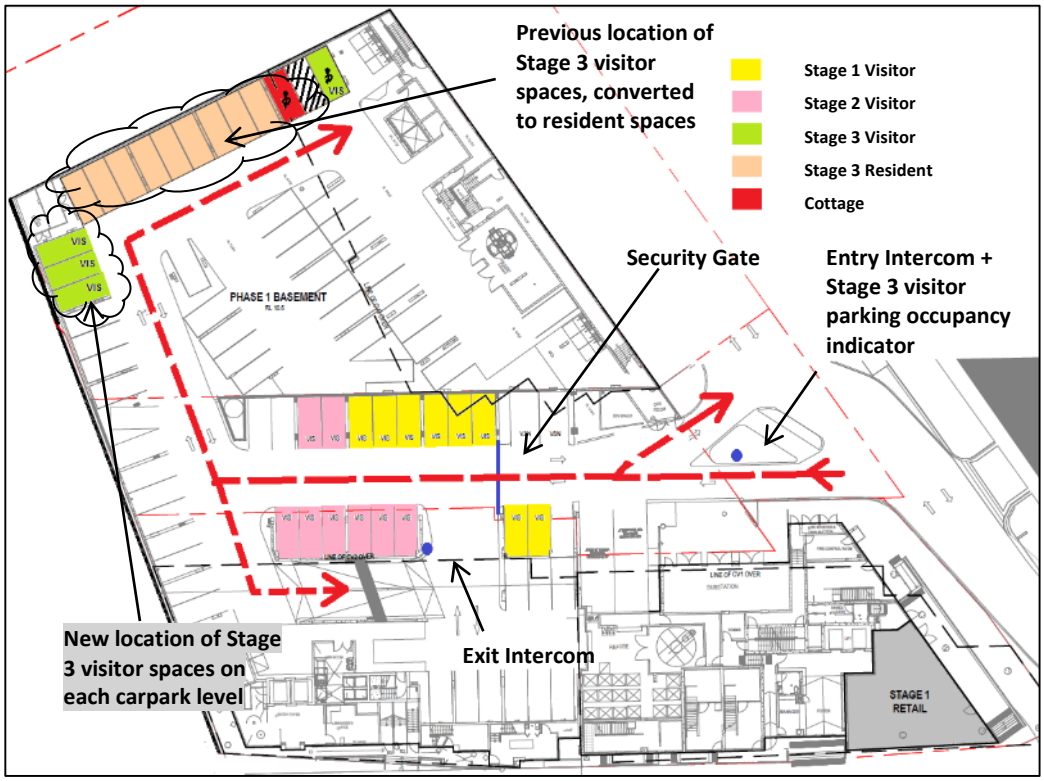


Figure 4.1: Stage 1, 2 and 3 Visitor Parking Arrangements (Podium Level 1 East)

To facilitate easy access to the relocated Stage 3 visitor spaces provided on the upper car parking levels it is proposed that an active car park occupancy system to be implemented in the interim for Stage 3. This will generally involve sensors on each of the Stage 3 visitor spaces on various levels to register if the space is occupied or vacant, with this information linked to a display panel at the main entry intercom off Trinity Street; so that when a visitor arrives and is buzzed in by the resident they can see where the vacant visitor spaces are located. In addition, appropriate signage will also be installed to clearly show the access/circulation routes for visitors to the parking spaces on each level. A copy of the performance brief for this system is included in Appendix D.

Given this is visitor parking scheme is proposed only to be an interim solution, with the spaces located to a final position within the Stage 4 car park at completion of Stage 4 (as is discussed further in Section 4.3.2), this is considered an acceptable solution as a temporary measure to facilitate ongoing availability of visitor parking throughout the staging of the master plan.

To facilitate the above necessary changes, it is also noted that amendments will be sought to the current Stage 3 approval (EDQ Ref. DEV2012/387) in accordance with the new information detailed in this report. A separate amendment application will be lodged with EDQ to formalise these changes to Stage 3.

4.3.2. Stage 4 Visitor Parking Arrangements

At the completion of Stage 4 it is proposed that all car park access will be facilitated through the existing Phase 1 car park, with entry and exit from Trinity Street. Internal connections will be provided between the Stage 3 and Stage 4 car parking areas on each level (4 levels total). This will result in the loss of 12 visitor car spaces (3 on each level) within the Stage 3 area.

To retain the minimum required number of Stage 3 parking spaces at the completion of Stage 4, it is proposed that the 12 lost Stage 3 visitor spaces will be reallocated within the extents of the new Stage 4 car park. In addition to these changes, two of the existing Stage 1 visitor spaces (the spaces located outside the security gate) will need to be removed to allow provision for a new temporary Stage 4 bin room in close proximity to the Stage 1 loading dock. These two Stage 1 visitor spaces will also be located within the new Stage 4 area.

The new Stage 4 visitor spaces will then be located within the Stage 4 car park on the podium level 1 (west) in close proximity to the Stage 4 building lift cores (aside from the visitor PWD space which will be located in the urban common). Access to all visitor parking spaces will occur in the same manner as is proposed at completion of Stage 3, with intercom access into the secured car park and circulation through the podium level 1 (east). There will, however, no longer be need for the active visitor car park occupancy system to be implemented with all Stage 3 and 4 visitor spaces located in the single area. With respect to egress for the visitor cars, the current exit intercom will be removed and instead a loop detector will be installed in the ground which will automatically trigger the security gate to open when exiting cars approach. As detailed in the respective approval conditions, suitable directional signage will be installed to clearly identify access routes to the respective visitor parking spaces.

The only notable impact of the changes to the Stage 1 and 3 visitor spaces as part of Stage 4 works is that the walking distance to the respective lifts will increase. This, however, is not considered to be a significant impost; with Stage 3 visitor spaces only moving up to 40m away from the previous locations. In addition, the Stage 3 PWD visitor space will not be moved, remaining immediately adjacent to the Stage 3 building lifts.

Figure 4.2 and Figure 4.3 show the location of visitor parking in the podium level 1 and podium level 2, respectively, and the internal vehicle access/circulation routes at the completion of Stage 4. The detailed car park allocation plans are also included in Appendix A.

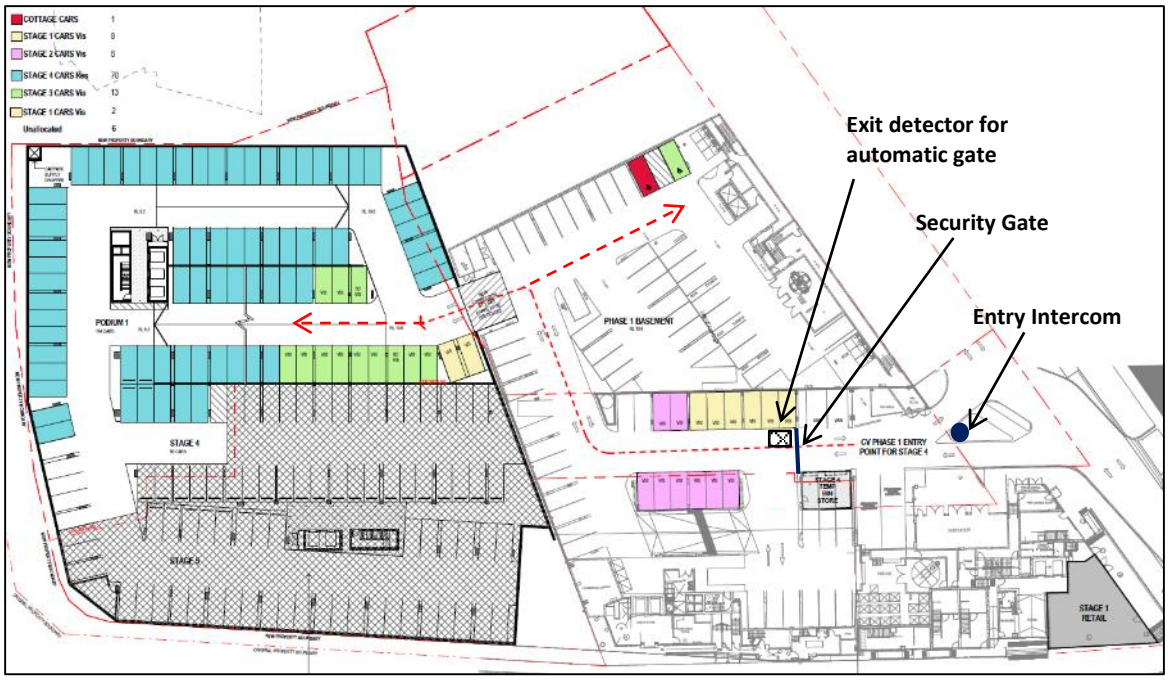


Figure 4.2: Stage 4 Visitor Parking Arrangements (Podium Level 1)

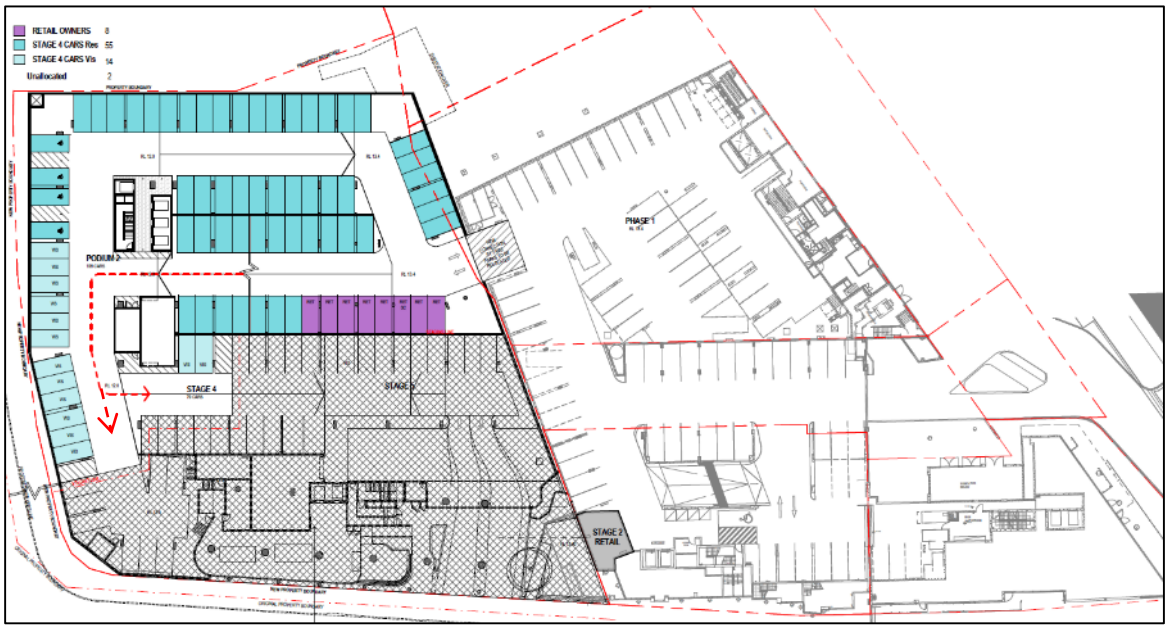


Figure 4.3: Stage 4 Visitor Parking Arrangements (Podium Level 2)

4.3.3. Stage 5 Visitor Parking Arrangements

At the completion of Stage 5 the full extent of the car park for the Central Village Master Plan site will be completed, with a secondary access point provided to Water Street. All visitor parking spaces for Stages 1, 2 and 3 will remain the same position as for the completion of Stage 4.

With respect to Stage 4 spaces these will be relocated and positioned along with the new Stage 5 visitor spaces at the start of the parking area immediately accessible from the new entry via Water Street.

It is also proposed that all Stage 4 and 5 visitor spaces will be located outside of the new security gate being provided for the Stage 4 and 5 car parking area; to provide improved access for visitors. Regardless of the above, it is proposed that access into the secured car parking area from the new Water Street entry point will be available for Stage 1, 2 and 3 visitors; with an additional entry intercom to be installed. Similar to the arrangements at the Trinity Street security gate, it is also recommended the new Water Street security gate allow for automatic opening for exiting vehicles via loop detectors. Overall, at the completion of Stage 5 the east and west sections of the internal car park will become fully interconnected, with visitors able to enter and exit the site from either Trinity Street or Water Street.

Figure 4.4 and Figure 4.5 show the location of visitor parking in the podium level 1 and podium level 2, respectively, and the internal vehicle access/circulation routes at the completion of Stage 5. This represents the ultimate vistior parking arrangements for the wider Central Village site. The detailed car park allocation plans are also included in Appendix A.

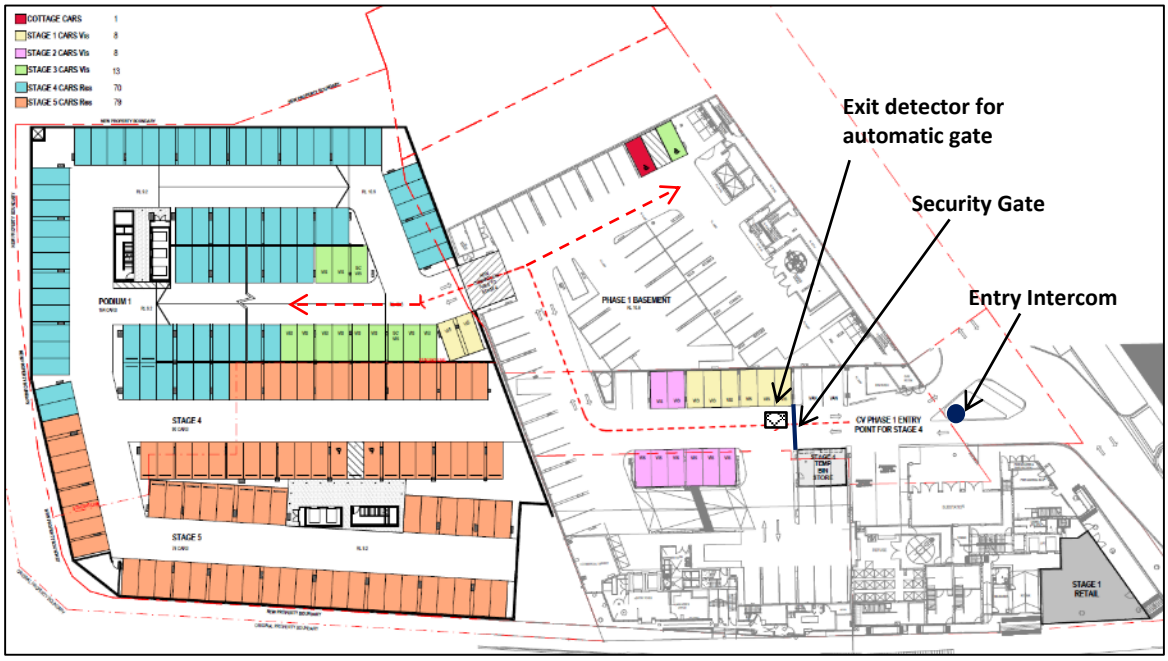


Figure 4.4: Stage 5 Visitor Parking Arrangements (Podium Level 1)

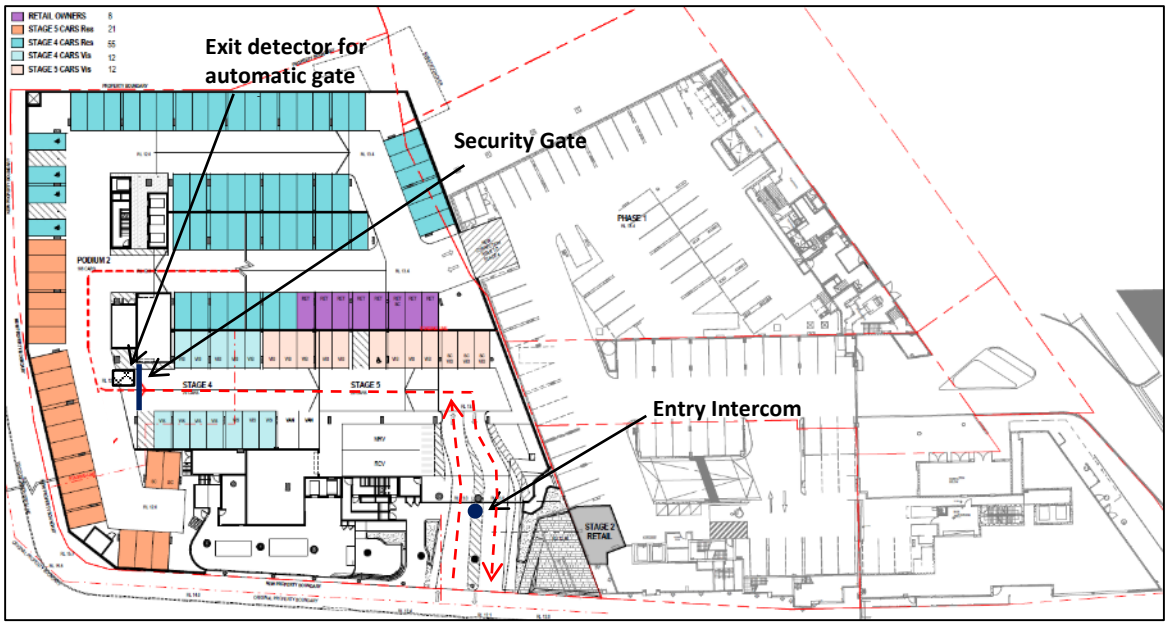


Figure 4.5: Stage 5 Visitor Parking Arrangements (Podium Level 2)

4.4. Proposed Car Park Design

The design of the Phase 1 parking areas was resolved in the previous development applications for these respective stages. The design of the components of the car park to be constructed as part of Phase 2 have been specifically assessed in this report.

The Australian Standard for Parking Facilities is adopted as the design standard for car parks in developments under the assessment of EDQ.

Table 4.5 identifies the characteristics of the proposed Phase 2 parking areas with respect to the requirements of the *Australian Standard for Parking Facilities, Part 1: Off-street car parking* (AS2890.1:2004) and *Part 6: Off-street parking for people with disabilities (AS2890.6:2009)*. The last column identifies the compliance of each design aspect.

Table 4.5: Phase 2 Car Park Design Criteria

Design Aspect	AS2890 Requirement	Proposed Provision	Compliance
Parking space length: • Residential bay (Class 1A) • Retail bay (Class 3) • Small car bay • PWD bay (Class 5)	5.4m (min) 5.4m (min) 5.0m (min) 5.4m (min)	5.4m 5.4m 5.0m (min) 5.4m	AS Compliant
Parking space width: • Residential bay (Class 1A) • Retail bay (Class 3) • Small car bay • PWD bay (Class 5)	2.4m (min) 2.6m (min) 2.3m (min) 2.4m (min) + 2.4m (min) 'Shared Area' next to space	2.4m 2.6m 2.3m (min) 2.4m + 2.4m 'Shared Area' next to space	AS Compliant
Parking Aisle Width	5.8m (min)	5.8m -6.4m	AS Compliant
Circulation Road/Ramps	5.5m (min) + clearance to walls	5.5m (min) + clearance to walls	AS Compliant
Parking envelope clearance - Column adjacent to bay	Located between 0.75m and 1.75m off aisle	All columns located between 0.75m and 1.75m off aisle	AS Compliant
Parking envelope clearance – space adjacent to wall	Space 0.3m clear of wall	Spaces 0.3m clear of wall	AS Compliant
Maximum Gradient: • PWD parking • Parking bay/aisle • Ramp • Ramp Transitions	1:40 (2.5%) 1:16 (6.25%) 1:4 (25%) 1:8 (12.5%) summit 1:6.7 (15%) sag	1:40 (2.5%) 1:16 (6.25%) 1:16 (6.25%) 1:16 (6.25%)	AS Compliant
Parking Aisle Extension	1m beyond last bay	1.0m beyond last bay, or provide "Reversing Zone" behind last bay	AS Compliant Refer to commentary below
Height Clearance: • General Min (incl. access to PWD bays) • Over PWD bay • Loading Dock (MRV/rear loading RCV)	2.2m (min) 2.5m (min) 4.5m (min)	2.2m (min) 2.5m (min) 4.5m (min)	AS Compliant Refer to commentary below.

The proposed car park layout generally complies with all design requirements of AS2890. Further commentary in relation to the proportion of small car spaces and height clearance is provided as follows.

Blind Aisle Extensions

Throughout the car parking areas blind aisles generally provide minimum 1.0m aisle extensions for the final parking spaces consistent with the provisions of AS2890. It is noted, however, that in the Stage 5 basement parking areas the angled layout of the car park results in end parking spaces without the full 1.0m aisle extension. In these instances, there is sufficient space at the back of the parking bay to allow vehicles to reverse out of the end space.

The swept paths for these typical end parking spaces are shown in TTM Drawing 13BRT0407-SK13 included in Appendix E

Given vehicles are able to enter and exit these parking spaces in a forward manner, similar to a typical end space, these alternative blind aisle treatments are also considered acceptable.

Minimum Height Clearance

The concept plans generally provide approximately 2.8m height clearance from floor-to-floor in the basement/podium car parking levels. Height clearance for the parking spaces in the urban common is generally unrestricted. Height clearance within the Stage 5 loading dock is a minimum of 4.5m, which is discussed further in Section 7.

With respect to the basement/podium car parking levels, detailed design of structure/roof mounted services is yet to be undertaken, however, these shall be done taking into consideration the general minimum 2.2m height clearance requirement plus the additional 2.5m requirement over the PWD spaces. It is proposed that services will be typically designed along the roof, particularly along the perimeter walls, which in this car park will typically be front ends (i.e. noses) of parking spaces. It is recognised that over PWD parking spaces, allowance for such services intrusions at the front of the space is permitted in accordance with Figure 2.7 of AS2890.6:2009. There is, however, no allowance for services intrusions at the front of standard/small parking spaces within AS2890.1:2004. As such, over many years TTM has developed a suitable intrusion zone allowance in conjunction with local authorities (particularly BCC) for standard parking spaces, which has been adopted in numerous multi-level car parking facilities throughout SEQ region. This alternative allowance is shown in Figure 4.6. It is therefore proposed that this intrusion zone allowance be implemented as an appropriate alternative solution for height clearance for standard/small parking spaces for the proposed development.

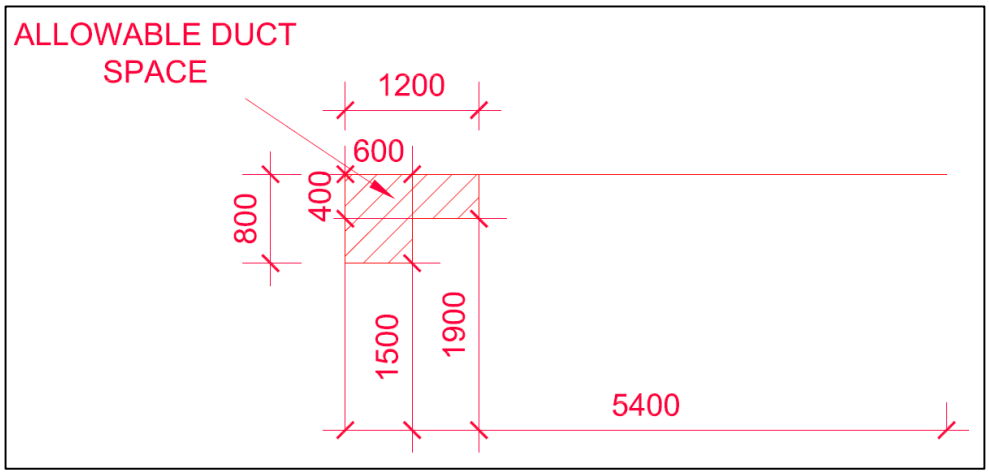


Figure 4.6: Acceptable Intrusion Zones for Services

Overall, the proposed car park layout generally complies with the requirements set out in AS2890 and is therefore considered acceptable.

5. Site Access Arrangements

5.1. Introduction

Given the size of the wider Central Village Master Plan, 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. As an alternative it was proposed to construct a new road fronting the site which would then allow multiple access points to be incorporated on both this new road and the existing Water Street. This new road, which is currently under construction, is Trinity Street. The design of Trinity Street was resolved in the previous development applications for Phase 1.

The revisions to Phase 2 result in the wider Central Village Master Plan providing a total of three access points onto the external road network; two for the Phase 1 precinct and one for the Phase 2 precinct. Phase 1 provides a main car park access and the internal roadway access (both onto Trinity Street) whilst Phase 2 provides a main car park access (onto Water Street).

A summary of the proposed access arrangements is shown in Figure 5.1.

