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ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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


Development Permit No.: D/118-2023

Dated: 9 August 2024

SITE BASED STORMWATER MANAGEMENT PLAN

Site Address:	Lot 2 Johnson Road, Gracemere QLD
Prepared Date:	05/02/2024
Revision:	0

DOCUMENT CONTROL

PROJECT INFORMATION	
Project Address	Lot 2 Johnson Road, Gracemere QLD
Lot Description	Lot 2 on RP617380
Project Number	2023006
Client	Turtleway Early Learning Pty Ltd
Council	Rockhampton Regional Council (RRC)
RPEQ	Charles Cook
Signature	
RPEQ No.	8480

DOCUMENT REVIEW

Revision	Date	Author	Reviewer
0	05/02/2024	Ammar Naqvi	Charles Cook

DOCUMENT DISTRIBUTION

Revision	Date	Distributed For	Distributed To
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1 INTRODUCTION

SEQ Civil Consulting Pty Ltd (SEQCC) has been engaged to prepare a Site-based Stormwater Management Plan (SBSMP) for the proposed development at Lot 2 Johnson Road, Gracemere QLD. The land parcel is legally described as Lot 2 on RP617380 (the subject site) and is located within Rockhampton Regional Council (RRC).

This assessment has been prepared generally in accordance with Rockhampton Region Planning Scheme, Queensland Urban Drainage Manual (QUDM, 2016), Australian Rainfall and Runoff (ARR) and Healthy Waterways – Water by Design.

1.1 SCOPE

Specifically, this report details the following:

- Describes the environmental setting of the development site;
- Describes the nature of the proposed development as it relates to stormwater quality;
- Calculates the peak flows for both pre- and post-development conditions;
- Calculates the detention volume required to achieve the pre-development state, if required;
- Establishment of a Lawful Point of Discharge (LPD) for the subject site;
- Stormwater Quality – Including an estimate of sediment and nutrient transport from the subject site and assessment against pollutant reduction targets for runoff exiting the site; and
- Stormwater Management Controls - for the construction and operational phases.

1.2 STORMWATER MANAGEMENT OBJECTIVES

The objectives of this SBSMP are to:

1. Minimise the number of pollutants such as sediment, litter and nutrients entering surrounding waterways and stormwater drainage infrastructure.
2. Achieve no increase in pre-development peak discharge from the subject site up to and including the 1% AEP (100-year ARI) storm event.
3. Ensure stormwater is managed to minimise the impact of flooding; and
4. Minimise environmental nuisance or harm from land-disturbing activities.

These objectives will be achieved through the implementation of:

1. Management strategies designed to minimise water pollution from development of the subject site;
2. Management strategies to maintain pre-development peak discharges at the existing lawful and practical point of discharge;
3. Specific construction phase controls to minimise erosion and control sediment loss; and
4. Specific operational phase controls to minimise sediment and nutrient export from the subject site.

2 EXISTING SITE CHARACTERISTICS

2.1 SITE OVERVIEW

The subject site is located within Rockhampton Regional Council (RRC) and covers a total area of 7209m² (or 0.721ha). The existing site is a vacant block of land currently grassed pervious areas with small to medium sized trees scattered throughout the site. The impervious area of the existing site is 0m², which amounts to 0.0% of the total site area.

Refer to the Figure 1 below for the aerial locality. Refer to **Appendix A** for the Site Survey Plan.



Figure 1 Site Location

2.2 EXISTING TOPOGRAPHY AND SITE DRAINAGE

The following topography details are in relation to the subject site located within Lot 2 Johnson Road, Gracemere QLD;

- The natural fall of the land generally slopes from the northern (side) and eastern (rear) boundaries of the site to the western (front) boundary of the subject site.
- The site levels range from RL29.0m AHD at the north-eastern corner of the site to RL26.0m AHD at the south-western corner of the site.
- The site has an average grade of 3.7%.
- An easement has been identified aligned with the northern (side) boundary of the site.
- Data obtained from detail survey and as-constructed information identifies the following existing stormwater infrastructure:
 - An open channel drain and associated inlet pit (Asset ID: 10318) located at the south-western corner of the subject site.
 - One (1) 1200x450 RCBC in the neighbouring property, being *Lot 1 on LN2621*, aligned with the southern boundary of the subject site.
 - One (1) 900mm RCP crossing under the Johnson roadway adjacent to the south-western corner of the subject site.

Refer to **Appendix A** for the site survey plan and **Appendix B** for the as-constructed information obtained from RRC Interactive Mapping system.

2.3 EXTERNAL UPSTREAM CATCHMENT ASSESSMENT

A review of the surrounding area has been undertaken to determine the extent of any external upstream catchments, which may flow towards the subject site. Based on contour maps obtained from the RRC Interactive Mapping system there appears to be no external upstream catchment which may contribute to overland flow through the site.

2.4 FLOODING ASSESSMENT

Based on an assessment of RRC Interactive Mapping, the subject site has been identified to be within a flood hazard area, however the flood hazard overlay code is not triggered for the subject site.

Refer to **Appendix B** for the Flood Map obtained from RRC Interactive Mapping system.

2.5 LAWFUL AND PRACTICAL POINT OF DISCHARGE

In accordance with the Queensland Urban Drainage Manual (QUDM), when proposing a development, it must demonstrate that a lawful point of discharge (LPD) exists.

A lawful point of discharge exists at a particular location when the following two (2) tests can be demonstrated as per QUDM:

- (i) The location of the discharge is under the lawful control of the local government or other statutory authority from whom permission to discharge has been received. This can include a park, drainage or road reserve, stormwater drainage easement; and
- (ii) In discharging to that location, the discharge will not cause an actionable nuisance (i.e. a nuisance for which the current or some future neighbouring proprietor may bring an action or claim for damages arising out of the nuisance), or environmental or property damage.

Surface runoff from the subject site currently sheet flows from the ground areas to the frontage of the site and to the open channel surface drain adjacent to the subject site's western boundary. The open channel surface drain discharges to an inlet pit (Asset ID: 10318) located adjacent to the south-western corner of the subject site.

Therefore, in order to maintain the pre-development flow conditions, the open channel surface drain and associated inlet pit (Asset ID: 10318) located adjacent to the south-western corner of the subject site will be considered the lawful point of discharge (LPD) for the site.

3 PROPOSED DEVELOPMENT

The proposed development comprises of a Material Change of Use (MCU) Development Application submission to Council, based on the following:

- A multiple dwelling residential development comprising of twenty (20) townhouse units.
- Dedicated hardstand driveway area provided for vehicle manoeuvring with eleven (11) dedicated car parking spaces provided within the development site.
- Access/egress to the site will be via a vehicle crossover connecting to Johnson Road.
- Dedicated landscaping areas throughout the site.
- The total area of the subject site is 7209m² (or 0.721ha).

Refer **Appendix C** for the proposed Development Site Plans.

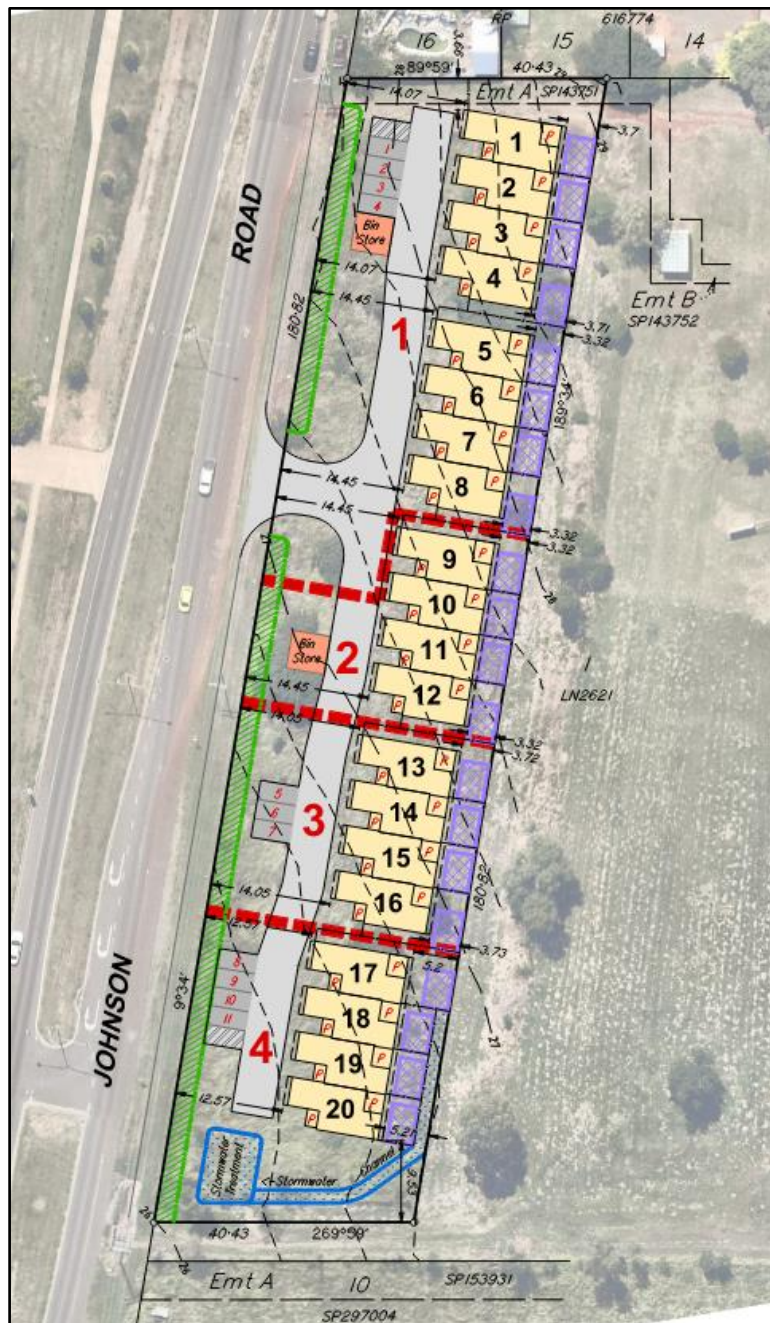


Figure 2 Development Site Layout

4 STORMWATER QUANTITY ASSESSEMENT

4.1 HYDROLOGIC OBJECTIVES

Hydrologic objectives for the subject site have been set in accordance with the Rockhampton Region Planning Scheme and the Queensland Urban Drainage Manual (QUDM), Fourth Edition 2016, including but not limited to:

- No increase in pre-development flows, up to and including the 100-year ARI (or 1% AEP);
- No adverse impact on adjoining or downstream properties;
- The proposed development shall ensure that all stormwater is directed to an LPD;
- A Major Design Storm Event of 100-year ARI (or 1% AEP); and
- A Minor Design Storm Event of 2-year ARI (or 39.35% AEP).

4.2 HYDROLOGICAL PARAMETERS

Catchment hydrology has been assessed for the pre and post-development scenarios and has been calculated using a DRAINS hydrological computer model (ILSAX Method). Calibration of the DRAINS hydrological computer model was achieved by comparing the DRAINS flow rates to the Rational Method calculations in accordance with QUDM (Fourth Edition, 2016), Section 4 and Section 5, and AS3500 – Plumbing and Drainage.

The default hydrological model used for this Assessment was the ILSAX Model. The following parameters were established in setting up the model:

- Paved (impervious) area depression storage (mm): 1
- Supplementary area depression storage (mm): 1
- Grassed (pervious) area depression storage (mm): 5
- Soil Type: Normal with antecedent rainfall depth for AMC 3 mm
- Rainfall Zone: Zone 3 – N.E. Coast
- AR&R 2016

4.3 DESIGN RAINFALL

The design rainfall Intensity Frequency Duration (IFD) data for all storm events up to an including 100-year ARI (or 1% AEP) has been obtained for the subject site from the Bureau of Meteorology for nominated ARI's and used in the DRAINS computer model. The design IFD data for the subject site can be seen in Figure 3 below. Rainfall temporal patterns used in the DRAINS hydrological computer model (ILSAX Method) analysis were prepared in accordance with Australian Rainfall and Runoff (AR&R 2016). Rainfall is modelled for the catchment in equal time intervals under each storm event and the subsequent runoff routed through a drainage system. To establish the most likely rain event that would require the greatest volume of detention, design storm durations of 5, 10, 15, 20, 25, 30, 45, 60, 90, 120, 180 and 360 minutes were modelled.

Location

Label: Not provided

Latitude: -23.452 [Nearest grid cell: 23.4625 (S)]

Longitude: 150.4518 [Nearest grid cell: 150.4625 (E)]



IFD Design Rainfall Intensity (mm/h)

Issued: 20 January 2024

Rainfall intensity for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
[FAQ for New ARR probability terminology](#)

Table

Chart

Unit:

Duration	Annual Exceedance Probability (AEP)						
	63.2%	50%#	20%*	10%	5%	2%	1%
1 min	157	174	230	269	308	361	402
2 min	131	146	193	226	258	299	332
3 min	124	137	182	213	243	283	314
4 min	118	132	174	204	233	272	302
5 min	114	127	167	196	224	261	291
10 min	95.0	106	139	163	186	218	244
15 min	81.2	90.1	119	139	159	187	209
20 min	70.9	78.7	104	121	139	164	183
25 min	63.1	70.1	92.4	108	124	146	163
30 min	56.9	63.2	83.5	97.8	112	132	147
45 min	44.3	49.3	65.3	76.6	88.0	104	116
1 hour	36.6	40.7	54.2	63.7	73.2	86.2	96.6
1.5 hour	27.5	30.7	41.1	48.5	55.9	66.1	74.2
2 hour	22.3	25.0	33.7	39.9	46.1	54.7	61.6
3 hour	16.6	18.6	25.4	30.2	35.1	42.0	47.5
4.5 hour	12.3	13.9	19.2	23.1	27.0	32.6	37.2
6 hour	9.94	11.3	15.8	19.2	22.6	27.5	31.5
9 hour	7.42	8.51	12.2	14.9	17.8	21.9	25.3
12 hour	6.05	6.98	10.1	12.5	15.2	18.8	21.9
18 hour	4.55	5.29	7.89	9.92	12.2	15.3	18.0
24 hour	3.73	4.35	6.61	8.42	10.4	13.3	15.7
30 hour	3.19	3.74	5.75	7.41	9.27	11.9	14.1
36 hour	2.80	3.30	5.13	6.66	8.39	10.8	12.9
48 hour	2.28	2.69	4.25	5.59	7.12	9.23	11.0
72 hour	1.69	2.00	3.21	4.26	5.51	7.20	8.66
96 hour	1.35	1.60	2.57	3.44	4.47	5.86	7.08
120 hour	1.12	1.33	2.14	2.85	3.72	4.89	5.91
144 hour	0.961	1.14	1.82	2.41	3.15	4.14	5.01
168 hour	0.839	0.994	1.57	2.07	2.70	3.55	4.30

Figure 3 IFD Data for Gracemere

4.4 PRE-DEVELOPMENT AND POST-DEVELOPMENT HYDROLOGY

The following parameters have been adopted for the existing pre-development and post-development site conditions assessed in accordance with QUDM Fourth Edition, Section 4:

Pre-Development Parameters:

- Catchment Area (CAT C1) = **0.721 ha**
- Time of Concentration, t_c = **10.8 minutes**
- Fraction Impervious, f_i = **0.0** (0.0% Impervious)
- Runoff Co-efficient, C_{10} value = **0.70**

Post-Development Parameters:

- Catchment Area (CAT C2 – Treated Area) = **0.563 ha**
- Time of Concentration, t_c = **7.3 minutes**
- Fraction Impervious, f_i = **0.70** (70% Impervious)
- Runoff Co-efficient, C_{10} value = **0.81**

- Catchment Area (CAT C3 – Bypass Area) = **0.158 ha**
- Time of Concentration, t_c = **5.0 minutes**
- Fraction Impervious, f_i = **0.0** (0% Impervious)
- Runoff Co-efficient, C_{10} value = **0.70**

The post development sub-catchments have been delineated to represent the contributing area that is to be conveyed via the internal drainage network (CAT C2) and the remaining ground areas where surface runoff from the landscaping areas is anticipated to bypass the internal drainage network (CAT C3) and sheet flow to the LPD. Refer to **Appendix D** for sub-catchment delineation.

4.4.1 PRE-DEVELOPMENT DRAINS MODEL PARAMETERS

Table 1 below shows the parameters used in the DRAINS Model for the pre-development catchment scenario.

Table 1 – Pre-Development Drains Model Parameters – CAT C1

Pre-Development Catchment (CAT C1)	Paved	Supplementary	Grassed
Percentage of Area (%)	0	0	100
Time of Concentration (minutes)	0	0	10.8

4.4.2 POST-DEVELOPMENT DRAINS MODEL PARAMETERS

Tables 2-3 below shows the parameters used in the DRAINS Model for the post-development catchment scenario.

Table 2 – Post-Development Drains Model Parameters – CAT C2

Post-Development Catchment (CAT C2)	Paved	Supplementary	Grassed
Percentage of Area (%)	70	0	30
Time of Concentration (minutes)	7.3	0	7.3

Table 3 – Post-Development Drains Model Parameters – CAT C3

Post-Development Catchment (CAT C3)	Paved	Supplementary	Grassed
Percentage of Area (%)	0	0	100
Time of Concentration (minutes)	0	0	5.0

4.4.3 PRE AND POST-DEVELOPMENT MODEL RESULTS

Summaries of the hydrological calculations for the pre- and post-development (unmitigated) scenarios are demonstrated in Tables 4-7 below. The results show the median temporal pattern stormwater of the critical duration for each design storm event.

Table 4 – Pre-Development Peak Flow – CAT C1

PRE-DEVELOPMENT PEAK DISCHARGE (Q) – CAT C1				
Storm Event (year)	Cy	Iy (mm/hr)	Peak Qy (Rational) (m ³ /s)	Peak Qy (ILSAX) (m ³ /s)
Q2 (39.35% AEP)	0.595	114	0.136	0.145
Q5 (18.13% AEP)	0.665	138	0.184	0.190
Q10 (10% AEP)	0.700	158	0.222	0.227
Q20 (5% AEP)	0.735	181	0.267	0.273
Q50 (2% AEP)	0.805	213	0.343	0.331
Q100 (1% AEP)	0.840	237	0.399	0.380

Table 5 – Post-Development Peak Flow – CAT C2

POST-DEVELOPMENT PEAK DISCHARGE (Q) –CAT C2				
Storm Event (year)	Cy	Iy (mm/hr)	Peak Qy (Rational) (m ³ /s)	Peak Qy (ILSAX) (m ³ /s)
Q2 (39.35% AEP)	0.689	129	0.139	0.162
Q5 (18.13% AEP)	0.770	156	0.188	0.204
Q10 (10% AEP)	0.810	179	0.227	0.242
Q20 (5% AEP)	0.851	205	0.273	0.280
Q50 (2% AEP)	0.932	240	0.350	0.332
Q100 (1% AEP)	0.972	268	0.407	0.372

Table 6 – Post-Development Peak Flow – CAT C3

POST-DEVELOPMENT PEAK DISCHARGE (Q) –CAT C3				
Storm Event (year)	Cy	Iy (mm/hr)	Peak Qy (Rational) (m ³ /s)	Peak Qy (ILSAX) (m ³ /s)
Q2 (39.35% AEP)	0.595	141	0.037	0.038
Q5 (18.13% AEP)	0.665	171	0.050	0.051
Q10 (10% AEP)	0.700	196	0.060	0.063
Q20 (5% AEP)	0.735	224	0.072	0.075
Q50 (2% AEP)	0.805	261	0.092	0.089
Q100 (1% AEP)	0.840	291	0.107	0.102

Table 7 – Pre-vs-Post-Development (Unmitigated) Peak Flow Comparison

PRE-VS-POST-DEVELOPMENT (UNMITIGATED) PEAK DISCHARGE (Q)				
Storm Event (year)	Pre-Development Peak Qy (CAT C1) (ILSAX) (m³/s)	Post-Development Unmitigated Peak Qy (CAT C2 + CAT C3) (ILSAX) (m³/s)	Difference (m³/s)	Increase / Decrease (%)
Q2 (39.35% AEP)	0.145	0.200	0.055	+38%
Q5 (18.13% AEP)	0.190	0.255	0.065	+34%
Q10 (10% AEP)	0.227	0.305	0.078	+34%
Q20 (5% AEP)	0.273	0.355	0.082	+30%
Q50 (2% AEP)	0.331	0.421	0.090	+27%
Q100 (1% AEP)	0.380	0.474	0.094	+25%

A comparison of the pre- and post-development peak flow rates for unmitigated stormwater discharge using DRAINS Model (ILSAX Method) indicates there will be approximately 0.055m³/s (55 L/s) to 0.094m³/s (94 L/s) increase in peak discharge from the subject site for all design storms (Q₂ to Q₁₀₀) as a result of the proposed development.

Therefore, On-site Stormwater Detention (OSD) is required for the proposed development in order to ensure there is no increase in pre-development peak flow rates from the subject site at the LPD.

4.5 ON-SITE DETENTION

To satisfy the objective of no increase in pre-development peak flows, a DRAINS software computer model has been developed to determine the required On-site Stormwater Detention (OSD) device characteristics (volume and outlet arrangement).

The peak discharge from the proposed development for all design storms up to and including the 1% AEP will be mitigated to equal to or less than pre-development flow via the implementation of a combined bioretention / detention basin. Refer to Table 8 below for basin summary.

Table 8 – On-Site Stormwater Detention Device Details

ON-SITE STORMWATER DETENTION (OSD) DEVICE DETAILS	
OSD Device	Combined Bioretention / Detention Basin
Basin Width (m)	5.50
Basin Length (m)	9.50
Total Basin Depth (m)	1.27
Detention Basin Base Area (m²)	51
Volume Available for Detention (m³)	171
Basin Base Level (m AHD)	RL: 25.88
Outlet Pit Surface Level (m AHD)	RL: 26.18
Top of Basin Level (m AHD)	RL: 27.15
Low Flow Outlet Pipe Invert Level (m AHD)	IL: 25.08

It is proposed to discharge stormwater runoff from CAT C2 (roof, road and ground) from the proposed development to the combined bioretention / detention basin. Stormwater from the combined bioretention / detention basin will then discharge at a mitigated rate to the Lawful Point of Discharge (LPD). The combined bioretention / detention basin has been designed over-mitigate runoff from CAT C2 to allow the bypassing ground areas of CAT C3 to discharge unmitigated as sheet flow to the LPD.

