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/52-2019

Dated: 11 August 2020

12 June 2020

File No: K4820-0003

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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

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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 Rockhamption 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.*

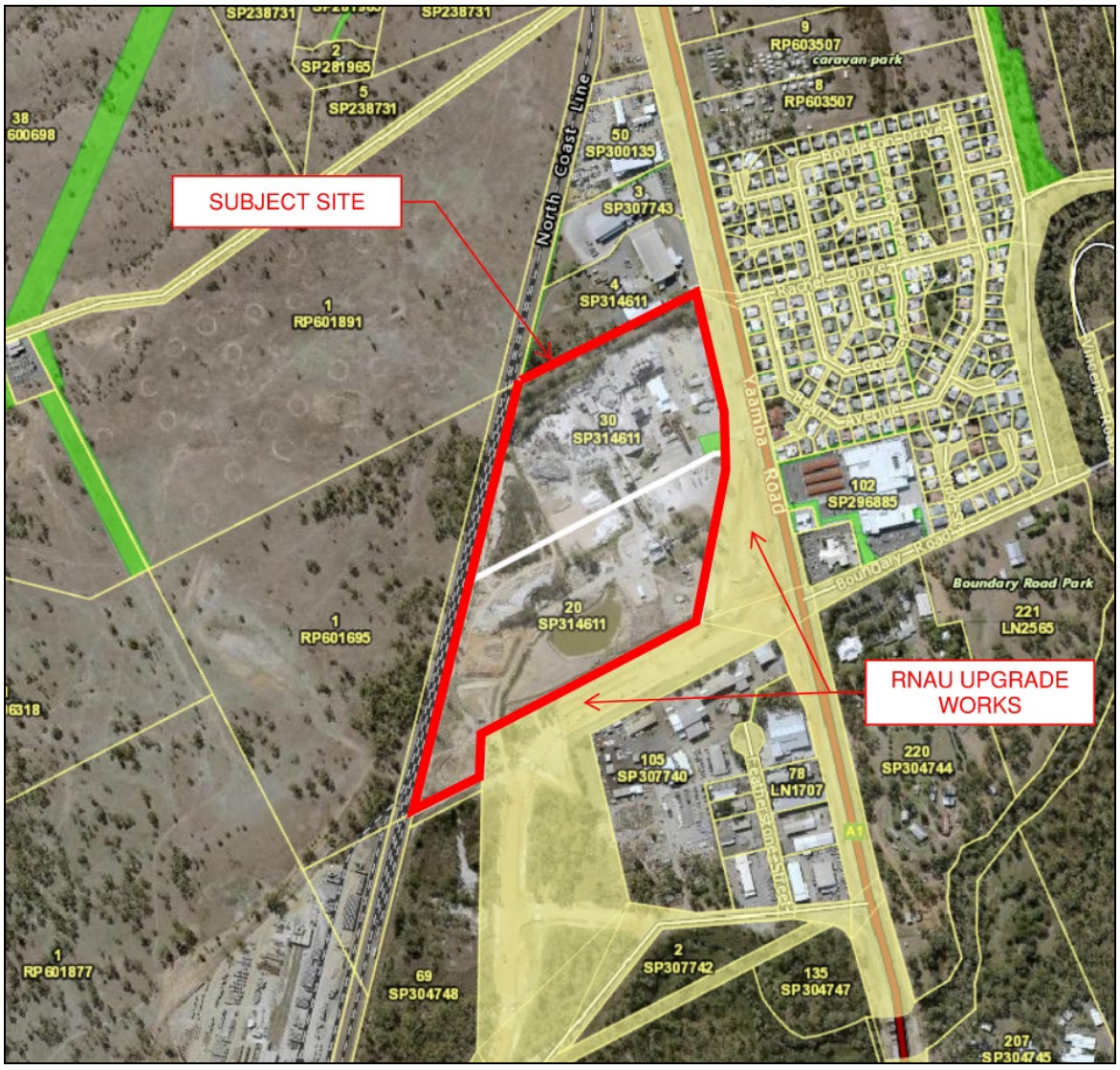

Figure 1: ***Site Location Plan (Source: QLD Globe – Modified)***

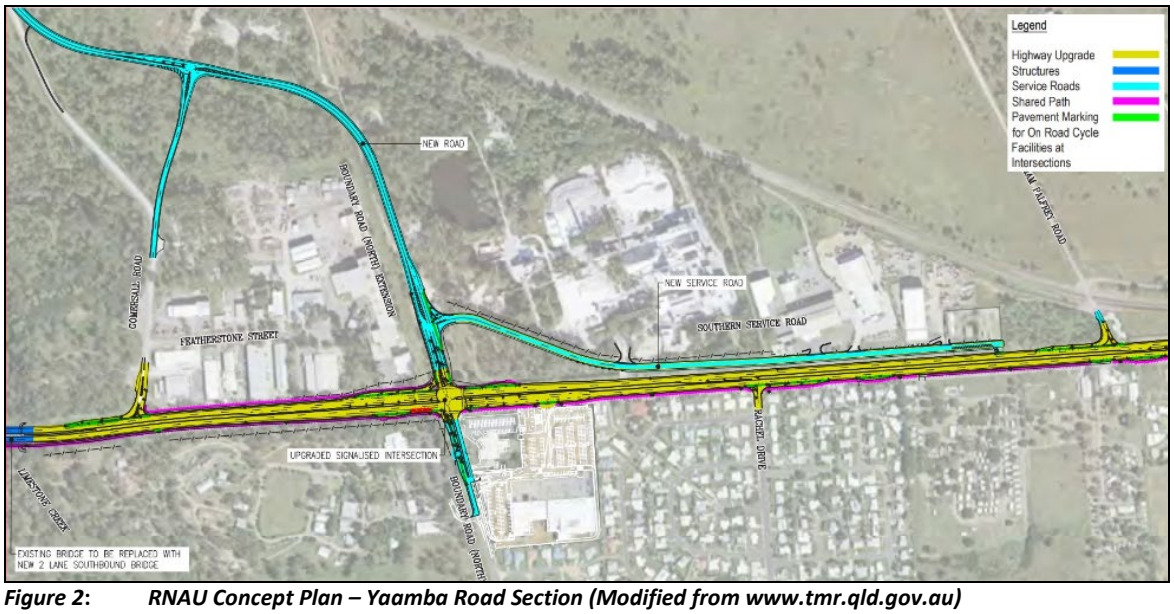

Figure 2*:** ***RNAU Concept Plan – Yaamba Road Section (Modified from www.tmr.qld.gov.au)

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.

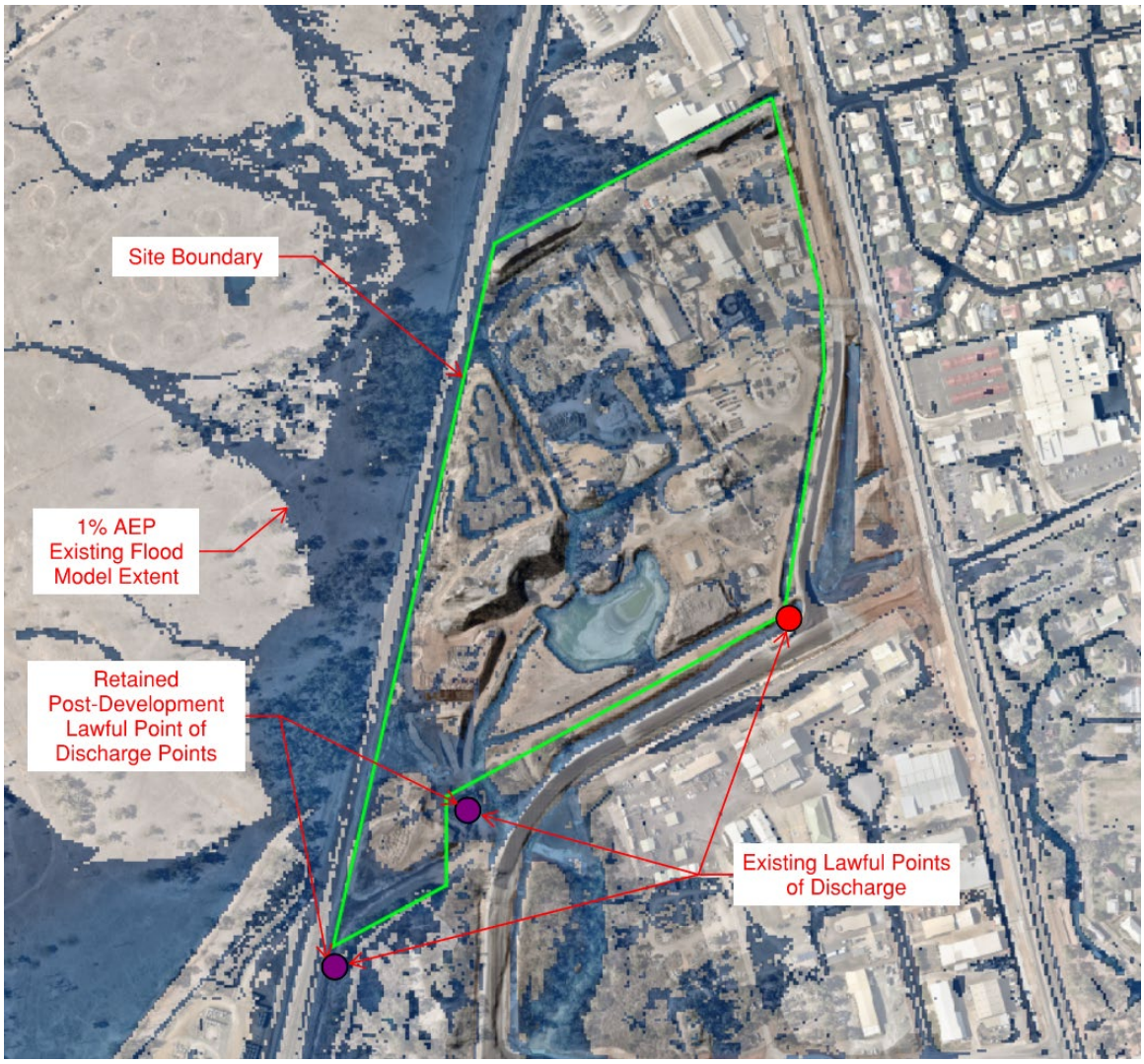

***Figure 3*: Deemed Lawful Points of Discharge (Source: RNAU Hydraulic Model, mapped in QGIS)**

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.

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.

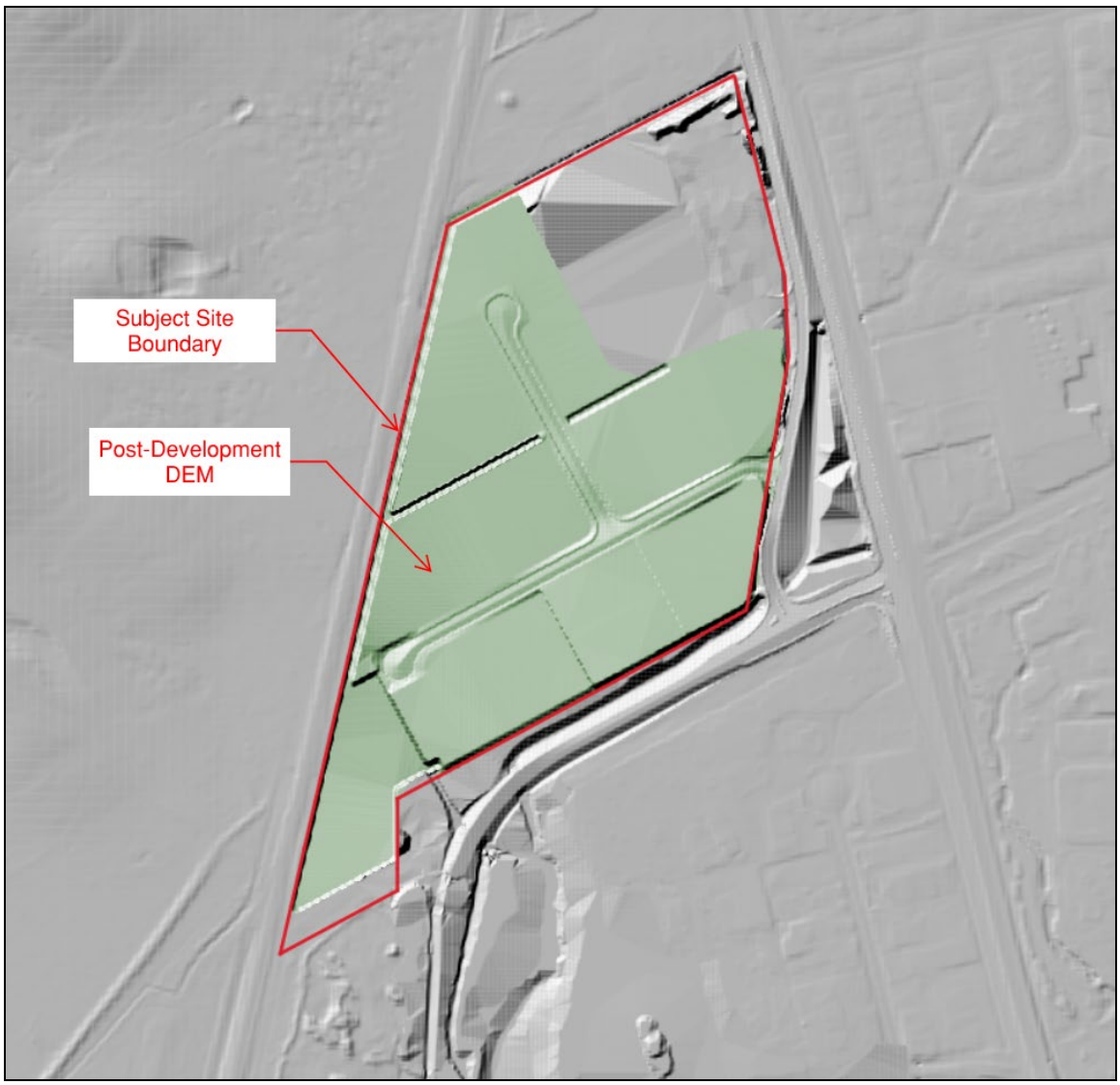

Figure 5*: *Proposed earthworks design surface Digital Elevation Model (DEM) provided by the client

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.

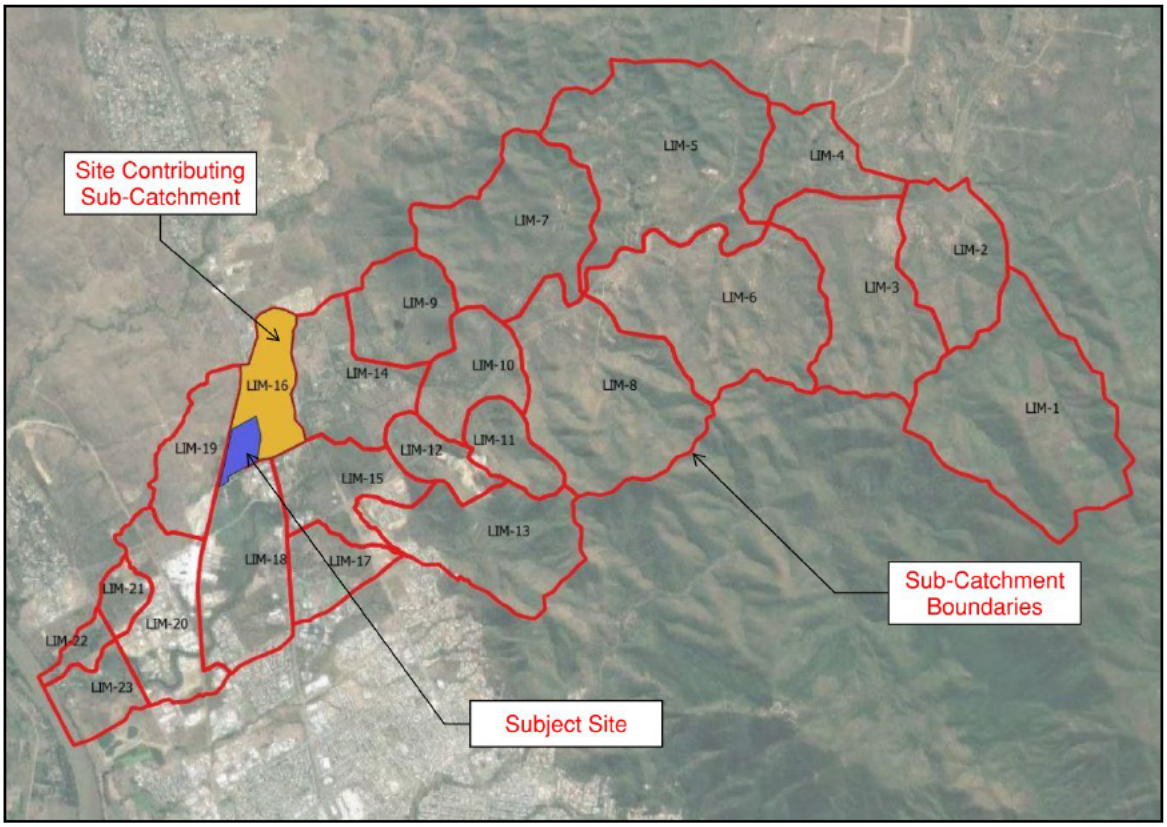

Figure 6: ***Subject Site Location within existing RNAU Tuflow model catchment***