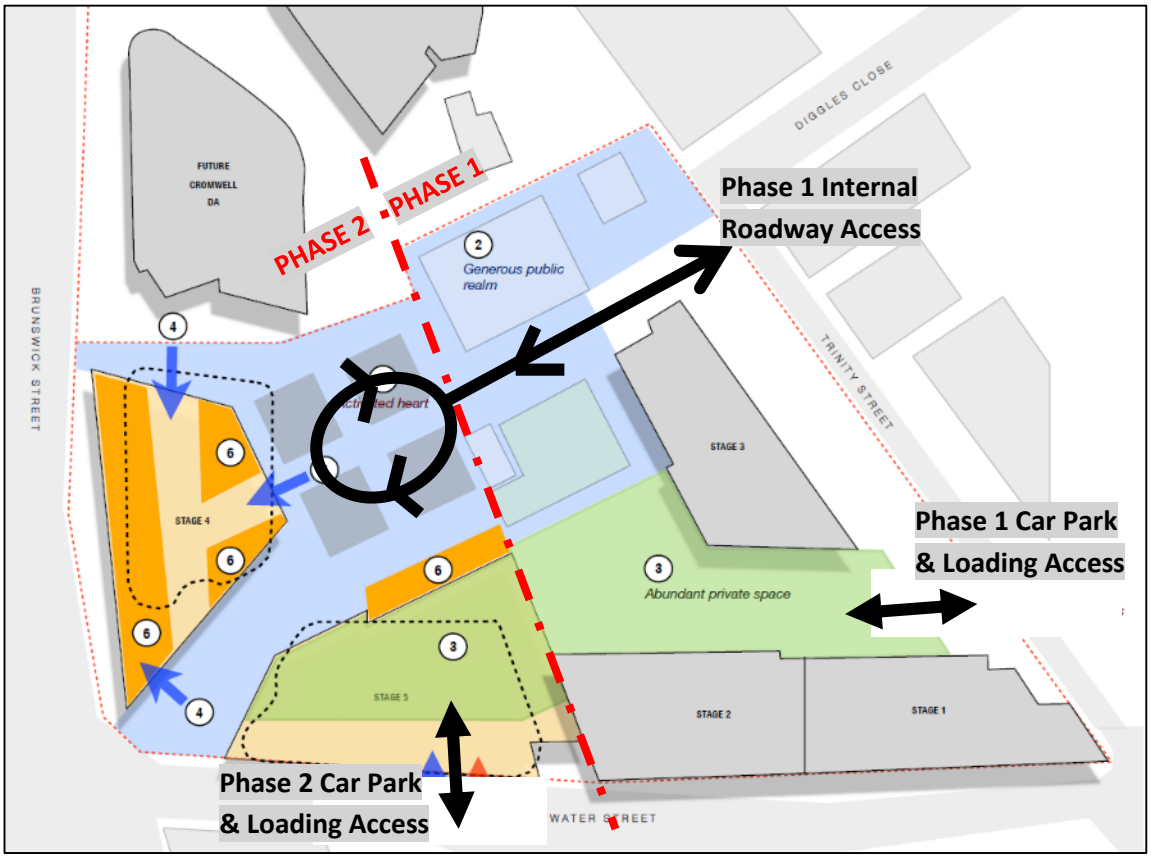


Figure 5.1: Site Access Arrangements Summary Map

The primary changes to the access arrangements for the revised Phase 2 scheme relate to the removal of the internal roadway/laneway which previously extended into Phase 2 and then connected to Water Street (running along the east side of Phase 2) which operated in a one-way manner. The revised Phase 2 scheme instead provides an internal roadway which terminates with a turnaround zone within Phase 2, with two-way movements through Phase 1 and entry/exit via the Trinity Street access. The added benefit of the removal of the laneway separating Phase 1 and 2 is that it has allowed for the internal car parks for each phase to be interconnected, essentially resulting in one combined internal car park over the full extent of the site. This will allow for improved accessibility for car park users, and added redundancy (for example, if there is a blockage at one of the access points, all car park traffic can utilise the alternative access point).

It is proposed that the new Phase 2 access will not be constructed until Stage 5, and in the interim all access to the new Stage 4 car park will be provided from the Phase 1 car park with access to Trinity Street.

Details of the characteristics of the various site accesses for Phases 1 and 2, and suitability of the proposed 'interim' access arrangements are detailed in the following sections.

5.2. Phase 1 Car Park and Loading Access

Vehicular access to the Phase 1 car park and loading area is gained through an all-movement site access onto the new Trinity Street located approximately 35m north of Water Street. This access is current complete and operating servicing the existing Stage 1 and 2 buildings.

The design of this access was resolved as part of the previous approvals for the earlier stages of the wider Central Village Master Plan. It was previously envisioned that the Phase 1 access will ultimately service the full Phase 1 car park (Stages 1, 2 and 3) which was to be completely separate from the Phase 2 car park.

Under the revised Phase 2 scheme, however, it is proposed the whole car park will be interconnected. In addition, as an interim solution at the completion of Stage 4 all access will be facilitated via this access point. The approved Phase 1 scheme provides a total of 368 parking spaces within the internal car parking areas. At completion of Stage 4, the car park access will service up to 675 parking spaces. The Phase 1 access was previously designed as a median separated, all-movements access which AS2890.1:2004 details is sufficient to service >600 low-turnover/Class 1A parking spaces from a local road. As such, the current design is still considered acceptable to accommodate the increased traffic demands of the Stage 4 car park traffic (as an interim solution) and also the ultimate scheme with the potential for more car spaces being serviced by this access. As is detailed further in Section 8.2, the Phase 1 car park access is expected to service up to 143vph (two-way) at completion of Stage 4 in the interim scenario and then ultimately up to 76vph (two-way) with traffic being more evenly split between the two car park access points.

Overall, the existing Phase 1 access provisions are still considered acceptable for the revised Phase 2 development scheme; including in the interim and ultimate scenarios.

5.3. Phase 1 Internal Roadway Access

The Phase 1 internal roadway access was approved as part of the previous Stage 3 as an all-movements entry and exit access. Under the previous Phase 2 scheme this was converted to a one-way (entry only) access arrangement. Under the revised Phase 2 scheme it is proposed this access will be converted back to an all-movements entry and exit access; given the internal roadway will no longer extend through to Water Street. This access will ultimately service up to 20 public parking spaces and setdown demands. The design of the access as part of the revised Phase 2 scheme is generally consistent with that proposed as part of the Stage 3 approval. This includes the access being provided in the form of a 6m wide driveway, which will be treated at the crossover point with Trinity Street to essentially form an intersection treatment with appropriate kerb returns on the corners to facilitate vehicle movements in and out of the driveway. As is detailed further in Section 8.2, the Phase 1 internal roadway access is expected to service up to 40vph (two-way) at ultimate completion; which the driveway access form is sufficient to accommodate.

Further to this, an assessment has also been conducted to confirm the sight distances at this driveway, which is depicted in an extract of the detailed civil road design included in Figure 5.2. As can be seen in Figure 5.2, a minimum of 55m sight distance is available to the south (down Trinity Street) and ~38m sight distance is available to the east (along travel path of Diggles Close) to the potential vehicle conflict point at the driveway. This satisfies the desirable 5-second gap (55m) and minimum 2-second gap (35m) sight distance requirements for a driveway onto a road with a design speed of 40km/hr as per AS2890.1:2004. These roads are classified as minor (local) roads under the BCC Road Hierarchy which have a maximum design speed of 40km/hr. With respect to the sight distance to the east (the direction where sight distance is partially restricted to the minimum requirements due to the road reserve/boundary alignments) it is also recognised that vehicles approaching from this direction will have to slow considerably to negotiate the tight bend/corner where Diggles Close meets Trinity Lane. As such, the speed at which vehicles will approach from this direction is expected to be much less than 40km/hr. For example, this corner has a radius of less than 10m. *Queensland Streets* indicates that the maximum negotiation speed for a car navigating a corner of this radii is 20km/hr. As such, this highlights the fact that the effective sight distance available in this direction (when considering this reduced vehicle operating speed) will be greater than the desirable 5-second gap equivalent sight distance; implying that vehicles exiting the driveway will have ample opportunity to observe conflicting traffic approaching from this direction and act accordingly.

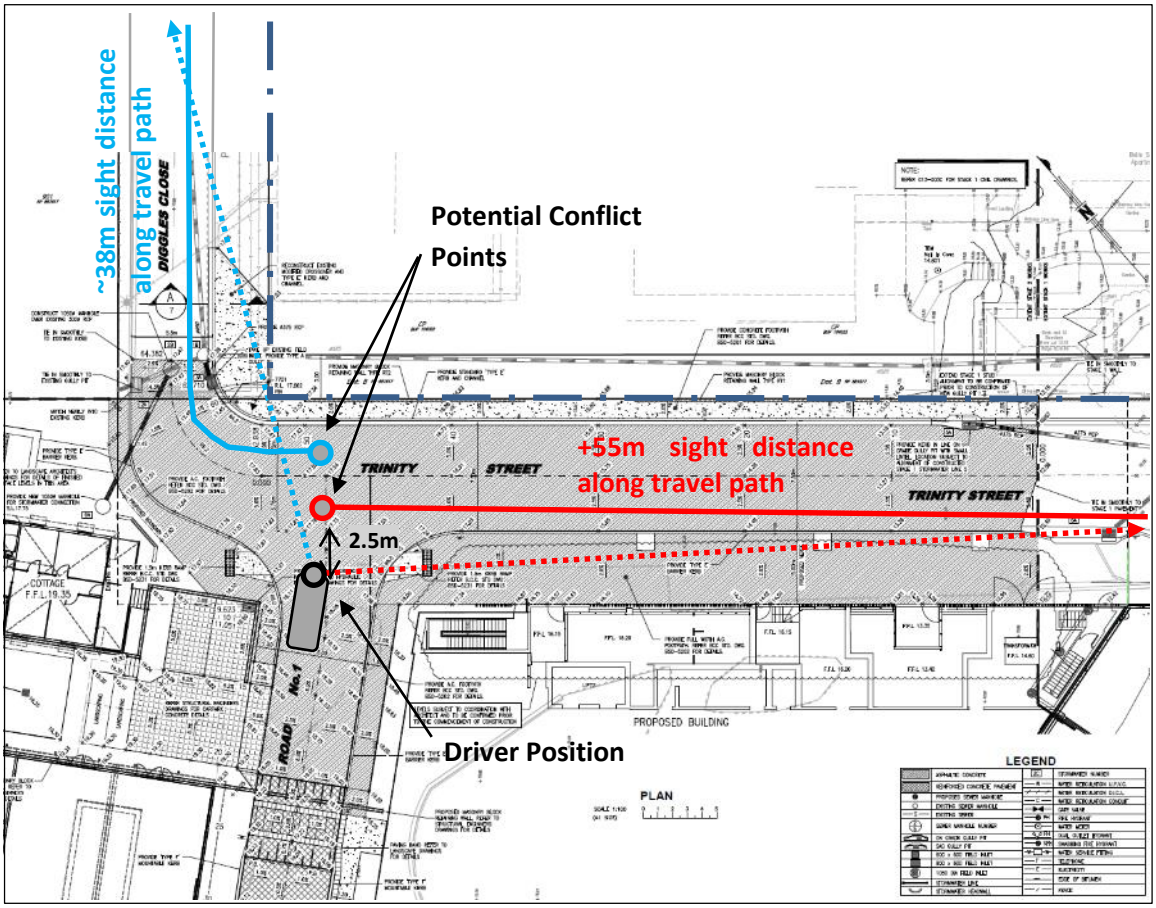


Figure 5.2: Sight Distance Assessment at Trinity Street Access

Overall, given the proposed new function of the Phase 1 internal roadway access is generally consistent with that which approved as part of Stage 3, and is still likely to accommodate similar vehicular movements, this is considered acceptable.

5.4. Phase 2 Car Park and Loading Access

Vehicular access to the Phase 2 car park and loading area is gained through an all-movement site access onto Water Street located approximately 50m east of the intersection with Brunswick Street. It is proposed that this access will be constructed in conjunction with Stage 5 of the development scheme.

This access will facilitate left-in/left-out traffic movements given the existing one-way nature of Water Street. TTM understands, however, 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.

Given this is a new access proposed as part of the revised Phase 2 scheme, the design has been assessed against the requirements of AS2890.1:2004. The key design parameters of this access and compliance with the respective AS2890.1:2004 requirements are set out in Table 5.1.

Table 5.1: Phase 2 Water Street Access Characteristics

Design Aspect	AS2890.1:2004 Requirement	Proposed Provision	Compliance
Crossover width	11.0-13.0m Category 3 Access^	12.0m Category 3 Access*	AS Compliant
Minimum distance intersection	6m from tangent point on kerb	~50m from Brunswick Street	AS Compliant
Sight distance	Ideally 69m, minimum of 45m	+50m to the west to the Brunswick Street / Water Street intersection, +100m to the east	AS Compliant
Entry queue capacity	9 vehicles (54m)^	4 vehicles (24m)	Alternative Solution. Refer to commentary below.
Driveway sight splays	2.0m wide x 2.5m deep	2.0m wide x 2.5m deep (minimum) on each side	AS Compliant
Gradient of first 6m	1:20 (5%)	1:20 (5%)	AS Compliant

^Based on the access servicing ~580 low-turnover, Class 1A parking spaces, and with access from a 'local road'

*Access will provide a BCC standard Type C2 crossover; with a 5.5m entry lane, 1.5m central median and 5.0m exit lane.

Based on a design speed of 50km/h on Water Street.

As can be seen in Table 5.1, the proposed access arrangements generally comply with Australian Standards requirements, except for the internal queuing provisions which is discussed further below.

Internal Queuing Capacity

The proposed access provisions provide a clear internal queuing distance of 4 vehicles between the property boundary and first internal conflict point/intersection (that being the start of the visitor parking area). With respect to entry queue capacity, it is noted that the car parking areas accessed from this driveway will be low-turnover residential parking spaces. As detailed further in Section 8.2, it is expected that the peak inflow into the Phase 2 site access will be at most 81vph when Stage 5 is complete. The probability of more than 4 vehicles entering the site at the same time (or say within a 30 second period) and all requiring to queue within the site, extending back onto Water Street, is less than 1%. This is based on the 'Poisson Distribution' equation for queuing theory, as outlined in the *Austroads Guide to Traffic Management Part2: Traffic Theory*. The proposed internal queuing capacity is sufficient to cater for the 99th percentile entry queue of the site, and is therefore considered acceptable.

It should also be noted that the queuing requirements specified in AS2890.1:2004 (derived from Table 3.3) primarily relate to the requirements at short-stay car parking facilities (e.g. city centre parking, parking stations, hospital and medical centres) and its application in this instance is not considered a mandatory design requirement.

Notwithstanding this, for comparison purposes it is noted that a short-stay car parking facility with approximately 110 spaces is likely to generate an equivalent peak inflow of 80vph (based on peak inflow of up to 75% of parking capacity), the same as the Phase 2 access. The minimum queuing provision under Table 3.3 of AS2890.1:2004 for a 110 space car parking facility would be 3.2 vehicles (which would round up to 4 vehicles). As such, the proposed internal queue provision of 4 vehicles for the Phase 2 access is considered acceptable based on the rationale behind the requirements detailed in AS2890.1:2004.

It is also recognised that a similar level of queuing provisions was approved for the previous Phase 2 development scheme; although in this instance the queuing capacity was set by the location of security lines/boom gates. In the revised Phase 2 scheme the security gate is located much further within the site with the queuing provision of 4 vehicles being the first internal intersection at the start of the visitor parking spaces. As such, in a practical sense the internal queuing provisions of the revised Phase 2 scheme (despite the access now servicing slightly more parking spaces than previously approved) is an improvement on the previous approved scheme.

Based on the above information, the internal queuing provisions are considered acceptable.

5.5. Conclusion

Overall, the proposed access arrangements for the Central Village Master Plan site generally comply with Australian Standards requirements and are therefore considered acceptable.

6. Internal Roadway and Urban Common

As part of the approval for Stage 3 of the Central Village Master Plan, a proposed internal roadway is to be constructed on the northern side of the site connecting with the new Trinity Street. This roadway is to be constructed in part as part of Stage 3 works to facilitate access to the at-grade parking spaces provided adjacent to the Heritage Drill Hall and to allow future connection with Phase 2 of the site. As part of the previous Phase 2 approval, this roadway was proposed to extend through the site with a secondary access to Water Street and operate in a one-way manner. Through the rationalisation of the Phase 2 development scheme, the internal roadway no longer is proposed to extend to Water Street put rather provide an at-grade urban common with parking and a setdown area. As such, the internal roadway as part of the revised scheme will operate in a two-way manner, with turnaround within the urban common on Phase 2.

The general arrangements of the internal roadway and urban common are detailed in Figure 6.1.

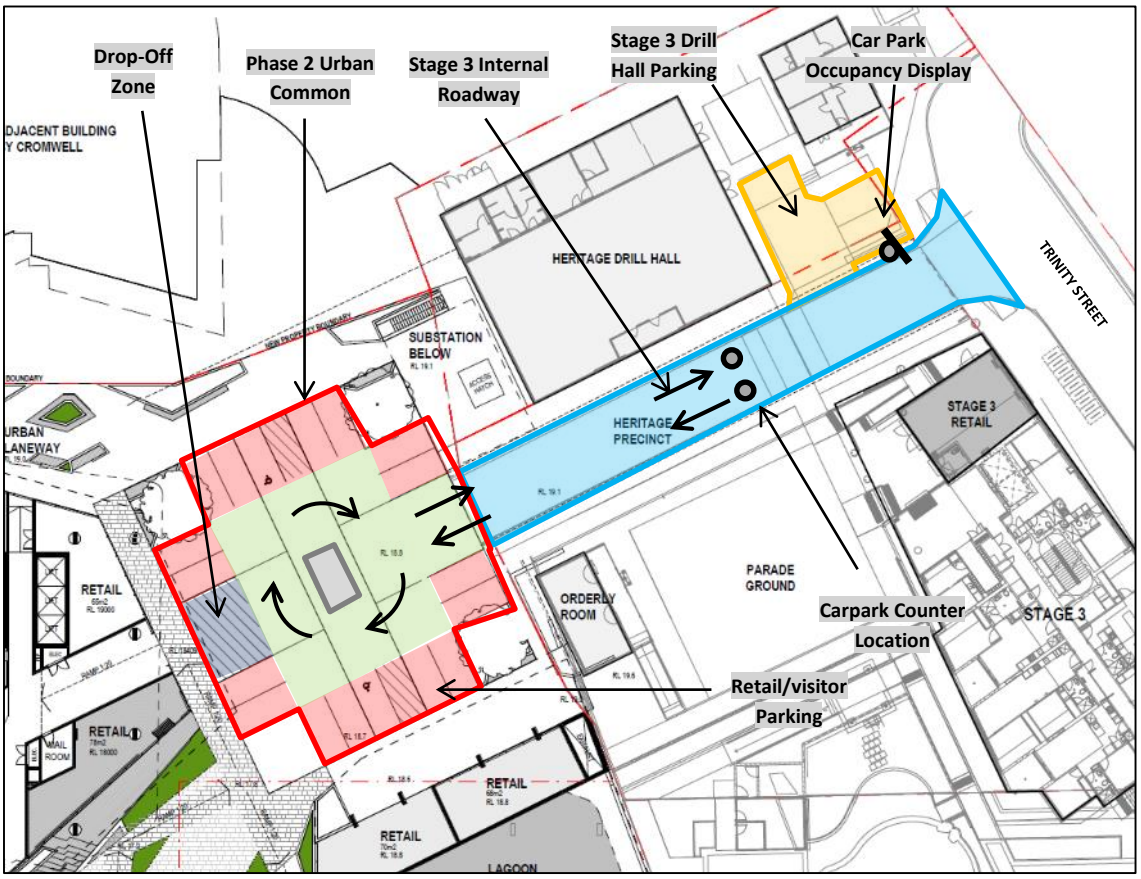


Figure 6.1: Proposed Internal Roadway and Parking/Setdown Provisions

As recommended by EDQ, it is proposed that a car park counter device will be installed at the entry point to the internal roadway, with an associated digital display visible from Trinity Street, to allow for vehicles to identify if there are vacant parking spaces within the urban common. A copy of the performance brief for this system is included in Appendix D.

It is proposed that the internal roadway and urban common will be designated as a 10km/h 'shared zone' and treated to appear as a private road with flush kerbs, alternative pavement treatments and other features.

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. It is also proposed that bollards will be located along the thresholds of the internal roadway and urban common to separate/delineate the shared zones from the pedestrian only zones.

As noted in the UK's Department for Transport's (DFT's) *Manual for Streets* the underlying philosophy of shared zones, is that streets can function better where users negotiate priority and movement with one another, rather than obeying fixed rules set by the local authority. These shared zones work because the need to negotiate causes drivers to travel slowly, and others to watch out and make eye contact before proceeding. In order to achieve this, shared zones typically involve the removal (or absence) of road markings, signage and physical limitations on movement such as kerbs.

The DFT observe that shared area techniques were first developed in the Netherlands. "The Kaden-Torenstraat junction in Drachten accommodates flows up to 17,000 vehicles and 2,000 cyclists and pedestrians per day, with no priority other than two pedestrian crossings. Initial data suggests that this scheme has reduced collisions compared to the seven years prior to installation (when the junction was controlled by conventional traffic signals)".

Figure 6.2 shows the Kaden- Torenstraat intersection in Drachten.

Similar situations where shared zone treatments have been provided within the Brisbane locality are the Logan Road Antiques Precinct in Woolloongabba (as shown in Figure 6.3), Chinatown Mall in Fortitude Valley (as shown in Figure 6.4), Main Drive at QUT Gardens Point (as shown in Figure 6.5) and Albert Street in Brisbane City (as shown in Figure 6.6).

Figure 6.2: Kaden-Torenstraat Intersection in Drachten

Figure 6.3: Shared Zone – Logan Road Antiques Precinct in Woolloongabba

Figure 6.4: Shared Zone - Chinatown Mall in Fortitude Valley **Source: Google Images**

Figure 6.5: Shared Zone – Main Drive at QUT Gardens Point **Source: Google Images**

Figure 6.6: Shared Zone - Albert Street in Brisbane City **Source: Google Streetview**

Signage will be introduced at the entry point to the internal road at Trinity Street in order to delineate this as a private and no-through road. Overall, it is anticipated that the internal roadway will be very lightly trafficked with it realistically only servicing the 20 at-grade publicly accessible parking spaces and access to the setdown area.

It is recognised, however, that in the interim (prior to completion of Stage 5) this internal roadway may also facilitate occasional service vehicles up to the size of a Medium Rigid Vehicle (MRV). Refer to further details in relation to this interim servicing provisions in Section 7.

The two-way roadway has a minimum width of 6.0m (as approved as part of Stage 3), which then widens out to the urban common. It is proposed this urban common will operate in a one-way manner with clockwise circulation of vehicles around the central island to turnaround, access the parking spaces or pull over in the drop-off area. The minimum roadway width around the central island is 6.0m which is also sufficient for one-way vehicle movements and also manoeuvring from the angle parking spaces. TTM Drawing 13BRT0407-SK14 included in Appendix E shows that the urban common has sufficient space to allow a B99 vehicle to circulate around the central island in a single continuous movement clear of the designated parking spaces and setdown area.

Overall, the proposed internal roadway and urban common for the revised Phase 2 scheme are considered acceptable.

7. Service Vehicle Provisions

7.1. Introduction

Phase 1 provides a dedicated loading area immediately within the site off Trinity Street which provides loading provisions for 2 Van bays, 1 Medium Rigid Vehicle (MRV) bay and 1 Refuse Collection Vehicle (RCV) bay. This was previous resolved as being sufficient for Phase 1, which included primarily residential uses and minimum amounts of retail uses.

It is noted that there are no specific loading bay requirements for residential developments indicated in either the BHUDA Development Scheme, Australian Standard for Parking Facilities or the BCC Brisbane City Plan 2014. With respect to the amount of retail/centre activities floor space proposed for Phase 2 (686m²), the BCC Brisbane City Plan 2014 recommends loading provisions of 1 Van bay, 1 SRV bay and 1 MRV bay.

7.2. Anticipated Service Vehicle Demands

Regardless of the above information, it is generally considered more acceptable that the service vehicle needs of Phase 2 be resolved on a 'first principles' basis, considering the likely demands for respective site uses.

It is generally expected that the service vehicle demands of the revised Phase 2 will include the following:

- Daily deliveries of small goods and consumables for the retail/centre activities tenancies, generally in Vans and SRVs.
- Occasional residential furniture/removalist delivery trucks. Based on the size of the units (with most units being smaller 1 and 2 bedroom configurations) it is expected that these vehicles will be limited to no greater than a MRV.
- Occasional larger delivery vehicles for the retail/centre activities tenancies, also up to the size of a MRV.
- RCVs related to the retail/residential uses. These vehicles will generally be rear-loading trucks, with the largest possible variant of these trucks operated by BCC Waste Services (specific for residential refuse collection, with retail collection by private contracts using smaller vehicles) which are up to 10.3m long.

Based on the above information, it is expected that there is need for multiple service vehicles on-site simultaneously, with the largest service vehicle (the 'design' service vehicle) being the 10.3m rear-loading RCV.

