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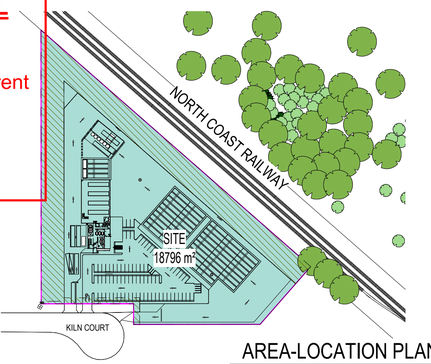
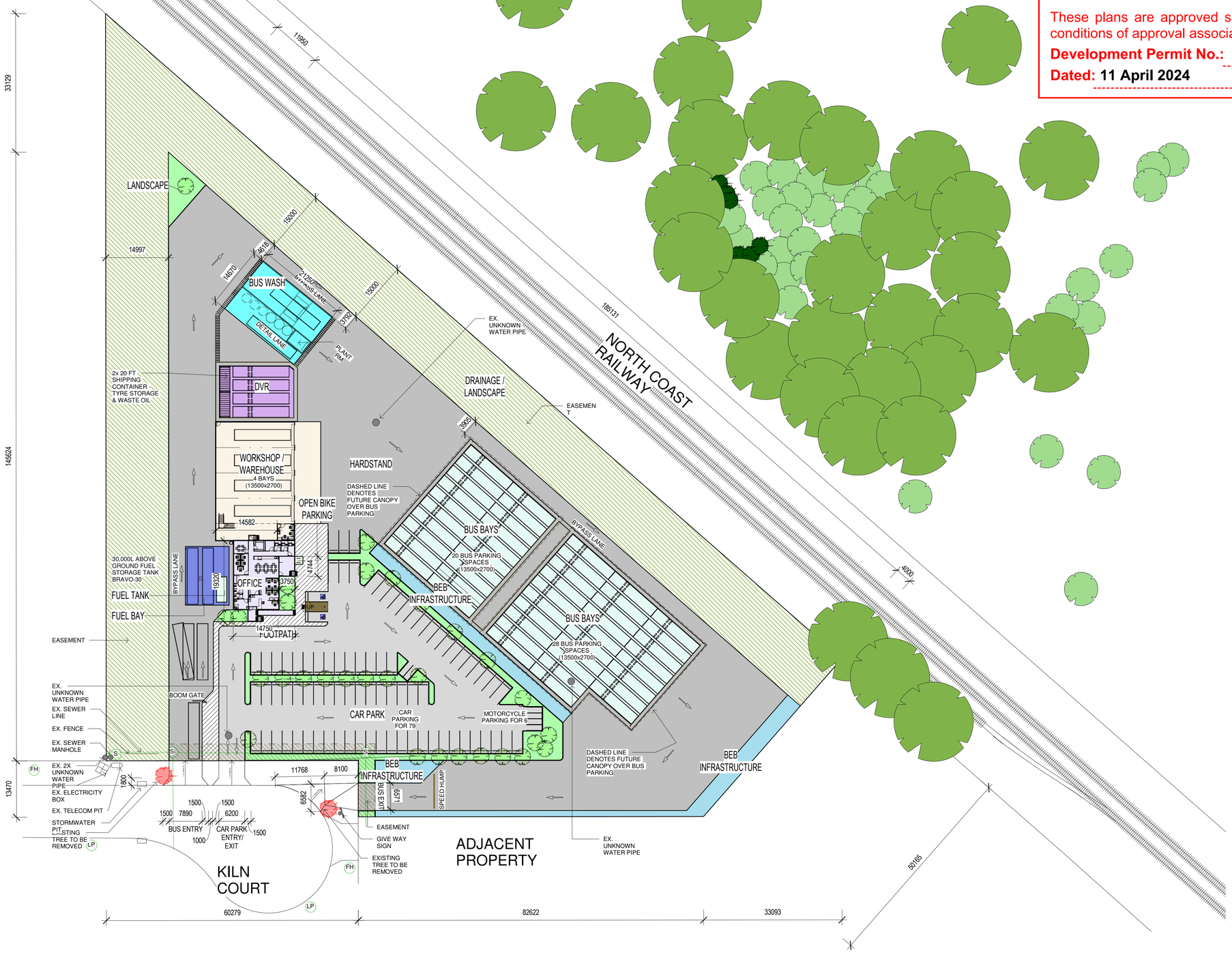


AREA-LOCATION PLAN

1 : 2000@A1



1 SITE PLAN

1 : 500@A1

CD-SITE ANALYSIS

SITE AREA (APPROX):	18796m2	100.00%
TOTAL SITE COVER:	1384m2	7.36%
TOTAL GFA:	1000m2	5.32%
TOTAL LANDSCAPE:	6265m2	33.32%
TOTAL IMPERVIOUS AREA:	12531m2	66.68%
MAXIMUM BUILDING HEIGHT ABOVE GROUND:	8610m	

CD-AREA SCHEDULE

COLOUR	AREA NAME	AREA
	BEB INFRASTRUCTURE	513 m²
	BUS BAYS	2040 m²
	BUS WASH	312 m²
	CAR PARK	2275 m²
	DRAINAGE / LANDSCAPE	5698 m²
	DVR	217 m²
	FOOTPATH	326 m²
	FUEL BAY	132 m²
	FUEL TANK	15 m²
	HARDSTAND	5759 m²
	LANDSCAPE	582 m²
	MEZZANINE	75 m²
	OFFICE	234 m²
	OPEN BIKE PARKING	4 m²
	WORKSHOP / WAREHOUSE	690 m²
Grand total		18871 m²

CD-LIGHT VEHICLE PARKING SCHEDULE

Description	COUNT
STANDARD CAR BAY	77
DISABLED CAR BAY	2
CONTRACTOR CAR BAY	3
Grand total: 82	

NOTE:
CHAIN MESH FENCE ON PROPERTY BOUNDARY AND ON CAR PARK PERIMETER

CD2001 REV S10 13.01.2024 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD SITE PLAN

Scale@A1 As indicated

0m 10m 20m 30m 40m 50m

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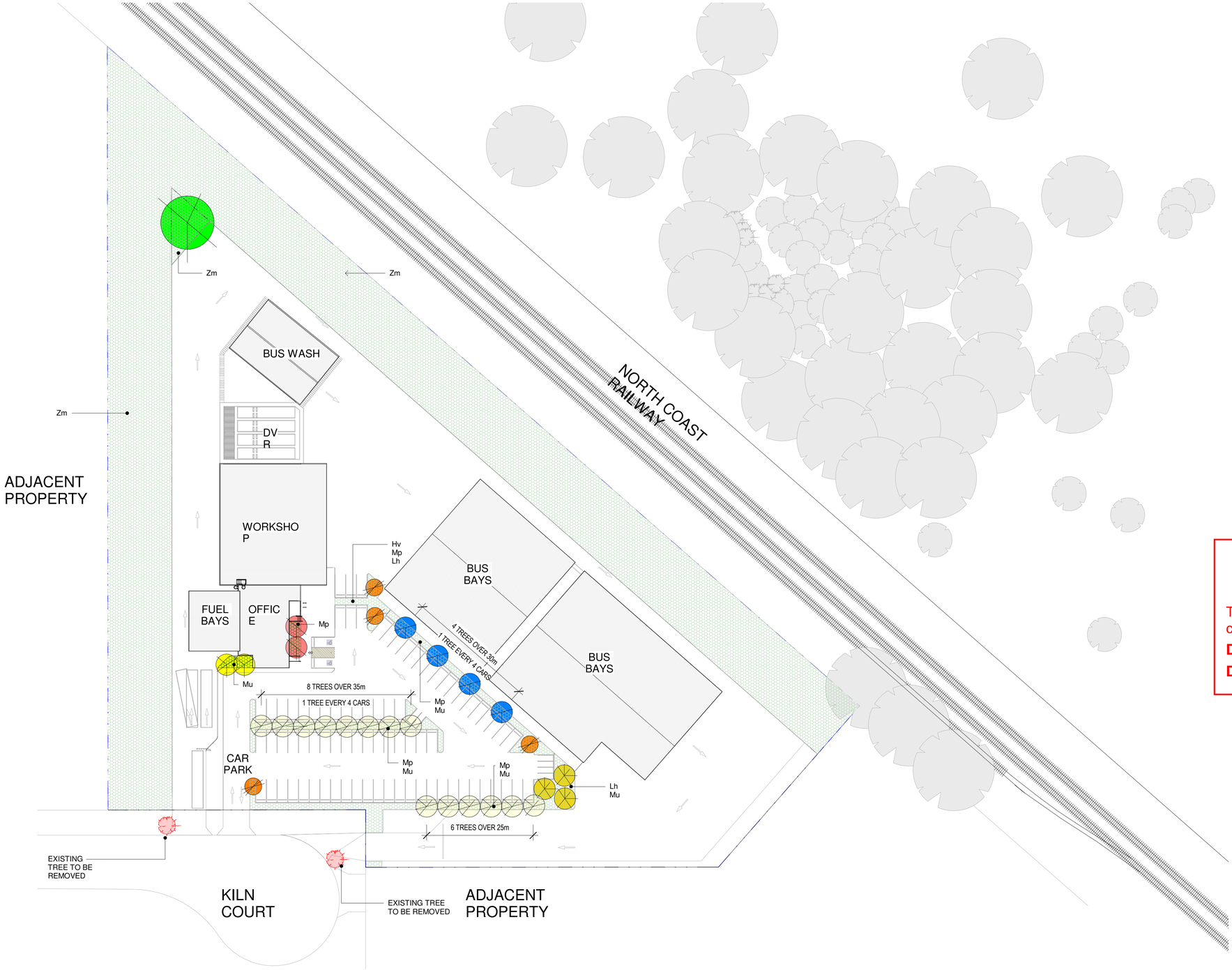

1 OVERALL LANDSCAPING PLAN
1 : 500@A1

DETAIL PLANNING SCHEDULE

TYPE	SYMBOL	BOTANIC NAME	COMMON NAME	SIZE	SPACING (m)
TREE		SCOLOPIA BRAUNII	FLINTWOOD	MEDIUM (25mH & 0.5m DIAMETER TRUNK)	AS SHOWN
TREE		GREVILLEA BANKSII	RED FLOWERED SILKY OAK	MEDIUM (10-30mH & 5-20m W)	AS SHOWN
TREE		XANTHOSTEMON CHRYSANTHUS	GOLDEN PENDA	MEDIUM (10-15mH & 6-12m W)	AS SHOWN
TREE		HARPULLIA PENDULA	TULIPWOOD	SMALL (6mH & 4m W)	AS SHOWN
TREE		GREVILLEA BAILEYANA	WHITE OAK	SMALL (5-10mH & 5m W)	AS SHOWN
TREE		ACACIA FIMBRIATA	BRISBANE GOLDEN WATTLE	SMALL (6mH & 5m W)	AS SHOWN
TREE		TRISTANIOPSIS LAURINA	WATER GUM	SMALL (5-15mH & 5m W)	AS SHOWN
GROUND COVER, CLIMBER	Hv	HARDENBERGIA VIOLACEA	NATIVE SARSPARILLA	SMALL (2-3.5mH & 2-3.5m W)	AS SHOWN
GRASS	Lh	LOMANDRA HYSTRIX	KATIE BELLES	SMALL (1.5-1.8mH & 1m W)	N/A
GRASS	Zm	ZOYSIA MACRANTHA	NARA NATIVE TURF	25mm TO 50mm H	N/A
GROUND COVER	Mp	MYOPORUM PARVIFOLIUM	CREEPING BOOBIALLA	150mm TO 300mm H	N/A
GROUND COVER	Mu		MULCH	N/A	N/A

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CD2021 REV S3 13.01.2024 BAB230106

KINETIC - 5 KILN CRT. ROCKHAMPTON QLD

OVERALL LANDSCAPING PLAN

Scale@A1 As indicated

0m 10m 20m 30m 40m 50m

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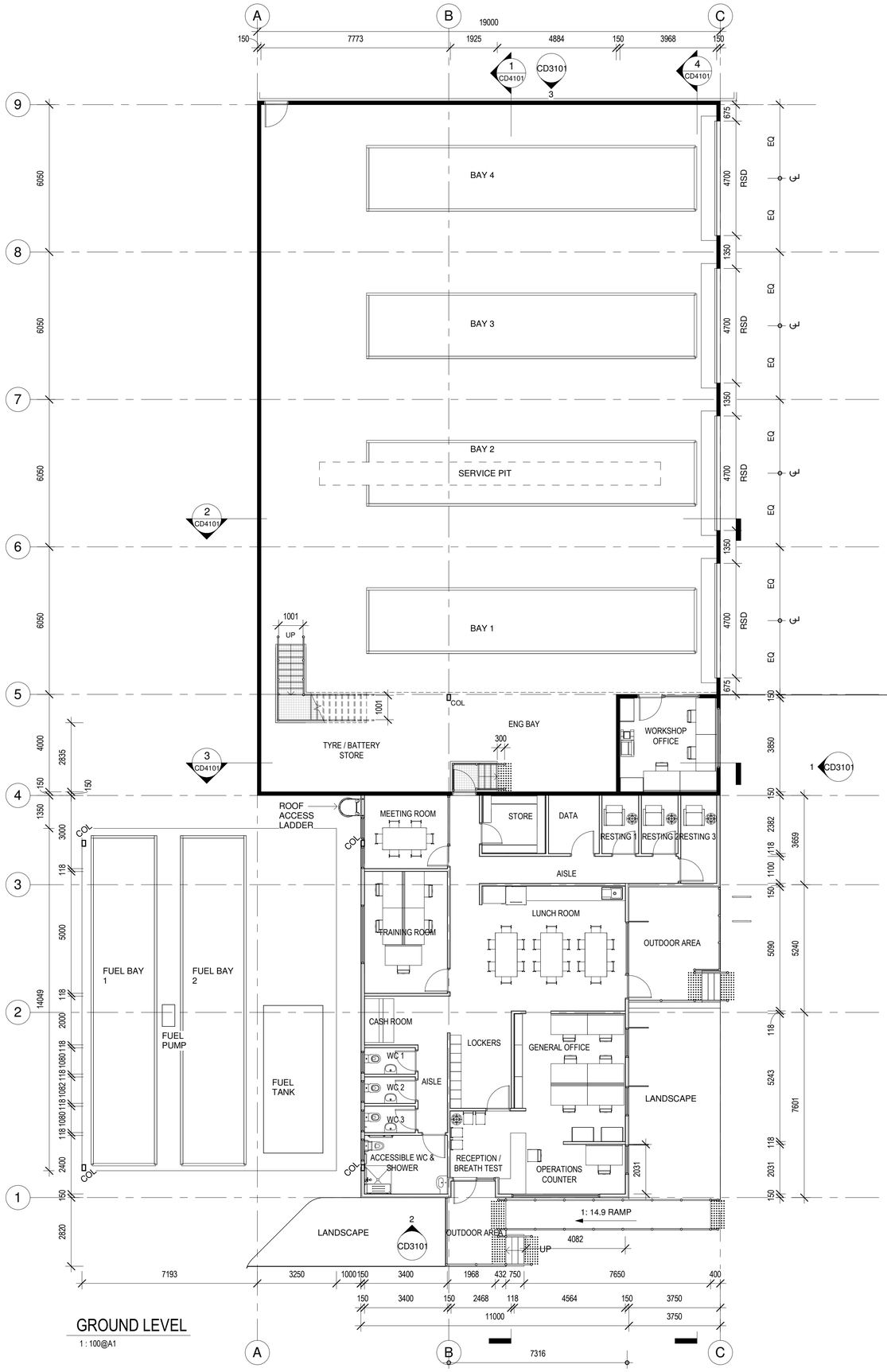
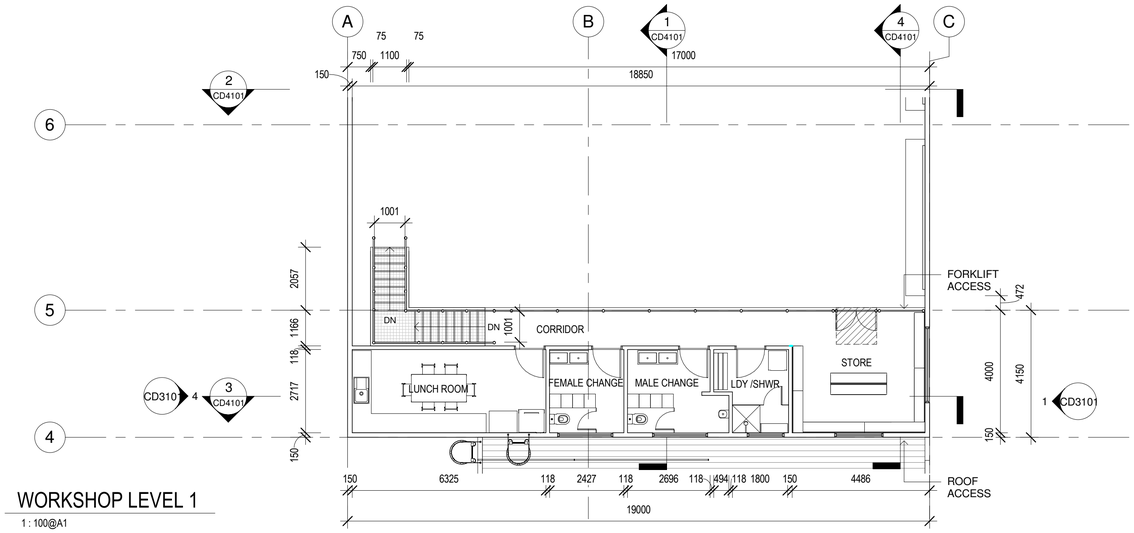


GROUND LEVEL

1 : 100@A1



WORKSHOP LEVEL 1

1 : 100@A1

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CD2201 REV S4 13.01.2024 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD

OFFICE & WORKSHOP FLOOR PLANS

Scale@A1 1 : 100

0m 1m 2m 3m 4m 5m

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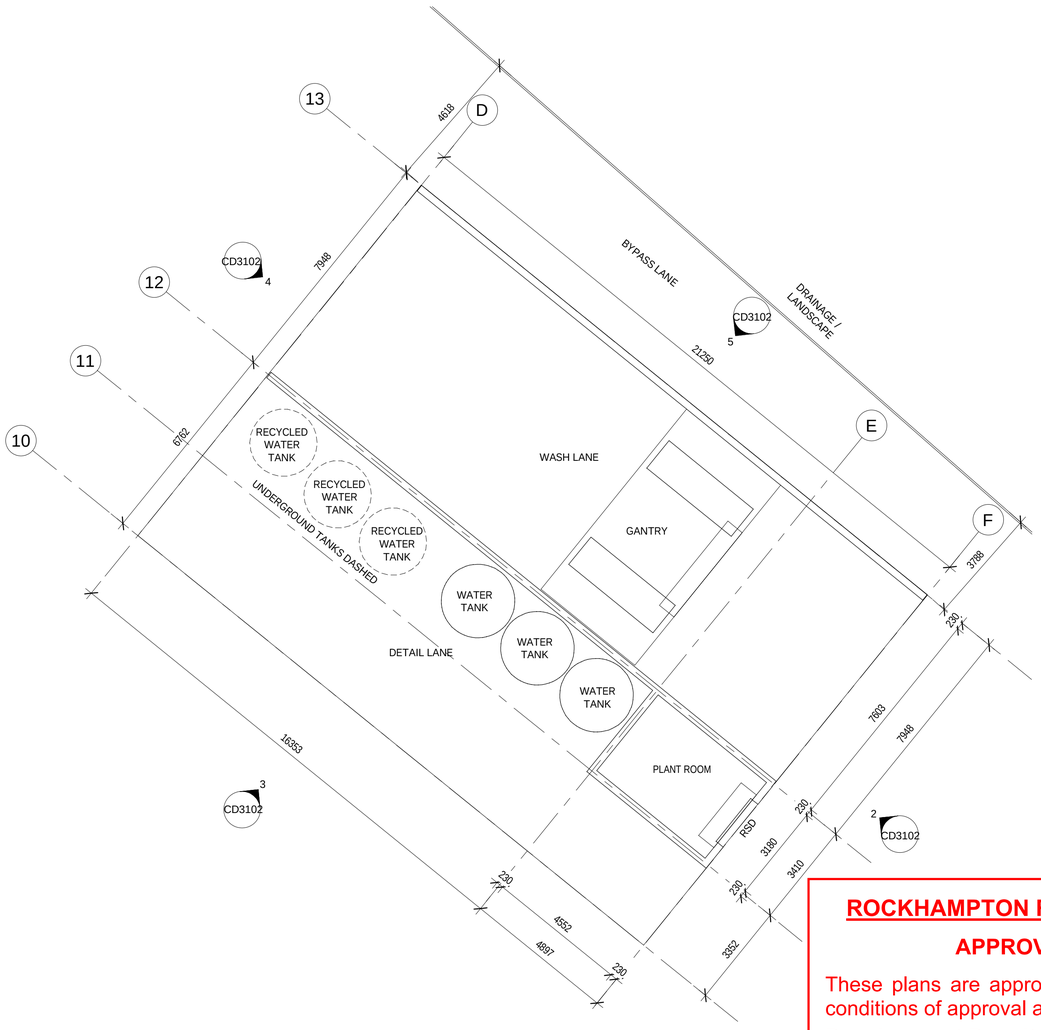
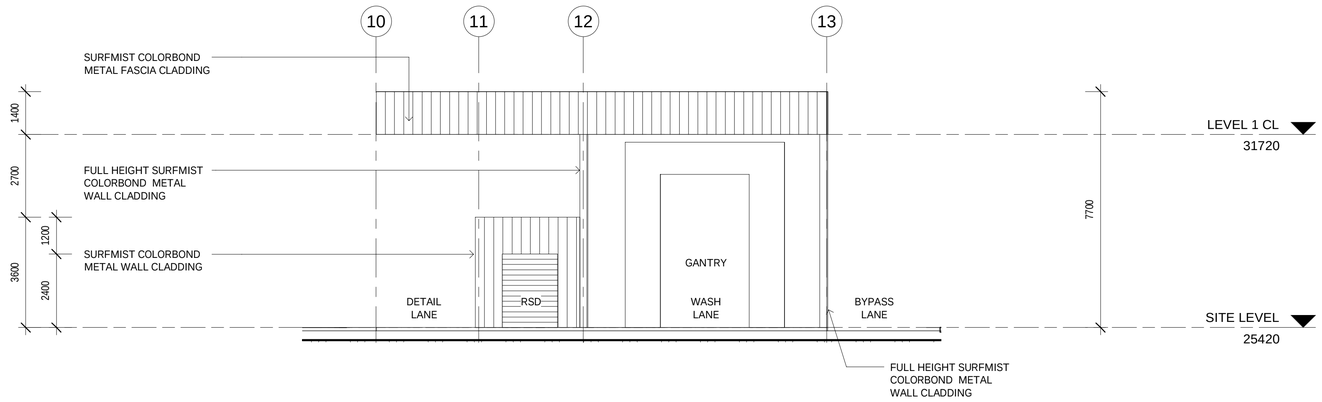
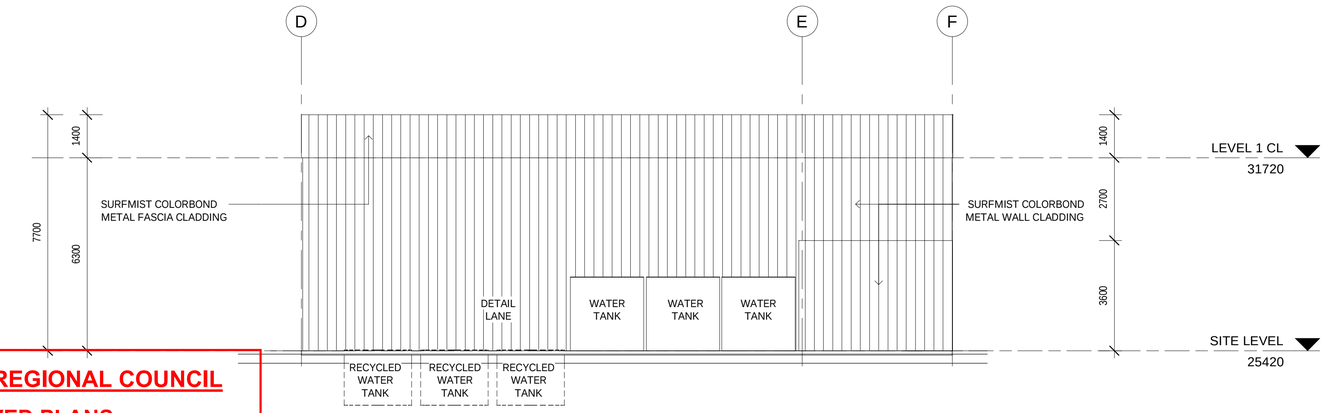


BUS WASH
1 : 100@A1



2 BUS WASH_NORTH ELEVATION
1 : 100@A1



3 BUS WASH_EAST ELEVATION
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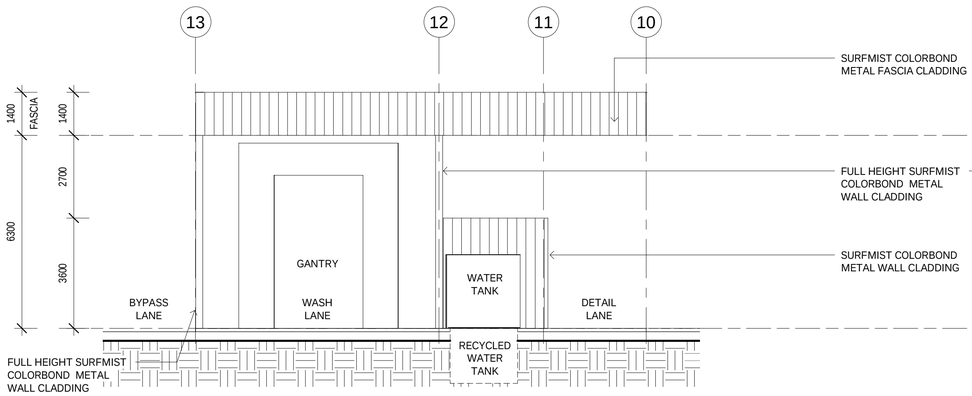

4 BUS WASH_SOUTH ELEVATION
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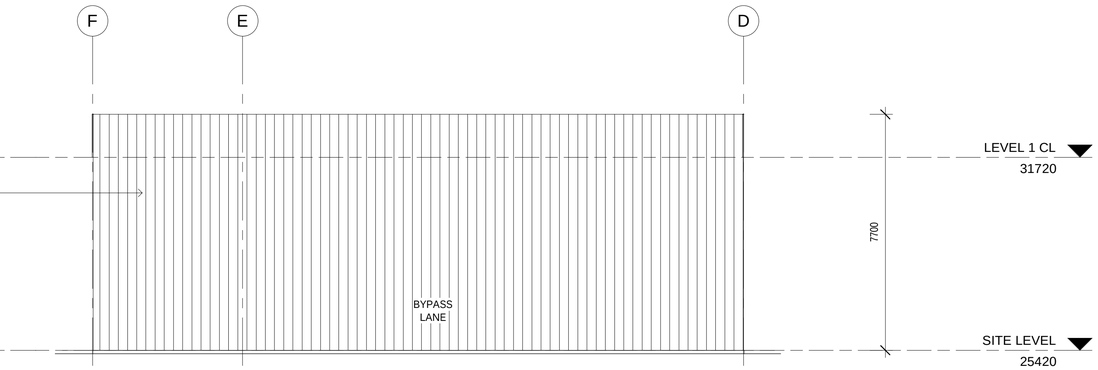

5 BUS WASH_ WEST ELEVATION
1 : 100@A1

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CD3102 REV S2 13.12.2023 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD BUS WASH PLAN AND ELEVATIONS Scale@A1 1 : 100

0m 2m 4m 6m 8m 10m

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Dated: 11 April 2024

Report Name:	PROPOSED BUS DEPOT DEVELOPMENT 5 KILN COURT, PARKHURST QLD 4702
Project No:	PC23341
Project Title:	Site Based Stormwater Management Plan

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Position:	Lead Civil Engineer
Signed:	
Date:	02/02/24

Approved by:	Weng Lye
Position:	Lead Civil Engineer
Signed:	
Date:	20/02/24

Revision	Description	Author	Checked	Approved	Date
A	First Draft	WL			13/12/23
B	Planning Submission	WL		OO	15/12/23
C	Planning Re-submission	PC		WL	20/02/24

Recipients are responsible for eliminating all superseded documents in their possession.

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1. INTRODUCTION

Peritas Consulting (Peritas) has been engaged by Kinetic Transport to prepare a Site Based Stormwater Management Plan (SMP) for the proposed bus depot located at 5 Kiln Court, Parkhurst QLD. The site is described as Lot 10 on SP326319 and is one of twelve developed lots for 777 Yaamba Road, Parkhurst which was approved on 11 August 2020 with the Development Permit no. D/52-2019.

The purpose of this SMP is to demonstrate that the proposed development will comply with the Capricorn Municipal Development Guidelines (CMDG), Queensland Urban Drainage Manual (QUDM 2017), Australian Rainfall and Runoff 2019 and State Planning Policy (SPP 2017).

With reference to the Stormwater Management Code the main performance outcomes set out by this SMP are to ensure a stormwater management system which achieves the integrated management of stormwater to:

a) Ensure that flooding impacts do not increase, including upstream or downstream of the development site.
b) Avoid net worsening of stormwater peak discharges and runoff volumes.
c) Utilises the use of water sensitive urban design principles.
d) Ensure the site maximises opportunities for capture and reuse.
e) Provide sufficient capacity to safely convey runoff taking into account increased runoff from impervious surfaces and flooding in local catchments.
f) Minimise rick to people and property.
g) Provide for safe access and maintenance.

2. SITE CHARACTERISTICS

2.1. SITE LOCATION AND TOPOGRAPHY

The site is one of the twelve developed lots (Lot 10 on 777 Yaamba Road) within the Lily Place industrial precinct located within the Parkhurst growth corridor, north of Rockhampton. The proposed Lily Place industrial development was for 777 Yaamba Road, Parkhurst and was approved on 11 August 2020 with Development Permit no. D/52-2019. The approved plans for D/52-2019 are attached as **Appendix E** for reference.

The subject site has a total area of 18,796 m^2, which consists of 5,698 m^2 of drainage easements / open drains. The site is bordered by Kiln Court on the southwest, North Coast Railway along the western boundary and industrial lots in all other directions. Refer to **Appendix A** for proposed site layout.

The site location is shown in Figure 1 below.

Figure 1 – Aerial View

The site contains existing drainage easements along the southern and western boundaries. Refer to feature survey completed for the site by GSPC and attached as **Appendix B**. The site predominantly grades to the southwest at a general grade of 0.7%. The site consists of bare earth surface with very minimal grass cover.

The Acid Sulfate Soil (ASS) Map from Rockhampton Regional Council shows that the proposed site is not situated within ASS risk zone.

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2.2. PROPOSED DEVELOPMENT

The proposed development is a bus servicing facility, office and parking areas. A proposed site layout is attached as **Appendix A**.

2.3. LAWFUL POINT OF DISCHARGE

The existing site surface grades towards the southwestern boundary and into the abutting drainage easement, which forms the Lawful Points of Discharge (LPOD) for the site. This was detailed by the Stormwater Management Plan and Hydraulic Impact Assessment (HIA) for 777 Yaamba Road, Parkhurst by Knobel Engineers dated 12 June 2020. The stormwater design was completed by Siris Consulting Engineers (reference: SCE-115-015 revision A). This report is attached as **Appendix E**.

The proposed development will not alter the stormwater discharge characteristics as detailed in the SMP by Knobel Engineers and Siris Consulting Engineers. An extract of the stormwater plan for the approved plans are as below:

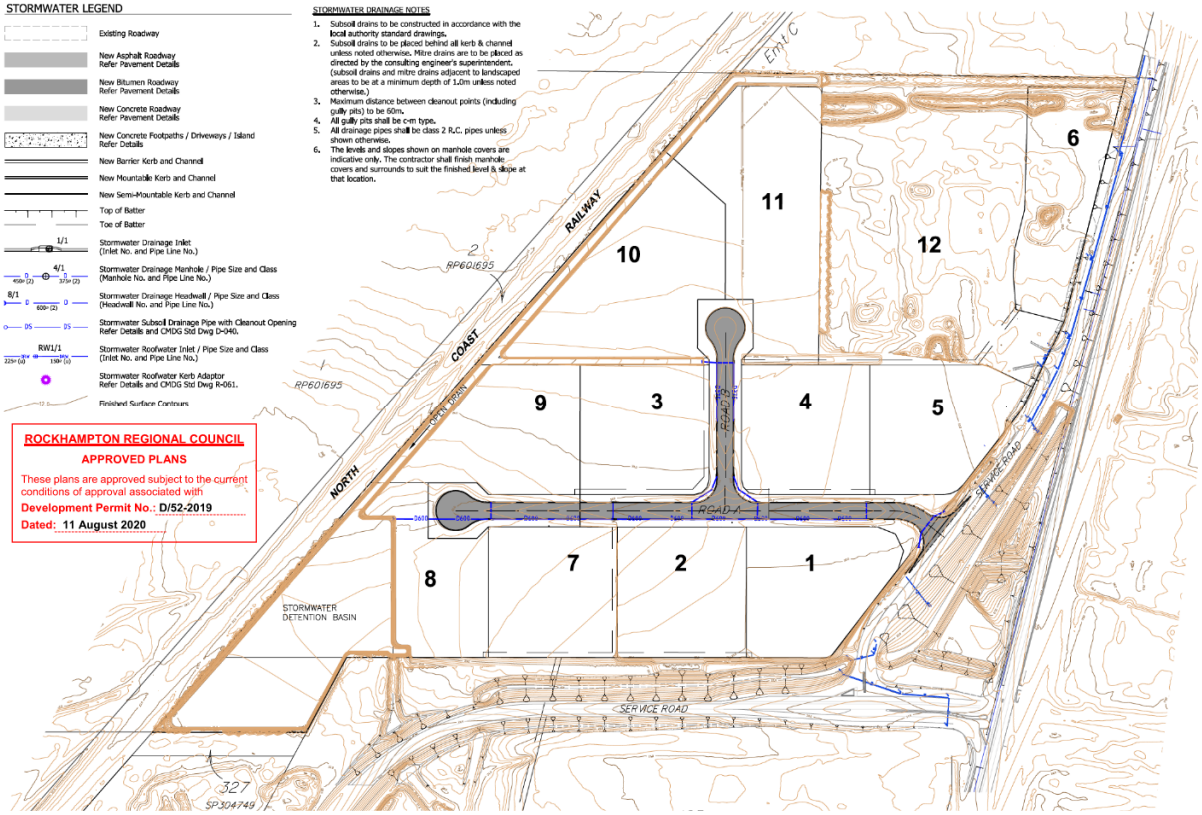

Figure 2 – Stormwater Layout Entire Development of 777 Yaamba Road

The asset map from the Council indicates the open drain (drainage easement) and 900mm × 900mm reinforced box culvert (RCBC) crossing at Kiln Court had been constructed, as below:

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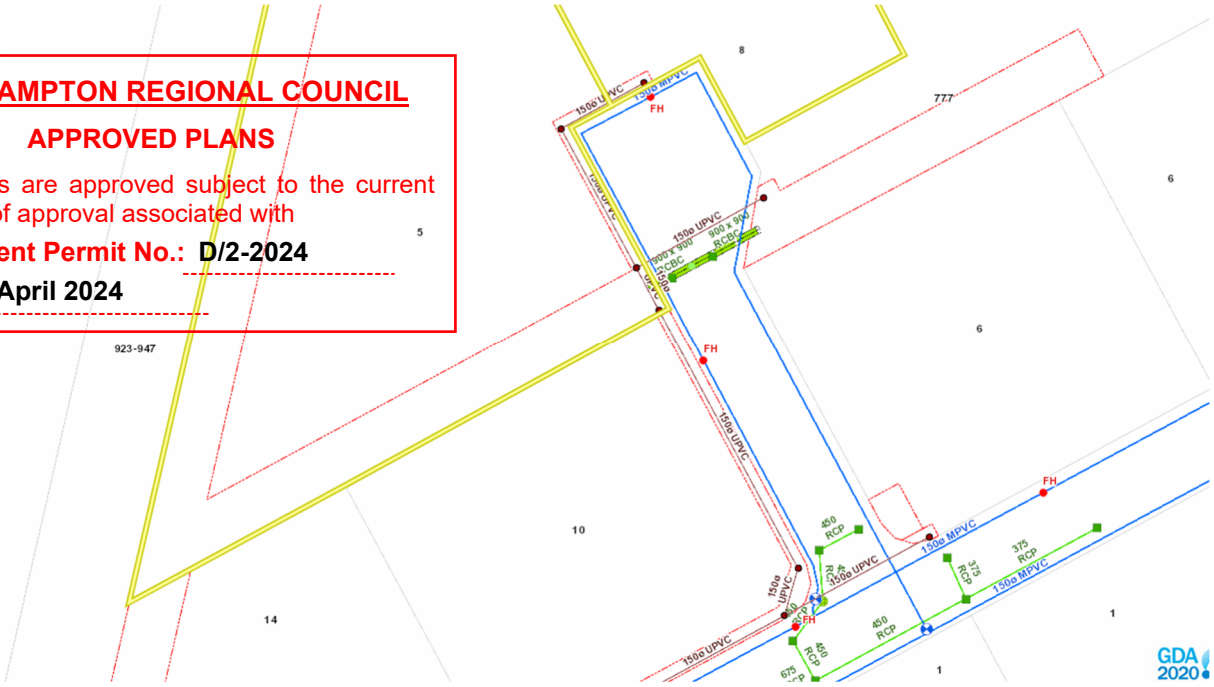

Figure 3 – Stormwater Information from Council Website

Runoff from the existing site currently flows within the drainage easements and continues southwards into a stormwater detention basin, as shown above in Figure 2.

The SMP and HIA by Knobel Engineers indicates that the prepared industrial lot level pads had been set above the designated flood event (DFE) and peak flood level reductions at the Queensland Rail (QR) Railway Corridor along the western boundary had been demonstrated in the TUFLOW modelling produced as part of the SMP and HIA by Knobel Engineers.

2.4. STORMWATER QUANTITY MANAGEMENT

All data used in the hydraulic calculations has been sought from the *ARR Data Hub* and the *Bureau of meteorology (BOM) Design Rainfall Data System (2016)*. It is proposed to utilise the existing stormwater discharge point in the south-western corner of the property and into the existing drainage easement. It is proposed that the site overland flow follows the existing condition and grades into the drainage easement and subsequently southwards to Limestone Creek.

Hydrological analyses of the stormwater quantity runoff have been completed using the DRAINS software for the existing site and developed site conditions. Peak flow rates have been calculated for the 63.21%, 39.35%, 20%, 10%, 5%, 2% and 1% Annual Exceedance Probability, to ensure that the post-development runoff flow rates do not exceed the existing site runoff flow rates. Storm durations from 5 minutes to 120 minutes were analysed with the results for the peak storm flows shown in **Table 1** below.

AEP (%)	Pre-Development Peak Flow Rates (m^3/s)	Post Development Peak Flow Rates (m^3/s)
63.21	0.143	0.322
39.35	0.222	0.405
20	0.309	0.495
10	0.399	0.593
5	0.498	0.693
2	0.618	0.828
1	0.723	0.938

Table 1 – Peak Outflows based on DRAINS modelling.

This assessment investigated the potential impacts the proposed development will have on peak flows discharging downstream of the site. The design objective is to mitigate increased flow rates resulting from the increased impervious areas to ensure a non-worsening of peak flows discharging from the site.

The hydraulic analysis using the DRAINS model has determined that a minimum total of 100 m3 of storage is required for runoff attenuation up to the 1% AEP storm event and is to be provided in the form of a below-ground detention tank. The final location onsite and construction levels will be determined at the detailed design stage.

During the 1% AEP storm event, all stormwater is discharged through the headwall outlet after at a rate of 610 L/s, providing an improved discharge rate as compared to pre-development conditions. Furthermore, all stormwater runoff is wholly contained within the project site and no there is no overflow into the adjacent easement swales. Referring to the DRAINS Model Set Up within Appendix F, all stormwater passes through the pit and pipe system to the lowest point on the site at Pit 1/6 (RL 27.74), where water ponds up to a depth of RL 27.85, which does not overtop the TOK at RL 27.95. The overflow route at this location (OF 1/6) is zero, which further reinforces that there is no spillage from the site.

A copy of the DRAINS model used in this report can be made available to Council upon request.

2.5.STORMWATER QUALITY MANAGEMENT

2.5.1. DESIGN APPROACH AND OBJECTIVE

The following guidelines and regulations were used for the design and modelling of the stormwater quality treatment train:

- Water by Design MUSIC Guidelines Version 1 – 2010
- State Planning Policy (SPP) 2017, Table B, Appendix 2

The Water Quality Objectives are summarised as below:

- 85% reduction in Total Suspended Solids (Sediment) (TSS)
- 60% reduction in Total Phosphorus (TP)
- 45% reduction in Total Nitrogen (TN)
- 90% reduction in Gross Pollutants (GP)

2.5.2. MUSIC MODELLING

The MUSIC model has been simulated based on the proposed development layout and treatment devices located where land availability and grades allowed. Device size was iterated until the target WQO's were met or site constraints prevented further expansion.

The model treatment train includes the use of bio-retention swale located within car parking area to capture the low flows and by-pass all high flows. Rainfall inputs included pluviograph rainfall data from Rockhampton Aero station.

A MUSIC schematic layout is presented in Figure 3 below. The site catchments, their areas and impervious proportions are summarised in Table 4 below:

Source Node	Area (m^2)	Type	Fraction Impervious
Industrial Roof	2,965	Industrial Roof	100%
Landscape Areas	567	Industrial Ground	20%
Pavements (concrete hardstand, asphalt pavement, etc.)	9,568	Industrial Road	100%

Table 2 – Source Node Fractions Impervious

Parameter		Input
Impervious Area Properties	Rainfall Threshold	1
Pervious Area Properties	Soil Capacity (mm)	18
	Initial Storage (%)	10
	Field Capacity	80
	Infiltration Capacity Coefficient – a	243
	Infiltration Capacity Coefficient – b	0.6
Groundwater Properties	Initial Depth (mm)	50
	Daily Recharge Rate (%)	0
	Daily Baseflow Rate (%)	31
	Daily Deep Seepage Rate (%)	0

Table 3 – Rainfall-Runoff Parameters

This Pollutant export parameters were assigned according to the Water by Design MUSIC Modelling Guidelines Version 1.0 – 2010. The pollutant export parameters adopted in the MUSIC model are summarised in Table 6 below.

Land Use Category		Log_{10} TSS (mg/L)		Log_{10} TP (mg/L)		Log_{10} TN (mg/L)	
		Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow
Industrial	Mean	1.92	0.78	-0.59	-1.11	0.25	0.14
	Std Dev	0.44	0.45	0.36	0.48	0.32	0.20

Table 4 – Pollutant Export Parameters (Industrial)

2.5.3. MUSIC ANALYSIS

Figure 4 below demonstrates the pollutant reduction achieved with the infiltration system model.

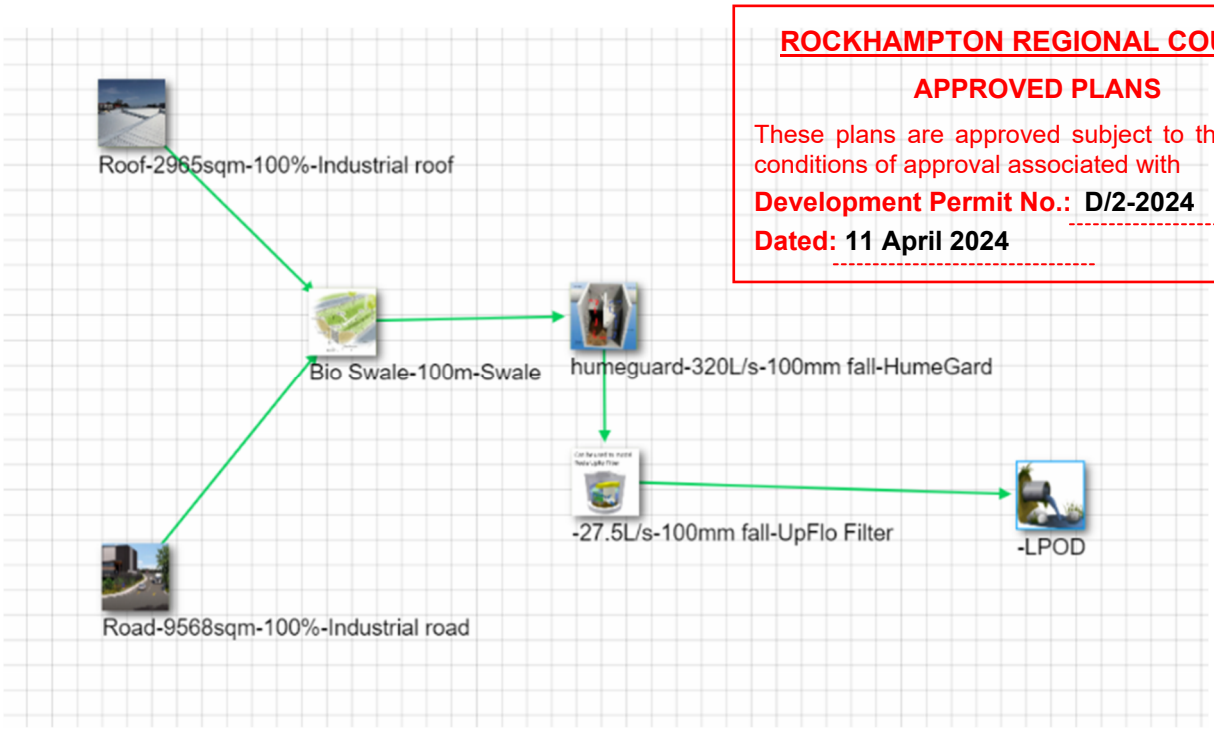

Figure 4 – MUSIC Model Schematic

The results demonstrate that a stormwater quality treatment train consisting of bio-retention swales, gross pollutant traps and Ocean Protect Jellyfish filter unit has the capability to reduce pollutant loads to levels beyond the required targets, as shown in **Table 7** below.

The location of the proposed stormwater quality treatment device is shown on design plan PC23341-CI-04.00.

Indicator	Annual Loads (kg/year)		Reduction	
	Without SQIDs	With SQIDs	Actual	Target
TSS	3,452	125	96%	85%
TP	5.77	1.11	81%	60%
TN	22.60	10.72	53%	45%
GP	222.76	0.00	100%	90%

Table 5 – MUSIC Model Results

2.5.4. WATER QUALITY – CONSTRUCTION PHASE

Table 5 below illustrates the typical types of pollutants generated during the construction phase of developments.

Pollutants	Sources	Priority
Litter	Paper, construction packaging, food packaging, cement bags, off-cuts	High
Sediment	Unprotected exposed soils and stockpiles during earthworks and building works	High
Hydrocarbons	Fuel and oil spills, leaks from construction equipment and temporary carpark areas	High
Toxic materials	Cement slurry, asphalt primer, solvents, cleaning agents, wash waters (e.g. from tile works)	Medium
Acid or Alkaline substances or producing substances	Acid sulphate soils, cement slurry and wash waters	High

Table 6 – Typical Pollutants Generated During Construction Phase

Over the construction period, it is generally the responsibility of the developer, through their principal contractor, to ensure that suitable temporary sediment and erosion controls are installed and maintained correctly.

It is recommended that for this development, the following high level erosion sediment control plan be adopted:

- Establish a single stabilised entry/exit point for the site works.
- Construct a shake-down grid at the entrance to facilitate the removal of sediment from vehicles leaving the site. The access road extending from the kerb to the grid should be comprised of 150-200mm deep pad of 40mm crushed rock.
- Install sediment fences along site boundary together with installation of mulch filter berms and earth bunds.
- Install fibre rolls and rock filter dams at locations where flows are concentrated such as against bunds or cut off drains.
- Install garbage bins and/or wind-proof litter areas on-site to minimise the dispersion of gross pollutants.
- Maintain stockpiles on site of all materials necessary for the emergency repair of all erosion control devices. This includes silt fences, clean and crushed rock for reapplication to the entrance road, fibre rolls etc.

- Undertake regular sweeping to remove material from the new and affected existing road surface and minimise impact on drainage system.

2.6. EROSION AND SEDIMENT CONTROL

During the construction phase of the development, an Erosion and Sediment Control Program (E&SCP) is required to minimise water quality impacts. Such an E&SCP should provide complete and detailed instructions on the following procedures:

- Before construction activities begin, sediment fences should be constructed on the downstream site boundaries and at the base of all proposed soil stockpiles.
- Areas for plant and construction material storage should be designated. Runoff from these areas should be directed to small holding ponds in case of spillages.
- Catch drains at the downstream boundary of construction activities should also be created to ensure that any sediment-laden runoff is contained and directed into a sediment basin and not permitted to flow unmitigated to downstream areas.
- Sediment basins should be constructed at appropriate locations to collect sediment at the downstream ends of the catch drains that convey runoff from exposed areas.
- Site personnel should be educated on the sediment and control measures implemented on site.
- Following rainfall events greater than 20mm, inspection of silt fences, sedimentation basins and other erosion control measures should be carried out. Where necessary, collected material should be removed and damaged equipment should be replaced immediately.

3. MAINTENANCE

3.1. BIO RETENTION MAINTENANCE

For the maintenance of the Bio-retention swale, it is important to remove weeds and debris regularly and watering until plants are established are actively growing. Watering is to be undertaken with the following frequency:

- Week 1-2, 3 times/ week
- Week 3-6, 2 times/ week
- Week 7-12, 1 time/ week

Watering requirements to sustain healthy vegetation should be determined during ongoing maintenance visits. Inspections are also recommended following large storm events to check for scour and damage.

Maintenance of the Bio-retention swale will include:

- Routine inspections of the surface profile to identify areas of sediment build-up, scour and erosion or clogging of the filter media material.
- Routine inspection of the overflow pits and under drains for blockages and litter build up.
- Removal of sediment where it is smothering at basin vegetation.
- Repair of a basin damage due to scour or erosion by replacement of filter media material and vegetation.

Maintenance of the gross pollutant traps and proprietary treatment unit (Ocean Protect Jellyfish or Humes Upflo filter) will be as specified by the suppliers.

Detailed maintenance techniques can be found in the Maintaining Vegetated Assets Guideline prepared by Water By Design.

4. CONCLUSION

This report has presented the results of hydrologic, hydraulic and stormwater management design to ensure the proposed development will flow to a lawful point of discharge and does not cause adverse effect on the surrounding properties or road while also demonstrating future development flows can be controlled in an engineered solution within the proposed site.

Key conclusions from this report include:

- The proposed development will meet Rockhampton Regional Council's Development Codes and Engineering Design Standards.
- Proposed stormwater infrastructure can cater for the Post-Development Flows collected within the site.
- The proposed Bio-Retention swale and treatment unit can adequately treat the proposed development.
- There are no worsening effects to downstream properties.

