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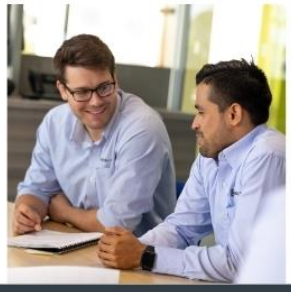

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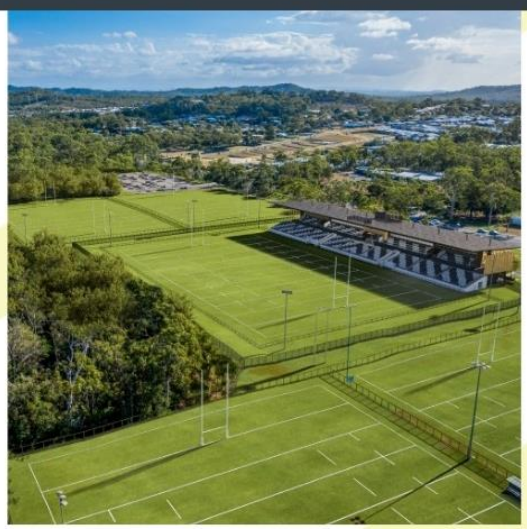

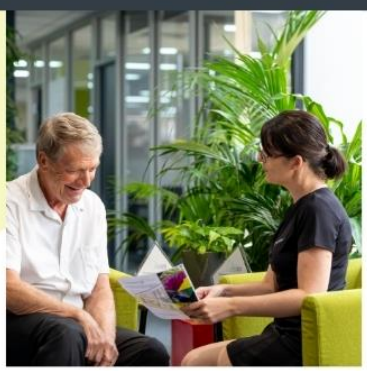

North MacLean Lot 7 & 8 Industrial Subdivision
Conceptual Stormwater Management Plan

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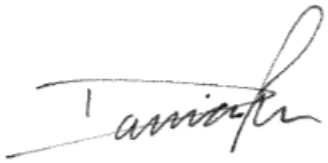
Signed:	
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MORETON BAY I SUNSHINE COAST I IPSWICH I BANGALOW

Executive Summary

Roubaix Properties Pty Ltd has engaged Burchills Engineering Solutions to prepare a Conceptual Stormwater Management Plan (CSMP) for the proposed development located at North MacLean.

This CSMP has been prepared in accordance with The Greater Flagstone Priority Development Area (PDA) and is to accompany the development application for a proposed subdivision. The CSMP has referenced relevant guidelines relating to stormwater management to form the conceptual basis of the stormwater plan. The following conclusions have been made as a result of this study.

Stormwater Quantity

- The flows discharging from the subject site will be conveyed via's swale's to the Site's LPD where it is captured in the downstream floodplain.

Stormwater Quality

- To achieve the *State Planning Policy – State Interest Guidance Material: Water Quality* Water Quality Objectives for the proposed internal road it is proposed to provide several street tree bio-retention pods with a total area of 70m^2,
- To achieve the State Planning Policy – State Interest Guidance Material: Water Quality Objectives for the individual lots, it is proposed to either use an ATLAN filter system, comprising of one (1) ATLAN Stormsack and four (4) ATLAN Filter's per lot, or a bioretention basin with a filter media of 40m^2.

Erosion and Sediment Control

- An Erosion Hazard Assessment has identified that the site is high-risk with regard to erosion potential.
- Sediment loss estimates have been used to determine that Type 1 sediment controls are required, given a yield of 133.8 m^3/year for the disturbed catchment.

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1. Introduction

Roubaix Properties Pty Ltd (Roubaix) has commissioned Burchills Engineering Solutions (Burchills) to prepare a Conceptual Stormwater Management Plan (CSMP) as part of a Development Approval (DA) submission, for a ROL to facilitate a 17-lot industrial subdivision, to Economic Development Queensland (EDQ). The proposed North MacLean Industrial development is located at Lot 7 & 8 on RP137101, encompassing the addresses 4745-4759 and 4761-4773 Mount Lindesay Highway, North MacLean.

1.1 Background

1.1.1 Regulatory Requirements and Technical Guidelines

The strategies proposed in this CSMP have been developed to address requirements from The Greater Flagstone Priority Development Area (PDA), and have also been prepared in accordance with the following guidelines:

- State Planning Policy July 2017 (DSPIP, 2017);
- Queensland Urban Drainage Manual (QUDM) Fourth Edition (IPWEAQ, 2017);
- Australian Rainfall & Runoff: A Guide to Flood Estimation (Ball J, 2019);
- Australian Government – Bureau of Meteorology (Bureau of Meteorology, n.d.);
- MUSIC Modelling Guidelines (Water By Design, 2019);
- WSUD Technical Guidelines for South East Queensland – Version 1 (Healthy Waterways, BCC, MBWCP, 2006);
- Best Practice Erosion and Sediment Control (IECA, 2008); and
- Best Practice Erosion and Sediment Control Appendix B - Draft Document Revision December 2016 (IECA, 2016).

1.2 Purpose

The main objectives of this CSMP are summarised as follows:

- Avoid the creation of nuisance flow or hazard problems;
- Protect the quality of surface and ground waters during construction and operation of new development;
- Maintain the natural hydraulic behaviour of catchments;
- Protect existing natural features and ecological processes;
- Integrate stormwater management infrastructure carefully in the urban and natural landscape; and
- Assess the proposed development design and ensure safety for end users with respect to flooding.

1.3 Scope

To achieve the above mentioned objectives, this CSMP details the following:

- Site description including:
  - Topography;
  - Land Use; and
  - Vegetation.
- Stormwater Quantity:
  - Control measures to ensure no net increase in peak discharge from the subject site (up to the 1% Average Exceedance Probability (AEP)).
- Stormwater Quality:
  - Address requirements of the SPP 2017.

To minimise the impact of the proposed development on the external environment and to avoid significant and / or sustained deterioration in downstream water quality the proponent shall implement this CSMP. This CSMP may be amended as required, in response to a monitoring and maintenance program.

2. Site Detail

2.1 Real Property Description

The site is legally described as Lot 7 & 8 on RP137101. The corresponding street address is 4745-4759 and 4761-4773 Mount Lindesay Highway, North MacLean. The combined site is generally rectangular and occupies an area of approximately 8.20 ha. The location of the subject site is shown on Figure 2.1.

Figure 2.1 Site Locality Plan

2.2 Physical Description

The site is accessed from Mount Lindesay Highway service road, an existing road which fronts the eastern boundary of the subject site.

The subject site is mostly flat, ranging from RL26 mAHD to RL29 mAHD. There is a separate development application on Lots 7 and 8 on RP137101 for bulk earthworks and vegetation clearing. Current features of the site include:

- Lot 7 is covered with trees and vegetation
- Lot 8 is covered with trees and vegetation.

The subject site is located within the Great Flagstone Priority Development Area (PDA).

The site is bounded by the following existing land uses:

- North: Lot 6 on RP137101 Vacant Land;
- East: Mount Lindsay Highway;
- South: Lot 2 on SP267252 Industrial business; and
- West: Lot 9 on RP137101 Industrial supplier/business.

2.3 Downstream Environment

The stormwater runoff is conveyed via overland flow to the northern site boundary, where is sheet flows across the vacant lots to the north eventually discharges into the Logan River.

2.4 Rainfall

The mean annual rainfall for the site has been estimated at 932.8 mm from the data set obtained from the nearest Bureau of Meteorology (BOM) station number 040542 at MacLean Bridge, Queensland.

2.5 Proposed Development

The proposed development is a 17 lot industrial subdivision across the two lots, with an internal road that gains access from Mount Lindesay Highway. The lots range in size from 3019m^2 to 4535m^2. Refer to the plan shown in Figure 2.2 below and in Appendix A.

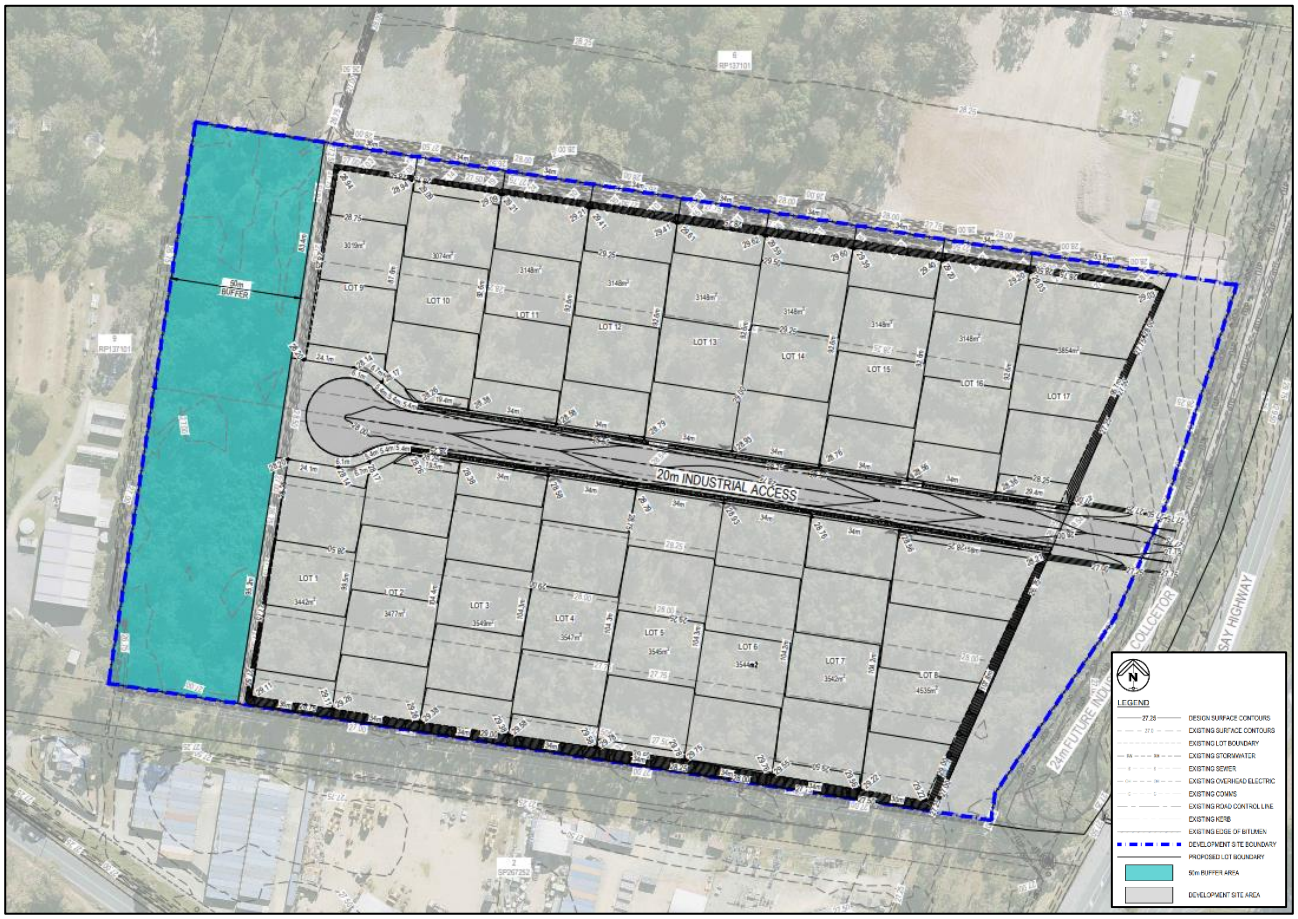


Figure 2.2 Proposed Development

3. Stormwater Quantity Assessment

3.1 Overview

The following section of this report outlines the measures required to meet the above mentioned objective in regard to stormwater quantity. In order to meet these objectives, it is necessary to ensure that post development discharge from the site will not create a worse situation for downstream property owners than that which existed prior to the development (i.e. non-worsening) (IPWEAQ, 2017).