To ensure peak flows from the proposed development are discharged at pre-development conditions or less from the combined bioretention / detention basin, it is proposed to utilise a Ø260mm orifice plate over a Ø375mm RCP as the low-flow outlet and a weir for the high-flow outlet. The weir is to be 3.0m wide and 430mm deep.

Refer to **Appendix D** for the Stormwater Management Plans which shows the location and details of the proposed combined bioretention / detention basin.

Table 9 below provides a summary of the DRAINS model results for the post development mitigated site scenario (with the implementation of the combined bioretention / detention basin within the DRAINS model). The results show the outflow from the detention basin (Basin Outflow), the water depth within the basin (Basin Stage) and the volume reached within the detention basin (Basin Storage Volume) to ensure that pre-development flow conditions for all storms are achieved.

Table 9 – DRAINS Post-Development (Mitigated) Detention Basin Summary

POST-DEVELOPMENT (MITIGATED) DETENTION BASIN SUMMARY					
Storm Event (year)	Low-Flow Pipe Outflow (m ³ /s)	High-Flow Weir Outflow (m ³ /s)	Total Basin Outflow (m ³ /s)	Basin Stage – Depth Above Outlet Pit (m)	Basin Storage Volume (m ³)
Q2 (39.35% AEP)	0.105	0.000	0.105	0.240	26.89
Q5 (18.13% AEP)	0.118	0.000	0.118	0.370	46.02
Q10 (10% AEP)	0.127	0.000	0.127	0.480	63.84
Q20 (5% AEP)	0.135	0.026	0.161	0.580	82.80
Q50 (2% AEP)	0.139	0.088	0.227	0.640	93.46
Q100 (1% AEP)	0.141	0.134	0.275	0.670	99.91

4.6 POST DEVELOPMENT MITIGATED DISCHARGE RESULTS

Table 10 provides a comparison of the pre-development peak flow rates from the subject site to the post-development mitigated peak discharge rates from the subject site at the LPD with the implementation of the combined bioretention / detention basin within the DRAINS model.

Table 10 – Comparison of Pre- vs. Post-Development Mitigated Discharge

PRE VS POST DEVELOPMENT MITIGATED PEAK DISCHARGE (Q)					
Storm Event (year)	Pre-Dev (CAT C1) Qy (m ³ /s)	Post-Dev Mitigated (CAT C2) Qy (m ³ /s)	Post-Dev Unmitigated (CAT C3) Qy (m ³ /s)	Difference (m ³ /s)	Reduction Y/N
Q2 (39.35% AEP)	0.145	0.105	0.038	-0.002	Y
Q5 (18.13% AEP)	0.190	0.118	0.051	-0.021	Y
Q10 (10% AEP)	0.227	0.127	0.063	-0.037	Y
Q20 (5% AEP)	0.273	0.161	0.075	-0.037	Y
Q50 (2% AEP)	0.331	0.227	0.089	-0.015	Y
Q100 (1% AEP)	0.380	0.275	0.102	-0.003	Y

Therefore, it is demonstrated that the proposed combined bioretention / detention basin will ensure that pre-development peak flow rates (or less) will be achieved at the LPD for the subject site in the post-development state.

Refer to Figure 4 below for a screen shot of the DRAINS model for the pre-development site scenario.

Refer to Figure 5 below for a screen shot of the DRAINS model for the post-development (unmitigated) site scenario.

Refer to Figure 6 below for a screen shot of the DRAINS model for the post-development (mitigated) site scenario.

Refer to **Appendix D** for the Stormwater Management Plans and details.

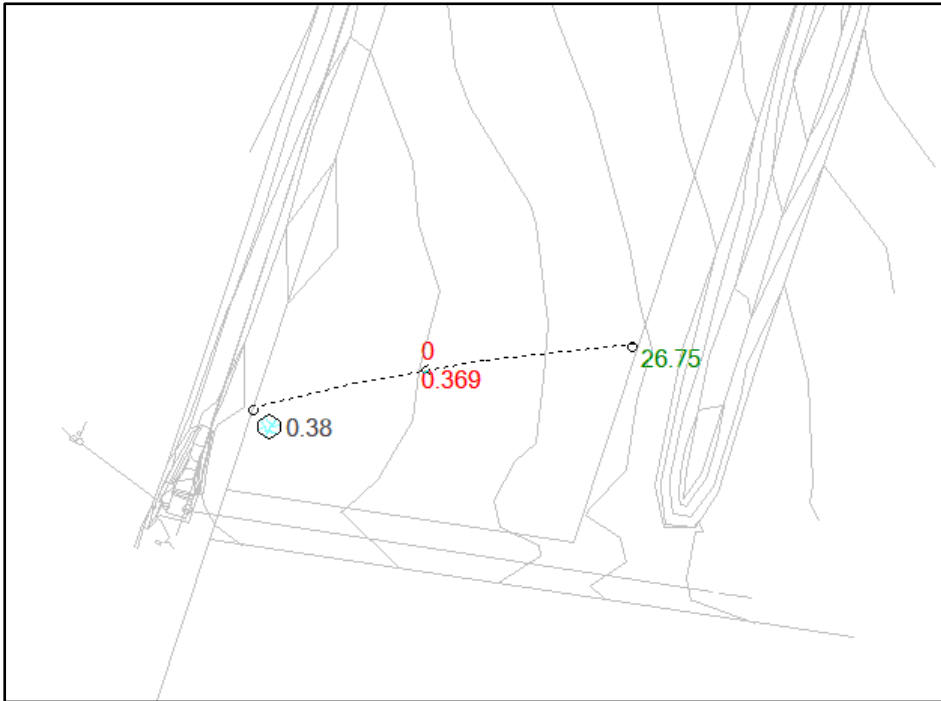
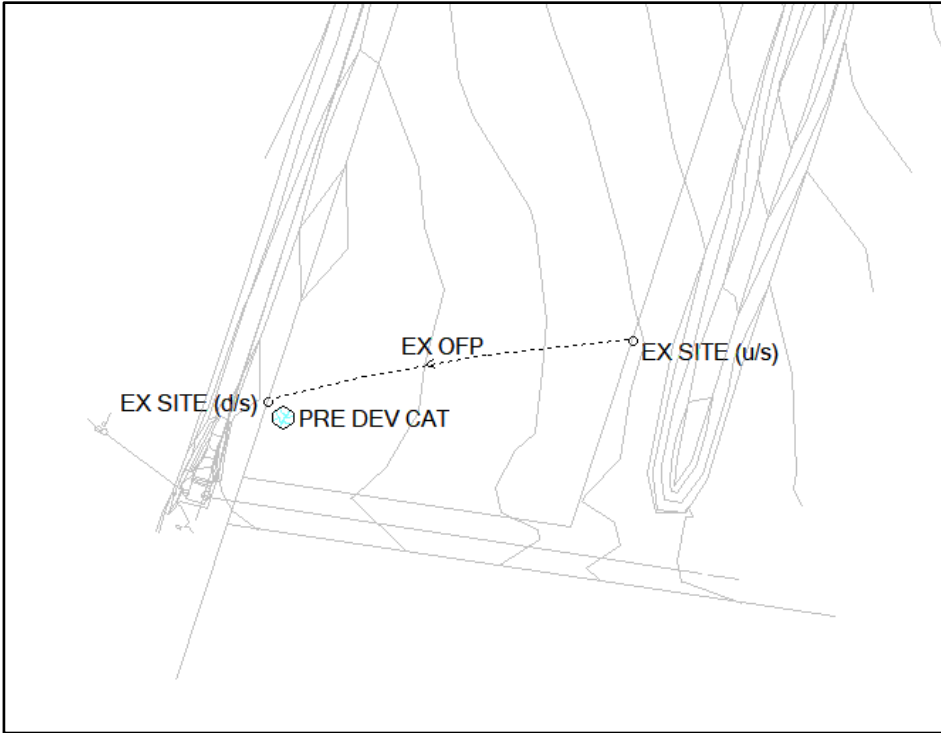


Figure 4 – Pre-Development DRAINS Model

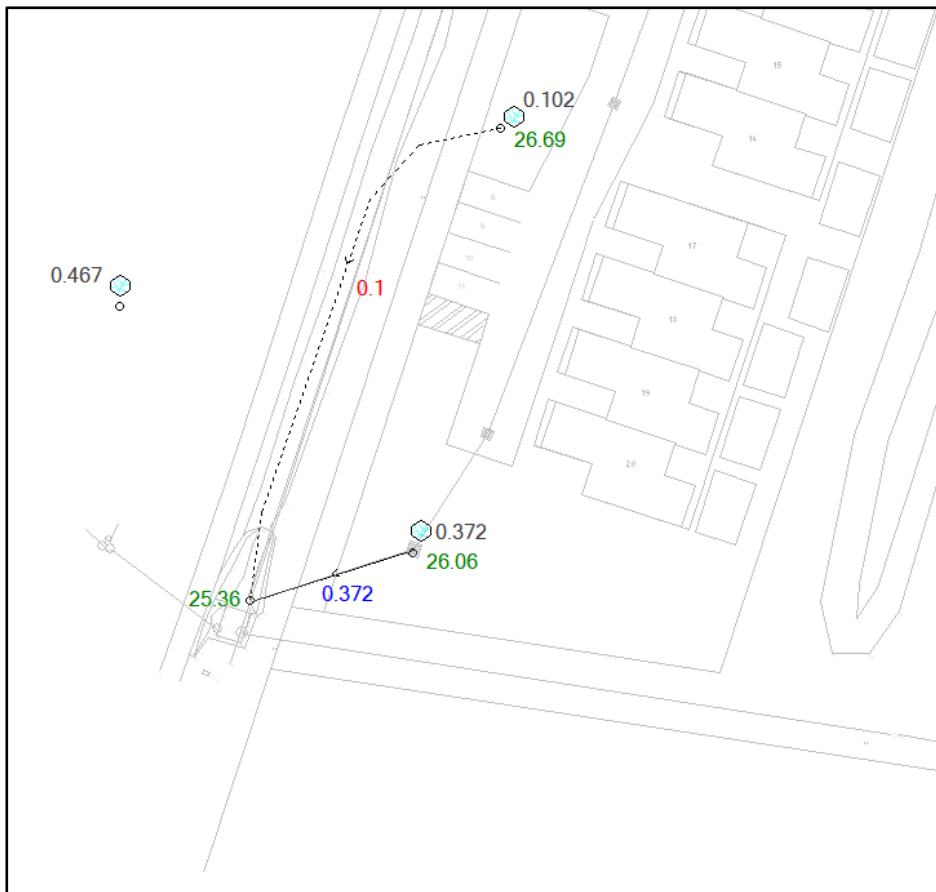
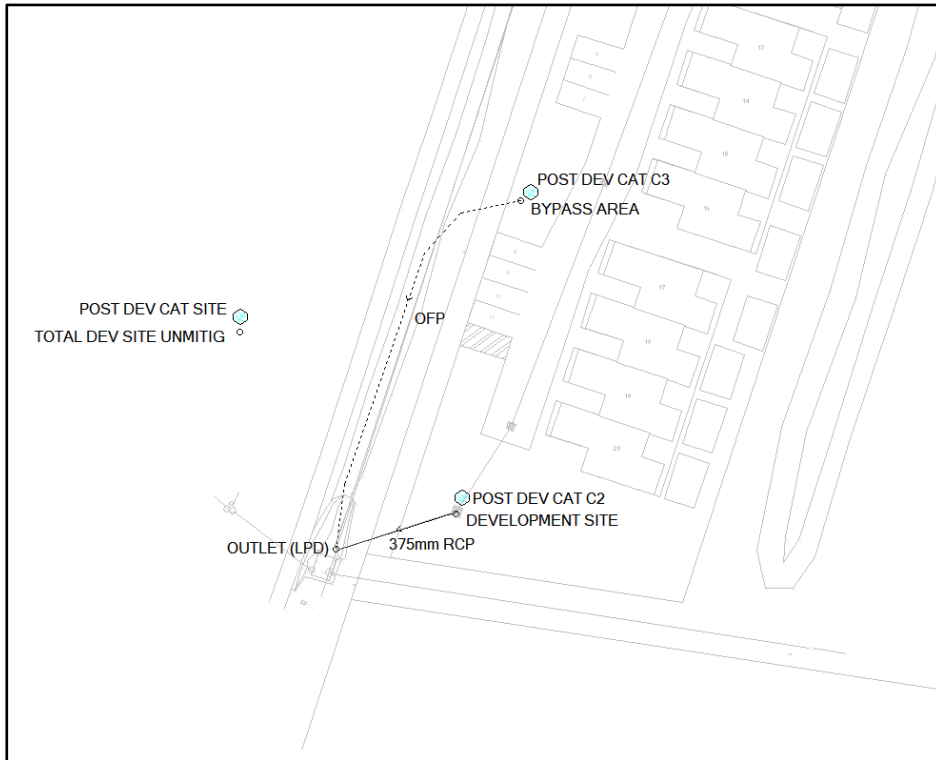


Figure 5 – Post-Development Unmitigated DRAINS Model

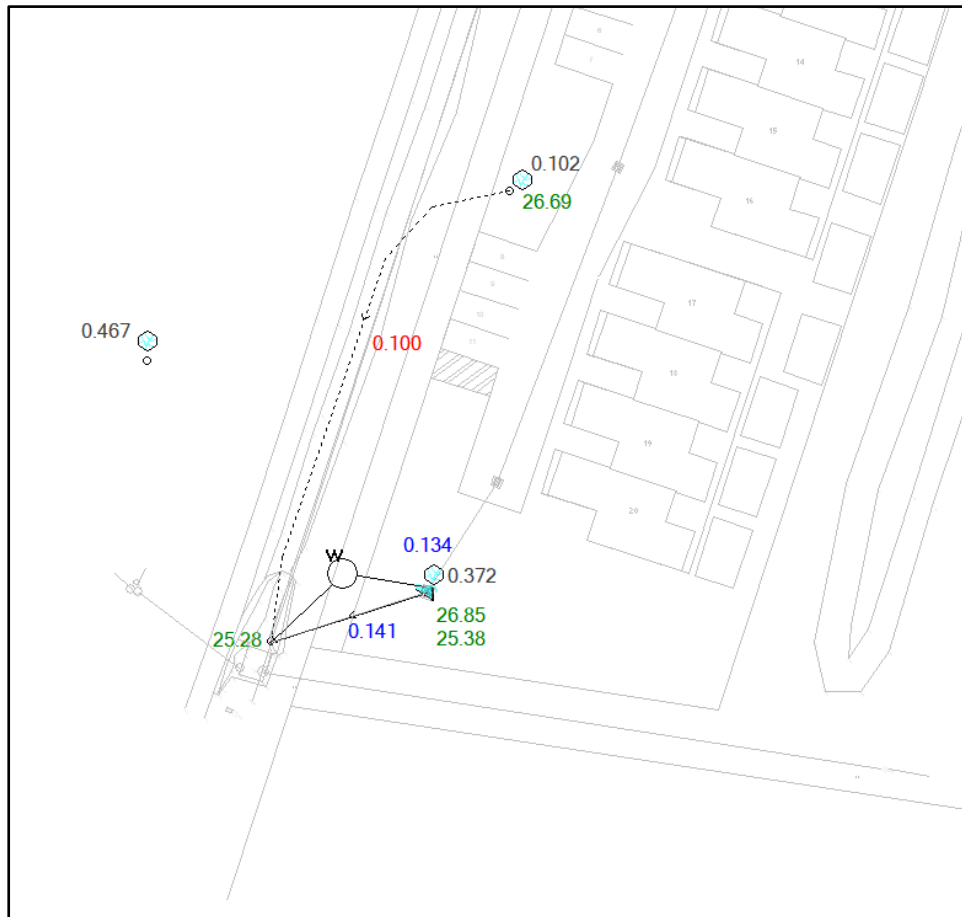


Figure 6 – Post-Development Mitigated DRAINS Model

4.7 PROPOSED DRAINAGE WORKS

As shown on the stormwater management plans (**Appendix D**) all roofwater runoff from the proposed residential dwellings will be directed via downpipes to internal stormwater drainage network under the driveway pavement and surface runoff from the ground areas within the development will be captured via the field inlets provided in the driveway. The internal drainage network will discharge surface runoff from the development site to the combined bioretention / detention basin located at the southern extent of the subject site. Stormwater runoff from the combined bioretention / detention basin will discharge at less than pre-development flow rates (via a Ø260mm low-flow orifice plate over the 375mm RCP outlet) to the LPD, being the open channel surface drain and associated inlet pit (Asset ID: 10318) located adjacent to the south-western corner of the subject site.

Overflow from the detention basin, which will occur during the Q_{20} to Q_{100} design storm event, will discharge at a mitigated rate (less than pre-development flow rates) via the 3.0m wide overflow weir to the lawful point of discharge (LPD) being the open channel surface drain and associated inlet pit (Asset ID: 10318) located adjacent to the south-western corner of the subject site.

Minor surface runoff from the landscaping ground areas (CAT C3) fronting the proposed development are unlikely to be captured and intended to sheet flow unmitigated to the LPD.

5 STORMWATER QUALITY ASSESSMENT

5.1 DEVELOPMENT TRIGGERS FOR STORMWATER QUALITY MANAGEMENT

The proposed development has been assessed against the latest State Planning Policy 2017 (SPP 2017). As the proposed development is a Material Change of Use (MCU) for urban purposes that involves a land area greater than 2,500m² and will result in an impervious area greater than 25% of the next developable area, consequently the State Planning Policy (SPP) 2017 is triggered for stormwater quality.

As the subject site triggers State Planning Policy 2017 (SPP 2017) stormwater quality assessment benchmarks, compliance with the stormwater quality design objectives in accordance with Council's Stormwater Management Code is required.

5.2 STORMWATER QUALITY OBJECTIVES

The following pollutants have been identified as part of the Stormwater Management Design objectives (for the operational phase of the development) based on State Planning Policy 2017 (SPP 2017) Appendix 2, "Table B: Post Construction phase – Stormwater Management Design Objectives". The Stormwater Quality Objectives (WQO's) provide the criteria for the design of an effective treatment system, as per Table 11 below:

Table 11 – Stormwater Quality Objectives (WQO's)

Pollutant	Stormwater Quality Objectives (Reduction in Mean Annual Load)
Total Suspended Solids (TSS)	85%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (GP)	90%

The percent reductions listed above are the target reductions for comparing mitigated site annual pollutant loads with unmitigated site annual pollutant loads. The proposed treatment strategy selected for the development will ensure these objectives are met for all pollutants.

5.3 RAINFALL DATA

The rainfall parameters used to simulate climate behaviour in the MUSIC model are presented in Table 12 below:

Table 12 – Stormwater Quality Objectives (WQO's)

Input	Data Used in Modelling
Rainfall Station	Rockhampton Aero (Station ID: 39083)
MUSIC Modelling Period	01/01/2000 – 31/01/2010
Modelling Time step	6 minutes

5.4 MUSIC MODELLING

Model for Urban Stormwater Improvement Conceptualisation (MUSIC) was used to assess the stormwater quality outcomes of the proposed development. MUSIC is specifically designed to assist in the development of strategies for urban stormwater hydrology and pollutant impacts.

The installation of the following Stormwater Quality Improvement Device's (SQID's) will achieve the above stormwater quality objectives (shown in Section 5.2):

- Five (5x) 'Atlan Stormsacks' to be installed within each of the stormwater field inlets as part of the internal drainage system (one (1x) Atlan Stormsack per inlet).
- 51m² combined bioretention / detention basin which provides a minimum of 51m² of filtration media. The figure below shows the bioretention basin input data in the MUSIC Model.

The screenshot shows a software dialog box titled "Properties of 51m2 Bio-retention Basin - 51m2 Filter Media". The dialog is organized into several sections with input fields and checkboxes:

- Location:** 51m2 Bio-retention Basin - 51m2 Filter Media
- Inlet Properties:**
 - Low Flow By-pass (cubic metres per sec): 0.000
 - High Flow By-pass (cubic metres per sec): 100.000
- Storage Properties:**
 - Extended Detention Depth (metres): 0.30
 - Surface Area (square metres): 51.00
- Filter and Media Properties:**
 - Filter Area (square metres): 51.00
 - Unlined Filter Media Perimeter (metres): 0.01
 - Saturated Hydraulic Conductivity (mm/hour): 200.00
 - Filter Depth (metres): 0.40
 - TN Content of Filter Media (mg/kg): 400
 - Orthophosphate Content of Filter Media (mg/kg): 30.0
- Infiltration Properties:**
 - Exfiltration Rate (mm/hr): 0.00
- Lining Properties:**
 - Is Base Lined?: Yes No
- Vegetation Properties:**
 - Vegetated with Effective Nutrient Removal Plants
 - Vegetated with Ineffective Nutrient Removal Plants
 - Unvegetated
- Outlet Properties:**
 - Overflow Weir Width (metres): 3.00
 - Underdrain Present?: Yes No
 - Submerged Zone With Carbon Present?: Yes No
 - Depth (metres): 0.00

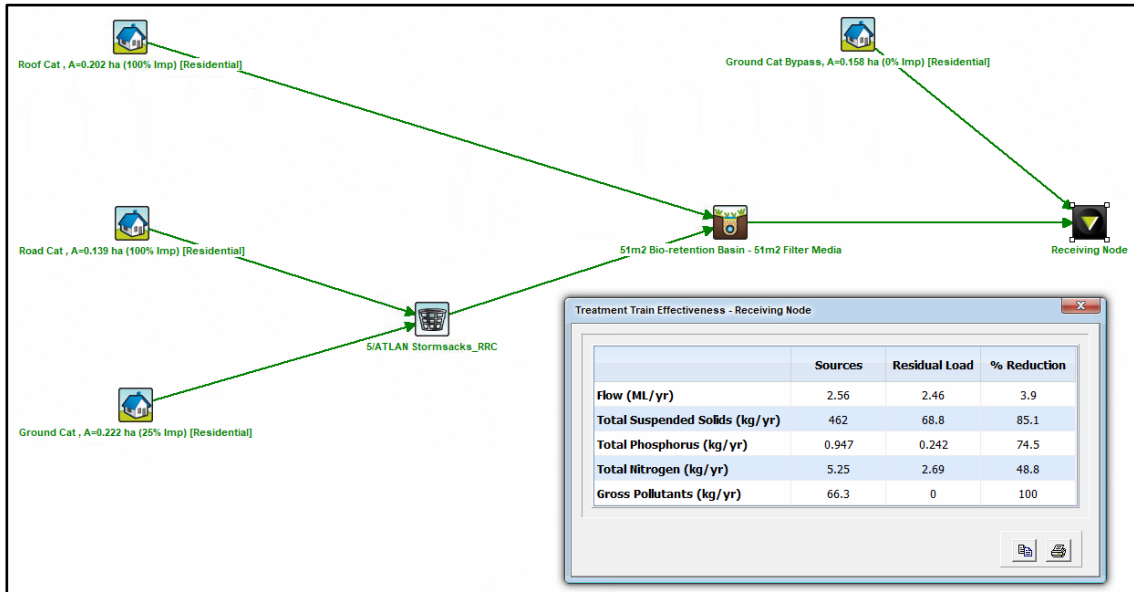
At the bottom of the dialog are buttons for "Fluxes...", "Notes...", "More", "Cancel", "Back", and "Finish".