7.3. Proposed Service Vehicle Provisions

7.3.1. Overall Phase 2 Provisions

As part of the revised Phase 2 development scheme it is proposed that a new loading area will also be provided with provision for 2 Van bays, 1 MRV bay and 1 RCV bay. This number of bays is greater than the recommended provisions of BCC for the retail uses.

In relation to additional demands generated by residential uses (and also refuse collection functions) it is proposed that a management strategy will be implemented to control the timing of all service vehicles accessing the loading area. This will involve the building manager coordinating with residents, retail tenants and refuse contractors to develop an appropriate schedule of servicing; to ensure no overlap of significant servicing demands at different periods of the day. With respect to residential furniture removals, it is expected that these would be 'booked-in' by residents/tenants with the manager who will allocate 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. It is noted that a similar management scheme is already in place for the operating Stages 1 and 2, with the building manager indicating that furniture delivery demands for the existing residential units occurs approximately 5 times a week at most.

Given the number of units and retail uses within Phase 2 it is expected that regular refuse collection will occur and so a dedicated RCV bay is warranted; similar to in Phase 1. Given the refuse collection times/periods is usually scheduled, the RCV bay can also be used as an additional loading bay for residential deliveries/furniture removals outside of collection times.

With the implementation of this management scheme for Phase 2 (and to incorporate retail & refuse demands), TTM consider that all service vehicle demands of Phase 2 can be appropriately accommodated within this loading area.

The Phase 2 loading area provides sufficient space for all service vehicles to manoeuvre into/out of the respective loading bays, allowing entry and exit from Water Street in a forward direction. TTM Drawing 13BRT0407-SK09 provided in Appendix E shows the respective swept paths of the design RCV and MRV manoeuvring in and out of the loading bays. The Van bays, located off the main visitor parking aisle will allow manoeuvring for smaller vehicles in a similar manner to the typical parking spaces. The height clearance within the Phase 2 loading area is also proposed to be a minimum of 4.5m, satisfying the requirements for MRV (4.5m minimum) and rear-loading RCV (3.6m minimum) access.

To provide further details on how the Phase 2 loading area and internal driveway will be delineated, TTM has also provided a concept signs and line marking plan which is detailed in TTM Drawing 13BRT0407-SK10 in Appendix E.

The overall Phase 2 service vehicle provisions are considered acceptable.

7.3.2. Interim Stage 4 Provisions

As the Phase 2 loading area will not be constructed until Stage 5, it is noted that in the interim there will be no formal loading area within Phase 2 at the completion of Stage 4. As an interim solution, it is proposed that Stage 4 service vehicle demands will be accommodated in the following manner:

- Stage 4 building refuse will be manually transferred to a new temporary bin store room adjacent to the existing Phase 1 loading area, with refuse to be collected in this location similar to refuse for Phase 1. It is understood that the currently operating Stages 1 and 2 have refuse trucks visiting 3 times a week (i.e. Monday, Wednesday and Friday). With the completion of Stages 3 (and temporary refuse collection of Stage 4) also being accommodated in Phase 1 it is expected that refuse collection frequency will likely occur daily in future, which is considered can be accommodated given a designated RCV loading bay is provided within the Phase 1 loading area.

- Residential furniture and retail deliveries for Stage 4 will be accommodated within the Phase 1 loading area, scheduled by the respective building managers in the same manner as Phase 1 residential furniture deliveries. Access from the Phase 1 loading dock to the Stage 4 lift core will then be possible through the internal car parking area for transportation of goods. Based on the current furniture delivery demands of Stages 1 and 2 being only up to 5 times a week (so once a day on weekdays), at the completion of Stages 3 and 4 (with the quantum of residential units increasing from 325 units to 806 units) it is likely that furniture delivery demands could increase to 2-3 times a day. Regardless, these demands are considered can still be accommodated within the Phase 1 loading dock (which provides 2 loading bays, when including the RCV bay) through the on-site booking system.

- In the event that the Phase 1 loading area is likely to be occupied, there is also an alternative option for service vehicles is to utilise the setdown area in the urban common. It is proposed that not all the parking spaces within the urban common will be allocated at the completion of Stage 4, providing two zones on the west and north sides of the urban common for informal use by service vehicles. In addition, it is proposed that construction of the central planter/island in the middle of the urban common will be delayed until Stage 5 completion to allow easy access for service vehicles to each of the proposed temporary parking zones. TTM Drawing 13BRT0407-SK14 included in Appendix E shows the swept path of a MRV accessing and standing within each of the zones clear of all other parking spaces. Regadless, it is proposed that service vehicle access to the urban common will be strictly controlled with the building managers to ensure that generally only one service vehicle will use this area at any given time; so the frequency of two large trucks being within the area simultaneously will be very uncommon.

Based on the above information, the proposed interim service provisions at the completion of Stage 4 (prior to construction of the dedicated Phase 2 loading area) will operate suitably.

7.4. Conclusion

Overall, the service vehicle provisions for Phase 2 are considered sufficient in the interim and ultimate scenarios with provision for a new loading area as part of Phase 2.

8. Road Network Performance

8.1. Traffic Generation

The Transport Roads & Maritime Service (TMRS) *Guide to Traffic Generating Developments* indicates that the peak hour trip generation characteristics of high density residential developments at metropolitan centres is between 0.07 - 0.32 trips/unit in the weekday AM peak-hour and between 0.06 - 0.41 trips/unit in the weekday PM peak-hour. The guide also provides traffic generation as a function of parking spaces, which equates to 0.09-0.29 trips/space in the weekday AM peak hour and 0.05-0.28 trips/space in the weekday PM peak hour. To validate the rates given in the TMRS document, TTM conducted traffic surveys of the existing completed Stage 1 and 2 buildings on Wednesday 9th September and Thursday 10th September 2015. These surveys captured the peak inflow and outflow of traffic during the morning and evening peak hour periods. Recent external intersection surveys at the Brunswick Street / Water Street intersection indicate the morning and afternoon road peak hour periods are 7:30-8:30am and 4:30-5:30pm.

Given that Stages 1 and 2 of Central Village comprise a high proportion of units without an allocated parking space (and therefore not generating vehicular trips), it was considered more appropriate to assess the traffic generation as a function of parking spaces. As detailed in Table 2.1, Stages 1 and 2 provide a total of 206 parking spaces for residential uses.

A summary of the traffic generation of Stages 1 and 2 during the road peak hour periods is shown in Table 8.1.

Table 8.1: Central Village Stage 1 & 2 – Surveyed Peak Hour Traffic Generation

Survey Day	AM Peak Hour (7:30-8:30am)		PM Peak Hour (4:30-5:30pm)	
	Total Movements	Traffic Gen (per parking space)	Total Movements	Traffic Gen (per parking space)
Wednesday 9th September	39 vph (27 out/12 in)	0.19vph/space	51 vph (17 out/34 in)	0.24vph/space
Thursday 9th September	50 vph (37 out/13 in)	0.25vph/space	30 vph (14 out/16 in)	0.18vph/space
Average	**0.21 vph/space**			

As can be seen in Table 8.1, the average peak hour traffic generation of the operating Stages 1 and 2 is 0.21vph per parking space. This falls within the range detailed within the TMRS guide. As such, this is considered a reasonable expectation for traffic generation of Stages 3 to 6.

It is also recognised that the development scheme includes provision for office and retail parking in addition to resident parking. TTM's experience of office (and staff) parking within inner city areas is that these spaces generate approximately 0.6vph in peak hour periods (i.e. 60% of the parking spaces turnover during the peak hour periods).

Similarly, the retail uses likely to be provided within the site would be expected to entail a mixture of food and drink (i.e. restaurants, cafes), boutiques or showroom uses; with TTM's experience suggesting that these parking spaces will on average generate 2vph per space in weekday peak hour periods (i.e. each parking space will turnover once with 1 entry and 1 exit movement during the designated peak hour).

Based on the above assumed turnover rates for the various car parking uses provided on-site, the estimated development traffic generation of development scheme is shown in Table 8.2.

Table 8.2: Central Village Peak Hour Traffic Generation Estimate

Development Component	No. of Spaces	Traffic Gen Rate	Peak Hour Trips
Phase 1 (Stages 1, 2 and 3)	367 spaces (res) 1 spaces (office) 2 spaces (retail)	0.21 vph/space (res) 0.6 vph/space (office/staff) 2.0 vph/space (retail)	**82 vph**
Stage 4	302 spaces (res) 12 spaces (staff) 8 spaces (retail)		**87 vph**
Stage 5	249 spaces (res) 7 spaces (retail)		**66 vph**
Total Development	**948 spaces**		**235 vph**

For reference, when the surveyed average traffic generation of Stage 1and 2 is applied to the full Phase 1 scheme (which results in a traffic estimation of 82vph) it is noted that this results in a traffic generation estimate on the lower range of what was estimated in the previous TTM Traffic Engineering Reports prepared for these development applications. For example, as detailed in the Stage 3 TTM Traffic Engineering Report, the overall traffic generation of Phase 1 was expected to be between 85-135vph.

Overall, the traffic generation estimation of the Central Village Master Plan is still generally consistent with previous expectations, regardless of any increase to on-site parking supply.

8.2. Traffic Distribution

The development peak hour traffic distribution on the surrounding road network was determined for the development scheme at the completion of Stage 4 (when all access is provided via the existing Phase 1 car park entry point) and Stage 5 (at full completion) using the following generic assumptions:

- An in/out split for residential development traffic of 30%/70% in the AM Peak and 70%/30% in the PM Peak, consistent with the results of the surveys of Stage 1 and 2 traffic movements.
- An in/out split for office development traffic of 80%/20% in the AM peak, and 20%/80% in the PM peak.
- An in/out split for retail traffic of 50%/50% in both peak hours

With respect to the more specific characteristics of the distributions, the following assumptions were made for interim scenario at the completion of Stage 4 (total of 169vph):

- All residential traffic will utilise main car park entry to Trinity Street, whilst retail traffic will utilise the internal roadway/urban common access at the northern end of Trinity Street (near Diggles Close).
- All vehicles entering the main car park entry will 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.
- Traffic entering the internal roadway/urban common access will come evenly with 50% from Diggles Close (from northern approaches) and 50% from Trinity Street (from southern approaches).
- 60% of vehicles exit to the south from Trinity Street access, and 40% to the north. Out of all the vehicles exiting to the south, 50% head south along Baxter Street and 50% turn right into Constance Street. Out of all the vehicles exiting to the north, 70% turn right onto Gregory Terrace to head east and 30% turn left to head west.

Figure 8.1 shows the assumed distribution of inbound and outbound traffic at the interim completion of Stage 4.

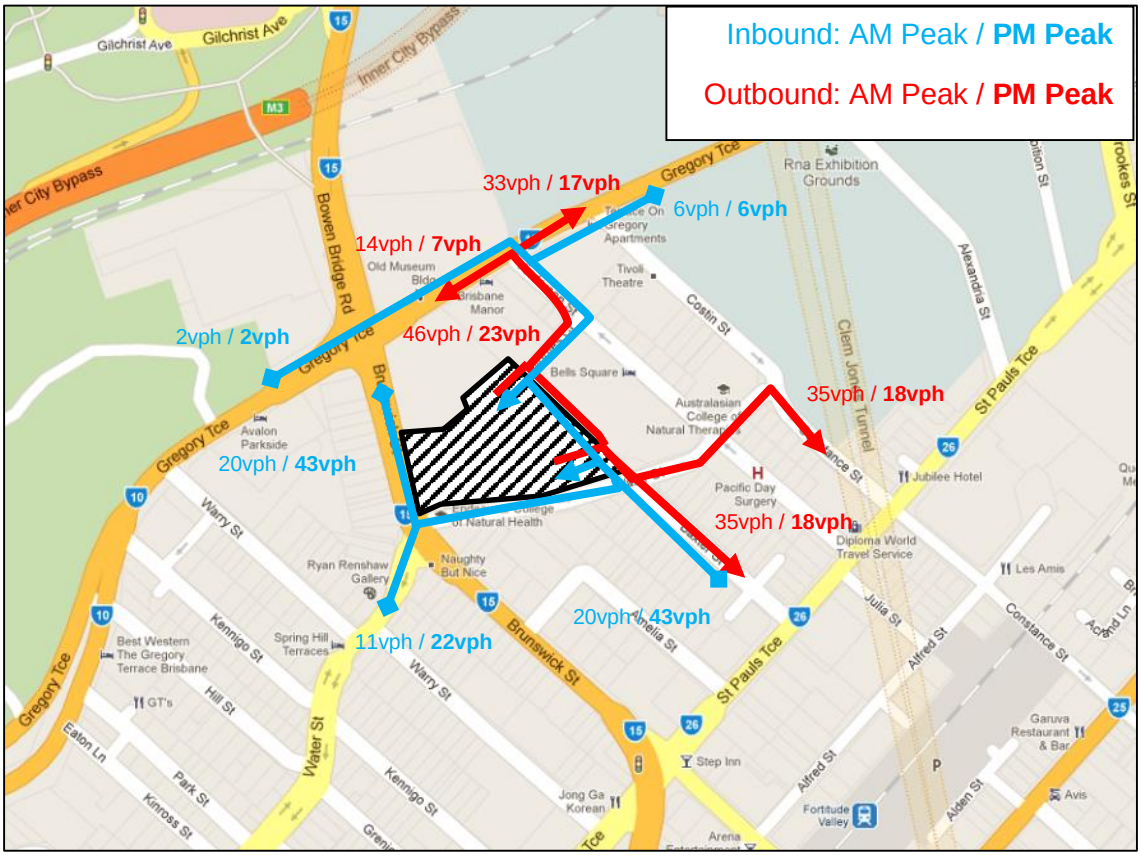


Figure 8.1: AM/PM Movements Peak Hour Traffic Volumes at Stage 4 Completion

At ultimate completion (full 235vph traffic generation), the following new assumptions were made for the re-distribution of development traffic with the new access point provided onto Water Street and interconnectivity of the car parking areas:

- Residential traffic will utilise both car park access points to either Trinity Street (Phase 1 car park access) or Water Street (Phase 2 car park access), whilst retail traffic will utilise only the internal roadway/urban common access at the northern end of Trinity Street.
- 40% of residential traffic would enter/exit via the Phase 1 car park access and 60% will enter/exit via the Phase 2 car park access to Water Street.
- All residential traffic entering Phase 1 access would come from Baxter Street, whilst 70% of the traffic entering the Phase 2 access will come from the north approach of Brunswick Street and 30% from Water Street.
- 60% of residential traffic will route towards the south (i.e. St Pauls Terrace) when exiting and 40% route towards the north (i.e. Gregory Terrace). Out of all the vehicles exiting to the south, 50% head south along Baxter Street and 50% turn right into Constance Street. Out of all the vehicles exiting to the north, 70% turn right onto Gregory Terrace to head east and 30% turn left to head west.
- Traffic entering the internal roadway/urban common access will come evenly from with 50% from Diggles Close (from northern approaches) and 50% from Trinity Street (from southern approaches).

Figure 8.2 shows the assumed distribution of inbound and outbound traffic at the completion of Stage 5 (representing the ultimate completion of the Central Village Master Plan).

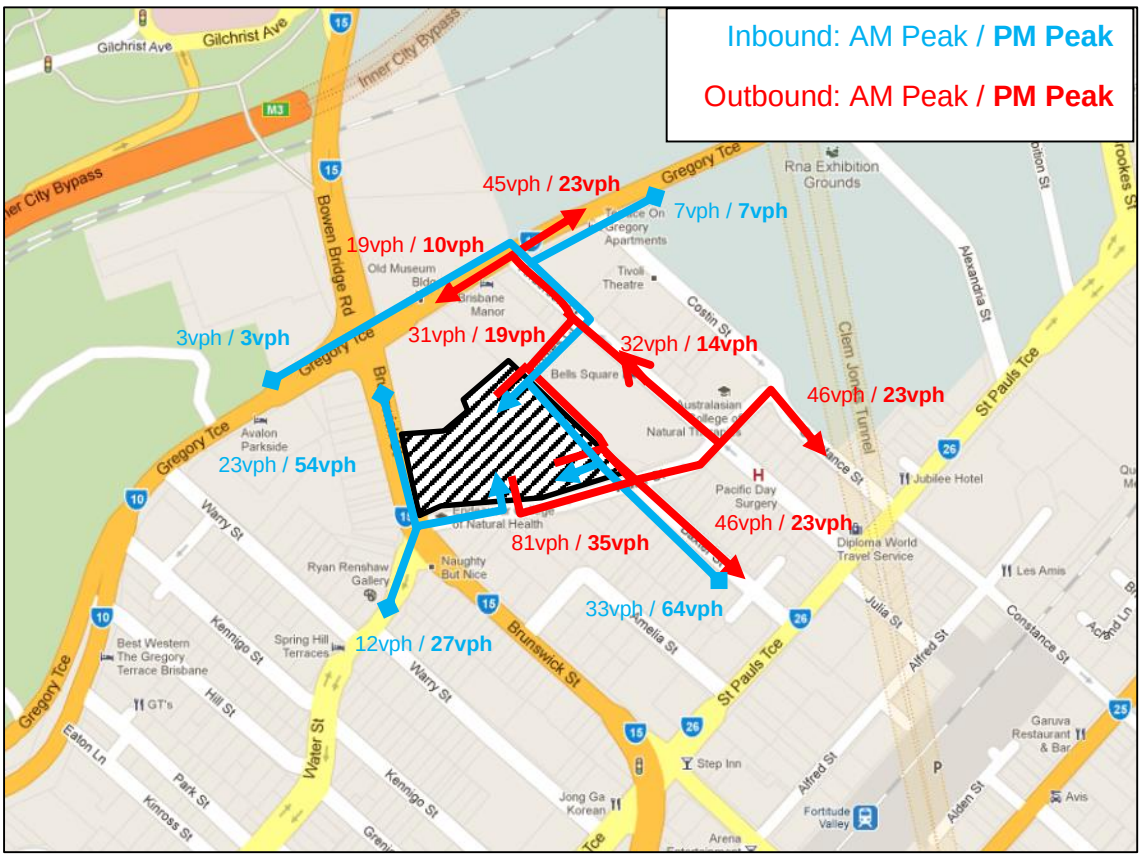


Figure 8.2: AM/PM Movements Peak Hour Traffic Volumes at Stage 5 Completion

8.3. Development Impacts

It should be noted the 'Bowen Hills Traffic Model' – which was developed by TTM for the former ULDA to assess the area wide road network performance and impacts of the various development projects within the Bowen Hills UDA – previously used generic traffic generation rates for the site of the proposed Central Village development.

This was based on assumed land redevelopment yields and maximum plot ratios specified in the former 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. 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 1,038 units (and peak hour generation of 244vph). Whilst it is understood that EDQ are in the process of updating the 'Bowen Hills Traffic Model' given that the proposed revised scheme with 1,055 units provides an anticipated traffic generation of 235vph, TTM considers the results are still valid for comparison purposes.

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 1,055 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 the former ULDA.

A copy of the Road Modelling and Impacts Analysis Letter prepared by TTM (TTM Ref. '27703let_traffic model update', dated 20th June 2012) is included in Appendix F.

8.4. Two-Way Conversion of Water Street

The future road planning activities summarised in Figure 3.1 show a conversion of Water Street to two-way flow is proposed between Brunswick Street and Anderson Street/ Misterton Street. Road widening and two-way conversion works along the full section of roadway 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 (to facilitate two lanes at the intersection approach).

The remaining section between Baxter Street and Anderson Street / Misterton Street was converted to two-way flow as part of Stage 2 of Central Village.

9. Active Transport

9.1. Public Transport

As indicated previously the subject site enjoys a high level of connectivity to the public transport network.

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.

9.2. Pedestrian Access

Phase 2 of the wider Central Village Master Plan provides a number of key pedestrian access provisions, including:

- Main pedestrian entry at the corner of Brunswick Street / Water Street up into the Level 1 urban common and primarily building entry point to Stage 4.
- A new pedestrian connection on the north side of the site between Brunswick Street and the Level 1 urban common.
- Direct access to the Stage 5 building lobby/entry point from Water Street.
- Internal linkages through to Phase 1, including through to Trinity Street and Diggles Close.
- Provision for new pedestrian connections on the north side of the site aligned with the connection points for the future redevelopment of the adjacent property at 527 Gregory Terrace.

All internal pedestrian access provisions are designed to provide equitable access for persons with disabilities, including ramps, hand rails, lifts, etc.

Overall, the revised Phase 2 scheme provides a high level of pedestrian accessibility and connectivity with surrounding provisions.

9.3. Cyclist Provisions

The BHUDA Development Scheme requires 1 resident bicycle space per unit plus 1 visitor bicycle space per 400m² GFA. In terms of the non-residential uses, employees are to have 1 bicycle space per 200m² NLA with 1 visitor space per 1000m² NLA.

Based on the approved bicycle parking provisions for Stages 1 -3, the wider Phase 1 of the development will provide a total of 634 bicycle parking spaces.

The bicycle parking requirements for Stage 4 and Stage 5, and the respective provisions proposed, are shown in Table 9.1 and Table 9.2.

Table 9.1: Stage 4 Bicycle Parking Requirements

Parking Component	Parking Rate	Proposed Extent	Bicycle Parking Requirement	Proposed Provision
Residential (Tenant)	1 space per unit	301 units	301 spaces	301 spaces
Retail (Employee)	1 space per 200m² GFA	447.5m² GFA	3 spaces	3 spaces
Residential (Visitor)	1 space per 400m² GFA	18,348m² GFA	46 spaces	47 spaces
Retail (Visitor)	1 space per 1,000m² GFA	447.5m² GFA	1 space	
TOTAL			**351 spaces**	**351 spaces**

Table 9.2: Stage 5 Bicycle Parking Requirements

Parking Component	Parking Rate	Proposed Extent	Bicycle Parking Requirement	Proposed Provision
Residential (Tenant)	1 space per unit	234 units	234 spaces	234 spaces
Retail (Employee)	1 space per 200m² GFA	142.5m² GFA	1 space	1 spaces
Residential (Visitor)	1 space per 400m² GFA	14,604m² GFA	37 spaces	38 spaces
Retail (Visitor)	1 space per 1,000m² GFA	142.5m² GFA	1 space	
TOTAL			**273 spaces**	**273 spaces**

Overall, the proposed bicycle provisions for Stage 4 and Stage 5 will be provided in accordance with the requirements of the BHUDA Development scheme. This will be provided generally as follows:

Resident and Employee Parking

- 167 secured resident/employee parking spaces in the form of bicycle racks within the internal car parking levels.
- 372 secured resident parking spaces in the form of hooks that allow the bicycles to be mounted/stored vertically (with wheels against wall). These hooks will be located within either vacant spaces/corners of the car park or adjacent to the parking spaces essentially along the line marking separating each parking space in an unobtrusive manner (providing a secure bicycle space for the respective unit which the parking space adjacent is allocated to). The bicycles mounted adjacent to the parking spaces will work appropriately as the resident can move their car if needed to mount/dismount the bicycle from the hook.
- Primary access to these spaces will be via the resident elevators from the main lobby points. Alternatively, ride up access is also possible from the internal car parking aisles with entry and exit from the main car park access points (i.e. Trinity Street in interim at completion of Stage 4 and Water Street at the completion of Stage 5).

Visitor Parking

- 36 visitor parking spaces (in the form of bicycle racks) will be provided on the Level 1 urban common for easy use by retail and residential visitors. Access to these parking spaces is via either the internal roadway/urban common from Trinity Street or walk up access from the various pedestrian access points to the urban common from surrounding footpaths.
- 49 visitor parking spaces (in the form of bicycle racks) will be provided in podium 2 level within the car park, with direct access from the main car park entry/exit point to Water Street.

With respect to access and usage of internal roadways/parking aisles by cyclists it is proposed that formal cyclist lanes/signage will be designated at the Phase 2 car park entry to Water Street. The typical treatment of this internal driveway is shown in the proposed signage and line marking plan TTM Drawing 13BRT0407-SK10 included in Appendix E. Beyond the main driveway, it is then proposed that all areas throughout the car park will be signed as a 10kph 'shared zones' and as such all users will enjoy equal priority. The gradients of the ramps within the various car parking levels align with the requirements set out in the *National Construction Code* (NCC) and *Austroads Part 14 – Cyclists* and permit access by both pedestrians and cyclists.

Overall, Phase 2 will provide a total of 624 bicycle parking spaces, which when added to the approved 634 spaces provided for Phase 1 equates to a total bicycle parking provision of 1,258 spaces.

10. Summary and Conclusions

10.1. Car Parking Arrangements

The proposal includes 948 parking spaces within the wider Central Village Master Plan; including 370 spaces approved as part of the Phase 1 and 578 spaces proposed as part of the revised Phase 2 scheme.

The 578 spaces as part of Phase 2 include 322 spaces for Stage 4 and 256 spaces for Stage 5. This includes resident parking at rates generally consistent with the BHUDA Development Scheme and additional retail/centre activity parking on the ground flood urban common to assist with accessibility and success of these proposed uses. The Phase 2 parking supply includes a total of 9 PWD spaces, split between resident, residential visitor and retail uses. Overall, the proposed parking provisions for Phase 2 are considered acceptable in the context of anticipated demands and overall provisions for the wider Central Village Master Plan scheme and BHUDA Development Scheme.