3.2 Assessment of the Master Subject Site

The following section details the stormwater quantity management plan proposed for the master subject site as a whole to ensure non-worsening downstream. Refer to Appendix C for the complete stormwater management plans for the master subject site.

3.2.1 Conveyance of Flows

Important information about the conveyance of flows for the pre-development and post-development scenarios are included in the table below.

Table 3.1 Conveyance of Flows – Subject Site

Subject	Description
Lawful Points of Discharge	One (1) Lawful Point of Discharge (LPD) has been identified in the existing scenario and is defined as the northern lot boundary. For the developed master subject site, the LPD is located along the northern boundary, however only extends the extent of the proposed western buffer. Refer to Figure 3.1 and Figure 3.2 below for more information.
Pre-Development	In the existing case, runoff from the site is conveyed via overland flow, where it discharges to the north at the LPD. Earthworks have been previously carried out on the subject site (Application No. DEV2025/1587). Refer to Figure 3.1 for more information.
Post-Development	In the developed case runoff is conveyed to the proposed swale's along the north, south and western site boundaries, discharging to the north at the LPD. Refer to Figure 3.2 for more information.

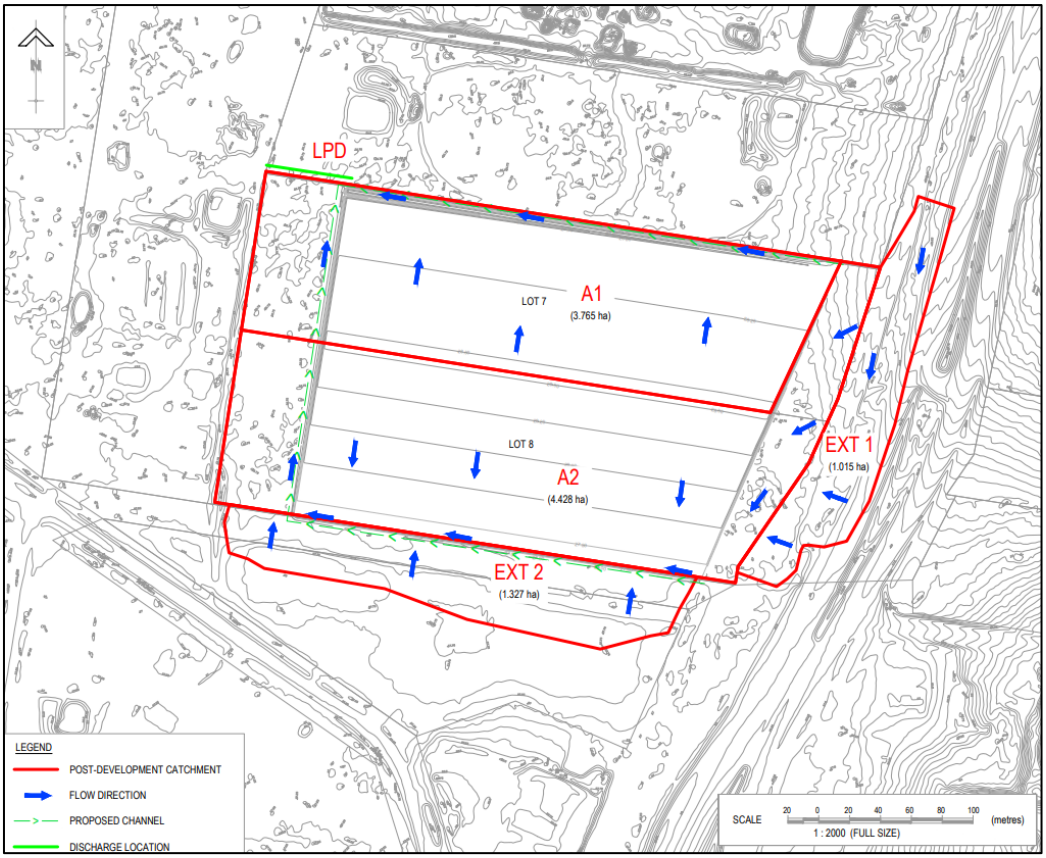


Figure 3.1 Pre-Development Catchments – Subject Site

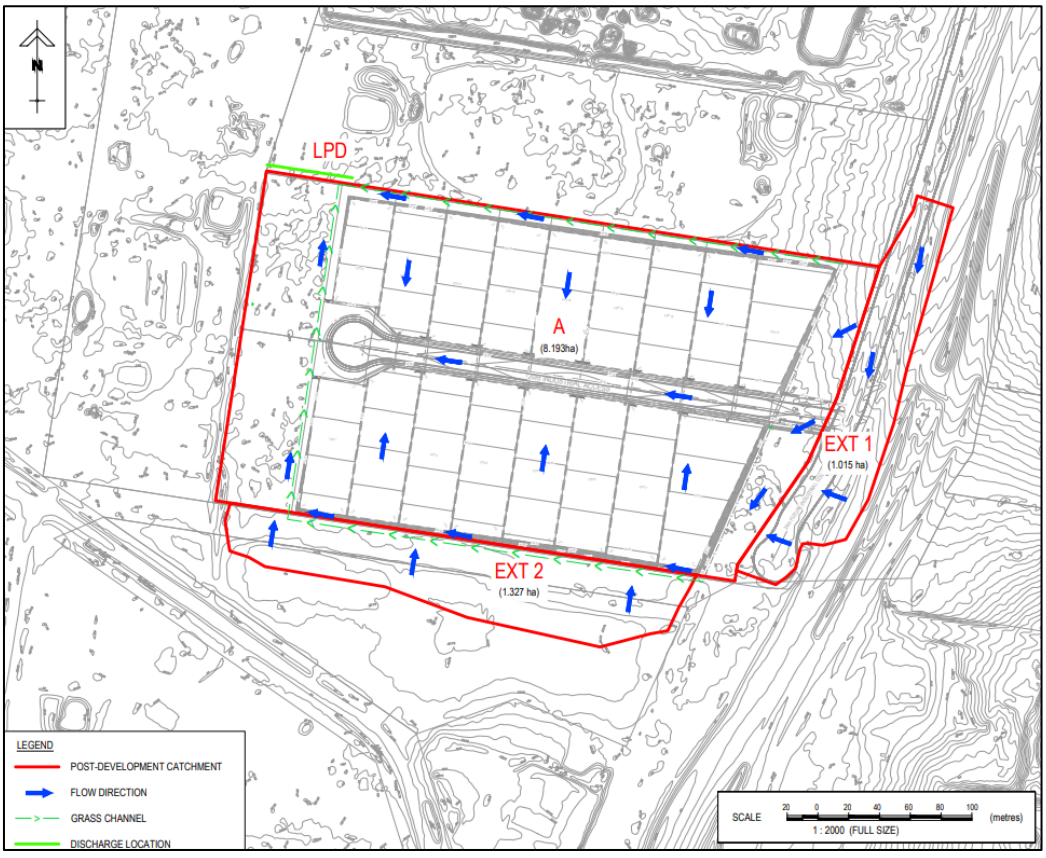


Figure 3.2 Post-Development Catchments – Subject Site

3.2.2 Management of Flows

In the post-developed scenario, the increase in flows from the master subject site is a result of the proposed internal road (with all flows from the proposed industrial lots catered for as per Section 3.3 below). Three swale's, located along the northern, southern and western boundaries of the proposed development pad (refer to Figure 3.2) will convey the flows produced over the site to the LPD.

As outlined in the Burchills Flood Letter dated 28 April, 2024 (BE220566_LTR_Flood_Lot_7-8_RP137101_20250428), the flows will discharge at the LPD before entering a floodplain to the north. Flows are conveyed to the north between Lot 3 and Lot 4 RP137101 before discharging to the channel on the MacLean Estates land (Lot 1 on RP113251). The proposed drainage easement on the western Master Subject Site boundary will help maintain this conveyance to the north.

Additionally, the Queensland State Planning Policy (SPP, July 2017) establishes performance-based outcomes for managing stormwater quantity to avoid adverse impacts on the environment and downstream infrastructure. While the SPP does not mandate stormwater detention be provided, it requires development to maintain or improve the natural hydrology of a site and mitigate potential impacts associated with increased runoff.

In particular, the SPP seeks to prevent downstream erosion, flooding, and infrastructure impacts and apply best practice environmental management (BPEM). In this case the site is located adjacent to a 1% AEP flood plain and the runoff from the site would not contribute adverse impact to the existing flood regime.

No mitigation measures are recommended for this increase in flows, with the downstream environment suitable to convey the runoff.

4. Stormwater Quality Assessment

4.1 Water Quality Objective (WQO)

In accordance with the *State Planning Policy – State Interest Guidance Material: Water Quality*, the total effect of permanent water quality control measures is to achieve reductions in the mean annual load generated by the development site at a minimum of:

- 90% for Gross Pollutants (>5mm);
- 80% for Total Suspended solids (TSS);
- 60% for Total Phosphorus (TP); and
- 45% for Total Nitrogen (TN).

This will ensure the environmental values of the downstream receiving waters are maintained and have been chosen as the WQO for the development.