Figure 7 – Bioretention Basin Details

Refer to **Appendix D** for typical details of the combined bioretention / detention basin.

The following figure illustrates the treatment train used for this development and provides the general arrangement of the stormwater quality treatment measures to be used.

Figure 8 – MUSIC Model Treatment Train for the Development Site



5.5 MUSIC SOURCE NODE PARAMETERS

The developed sub-catchments were further separated into the effective contributing impervious areas of, Roof, Road and pervious/impervious Ground (garden, landscaped area, footpath pavement, patios etc) runoff (where applicable).

Effective Impervious Area (EIA) is the area that will directly contribute flow to the drainage network. These areas will be “effective” in generating runoff which will be delivered rapidly at the catchment outlet during a rainfall event.

Table 13 – MUSIC Model Catchment Areas

Catchment ID	Catchment Land Use	Area (ha)	Total Impervious Percentage (%)
Treated Area (CAT C2)	Residential - Road	0.139	100
	Residential - Roof	0.202	100
	Residential - Ground	0.222	25
Bypass Area (CAT C3)	Residential - Ground	0.158	0
Total Development Area		0.721	55

Refer to **Appendix D** for the MUSIC model catchment area plan.

5.6 RAINFALL AND POLLUTANT EXPORT PARAMETERS

The MUSIC model rainfall-runoff parameters for a residential development have been adopted in accordance with “Table 3.7 – Recommended MUSIC Rainfall-Runoff Parameters” of the MUSIC Modelling Guidelines Version 1.0, as summarised in Table 14 below:

Table 14 – MUSIC Model Runoff Parameters

Parameter	
Land use	Urban Residential
Rainfall threshold (mm)	1
Soil storage capacity (mm)	500
Initial storage (% capacity)	10
Field capacity (mm)	200
Infiltration capacity coefficient a	211
Infiltration capacity exponent b	5.0
Initial depth (mm)	50
Daily recharge rate (%)	28
Daily base flow rate (%)	27
Daily deep seepage rate (%)	0

The MUSIC model Base and Storm Flow Concentration parameters (Log₁₀ values) for a residential development have been adopted in accordance with “Table 3.8 – Pollutant Export Parameters for Split Catchment Land Use (Log₁₀ Values)” of the MUSIC Modelling Guidelines Version 1.0, as summarised in Table 15 below:

Table 15 – MUSIC Pollutant Concentration Parameters (Residential)

		TSS		TP		TN	
		Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
Roof	Mean (Log mg/L)	N/A	1.30	N/A	-0.89	N/A	0.26
	Std Dev (Log mg/L)	N/A	0.39	N/A	0.31	N/A	0.23
Road	Mean (Log mg/L)	1.00	2.43	-0.97	-0.30	0.20	0.26
	Std Dev (Log mg/L)	0.34	0.39	0.31	0.31	0.20	0.23
Ground	Mean (Log mg/L)	1.00	2.18	-0.97	-0.47	0.20	0.26
	Std Dev (Log mg/L)	0.34	0.39	0.31	0.31	0.20	0.23

5.7 MUSIC MODEL RESULTS

The post-development (mitigated) MUSIC model has been simulated using the meteorological data and other associated parameters provided above. The results are summarised in Table 16 below.

Table 16 – MUSIC Pollutant Load Assessment Results

Parameter	WQO	Sources	Residual Load	Reduction % Achieved	WQO Compliance (Y/N)
Flow (ML/yr)	N/A	2.56	2.46	3.9	N/A
Total Suspended Solids (kg/yr)	85%	462	68.8	85.1	Y
Total Phosphorus (kg/yr)	60%	0.947	0.242	74.5	Y
Total Nitrogen (kg/yr)	45%	5.25	2.69	48.8	Y
Gross Pollutants (kg/yr)	90%	66.3	0	100	Y

The above table demonstrates that the Stormwater Quality Improvement Device (SQID) implemented will achieve Council's stormwater quality objectives (WQO's).

Refer to **Appendix D** for typical details of the combined bioretention / detention basin.

6 EROSION AND SEDIMENT MANAGEMENT

6.1 EROSION AND SEDIMENT MANAGEMENT

6.1.1 PRE-DEVELOPMENT

Prior to construction commencing, the following sediment and erosion control measures will be implemented, where appropriate, to minimise disturbance and ensure water quality is maintained:

- Designation of transport routes to ensure minimal vegetation disturbance. Transport routes will have construction exits in accordance with Best Practice Erosion and Sediment Control (BPESC) document of International Erosion Control Association (IECA) Australia
- Maximise vegetated open space areas to reduce soil disturbance and provide filter strip treatment for runoff;
- Construction entry/exit to be installed and will comprise of a designed gravel pad or equivalent material in accordance with (BPESC) document of (IECA) Australia
- Install sediment fences around the proposed bulk earthworks site (along toe of batter alignment); and
- Regularly water spray adjacent to the proposed bulk earthworks site (along property boundary) for dust suppression

6.1.2 BULK EARTHWORKS

A number of erosion and sediment control measurements listed below should be implemented, where appropriate, when the construction involves bulk earthwork. The typical control measures are listed below:

- Construct chutes to control runoff over earthworks batters;
- Construction of temporary bund at the top of all earthworks batters to ensure runoff is directed to chutes and away from exposed batters;
- Drainage structure sediment barriers will be installed at all field inlets and gully inlets;
- Vehicle shake down area will be constructed at all vehicle entry/exist points to and from the site;
- Sediment fences will be installed at all downstream developable area boundaries and down slope areas of material stockpile bases; and
- All batters to be top-soiled and seeded immediately upon reaching finished earthworks levels

6.1.3 CONSTRUCTION

The following measures will be undertaken, where appropriate, to mitigate water quality impacts during construction phase:

- Sediment fences to be erected at the downstream site boundaries and at the base of all batters and stockpiles to prevent sediment transportation off site;
- Grass filter strips to be placed along all road verges;
- Re-vegetation of all disturbed areas within two weeks of completion; and
- All sediment control structures to be maintained in an effective manner and inspected after each storm event. No structure is to accumulate sediment above 40% of its capacity.

7 MONITORING AND MAINTENANCE

7.1 GENERAL

The following monitoring and maintenance procedures (where applicable) are to be undertaken by the site supervisor during all phases of the development:

- If any validated complaints or evidence of water quality deterioration is reported downstream of the site, the following actions are to be taken:
 - Locate source of water quality deterioration
 - Construct temporary controls to prevent continuing short-term deterioration.
 - Repair existing controls, modify procedures or construct additional controls to prevent further deterioration.

The general requirement of monitoring during the construction phase (where applicable) will be:

- Work activities are restricted to designated construction areas;
- Earthworks and site clearing are undertaken in accordance with the Erosion and Sediment Control Plans;
- Erosion and sediment control devices are to be constructed/installed in accordance with the approved Erosion and Sediment Control Plans;
- Inspection of sediment fences and erosion and sediment control structures/devices on a weekly basis as well as after any rain event exceeding 25mm in 24hrs;
- Stormwater discharges from the site do not have any diverse effect on the downstream environment;
- Monitoring and recording of the performance of the drainage control devices including water quality testing where required;
- Any failure in the stormwater system shall be immediately rectified to prevent uncontrolled discharge from the disturbed area of the site; and
- Any failure to the stormwater system causing damage to surroundings should implement immediate remedial work to the damaged areas.

7.2 RESPONSIBILITY AND REPORTING

- The contractor shall be responsible for monitoring the performance of all drainage control and erosion and sediment control devices;
- Records of any failures to devices should be kept and reported to the Construction Manager;
- Regular inspections of the devices shall be reported to the Construction Manager; and
- Inspections of the devices after heavy rainfall shall be reported to the Construction Manager.

8 CONCLUSIONS

This report has assessed the hydrology and hydraulics of the proposed development at Lot 2 Johnson Road, Gracemere QLD for the pre-development and post-development scenarios.

Based on this stormwater management strategy the following conclusions have been drawn:

- The open channel surface drain and associated inlet pit (Asset ID: 10318) located adjacent to the south-western corner of the subject site will be considered the lawful point of discharge (LPD) for the site.
- Peak stormwater discharge from the proposed development for all design storms up to and including the Q100 ARI (1% AEP) critical storm will be mitigated to equal to or less than pre-development flow rates via the implementation of a combined bioretention / detention basin that provides 171m³ of stormwater detention for the proposed development.
- As the development triggers requirements for stormwater quality management in accordance with State Planning Policy 2017, it is proposed to provide stormwater quality treatment via the implementation of a combined bioretention / detention basin that provides a minimum of 51m² of filtration media each for the proposed development, in addition to a minimum of five (5) Atlan Stormsacks to be installed within each of the proposed stormwater field inlets as part of the internal drainage system.
- In accordance with RRC Interactive Mapping, the subject site has been identified to be within a flood hazard area, however the flood hazard overlay code is triggered for the subject site.

This report has demonstrated that the proposed development provides an acceptable solution for stormwater management and has been designed to comply accordance with Rockhampton Region Planning Scheme, Queensland Urban Drainage Manual (QUDM, 2016), Australian Rainfall and Runoff (ARR) and Healthy Waterways – Water by Design.

9 APPENDICES

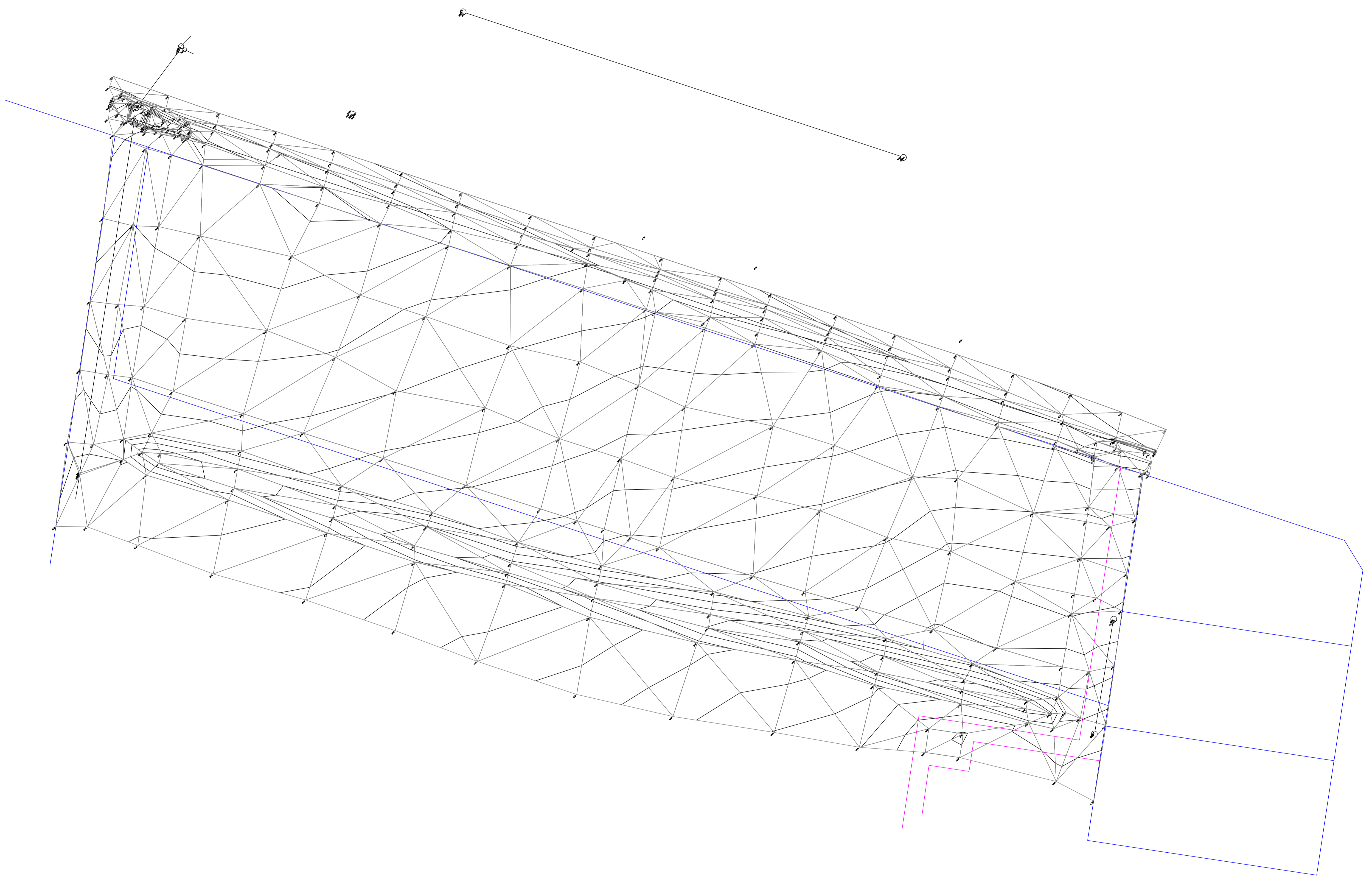
Appendix A: SITE SURVEY PLAN

Appendix B: RRC AS-CONSTRUCTED AND PROPERTY FLOOD REPORT

Appendix C: DEVELOPMENT SITE PLANS

Appendix D: STORMWATER MANAGEMENT PLANS

APPENDIX A SITE SURVEY PLAN



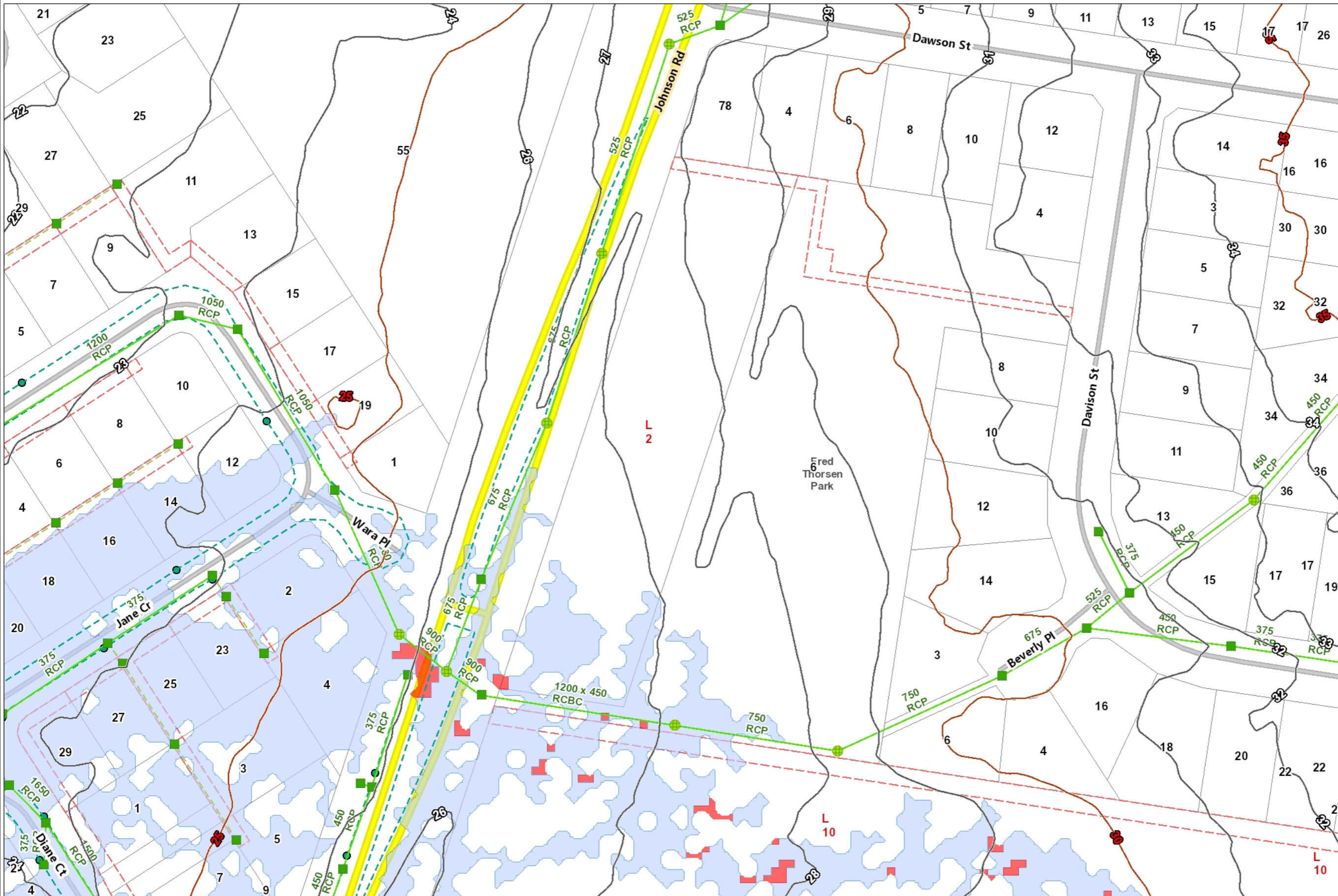
APPENDIX B

RCC AS-CONSTRUCTED AND PROPERTY FLOOD REPORT



Legend

- Development Information
- 1m Intervals
- Major
- Basic
- Not Available
- Stormwater Main Labels
- Junctions Labels
- Culverts
- Stormwater Junctions
- Inlets
- Access Chambers
- Stormwater Pipes
- Open Channel
- Mains
- Culvert Pipes
- Inter-allotment
- Other
- Subsoil pipes
- Subsoil Clean Out pits
- RRC Mask
- RRC Mask
- Fitzroy River Flood
- H1 (Low)
- H2 (Medium)
- H3 (High)
- H4 (High)
- H5 (Extreme)
- H6 (Extreme)
- Floodplain Investigation Area
- Fitzroy River Defined Flood Event
- Planning Area 1
- Planning Area 2
- North Rockhampton Flood Management Area
- Roads1
- Main roads
- Major council roads
- Standard council roads
- Access roads
- Private roads
- Easements
- Property Parcels
- Ocean
- Rivers
- DCDB Parks
- CQ LGA Boundaries



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

14 November 2023

Your Ref: NA
Telephone: 07 4936 8099
Email: developmentadvice@rrc.qld.gov.au

Capricorn Survey Group (Cq) Pty Ltd
PO BOX 1391
ROCKHAMPTON QLD 4700

Dear Sir / Madam

**FLOOD INFORMATION REQUEST FOR LOT 2 JOHNSON ROAD, GRACEMERE QLD 4702
DESCRIBED AS LOT 2 ON RP617380**

Council is in receipt of your application dated 6 November 2023 requesting flood information for Lot 2 Johnson Road, Gracemere, and more properly described as Lot 2 on RP617380.

Please find attached a Flood Search Property Report for your reference. The purpose of this report is to provide flood level information to support the application of Council's planning scheme Flood Hazard overlay code, floodplain planning provisions, and applicable flood planning levels.

Council records show that the abovementioned property parcel is identified as being at risk of flood in a 1% AEP Local Storm / Overland Flow flooding event. Annual Exceedance Probability (AEP) is the probability of a flood event of a given magnitude being equalled or exceeded in any one year. A 1% AEP event means there is statistically a 1% (or 1 in 100) probability that an event of that magnitude will occur or be exceeded in any year.

The design flood level information contained within this report provide water surface levels for a range of typical planning and development design standards. The flood planning level for most development in the Flood Hazard overlay area is the Defined Flood Event (DFE). Council has adopted a DFE of 1% AEP as a planning standard for the management of development in Rockhampton Region. As such, for most development types - the floodplain planning provisions of Council's planning scheme apply relative to the 1% AEP defined flood event. Exceptions apply for critical infrastructure. The Defined flood event may change as Council undertakes further flood risk analysis and profiling as part of its long-term floodplain management planning for the catchment.

The flood levels contained within this flood search report have been sourced from Council's adopted flood modelling and flood study at this location, and are based on the best available information at the time of completing the study. The flood levels are measured in metres Australian Height Datum (mAHD), where mean sea level is approximately zero (0) mAHD.

Council is committed to providing residents with the most up to date flood risk information. The current flood study for this catchment area has assessed flood risk for a number of flood events including rare flood events greater than the 1%AEP flood, to provide a better understanding of the flood behaviour in the catchment. As such, the flood search report contains flood levels for flood events such as the 0.2%AEP (1 in 500 year AEP), 0.05% AEP (1 in 2000 year flood event), and the PMF (probable maximum flood). This information is being provided for completeness, and may not be applicable for development assessment purposes.

Please note: All reasonable steps have been undertaken to ensure the information presented in this report is accurate at the time of generation. Changes to the topography and condition of the local creeks and waterways may have an impact on flooding. Over time, Council may also undertake further technical studies to maintain the understanding of flooding across the city, and update the information available.

