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02	FOR INFOMATION	19/09/24	CPA	EB	MC
01	PROGRESS ISSUE	30/08/24	CPA	EB	MC

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

3D DRAWING & RENDERS - CARWASH SHEET 01

JOB No	DRAWING No	ISSUE
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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

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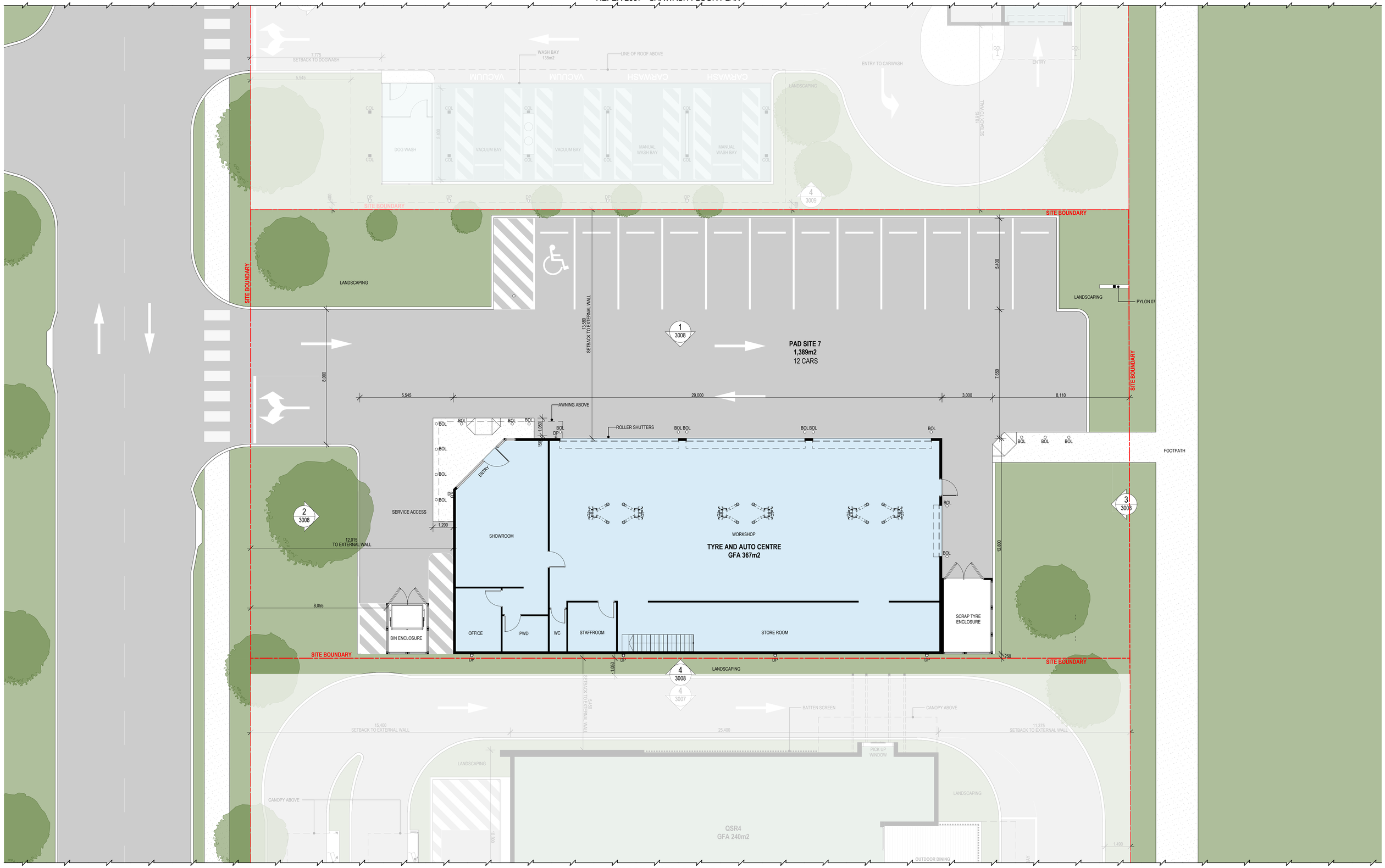

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DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

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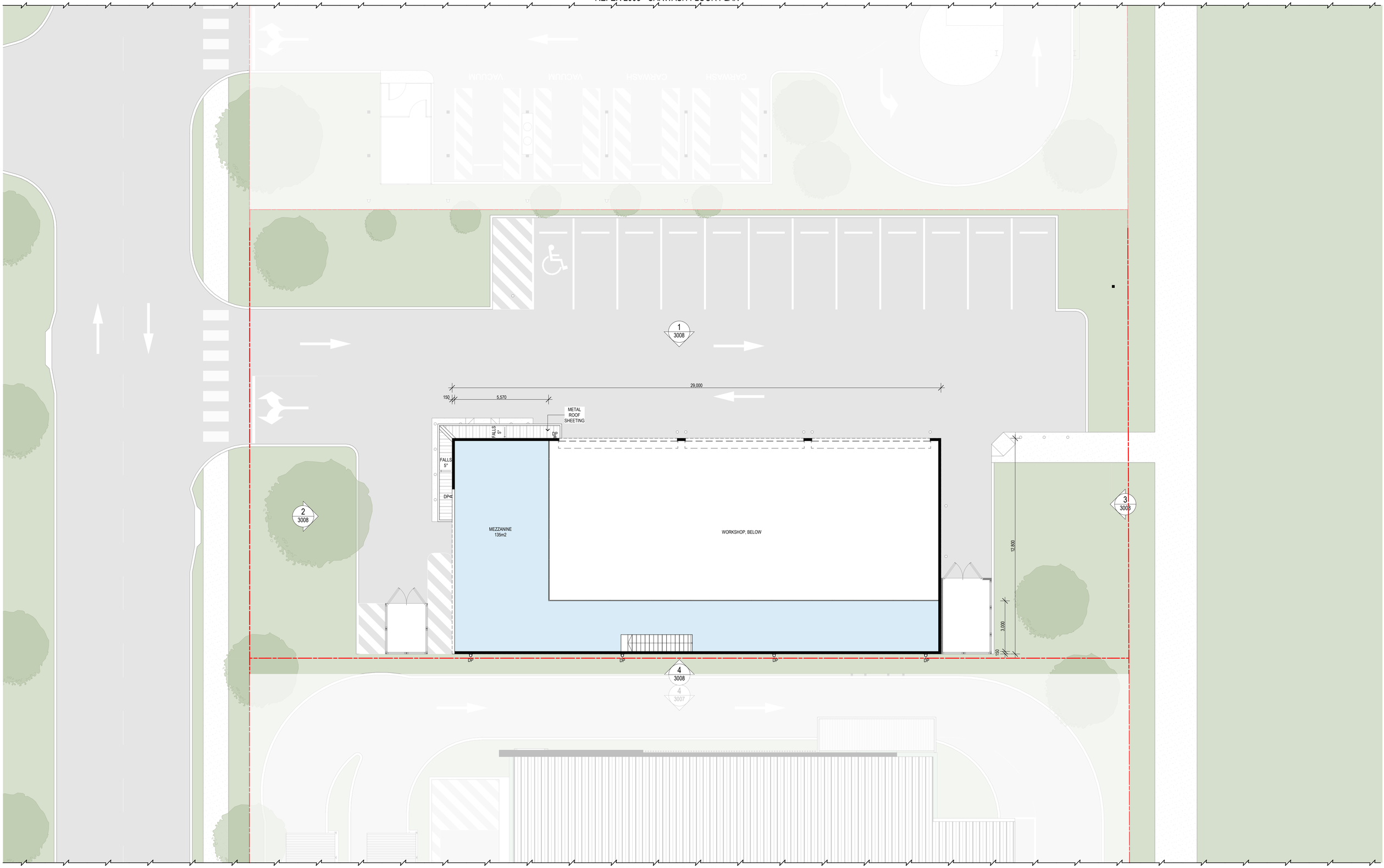

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
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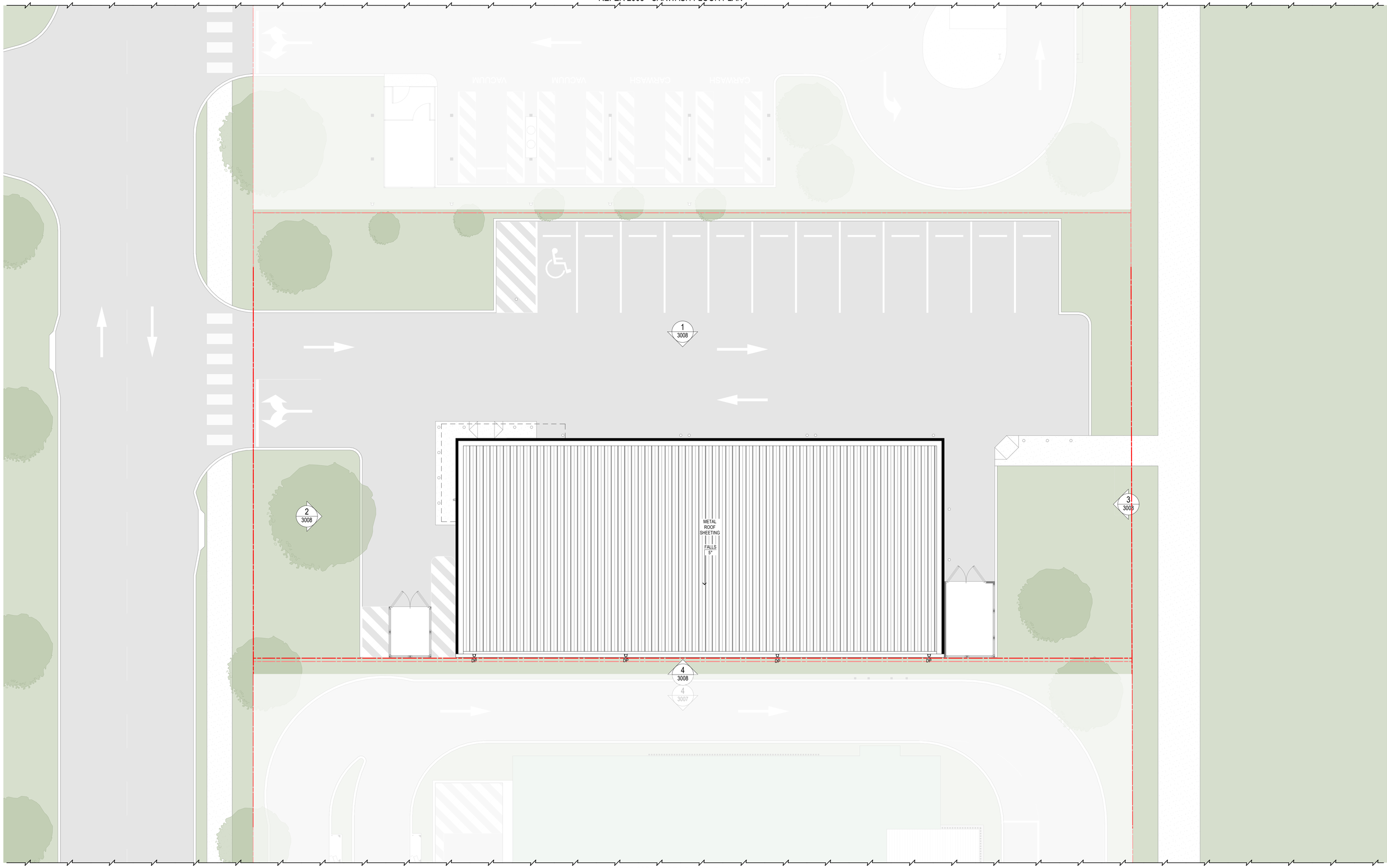

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

TYRE AND AUTO CENTRE ROOF PLAN

JOB No	DRAWING No	ISSUE
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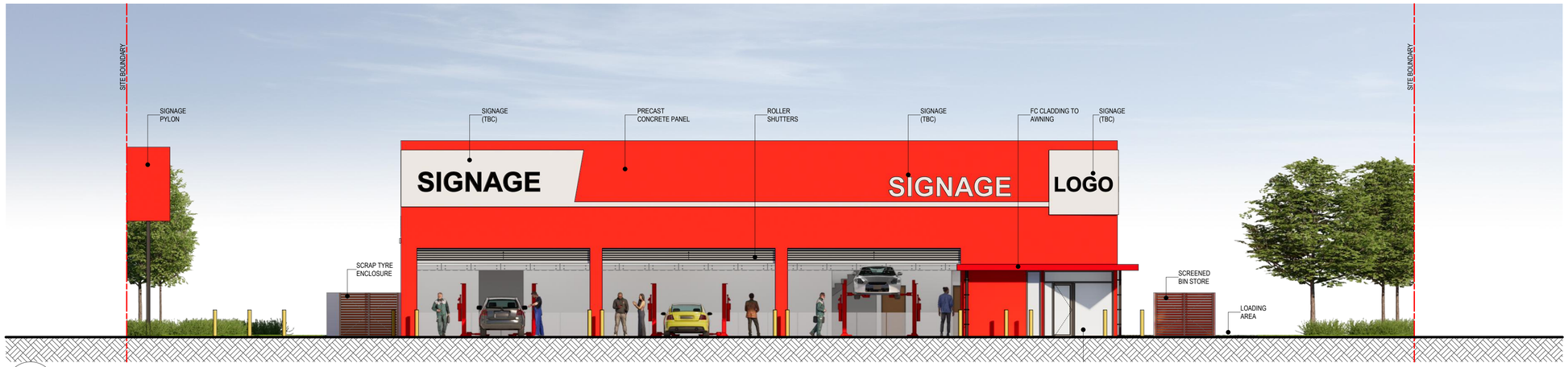

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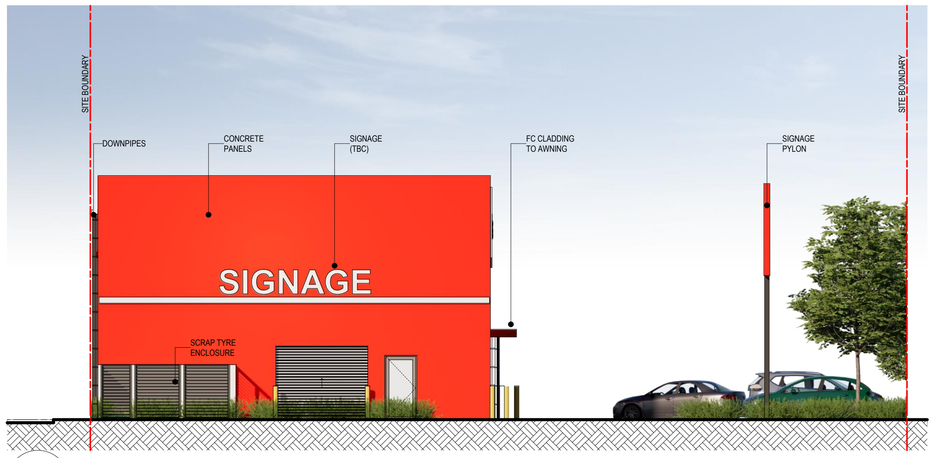

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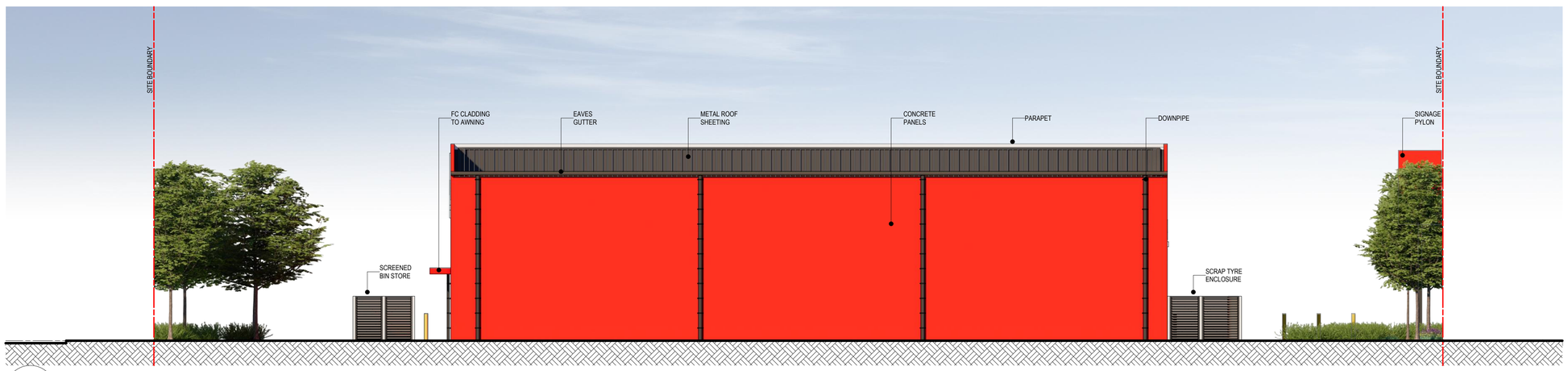

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01	PROGRESS ISSUE	23/08/24	CPA	MC	MC

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

TYRE AND AUTO CENTRE ELEVATIONS

JOB No	DRAWING No	ISSUE
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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

3D DRAWING & RENDERS - TYRE AND AUTO SHEET 01

JOB No	DRAWING No	ISSUE
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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