4.2 Water Quality Assessment Summary

The Stormwater Quality Plan for this development is split into two sections. Section 4.3 outlines the water quality plan for the subject site as a whole (Master Subject Site), whilst Section 4.3 provides the water quality plan for the seventeen (17) individual proposed lots (Individual Lot). For the individual lots, two treatment options have been outlined below for the future developments – an ATLAN filter system and a bioretention basin. The remaining area – the internal road, will be treated by street trees as a part of the subject site water quality assessment.

4.3 Subject Site

4.3.1 Treatment Train

To ensure the above WQO's can be met at the subject site's LPD, a treatment train was proposed for the developed site and modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software. The treatment train proposes sixteen street trees along the internal road, with 4.38m^2 of area per tree, or a total of 70m^2. The location of the proposed treatment train elements is included in the Burchills Civil Engineering Plans within Appendix E.

Typical sections of a street tree within turf have been included in Figure 4.1 and Figure 4.2. They will be designed in accordance with Brisbane City Council Standard Drawings for 'Stormwater Treatment Asset, Tree Within Turf' during the detailed design phase of the development (BCC, 2023)

For the MUSIC Model, a combined bioretention basin was used to represent the sixteen (16) street trees, or the combined area of 70m^2. The parameters used are shown in Table 4.1 below.

Table 4.1 Proposed Bio-Retention Street Tree Parameters

Parameter	Street Trees
Extended Detention Depth	0.3m
Filter Media Area	70m^2
Filter Media Depth	0.5m
Overflow Weir Width	7m

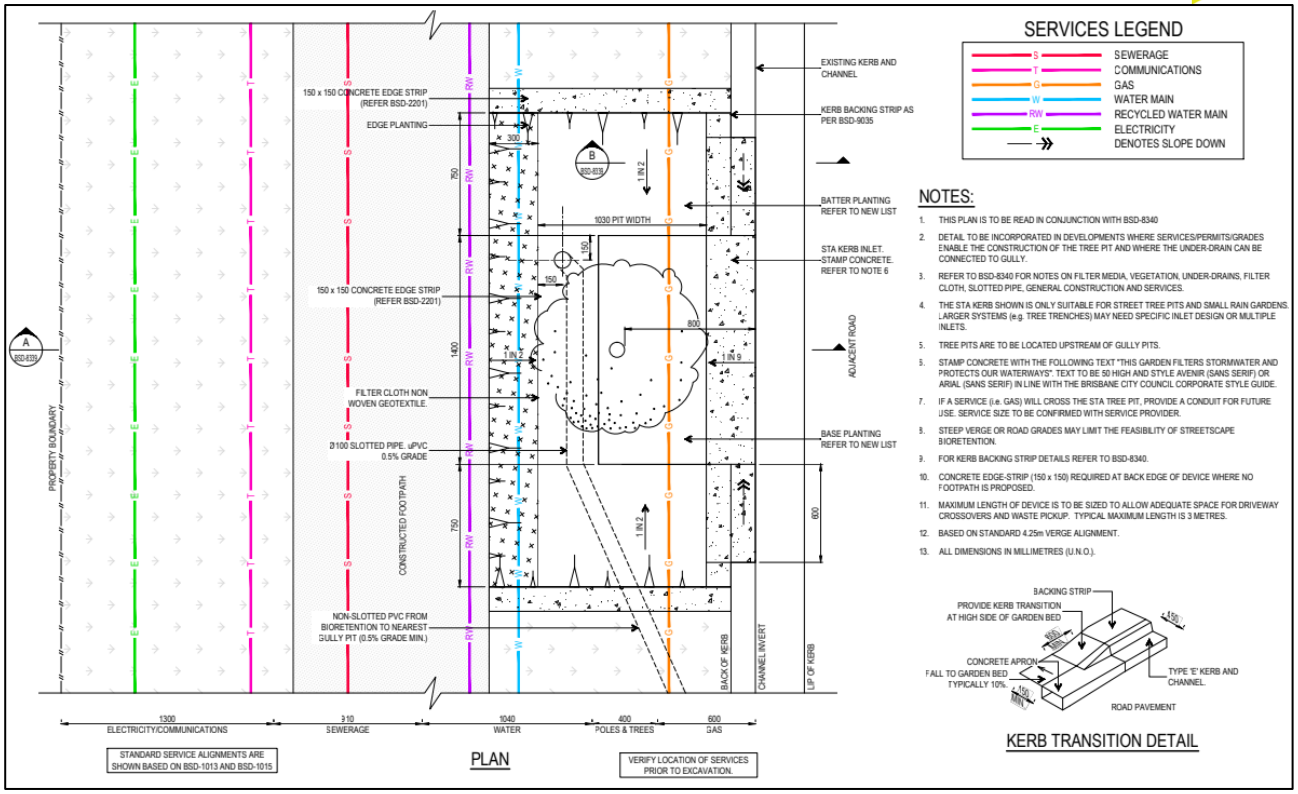


Figure 4.1 Typical Street Tree Within Turf – Plan (BSD-8339)

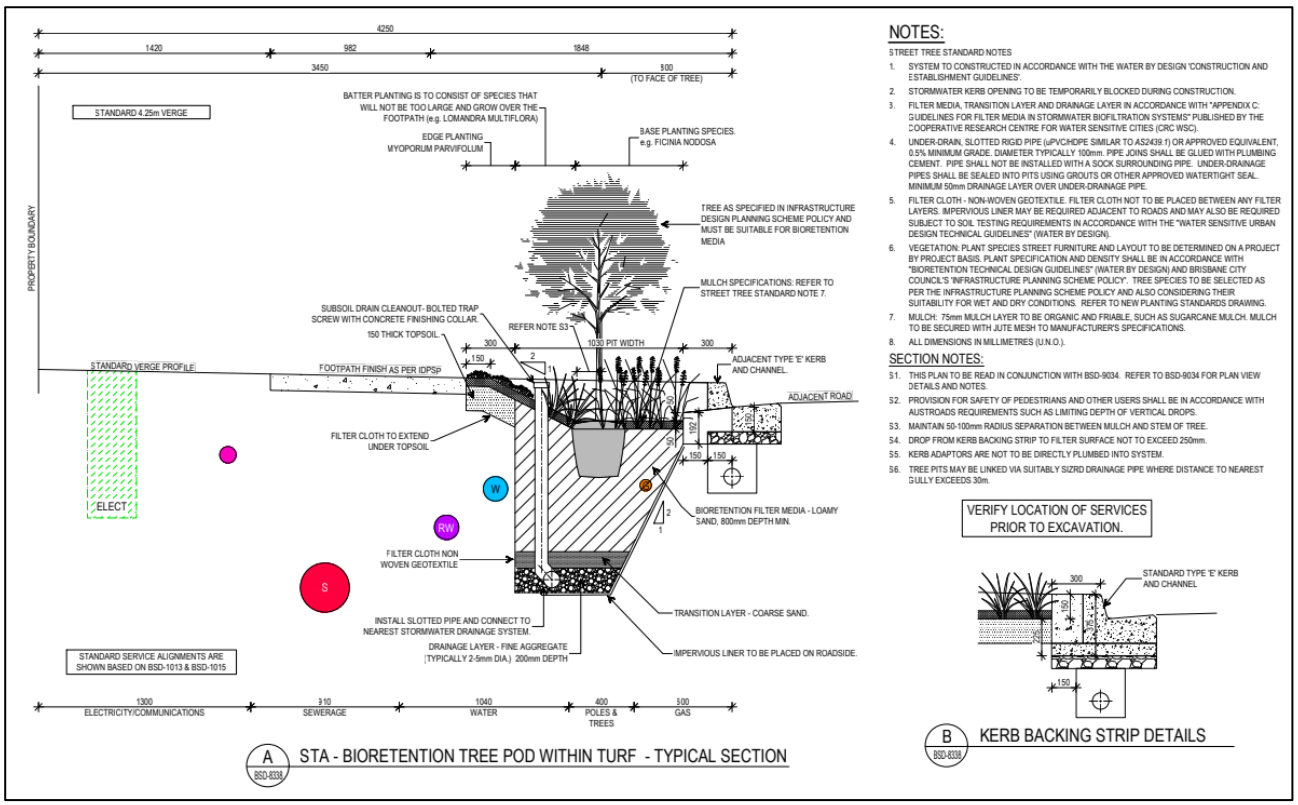


Figure 4.2 Typical Street Tree Within Turf – Section (BSD-8340)

4.3.2 MUSIC Results

Results of the MUSIC modelling for the treatment train effectiveness are summarised in Appendix B. The results indicate the 80%, 60%, 45% and 90% reduction target for TSS, TP, TN and gross pollutants respectively are achieved for the rainfall data set simulated.

Table 4.2 Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
TSS	2100	394	81.2	80
TP	3.28	0.783	76.1	60
TN	10.7	5.64	47.4	45
GP	117	0	100	90

NOTE: All simulations have been run with pollutant export estimation set to “stochastic generation”.

A screen capture of the MUSIC model and treatment train effectiveness results are presented in Figure 4.5.