Detailed design of the basement car park for Phase 2 has been undertaken in accordance with the requirements of AS2890.1; albeit with some minor performance solutions which have been demonstrated by TTM to be acceptable.

10.2. Development Access

The revised Phase 2 scheme results in the wider Central Village Master Plan development providing a total of three access points onto the external road network. This includes a car park access point to Trinity Street and an additional access to the internal roadway/urban common from Phase 1 (already approved), and an additional car park access point to Water Street as part of Phase 2. The Phase 1 and 2 car parks will become fully interconnected ultimately, providing two access points for the wider combined internal car park. These arrangements are considered satisfactory in providing a high level of accessibility to the site and cater for the anticipated travel demands associated with the development, including an interim solution at completion of Stage 4 where all car park access is provided from the Trinity Street access. The proposed new Phase 2 access is designed generally in accordance with the requirements of AS2890; however, an alternative solution is proposed with respect to queuing capacity which has been deemed acceptable.

10.3. Service Vehicle Arrangements

The revised Phase 2 scheme provides a dedicated loading area accommodation 2 Van bays, 1 MRV bay and 1 RCV bay. This is provided in addition to the approved loading area (of similar size) as part of Phase 1.

The Phase 2 loading area is proposed to be constructed in conjunction with Stage 5, with interim servicing provisions for Stage 4 prior to this construction involving usage of the Phase 1 loading area (which has sufficient spare capacity to accommodate increased service vehicle demands) and usage of the internal roadway/urban common setdown area for informal service vehicle parking.

Overall, the service vehicle provisions for Phase 2 in the context of the wider Central Village Master Plan are considered to be sufficient to service the demands of the development.

10.4. Development Traffic Impacts

The impact of the whole Central Village Master Plan as 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 former ULDA.

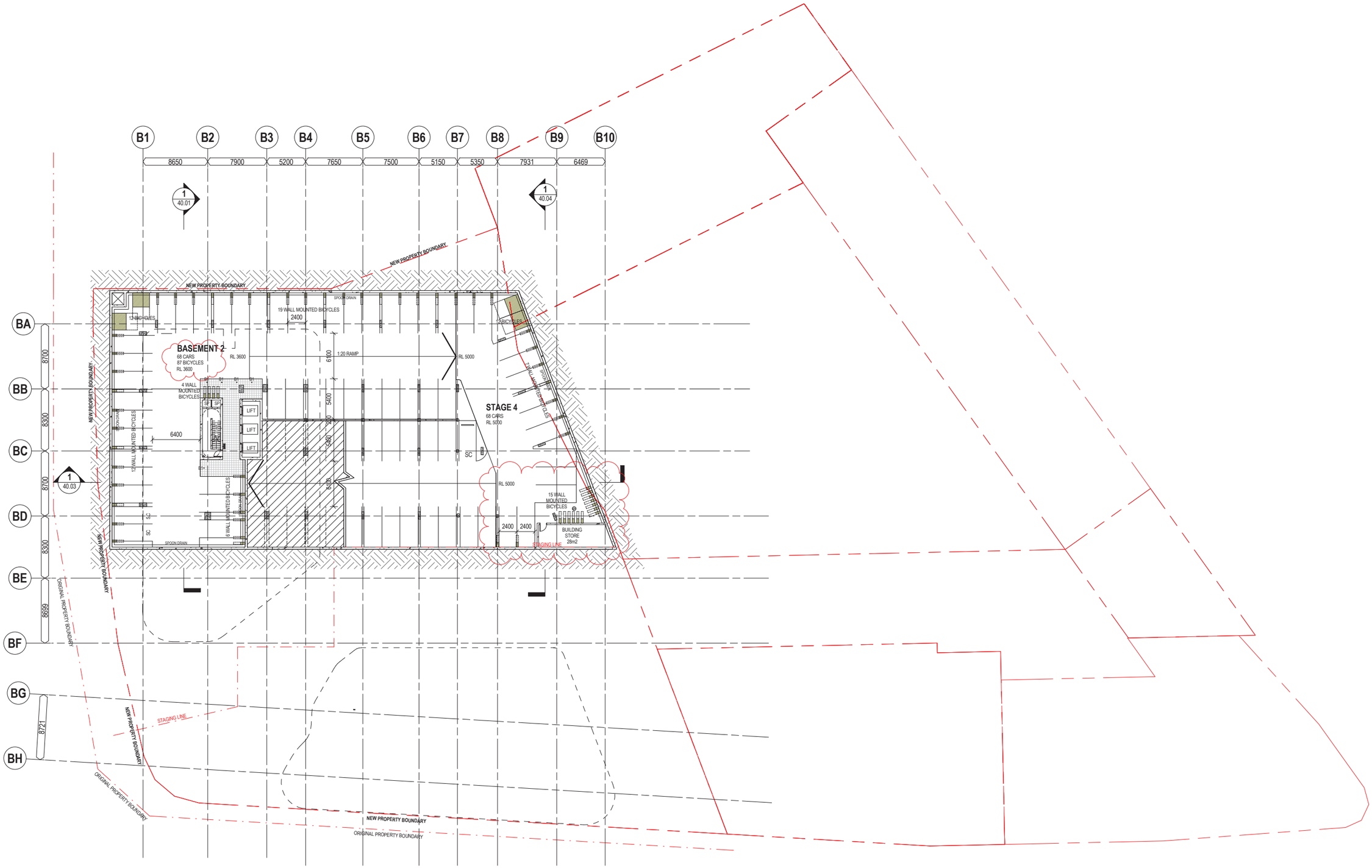
10.5. Active Transport

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.

The revised Phase 2 scheme provides a high level of internal pedestrian accessibility and connectivity with the surrounding footpath network.

1,258 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. Based on the approved bicycle parking provisions for Stages 1 -3, the wider Phase 1 of the development will provide a total of 634 bicycle parking spaces. The revised Phase 2 scheme will incorporate a total supply of 624 bicycle parking spaces, split between resident, employee and visitor use; consistent with the requirements of the BHUDA Development Scheme.

Appendix A Central Village Master Plan Phase 2 Development Plans



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1	PRELIMINARY CO-ORDINATION	20.11.15

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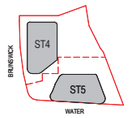

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PROJECT ARCHITECT	NL	
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SCALE: 1 : 250 [A1]

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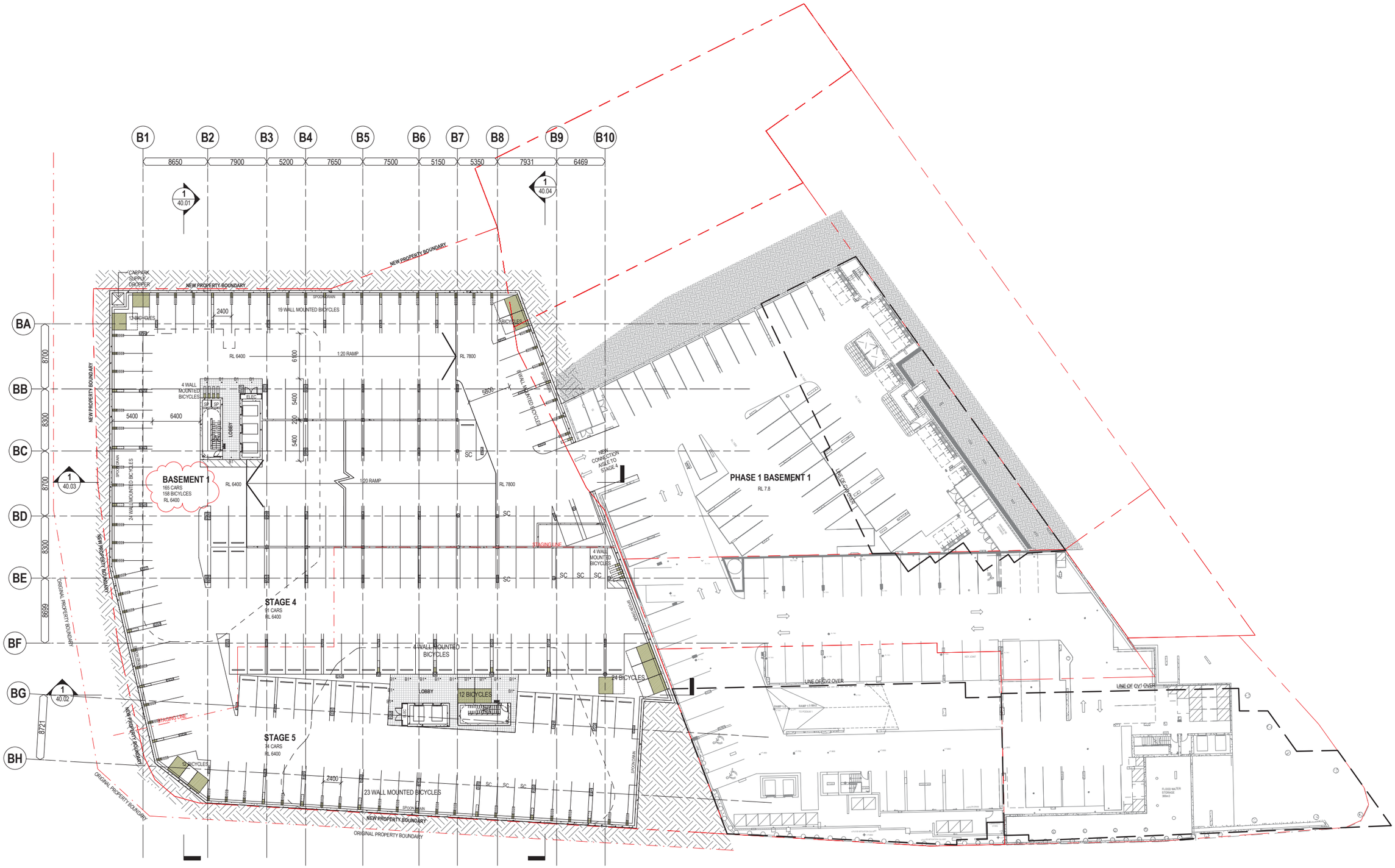

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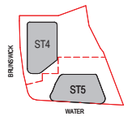

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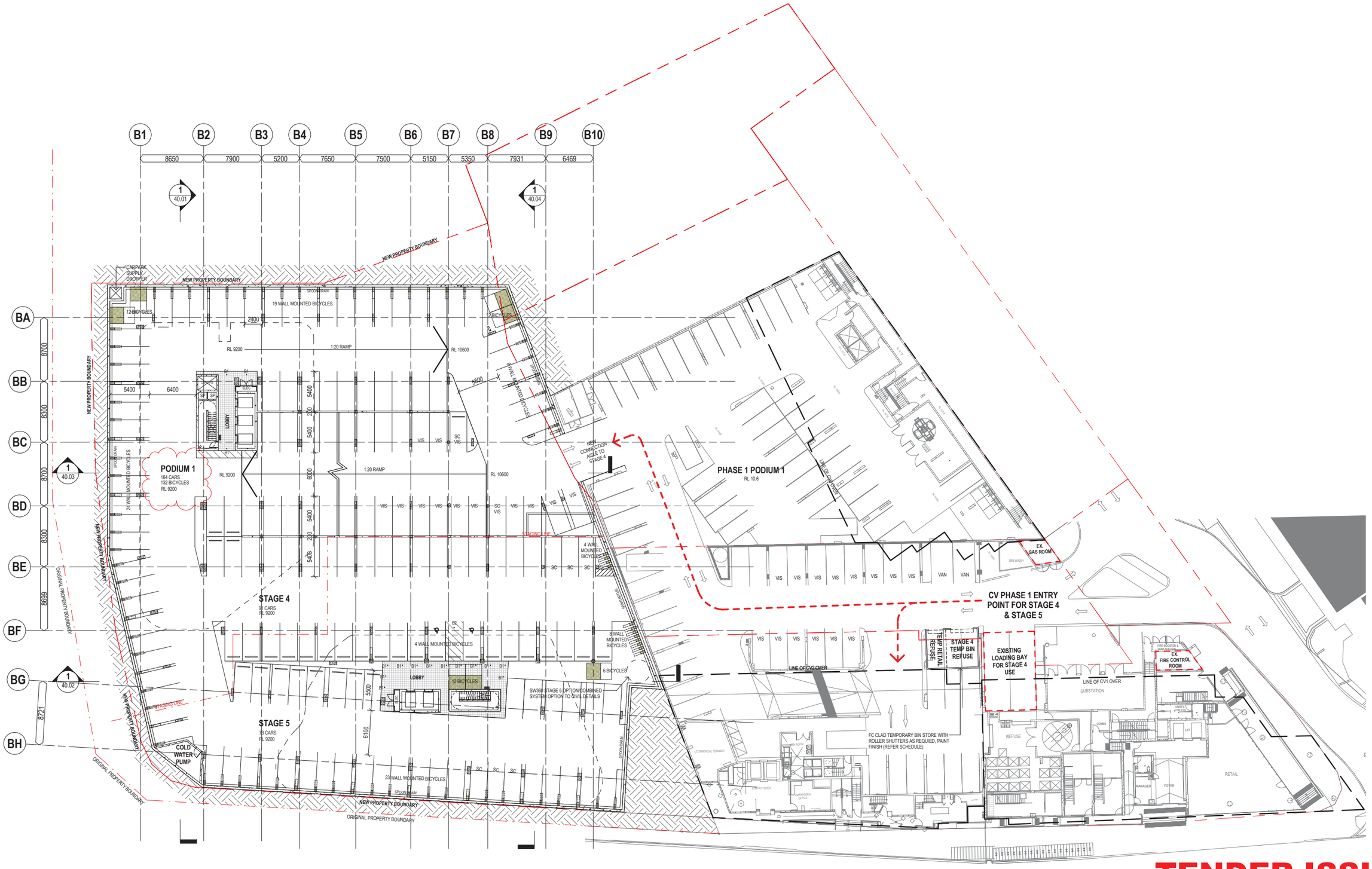

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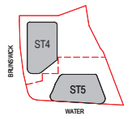

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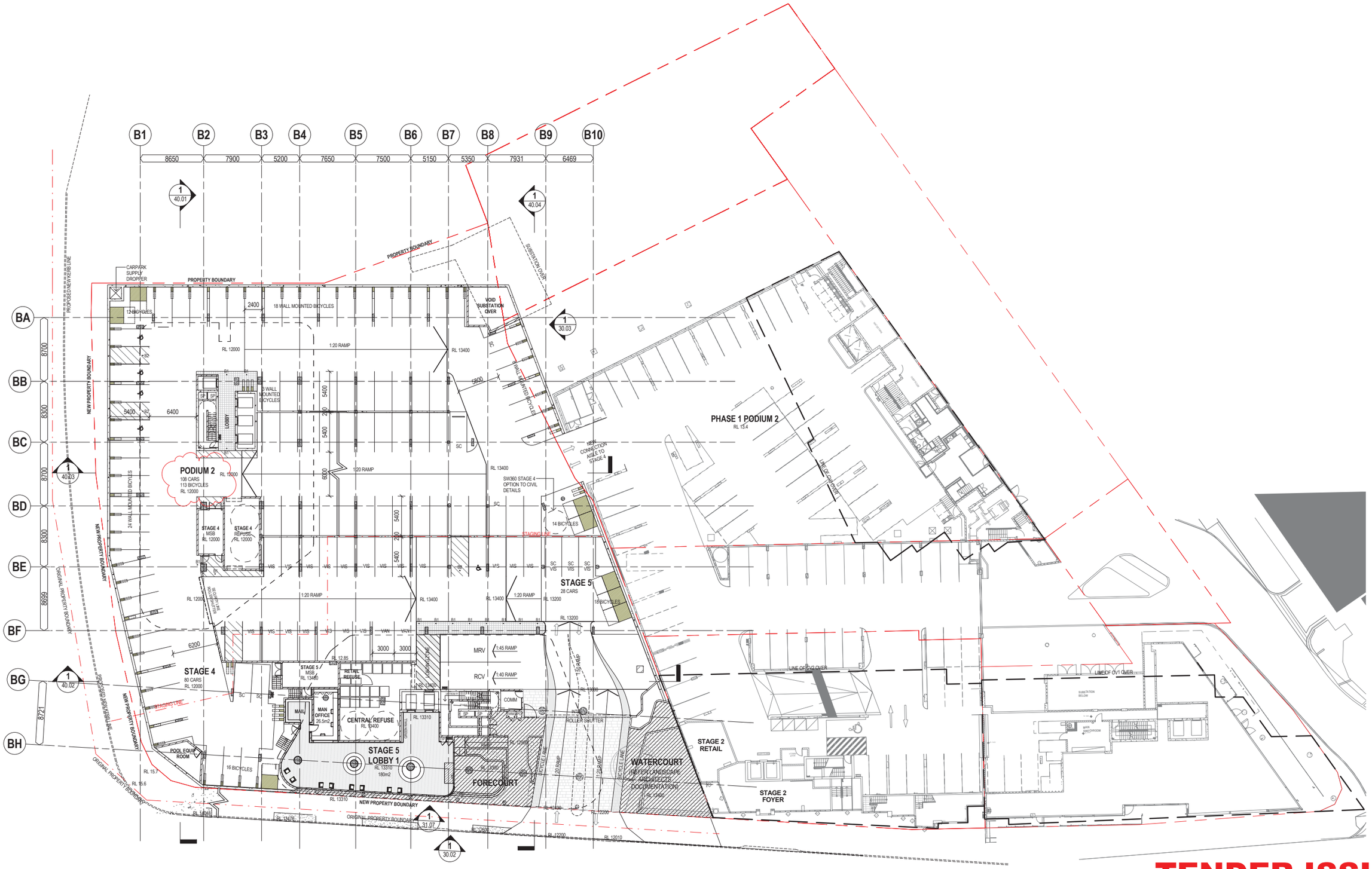

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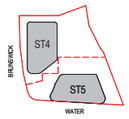

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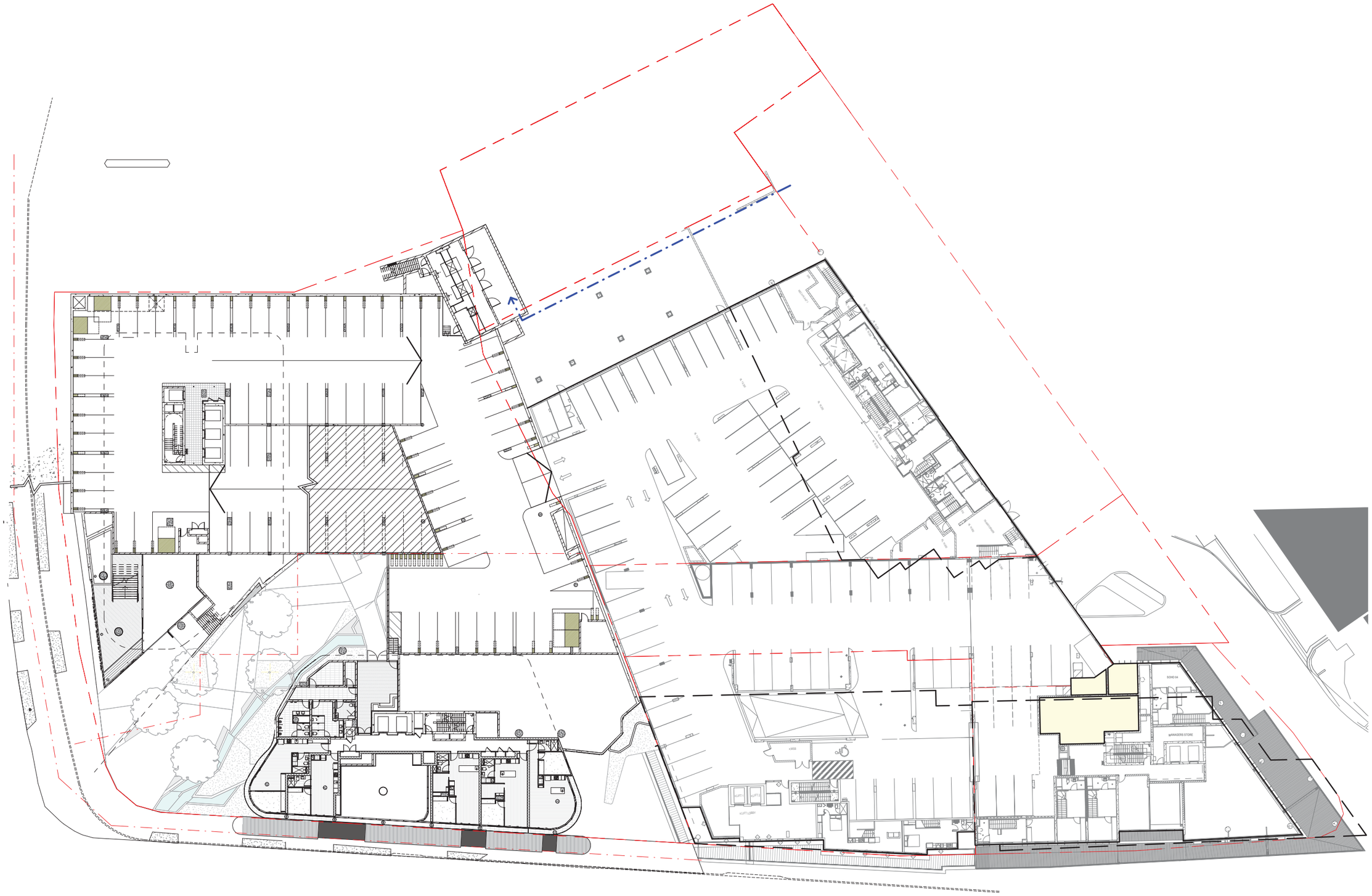
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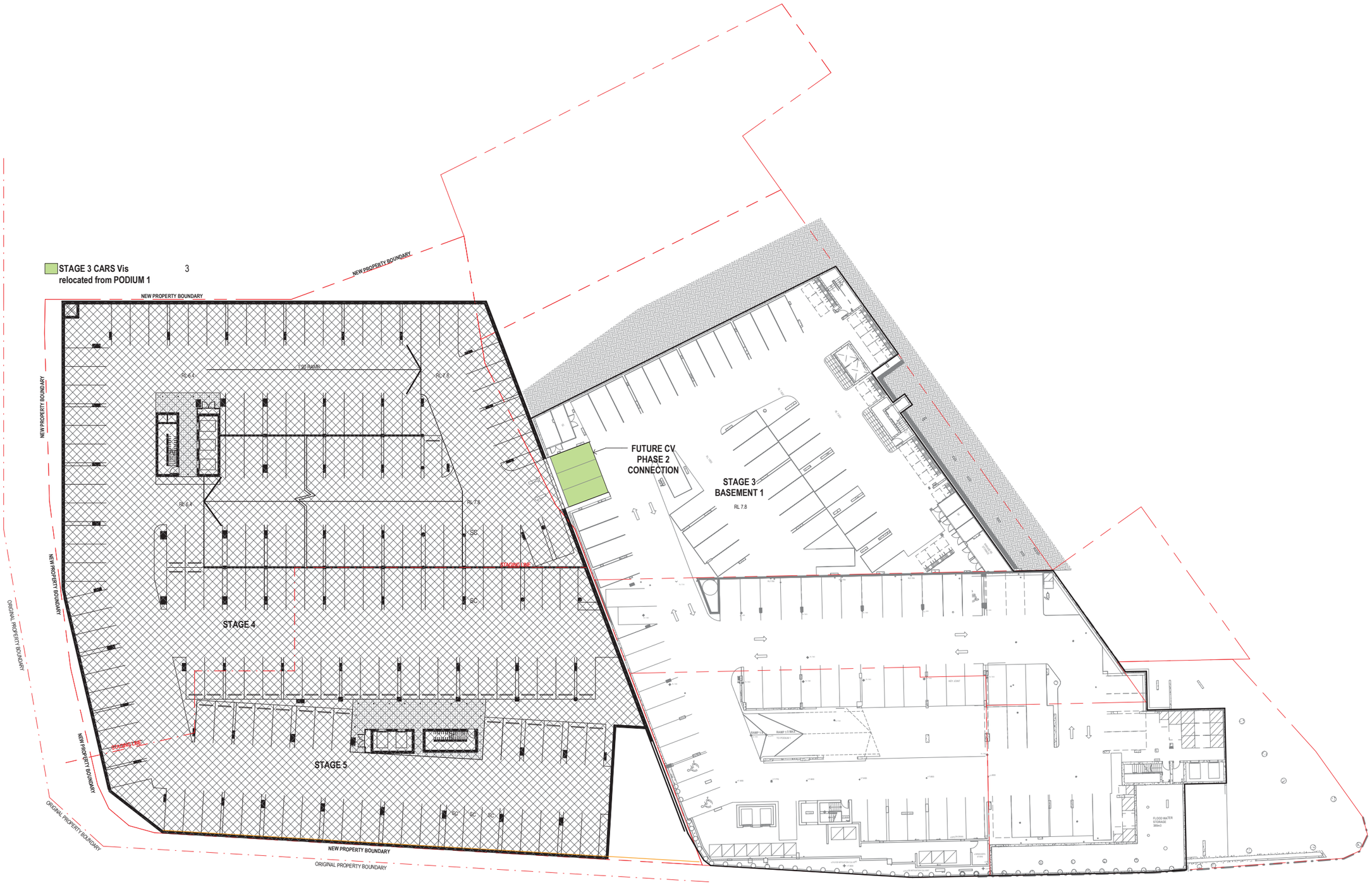