3D DRAWING & RENDERS - TYRE AND AUTO SHEET 02

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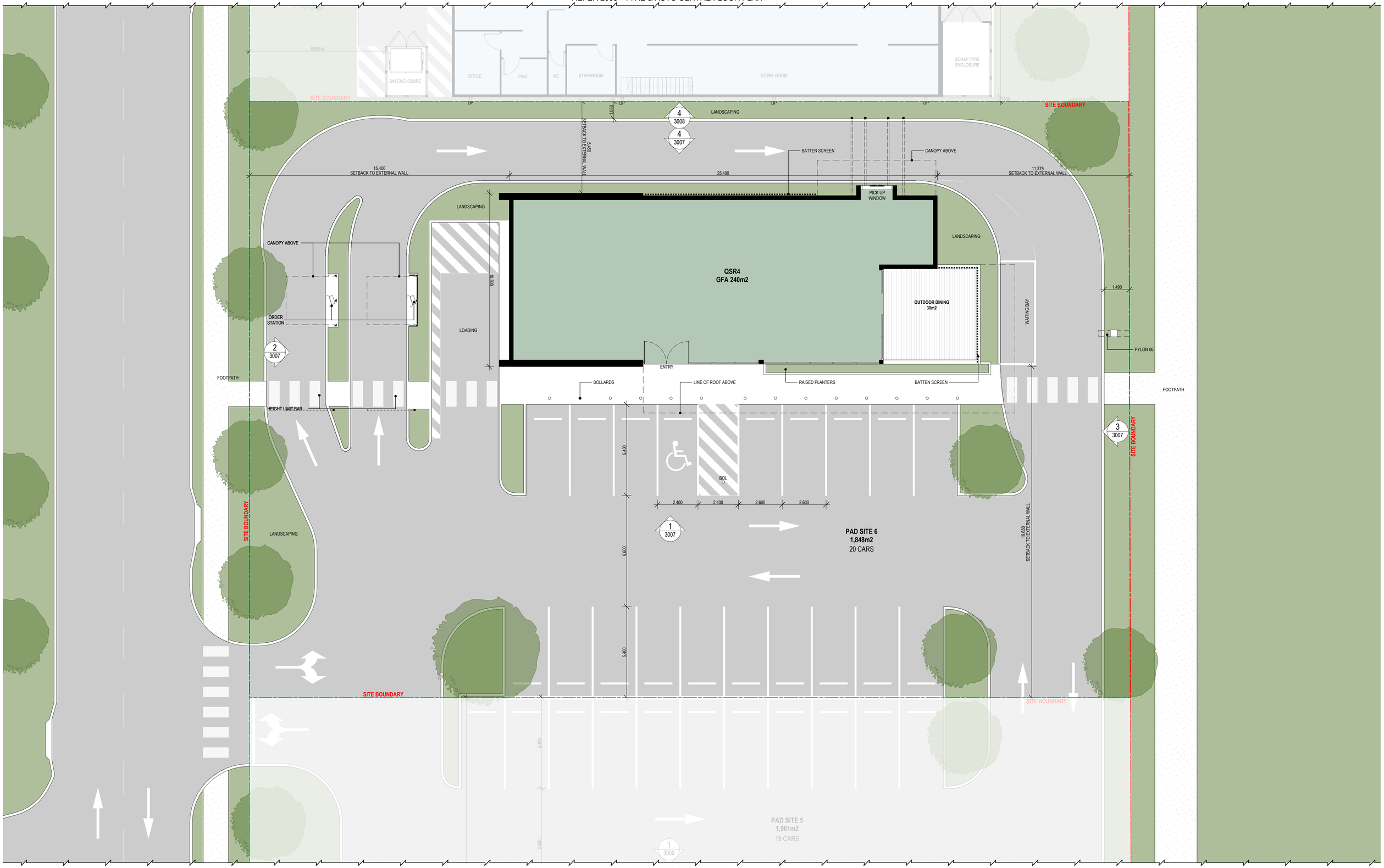

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
QSR4 FLOOR PLAN

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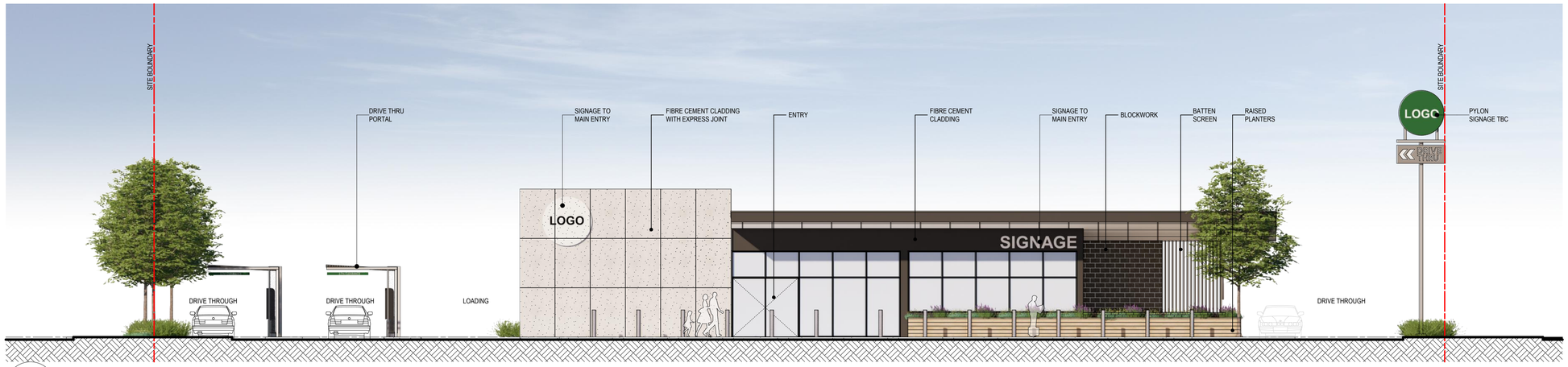

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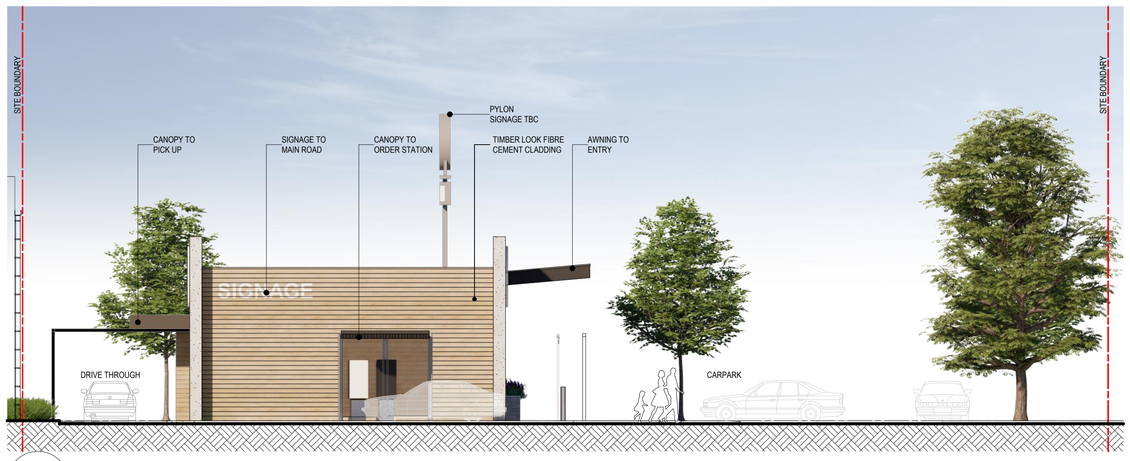

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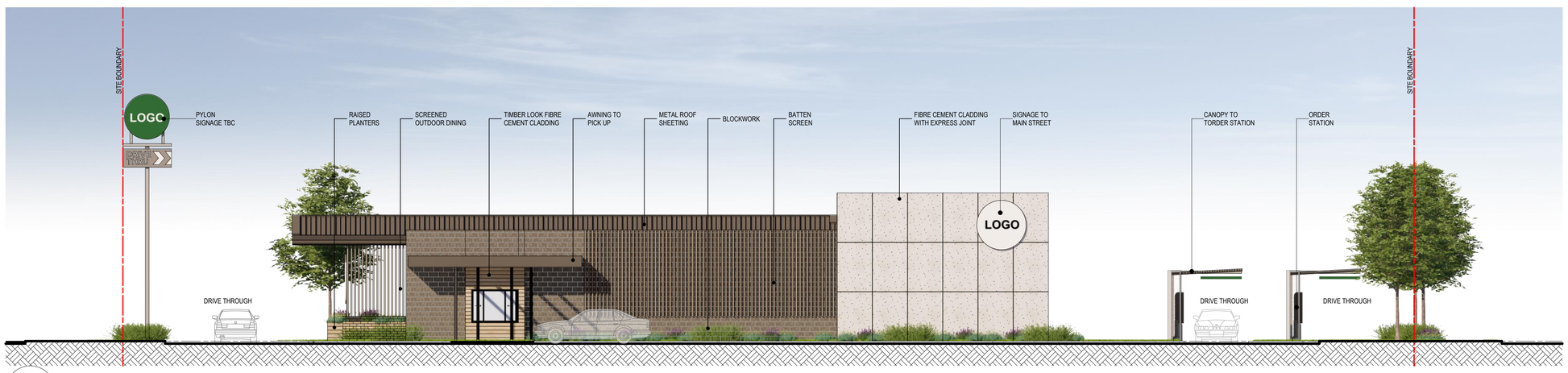

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

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JOB No	DRAWING No	ISSUE
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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

3D DRAWING & RENDERS - QSR4 SHEET 01

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

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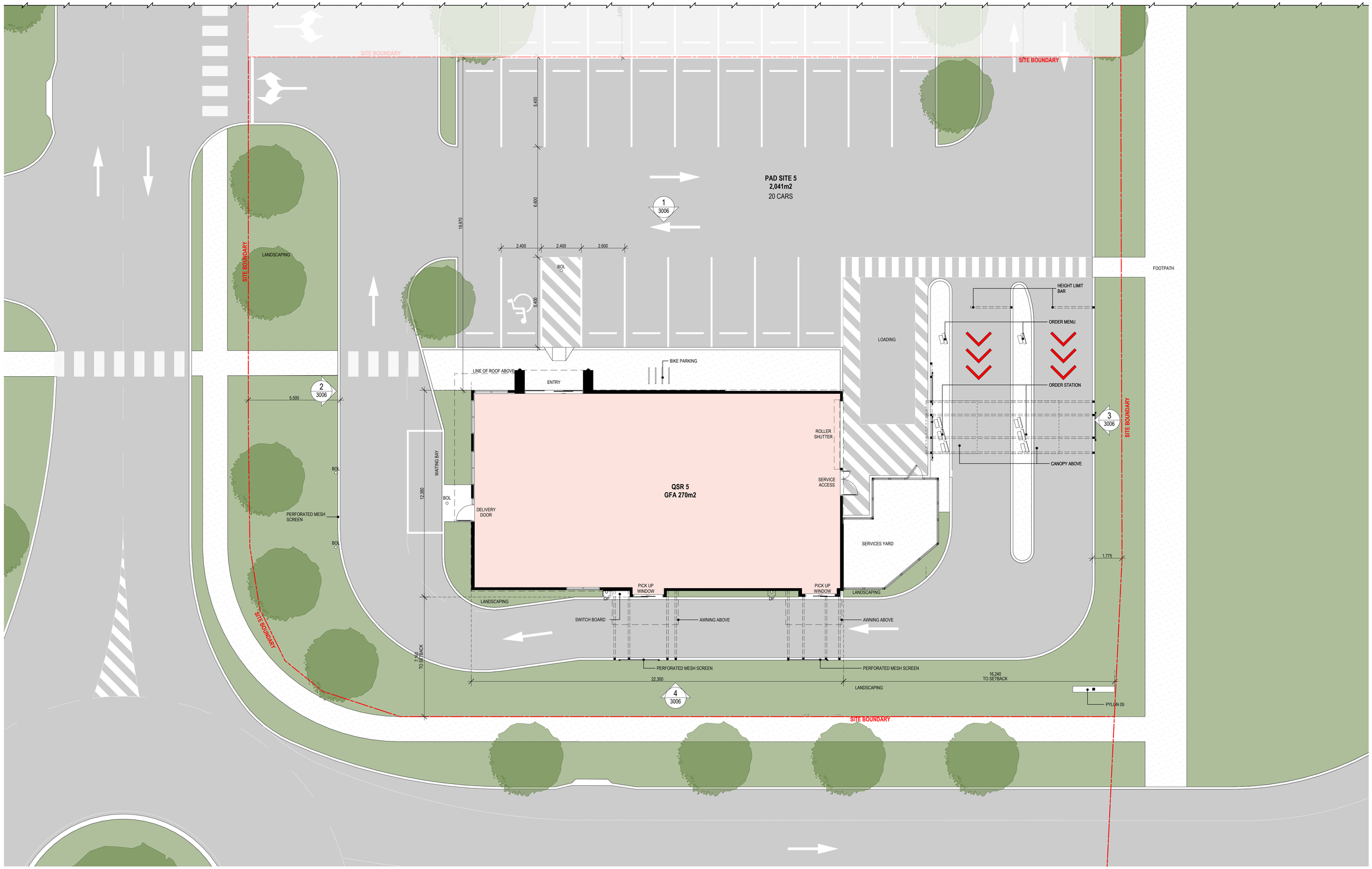

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

QSR 5 FLOOR PLAN

ISSUE PURPOSE	DATE	D	C	A	JOB No	DRAWING No	ISSUE
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Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

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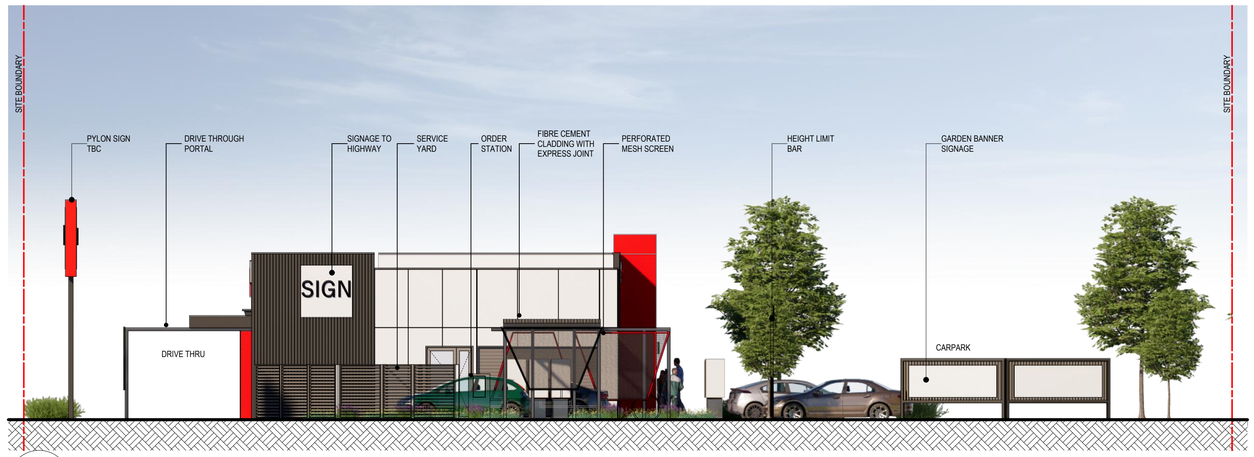

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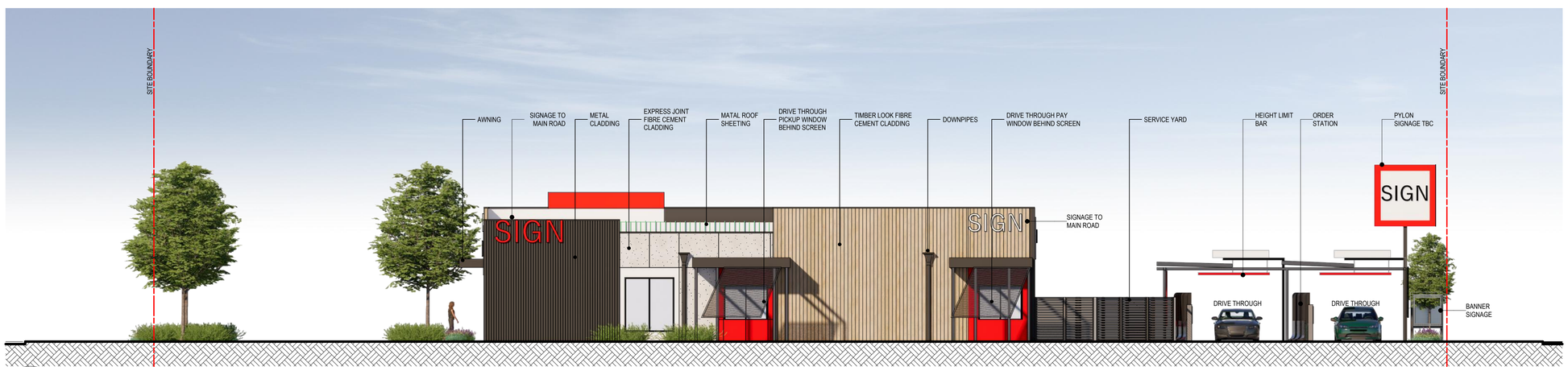

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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
QSR 5 ELEVATIONS

JOB No	DRAWING No	ISSUE
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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

3D DRAWING & RENDERS - QSR 5 SHEET 01

JOB No	DRAWING No	ISSUE
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PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE

3D DRAWING & RENDERS - QSR 5 SHEET 02

JOB No	DRAWING No	ISSUE
6570	SD0206	04

APPENDIX E

Engineering Report prepared by Premise

brazier motti

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PARKSIDE DEVELOPMENT PTY LTD

GREATER ASCOT TOWN CENTRE STAGE 1

ENGINEERING REPORT

Report No: P001406.R02
Rev: A
8 November 2024

Premise

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

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DOCUMENT AUTHORISATION					
Revision	**Revision Date**	**Proposal Details**			
A	08/11/24	For Approval			
Prepared By		**Reviewed By**		**Authorised By**	
Zac Strogusz		Zac Strogusz		Katie De Lacey	

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Version: 1, Version Date: 18/11/2024

CONTENTS

TABLES

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

FIGURES

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

1. INTRODUCTION

Premise have been commissioned by Parkside Development Pty Ltd to prepare this Engineering Report in support of a development application for the Greater Ascot Town Centre Stage 1. The existing site is located at 890 Dalrymple Road (Lot 2 on SP 107219), as shown in Figure 1. This report is to accompany a Material Change of Use application (MCU) of the lot to allow stage 1 of a multistage town centre precinct to be developed.

Figure 1 – Site Location

The proposed development (Stage 1) includes earthworks, sewer and water reticulation, stormwater drainage, roadworks, and electrical and telecommunication works. Stormwater quality objectives are addressed via a standalone report in Appendix E.