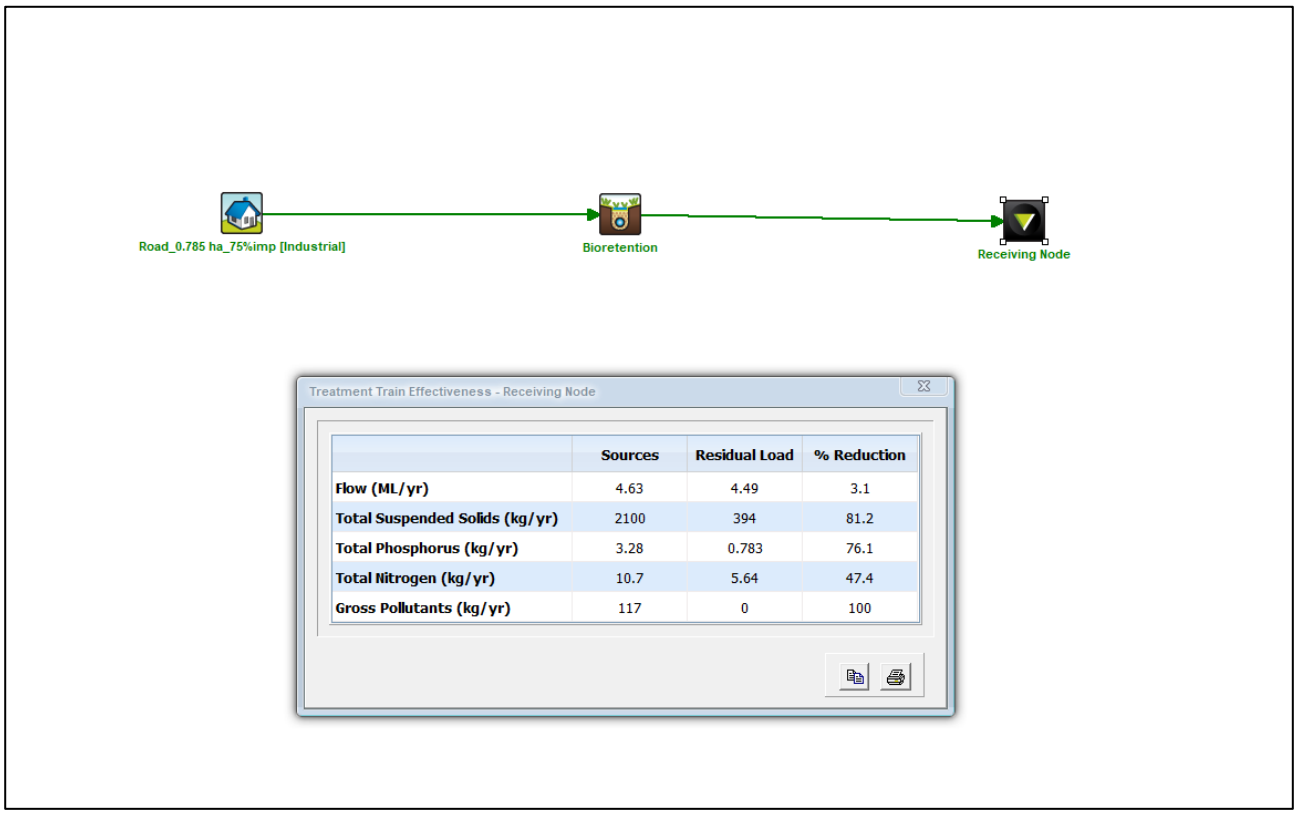


Figure 4.3 Treatment Train Layout & MUSIC Results

4.4 Proposed Individual Lots

4.4.1 Treatment Train

To ensure the above WQO's can be met at the site's LPD, a treatment train was proposed for the developed site and modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software.

There are two options provided below for the proposed treatment train to treat the roof, road and ground areas of the individual lots: An ATLAN Filter system or a bioretention basin.

4.4.2 ATLAN Filter System

The conceptual parameters of the proposed ATLAN Filter are presented below, and further detail of the input parameters used within MUSIC are included in Appendix B. The location of the proposed treatment train elements is included in the Civil Plans within Appendix E. The recommended filter configuration is as follows:

- Four (4) x Tall ATLAN Filter Cartridges;
- One (1) x ATLAN Stormsacks.

A typical section of an ATLAN Filter has been included in Figure 4.4. The stormwater treatment system has been designed and will be installed by ATLAN.

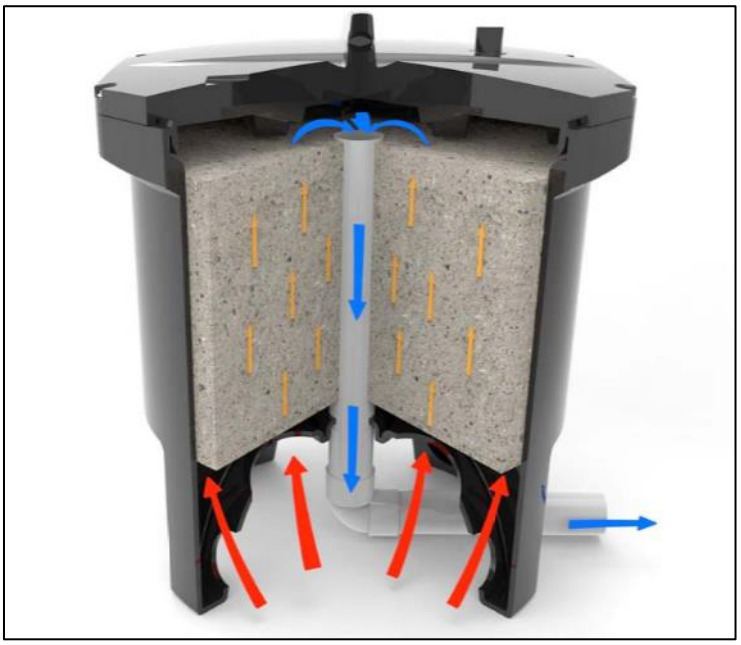


Figure 4.4 Typical ATLAN (ATLAN, 2024)

4.4.3 MUSIC Results

Results of the MUSIC modelling for the treatment train effectiveness are summarised in Appendix B. The results indicate the 80%, 60%, 45% and 90% reduction target for TSS, TP, TN and gross pollutants respectively are achieved for the rainfall data set simulated.

Table 4.3 Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
TSS	277	51.6	81.3	80
TP	0.698	0.203	70.9	60
TN	5.52	2.64	52.2	45
GP	57.6	0	100	90

NOTE: All simulations have been run with pollutant export estimation set to “stochastic generation”.

A screen capture of the MUSIC model and treatment train effectiveness results are presented in Figure 4.5.

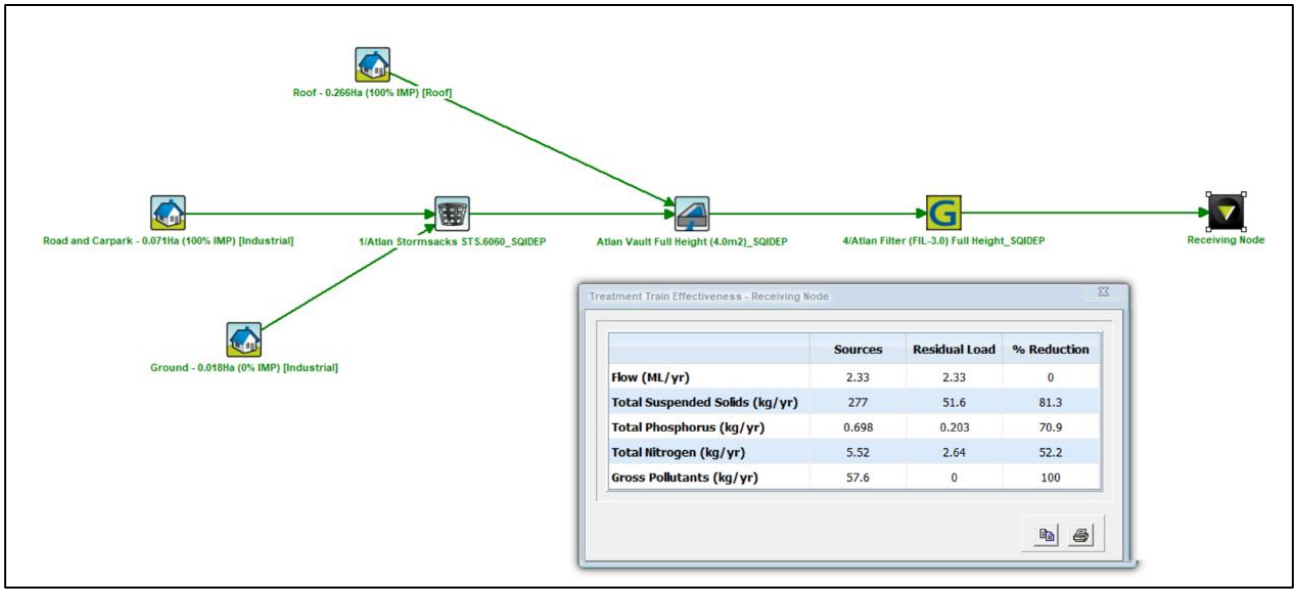


Figure 4.5 Treatment Train Layout & MUSIC Results

4.4.4 Bioretention Basin

The typical details for the proposed bioretention basin (per individual lot) are shown below in Table 4.4.

Table 4.4 Proposed Bio-retention Basin Parameters

Parameter	Modelled Value
Filter Media Area	40m^2
Surface Area	40m^2
Extended Detention Depth	0.30 m
Filter Media Depth	0.50 m
Transition Layer	0.10 m
Drainage Layer	0.2-0.4 m

A typical section of a bioretention basin has been included in the figures below.

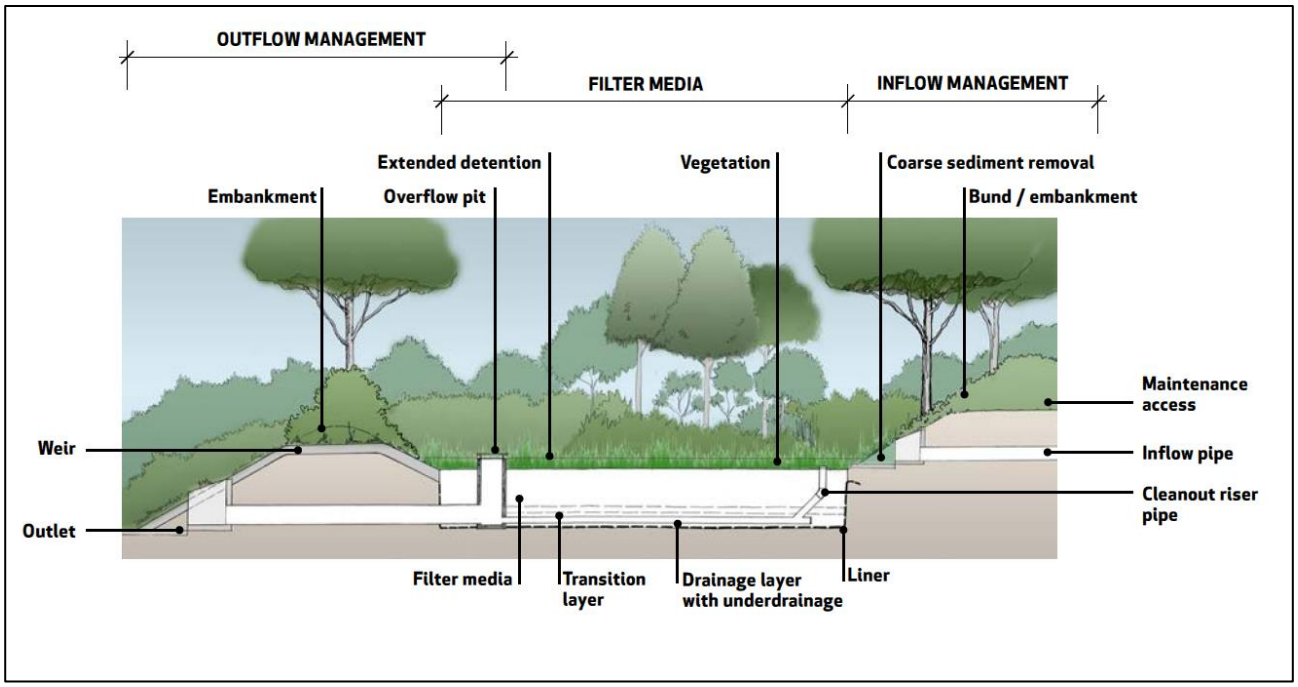


Figure 4.6 Typical Bioretention Basin (Water By Design, 2014)