Should you have any queries regarding this information please contact Council's Development Engineering section using the contact information above.

Yours faithfully

A handwritten signature in black ink, appearing to read 'Mohit Paudyal', with a long horizontal flourish extending to the right.

Mohit Paudyal
Senior Development Engineer
Planning and Regulatory Services

Enc Flood Search Property Report and Flood Property Map

Rockhampton Regional Council Flood Search Property Report

Property Address: Lot 2 Johnson Road, Gracemere

Lot Details: Lot 2 on RP617380

Date of Issue: 14 November 2023



Flood Search Property Report Overview

It is possible for one or more sources of flooding to occur, especially where a property is near a creek or waterway. These flooding sources can include riverine, creek and overland flow flooding which can each behave differently and impact how a building or development is designed. All flood hazard triggers should be considered when designing and planning with flooding in mind.

The Rockhampton Regional Council Flood Search Report is provided to support planning and development, in accordance with the current version of the Rockhampton Region Planning Scheme 2015.

This report summaries flood information for this property to inform and supplement the application of the Council's planning scheme Flood Hazard overlay code, floodplain planning provisions, and the applicable flood planning levels. The contents of this report have been derived from Council's flood studies and flood modelling and should be considered along with all other applicable planning and development requirements. Flood studies and associated modelling assist Council to better understand flooding in the Rockhampton region and implement plans to avoid and mitigate its impacts on the community.

Flood modelling of the Fitzroy River has been progressively refined over a long period of time. The flood modelling addresses riverine impacts on Rockhampton City and surrounding areas, including Alton Downs, Pink Lily, Nine Mile, Fairy Bower, Midgee and Port Curtis. Local Creek and Catchment Flood Studies provide Council with information on flood behaviour of the creeks, and how they are expected to respond during varying intensities and durations of rainfall events.

Understanding your flood risk can help you prepare for flooding at your home or business. The information provided in this report utilises information from the most up to date flood studies available to Council at the date of issue of this report. All reasonable steps have been undertaken to ensure the information presented in this report is accurate at the time of generation. Changes to the topography and condition of the local creeks and waterways may have an impact on flooding. Over time, Council may undertake further technical studies to maintain the understanding of flooding across the city, and update the information available.

Copies of Council's current Flood Studies are available on Council's website at www.rrc.qld.gov.au

What is flood modelling?

Flood modelling uses sophisticated computer software to estimate how rainfall of various intensities and duration produce stormwater flows along creek and river catchments.

Flood modelling is used to estimate:

- The inundation extents of the areas that may be flooded;
- The peak depths of flood waters; and
- The hazard related to the depth of water or how quickly the water flows (velocity).

Flood modelling estimates a range of design floods based on a statistical analysis of rainfall information provided by the Bureau of Meteorology. This information is used to establish the likelihood of a rainfall or flood event.

Disclaimer

Council provides this information as a general reference source only and has taken all reasonable measures to ensure that the material in this report is as accurate as possible at the time of publication. Council makes no representation and gives no warranty about the accuracy, reliability, completeness or suitability for any particular purpose of the information. To the full extent that it is able to do so in law, the Council disclaims all liability including liability in negligence, for losses and damages including indirect and consequential loss and damage, caused by or arriving from anyone using or relying on the information for any purpose.

When reading this report, please consider:

- If a property is identified as being at risk of being affected by Fitzroy River and/ or Local Creek Catchment flooding, the highest maximum flood heights should be used to establish minimum building and development levels. For large property parcels - there may be a significant difference between the minimum and maximum flood heights for a particular flood type. In these situations, you may need to seek further advice from Council regarding the flood height that is appropriate for the exact location of the proposed building or development.
- The flood maps included with this report display the flood inundation extent only. All maps generated from the Flood Studies are available on Council's website.
- The flood maps provided depict the flood inundation extents under existing climate and catchment conditions.
- If preparing a new building and/or development application, it is recommended that you confirm all flood related provisions within Council's Planning Scheme relevant to the property.

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Property Details

Address: Lot 2 Johnson Road, Gracemere QLD 4702
Lot and plan: Lot 2 on RP617380

Property Ground Levels:

Property ground levels can be found on the attached property flood report. The ground level data has been sourced from Aerial LiDAR survey, and as such, these levels are approximate.

Should the extent of flooding at a property need to be more accurately predicted, then individual property level information (e.g. surveyed site levels, and building floor levels) could be utilised in conjunction with Council's flood information. Council does not undertake this level of investigation or survey on behalf of property owners.

For your information:

AHD (Australian Height Datum) is the National Mapping Datum used throughout Australia. The level of 0.0m AHD is approximately mean sea level.

Elevation Data Source: The digital elevation model used in the flood modelling is generated on a regional scale and utilises ground level elevations from aerial laser surveys performed in 2016. The survey data used to determine the extent and depth of potential inundation is captured and updated periodically and may not reflect inundation of land that has recently been modified, such as a new subdivision that has changed the existing landform.

Flood Information

Riverine Flood: Not Affected

Local Storm / Overland Flow Flood: Affected

The property is identified as being at risk of flooding from Local Storm / Overland Flow flooding. The attached map displays the 1% AEP flood extent on the property due to the Local Storm / Overland Flow Flooding. Planning and development must consider risk to people and property, natural floodplain characteristics, and flood free/low flood hazard access outcomes during local storm and overland flow flood events.

For your information:

AEP (Annual Exceedance Probability) is the probability of a flood event of a given size occurring or being exceeded in any one year. Information in relation to more or less likely floods and the full flood plain extent can be accessed on Council's website.

Disclaimer

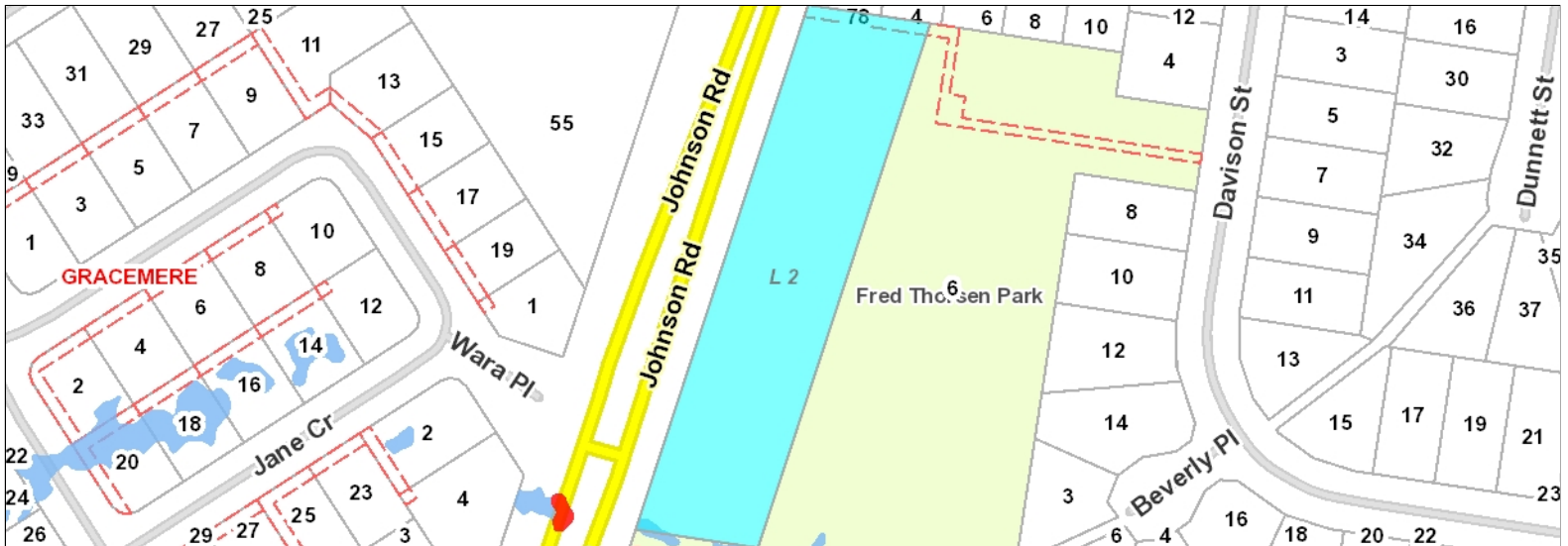
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Flood Report for L 2 Johnson Road Gracemere QLD 4702

Printed from
GeoCortex on
13/11/2023

Owners: Turtleway Learning Centre Pty Ltd **Ratepayer Address:** 18 Banksia Ave TIN CAN BAY QLD 4580

Parcel ID: RP617380/2 **Land use:** Vacant Land



Riverine Catchment: Fitzroy River Flood Study

Creek Catchment: Report 2014

Mitigation Area: N/A

Horizontal Datum: MGA 56, GDA 2020 **Elevation / WSL:** mAHD **Velocity:** m/sec

Comments

N/A

Riverine

PMF WSL Min:	N/A	AEP 2% WSL Min:	N/A
PMF WSL Max:	N/A	AEP 2% WSL Max:	N/A
PMF Velocity Min:	N/A	AEP 2% Velocity Min:	N/A
PMF Velocity Max:	N/A	AEP 2% Velocity Max:	N/A
AEP 0.05% WSL Min:	N/A	AEP 5% WSL Min:	N/A
AEP 0.05% WSL Max:	N/A	AEP 5% WSL Max:	N/A
AEP 0.05% Velocity Min:	N/A	AEP 5% Velocity Min:	0.17
AEP 0.05% Velocity Max:	N/A	AEP 5% Velocity Max:	1.67
AEP 0.2% WSL Min:	N/A	AEP 10% WSL Min:	N/A
AEP 0.2% WSL Max:	N/A	AEP 10% WSL Max:	N/A
AEP 0.2% Velocity Min:	N/A	AEP 10% Velocity Min:	N/A
AEP 0.2% Velocity Max:	N/A	AEP 10% Velocity Max:	1.59
AEP 0.5% WSL Min:	N/A	AEP 18% WSL Min:	N/A
AEP 0.5% WSL Max:	N/A	AEP 18% WSL Max:	N/A
AEP 0.5% Velocity Min:	N/A	AEP 18% Velocity Max:	N/A
AEP 0.5% Velocity Max:	N/A	AEP 18% Velocity Max:	N/A
AEP 1% WSL Min:	N/A	AEP 39% WSL Min:	N/A
AEP 1% WSL Max:	N/A	AEP 39% WSL Max:	N/A
AEP 1% Velocity Min:	N/A	AEP 39% Velocity Min:	N/A
AEP 1% Velocity Max:	N/A	AEP 39% Velocity Max:	N/A

Creek \ Local Catchment

PMF WSL Min:	N/A	AEP 5% WSL Min:	26.35
PMF WSL Max:	N/A	AEP 5% WSL Max:	26.98
PMF Velocity Min:	N/A	AEP 5% Velocity Min:	0.17
PMF Velocity Max:	N/A	AEP 5% Velocity Max:	1.67
AEP 0.05% WSL Min:	N/A	AEP 10% WSL Min:	26.34
AEP 0.05% WSL Max:	N/A	AEP 10% WSL Max:	26.97
AEP 0.05% Velocity Min:	N/A	AEP 10% Velocity Min:	0.04
AEP 0.05% Velocity Max:	N/A	AEP 10% Velocity Max:	N/A
AEP 0.2% WSL Min:	N/A	AEP 18% WSL Min:	26.33
AEP 0.2% WSL Max:	N/A	AEP 18% WSL Max:	26.97
AEP 0.2% Velocity Min:	N/A	AEP 18% Velocity Min:	0.04
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AEP 0.5% Velocity Max:	N/A	AEP 39% Velocity Max:	N/A
AEP 1% WSL Min:	26.40	AEP 63% WSL Min:	26.35
AEP 1% WSL Max:	27.00	AEP 63% WSL Max:	26.98
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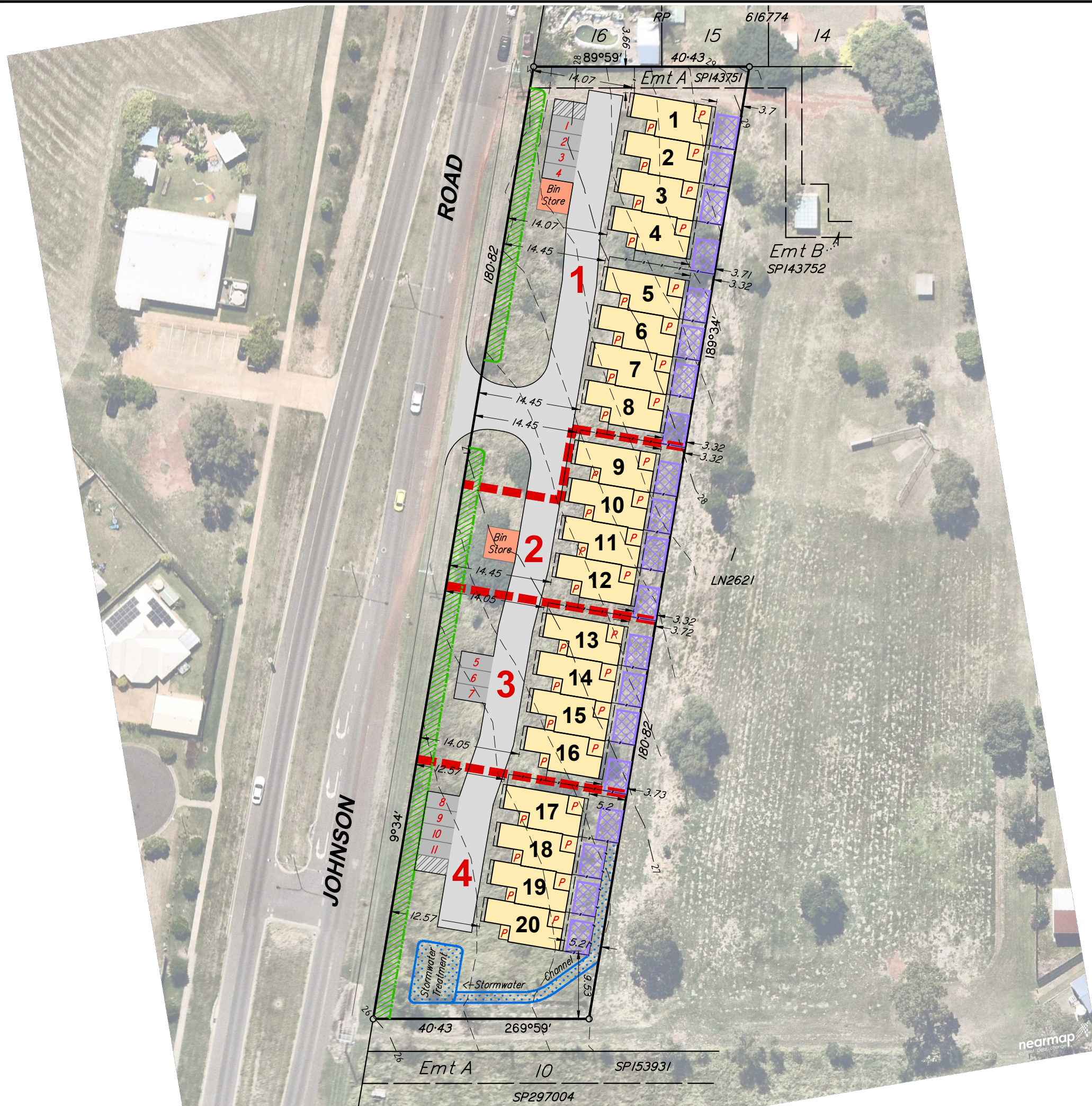
Property Elevation

Ground Elevation (Min): 26.05
Ground Elevation (Max): 29.24

AEP 2% WSL Min:	26.35
AEP 2% WSL Max:	26.99
AEP 2% Velocity Min:	0.19
AEP 2% Velocity Max:	1.76

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APPENDIX C DEVELOPMENT SITE PLANS



- 1 2 Storey Unit Dwelling ('P' denotes Patio or Porch)
- Indicative Bin Storage
- 1 2 3 4 5 Car Parks 6m x 3m (Typ)
- Concrete Driveway & Internal Road
- Vehicle Turn Around Bay
- Stormwater Channel & Treatment Area
- Landscape Vegetation With Deep Plantings
- Private Open Space 6m x 4m
- Stage Boundary

NOTES:
 Building setbacks are to the outer extent of buildings being the face of building or edge of guttering as applicable

See Sheet 2 for typical unit layout and elevation plans

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
Turtleway Early Learning Pty Ltd

project
Johnson Road, Gracemere

plan of **Material Change of Use**
Proposed Multiple Dwellings
 20 Units + 11 Car Parking Spaces
 (With Nearmap Underlay)

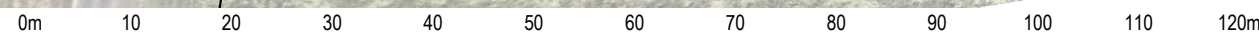
rd
Lot 2 on RP617380

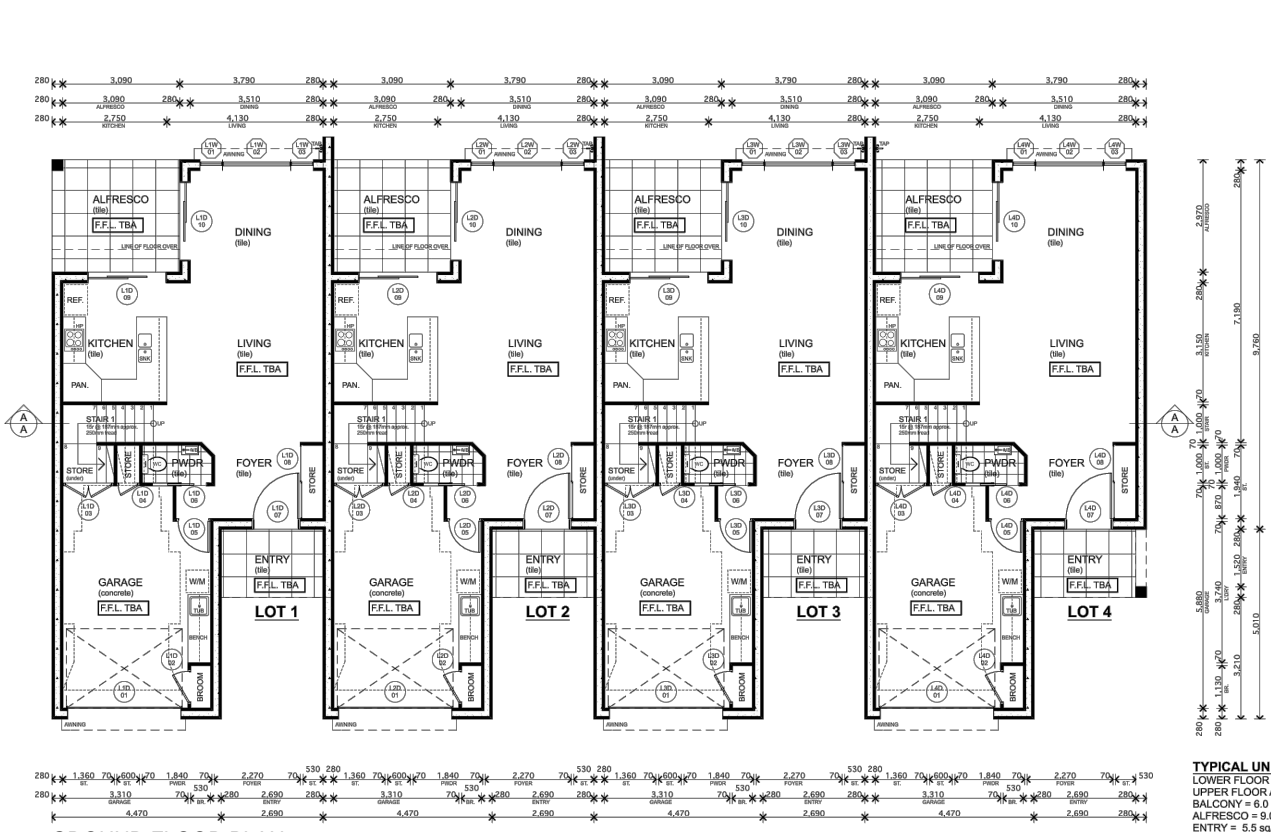
lga
Rockhampton Regional Council

issue	date	details	authorised
A	23-06-2023	Initial Issue	RJKF
B	4-09-2023	Building setbacks added	RJKF



scale **1:750 @ A3** AHD 0.25m Contours
 sheet no. **1 of 2** 4662-01-MCU-B
 plan no. **4662-01-MCU** issue **B**





GROUND FLOOR PLAN
TYPICAL BUILDING
1:200

TYPICAL UNIT FLOOR AREAS:
LOWER FLOOR AREA = 83.0 sq/m
UPPER FLOOR AREA = 79.0 sq/m
BALCONY = 6.0 sq/m
ALFRESCO = 9.0 sq/m
ENTRY = 5.5 sq/m
TOTAL = 182.5 sq/m
TILE FLOOR AREA = 47 sq/m
WET AREA FLOOR = 15 sq/m
CARPET FLOOR AREA = 51 sq/m