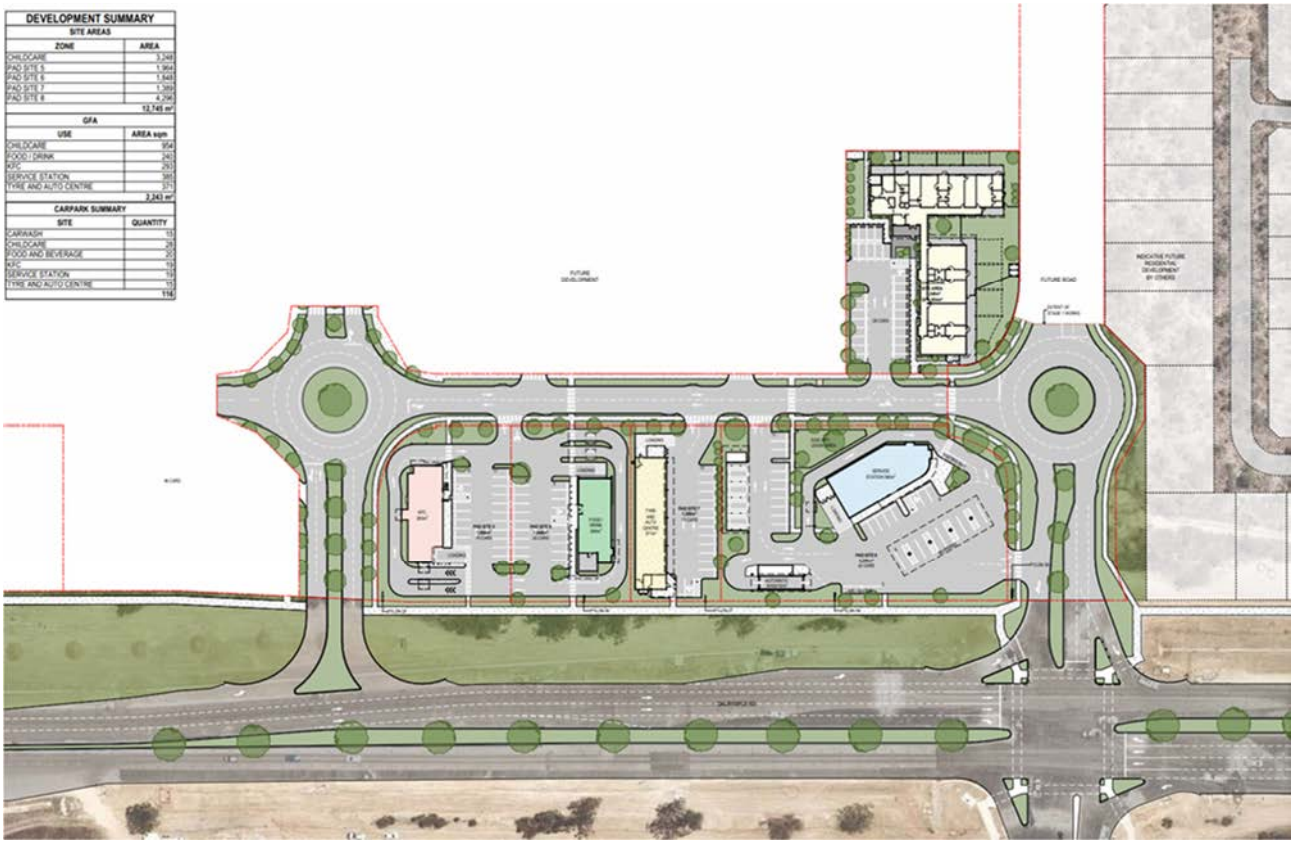
The proposed development site is adjacent to the residential component of Greater Ascot Development and bound by Dalrymple Road to the south. West of the site is Shaw Road.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

2. PROPOSED DEVELOPMENT

The architectural layouts by Cotter Parker, illustrating the proposed commercial precinct are attached in Appendix A. An extract of this layout is shown below in Figure 2:

Figure 2 Proposed Development Architectural Layout



The proposed development consisting of Stage 1 of the precinct is expected to include:

- A service station, including a convenience store and carwash, with a Gross Floor Area (GFA) of 385 m^2.
- A car service centre of with a GFA of 371 m^2.
- Two (2) fast-food restaurants with a combined total GFA of 533 m^2.
- A childcare centre site with a total area of 3,248 m^2.
- Four (4) pad sites with a combined area of 9,497 m^2.

The proposed development will also consist of an internal road network consisting of two (2) roundabouts.

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Version: 1, Version Date: 18/11/2024

3. TRAFFIC AND ROADWAYS

3.1 Development Access

Access to Stage 1 is proposed to be from two (2) accesses from the southern site boundary via Dalrymple Road. This includes a western and an eastern access as shown in the development site plan in Appendix B and reproduced in Figure 2.

3.2 External Road Network

Dalrymple Road is an existing Local Government Road under the governing authority of Townsville City Council (TCC), comprising two lanes in each direction.

Bishop Putney Road is located to the south of the site forming a priority-controlled T-intersection with Dalrymple Road, providing access to and from St Benedict's Catholic School. Upon completion of Stage 1, this intersection will become a four-way signalized intersection, providing access to the development via the northern leg.

3.3 Internal Road Network

The internal road network will be designed to service the development in accordance with the Road pavement shall be designed in accordance with Council Standards. The eastern access will be a Major Collector-Main Street. The Road Hierarchy and typical cross section is shown on Premise Sketch P001406/SKC01 and is attached in Appendix A.

Road pavements will be designed and constructed in accordance with Council Standards and policy for commercial type roads based on site geotechnical testing. All line marking and signage requirements shall be in accordance with the Manual of Uniform Traffic Control Devices.

4. ALLOTMENTS AND EARTHWORKS

4.1 Existing Vegetation

The subject site comprises an approximate area of 2.2 Ha and is currently unoccupied. The site is classified as an area of High Environmental Importance under the Townsville City Council Planning Scheme Environmental Importance Overlay (OM-08.0). However, the site is devoid of vegetation classified as a Matter of Environmental Significance (MSES) under the State Planning Policy (2017). Furthermore, recent aerial mapping confirms that the site has been cleared and is devoid of any substantial vegetation.

4.2 Existing Ground Conditions

The site for Stage 1 of the development is relatively flat, with minimal variation between existing surface elevations which range from 13 to 12m AHD. As the site is located between 5-20 m AHD, the risk of encountering Acid Sulfate Soils is considered low.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

4.3 Required Earthworks

The site shall be shaped to ensure positive drainage towards roadways or drainage reserves. Grading will be in accordance with Council requirements for non-residential allotments. The subject site shall be filled to a 100-year flood immunity standard in accordance with the current Townsville City Council Planning Scheme Policy Development Manual and State Government requirements. All allotment earthworks shall be carried out to Level 1 testing and inspection by a NATA registered geotechnical inspection and testing authority.

5. STORMWATER AND DRAINAGE

Stormwater drainage shall be designed and constructed in accordance with the Townsville City Plan – Planning Scheme Policy – Schedule 6.4.4.4 Stormwater Drainage Design and associated reference documents.

The development will be shaped to ensure positive drainage towards roadways or drainage reserves (ultimately east) as per Council requirements. A preliminary layout of the stormwater strategy is included in Appendix E.

5.1 Internal Drainage

Minor system (Principal Centre (CBD) Q10 – 10% AEP) stormwater flows shall be collected from buildings and carparks and transported via roadway kerb and channel, inverts, and kerb inlet pits and underground stormwater drainage pipes to the roads stormwater system before being discharged to the major drainage system as per Council standards. The major drainage system is the temporary existing open drain that diverts around Greater Ascot Town Centre Stage 1, into the permanent existing drain to the east, and ultimately to the Bohle River.

Major system (Q100 – 1% AEP) stormwater flows, surplus to the minor system capacity, shall be transported via the roadway systems to the main drainage paths, and discharged as per normal Council requirements.

The existing small stormwater catchment from the western side of Shaw Road which discharges under Shaw Road and, the balance of the commercial site, has been allowed to be diverted around stage 1 into the existing temporary drain which diverts around stage 1.

5.2 Stormwater Quality Management Plan

Water Sensitive Urban Design (WSUD) techniques and solutions shall be confirmed during detailed design of the proposed development to ensure adverse impacts are minimalised. A Stormwater Quality Management report has been prepared for the proposed development and is attached as a standalone Report in Appendix E.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

6. WATER RETICULATION

6.1 Water Infrastructure Assessment

Existing water infrastructure services in the vicinity of the proposed development site are shown in Figure 3. As shown, there is currently a DN500 trunk main which runs parallel to the southern side of the Dalrymple Road Reserve.

Figure 3 – Existing Trunk Water Infrastructure in Site Vicinity

The existing reticulation within the vicinity of the development is shown in Figure 4 and 4 and the preliminary water sketch on Appendix C. There is an existing DN250 water main which runs along the frontage of the proposed development site, and connects to the existing DN500 trunk main on Dalrymple Road.

The segment running to the north of the site (eastern site boundary) is a temporary installation and is located within the neighbouring eastern lot. This main will be truncated and replaced by a new ultimate main which is within development Road Reserve. Refer to the preliminary water sketch in Appendix C.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Figure 4 – Existing Water Reticulation Infrastructure in Site Vicinity

6.2 Reticulation Mains

The development will be provided with a reticulated water supply, connecting to the existing DN250 main shown in Figure 4. A conceptual water network layout is shown in Appendix C.

Each Easement or Lot within the proposed development shall be serviced via water mains of DN150 PVC . DN150 PVC water mains will generally be on a 1.8m alignment from the property boundary. Valves and hydrants shall be provided in accordance with normal Council requirements.

A hydraulic model for the proposed water network has been developed using WaterCAD, with a model output report included in Appendix G.

1.1 Water Demands

An evaluation of likely demands attributable to the proposed development has been undertaken. The Equivalent Population (EP) for each commercial site within the development site is shown in Table 1. A Loading rate is of 56.8 EP/Ha has been adopted as per Table SC3.1.6a of the Townsville City Plan.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Table 1 - Equivalent Population (EP) Assessment - Water

Land Use	Area (Ha)	Loading Rate (Water)	Equivalent Population (EP)
KFC	0.23	56.8 EP/Ha	13
Food/Drink	0.21	56.8 EP/Ha	12
Tyre and Auto Centre	0.18	56.8 EP/Ha	10
Service Station	0.47	56.8 EP/Ha	27
Childcare	0.32	56.8 EP/Ha	19
Total	**1.40**		**81**

The CTM Water Alliance Design and Construction Code (2020) have been used to estimate the likely average day demand and peak hour and mean day maximum month that will apply to the overall development site for water assessment works.

Table 2 presents a summary of the relevant Townsville City Council demand parameters that apply to new and existing developments in the local region.

Table 2 – Design Parameters – Water Demands

Parameter	Adopted Value
Demands	
Average Day Demand	600 L/EP/day
Mean Day Maximum Month to Average Day (MDMM / AD) Ratio	1.5
Peak Hour to Average Day Demand (PH/AD) Ratio	2.81
Fire Fighting – Commercial	Fire demand 30 L/s over 4h duration, with concurrent Peak Hour background demand
Service Pressures	
Minimum	22 m at property boundary
Maximum	80 m
Emergency Fire Operating Conditions (Minimum Residual Mains Pressures)	12 m at flowing hydrant 6 m elsewhere in mains that have customer connection.

The water demands for each commercial site within the development are presented in Table 3.

Table 3 – Water Demands

Land Use	Equivalent Population (EP)	Average Day Demand (AD)	Mean Day Maximum Month (MDMM)	Peak Hour (PH)
KFC	13	0.10	0.15	0.28
Food/Drink	12	0.09	0.14	0.26
Tyre and Auto Centre	10	0.08	0.11	0.21
Service Station	27	0.21	0.31	0.58
Childcare	19	0.15	0.22	0.41

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Total	**81**	**0.62**	**0.93**	**1.74**

Based on the population assessment of 81 EP and the above demand parameters, the peak hour demand would be up to 1.74L/s plus firefighting.

1.2 Water Network Analysis

A hydraulic analysis was undertaken to assess the necessary infrastructure required to service the development. A WaterCAD model has been developed for Greater Ascott Town Centre (file name "P001406 Greater Ascot Town Centre Stage 1 WaterCAD") for use in the water supply hydraulic assessment for the development.

The water network modelling assessment demonstrated:

- The standard scenario had a maximum pressure of 41m throughout the proposed reticulation network, which is well below the desired maximum service pressure of 80 m.
- The firefighting scenario had a maximum pressure of 41 m and a minimum pressure of 35 m, demonstrating ample pressure will be available.

The attached WaterCAD model output in Appendix G shows the proposed layout of the water network and reticulation mains required for the proposed development.

7. SEWERAGE INFRASTRUCTURE

Existing sewerage services within the vicinity of the proposed development are shown in Figure 5 (and in Appendix D). There are currently no trunk mains located within the Dalrymple road reserve. There is an existing DN300 gravity main located approximately 140 m to the northeast of the site. This main directs flow east along Blackmoor Promenade, across Greater Ascot Avenue and along Huntsmans Cresent to a Sewage Pumping Station on the northern side of Dalrymple Road. This Town Centre development will connect into this existing DN300 gravity main.

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Version: 1, Version Date: 18/11/2024

Figure 5 – Existing Sewer Infrastructure in Vicinity of the Proposed Development

1.3 Sewer Demands

An evaluation of likely sewer demands attributable to the proposed development has been undertaken. The Equivalent Population (EP) for each commercial site within the development site is shown in Table 1. A Loading rate is of 57.3 EP/Ha (Sewage) has been adopted as per Table SC3.1.6a of the Townsville City Plan.

Table 4 - Equivalent Population (EP) Assessment - Water

Land Use	Area (Ha)	Loading Rate (Water)	Equivalent Population (EP)
KFC	0.23	57.3 EP/Ha	13
Food/Drink	0.21	57.3 EP/Ha	12
Tyre and Auto Centre	0.18	57.3 EP/Ha	11
Service Station	0.47	57.3 EP/Ha	27
Childcare	0.32	57.3 EP/Ha	19
Total	**1.40**		**82**

The CTM Water Alliance Design and Construction Code (2020) have been used to establish the likely average dry weather flow (ADWF), peak dry weather flow (PDWF) and peak wet weather flow (PWWF) that will apply to the overall development site for the sewer assessment works. Table 5 presents a summary of the relevant Townsville City Council demand parameters that apply to new and existing developments in the local region.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Table 5 – Design Parameters – Sewage Demands

Parameter	Adopted Value
Average Day Weather Flow (ADWF)	230 L/EP/day
Peak Dry Weather Flow (PDWF)	4.7*EP^(-0.105)*ADWF
Peak Wet Weather Flow (PWWF)	5*ADWF

The sewer demands for each commercial site within the development are presented in Table 6.

Table 6 – Sewer Demands

Land Use	Equivalent Population (EP)	Average Dry Weather Flow (ADWF)	Peak Dry Weather Flow (PDWF)	Peak Wet Weather Flow (PWWF)
KFC	13	0.03	0.12	0.17
Food/Drink	12	0.03	0.12	0.16
Tyre and Auto Centre	10	0.03	0.11	0.15
Service Station	27	0.07	0.24	0.36
Childcare	19	0.05	0.17	0.25
Total	**82**	**0.22**	**0.76**	**1.09**

Based on the population assessment of 82 EP and the above demand parameters, the peak wet weather flow would be up to 1.09L/s.

7.1 Sewerage Design Criteria

A conceptual sewer layout is shown on Premise Sketch p001406-SKC04 in Appendix D. The proposed gravity sewer line will direct flows north to the existing DN300 trunk main shown in Figure 5.

The sewerage network shall be designed and constructed in accordance with the Townsville City Plan – Planning Scheme Policy and Water Systems Australia Specification WSA-03.

The location and sizing of the internal sewerage infrastructure will be verified as part of the detailed design of the development planning approvals.

8. PATHS AND PEDESTRIANS

There are currently no active transport facilities fronting the existing lot boundary. There is a pathway located on the southern side of the Dalrymple Road Reserve (under construction). This provides a route for pedestrians to access St Benedict's Catholic School from the east by crossing Bishop Putney Road.

To assist in pedestrian circulation through development, it is proposed to construct a new concrete pathway network. The pedestrian pathway network for the development is shown in the architectural

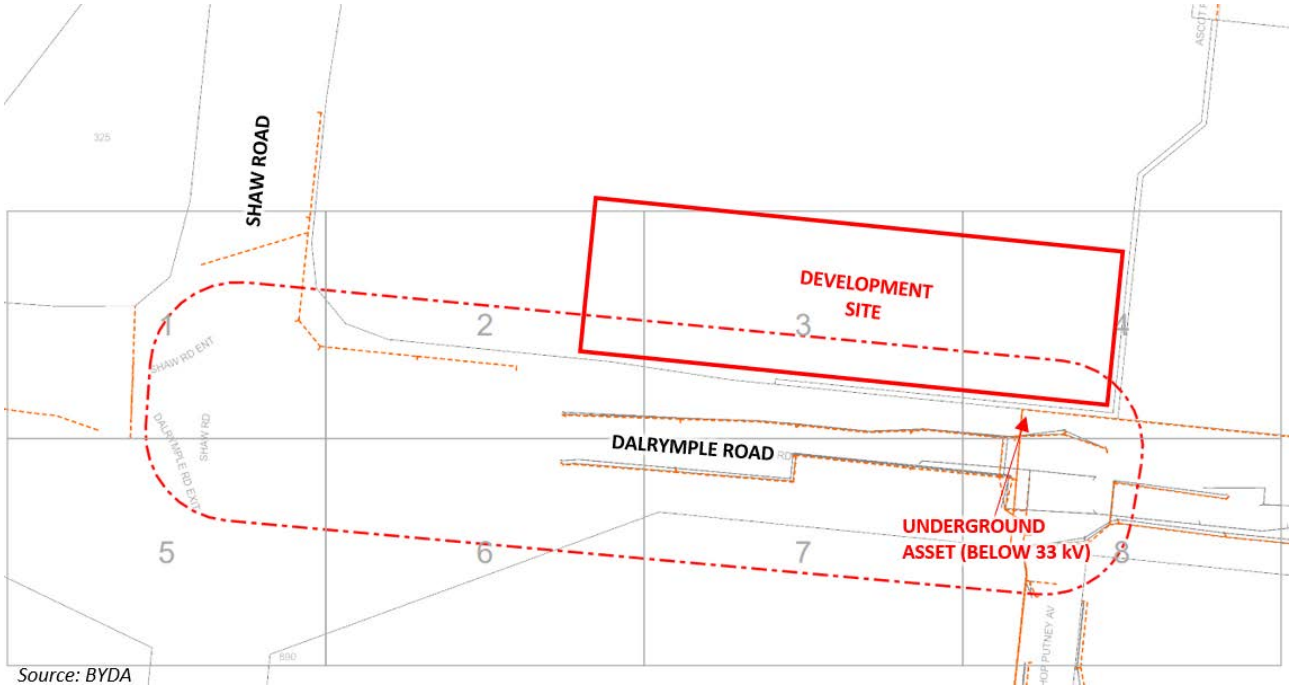
Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

layouts in Appendix B and will be fully considered as part of detailed design. This pathway network will run adjacent the southern site boundary, providing connectivity from the eastern residences and pedestrians crossing from Bishop Putney Road to the south.

9. ELECTRICITY AND COMMUNICATIONS

A search of Before You Dig Australia (BYDA) has been undertaken to identify existing underground electrical and telecommunications in the site vicinity. As shown in Figure 6, Ergon administers electrical assets (below 33 kV) in the Dalrymple Road reserve. The closest existing electrical cable to the site is located near the northeast corner of the existing lot boundary, which crosses Dalrymple Road to before continuing along the western side of Bishop Putney Road.

Figure 6 – Existing Electrical Assets in Site Vicinity



Source: BYDA

Furthermore, is also an NBN line located on the southern side of Dalrymple Road opposite the site with two pits located either side of the intersection between Bishop Putney Road.