5. REFERENCES

- Queensland Urban Drainage Manual – QUDM, Queensland, 2018.
- Capricorn Municipal Development Guidelines (CMDG).
- Queensland Urban Drainage Manual (QUDM 2017).
- Australian Rainfall and Runoff 2019
- State Planning Policy (SPP2017).
- Best Practice Erosion & Sediment Control – IECA, Nov. 2008
- The Healthy Waterways Water Sensitive Urban Design – Technical Design Guidelines for Southeast Queensland and other Technical Guidelines by Water by Design

APPENDIX A – PROPOSED DEVELOPMENT

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

KINETIC ROCKHAMPTON

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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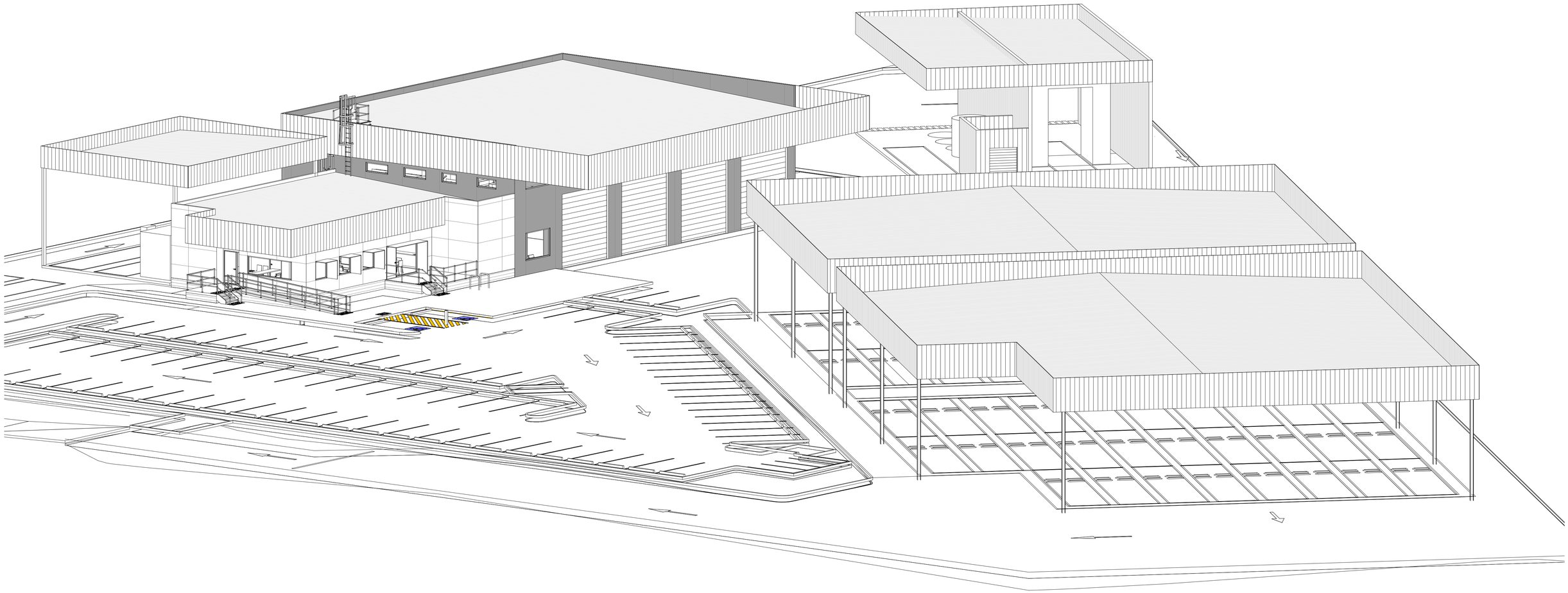
Development Permit No.: D/2-2024

Dated: 11 April 2024



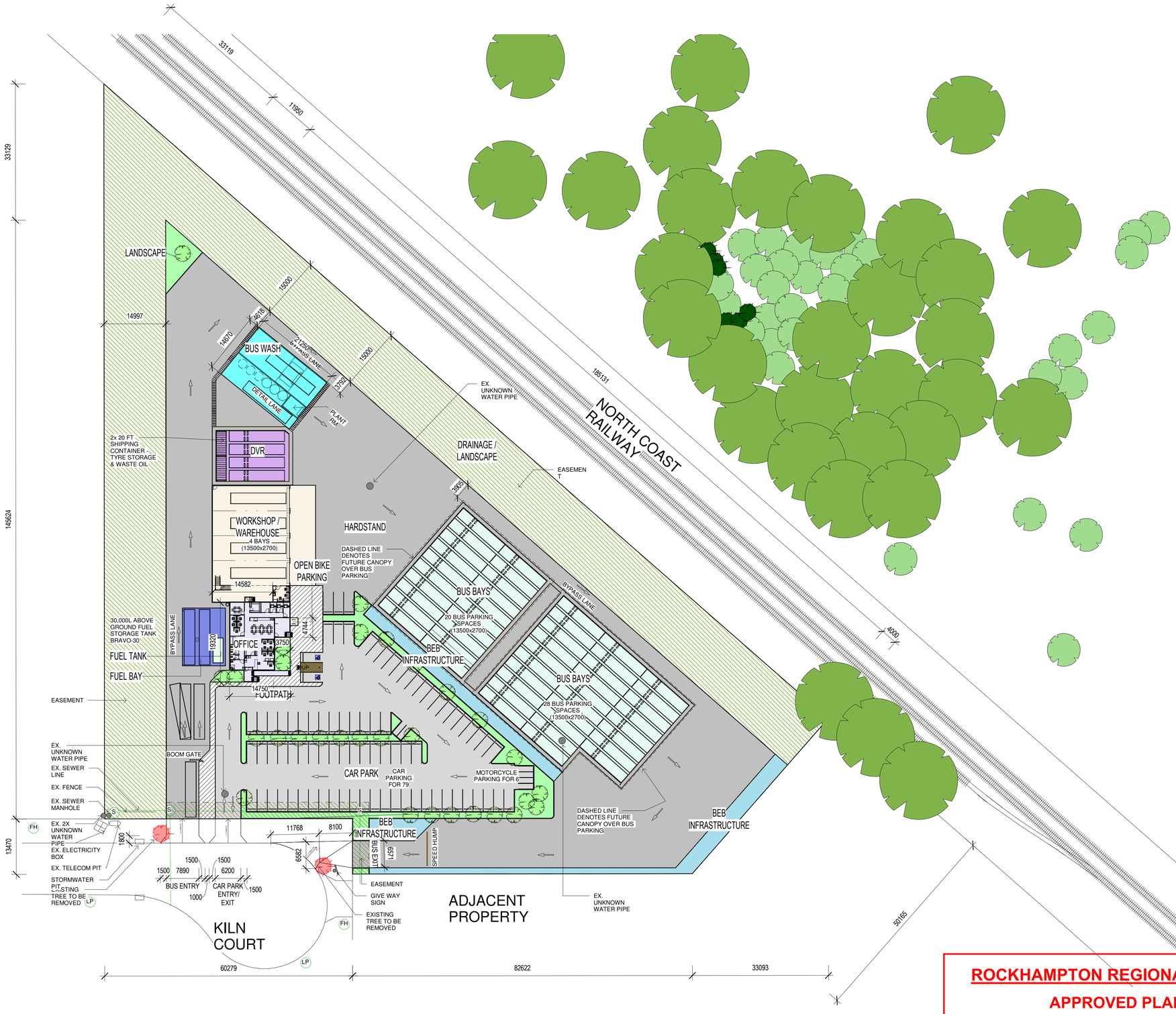
CD0000 REV S1 13.01.2024 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD COVERSHEET Scale@A1

0m 1m 2m 3m 4m 5m

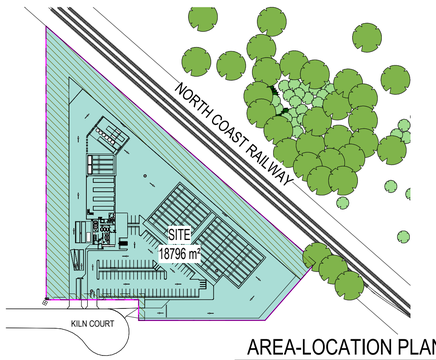
FOR APPROVAL

BELL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 **M** +61 419 996 978 **P** +61 8 8373 3870



1 SITE PLAN
1 : 500@A1



AREA-LOCATION PLAN
1 : 2000@A1

CD-SITE ANALYSIS

SITE AREA (APPROX):	18796m2	100.00%
TOTAL SITE COVER:	1384m2	7.36%
TOTAL GFA:	1000m2	5.32%
TOTAL LANDSCAPE:	6265m2	33.32%
TOTAL IMPERVIOUS AREA:	12531m2	66.68%
MAXIMUM BUILDING HEIGHT ABOVE GROUND:	8610m	

CD-AREA SCHEDULE

COLOUR	AREA NAME	AREA
	BEB INFRASTRUCTURE	513 m²
	BUS BAYS	2040 m²
	BUS WASH	312 m²
	CAR PARK	2275 m²
	DRAINAGE / LANDSCAPE	5698 m²
	DVR	217 m²
	FOOTPATH	326 m²
	FUEL BAY	132 m²
	FUEL TANK	15 m²
	HARDSTAND	5759 m²
	LANDSCAPE	582 m²
	MEZZANINE	75 m²
	OFFICE	234 m²
	OPEN BIKE PARKING	4 m²
	WORKSHOP / WAREHOUSE	690 m²
Grand total		18871 m²

CD-LIGHT VEHICLE PARKING SCHEDULE

Description	COUNT
STANDARD CAR BAY	77
DISABLED CAR BAY	2
CONTRACTOR CAR BAY	3
Grand total: 82	

NOTE:
CHAIN MESH FENCE ON PROPERTY BOUNDARY AND ON CAR PARK PERIMETER

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: **D/2-2024**

Dated: **11 April 2024**

CD2001 REV S10 13.01.2024 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD SITE PLAN

Scale@A1 As indicated

0m 10m 20m 30m 40m 50m

FOR APPROVAL

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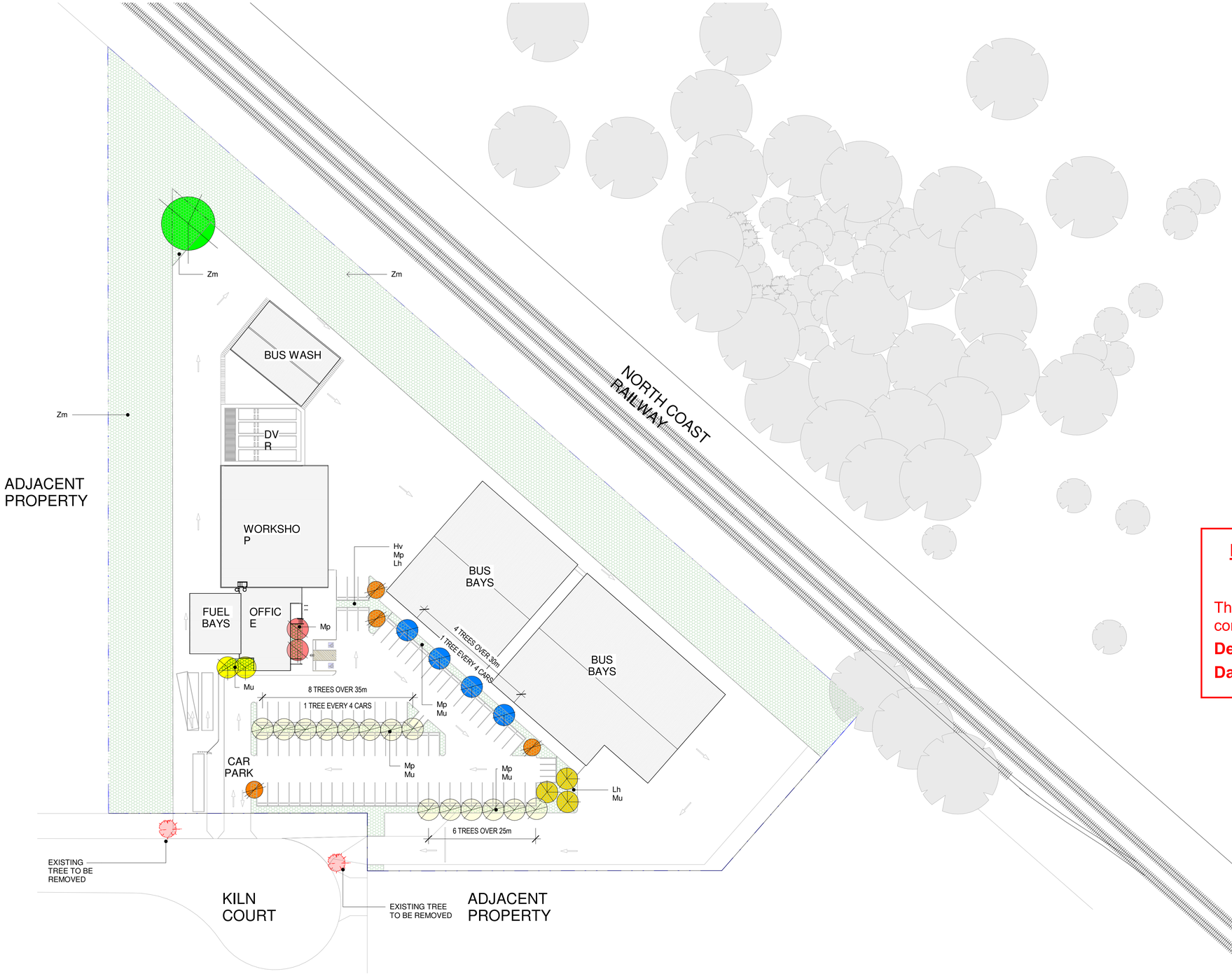

1 OVERALL LANDSCAPING PLAN
1 : 500@A1

DETAIL PLANNING SCHEDULE

TYPE	SYMBOL	BOTANIC NAME	COMMON NAME	SIZE	SPACING (m)
TREE		SCOLOPIA BRAUNII	FLINTWOOD	MEDIUM (25mH & 0.5m DIAMETER TRUNK)	AS SHOWN
TREE		GREVILLEA BANKSII	RED FLOWERED SILKY OAK	MEDIUM (10-30mH & 5-20m W)	AS SHOWN
TREE		XANTHOSTEMON CHRYSANTHUS	GOLDEN PENDA	MEDIUM (10-15mH & 6-12m W)	AS SHOWN
TREE		HARPULLIA PENDULA	TULIPWOOD	SMALL (6mH & 4m W)	AS SHOWN
TREE		GREVILLEA BAILEYANA	WHITE OAK	SMALL (5-10mH & 5m W)	AS SHOWN
TREE		ACACIA FIMBRIATA	BRISBANE GOLDEN WATTLE	SMALL (6mH & 5m W)	AS SHOWN
TREE		TRISTANIOPSIS LAURINA	WATER GUM	SMALL (5-15mH & 5m W)	AS SHOWN
GROUND COVER, CLIMBER	Hv	HARDENBERGIA VIOLACEA	NATIVE SARSPARILLA	SMALL (2-3.5mH & 2-3.5m W)	AS SHOWN
GRASS	Lh	LOMANDRA HYSTRIX	KATIE BELLES	SMALL (1.5-1.8mH & 1m W)	N/A
GRASS	Zm	ZOYSIA MACRANTHA	NARA NATIVE TURF	25mm TO 50mm H	N/A
GROUND COVER	Mp	MYOPORUM PARVIFOLIUM	CREEPING BOOBIALLA	150mm TO 300mm H	N/A
GROUND COVER	Mu		MULCH	N/A	N/A

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Dated: 11 April 2024

CD2021 REV S3 13.01.2024 BAB230106

KINETIC - 5 KILN CRT. ROCKHAMPTON QLD

OVERALL LANDSCAPING PLAN

Scale@A1 As indicated

0m 10m 20m 30m 40m 50m

DRAWING TO BE PRINTED IN COLOUR

FOR APPROVAL

BELL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 M +61 419 996 978 P +61 8 8373 3870

APPENDIX B – SITE SURVEY AND EXISTING SERVICES PLAN

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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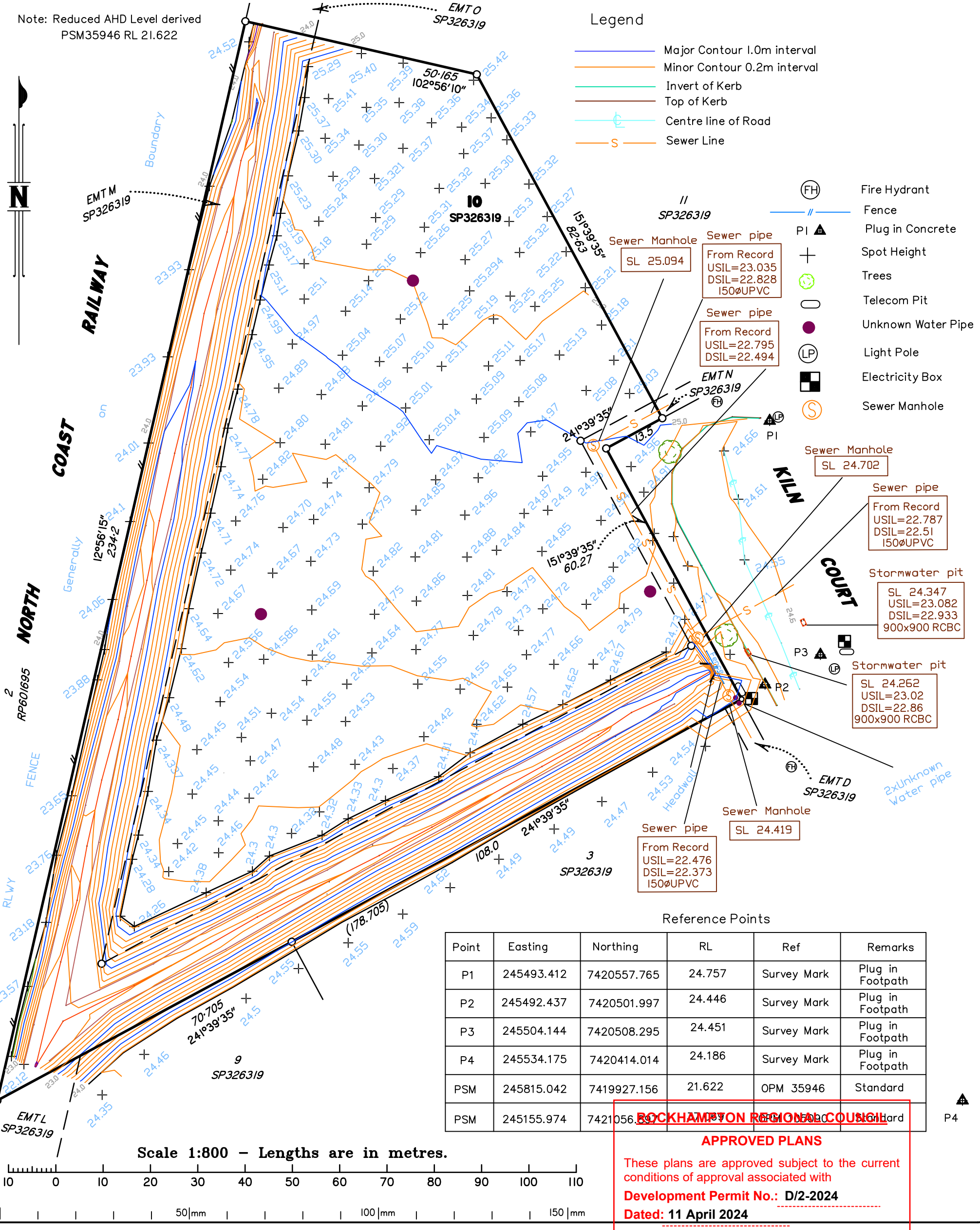
Dated: 11 April 2024

Note: Reduced AHD Level derived
PSM35946 RL 21.622



Reference Points

Point	Easting	Northing	RL	Ref	Remarks
P1	245493.412	7420557.765	24.757	Survey Mark	Plug in Footpath
P2	245492.437	7420501.997	24.446	Survey Mark	Plug in Footpath
P3	245504.144	7420508.295	24.451	Survey Mark	Plug in Footpath
P4	245534.175	7420414.014	24.186	Survey Mark	Plug in Footpath
PSM	245815.042	7419927.156	21.622	OPM 35946	Standard
PSM	245155.974	7421056.897	17.799	OPM 35940	Standard

Scale 1:800 – Lengths are in metres.

10 0 10 20 30 40 50 60 70 80 90 100 110

0 50mm 100mm 150mm

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/2-2024
Dated: 11 April 2024

This plan has been prepared from a combination of field survey and existing records for the purpose of showing the physical features of the land to assist in designing future development, and should not be used for any other purpose.
The title boundaries shown hereon were not verified or marked at the time of survey but where determined by existing title dimensions and occupation (where available), not by field measurement. As such, these dimensions could be out of date and incorrect by modern standards. This plan should not be used for building to boundary, or to prescribe set-backs, without further boundary survey.
Services shown hereon were located where possible by field survey completed on 26-10-23. If not able to be so located, known services have been shown from the record of the relevant authorities or service providers where available and have been noted accordingly on this plan. All services shown from records only will need verification prior to, or during work on site.
Prior to any demolition, excavation or construction on site, the relevant authority should be contacted for:

- Verification of all services plotted from records only; and
- Possible location of any services altered since this survey was completed or any new services installed either on or adjacent to this site.

Before starting any demolition, excavation or construction on this site, the relevant person should make an independant and updated enquiry of 'dial before you dig' and any relevant service providers to ascertain the existance of further services (if any) and the accurate location of those not able to have been surveyed at the time of preparing this plan.
No responsibility can be accepted by GSPC for any damage caused to any underground service or any loss or injury so suffered if enquiry and verification have not been completed in accordance with this note.
This note is an integral part of this plan. Reproduction of this plan or any part of it without this note being included in full will render information shown on such reproduction invalid and not suitable for use.

Detail and Level survey over Lot 10 on SP326319

GSPC
(Gracemere Surveying and Planning Consultants Pty Ltd)
ABN: 40 124 780 445
PO Box 379 Gracemere QLD 4702
Rockhampton & Toowoomba
PH: (07) 4922 7033 email: admin@gspc.com.au FAX: (07) 4922 7044

LOCALITY: PARKHURST
LOCAL GOVERNMENT: Rockhampton Regional Council
HORIZONTAL DATUM: GDA94 Zone 56
MERIDIAN: SP326319
VERTICAL DATUM: AHD
DERIVED vide: PM 35946
MAP REF: 9051-34433

PLAN SCALE: 1:800
AUTOCAD SCALE: 1:1000
DATE: 06-11-2023
DRAWN: Rupesh

SHEET 1 OF 1
REF. 231295-01

DBYD Number: 35371380

5 Kiln Court, Parkhurst

Sequence Number: 231544198

ROCKHAMPTON REGIONAL COUNCIL

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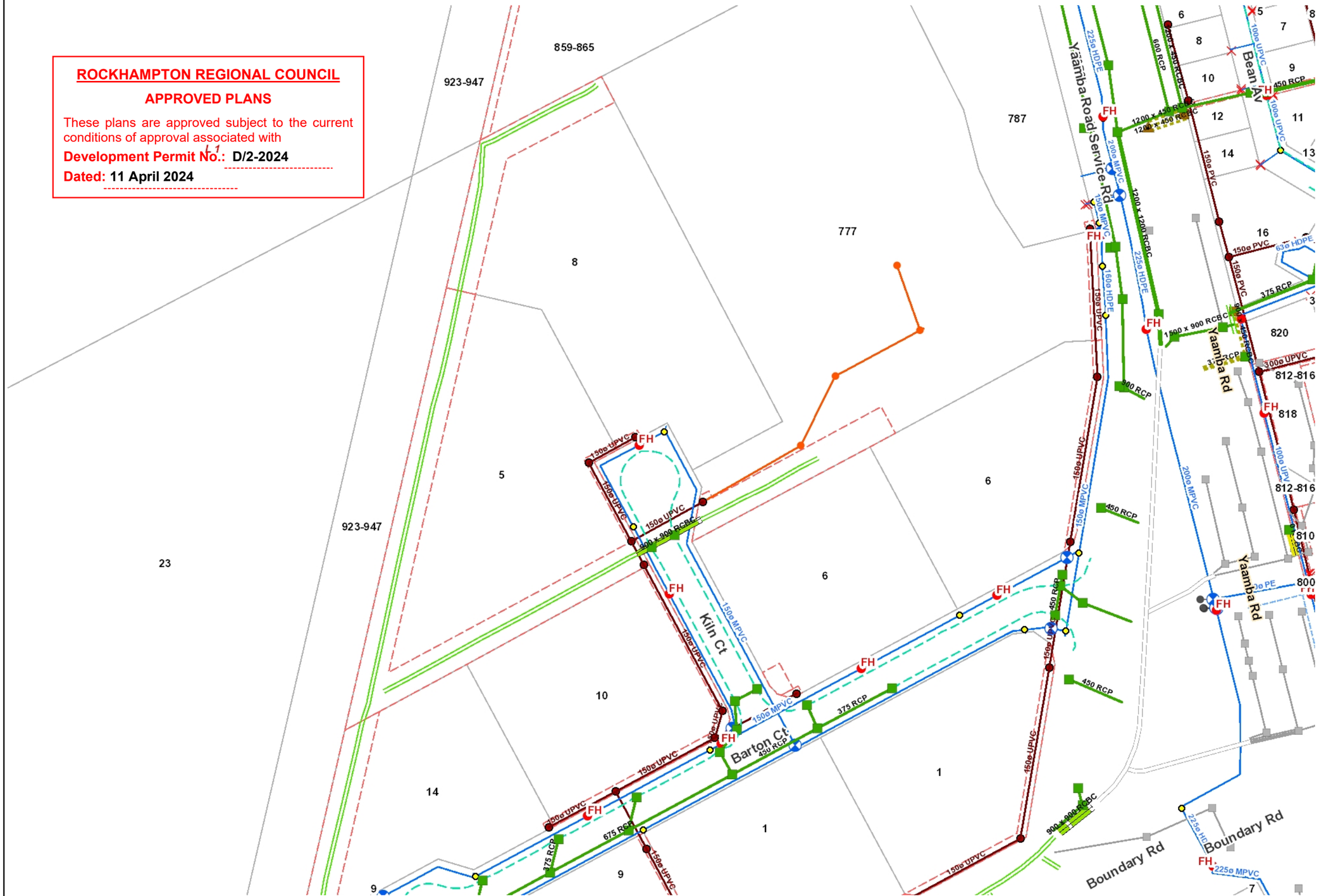

DBYD - Rockhampton Regional Council Infrastructure

CBD Parking sensor zones

Water
- Gate, Sluice, Butterfly
- Air Valve
- Ball Cock, Stop Cock
- Ball Valve
- Motor Sluice Valve
- Non Return Valve
- Pressure Reducing Valve
- RPZ Valve
- Reflux Valve
- Scour Valve
- Sluice Bypass Valve
- Tap
- Other Valve Type
- Open - Dialysis
- Closed - Zone
- Valve Normally Open
- Valve Normally Closed
- Trunk Main
- Reticulation Main
- Raw Water Main
- Scour Line
- Other Main Type
- Water Service
- Hydrants
- Reservoirs
- Intake
- Pump Station
- Treatment Plant
- Unknown
- Abandoned Mains

Private Water
- Private Water Hydrants
- Private Water Valves
- Private Water Mains
- Private Water Abandoned Mains

Stormwater
- Flood Mitigation Devices
- Culverts
- Headwalls
- Stormwater Junctions
- Pollution Trap
- Subsoil Clean-Out pit
- Stormwater Jump ups
- Connector; Reticulation Main
- Culvert Pipe; LinkSlab
- Inter-Allotment
- Low Flow Pipe
- Other
- Stormwater Drop Structures
- Batter Chute; Open Channel
- Bio-Retention Swale
- Subsoil Drain
- Weirs
- Bio-Retention
- Detention/Retention
- Abandoned Mains
- Abandoned Headwalls
- Abandoned Culverts
- Abandoned Junctions

Private Stormwater
- Culverts Private
- Headwalls Private
- Stormwater Junctions Private
- Pollution Trap Private
- Subsoil Clean-Out pit Private
- Stormwater Jump Up Private
- Stormwater Main Private
- Open Channel Private
- Subsoil Drain Private
- Retention Basins Private

Effluent
- Effluent Structures
- Effluent Valves
- Effluent Mains

Sewer
- Pump Station
- Treatment Plant
- Combined Main
- Reticulation Main
- Trunk Main
- Overflow Main
- Sewer Rising Mains
- Roll Over
- Lamp Hole | Inspection Opening
- Overflow Chamber
- Access Chambers
- Sewer Valves
- Sewer Jump Ups
- Sewer Access Chambers Abandoned
- Sewer Mains Abandoned

Private Sewer
- Pump Station
- Treatment Plant
- Sewer Access Chambers Private
- Sewer Joints Private
- Sewer Valves Private
- Sewer Gravity Mains Private
- Sewer Rising Mains Private
- Sewer Jump Ups Private
- Sewer Mains Abandoned Private
- Sewer Access Chambers Abandoned Private

Administrative
- Easements
- Property Parcels

GDA2020

A3 Page scale at 1:2,000.00

Printed from GeoCortex on 31/10/2023

Rockhampton Regional Council

APPENDIX C – STORMWATER MANAGEMENT PLAN

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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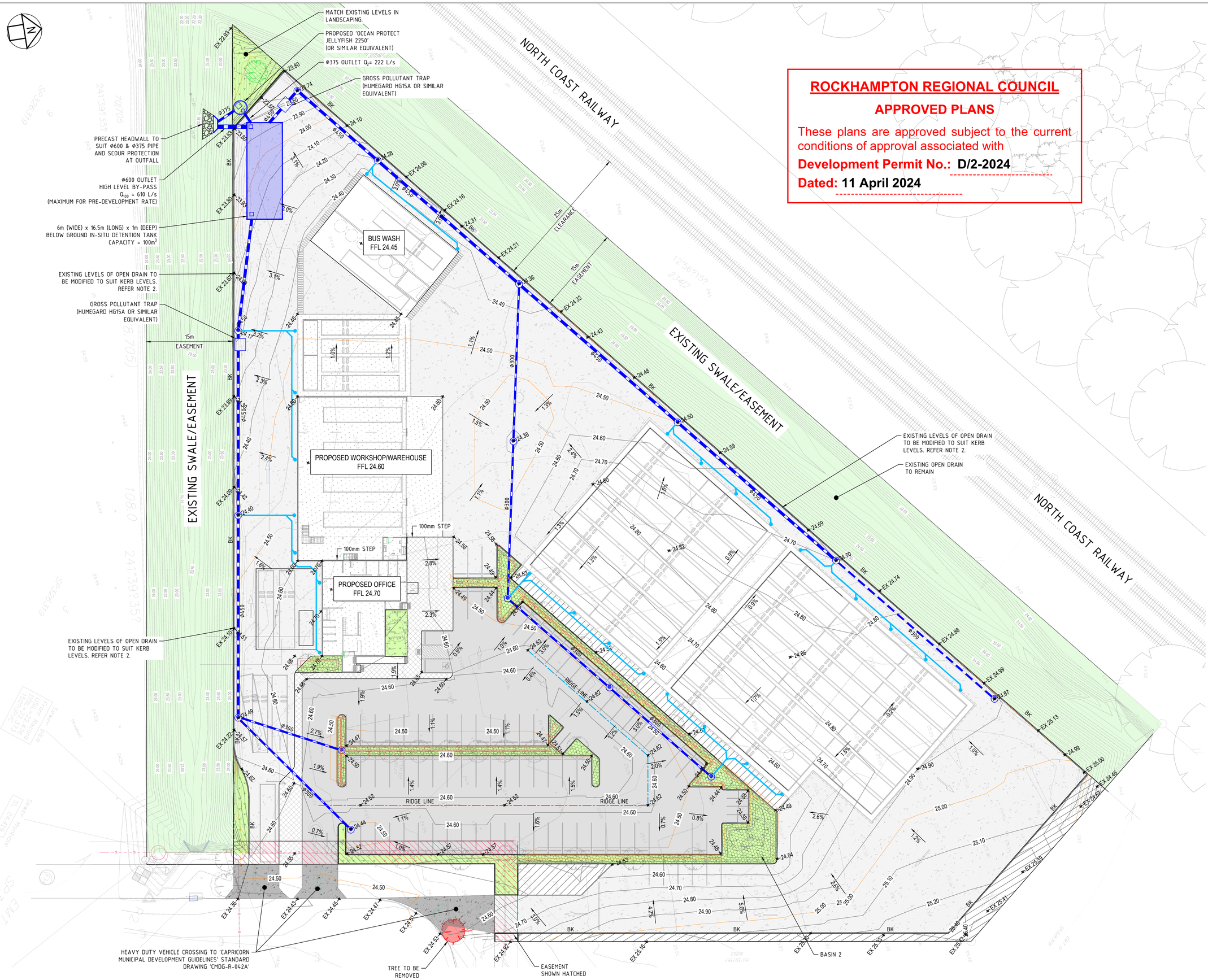
Dated: 11 April 2024



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

NOTES:

LEGEND

- EXTEND OF WORKS BOUNDARY
- PROPOSED CONCRETE PAVEMENT
- PROPOSED LANDSCAPE
- PROPOSED ASPHALT PAVEMENT (LIGHT DUTY)
- PROPOSED FOOTPATH
- PROPOSED BIO-RETENTION (0.15m DEPTH) U.N.O
- EXISTING SWALE/EASEMENT (15.0m WIDE)
- BEB INFRASTRUCTURE
- EXISTING SEWER EASEMENT
- PROPOSED VEHICLE CROSSING
- PROPOSED MAJOR CONTOURS
- PROPOSED MINOR CONTOURS
- EXISTING CONTOURS
- PROPOSED DRAINAGE PIPE & SIZE
- PROPOSED PITS
- PROPOSED 300mm WIDE TRENCH DRAIN WITH CLASS 'D' DUCTILE IRON GRATE
- EXISTING WATER
- EXISTING SEWER
- EXISTING COMMUNICATIONS
- PROPOSED BARRIER KERB (BK)
- PROPOSED ROOFED DRAINAGE

NOTE

1. THE PIPE DIMENSIONS ARE SHOWN INDICATIVELY ONLY AND TO BE CONFIRMED DURING DETAILED DESIGN STAGE.
2. EXISTING LEVELS OF OPEN DRAINS ALONG WESTERN BOUNDARY TO BE CONFIRMED WITH COUNCIL DURING DETAILED DESIGN STAGE TO MAINTAINED EXISTING FLOW CONDITIONS AS DESIGN AND APPROVED AS PART OF THE LILE PLACE INDUSTRIAL PRECINCT.
3. SUBSOIL DRAINS TO BE CONSTRUCTED IN ACCORDANCE WITH ROCKHAMPTON REGIONAL COUNCIL STANDARD DRAWINGS.
4. MAXIMUM DISTANCE BETWEEN CLEANOUT POINTS (INCL. GULLY PITS) TO BE 60m.
5. ALL DRAINAGE PIPES SHALL BE CLASS 2 R.C. PIPES UNLESS NOTED OTHERWISE.

1:300 AT A1

0 3m 6m 9m 12m 15m

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	DRAWN	DATE
A	ISSUED FOR INFORMATION	JW	13.12.23
B	ISSUED FOR APPROVAL	JW	15.12.23
C	ISSUED FOR APPROVAL	JW	20.02.24

peritas

PERTH
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A: 74 GOODWOOD PDE, BURSWOOD, WA 6100
E: ENQUIRE@PERITASGROUP.COM.AU

MELBOURNE
P: 03 8657 9292
A: 1 QUEENS ROAD, MELBOURNE, VIC 3004
E: ENQUIRE@PERITASGROUP.COM.AU

CLIENT:

KINETIC
moving people

DESIGNED:	DRAWN:	CHECKED:
J.WOODHAM	J.WOODHAM	W.LYE
SURVEY DATUM:	WAPC No:	SCALE:
MGA 56		N/A @ A1
DWG IS NOT FOR CONSTRUCTION UNLESS SIGNED BELOW:		DATE CREATED:
		23.11.23

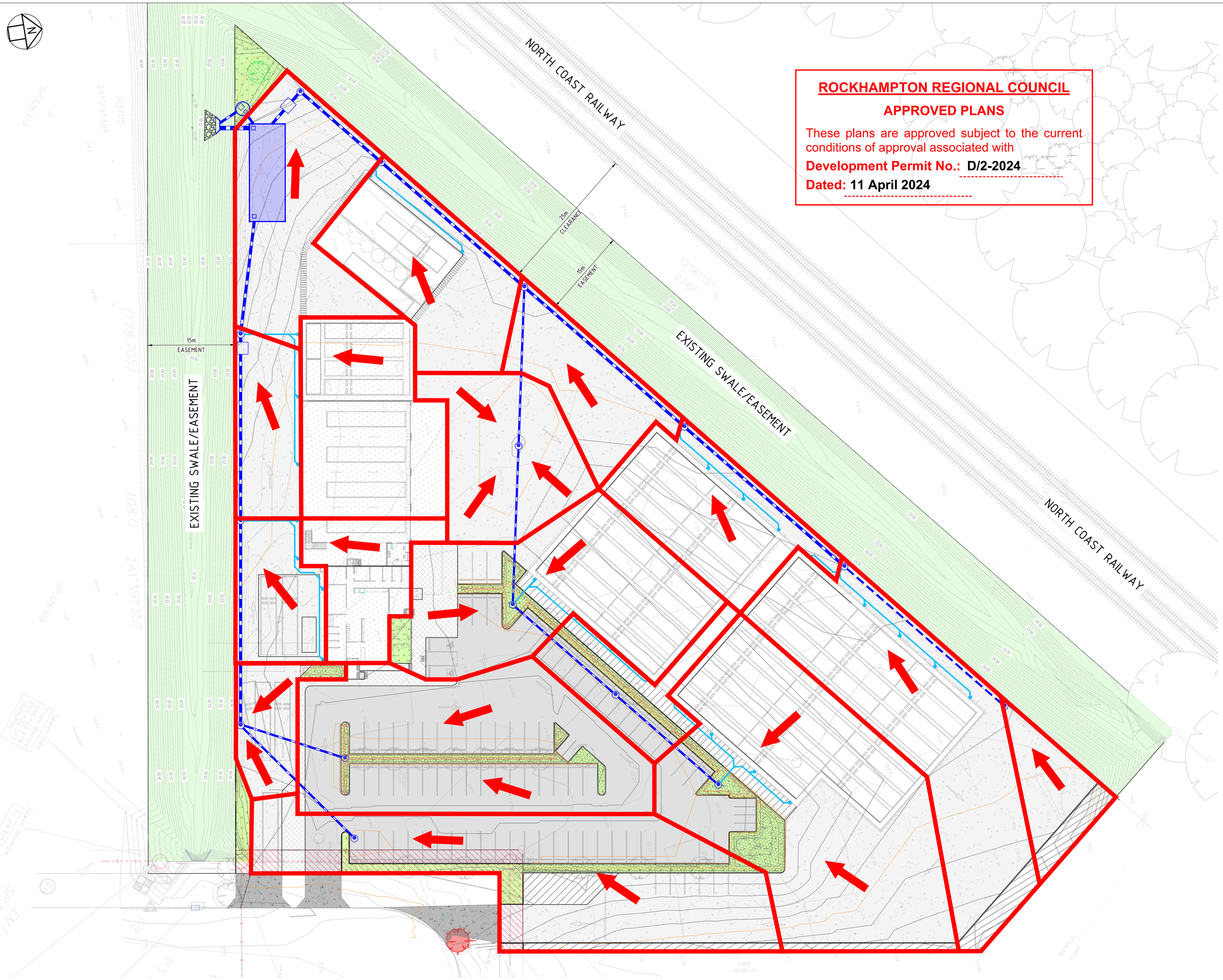
PROJECT:

KINETIC - BUS DEPOT
5 KILN COURT
ROCKHAMPTON, 4700, QLD

TITLE:

STORMWATER MANAGEMENT PLAN

PROJECT NUMBER:	DRG NUMBER:	REV:
PC23341	CI-04.00	C



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Dated: 11 April 2024

NOTES:

LEGEND

- EXTEND OF WORKS BOUNDARY
- PROPOSED CONCRETE PAVEMENT
- PROPOSED LANDSCAPE
- PROPOSED ASPHALT PAVEMENT (LIGHT DUTY)
- PROPOSED FOOTPATH
- PROPOSED BIO-RETENTION (0.15m DEPTH) U.N.O
- EXISTING SWALE/EASEMENT (15.0m WIDE)
- BEB INFRASTRUCTURE
- EXISTING SEWER EASEMENT
- PROPOSED VEHICLE CROSSING
- 30.00 PROPOSED MAJOR CONTOURS
- 30.10 PROPOSED MINOR CONTOURS
- 23.00 EXISTING CONTOURS
- PROPOSED DRAINAGE PIPE & SIZE
- PROPOSED PITS
- PROPOSED 300mm WIDE TRENCH DRAIN WITH CLASS 'D' DUCTILE IRON GRATE
- EXISTING WATER
- EXISTING SEWER
- EXISTING COMMUNICATIONS
- PROPOSED BARRIER KERB (BK)
- PROPOSED ROOFED DRAINAGE
- STORMWATER CATCHMENT BOUNDARY

1:300 AT A1

0 3m 6m 9m 12m 15m

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION	DRAWN	DATE
A	ISSUED FOR APPROVAL	JW	20.02.24

peritas

PERTH
P: 08 6336 9299
A: 74 GOODWOOD PDE, BURSWOOD, WA 6100
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P: 03 8657 9292
A: 1 QUEENS ROAD, MELBOURNE, VIC 3004
E: ENQUIRE@PERITASGROUP.COM.AU

CLIENT:

KINETIC
moving people

DESIGNED:	DRAWN:	CHECKED:
J.WOODHAM	J.WOODHAM	W.LYE
SURVEY DATUM:	WAPC No:	SCALE:
MGA 56		N/A @ A1
DWG IS NOT FOR CONSTRUCTION UNLESS SIGNED BELOW:		DATE CREATED:
		23.11.23

PROJECT:

KINETIC - BUS DEPOT
5 KILN COURT
ROCKHAMPTON, 4700, QLD

TITLE:

STORMWATER CATCHMENT PLAN

PROJECT NUMBER:	DRG NUMBER:	REV:
PC23341	CI-04.10	A

APPENDIX D – CODE COMPLIANCE

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

Stormwater management code

Stormwater management – General

Performance outcomes	Acceptable outcomes	Proposed Compliance
Stormwater management - General		
PO1 Development provides a stormwater management system which achieves the integrated management of stormwater to: 1. ensure that flooding impacts do not increase, including upstream or downstream of the development site; 2. avoid net worsening of stormwater peak discharges and runoff volumes; 3. utilises the use of water sensitive urban design principles; and 4. ensure the site maximizes opportunities for capture and reuse.	**AO1.1** Development provides a stormwater management system which is designed in compliance with SC6.18— Stormwater management planning scheme policy, SC6.10 — Flood hazard planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff. **AND** **AO1.2** Stormwater is conveyed to a lawful point of discharge in accordance with the Queensland Urban Drainage Manual.	**AO1.1:** The stormwater management strategy set out in this Stormwater Management Plan had assessed the peak flows pre and post development at 63.21%, 39.35%, 20%, 10%, 5%, 2% and 1% Annual Exceedance Probability, to ensure that the post-development runoff flow rates do not exceed the existing site runoff flow rates. Stormwater quantity and quality measures had been proposed in accordance to the requirements set out in QUDM and ARR 2019. **AO1.2:** The lawful point of discharge is in compliance with QUDM.
PO2 Development provides a stormwater management system which: 1. has sufficient capacity to safely convey run-off taking into account	**AO2.1** Development provides a stormwater management system which is designed in compliance with SC6.18 — Stormwater management planning scheme policy, Queensland Urban Drainage Manual,	**AO2.1:** SMP is compliant.

increased run-off from impervious surfaces and flooding in local catchments; 2. maximises the use of natural waterway corridors and natural channel design principles; and 3. efficiently integrates with existing stormwater treatments upstream and downstream.	Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff.	**ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**
PO3 Development ensures that the location and design of stormwater detention and water quality treatment facilities: 1. minimise risk to people and property; 2. provide for safe access and maintenance; and 3. provide for the safe recreational use of stormwater management features.	**AO3.1** Development provides for stormwater detention and water quality treatment facilities which are located outside of a waterway. **AND** **AO3.2** Development provides for stormwater detention in accordance with SC6.18 — Stormwater management planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff. **AND** **AO3.3** Development provides a stormwater quality treatment system which is designed in accordance with State Planning Policy - Water Quality.	Quantity and quality treatment of stormwater are detailed in SMP.

Environmental values

Performance outcomes	Acceptable outcomes	Proposed Compliance
Environmental values		
PO4 Development and drainage works including stormwater channels, creek modification works, bridges, culverts and major drains, protect and enhance the environmental values of the waterway corridors and drainage paths and permit terrestrial and aquatic fauna movement. Editor's note—Compliance with the performance outcomes and acceptable outcomes should be demonstrated by the submission of a site-based stormwater management plan for development.	**AO4.1** Development ensures natural waterway corridors and drainage paths are retained. **AND** **AO4.2** Development incorporates the use of natural channel design principles in constructed components to maximise environmental benefits and waterway stability in accordance with the Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff. **AND** **AO4.3** Development provides stormwater outlets into waterways, creeks, wetlands and overland flow paths with energy dissipation to minimise scour in accordance with the Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff.	The proposed open drains are gazetted as drainage easements and will be finished as grassed. **ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**
PO5 Development protects and enhances the environmental and water quality values of	No acceptable outcome is nominated.	The quantity and quality treatment proposed serve to protect the environmental and water

waterways, creeks and estuaries within or external to the site.		quality values of receiving waterways, being Limestone Creek.

Overland flow path tenure

Performance outcomes	Acceptable outcomes	Proposed Compliance
Overland flow path **tenure**		
PO6 All overland flow paths are maintained under tenure arrangements that facilitate efficient infrastructure and enhance environmental sustainability.	No acceptable outcome is nominated.	A drainage easement along the western boundary serves as the designated stormwater runoff conveyance and overland flow path.

Detention Systems

Performance outcomes	Acceptable outcomes	
Detention Systems		
PO7 Detention basins are designed, located and constructed on land solely dedicated for stormwater management.	**AO7.1** Detention basins are designed in accordance with SC6.18 Stormwater management planning scheme policy.	A separate underground tank serves as stormwater detention had been provided for the subject site.
PO8 Development ensures that location and design of stormwater detention and water quality treatment: 1. minimises risk to people and property; 2. provides for safe access and maintenance; and	**AO8.1** Development provides a stormwater management system designed in accordance with SC6.10 Flood hazard planning scheme policy and SC6.18 Stormwater management planning scheme policy.	The proposed stormwater detention tank and quality treatment unit are proposed at location where they can be accessed safely as part of ongoing maintenance purposes.

3. minimises ecological impacts to creeks and waterways.		
PO9 Flood plain storage and function, and detention system functions are maintained. This shall include ensuring that: 1. detention system design does not remove floodplain storage; and 2. detention systems continue to operate effectively during a major storm event.	No acceptable outcome is nominated. **ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**	This stormwater Management Plan (SMP) had been updated with flood modelling up to 1% AEP or 1 in 100-year scenario.
PO10 Detention basins shall not be provided in locations that prevent easy access to or maintenance of the detention basin.	**AO10.1** The location of detention basins are in accordance with SC6.18 Stormwater management planning scheme policy.	As above the stormwater detention tank has safe access.

Efficiency and whole of life cycle cost

Performance outcomes	Acceptable outcomes	Proposed Compliance
Efficiency and whole of life cycle cost		
PO11 Development ensures that there is sufficient site area to accommodate an effective stormwater management system.	No acceptable outcome is nominated.	This stormwater Management Plan (SMP) had been updated with flood modelling up to 1% AEP or 1 in 100-year scenario. Suitable stormwater quantity and quality management devices are detailed.

PO12 Development provides for the orderly development of stormwater infrastructure within a catchment, having regard to the: 1. existing capacity of stormwater infrastructure within and external to the site, and any planned stormwater infrastructure upgrades; 2. safe management of stormwater discharge from existing and future upslope development; and 3. implications for adjacent and down-slope development.	No acceptable outcome is nominated. **ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**	The proposed stormwater infrastructure for the subject site is adequately designed to discharge into as built stormwater detention basin and open drains at “pre-development” rates.
PO13 Development provides proposed stormwater infrastructure which: 1. remains fit for purpose for the life of the development and maintains full functionality in the design storm event; and 2. can be safely accessed and maintained in a cost effective way.	No acceptable outcome is nominated.	The proposed stormwater infrastructure for the subject site is adequately designed.

Erosion and sediment control

Performance outcomes	Acceptable outcomes	Proposed Compliance
Erosion and sediment control		
PO14 Development ensures that all reasonable and practicable measures are taken to manage the impacts of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, civil construction, installation of services, rehabilitation, revegetation and landscaping to protect: 1. the environmental values and water quality objectives of waters; 2. waterway hydrology; and 3. the maintenance and serviceability of stormwater infrastructure.	**AO14.1** Erosion and sediment control plan is to be designed and implemented in accordance with the Capricorn Municipal Development Guidelines. **ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**	Erosion and sediment control measures will be implemented on site during construction and details will be provided at the time of Operational Works.

Water quality within catchment areas

Performance outcomes	Acceptable outcomes	Proposed Compliance
Water quality within catchment areas		
PO15 For development proposals within the Fitzroy River sub-basin, relevant environmental values are recognised and enhanced, and relevant water quality objectives are addressed.	**AO15.1** Development complies with the provisions of the State Planning Policy - Guideline - Water Quality. **AND** **AO15.2**	The development will not impact on water quality of the Fitzroy River catchment.

	Development adjoining the full supply height above the Fitzroy River Barrage includes the provision of an effective buffer that assists in filtering runoff, including: 1. a buffer distance of 100 metres to the water supply height of the barrage which excludes cropping or grazing of a low intensity nature; and 2. fencing and water troughs installed on the land to prevent encroachment of animals within 100 metres of the full supply height above the barrage.	**ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**

Protecting water quality

Performance outcomes	Acceptable outcomes	Proposed Compliance
Protecting water quality		
PO16 The development is compatible with the land use constraints of the site for: 1. achieving stormwater design objectives; and 2. avoiding or minimising the entry of contaminants into, and transport of contaminants in stormwater.	**AO16.1** Development is undertaken in accordance with a stormwater management plan that: 1. incorporates stormwater quality control measures to achieve the design objectives set out in the State Planning Policy – Guideline – Water Quality; 2. provides for achievable stormwater quality treatment	The proposed use will not discharge contaminants to any waterways. The proposed waste storage areas will only drain to new sewer.

ROCKHAMPTON REGIONAL COUNCIL **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**	measures reflecting land use constraints, such as soil type, landscape features (including landform), nutrient hazardous areas, acid sulfate soil and rainfall erosion potential; and 3. accounts for development type, construction phase, local landscape, climatic conditions and design objectives. Editor's note—A stormwater management plan includes the design, construction, operation, maintenance of the stormwater system. Editor's note—SC6.18 — Stormwater management planning scheme policy provides guidance on preparing a stormwater quality management plan.	

Protecting water quality in existing natural waterways

Performance outcomes	Acceptable outcomes	Proposed Compliance
Protecting water quality in existing natural waterways		
PO17 The waterway is designed for stormwater flow management, stormwater quality management and the following end use purposes: 1. amenity including aesthetics, 2. landscaping and recreation; 3. flood management;	No acceptable outcome is nominated.	The development will not impact on water quality of any existing waterways.

4. stormwater harvesting as part of an integrated water cycle management plan; 5. as a sustainable aquatic habitat; and 6. the protection of water environmental values.		
PO18 The waterway is located in a way that is compatible with existing tidal waterways.	**AO18.1** Where the waterway is located adjacent to, or connected to, a tidal waterway by means of a weir, lock, pumping system or similar: 1. there is sufficient flushing or a tidal range of more than 0.3 metres; or 2. any tidal flow alteration does not adversely impact on the tidal waterway; or 3. there is no introduction of salt water into freshwater environments.	The development will not impact on water quality of any existing waterways.
PO19 The construction phase for the waterway is compatible with protecting water environmental values in existing natural waterways.	**AO19.1** Erosion and sediment control measures are incorporated during construction to achieve design objectives set out in State Planning Policy - Guideline - Water Quality. Editor's note—Erosion and sediment control is to be designed and implemented in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control Guidelines.	The development will not impact on water quality of any existing waterways.
PO20 Stormwater overflows from the waterway do not	**AO20.1** Stormwater run-off entering non-tidal waterways is	The development will not impact on

result in lower water quality objectives in existing natural waterways.	pre-treated prior to release in accordance with the guideline design objectives, water quality objectives of local waterways, and any relevant local area stormwater management plan.	water quality of any existing waterways.

State Code 2: Development in a railway environment

Stormwater and overland flow

Performance outcomes	Acceptable outcomes	Proposed Compliance
Stormwater management - General		
PO12 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard in a **railway corridor**.	No acceptable outcome is prescribed.	The proposed stormwater infrastructure for the subject site is adequately designed to discharge into as built stormwater detention basin and open drains at “pre-development” rates.
PO13 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of the **railway corridor**, **rail transport infrastructure** or **other rail infrastructure**.	No acceptable outcome is prescribed.	As above – there is no impact of the stormwater runoff or overland flow generated from the development site to the railway corridor and infrastructure.
PO14 Stormwater run-off or overland flow from the development site does not interfere with the **structural integrity** or physical condition of the **railway corridor**, **rail transport infrastructure** or **other rail infrastructure**.	No acceptable outcome is prescribed.	As above – there is no impact of the stormwater runoff or overland flow generated from the development site to the railway corridor and infrastructure.
PO15 Development does not result in a material	No acceptable outcome is prescribed.	As above – there is no impact of the stormwater runoff or overland flow

worsening of flooding impacts within a **railway corridor**.		generated from the development site to the railway corridor.
PO16 Development does not create a safety hazard in a **railway corridor**.	No acceptable outcome is prescribed.	There is no impact of the stormwater runoff or overland flow generated from the development site that would create safety hazard within the railway corridor.

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APPENDIX E – APPROVED SMP BY KNOBEL ENGINEERS AND SIRIS CONSULTING ENGINEERS

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

STORMWATER MANAGEMENT PLAN (INCLUDING HYDRAULIC IMPACT ASSESSMENT)

Proposed Industrial Development
777 Yaamba Road
PARKHURST

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

12 June 2020

File No: K4820-0003

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KNOBEL ENGINEERS

DOCUMENT CONTROL SHEET

Title:	Stormwater Management Plan (Including Hydraulic Impact Assessment)
Document No:	K4820-0003
Original Date of Issue:	15 May 2020
Project Manager:	Martin Roushani-Zarmehri
Author:	M. Roushani-Zarmehri
Client:	Siris Consulting Engineers
Client Contact:	D. Cugola
Client Reference:	777 Yaamba Road, Parkhurst
Synopsis:	This Hydraulic Impact Assessment Report provides details of the potential for hydraulic impact due to the Proposed Industrial Development on 777 Yaamba Road Parkhurst. It includes adopted modelling parameters, hydraulic constraints, conceptual design information for the proposed development and a summary of the mitigation of impacts.

Reviewed by RPEQ	Reg. No.	Signed	Date
Martin Roushani-Zarmehri	22549		12 June 2020

Revision/Checking History

Revision No	Date	Checked By	Issued By
A	15 May 2020	Aaron Pianta	Martin Roushani-Zarmehri
B	12 June 2020	Aaron Pianta	Martin Roushani-Zarmehri

Distribution

Recipient	No of Copies	Method
D.Cugola – Siris Consulting Engineers	1	PDF

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The information contained within this report is provided in good faith in the belief that no information, opinions or recommendations made are misleading. All comments and opinions given in this report are based on information supplied by the client, their agent and third parties.

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1.0 INTRODUCTION

1.1 Background

Knobel Engineers has been commissioned by Siris Consulting Engineers to carry out a Stormwater Management Plan (SMP), which includes a Hydraulic Impact Assessment (HIA) at 777 Yaamba Road, Parkhurst, ('the site'). This HIA is to facilitate a Development Application for an Industrial Reconfiguration Of Lot (ROL) application to Rockhampton Regional Council, and the referable State Agencies.

Accordingly, this report has been provided in response to the Information Requests ('IR') by Rockhampton Regional Council ('RRC') - Application Reference No: D/52-2019, dated 11 July 2019, and the Queensland Government's Department of State Development, Manufacturing, Infrastructure and Planning ('SDMIP') – SARA Reference: 1907-12044 SRA dated 5 August 2019.

This report should be read in conjunction with the Response to RRC Information Request (Document No: K4820-0005) and the State Assessment and Referral Agency Information Request (Document No: K4820-0006), prepared by Knobel Engineers.

1.2 Study Objectives

This SMP aims to:

- Review existing information and studies for the subject site and surrounding catchment;
- Undertake site analysis for stormwater quantity and quality management purposes;
- Adopt the provided modelling files provided by the Department of Transport (as deemed appropriate by RRC), being the Rockhampton Northern Access Upgrade ('RNAU') TuFLOW Hydraulic Model, to establish a "base case" hydraulic model;
- Hydrological assessment of the subject site considering the proposed development;
- Update the "base case" model with the post-development scenario (provided by Siris Consulting Engineers), which adopts updated hydrologic implications, topographical modifications, manning's roughness and drainage, to investigate and determine if there are any anticipated flood impacts as a result of the proposed development.
- Analysis the pre- and post-development scenarios for the typical 39% AEP to 1% AEP critical duration events, for assessment purposes;
- Propose mitigation solutions should any hydraulic impacts be determined; and
- Provide output results from the hydraulic modeling including pre-versus post development flood level and velocity afflux mapping.

1.3 Site Description

1.3.1 Location and Context

The site is located at 777 Yaamba Road, Parkhurst, however is formally identified as the following lots:

- Lot 20 on SP314611 (Area = 10.67ha); and
- Lot 30 on SP314611 (Area = 8.887ha).

The site location and surrounding properties have been illustrated in *Figure 1* below.

The northern lot (30/SP314611) contains a major and minor access point, which fronts Yaamba Road. Yaamba Road forms part of the Bruce Highway, which is currently in the process of being upgraded as part of the Department of Transport and Main Roads (DTMR) Rockhampton Northern Access Upgrade (RNAU) project (RNAU Concept Plan: Proposed site's extents shown in figure 2 below).

Upon completion of the works at the site frontage, the subject site will retain the northern access point, however will be connected to a Service Road adjacent to the Bruce Highway. An opportunity to connect the southern portion of the site to a Southern Service Road is also available.

As illustrated in, the site is bound by an industrial lot to the north and south-west, bounded by Yaamba Road and a service road to the east and south-east of the site, and by the Queensland Rail ('QR') North Coast Railway Line to the west.

The subject site in the context of the surrounding area is shown in *Figure 2.*

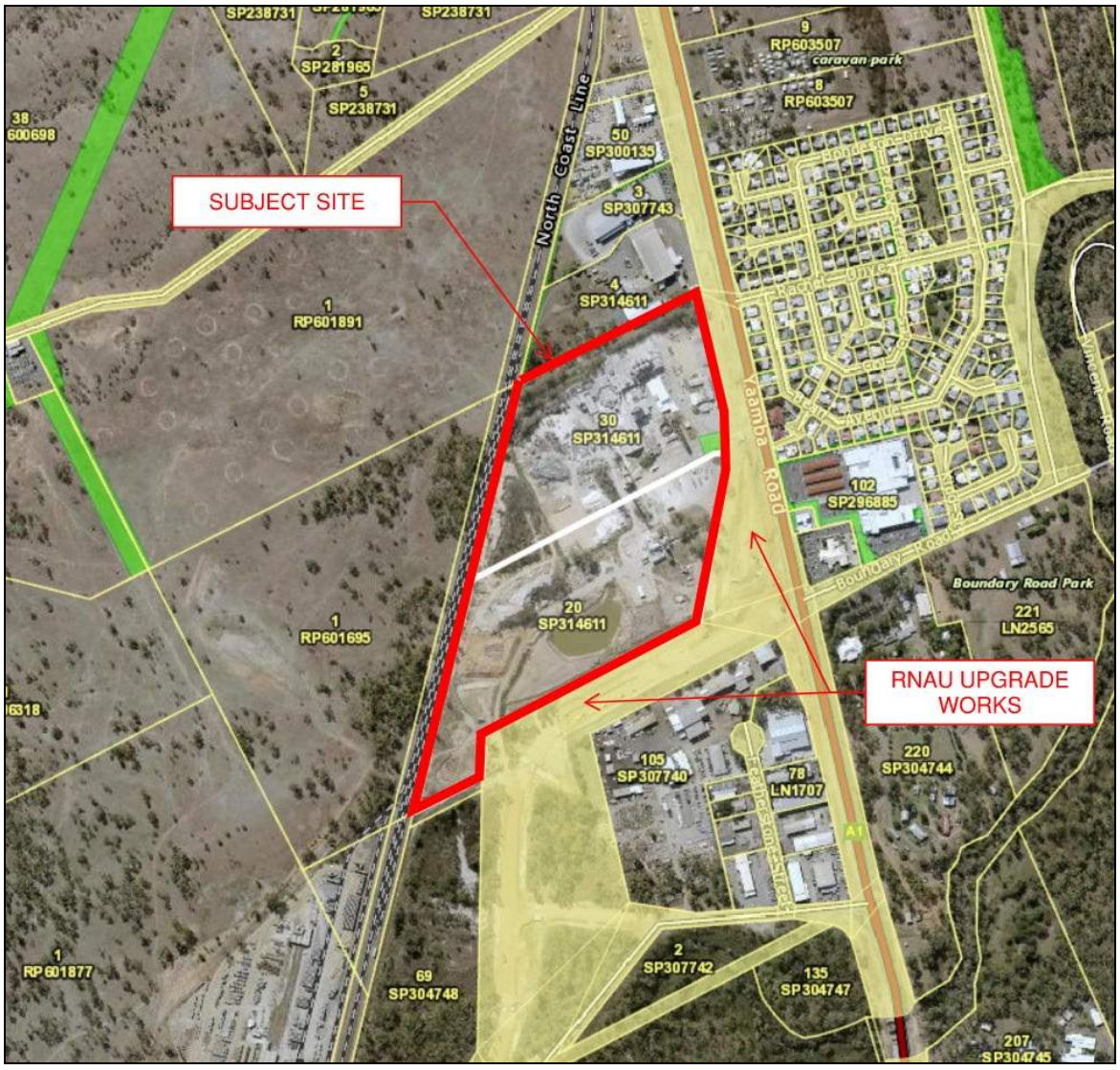

Figure 1: ***Site Location Plan (Source: QLD Globe – Modified)***

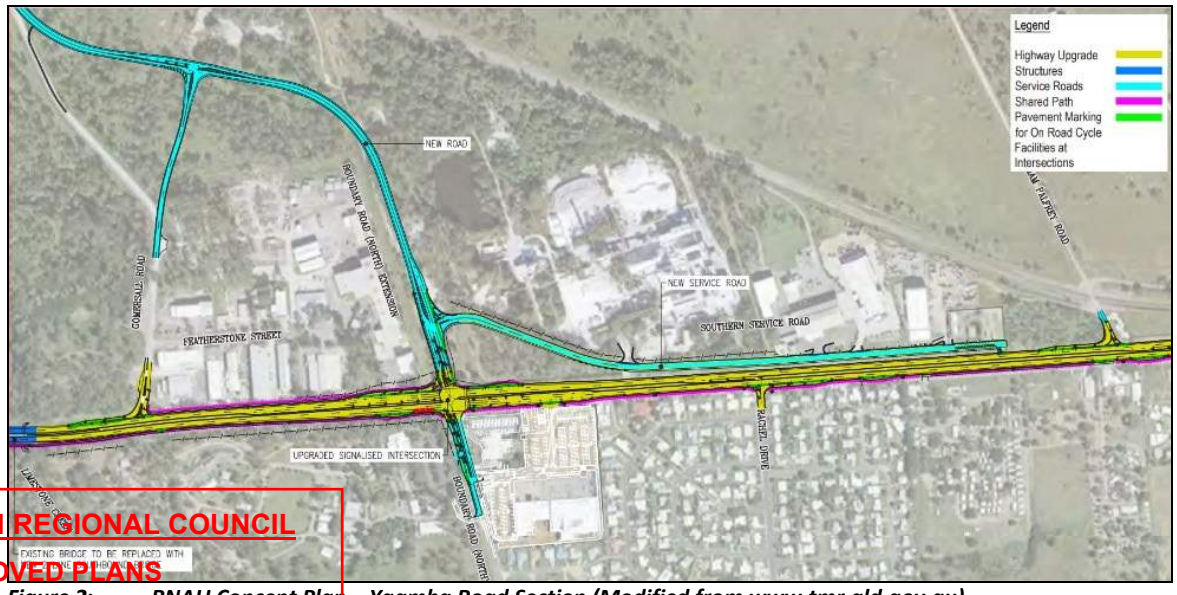

Figure 2: ***RNAU Concept Plan – Yaamba Road Section (Modified from www.tmr.qld.gov.au)***

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1.3.2 Existing and Proposed Use

The subject site was recently reconfigured through a partial resumption of land for the RNAU project. The site contains the remnants of the old Parkhurst Cement Works which was abandoned in 2009. The site contains a manmade waterbody to the south, which is deemed to have been utilised for industrial activities (Cement plant operations) over time.

As part of the Development Application (DA) for the site, it is proposed that the old cement works infrastructure is demolished and the site be levelled, in preparation of a 13 Lot Industrial Subdivision, and associated stormwater management area, as shown in Appendix A of this report (Drawing Ref: SCE-115-002).

1.3.3 Lawful Point of Discharge

Due to the complex topography within the existing site, as a result of the historical cement plant industrial activities, a stormwater catchment plan is not deemed appropriate. However, the existing and post-development Lawful Points of Discharge are able to be ascertained via the Rainfall-On-Grid hydraulic model, as these utilise topographical data, and determine the concentrated flow paths leaving the site.

Refer to Figure 3 below which illustrates the deemed pre and post-development Lawful Points of Discharge.