WEST ELEVATION
TYPICAL BUILDING
1:200

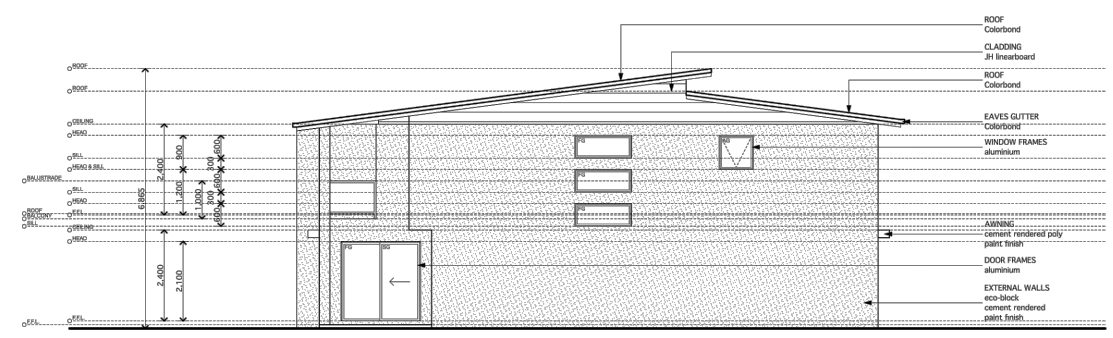


EAST ELEVATION
TYPICAL BUILDING
1:200

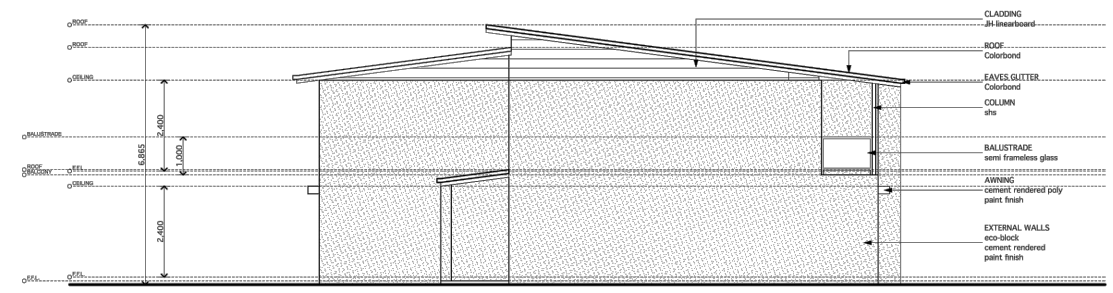


FIRST FLOOR PLAN
TYPICAL BUILDING
1:200

TYPICAL UNIT FLOOR AREAS:
LOWER FLOOR AREA = 83.0 sq/m
UPPER FLOOR AREA = 79.0 sq/m
BALCONY = 6.0 sq/m
ALFRESCO = 9.0 sq/m
ENTRY = 5.5 sq/m
TOTAL = 182.5 sq/m
TILE FLOOR AREA = 47 sq/m
WET AREA FLOOR = 15 sq/m
CARPET FLOOR AREA = 51 sq/m



NORTH ELEVATION
TYPICAL BUILDING
1:200



SOUTH ELEVATION
TYPICAL BUILDING
1:200

client
Turtleway Early Learning Pty Ltd

project
Johnson Road, Gracemere
plan of **Material Change of Use**
Proposed Multiple Dwellings
20 Units + 11 Car Parking Spaces
(With Nearmap Underlay)

rdp
Lot 2 on RP617380
lga
Rockhampton Regional Council

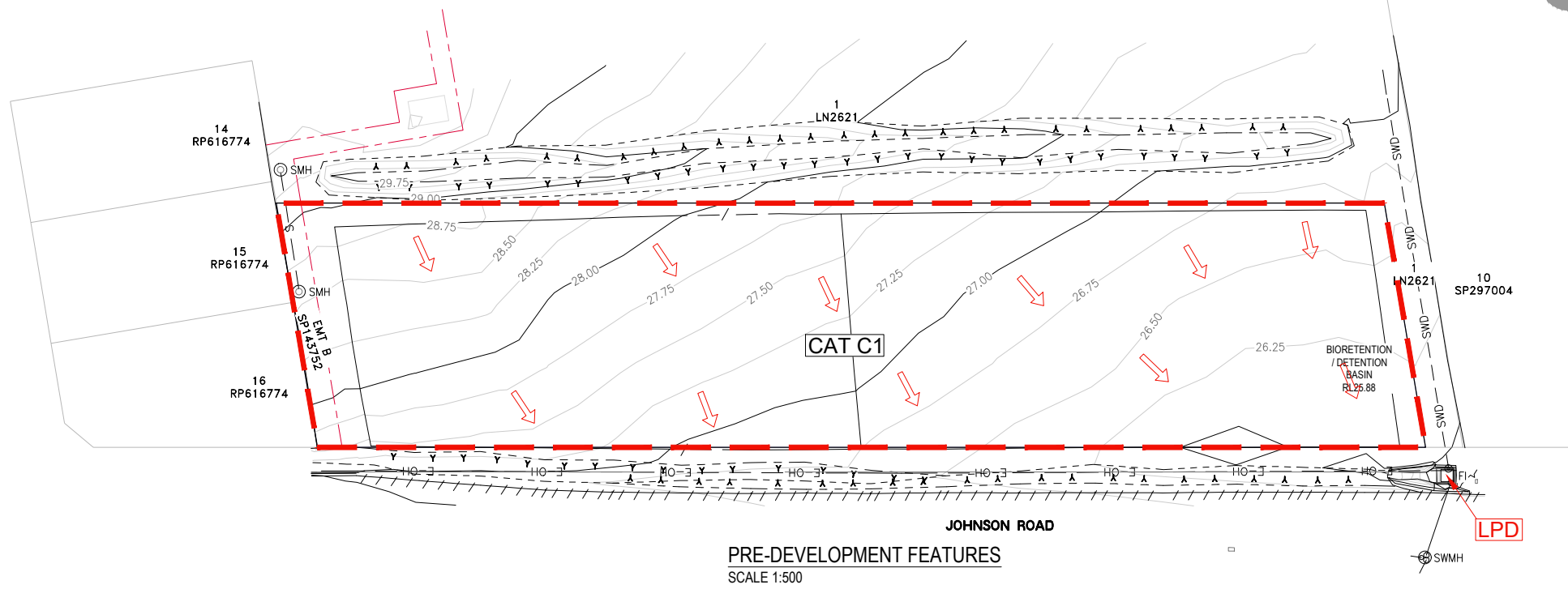
issue	date	details	authorised
A	23-06-2023	Initial Issue	RJKF
B	4-09-2023	Building setbacks added	RJKF

created
 **capricornsurveygroup**
SURVEYING & PLANNING SOLUTIONS
07 4927 5199 | reception@csqgroup.com.au | 132 Victoria Parade, Rockhampton QLD 4700

scale
1:200 @ A3 AHD 0.25m Contours
sheet no. **2 of 2**
plan no. **4662-01-MCU**
scale
datum
cad file
issue
4662-01-MCU **B**



APPENDIX D STORMWATER MANAGEMENT PLANS



FEATURE LEGEND

— 65.00 —	MAJOR EXISTING CONTOURS (1.00m INTERVAL)
— 65.25 —	MINOR EXISTING CONTOURS (0.25m INTERVAL)
□ FI	EXISTING STORMWATER DRAINAGE, FIELD INLET & MANHOLE
— S —	EXISTING SEWER MAIN & MANHOLE
— E-OH —	EXISTING ELECTRICITY OVERHEAD
— / —	EXISTING FENCE
— / —	EXISTING EDGE OF BITUMEN
— / —	EXISTING TOP OF BANK
— / —	EXISTING BOTTOM OF BANK
— / —	EXISTING EASEMENT
— / —	PROPOSED CONTOURS
— / —	PROPOSED FENCE
— / —	PROPOSED BUILDING
— / —	PROPERTY BOUNDARY
— / —	PROPOSED ROOF EXTENT
— / —	PROPOSED RETAINING WALL
— / —	PROPOSED STORMWATER DRAINAGE & PIT
— / —	PROPOSED CONCRETE
— / —	PROPOSED DRIVEWAY
— / —	PROPOSED LANDSCAPING WITH DEEP PLANTING
— / —	PRE-DEVELOPMENT CATCHMENT AREA
— / —	POST-DEVELOPMENT CATCHMENT AREA
— / —	LAWFUL POINT OF DISCHARGE
— / —	PRE-DEVELOPMENT FLOW DIRECTION
— / —	POST-DEVELOPMENT FLOW DIRECTION

RATIONAL METHOD CALCULATION TABLE

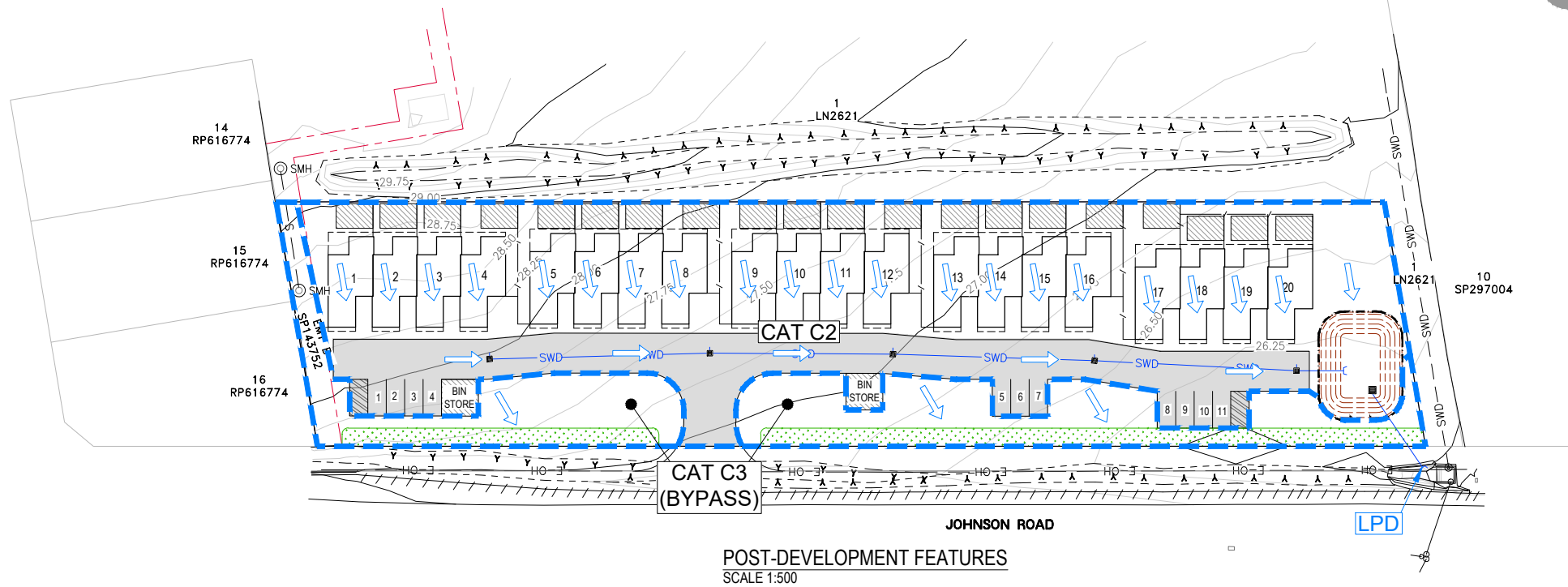
PRE-DEVELOPMENT - CAT C1	
TOTAL SITE AREA (ha)	0.721
IMPERVIOUS AREA (m ²)	0
FRACTION IMPERVIOUS	0.00
TIME OF CONCENTRATION, T _c (MIN.)	10.8
RUNOFF COEFFICIENT, C ₁₀	0.70
MINOR STORM PEAK FLOW RATE, Q ₂ (m ³ /s)	0.136
MAJOR STORM PEAK FLOW RATE, Q ₁₀₀ (m ³ /s)	0.399

RATIONAL METHOD CALCULATION TABLE

POST-DEVELOPMENT - CAT C2	
TOTAL SITE AREA (ha)	0.563
IMPERVIOUS AREA (m ²)	3965
FRACTION IMPERVIOUS	0.70
TIME OF CONCENTRATION, T _c (MIN.)	7.3
RUNOFF COEFFICIENT, C ₁₀	0.77
MINOR STORM PEAK FLOW RATE, Q ₂ (m ³ /s) (UNMITIGATED, MITIGATED)	(0.131, 0.105)
MAJOR STORM PEAK FLOW RATE, Q ₁₀₀ (m ³ /s) (UNMITIGATED, MITIGATED)	(0.384, 0.275)

RATIONAL METHOD CALCULATION TABLE

POST-DEVELOPMENT - CAT C3 (BYPASS)	
TOTAL SITE AREA (ha)	0.158
IMPERVIOUS AREA (m ²)	0
FRACTION IMPERVIOUS	0.00
TIME OF CONCENTRATION, T _c (MIN.)	5.0
RUNOFF COEFFICIENT, C ₁₀	0.70
MINOR STORM PEAK FLOW RATE, Q ₂ (m ³ /s)	0.037
MAJOR STORM PEAK FLOW RATE, Q ₁₀₀ (m ³ /s)	0.107



NOTES - GENERAL

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CLIENT:

TURTLEWAY EARLY LEARNING PTY LTD

SITE ADDRESS:

LOT 2 JOHNSON ROAD, GRACEMERE, QLD. 4702

RPD:

Lot: 2
Plan: RP617380
Local Authority: ROCKHAMPTON REGIONAL COUNCIL
Level Datum: AHD
Meridian: -
Contour Interval: 0.25m
PSM: PM13410
RL: -

ASSOCIATED CONSULTANTS:

HARTECS GROUP

ALL DRAWINGS TO BE READ IN CONJUNCTION WITH GENERAL NOTES

DRAWING TITLE:

**STORMWATER MANAGEMENT PLAN
PRE VS. POST DEVELOPMENT
ASSESSMENT CATCHMENT LAYOUT**

Issue	Date	Description	DRN	CHK
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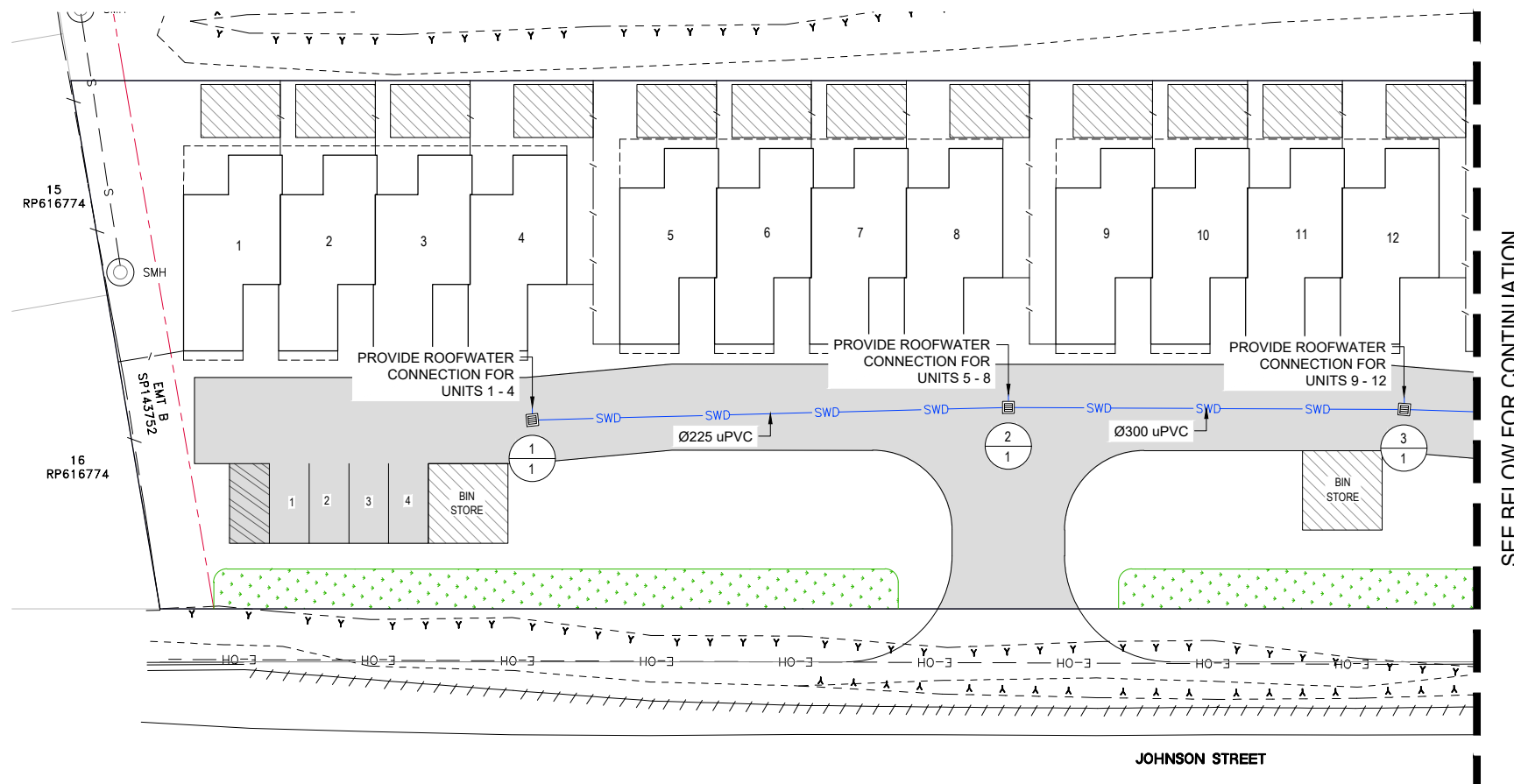
SIGNED:

NAME: Charles Cook
RPEQ No: 8480

SCALE IN METRES

Scale at A1:
SCALE 10 0 10 20 1:500

Designed:	Ammar Naqvi
Drafted:	Xavier Cook
Date:	05/02/2024
Drawing No:	Rev. No:
001	0

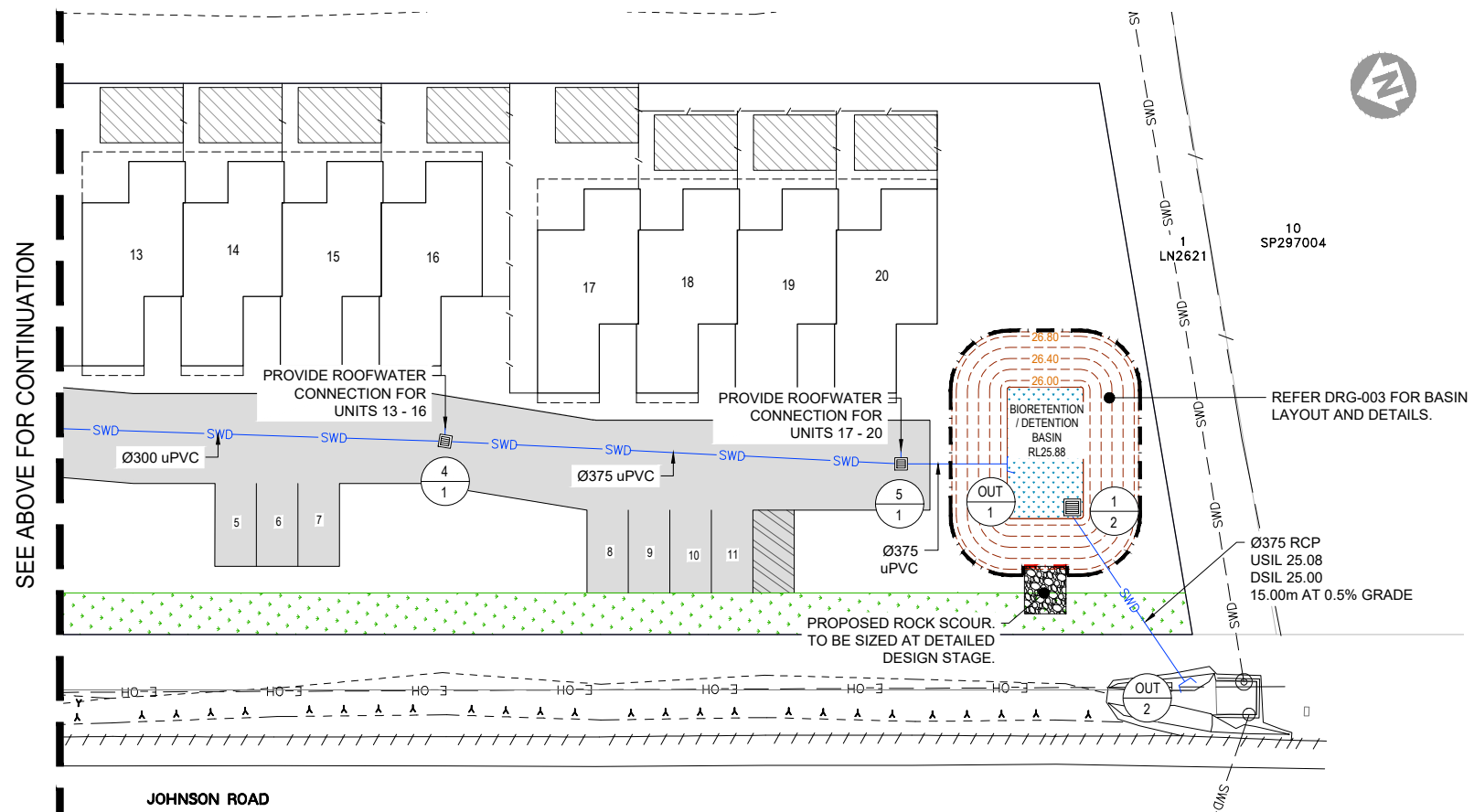


STORMWATER DRAINAGE LAYOUT
SCALE 1:250

SEE BELOW FOR CONTINUATION

FEATURE LEGEND

- 65.00 — MAJOR EXISTING CONTOURS (1.00m INTERVAL)
- 65.25 — MINOR EXISTING CONTOURS (0.25m INTERVAL)
- FI — SWD — SWMH EXISTING STORMWATER DRAINAGE, FIELD INLET & MANHOLE
- S — SMH EXISTING SEWER MAIN & MANHOLE
- — — EXISTING KERB AND CHANNEL
- E-OH — EXISTING ELECTRICITY OVERHEAD
- / — EXISTING FENCE
- — — EXISTING EDGE OF BITUMEN
- — — EXISTING TOP OF BANK
- — — EXISTING BOTTOM OF BANK
- — — EXISTING EASEMENT
- - - - PROPOSED CONTOURS
- — — PROPOSED FENCE
- — — PROPOSED BUILDING
- — — PROPERTY BOUNDARY
- — — PROPOSED ROOF EXTENT
- — — PROPOSED ROOF EXTENT
- — — PROPOSED STORMWATER DRAINAGE & PIT
- — — PROPOSED CONCRETE
- — — PROPOSED DRIVEWAY
- — — PROPOSED LANDSCAPING WITH DEEP PLANTING



STORMWATER DRAINAGE LAYOUT
SCALE 1:250

SEE ABOVE FOR CONTINUATION

STORMWATER STRUCTURES TABLE		
STRUCTURE NUMBER	DESCRIPTION	TRAFFICABLE
1/1	600 x 600 GRATED INLET PIT WITH ATLAN STORMSACK	YES
2/1	600 x 600 GRATED INLET PIT WITH ATLAN STORMSACK	YES
3/1	600 x 600 GRATED INLET PIT WITH ATLAN STORMSACK	YES
4/1	600 x 600 GRATED INLET PIT WITH ATLAN STORMSACK	YES
5/1	600 x 600 GRATED INLET PIT WITH ATLAN STORMSACK	YES
OUT/1	HEADWALL INLET	NO
1/2	900 x 900 GRATED INLET PIT	NO
OUT/2	HEADWALL OUTLET	NO

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2. DESIGN IS SUBJECT TO OPERATIONAL WORKS SUBMISSION AND APPROVAL.