Negotiations shall be undertaken with utility service providers for the supply of electricity and telecommunications to the development. Any electrical reticulation design for the proposed internal works will be completed by a qualified Electrical Engineer during the detailed design phase, and all appropriate approvals sought from the relevant authority.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

10. CONCLUSION

A review of the services proposed for this development and their impact on surrounding services, indicates that there is no impediment to development. The development can be adequately serviced by the existing water and sewer networks and electrical and telecommunications are also available within the vicinity of the site. The proposed minor and major drainage networks are in line with existing overall stormwater management plans approved for this development.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

APPENDIX A

ROAD HIERARCHY AND CROSS SECTION PLAN

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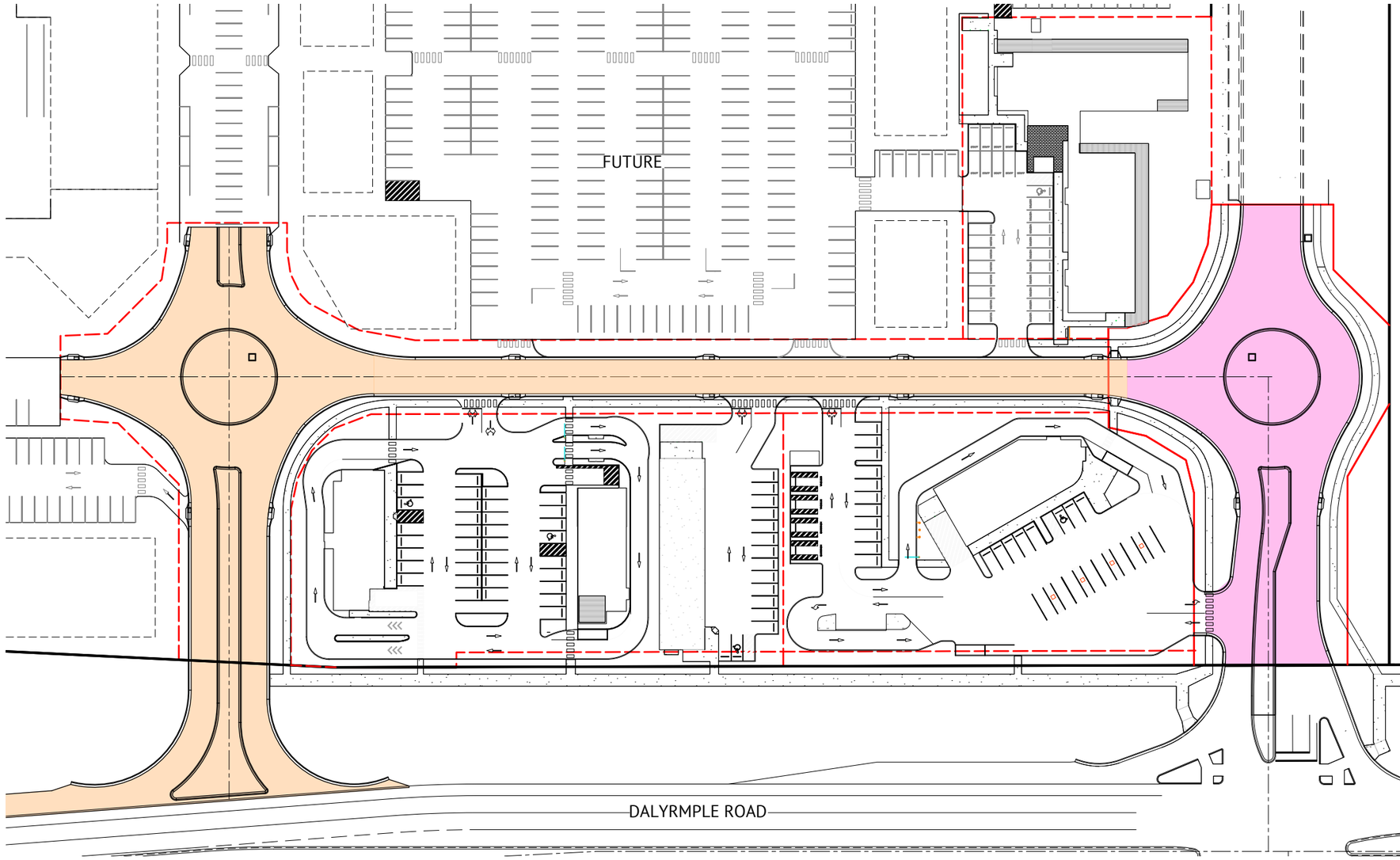
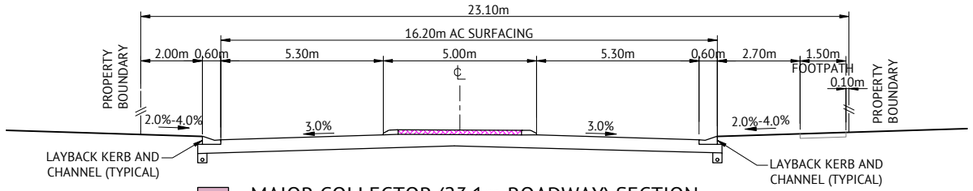
Version: 1, Version Date: 18/11/2024



ROAD TYPES

ROAD DESCRIPTION (FOR DETAILS REFER TO TYPICAL SECTIONS PLAN)	ROAD RESERVE WIDTH
MAJOR COLLECTOR/MAIN STREET	23.10m
INTERNAL PRIVATE ROAD NETWORK	15.25m



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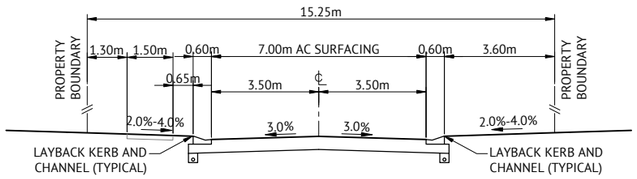

TYPICAL INTERNAL ROAD (15.25m ROADWAY) SECTION
SCALE 1:100

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SCALE
0 2 4 6m
SCALE 1:100 (A1)
0 10 20 30m
SCALE 1:500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT PARKSIDE DEVELOPMENT PTY LTD
PROJECT GREATER ASCOT TOWN CENTRE - STAGE 1
LOCATION DALRYMPLE ROAD, SHAW
SHEET TITLE ROAD HIERARCHY

JOB CODE P001406
SHEET NUMBER SKC01
REV 1

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

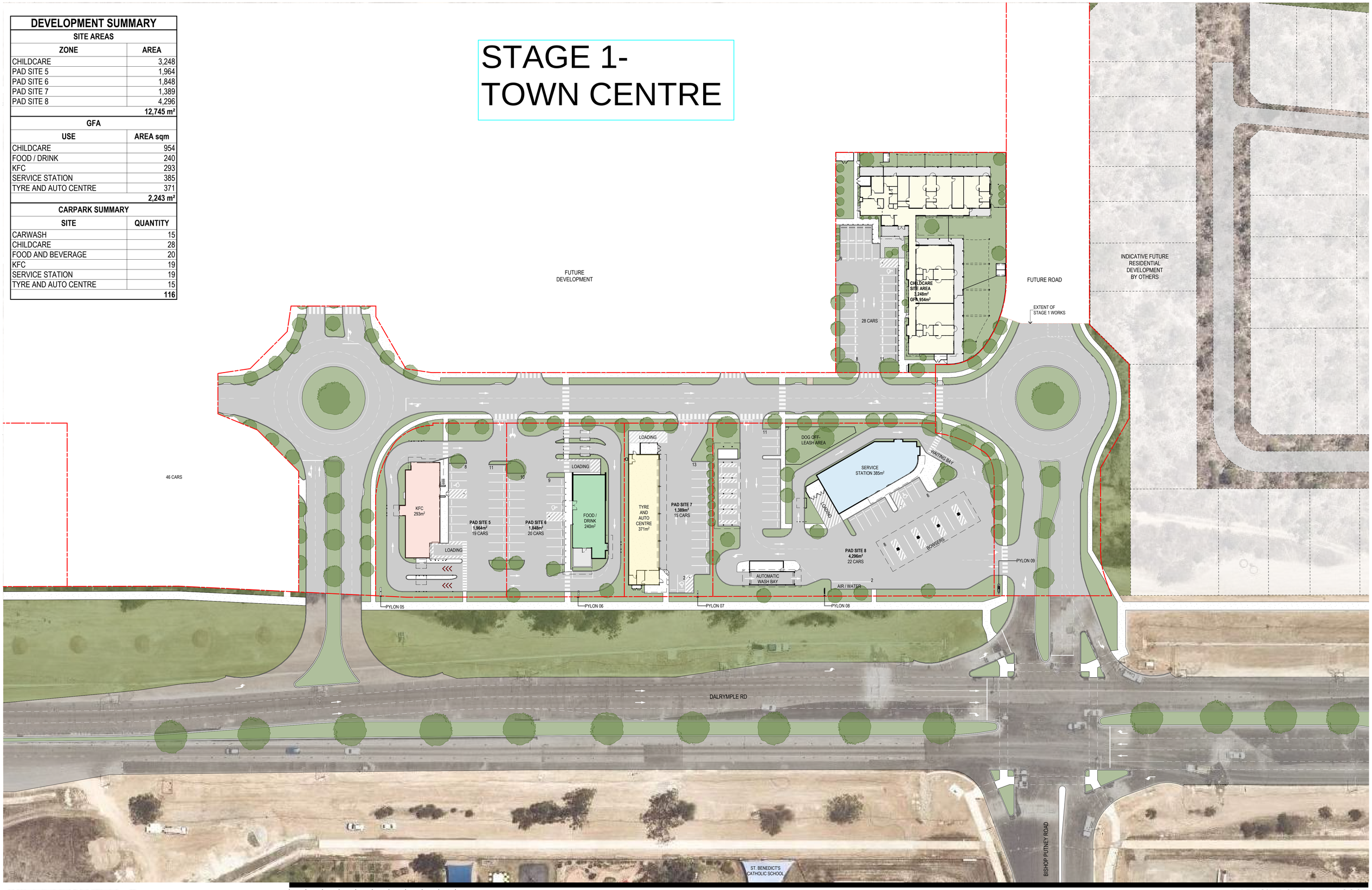
APPENDIX B

DEVELOPMENT SITE PLAN

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

STAGE 1- TOWN CENTRE

DEVELOPMENT SUMMARY	
SITE AREAS	
ZONE	**AREA**
CHILDCARE	3,248
PAD SITE 5	1,964
PAD SITE 6	1,848
PAD SITE 7	1,389
PAD SITE 8	4,296
	12,745 m²
GFA	
USE	**AREA sqm**
CHILDCARE	954
FOOD / DRINK	240
KFC	293
SERVICE STATION	385
TYRE AND AUTO CENTRE	371
	2,243 m²
CARPARK SUMMARY	
SITE	**QUANTITY**
CARWASH	15
CHILDCARE	28
FOOD AND BEVERAGE	20
KFC	19
SERVICE STATION	19
TYRE AND AUTO CENTRE	15
	116



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SCALE 1: 1000 @ A3

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06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	PROGRESS ISSUE	30/08/24	CPA	EB	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	20/08/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	01/07/24	EB	MC	MC

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
STAGE 1 SITE PLAN

JOB No	DRAWING No	ISSUE
6570	SD1002	07

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

ALL STAGES - TOWN CENTRE

AREAS SUMMARY

STAGE	USE	AREA
STAGE 1		
	CHILDCARE	954
	FOOD / DRINK	240
	KFC	293
	SERVICE STATION	385
	TYRE AND AUTO CENTRE	371
		2,243 m²
STAGE 2A		
	KIOSK	25
	LFR	2,559
	RETAIL	788
	SUPERMARKET	3,814
	TOWN SQUARE	1,573
		8,759 m²
STAGE 2B		
	RETAIL	1,029
		1,029 m²
STAGE 2C		
	RETAIL	1,405
		1,405 m²
STAGE 2D		
	GROCERIES	1,532
	LIBRARY	287
	MINI MAJOR	624
	RETAIL	342
	SWIM SCHOOL	602
		3,387 m²
STAGE 2E		
	LFR	1,246
	MC DONALDS	533
	QSR 2	277
	QSR 3	271
		2,327 m²
STAGE 3		
	BEER GARDEN	195
	LFR	13,355
	LIQUOR	800
	RETAIL	153
	TAVERN	557
		15,060 m²
		34,210 m²

CARPARK SUMMARY

STAGE	USE	QUANTITY
STAGE 1		
	CARWASH	15
	CHILDCARE	28
	FOOD AND BEVERAGE	20
	KFC	19
	SERVICE STATION	19
	TYRE AND AUTO CENTRE	15
		116
STAGE 2A		
		6
	DTB	6
	STREET PARKING	27
	SUPERMARKET	253
		292
STAGE 2B		
	RETAIL	24
		24
STAGE 2C		
	STREET PARKING	37
	SUPERMARKET	18
		55
STAGE 2D		
	SWIM SCHOOL	24
		24
STAGE 2E		
	LFR	46
	MC DONALDS	24
	QSR 2	20
	QSR 3	21
		111
STAGE 3		
	LFR	400
	TAVERN AND LIQUOR	44
		444
		1066

PARKING RATIO

STAGE 1		
2,243 m²	116 CARS	1 CAR / 19.3 m²
STAGE 2 COMBINED		
16,907 m²	506 CARS	1 CAR / 33.4 m²
STAGE 3		
15,060 m²	444 CARS	1 CAR / 33.9 m²
OVERALL BALANCE		
34,210 m²	1066 CARS	1 CAR / 32.1 m²

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06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	STAGE 2 PROGRESS ISSUE	05/09/24	EB	MC	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	23/07/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	12/07/24	CPA	MC	MC
ISSUE PURPOSE		**DATE**	**D**	**C**	**A**

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
MASTERPLAN

JOB No	DRAWING No	ISSUE
6570	**SD1003**	**08**

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Version: 1, Version Date: 18/11/2024

APPENDIX C

CONCEPTUAL WATER NETWORK LAYOUT

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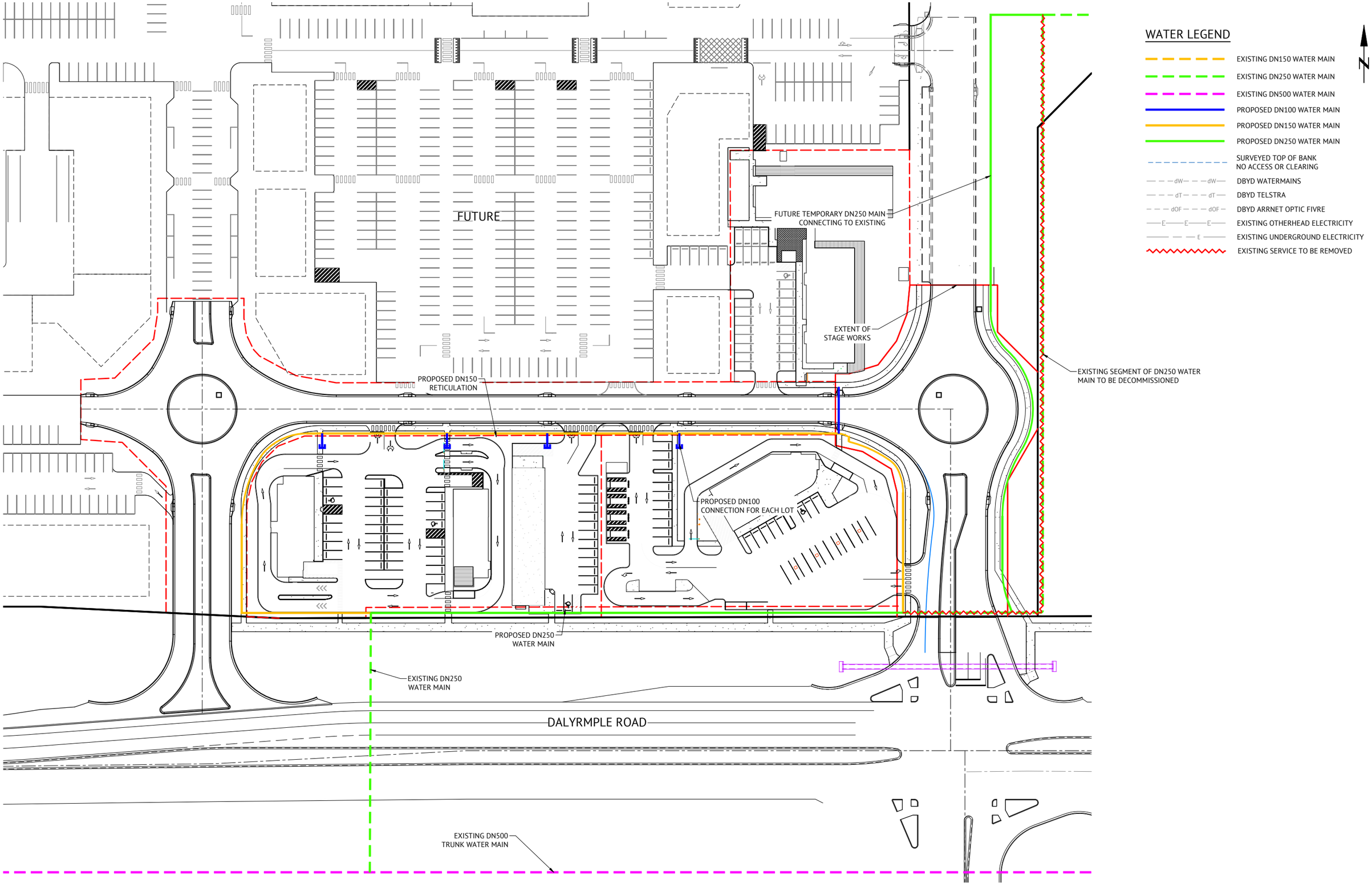
Version: 1, Version Date: 18/11/2024



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CHECKED Z.STROGUSZ
PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION RPEQ 31559 K.DE LACEY

SCALE
0 10 20 30m
SCALE 1:500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: PARKSIDE DEVELOPMENT PTY LTD
PROJECT: GREATER ASCOT TOWN CENTRE - STAGE 1
LOCATION: DALRYMPLE ROAD, SHAW
SHEET TITLE: WATER RETICULATION PLAN