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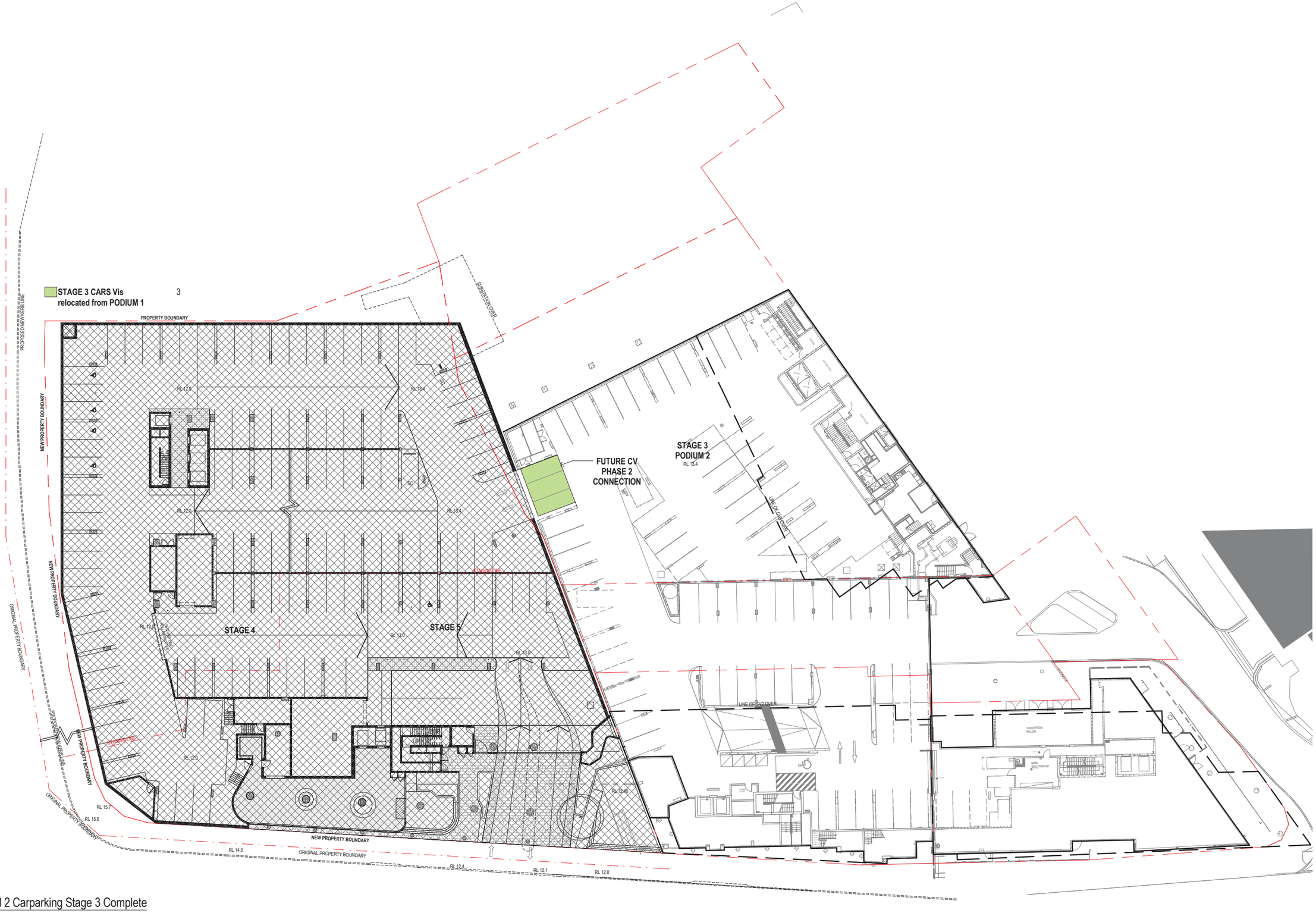

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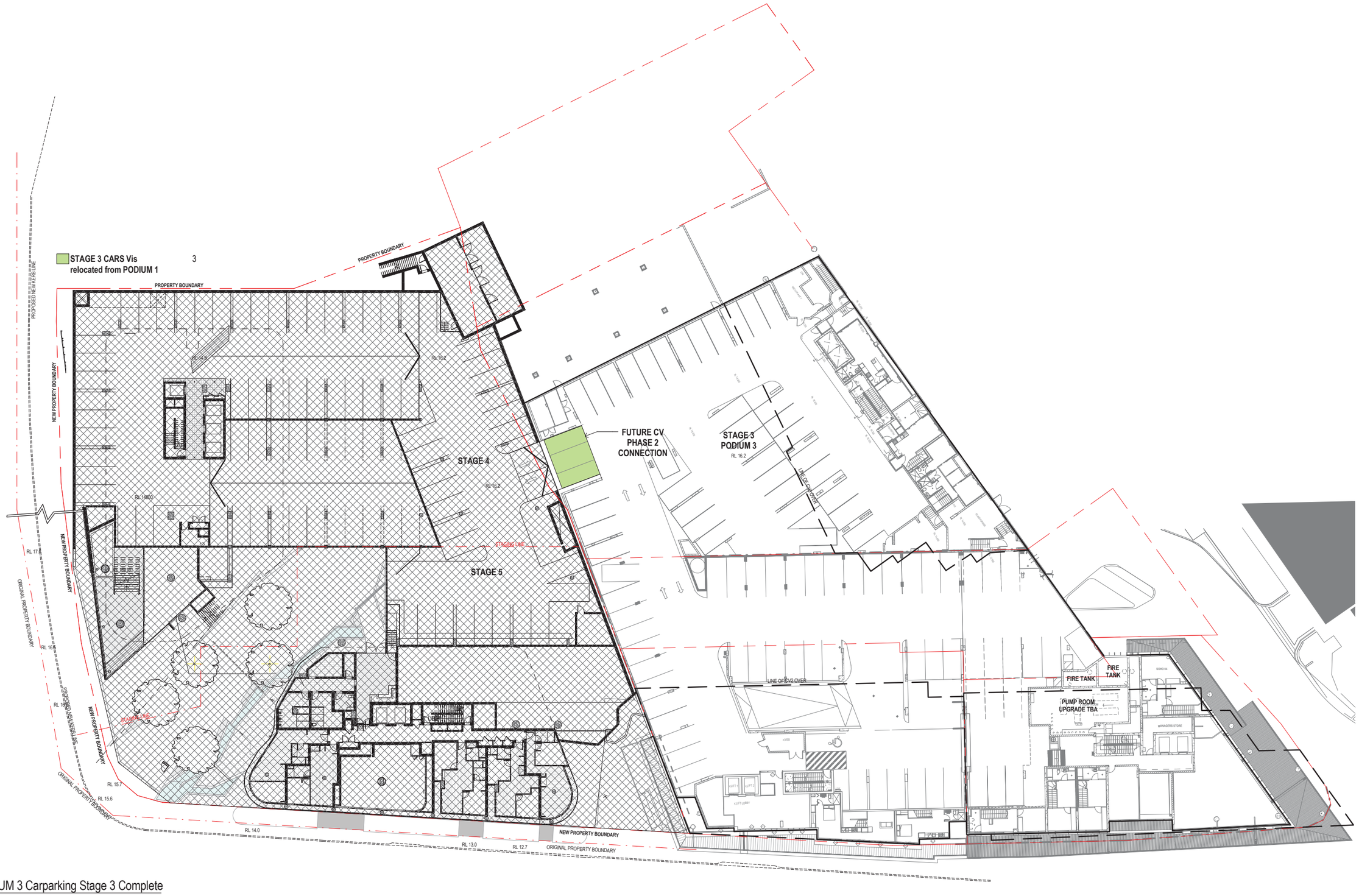

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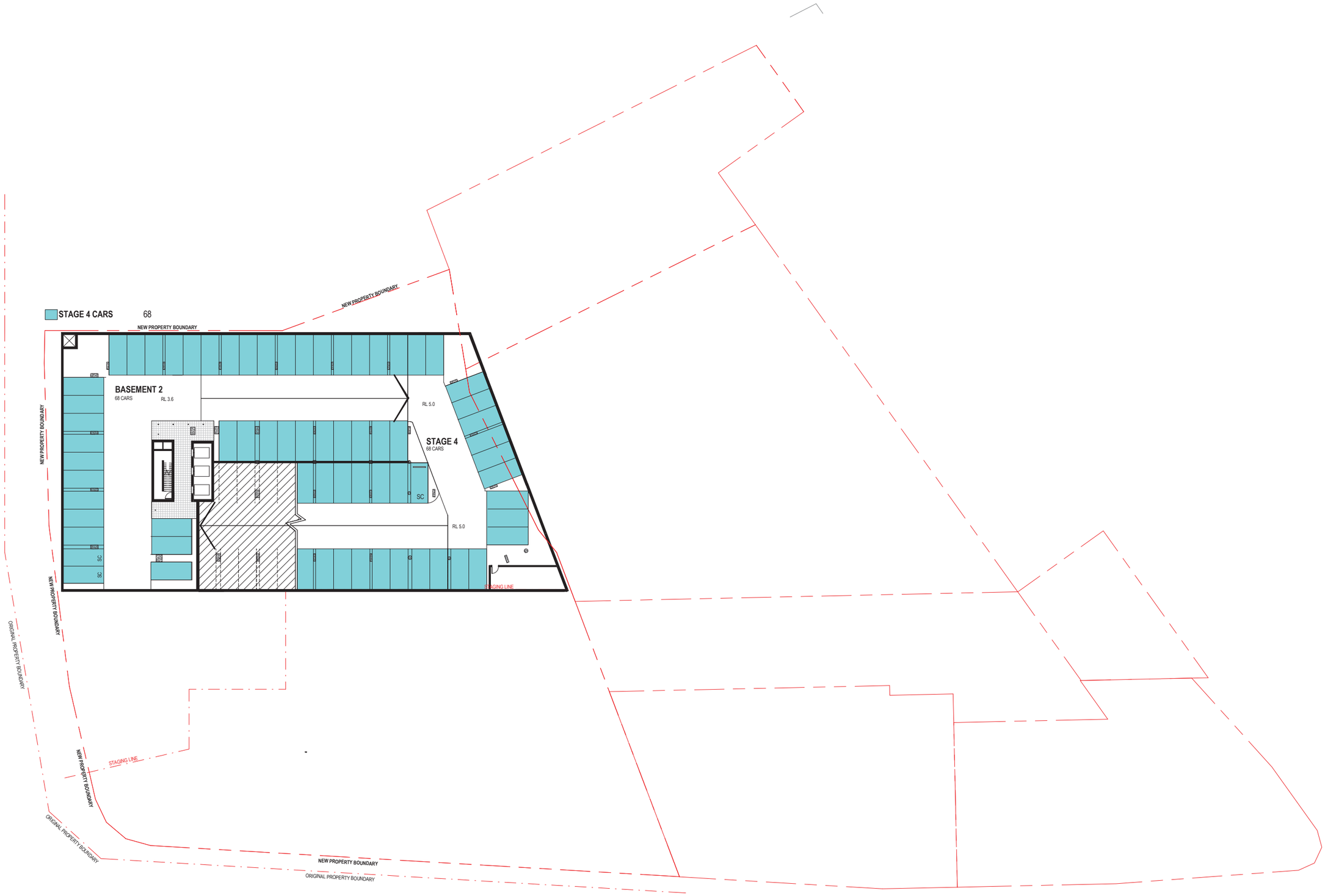

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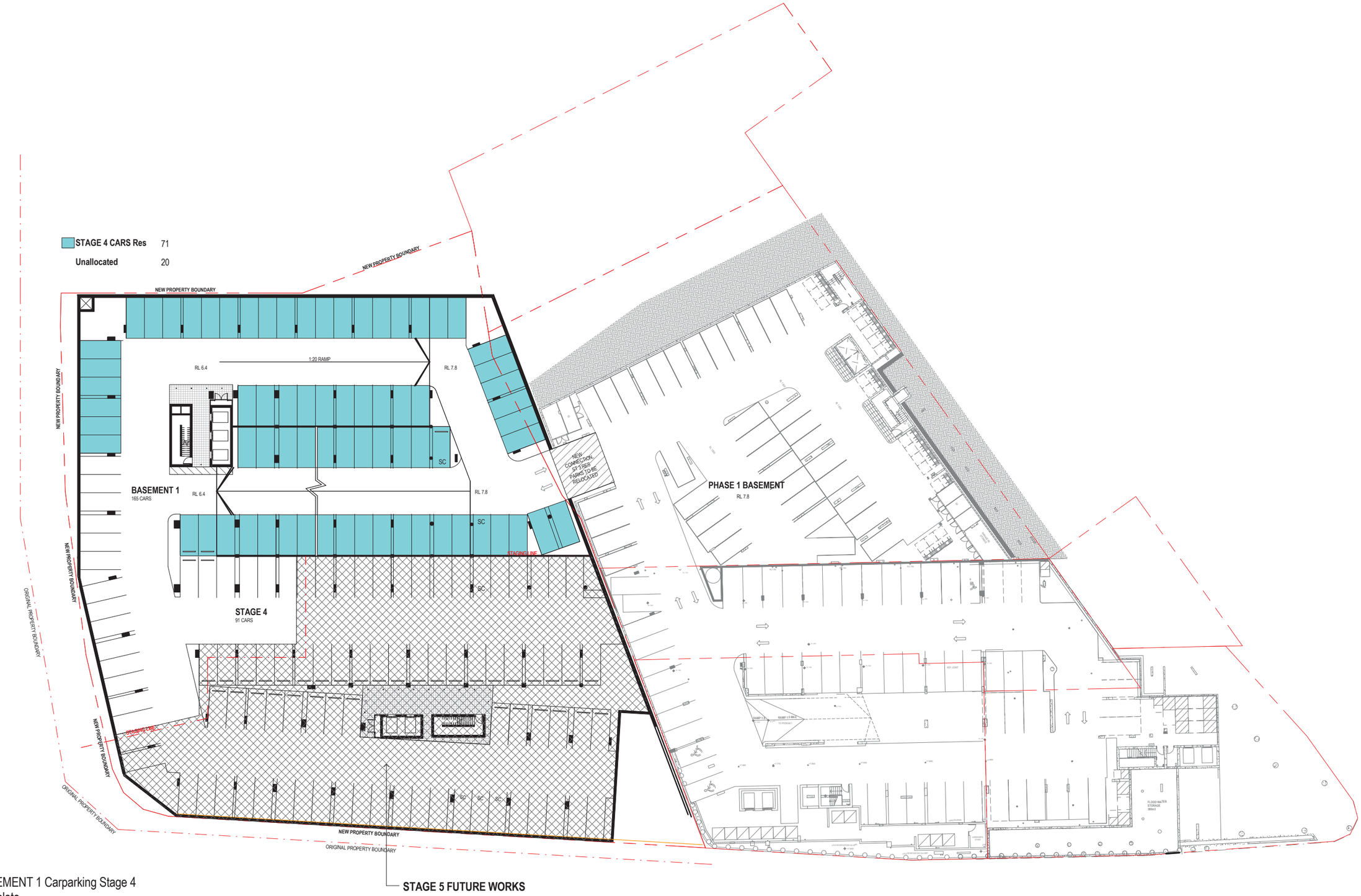

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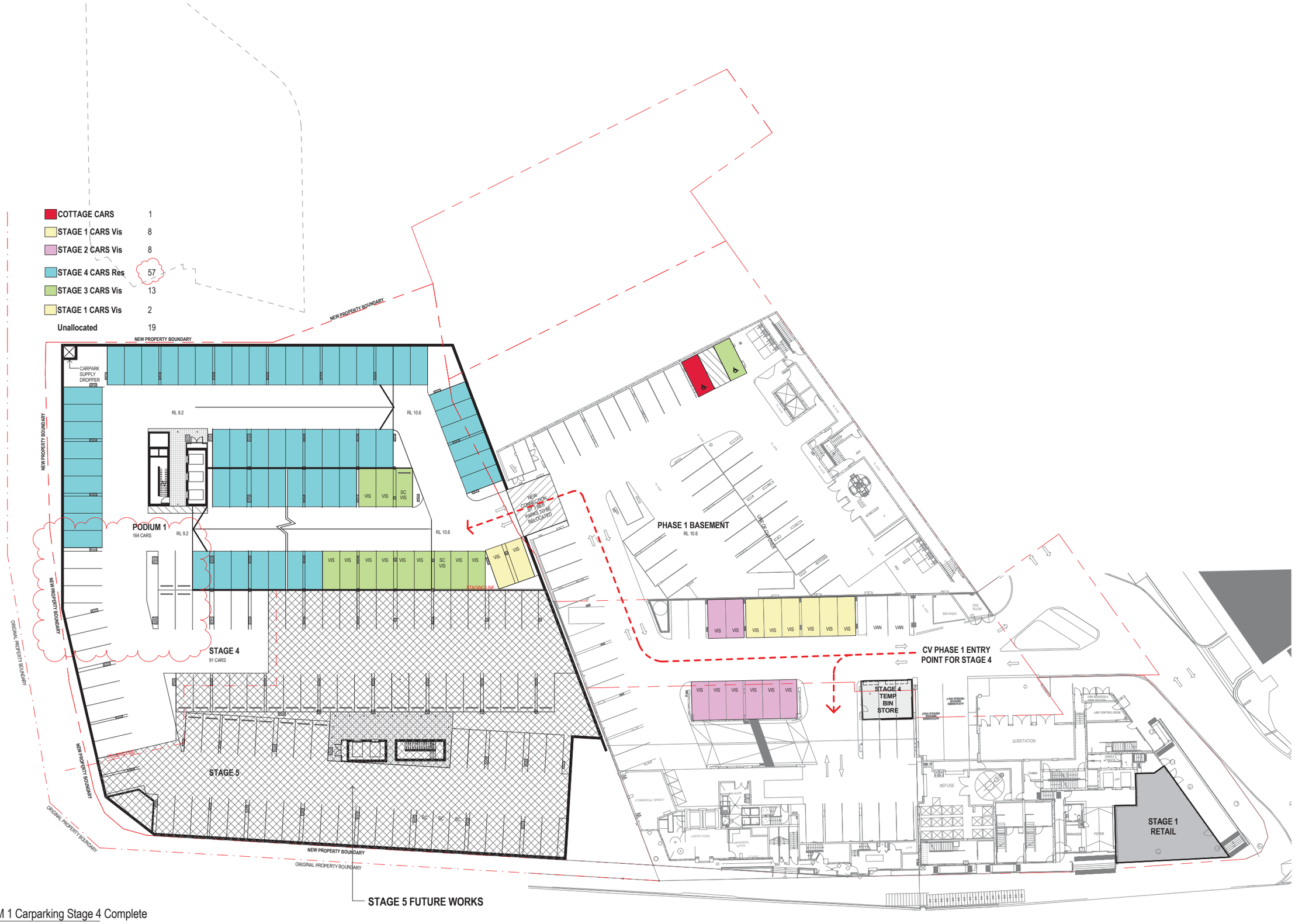

1 PODIUM 1 Carparking Stage 4 Complete
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P: 07 3221 0672 F: 07 3221 0683 EMAIL: mail@bureauproberts.com.au www.bureauproberts.com.au

CLIENT:
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CENTRAL VILLAGE STAGE 4 AND 5
ADDRESS:
CORNER OF WATER AND BRUNSWICK STREET

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DESIGN ARCHITECT	TM

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DRAWING TITLE:
STAGE 4 PARKING

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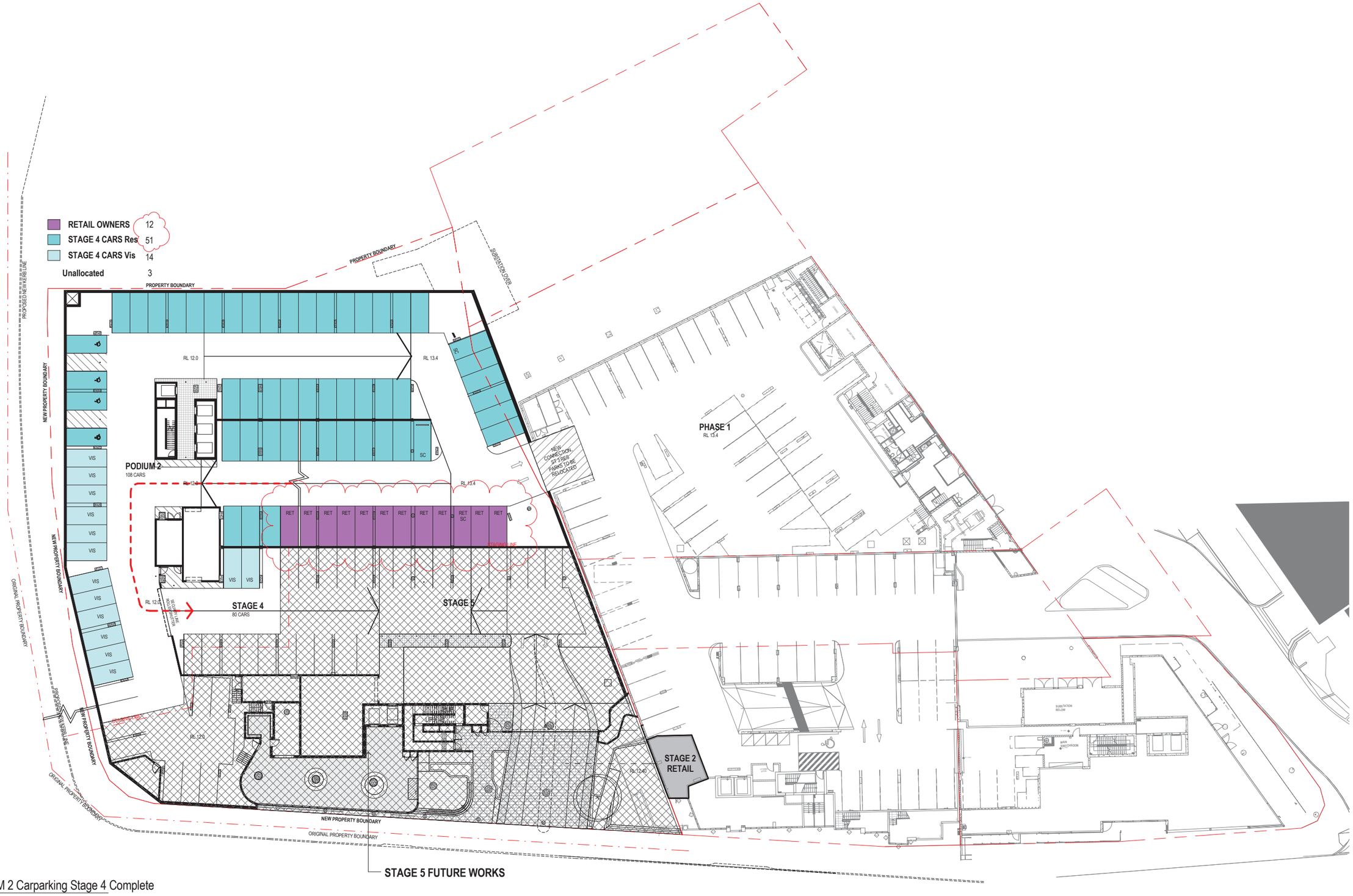

1 PODIUM 2 Carparking Stage 4 Complete
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DRAWING TITLE:
STAGE 4 PARKING

CAD FILE NO: C:\DATA\14037_CV_DD_central_tanen.rvt

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DESIGN ARCHITECT	TM

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STAGE 4 PARKING

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PROJECT NO: 14037
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DRAWING NUMBER: 24.09
REVISION: 4

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1 LEVEL 4 Carpark Stage 4 Complete
1 : 250

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7	REVISED CARPARK STAGING PLANS	17.02.16
6	REVISED DA ISSUE	10.02.16
5	TENDER ADDENDUM	02.02.16
4	REVISED CARPARK STAGING	01.02.16
3	FOR TENDER	15.01.16
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1	REVISED DA ISSUE	08.12.15

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DESIGN ARCHITECT	TM

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DRAWING TITLE: STAGE 4 PARKING