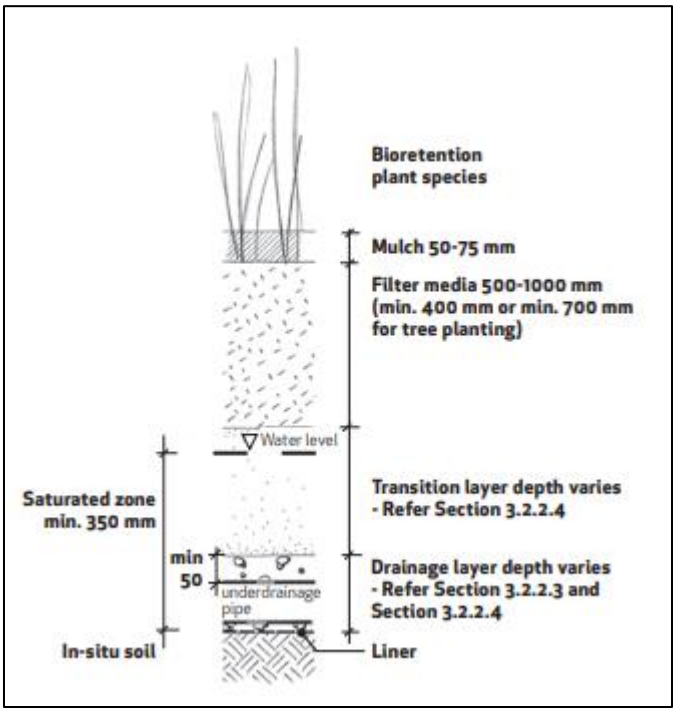


Figure 4.7 Typical Drainage Profile (Water By Design, 2014)

4.4.5 MUSIC Results

Results of the MUSIC modelling for the treatment train effectiveness are summarised in Appendix B. The results indicate the 80%, 60%, 45% and 90% reduction target for TSS, TP, TN and gross pollutants respectively are achieved for the rainfall data set simulated.

Table 4.5 Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
TSS	278	48.9	82.4	80
TP	0.691	0.191	72.4	60
TN	5.47	2.63	51.9	45
GP	57.6	0	100	90

NOTE: All simulations have been run with pollutant export estimation set to “stochastic generation”.

A screen capture of the MUSIC model and treatment train effectiveness results are presented in Figure 4.5.

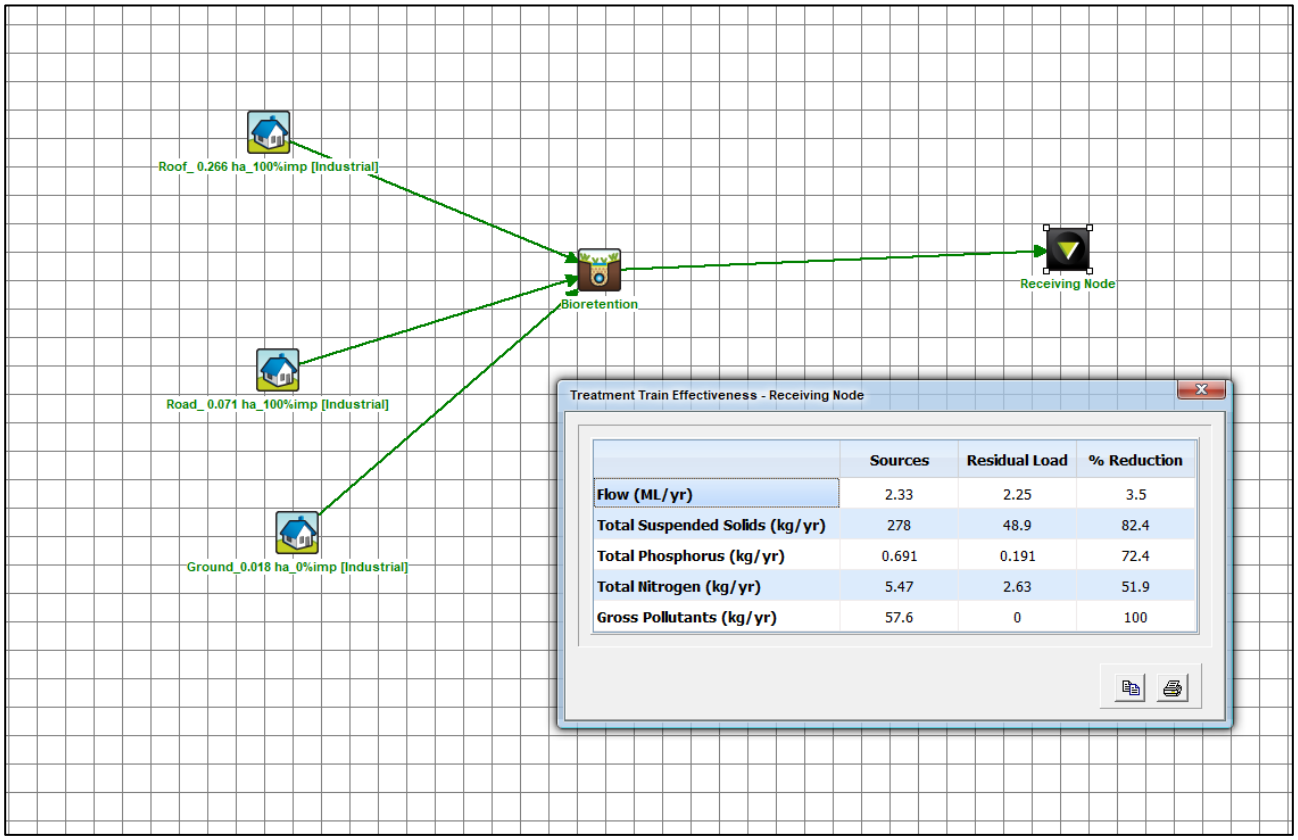


Figure 4.8 Treatment Train Layout & MUSIC Results

5. Erosion and Sediment Control

5.1 Best Management Practices

Stormwater runoff quality during the construction phase of this development shall be managed in accordance with Best Practice Erosion and Sediment Control (IECA, 2008), which is the current recognised construction industry best management practice (BMP) for erosion and sediment control.

Erosion and Sediment Control (ESC) plans are required to be implemented during the construction phase to minimise environmental harm to on-site stormwater treatment devices and downstream receiving waters.

It is important to note that the measures identified below are a generic approach to construction phase stormwater quality management. Erosion and sediment control is highly dependent on local site conditions and staging of the proposed earth disturbing activities. Therefore, further details of the erosion and sediment control systems and procedures will be provided for each development stage when more information is available regarding in-situ soils and development staging.

5.2 Erosion Hazard Assessment

As part of the IECA guidelines, an erosion hazard assessment is to be completed to identify low-risk and high-risk short-term land disturbances within a given region (IECA, 2008). This Erosion Hazard Assessment estimates a TASK number which triggers if a site should be treated as high or low risk in regard to erosion control measures. A trigger value for high-risk site of 200 will be adopted for future stage as recommended by IECA. High risk sites trigger further need for assessment.

Table 5.1 Erosion Hazard Assessment

Catchment ID	Area (m^2)	Duration of Disturbance (months)	Slope Factor	K Factor	TASK Number
Post A	81930	6	0.21	0.040	**4129.3**

From Table 5.1 the results show that the Post A Catchment requires high-risk ESC treatment. Given the development proposal is at a conceptual phase, further details of the erosion and sediment control systems and procedures will be provided at the detailed design stage.

5.3 Erosion Control Standard

The best practice erosion control measures for high-risk development as detailed in Best Practice Erosion and Sediment Control (IECA, 2008) include the following:

- All reasonable and practical steps to be taken to apply best practice erosion control measures to completed earthworks, or otherwise stabilise such works, prior to anticipated rainfall - including existing unstable, undisturbed, soil surfaces under the management or control of the building/construction works;
- Land clearing limited to maximum 4 weeks work;
- Disturbed soil surfaces stabilised with minimum 75% cover within 10 days of completion of works within any area of a work site;
- Staged construction and stabilisation of earth batters; and
- Soil stockpiles and unfinished earthworks are suitably stabilised (covered) if disturbance is expected to be suspended for a period exceeding 10 days.

5.4 Sediment Loss Estimate

The potential volume of sediment loss from the subject site has been estimated using the Revised Universal Soil Loss Equation (RUSLE).

RUSLE calculates annual soil loss rates based on:

$$A = R. K. LS. C .P$$

Where:

A = annual soil loss due to erosion (t/ha/yr)

R = rainfall erosivity factor

K = soil erodibility factor

LS = topographic factor derived from slope length and slope gradient

C = cover and management factor

P = erosion control practice factor

Table 5.2 Potential Sediment Loss (RUSLE)

Catch. ID	Area (ha)	Slope Length (m)	Slope Grade (%)	Intensity $^{6}I_{2}$ (mm/hr)	R	K	LS	C	P	A (t/ha/yr)	Yield (m^3/yr)
A	8.193	80	1.00	9.84	2149	0.04	0.19	1	1.3	21.2	133.8

*Note soil testing will need to be carried out to confirm soil type

Table 5.3 Sediment Control Standard (default) based on soil loss rate (IECA, 2008)

Area limit (m^2) [1]	Soil loss rate limit (t/ha/yr) [2]			Soil loss rate limit (t/ha/month) [3]		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
250	N/A	N/A	[4]	N/A	N/A	[4]
1000	N/A	N/A	All cases	N/A	N/A	All cases
2500	N/A	> 75	75	N/A	> 6.25	6.25
>2500	> 150	150	75	> 12.5	12.5	6.25

5.5 Sediment Pond Requirement

Sediment ponds are generally required during construction where:

- The disturbed area is greater than 10,000m^2 and the expected sediment loss is greater than 75 t/ha/yr;
- The disturbed soils are dispersive; and/or
- Where there is a need to control runoff suspended solids/turbidity.

As presented in Table 5.2, it is expected that the potential annual soil loss will not exceed 75 t/ha/yr for any of the catchments, and therefore a sediment pond is not required during construction.