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

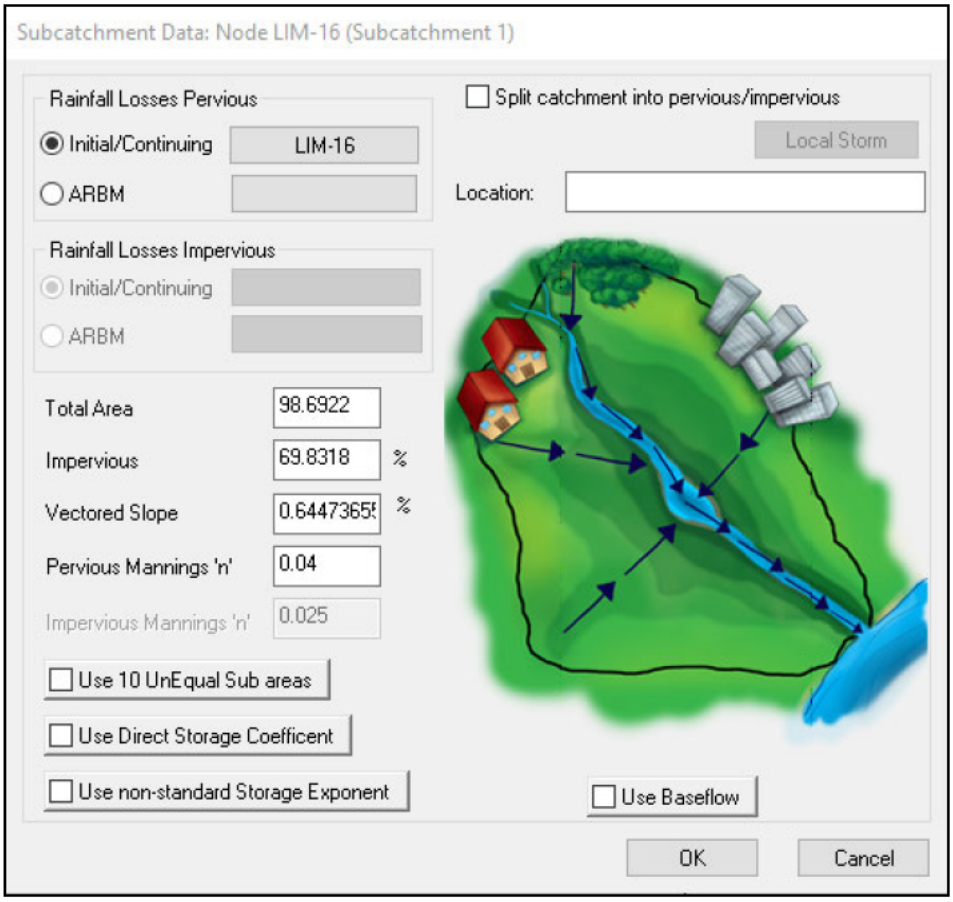

Figure 7: ***LIM-16 Sub-Catchment properties – Source: Supplied XPRAFTS model***

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.

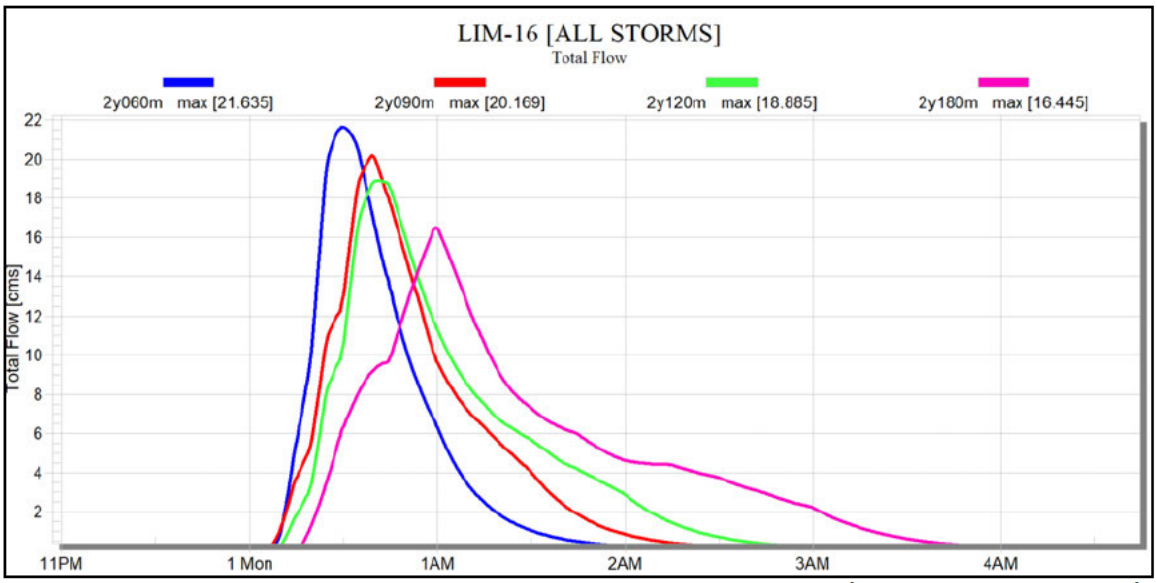

Figure 8: 39% AEP XPRAFTS Local Inflow Hydrographs – Sub-Catchment LIM-16 (Source: RRC XPRAFTS model)

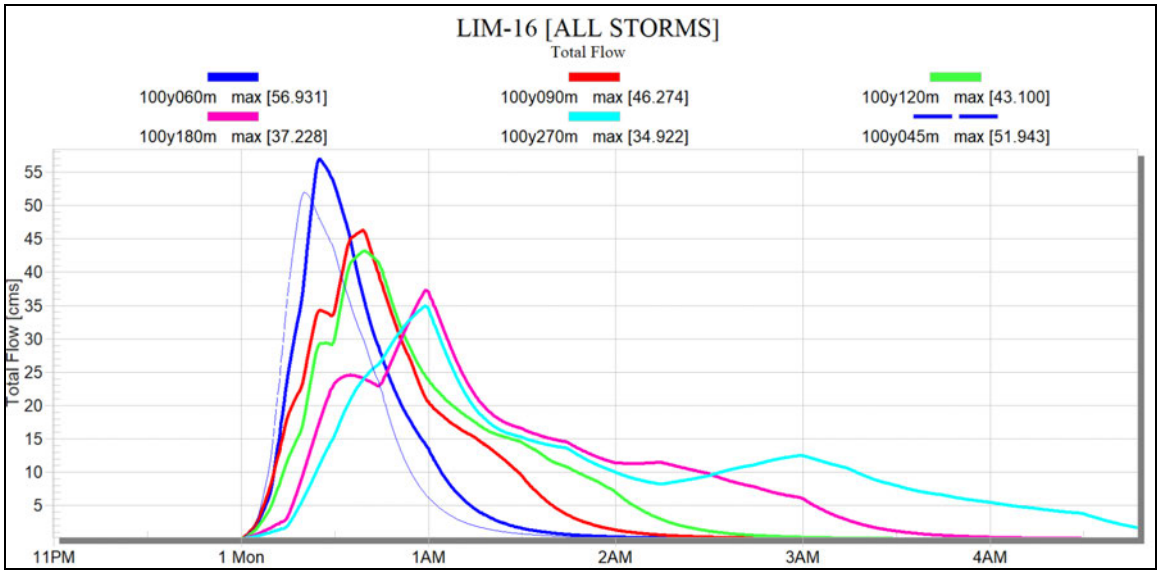

***Figure 9*: 1% AEP XPRAFTS Local Inflow Hydrographs – Sub-Catchment LIM-16 (Source: RRC XPRAFTS model)**

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 online 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.*

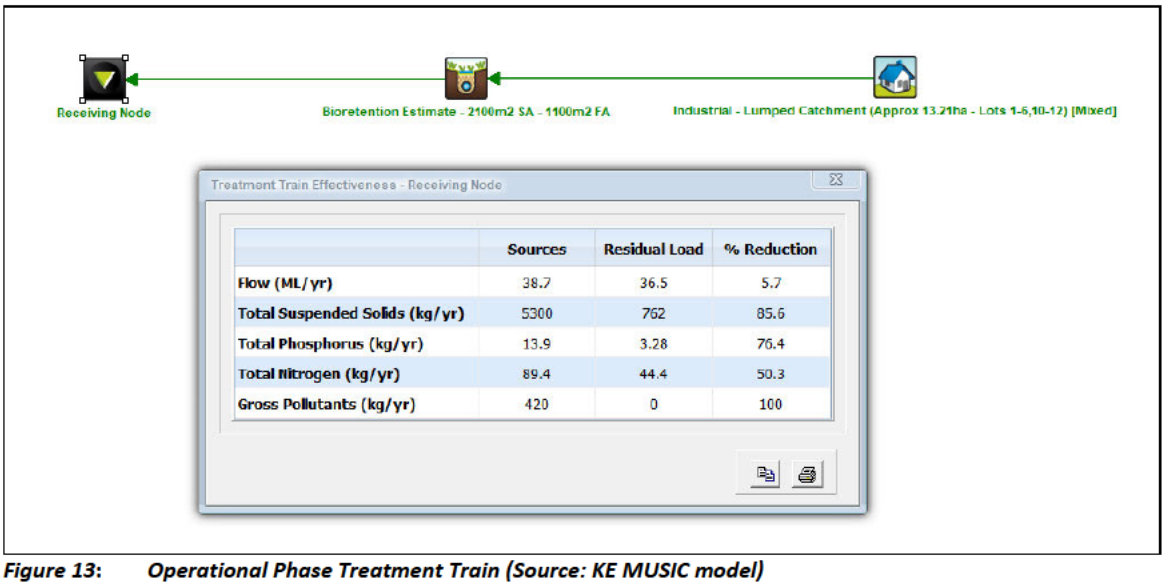

Figure 13: Operational Phase Treatment Train (Source: KE MUSIC model)

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.

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

AMENDED PLANS APPROVED

15 September 2021

DATE

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

Development Permit No.: D/52-2019

Dated: 11 August 2020

RAILWAY

COAST

ROAD

(BRUCE HIGHWAY)

YAAMBA

NORTH

RP601695

SP300134

128943

11	1·008 ha	301·72			
12	1·377 ha				
13	3·710 ha				
6	1·001 ha	305·72	73·96	195·02	95·14
10	1·004 ha				
9	1.266 ha	81.91	100·0	(125·5)	100·5
3	1·002 ha	100·0			
4	1·0 ha	99·5			100·5
5	1·003 ha	90·17	39·73	18·95	100·5
8	1.687 ha	309·35	4·0	25·0	300·81
7	1·006 ha	100·0			
2	1·006 ha	100·0			100·57
1	1·001 ha	101·8	64·65	86·44	100·57

(396·58) 186·79 31·85 19·78 26·89 38·48 56·84 74·08 6·05 ea 56·69 99·5 22·24 14·53 80

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

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
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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

APPENDIX

B

Knobel Engineers

Model Layout Plans

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

ISSUE No.	DATE	AMENDMENT
1	15-05-20	FOR REPORT

KNOBEL ENGINEERS
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PO Box 41, Varsity Lakes Q 4227
ABN: 33 071 435 202
W: knobelengineers.com.au
GOLD COAST | BRISBANE | BALLINA | ROCKHAMPTON

CLIENT: SIRIS CONSULTING ENGINEERS

PROJECT: PROPOSED INDUSTRIAL SUBDIVISION
777 YAAMBA ROAD, PARKHURST

DESIGN	DRAWN	APPROVED
-	AR	-

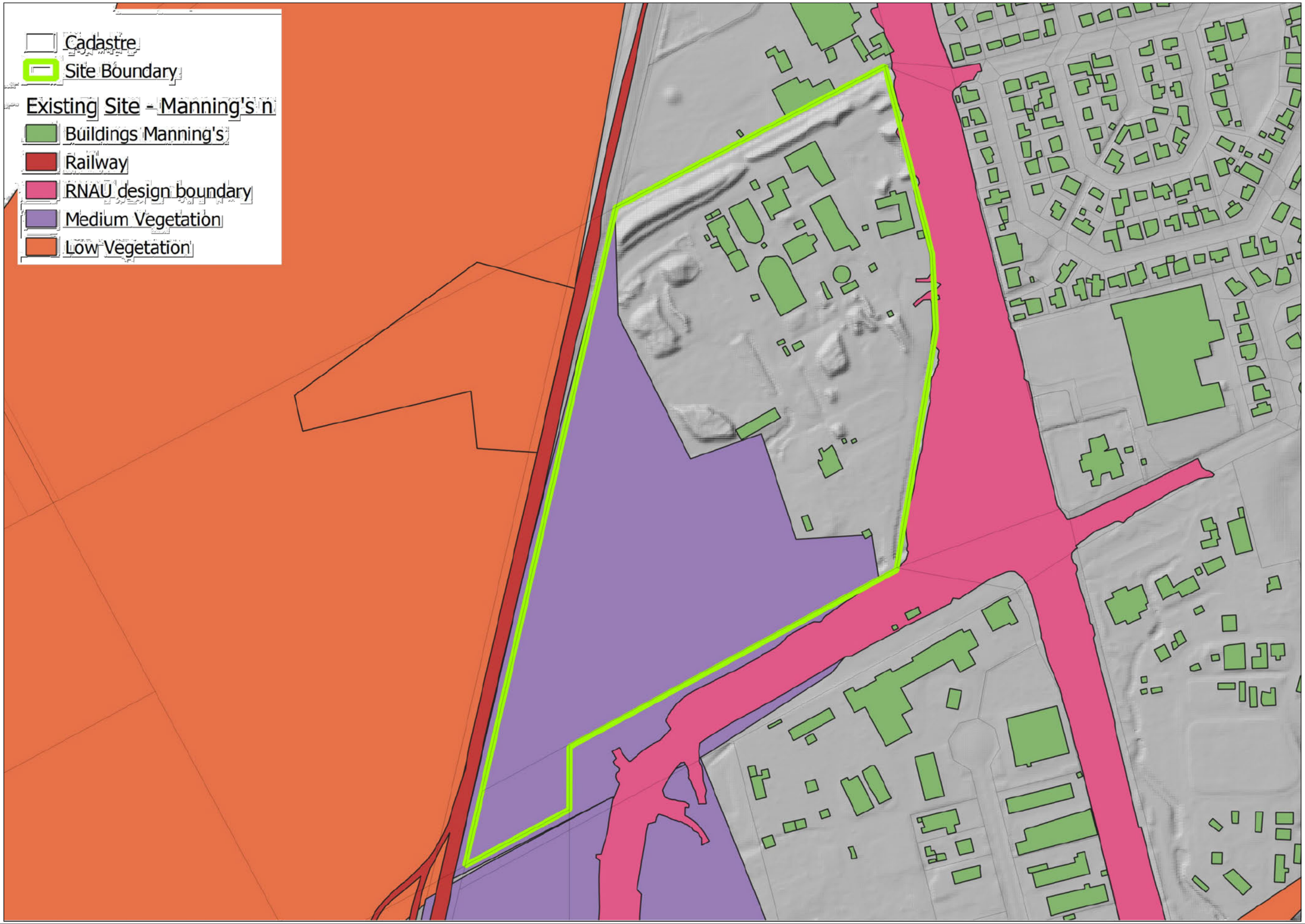
TITLE: EXISTING SITE LAYOUT

SCALE:

PROJECT NO.: K4820

DWG NO.: B001

ISSUE: 1



ISSUE No.	DATE	AMENDMENT
1	15-05-20	FOR REPORT

KNOBEL ENGINEERS
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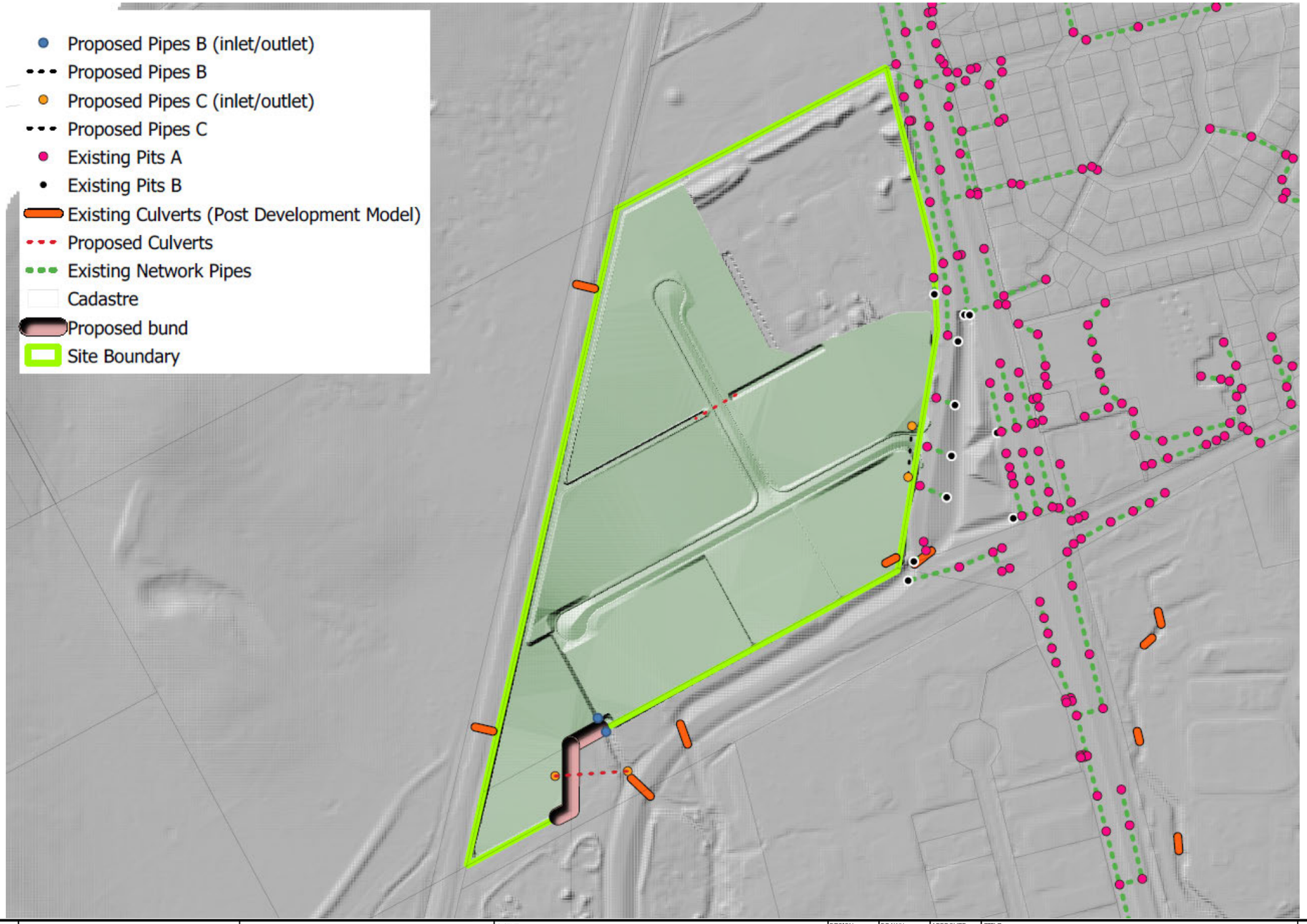
GOLD COAST | BRISBANE | BALLINA | ROCKHAMPTON

CLIENT	DESIGN	DRAWN	APPROVED	TITLE	PROJECT NO.
SIRIS CONSULTING ENGINEERS	-	AR	-	EXISTING SITE MANNINGS VALUE'S LAYOUT	K4820
PROJECT: PROPOSED INDUSTRIAL SUBDIVISION 777 YAAMBA ROAD, PARKHURST				SCALE	DWG NO. B002 / ISSUE 1



ISSUE No.	DATE	AMENDMENT
1	15-05-20	FOR REPORT

KNOBEL ENGINEERS
Suite 4 - 155 Varsity Parade, Varsity Lakes Q 4227
PO Box 41, Varsity Lakes Q 4227
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E: eng@knobelengineers.com.au
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GOLD COAST | BRISBANE | BALLINA | ROCKHAMPTON

CLIENT: SIRIS CONSULTING ENGINEERS

PROJECT: PROPOSED INDUSTRIAL SUBDIVISION
777 YAAMBA ROAD, PARKHURST

DESIGN	DRAWN	APPROVED
-	AR	-

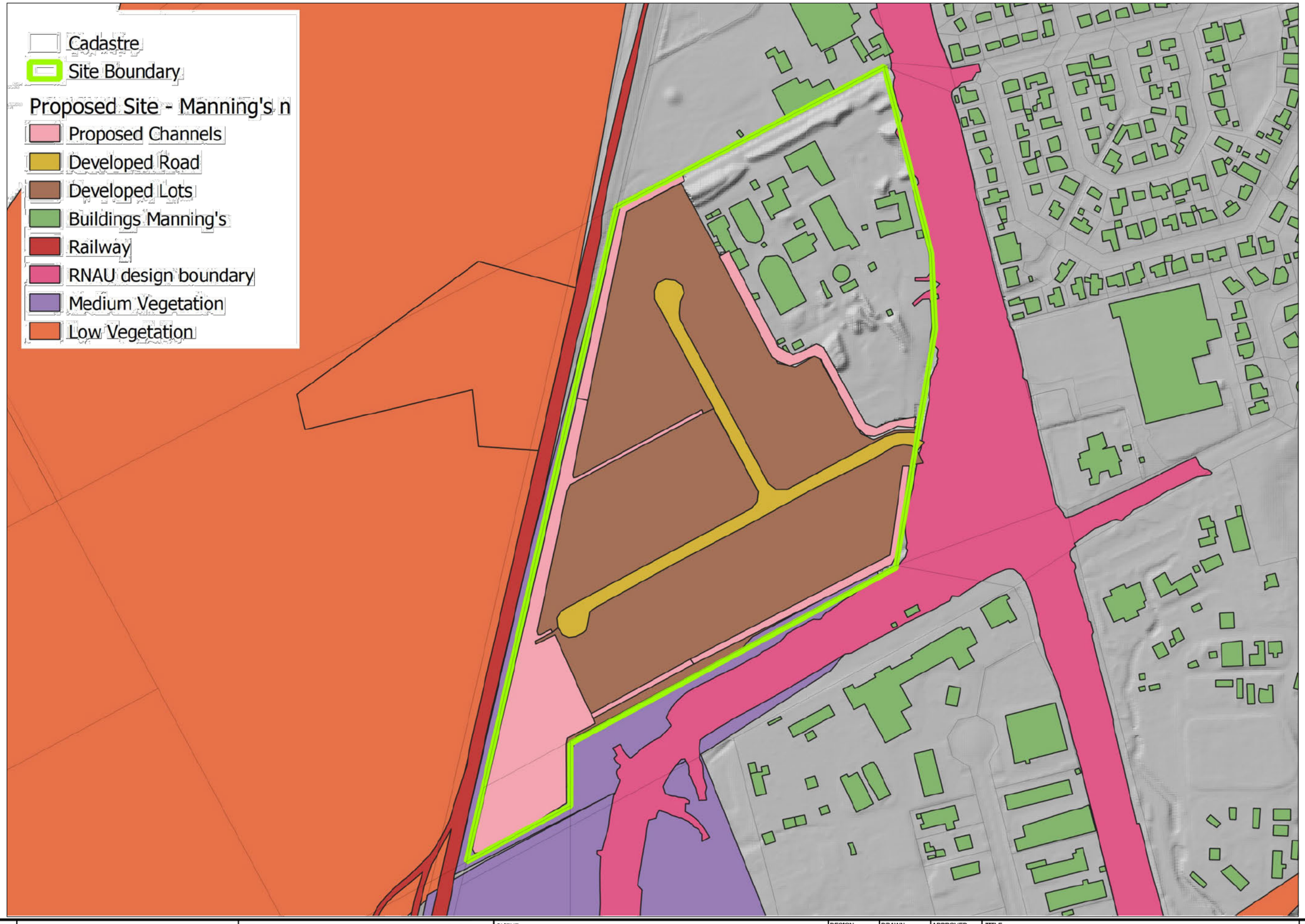
TITLE: PROPOSED SITE LAYOUT

SCALE:

PROJECT NO.: K4820

DWG NO.: B003

ISSUE: 1



			KNOBEL ENGINEERS	CLIENT	DESIGN	DRAWN	APPROVED	TITLE	PROJECT NO.
			Suite 4 - 155 Varsity Parade, Varsity Lakes Q 4227 T: 07 5580 9777 F: 07 5580 9133 E: eng@knobelengineers.com.au PO Box 41, Varsity Lakes Q 4227 ABN: 33 071 435 202 W: knobelengineers.com.au	SIRIS CONSULTING ENGINEERS	-	AR	-	PROPOSED SITE MANNINGS VALUE'S LAYOUT	K4820
				PROJECT					DWG NO. / ISSUE
1	15-05-20	FOR REPORT	GOLD COAST | BRISBANE | BALLINA | ROCKHAMPTON	PROPOSED INDUSTRIAL SUBDIVISION 777 YAAMBA ROAD, PARKHURST				SCALE	B004 / 1
ISSUE No.	DATE	AMENDMENT							

APPENDIX

C

Knobel Engineers

Pre-Development Peak Flood Mapping

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

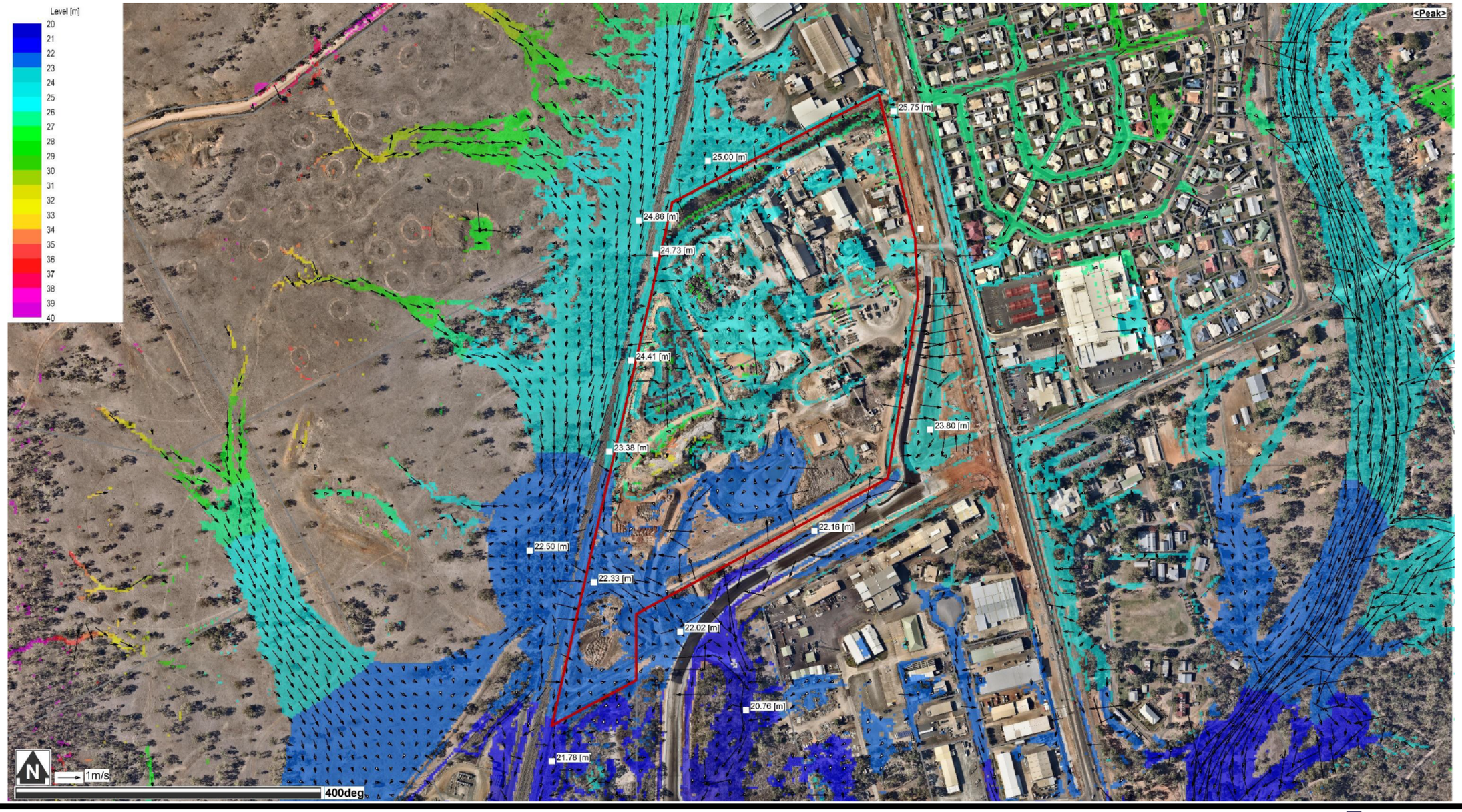


Figure F100/A
1% AEP Pre-Development Flood Water Level

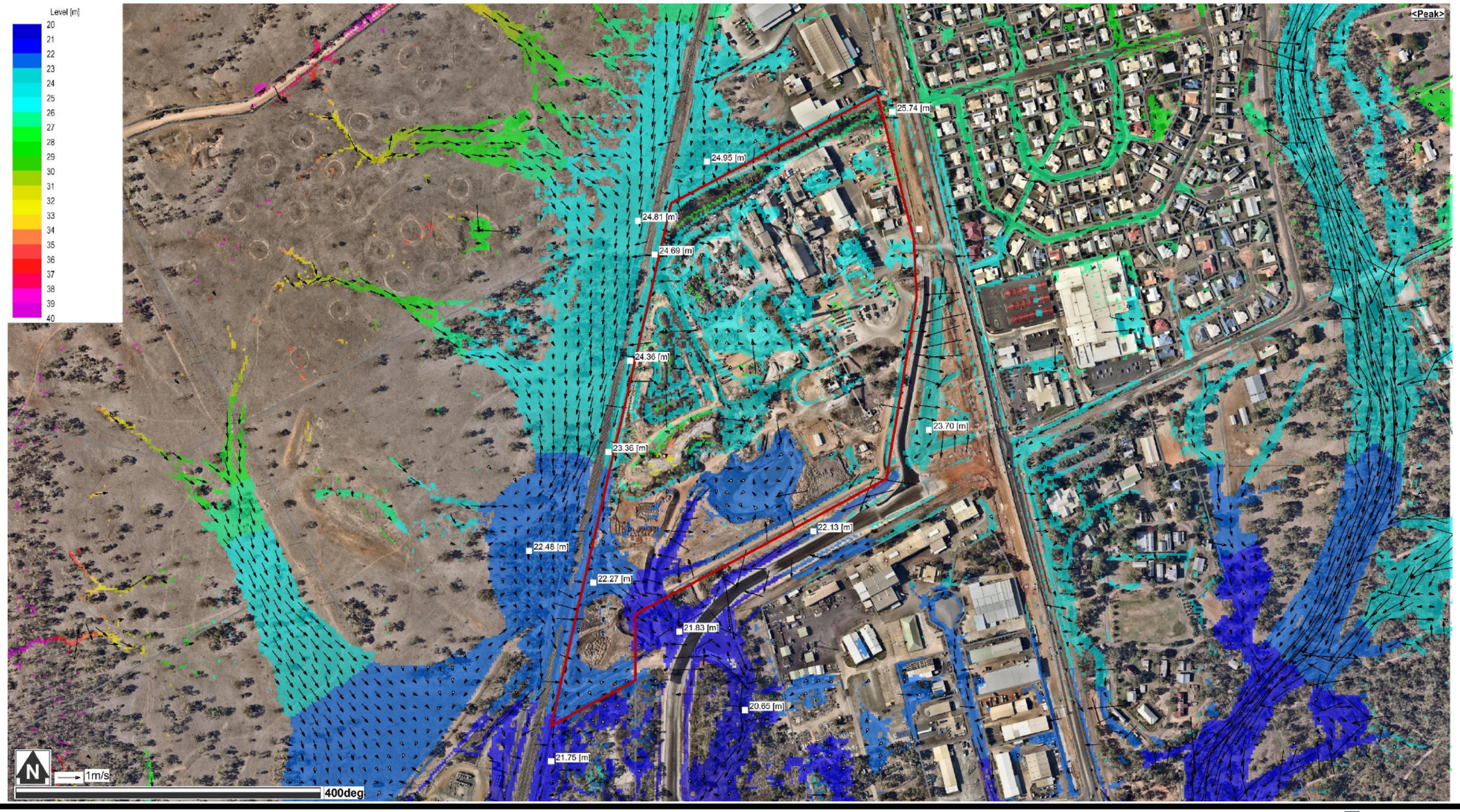
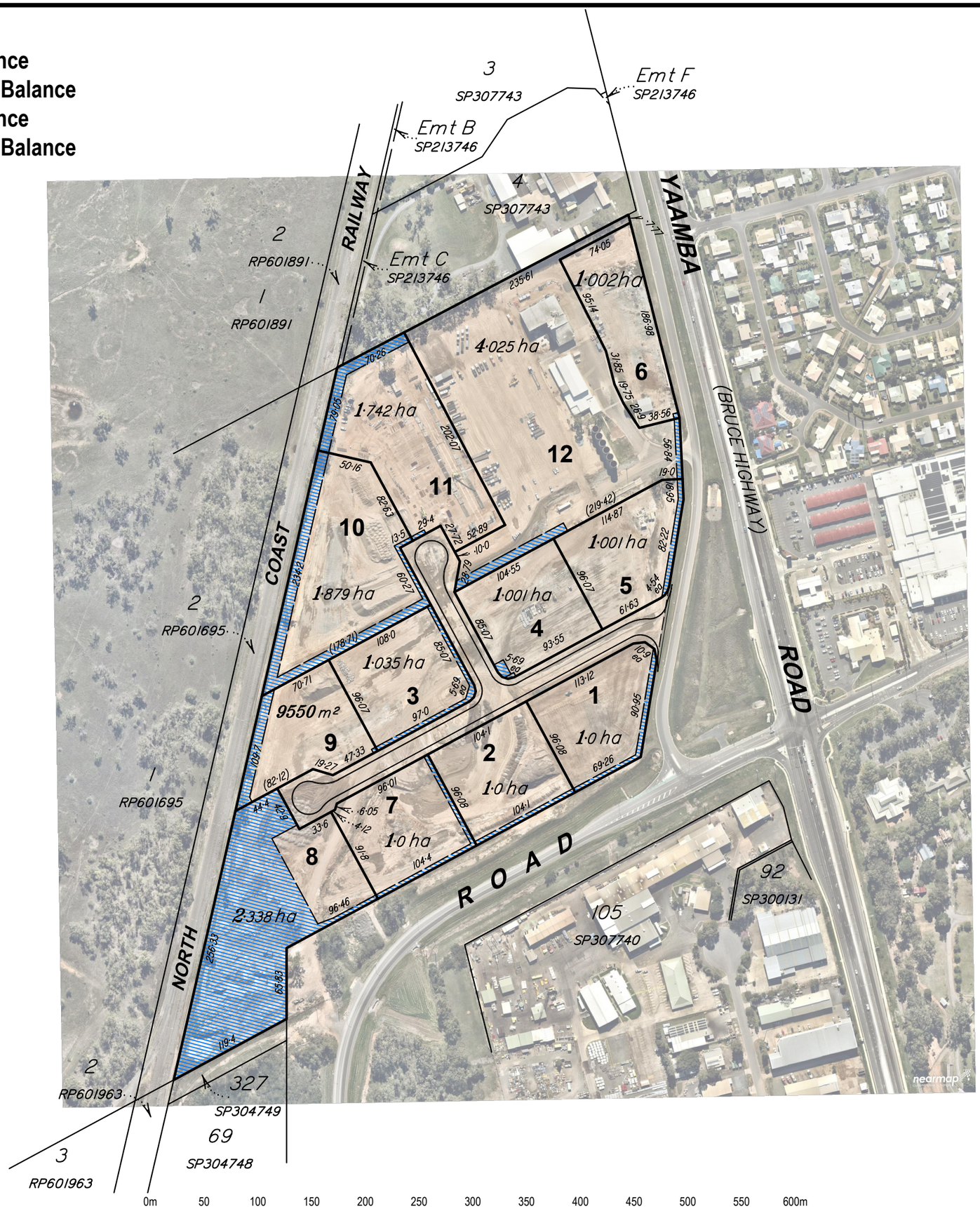