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DATE: 17.02.16

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PROJECT NO: 14037

PHASE: DD

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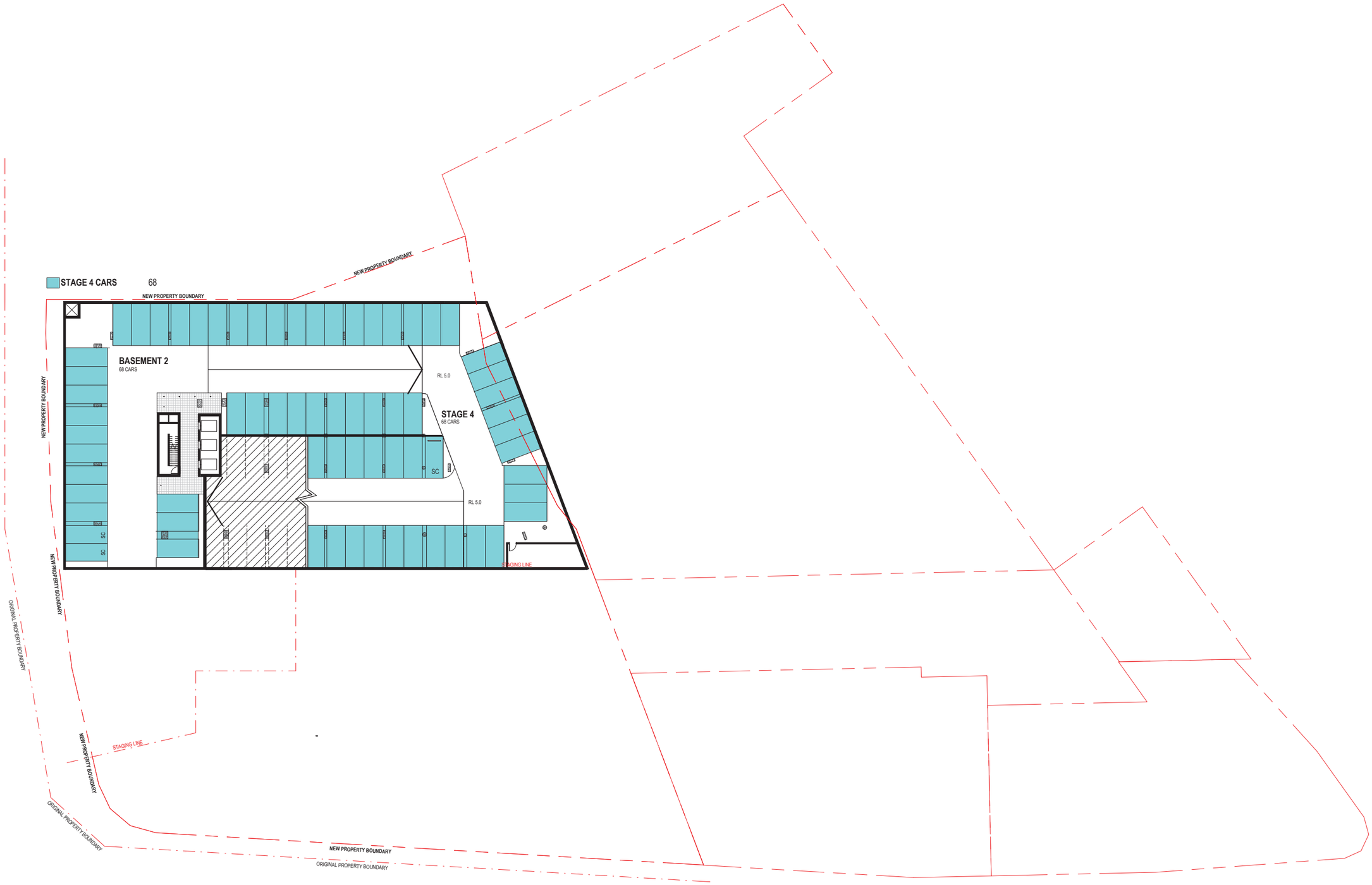

1 BASEMENT 2 Carparking Complete
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DESIGN ARCHITECT	TM

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1 BASEMENT 1 Carparking Complete
1 : 250

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DESIGN ARCHITECT	TM

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1 PODIUM 1 Carparking Complete
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1 PODIUM 2 Carparking Complete
1 : 250

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NORTH:

SCALE: 1 : 250 [A1]

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COMPLETED STAGES PARKING

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14037	DD	24.14	4

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1 PODIUM 3 Carparking Complete
1 : 250

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PROJECT NO: 14037
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DRAWING NUMBER: 24.15
REVISION: 4

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NEW BUILT CARPARKING SUMMARY

STAGE 1 VISITORS	2
STAGE 3 VISITORS	13
STAGE 4 VISITORS	15
STAGE 5 VISITORS	12
STAGE 4 RESIDENTS	287
STAGE 5 RESIDENTS	237
RETAIL VIS/OWNER	27
TOTAL	593

1 LEVEL 4 Carparking Complete
1 : 250

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PROJECT ARCHITECT	NL	
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PROJECT NO: 14037
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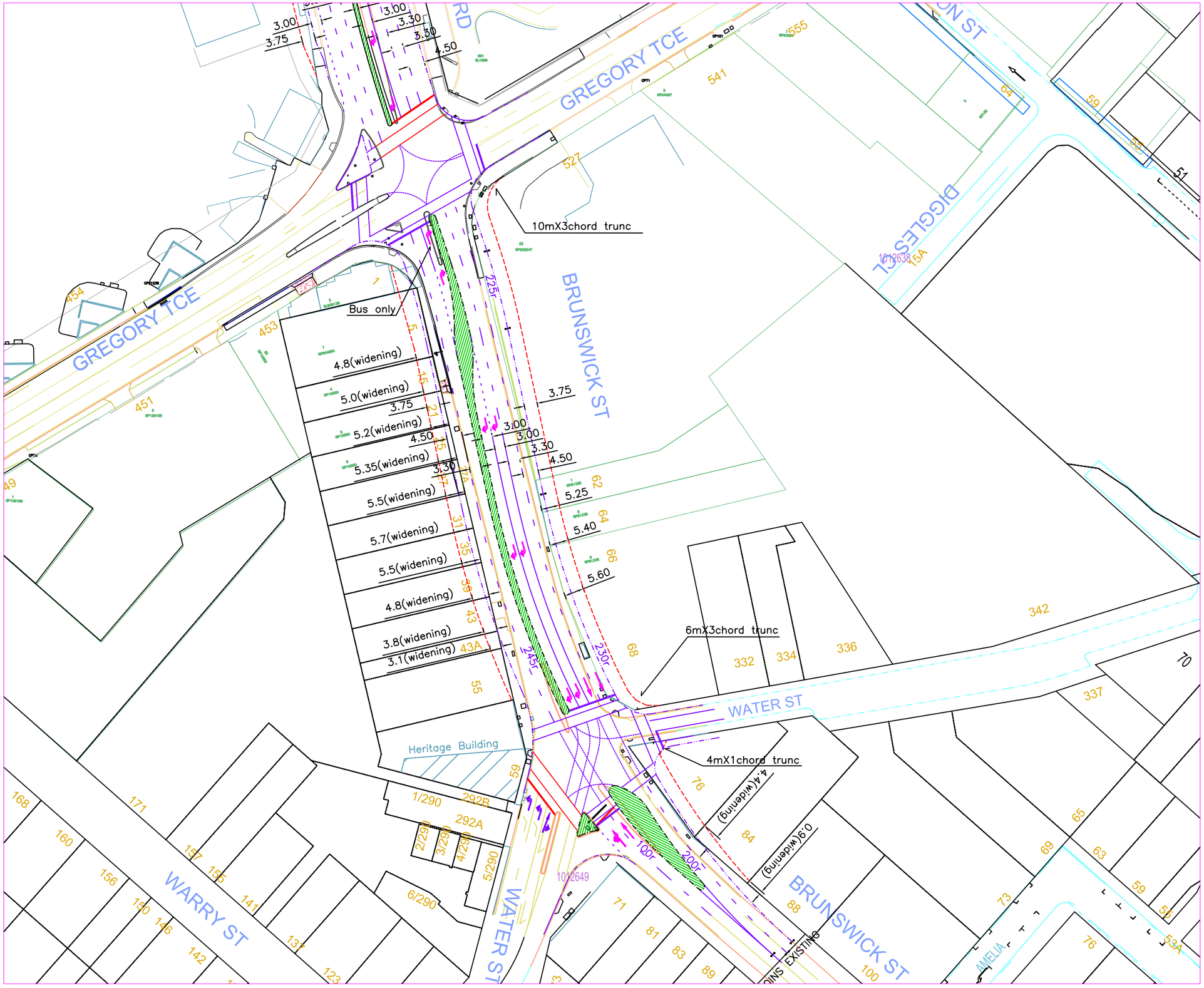
Appendix B BCC Concept Roadworks Design – Brunswick Street (DWG. RPN677)



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

ISSUE	AMENDMENT	DRAWN DATE	CHK'D DATE	APPR'D DATE
A	Original Issue			

CAD REF: G:\PROJECTS\DRAWINGS\brunswick-aerial.DWG

FULL SIZE A1

DIVISIONAL MANAGER BRISBANE INFRASTRUCTURE

MANAGER TRANSPORT AND TRAFFIC

DESIGNED	CVF 6-7-12	FILE NO.	
TRACED		SURVEY NO.	
CHECKED		ASSOCIATED PLANS	

Brisbane Infrastructure

BRISBANE CITY COUNCIL – BRISBANE INFRASTRUCTURE

CONCEPT DESIGN
PROPOSED ROADWORKS
BRUNSWICK ST– FORTITUDE VALLEY

NO. 1 IN SET OF 1

RPN677

A

Appendix C Phase 2 Car Parking Allocation Brief

CENTRAL VILLAGE PHASE 2 – CAR PARK ALLOCAITON CONSTRAINTS & METHODOLOGY
Based on Legal advice obtained from HWL Lawyers

Consent is required from various parties to the steps involved to amending the carparking arrangements to facilitate CV Phase 2, some of which are completely outside of Metro's control.

The below details the structure and allocation of carparks:

1. The basement forms part of the Common Property of Central Village community titles scheme (**Principal Common Property**).
2. The Body Corporate for Central Village community titles scheme (**Principal Body Corporate**) controls the Principal Common Property.
3. To allocate carparks to lots in a subsidiary scheme (which form part of the Principal Common Property), the carparks must first be allocated under the Principal CMS for the exclusive use of the subsidiary scheme. The subsidiary scheme must then allocate the carpark for the exclusive use of the occupants of a lot within the subsidiary scheme.
4. As you propose to change allocations between subsidiary schemes (and not just reallocate to different lots within the same subsidiary scheme), the consent of each subsidiary scheme (being the Body Corporate for the Canterbury Towers community titles scheme (**Canterbury Towers Body Corporate**) and the Body Corporate for the Stage 4 community titles scheme), the Principal Body Corporate and the affect lot owners is required to the allocation, surrender and reallocation of each carpark.
5. Numerous amendments would be required to the community management statement for Central Village community titles scheme (**Principal CMS**) and the Canterbury Towers community management statement to give effect to the proposed changes below.
6. The Principal Body Corporate is only required to consent to a new Principal CMS if all changes to the Principal CMS are <u>strictly</u> in accordance with Schedule B of the Principal CMS.
7. The proposed changes are not in any way, let alone strictly, in accordance with Schedule B of the Principal CMS. Therefore, the Principal Body Corporate does not have to sign any new Principal CMS and **Metro cannot make them as they have no control over the Principal Body Corporate.**
8. We also cannot pass resolutions now or on formation of the Canterbury Towers Body Corporate consenting to the new community management statements giving effect to these changes as the new CMS's must be registered within 3 months of the passing of the resolution or the resolution will lapse. This is because the new CMS's can only be registered once the stage 4 works are complete. On completion of stage 4 when the resolutions are required, you will not control the Canterbury Towers Body Corporate or the Principal Body Corporate **and cannot make them agree to this reallocation.**
9. You will also need the consent of the individual lot owners in Canterbury Towers to the change in carpark allocations. These lots have already been sold and you are not permitted under the Contract Terms to reallocate their carparks after Settlement. **There is no obligations on the Buyers to agree to the change in carpark and Metro cannot make them agree.**

Based on the above, the methodology for allocation of parking spaces for Phase 2 will need to be as follows:

1. The visitor carparks for Canterbury Towers are located in the basement connection points.
2. Visitor carparks remain part of the Principal Common Property and are not allocated to either a subsidiary scheme or a lot. Therefore, the consent of the subsidiary body corporates and the lot owners are not required to change the location of visitor carparks.
3. Metro can request the consent of the Principal Body Corporate now to change Schedule B of the Principal CMS to permit the reallocation of carparks and bin store areas and, if the resolution is passed, a new Principal CMS registered now to take this into account.
4. With this one change, all future requests by Metro to change the Principal CMS will be in accordance with Schedule B of the Principal CMS and the Principal Body Corporate must sign the new Principal CMS's.

Whilst it is understood that EDQ would prefer that all visitor carparks are located as close as possible to the entry point, this cannot be accommodated as it would mean that Metro would be constructing and selling Stages 3, 4 and 5 without certainty that the lots can be titled and settled. This is not an acceptable risk for any developer and would not be accepted by any construction funder.

Appendix D Car Park Performance Brief

Performance Brief

Stage 3 Active Visitor Car Park Identification System

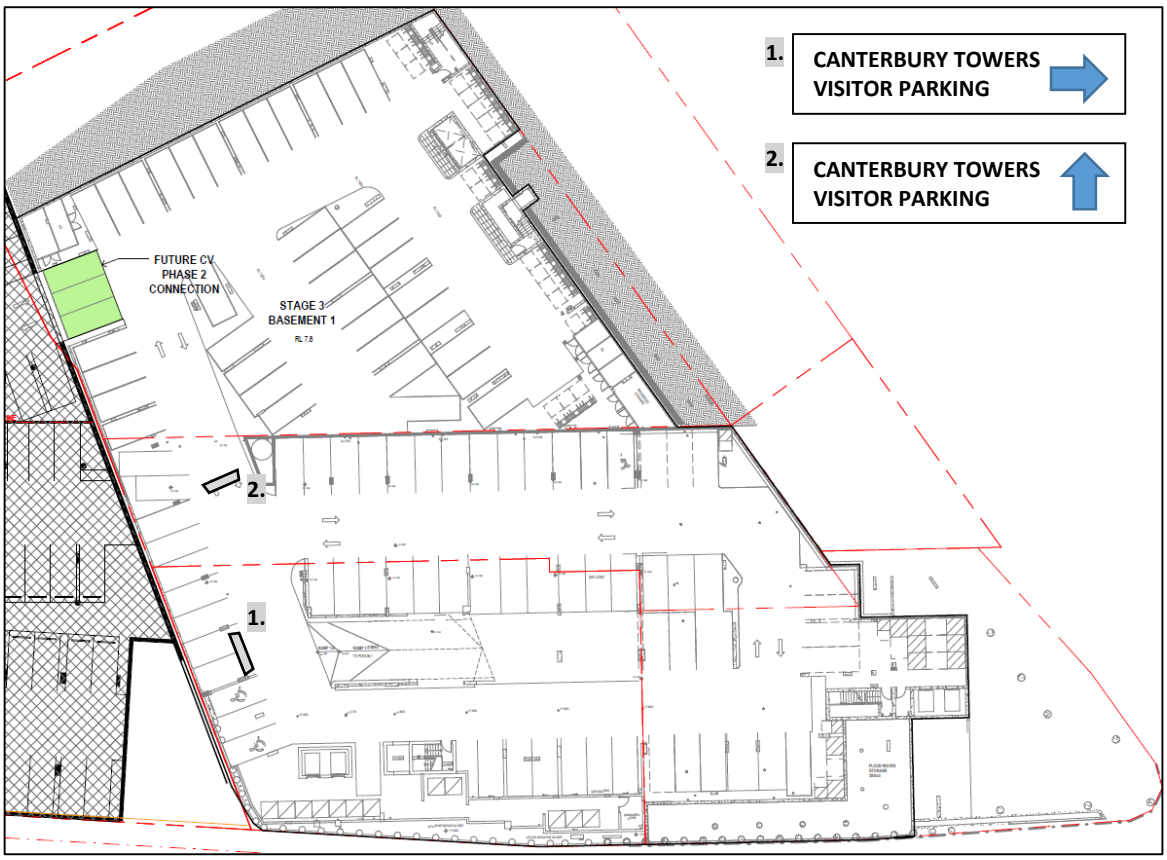
This system will require active car park occupancy sensors at each of the 13 visitor parking spaces (3-4 spaces on each parking level), connected to a central control unit, which then relays car occupancy information back to a display panel at the car park entry intercom. This display will need to identify how many visitor parking spaces are available on each parking level, similar to the below example:

CANTERBURY TOWERS VISITOR PARKING AVAILABILITY		
Basement 1	3	spaces available
Podium 1	4	spaces available
Podium 2	3	spaces available
Podium 3	3	spaces available

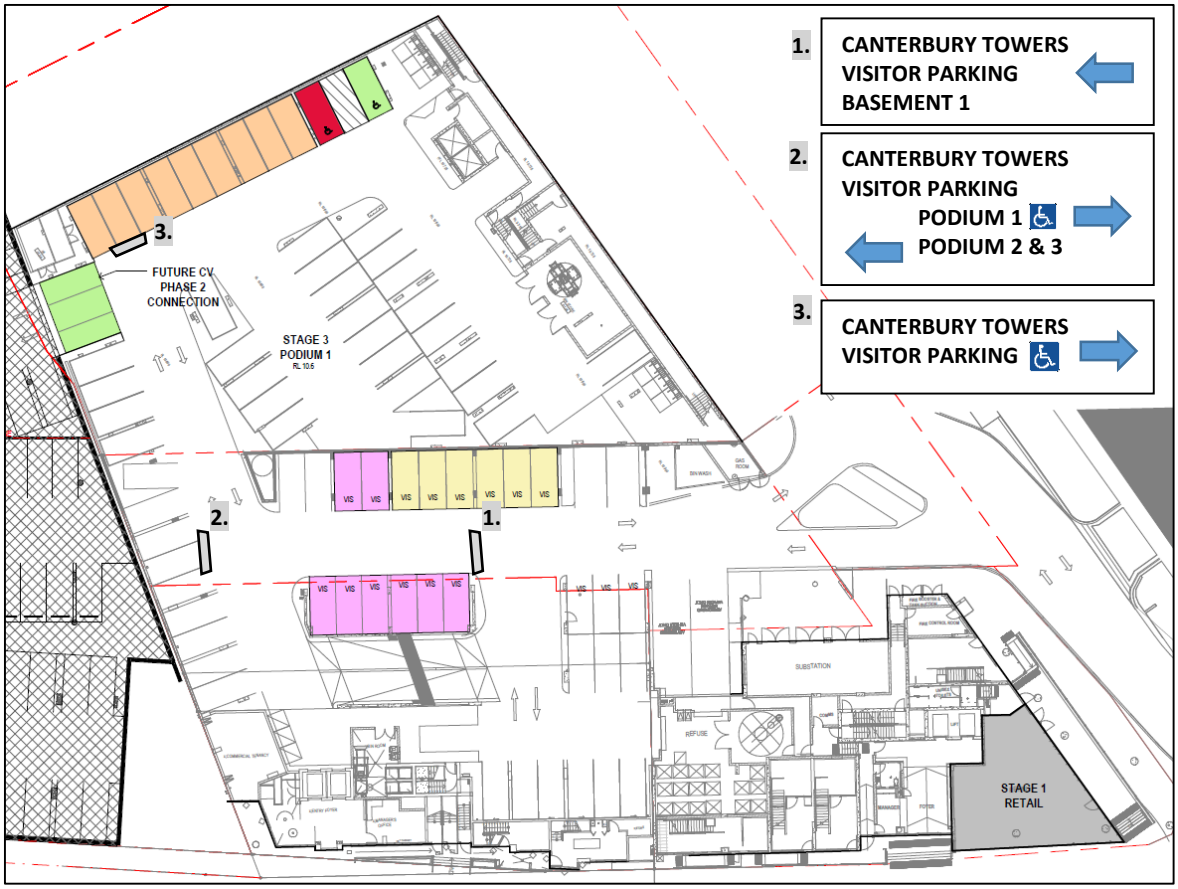
An example of an acceptable car park occupancy sensor to adopt would be the "SmartEye" ground or roof-mounted sensors (1 for each parking bay) developed by Smart Parking Limited. A recommended Australian supplier and installer for this system is Traffic and Parking Solutions (TPS) Group (1300 997 026).

In addition to the above car park equipment, static directional signage will be required within the car parking areas to direct visitor vehicles to the respective visitor parking spaces on each level. The typical signage required on each level (as a minimum) is shown in the figures on the following pages. These would need to be installed hanging from the roof or against columns/walls so they do not obstruct vehicle movements throughout the car park.

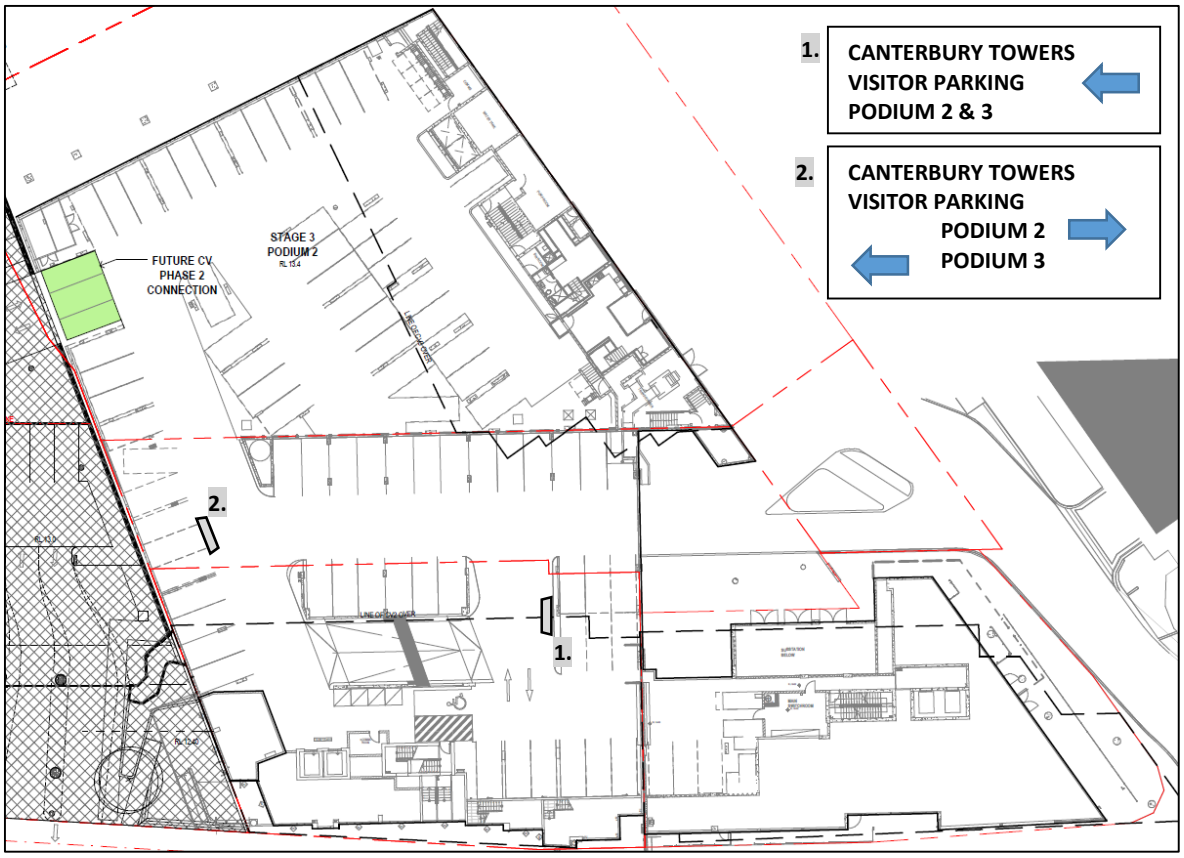
Basement 1 Level



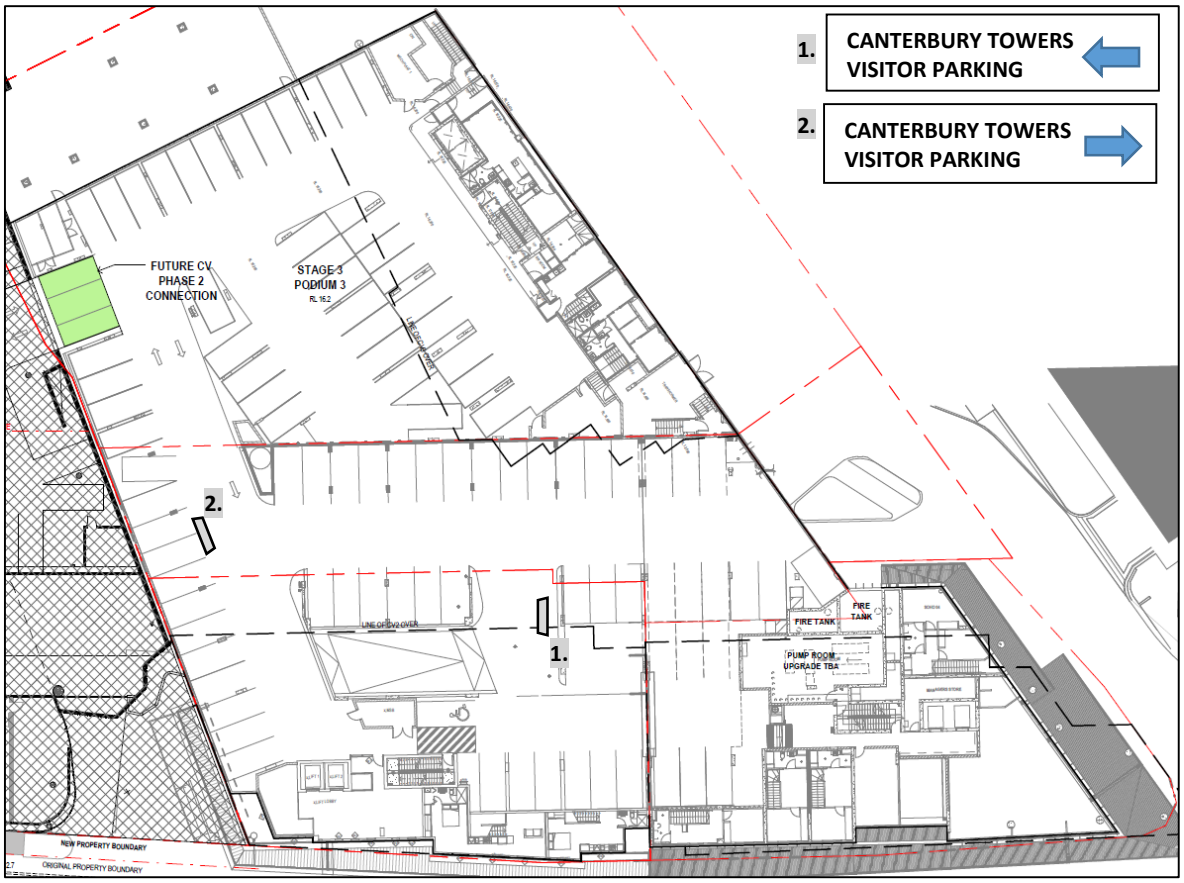
Podium 1 Level



Podium 2



Podium 3



Performance Brief

Phase 2 Urban Common Car Park Counter

This system will require a vehicle detector positioned on the main driveway to record vehicles entering and exiting. Using this movement data, and a predetermined maximum car parking capacity (18 spaces total) the number of vacant spaces will be calculated by a central control unit, which is then relayed to a display panel at the driveway entry point. The below figure shows an example of the car park display:

CENTRAL VILLAGE URBAN COMMON

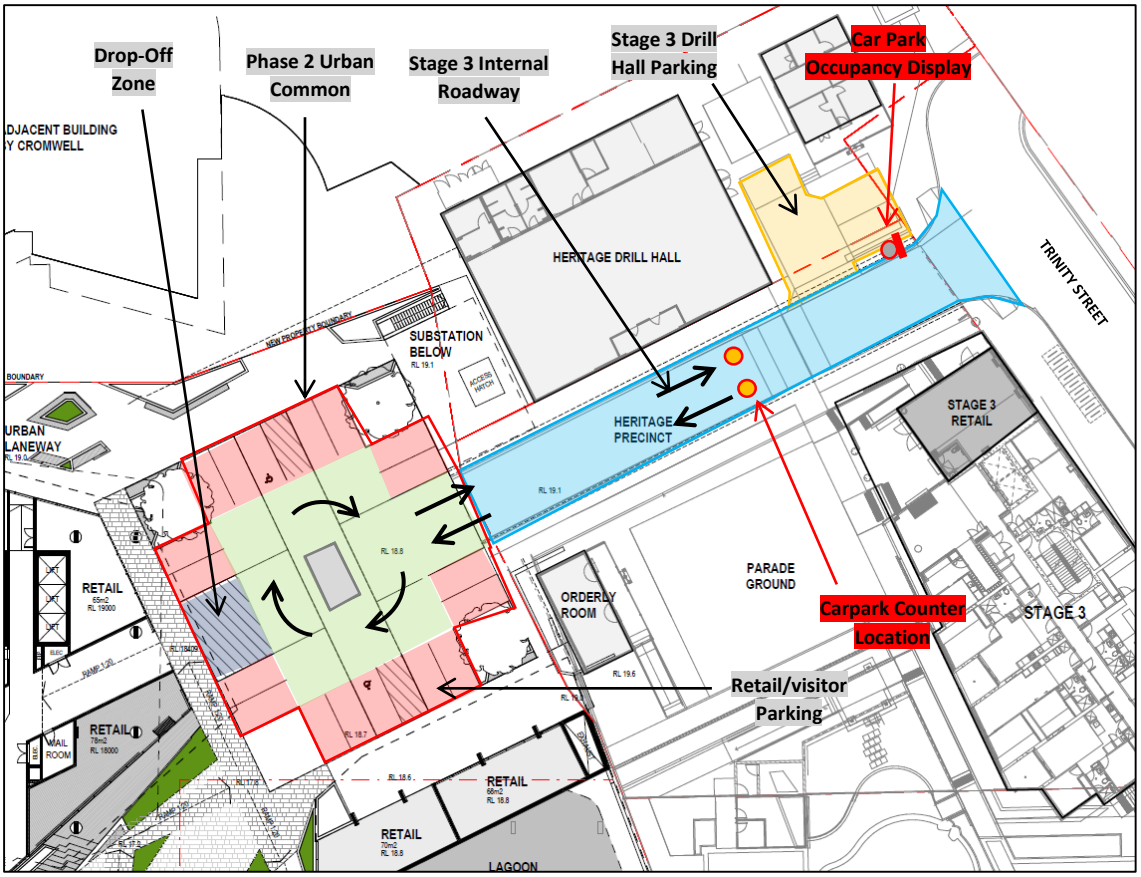
18 spaces available

An example of an acceptable vehicle counter to adopt would be the "SmartCounter" ground sensors (1 for each of the entry/exit sides of the internal roadway) developed by Smart Parking Limited. A recommended Australian supplier and installer for this system is Traffic and Parking Solutions (TPS) Group (1300 997 026).

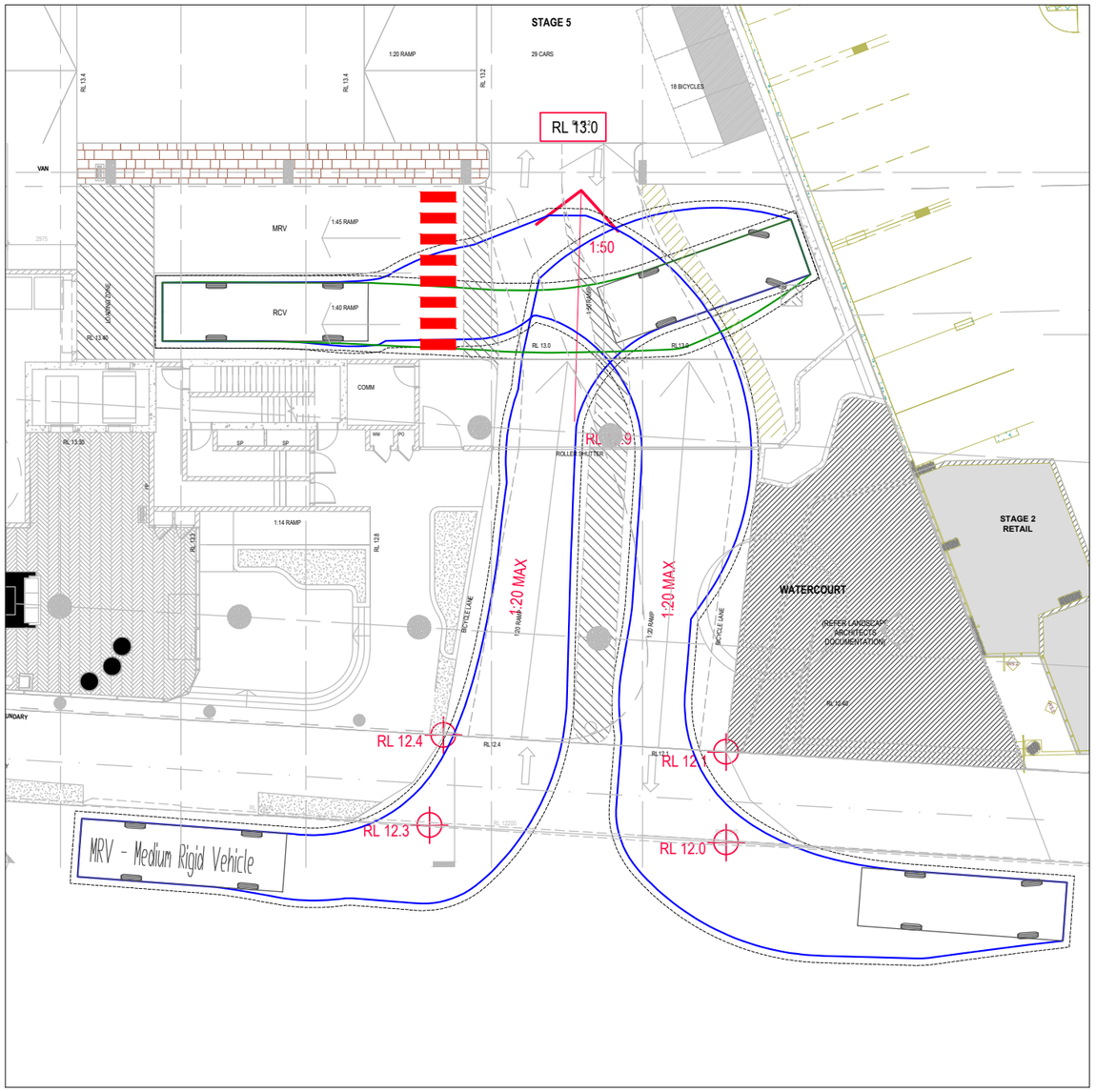
Given this system calculates parking availability based on entry/exit movements, the system will also require ability to be calibrated routinely by an external user/operator such that the system does not fall out of synchronisation. For example, the system will need to be able to be reset manually when the car park is empty (allow parking availability to revert back to default full vacancy) or for a preset occupancy figure to be inputted from a manual car park count.

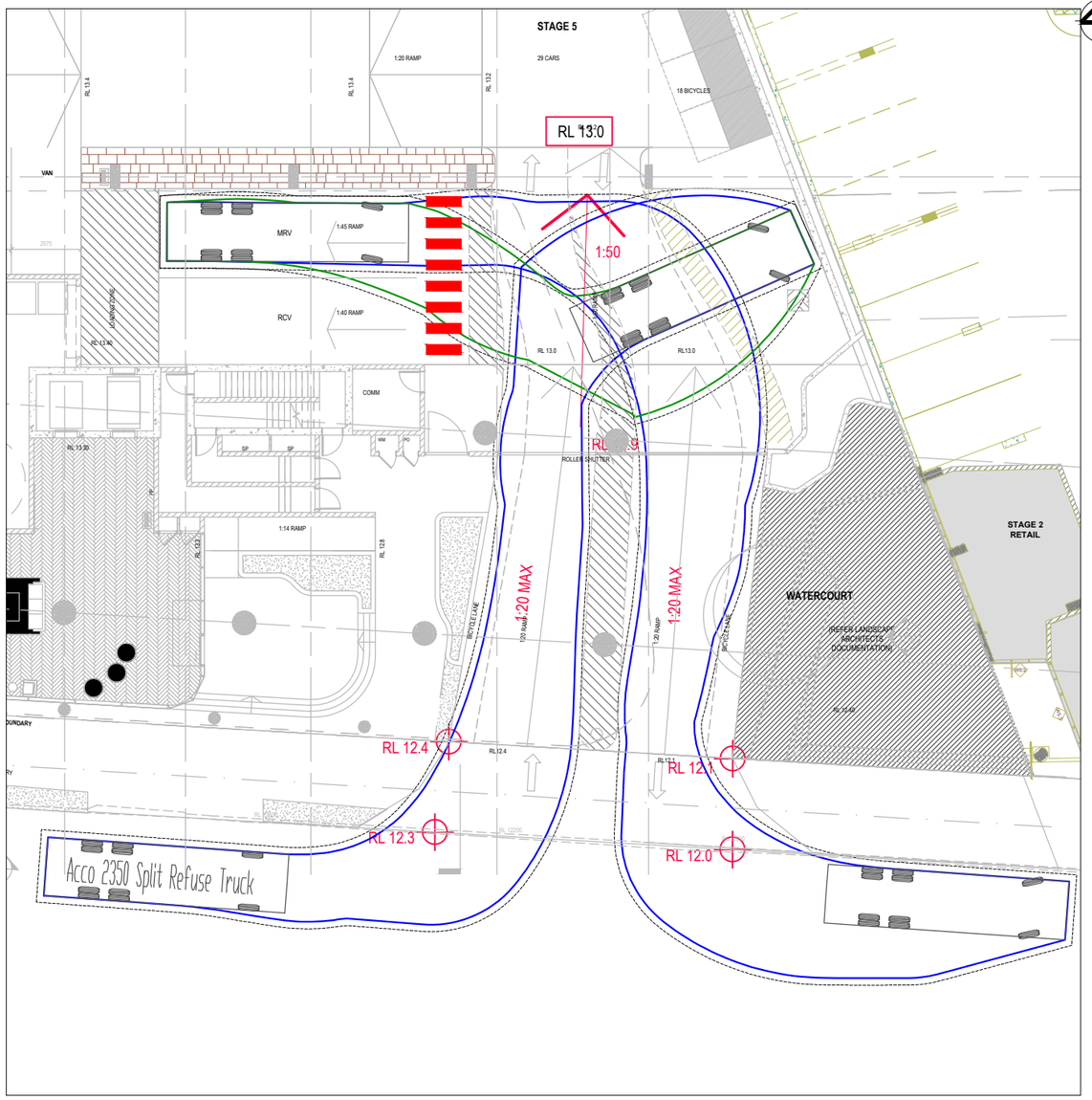
The figure on the following page shows the recommended positions to locate the ground vehicle counters and entry display sign.

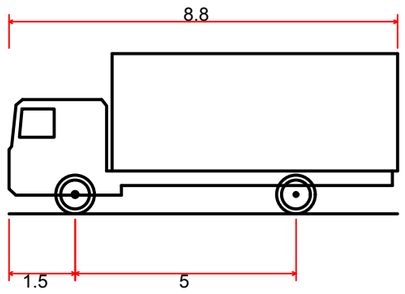
Level 4


Drop-Off Zone
Phase 2 Urban Common
Stage 3 Internal Roadway
Stage 3 Drill Hall Parking
Car Park Occupancy Display
HERITAGE DRILL HALL
TRINITY STREET
SUBSTATION BELOW
HERITAGE PRECINCT
STAGE 3 RETAIL
PARADE GROUND
ORDERLY ROOM
Carpark Counter Location
STAGE 3
Retail/visitor Parking
RETAIL
LAGOON

Appendix E TTM Drawings

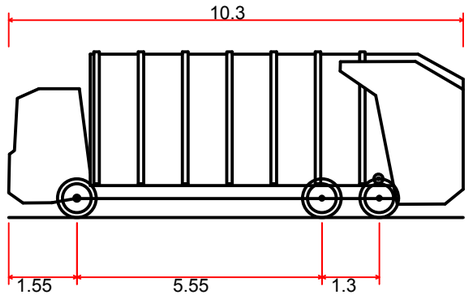






MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



Acco 2350 Split Refuse Truck

Overall Length	10.300m
Overall Width	2.500m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	11.300m

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CENTRAL VILLAGE STAGE 4

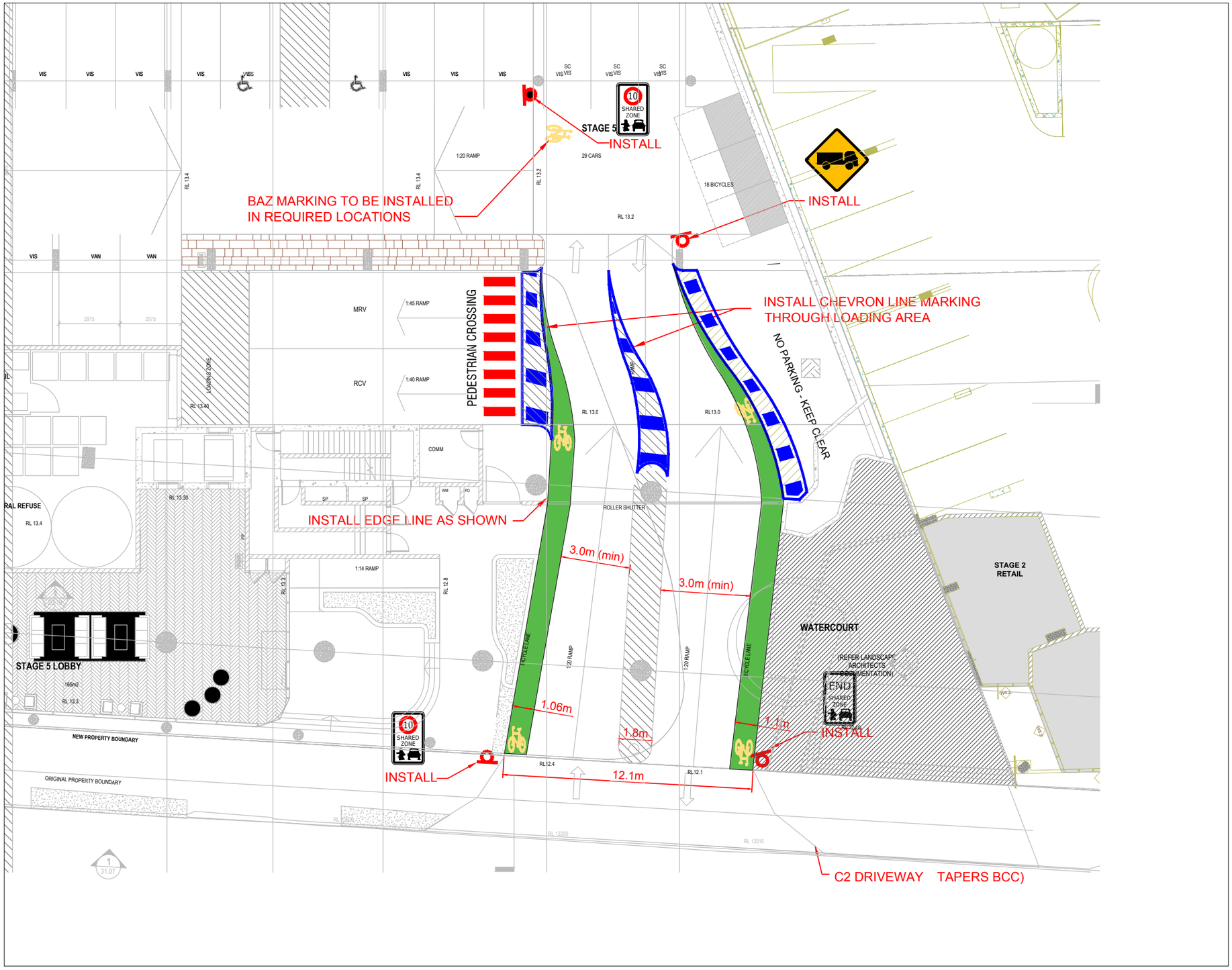
SWEPT PATH ANALYSIS
RCV AND MRV DESIGN VEHILCES

TTM REFERENCE
13BRT0407-SK09E

DRAWN CL
CHECKED RB

DATE
21 DEC 2015

0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE



NOTES

1. DESIGN FINALISTION ISSUED FOR EDQ - DSDIP APPROVAL.
2. TRAFFIC SIGNS AND LINE MARKINGS ARE TO BE INSTALLED IN ACCORDANCE WITH MUTCD GUIDELINES [PART 2].
3. LOCATION OF TRAFFIC SIGNS TO BE DETERMINED ON SITE BASED ON EXISTING STRUCTURES AND VISIBILITY.

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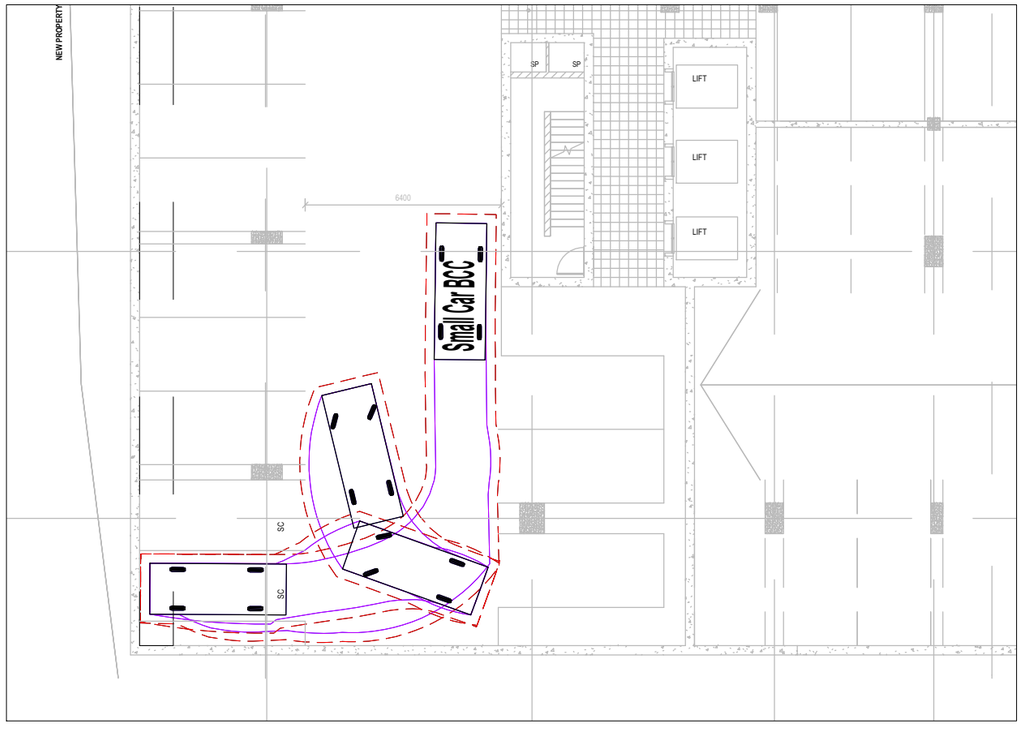
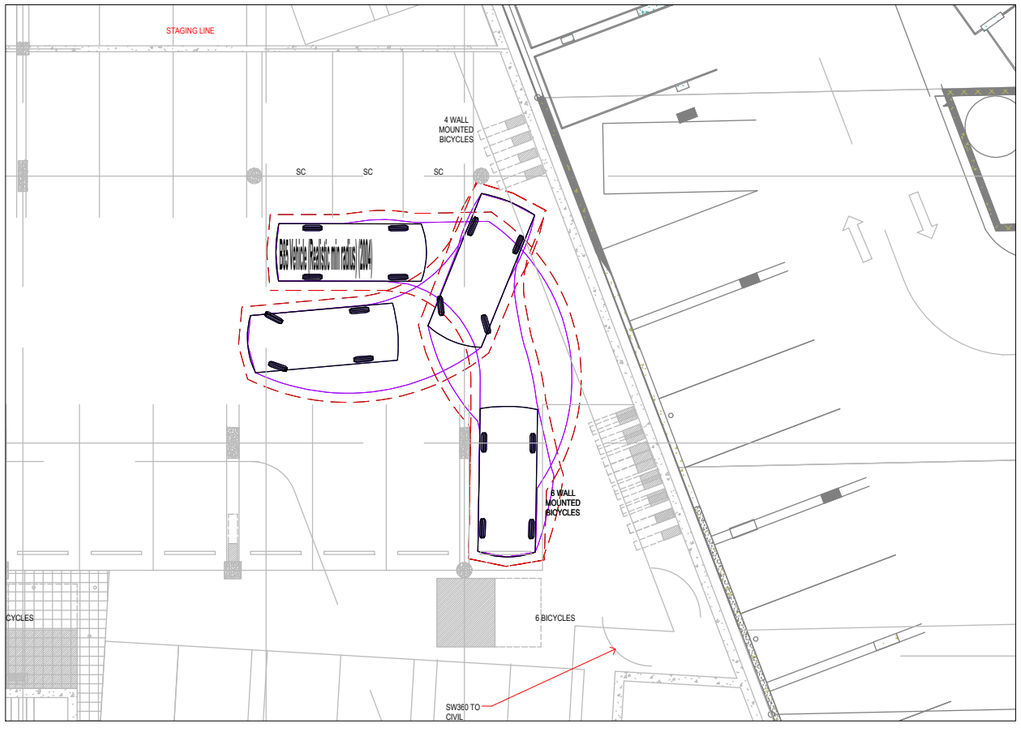
CENTRAL VILLAGE PHASE 2 DA