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CLIENT:
TURTLEWAY EARLY LEARNING PTY LTD

SITE ADDRESS:
LOT 2 JOHNSON ROAD, GRACEMERE, QLD. 4702

RPD:
Lot: 2
Plan: RP617380
Local Authority: ROCKHAMPTON REGIONAL COUNCIL
Level Datum: AHD
Meridian: -
Contour Interval: 0.25m
PSM: PM13410
RL: -

ASSOCIATED CONSULTANTS:
HARTECS GROUP

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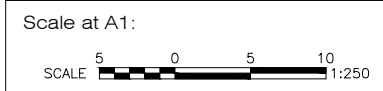
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STORMWATER MANAGEMENT PLAN DRAINAGE LAYOUT

Issue	Date	Description	DRN	CHK
0	05/02/2024	PRELIMINARY ISSUE	XC	AN

SIGNED:

NAME: Charles Cook
RPEQ No: 8480

SCALE IN METRES



Designed:	Ammar Naqvi
Drafted:	Xavier Cook
Date:	05/02/2024
Drawing No:	002
Rev. No:	0



CLIENT:
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SITE ADDRESS:
LOT 2 JOHNSON ROAD, GRACEMERE, QLD. 4702

RPD:
Lot: 2
Plan: RP617380
Local Authority: ROCKHAMPTON REGIONAL COUNCIL
Level Datum: AHD
Meridian: -
Contour Interval: 0.25m
PSM: PM13410
RL: -

ASSOCIATED CONSULTANTS:
HARTECS GROUP

ALL DRAWINGS TO BE READ IN CONJUNCTION WITH GENERAL NOTES

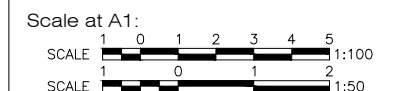
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**STORMWATER MANAGEMENT PLAN
BIO-RETENTION BASIN LAYOUT,
SECTIONS, DETAILS & NOTES.**

Issue	Date	Description	DRN	CHK
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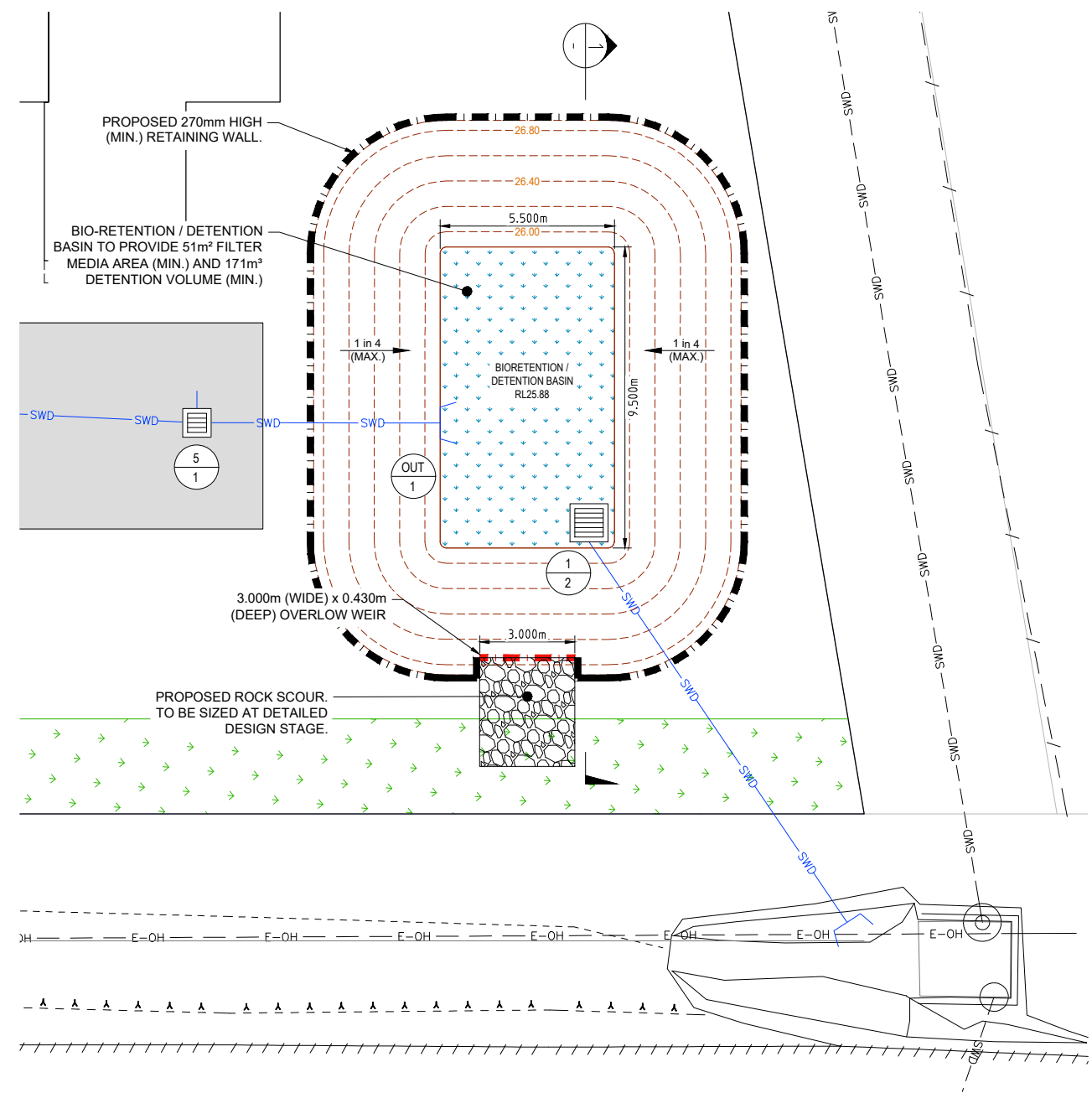
SIGNED:

NAME: Charles Cook
RPEQ No: 8480

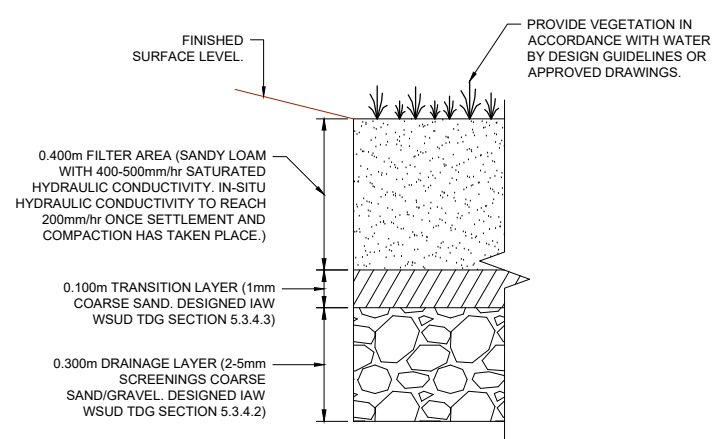
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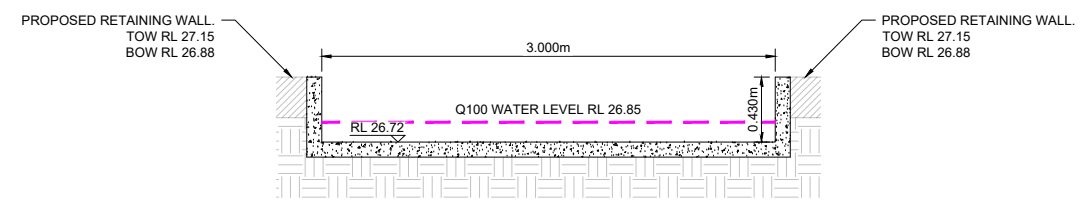
Designed:	Ammar Naqvi
Drafted:	Xavier Cook
Date:	05/02/2024
Drawing No:	Rev. No:
003	0



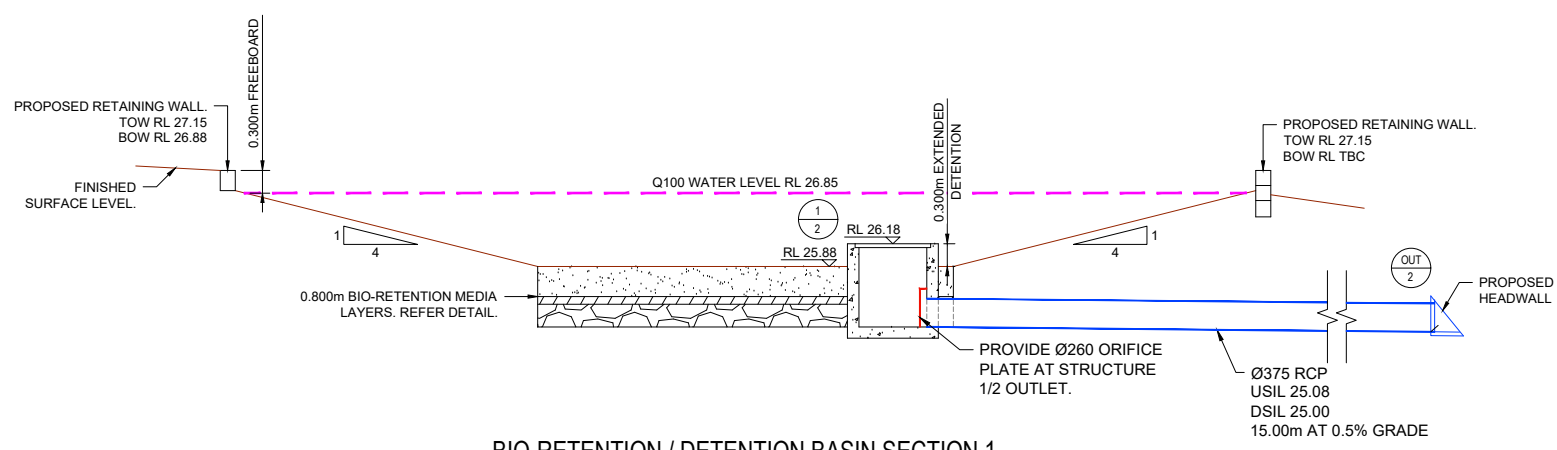
BIORETENTION / DETENTION BASIN LAYOUT
SCALE 1:100



BIO-RETENTION MEDIA DETAIL
SCALE 1:10




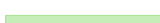



OVERFLOW WEIR DETAIL
SCALE 1:25



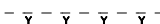



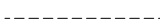








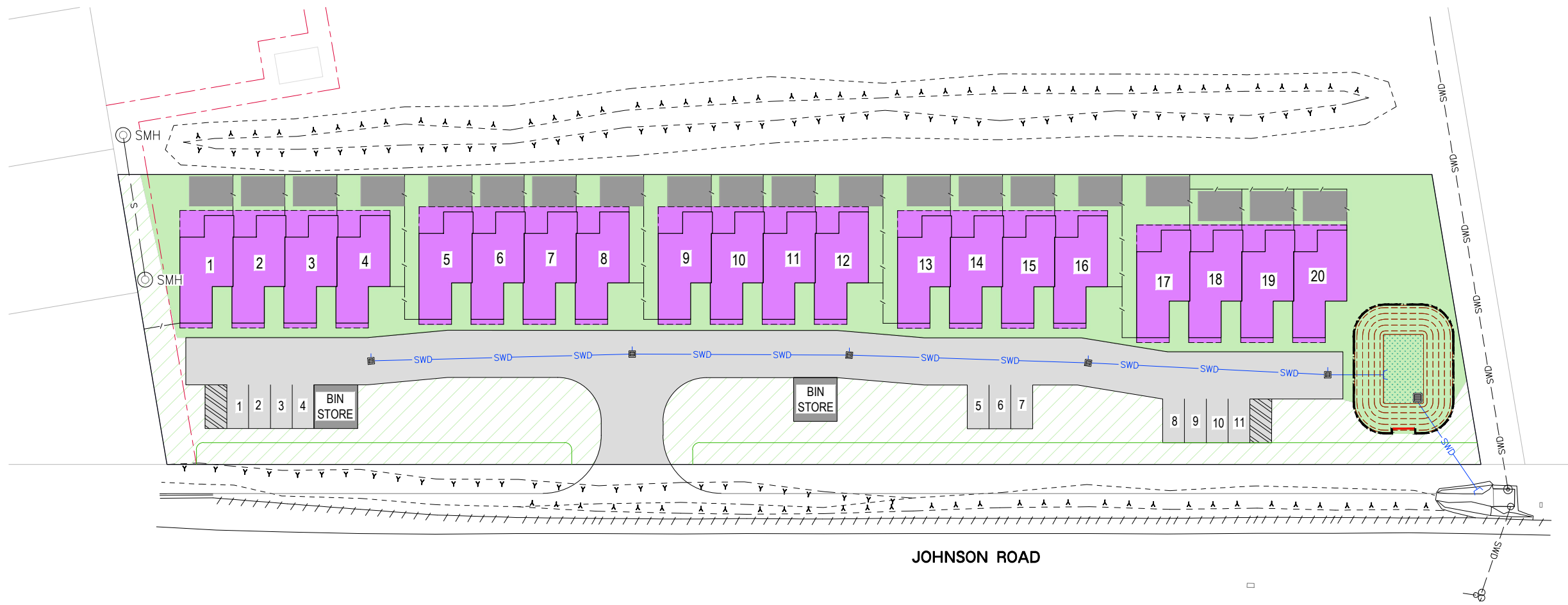
BIO-RETENTION / DETENTION BASIN SECTION 1
SCALE 1:50

MUSIC CATCHMENT LEGEND

-  PROPOSED ROOF
(0.202ha, 404.6m² / UNIT BLOCK)
-  PROPOSED DRIVEWAY
(0.139ha)
-  PROPOSED GROUND IMPERVIOUS
(0.056ha, 25m² / PER UNIT + BIN AREA)
-  PROPOSED GROUND PERVIOUS
(0.166ha)
-  PROPOSED GROUND BYPASS AREA
(0.158ha, fi = 0.00)

FEATURE LEGEND

-  EXISTING STORMWATER DRAINAGE, FIELD INLET & MANHOLE
-  EXISTING KERB AND CHANNEL
-  EXISTING EDGE OF BITUMEN
-  EXISTING TOP OF BANK
-  EXISTING BOTTOM OF BANK
-  EXISTING EASEMENT
-  PROPOSED CONTOURS
-  PROPOSED FENCE
-  PROPOSED BUILDING
-  PROPERTY BOUNDARY
-  PROPOSED ROOF EXTENT
-  PROPOSED RETAINING WALL
-  PROPOSED STORMWATER DRAINAGE & PIT



JOHNSON ROAD

MUSIC CATCHMENT LAYOUT
SCALE 1:300

NOTES - GENERAL

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SEQ CIVIL CONSULTING:

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CLIENT:

TURTLEWAY EARLY LEARNING PTY LTD

SITE ADDRESS:

LOT 2 JOHNSON ROAD, GRACEMERE, QLD. 4702

RPD:

Lot: 2
Plan: RP617380
Local Authority: ROCKHAMPTON REGIONAL COUNCIL
Level Datum: AHD
Meridian: -
Contour Interval: 0.25m
PSM: PM13410
RL: -

ASSOCIATED CONSULTANTS:

HARTECS GROUP

ALL DRAWINGS TO BE READ IN CONJUNCTION WITH GENERAL NOTES

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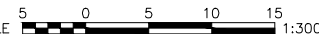
**STORMWATER MANAGEMENT PLAN
MUSIC CATCHMENT**

Issue	Date	Description	DRN	CHK
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SIGNED:

NAME: Charles Cook
RPEQ No: 8480

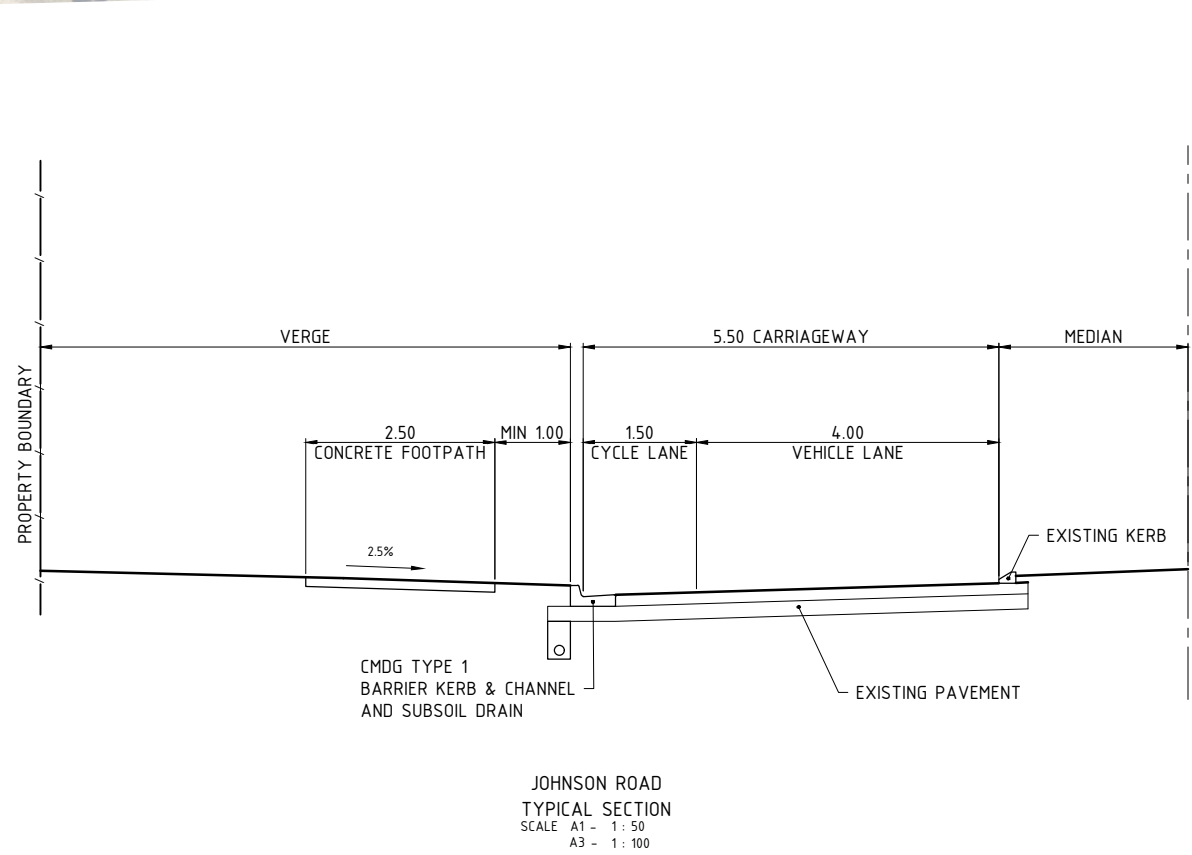
SCALE IN METRES

Scale at A1:
SCALE  1:300

Designed:	Ammar Naqvi
Drafted:	Xavier Cook
Date:	05/02/2024
Drawing No:	004
Rev. No:	0



ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
 These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/118-2023
Dated: 9 August 2024



PLAN
 SCALE A1 - 1 : 500
 A3 - 1 : 1000

DO NOT SCALE OFF DRAWING

5 0 5 10 15 20 25m 1:500
 0.5 0 0.5 1.0 1.5 2.0 2.5m 1:50

SCALE ORIG. SHEET SIZE A1

SURVEYOR CAPRICORN SURVEY GROUP
 PH: (07)49275199 EMAIL: reception@csgcq.com.au
 GRID & DATUM: GDA20 Z56

DOCUMENT CONTROL					
REV.	DATE	DESCRIPTION	DRF	DES	VER
A	01.02.24	COUNCIL RFI RESPONSE	VR	VR	CC

FULL NAME CHARLES COOK
 RPEQ No 8480
 DATE 01.02.24
 APPROVED ON BEHALF OF HARTECS

ABN 27 158 351 663
 PH: 1300 220 195
 EMAIL: admin@hartecs.com.au
 OFFICE: ROCKHAMPTON