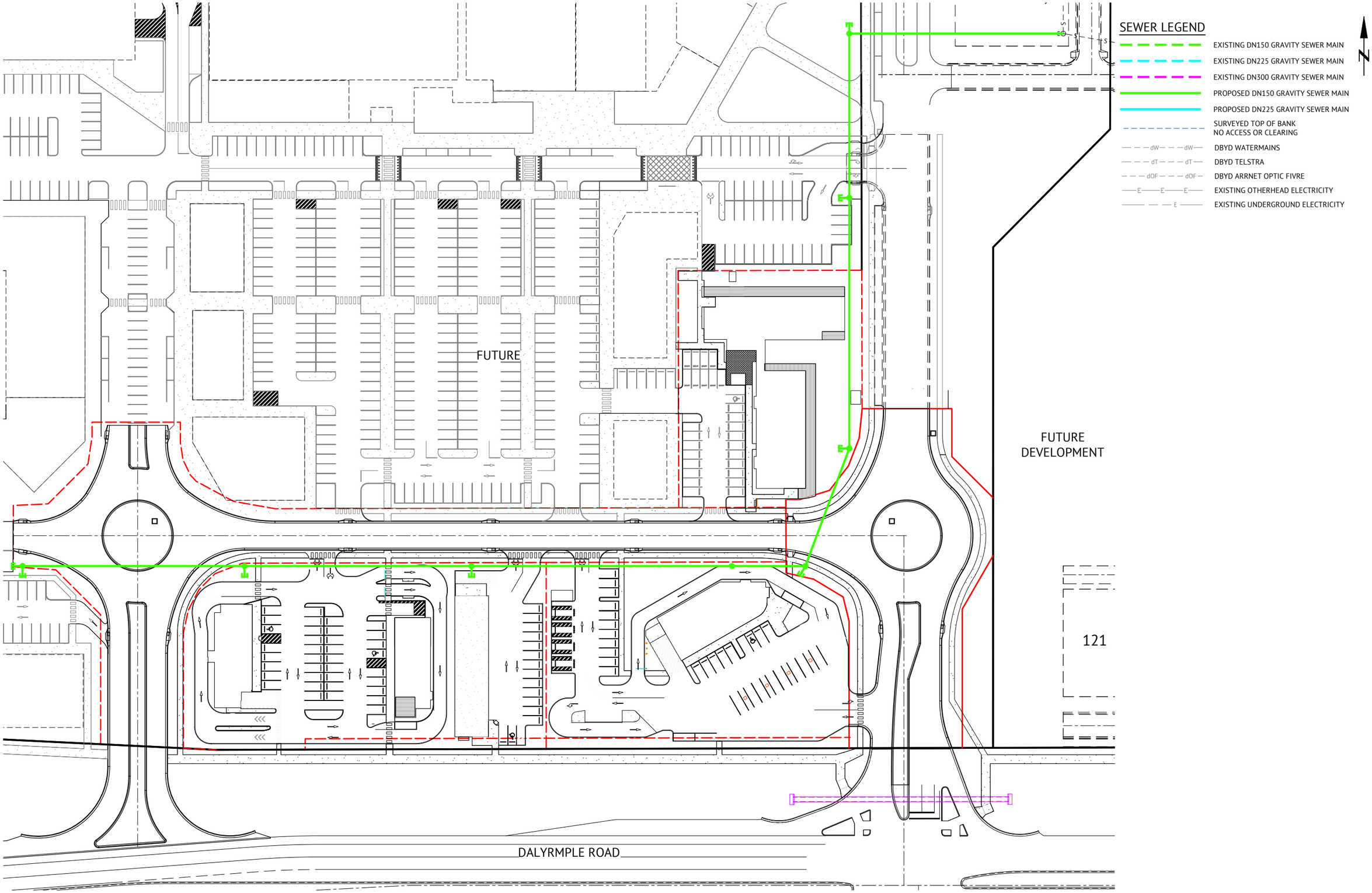
JOB CODE: P001406
SHEET NUMBER: SKC03
REV: 1

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

APPENDIX D

CONCEPTUAL SEWER LAYOUT

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024



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SCALE 0 10 20 30m
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CLIENT PARKSIDE DEVELOPMENT PTY LTD
PROJECT GREATER ASCOT TOWN CENTRE - STAGE 1
LOCATION DALRYMPLE ROAD, SHAW
SHEET TITLE SEWERAGE RETICULATION PLAN

JOB CODE P001406
SHEET NUMBER SKC04
REV 1

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

APPENDIX E

PROPOSED STORMWATER LAYOUT

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

STORMWATER LEGEND

- EXISTING SURFACE CONTOURS
- EXISTING STORMWATER DRAINAGE
- PROPOSED STORMWATER DRAINAGE
- DRAINAGE SWALE
- DIRECTION OF FLOW

FUTURE CULVERT

FUTURE CULVERT

FUTURE ULTIMATE DRAIN

FUTURE CULVERT

FUTURE ULTIMATE DRAIN

EXISTING ULTIMATE DRAIN TO REMAIN BEYOND

FUTURE

EXISTING STORMWATER DRAIN (TEMPORARY)

TEMPORARY SWALE DRAIN

FUTURE DEVELOPMENT

107

121 122 123

PROPOSED STUBS TO SERVICE EACH LOT

PROPOSED STORMWATER DRAINAGE

EXISTING STORMWATER DRAINAGE

DALYRMPLE ROAD

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PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION RPEQ 31559 K.DE LACEY

SCALE
0 15 30 45m
SCALE 1:750(A1)
ORIGINAL SHEET SIZE A1

CLIENT: PARKSIDE DEVELOPMENT PTY LTD
PROJECT: GREATER ASCOT TOWN CENTRE - STAGE 1
LOCATION: DALRYMPLE ROAD, SHAW
SHEET TITLE: STORMWATER RETICULATION

JOB CODE: P001406
SHEET NUMBER: SKC02
REV: 1

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

APPENDIX F

STORMWATER QUALITY MANAGEMENT PLAN

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

PARKSIDE DEVELOPMENT PTY LTD

GREATER ASCOT TOWN CENTRE STAGE 1

STORMWATER QUALITY MANAGEMENT PLAN

Report No: P001406.R03
Rev: A
7 November 2024

Premise

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

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DOCUMENT AUTHORISATION					
Revision	**Revision Date**	**Proposal Details**			
A	07/11/24	For Approval			
Prepared By		**Reviewed By**		**Authorised By**	
Lawrence Mills		Zac Strogusz		Katie De Lacey	

CONTENTS

TABLES

FIGURES

APPENDICES

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

INTRODUCTION

Premise Townsville Pty Ltd has been commissioned by Parkside Developments Pty Ltd to prepare a Stormwater Quality Management Plan for Stage 1 of the Greater Ascot Town Centre on Lot 2 on SP 107219.

Townsville City Council has consistently provided support for stormwater quality management strategies that involved a monetary contribution toward catchment-wide off-site stormwater quality management infrastructure, for similarly sized developments of a similar nature. It is requested that a monetary contribution be accepted for this development's Stormwater Quality Management Strategy.

EXISTING SITE

The site (Stage 1 of Town Centre) is generally a greenfield site with undeveloped land and is zoned as "Emerging Community" under the TCC Planning Scheme. Land use surrounding the site is generally low to medium density residential. The site is currently unoccupied, consisting of cleared land, situated on the outer South Western corner of Greater Ascot Residential Development.

PROPOSED DEVELOPMENT

The proposed development (Stage1) will consist of five lots which will consist of the following commercial uses:

- A service station, including a convenience store and carwash.
- A car service centre.
- Two (2) fast-food restaurants.
- A childcare centre site.

The proposed development will also consist of an internal road network consisting of two (2) roundabouts, which will be connected to future stages of the Greater Ascott Town Centre. Each of the above commercial facilities are expected to implement their own Stormwater Treatment devices and are not considered within the scope of this Stormwater Quality Plan. The catchment considered as part of this plan, will consist only of the internal road network which is estimated to comprise an area of 0.91 Ha.

Stormwater Quality

Current best practice Water Sensitive Urban Design (WSUD) techniques and solutions shall be employed during detailed design to ensure adverse impacts are minimised in accordance with the State Planning Policy (December 2013) and in association with Townsville City Council's WSUD for the Costal Dry Tropics (Townsville) Technical Guidelines (2011).

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

WATER QUALITY OBJECTIVES

The impact of the proposed development was evaluated in terms of long-term average annual pollutant loadings for a traditional residential site. This was accomplished by:

- Establishing long-term base line pollutant loads from a Model for Urban Stormwater Improvement Conceptualisation (MUSIC) model of the current land uses in the catchment;
- Modifying the baseline MUSIC model to incorporate the effects of the development due to changes in land use of the proposed development; and
- Examining the relative increase / decrease in long-term pollutant loads to the receiving waters.

The major pollutants associated with the proposed development are total suspended solids, total Nitrogen, total Phosphorus and gross pollutants.

Townsville City Council requires reduction in pollutants generated from the developed site as detailed below:

- Total suspended solids – 80%;
- Total Phosphorus – 65%;
- Total Nitrogen – 40%; and
- Gross pollutants – 90%.

MUSIC MODELLING

MUSIC is a water quality modelling system developed by the Cooperative Research Centre for Catchment Hydrology (CRCCH). MUSIC can simulate runoff quantity and quality for catchments ranging in scale from a single residential lot to several square kilometres. MUSIC is widely suited to assessing the effectiveness of the proposed stormwater controls.

The latest version of MUSIC (v6.3.3) was used to analyse the proposed stormwater controls in this development.

The following data was used as input for the MUSIC models:

- Long term rainfall data was obtained from the Townsville AERO pluviometer (gauge number 032040) at a six (6) minute data interval for a representative period from 1990-1999;
- Monthly aerial potential evapotranspiration data from the Townsville Aero pluviometer;
- A commercial area was adopted as the land use; and
- Generic pollutant export parameters for the identified land uses have been adopted from the MUSIC Modelling Guidelines (Water by Design, Version 1, 2010).

The development was modelled as one lumped catchment (roadway and vegetation). (The breakdown of split areas was equivalent to the overall lumped fraction impervious). The catchment drains to a single bio-retention basin. The catchment characteristics are summarised in Table 1 and a model schematic is shown in **Error! Reference source not found.**.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Table 1 – Catchment Characteristics

Catchment	Land Use	Catchment Area (Ha)	% Impervious
Greater Ascott Town Centre Stage 1 – Internal Road	COMMERCIAL	0.91	75%

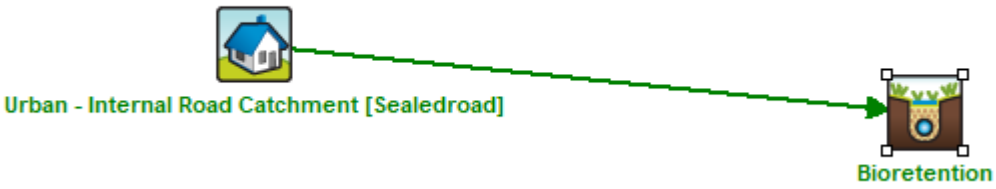


Figure 1 - Model Schematic (MUSIC)

TREATMENT STRATEGY

A treatment strategy for the proposed development has been determined. The proposed treatment strategy includes an end of line bioretention system. Table 2 summarises the parameters used for modelling the bioretention system in MUSIC.

Table 2 – Bioretention Parameters

	Parameter	Bioretention A
1	Surface Area (m^2)	192
2	Extended detention depth (m)	0.3
3	Filter treatment area (m^2)	140
4	Unlined filter media perimeter (m)	54
5	Saturated hydraulic conductivity (mm/hr)	200
6	Filter depth (m)	0.6
7	TN content of filter media (%)	800
8	Orthophosphate content of filter media (mg/kg)	30
9	Is the base lined?	No
10	Vegetated with effective nutrient removal plants	Yes
11	Overflow weir width (m)	5
12	Exfiltration rate (mm/hr)	0
13	If an exfiltration rate has been used, have node water balance losses been used in calculations of treatment train effectiveness	N/A

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

	Parameter	Bioretention A
14	If exfiltration rate has been used is the exfiltration rate justified?	N/A
15	Underdrain present?	Yes
16	Submerged zone with carbon present?	Yes
17	Depth of submerged zone (m)	0.45
18	Confirmation that K and C* remain default	Yes

Further specifications are as follows:

- Filter Medium – Sandy Loam;
- Transition layer – 100mm thick coarse sand in accordance with WSUD TDG 2006;
- Drainage layer – 200mm 2-5mm gravel in accordance with WSUD TDG 2006; and
- Underdrain System – An under-drain system of slotted drainage pipes (100mm dia at 1.5m centres).

Note: Transition Layer comply with the following: Top of drainage layer is to be at least 100mm above the top of the pipe and filter media / drainage material to comply with the Drainage of Subsurface Water from Road – Technical Bulletin No 32 (VicRoads).

POLLUTANT LOAD ASSESSMENT

Table 3 summarises the MUSIC results by showing a comparison of the mean pollutant loads for the Treatment Strategy. Overall pollutant loads have been reported at the downstream extent of the model.

Table 3 – Summary of MUSIC Results

Pollutant	Developed Case	Developed Case with treatment		Pollutant Reduction Targets
	Annual Load	Residual Load and Percentage Reduction		
Total Suspended Solids (kg/yr)	1500	194	87.1 %	80%
Total Phosphorus (kg/yr)	4.07	1.28	68.5 %	65%
Total Nitrogen (kg/yr)	23.7	9.55	59.6 %	40%
Gross Pollutants (kg/yr)	148	0	100 %	90%

The model results indicate the developed case of the site with treatment devices to be:

- Overall Total Suspended Solids loads are reduced by approximately 87%;
- Total Phosphorus loads are reduced by approximately 68%;
- Total Nitrogen loads are reduced by approximately 60%; and
- Gross Pollutant loads are reduced by 100%.

This indicates that the proposed bioretention has been adequately sized to satisfy the minimum reduction targets, as specified by Townsville City Council.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

RECOMMENDATION

In line with advice provided by Townsville City Council for similar developments of comparable size, it is proposed that bioretention infrastructure is not implemented on the subject site as a part of this development. For this development:

a) The provision of on-site stormwater quality management infrastructure is not a cost-effective means of achieving stormwater quality outcomes for the developer;

b) The maintenance costs associated with any on-site stormwater quality management infrastructure is not a cost-effective means for Council to achieve stormwater quality outcomes;

c) Any on-site stormwater quality management infrastructure that is provided on-site will be a less effective means of achieving stormwater quality outcomes than an offsite solution that could treat water from the broader catchment; and

A monetary contribution toward the implementation of catchment-wide stormwater quality management infrastructure, or the preparation of plans for such infrastructure, is recommended to be the most efficient and effective way to realise stormwater quality improvement for the catchment.

Table 4 below summarises construction details of recent bioretention basins built in Townsville over the past year including development name, treatment areas, construction costs, and the calculated cost per m^2 of filter/treatment area. The construction costs include earthworks, drainage structures, subsoil drains, filter material and temporary turfing, topsoil & geofabric for each bioretention. The Temporary turfing, topsoil and geofabric is not required when the bioretention is constructed to its ultimate form and therefore the temporary works are considered equal in value to the planting out of the basin treatment surface area.

Error! Reference source not found. contains the bioretention basins civil layout plans and extracts from the progress claims for each of the developments listed in Table 4.

Table 4 – Bioretention Construction Costs

Development	Basin Filter Treatment Area m2 (Approx.)	Total Construction Cost (2023/2024)	Cost per m^2 of Filter Treatment Area
ELLIOT SPRINGS - WHITES CREEK STAGES 37 TO 40 - BASIN A	570	$ 206,425.00	$ 362.15
ELLIOT SPRINGS - WHITES CREEK STAGES 37 TO 40 -BASIN B	230	$ 91,238.00	$ 396.69
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 - BASIN C	410	$ 177,660.00	$ 433.32
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 - BASIN D	1055	$ 383,555.00	$ 363.56

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Development	Basin Filter Treatment Area m2 (Approx.)	Total Construction Cost (2023/2024)	Cost per m^2 of Filter Treatment Area
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 - BASIN E	208	$ 122,009.00	$ 586.58
GREATER ASCOT STAGES 804 805 806 - BASIN A	380	$ 124,545.00	$ 327.75
GREATER ASCOT STAGES 804 805 806 - BASIN B	335	$ 110,033.00	$ 328.46
RIVERSTONE - BASIN A	270	$ 74,457.00	$ 275.77
RIVERSTONE - BASIN B	620	$ 127,857.00	$ 206.22
Total	**4078m^2**	**$ 1,417,779.00**	**$347.65/$m^2$**

Based on the developments listed in Table 4 it is determined that the average construction cost per m^2 of Filter treatment area for a bioretention basin in Townsville is approximately $347.65/$m^2$.

The cost of providing stormwater treatment facilities for the Stage 1 of the Greater Ascott Town Centre, proportionate to the approved land area has been calculated as 140m^2 (Table 2, Row 3) basin filter treatment area, multiplied by average construction cost per m^2 $347/m2, $48,580.00 excl GST.

It is recommended that the developer and council enter into an Infrastructure Agreement based on the above calculated costs and the developer makes a monetary contribution to Townsville City Council to offset any stormwater quality requirements of the development.

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

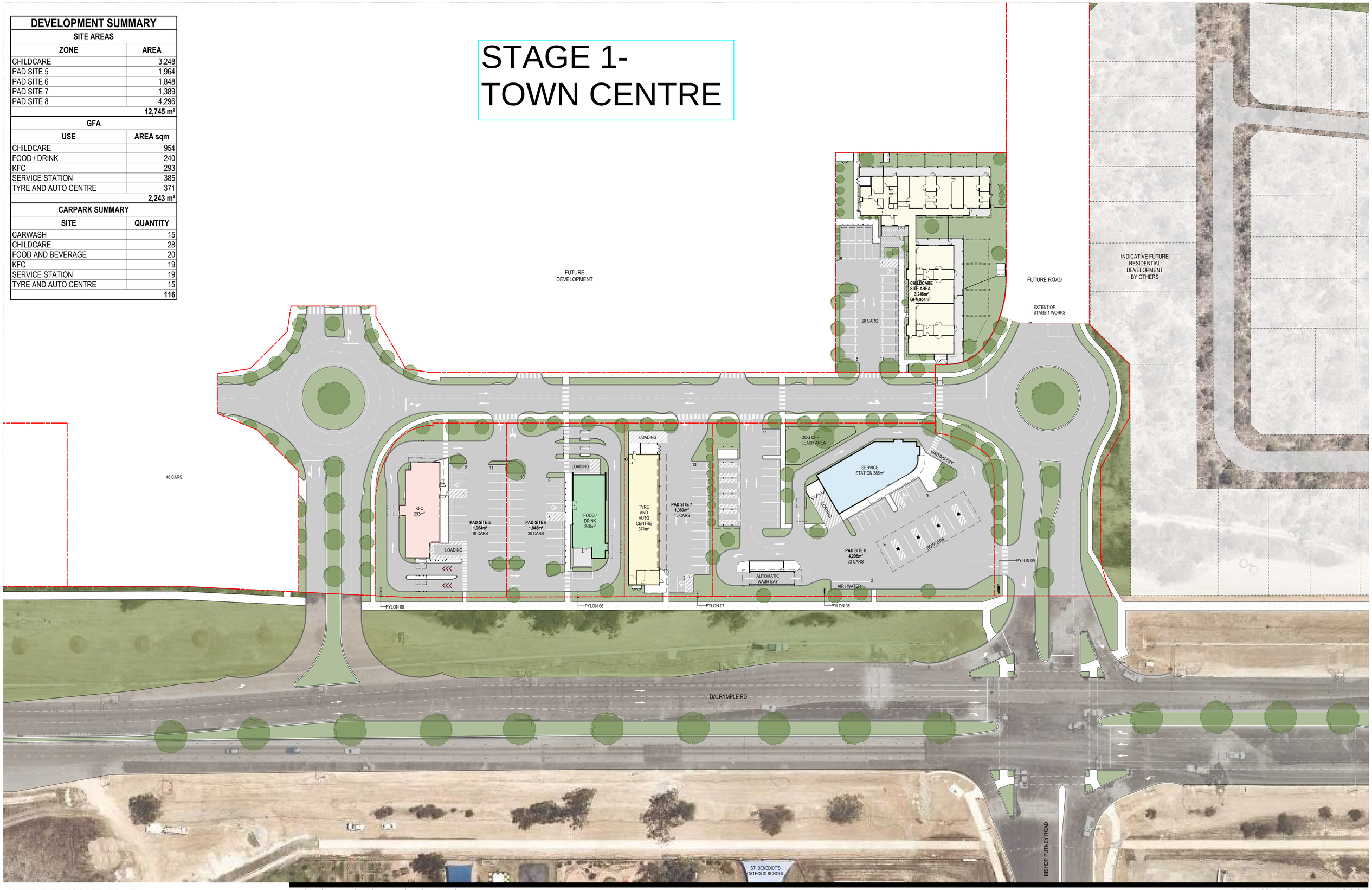
Appendix A

Development Site Plan

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

STAGE 1- TOWN CENTRE

DEVELOPMENT SUMMARY	
SITE AREAS	
ZONE	**AREA**
CHILDCARE	3,248
PAD SITE 5	1,964
PAD SITE 6	1,848
PAD SITE 7	1,389
PAD SITE 8	4,296
	12,745 m²
GFA	
USE	**AREA sqm**
CHILDCARE	954
FOOD / DRINK	240
KFC	293
SERVICE STATION	385
TYRE AND AUTO CENTRE	371
	2,243 m²
CARPARK SUMMARY	
SITE	**QUANTITY**
CARWASH	15
CHILDCARE	28
FOOD AND BEVERAGE	20
KFC	19
SERVICE STATION	19
TYRE AND AUTO CENTRE	15
	116