Figure F101/A
2% AEP Pre-Development Peak Flood Water Level

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



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
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777 YAAMBA ROAD
PARKHURST, QLD. 4702

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

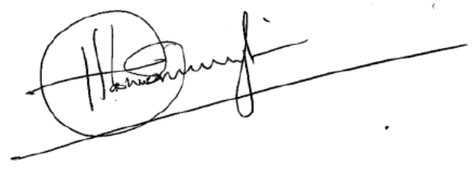
Development Permit No.: D/52-2019

Dated: 11 August 2020

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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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/52-2019

Dated: 11 August 2020

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 CERTIFICATION 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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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

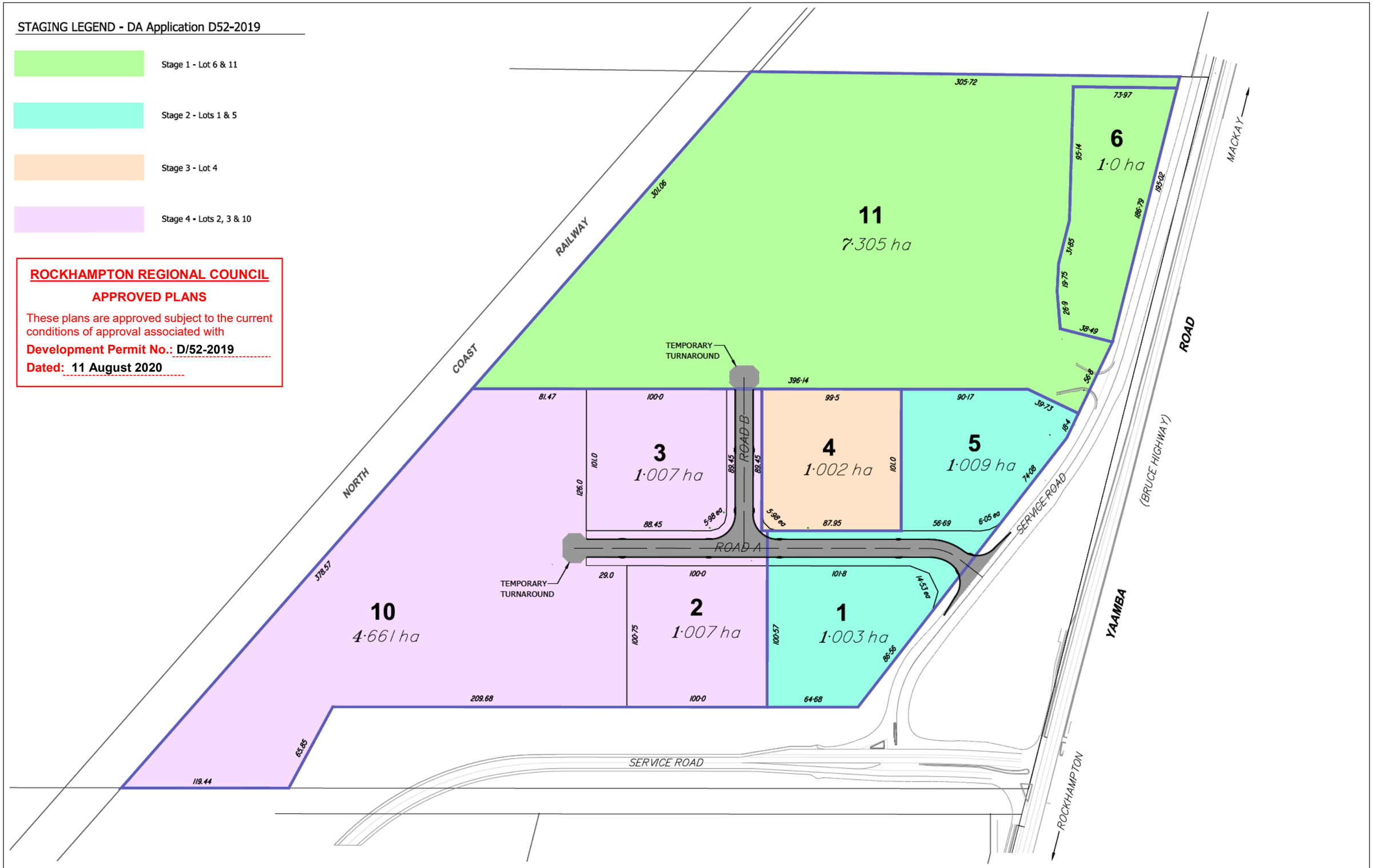
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/52-2019

Dated: 11 August 2020



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: 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,
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
EMAIL: david@sir seng 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
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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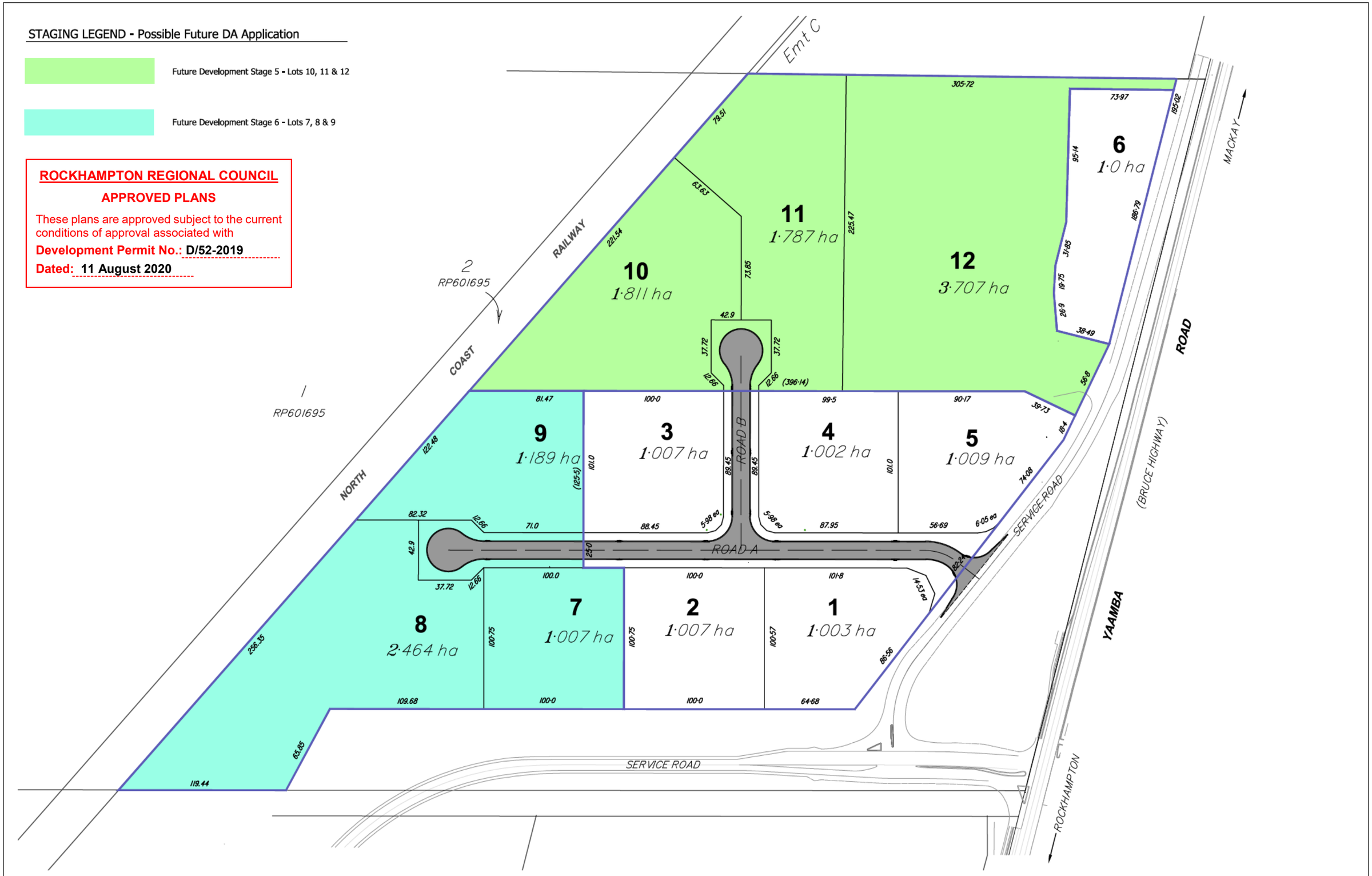

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
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DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

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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,
PARKHURST, QLD. 4702

SIRIS CONSULTING ENGINEERS
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PHONE: 07 4930 2877 (off ce) 0404 119 734 (mobile)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703
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

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)

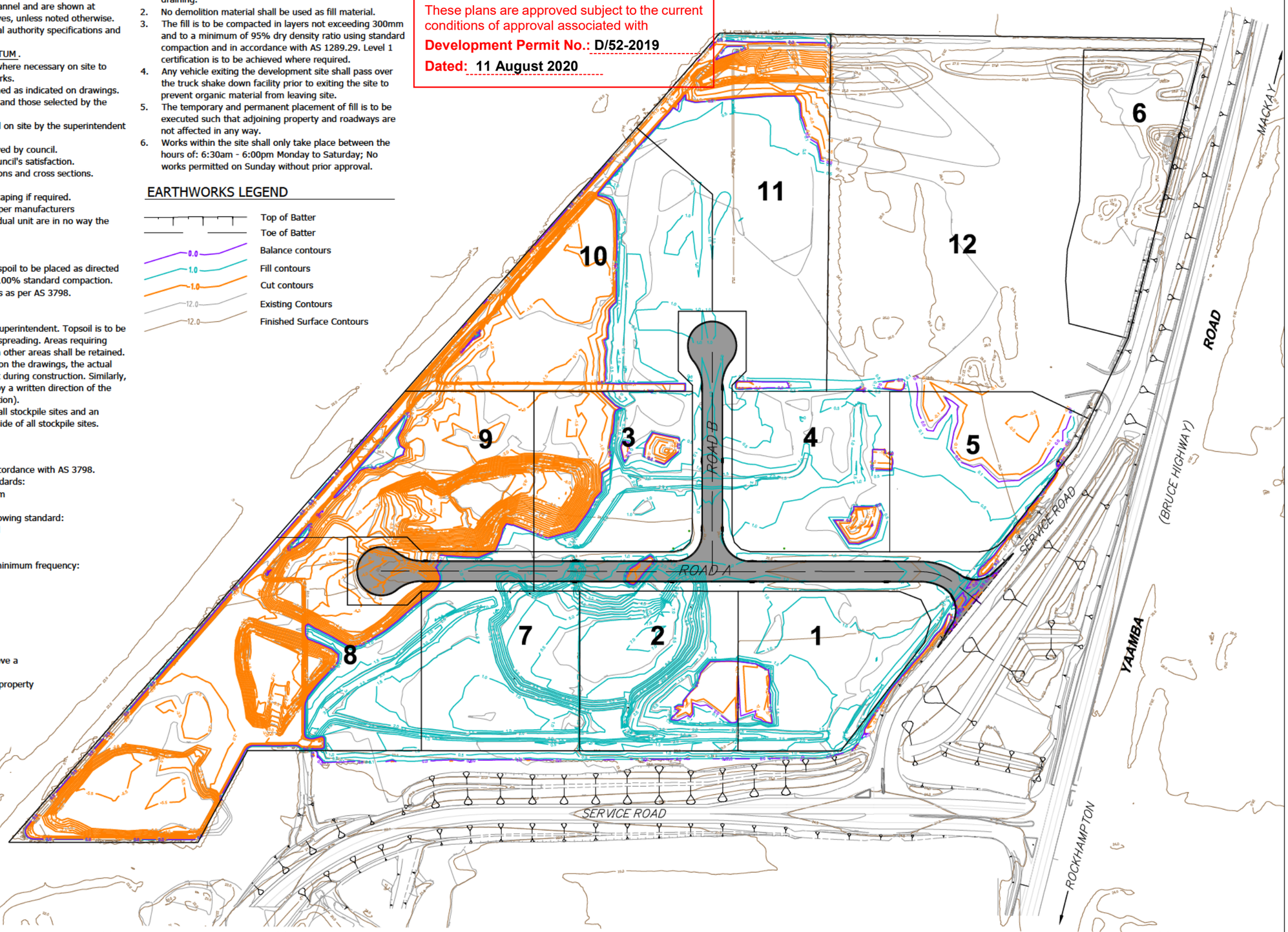
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/52-2019

Dated: 11 August 2020



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)
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703
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
- Fill contours
- Cut contours
- Existing Contours
- Finished Surface Contours