CLIENT
 TURTLEWAY EARLY LEARNING
 PTY LTD

PROJECT
 JOHNSON ROAD, GRACEMERE
 LOT 2 on RP617380
 GRACEMERE, QLD 4702
 D/118-2023

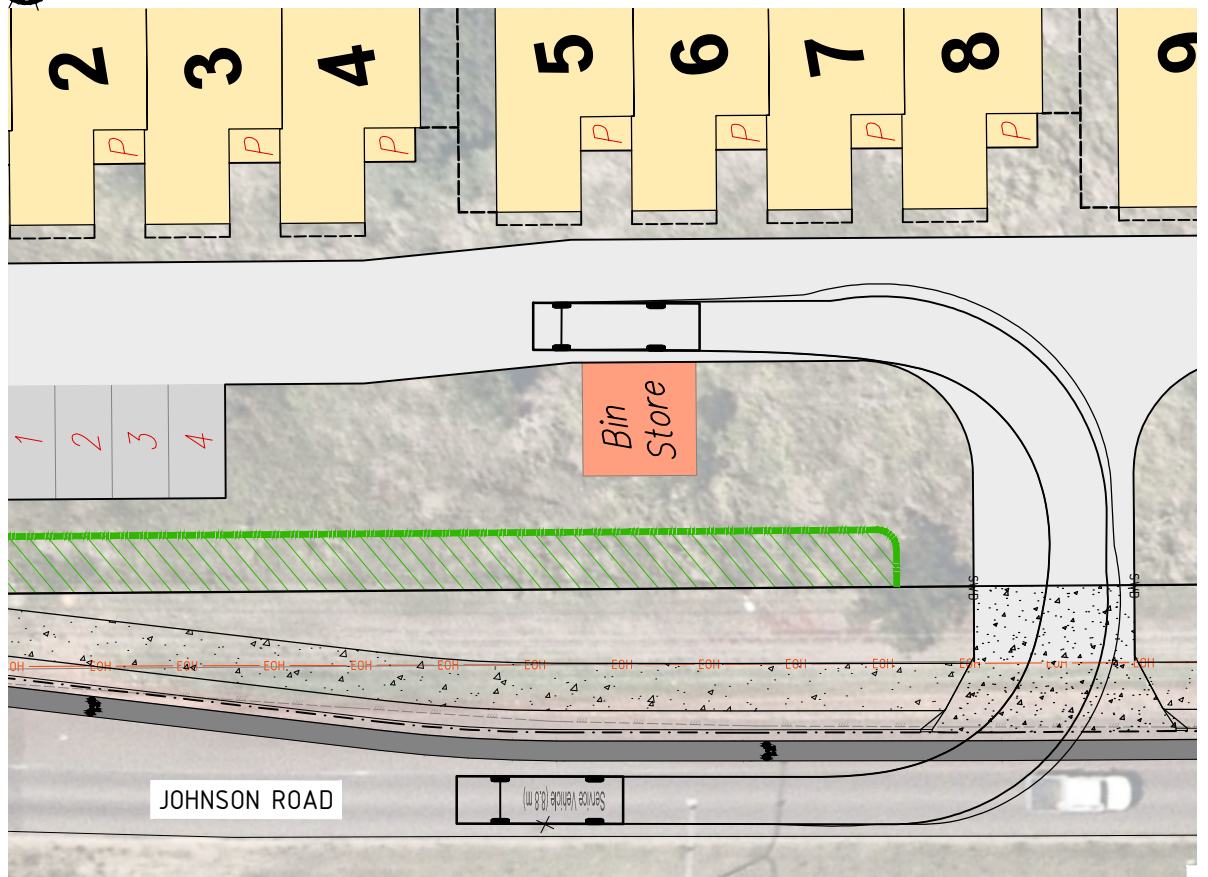
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 JOHNSON ROAD FRONTAGE
 TREATMENT

STATUS
COUNCIL RFI RESPONSE

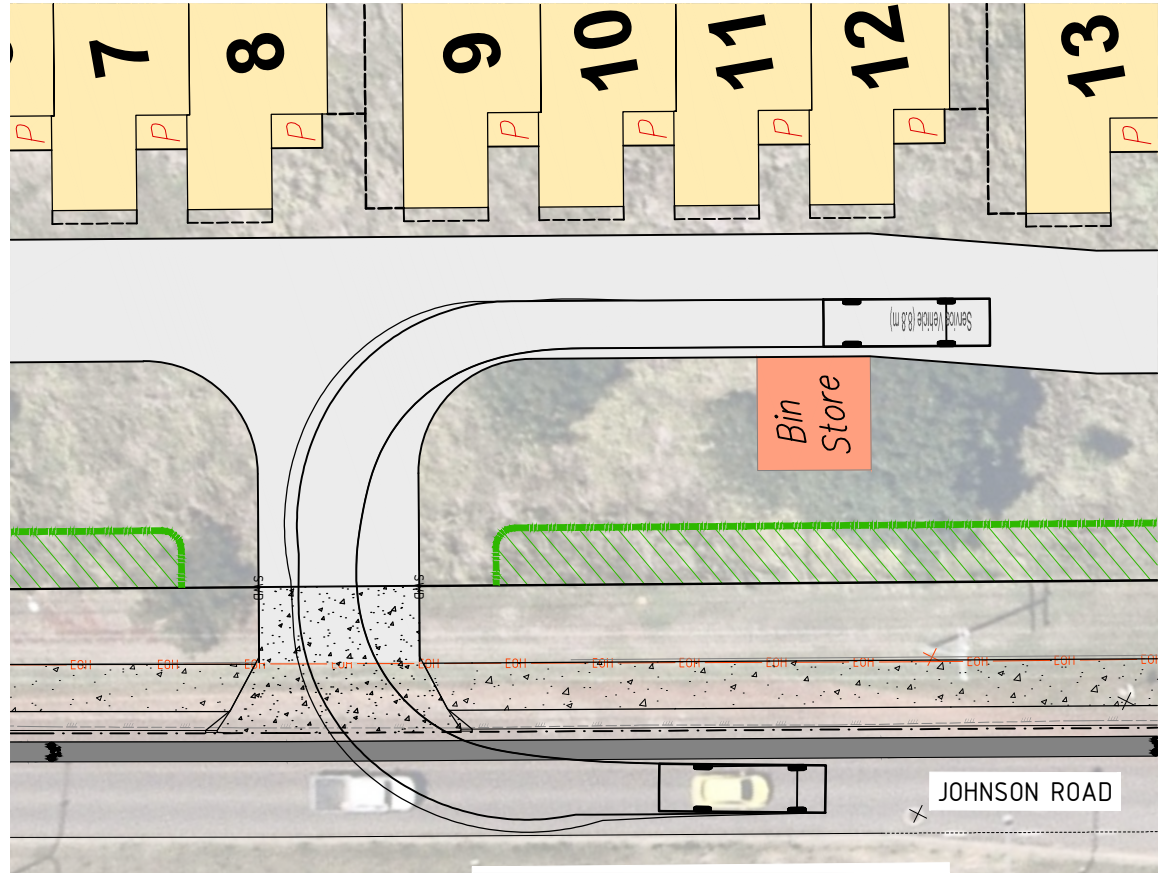
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 REV. A

SHEET NO. 02 OF 03

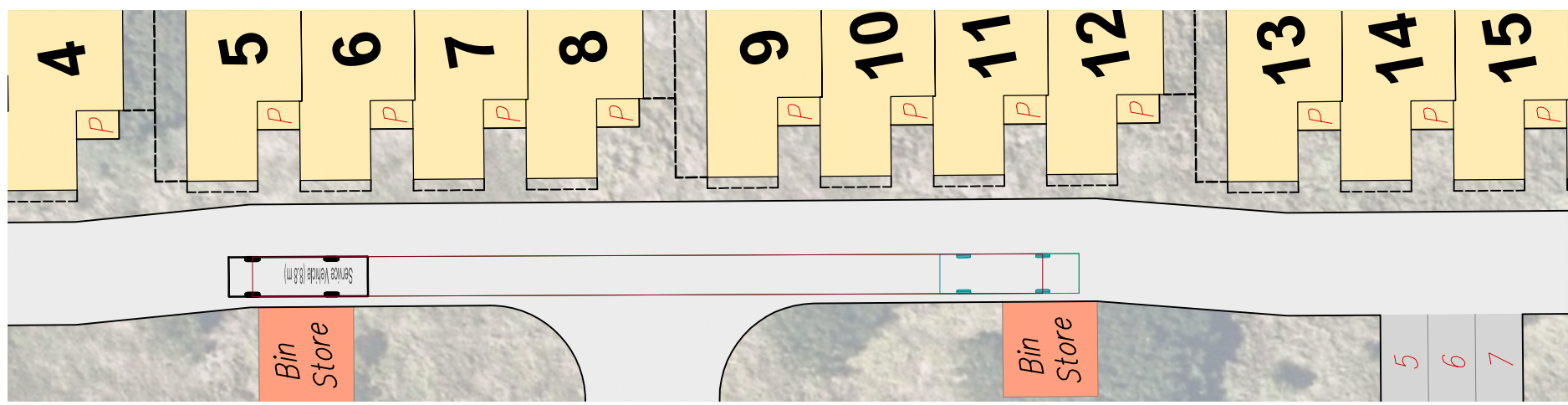
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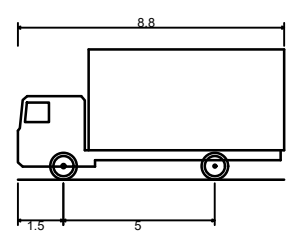
WCV ENTERING FROM JOHNSON ROAD
 VEHICLE MOVEMENT PATH
 SCALE A1 - 1:200
 A3 - 1:400



WCV EXITING TO JOHNSON ROAD
 VEHICLE MOVEMENT PATH
 SCALE A1 - 1:200
 A3 - 1:400



WCV REVERSING TO SOUTHERN
 WASTE COLLECTION
 VEHICLE MOVEMENT PATH
 SCALE A1 - 1:200
 A3 - 1:400



Service Vehicle (8.8 m)
 Overall Length 8.800m
 Overall Width 2.500m
 Overall Body Height 4.300m
 Min Body Ground Clearance 0.427m
 Track Width 2.500m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 12.500m

WCV / SERVICE VEHICLE
 DESIGN VEHICLE DIMENSIONS
 SCALE A1 - N.T.S.
 A3 - N.T.S.

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Dated: 9 August 2024

DO NOT SCALE OFF DRAWING
 2.0 0 2.0 4.0 6.0 8.0 10.0m
 SCALE 1:200
 SCALE ORIG. SHEET SIZE A1
 SURVEYOR CAPRICORN SURVEY GROUP
 PH: (07)49275199 EMAIL: reception@csgcq.com.au
 GRID & DATUM: GDA20 Z56

DOCUMENT CONTROL			
REV.	DATE	DESCRIPTION	DRF DES VER
A	01.02.24	COUNCIL RFI RESPONSE	VR VR CC

FULL NAME CHARLES COOK
 RPEQ No 8480
 DATE 01.02.24
 APPROVED ON BEHALF OF HARTECS

ABN 27 158 351 663
 PH: 1300 220 195
 EMAIL: admin@hartecs.com.au
 OFFICE: ROCKHAMPTON

CLIENT TURTLEWAY EARLY LEARNING PTY LTD
 PROJECT JOHNSON ROAD, GRACEMERE LOT 2 on RP617380 GRACEMERE, QLD 4702 D/118-2023

DRAWING TITLE VEHICLE MOVEMENT PATH WCV ACCESS

STATUS COUNCIL RFI RESPONSE	
PROJ - DWG. No.	REV.
PRJ-0356-01-GN03	A

SHEET NO. 03 OF 03

PROJECT

PROPOSED JOHNSON DEVELOPMENT

ADDRESS

JOHNSON ROAD, GRACEMERE

**ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS**

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Dated: 9 August 2024

REAL PROPERTY DESCRIPTION

Lot Number: 2
 Reg/Survey Plan Number: RP617380



OVERALL SITE PLAN

1 : 2000

DO NOT SCALE DRAWING

ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	

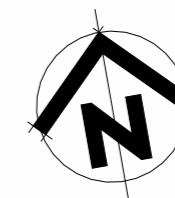
ISSUED FOR
PRELIMINARY

Project:	PROPOSED DEVELOPMENT
Address:	JOHNSON ROAD, GRACEMERE
Drawing Title:	OVERALL SITE PLAN



0407 271 336 **M**
 info@deaignelements.com.au **E**
 QBCC No: 1247120 BDAQ No: 0001677

Scale: As indicated	Rev: 1	26/03/2024 12:45:38 PM
Date: MAR 2024		
Drawn: NJB		
Project No: 24_081	Drawing No: S-01	



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ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:
1	PRELIMINARY	25/03/2024

REVISIONS



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PRELIMINARY

Project:

**PROPOSED
DEVELOPMENT**

Address:

**JOHNSON ROAD,
GRACEMERE**

Drawing Title:

3D VIEWS



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QBCC No: 1247120

BDAQ No: 0001677

Scale:	Rev:
Date: MAR 2024	1
Drawn: NJB	

Project No: **24_081** Drawing No: **S-02**

26/03/2024 12:45:38 PM

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APPROVED PLANS

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Dated: 9 August 2024



DO NOT SCALE DRAWING
ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	

ISSUED FOR
PRELIMINARY

Project:
PROPOSED DEVELOPMENT

Address:
**JOHNSON ROAD,
GRACEMERE**

Drawing Title:
3D VIEWS

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QBCC No: 1247120 BDAQ No: 0001677

Scale:	Rev:	1 26/03/2024 12:45:39 PM
Date: MAR 2024		
Drawn: NJB		
Project No: 24_081	Drawing No: S-03	

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Dated: 9 August 2024



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ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	

ISSUED FOR
PRELIMINARY

Project:	PROPOSED DEVELOPMENT
Address:	JOHNSON ROAD, GRACEMERE
Drawing Title:	3D VIEWS

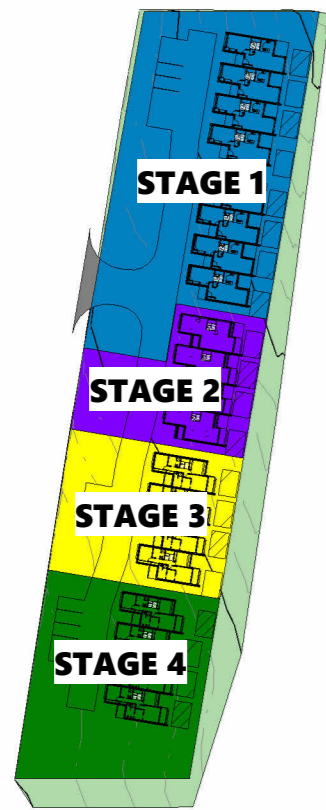
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BUILDING DESIGNERS

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QBCC No: 1247120 BDAQ No: 0001677

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Date: MAR 2024		
Drawn: NJB		
Project No: 24_081	Drawing No: S-04	

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Dated: 9 August 2024



Proposed Stage Plan

1 : 1750

STAGES LEGEND

- | | |
|-----------------|-----------------|
| STAGE 1 | STAGE 3 |
| 3 X UNIT TYPE 1 | 2 X UNIT TYPE 1 |
| 3 X UNIT TYPE 2 | 1 X UNIT TYPE 2 |
| 2 X UNIT TYPE 3 | 1 X UNIT TYPE 3 |
| STAGE 2 | STAGE 4 |
| 1 X UNIT TYPE 1 | 1 X UNIT TYPE 1 |
| 2 X UNIT TYPE 2 | 1 X UNIT TYPE 2 |
| 1 X UNIT TYPE 3 | 2 X UNIT TYPE 3 |

TOTAL: 20 UNITS

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Dated: 9 August 2024

Proposed Site Plan

1 : 750



GENERAL LEGEND

- LANDSCAPING
- LAWN
- PRIVATE UNIT LAWN
- CONCRETE DRIVEWAY
- CAR PARK 6m X 3m
- P** PATIO

DO NOT SCALE DRAWING

ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	

ISSUED FOR PRELIMINARY

Project:

PROPOSED DEVELOPMENT

Address:

JOHNSON ROAD, GRACEMERE

Drawing Title:

PROPOSED SITE & STAGE PLAN



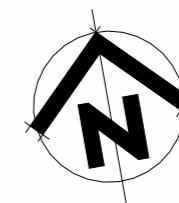
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QBCC No: 1247120 BDAQ No: 0001677

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Date: MAR 2024	26/03/2024 12:45:41 PM
Drawn: NJB	

Project No: 24_081	Drawing No: S-05
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No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	

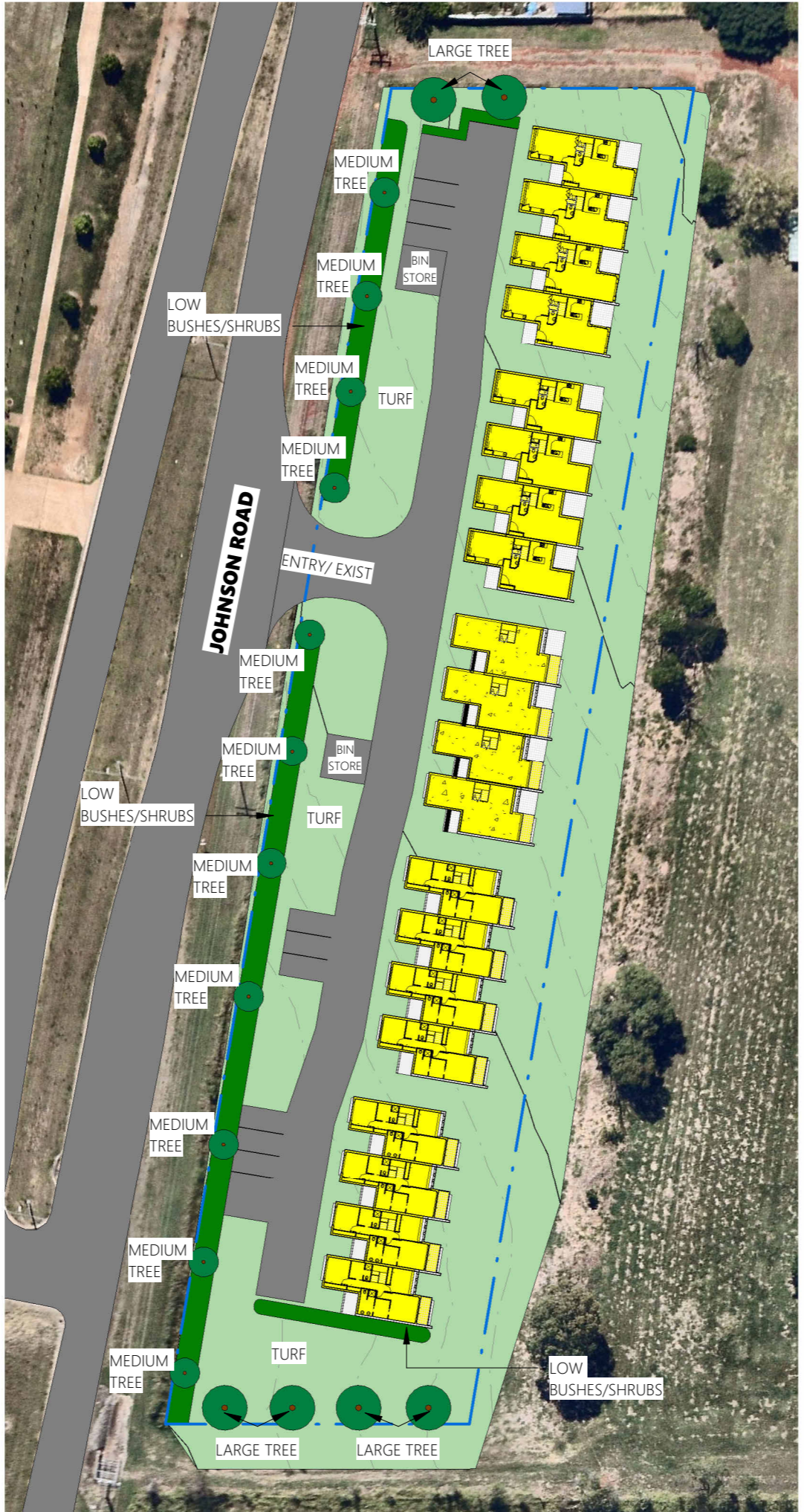
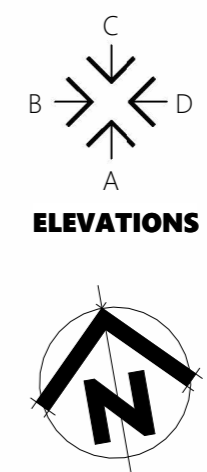
ISSUED FOR
PRELIMINARY

Project:
PROPOSED DEVELOPMENT
Address:
JOHNSON ROAD, GRACEMERE

Drawing Title:
PROPOSED LANDSCAPING PLAN

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BUILDING DESIGNERS
0407 271 336 **M**
info@dezi nelements.com.au **E**
QBCC No: 1247120 BDAQ No: 0001677

Scale: As indicated	Rev: 1	26/03/2024 12:45:41 PM
Date: MAR 2024		
Drawn: NJB		
Project No: 24_081	Drawing No: S-06	



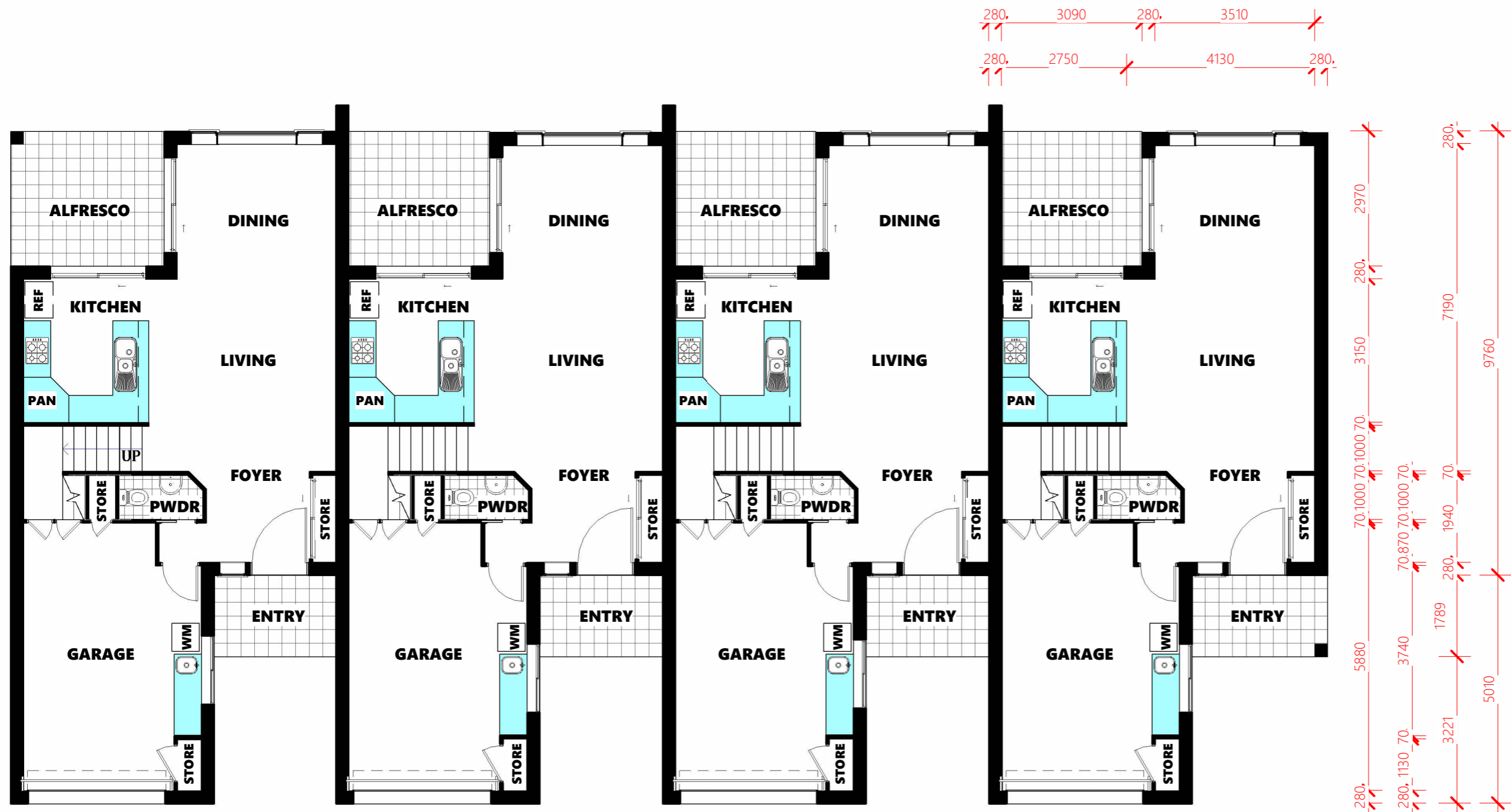
ROCKHAMPTON REGIONAL COUNCIL
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Dated: 9 August 2024

_Proposed Site Landscaping Plan
1 : 750

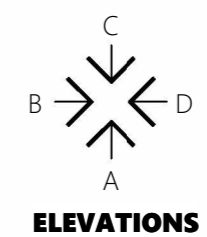
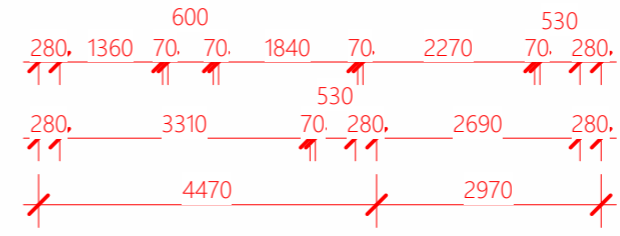
DO NOT SCALE DRAWING
ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:
1	PRELIMINARY	25/03/2024

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Dated: 9 August 2024



Proposed Ground Floor
1 : 100

GENERAL NOTE:
-TYPICAL UNIT SET
-3 DIFFERENT WALL DESIGN STYLES
- REFER TO 3D VIEWS FOR FINISHES.