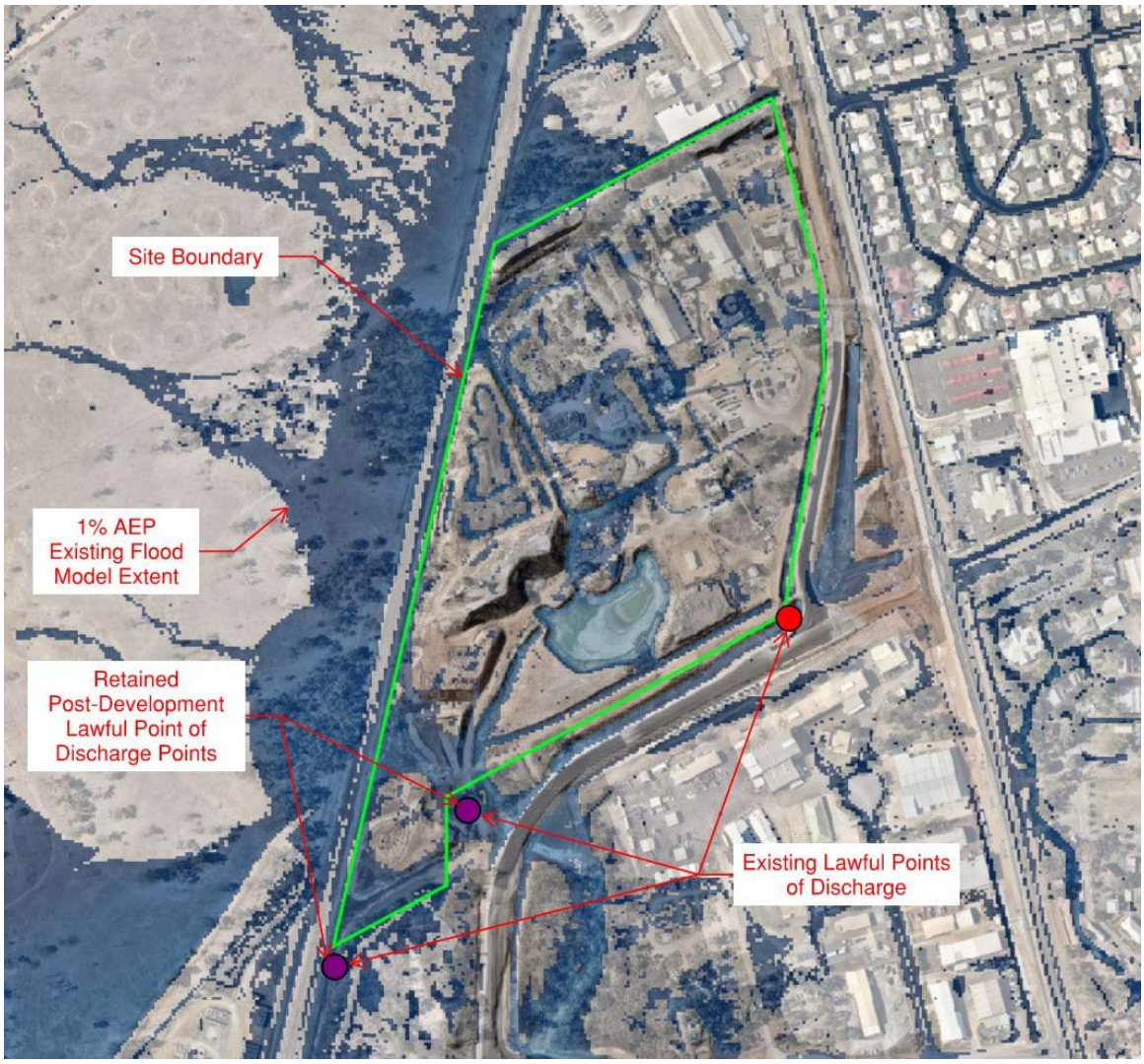

Figure 3: Deemed Lawful Points of Discharge (Source: RNAU Hydraulic Model, mapped in QGIS)

2.0 PROVIDED DATA AND MODELLING APPROACH

To assess the potential for both stormwater quantity management and flood hydraulic impact, as a result of the proposed development, a hydraulic impact assessment is deemed required. As part of a data agreement, Rockhampton Regional Council (RRC) have supplied the DTMR RNAU TUFLOW and XPRAFTS Model for development assessment purposes, as this model would more appropriately reflect an existing scenario for the assessment.

BMT WBM's TUFLOW model is deemed an appropriate model to adopt, as it simulates depth-averaged one and two-dimensional free-surface flows using a majority of the hydraulic shallow water equation.

The TuFLOW models provided by RRC contained design AEP storms between the 10% and 1% design AEP events, and therefore to provide an assessment of all typical design events from the 39% design AEP event, additional hydrological outputs were generated from the XPRAFTS hydrologic model (provided by RRC), to extend the TuFLOW model's design event runs.

This modelling approach has been adopted to meet the requirements requested by the State Assessment and Referral Agency (SARA), where the following flood and stormwater events (39%, 18%, 10%, 5%, 2% and 1% AEP) are required to demonstrate that the post-development case will achieve a deemed non-worsening criteria impact when compared to the existing case scenario.

2.1 Existing Case Scenario Adoption

The supplied RNAU TUFLOW models were prepared by AECOM (Rockhampton) on behalf of Rockhampton Regional Council (RRC) and the Queensland Department of Transport and Main Roads (DTMR), as part of the RNAU project.
The supplied modelling files include two different model setups – one for RRC and the other for TMR. Based off consultation with RRC's engineering officers, it was deemed appropriate to adopt the RNAU design model setup, given that this scenario more appropriately represents the 'existing condition' (inclusive of a completed RNAU project) of the site and its surroundings.

Further liaison with RRC has assisted in determining the suitable base model to be adopted.
It was determined that the model scenario "D3c" by DTMR was the most appropriate model to adopt for a base case, given this scenario also takes into consideration climate change.

Refer to Table 1 below for the different types of scenarios provided by RRC.

For further details on the pre-development TuFLOW model setup and 2D Manning's roughness map, refer to *Appendix B* of this report.

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Table 1: Provided TuFLOW Model Scenarios

TuFLOW Model Scenario	Model Description
E2c	RRC model setup – pre RNAU
R2e	RRC model setup – post RNAU
E2b	TMR model setup – pre RNAU
D3c (Adopted)	TMR model setup – post RNAU + Climate Change

2.2 RNAU TMR TUFLOW Model

The RNAU TUFLOW model by TMR is based on the extents of RRC's Limestone Creek Catchment. To simulate the worst-case scenario of the site, the existing detention basin will be represented as being at full capacity before the event storm is to be applied on the model.

Figure 4: RNAU Model Components (Source: provided RNAU TuFLOW, files - Mapped in QGIS)

Additional items that are to be noted as part of adopting the RNAU TuFLOW 'D3c' scenario model include:

- The level of detail as part of the RNAU project is based off design work completed as of the 15th March 2018;
- Bridge parameters are based on the 85% complete bridge design for Limestone Creek Southbound Bridge;
- The Ultimate Bridge Design for Limestone Creek Northbound Bridge was modelled as a sensitivity using the 15% complete bridge design drawings;
- Modelling is based on provided RNAU project design only;
- The adopted upstream flow diversion strategy at Norman Road and Bondeson Drive is modelled utilising adopted conceptual design available at the time of modelling; and
- The existing water body within the site area was modelled as full capacity, as historical aerial imagery demonstrates this water body generally being full over the long term.

Table 2 below identifies the event and duration modelling results supplied by RRC within the TuFLOW Model. Section 3.0 provides discussion on the adopted methods to extend the hydrologic outputs to simulate the critical duration events for the site.

Table 2: Provided TuFLOW Model Scenarios

Event (AEP)	Provided Durations (Mins)
39%	No results provided
18%	No results provided
10%	120mins
5%	60mins
2%	60mins
1%	90mins

2.3 Design Case Provided Data

Siris Consulting Engineers has provided the proposed design case Digital Elevation Model (DEM) data, which has been used as a base case in preliminary mitigation iterations. In order to provide a desired outcome for a deemed acceptable hydraulic impact, further consultation has been undertaken with Siris Consulting Engineers, to provide a civil design outcome which integrates the required hydraulic design outcomes.

The design case DEM data which has been 'stamped' over the existing case model, which has been illustrated below in *Figure 4* for an appreciation of the model approach.

For further details on the post-development TuFLOW model setup and 2D Manning's roughness map, refer to *Appendix B* of this report.

***Figure 5*: Proposed earthworks design surface Digital Elevation Model (DEM) provided by the client**

3.0 HYDROLOGIC ASSESSMENT

3.1 Hydrological Model - XPRAFTS

RRC has supplied Knobel Engineers ('KE'), a copy of the XPRAFTS model used for the RNAU project. As per the supplied XPRAFTS model by RRC, the sub-catchments within the regional Limestone Creek catchments were reviewed, to determine which sub-catchment have influencing flows over the site, to run the appropriate hydrological simulations, for critical duration adoption purposes.

As seen in the Limestone Creek catchment delineation data, mapped in *Figure 5* below, the main sub-catchment which has influence and pertains to the subject site is sub-catchment LIM-16. It is deemed no other sub-catchments contribute flow to the site, or the sub-catchment of which the site pertains to.

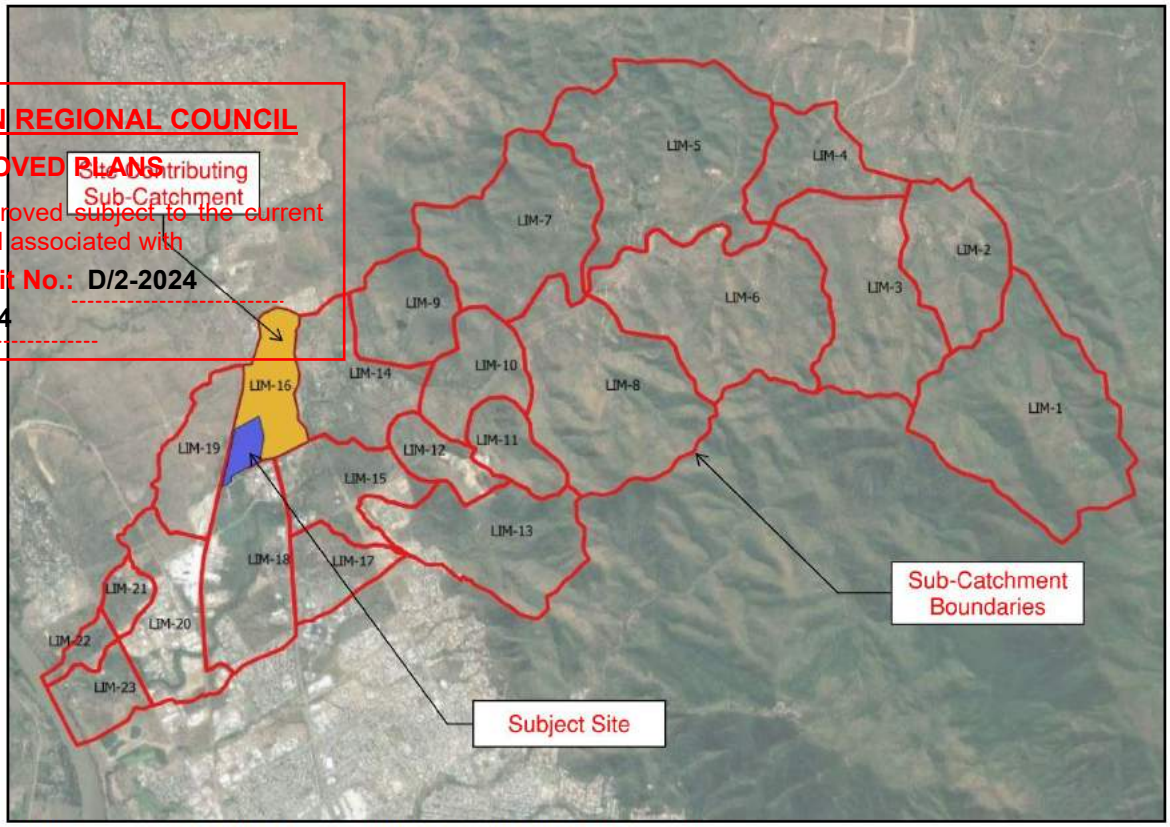

Figure 6: ***Subject Site Location within existing RNAU Tuflow model catchment***

A screenshot of the sub-catchment properties within the supplied XPRAFTS model is shown below in *Figure 6.*

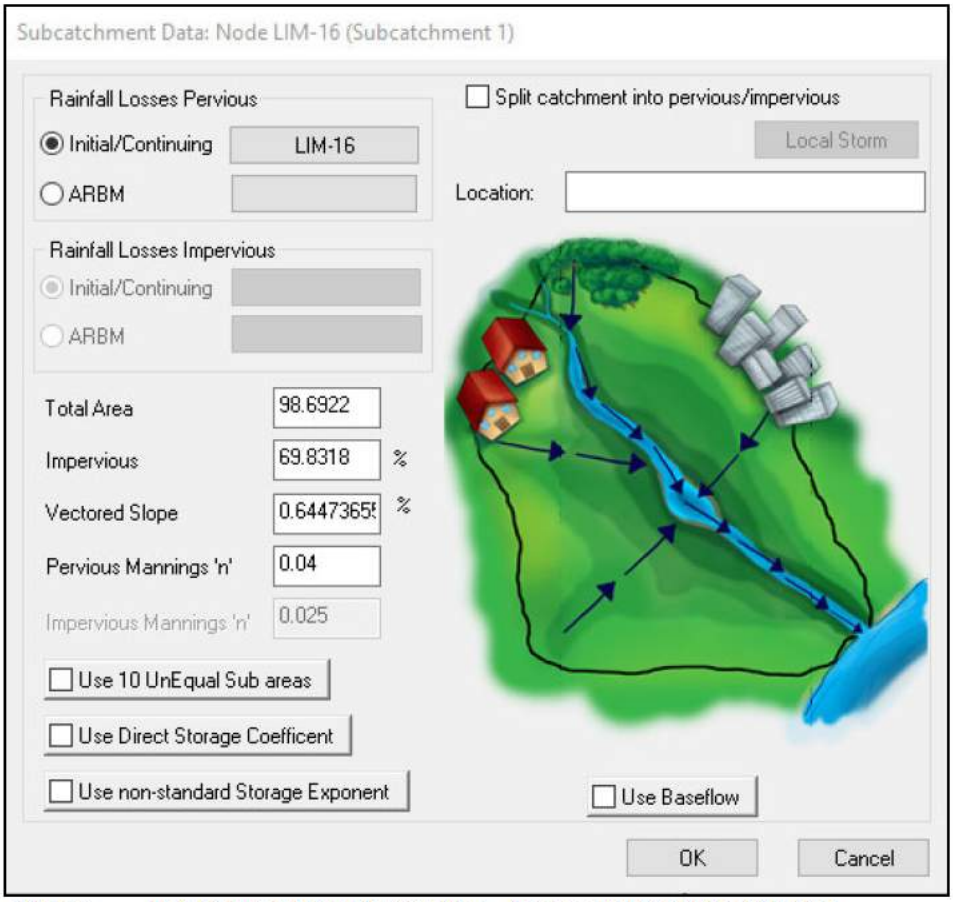

Figure 7: ***LIM-16 Sub-Catchment properties – Source: Supplied XPRAFTS model***

The adopted Pervious Initial Loss, as per the provided XPRAFTS model for each corresponding design storm AEP event were retained, and have been shown in Table 3 below for clarity:

Table 3: Adopted Initial Losses (Source: RRC/RNAU XPRAFTS Model)

Event (AEP)	Adopted Initial Loss (mm/hr)
39%	10
18%	10
10%	10
5%	5
2%	0
1%	0

3.2 XPRAFTS Model Results

The inflow hydrographs found in the supplied XPRAFTS shows that peak flow and duration for the proposed development site for each corresponding event are:

Table 4: XPRAFTS Peak Flow Rate

Event (AEP)	XPRAFTS Peak Flow Rate (m^3/s)	Critical Duration (min)
39%	21.6	60
18%	29.7	60
10%	34.5	60
5%	41.6	60
2%	49.6	60
1%	56.9	60

For a visual appreciation of the flow hydrographs from the site's sub-catchments, a range of duration hydrographs have been provided for the 39% and 1% design AEP events in Figure 6 and 7, respectively.

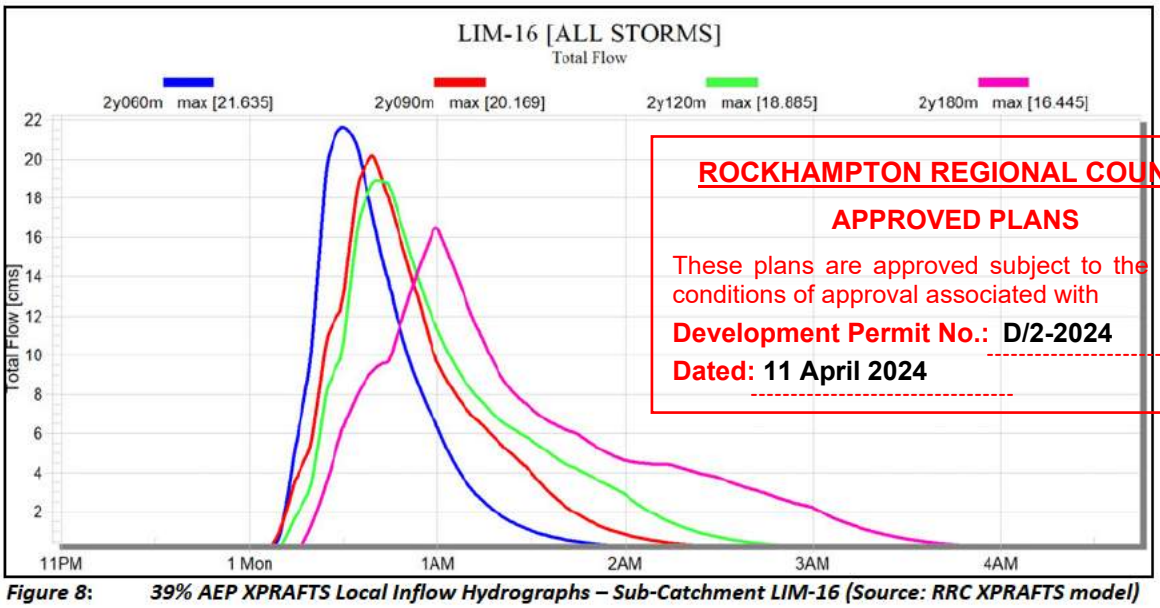

Figure 8: 39% AEP XPRAFTS Local Inflow Hydrographs – Sub-Catchment LIM-16 (Source: RRC XPRAFTS model)

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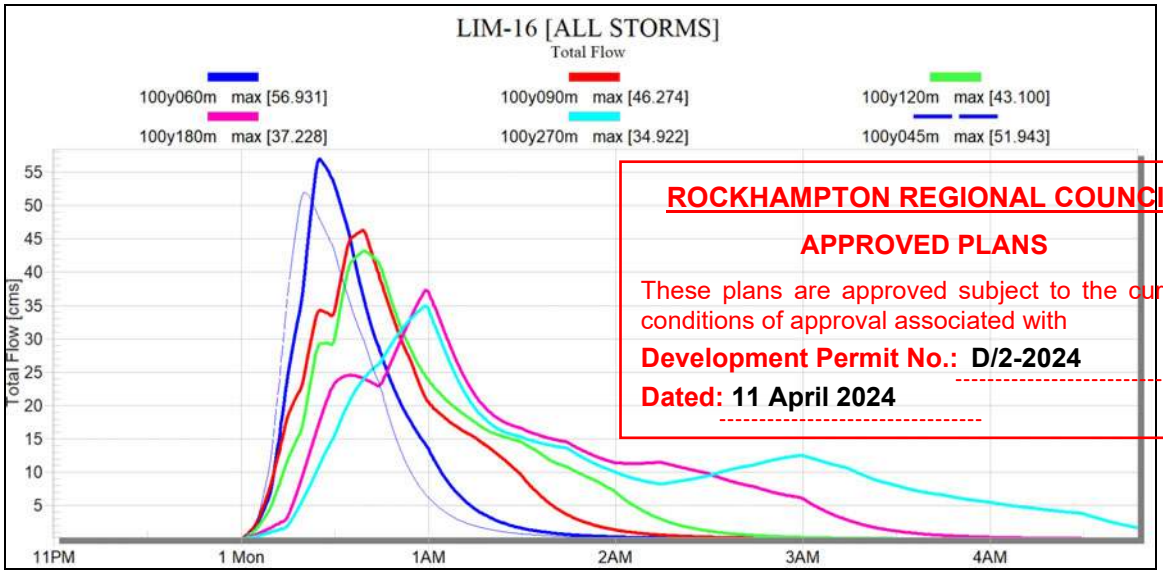

***Figure 9*: 1% AEP XPRAFTS Local Inflow Hydrographs – Sub-Catchment LIM-16 (Source: RRC XPRAFTS model)**

As noted in the above figures, the critical duration has been determined as the 60min storm duration for all design AEP events.

Given the site is already zoned as industrial in the pre-development scenario, it was deemed reasonable to adopt these critical durations for the post-development assessment for a consistent approach.

4.0 HYDRAULIC ASSESSMENT

A hydraulic assessment utilising TUFLOW was undertaken to establish pre development flood extents/flow paths, flood levels and flood velocities across the site for the 1 in 2yr ARI (39% AEP), 1 in 5yr ARI (18% AEP), 1 in 10yr ARI (10% AEP), 1 in 20yr ARI (5% AEP), 1 in 50yr ARI (2% AEP) and 1 in 100yr ARI (1% AEP) critical design storm events.

To provide an adequate assessment in accordance with Council and SARA requirements, the hydraulic assessment will demonstrate and quantify any potential impacts caused by the proposed development, on peak flood levels within and external to the site. The following section describes the pre development and post development hydraulic model verification, set-up and results of the modelling.

4.1 Hydraulic Modelling

4.1.1 Model Consistency

To ensure consistency between the supplied models by RRC/TMR and that of KE's, all XPRAFTS and TUFLOW inputs by KE were based and built from the supplied models. The hydrologic method utilised within the supplied TuFLOW model was the Rainfall On Grid method, which has been retained for this assessment.

The supplied TuFLOW model has been setup to run utilising TuFLOW Classic, however to provide a much faster runtime, TuFLOW's Heavily Parallelised Compute (HPC) functionality with GPU processing has been adopted within the hydraulic impact assessment modelling. Accordingly, the HPC results have been confirmed via benchmarking against the Classic results, that the modelling outcomes are reasonably similar, and suitable for adoption for the hydraulic impact assessment.

See Figure 9 below which demonstrates the 1% AEP design event impacts, between the TuFLOW Classic result and the TuFLOW HPC result.

Figure 10: 1% AEP TuFLOW Classic vs. TuFLOW HPC Comparison (Source: WaterRIDE)

4.1.2 Land Use Manning's (n)

For both base case scenario and post development scenario, the Manning's 'n' values and associated model layers set up in the previous RNAU TUFLOW model remained unchanged and were adopted for this HIA. The adopted Manning's 'n' hydraulic roughness parameters are outlined below in *Table 5*.

Refer to *Appendix B* for the pre and post-development 2D Manning's 'n' roughness maps.

Table 5: Manning's 'n' Roughness Coefficients – Adopted from Council's TUFLOW Model Parameters

Materials Layer	Manning's 'n' Value
High Density Residential - General lots < 1200 sq. meters	0.060-0.150
Medium Density Residential - Mixture of clear and vegetation areas on developed land	0.060-0.120
Low Density Residential - High density vegetation with building obstructions	0.060-0.090
Industrial, Outlet Protection	0.060
High Density Vegetation - Very bushy and many plant obstructions	0.090-0.150
Medium Density Vegetation - Bushy with larger plant obstructions	0.070-0.110
Low Density Vegetation - Long grass, some brush	0.045-0.080
Channel	0.050-0.060
Riparian Corridor - Bushy with larger plant obstructions	0.060-0.100
Maintained Grass	0.035
Road Reserve	0.030
Railway	0.025
Fitzroy River Bed (at DS boundary)	0.022
Long Grass	0.040
Buildings	0.018-0.50
Steep Slopes	0.090-0.110

4.1.3 Pre-Developed Scenario Model

The base case model set up was described in the previous section (Section 2.2).

The peak water depth and peak velocity mapping results for the pre-development TUFLOW model scenarios have been presented in Appendix D, for the following design storm events:

- 1 in 2yr ARI (39% AEP);
- 1 in 5yr ARI (18% AEP);
- 1 in 10yr ARI (10% AEP);
- 1 in 20yr ARI (5% AEP);
- 1 in 50yr ARI (2% AEP); and
- 1 in 100yr ARI (1% AEP).

4.1.4 Post-Development Scenario Model

The proposed development layout of the site is attached in *Appendix A* of the report.

As illustrated in the development plan supplied by Siris Consulting Engineers, the proposed subdivision site has been designed to ultimately discharge flows from the individual lots to the proposed basin in the south-western corner of the site area. There is also a channel through the site to divert flows from the eastern side, and along the western boundary, to promote capture of flows off the Queensland Rail land, and into a formalised channel.

The developed scenario's building pads have been levelled to be above the adjacent major flow channels along the perimeter of the site, to ensure an adequate level of freeboard has been considered.
The north-eastern half of the subject site will remain at existing site levels, as no earthworks are proposed in this region.

The 2D Manning's roughness 'n' has also been updated as per the Manning's values provided in Table 5, in proposed development areas, to account for future impervious surfaces and roads.

The topographical modifications undertaken using TuFLOW modelling tools, in addition the client's supplied design tin, includes proposed culverts discharging from the basin, and drainage under the proposed internal road, as detailed below.

Channels

It is noted that further refinement of the channels can be undertaken at detailed design to provide equivalent conveyance abilities;

- A channel which runs parallel along the inner western boundary of the site, that collects external north-western flows, and any additional flow from the adjacent QR land. This ultimately connects to the site's proposed basin. This channel varies along it's width, however has approximate maximum sizes of a 4m wide base, 10m wide top, and approximately 1.8m deep;
- A channel through the middle of the site, which connects the eastern parts, to discharge flows towards the western parts of the site, modelled to be approximately 4m bottom width, 8m top width, and approximately 600mm deep on the upstream side. Whereas on the downstream side, it has been modelled to be approximately 4m bottom width, 6m top width and 1.2m deep. These flows ultimately connect to the site's proposed basin;

Basin

- A basin has been provided at the southern corner of the site, which has a basin invert level at RL20.55mAHD at the lowest regions, and embankments as high as 23.0mAHD. The basin has a floor slope of approximately 0.8% to allow it to drain efficiently. The basin outlet pipes are detailed below;
- A portion of the proposed basin contains a stormwater quality treatment bioretention basin area. Refer to Section 5.0 of this report for further information of the adopted bioretention area.

Drainage Structures

- 2no. 900mm RCP cross-road drainage structures to connect middle channels internal to the site;
- Basin Outlets:
    - 1no. 600mm (W) x 900mm (H) Rectangular Concrete Box Culvert; and
    - 3no. 900mm (W) x 900mm (H) Rectangular Concrete Box Culverts.

Designated Flood Level

The Defined Flood (Event) Level (DFL) for the site is determined via the 1 in 100yr ARI (1% AEP) storm event as defined in the Local government's requirement and QUDM. Given the topographical changes across the site and the flooding source, the post-development DFL for the site varies across the channel chainages, and the respective depth along the chainage. Accordingly, the detailed civil design is to adhere to the minimum DFL level requirements as shown in the post-development modelling peak mapping results.

The base case model set up was described in the previous section (Section 2.2).

Peak Mapping Results

The peak water depth and peak velocity mapping results for the post-development TUFLOW model scenarios have been presented in Appendix E, for the following design storm events:

- 1 in 2yr ARI (39% AEP);
- 1 in 5yr ARI (18% AEP);
- 1 in 10yr ARI (10% AEP);
- 1 in 20yr ARI (5% AEP);
- 1 in 50yr ARI (2% AEP); and
- 1 in 100yr ARI (1% AEP).

The peak water level map has also been provided for the 1 in 100yr ARI (1% AEP) event, to demonstrate the required DFL levels for the proposed development.

4.1.5 Hydraulic Impact Assessment

The peak water surface levels were generated for both pre-developed and post-developed Scenarios, and an afflux impact assessment has been undertaken and peak flood impact maps presented in Appendix E. The figures present the potential flood level impact (afflux) caused by the proposed development for the 39% to 1% design AEP events.

As seen in *Appendix E* of the report, there is afflux shown externally to the eastern and south-eastern sides of the site, within the existing DTMR roadside channels. It is however noted that these regions have been
Provided as dedications to DTMR previously, to provide trafficability off Yamba Road/Bruce Highway, and to contain stormwater within these roadside channels.
Furthermore, the afflux demonstrated is deemed to occur, given the development of the site up to the boundary is disallowing road surface flows to enter into the site, but rather is shown to be displaced into the allocated channels in the DTMR dedicated stormwater channels.
Accordingly, the afflux results shown in the stormwater channel regions are deemed to be generally contained in the DTMR road regions, and therefore not deemed to affect the trafficability of the proposed design works.

There is afflux demonstrated within the subject site boundaries, however this is deemed to be acceptable.

It is noted that there are small random afflux cells within the model, however given the adopted approach is a Rainfall On Grid method, it is common to experience a level of model noise as shown below in Figure 10.

***Figure 11*: Examples of ROG Model Noise (Source: 39% AEP event Peak Afflux Map, via WaterRIDE)**

The post-development scenario has shown a general decrease in peak water levels for all design AEP events within the Railway Corridor and the north-western portion of the site, which is generally deemed a desirable outcome.

The peak flow rates and peak water levels leaving the site at the southern Lawful Point of Discharge (LPOD) also demonstrates a general reduction from pre to post-development scenarios for all design AEP events, and therefore is deemed an appropriate solution.

Figure 12*: *1% AEP event Peak Afflux Map (Source: WaterRIDE)

Overall modelling indicates that there are no actionable or adverse impacts to neighbouring properties or transport infrastructure, in particular the QR Railway Corridor at the western side of the site (whereby peak flood level reductions have also been demonstrated), for all design AEP events. Accordingly, it is deemed that the requirements by the State Assessment and Referral Agency (SARA) have been satisfied, in accordance with the State Development Assessment Codes.

4.1.6 Proposed Flood Compliant Levels

As discussed previously the proposed industrial lot level pads have been set above the designated flood event (DFE) for modelling purposes and as a conservative approach.

5.0 WATER QUALITY ASSESSMENT

5.1 Background

The development of the land has the potential to increase the pollutant loads within stormwater runoff and downstream watercourses. During the construction phase of the development, disturbances to the existing ground have the potential to significantly increase sediment loads entering downstream drainage systems and watercourses. The operational phase of the development will potentially increase the amount of sediments and nutrients washing from the site.

The following sections describe construction and operational phase controls and water quality modelling of the proposed treatment train in compliance with Council guidelines.

5.2 Construction Phase

A high risk of stormwater pollution will occur from the site during the construction phase due to erosion and sediment transportation off site to the receiving environment. The majority of this risk results from construction activities disturbing the site and exposing areas of soil to the direct erosive influence of the environment.

The following section outlines the procedures necessary to minimise erosion and control sediment during construction in accordance with the International Erosion Control Association (IECA) Best Practice ESC Document.

5.2.1 Key Pollutants

The key pollutants have been identified for the Construction Phase of this development.

Table 6: Key Pollutants, Construction Phase

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, material off cuts.
Sediment	Exposed soils and stockpiles during earthworks and building works.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment and temporary car park areas.
Toxic Materials	Cement slurry, asphalt primer, solvents, cleaning agents, and wash waters (e.g., from tile works).
Acids or Alkaline substances	Acid sulphate soils, cement slurry and wash waters.

5.2.2 Sediment and Erosion Controls

Sediment and Erosion Control devices (S&EC) employed on the site shall be designed and constructed in accordance with the *International Erosion Control Association (IECA) Best Practice ESC Document*. As the bulk earthworks for the site have already been conducted, the following devices and management measures proposed for controlling sediment and erosion are specific to the construction of the operational phase development works.

Pre-Construction

- Stabilised site access/exit onto Yaamba Road (Service Road) to the east;
- Sediment fences to be located around the perimeter of the site;
- Sediment trap to be installed in the southeast corner of the site;
- Dust fencing to be installed if required; and
- Educate site personnel to the requirements of Erosion and Sediment Control Plan.

Initial Construction – Bulk Earthworks

- Maintain construction access/exit, sediment fencing, dust fences and all other existing controls as required;
- Construct diversion drains to convey disturbed site run-off to the temporary sediment traps; and
- Confine construction activities to stages to minimise areas of disturbance at any given time.

Second Stage Construction

- Maintain construction access/exit, sediment fencing, dust fences, diversion drain, and all other existing controls as required;
- Progressively revegetate finished areas where applicable;
- Divert runoff from un-disturbed areas around disturbed areas; and
- Drainage structure protection around field inlets and gully pits.

During construction, all areas of exposed soils allowing dust generation are to be suitably treated. Treatments will include covering the soil and watering. Road accesses are to be regularly cleaned to prevent the transmission of soil on vehicle wheels and eliminate any build-up of typical road dirt and tyre dusts from delivery vehicles.

Adequate waste disposal facilities are to be provided and maintained on the site to cater for all waste materials such as litter, hydrocarbons, toxic materials, acids or alkaline substances.

5.2.3 Water Quality Monitoring and Inspections

To ensure that the water quality objectives are being met during the construction phase of the development water quality monitoring shall be conducted. Water quality monitoring shall use a calibrated probe or sampling and testing at a NATA registered laboratory.

Location: Monitoring Stations at the most downstream location of each sub-catchment, after sediment fences, to ensure an adequate reading of site sediment treatment.

Parameters: Site discharge criteria.

Frequency: Following at least 30 mm of rainfall in a 24 hour period.

The contractor shall be responsible for the inspection and maintenance of all sediment and erosion control devices. Additional controls and review of existing controls shall be undertaken in response to the results of the above-mentioned monitoring program.

5.2.4 Reporting

An inspection report shall be written by a suitably qualified and experienced scientist/engineer following each water quality monitoring episode. The report shall include at least the following information:

- Name, address and real property description for the development site;
- Council file reference number (if known);
- Monitoring locations;
- Performance criteria;
- Results for each monitoring location, identifying any breaches of performance criteria;
- Recommended corrective actions to be taken and additional sediment and erosion controls, if required; and
- Inspection reports shall be provided to the contractor for their action and compilation in an on-site register.

If the above-mentioned performance criteria are exceeded and results from the downstream monitoring stations show significant deterioration from upstream results (if applicable), the contractor shall implement all recommendation of the inspection report within one (1) working day of receipt of the report.

5.3 Operational Phase

The following sections provide details of the Stormwater Quality Improvement Devices (SQID's) proposed for the operational phase of the development.

5.3.1 Stormwater Quality Objectives

To protect the water quality of the downstream watercourses the following Water Quality Objectives (WQO's) has been applied to stormwater runoff from the site in accordance with the State Planning Policy 2017 and the RRC Stormwater Quality requirements.

Best Management Practices (BMP) are required to be demonstrated for all Development Applications within RRC and are recommended to be implemented by the developer. Where practicable, methods such as first flush devices, and discharging stormwater to landscaped/grassed areas prior to discharge to the LPOD, are to be incorporated into the site's stormwater strategy, where the opportunity is available.

The following load reduction targets must be achieved when assessing the post-development treatment train (comparison of unmitigated developed case versus developed mitigated case).

- 85% reduction in Total Suspended Sediment (TSS)
- 60% reduction in Total Phosphorus (TP)
- 45% reduction in Total Nitrogen (TN)
- 90% reduction in litter (sized 5 mm or greater)

5.3.2 Post Development MUSIC Modelling

To assess the potential quantities of pollutants anticipated to be discharged from the site, the water quality modelling package 'Model for Urban Stormwater Improvement Conceptualisation' (MUSIC) V6.3 by eWATER has been applied. MUSIC Modelling Parameters and delineated data have been sourced from Water by Design, *MUSIC Modelling Guidelines*, and where possible, via Source MUSIC Link data.

Rainfall data has been sourced from Rainfall Station 39083, (Rockhampton) using a date range from 1991 to 2001 and a 6 Minute Time Step, in accordance with RRC requirements.

5.3.3 Adopted Catchments

The development has been modelled with the assumption that all developable areas and road Q3-month flows are to be diverted to the treatment area, which is located at the lowest point within the subject site. The adopted primary treatment strategy for the site is a large bioretention basin for the entire development, which shall allow flows to be treated prior to discharge into the receiving waterways downstream of the subject site.

The MUSIC model schematic has been illustrated in *Figure 9*.

Stormwater Pollutant catchment modelling for the development has been estimated based off catchment analysis, and the prescribed Water by Design MUSIC modelling guidelines Version 1.0, 2010 (WBDMG).

Given the future variability in catchment type splits, a Lumped catchment approach has been adopted for the subject site, which adopts an Industrial Lumped type for consistency.

Typical Impervious Fractions used for Lumped-catchments have been adopted from Table 3.6 in the Water by Design MUSIC Modelling Guidelines Version 1.0, 2010.

Adopted catchment parameters have been provided below in *Table 7*.

Table 7: MUSIC Model Catchment Parameters

Catch ID	Catchment Type	Treatment Type	Adopted Parameters	
			Area (ha)	fi
Development	Industrial (Lumped)	Bioretention	13.21	0.90

Further assumptions associated with the model involve:

- The rainfall-runoff parameters have been based off the Industrial Land Use parameters set out in WBDMG Table 3.7;
- The pollutant export parameters for Lumped-catchment Residential land use has been adopted from WBDMG Table 3.9;
- Default routing (No flow routing or translation between nodes);
- No seepage/exfiltration (0 mm/hr); and
- All other parameters used within the modelling were based on Water by Design MUSIC Modelling Guidelines Version 1.0, 2010.

5.3.4 Adopted SQID Design Parameters

A Bioretention (SQID – Stormwater Quality Improvement Device) will be utilised to treat stormwater runoff from the site, as it is deemed the most suitable for the proposed site use. The proposed SQID has been provided for modelling purposes only and is subject to council approval. Accordingly, similar and alternative SQID devices may be adopted upon council assessment and approval.

Detailed design of the stormwater treatment train shall be in accordance with the WSUD, Technical Design Guidelines for South East Queensland – Version 1 (June 2006).

BIORETENTION BASIN

A bioretention basin is designed to pond stormwater allowing it to percolate through a layer of filter media, typically sandy loam. Runoff passing through the filter media is collected with a perforated pipe discharging to the downstream drainage infrastructure. The Bioretention basins shall be located to treat all stormwater from the development areas.

The required bioretention parameters are based on the model output for compliance with the SPP and have been provided below in *Table 8.*

Table 8: Adopted Bioretention System Parameters

Parameter	Northern Basin Adopted Values
Surface Area (m^2)	2100
Extended detention depth (m)	0.30
Filter area (m^2)	1100
Unlined filter media perimeter (m)	0.01
Saturated hydraulic conductivity (mm/hr)	180
Filter depth (m)	0.60
TN content of filter media (%)	400
Orthophosphate content of filter media (mg/kg)	30
Is the base lined?	Yes
Vegetated with effective nutrient removal plants	Yes
Overflow weir width (m)	3.60
Exfiltration rate (mm/hr)	0
Underdrain present?	Yes
Submerged zone with carbon present?	No
Depth of submerged zone (m)	N/A
Confirmation that K and C* remain default	Yes

An illustration of the MUSIC model of the adopted operational treatment train for the post-development site has been provided below in *Figure 10.*

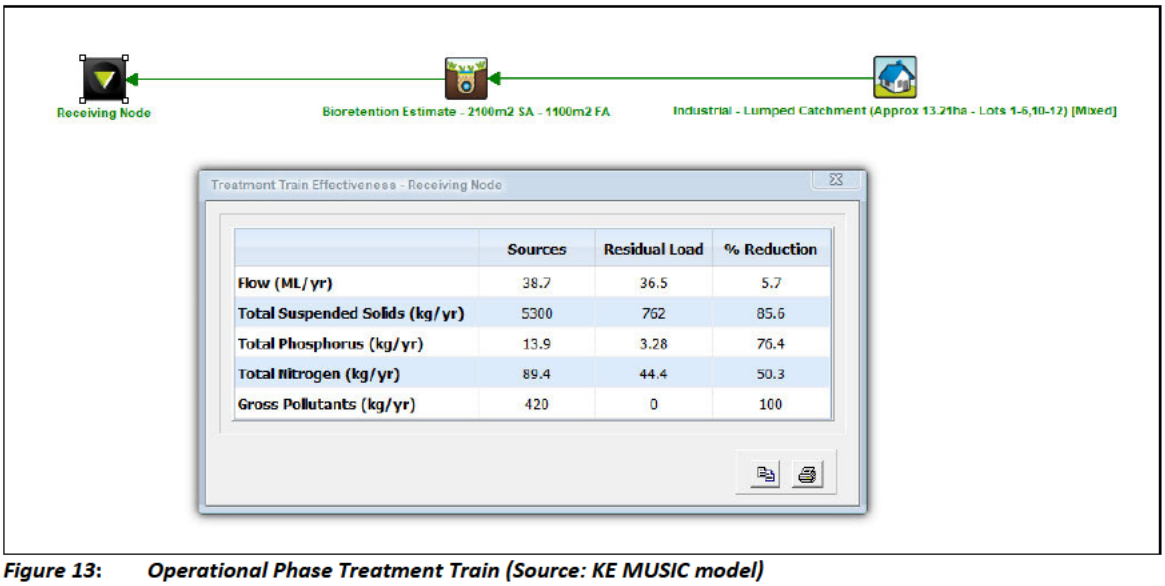

Figure 13: Operational Phase Treatment Train (Source: KE MUSIC model)

5.3.5 Post Development Modelling Results - Mitigated

The modelled Stormwater Quality Improvement Devices (SQID) has demonstrated a reduction in the amount of sediments and nutrients discharging from the post-development site. *Table 9* illustrates the effectiveness of the SQID's within the treatment train at the Receiving Node.

Table 9: Treatment Train Effectiveness at Receiving Node

Parameter	Post	Post Mitigated	Reduction	Water Quality Objectives
Flow (ML/yr)	38.7	36.5	8	-
TSS (kg/yr)	5300	762	86	80 %
TP (kg/yr)	13.90	3.28	76	60 %
TN (kg/yr)	89.4	44.4	50	45 %
Gross Pollutants (kg/yr)	420	0	100	90 %

The results demonstrate that the proposed SQID's meet the intended Water Quality Objectives for Gross Pollutants, Suspended Solids, Phosphorous and Nitrogen levels, in accordance with the RRC Requirements and The State Planning Policy 2017.

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/2-2024
Dated: 11 April 2024

6.0 CONCLUSION

Knobel Engineers has been commissioned by Siris Consulting Engineers to carry out a Stormwater Management Plan (SMP), which includes a Hydraulic Impact Assessment (HIA) at 777 Yaamba Road, Parkhurst, ('the site'). This HIA is to facilitate a Development Application for a Industrial Reconfiguration Of Lot (ROL) application to Rockhampton Regional Council, and the referable State Agencies.

This Stormwater Management Plan (SMP) and Hydraulic Impact Assessment (HIA) was prepared to quantify and demonstrate the the potential stormwater and flooding within the site, as a result of the proposed industrial development within 777 Yaamba Rd, Parkhurst, Rockhampton.

The results of the analysis have determined that:

- The adoption of a proposed basin and conveyance channels within the site, provides adequate mitigation, in order to demonstrate no worsening from pre to post-development scenarios. The proposed basin contains a bioretention component which has been demonstrated via a MUSIC model, to provide adequate stormwater quality treatment for the site, in accordance with The State Planning Policy;
- The stormwater quantity management for the site has been demonstrated via the hydraulic impact assessment component of this Stormwater Management Plan report;
- The designated flood level (DFL) for the site varies between approximately 25.00m AHD to 22.30mAHD, based on location within the site;
- The site in the existing scenario is inundated in the 1% AEP event, up to approximately 3.60m within the existing water body, and up to approximately 2.0m within the existing channels within the site;
- Existing velocities around the site are generally within 1.0m/s along the north, west and southern boundaries, and up to approximately 2.0m/s along the southern side, in the 1% AEP design event;
- The proposed development has generally demonstrated no actionable nuisance or adverse impacts externally (no material worsening of peak flood level or peak flood velocity), which includes the State Controlled Road (Yaamba Road/Bruce Highway) and the Railway Corridor to the west; and
- The current conceptual layout is deemed to be acceptable at this phase of the development application. Further refinement of the channels can be undertaken at the detailed design phase, to accommodate the required flows and outcomes from this preliminary hydraulic impact analysis.

APPENDIX

A

Siris Consulting Engineers

Lily Place Estate Site Layout Plan

(Ref: SCE-115-002)

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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RAILWAY

COAST

ROAD

(BRUCE HIGHWAY)

YAAMBA

NORTH

11	1.008 ha	
12	1.377 ha	
13	3.710 ha	
6	1.001 ha	
10	1.004 ha	
9	1.266 ha	
3	1.002 ha	
4	1.0 ha	
5	1.003 ha	
8	1.687 ha	
7	1.006 ha	
2	1.006 ha	
1	1.001 ha	

RP601695

SP300134

128943

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	05/20	DA APPROVAL

DATUM AHD

CO-ORD. GDA94

DESIGN REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

DRAFTING REVIEW

RPEQ CERTIFICATION: Harsha Weerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD,
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@siriseng neers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (off ce) 0404 119 734 (mob le)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
SITE LAYOUT PLAN

PLAN NUMBER: SCE-115-002

REVISION: A

0 10m 40m
1:2000

DO NOT SCALE - ASK IF IN DOUBT

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APPROVED PLANS

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Dated: 11 April 2024

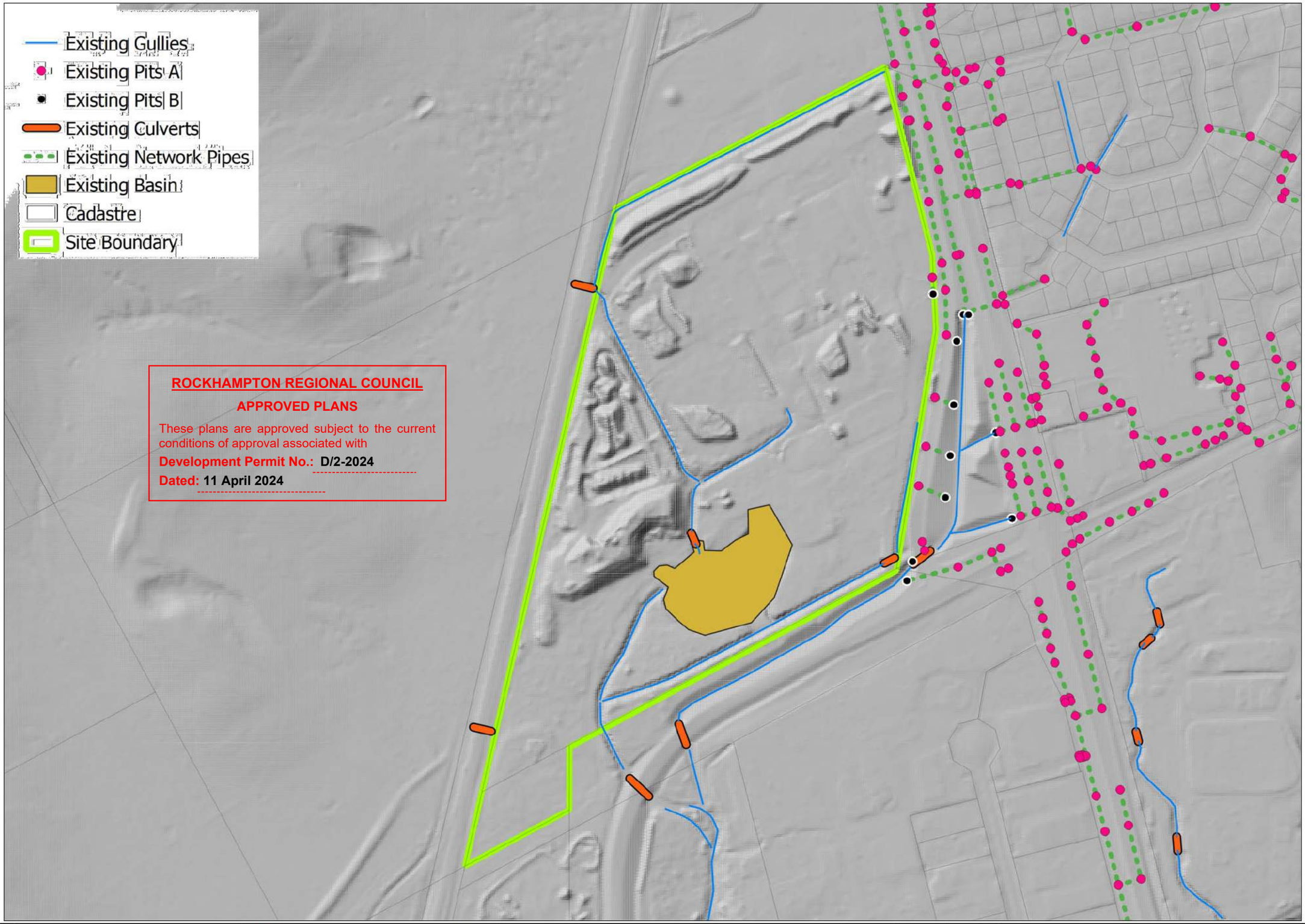
APPENDIX

B

Knobel Engineers

Model Layout Plans

(Ref: K4820/B001/A to B004/A)



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1	15-05-20	FOR REPORT

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CLIENT: SIRIS CONSULTING ENGINEERS

PROJECT: PROPOSED INDUSTRIAL SUBDIVISION
777 YAAMBA ROAD, PARKHURST

DESIGN	DRAWN	APPROVED
-	AR	-

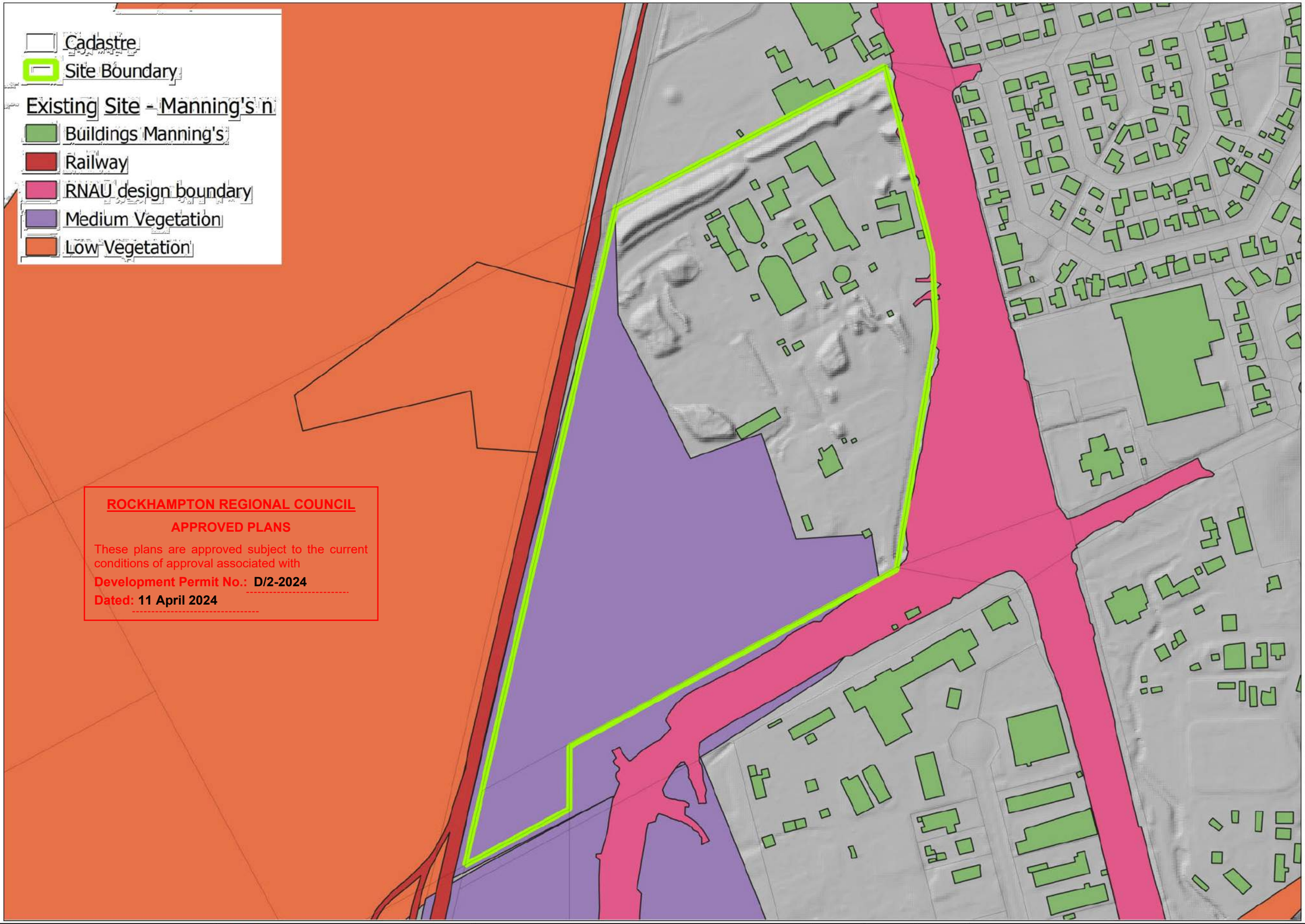
TITLE: EXISTING SITE LAYOUT

SCALE:

PROJECT NO.: K4820

DWG NO.: B001

ISSUE: 1



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CLIENT: SIRIS CONSULTING ENGINEERS

PROJECT: PROPOSED INDUSTRIAL SUBDIVISION
777 YAAMBA ROAD, PARKHURST

DESIGN	DRAWN	APPROVED
-	AR	-

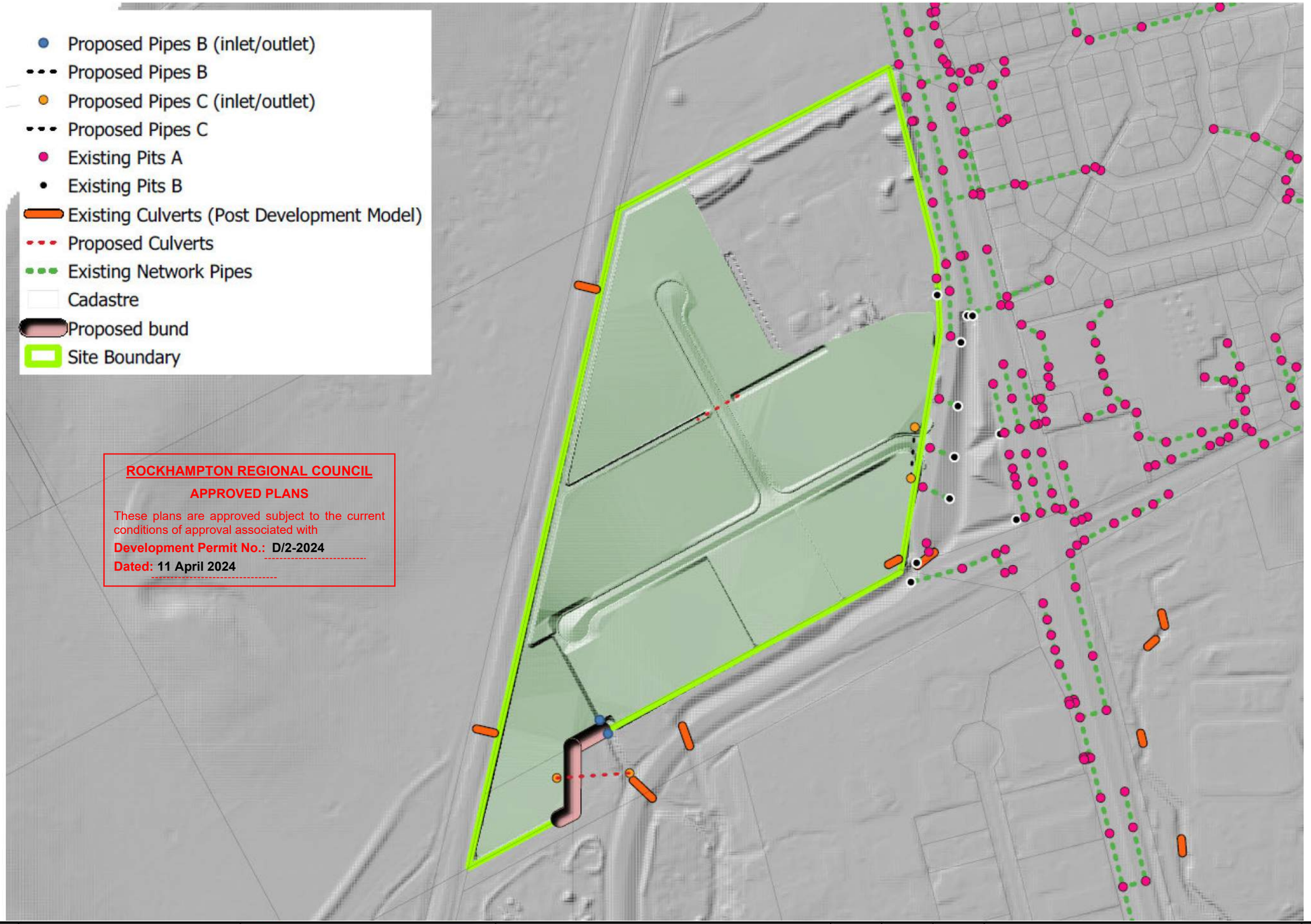
TITLE: EXISTING SITE MANNINGS VALUE'S LAYOUT

SCALE:

PROJECT NO.: K4820

DWG NO.: B002

ISSUE: 1



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CLIENT: SIRIS CONSULTING ENGINEERS

PROJECT: PROPOSED INDUSTRIAL SUBDIVISION
777 YAAMBA ROAD, PARKHURST

DESIGN	DRAWN	APPROVED
-	AR	-

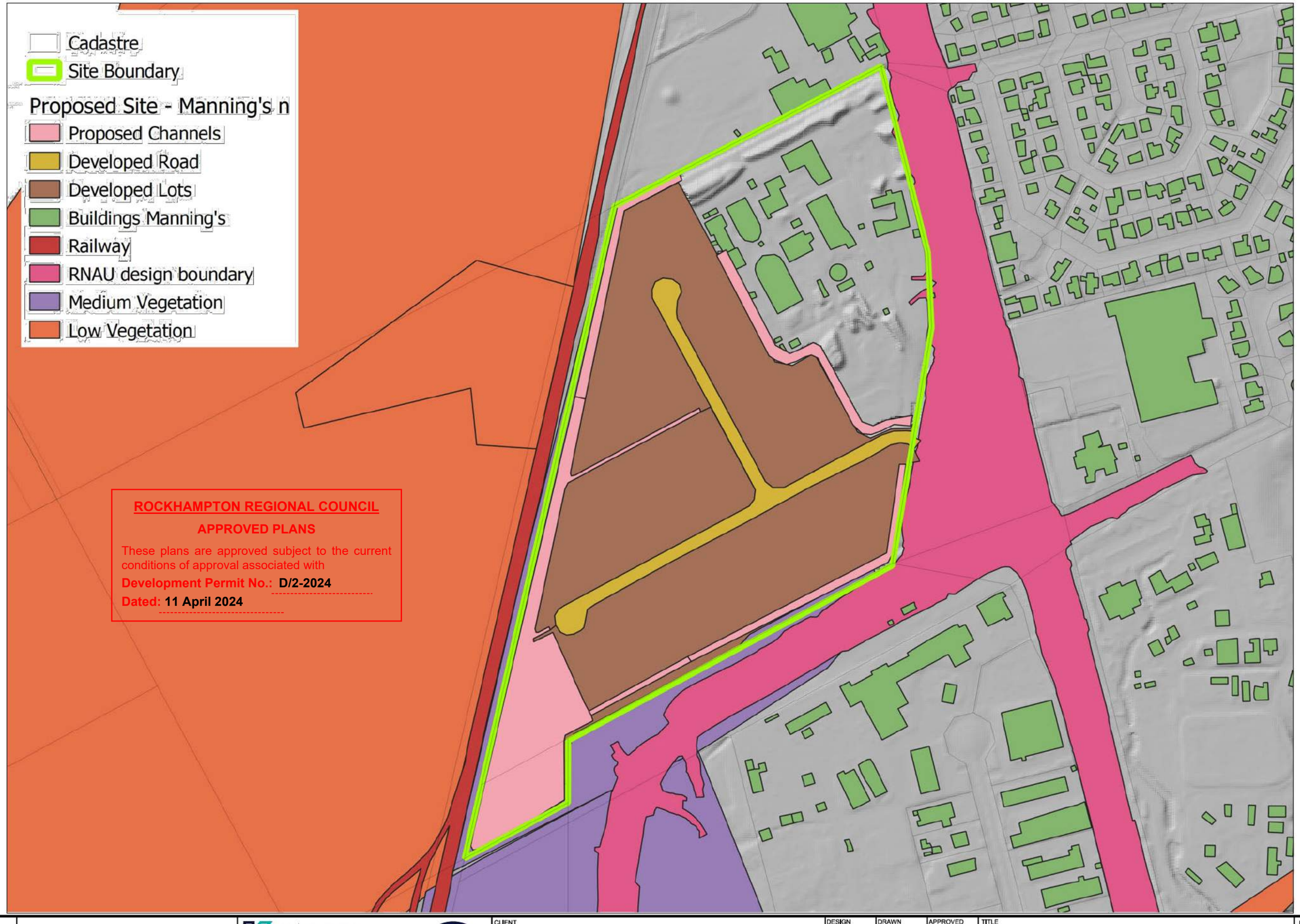
TITLE: PROPOSED SITE LAYOUT

SCALE:

PROJECT NO.: K4820

DWG NO.: B003

ISSUE: 1



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CLIENT: SIRIS CONSULTING ENGINEERS

PROJECT: PROPOSED INDUSTRIAL SUBDIVISION
777 YAAMBA ROAD, PARKHURST

DESIGN	DRAWN	APPROVED
-	AR	-

TITLE: PROPOSED SITE MANNINGS VALUE'S LAYOUT

SCALE:

PROJECT NO.: K4820

DWG NO.: B004

ISSUE: 1

APPENDIX

C

Knobel Engineers

Pre-Development Peak Flood Mapping

(Ref: K3328/F100/A to F305/A)

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 11 April 2024

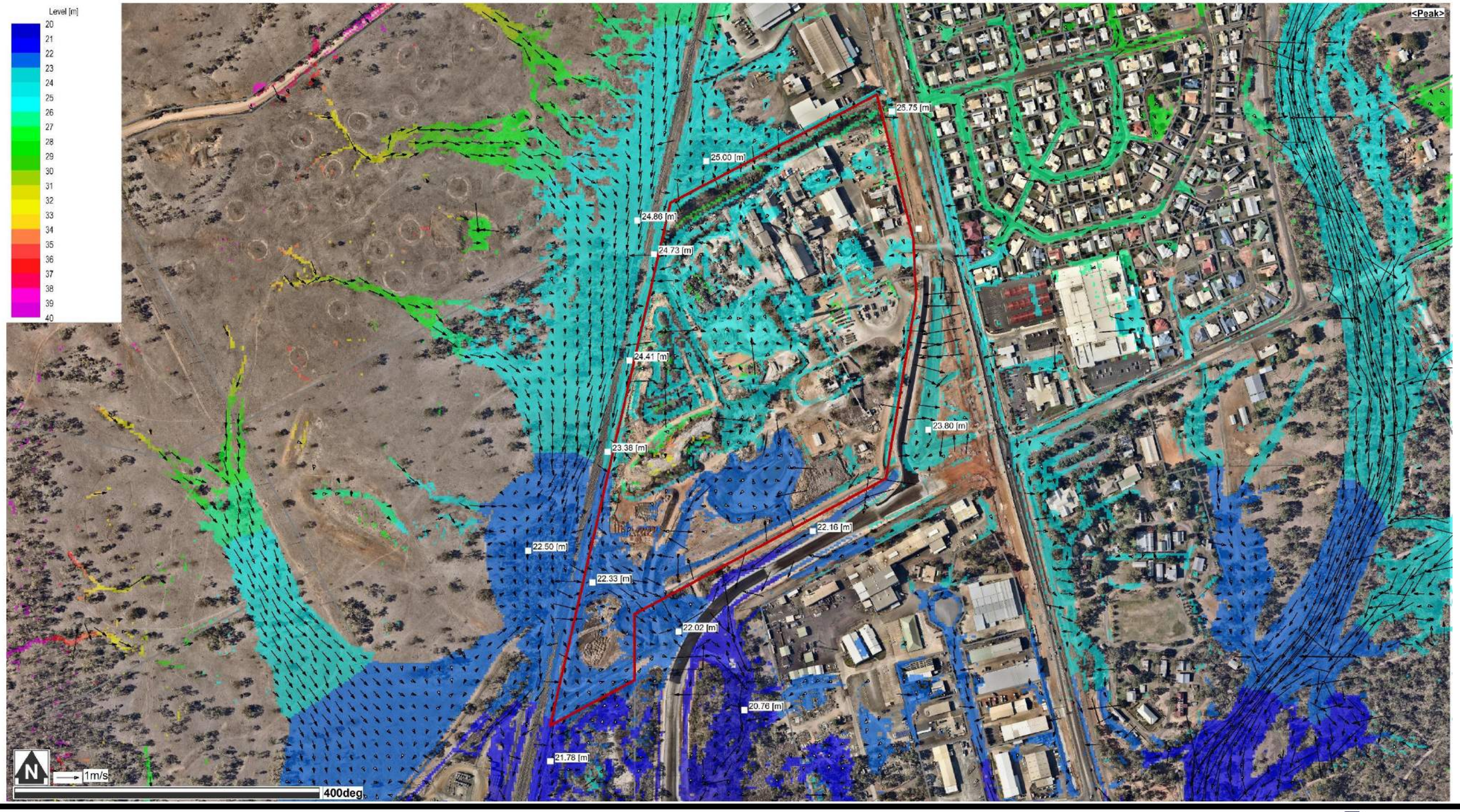

Figure F100/A
1% AEP Pre-Development Flood Water Level

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

Model Run: LIM_TMR_D3c_~ARI~Y_060m_08GPU

Project Number: K4820

Output Date: 15.05.2020

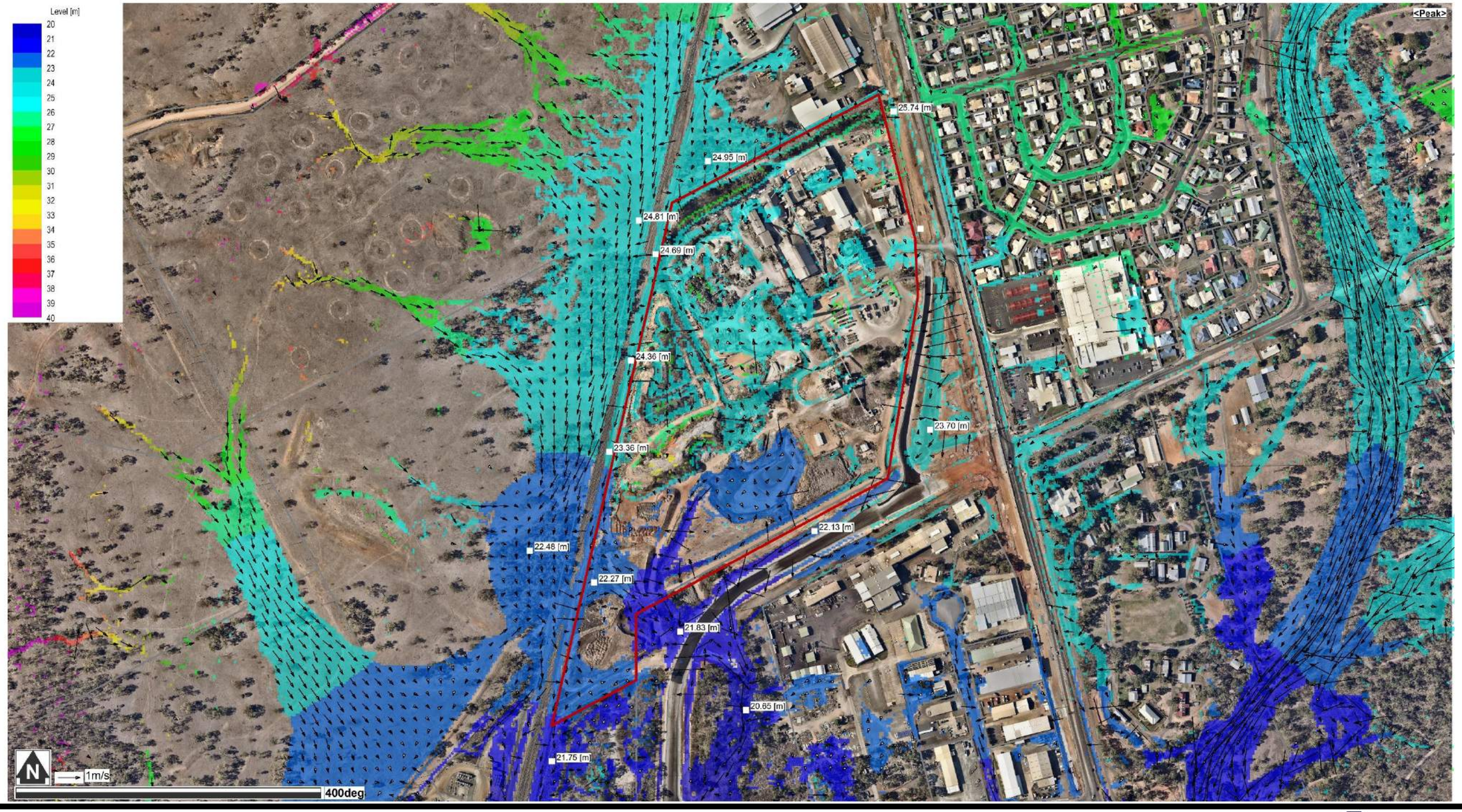

Figure F101/A
2% AEP Pre-Development Peak Flood Water Level

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 11 April 2024

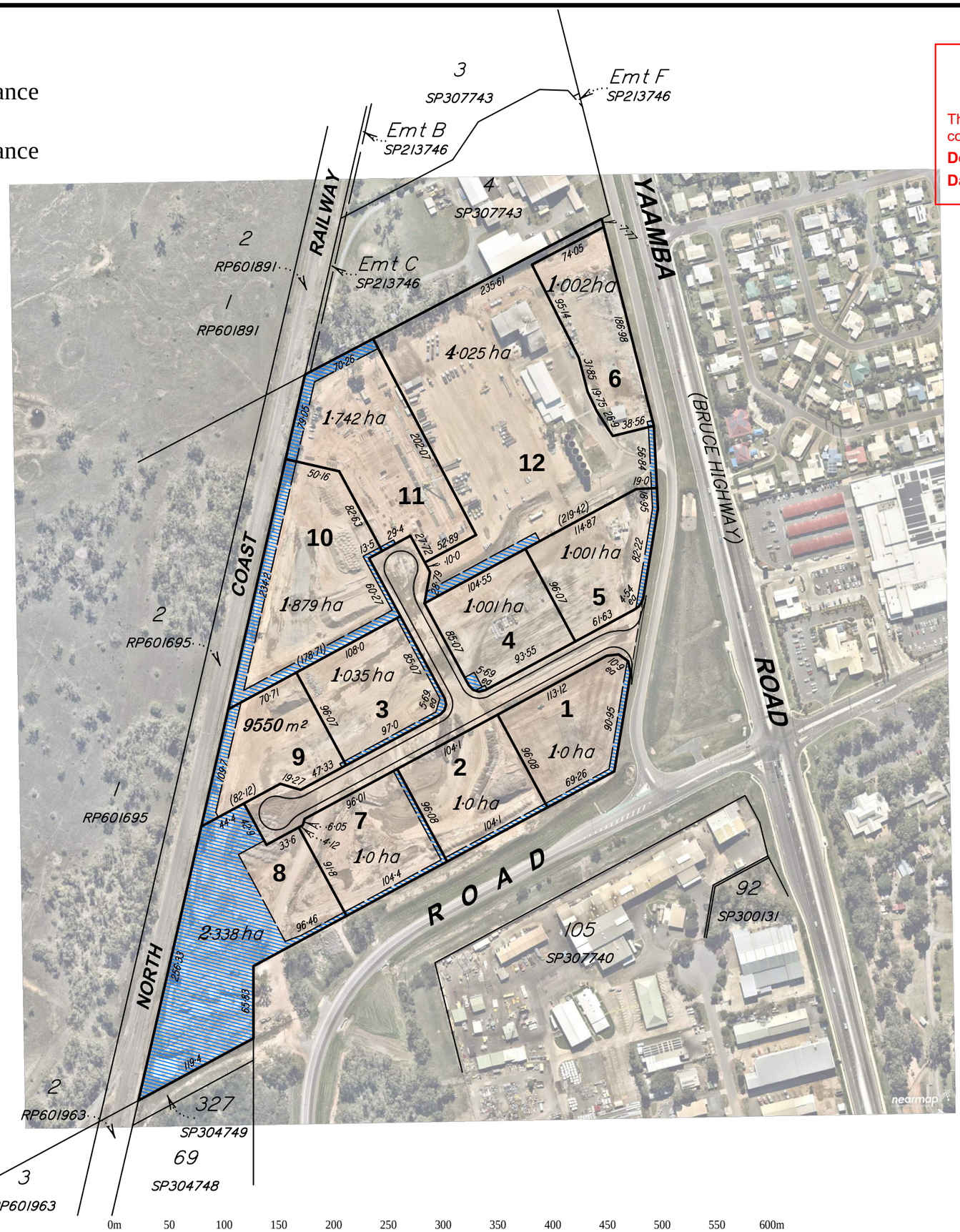
Project Number: K4820

Model Run: LIM_TMR_D3c_~ARI~Y_060m_08GPU

Output Date: 15.05.2020

STAGING

Stage 1	Lot 6 + Balance
Stage 2	Lots 1 & 5 + Balance
Stage 3	Lot 4 + Balance
Stage 4	Lots 2 & 3 + Balance
Stage 5	Lots 10-12
Stage 6	Lots 7-9



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

IMPORTANT NOTE

This plan was prepared to accompany an application to Rockhampton Regional Council and should not be used for any other purpose.

The dimensions and areas shown hereon are subject to field survey and also to the requirements of council and any other authority which may have requirements under any relevant legislation.

In particular, no reliance should be placed on the information on this plan for any financial dealings involving the land.

This note is an integral part of this plan.

client

JRT

project

Sibelco Site
777 Yaamba Road,
Parkhurst

plan of

Reconfiguration Plan
(2 Lots into 12 Lots + Easements)
(with Ortho Underlay)

rpd

Lots 20 & 30
on SP314611

lga

Rockhampton Regional Council

issue	date	details	authorised
A	28-06-2019	Initial Issue	RJKF
B	8-07-2020	Lots 10-12 & 7-9 (Stages 5 & 6) added	RJKF
C	16-08-2021	Lot Layout amended, Emts added	RJKF
D	7-09-2021	Lots 10-12 widths amended	RJKF

created

capricornsurveygroupcq
SURVEYING & PLANNING SOLUTIONS
07 4927 5199 | reception@csgcq.com.au | 132 Victoria Parade, Rockhampton QLD 4700

scale: 1:4000 @ A3
datum: -
sheet no.: 1 of 1
cad file: 7249-03-ROL-D
plan no.: 7249-03-ROL
issue: D

JRT CIVIL
PARKHURST HANDLING PTY LTD
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

PLAN REGISTER

Plan No.	Plan Title
SCE-115/001	Cover Sheet
SCE-115/002	Site Layout Plan
SCE-115/003	Staging Plan - Sheet 1
SCE-115/004	Staging Plan - Sheet 2
SCE-115/005	Typical Sections
SCE-115/006	Earthworks Plan General Layout
SCE-115/007	Earthworks Plan - Sheet 1
SCE-115/008	Earthworks Plan - Sheet 2
SCE-115/009	Earthworks Plan - Sheet 3
SCE-115/010	Roadworks Plan
SCE-115/011	Road Long Section Plan - Sheet 1
SCE-115/012	Road Long Section Plan - Sheet 2
SCE-115/013	Intersection & Vehicle Turn Paths Plan
SCE-115/014	Cul-de-sac & Intersection Setout Details
SCE-115/015	Stormwater General Layout
SCE-115/016	Stormwater Layout Plan - Sheet 1
SCE-115/017	Stormwater Layout Plan - Sheet 2
SCE-115/018	Sewerage Plan General Layout - Sheet 1
SCE-115/019	Sewerage Layout Plan - Sheet 1
SCE-115/020	Sewerage Layout Plan - Sheet 2
SCE-115/021	Sewerage Layout Plan - Sheet 3
SCE-115/022	Sewerage Long Section Plan - Sheet 1
SCE-115/023	Sewerage Long Section Plan - Sheet 2
SCE-115/024	Sewerage Long Section Plan - Sheet 3
SCE-115/025	Water & Electrical Services General Layout
SCE-115/026	Water & Electrical Services Plan - Sheet 1
SCE-115/027	Water & Electrical Services Plan - Sheet 2

Harsha R. Weerasinghe
RPEQ 8372

SIRIS CONSULTING ENGINEERS

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PHONE: 07 4930 2877 (office), 0407 119 734 (mobile)
ADDRESS: Shop 3, 5-7 Normanby Street, Yeppoon, QLD, 4703

DA APPLICATION PLANS

PLAN NUMBER: SCE-115-001 (A)

DA APPLICATION

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWI	DWC	06/20	DA APPLICATION

DATUM AHD

CO-ORD. GDA94

DESIGN REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

DRAFTING REVIEW

RPEQ CERTIFICATION: Veerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD,
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@siriseng.neers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (off ce) 0404 119 734 (mob le)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
SITE LAYOUT PLAN

PLAN NUMBER: SCE-115-002

REVISION: A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT

STAGING LEGEND - DA Application D52-2019

- Stage 1 - Lot 6 & 11
- Stage 2 - Lots 1 & 5
- Stage 3 - Lot 4
- Stage 4 - Lots 2, 3 & 10

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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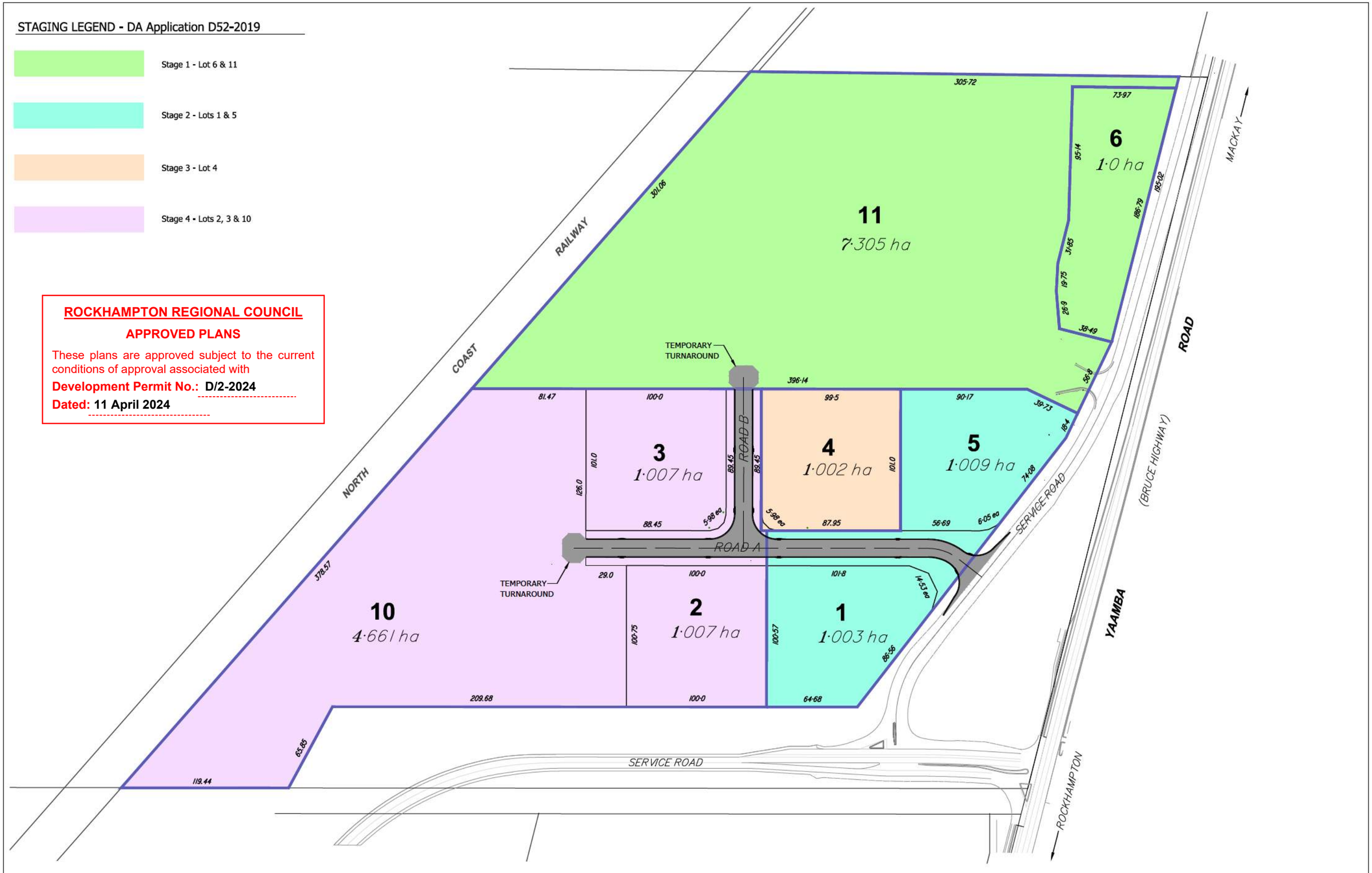
Development Permit No.: D/2-2024

Dated: 11 April 2024



ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD

CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICATION Weerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE
777 YAAMBA ROAD,
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
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LILY PLACE ESTATE
PROPOSED STAGING PLAN
SHEET 1

PLAN NUMBER SCE-115-003

REVISION A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT

STAGING LEGEND - Possible Future DA Application

Future Development Stage 5 - Lots 10, 11 & 12

Future Development Stage 6 - Lots 7, 8 & 9

ROCKHAMPTON REGIONAL COUNCIL

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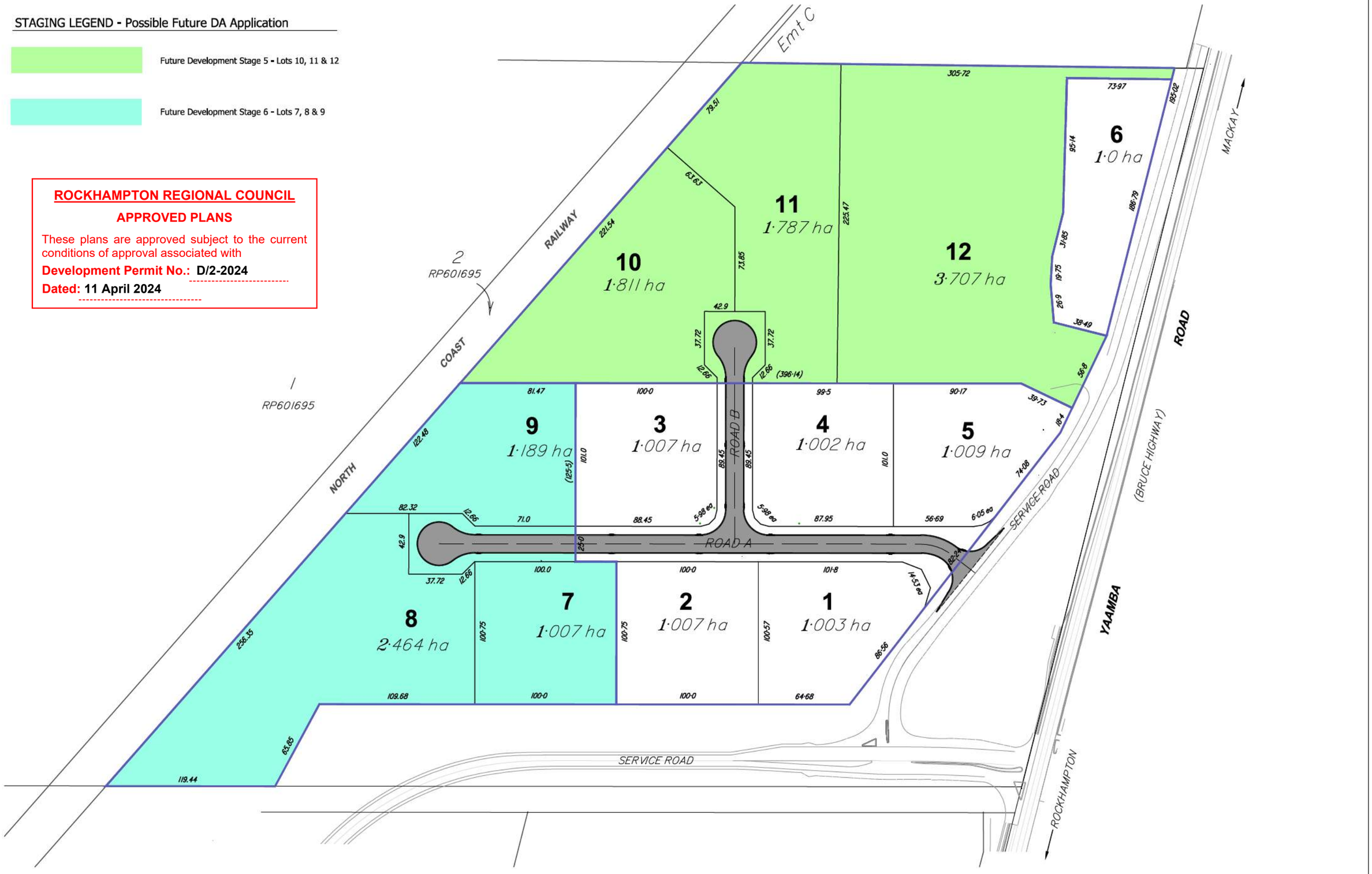

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFIER: Neerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD,
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ABN:34 481 028 699

LILY PLACE ESTATE
PROPOSED STAGING PLAN
SHEET 2

PLAN NUMBER: SCE-115-004

REVISION: A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

GENERAL

1. All dimensions on the job are in metres unless shown otherwise.
2. The contractor shall verify the locations of all existing services with the relevant authorities before commencing construction. Any costs associated with repairing damage to existing services shall be paid for by the contractor.
3. Dimensions, radii and levels refer to lip of, kerb and channel and are shown at tangent points and equally spaced points on single curves, unless noted otherwise.
4. All work shall be carried out in accordance with the local authority specifications and drawings unless directed otherwise.
5. All levels in this contract are AUSTRALIAN HEIGHT DATUM .
6. Levels for connection to existing works may be varied where necessary on site to achieve a satisfactorily smooth finish to the existing works.
7. All footpaths shall be topsoiled, turfed and hydro mulched as indicated on drawings.
8. All trees (except those on the fill and road works limits and those selected by the superintendent) to be retained.
9. Trees close to the road and sewers shall be determined on site by the superintendent for removal.
10. All materials shall be transported only on routes approved by council.
11. Method of disposal of all waste materials shall be to council's satisfaction.
12. All levels are dtm derived for layouts, longitudinal sections and cross sections. contractor to confirm on site before construction.
13. Developer to appoint contract for all fencing and landscaping if required.
14. All precast units are to be transported and installed as per manufacturers specifications and the structural integrity of each individual unit are in no way the responsibility of the consulting engineers.

GENERAL EARTHWORKS

1. All fill areas shall be compacted to 95% std. All excess spoil to be placed as directed by the site superintendent. All fill under roads shall be 100% standard compaction. Level 1 gta control and certification for "controlled fill" is as per AS 3798.
2. Refer to dwg SCE-115-006 for earthworks details.
3. All earthworks quantities are solid fill.
4. Earthworks spoil is to be stockpiled as directed by the superintendent. Topsoil is to be stripped to a depth of 75mm and stockpiled for later respreading. Areas requiring filling or roadworks are to be stripped and vegetation in other areas shall be retained.
5. Not withstanding the limits of cutting and filling shown on the drawings, the actual limits shall be determined on site by the superintendent during construction. Similarly, finished surface levels for allotments may be adjusted by a written direction of the superintendent during construction. (refer job specification).
6. Silt fencing is to be placed on the down stream side of all stockpile sites and an adequate cutoff drain is to be placed on the upstream side of all stockpile sites.

EARTHWORKS AND ROADWORKS NOTES

1. Control testing of earthworks shall be undertaken in accordance with AS 3798.
2. Fill shall be placed and compacted to the following standards:

(i) Cohesive material: allotment fill shall achieve a minimum dry density ratio of 98% or higher.

3. Roadwork embankments shall be compacted to the following standard:

(i) Minimum dry density ratio of 95% for cohesive material

(ii) or minimum dry density ratio of 80% for non cohesive material to a depth of 300mm below subgrade level.

4. Field density test shall be undertaken at the following minimum frequency:

(i) Type 1 large scale operations lot fillings and road embankments

- (a) 1 test per layer or 200mm thickness per material type per 2500m² or,
- (b) 1 test per 500m³ distributed reasonably evenly throughout full depth and area or,
- (c) 3 test per visit whichever requires the most tests.

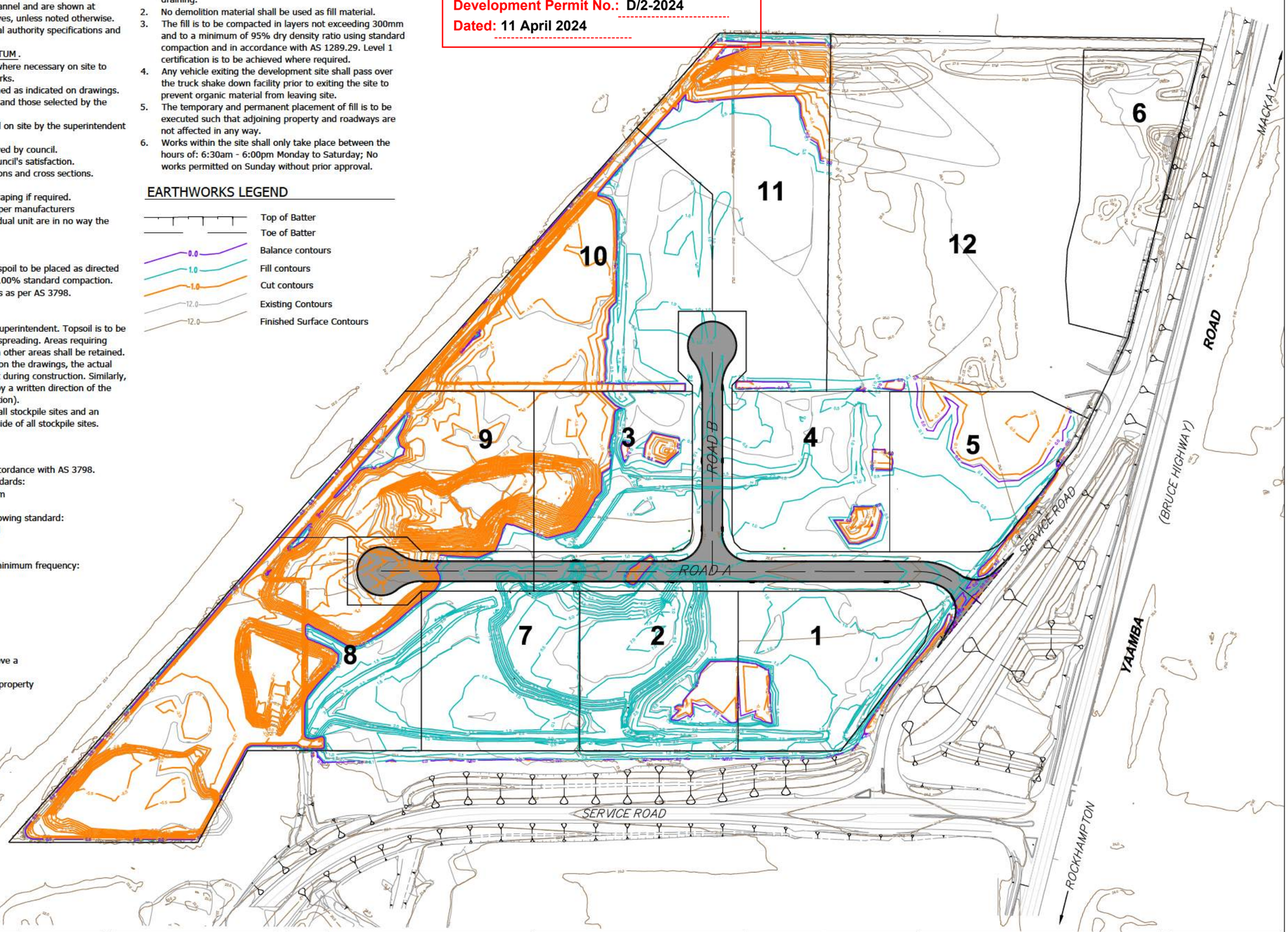
5. Road pavement shall be placed and compacted to achieve a minimum dry density ratio (MDDR) of 100% standard.
6. Batter slopes 1 in 6 within road reserve & 1 in 4 within property boundary unless specified otherwise.

FILL MANAGEMENT NOTES

1. The fill material will comprise only natural earth and rock and shall be free of contaminants, noxious, hazardous, deleterious and organic material and shall be free draining.
2. No demolition material shall be used as fill material.
3. The fill is to be compacted in layers not exceeding 300mm and to a minimum of 95% dry density ratio using standard compaction and in accordance with AS 1289.29. Level 1 certification is to be achieved where required.
4. Any vehicle exiting the development site shall pass over the truck shake down facility prior to exiting the site to prevent organic material from leaving site.
5. The temporary and permanent placement of fill is to be executed such that adjoining property and roadways are not affected in any way.
6. Works within the site shall only take place between the hours of: 6:30am - 6:00pm Monday to Saturday; No works permitted on Sunday without prior approval.

EARTHWORKS LEGEND

- Top of Batter
- Toe of Batter
- Balance contours (0.0)
- Fill contours (1.0)
- Cut contours (-1.0)
- Existing Contours (12.0)
- Finished Surface Contours (12.0)



ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

REVISION

DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICATE: Veerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@sirisengineers.com.au
PHONE: 07 4930 2877 (office) 0407 119 734 (mobile)
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ABN:34 481 028 699

LILY PLACE ESTATE
PROPOSED EARTHWORKS PLAN
GENERAL LAYOUT

PLAN NUMBER: SCE-115-006

REVISION: A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT

EARTHWORKS LEGEND

- Top of Batter
- Toe of Batter
- Balance contours (0.0)
- Fill contours (1.0)
- Cut contours (1.0)
- Existing Contours (12.0)
- Finished Surface Contours (12.0)

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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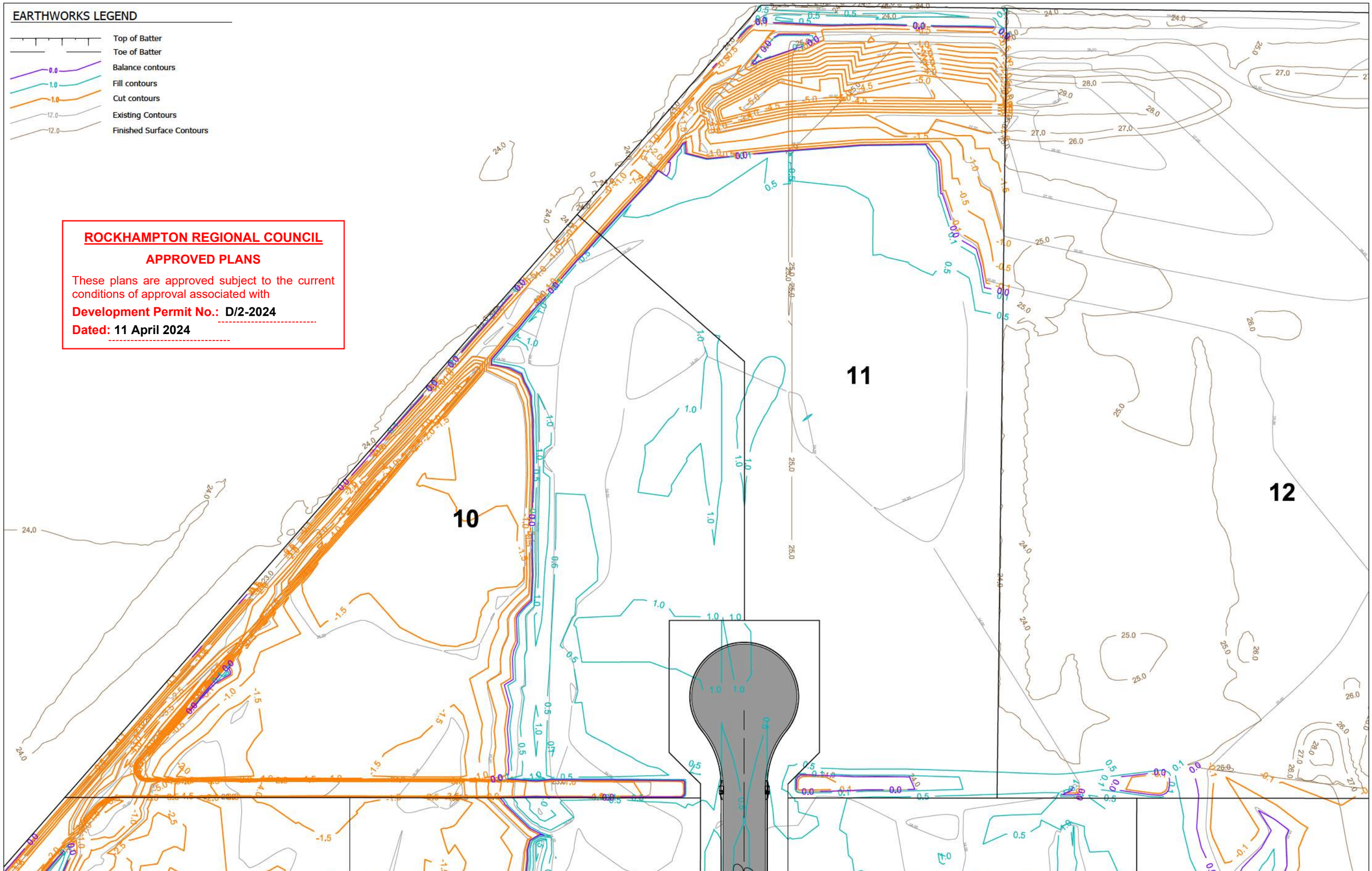
Development Permit No.: D/2-2024

Dated: 11 April 2024



JOINS PLAN SCE-115-009

JOINS PLAN SCE-115-008

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT: Veerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
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777 YAAMBA ROAD
PARKHURST, QLD. 4702

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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703
ABN:34 481 028 699

LILY PLACE ESTATE
EARTHWORKS PLAN
SHEET 1

PLAN NUMBER: SCE-115-007

REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

JOINS PLAN SCE-115-007

JOINS PLAN SCE-115-009

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Dated: 11 April 2024

EARTHWORKS LEGEND

- Top of Batter
- Toe of Batter
- Balance contours
- Fill contours
- Cut contours
- Existing Contours
- Finished Surface Contours

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD

CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ...eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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LILY PLACE ESTATE EARTHWORKS PLAN SHEET 2

PLAN NUMBER: SCE-115-008

REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

JOINS PLAN SCE-115-007

EARTHWORKS LEGEND

- Top of Batter
- Toe of Batter
- Balance contours
- Fill contours
- Cut contours
- Existing Contours
- Finished Surface Contours

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Dated: 11 April 2024

9

8

7

JOINS PLAN SCE-115-008

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD

CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ...eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE EARTHWORKS PLAN SHEET 3

PLAN NUMBER SCE-115-009

REVISION A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

EARTHWORKS AND ROADWORKS NOTES

1. Control testing of earthworks shall be undertaken in accordance with AS 3798.
2. Fill shall be placed and compacted to the following standards:
(i) Cohesive material: allotment fill shall achieve a minimum dry density ratio of 98% or higher.
3. Roadwork embankments shall be compacted to the following standard:
(i) Minimum dry density ratio of 95% for cohesive material
(ii) or minimum dry density ratio of 80% for non cohesive material to a depth of 300mm below subgrade level.
4. Field density test shall be undertaken at the following minimum frequency:
(i) Type 1 large scale operations lot fillings and road embankments
   (a) 1 test per layer or 200mm thickness per material type per 2500m² or,
   (b) 1 test per 500m³ distributed reasonably evenly throughout full depth and area or,
   (c) 3 test per visit whichever requires the most tests.
5. Road pavement shall be placed and compacted to achieve a minimum dry density ratio (MDDR) of 100% standard.
6. Batter slopes 1 in 6 within road reserve & 1 in 4 within property boundary unless specified otherwise.

PAVEMENT & KERB

1. Pavement thickness is provisional only and shall be confirmed after the subgrade testing. The contractor shall initially excavate 250mm below finished surface.
2. Pavement design is to be in accordance with council's engineering works manual.
3. All kerb and channel shall be mountable kerb and channel unless noted otherwise. Refer to details on plan SCE-115-013.
4. Pram ramps to be provided at all intersections where shown.

LINEMARKING NOTES

1. All signs and pavement markings are to be in accordance with the 'Manual of Uniform Traffic Control Devices' (QLD).
2. All works shall be constructed in accordance with current council standard specifications, methods and drawings.
3. Noses of all traffic islands to be painted with reflective white paint
4. All redundant line markings shall be ground off.
5. All existing redundant signs shall be removed / relocated.

ROADWORKS LEGEND

- Existing Edge of Bitumen
- Existing Kerb and Channel
- Existing Roadway
- New Asphalt Roadway Refer Pavement Details
- New Bitumen Roadway Refer Pavement Details
- New Concrete Roadway Refer Pavement Details
- New Concrete Footpaths / Driveways / Island Refer Details
- New Barrier Kerb and Channel
- New Mountable Kerb and Channel
- New Semi-Mountable Kerb and Channel
- 12.0 Finished Surface Contours

ROCKHAMPTON REGIONAL COUNCIL

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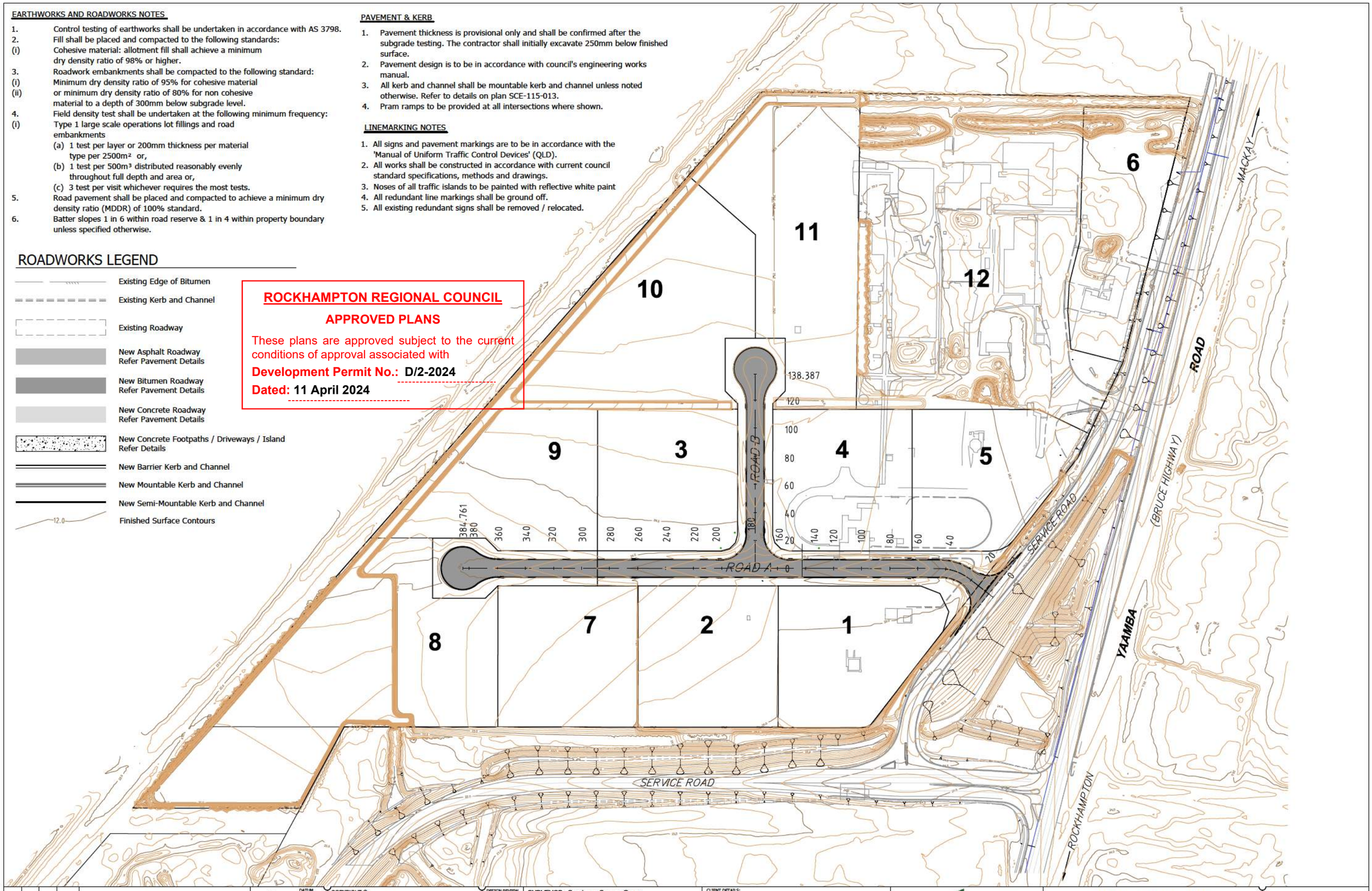

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
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DATUM AHD
CO-ORD. GDA94

DESIGN REVIEW
DRAFTING REVIEW
RPEQ CERTIFICATE: Veerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: INDUSTRIAL ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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PHONE: 07 4930 2877 (office) 0407 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

INDUSTRIAL ESTATE PROPOSED ROADWORKS PLAN

PLAN NUMBER: SCE-115-010
REVISION: A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT

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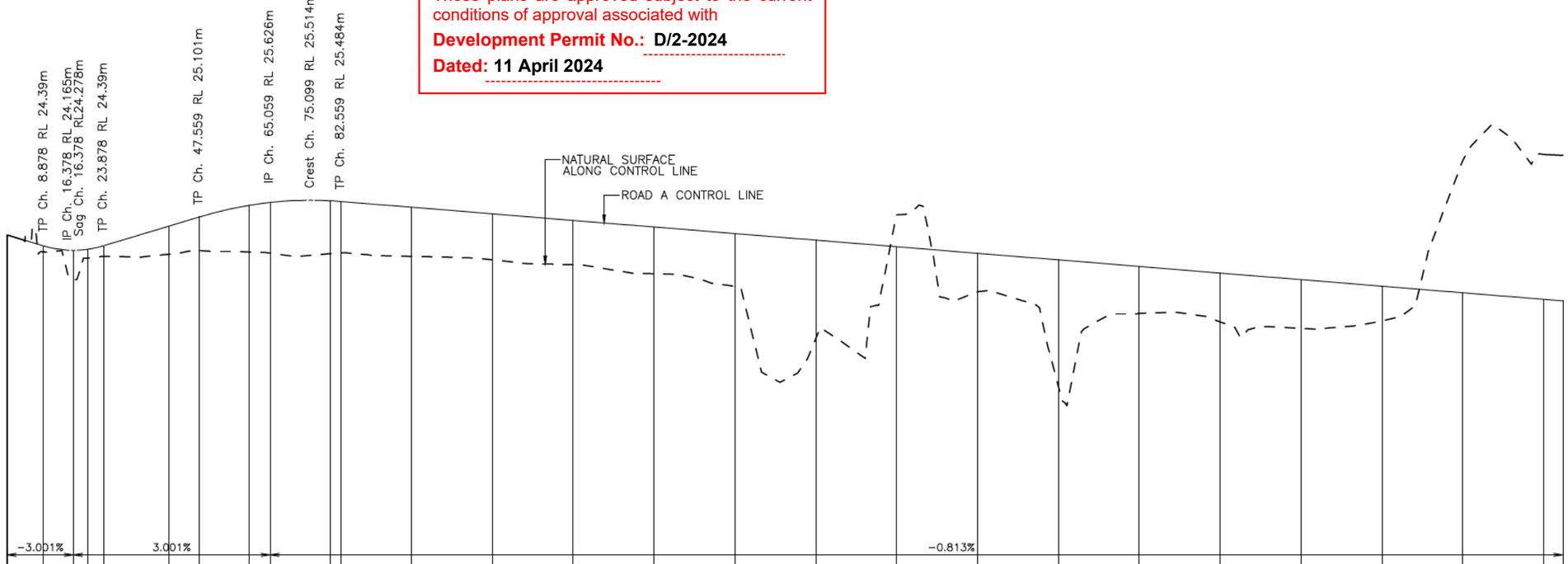


RIGHT LIP LEVELS						24.209	24.692	24.919	25.208	25.277	25.319	25.302	25.160
LEFT LIP LEVELS						24.209	24.692	24.919	25.208	25.277	25.319	25.302	25.160
EXISTING SURFACE	24.657	24.657	24.243	23.548	24.086	24.128	24.178	24.273	24.237	24.207	24.195	24.216	24.129
DESIGN HEIGHTS	24.657	24.657	24.390	24.278	24.304	24.390	24.874	25.101	25.390	25.459	25.501	25.484	25.342
CHAINAGE	0.000	0.000	8.878	16.378	20.000	23.878	40.000	47.559	60.000	65.059	80.000	82.559	100.000

RIGHT LIP LEVELS	24.998	24.835	24.673	24.510	24.348	24.185	24.022	23.860	23.697	23.535	23.372	23.209	23.047		
LEFT LIP LEVELS	24.998	24.835	24.673	24.510	24.348	24.185	24.022	23.860	23.697	23.535	23.372	23.209	23.047		
EXISTING SURFACE	24.044	23.922	23.698	23.382	22.094	25.153	23.253	20.917	22.718	22.509	22.348	22.528	26.498	26.647	26.626
DESIGN HEIGHTS	25.179	25.017	24.854	24.692	24.529	24.366	24.204	24.041	23.879	23.716	23.553	23.391	23.228	23.066	23.027
CHAINAGE	120.000	140.000	160.000	180.000	200.000	220.000	240.000	260.000	280.000	300.000	320.000	340.000	360.000	380.000	384.761

LONGITUDINAL SECTION ROAD A
Horizontal scale 1:500 (A1)
Vertical scale 1:50 (A1)

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

REVISION

N

DATUM
AHD

CO-ORD.
GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR:
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER:

RPEQ CERTIFICAT eerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS

EMAIL: david@sirisengineers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (office) 0404 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
ROAD LONG SECTION PLAN
SHEET 1

PLAN NUMBER
SCE-115-011

REVISION
A

HOR. 1 : 500
0 10 20
0 1 2
VERT. 1 : 50
DO NOT SCALE - ASK IF IN DOUBT

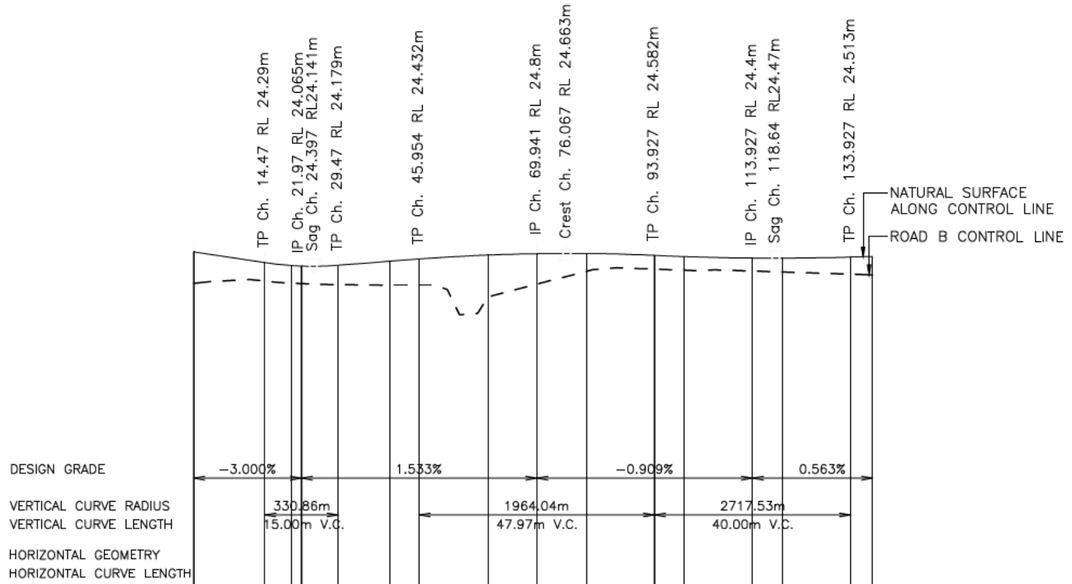
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024



RIGHT LIP LEVELS						23.998	24.159	24.251	24.416	24.472	24.478	24.400	24.400	24.352	24.293	24.288	24.331	
LEFT LIP LEVELS						23.998	24.159	24.251	24.416	24.472	24.478	24.400	24.400	24.352	24.293	24.288	24.331	
EXISTING SURFACE	23.442	23.442	23.536	23.450	23.430	23.388	23.373	23.380	22.894	23.410	23.927	24.021	24.021	23.978	23.944	23.905	23.815	23.786
DESIGN HEIGHTS	24.724	24.724	24.290	24.170	24.150	24.179	24.341	24.432	24.597	24.654	24.659	24.582	24.582	24.533	24.474	24.470	24.513	24.538
CHAINAGE	0.000	0.000	14.470	20.000	21.970	29.470	40.000	45.954	60.000	69.941	80.000	93.927	93.927	100.000	113.927	120.000	133.927	138.387

LONGITUDINAL SECTION ROAD B
Horizontal scale 1:500 (A1)
Vertical scale 1:100 (A1)

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

REVISION

N

DATUM
AHD
CO-ORD.
GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR:
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER:

RPEQ CERTIFICAT eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
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DEVELOPMENT DETAILS:
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777 YAAMBA ROAD
PARKHURST, QLD. 4702

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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
ROAD LONG SECTIONS PLAN
SHEET 2

PLAN NUMBER
SCE-115-012

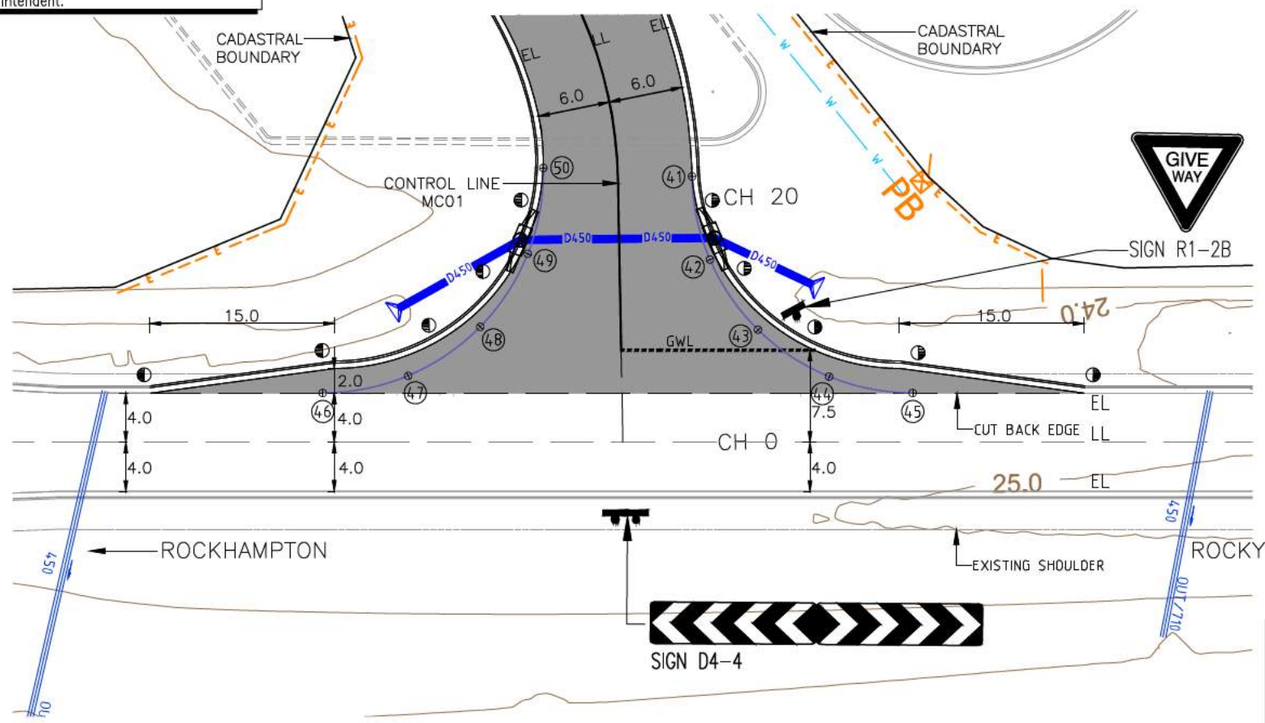
REVISION
A

HOR. 1 : 500
0 10 20
0 2 4
VERT. 1 : 100
DO NOT SCALE - ASK IF IN DOUBT

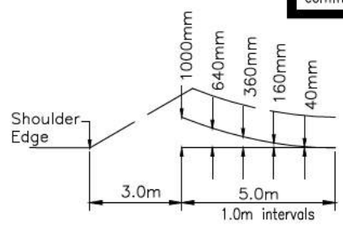
NOTE:
The extents of the vertical alignment of the road is bound by the survey. Non survey section of road to be constructed on site under instruction from the superintendent.

Utility Services. No work is to be done within 4m of service without first consulting relevant Service Authority.

THIS IS A COMPILED PLAN
This layout has been produced from existing plans, photos and on measurements. The design is based on approxiate dimensions only should be verified on site by the contractor prior to commencement of work.