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BRISBANE
T 61 7 3846 7422

COTTEE PARKER ARCHITECTS PTY LTD
ABN 77 010 924 106

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SCALE 1: 1000 @ A3

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07	MASTERPLAN PROGRESS ISSUE	27/09/24	CPA	EB	EB
06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	PROGRESS ISSUE	30/08/24	CPA	EB	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	20/08/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	01/07/24	EB	MC	MC

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW
CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
STAGE 1 SITE PLAN

JOB No	DRAWING No	ISSUE
6570	SD1002	07

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

ALL STAGES - TOWN CENTRE

AREAS SUMMARY

STAGE	USE	AREA
STAGE 1		
	CHILDCARE	954
	FOOD / DRINK	240
	KFC	293
	SERVICE STATION	385
	TYRE AND AUTO CENTRE	371
		2,243 m²
STAGE 2A		
	KIOSK	25
	LFR	2,559
	RETAIL	788
	SUPERMARKET	3,814
	TOWN SQUARE	1,573
		8,759 m²
STAGE 2B		
	RETAIL	1,029
		1,029 m²
STAGE 2C		
	RETAIL	1,405
		1,405 m²
STAGE 2D		
	GROCERIES	1,532
	LIBRARY	287
	MINI MAJOR	624
	RETAIL	342
	SWIM SCHOOL	602
		3,387 m²
STAGE 2E		
	LFR	1,246
	MC DONALDS	533
	QSR 2	277
	QSR 3	271
		2,327 m²
STAGE 3		
	BEER GARDEN	195
	LFR	13,355
	LIQUOR	800
	RETAIL	153
	TAVERN	557
		15,060 m²
		34,210 m²

CARPARK SUMMARY

STAGE	USE	QUANTITY
STAGE 1		
	CARWASH	15
	CHILDCARE	28
	FOOD AND BEVERAGE	20
	KFC	19
	SERVICE STATION	19
	TYRE AND AUTO CENTRE	15
		116
STAGE 2A		
		6
	DTB	6
	STREET PARKING	27
	SUPERMARKET	253
		292
STAGE 2B		
	RETAIL	24
		24
STAGE 2C		
	STREET PARKING	37
	SUPERMARKET	18
		55
STAGE 2D		
	SWIM SCHOOL	24
		24
STAGE 2E		
	LFR	46
	MC DONALDS	24
	QSR 2	20
	QSR 3	21
		111
STAGE 3		
	LFR	400
	TAVERN AND LIQUOR	44
		444
		1066

PARKING RATIO

STAGE 1		
2,243 m²	116 CARS	1 CAR / 19.3 m²
STAGE 2 COMBINED		
16,907 m²	506 CARS	1 CAR / 33.4 m²
STAGE 3		
15,060 m²	444 CARS	1 CAR / 33.9 m²
OVERALL BALANCE		
34,210 m²	1066 CARS	1 CAR / 32.1 m²

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07	MASTERPLAN PROGRESS ISSUE	25/09/24	EB	MC	MC
06	FOR INFOMATION	19/09/24	CPA	EB	MC
05	STAGE 2 PROGRESS ISSUE	05/09/24	EB	MC	MC
04	PROGRESS ISSUE	23/08/24	CPA	MC	MC
03	FOR INFORMATION	23/07/24	EB	MC	MC
02	FOR INFORMATION	15/07/2024	JG	EB	MC
01	FOR INFORMATION	12/07/24	CPA	MC	MC
ISSUE PURPOSE		**DATE**	**D**	**C**	**A**

SD

PARKSIDE GREATER ASCOT

DALRYMPLE ROAD, SHAW

CLIENT - PARKSIDE DEVELOPMENTS

DRAWING TITLE
MASTERPLAN

JOB No	DRAWING No	ISSUE
6570	**SD1003**	**08**

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

Appendix B

Preliminary Stormwater Drainage Layout Plan

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

STORMWATER LEGEND

- EXISTING SURFACE CONTOURS
- EXISTING STORMWATER DRAINAGE
- PROPOSED STORMWATER DRAINAGE
- DRAINAGE SWALE
- DIRECTION OF FLOW

FUTURE CULVERT

FUTURE CULVERT

FUTURE ULTIMATE DRAIN

FUTURE CULVERT

FUTURE ULTIMATE DRAIN

EXISTING ULTIMATE DRAIN TO REMAIN BEYOND

FUTURE

EXISTING STORMWATER DRAIN (TEMPORARY)

TEMPORARY SWALE DRAIN

FUTURE DEVELOPMENT

107

121 122 123

PROPOSED STUBS TO SERVICE EACH LOT

PROPOSED STORMWATER DRAINAGE

EXISTING STORMWATER DRAINAGE

DALYRMPLE ROAD

N

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
08/11/2024	1	PRELIMINARY - NOT FOR CONSTRUCTION		

REVISIONS

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84 DENHAM STREET
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DESIGNED C.CLARK
CHECKED Z.STROGUSZ
PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION RPEQ 31559 K.DE LACEY

SCALE
0 15 30 45m
SCALE 1:750(A1)
ORIGINAL SHEET SIZE A1

CLIENT: PARKSIDE DEVELOPMENT PTY LTD
PROJECT: GREATER ASCOT TOWN CENTRE - STAGE 1
LOCATION: DALRYMPLE ROAD, SHAW
SHEET TITLE: STORMWATER RETICULATION

JOB CODE: P001406
SHEET NUMBER: SKC02
REV: 1

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

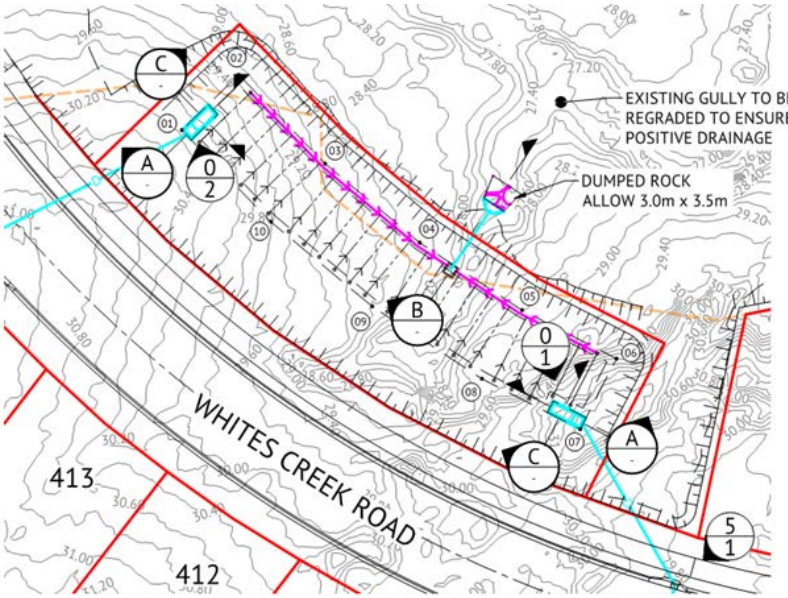
Appendix C

Bio Retention Layout Plans and Costs

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

BASIN A - BASE AREA 615m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 37 TO 40 LLC-0093 SEPT 2024					
Item	**Description**	**Unit**	**Quantity**	**Contract Rate**	**Contract Amount**
4	**Scour Protection**				
(a)	Dumped rock - 600mm thick (D_{50} 300mm) on geotextile fabric (Bidum A34)	m^2	11	$ 45.25	$ 497.75
5	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(a)	Bio-Retention A - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	600	$ 183.60	$ 110,160.00
(b)	Bio-Retention A - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	600	$ 117.23	$ 70,338.00
7	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCBC sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	2.0	$ 11,259.51	$ 22,519.02
(a)	Hydromulching H2	m^2	990	$ 2.94	$ 2,910.60
					$ 206,425.37

from payment claim 05



MODIFIED HES AND BIO-RETENTION BASIN A LAYOUT
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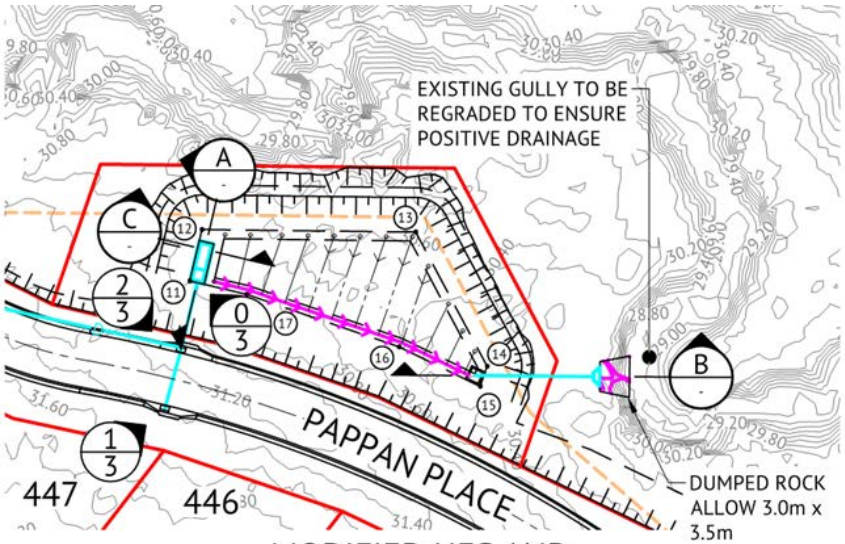
Version: 1, Version Date: 18/11/2024

BASIN B - BASE AREA 245 m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 37 TO 40 LLC-0093 SEPT 2024					
Item	**Description**	**Unit**	**Quantity**	**Contract Rate**	**Contract Amount**
4	**Scour Protection**				
(a)	Dumped rock - 600mm thick (D_{50} 300mm) on geotextile fabric (Bidum A34)	m^2	11	$ 45.25	$ 497.75
5	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(c)	Bio-Retention B - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	236	$ 209.15	$ 49,359.40
(d)	Bio-Retention B - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	236	$ 122.90	$ 29,004.40
7	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCBC sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1.0	$ 11,259.51	$ 11,259.51
(a)	Hydromulching H2	m^2	380	$ 2.94	$ 1,117.20
					$ 91,238.26

from payment claim 05



MODIFIED HES AND BIO-RETENTION BASIN B LAYOUT

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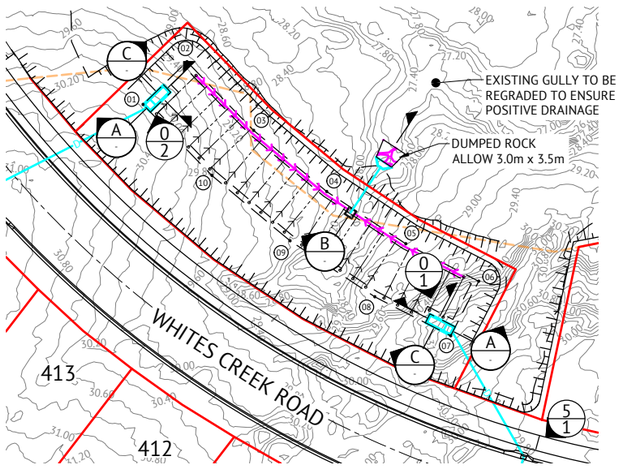
Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024



MODIFIED HES AND BIO-RETENTION BASIN A LAYOUT

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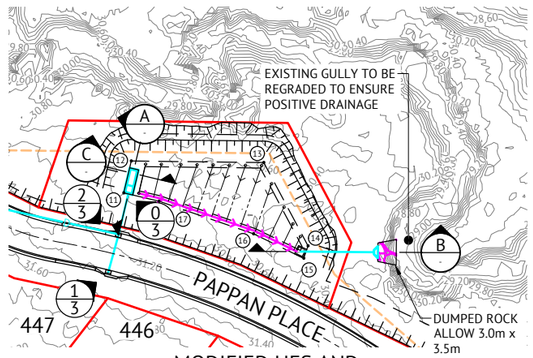
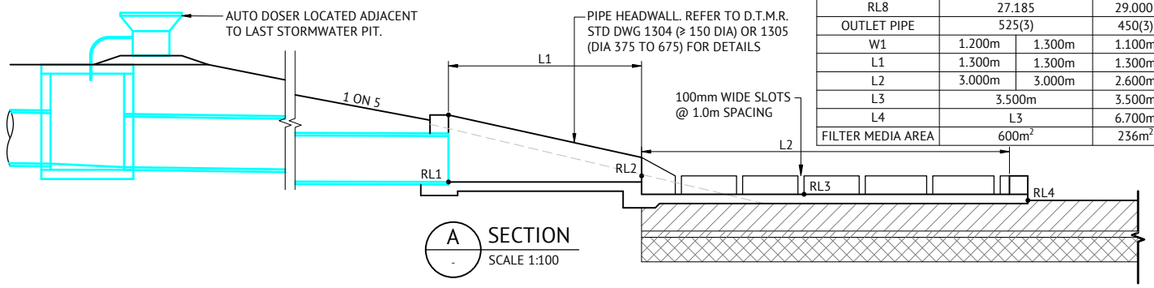


MODIFIED HES AND BIO-RETENTION BASIN B LAYOUT

SCALE: 1:500

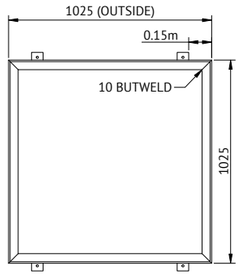
H.E.S DETAILS

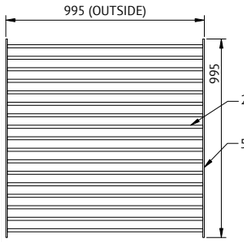
NOTATION	BASIN A		BASIN B
	OUTLET 0/1	OUTLET 0/2	
RL1	DSIL		DSIL
RL2	RL1 + 0.100m		RL1 + 0.100m
RL3	RL1 - 0.200m		RL1 - 0.200m
RL4	RL1 - 0.300m		RL1 - 0.300m
RL5	RL1 + 0.100m		RL1 + 0.100m
RL6	RL1 + 0.400m		RL1 + 0.400m
RL7	27.285		29.100
RL8	27.185		29.000
OUTLET PIPE	525(3)		450(3)
W1	1.200m	1.300m	1.100m
L1	1.300m	1.300m	1.300m
L2	3.000m	3.000m	2.600m
L3	3.500m		3.500m
L4	L3		6.700m
FILTER MEDIA AREA	600m²		236m²

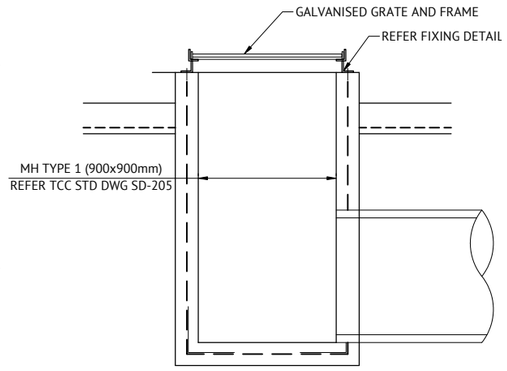


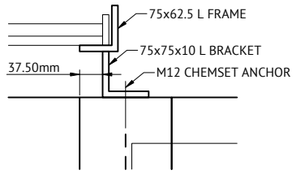
A SECTION

SCALE 1:100



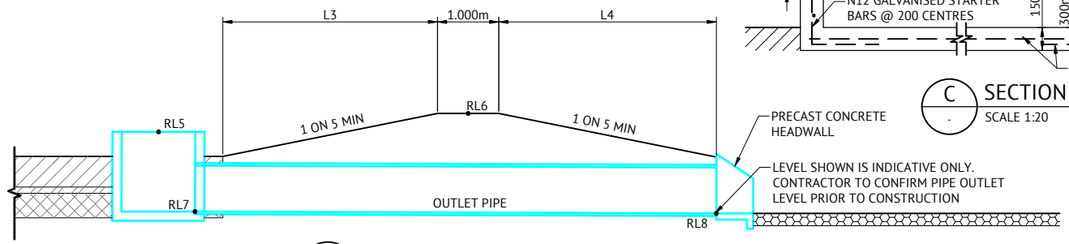






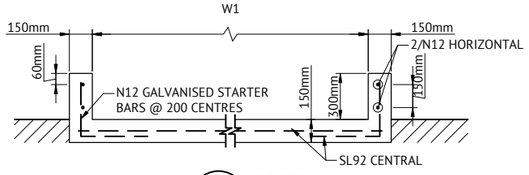
RAISED GRATE FIELD INLET

SCALE: 1:20



B SECTION

SCALE 1:100



C SECTION

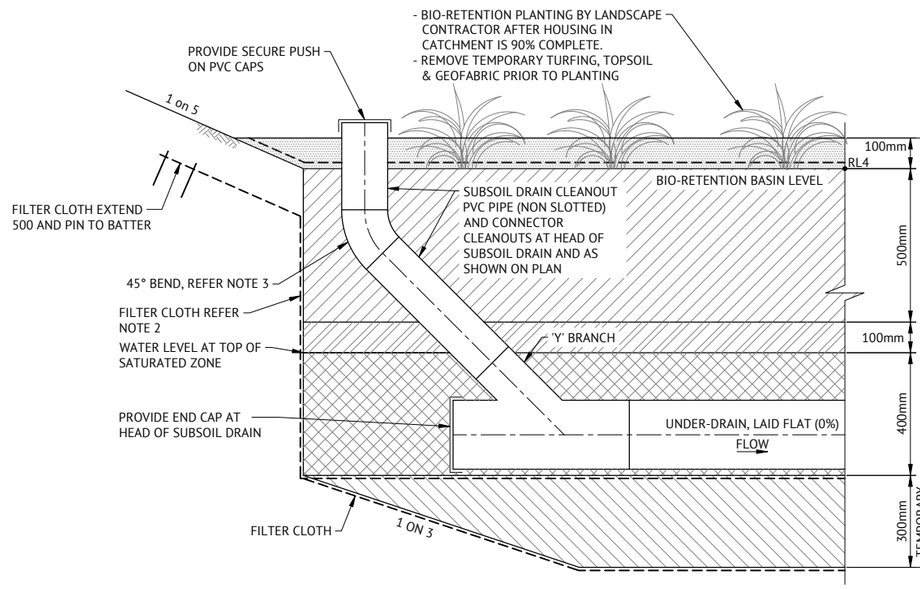
SCALE 1:20

LEGEND

- EXISTING SURFACE CONTOURS (5.90)
- VEGETATION BUFFER
- EARTHWORKS LEVEL (RL.31.75)
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m²) ROCK GRADING - 600mm THICK d50 = 300mm

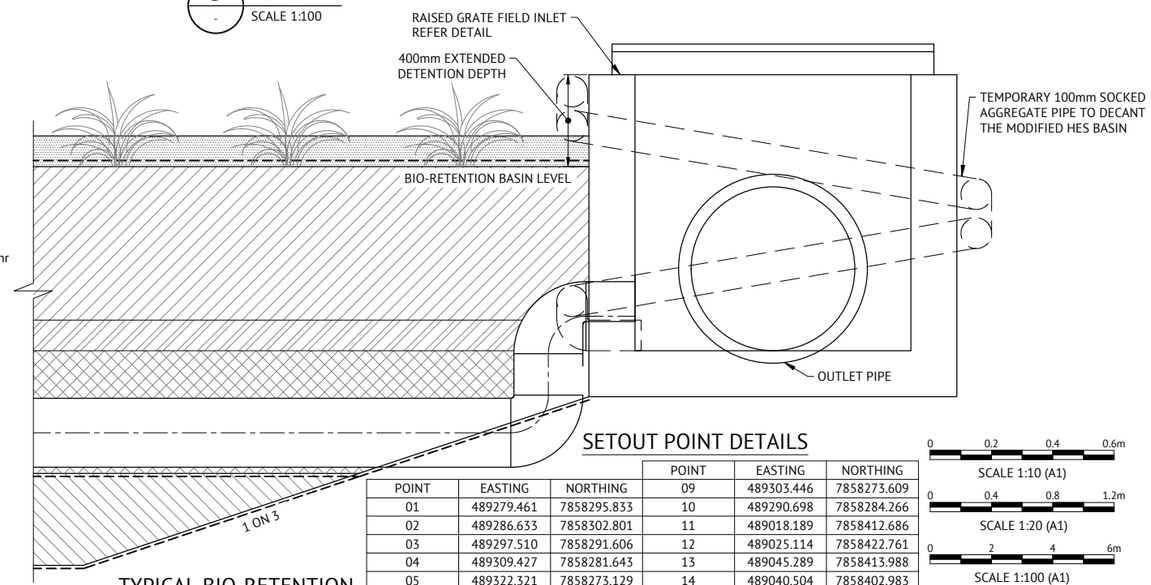
NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
   FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS.
3. UNDER-DRAIN: 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE. PIPES SHOULD NOT BE INSTALLED WITH A FILTER SOCK SURROUNDING PIPE. UNDER-DRAINAGE PIPES SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).



BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA

SCALE: 1:10



TYPICAL BIO-RETENTION BASIN OVERFLOW PIT

SCALE: 1:10

SETOUT POINT DETAILS

POINT	EASTING	NORTHING	POINT	EASTING	NORTHING
01	489279.461	7858295.833	10	489290.698	7858284.266
02	489286.633	7858302.801	11	489018.189	7858412.686
03	489297.510	7858291.606	12	489025.114	7858422.761
04	489309.427	7858281.643	13	489045.289	7858413.988
05	489322.321	7858273.129	14	489040.504	7858402.983
06	489334.220	7858267.016	15	489033.472	7858399.460
07	489329.651	7858258.121	16	489025.273	7858403.447
08	489317.266	7858264.483	17	489009.855	7858408.756
09	489303.446	7858273.609			

0 0.2 0.4 0.6m
SCALE 1:10 (A1)

0 0.4 0.8 1.2m
SCALE 1:20 (A1)

0 2 4 6m
SCALE 1:100 (A1)

0 10 20 30m
SCALE 1:500 (A1)

FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
22/03/23	B	LOT LAYOUT REVISED	GB	PP
07/11/22	A	ISSUED FOR CONSTRUCTION	GB	PP
12/08/22	1	ISSUED FOR OPERATIONAL WORKS APPROVAL	JJ	PP

REVISIONS

Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED JJONES
CHECKED G.BROSNAN
PROJECT MANAGER P.PETERSEN
ENGINEERING CERTIFICATION
P.PETERSEN RPEQ 13231

SCALE

ORIGINAL SHEET SIZE A1

CLIENT: LENDLEASE COMMUNITIES (TOWNSVILLE) PTY LTD

PROJECT: WHITES CREEK STAGES 37-40

LOCATION: WHITES CREEK ROAD, JULAGO

SHEET TITLE: MODIFIED H.E.S SEDIMENT BASIN AND BIO-RETENTION BASIN DETAILS

JOB CODE: LLC-0093

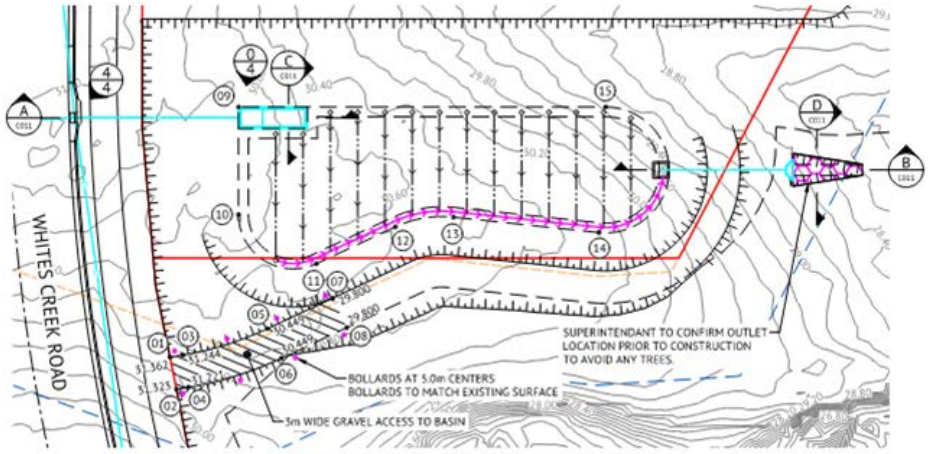
SHEET NUMBER: C031

REV: B

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

BASIN C - BASE 440m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 LLC-0095 TENDERS ONLY					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Scour Protection**				
(a)	Dumped rock - 500mm thick (D_{50} 200mm) on geotextile fabric (Bidrum A34)	m^2	13	$ 69.90	$ 908.70
4	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(a)	Bio-Retention C - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	440	$ 68.99	$ 30,355.60
(b)	Bio-Retention C - preparation of subgrade, installation of all drainage pipes and filter media,	m^2	440	$ 282.63	$ 124,357.20
2	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1	$ 22,039.30	$ 22,039.30
2	**LANDSCAPING Earthworks**				
					$ 177,660.80

taken from Tender

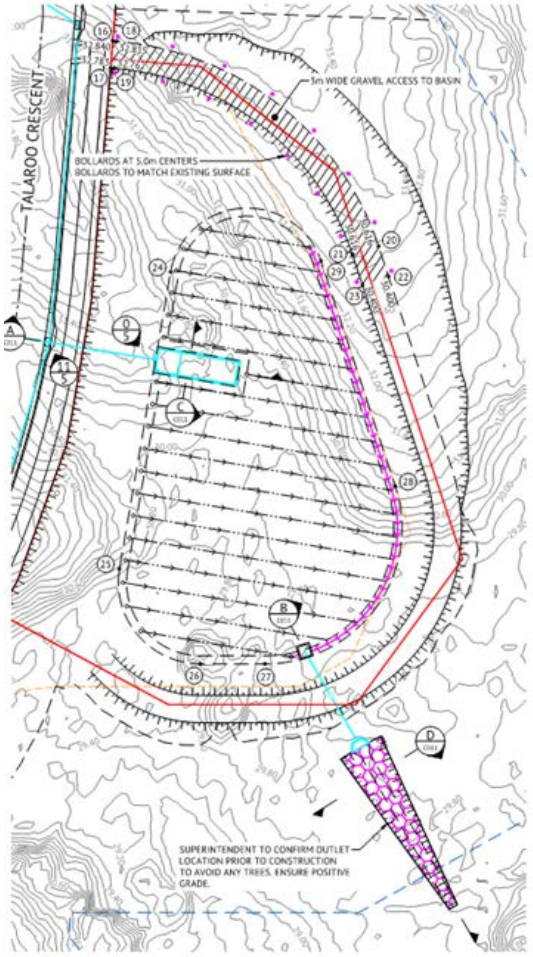


HES AND BIO-RETENTION BASIN C LAYOUT
SCALE: 1:250

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

BASIN D - BASE 1135m2					
ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 LLC-0095 TENDERS ONLY					
Item	**Description**	**Unit**	**Quantity**	**Rate**	**Amount**
3	**Scour Protection**				
(a)	Dumped rock - 500mm thick (D_{50} 200mm) on geotextile fabric (Bidrum A34)	m^2	61	$ 69.90	$ 4,263.90
(c)	Bio-Retention D - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	1135	$ 46.06	$ 52,278.10
(d)	Bio-Retention D - preparation of subgrade, installation of all drainage pipes and filter media,	m^2	1135	$ 268.70	$ 304,974.50
2	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1	$ 22,039.30	$ 22,039.30
2	**LANDSCAPING Earthworks**				
					$ 383,555.80

taken from Tender



HES AND BIO-RETENTION BASIN D LAYOUT
SCALE: 1:250

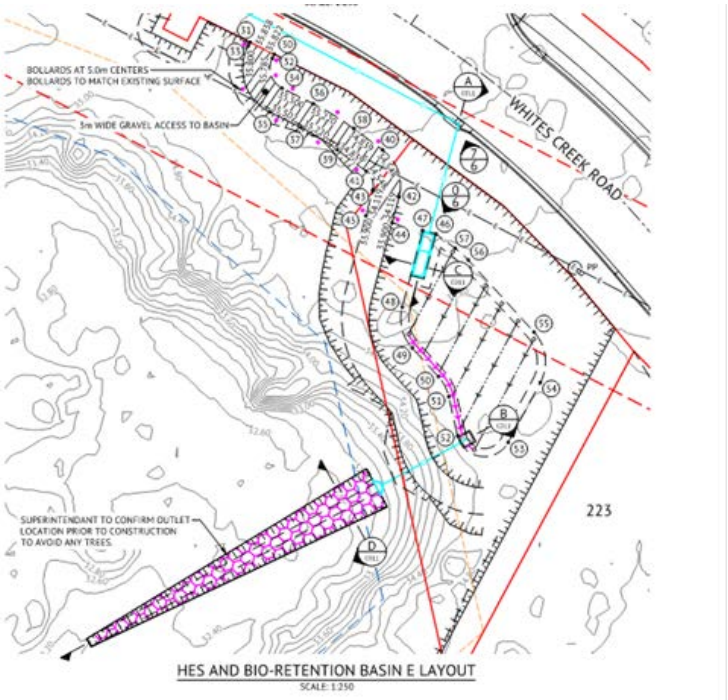
Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

BASIN E - BASE 224m2

ELLIOT SPRINGS - WHITES CREEK STAGES 10 -14 LLC-0095 TENDERS ONLY

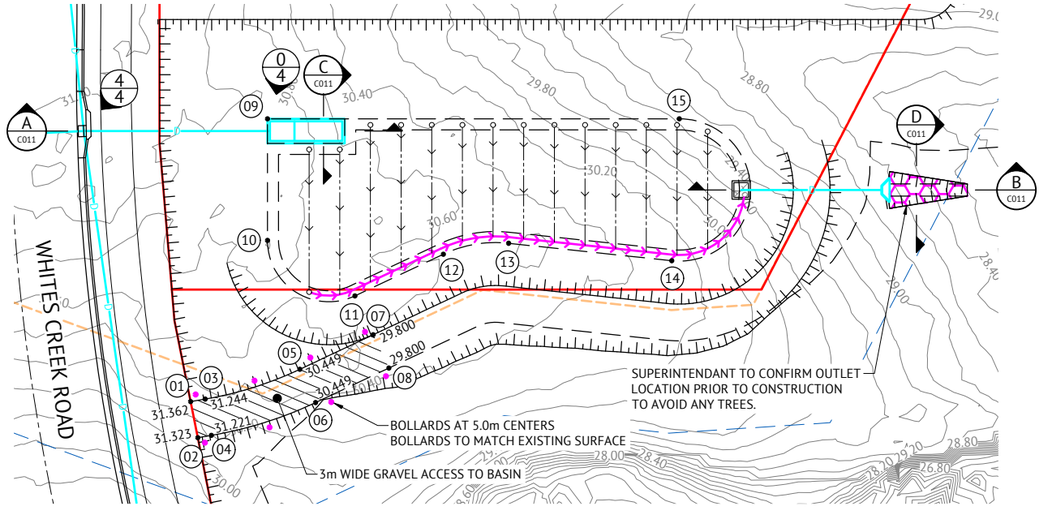
Item	Description	Unit	Quantity	Rate	Amount
3	**Scour Protection**				
(a)	Dumped rock - 500mm thick (D_{50} 200mm) on geotextile fabric (Bidrum A34)	m^2	106	$ 69.90	$ 7,409.40
(f)	Bio-Retention E - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	224	$ 302.16	$ 67,683.84
(e)	Bio-Retention E - including excavate 300mm below filter media profile, place geofabric and	m^2	224	$ 111.06	$ 24,877.44
2	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay	Each	1	$ 22,039.30	$ 22,039.30
					$ 122,009.98

taken from Tender



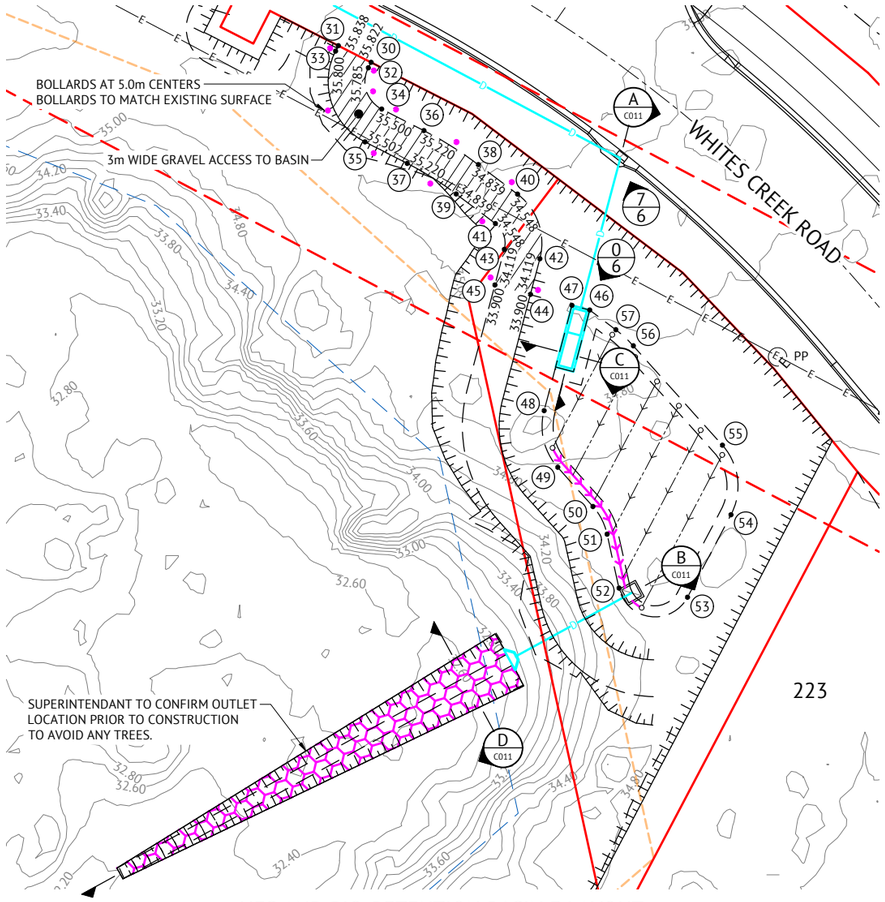
HES AND BIO-RETENTION BASIN E LAYOUT
SCALE: 1:250

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024



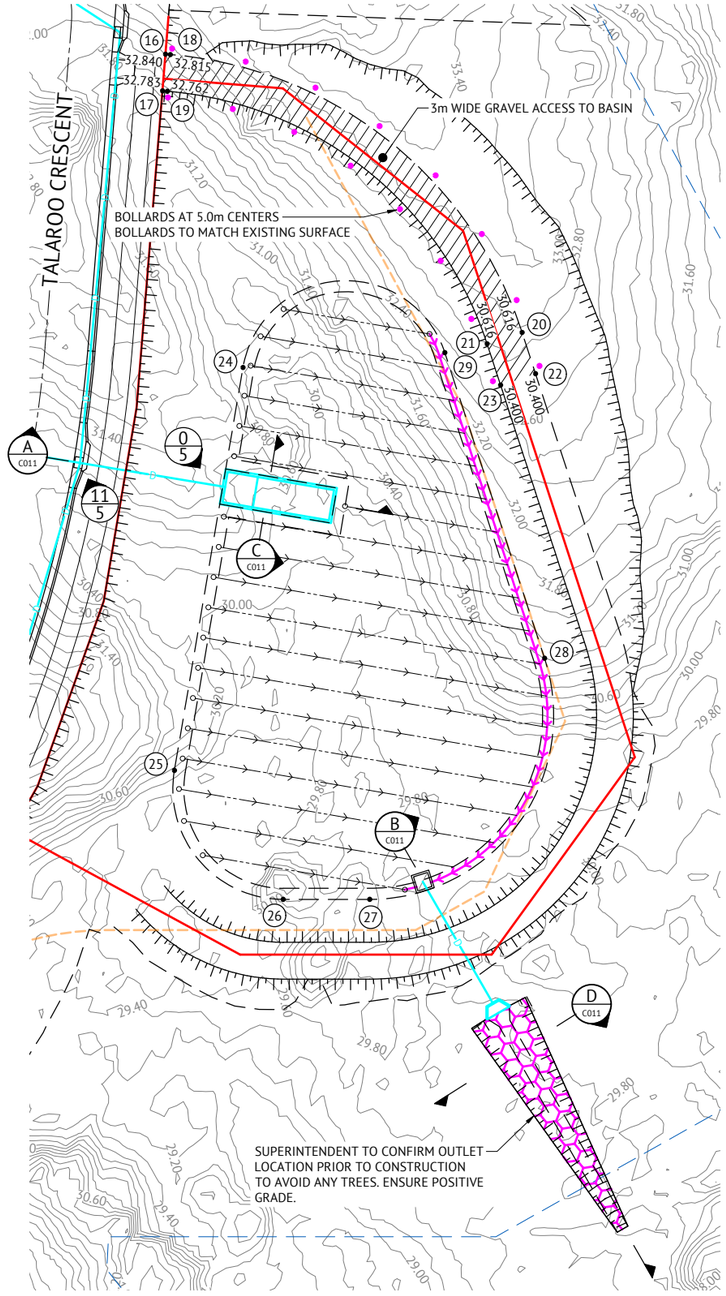
HES AND BIO-RETENTION BASIN C LAYOUT

SCALE: 1:250



HES AND BIO-RETENTION BASIN E LAYOUT

SCALE: 1:250



HES AND BIO-RETENTION BASIN D LAYOUT

SCALE: 1:250

LEGEND

- EXISTING SURFACE CONTOURS
- RL.31.75 — EARTHWORKS LEVEL
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- VEGETATION BUFFER
- SURVEYED TOP OF BANK NO ACCESS OR CLEARING
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m²) ROCK GRADING - 400mm THICK 75mm-325mm, AVERAGE SIZE 200mm
- GRAVEL TRACK BOLLARDS
- EXISTING OVERHEAD POWER LINE
- EASEMENT
- PP — POWER POLE

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH IPWEA STANDARD DRAWING DS-078.
2. FILTER CLOTH - PROPRIETARY PRODUCT, BIDIM A24 OR EQUIVALENT NON-WOVEN GEOTEXTILE.
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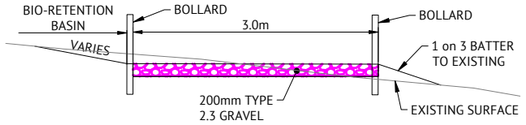
4. FOR COARSE SEDIMENT FOREBAY CONCRETE AND REINFORCEMENT DETAILS, REFER TO DTMR STANDARD DRAWING 1304 (DRAWINGS 1 AND 2).