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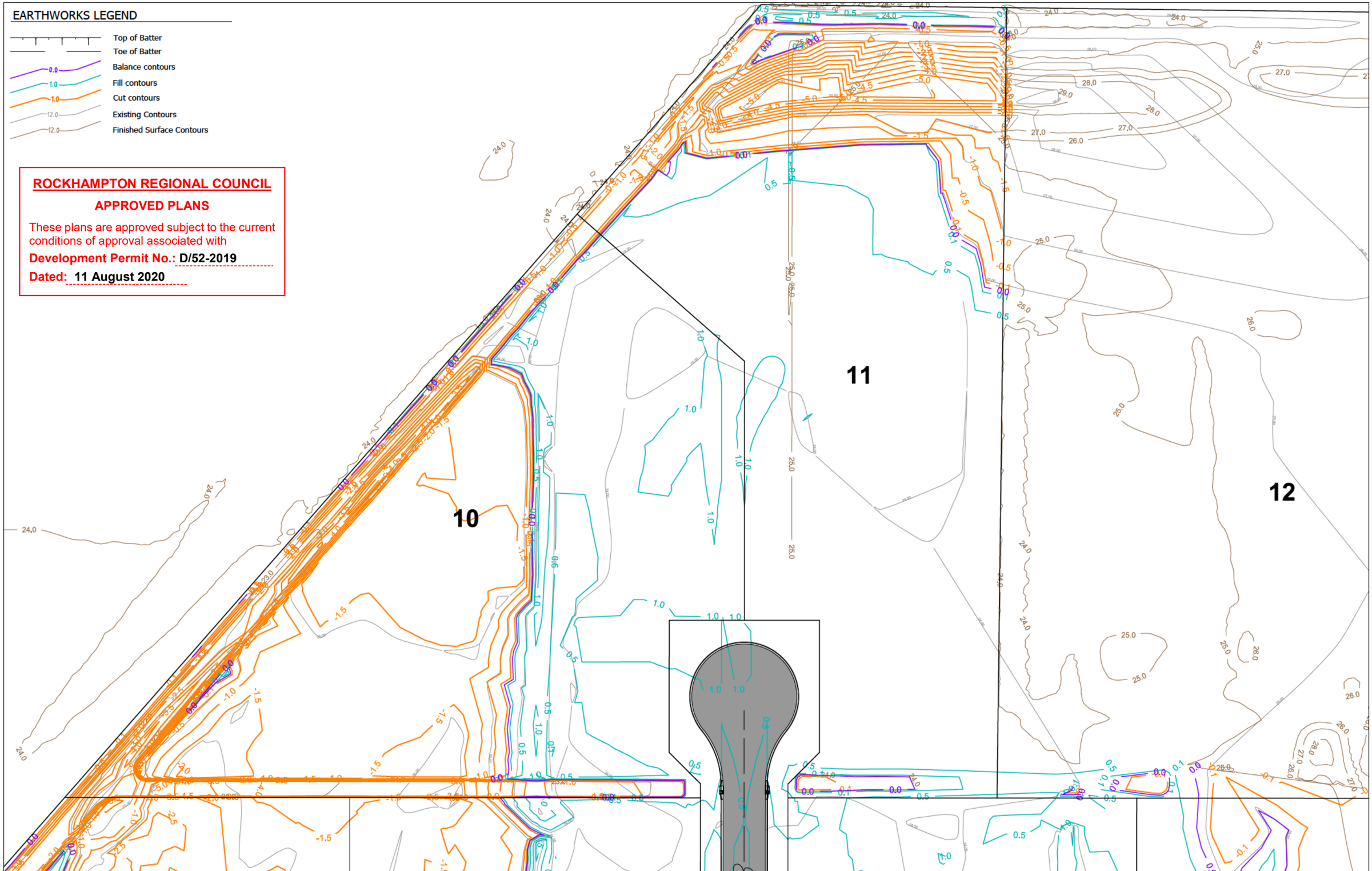

JOINS PLAN SCE-115-009

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: Leerasinghe 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

3

4

5

2

1

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/52-2019

Dated: 11 August 2020

EARTHWORKS LEGEND

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

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DATUM: AHD

CO-ORD.: GDA94

DESIGN REVIEW

DRAFTING REVIEW

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

RPEQ CERTIFICATE: [signature] 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
ABN:34 481 028 699

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 August 2020

9

8

7

JOINS PLAN SCE-115-008

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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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ABN:34 481 028 699

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

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2. Fill shall be placed and compacted to the following standards:
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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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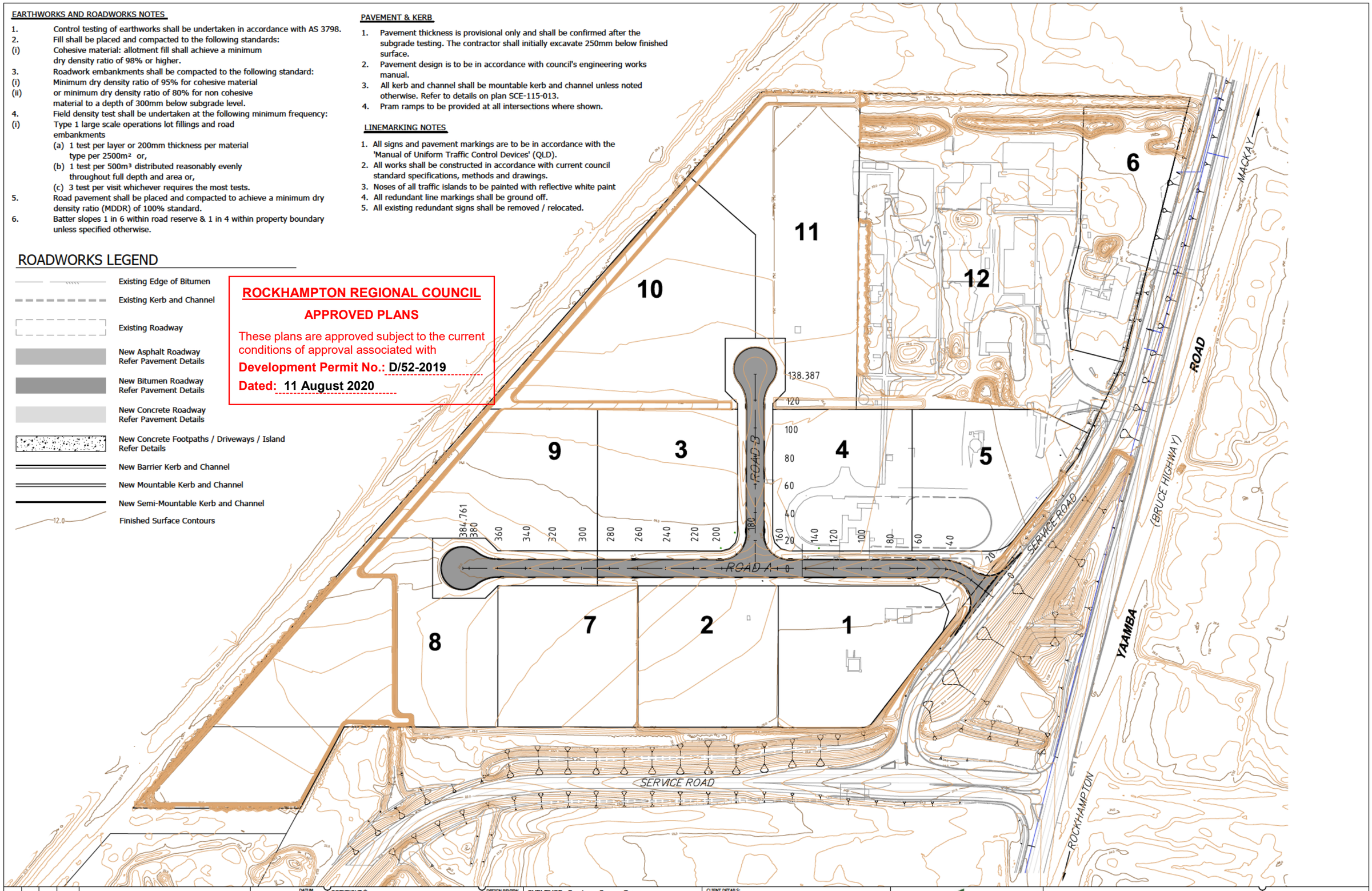

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RPEQ CERTIFICAT Veerasinghe RPEQ 8372
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

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DEVELOPMENT DETAILS:
INDUSTRIAL ESTATE
777 YAAMBA ROAD
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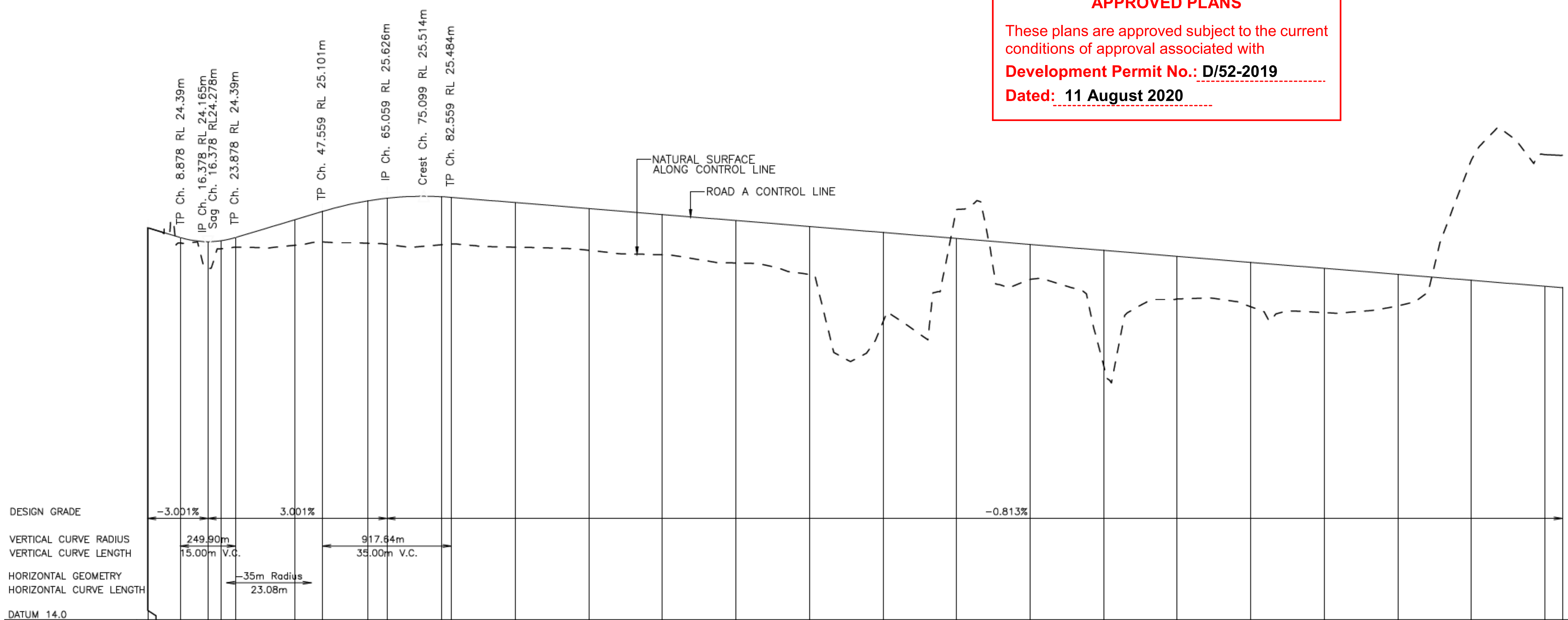
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

INDUSTRIAL ESTATE
PROPOSED ROADWORKS PLAN

PLAN NUMBER SCE-115-010
REVISION A

0 50.0m
1:2500

DO NOT SCALE - ASK IF IN DOUBT



RIGHT LIP LEVELS						24.209	24.692	24.919	25.208	25.277	25.319	25.302	25.160	24.998
LEFT LIP LEVELS						24.209	24.692	24.919	25.208	25.277	25.319	25.302	25.160	24.998
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	24.044
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	25.179
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	120.000

RIGHT LIP LEVELS	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	24.835	24.673	24.510	24.348	24.185	24.022	23.860	23.697	23.535	23.372	23.209	23.047		
EXISTING SURFACE	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	25.017	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	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)

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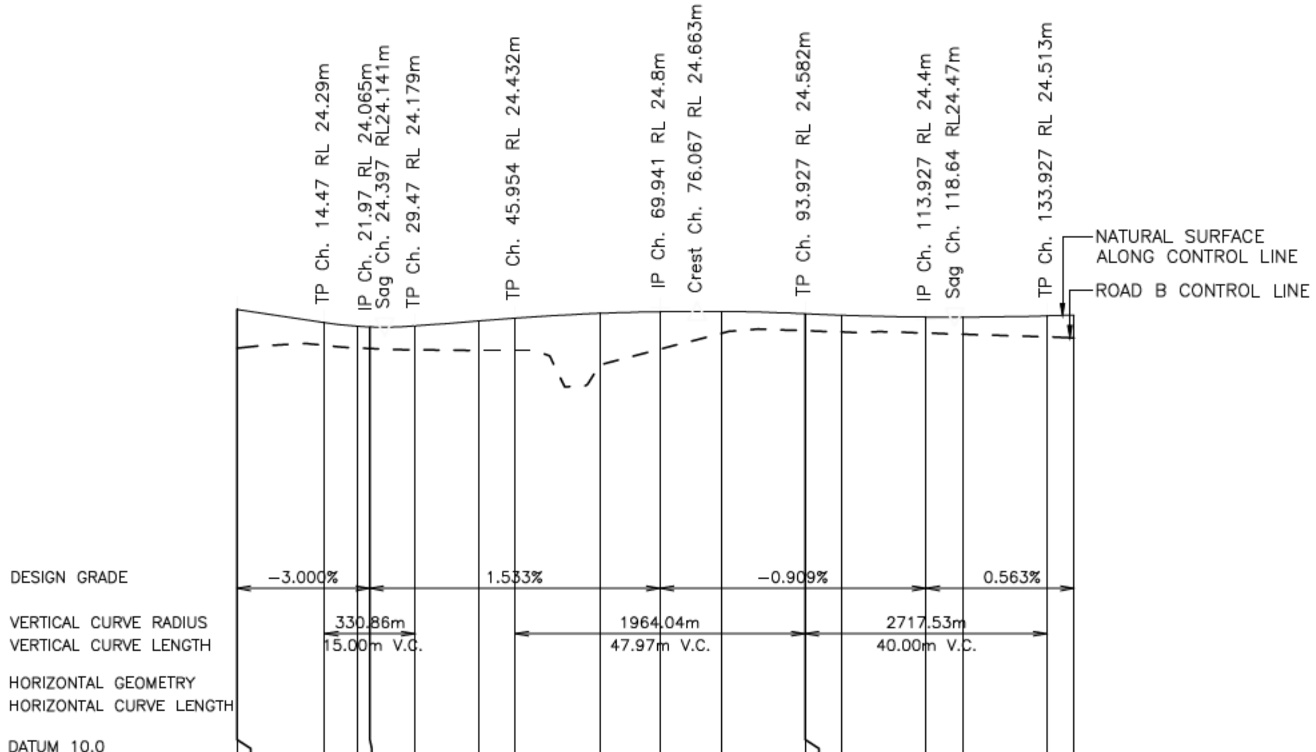
ADDRESS: Shop 3 5-7 Normanby Street Yeppoon QLD 4703

LILY PLACE ESTATE
ROAD LONG SECTION PLAN
SHEET 1
PLAN NUMBER SCE-115-011
REVISION A

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



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

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

DATUM AHD
CO-ORD. GDA94

DESIGN REVIEW
DRAFTING REVIEW

SURVEYOR:
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER:
RPEQ CERTIFICAT... 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

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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
ROAD LONG SECTIONS PLAN
SHEET 2

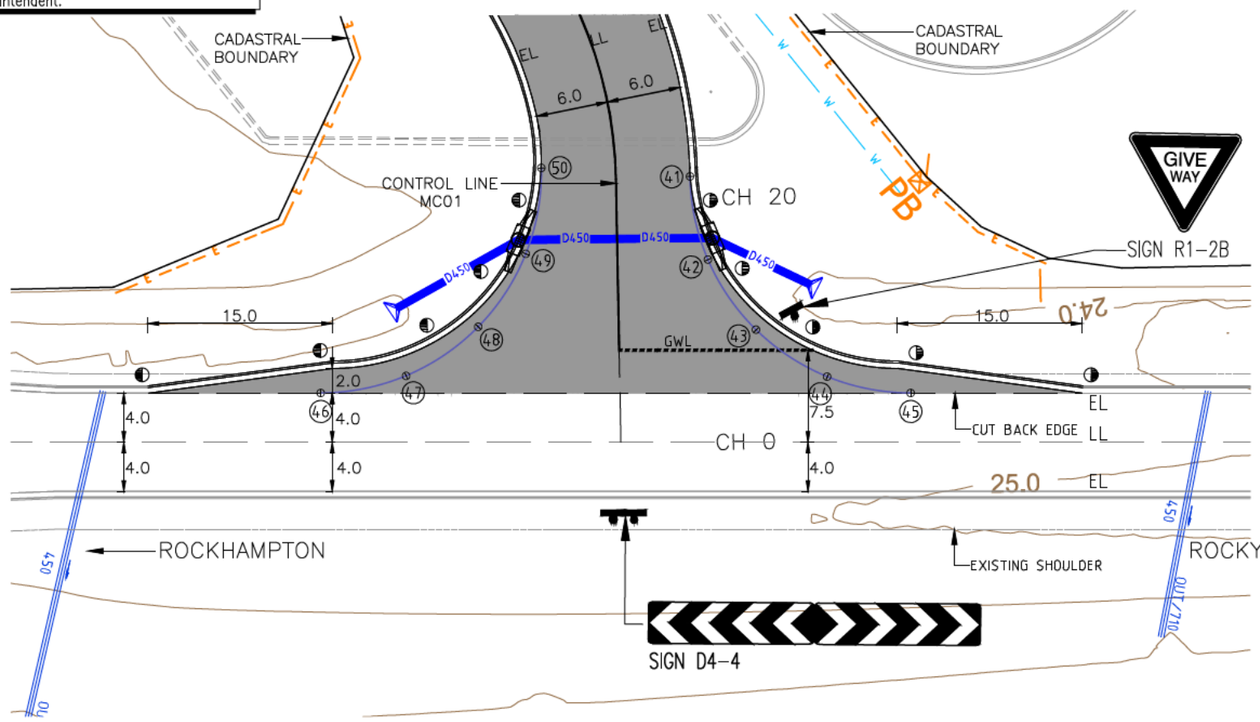
PLAN NUMBER: SCE-115-012
REVISION: A

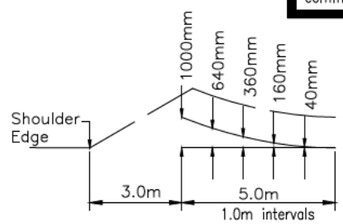
HOR. 1 : 500 (0, 10, 20)
VERT. 1 : 100 (0, 2, 4)
DO NOT SCALE - ASK IF IN DOUBT

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.