5.6 Sediment Control Standard

Table B1 of the guidelines (IECA, 2018) provides a method for determining the sediment control standard for construction activities based on the estimated soil loss rate. Based on the size of the development, it is likely that Type 1 sediment controls are required for this site. A list of Type 1 and supplementary sediment control techniques is provided in Table 5.4 below based on Table 4.5.3 and Table 4.5.4 of the guidelines (IECA, 2008). These control techniques provide a guide that is recommended to be used to minimise the downstream effect of sediments.

Table 5.4 Sediment Control Techniques

Techniques	Type 1	Supplementary
Sheet flow treatment	> Buffer Zone capable of infiltrating 100% of stormwater runoff or process water > Infiltration basin or sand filter bed capable of infiltrating 100% of flow	> Grass Filter Strips > Fibre Rolls > Stiff Grass Barrier
Concentrated flow treatment	> Sedimentation Basin (sized in accordance with design standard)	> Straw Bale Barrier > Kerb Inlet Sediment Traps (on-grade and sag inlet traps, including Gully Bags) > Check Dam Sediment Traps
De-watering sediment control	> Type F/D Sediment Basin > Stilling Pond	> Grass Filter Bed
Instream sediment control	> Pump sediment-laden water to an off-stream Type F or Type D Sediment Basin or high filtration system	> Straw Bale Barrier (short-term device only)
Other		> Construction exits (Rock Pads, Wash Bays)

6. Conclusion

This Conceptual Stormwater Management Plan (CSMP) has been prepared for Roubaix Properties Pty Ltd for Development Application for Lot 4 on RP97736. This CSMP has referenced relevant guidelines relating to stormwater management to form the conceptual basis of the stormwater plan.

The stormwater runoff from the subject site is conveyed to the LPD via overland flow and proposed swales, where it will discharge to an existing floodplain downstream.

To meet the State Planning Policy – State Interest Guidance Material: Water Quality objectives for the proposed internal road, the design includes several street tree bio-retention pods providing a total treatment area of 70 m². Water quality objectives will be achieved for individual lots by the future land owner with each lot to include an ATLAN filtration system—consisting of one (1) ATLAN Stormsack and four (4) ATLAN Filters—or a bioretention basin with 40 m² of filter media.

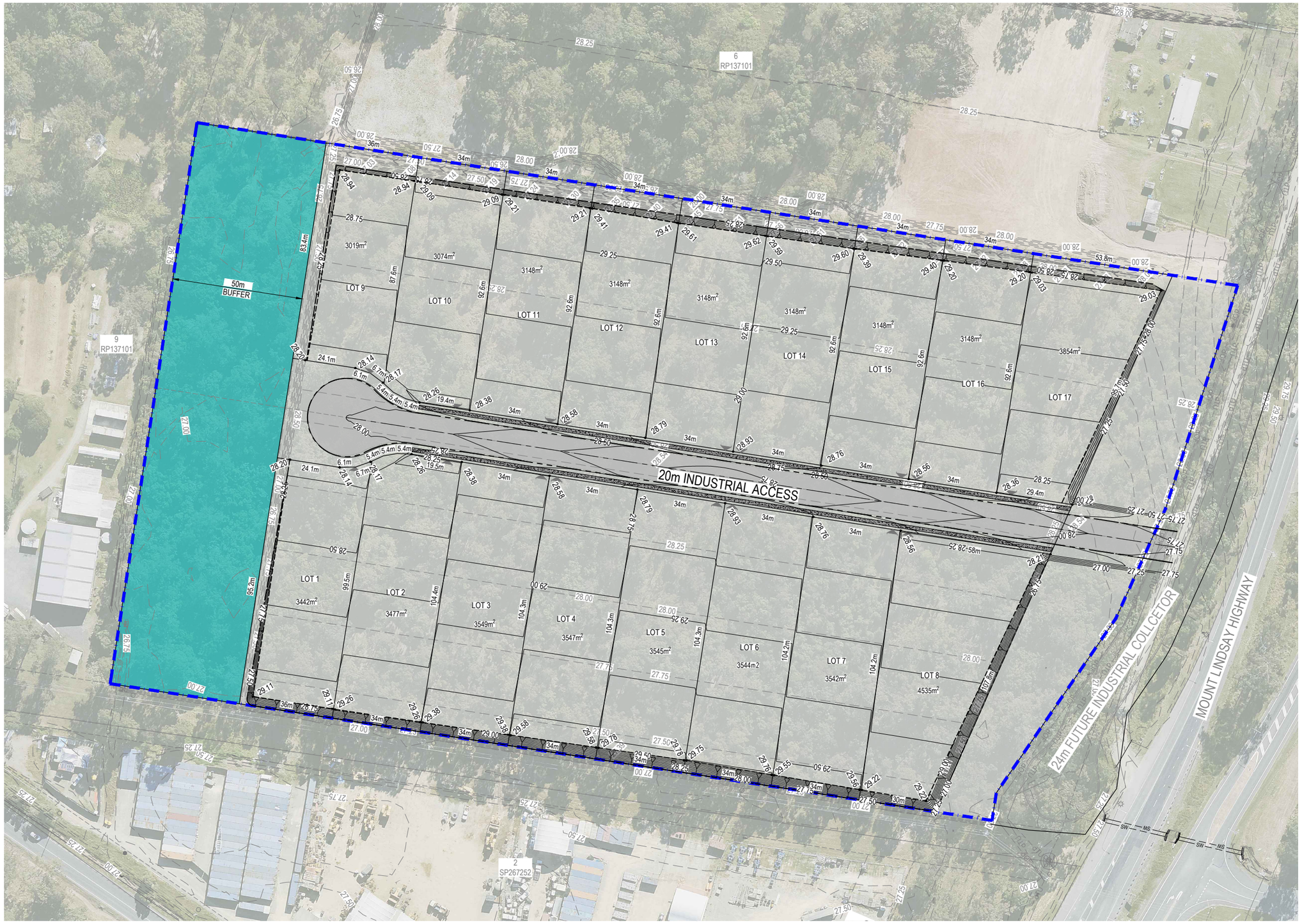
An Erosion Hazard Assessment has identified that the site is high-risk with regard to erosion potential. Sediment loss estimates have been used to determine that Type 1 sediment controls are required, given a yield of 133.8 m^3/year for the disturbed internal catchment. More detailed ESC controls and measures are to be designed and prepared in the detailed design phase of the project.

Please note that in relation to the individual lots, the current application is for a Reconfiguration of a Lot (ROL) only. As such, any future development on these lots would be subject to a Material Change of Use (MCU) application. This process ensures that appropriate development controls can be assessed and conditioned at the time of use, allowing EDQ to manage compliance with planning and infrastructure requirements prior to any development occurring.

Appendix A – Proposed Plans of Development

LEGEND

- 27.25 — DESIGN SURFACE CONTOURS
- 27.0 — EXISTING SURFACE CONTOURS
- EXISTING LOT BOUNDARY
- SW — EXISTING STORMWATER
- S — EXISTING SEWER
- OH — EXISTING OVERHEAD ELECTRIC
- C — EXISTING COMMS
- EXISTING ROAD CONTROL LINE
- EXISTING KERB
- EXISTING EDGE OF BITUMEN
- DEVELOPMENT SITE BOUNDARY
- PROPOSED LOT BOUNDARY
- 50m BUFFER AREA
- DEVELOPMENT SITE AREA



WARNING: UNDERGROUND SERVICES:
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

OVERALL LAYOUT PLAN

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
A	ISSUE FOR APPROVAL	24-02-25

BURCHILLS ENGINEERING SOLUTIONS
GOLD COAST | BRISBANE | TOOWOOMBA
IPSWICH | MORETON BAY
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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
OVERALL LAYOUT PLAN

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
10 0 5 10 15 20 25 30 35m
1 : 750 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 24-06-25
PROJECT LEADER : JACK SHAO
DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER
CHECKED : JACK SHAO
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE220566-DA
DRAWING No. : C1101
VERSION: B

Appendix B – MUSIC Input Parameters

MUSIC Modelling was conducted for the internal road and the individual lots separately. This is shown in the two sections below.

MUSIC – Internal Road

Rainfall and Evapotranspiration

MUSIC modelling was based on 6-minute interval data obtained from the Bureau of Meteorology (BOM) for rainfall station 040756 Greenbank, QLD, as summarised in the table below.

Meteorological and Rainfall Runoff Data Reporting Table

Input	Data Used in Modelling
Rainfall station	040659
Time step	6 minute
Modelling period	1/01/1980 to 31/12/1989 (10 years)
Mean annual rainfall (mm)	759
Rainfall runoff parameters	Industrial
Pollutant export parameters	Industrial

Catchment Parameters

Based on the proposed land uses within the development, the site has been modelled as urban land use as detailed in the table below. The site has been divided into roof, ground and road source nodes as per the architectural drawings included in Appendix A.

Land Use Parameters

Catchment ID	Land Use	Total Impervious (%)
Road	Industrial	75

The MUSIC catchment plan with full breakdown of rood, ground and road areas is presented in Appendix E. The pollutant loads and runoff parameters for each source node have been based on the data from the Water by Design MUSIC Modelling Guidelines (2010), as summarised in the tables below/

Rainfall Runoff Parameters

Parameter	All Nodes
Landuse	Industrial
Rainfall threshold (mm)	1
Soil storage capacity (mm)	18
Initial storage (% capacity)	10
Field capacity (mm)	80

Parameter	All Nodes
Infiltration capacity coefficient a	243
Infiltration capacity coefficient b	0.6
Initial depth (mm)	50
Daily recharge rate (%)	0
Daily baseflow rate (%)	31
Daily seepage rate (%)	0

Pollutant Load Parameters

Urban Residential	Total Suspended Solids (log mg/L)		Total Phosphorous (log mg/L)		Total Nitrogen (log mg/L)	
	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.
Storm Flow Concentration	1.30(1)	0.44	-0.89(1)	0.36	0.25	0.32
Base Flow Concentration	0(1)	0(1)	0(1)	0(1)	0(1)	0(1)

NOTE: (1) values applied to 'Roof' areas

The bioretention parameters used to represent the street trees are shown below.