TYPICAL GRAVEL ACCESS SECTION

NTS

SETOUT POINT DETAILS

POINT	EASTING	NORTHING
01	489231.074	7858369.723
02	489231.661	7858366.780
03	489232.261	7858369.926
04	489232.766	7858366.969
05	489239.983	7858372.355
06	489241.261	7858369.640
07	489245.963	7858375.170
08	489247.241	7858372.456
09	489237.342	7858392.773
10	489237.342	7858382.860
11	489244.472	7858378.337
12	489251.686	7858381.733
13	489257.009	7858382.629
14	489270.314	7858381.206
15	489270.931	7858392.773
16	489196.577	7858754.429
17	489196.333	7858751.439
18	489196.972	7858754.397
19	489196.728	7858751.406
20	489225.658	7858731.748
21	489222.806	7858730.817
22	489226.755	7858728.387
23	489223.904	7858727.456
24	489202.899	7858728.890
25	489197.304	7858696.045
26	489206.176	7858685.533
27	489213.233	7858685.533
28	489227.492	7858705.189

POINT	EASTING	NORTHING
29	489219.358	7858730.101
30	488905.197	7858736.713
31	488902.524	7858738.075
32	488904.970	7858736.267
33	488902.297	7858737.629
34	488906.062	7858732.905
35	488904.700	7858730.232
36	488909.504	7858731.151
37	488908.142	7858728.478
38	488913.939	7858728.380
39	488912.133	7858725.984
40	488917.136	7858725.971
41	488915.330	7858723.575
42	488918.961	7858720.701
43	488916.060	7858721.467
44	488918.194	7858717.799
45	488915.294	7858718.566
46	488923.028	7858716.522
47	488921.578	7858716.905
48	488919.309	7858708.318
49	488920.420	7858703.704
50	488923.286	7858700.505
51	488924.444	7858698.250
52	488925.418	7858693.858
53	488931.001	7858693.108
54	488934.546	7858699.833
55	488933.847	7858705.502
56	488926.585	7858713.606
57	488925.156	7858714.919

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
30/08/24	2	RESPONSE TO COUNCIL RFI	GB	ZS
03/10/23	1	ISSUED FOR OPERATIONAL WORKS APPROVAL	GB	PP

REVISIONS

Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED G.BROSNAN
CHECKED Z.STROGUSZ
PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION A.PEASE RPEQ 22556

SCALE 0 5 10 15m
SCALE 1:250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT LENDLEASE COMMUNITIES (TOWNSVILLE) PTY LTD
PROJECT WHITES CREEK STAGES 10-14
LOCATION WHITES CREEK ROAD, JULAGO
SHEET TITLE BIO-RETENTION DETAILS PLAN - SHEET 1 OF 2

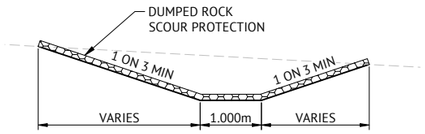
JOB CODE LLC-0095
SHEET NUMBER C010
REV 2

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

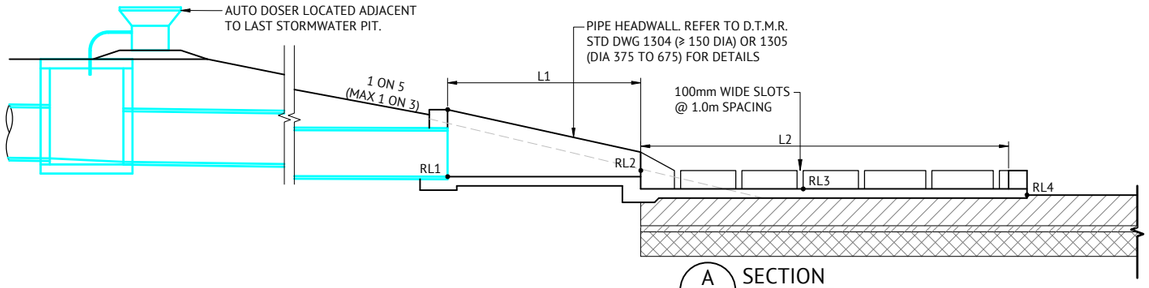
BASIN DETAILS

NOTATION	BASIN C	BASIN D	BASIN E
RL1	29.400	30.000	33.500
RL2	RL1 + 0.100m	RL1 + 0.100m	RL1 + 0.100m
RL3	RL1 - 0.200m	RL1 - 0.200m	RL1 - 0.200m
RL4	RL1 - 0.300m	RL1 - 0.300m	RL1 - 0.300m
RL5	RL1 + 0.100m	RL1 + 0.100m	RL1 + 0.100m
RL6	RL1 + 0.400m	RL1 + 0.400m	RL1 + 0.400m
RL7	28.200	28.800	32.300
RL8	28.170	28.770	32.270
OUTLET PIPE	600(3)	900(3)	450(3)
W1	1.600m	2.500m	1.100m
L1	2.000m	2.500m	2.000m
L2	3.900m	6.300m	2.800m
L3	3.500m	3.500m	3.500m
L4	L3	L3	L3
FILTER MEDIA AREA	439m^2	1135m^2	224m^2

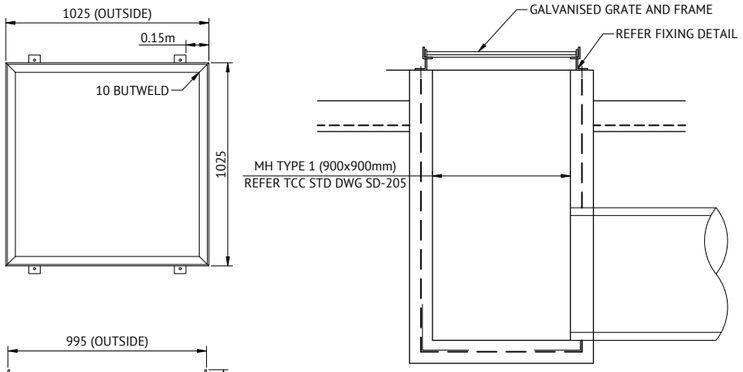
C SECTION
SCALE 1:20

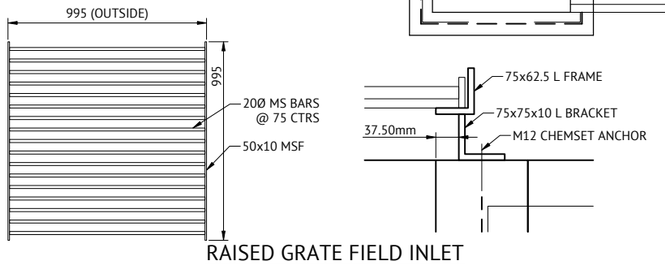


D SECTION
SCALE 1:50



A SECTION
SCALE 1:100





RAISED GRATE FIELD INLET
SCALE: 1:20

LEGEND

- EXISTING SURFACE CONTOURS (5.90)
- EARTHWORKS LEVEL (RL.31.75)
- TOP OF BATTER
- BOTTOM OF BATTER
- 225Ø uPVC PIPE
- 100Ø FLEXIBLE PERFORATED CORRUGATED PIPE WITH CAPPED CLEAN OUT POINT, REFER THIS SHEET FOR DETAILS
- VEGETATION BUFFER
- SURVEYED TOP OF BANK NO ACCESS OR CLEARING
- DUMPED ROCK SCOUR PROTECTION ON GEOTEXTILE FABRIC (200g/m^2) ROCK GRADING - 400mm THICK 75mm-325mm, AVERAGE SIZE 200mm
- EXISTING OVERHEAD POWER LINE
- EASEMENT
- POWER POLE (PP)

NOTES:

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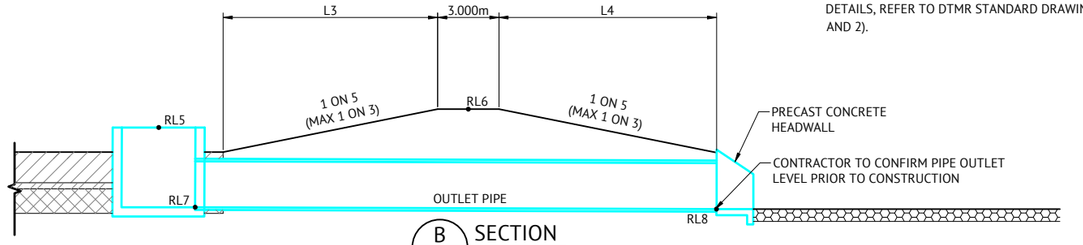
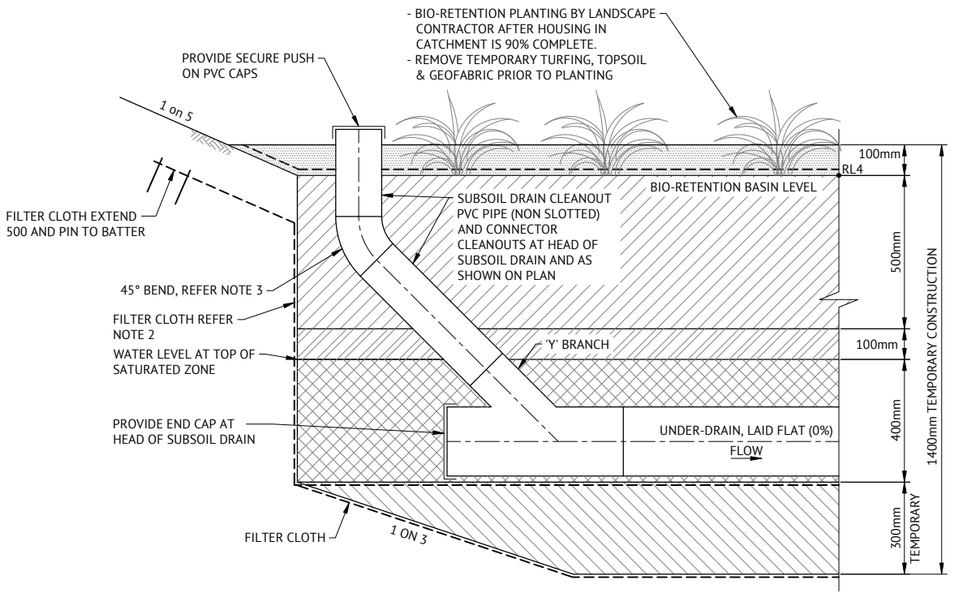
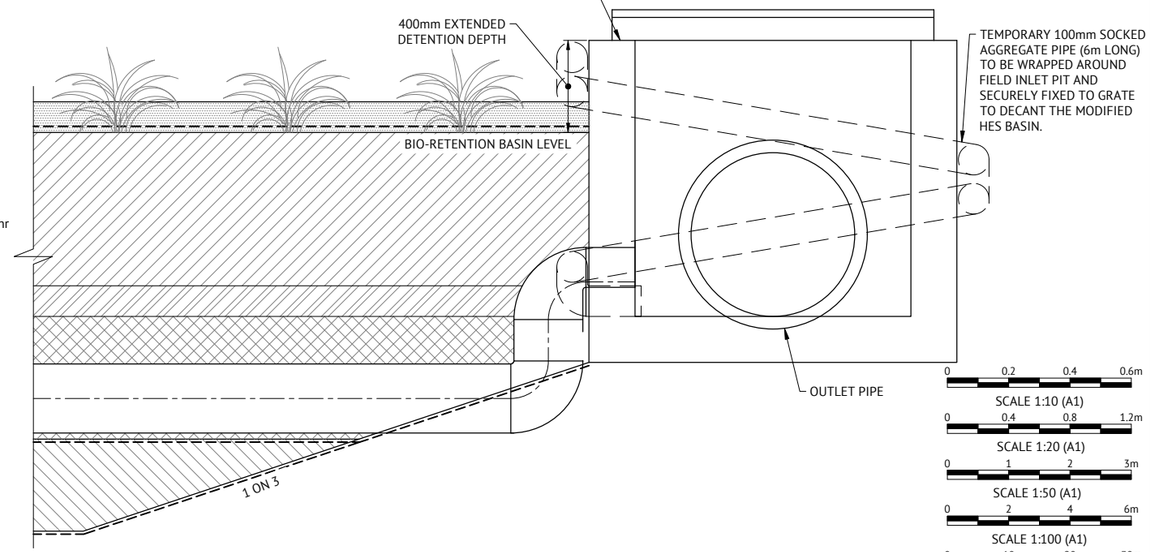


B SECTION
SCALE 1:100



BIO-RETENTION BASIN SUBSOIL CLEANOUT AND FILTER MEDIA
SCALE: 1:10



TYPICAL BIO-RETENTION BASIN OVERFLOW PIT
SCALE: 1:10

0 0.2 0.4 0.6m — SCALE 1:10 (A1)
0 0.4 0.8 1.2m — SCALE 1:20 (A1)
0 1 2 3m — SCALE 1:50 (A1)
0 2 4 6m — SCALE 1:100 (A1)
0 10 20 30m — SCALE 1:500 (A1)

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
30/08/24	2	RESPONSE TO COUNCIL RFI	GB	ZS
03/10/23	1	ISSUED FOR OPERATIONAL WORKS APPROVAL	GB	PP

REVISIONS

Premise
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84 DENHAM STREET
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DESIGNED G.BROSNAN
CHECKED Z.STROGUSZ
PROJECT MANAGER Z.STROGUSZ
ENGINEERING CERTIFICATION A.PEASE RPEQ 22556
SCALE
ORIGINAL SHEET SIZE A1

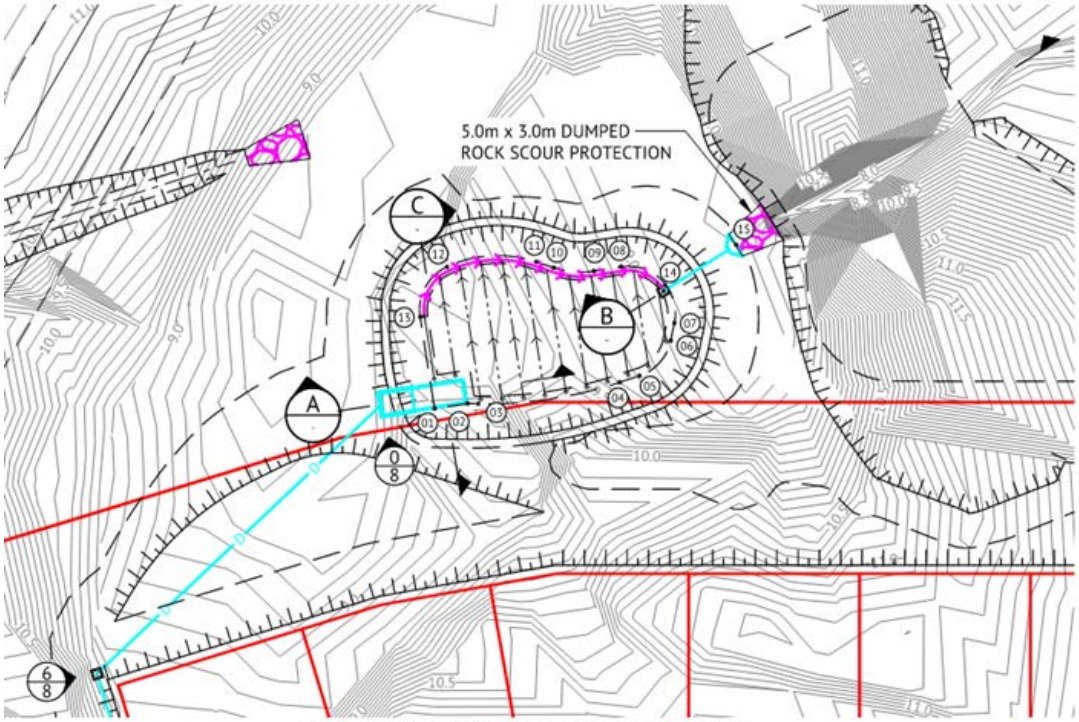
CLIENT: LENDLEASE COMMUNITIES (TOWNSVILLE) PTY LTD
PROJECT: WHITES CREEK STAGES 10-14
LOCATION: WHITES CREEK ROAD, JULAGO
SHEET TITLE: BIO-RETENTION DETAILS PLAN - SHEET 2 OF 2

JOB CODE: LLC-0095
SHEET NUMBER: C011
REV: 2

Document Set ID: 26515272
Version: 1, Version Date: 18/11/2024

BASIN A - BASE 410m2					
GREATER ASCOT STAGES 805 806 PAR0081					
Item	Description	Unit	Quantity	Rate	Amount
3	**Revegetation including establishment**				
(a)	Hydromulching -	m^2	350	$ 7.60	$ 2,660.00
4	**Bio-Retention drainage works including subsoil drainage, filter media and temporary turfing**				
(a)	Bio-Retention A - including excavate 300mm below filter media profile, place geofabric and installation of floculation unit and floculant	m^2	410	$ 60.00	$ 24,600.00
(b)	Bio-Retention A - preparation of subgrade, installation of all drainage pipes and filter media, geofabric, topsoil and turf	m^2	410	$ 130.00	$ 53,300.00
4	**Field inlets complete including excavation and disposal of spoil**				
(b)	Flush grate field inlet - 900mm x 900mm - Basin A & B	Each	1	$ 6,585.00	$ 6,585.00
6	**Supply and construct cast in situ concrete headwall, wingwall and apron to match the following RCP sizes**				
(a)	Bio-retention headwall including wingwalls and course sediment forebay - Basin - A	Each	1	$ 36,500.00	$ 36,500.00
6	**Scour Protection**				
(a)	Dumped Rock - 400mm thick (DN 200mm) on geotextile fabric (200g/m2)	m^2	15	$ 60.00	$ 900.00
					$ 124,545.00

taken from Claim 6



BIO-RETENTION BASIN A LAYOUT
SCALE: 1:500

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