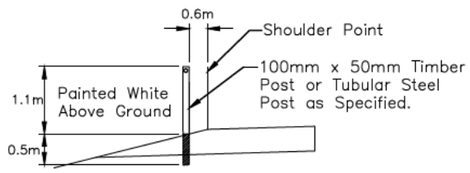




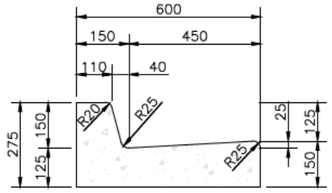
FLARE DETAIL
1:5

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

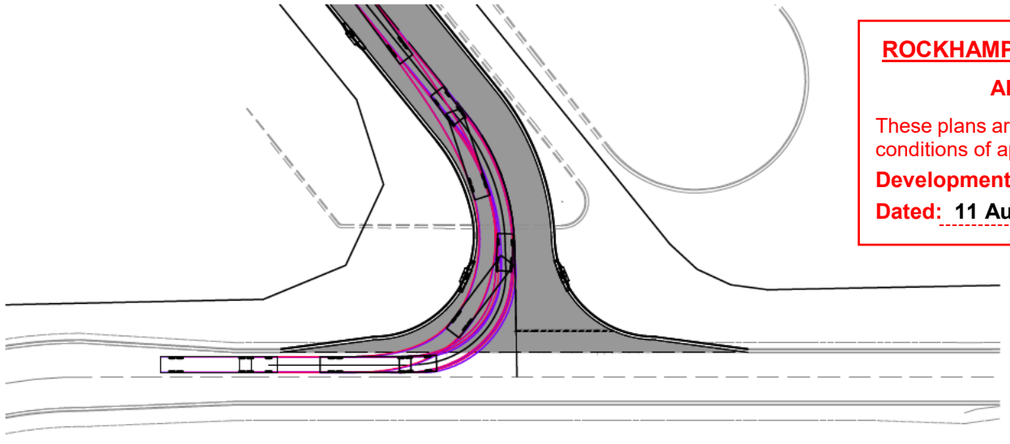
INTERSECTION SETOUT TABLE

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

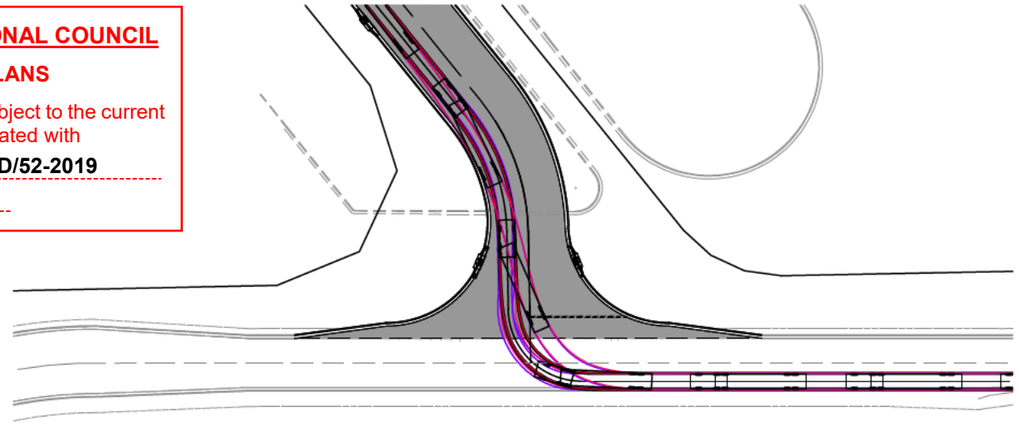
INTERSECTION SETOUT TABLE

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

INTERSECTION LAYOUT



ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/52-2019
Dated: 11 August 2020



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
FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

SURVEYOR: Capricorn Survey Group
CIVIL DESIGNER: Siris Consulting Engineers
LANDSCAPE DESIGNER: Contour Consulting
eerasinghe RPEQ 8372

CLIENT DETAILS:
PARKHURST HOLDINGS PTY LTD

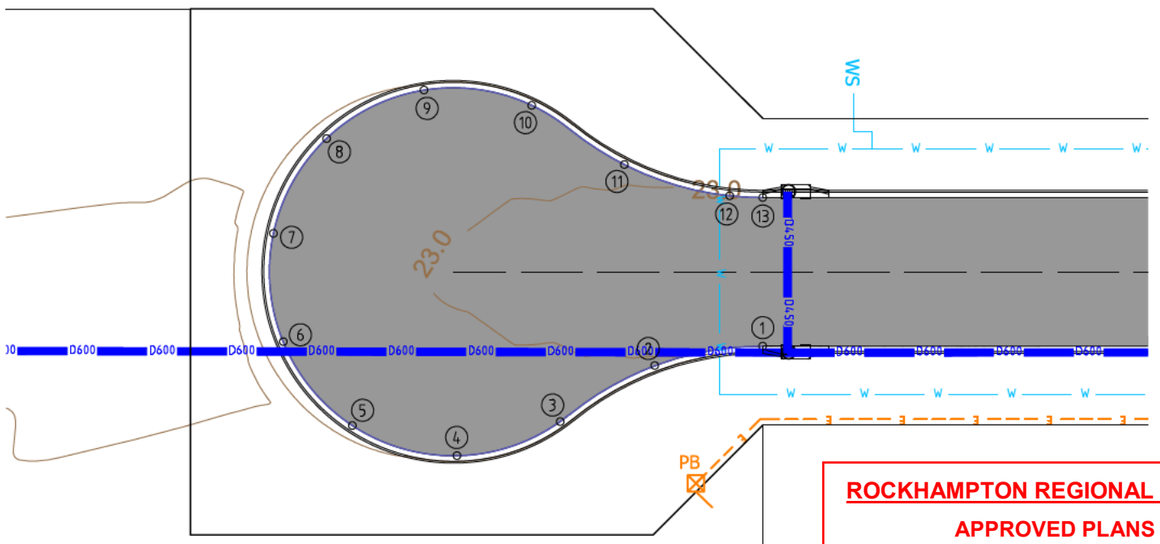
DEVELOPMENT DETAILS:
LILY PLACE ESTATE
777 YAAMBA ROAD
PARKHURST, QLD. 4702

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

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

APPROVED PLANS

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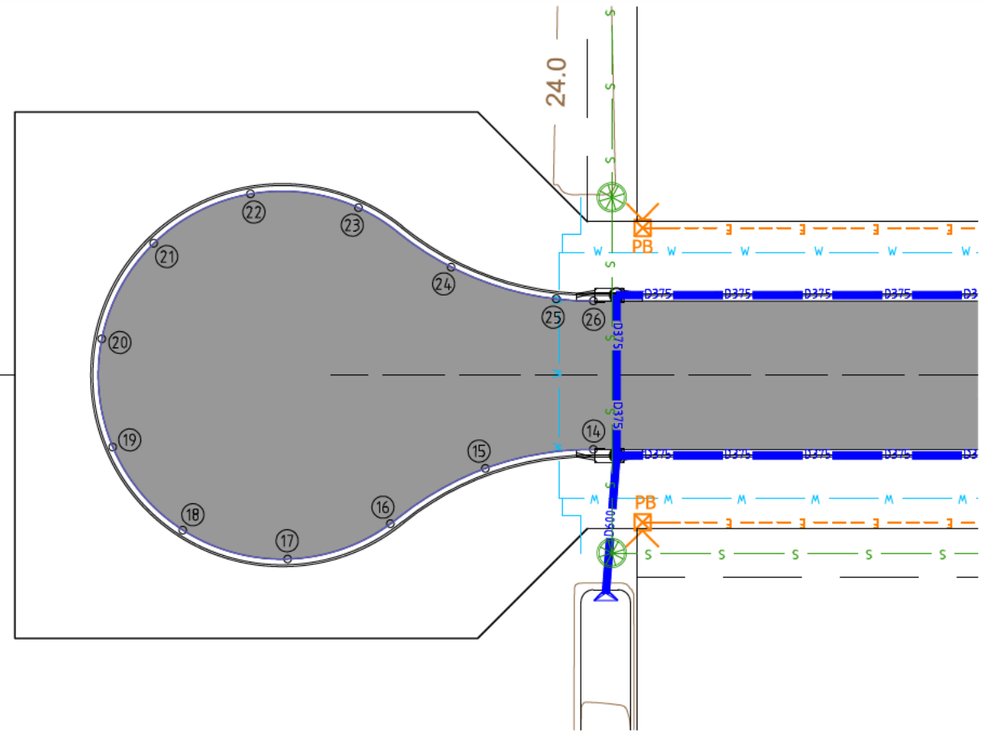
Development Permit No.: D/52-2019

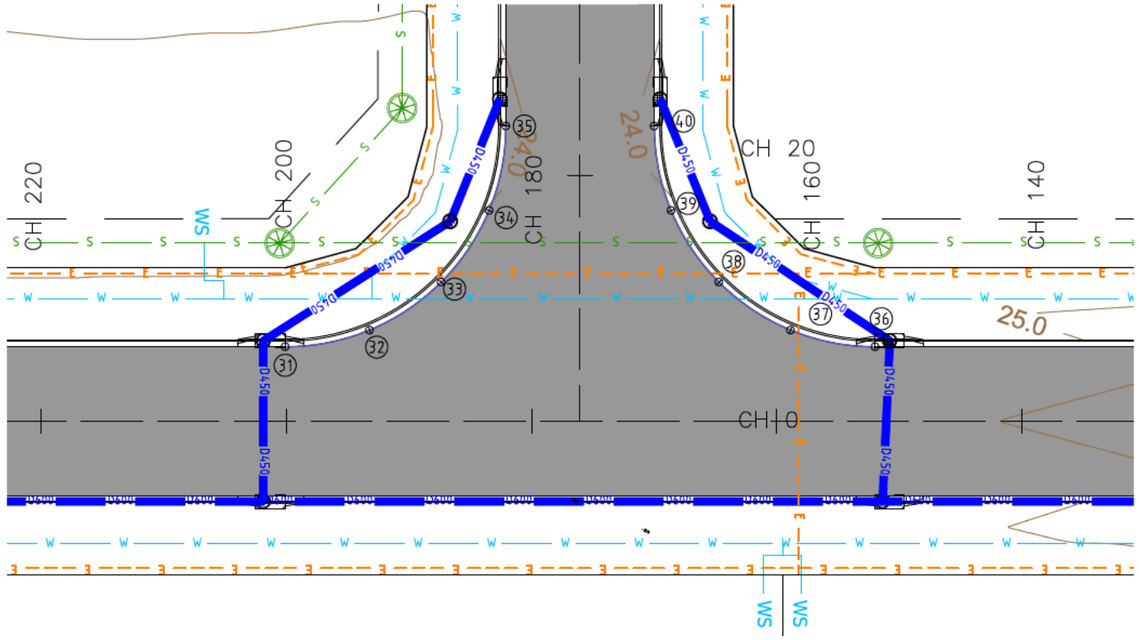
Dated: 11 August 2020



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

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

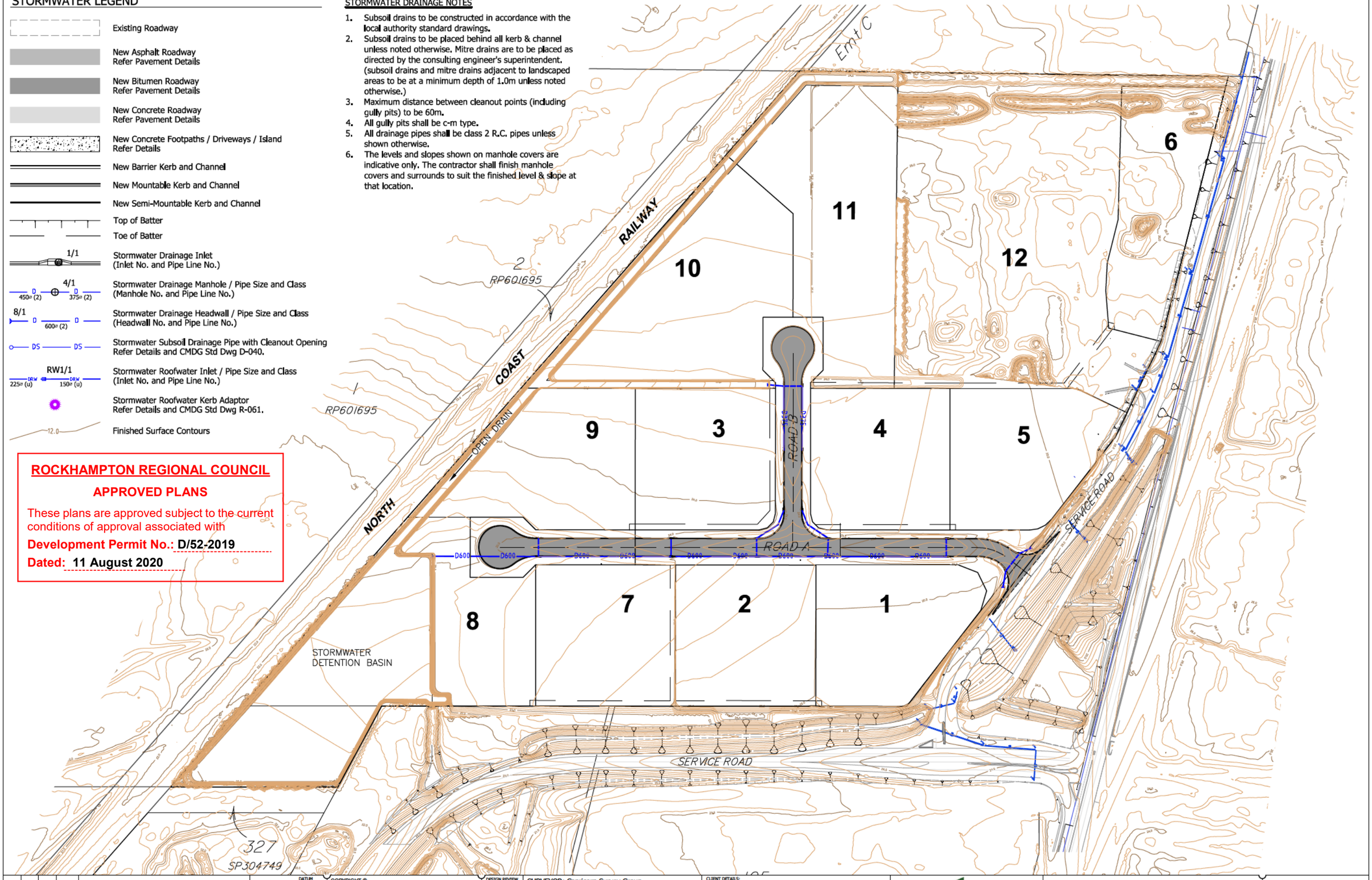
These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/52-2019

Dated: 11 August 2020

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.