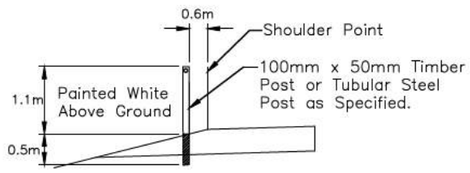
INTERSECTION LAYOUT



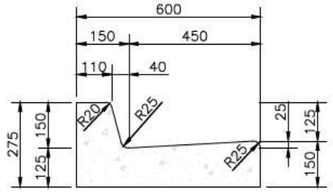
FLARE DETAIL
1:5

PLAN LEGEND

- D450 — New Stormwater Drainage Headwall / Pipe Size
- E PB — New Electrical Pillar Box – Property Connection (Concept Layout Only)
- W — New Water Reticulation Main
- New Barrier Kerb and Channel
- Existing Kerb and Channel
- Existing 450mm Stormwater Culvert



TYPICAL POSITIONING OF ROAD EDGE GUIDE POSTS
1:10



BARRIER KERB & CHANNEL
1:20

INTERSECTION SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL	CHAINAGE
41	245695.932	7420489.251	24.149	0.000
42	245702.868	7420489.453	24.133	6.983
43	245709.212	7420492.265	24.335	13.966
44	245714.022	7420497.267	24.577	20.949
45	245716.581	7420503.717	24.684	27.932

INTERSECTION SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL	CHAINAGE
46	245707.788	7420456.419	24.339	0.000
47	245707.682	7420463.525	24.330	7.154
48	245704.834	7420470.037	24.175	14.308
49	245699.687	7420474.938	24.061	21.463
50	245693.044	7420477.465	24.175	28.617

ROCKHAMPTON REGIONAL COUNCIL
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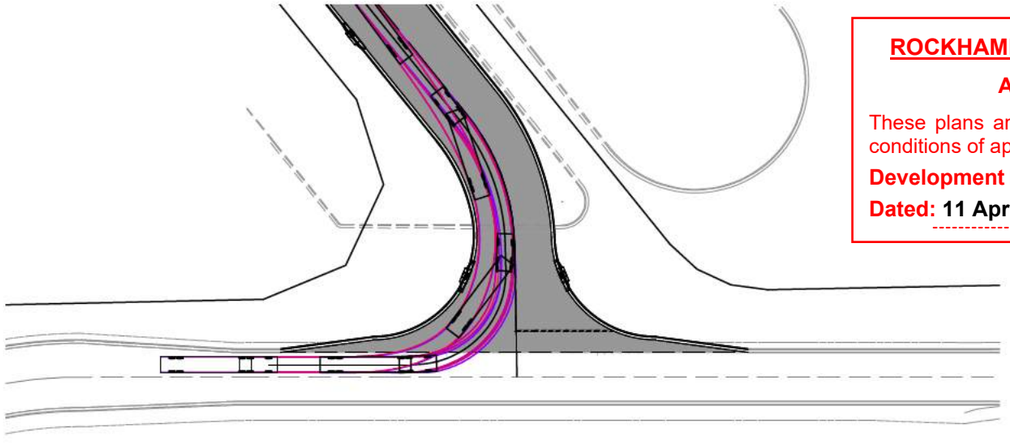
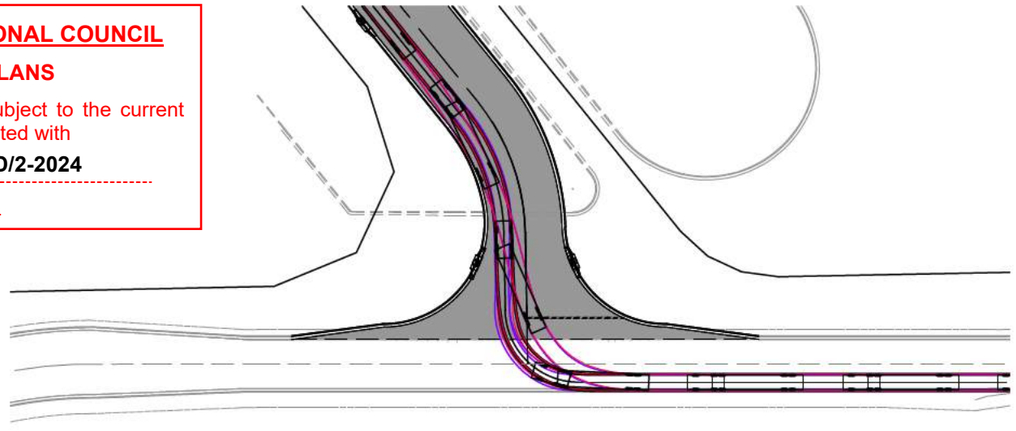


INTERSECTION VEHICLE TURN PATH
LEFT-TURN IN
1:1000



INTERSECTION VEHICLE TURN PATH
RIGHT-TURN IN
1:1000

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD
CO-ORD. GDA94

DESIGN REVIEW
DRAFTING REVIEW
RPEQ CERTIFICAT RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

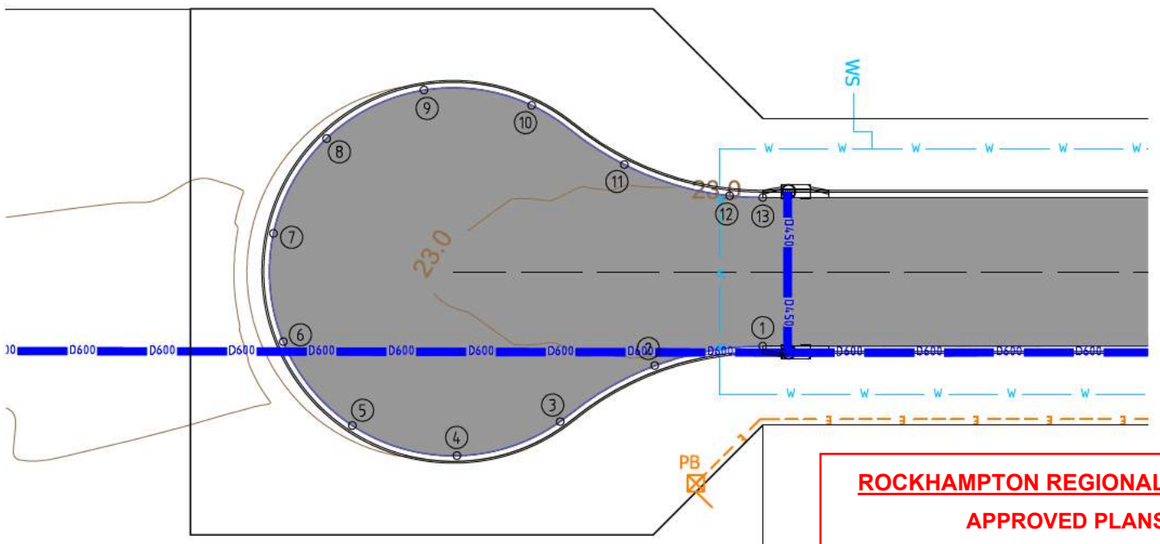
CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD
DEVELOPMENT DETAILS: LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@sirisengineers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (office) 0407 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
PROPOSED INTERSECTION & VEHICLE TURN PATHS PLAN

PLAN NUMBER SCE-115-013
REVISION A

0 2.5m 10.0m
1:500
DO NOT SCALE - ASK IF IN DOUBT



ROAD A CUL-DE-SAC

ROCKHAMPTON REGIONAL COUNCIL

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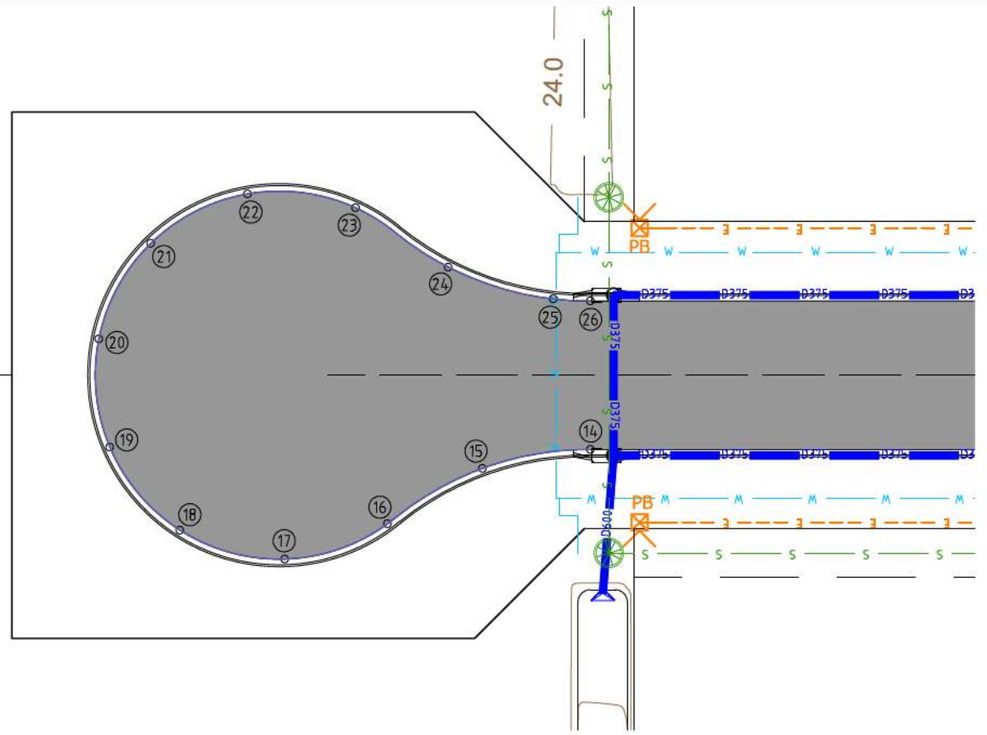
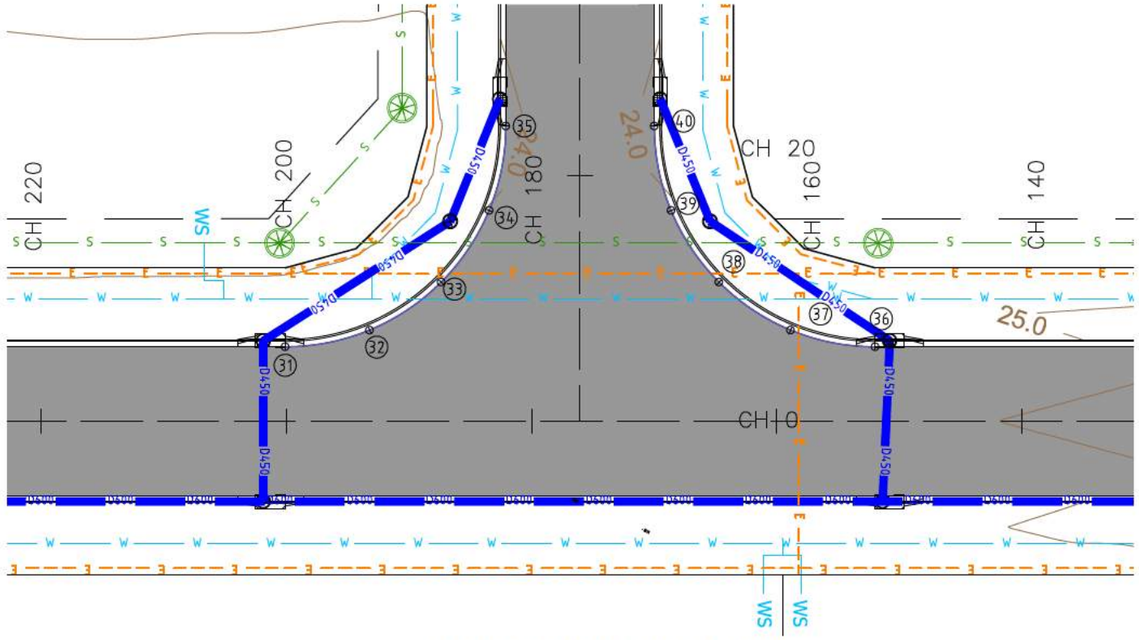


ROAD B CUL-DE-SAC

ROAD A CUL-DE-SAC SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL	CHAINAGE
1	245398.293	7420324.681	23.051	0.000
2	245391.302	7420319.090	22.984	9.000
3	245386.685	7420311.413	22.930	18.000
4	245380.596	7420304.970	22.889	27.000
5	245371.931	7420303.091	22.861	36.000
6	245363.720	7420306.432	22.847	45.000
7	245358.829	7420313.826	22.845	54.000
8	245358.967	7420322.691	22.856	63.000
9	245364.087	7420329.929	22.880	72.000
10	245372.399	7420333.012	22.917	81.000
11	245381.355	7420332.343	22.966	90.000
12	245390.115	7420334.182	23.029	99.000
13	245392.549	7420335.330	23.051	101.692



ROAD A & B INTERSECTION

ROAD B CUL-DE-SAC SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL	CHAINAGE
14	245496.062	7420517.219	24.289	0.000
15	245490.518	7420524.248	24.284	9.000
16	245482.867	7420528.901	24.279	18.000
17	245476.354	7420534.918	24.276	27.000
18	245474.377	7420543.560	24.274	36.000
19	245477.624	7420551.809	24.272	45.000
20	245484.963	7420556.784	24.272	54.000
21	245493.828	7420556.746	24.273	63.000
22	245501.124	7420551.710	24.275	72.000
23	245504.301	7420543.433	24.278	81.000
24	245503.639	7420534.478	24.282	90.000
25	245505.418	7420525.705	24.287	99.000
26	245506.712	7420522.963	24.289	102.033

ROAD A & B INTERSECTION SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL	CHAINAGE
31	245532.888	7420411.022	24.347	0.000
32	245538.300	7420415.498	24.335	7.069
33	245541.588	7420421.705	24.186	14.137
34	245542.250	7420428.697	24.015	21.206
35	245540.186	7420435.410	23.940	28.274

ROAD A & B INTERSECTION SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL	CHAINAGE
36	245575.223	7420433.856	24.738	0.000
37	245568.510	7420431.792	24.606	7.069
38	245561.518	7420432.454	24.324	14.137
39	245555.311	7420435.741	24.049	21.206
40	245550.836	7420441.154	23.940	28.274

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD

CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@sirisengineers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (office) 0407 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
CUL-DE-SAC & INTERSECTION
SETOUT DETAILS

PLAN NUMBER SCE-115-014

REVISION A

0 2.5m 10.0m
1:500

DO NOT SCALE - ASK IF IN DOUBT

STORMWATER LEGEND

- Existing Roadway
- New Asphalt Roadway — Refer Pavement Details
- New Bitumen Roadway — Refer Pavement Details
- New Concrete Roadway — Refer Pavement Details
- New Concrete Footpaths / Driveways / Island — Refer Details
- New Barrier Kerb and Channel
- New Mountable Kerb and Channel
- New Semi-Mountable Kerb and Channel
- Top of Batter
- Toe of Batter
- 1/1 — Stormwater Drainage Inlet (Inlet No. and Pipe Line No.)
- 4/1 — D 450ø (2) — D 375ø (2) — Stormwater Drainage Manhole / Pipe Size and Class (Manhole No. and Pipe Line No.)
- 8/1 — D 600ø (2) — D — Stormwater Drainage Headwall / Pipe Size and Class (Headwall No. and Pipe Line No.)
- DS — DS — Stormwater Subsoil Drainage Pipe with Cleanout Opening Refer Details and CMDG Std Dwg D-040.
- RW1/1 — DRW 225ø (u) — DRW 150ø (u) — Stormwater Roofwater Inlet / Pipe Size and Class (Inlet No. and Pipe Line No.)
- Stormwater Roofwater Kerb Adaptor Refer Details and CMDG Std Dwg R-061.
- 12.0 — Finished Surface Contours

STORMWATER DRAINAGE NOTES

1. Subsoil drains to be constructed in accordance with the local authority standard drawings.
2. Subsoil drains to be placed behind all kerb & channel unless noted otherwise. Mitre drains are to be placed as directed by the consulting engineer's superintendent. (subsoil drains and mitre drains adjacent to landscaped areas to be at a minimum depth of 1.0m unless noted otherwise.)
3. Maximum distance between cleanout points (including gully pits) to be 60m.
4. All gully pits shall be c-m type.
5. All drainage pipes shall be class 2 R.C. pipes unless shown otherwise.
6. The levels and slopes shown on manhole covers are indicative only. The contractor shall finish manhole covers and surrounds to suit the finished level & slope at that location.

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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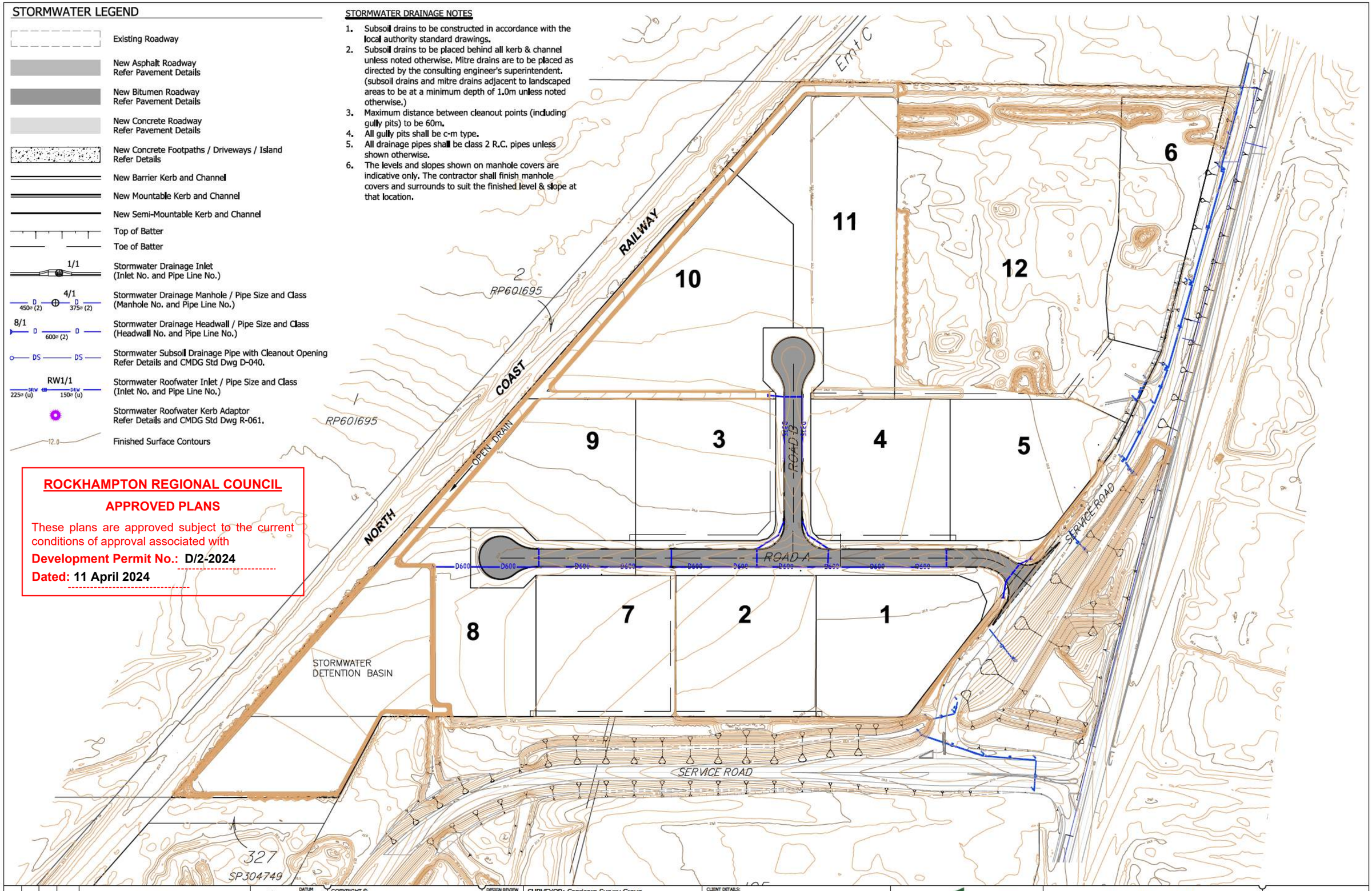

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD — CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ... eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE, 777 YAAMBA ROAD, PARKHURST, QLD. 4702

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EMAIL: david@sirisengineers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (office) 0407 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
PROPOSED STORMWATER
GENREAL LAYOUT

PLAN NUMBER: SCE-115-015

REVISION: A

0 — 50.0m — 1:2500

DO NOT SCALE - ASK IF IN DOUBT

STORMWATER LEGEND

- Existing Roadway
- New Asphalt Roadway — Refer Pavement Details
- New Bitumen Roadway — Refer Pavement Details
- New Concrete Roadway — Refer Pavement Details
- New Concrete Footpaths / Driveways / Island — Refer Details
- New Barrier Kerb and Channel
- New Mountable Kerb and Channel
- New Semi-Mountable Kerb and Channel
- Top of Batter
- Toe of Batter
- 1/1 — Stormwater Drainage Inlet (Inlet No. and Pipe Line No.)
- 4/1 — D 450ø (2) — D 375ø (2) — Stormwater Drainage Manhole / Pipe Size and Class (Manhole No. and Pipe Line No.)
- 8/1 — D 600ø (2) — Stormwater Drainage Headwall / Pipe Size and Class (Headwall No. and Pipe Line No.)
- DS — DS — Stormwater Subsoil Drainage Pipe with Cleanout Opening. Refer Details and CMDG Std Dwg D-040.
- RW1/1 — DRW 225ø (u) — DRW 150ø (u) — Stormwater Roofwater Inlet / Pipe Size and Class (Inlet No. and Pipe Line No.)
- Stormwater Roofwater Kerb Adaptor. Refer Details and CMDG Std Dwg R-061.
- 12.0 — Finished Surface Contours

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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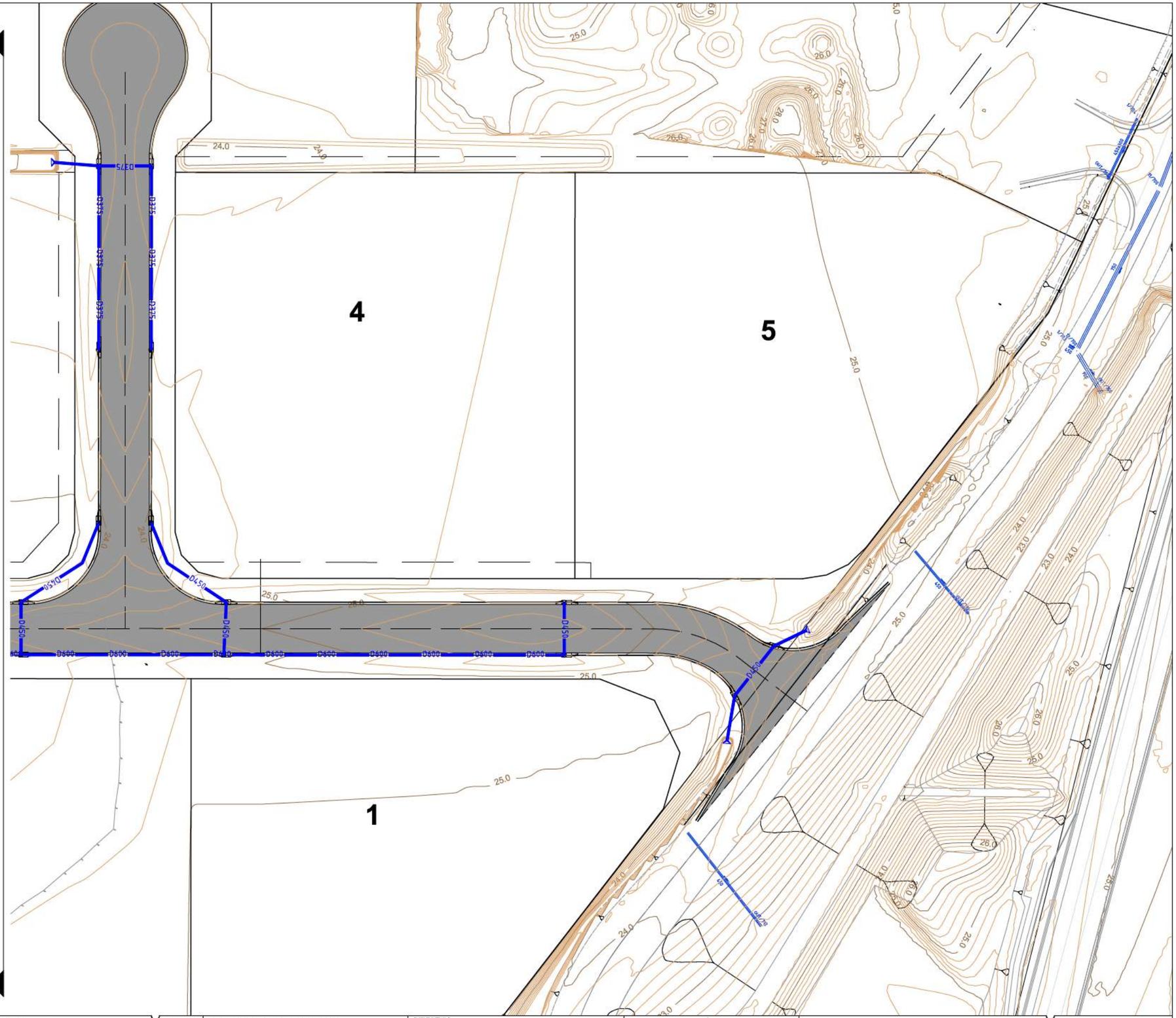
Dated: 11 April 2024

JOINS PLAN SCE-115-017



ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD — CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ...eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE, 777 YAAMBA ROAD, PARKHURST, QLD. 4702

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LILY PLACE ESTATE
STORMWATER LAYOUT PLAN
SHEET 1

PLAN NUMBER: SCE-115-016

REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

STORMWATER LEGEND

- Existing Roadway
- New Asphalt Roadway
  Refer Pavement Details
- New Bitumen Roadway
  Refer Pavement Details
- New Concrete Roadway
  Refer Pavement Details
- New Concrete Footpaths / Driveways / Island
  Refer Details
- New Barrier Kerb and Channel
- New Mountable Kerb and Channel
- New Semi-Mountable Kerb and Channel
- Top of Batter
- Toe of Batter
- 1/1 Stormwater Drainage Inlet
  (Inlet No. and Pipe Line No.)
- 4/1 D 450⌀ (2) D 375⌀ (2) Stormwater Drainage Manhole / Pipe Size and Class
  (Manhole No. and Pipe Line No.)
- 8/1 D 600⌀ (2) D Stormwater Drainage Headwall / Pipe Size and Class
  (Headwall No. and Pipe Line No.)
- DS DS Stormwater Subsoil Drainage Pipe with Cleanout Opening
  Refer Details and CMDG Std Dwg D-040.
- RW1/1 DRW 225⌀ (u) DRW 150⌀ (u) Stormwater Roofwater Inlet / Pipe Size and Class
  (Inlet No. and Pipe Line No.)
- Stormwater Roofwater Kerb Adaptor
  Refer Details and CMDG Std Dwg R-061.
- 12.0 Finished Surface Contours

ROCKHAMPTON REGIONAL COUNCIL

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DATUM AHD
CO-ORD. GDA94

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DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting
RPEQ CERTIFICAT ... 'eerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

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LILY PLACE ESTATE
STORMWATER LAYOUT PLAN
SHEET 2

PLAN NUMBER SCE-115-017
REVISION A

0 20.0m
1:1000
DO NOT SCALE - ASK IF IN DOUBT

SEWERAGE LEGEND

- Existing Roadway
- New Asphalt Roadway — Refer Pavement Details
- New Bitumen Roadway — Refer Pavement Details
- New Concrete Roadway — Refer Pavement Details
- Existing Sewer Main and Manhole
- Existing Sewer House Connection
- New Sewer Main and Manhole (Manhole No. and Sewer Line No.)
- New Sewer House Connection (Refer details and CMDG Std Dwg S-030)
- New Sewer Rising Main (Refer details and CMDG Std Dwgs)
- New Sewer Easement (Refer Surveyors Plans)
- Top of Batter
- Toe of Batter
- Finished Surface Contours

SEWERAGE NOTES

1. House connections shall be 100 dia. and terminate at the inlet end of the inspection pipe. The end shall be sealed with plug and clip and the invert level of the bend shall be as directed by the superintendent.
2. Alignment of sewer main in private property shall be 1.5m from the front and rear property boundary, 1.0m from the side property boundary and 2.0m from the rear boundary where inter-allotment drainage run parallel unless noted otherwise.
3. All sewers shall be 150 dia. uPVC class SN8 RRJ unless otherwise noted.
4. All sewer manholes to be 1050mm diameter, unless specified otherwise on sewer longitudinal sections.
5. Manhole lids to be constructed to follow slope of batters if possible.
6. Class D concrete lids are required for all manholes unless specified otherwise on the sewer longitudinal sections.
7. For manhole lid details, refer IPWEAQ standard drawings.
8. For manhole lid details for access chambers located within park reserve or below Q10 flood event, refer local authority standard drawings.
9. All sewerage house connections greater than 2.0m deep shall be provided with heavy-duty reinforced fibreglass junctions.
10. All chambers are to have precast fibreglass bases and are to be constructed and installed as per the manufacturer's specifications.
11. All proposed sewerage access chambers located within a park or reserve, or below Q10 flood event, must be provided with bolt down lids.

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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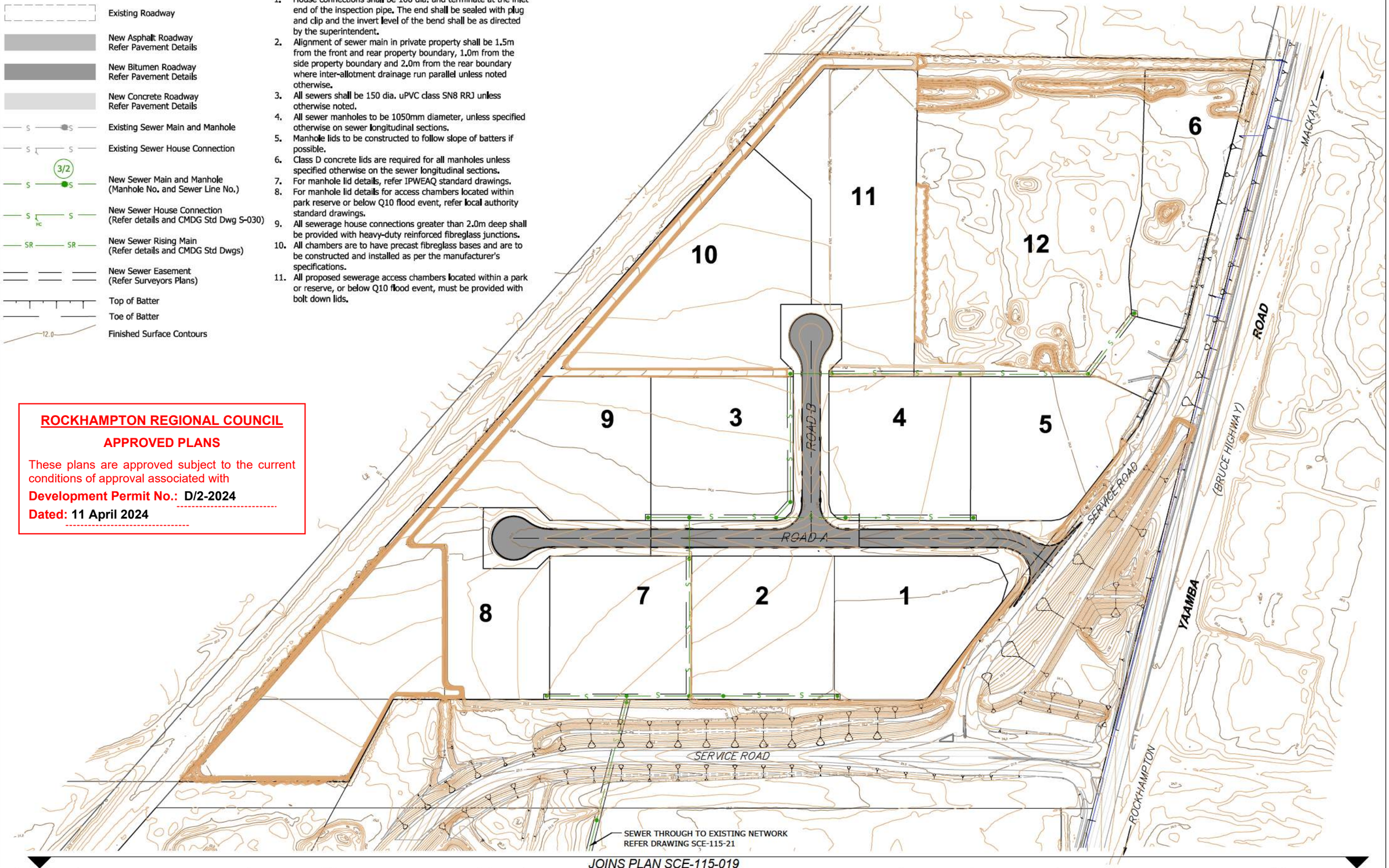
Dated: 11 April 2024



JOINS PLAN SCE-115-019

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD
CO-ORD.: GDA94

DESIGN REVIEW
SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting
DRAFTING REVIEW
RPEQ CERTIFICAT: Veerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD
DEVELOPMENT DETAILS: LILY PLACE ESTATE, 777 YAAMBA ROAD, PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@sirisengineers.com.au ABN:34 481 028 699
PHONE: 07 4930 2877 (office) 0407 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
PROPOSED SEWERAGE PLAN
GENERAL LAYOUT - SHEET 1

PLAN NUMBER: SCE-115-018
REVISION: A

0 50.0m
1:2500
DO NOT SCALE - ASK IF IN DOUBT

SEWERAGE LEGEND

- Existing Roadway
- New Asphalt Roadway — Refer Pavement Details
- New Bitumen Roadway — Refer Pavement Details
- New Concrete Roadway — Refer Pavement Details
- Existing Sewer Main and Manhole
- Existing Sewer House Connection
- New Sewer Main and Manhole (Manhole No. and Sewer Line No.)
- New Sewer House Connection (Refer details and CMDG Std Dwg S-030)
- New Sewer Rising Main (Refer details and CMDG Std Dwgs)
- New Sewer Easement (Refer Surveyors Plans)
- Top of Batter
- Toe of Batter
- Finished Surface Contours

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

3 4 5 7 2 1

150 uPVC 1 in 150.0

JOINS PLAN SCE-115-020

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD — CO-ORD. GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ...eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE, 777 YAAMBA ROAD, PARKHURST, QLD. 4702

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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
SEWERAGE LAYOUT PLAN
SHEET 1

PLAN NUMBER: SCE-115-019 — REVISION: A

0 20.0m — 1:1000

DO NOT SCALE - ASK IF IN DOUBT

JOINS PLAN SCE-115-019

SEWERAGE LEGEND

- Existing Roadway
- New Asphalt Roadway — Refer Pavement Details
- New Bitumen Roadway — Refer Pavement Details
- New Concrete Roadway — Refer Pavement Details
- Existing Sewer Main and Manhole
- Existing Sewer House Connection
- New Sewer Main and Manhole (Manhole No. and Sewer Line No.) — e.g. 3/2
- New Sewer House Connection (Refer details and CMDG Std Dwg S-030)
- New Sewer Rising Main (Refer details and CMDG Std Dwgs)
- New Sewer Easement (Refer Surveyors Plans)
- Top of Batter
- Toe of Batter
- Finished Surface Contours — 12.0

8

150 uPVC 1 in 150.0

1/2 — 7/1 — 6/1 — 8/1 — 9/1 — 10/1

IL19.98m

IL19.41m

IL19.39m — 5/1

IL18.77m — IL18.79m — 4/1

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

JOINS PLAN SCE-115-021

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ... eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE, 777 YAAMBA ROAD, PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
SEWERAGE LAYOUT PLAN
SHEET 1

PLAN NUMBER: SCE-115-020

REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

JOINS PLAN SCE-115-020

SEWERAGE LEGEND

- Existing Roadway
- New Asphalt Roadway — Refer Pavement Details
- New Bitumen Roadway — Refer Pavement Details
- New Concrete Roadway — Refer Pavement Details
- Existing Sewer Main and Manhole
- Existing Sewer House Connection
- New Sewer Main and Manhole (Manhole No. and Sewer Line No.) — 3/2
- New Sewer House Connection (Refer details and CMDG Std Dwg S-030)
- New Sewer Rising Main (Refer details and CMDG Std Dwgs)
- New Sewer Easement (Refer Surveyors Plans)
- Top of Batter
- Toe of Batter
- Finished Surface Contours — 12.0

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 11 April 2024

4/1
IL18.77m
150 uPVC 1 in 150.0
3/1
IL18.17m
IL18.15m
150 uPVC 1 in 150.0
2/1
IL17.55m
IL17.53m
150 uPVC 1 in 150.0
1/1
IL17.32m
IL17.30m
150 uPVC 1 in 150.0
EX1
IL17.09m
EXISTING SEWER MANHOLE
PRIVATE WORKS QUOTE REQUIRED

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

REVISION

DATUM: AHD
CO-ORD.: GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICATE: Veerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
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DEVELOPMENT DETAILS:
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ABN:34 481 028 699

LILY PLACE ESTATE
SEWERAGE LAYOUT PLAN
SHEET 2

PLAN NUMBER: SCE-115-021
REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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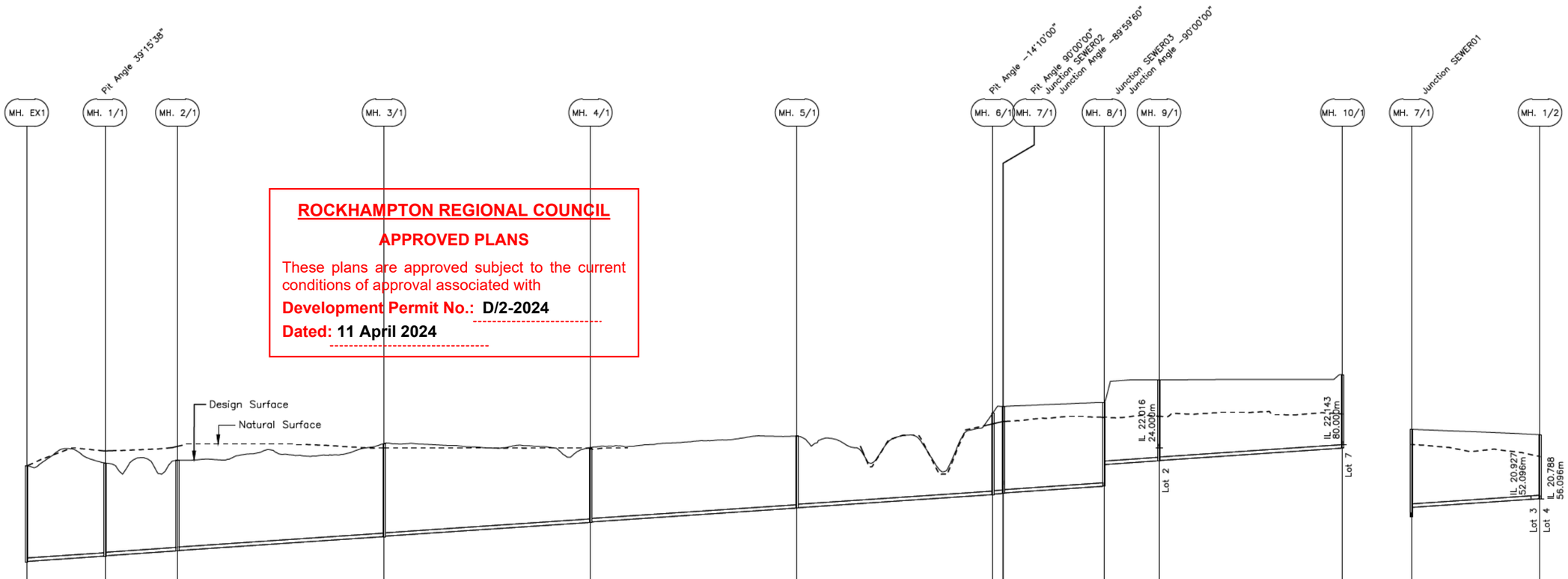
Development Permit No.: **D/2-2024**

Dated: **11 April 2024**



LINE: SEWER01

Datum R.L. 6.000

	PIPE DIAMETER	PIPE GRADE	DEPTH TO INVERT	R.L. OF INVERT	R.L. OF FIN.SURF.	CHAINAGE
MH. EX1			4.205 4.176 4.176	17.040 17.070 17.070	21.245	0.000
	150 dia.	1 in 150				34.157
MH. 1/1			4.052 4.032	17.298 17.318	21.350	34.157
	150 dia.	1 in 150				31.562
MH. 2/1			3.940 3.920	17.528 17.548	21.468	65.719
	150 dia.	1 in 150				90.046
MH. 3/1			4.055 4.035	18.148 18.168	22.203	155.765
	150 dia.	1 in 150				90.000
MH. 4/1			3.259 3.239	18.768 18.788	22.028	245.765
	150 dia.	1 in 150				90.000
MH. 5/1			3.132 3.112	19.388 19.408	22.520	335.765
	150 dia.	1 in 150				85.359
MH. 6/1			3.559 3.539	19.977 19.997	23.537	421.124
	150 dia.	1 in 150				4.500
MH. 7/1			3.793 3.773	20.027 20.047	23.820	425.624
	150 dia.	1 in 150				43.904
MH. 8/1			3.645 2.699	20.340 21.287	23.985	469.527
	150 dia.	1 in 150				24.000
MH. 9/1			3.526 3.506	21.447 21.467	24.972	493.527
	150 dia.	1 in 150				80.000
MH. 10/1			3.200	22.000	25.200	573.527

LINE: SEWER02

Datum R.L. 7.000

	PIPE DIAMETER	PIPE GRADE	DEPTH TO INVERT	R.L. OF INVERT	R.L. OF FIN.SURF.	CHAINAGE
MH. 7/1			3.793 3.394	20.027 20.426	23.820	0.000
	150 dia.	1 in 150				56.096
MH. 1/2			2.788	20.800	23.588	56.096

VERTICAL SCALE: 1:200
HORIZONAL SCALE: 1:2000

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD
CO-ORD. GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR:
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER:
RPEQ CERTIFICAT... eerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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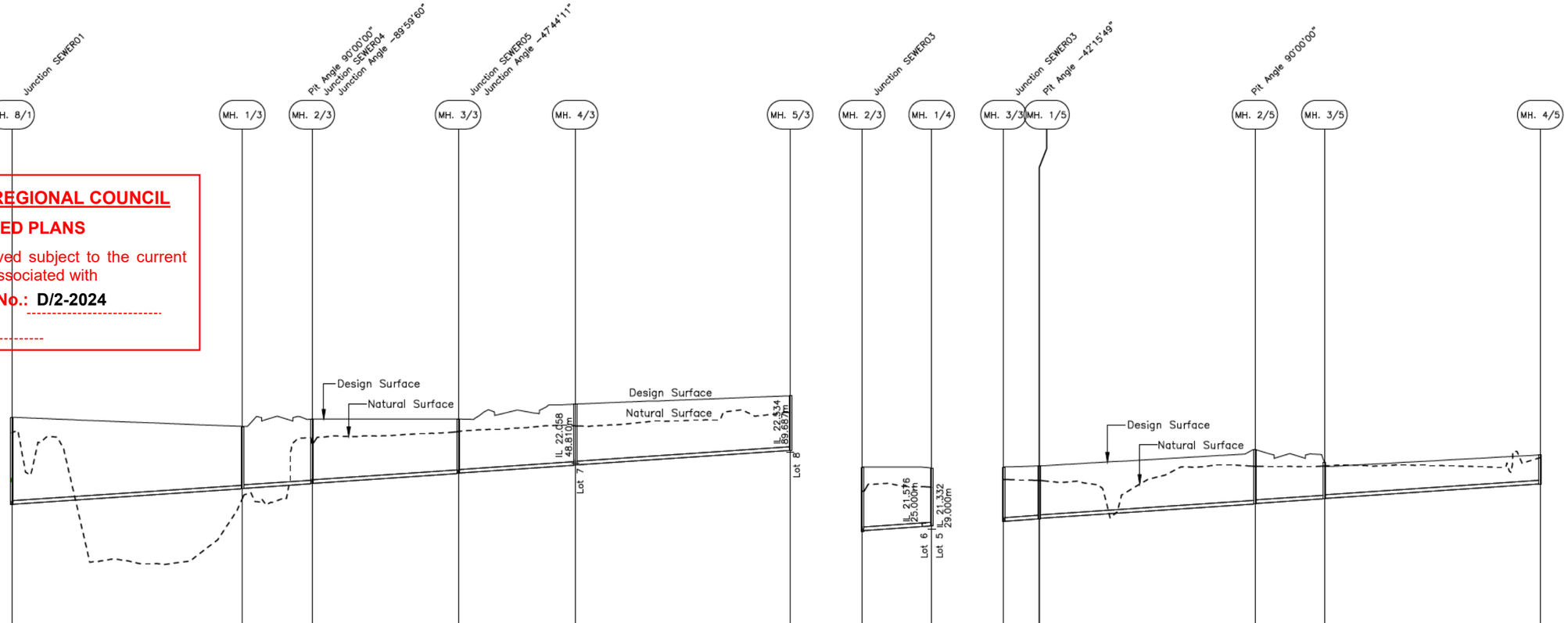
LILY PLACE ESTATE
SEWER LONG SECTION PLAN
SHEET 1

PLAN NUMBER SCE-115-022
REVISION A

1: 2000 VERT
0 25 50
0 2.5 5
1: 200 HORT.
DO NOT SCALE - ASK IF IN DOUBT



VERTICAL SCALE: 1:200
HORIZONAL SCALE: 1:2000

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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DATUM
AHD
CO-ORD.
GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR:
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER:
RPEQ CERTIFICAT eerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
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DEVELOPMENT DETAILS:
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PARKHURST, QLD. 4702

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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
SEWER LONG SECTIONS PLAN
SHEET 2

PLAN NUMBER
SCE-115-023

REVISION
A

1 : 2000 VERT
0 25 50
0 2.5 5
1 : 200 HORT.
DO NOT SCALE - ASK IF IN DOUBT

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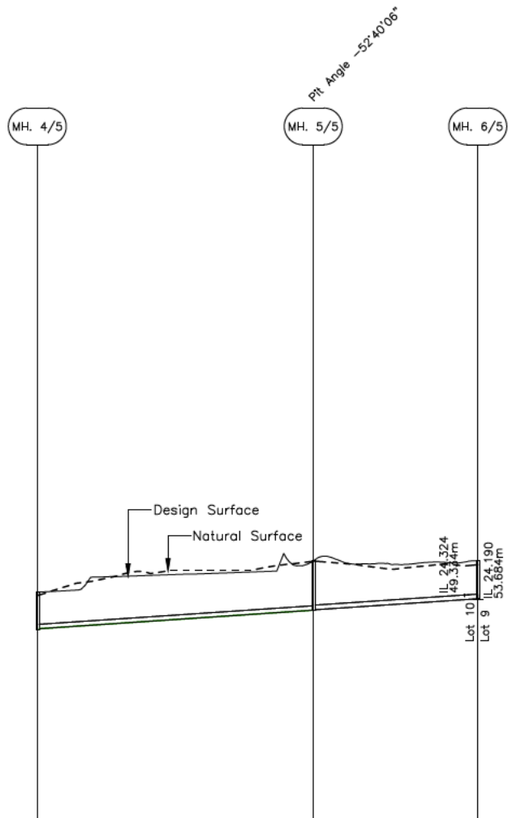

PIPE DIAMETER	150 dia.		150 dia.
PIPE GRADE	1 in 150		1 in 150
LINE	SEWER05		
Datum R.L.	9.000		
DEPTH TO INVERT	1.214 / 1.194	1.615	1.595 / 1.233
R.L. OF INVERT	23.202 / 23.222	23.822	23.842 / 24.200
R.L. OF FIN.SURF.	24.416	25.437	25.433
CHAINAGE	223.864	90.000	313.864 / 53.684 / 367.547

VERTICAL SCALE: 1:200
HORIZONAL SCALE: 1:2000

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD
CO-ORD.: GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR:
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER:
RPEQ CERTIFICAT: eerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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PHONE: 07 4930 2877 (office) 0404 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
SEWER LONG SECTIONS PLAN
SHEET 3

PLAN NUMBER: SCE-115-024
REVISION: A

1:2000 VERT
0 25 50
0 2.5 5
1:200 HORT.
DO NOT SCALE - ASK IF IN DOUBT

ELECTRICAL & WATER RETICULATION LEGEND

- Existing Roadway
- New Bitumen Roadway
  Refer Pavement Details
- New Electrical Main - Underground
  (Concept Layout Only)
- New Electrical Pillar Box - Property Connection
  (Concept Layout Only)
- New mPVC Class 16 Water Reticulation Main
  Refer CMDG Std Dwgs W-040 and W-041
- New Water Fire Hydrant
  Refer CMDG Std Dwg W-060, W-061, W-061A and W-062
- New Water Sluice Valve
  Refer CMDG Std Dwg W-060, W-061, W-061A and W-062
- Top of Batter
- Toe of Batter
- Finished Surface Contours

ELECTRICAL RETICULATION NOTES

1. This electrical conduit layout is a CONCEPTUAL underground electrical design to assist the local authority with the Operational Works Application. Refer certified electrical plans and Ergon Energy URD CONSTRUCTION CIVIL DRAWINGS for trenching and lighting arrangements. The formal electrical design must be completed by Ergon Energy or an Electrical Engineer certified by Ergon Energy.
2. The street lighting design is CONCEPTUAL and is to be formally documented on the design plans completed by Ergon Energy or the certified Electrical Engineer.
3. The contractor shall identify the extent and location of all existing services within or surrounding the works area. All services shall be protected against any damage during construction of the works. The contractor shall be responsible for all costs incurred by any damage to the existing services.
4. All Electricity trenching to be on 0.450m alignment where running parallel with property boundaries, in accordance with Ergon Energy and the local authority policies and requirements.
5. Kerb markers to be installed where conduits cross existing new roadways in accordance with CMDG Std Dwg R-070.

WATER RETICULATION NOTES

1. All pipes are to be mPVC class 16 RRJ to AS 2977 unless noted otherwise and have a minimum 600mm cover.
2. Hydrant and valve installation to be in accordance with local authority standard drawings.
3. Reticulation mains to be laid 2.5m from the property boundary unless otherwise noted on the drawings.
4. For pipes to be laid on curves, the perferred maximum pipe joint deflection per joint shall be 1.5 degrees. (the absolute maximum deflection per joint shall be 3 degrees.)
5. Water conduit crossings shall be aligned from the common boundary of allotments served.
6. uPVC mains to be flushed and tested in accordance with the specification.
7. All valves and reducers at water main junctions shall be flange - flange jointed unless noted otherwise.
8. All bends, tees and deadends are to have thrust blocks as per local authority standard drawings and must be DICL socketed minimum
9. For thrust block details, refer local authority standard drawings.
10. Conduits under roadways shall be 100mm dia. uPVC SN8 conduit sealed each end with heavy duty plastic tape. Refer local authority standard drawings.
11. Service marker stake and brass indicator discs to be installed as per local authority standard drawings.
12. All fittings and elongated gibaults are to comprise stainless steel bolts.
13. Hydrant locations to be marked as per local authority standard drawings.
14. Water mains and service conduits to be laid in accordance with local authority standard drawings.
15. Marker tape (200mm with tracer wire for electro detection) shall be provided over all watermains and services.
16. End caps and fire hydrants to be provided for water mains at end of stages if stages completed separately, as per local authority guidelines.

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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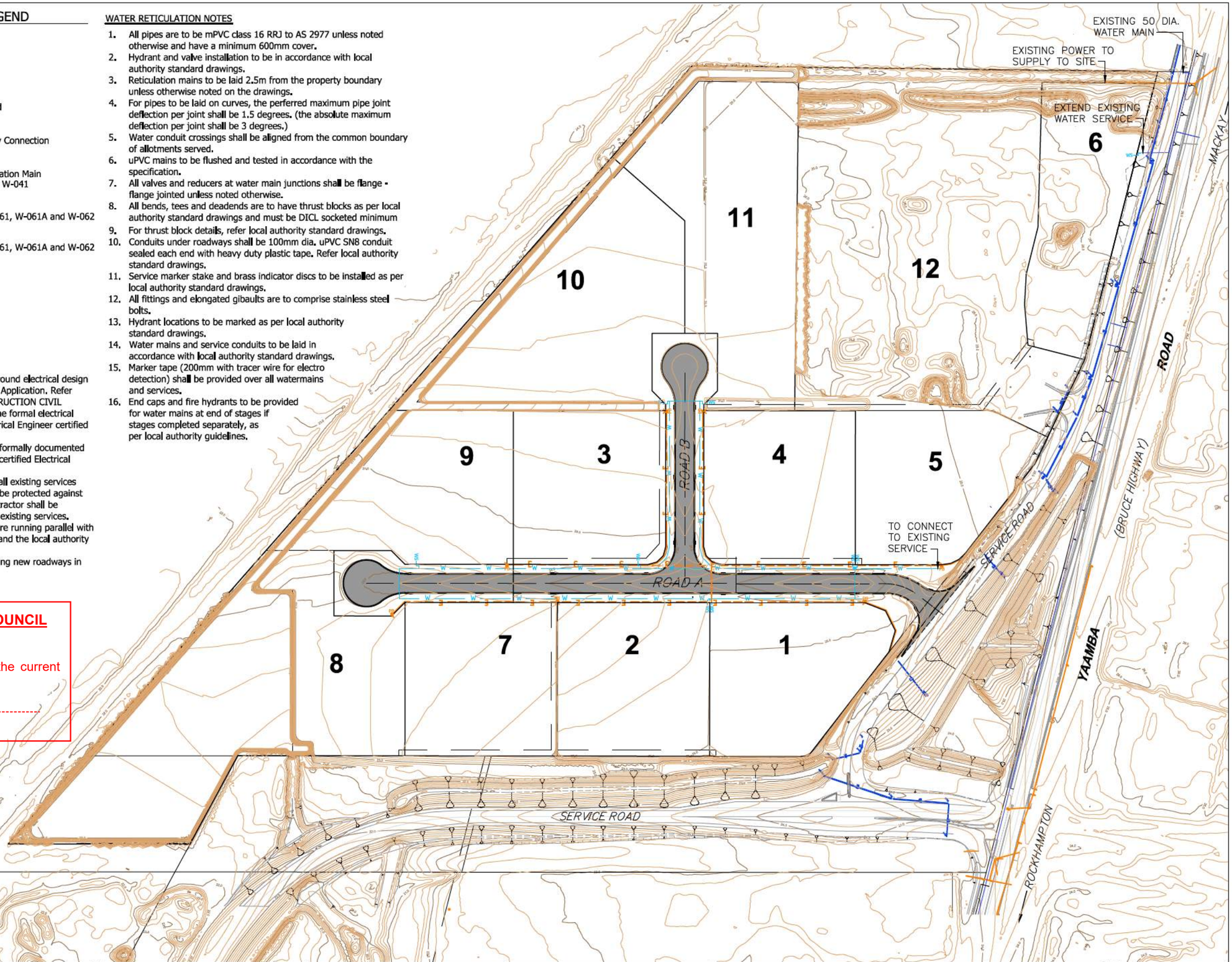
Development Permit No.: D/2-2024

Dated: 11 April 2024



ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM AHD
CO-ORD. GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICATE: Veerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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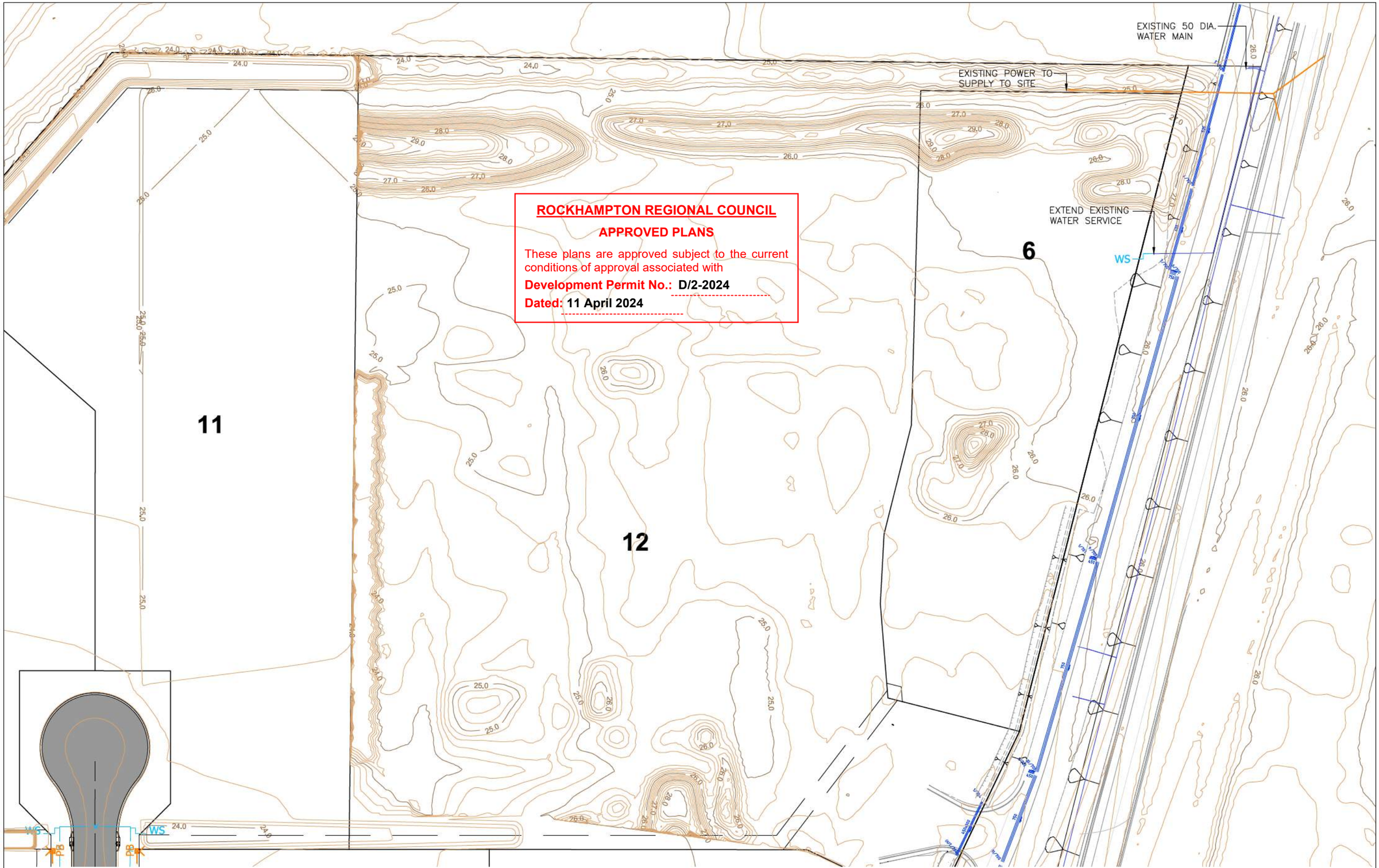
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703
ABN:34 481 028 699

LILY PLACE INDUSTRIAL ESTATE
WATER & ELECTRICAL SERVICES PLAN
GENERAL LAYOUT

PLAN NUMBER: SCE-115-025
REVISION: A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT



JOINS PLAN SCE-115-027

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD
CO-ORD.: GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting
RPEQ CERTIFICAT: Veerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST PTY LTD
DEVELOPMENT DETAILS: LILY PLACE ESTATE, 777 YAAMBA ROAD, PARKHURST, QLD. 4702

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ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