ISSUED FOR
PRELIMINARY

Project:
PROPOSED DEVELOPMENT
Address:
JOHNSON ROAD, GRACEMERE, QLD, 4702
Drawing Title:
GROUND FLOOR PLAN

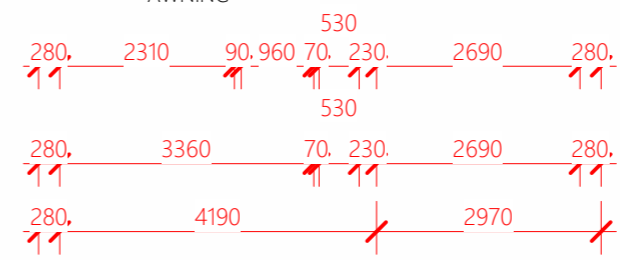
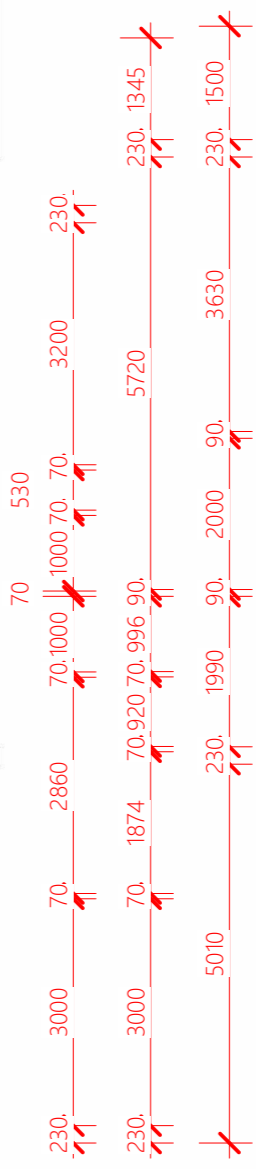
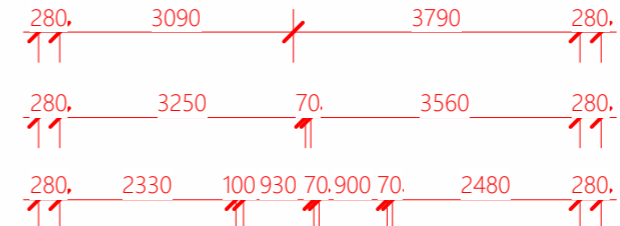
dezinelements
BUILDING DESIGNERS
0407 271 336 **M**
info@dezi nelements.com.au **E**
QBCC No: 1247120 BDAQ No: 0001677

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Date: MAR 2024	26/03/2024 12:39:26 PM
Drawn: NJB	
Project No: 24_081	Drawing No: S-07

DO NOT SCALE DRAWING
ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:
1	PRELIMINARY	25/03/2024

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Proposed Upper Floor

1 : 100

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Dated: 9 August 2024

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PRELIMINARY

Project:
PROPOSED DEVELOPMENT
Address:
JOHNSON ROAD, GRACEMERE, QLD, 4702
Drawing Title:
FIRST FLOOR PLAN



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info@deaignelements.com.au **E**
QBCC No: 1247120 BDAQ No: 0001677

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Date: MAR 2024	26/03/2024 12:39:26 PM
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Project No: **24_081** Drawing No: **S-08**

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No:	Description:	Date:
1	PRELIMINARY	25/03/2024

REVISIONS

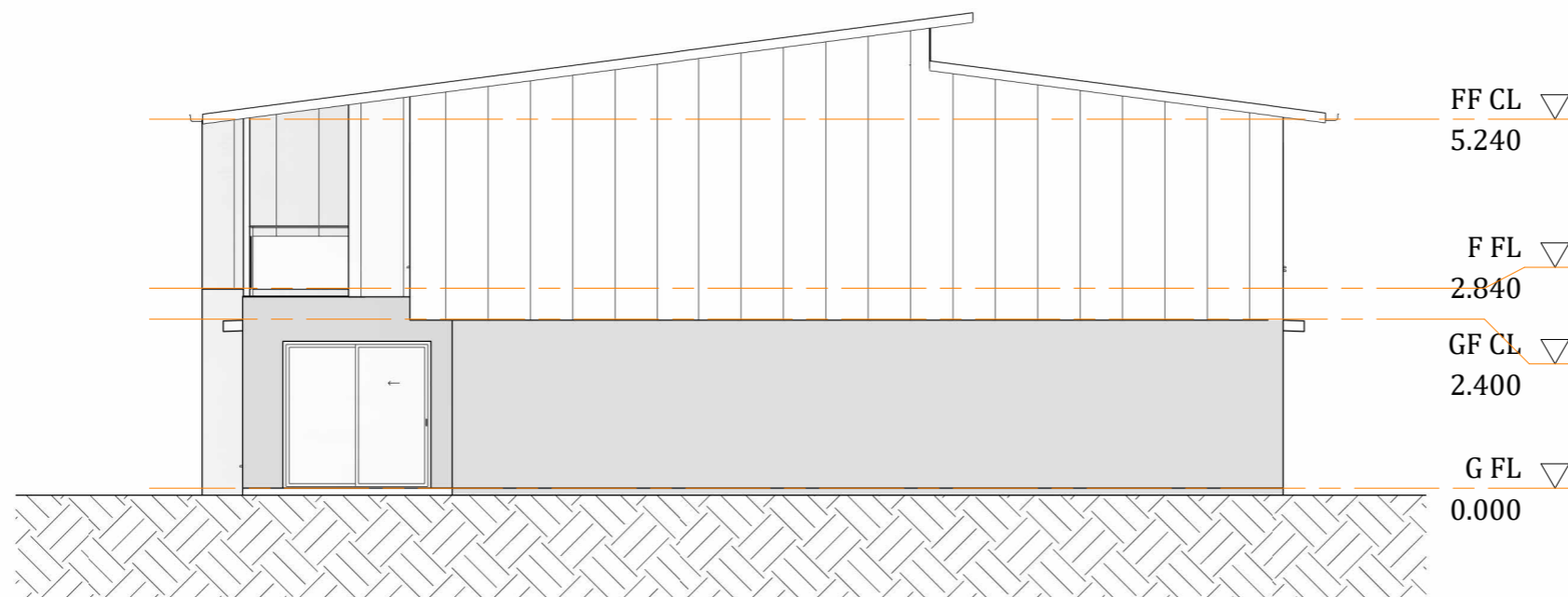


Elevation A

1 : 100

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APPROVED PLANS

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Dated: 9 August 2024



Elevation B

1 : 100

GENERAL NOTE:
-TYPICAL UNIT SET
-3 DIFFERENT WALL DESIGN STYLES
- REFER TO 3D VIEWS FOR FINISHES.

ISSUED FOR
PRELIMINARY

Project: **PROPOSED DEVELOPMENT**

Address: **JOHNSON ROAD, GRACEMERE, QLD, 4702**

Drawing Title: **ELEVATIONS**

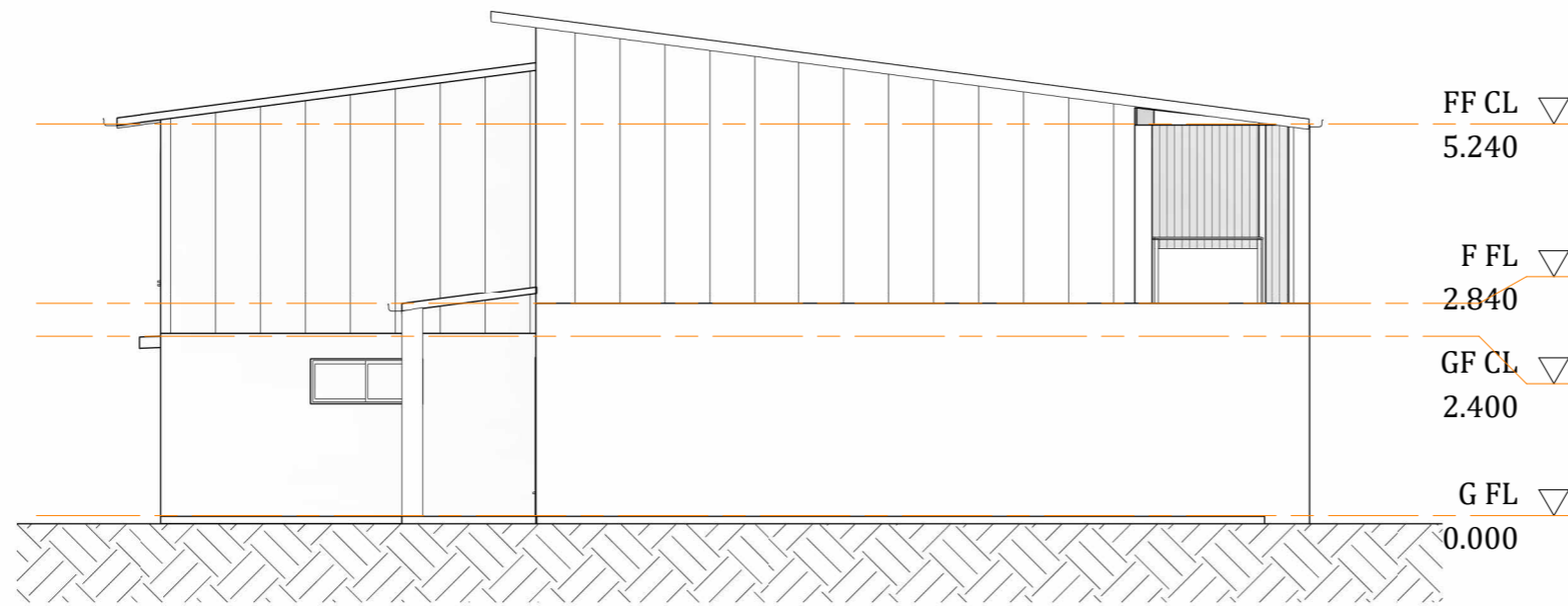


0407 271 336 **M**
info@dezignelements.com.au **E**
QBCC No: 1247120 BDAQ No: 0001677

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Date: MAR 2024	1 <small>26/03/2024 12:39:28 PM</small>
Drawn: NJB	
Project No: 24_081	Drawing No: S-09

DO NOT SCALE DRAWING
ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	



Elevation C

1 : 100



Elevation D

1 : 100

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Development Permit No.: D/118-2023

Dated: 9 August 2024

GENERAL NOTE:
- TYPICAL UNIT SET
- 3 DIFFERENT WALL DESIGN STYLES
- REFER TO 3D VIEWS FOR FINISHES.

ISSUED FOR
PRELIMINARY

Project:

PROPOSED DEVELOPMENT

Address:

**JOHNSON ROAD,
GRACEMERE, QLD, 4702**

Drawing Title:

ELEVATIONS



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QBCC No: 1247120

BDAQ No: 0001677

Scale: 1 : 100	Rev: 1
Date: MAR 2024	26/03/2024 12:39:29 PM
Drawn: NJB	

Project No: **24_081** Drawing No: **S-10**

DO NOT SCALE DRAWING
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No:	Description:	Date:
1	PRELIMINARY	25/03/2024

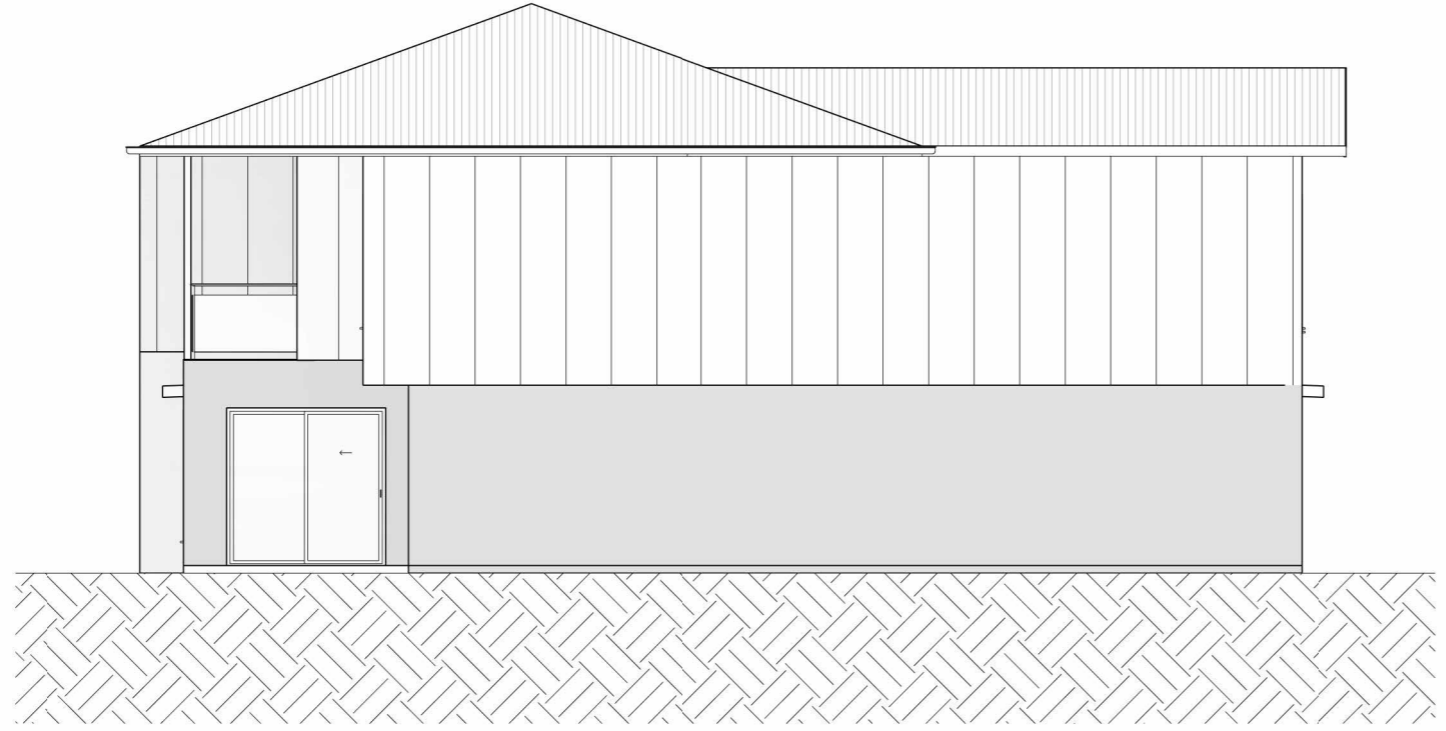
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Elevation A - Roof Style 2

1 : 100

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Dated: 9 August 2024



Elevation B - Roof Style 2

1 : 100

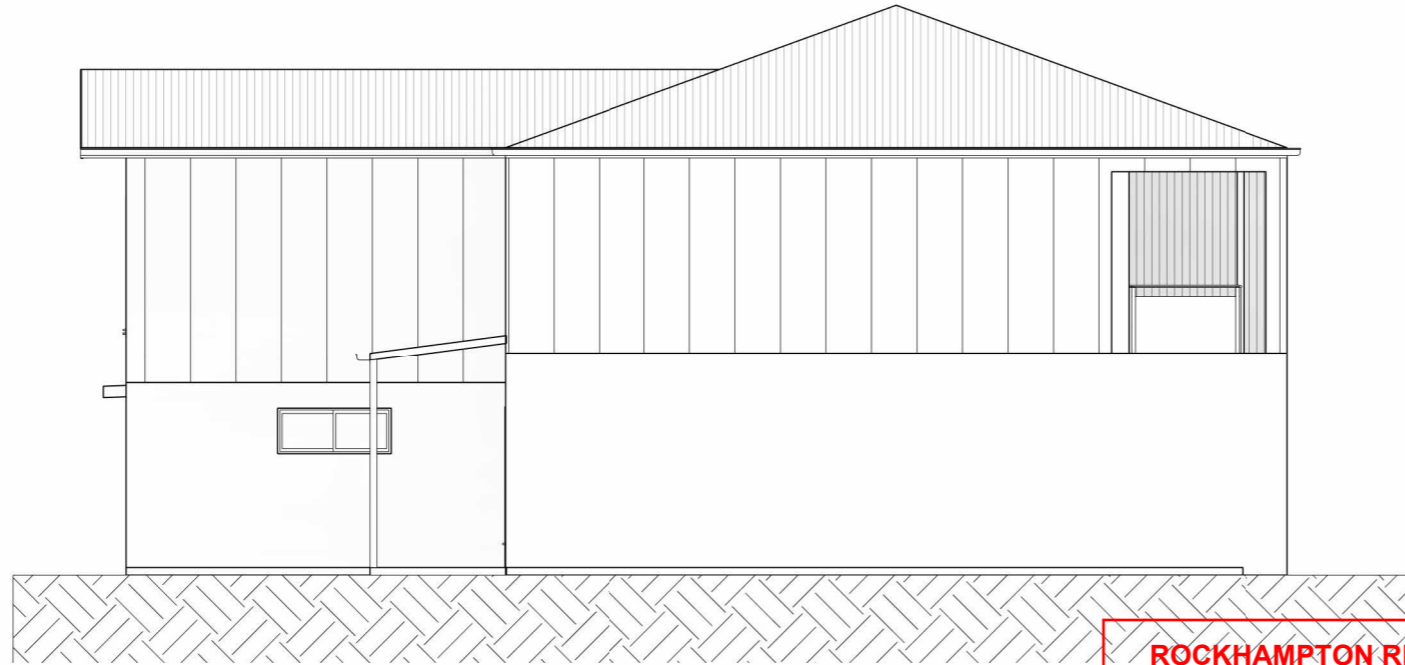
GENERAL NOTE:
- TYPICAL UNIT SET
- 3 DIFFERENT WALL DESIGN STYLES
- REFER TO 3D VIEWS FOR FINISHES.

ISSUED FOR
PRELIMINARY

Project:
PROPOSED DEVELOPMENT
Address:
**JOHNSON ROAD,
GRACEMERE, QLD, 4702**
Drawing Title:
**ELEVATIONS - ROOF
STYLE 2**

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BUILDING DESIGNERS
0407 271 336 **M**
info@dezi nelements.com.au **E**
QBCC No: 1247120 BDAQ No: 0001677

Scale: 1 : 100	Rev: 1
Date: MAR 2024	26/03/2024 12:39:31 PM
Drawn: NJB	
Project No: 24_081	Drawing No: S-11



Elevation C - Roof Style 2

1 : 100

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Dated: 9 August 2024



Elevation D - Roof Style 2

1 : 100

GENERAL NOTE:
 -TYPICAL UNIT SET
 -3 DIFFERENT WALL DESIGN STYLES
 - REFER TO 3D VIEWS FOR FINISHES.

DO NOT SCALE DRAWING
 ALL DIMENSION IN MILLIMETERS

No:	Description:	Date:	REVISIONS
1	PRELIMINARY	25/03/2024	

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PRELIMINARY

Project:	PROPOSED DEVELOPMENT
Address:	JOHNSON ROAD, GRACEMERE, QLD, 4702
Drawing Title:	ELEVATIONS - ROOF STYLE 2

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 BUILDING DESIGNERS
 0407 271 336 **M**
 info@dezi nelements.com.au **E**
 QBCC No: 1247120 BDAQ No: 0001677

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Drawn: NJB		
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