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

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

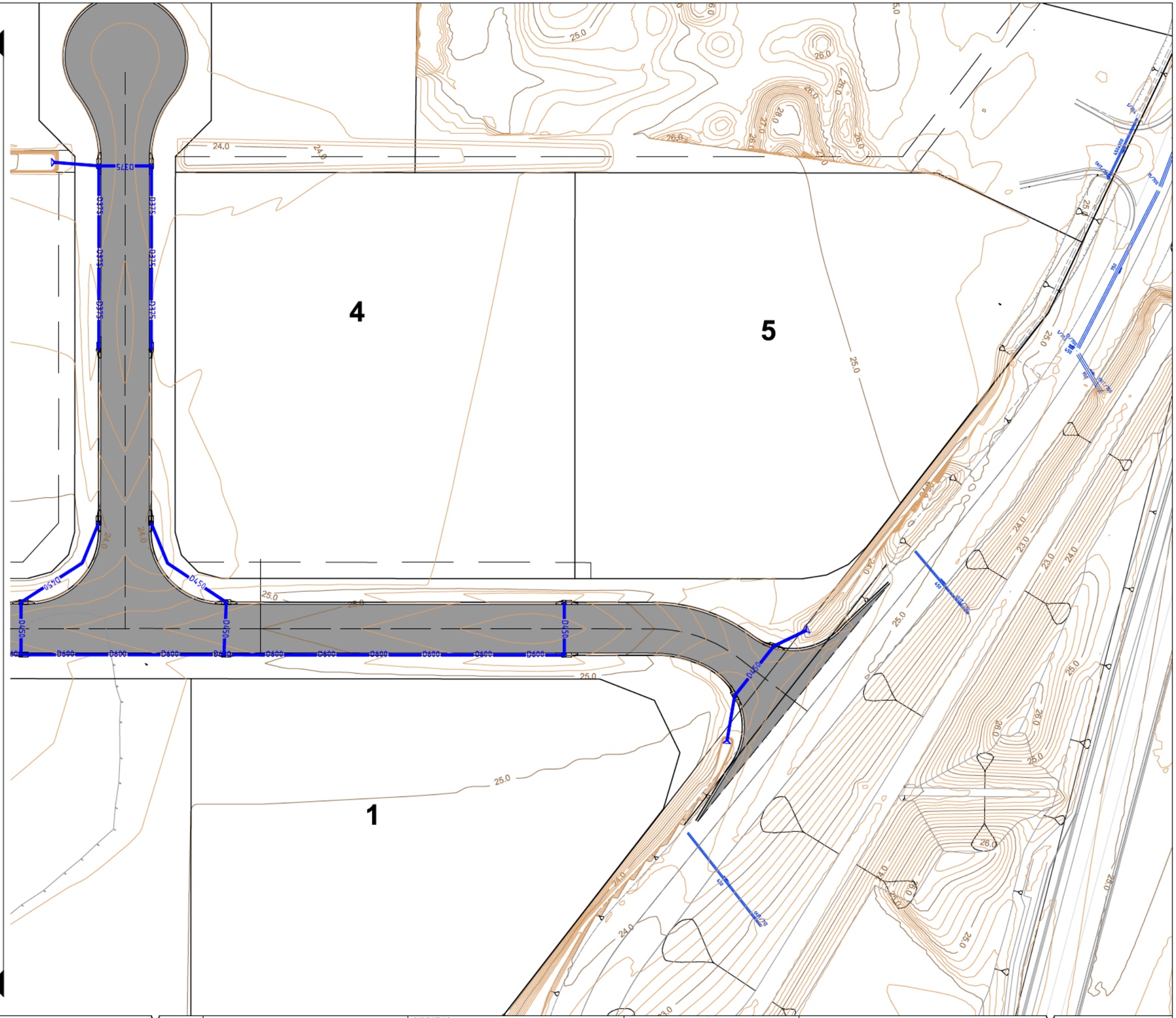
APPROVED PLANS

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

Development Permit No.: D/52-2019

Dated: 11 August 2020

JOINS PLAN SCE-115-017



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

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 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

OPEN DRAIN

OPEN DRAIN

D600 D600 D600 D600 D600 D450 D600 D600 D600 D600 D600 D600 D450 D600 D600 D600 D600 D450

9

3

8

7

2

STORMWATER DETENTION BASIN

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/52-2019

Dated: 11 August 2020

JOINS PLAN SCE-115-016

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 — Heerasinghe 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
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.) — 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

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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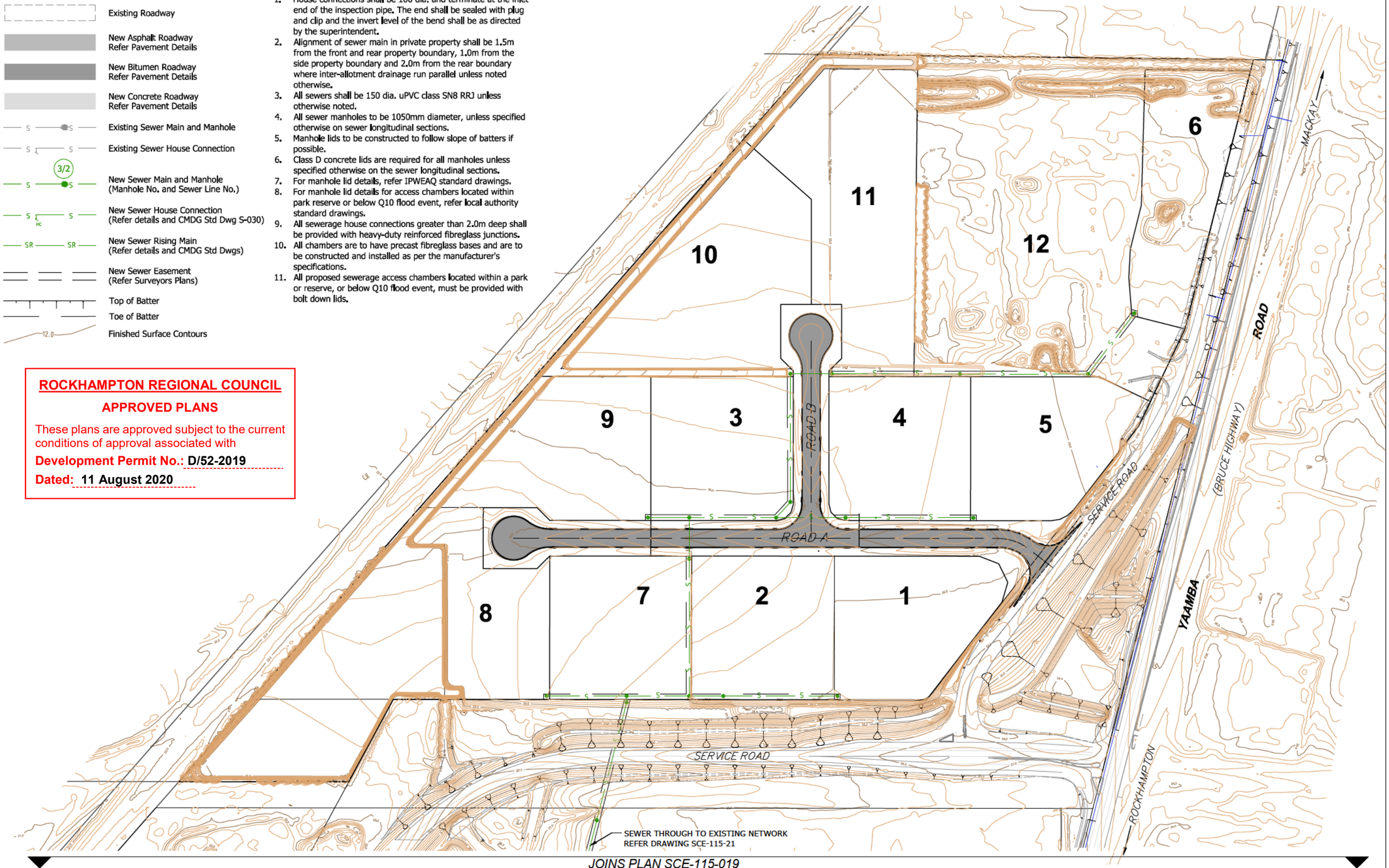

JOINS PLAN SCE-115-019

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 — Heerasinghe 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
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

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

Development Permit No.: D/52-2019

Dated: 11 August 2020

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 CERTIFICATE — beerasinghe — 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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ABN:34 481 028 699

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.) — 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/52-2019

Dated: 11 August 2020

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

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.)
- 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

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

Development Permit No.: D/52-2019

Dated: 11 August 2020

IL18.77m
4/1
150 uPVC 1 in 150.0
IL18.17m
IL18.15m
3/1
150 uPVC 1 in 150.0
IL17.55m
IL17.53m
2/1
150 uPVC 1 in 150.0
IL17.32m
IL17.30m
1/1
150 uPVC 1 in 150.0
IL17.07m
EXISTING SEWER MANHOLE
PRIVATE WORKS QUOTE REQUIRED
EX1

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
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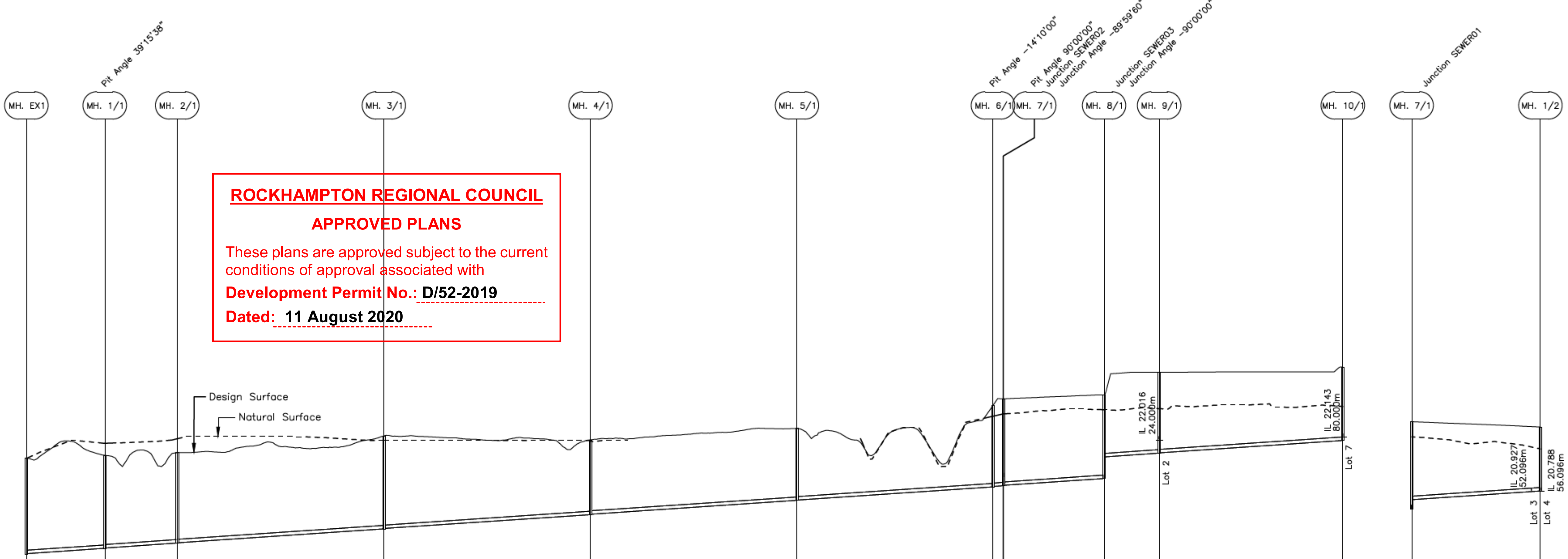
LILY PLACE ESTATE
SEWERAGE LAYOUT PLAN
SHEET 2

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/52-2019

Dated: 11 August 2020

LINE: SEWER01 — Datum R.L. 6.000

Segment	PIPE DIAMETER	PIPE GRADE	CHAINAGE (length)
MH. EX1 – MH. 1/1	150 dia.	1 in 150	34.157
MH. 1/1 – MH. 2/1	150 dia.	1 in 150	31.562
MH. 2/1 – MH. 3/1	150 dia.	1 in 150	90.046
MH. 3/1 – MH. 4/1	150 dia.	1 in 150	90.000
MH. 4/1 – MH. 5/1	150 dia.	1 in 150	90.000
MH. 5/1 – MH. 6/1	150 dia.	1 in 150	85.359
MH. 6/1 – MH. 7/1	150 dia.	1 in 150	4.500
MH. 7/1 – MH. 8/1	150 dia.	1 in 150	43.904
MH. 8/1 – MH. 9/1	150 dia.	1 in 150	24.000
MH. 9/1 – MH. 10/1	150 dia.	1 in 150	80.000

Manhole	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
MH. 1/1	4.052 / 4.032	17.298 / 17.318	21.350	34.157
MH. 2/1	3.940 / 3.920	17.528 / 17.548	21.468	65.719
MH. 3/1	4.055 / 4.035	18.148 / 18.168	22.203	155.765
MH. 4/1	3.259 / 3.239	18.768 / 18.788	22.028	245.765
MH. 5/1	3.132 / 3.112	19.388 / 19.408	22.520	335.765
MH. 6/1	3.559 / 3.539	19.977 / 19.997	23.537	421.124
MH. 7/1	3.793 / 3.773	20.027 / 20.047	23.820	425.624
MH. 8/1	3.645 / 2.699	20.340 / 21.287	23.985	469.527
MH. 9/1	3.526 / 3.506	21.447 / 21.467	24.972	493.527
MH. 10/1	3.200	22.000	25.200	573.527

LINE: SEWER02 — Datum R.L. 7.000

Segment	PIPE DIAMETER	PIPE GRADE	CHAINAGE (length)
MH. 7/1 – MH. 1/2	150 dia.	1 in 150	56.096

Manhole	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
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[illegible] 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

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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)
1: 200 HORT. (0, 2.5, 5)
DO NOT SCALE - ASK IF IN DOUBT

ROCKHAMPTON REGIONAL COUNCIL

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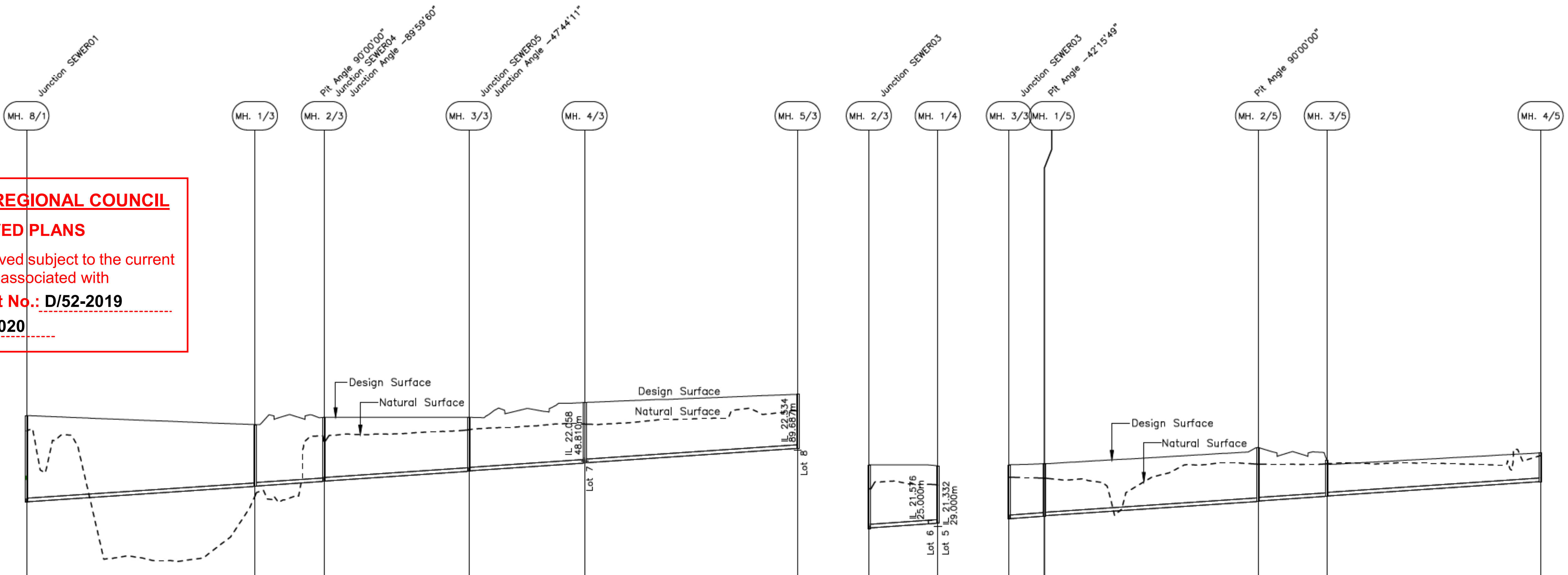
Dated: 11 August 2020



LINE SEWER03 (Datum R.L. 6.000)