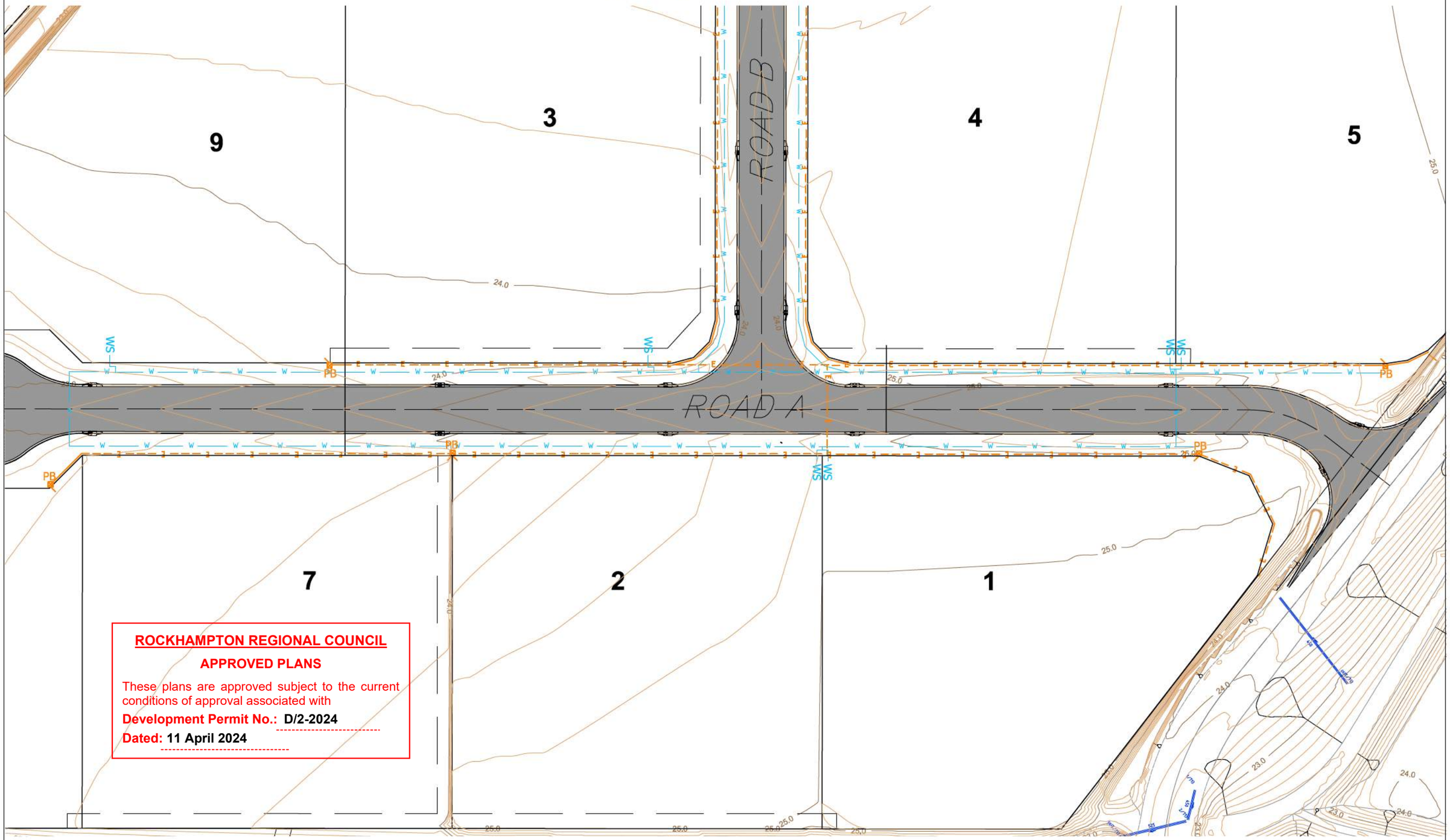
LILY PLACE INDUSTRIAL ESTATE
WATER & ELECTRICAL SERVICES PLAN
SHEET 1

PLAN NUMBER: SCE-115-026
REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

JOINS PLAN SCE-115-026



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWE	DWE	06/20	DA APPLICATION

DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting

RPEQ CERTIFICAT ...eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
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LILY PLACE INDUSTRIAL ESTATE
WATER & ELECTRICAL SERVICES PLAN
SHEET 2

PLAN NUMBER: SCE-115-027

REVISION: A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

APPENDIX F – HYDRAULIC AND HYDROLOGY ANALYSIS

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

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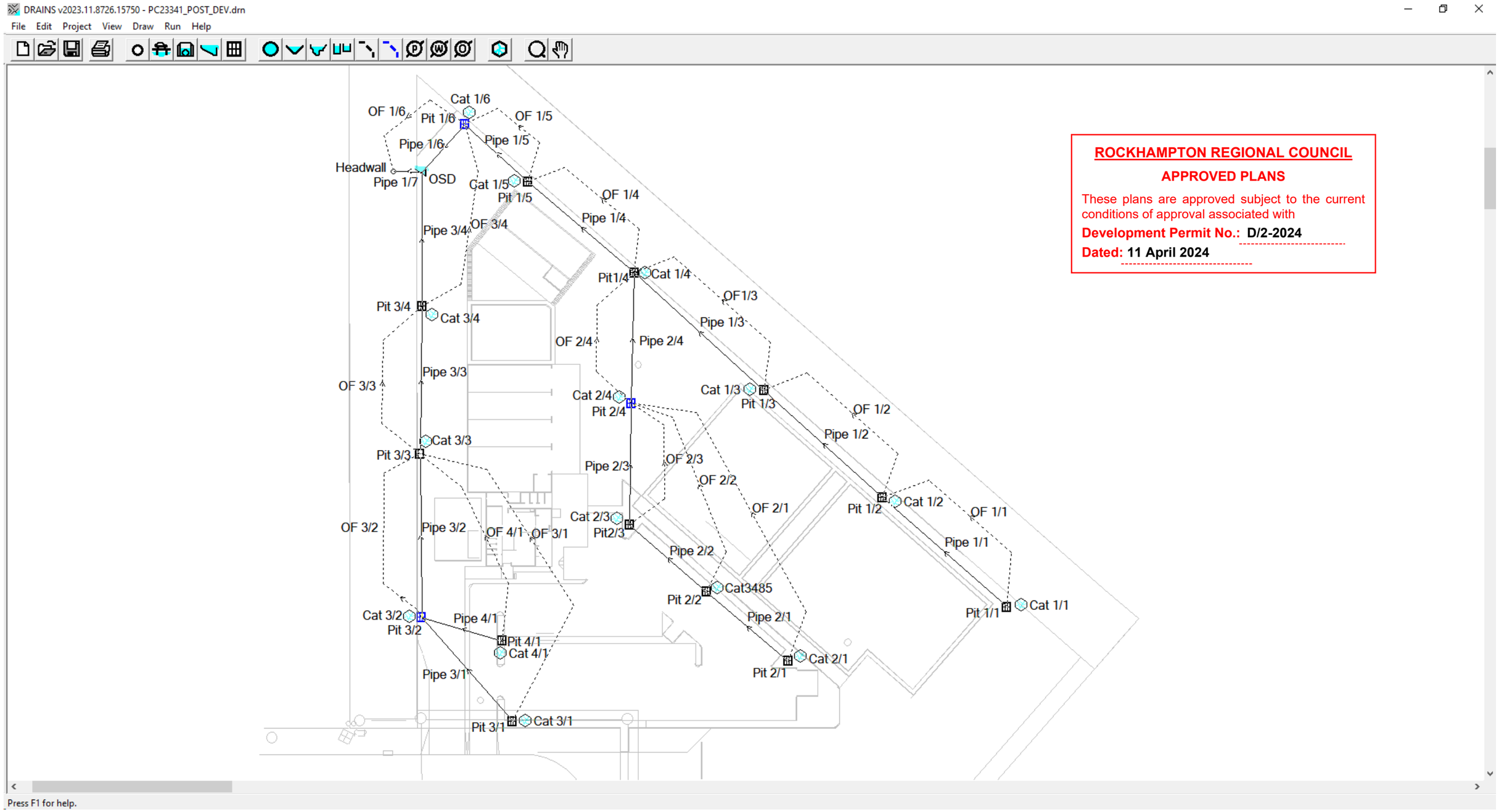
Dated: 11 April 2024

DRAINS MODEL SET UP

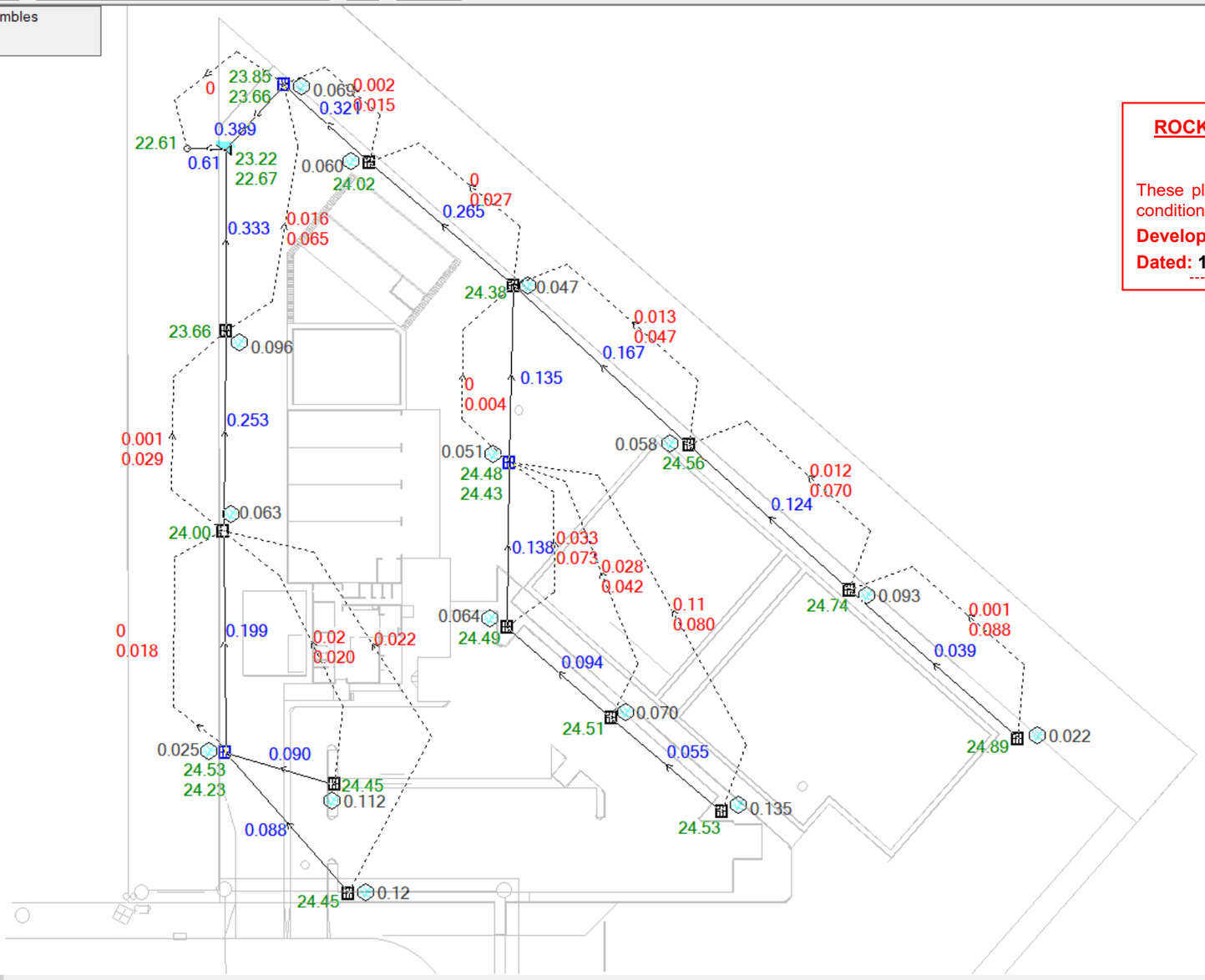


1% AEP RESULTS

DRAINS v2023.11.8726.15750 - PC23341_POST_DEV.drn

File Edit Project View Draw Run Help

Results for median storm in critical 1% AEP ensembles using Full Unsteady hydraulic model.



ROCKHAMPTON REGIONAL COUNCIL

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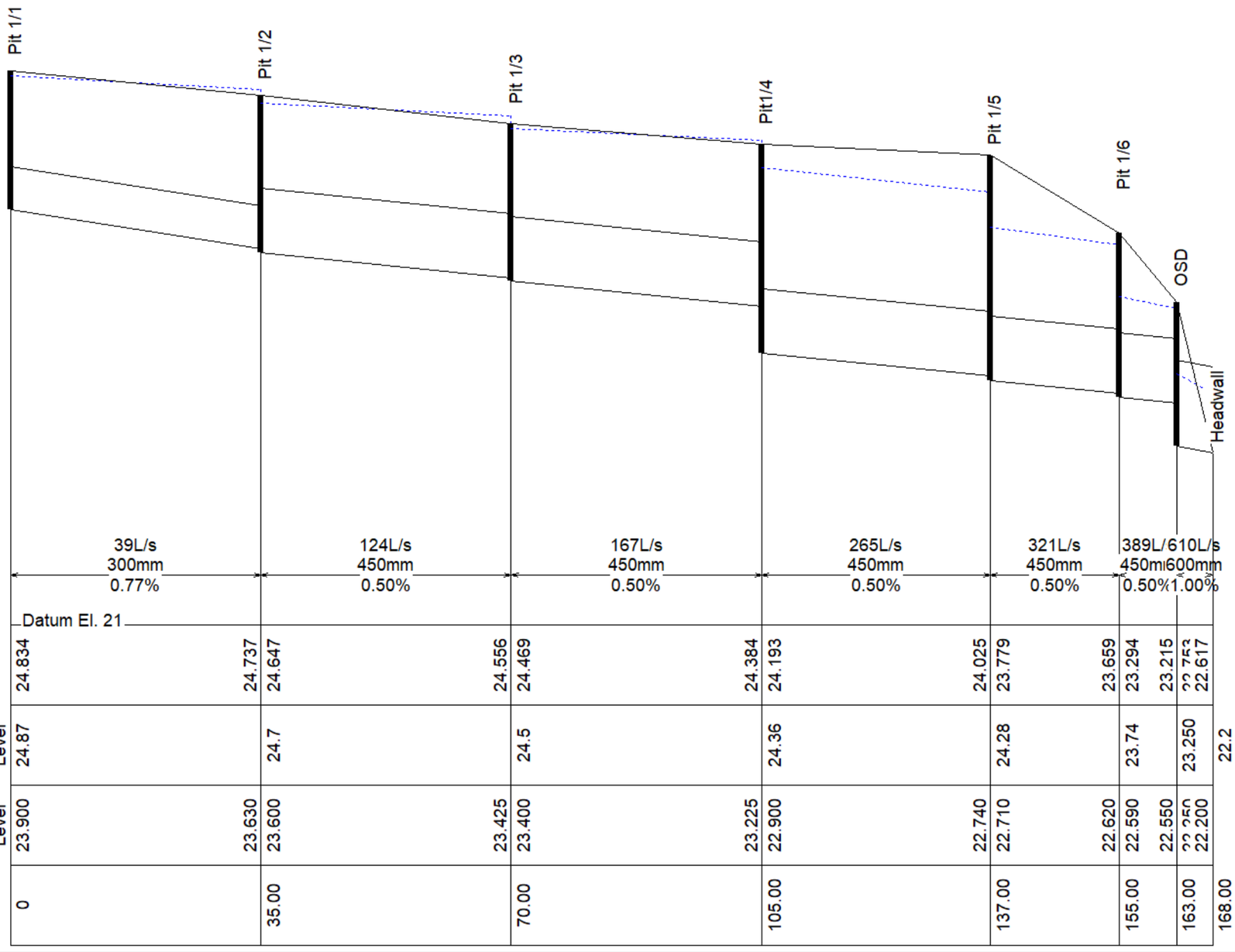
Dated: 11 April 2024

Results of Full Unsteady Hydraulic Analysis for major storms

1% AEP LONGSECTIONS

Long Section Drawing - Preview



Chainage	Invert Level	Surface Level	HGL
0	23.900	24.87	24.834
			24.737
35.00	23.600	24.7	24.647
	23.630		24.556
70.00	23.400	24.5	24.469
	23.425		24.384
105.00	22.900	24.36	24.193
	23.225		24.025
137.00	22.710	24.28	23.779
	22.740		23.659
155.00	22.590	23.74	23.294
	22.620		23.215
163.00	22.200	23.250	22.752
	22.550		22.617
168.00		22.2	

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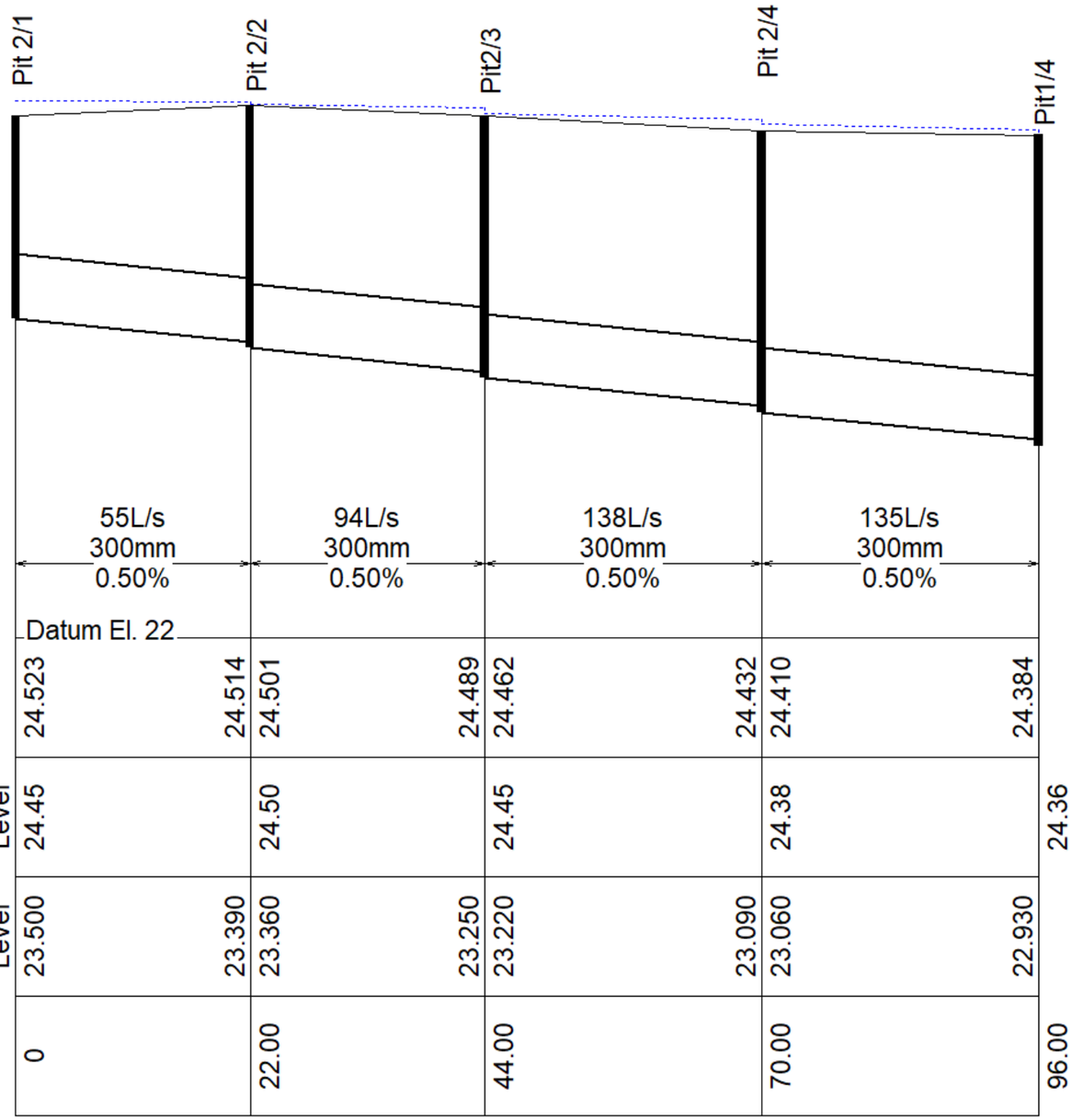
Long Section Drawing - Preview



Chainage	Invert Level	Surface Level	HGL
0	23.500	24.45	24.523
22.00	23.390		24.514
	23.360	24.50	24.501
44.00	23.250		24.489
	23.220	24.45	24.462
70.00	23.090		24.432
	23.060	24.38	24.410
96.00	22.930	24.36	24.384

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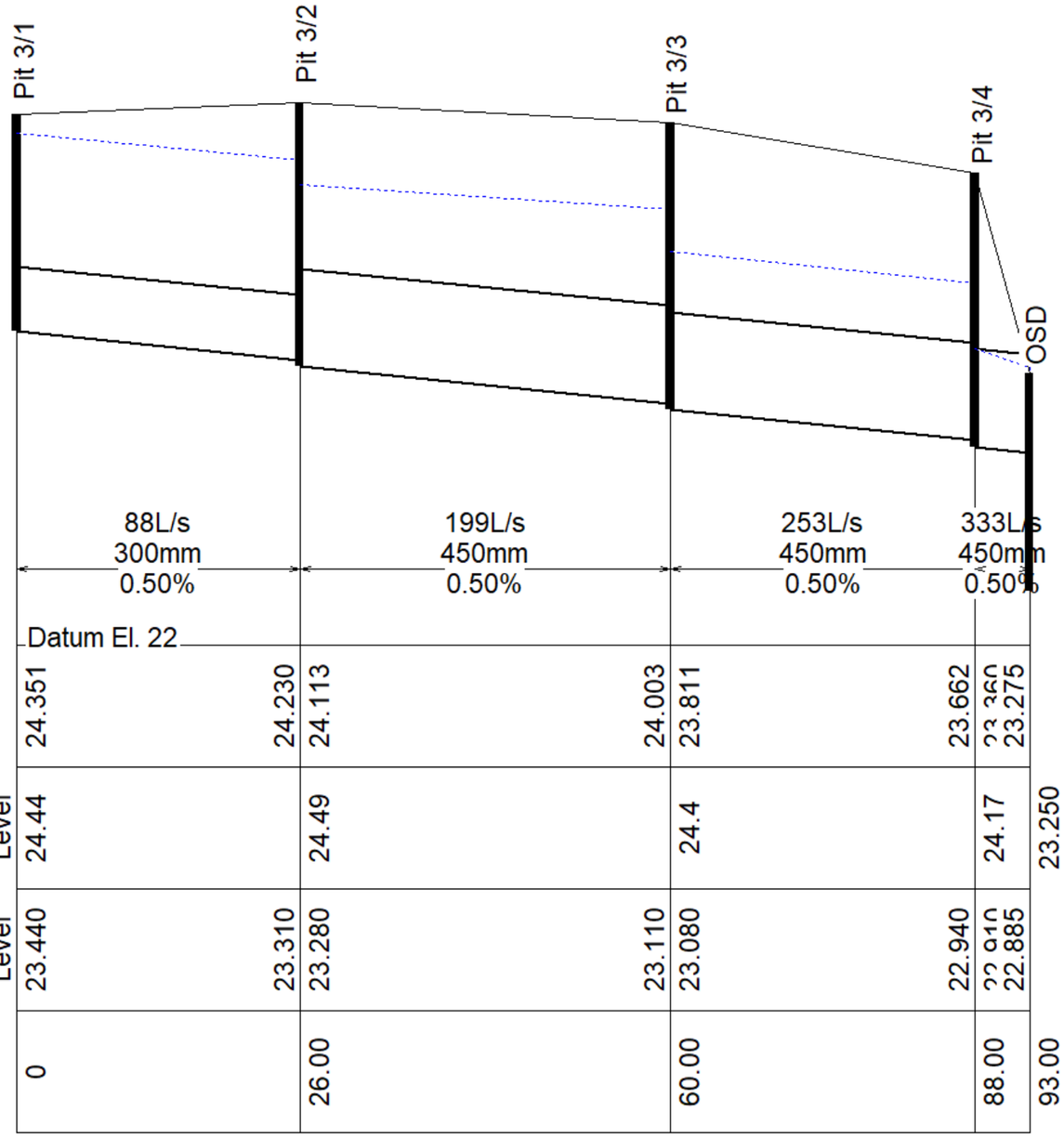
Long Section Drawing - Preview



Chainage	Invert Level	Surface Level	HGL
0	23.440	24.44	24.351
			24.230
26.00	23.280	24.49	24.113
			24.003
60.00	23.080	24.4	23.811
			23.662
88.00	22.940	24.17	23.360
	22.885		23.275
93.00		23.250	

ROCKHAMPTON REGIONAL COUNCIL

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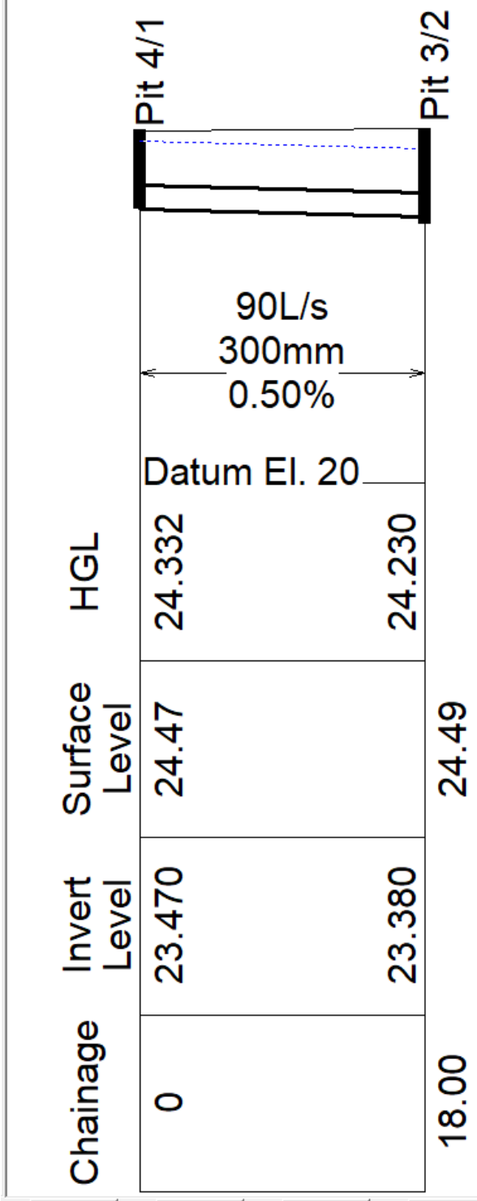
Long Section Drawing - Preview



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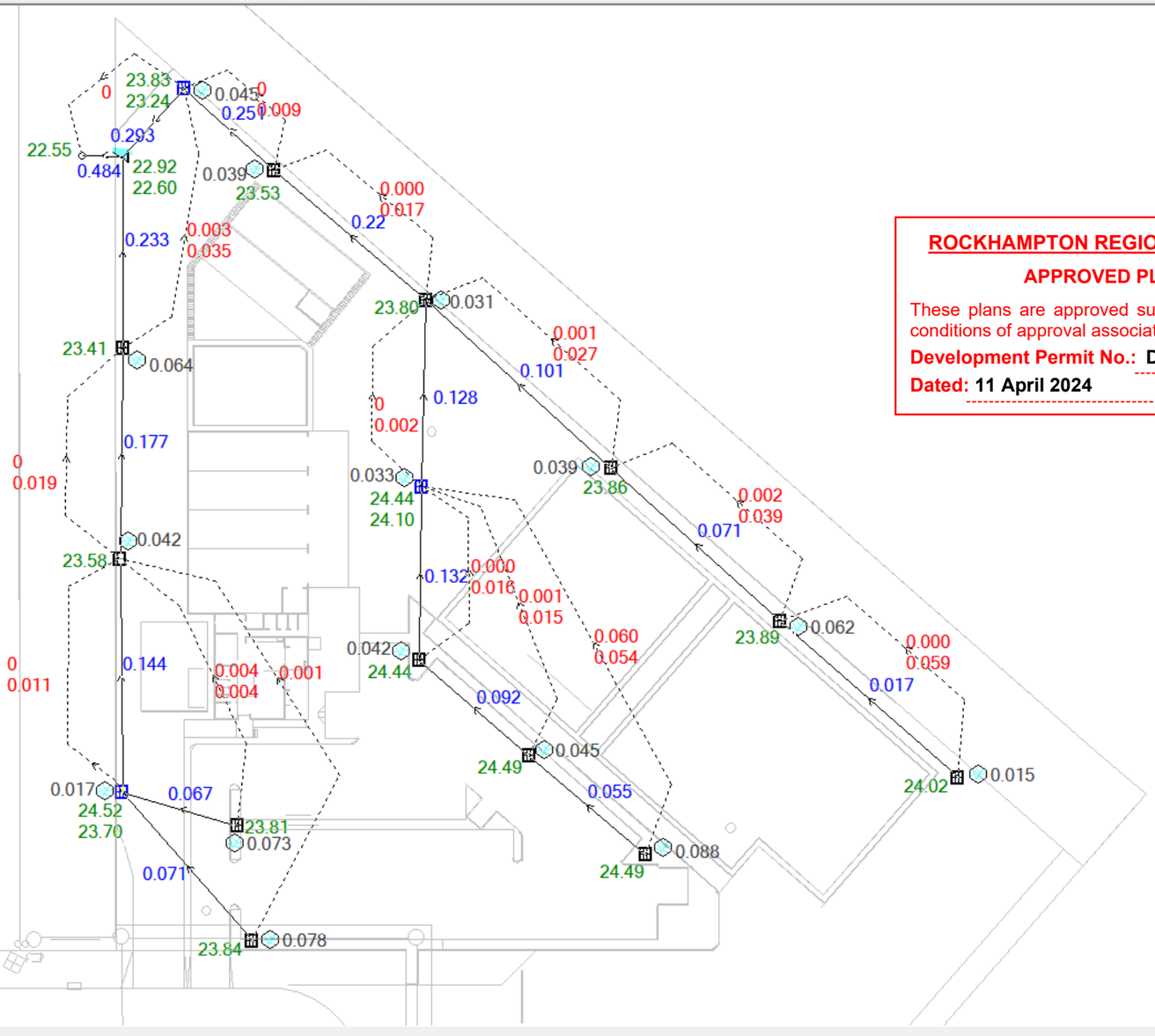
10% AEP RESULTS

DRAINS v2023.11.8726.15750 - PC23341_POST_DEV.drn

File Edit Project View Draw Run Help

Results for median storm in critical 10% AEP ensembles using Full Unsteady hydraulic model.



ROCKHAMPTON REGIONAL COUNCIL

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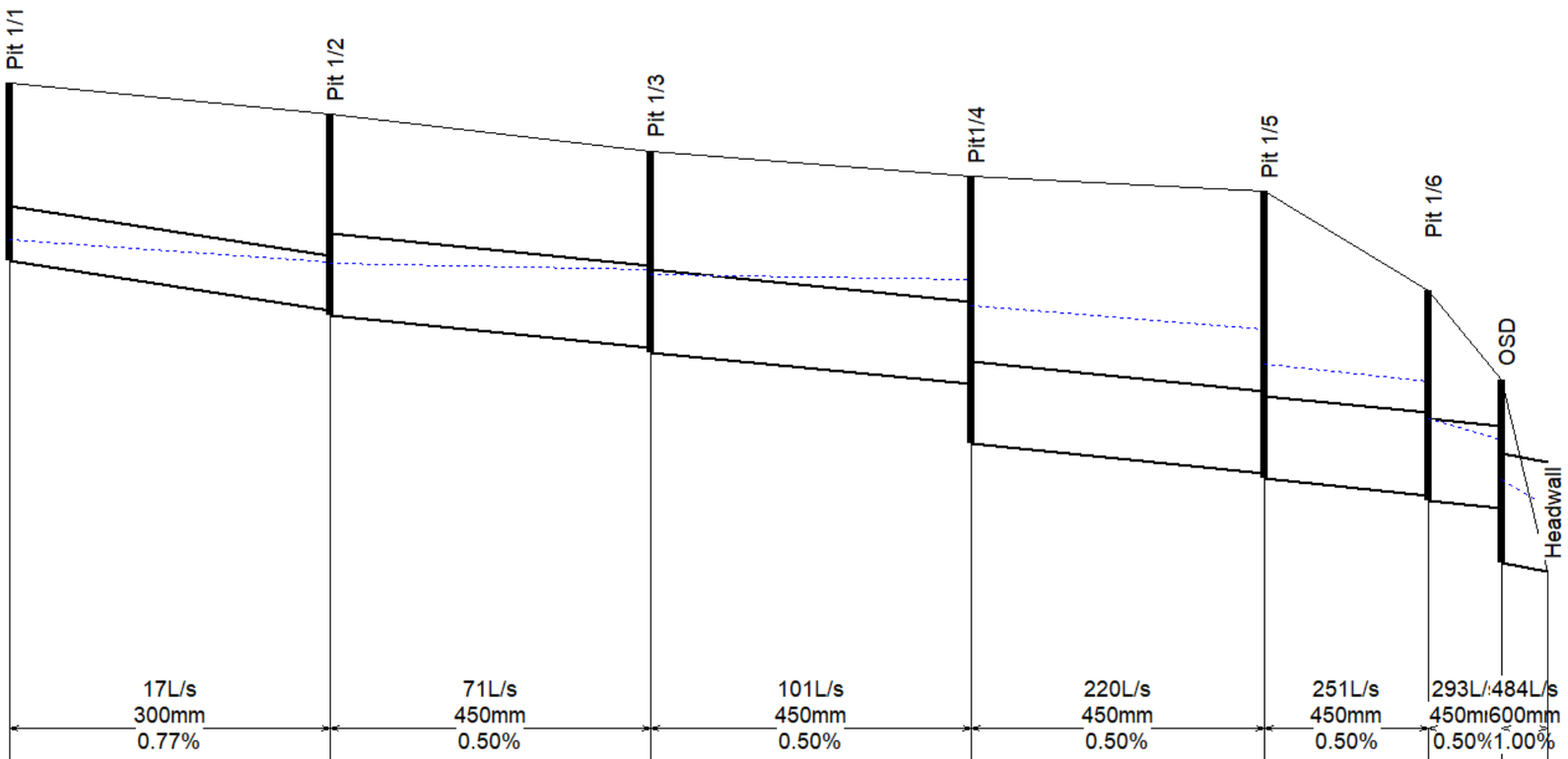
Dated: 11 April 2024

Results of Full Unsteady Hydraulic Anaysis for minor storms

10% AEP LONG SECTIONS

Long Section Drawing - Preview



Chainage	Invert Level	Surface Level	HGL
0	23.900	24.87	24.016
	23.630		23.892
35.00	23.600	24.7	23.884
	23.425		23.856
70.00	23.400	24.5	23.827
	23.225		23.798
105.00	22.900	24.36	23.654
	22.740		23.527
137.00	22.710	24.28	23.337
	22.620		23.243
155.00	22.590	23.74	23.040
	22.550		22.926
163.00	22.250	23.250	22.703
	22.200		22.553
168.00		22.2	

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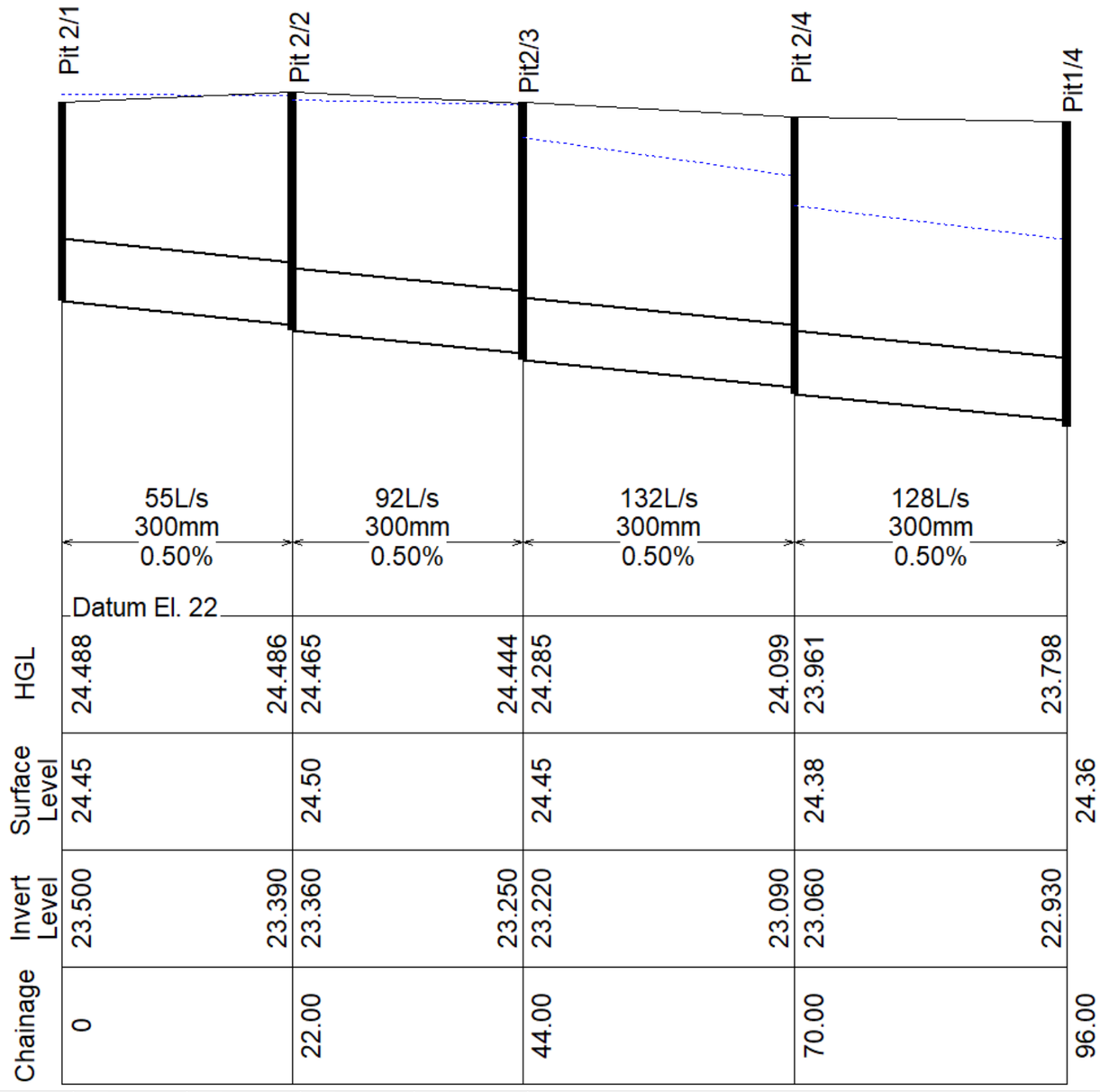
Long Section Drawing - Preview



Chainage	Invert Level	Surface Level	HGL
0	23.500	24.45	24.488
	23.390		24.486
22.00	23.360	24.50	24.465
	23.250		24.444
44.00	23.220	24.45	24.285
	23.090		24.099
70.00	23.060	24.38	23.961
	22.930		23.798
96.00		24.36	

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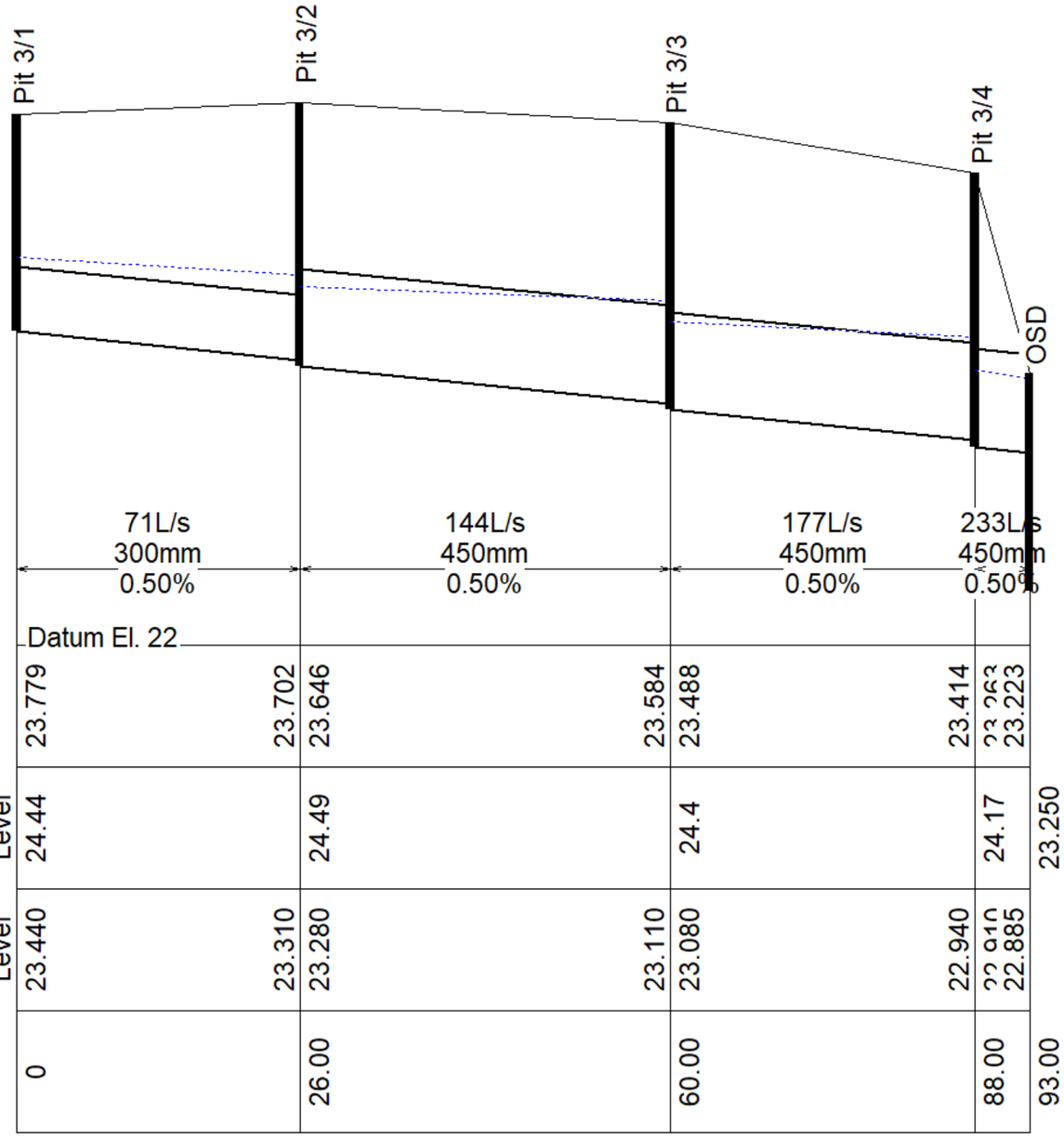

Chainage	Invert Level	Surface Level
0	23.440	24.44
26.00	23.310	24.49
60.00	23.280	24.4
88.00	23.110	24.17
93.00	23.080	23.250
	22.940	
	22.885	

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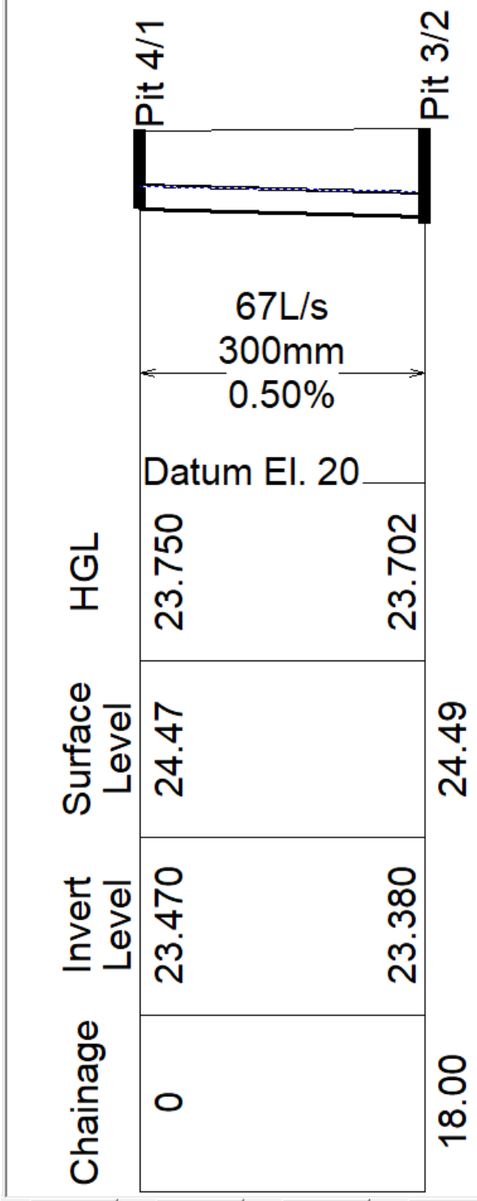

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1% AEP

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Pit 1/1	24.89		0.024		0	0.001	Outlet System
Pit 1/2	24.74		0.045		0	0.012	Outlet System
Pit 1/3	24.56		0.047		0	0.013	Outlet System
Pit1/4	24.38		0.051		0	0	Outlet System
Pit 1/5	24.02		0.058		0.26	0.002	Inlet Capacity
Pit 1/6	23.66	23.85	0.065	3.5	0.08	0	Inlet Capacity
Headwall	22.61		0				
Pit 3/1	24.45		0.133		0	0.022	Outlet System
Pit 3/2	24.23	24.53	0.028	0.6	0.26	0	Inlet Capacity
Pit 3/3	24		0.116		0.4	0.001	Inlet Capacity
Pit 3/4	23.66		0.092		0.51	0.016	Inlet Capacity
Pit 4/1	24.45		0.124		0.02	0.02	Inlet Capacity
Pit 2/1	24.53		0.149		0	0.11	Outlet System
Pit 2/2	24.51		0.077		0	0.028	Outlet System
Pit2/3	24.49		0.071		0	0.033	Outlet System
Pit 2/4	24.43	24.48	0.254	6.9	0	0	Outlet System

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat 1/1	0.022	0.022	0	2	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/2	0.093	0.093	0	4	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/3	0.058	0.058	0	3	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/4	0.047	0.047	0	3	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/5	0.06	0.06	0	4	2	2	1% AEP, 5 min burst, Storm 1
Cat 1/6	0.069	0.069	0	4	2	2	1% AEP, 5 min burst, Storm 1
Cat 3/1	0.12	0.111	0.009	4	5	2	1% AEP, 5 min burst, Storm 1
Cat 3/2	0.025	0.025	0	1	0	2	1% AEP, 5 min burst, Storm 1
Cat 3/3	0.063	0.063	0	4	0	2	1% AEP, 5 min burst, Storm 1
Cat 3/4	0.096	0.096	0	4	0	2	1% AEP, 5 min burst, Storm 1
Cat 4/1	0.112	0.103	0.008	4	5	2	1% AEP, 5 min burst, Storm 1
Cat 2/1	0.135	0.125	0.01	4	5	2	1% AEP, 5 min burst, Storm 1
Cat3485	0.07	0.065	0.005	3	5	2	1% AEP, 5 min burst, Storm 1
Cat 2/3	0.064	0.06	0.005	3	5	2	1% AEP, 5 min burst, Storm 1
Cat 2/4	0.051	0.047	0.004	2	5	2	1% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe 1/1	0.039	0.55	24.834	24.737	1% AEP, 5 min burst, Storm 1

Pipe 1/2	0.124	0.78	24.647	24.556	1% AEP, 5 min burst, Storm 1
Pipe 1/3	0.167	1.05	24.469	24.384	1% AEP, 5 min burst, Storm 1
Pipe 1/4	0.265	1.67	24.193	24.025	1% AEP, 5 min burst, Storm 1
Pipe 1/5	0.321	2.02	23.779	23.659	1% AEP, 5 min burst, Storm 1
Pipe 1/6	0.389	2.44	23.294	23.215	1% AEP, 5 min burst, Storm 1
Pipe 1/7	0.61	2.91	22.753	22.617	1% AEP, 10 min burst, Storm 7
Pipe 3/1	0.088	1.25	24.351	24.23	1% AEP, 5 min burst, Storm 1
Pipe 3/2	0.199	1.25	24.113	24.003	1% AEP, 5 min burst, Storm 1
Pipe 3/3	0.253	1.59	23.811	23.662	1% AEP, 5 min burst, Storm 1
Pipe 3/4	0.333	2.27	23.36	23.275	1% AEP, 5 min burst, Storm 1
Pipe 4/1	0.09	1.27	24.332	24.23	1% AEP, 5 min burst, Storm 1
Pipe 2/1	0.055	0.77	24.523	24.514	1% AEP, 15 min burst, Storm 1
Pipe 2/2	0.094	1.33	24.501	24.489	1% AEP, 15 min burst, Storm 5
Pipe 2/3	0.138	1.95	24.462	24.432	1% AEP, 10 min burst, Storm 7
Pipe 2/4	0.135	1.9	24.41	24.384	1% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF 1/1	0.001	0.088	1.721	0.114	0.08	2.96	0.67	1% AEP, 5 min burst, Storm 1
OF 1/2	0.012	0.07	1.856	0.105	0.07	2.64	0.64	1% AEP, 5 min burst, Storm 1
OF1/3	0.013	0.047	1.555	0.097	0.05	2.38	0.59	1% AEP, 5 min burst, Storm 1
OF 1/4	0	0.027	1.229	0.089	0.04	2.1	0.54	1% AEP, 5 min burst, Storm 1
OF 1/5	0.002	0.015	2.092	0.042	0.04	0.52	1.05	1% AEP, 5 min burst, Storm 1
OF 1/6	0	0	1.205	0	0	0	0	
OF 3/1	0.022	0.02	0.076	0.033	0.01	9.99	0.32	1% AEP, 10 min burst, Storm 10
OF 3/2	0	0.018	1.555	0.075	0.03	1.64	0.5	1% AEP, 5 min burst, Storm 1
OF 3/3	0.001	0.029	1.997	0.079	0.04	1.78	0.57	1% AEP, 5 min burst, Storm 1
OF 3/4	0.016	0.065	2.483	0.081	0.07	1.83	0.86	1% AEP, 5 min burst, Storm 1
OF 4/1	0.02	0.02	0.115	0.024	0	8.1	0.31	1% AEP, 10 min burst, Storm 10
OF 2/1	0.11	0.08	0.091	0.036	0.02	10.25	0.47	1% AEP, 10 min burst, Storm 3
OF 2/2	0.028	0.042	0.15	0.019	0.01	7.05	0.34	1% AEP, 5 min burst, Storm 1
OF 2/3	0.033	0.073	0.115	0.02	0.01	7.34	0.35	1% AEP, 20 min burst, Storm 10
OF 2/4	0	0.004	0.212	0.009	0	5.1	0.2	1% AEP, 10 min burst, Storm 7

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD	23.22	96.5	0.61	0.61	0

Run Log for DRAINS v2023.11.8726.15750 - PC23341_POST_DEV

{\colortbl;\red0\green0\blue0;\red192\green0\blue0;}Run Log for DRAINS v2023.11.8726.15750 - PC23341_POST_DEV.drn run at 17:25:58 on 19/2/2024 using Watercom Drains v2023.11.8726.15750

Upwelling occurred at: Pit 2/4, Pit 2/1

Freeboard was less than 0.15m at Pit 1/6, Pit 2/2, Pit 4/1, Pit 3/1, Pit 1/1, Pit 1/2, Pit 1/3, Pit2/3, Pit1/4

Flows were safe in all overflow routes.

1% AEP

Results of a simplified bottom up HGL analysis.
This provides a simple analysis that can be checked manually. It is useful where Council insists on a manual check on HGLs.
The HGLs shown here may be different to the more accurate values normally calculated by Drains.
This simplified analysis assumes the maximum flows and HGLs throughout the system occur at the same time. In fact, in different parts of the system, they may occur during different storms, or even at different times within the one storm, and that flow is steady.

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat 1/1	0.022	0.022	0	2	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/2	0.093	0.093	0	4	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/3	0.058	0.058	0	3	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/4	0.047	0.047	0	3	0	2	1% AEP, 5 min burst, Storm 1
Cat 1/5	0.06	0.06	0	4	2	2	1% AEP, 5 min burst, Storm 1
Cat 1/6	0.069	0.069	0	4	2	2	1% AEP, 5 min burst, Storm 1
Cat 3/1	0.12	0.111	0.009	4	5	2	1% AEP, 5 min burst, Storm 1
Cat 3/2	0.025	0.025	0	1	0	2	1% AEP, 5 min burst, Storm 1
Cat 3/3	0.063	0.063	0	4	0	2	1% AEP, 5 min burst, Storm 1
Cat 3/4	0.096	0.096	0	4	0	2	1% AEP, 5 min burst, Storm 1
Cat 4/1	0.112	0.103	0.008	4	5	2	1% AEP, 5 min burst, Storm 1
Cat 2/1	0.135	0.125	0.01	4	5	2	1% AEP, 5 min burst, Storm 1
Cat3485	0.07	0.065	0.005	3	5	2	1% AEP, 5 min burst, Storm 1
Cat 2/3	0.064	0.06	0.005	3	5	2	1% AEP, 5 min burst, Storm 1
Cat 2/4	0.051	0.047	0.004	2	5	2	1% AEP, 5 min burst, Storm 1

PIPE DETAILS

Pipe	Flow (cu.m/s)	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Int. Dia (mm)	Rough (mm)	Nom.Capacity (cu.m/s)	V (m/sec)	D/S HGL (m)	Friction Loss (m)	U/S HGL (m)
Pipe 1/6	0.389	8	22.59	22.55	0.5	450	0.3	0.246	2.4	23	0.04	23.04
Pipe 1/5	0.321	18	22.71	22.62	0.5	450	0.3	0.246	2	23.497	0.153	23.65
Pipe 1/4	0.265	32	22.9	22.74	0.5	450	0.3	0.246	1.7	23.961	0.187	24.148
Pipe 2/4	0.135	26	23.06	22.93	0.5	300	0.3	0.085	1.9	24.361	0.326	24.688
Pipe 2/3	0.138	26	23.22	23.09	0.5	300	0.3	0.085	2	24.965	0.343	25.307
Pipe 2/2	0.094	22	23.36	23.25	0.5	300	0.3	0.085	1.3	25.598	0.137	25.735
Pipe 2/1	0.055	22	23.5	23.39	0.5	300	0.3	0.085	0.8	25.871	0.047	25.919
Pipe 3/4	0.333	5	22.91	22.885	0.5	450	0.3	0.246	2.3	23.335	0.025	23.36
Pipe 3/3	0.253	28	23.08	22.94	0.5	450	0.3	0.246	1.6	23.696	0.149	23.845
Pipe 3/2	0.199	34	23.28	23.11	0.5	450	0.3	0.246	1.2	24.039	0.113	24.151
Pipe 4/1	0.09	18	23.47	23.38	0.5	300	0.3	0.085	1.3	24.271	0.103	24.373
Pipe 3/1	0.088	26	23.44	23.31	0.5	300	0.3	0.085	1.3	24.271	0.143	24.414
Pipe 1/3	0.167	35	23.4	23.225	0.5	450	0.3	0.246	1.1	24.361	0.083	24.444
Pipe 1/2	0.124	35	23.6	23.425	0.5	450	0.3	0.246	0.8	24.529	0.047	24.576

PIT & NODE DETAILS

Node	Headloss Coeff (Ku)	Shock Loss (m)	HGL (m)	Free-board	Overflow (cu.m/s)
Headwall			22.614		
OSD			22.667		
Pit 1/6	1.5	0.457	23.497	0.24	0
Pit 1/5	1.5	0.311	23.961	0.32	0.002
Pit1/4	1.5	0.213	24.361	0	0
Pit 2/4	1.5	0.277	24.965	-0.58	0
Pit2/3	1.5	0.291	25.598	-1.15	0.033
Pit 2/2	1.5	0.136	25.871	-1.37	0.028
Pit 2/1	1.5	0.046	25.964	-1.51	0.11
Pit 3/4	1.5	0.336	23.696	0.48	0.016
Pit 3/3	1.5	0.194	24.039	0.36	0.001
Pit 3/2	1.5	0.119	24.271	0.22	0
Pit 4/1	1.5	0.124	24.498	-0.03	0.02
Pit 3/1	1.5	0.12	24.534	-0.09	0.022
Pit 1/3	1.5	0.085	24.529	-0.03	0.013
Pit 1/2	1.5	0.047	24.623	0.08	0.012

Pipe 1/1	0.039	35	23.9	23.63	0.77	300	0.3	0.105	0.6	24.623	0.039	24.662	Pit 1/1	1.5	0.023	24.686	0.19	0.001

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF 1/1	0.001	0.182	1.721	0.148	0.11	4.09	0.71	1% AEP, 5 min burst, Storm 1
OF 1/2	0.012	0.129	1.856	0.128	0.09	3.43	0.71	1% AEP, 5 min burst, Storm 1
OF1/3	0.013	0.09	1.555	0.121	0.07	3.18	0.57	1% AEP, 5 min burst, Storm 1
OF 1/4	0	0.057	1.229	0.113	0.05	2.9	0.43	1% AEP, 5 min burst, Storm 1
OF 1/5	0.002	0.029	2.092	0.06	0.07	1.14	1.13	1% AEP, 5 min burst, Storm 1
OF 1/6	0	0	1.205	0	0	0	0	
OF 3/1	0.022	0.02	0.076	0.029	0	9.14	0.13	1% AEP, 10 min burst, Storm 10
OF 3/2	0	0.037	1.555	0.091	0.04	2.16	0.49	1% AEP, 5 min burst, Storm 1
OF 3/3	0.001	0.058	1.997	0.097	0.06	2.37	0.64	1% AEP, 5 min burst, Storm 1
OF 3/4	0.016	0.117	2.483	0.113	0.1	2.92	0.88	1% AEP, 5 min burst, Storm 1
OF 4/1	0.02	0.027	0.115	0.027	0	8.67	0.18	1% AEP, 10 min burst, Storm 10
OF 2/1	0.11	0.105	0.091	0.054	0.01	12.09	0.25	1% AEP, 10 min burst, Storm 3
OF 2/2	0.028	0.067	0.15	0.035	0.01	10.21	0.29	1% AEP, 5 min burst, Storm 1
OF 2/3	0.033	0.099	0.115	0.041	0.01	10.8	0.34	1% AEP, 20 min burst, Storm 10
OF 2/4	0	0.009	0.212	0.013	0	5.86	0.2	1% AEP, 10 min burst, Storm 7

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

10% AEP

DRAINS results prepared from Version 2023.11.8726.15750

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
Pit 1/1	24.02		0.016		0.85	0	Inlet Capacity
Pit 1/2	23.89		0.03		0.81	0.002	Inlet Capacity
Pit 1/3	23.86		0.025		0.64	0.001	Inlet Capacity
Pit1/4	23.8		0.017		0.56	0	None
Pit 1/5	23.53		0.03		0.75	0	None
Pit 1/6	23.24	23.83	0.032	2.1	0.5	0	Inlet Capacity
Headwall	22.55		0				
Pit 3/1	23.84		0.088		0.6	0.001	Inlet Capacity
Pit 3/2	23.7	24.52	0.018	0.3	0.79	0	Inlet Capacity
Pit 3/3	23.58		0.04		0.82	0	None
Pit 3/4	23.41		0.059		0.76	0.003	Inlet Capacity
Pit 4/1	23.81		0.082		0.66	0.004	Inlet Capacity
Pit 2/1	24.49		0.099		0	0.06	Outlet System
Pit 2/2	24.49		0.051		0.01	0.001	Inlet Capacity
Pit2/3	24.44		0.047		0.01	0	None
Pit 2/4	24.1	24.44	0.092	2.6	0.28	0	Inlet Capacity

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat 1/1	0.015	0.015	0	2	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/2	0.062	0.062	0	4	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/3	0.039	0.039	0	3	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/4	0.031	0.031	0	3	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/5	0.039	0.039	0	4	2	2	10% AEP, 5 min burst, Storm 1
Cat 1/6	0.045	0.045	0	4	2	2	10% AEP, 5 min burst, Storm 1
Cat 3/1	0.078	0.073	0.004	4	5	2	10% AEP, 5 min burst, Storm 1
Cat 3/2	0.017	0.017	0	1	0	2	10% AEP, 5 min burst, Storm 1
Cat 3/3	0.042	0.042	0	4	0	2	10% AEP, 5 min burst, Storm 1
Cat 3/4	0.064	0.064	0	4	0	2	10% AEP, 5 min burst, Storm 1
Cat 4/1	0.073	0.068	0.004	4	5	2	10% AEP, 5 min burst, Storm 1
Cat 2/1	0.088	0.083	0.005	4	5	2	10% AEP, 5 min burst, Storm 1
Cat3485	0.045	0.043	0.003	3	5	2	10% AEP, 5 min burst, Storm 1
Cat 2/3	0.042	0.04	0.002	3	5	2	10% AEP, 5 min burst, Storm 1
Cat 2/4	0.033	0.031	0.002	2	5	2	10% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe 1/1	0.017	0.68	24.016	23.892	10% AEP, 5 min burst, Storm 1

Pipe 1/2	0.071	0.67	23.884	23.856	10% AEP, 5 min burst, Storm 1
Pipe 1/3	0.101	0.65	23.827	23.798	10% AEP, 10 min burst, Storm 6
Pipe 1/4	0.22	1.38	23.654	23.527	10% AEP, 10 min burst, Storm 4
Pipe 1/5	0.251	1.58	23.337	23.243	10% AEP, 10 min burst, Storm 8
Pipe 1/6	0.293	2.06	23.04	22.926	10% AEP, 10 min burst, Storm 8
Pipe 1/7	0.484	2.79	22.703	22.553	10% AEP, 10 min burst, Storm 6
Pipe 3/1	0.071	1	23.779	23.702	10% AEP, 5 min burst, Storm 1
Pipe 3/2	0.144	1.04	23.646	23.584	10% AEP, 5 min burst, Storm 1
Pipe 3/3	0.177	1.17	23.488	23.414	10% AEP, 5 min burst, Storm 1
Pipe 3/4	0.233	1.82	23.263	23.223	10% AEP, 5 min burst, Storm 1
Pipe 4/1	0.067	0.97	23.75	23.702	10% AEP, 5 min burst, Storm 1
Pipe 2/1	0.055	0.78	24.488	24.486	10% AEP, 10 min burst, Storm 7
Pipe 2/2	0.092	1.31	24.465	24.444	10% AEP, 5 min burst, Storm 1
Pipe 2/3	0.132	1.87	24.285	24.099	10% AEP, 5 min burst, Storm 1
Pipe 2/4	0.128	1.82	23.961	23.798	10% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF 1/1	0	0.059	0.183	0.104	0.06	2.6	0.62	10% AEP, 5 min burst, Storm 1
OF 1/2	0.002	0.039	0.198	0.092	0.05	2.19	0.57	10% AEP, 5 min burst, Storm 1
OF1/3	0.001	0.027	0.166	0.084	0.04	1.95	0.54	10% AEP, 5 min burst, Storm 1
OF 1/4	0	0.017	0.131	0.077	0.03	1.69	0.49	10% AEP, 5 min burst, Storm 1
OF 1/5	0	0.009	0.453	0.036	0.03	0.41	0.81	10% AEP, 5 min burst, Storm 1
OF 1/6	0	0	0	0	0	0	0	
OF 3/1	0.001	0	0	0.009	0	5.12	0.16	10% AEP, 10 min burst, Storm 8
OF 3/2	0	0.011	0.166	0.068	0.03	1.4	0.46	10% AEP, 5 min burst, Storm 1
OF 3/3	0	0.019	0.213	0.072	0.04	1.55	0.55	10% AEP, 5 min burst, Storm 1
OF 3/4	0.003	0.035	0.264	0.063	0.05	1.23	0.83	10% AEP, 5 min burst, Storm 1
OF 4/1	0.004	0.004	0	0.013	0	5.86	0.2	10% AEP, 10 min burst, Storm 8
OF 2/1	0.06	0.054	0	0.027	0.01	8.68	0.41	10% AEP, 10 min burst, Storm 4
OF 2/2	0.001	0.015	0	0	0	0	0	10% AEP, 10 min burst, Storm 8
OF 2/3	0	0.016	0	0	0	0	0	10% AEP, 5 min burst, Storm 1
OF 2/4	0	0.002	0	0.007	0	4.16	0.18	10% AEP, 10 min burst, Storm 6

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
OSD	22.92	66.9	0.484	0.484	0

Run Log for DRAINS v2023.11.8726.15750 - PC23341_POST_DEV

{\colortbl;\red0\green0\blue0;\red192\green0\blue0;}Run Log for DRAINS v2023.11.8726.15750 - PC23341_POST_DEV.drn run at 17:31:48 on 19/2/2024 using Watercom Drains v2023.11.8726.15750

No water upwelling from any pit.