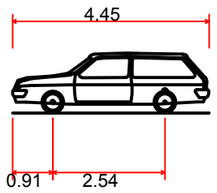
TRAFFIC SIGNS AND LINE MARKING PLAN
PODIUM LEVEL 2 - LOADING AREA ENTRY

TTM REFERENCE	REVISION
13BRT0407-SK10	F
DRAWN: CL	CHECKED: RB
DATE: 21 DEC 2015	

0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

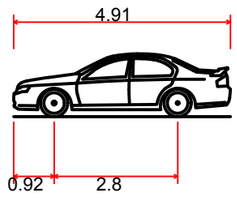






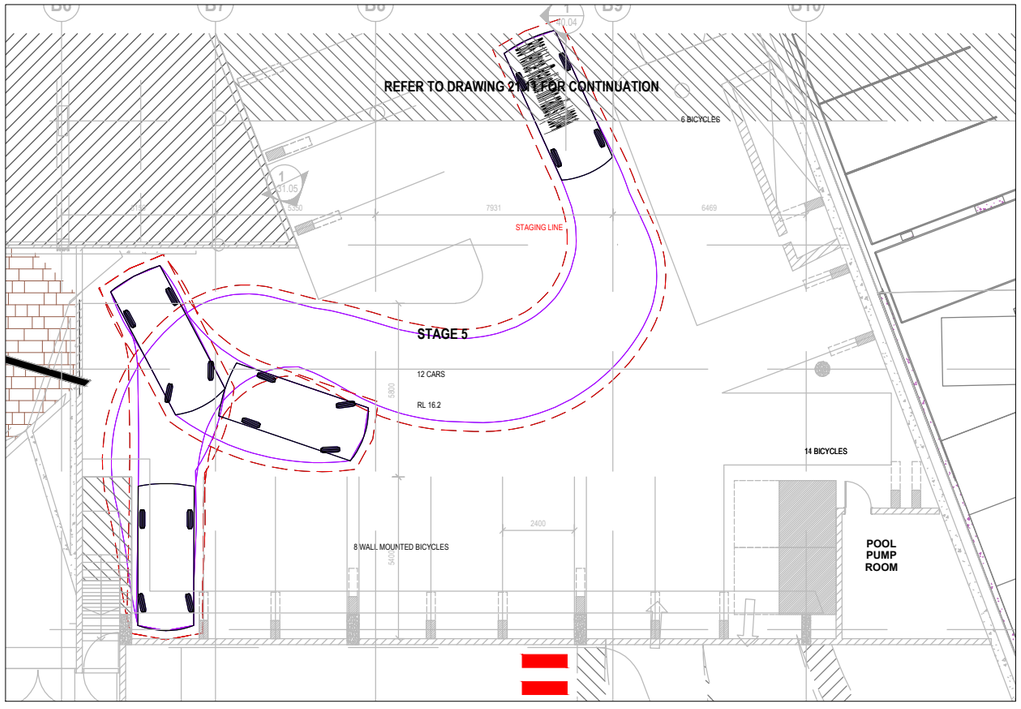
Small Car BCC

Overall Length	4.450m
Overall Width	1.660m
Overall Body Height	1.354m
Min Body Ground Clearance	0.195m
Track Width	1.400m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	5.600m



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m



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CENTRAL VILLAGE PHASE 2 DA

SWEPT PATH ANALYSIS
B85 DESIGN VEHICLE

TTM REFERENCE
13BRT0407-SK13D

DRAWN CL
CHECKED RB
DATE 21 DEC 2015

0 1 2 3 4 5m
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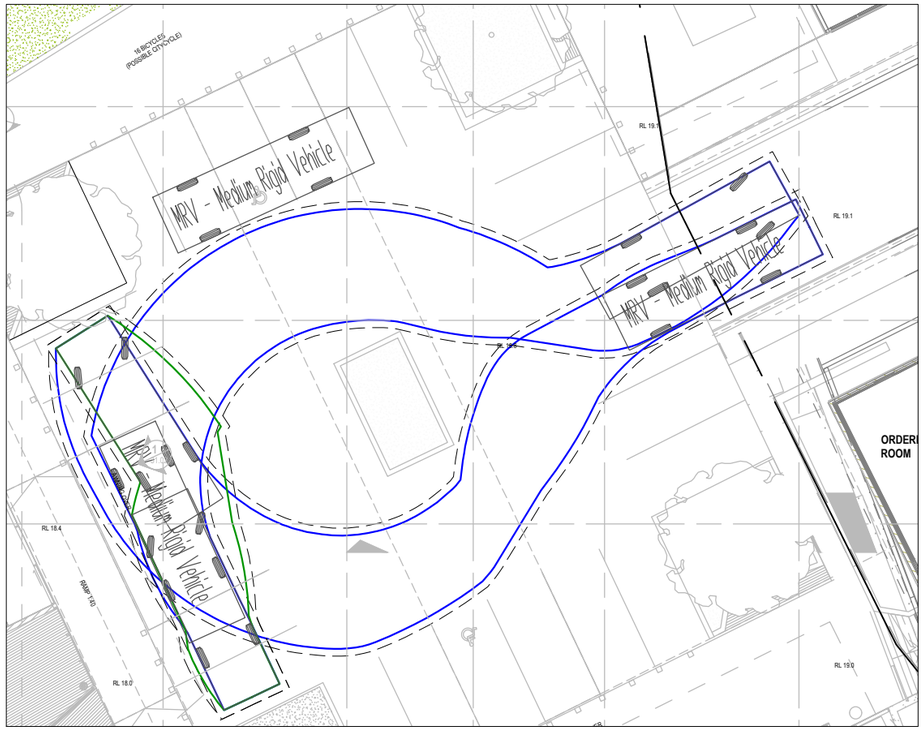
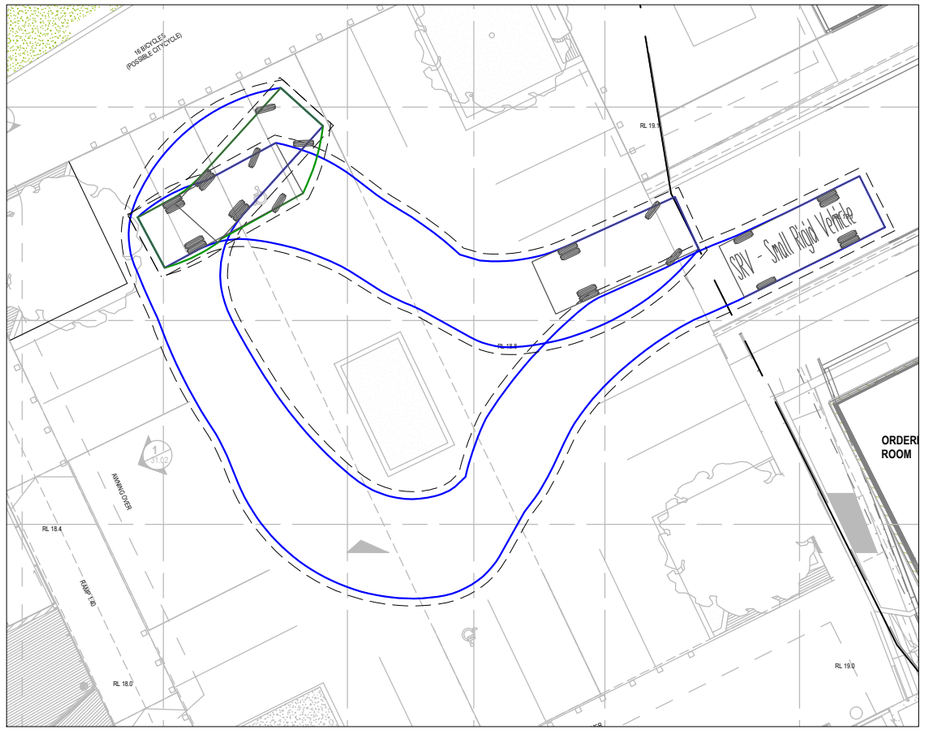
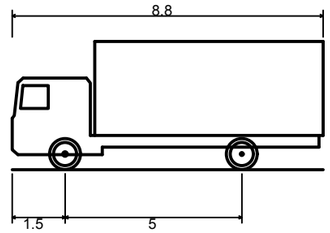
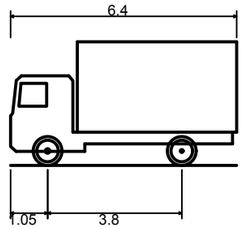






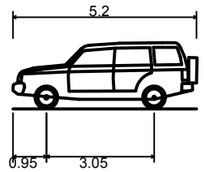
MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m



SRV - Small Rigid Vehicle

Overall Length	6.400m
Overall Width	2.330m
Overall Body Height	3.500m
Min Body Ground Clearance	0.398m
Track Width	2.330m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	7.100m



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m

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CENTRAL VILLAGE, PHASE 2

SWEPT PATH ANALYSIS
LEVEL 1 URBAN COMMON

TTM REFERENCE
13BRT0407-SK14D

DRAWN CL
CHECKED RB
DATE 28 JAN 2016

0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

Appendix F Road Modelling & Impacts 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 24th 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.

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

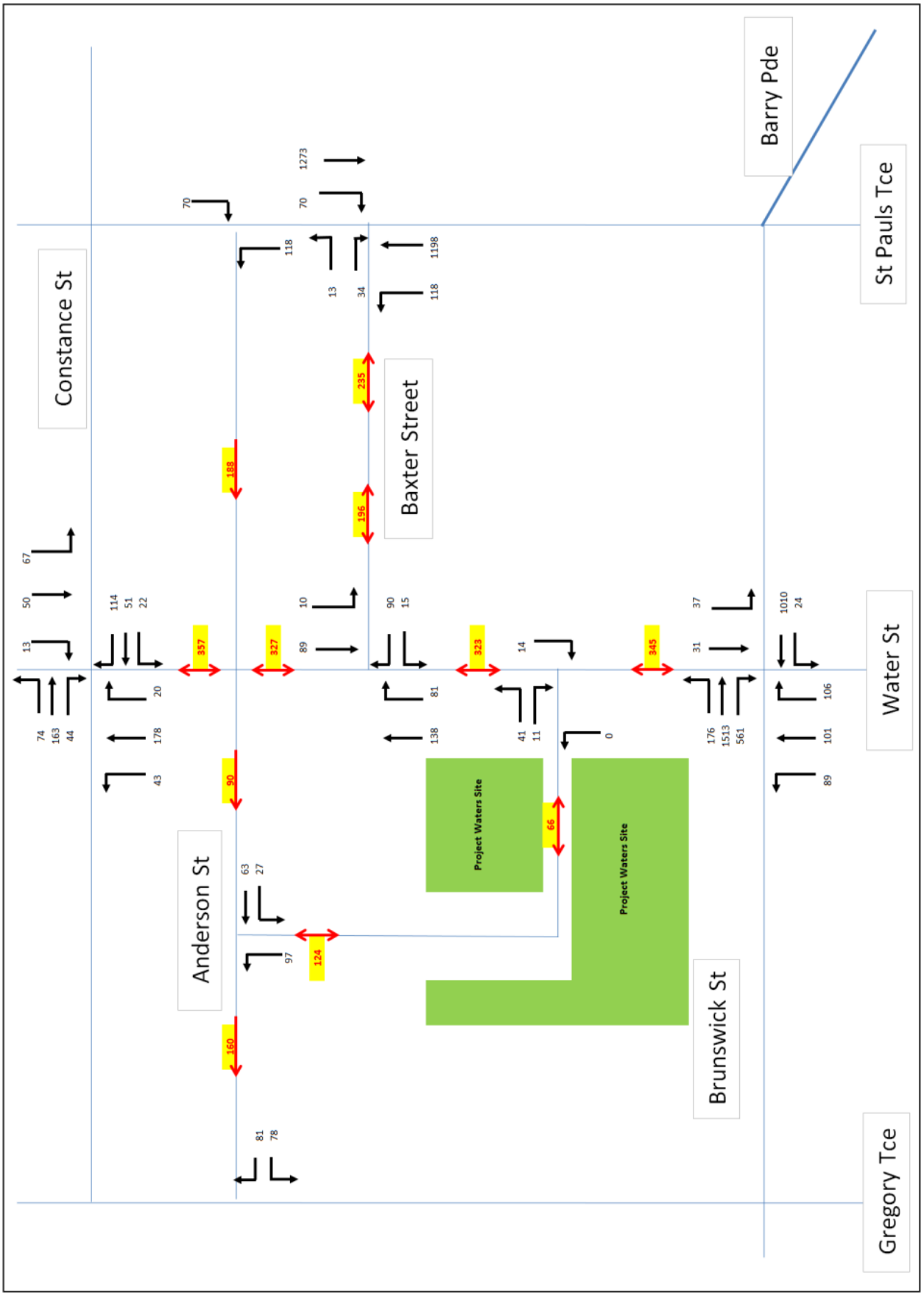


Figure 2: 2026 AM Peak – New Bowen Hills Model Outputs (Updated Project Waters Scheme)

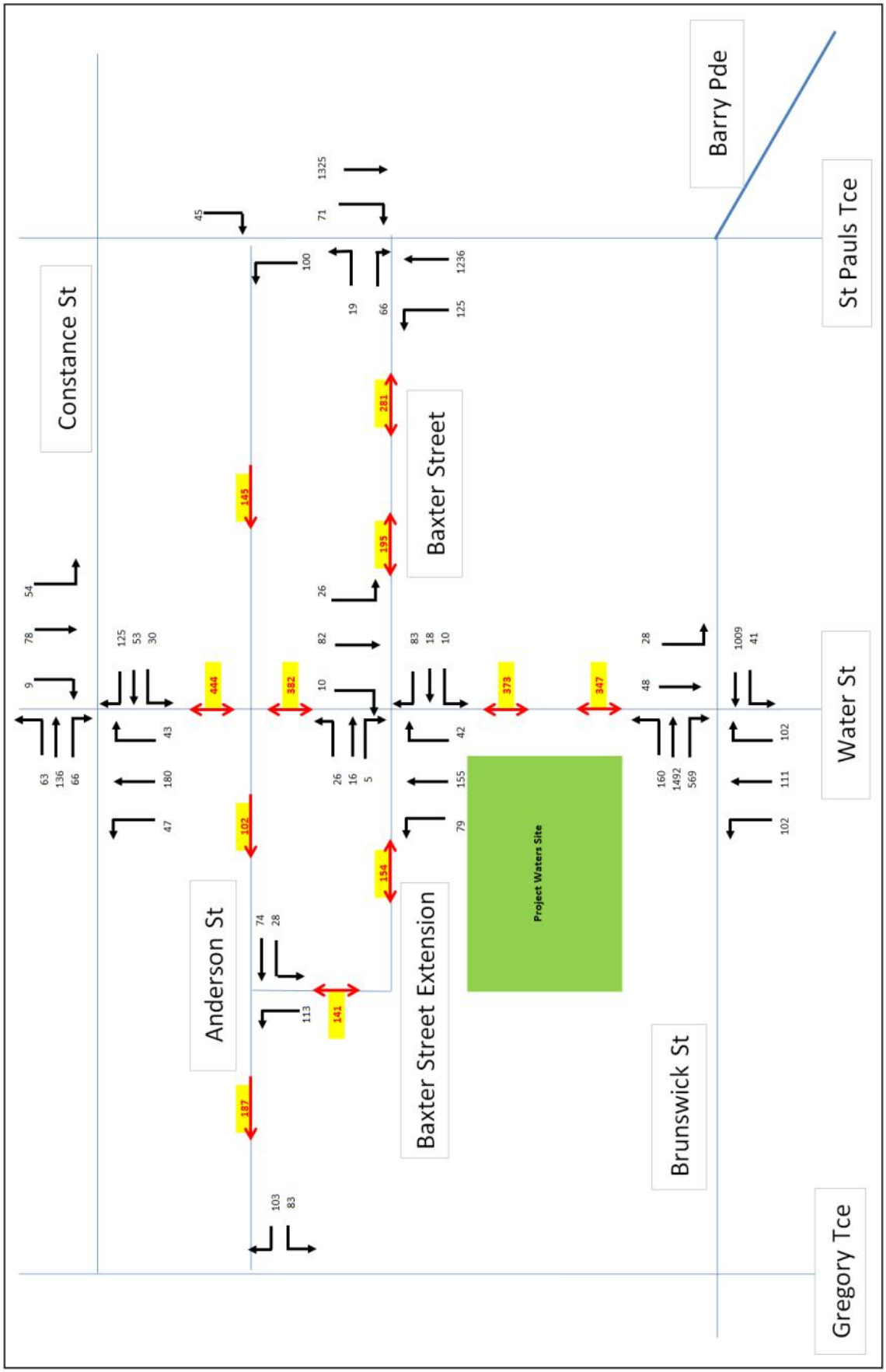


Figure 3: 2026 PM Peak – Original Bowen Hills Model Outputs

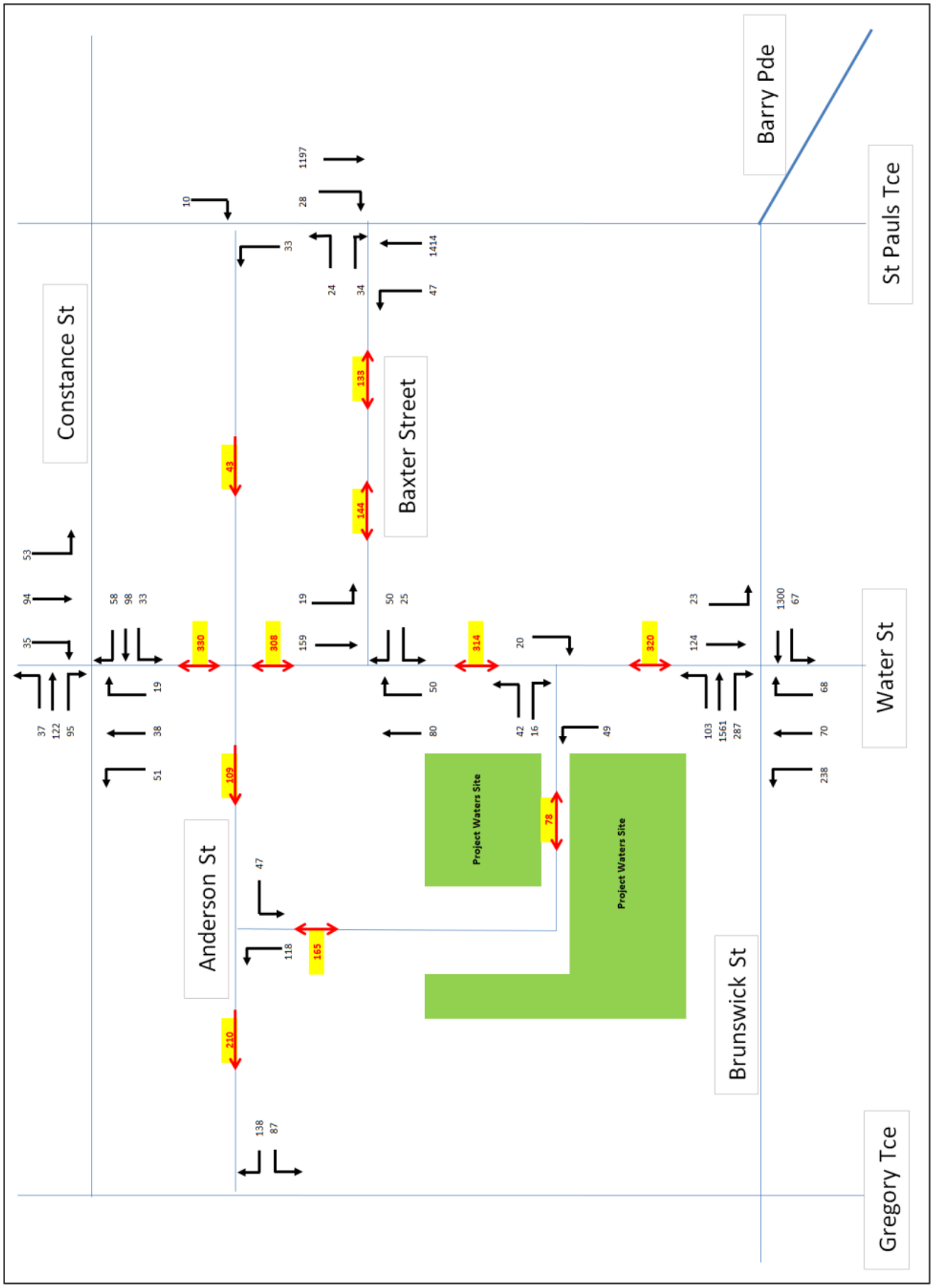
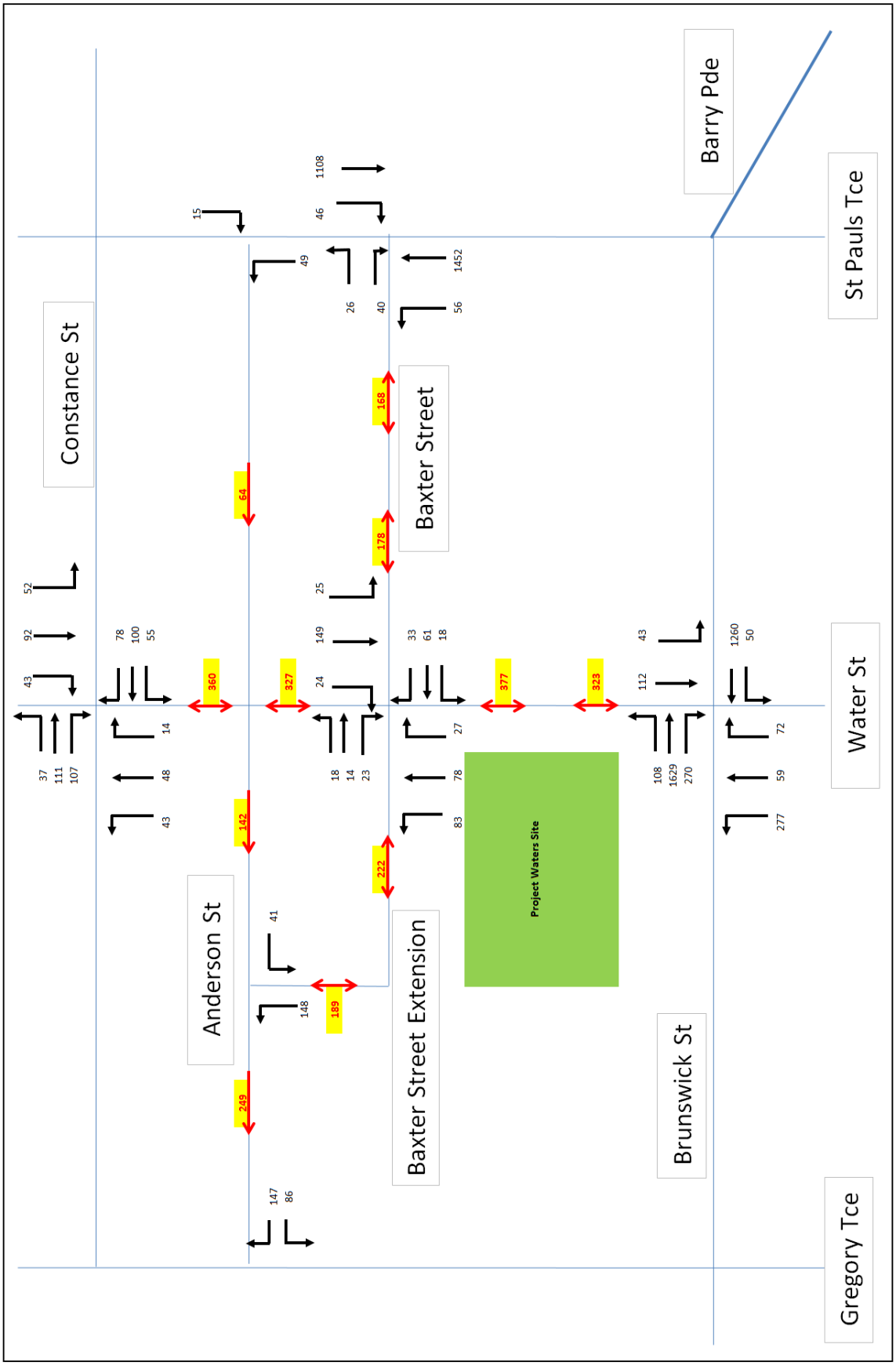


Figure 4: 2026 PM Peak – New Bowen Hills Model Outputs (Updated Project Waters Scheme)



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.

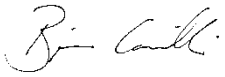
During the AM Peak hour, the greatest change in through volume traffic is apparent on Water Street (to the east of the site), where the through volumes between Anderson Street and Constance Street are expected to increase from 357vph to 444vph (87vph or 25% increase). The other roads, however, are expected 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,



Brian Camilleri
Principal Director