	MH. 8/1		MH. 1/3		MH. 2/3		MH. 3/3		MH. 4/3		MH. 5/3
PIPE DIAMETER		150 dia.		150 dia.		150 dia.		150 dia.		150 dia.	
PIPE GRADE		1 in 150		1 in 150		1 in 150		1 in 150		1 in 150	
DEPTH TO INVERT	3.645 / 3.630		2.605 / 2.585		2.699 / 2.679		2.272 / 2.252		2.554 / 2.534		2.284
R.L. OF INVERT	20.340 / 20.355		20.997 / 21.017		21.210 / 21.230		21.637 / 21.657		21.982 / 22.002		22.600
R.L. OF FIN.SURF.	23.985		23.602		23.909		23.909		24.536		24.884
CHAINAGE	0.000	96.247	96.247	29.000	125.247	61.004	186.251	48.810	235.061	89.687	324.747

LINE SEWER04 (Datum R.L. 8.000)

	MH. 2/3		MH. 1/4
PIPE DIAMETER		150 dia.	
PIPE GRADE		1 in 150	
DEPTH TO INVERT	2.699 / 2.652		2.417
R.L. OF INVERT	21.210 / 21.257		21.450
R.L. OF FIN.SURF.	23.909		23.867
CHAINAGE	0.000	29.000	29.000

LINE SEWER05 (Datum R.L. 8.000)

	MH. 3/3		MH. 1/5		MH. 2/5		MH. 3/5		MH. 4/5
PIPE DIAMETER		150 dia.		150 dia.		150 dia.		150 dia.	
PIPE GRADE		1 in 150		1 in 150		1 in 150		1 in 150	
DEPTH TO INVERT	2.272 / 2.259		2.207 / 2.187		2.271 / 2.251		1.529 / 1.509		1.214
R.L. OF INVERT	21.637 / 21.650		21.749 / 21.769		22.369 / 22.389		22.582 / 22.602		23.202
R.L. OF FIN.SURF.	23.909		23.956		24.640		24.111		24.416
CHAINAGE	0.000	14.864	14.864	90.000	104.864	29.000	133.864	90.000	223.864

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

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
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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: PARKHURST HOLDINGS PTY LTD

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

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LILY PLACE ESTATE SEWER LONG SECTIONS PLAN SHEET 2

PLAN NUMBER: SCE-115-023
REVISION: A

1: 2000 VERT (0, 25, 50)
1: 200 HORT. (0, 2.5, 5)
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APPROVED PLANS

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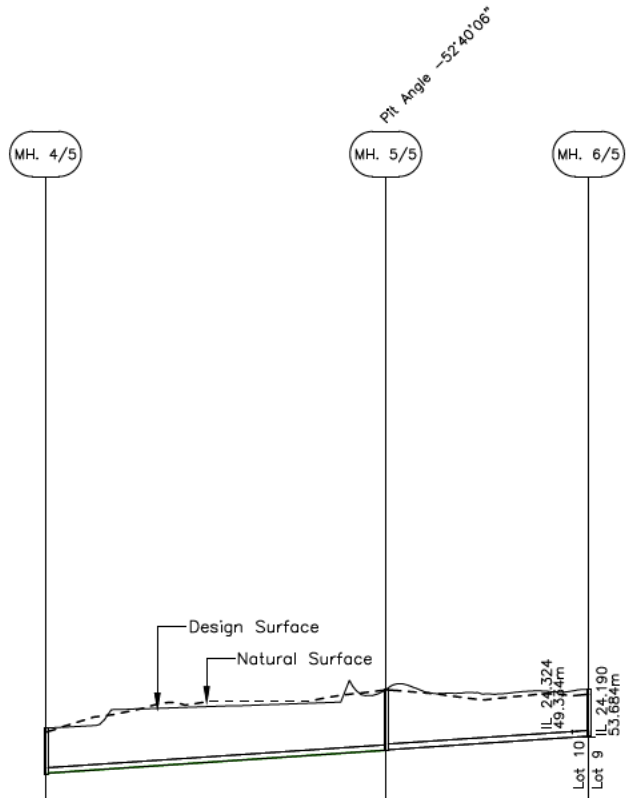
Dated: 11 August 2020



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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LILY PLACE ESTATE
SEWER LONG SECTIONS PLAN
SHEET 3

PLAN NUMBER: SCE-115-024

REVISION: A

1:2000 VERT (0, 25, 50)

1:200 HORT. (0, 2.5, 5)

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

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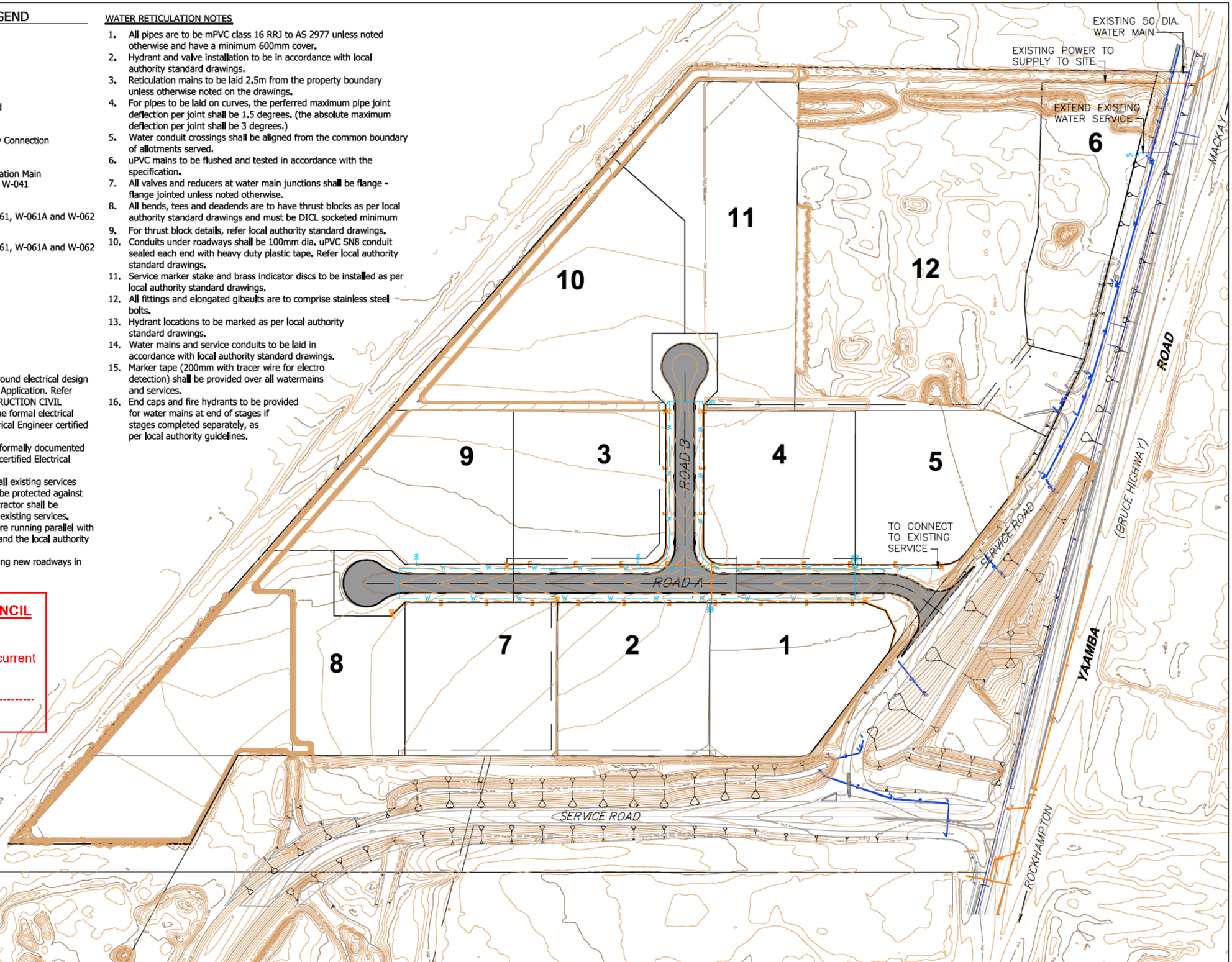

ISSUE	DESIGN	DRAWN	DATE	REVISION DETAILS
A	DWC	DWC	06/20	DA APPLICATION

DATUM: AHD
CO-ORD.: GDA94

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

CLIENT DETAILS:
PARKHURST PTY LTD
DEVELOPMENT DETAILS:
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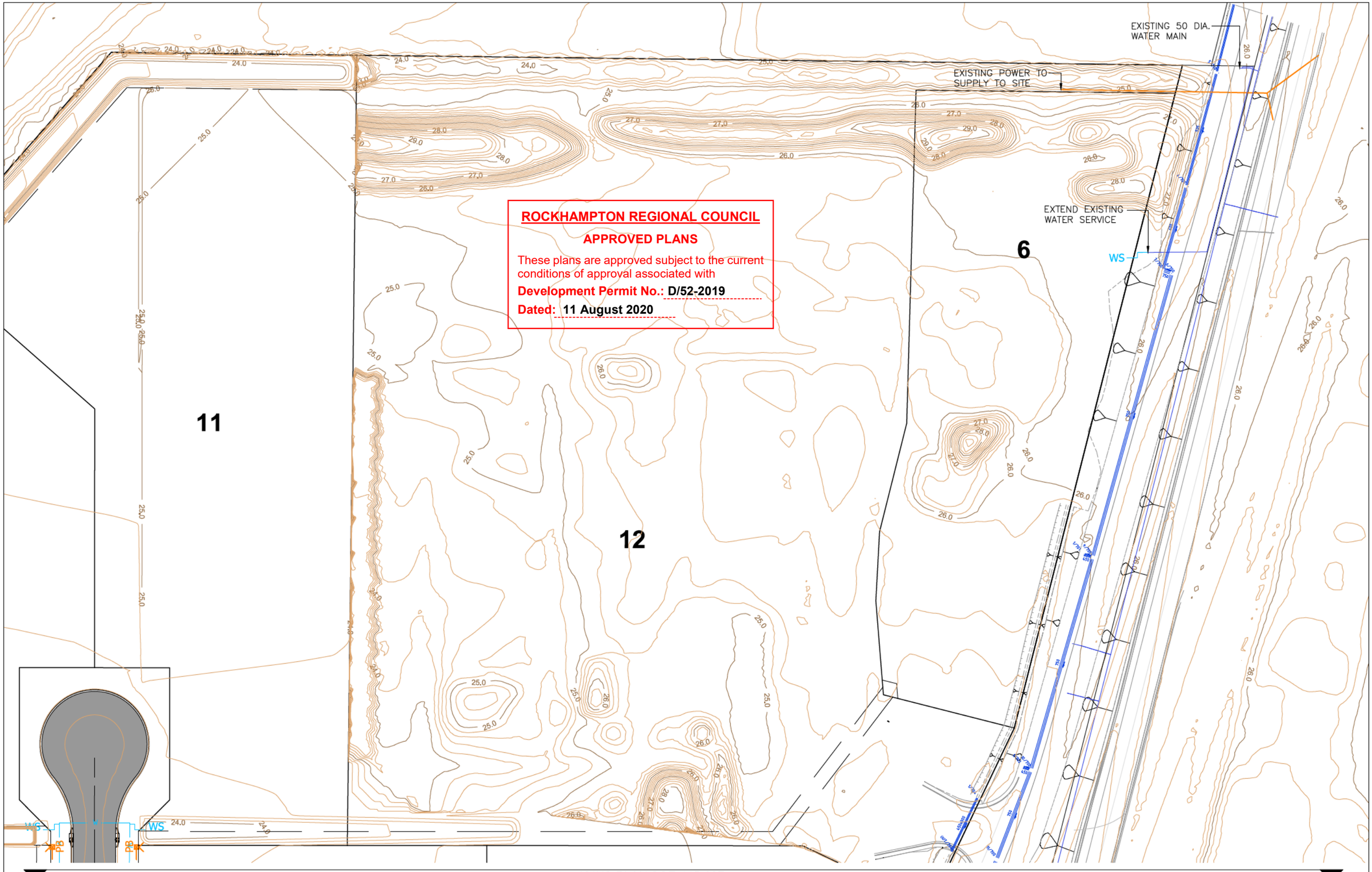
LILY PLACE INDUSTRIAL ESTATE
WATER & ELECTRICAL SERVICES PLAN
GENERAL LAYOUT

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	DWE	DWE	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 CERTIFICAT ...eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS: PARKHURST PTY LTD

DEVELOPMENT DETAILS: LILY PLACE ESTATE
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LILY PLACE INDUSTRIAL ESTATE WATER & ELECTRICAL SERVICES PLAN SHEET 1

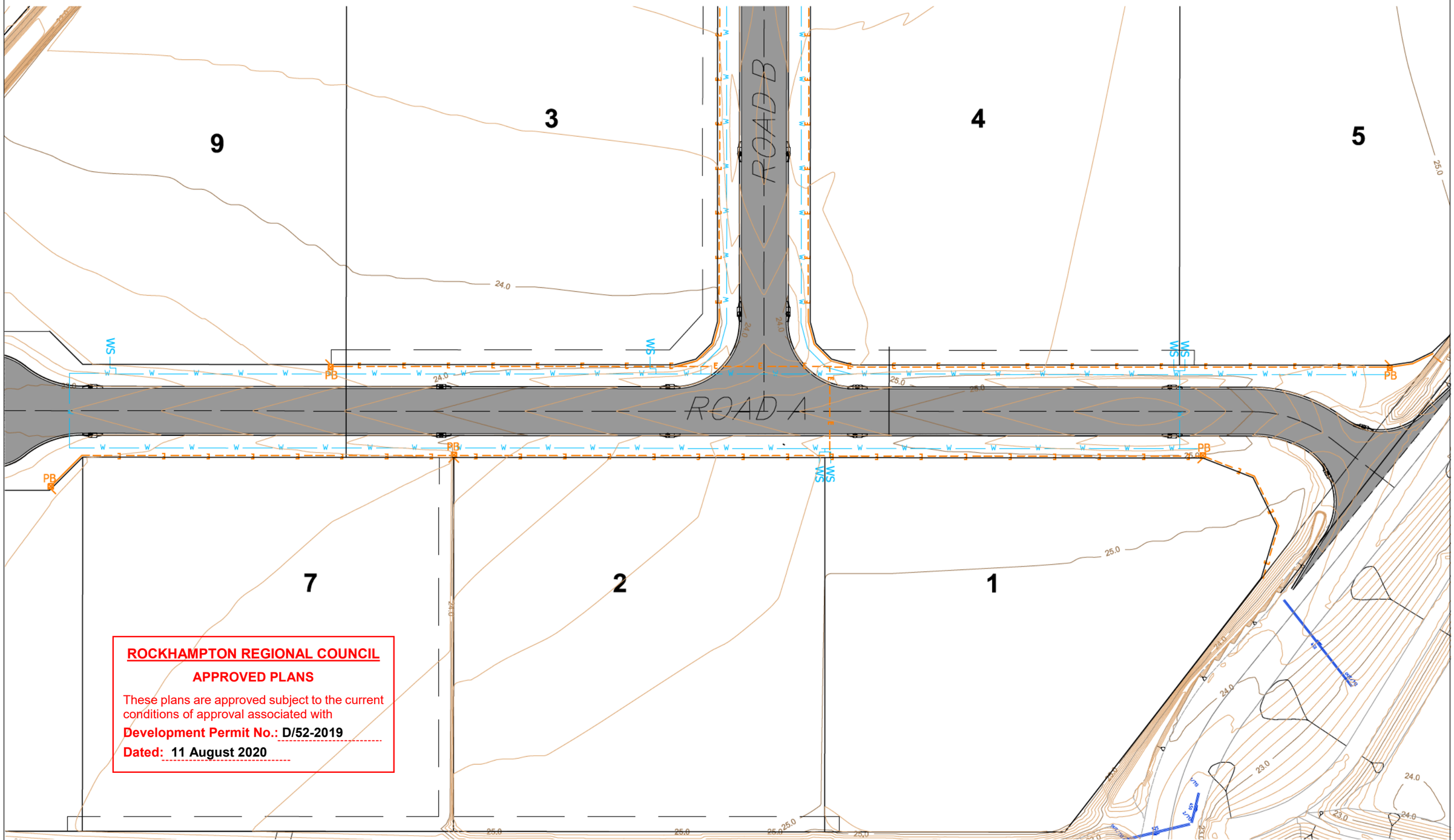
PLAN NUMBER SCE-115-026

REVISION A

0 20.0m
1:1000

DO NOT SCALE - ASK IF IN DOUBT

JOINS PLAN SCE-115-026



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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 [signature] eerasinghe RPEQ 8372

FOR & ON BEHALF OF SIRIS & ASSOCIATES CONSULTING ENGINEERS

CLIENT DETAILS:
PARKHURST PTY LTD

DEVELOPMENT 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

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