Freeboard was less than 0.15m at Pit 2/2, Pit 2/1, Pit2/3

10% AEP

Results of a simplified bottom up HGL analysis.
This provides a simple analysis that can be checked manually. It is useful where Council insists on a manual check on HGLs.
The HGLs shown here may be different to the more accurate values normally calculated by Drains.
This simplified analysis assumes the maximum flows and HGLs throughout the system occur at the same time. In fact, in different parts of the system, they may occur during different storms, or even at different times within the one storm, and that flow is steady.

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
Cat 1/1	0.015	0.015	0	2	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/2	0.062	0.062	0	4	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/3	0.039	0.039	0	3	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/4	0.031	0.031	0	3	0	2	10% AEP, 5 min burst, Storm 1
Cat 1/5	0.039	0.039	0	4	2	2	10% AEP, 5 min burst, Storm 1
Cat 1/6	0.045	0.045	0	4	2	2	10% AEP, 5 min burst, Storm 1
Cat 3/1	0.078	0.073	0.004	4	5	2	10% AEP, 5 min burst, Storm 1
Cat 3/2	0.017	0.017	0	1	0	2	10% AEP, 5 min burst, Storm 1
Cat 3/3	0.042	0.042	0	4	0	2	10% AEP, 5 min burst, Storm 1
Cat 3/4	0.064	0.064	0	4	0	2	10% AEP, 5 min burst, Storm 1
Cat 4/1	0.073	0.068	0.004	4	5	2	10% AEP, 5 min burst, Storm 1
Cat 2/1	0.088	0.083	0.005	4	5	2	10% AEP, 5 min burst, Storm 1
Cat3485	0.045	0.043	0.003	3	5	2	10% AEP, 5 min burst, Storm 1
Cat 2/3	0.042	0.04	0.002	3	5	2	10% AEP, 5 min burst, Storm 1
Cat 2/4	0.033	0.031	0.002	2	5	2	10% AEP, 5 min burst, Storm 1

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 11 April 2024

PIPE DETAILS

Pipe	Flow (cu.m/s)	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Int. Dia (mm)	Rough (mm)	Nom.Capacity (cu.m/s)	V (m/sec)	D/S HGL (m)	Friction Loss (m)	U/S HGL (m)
Pipe 1/6	0.293	8	22.59	22.55	0.5	450	0.3	0.246	2.1	23	0.04	23.04
Pipe 1/5	0.251	18	22.71	22.62	0.5	450	0.3	0.246	1.6	23.299	0.095	23.393
Pipe 1/4	0.22	32	22.9	22.74	0.5	450	0.3	0.246	1.4	23.584	0.13	23.714
Pipe 2/4	0.128	26	23.06	22.93	0.5	300	0.3	0.085	1.8	23.86	0.298	24.158
Pipe 2/3	0.132	26	23.22	23.09	0.5	300	0.3	0.085	1.9	24.41	0.315	24.726
Pipe 2/2	0.092	22	23.36	23.25	0.5	300	0.3	0.085	1.3	24.994	0.132	25.126
Pipe 2/1	0.055	22	23.5	23.39	0.5	300	0.3	0.085	0.8	25.256	0.048	25.304
Pipe 3/4	0.233	5	22.91	22.885	0.5	450	0.3	0.246	1.8	23.238	0.025	23.263
Pipe 3/3	0.177	28	23.08	22.94	0.5	450	0.3	0.246	1.2	23.428	0.075	23.502
Pipe 3/2	0.144	34	23.28	23.11	0.5	450	0.3	0.246	1	23.597	0.061	23.658
Pipe 4/1	0.067	18	23.47	23.38	0.5	300	0.3	0.085	1	23.721	0.057	23.778
Pipe 3/1	0.071	26	23.44	23.31	0.5	300	0.3	0.085	1	23.721	0.093	23.814
Pipe 1/3	0.101	35	23.4	23.225	0.5	450	0.3	0.246	0.6	23.86	0.031	23.891
Pipe 1/2	0.071	35	23.6	23.425	0.5	450	0.3	0.246	0.7	23.922	0.016	23.937

PIT & NODE DETAILS

Node	Headloss Coeff (Ku)	Shock Loss (m)	HGL (m)	Free-board	Overflow (cu.m/s)
Headwall			22.553		
OSD			22.599		
Pit 1/6	1.5	0.259	23.299	0.44	0
Pit 1/5	1.5	0.19	23.584	0.7	0
Pit1/4	1.5	0.146	23.86	0.5	0
Pit 2/4	1.5	0.253	24.41	-0.03	0
Pit2/3	1.5	0.268	24.994	-0.54	0
Pit 2/2	1.5	0.13	25.256	-0.75	0.001
Pit 2/1	1.5	0.047	25.351	-0.9	0.06
Pit 3/4	1.5	0.165	23.428	0.74	0.003
Pit 3/3	1.5	0.095	23.597	0.8	0
Pit 3/2	1.5	0.063	23.721	0.77	0
Pit 4/1	1.5	0.068	23.846	0.62	0.004
Pit 3/1	1.5	0.077	23.891	0.55	0.001
Pit 1/3	1.5	0.031	23.922	0.58	0.001
Pit 1/2	1.5	0.015	23.953	0.75	0.002

Pipe 1/1	0.017	35	23.9	23.63	0.77	300	0.3	0.105	0.7	23.953	0.026	23.979	Pit 1/1	1.5	0.004	23.983	0.89	0

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
OF 1/1	0	0.121	0.183	0.129	0.08	3.47	0.65	10% AEP, 5 min burst, Storm 1
OF 1/2	0.002	0.078	0.198	0.109	0.07	2.79	0.64	10% AEP, 5 min burst, Storm 1
OF1/3	0.001	0.056	0.166	0.104	0.05	2.6	0.52	10% AEP, 5 min burst, Storm 1
OF 1/4	0	0.037	0.131	0.098	0.04	2.41	0.4	10% AEP, 5 min burst, Storm 1
OF 1/5	0	0.018	0.453	0.052	0.06	0.86	1.06	10% AEP, 5 min burst, Storm 1
OF 1/6	0	0	0	0	0	0	0	
OF 3/1	0.001	0	0	0.009	0	5.16	0.05	10% AEP, 10 min burst, Storm 8
OF 3/2	0	0.024	0.166	0.079	0.04	1.77	0.46	10% AEP, 5 min burst, Storm 1
OF 3/3	0	0.038	0.213	0.085	0.05	1.96	0.61	10% AEP, 5 min burst, Storm 1
OF 3/4	0.003	0.069	0.264	0.095	0.08	2.31	0.8	10% AEP, 5 min burst, Storm 1
OF 4/1	0.004	0.008	0	0.016	0	6.44	0.13	10% AEP, 10 min burst, Storm 8
OF 2/1	0.06	0.07	0	0.044	0.01	11.09	0.22	10% AEP, 10 min burst, Storm 4
OF 2/2	0.001	0.032	0	0.025	0.01	8.44	0.23	10% AEP, 10 min burst, Storm 8
OF 2/3	0	0.032	0	0.025	0.01	8.44	0.24	10% AEP, 5 min burst, Storm 1
OF 2/4	0	0.006	0	0.01	0	5.39	0.18	10% AEP, 10 min burst, Storm 6

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

MODUS
Transport & Traffic Engineering

Traffic Impact Assessment

5 Kiln Court, Parkhurst
Proposed Bus Depot

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
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Document Information

Prepared for Kinetic Group	**Job Reference** MOD23174QLD
Project: 5 Kiln Court, Parkhurst Proposed Bus Depot	

Document Control

Version	Date	Description of Revision	Prepared by	Approved By
A	13/12/2023	Final	Emily Gallagher	Tetteh Anang
B	14/12/2023	Final	Emily Gallagher	Tetteh Anang

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Here at Modus, we are a team of engineers with extensive knowledge and experience providing quality service to both public and private sectors, from large contractors and developers to state and local governments.

Whether your project is a small residential development, mixed use development, a large commercial precinct or anything in between, our experienced traffic engineers will apply sound and practical traffic engineering principles to achieve an outstanding outcome for your project.

For more information about our company and the services we provide, please visit www.modusengineering.com.au

Contents

1 Introduction

1.1 Overview

Modus has been commissioned by Kinetic Group, to provide traffic and transport advice in relation to the proposed bus depot located at 5 Kiln Court, Parkhurst.

The proposed site area has a current approval for a reconfiguration of lots (two lots into twelve lots) as part of the Lily Place Estate. The approval was granted in August 2022 (application reference: D/52-2019).

This Traffic Impact Assessment (TIA) has been produced by Modus to assess the traffic and transport engineering items in support of the proposed development. A copy of the proposed development plans has been provided at **Appendix A**.

A response to the Rockhampton Access, parking and transport Code has been provided at **Appendix C**.

1.2 References

The following resources were referred to in the preparation of the report:

- The Rockhampton Planning Scheme, particularly:
  - Section 9.3.1 Access, Parking and Transport Code
  - Schedule 6.4 Bicycle Network Planning Scheme Policy
  - Schedule 6.15 Road infrastructure and Hierarchy Planning Scheme Policy
- AS2890.1 Australian Standards Parking Facilities Part 1: Off-Street Car Parking
- AS2890.2 Australian Standards Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities
- RTA Guide to Traffic Generating Developments, 2002

1.3 Limitations

Modus has completed this traffic report in accordance with the usual care and thoroughness of the consulting profession. The assessment is based on accepted traffic engineering practises and standards applicable at the time of undertaking the assessment. Modus disclaims responsibility for any changes to project planning or road conditions that may occur after completion of the assessment.

2 Existing Conditions

2.1 Site Location

The development site is located at 5 Kiln Court, Parkhurst and is bounded by Kiln Court / vacant land to the east, vacant land to the south, an existing industrial development to the north/east and a railway track to the west.

The site is identified within the Council Planning Scheme as a Special Industry Zone and is surrounded by similar zones in all directions with the exception of a Special Purpose Zone to the east.

The site location is shown on Figure 2-1.

Figure 2-1 Site Location

Source: Nearmap

2.2 Existing Site Use

The site is currently vacant land.

2.3 Existing Road Network

Table 2-1 outlines the characteristics of the existing road network in close proximity to the proposed development site.

Table 2-1 Key Road Characteristics

Road	Hierarchy	Authority	Speed Limit	Typical Form
Kiln Court	Local Road	RCC	50km/h*	Two lanes, undivided, plus parking
Barton Circuit	Local Road	RCC	50km/h*	Two lanes, undivided, plus parking
Yaamba Service Road	Main Road	RCC	40km/h	Two lanes, undivided
Boundary Road	Council Road & Urban Arterial	RCC	60km/h	Two lanes, undivided
Yaamba Road	Highway	DTMR	60km/h	Four lanes, divided

*Default speed limit in built up areas

2.4 Active Transport Network

The development site is situated within a reasonably well-connected active transport network. As the development is located within an industrial and commercial precinct, there are no off-road footpaths provided along the frontage road or other surrounding roads. This is generally acceptable for a development of this nature as Modus does not expect that staff members will walk to / from the site. It is noted that there are footpaths provided on both verges of Yaamba Road.

On-road cycling is supported within close proximity of the site along Boundary Road and Yaamba Road.

2.5 Public Transport Network

The development is located within a 400m radius (5-minute walk) of three (3) existing bus stops located along Yaamba Road (#860317, #860316 and #860315).

There is one (1) commuter transport route that services these bus stops approximately 10 times a day at a frequency of every hour. Route 410 connects the site to Pankhurst, CQU, Stockland and Rockhampton City.

2.6 Future Network Planning

Review of Council's Local Government Infrastructure Plan (LGIP) mapping indicates that there are no planned road or intersection upgrades within the vicinity of the site.

3 Proposed Development

3.1 Overview

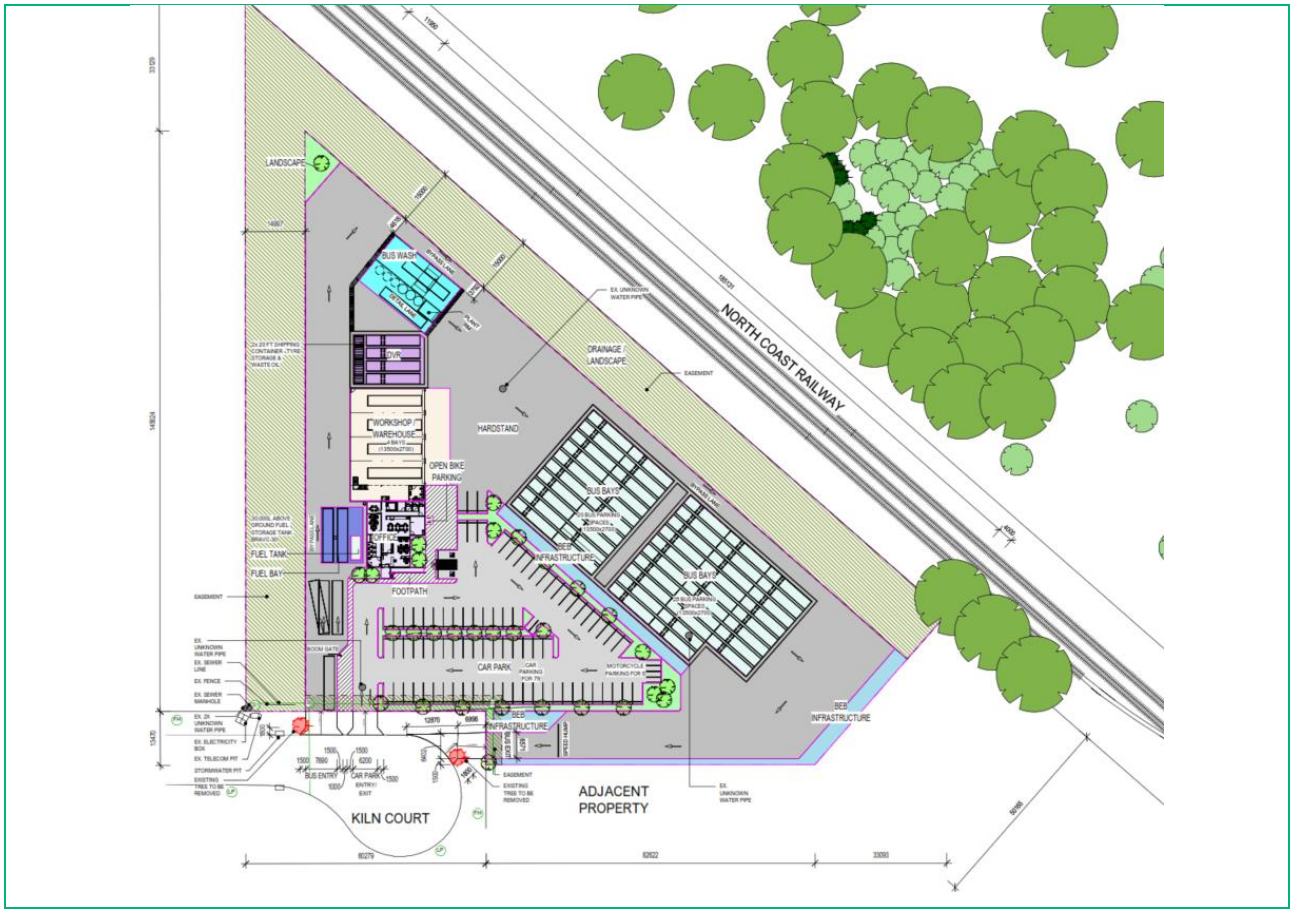
The development site proposes to provide a total office and workshop GFA of approximately 1,000sq.m and provides a total of 82 car parking spaces (79 spaces in the car parking area and three (3) spaces within the bus area), six (6) motorcycle parking spaces and 48 bus parking spaces on-site.

The development provides the following staff arrangements:

- Non-bus drivers – 8 staff members
- Bus drivers – 48 staff members

The proposed development plan is illustrated in Figure 3-1. A copy of the development plans can be found at **Appendix A**.

Figure 3-1 Proposed Development Plan



Source: Bell CD2001

3.2 Development Access

The development proposes one (1) bus entry crossover, one (1) bus exit crossover and one (1) light vehicle all-movements crossover.

4 Traffic and Transport Arrangements

4.1 Access Arrangement

4.1.1 Design

Access to the development is proposed via the following crossovers:

- One (1) 7.88m Bus Entry only crossover located along Kiln Court cul-de-sac.
- One (1) 6.5m Bus Exit only crossover located along Kiln Court cul-de-sac.
- One (1) 6.2m light vehicle entry / exit crossover located along Kiln Court cul-de-sac.

4.1.2 Location

In accordance with Australian Standards AS2890.1, access driveways should not be located within 6.0m of the tangent points from adjacent intersections. The proposed driveway location does not fall within 6.0m of an adjacent intersection and therefore satisfies the minimum separation requirements of AS2890.1.

The proposed accesses are additionally all provided with at least 1m separation between each other and adjacent development crossovers. Modus believes that this is adequate for the proposed development.

4.1.3 Queuing

In accordance with the AS2890.1 requirements, a minimum of 12m (2 cars) is to be provided for car parks with 1-100 spaces. The proposed arrangement provides 12m (2 cars) to the first internal conflict (car parking space) and therefore complies with the minimum requirements.

4.1.4 Sight Distance

Provision of safe sight distance at access driveways is required to be achieved in both directions at each access location to ensure adequate visibility of oncoming vehicles. As the accesses are located at the termination of a cul-de-sac head, the sight distance is only required to be satisfied in the southern direction towards Barton Circuit.

A speed limit of 50km/h has been adopted for the sight distance assessment. The desirable sight distance required by AS2890.1 is 69m measured along the roadway and 2.5m from the outside edge of the kerb. The proposed accesses satisfy the sight distance requirements and therefore comply with AS2890.1.

4.1.5 Pedestrian Sight Splays

In accordance with AS2890.1, the development accommodates a 2.5m by 2.0m pedestrian sight splay at the property boundary. It is recommended that the fence for the property is maintained to be permeable within the pedestrian sight splay, i.e. chain link fence, to ensure sufficient visibility between outbound vehicles and pedestrians along the frontage.

Overall, the proposed access arrangements are considered suitable for the proposed development.

4.2 Car Parking Provision

As there is no guidance on a transport depot use within the RCC Planning Scheme, Modus has referred to the RTA GTRD for road transport terminals. As such, this requirement states that all parking (employees and visitor) must be provided to satisfy the peak demand. Additionally, the number of service vehicles must be provided to accommodate one (1) space for each vehicle present at the peak vehicle accumulation on site. As mentioned above, the peak demand is as follows:

- Maximum of 56 staff parking
- Maximum of 48 buses

The development proposes to provide a total of 82 car parking spaces (79 spaces in the car parking area and three (3) spaces within the bus area), six (6) motorcycle parking spaces and 48 bus parking spaces on-site.

Therefore, the parking supply is anticipated to meet the demands of the development, in accordance with the RTA GTRD.

4.3 Bicycle Car Parking Provision

The Rockhampton Bicycle Network Planning Scheme does not state a requirement for bicycle parking for a development of this nature.

Notwithstanding this, the development site has made provision for a bicycle rack on site, designed in accordance with AS2890.3 requirements.

4.4 Car Parking Layout

The car parking layout of the proposed development has been assessed against the design guidelines within *AS2890.1.* The compliance has been summarised in Table 4-1 below.

Table 4-1 Car Parking Layout Design Review

Design Criteria	AS2890.1 Standard	Proposed Design	Compliant
Parking Bays (Class 1A)			
Bay Length	5.4m	5.4m	✓
Bay Width	2.4m	2.5m	✓
Aisles and Ramps (Class 1A)			
Parking Aisle Width	5.8m	Min. 5.8m	✓
Circulation Aisle (car park)	5.8m	Min. 5.8m	✓
Circulation Aisle (bus access)	6.5m	Min. 6.5m	✓

Therefore, the proposed car parking layout is generally compliant with the requirements outlined in *AS2890.1.*

4.5 Site Servicing

The site does not provide any dedicated loading bays for servicing / refuse collection on-site, other than the line marked bus bays. All servicing / refuse collection is expected to occur outside of peak operating hours when buses are anticipated to be onsite. Therefore, use of the hardstand area for utilisation of servicing and manoevuring for these vehicles is considered to be suitable and not anticipated to have any impact on the safety or operation of the site.

Modus conducted a swept path assessment of the largest design vehicle (12.5m bus), which determined that the bus can safely and efficiently access and service the site in a forward gear with all manoevuring to be conducted on-site.

This manoevuring has been demonstrated via the swept path drawing attached in **Appendix B**. Additionally, a swept path assessment of the RCV manoeuvring through the site had been attached at **Appendix B**.

Therefore, the proposed servicing provisions are considered suitable for the intended use of the site.

5 Traffic Impact Assessment

5.1 Traffic Generation

The RTA GTGD recommends adopting traffic generation rates for road transport terminals. Application of these rates for the site is outlined in Table 5-1 below.

Table 5-1 Traffic Generation

Use	GFA	Generation Rate	Peak Hour Generation	Daily Generation
Road Transport Terminal	1,000m^2	1vph (vehicles per hour) per 100m^2 GFA (peak hour) 5vpd (vehicles per day) per 100m^2 GFA (daily)	10vph	50vpd

Overall, the development is expected to generate traffic 10vph (peak hour) and 50vpd (daily).

5.2 Traffic Impacts

The anticipated traffic generation equates to approximately one (1) vehicle entering or exiting the site every six (6) minutes during peak periods. This quantum of traffic is considered to be negligible and will be further distributed through the local road network via Kiln Court onto Barton Circuit and Yaamba Road.

Additionally, it is important to note that due to the operation of the site, the peak hour development traffic will not coincide with the typical road network peak periods that occur on weekdays between 7:00am-9:00am and 4:00pm-6:00pm.

As such, the proposed development is unlikely to have any perceptible impact on the operational performance of the local road network.

6 Summary

Modus has been commissioned by Kinetic Group, to provide traffic and transport advice in relation to the proposed bus depot development located at 5 Kiln Court, Parkhurst. Based on our review, Modus has the following key findings:

Existing Conditions

- The development site is located at 5 Kiln Court, Parkhurst and is bounded by Kiln Court / vacant land to the east, vacant land to the south, an existing industrial development to the north/east and a railway track to the west.

Proposed Development

- The development site proposed to comprise of a total office and workshop GFA of approximately 1,000m^2 and provides a total of 82 car parking spaces (79 spaces in the car parking area and three (3) spaces within the bus area), six (6) motorcycle spaces and 48 bus parking spaces on-site.

Traffic and Transport Review

- The proposed access arrangements are considered suitable for the proposed development.
- The proposed accesses satisfy the sight distance requirements and therefore comply with AS2890.1.
- The proposed provision of 82 parking spaces, six (6) motorcyle spaces and 48 bus bays are suitable to accommodate the peak demands for the site.
- The development site has made provision for a bicycle rack on site, designed in accordance with AS2890.3 requirements.
- The proposed car parking layout is generally compliant with the requirements outlined in AS2890.1.
- The proposed servicing provisions are considered suitable for the intended use of the site.

Traffic Generation

- The development is expected to generate traffic 4vph (peak hour) and 20vpd (daily), and as such, is unlikely to have any perceptible impact on the operational performance of the local road network.

Overall, Modus considers the proposed development acceptable from a traffic engineering perspective.

APPENDIX A

Development Plan

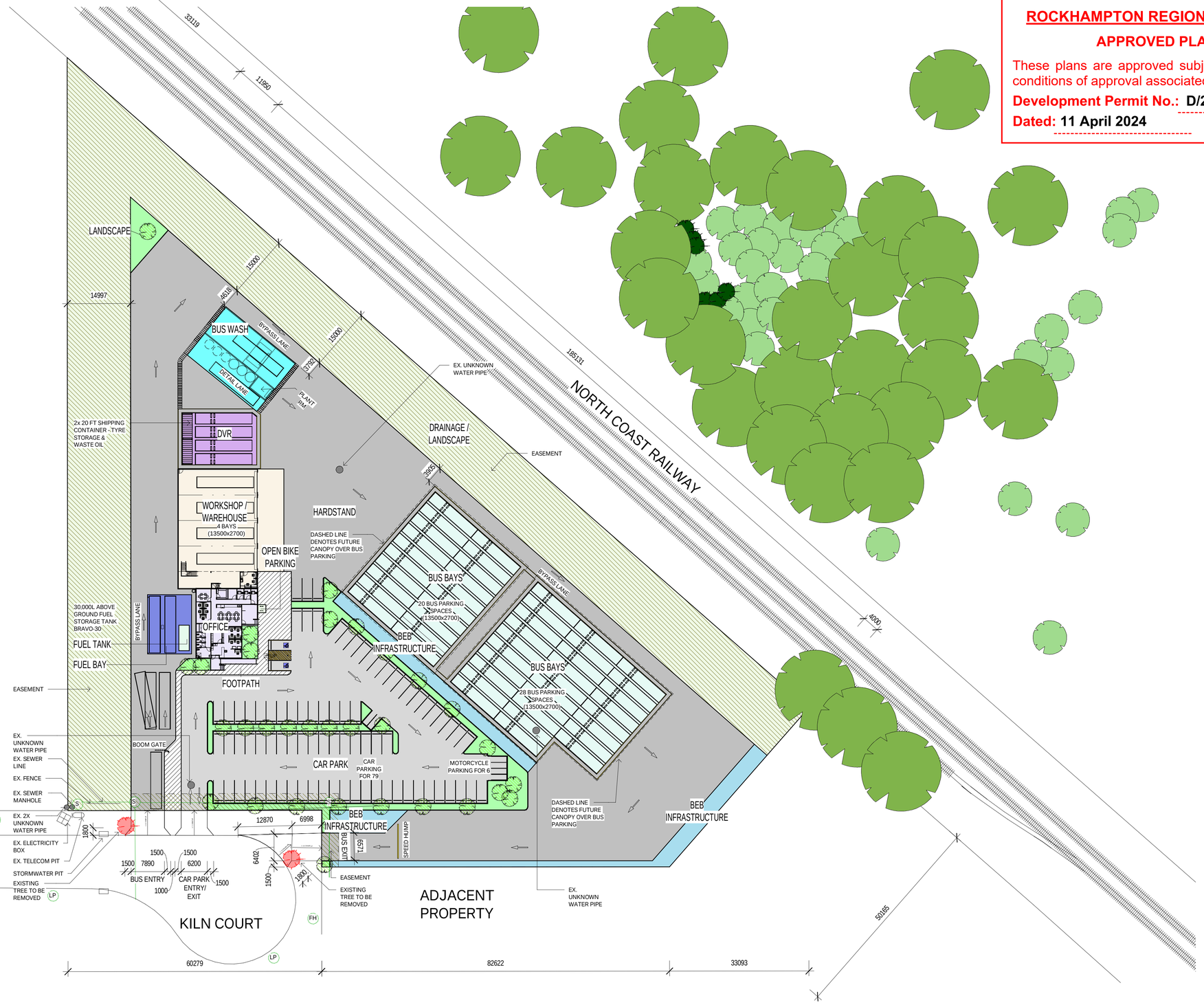
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

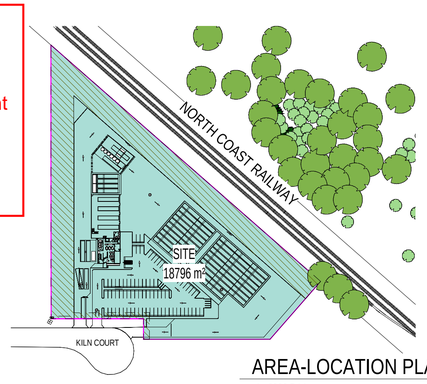
Development Permit No.: D/2-2024

Dated: 11 April 2024



1 SITE PLAN

1 : 500@A1



AREA-LOCATION PLAN

1 : 2000@A1

CD-SITE ANALYSIS

SITE AREA (APPROX):	18796m2	100.00%
TOTAL SITE COVER:	1384m2	7.36%
TOTAL GFA:	1000m2	5.32%
TOTAL LANDSCAPE:	6265m2	33.32%
TOTAL IMPERVIOUS AREA:	12531m2	66.68%
MAXIMUM BUILDING HEIGHT ABOVE GROUND:	8610m	

CD-AREA SCHEDULE

COLOUR	AREA NAME	AREA
	BEB INFRASTRUCTURE	528 m²
	BUS BAYS	2040 m²
	BUS WASH	312 m²
	CAR PARK	2275 m²
	DRAINAGE / LANDSCAPE	5698 m²
	DVR	217 m²
	FOOTPATH	326 m²
	FUEL BAY	132 m²
	FUEL TANK	15 m²
	HARDSTAND	5759 m²
	LANDSCAPE	567 m²
	MEZZANINE	75 m²
	OFFICE	235 m²
	OPEN BIKE PARKING	4 m²
	WORKSHOP / WAREHOUSE	690 m²
Grand total		18871 m²

CD-LIGHT VEHICLE PARKING SCHEDULE

Description	COUNT
STANDARD CAR BAY	77
DISABLED CAR BAY	2
CONTRACTOR CAR BAY	3
Grand total: 82	

NOTE:
CHAIN MESH FENCE ON PROPERTY BOUNDARY AND ON CAR PARK PERIMETER

CD2001 REV S8 13.12.2023 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD SITE PLAN

Scale@A1 As indicated

0m 10m 20m 30m 40m 50m

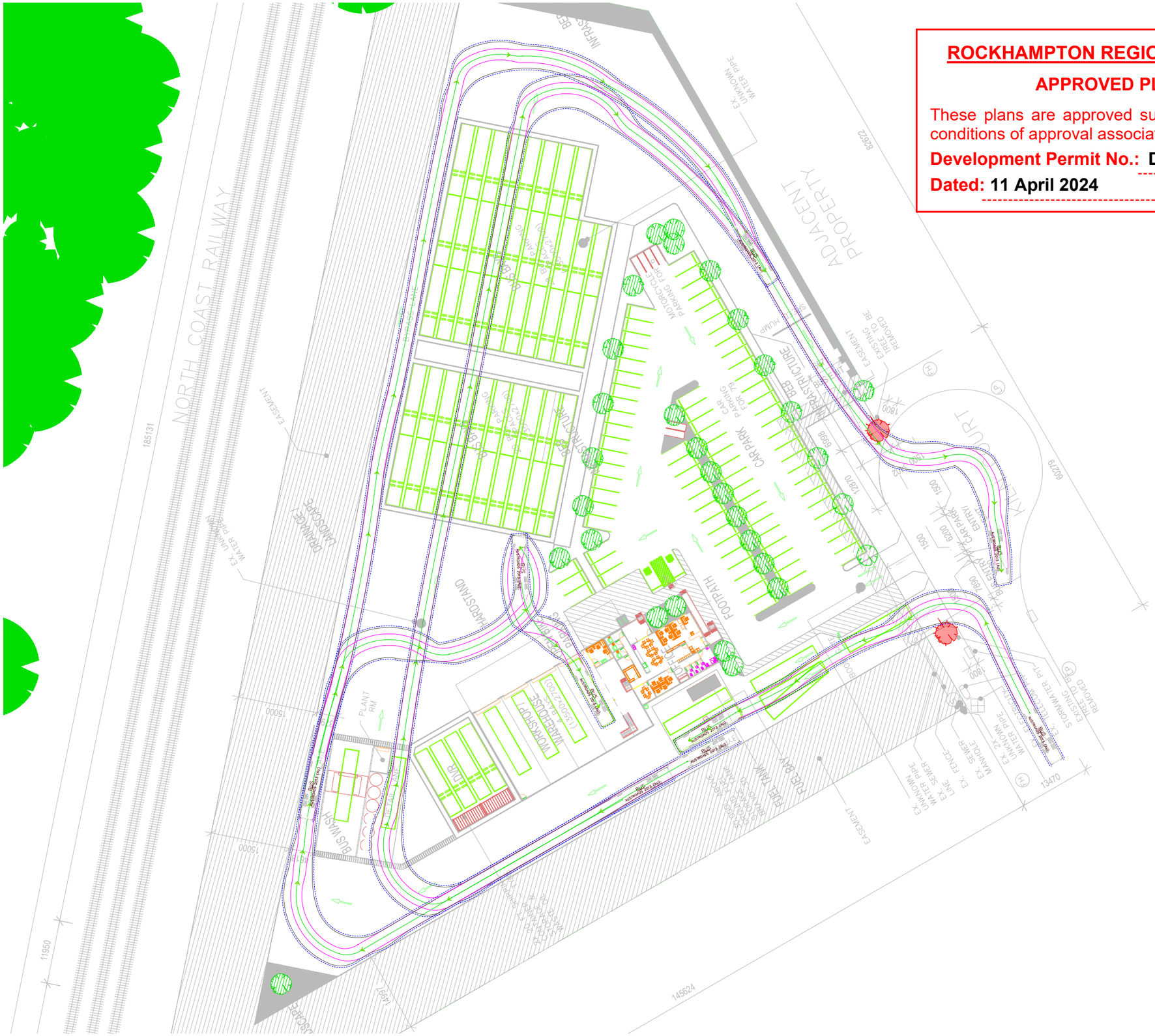
FOR APPROVAL

BELL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 M +61 419 996 978 P +61 8 8373 3870

APPENDIX B

Swept Path Assessment



ROCKHAMPTON REGIONAL COUNCIL

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Dated: 11 April 2024

VEHICLE USED IN SIMULATION

BUS

meters

Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 36.6

SWEPT PATH LEGEND	
—	VEHICLE BODY
—	FRONT TIRES
➤	VEHICLE PATH
- - -	VEHICLE CLEARANCE (300mm)
—	VEHICLE

PROJECT

5 KILN COURT,
PANKHURST

CLIENT

KINETIC GROUP

DRAWING TITLE

SWEPT PATH ASSESSMENT
BUS THROUGH SITE

DRAWING NUMBER

MOD2317QLD - SK01

DATE	REVISION
12 DEC 2023	A

REV	DRAWN BY	APPROVED	DATE	AMENDMENT DETAILS
A	E.G	T.A	12/12/23	DESIGN REVIEW

MODUS
Transport and Traffic Engineering

PRELIMINARY ADVICE ONLY

NOT TO BE USED FOR CONSTRUCTION

GENERAL NOTES:

1.PRELIMINARY DESIGN ISSUED FOR COMMENT ONLY.

2.ALL DIMENSIONS ARE PROVIDED IN METERS UNLESS NOTED OTHERWISE.

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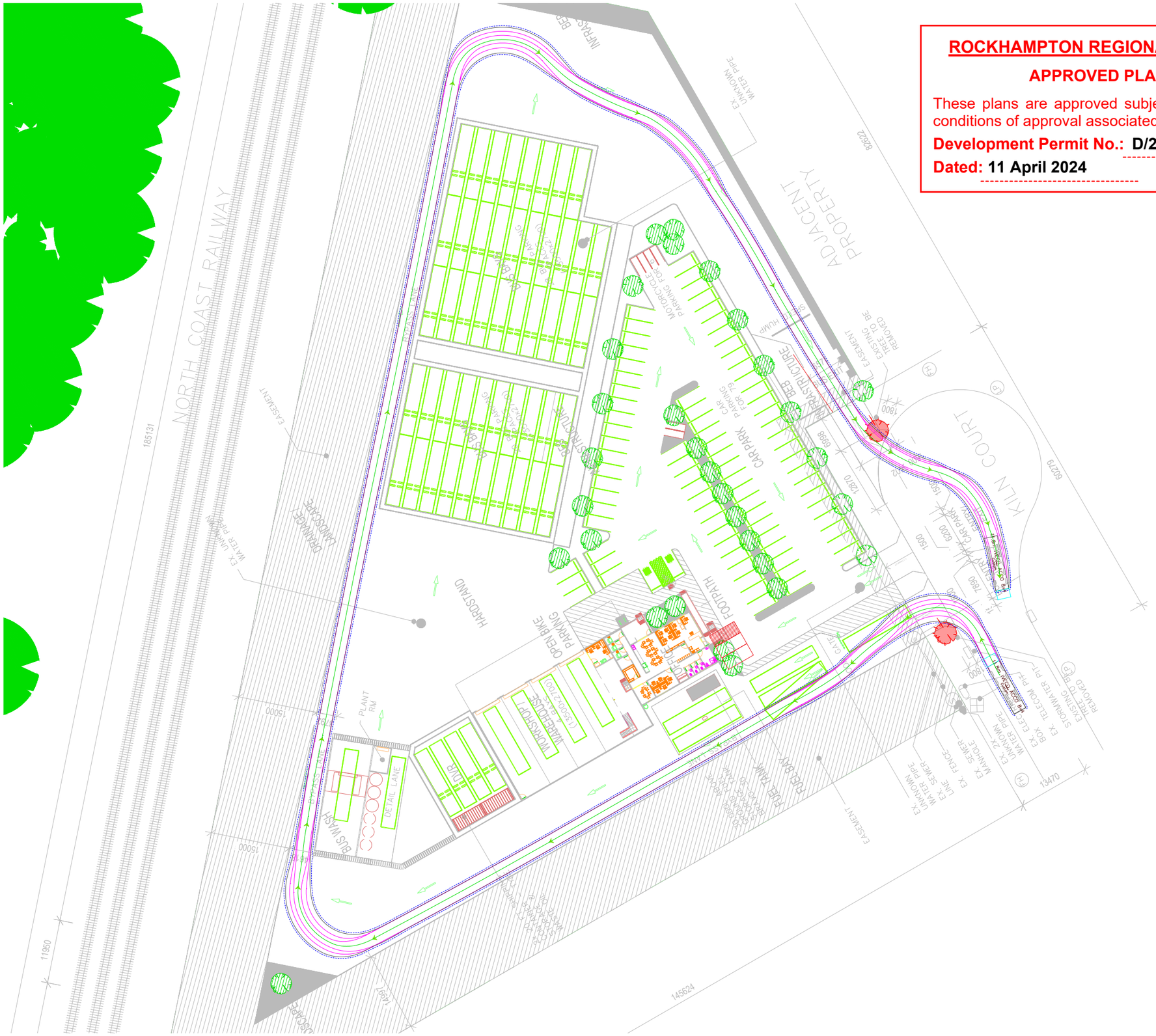

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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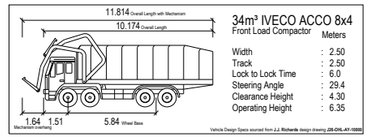
Development Permit No.: D/2-2024

Dated: 11 April 2024

VEHICLE USED IN SIMULATION



SWEPT PATH LEGEND

- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (300mm)
- VEHICLE

N

0 5 10 15 20 25 30m

5 4 3 2 1

SCALE 1: 750

PROJECT

5 KILN COURT, PANKHURST

CLIENT

KINETIC GROUP

DRAWING TITLE

SWEPT PATH ASSESSMENT RCV THROUGH SITE

DRAWING NUMBER

MOD2317QLD - SK02

DATE	REVISION
12 DEC 2023	A

REV	DRAWN BY	APPROVED	DATE	AMENDMENT DETAILS
A	E.G	T.A	12/12/23	DESIGN REVIEW

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APPENDIX C

Code Response

9.3.1 Access, parking and transport code

9.3.1.1 Application

This code applies to assessing development where the code is identified as applicable in the tables of assessment.

When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5.

9.3.1.2 Purpose

(1) The purpose of the access, parking and transport code is to ensure that parking, access and transport facilities for vehicles, pedestrians and cyclists are provided to service development in a safe, equitable and

(2) sustainable way.

The purpose of the code will be achieved through the following overall outcomes:

(a) the function, safety and efficiency of the transport network is optimised;

(b) pedestrians and cyclists are provided with a high level of accessibility which is equitable, safe and convenient;

(c) on-site access, transport and parking facilities are integrated with external walking and cyclist networks and public transport nodes;

(d) the use of public transport is facilitated wherever practicable;

(e) vehicle parking and access is provided, which is functional and sufficient to meet the demand likely to be generated by the development;

(f) vehicle parking and access achieves a high standard of urban design and integration with the function and appearance of the development; and

(g) adverse impacts on the environment and the amenity of the locality are avoided.

9.3.1.3 Specific benchmarks for assessment

Table 9.3.1.3.1 Development outcomes for assessable development

Access driveways

Table 9.3.1.3.1 Development outcomes for assessable development (part)

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Access driveways			
PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account: (a) the size of the parking area; (b) the volume, frequency and type of vehicle traffic; (c) the need for some land uses (for example hospitals) to accommodate emergency vehicle access; (d) the type of use and the implications on parking and circulation, for example long-term or short-term car parking; (e) frontage road function and conditions; and (f) the capacity and function of the adjoining	**AO1.1** Access driveways are not located within: (a) twenty–five (25) metres of a signalised road intersection; (b) twenty (20) metres of an un-signalised road intersection in an industrial or centres zone or ten (10) metres otherwise; and (c) one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset.	✔ AO	The driveways are designed in accordance with the Rockhampton Council requirements. Refer to Section 4 within the Traffic impact Assessment (MOD23174QLD-TIA-A) by Modus.
PO2	**AO2.1** Access driveways:	✔ AO	Refer to civil drawings and proposed development plans.

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Access driveways			
Access driveways do not disrupt existing road or footpath infrastructure. **ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**	(a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; (b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the road carriageway; (c) must be sealed and to a formed road; (d) are not constructed over an access point to equipment under the control of a regulatory authority, including storm water pits, water meters, hydrants and telephone pits; and (e) are raised or lowered to match the surface level of the driveway, where an access chamber is to be incorporated within the driveway.		
PO3 Access driveways are designed and constructed so as to: (a) enable safe and functional vehicular access from the street to the property; and (b) not cause a change in the level of a footpath.	**AO3.1** Access driveways are constructed in compliance with the Capricorn Municipal Development Guidelines.	✓ AO	The accesses are designed generally in accordance with the Capricorn Municipal Development Guidelines. Refer to Section 4.1 within the Traffic impact Assessment (MOD23174QLD-TIA-A) by Modus, as well as the proposed development plans.

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Access driveways			
PO4 A driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	**AO4.1** A driveway has a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	N/A	

Parking

Table 9.3.1.3.1 Development outcomes for assessable development (part

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Parking			
PO5 Provision is made for on-site vehicle parking: (a) to meet the demand likely to be generated by the development; and (b) to avoid on-street parking where that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity. Editor's note—SC6.6 — Car parking contributions planning scheme policy prescribes circumstances under which an applicant can satisfy PO5.	AO5.1 AO5.1.1 On-site car parking is provided at the rates set out in Table 9.3.1.3.2 of the access, parking and transport code. OR AO5.1.2 Where a change of use of existing premises is proposed and there is no increase in the gross floor area, the existing number of on-site car parks is retained or increased. **AND** AO5.2 All Parking, loading and manoeuvring facilities for visitors and employed to be located on-site. **AND** Manoeuvring facilities to be of adequate dimensions to prevent any queuing in a roadway.	✓ PO	As there is no guidance on a transport depot use within the RCC Planning scheme, Modus has referred to the RTA GTRD for road transport terminals. The parking supply detailed in Section 4.1 within the Traffic impact Assessment (MOD23174QLD-TIA-A) by Modus is anticipated to meet the demands of the development, in accordance with RTA GTRD.
PO6	**AO6.1**	✓ AO	Refer to Section 4 within the Traffic impact Assessment

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Parking			
Parking and servicing facilities are designed to meet user requirements.	Parking spaces, access and manoeuvring facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS2890.		(MOD23174QLD -TIA-A) by Modus, as well as the proposed development plans.
PO7 Sites with more than one (1) road frontage (excluding laneways) gain access only from the lower order road, except if it will introduce traffic generated by a non–residential use into a street that is in a residential zone.	No acceptable outcome is nominated.	N/A	
PO8 Parking areas are illuminated in a manner that maximises user safety but minimises the impacts on adjoining residents.	**AO8.1** Parking areas for uses that operate at night are illuminated in accordance with the requirements of Australian Standard AS 1158. **AND** **AO8.2** Lighting used in parking areas does not cause an environmental nuisance and complies with Australian Standard AS 4282.	N/A	
PO9 Car parking areas, pathways and other elements of the transport network are designed to enhance public safety by discouraging crime and antisocial behaviour, having regard to: (a) provision of opportunities for casual surveillance;	No acceptable outcome is nominated. Editor's note—Refer to Crime Prevention Through Environmental Design (CPTED) guidelines for Queensland for guidance.	N/A	

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Parking			
(b) the use of fencing to define public and private spaces, whilst allowing for appropriate sightlines; (c) minimising potential concealment points and assault locations; (d) minimising opportunities for graffiti and other vandalism; and e) restricting unlawful access to buildings and between buildings.	**ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**		
PO10 Parking and servicing areas are kept accessible and available for their intended use at all times during the normal business	No acceptable outcome is nominated.	N/A	

Transport impact

Table 9.3.1.3.1 Development outcomes for assessable development (part)

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Transport impact Editor's note—Applicants should note that the Department of Transport and Main Roads may have additional requirements.			
PO11 Development contributes to the creation of a transport network which is designed to:	No acceptable outcome is nominated. Editor's note—Refer to SC6.19 – Structure plan planning scheme policy for guidance.	✓AO	Refer to the Traffic impact Assessment (MOD23174QLD -TIA-A) by Modus.

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Transport impact Editor's note—Applicants should note that the Department of Transport and Main Roads may have additional requirements.			
(a) achieve a high level of permeability and connectivity for all modes of transport, including pedestrians and cyclists, within the development and to the surrounding area; and (b) encourage people to walk, cycle or use public transport to and from the site instead of using a car.	**ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**		
PO12 Development is located on roads that are appropriate for the nature of traffic (including vehicles, pedestrians and cyclists) generated, having regard to the safety and efficiency of the transport network.	**AO12.1** Traffic generated by the development is safely accommodated within the design capacity of roads as provided in SC6.15 — Road infrastructure and hierarchy planning scheme policy. **AND** **AO12.2** A road or street does not connect with another road or street that is more than two (2) levels higher or lower in the road hierarchy. **AND** **AO12.3** The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines.	✔ AO N/A N/A	Refer to Section 5 within the Traffic impact Assessment (MOD23174QLD -TIA-A) by Modus.
PO13	No acceptable outcome is nominated	N/A	

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Transport impact Editor's note—Applicants should note that the Department of Transport and Main Roads may have additional requirements.			
Where the nature of the development creates a demand, provision is made for set down and pick-up facilities by bus, taxis or private vehicle, which: (a) are safe for pedestrians and vehicles; (b) are conveniently connected to the main component of the development by pedestrian pathway; and (c) provide for pedestrian priority and clear sightlines.	**ROCKHAMPTON REGIONAL COUNCIL** **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/2-2024** **Dated: 11 April 2024**		

SITE ACCESS

Table 9.3.1.3.1 Development outcomes for assessable development (part)

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Site access			
PO14 Development does not impact on the safety, operation or function of the road network or system.	**AO14.1** Vehicle manoeuvring into and from the site for all vehicles is designed in accordance with the Australian Standard AS2890, as updated from time to time. **AND '**	✔ AO	All vehicles can enter and egress the site in forward gear. Refer to Appendix B in the traffic impact assessment (MOD23174QLD -TIA-A) by Modus.

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Site access			
	AO14.2 No direct property access is gained to a highway, main road, urban arterial or sub arterial road as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy other than via a service road or a joint access arrangement with other sites. **AND AO14.3** Development that generates greater than 100 vehicle movements per day does not gain access to or from an urban access place or urban access streets as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy.	✓ AO **N/A**	Development provides access via a local road.
PO15 Development facilitates the orderly provision and upgrading of the transport network or contributes to the construction of transport network improvements.	No acceptable outcome is nominated.	N/A	
PO16 On-site transport network infrastructure integrates safely and effectively with surrounding networks.	**AO16.1** Intersections, connections and access arrangements are designed in accordance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890.	✓ AO	The accesses are designed in accordance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890. Refer to Section 4.1 within the Traffic impact Assessment (MOD23174QLD-TIA-A) by Modus, as well as the proposed development plans.

Pedestrian and cyclist facilities

Table 9.3.1.3.1 Development outcomes for assessable development (part)

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Pedestrian and cyclist facilities			
PO17 Development provides safe and convenient pedestrian and cycle movement to the site and within the site having regard to desire lines, users' needs, safety and legibility.	**AO17.1** Pedestrian and cyclist movement are designed in compliance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890 — Parking facilities.		
PO18 Provision is made for adequate bicycle parking and end of trip facilities, to meet the likely needs of users and encourage cycle travel		N/A	A development of this nature does not require bicycle parking.

Servicing

Table 9.3.1.3.1 Development outcomes for assessable development (part)

Performance outcomes	Acceptable Outcomes	Compliance	Comment
Servicing			
PO19 Refuse collection vehicles are able to safely access on-site refuse collection facilities.	**AO19.1** Refuse collection areas are provided and designed in accordance with the waste management code and Australian Standard AS 2890.	✓AO	Refer to Appendix B in the traffic impact assessment (MOD23174QLD -TIA-A) by Modus.

MODUS
Transport and Traffic Engineering

Technical Memorandum

To	Kinetic Holding Company Pty Ltd	Date	14 February 2024
Prepared by	Arthur Stamatiou, Modus Senior Traffic Engineer	Approved by	Tetteh Anang, Modus Senior Traffic Engineer (RPEQ 28656)
Location	5 Kiln Court Parkhurst		
Subject	Proposed Bus Depot - Traffic Engineering IR Response		
Status	Final	Attachments	**Appendix A:** Council Information Request **Appendix B**: Development Plans **Appendix C:** Swept Path Assessment

1 Introduction

Modus has been commissioned by Kinetic Holding Company Pty Ltd, to provide traffic and transport advice in response to the Rockhampton Regional Council (RRC) Information Request (IR) regarding the proposed development located at 5 Kiln Court Parkhurst.

Following the submission of the Development Application, RRC raised an IR (Reference Number: D/2-2024), dated the 23st of January 2024, requesting further information regarding the traffic and transport components of the proposed development. A copy of the IR has been provided at **Appendix A**.

This technical memorandum has been produced by Modus in response to the IR items relating to the traffic and transport components in support of the proposed development. For ease of reference, the Council IR item has been reproduced on the subsequent pages, with Modus' response immediately following the relevant item.

Furthermore, the proposed development plans have been attached at **Appendix B**.

2 Council Information Request

Item 3 – Traffic and Transport

There is an approved vehicle entry/exit crossover as part of the adjacent development (Lot 11 on SP326319). This entry/exit crossover is located next to the proposed bus exit only crossover resulting some safety concern due to proposed bus exit swept paths. Please provide information as how to accommodate safe vehicle manoeuvring for the two development sites simultaneously.

Modus Response

To address Council's concerns, Modus has reviewed the adjacent developments approved access in conjunction with the proposed development egress point. This review indicated that there was little to no separation between the two access points. Given Rockhampton Regional Council Planning Scheme does not provide a requirement for driveway separation from adjacent driveways, the development plans have been amended to provide a minimum 1m separation between the access points as illustrated in Figure 2-1 and Appendix B.

ROCKHAMPTON REGIONAL COUNCIL

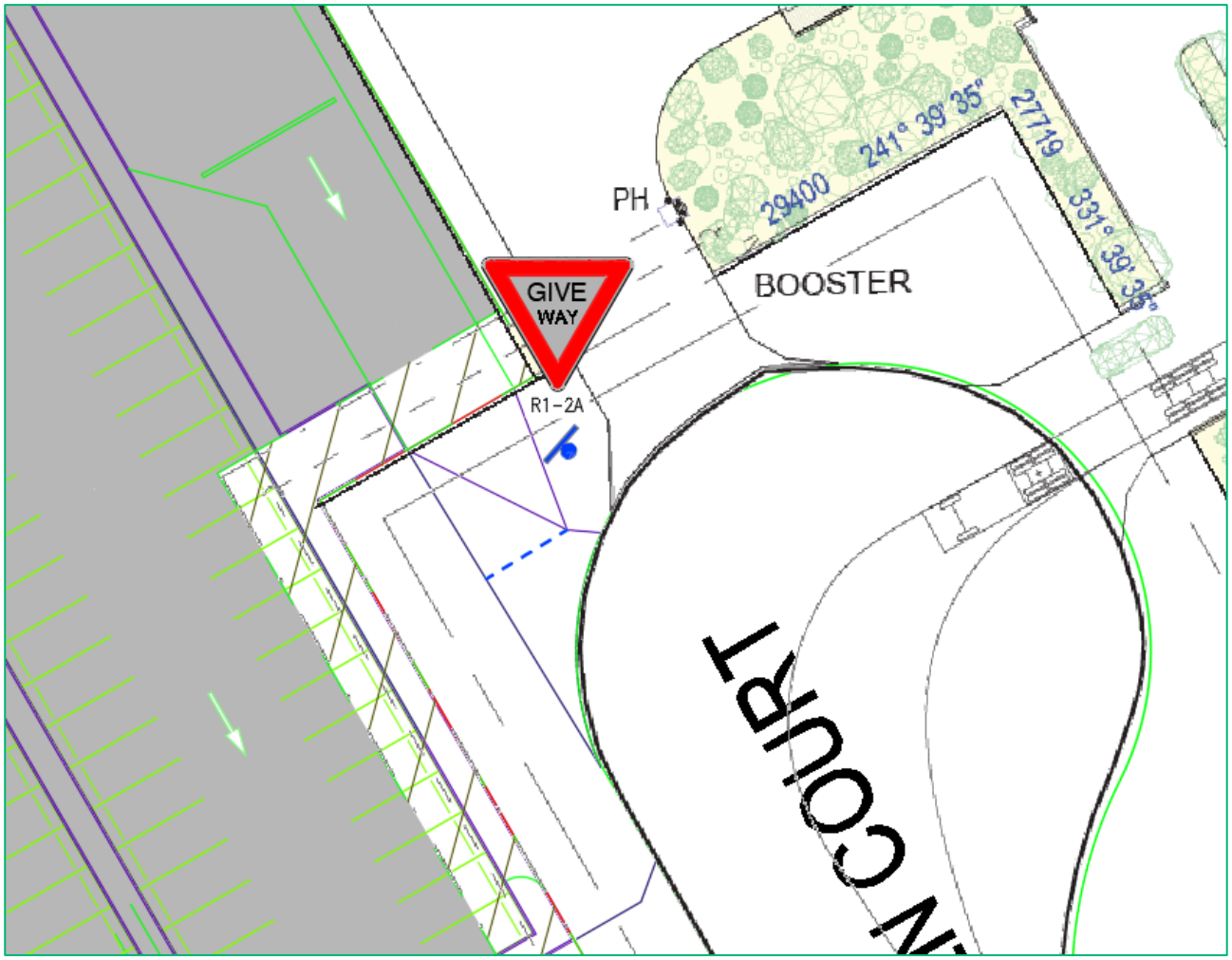
APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: **D/2-2024**

Dated: **11 April 2024**

Figure 2-1 Proposed Development Egress Point



Additionally, the proposed development egress point has been provided with give way line marking and a give way sign to ensure priority is given to vehicles already on Kiln Court. The swept path assessment for the proposed driveway location has been amended to illustrated that the bus / refuse collection vehicle will not impend vehicles from the adjacent development.

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

3 Summary

Therefore, Modus is of the opinion that the Council IR items have been sufficiently addressed from a traffic engineering perspective, and there are no outstanding concerns relating to the traffic and transport components of the proposed development at 5 Kiln Court Parkhurst.

Should there be any issue with the above, please contact the undersigned.

Yours sincerely,

MODUS TRANSPORT AND TRAFFIC ENGINEERING

Tetteh Anang
Senior Traffic Engineer

RPEQ 28656

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: **D/2-2024**

Dated: **11 April 2024**

APPENDIX A

Council Information Request

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: **D/2-2024**

Dated: **11 April 2024**

Rockhampton Office
232 Bolsover St, Rockhampton
Gracemere Office
1 Ranger St, Gracemere
Mount Morgan Office
32 Hall St, Mount Morgan

23 January 2024

Our reference: D/2-2024
Enquiries to: Sophie Muggeridge
Telephone: 07 4936 8099

Kinetic Holding Company Pty Ltd
C/- Place Design Group
PO BOX 775
BRISBANE QLD 4001

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

Dear Sir/Madam

INFORMATION REQUEST – DEVELOPMENT APPLICATION D/2-2024 FOR MATERIAL CHANGE OF USE FOR A TRANSPORT DEPOT – SITUATED AT 5 KILN COURT, PARKHURST – DESCRIBED AS LOT 10 ON SP326319

Council refers to your application received by Council on 11 January 2024.