Bioretention Basin Parameters (Street Trees)

Parameter	Value
Low Flow By-pass (m^3/s)	0
High Flow By-pass (m^3/s)	100
Extended Detention Depth (m)	0.3
Surface Area (m^2)	70
Filter Area (m^2)	70
Unlined Filter Media Perimeter (m)	0.01
Saturated Hydraulic Conductivity (mm/hr)	200
Filter Depth (m)	0.5
TN Content of Filter Media (mg/kg)	30
Exfiltration Rate (mm/hr)	0
Base Lined (Y/N)	Y
Vegetated with Effective Nutrient Removal Plans (Y/N)	Y
Overflow Weir Width (m)	7
Underdrain Present (Y/N)	Y
Submerged Zone With Carbon Present (Y/N)	N

MUSIC – Individual Lots

Rainfall and Evapotranspiration

MUSIC modelling was based on 6-minute interval data obtained from the Bureau of Meteorology (BOM) for rainfall station 040756 Greenbank, QLD, as summarised in the table below.

Meteorological and Rainfall Runoff Data Reporting Table

Input	Data Used in Modelling
Rainfall station	040659
Time step	6 minute
Modelling period	1/01/1980 to 31/12/1989 (10 years)
Mean annual rainfall (mm)	759
Rainfall runoff parameters	Industrial
Pollutant export parameters	Industrial

Catchment Parameters

Based on the proposed land uses within the development, the site has been modelled as urban land use as detailed in the table below. The site has been divided into roof, ground and road source nodes as per the architectural drawings included in Appendix A.

Land Use Parameters

Catchment ID	Land Use	Total Impervious (%)
Roof	Urban	100
Ground	Urban	0
Road	Urban	100

The MUSIC catchment plan with full breakdown of rood, ground and road areas is presented in Appendix F. The pollutant loads and runoff parameters for each source node have been based on the data from the Water by Design MUSIC Modelling Guidelines (2010), as summarised in the tables below

Rainfall Runoff Parameters

Parameter	All Nodes
Landuse	Industrial
Rainfall threshold (mm)	1
Soil storage capacity (mm)	18
Initial storage (% capacity)	10
Field capacity (mm)	80
Infiltration capacity coefficient a	243

Parameter	All Nodes
Infiltration capacity coefficient b	0.6
Initial depth (mm)	50
Daily recharge rate (%)	0
Daily baseflow rate (%)	31
Daily seepage rate (%)	0

Pollutant Load Parameters

Urban Residential	Total Suspended Solids (log mg/L)		Total Phosphorous (log mg/L)		Total Nitrogen (log mg/L)	
	Mean	Std Dev.	Mean	Std Dev.	Mean	Std Dev.
Storm Flow Concentration	1.30(1) 2.43(2) 2.16(3)	0.38	-0.89(1) -0.30(2) -0.39(3)	0.34	0.37	0.34
Base Flow Concentration	0(1) 0.78(2,3)	0(1) 0.39(2,3)	0(1) -0.60(2,3)	0(1) 0.50(2,3)	0(1) 0.32(2,3)	0(1) 0.30(2,3)

NOTE: (1) values applied to 'Roof' areas

(2) Values applied to 'Carpark' areas

(3) Values applied to 'Ground' areas

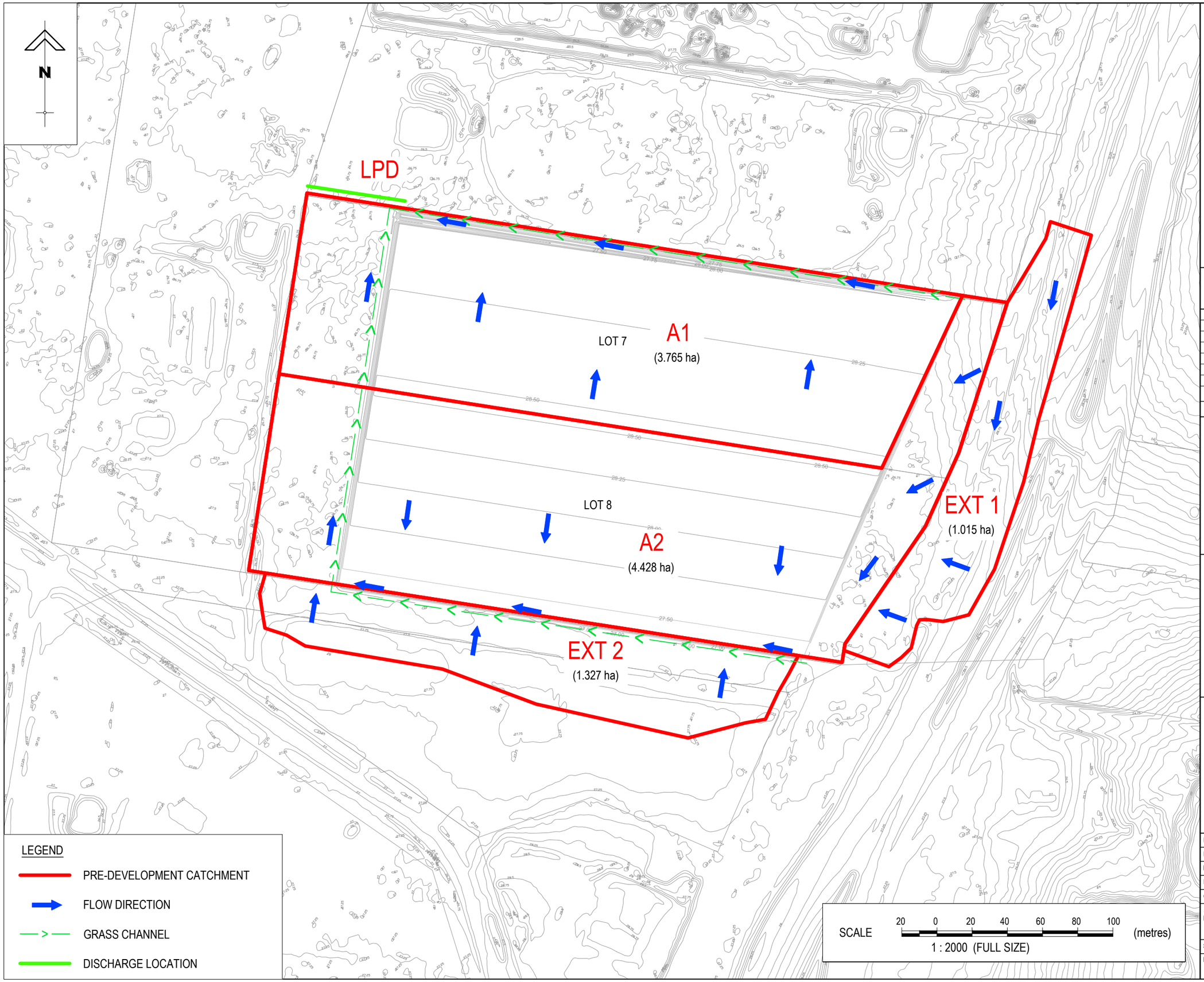
The bioretention basin parameters used for the individual lots bio basins in shown below.

Bioretention Basin Parameters (Lot Basins)

Parameter	Value
Low Flow By-pass (m^3/s)	0
High Flow By-pass (m^3/s)	100
Extended Detention Depth (m)	0.3
Surface Area (m^2)	40
Filter Area (m^2)	40
Unlined Filter Media Perimeter (m)	0.01
Saturated Hydraulic Conductivity (mm/hr)	200
Filter Depth (m)	0.5
TN Content of Filter Media (mg/kg)	30
Exfiltration Rate (mm/hr)	0
Base Lined (Y/N)	Y
Vegetated with Effective Nutrient Removal Plans (Y/N)	Y

Parameter	Value
Overflow Weir Width (m)	4
Underdrain Present (Y/N)	Y
Submerged Zone With Carbon Present (Y/N)	N

Appendix C – Burchills Engineering Solutions Conceptual Stormwater Management Drawings – Subject Site



PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

BURCHILLS ENGINEERING SOLUTIONS

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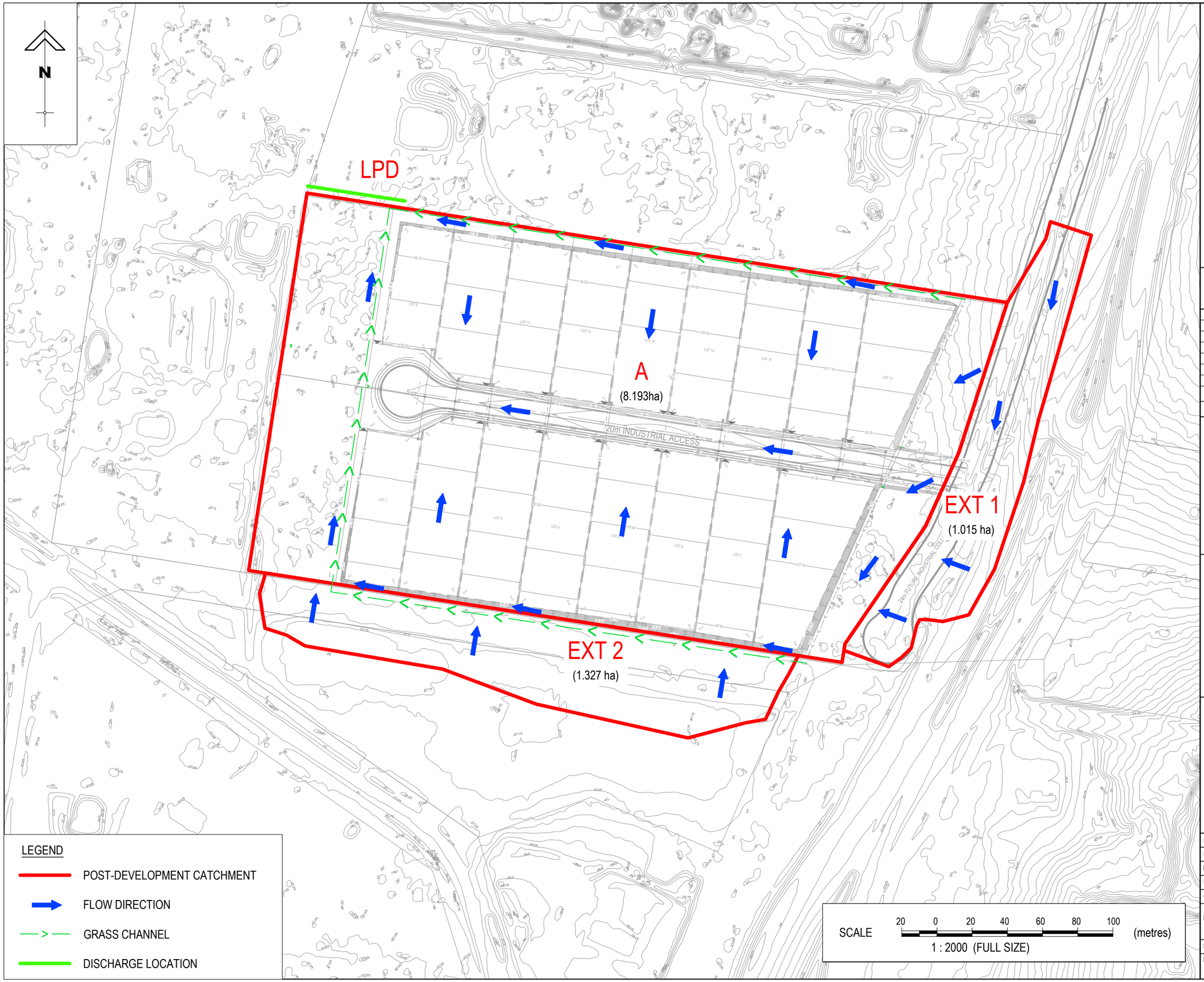
FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