Council officers have undertaken a detailed assessment of the development application and require you to provide further information to address the following issues:

Stormwater

1.0 The basin constructed as part of the industrial subdivision has been designed to accommodate the regional catchment (external areas and subject site) to ensure no impacts are evident downstream of the development. Despite the regional basin considering the 'ultimate catchment', the locally designed stormwater system for the industrial subdivision has considered the subject site 5 Kiln Court Parkhurst – Lot 10 on SP326319 to be in a pre-development state. As such, the development will need to implement stormwater management provisions to ensure the post development flows are mitigated to the pre-development scenario for events from the 39.35% to 1% AEP events.

2.0 Please provide digital copy of the MUSIC model for review.

Traffic and Transport

3.0 There is an approved vehicle entry/exit crossover as part of the adjacent development (Lot 11 on SP326319). This entry/exit crossover is located next to the proposed bus exit-only crossover resulting some safety concern due to proposed bus exit swept paths. Please provide information as how to accommodate safe vehicle manoeuvring for the two development sites simultaneously.

Structures within the sewerage easement

4.0 Proposed trees, stormwater basin/landscape area and BEB infrastructure are not permitted within the existing sewerage easement. Please remove these items from the sewerage easement and amend the necessary drawings and reports accordingly.

Under section 13 of the Development Assessment Rules, the Applicant has three (3) options available in response to this information request. The Applicant must give the Assessment Manager:

1. all of the information requested; or
2. part of the information requested, together with a notice requiring the Assessment Manager and each referral agency to proceed with the assessment of the application; or
3. a notice:
    i. stating the Applicant does not intend to supply any of the information requested; and
    ii. requiring the Assessment Manager and each referral agency to proceed with the assessment of the application.

Response to this further information request should be forwarded to:

General.Enquiries@rrc.qld.gov.au or;
Development Assessment Section
Rockhampton Regional Council
PO Box 1860
ROCKHAMPTON QLD 4700

A response needs to be received within a period of three (3) months from the date of this letter, In accordance with section 68 (1) of the *Planning Act 2016* and sections 12 and 13 of the Development Assessment Rules. Please forward your response to this information request to Council at your earliest convenience, in order for the assessment of your application to progress further.

Should you have any queries regarding the above information request, please contact the undersigned on 07 4936 8099.

Yours faithfully

Kathy McDonald on behalf of
Sophie Muggeridge
Planning Officer
Planning and Regulatory Services

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

Information Request Response Form
(to be returned to the Assessment Manager with the response)

I _____ choose to respond to the Assessment Manager's Information Request:

- ☐ in full;

  OR

- ☐ in part, with this notice requiring the Assessment Manager and each referral agency to proceed with the assessment of the application;

  OR

- ☐ stating that I do not intend to supply any of the information requested; and requiring the Assessment Manager and each referral agency to proceed with the assessment of the application.

A copy of the response to the Assessment Manager's information request has been provided to all Referral Agencies nominated on the Confirmation Notice.

I understand the requirements of this Information Request as listed above.

Signed : _____ Date : _____

Position : _____

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 11 April 2024

APPENDIX B

Development Plans

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: **D/2-2024**

Dated: **11 April 2024**

KINETIC ROCKHAMPTON

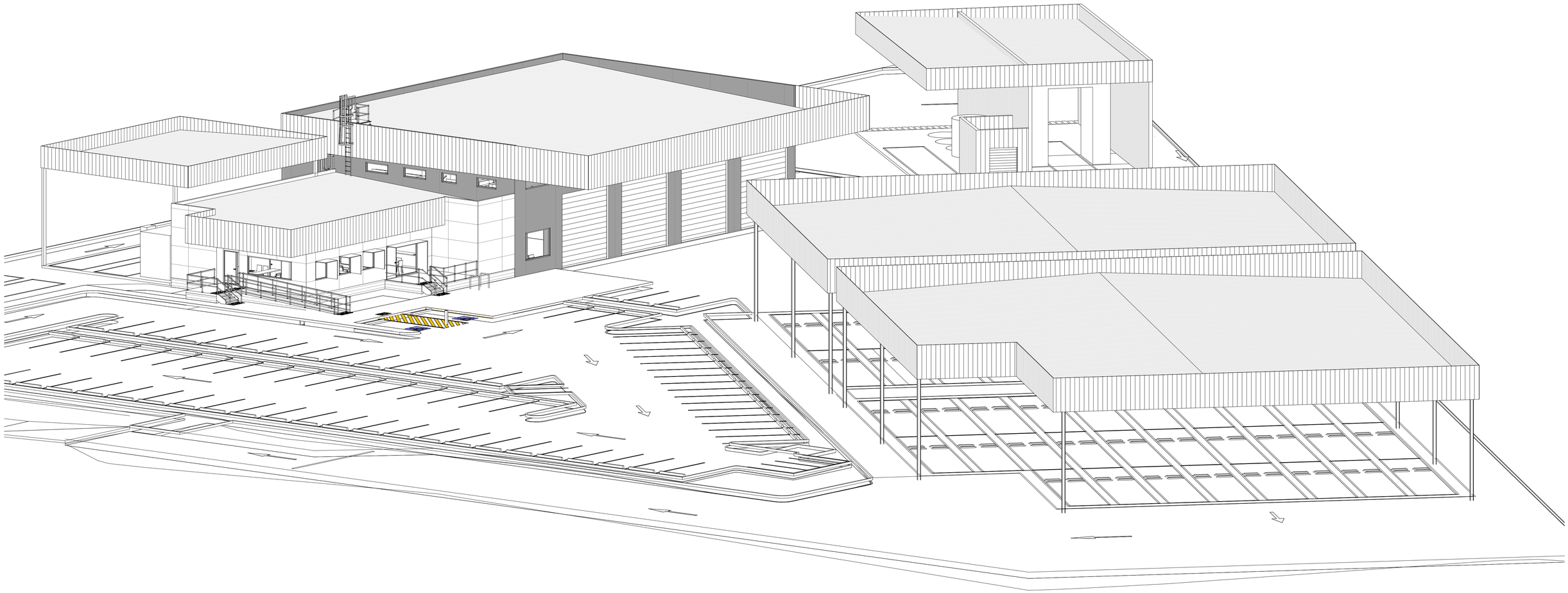
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024



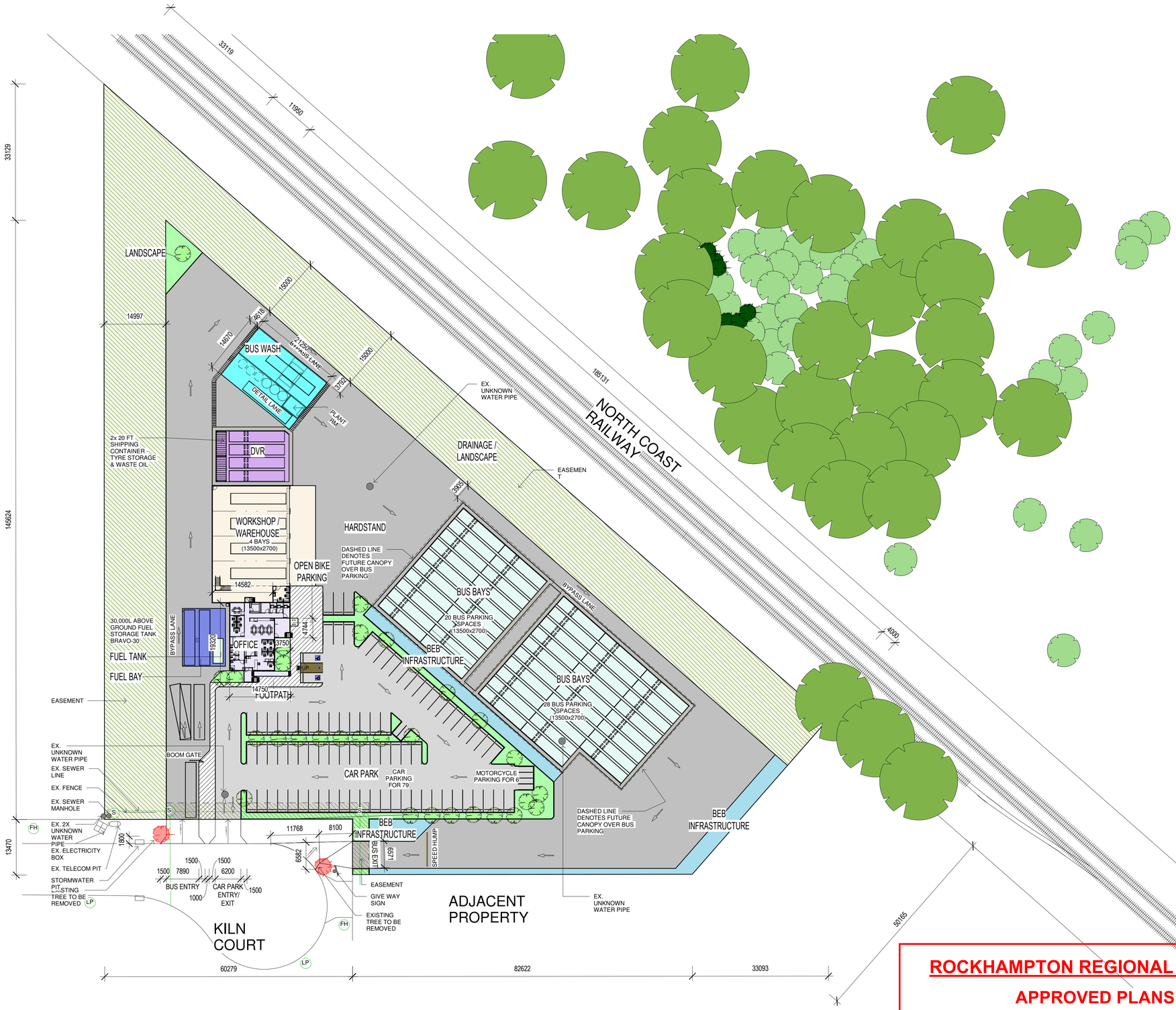
CD0000 REV S1 13.01.2024 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD COVERSHEET Scale@A1

0m 1m 2m 3m 4m 5m

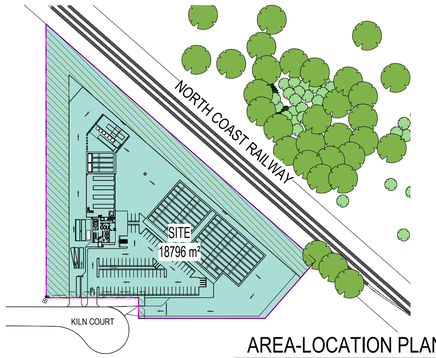
FOR APPROVAL

BELL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 **M** +61 419 996 978 **P** +61 8 8373 3870



1 SITE PLAN
1 : 500@A1



AREA-LOCATION PLAN
1 : 2000@A1

CD-SITE ANALYSIS

SITE AREA (APPROX):	18796m2	100.00%
TOTAL SITE COVER:	1384m2	7.36%
TOTAL GFA:	1000m2	5.32%
TOTAL LANDSCAPE:	6265m2	33.32%
TOTAL IMPERVIOUS AREA:	12531m2	66.68%
MAXIMUM BUILDING HEIGHT ABOVE GROUND:	8610m	

CD-AREA SCHEDULE

COLOUR	AREA NAME	AREA
	BEB INFRASTRUCTURE	513 m²
	BUS BAYS	2040 m²
	BUS WASH	312 m²
	CAR PARK	2275 m²
	DRAINAGE / LANDSCAPE	5698 m²
	DVR	217 m²
	FOOTPATH	326 m²
	FUEL BAY	132 m²
	FUEL TANK	15 m²
	HARDSTAND	5759 m²
	LANDSCAPE	582 m²
	MEZZANINE	75 m²
	OFFICE	234 m²
	OPEN BIKE PARKING	4 m²
	WORKSHOP / WAREHOUSE	690 m²
Grand total		18871 m²

CD-LIGHT VEHICLE PARKING SCHEDULE

Description	COUNT
STANDARD CAR BAY	77
DISABLED CAR BAY	2
CONTRACTOR CAR BAY	3
Grand total: 82	

NOTE:
CHAIN MESH FENCE ON PROPERTY BOUNDARY AND ON CAR PARK PERIMETER

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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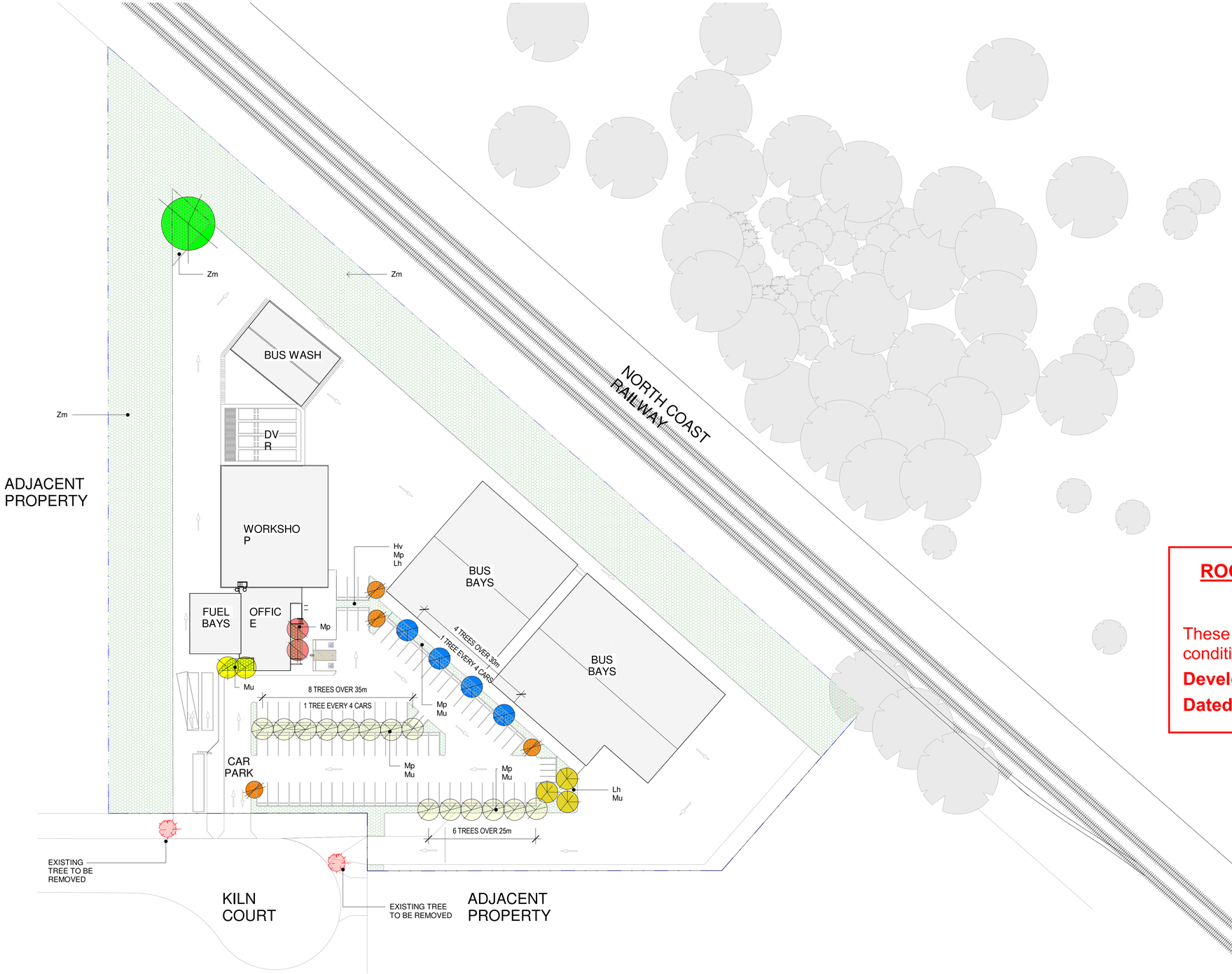
Development Permit No.: D/2-2024

Dated: 11 April 2024

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 M +61 419 996 978 P +61 8 8373 3870



1 OVERALL LANDSCAPING PLAN
1 : 500@A1

DETAIL PLANNING SCHEDULE

TYPE	SYMBOL	BOTANIC NAME	COMMON NAME	SIZE	SPACING (m)
TREE		SCOLOPIA BRAUNII	FLINTWOOD	MEDIUM (25mH & 0.5m DIAMETER TRUNK)	AS SHOWN
TREE		GREVILLEA BANKSII	RED FLOWERED SILKY OAK	MEDIUM (10-30mH & 5-20m W)	AS SHOWN
TREE		XANTHOSTEMON CHRYSANTHUS	GOLDEN PENDA	MEDIUM (10-15mH & 6-12m W)	AS SHOWN
TREE		HARPULLIA PENDULA	TULIPWOOD	SMALL (6mH & 4m W)	AS SHOWN
TREE		GREVILLEA BAILEYANA	WHITE OAK	SMALL (5-10mH & 5m W)	AS SHOWN
TREE		ACACIA FIMBRIATA	BRISBANE GOLDEN WATTLE	SMALL (6mH & 5m W)	AS SHOWN
TREE		TRISTANIOPSIS LAURINA	WATER GUM	SMALL (5-15mH & 5m W)	AS SHOWN
GROUND COVER, CLIMBER	Hv	HARDENBERGIA VIOLACEA	NATIVE SARSPARILLA	SMALL (2-3.5mH & 2-3.5m W)	AS SHOWN
GRASS	Lh	LOMANDRA HYSTRIX	KATIE BELLES	SMALL (1.5-1.8mH & 1m W)	N/A
GRASS	Zm	ZOYSIA MACRANTHA	NARA NATIVE TURF	25mm TO 50mm H	N/A
GROUND COVER	Mp	MYOPORUM PARVIFOLIUM	CREEPING BOOBIALLA	150mm TO 300mm H	N/A
GROUND COVER	Mu		MULCH	N/A	N/A

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

CD2021 REV S3 13.01.2024 BAB230106

KINETIC - 5 KILN CRT. ROCKHAMPTON QLD

OVERALL LANDSCAPING PLAN

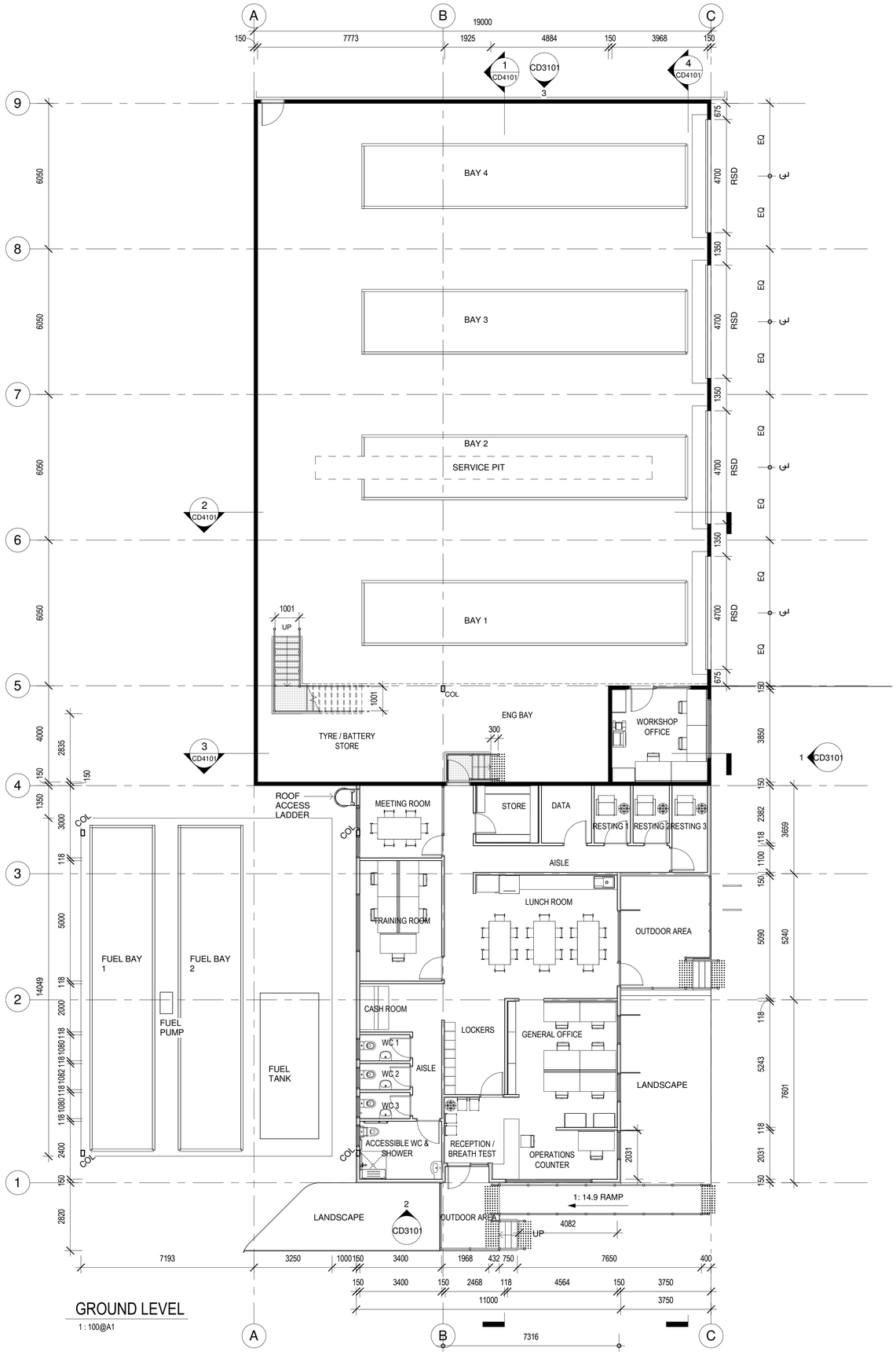
Scale@A1 As indicated

0m 10m 20m 30m 40m 50m

DRAWING TO BE PRINTED IN COLOUR

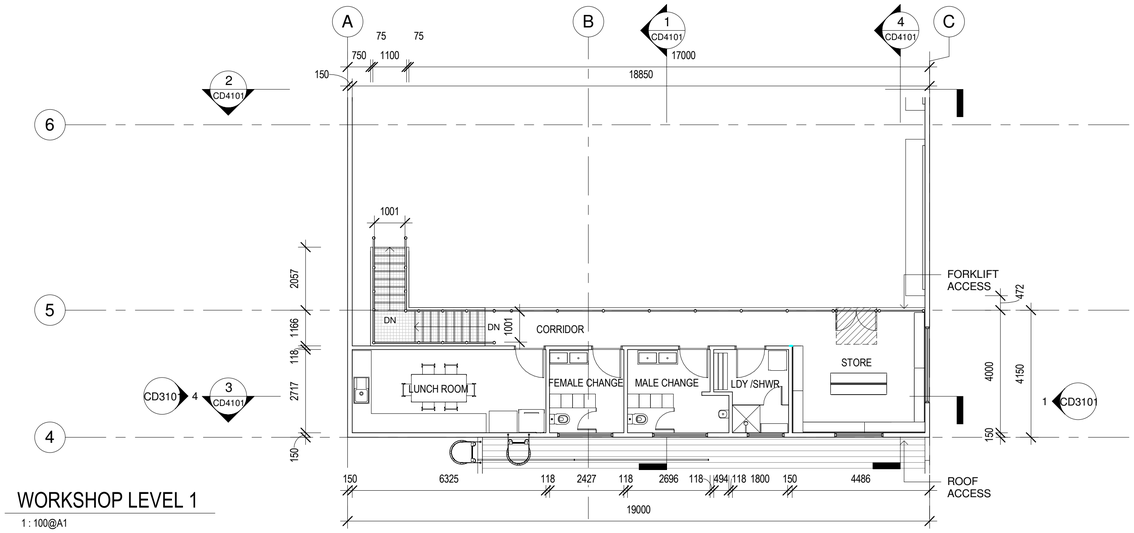
FOR APPROVAL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 M +61 419 996 978 P +61 8 8373 3870



GROUND LEVEL

1 : 100@A1



WORKSHOP LEVEL 1

1 : 100@A1

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/2-2024

Dated: 11 April 2024

CD2201 REV S4 13.01.2024 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD

OFFICE & WORKSHOP FLOOR PLANS

Scale@A1 1 : 100

0m 1m 2m 3m 4m 5m

FOR APPROVAL

BELL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 M +61 419 996 978 P +61 8 8373 3870

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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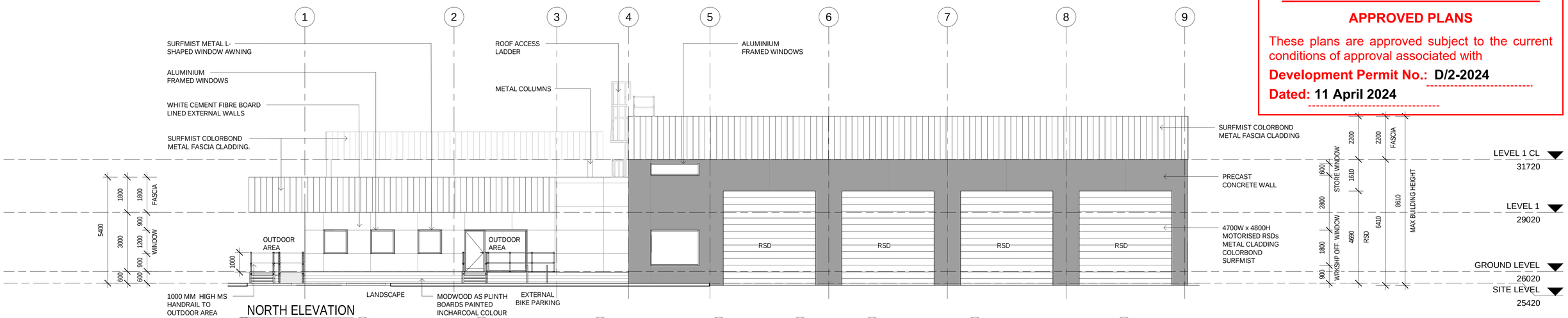
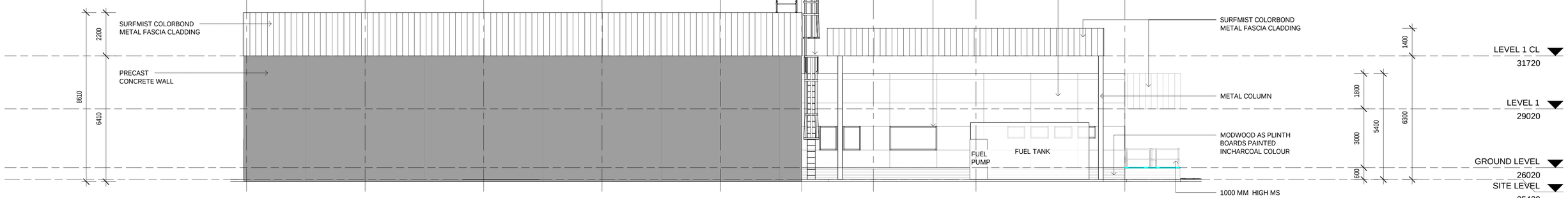
Dated: 11 April 2024



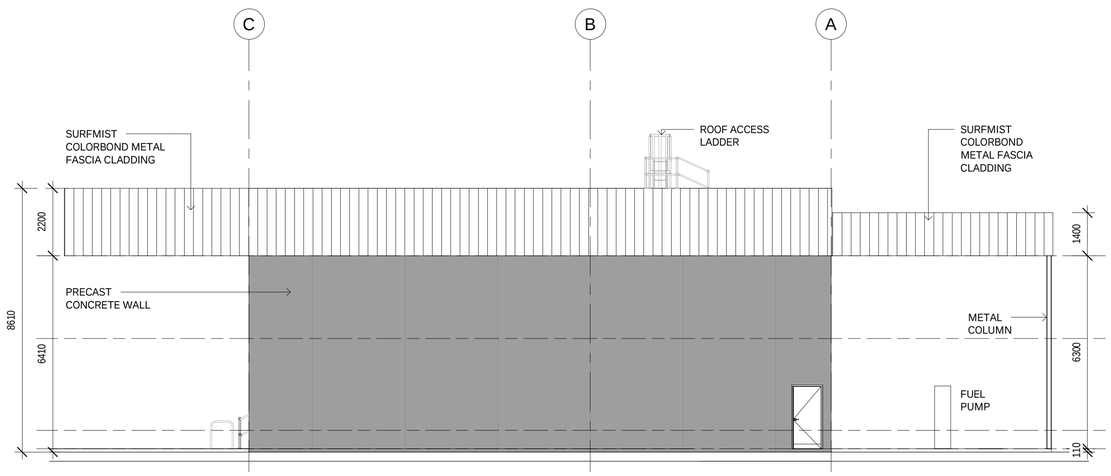
NORTH ELEVATION

1 : 100@A1



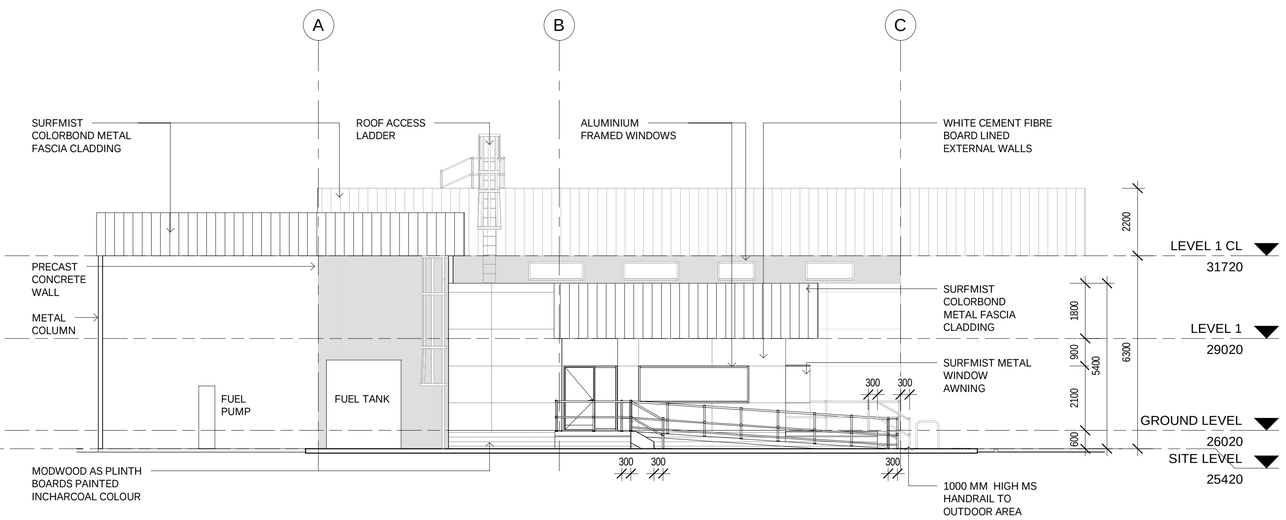
SOUTH ELEVATION

1 : 100@A1



WEST ELEVATION

1 : 100@A1



EAST ELEVATION

1 : 100@A1

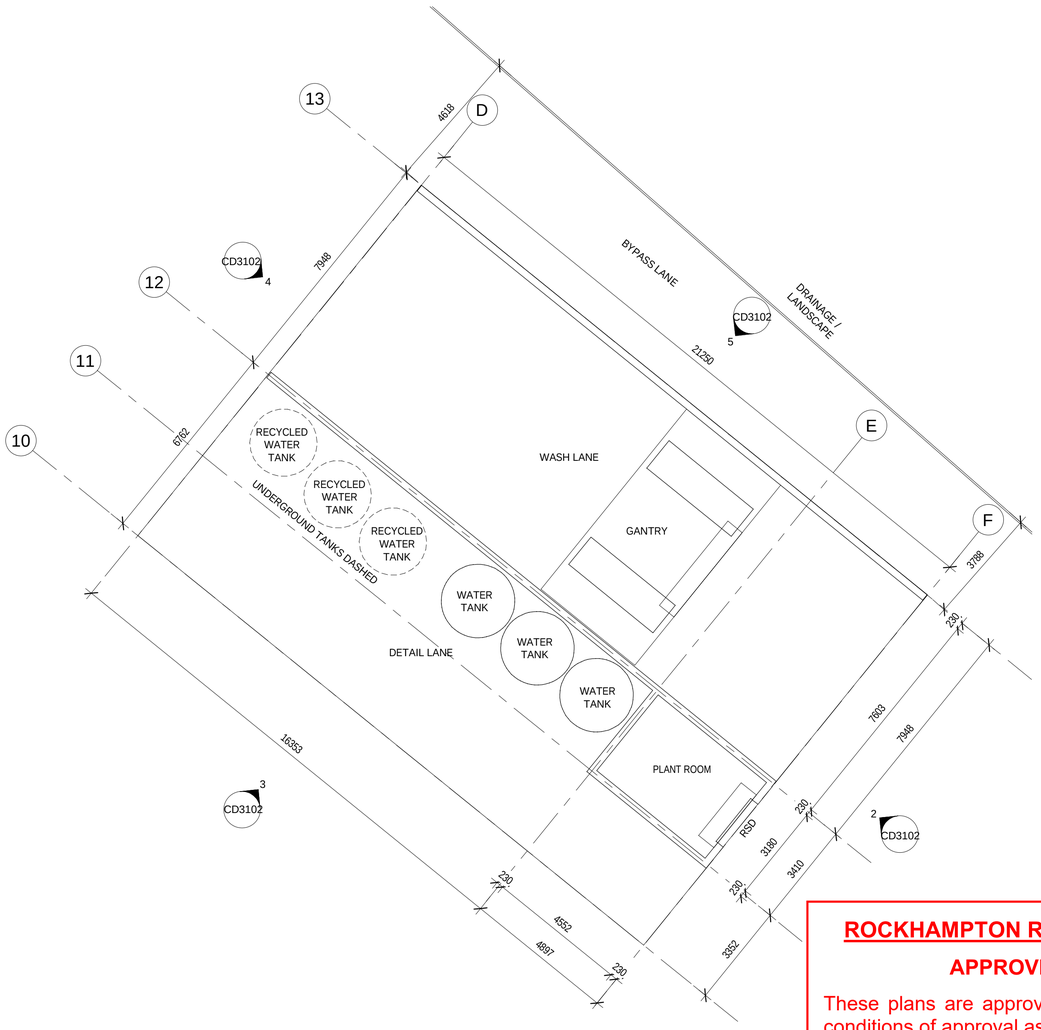
CD3101 REV S3 13.12.2023 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD ELEVATIONS Scale@A1 1 : 100

0m 2m 4m 6m 8m 10m

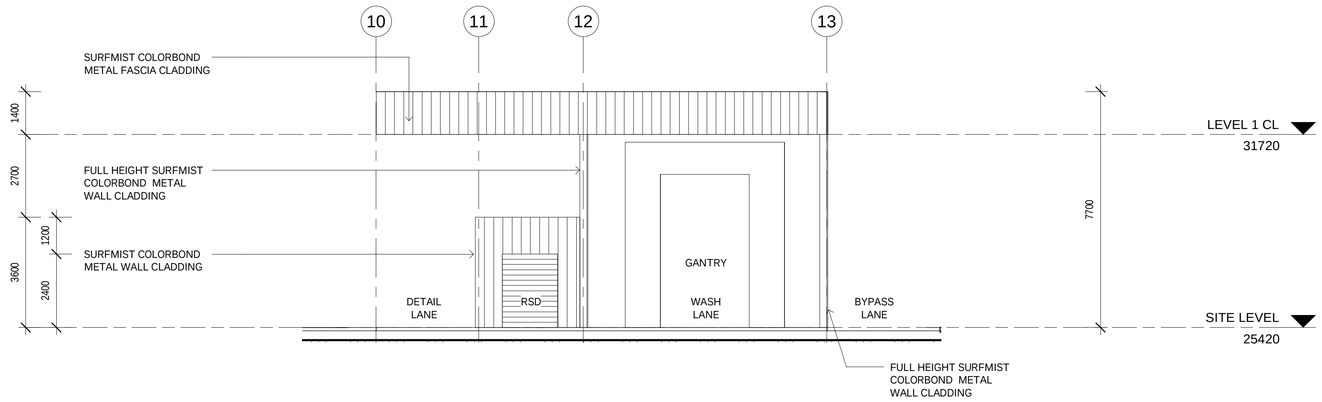
FOR APPROVAL

BELL

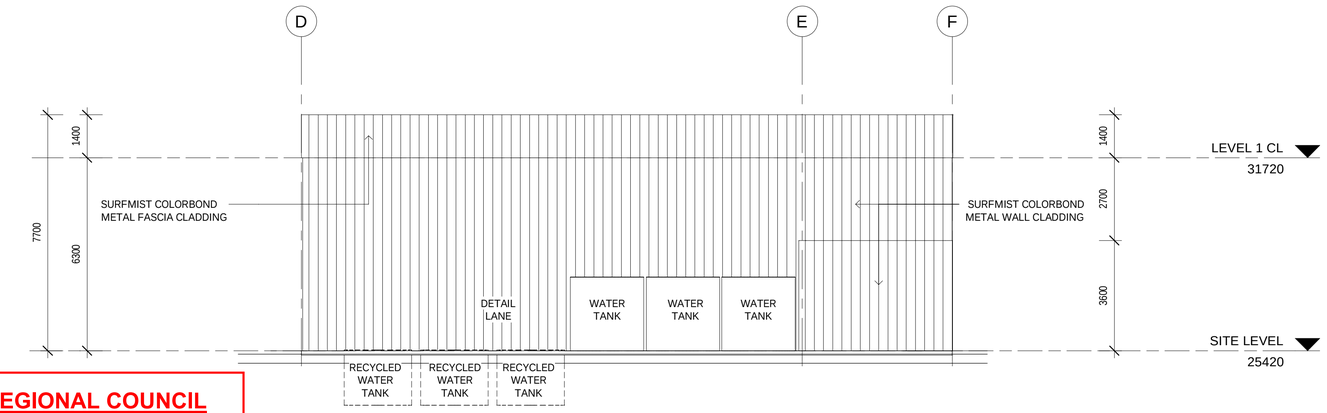
BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 **M** +61 419 996 978 **P** +61 8 8373 3870



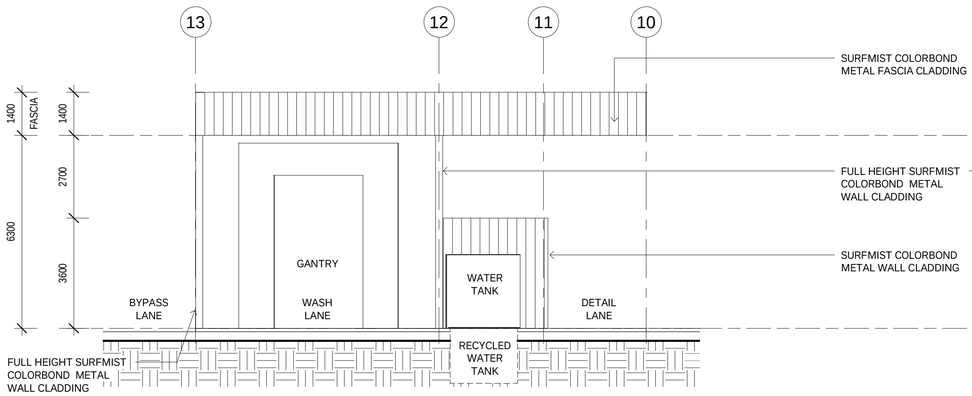
BUS WASH
1 : 100@A1



2 BUS WASH_NORTH ELEVATION
1 : 100@A1



3 BUS WASH_EAST ELEVATION
1 : 100@A1



4 BUS WASH_SOUTH ELEVATION
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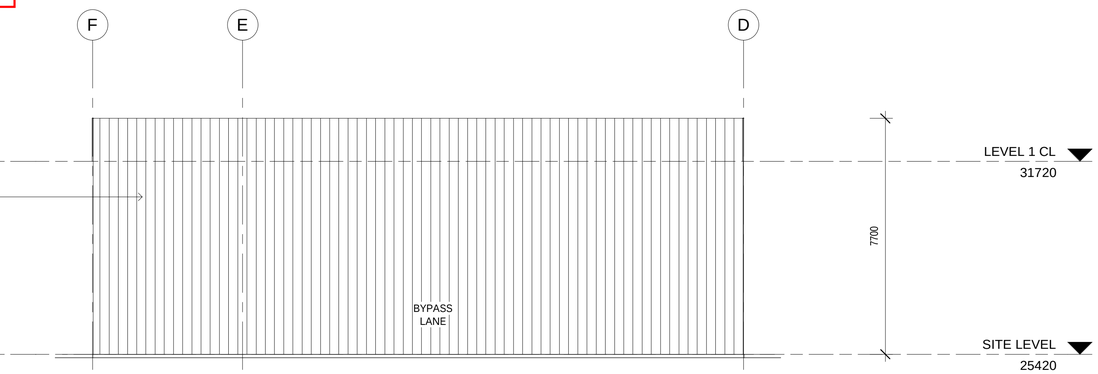

5 BUS WASH_ WEST ELEVATION
1 : 100@A1

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

CD3102 REV S2 13.12.2023 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD BUS WASH PLAN AND ELEVATIONS Scale@A1 1 : 100

0m 2m 4m 6m 8m 10m

FOR APPROVAL

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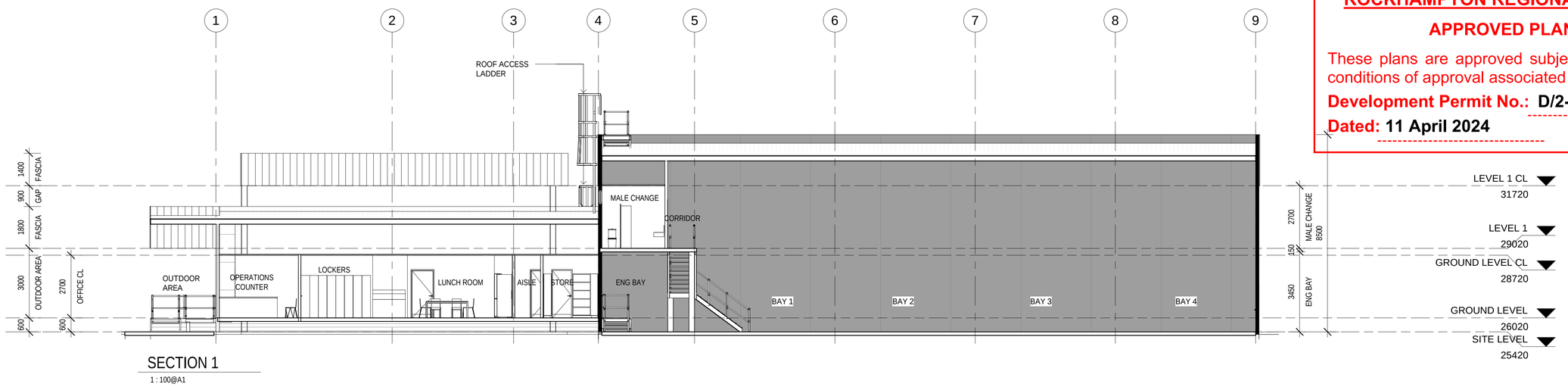
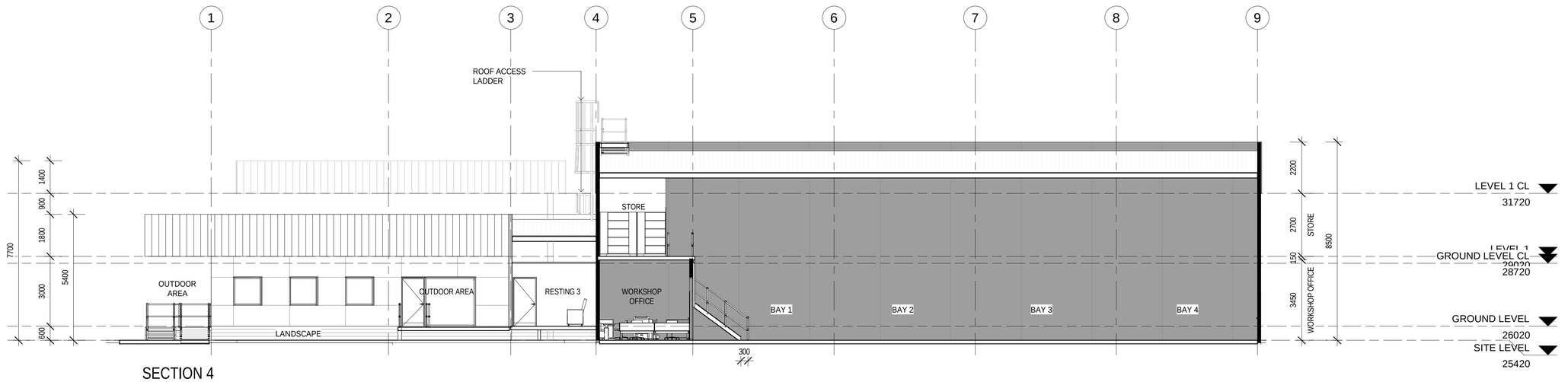


SECTION 1

1 : 100@A1



SECTION 4

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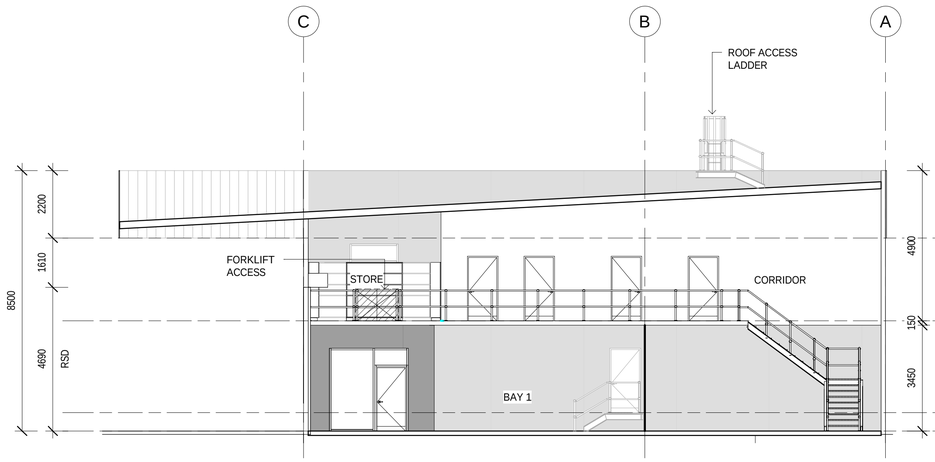

SECTION 2

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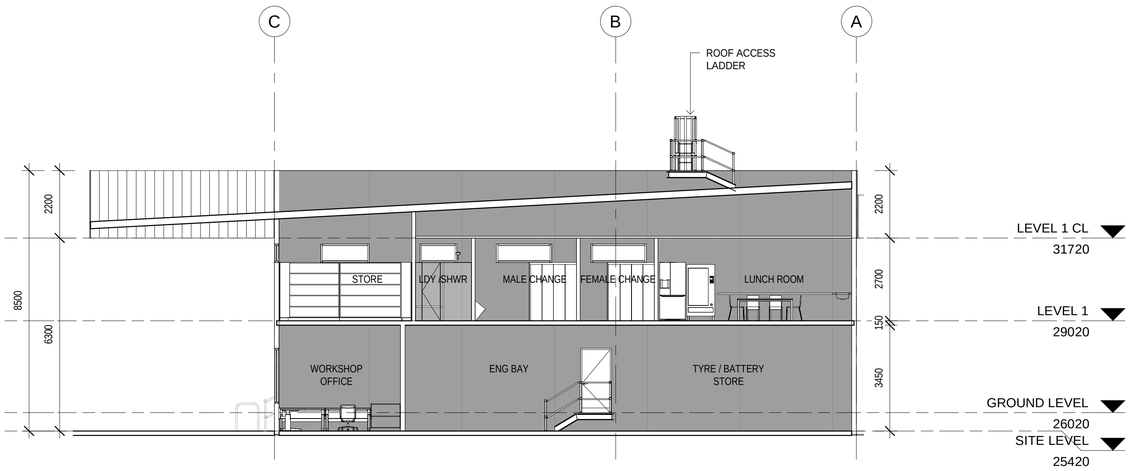

SECTION 3

1 : 100@A1

CD4101 REV S2 13.12.2023 BAB230106 KINETIC - 5 KILN CRT. ROCKHAMPTON QLD SECTIONS Scale@A1 1 : 100

0m 2m 4m 6m 8m 10m

FOR APPROVAL

BELL Architecture Pty Ltd ABN 26 169 081 734 Level 1, 80 Pirie Street, Adelaide, 5000 PO Box 3029 Rundle Mall 5000 **M** +61 419 996 978 **P** +61 8 8373 3870

APPENDIX C

Swept Path Assessment

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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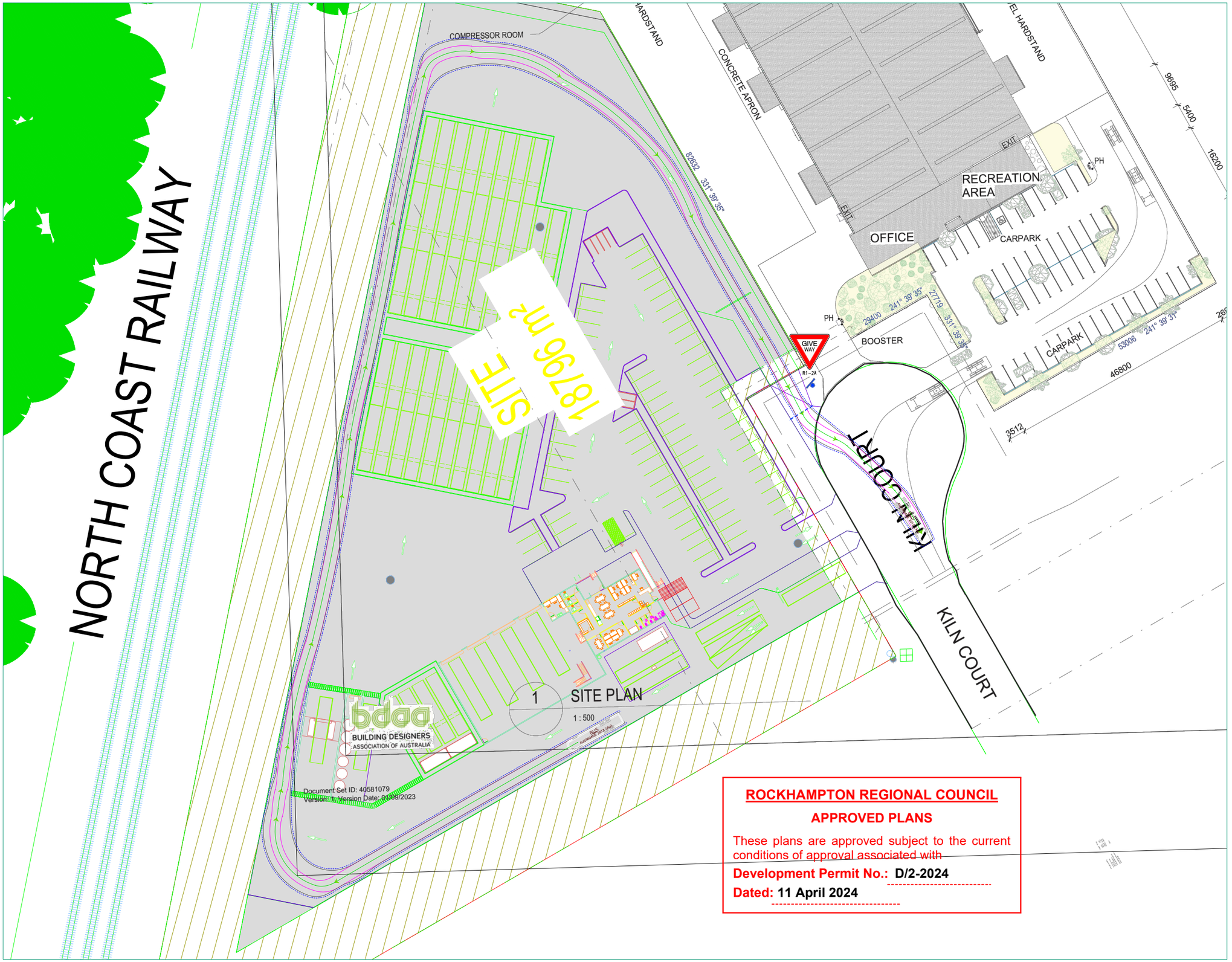
Development Permit No.: D/2-2024

Dated: 11 April 2024



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/2-2024

Dated: 11 April 2024

VEHICLE USED IN SIMULATION

SWEPT PATH LEGEND
- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (300mm)
- VEHICLE

N

0 5 10 15 20 25 30m
5 4 3 2 1
SCALE 1: 750

PROJECT

5 KILN COURT, PANKHURST

CLIENT

TMX TRANSFORM

DRAWING TITLE

SWEPT PATH ASSESSMENT BUS THROUGH SITE

DRAWING NUMBER

MOD2317QLD - SK01

DATE	REVISION
31 JAN 2024	C

REV	DRAWN BY	APPROVED	DATE	AMENDMENT DETAILS
A	E.G	T.A	12/12/23	DESIGN REVIEW
B	A.S	T.A	31/01/24	DESIGN REVIEW
C	A.S	T.A	14/02/24	DESIGN REVIEW

MODUS
Transport and Traffic Engineering

ABN 84 102 758 061
310 Edward Street, BRISBANE CITY QLD 4000

T: 1300 606 408 E: marketing@moduseng.com.au
W: www.modusengineering.com.au

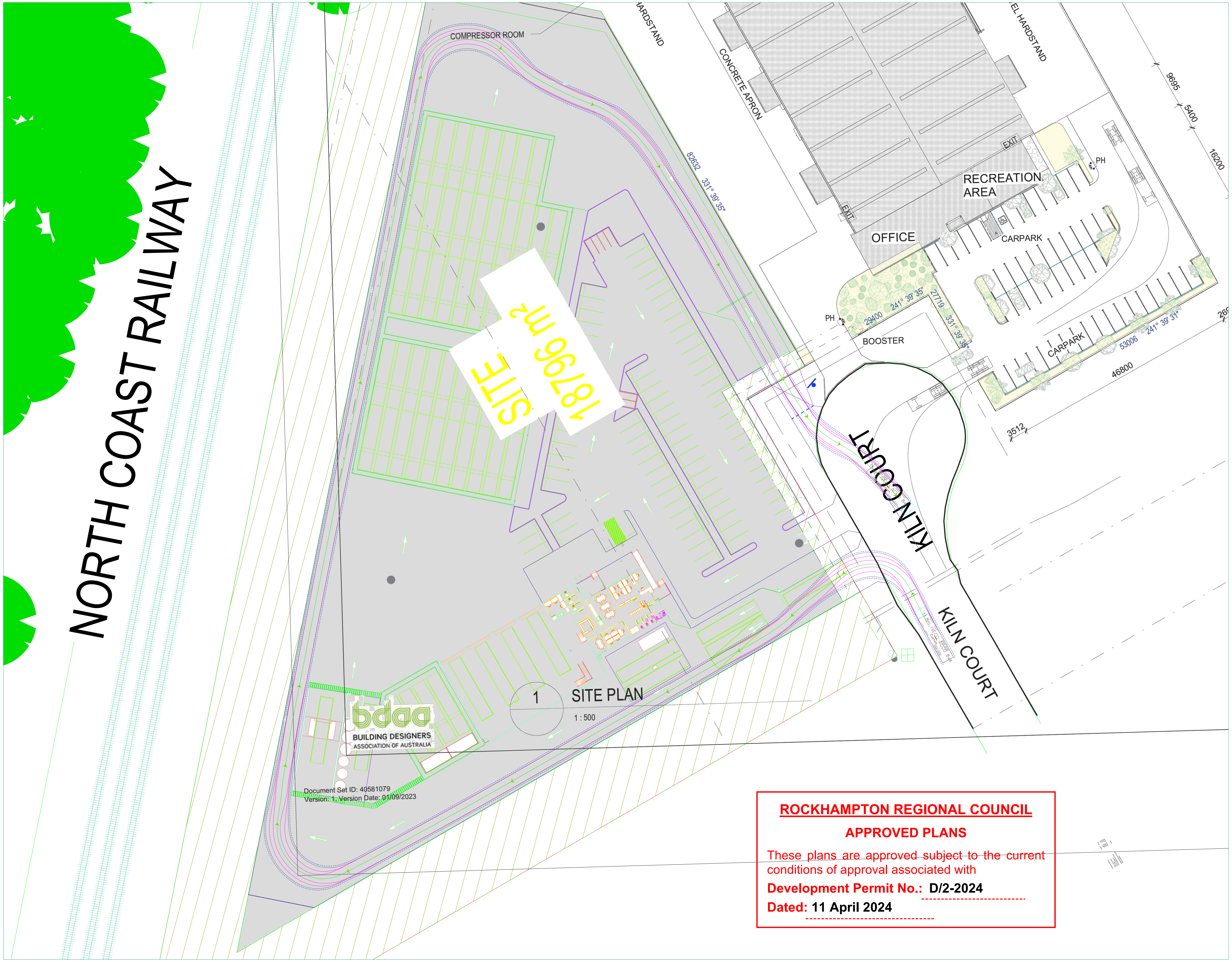
PRELIMINARY ADVICE ONLY

NOT TO BE USED FOR CONSTRUCTION

GENERAL NOTES:

1.PRELIMINARY DESIGN ISSUED FOR COMMENT ONLY.

2.ALL DIMENSIONS ARE PROVIDED IN METERS UNLESS NOTED OTHERWISE.



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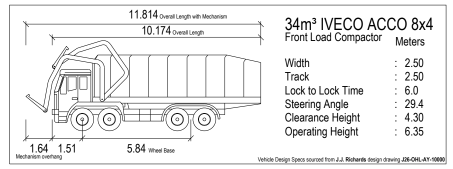
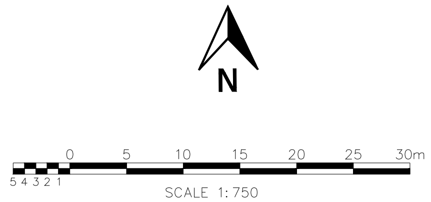
Dated: 11 April 2024

VEHICLE USED IN SIMULATION



SWEPT PATH LEGEND

- VEHICLE BODY
- FRONT TIRES
- VEHICLE PATH
- VEHICLE CLEARANCE (300mm)
- VEHICLE



PROJECT

5 KILN COURT, PANKHURST

CLIENT

TMX TRANSFORM

DRAWING TITLE

SWEPT PATH ASSESSMENT RCV THROUGH SITE

DRAWING NUMBER

MOD2317QLD - SK02

DATE	REVISION
31 JAN 2024	C

REV	DRAWN BY	APPROVED	DATE	AMENDMENT DETAILS
A	E.G	T.A	12/12/23	DESIGN REVIEW
B	A.S	T.A	31/01/24	DESIGN REVIEW
C	A.S	T.A	14/02/24	DESIGN REVIEW

MODUS
Transport and Traffic Engineering

ABN 84 102 758 061
310 Edward Street, BRISBANE CITY QLD 4000

T: 1300 606 408 E: marketing@moduseng.com.au
W: www.modusengineering.com.au

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