PRE -DEVELOPMENT CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : AS SHOWN	DATUM : / FULL SIZE : A3
PROJECT No.: BE220566	DRAWING No. : N200 / VERSION: A



PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

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EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

POST - DEVELOPMENT CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : AS SHOWN	DATUM : / FULL SIZE : A3
PROJECT No.: BE220566	DRAWING No. : N201 / VERSION: A

CATCHMENT A

ROAD AND CARPARK:	0.785 ha
TOTAL AREA:	0.785 ha

LEGEND

- MUSIC CATCHMENT
- ROAD AND CARPARK

SCALE 20 0 20 40 60 80 100 (metres)

1 : 2000 (FULL SIZE)

PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

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COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

MUSIC CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : AS SHOWN	DATUM : FULL SIZE : A3
PROJECT No.: BE220566	DRAWING No. : N202 VERSION: A

Appendix D – Burchills Engineering Solutions Conceptual Stormwater Management Drawings – Individual Lots

PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

BURCHILLS ENGINEERING SOLUTIONS

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COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

PRE-DEVELOPMENT CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	RPEQ No. :

SCALE : AS SHOWN	DATUM :	FULL SIZE : A3
PROJECT No.: BE220566	DRAWING No. : N200	VERSION: A

LEGEND

- POST-DEVELOPMENT CATCHMENT
- FLOW DIRECTION
- DISCHARGE LOCATION

SCALE 5 0 5 10 15 20 25 (metres)

1 : 500 (FULL SIZE)

PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

BURCHILLS ENGINEERING SOLUTIONS

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FAX: +61 7 5509 6411
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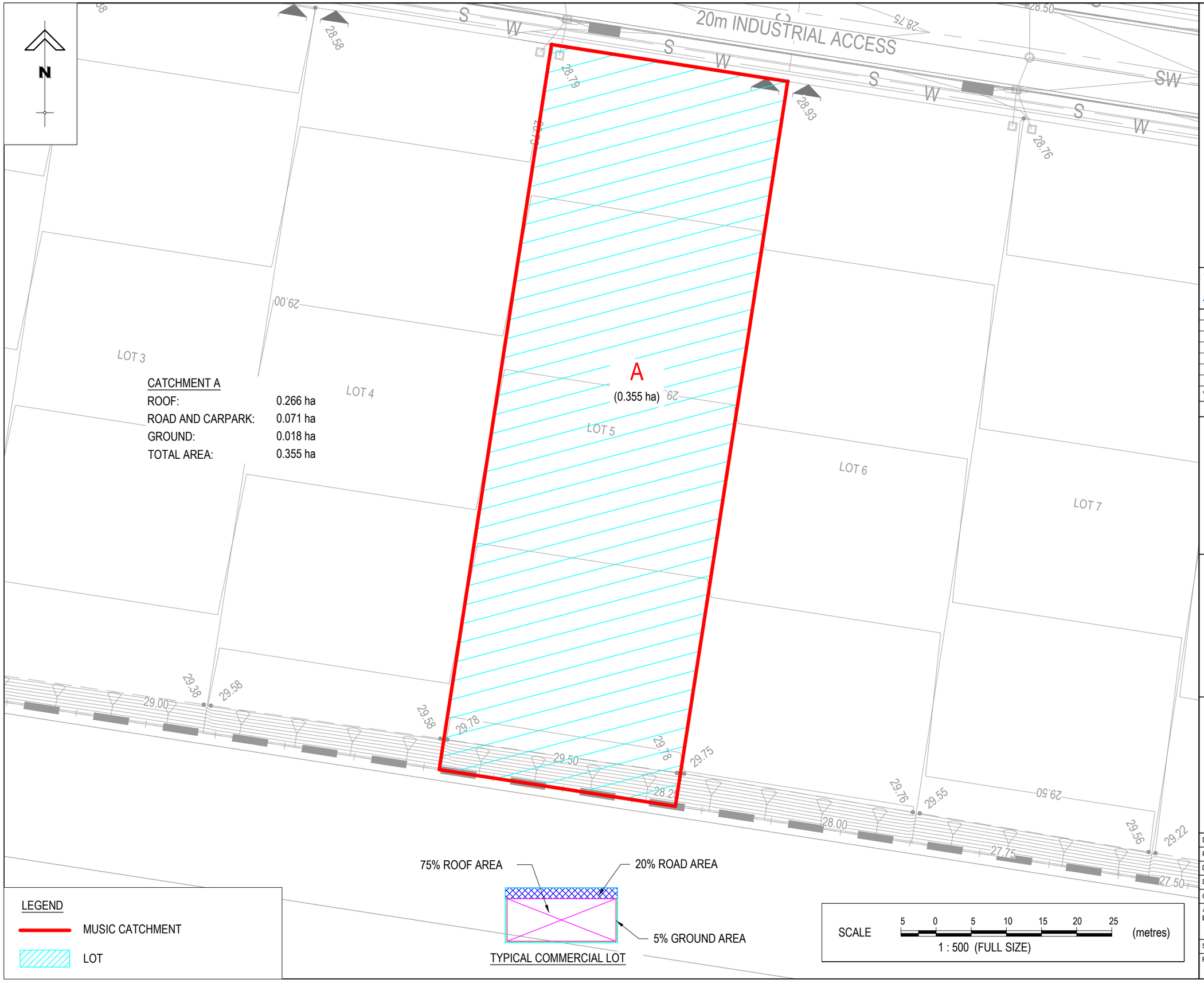
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

POST-DEVELOPMENT CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : AS SHOWN	DATUM : / FULL SIZE : A3
PROJECT No.: BE220566	DRAWING No. : N201 / VERSION: A



PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

BURCHILLS ENGINEERING SOLUTIONS

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

MUSIC CATCHMENT PLAN

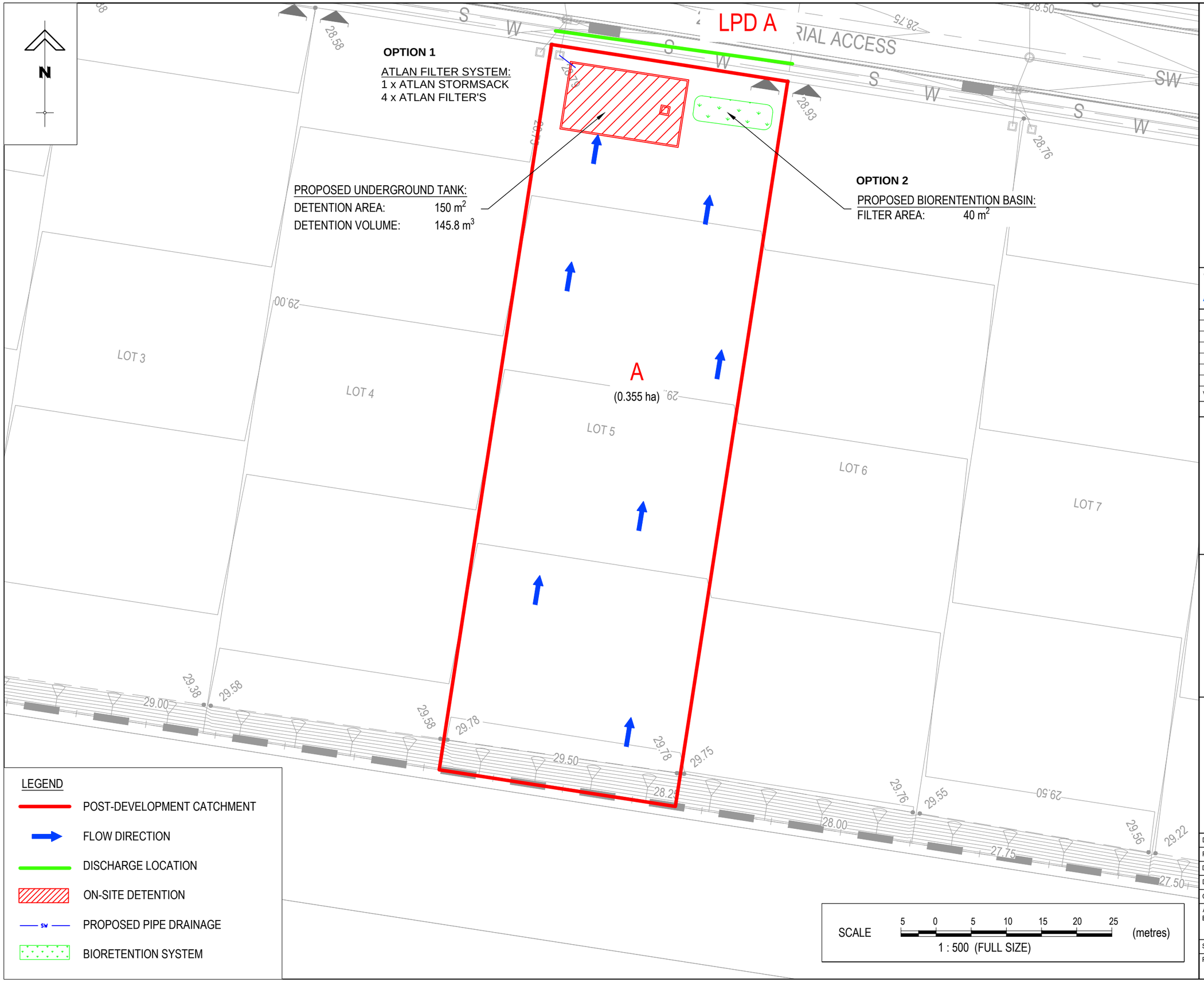
DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

RPEQ No. :

SCALE : AS SHOWN	DATUM :	FULL SIZE : A3

PROJECT No.:	DRAWING No. :	VERSION:
BE220566	N202	A



PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

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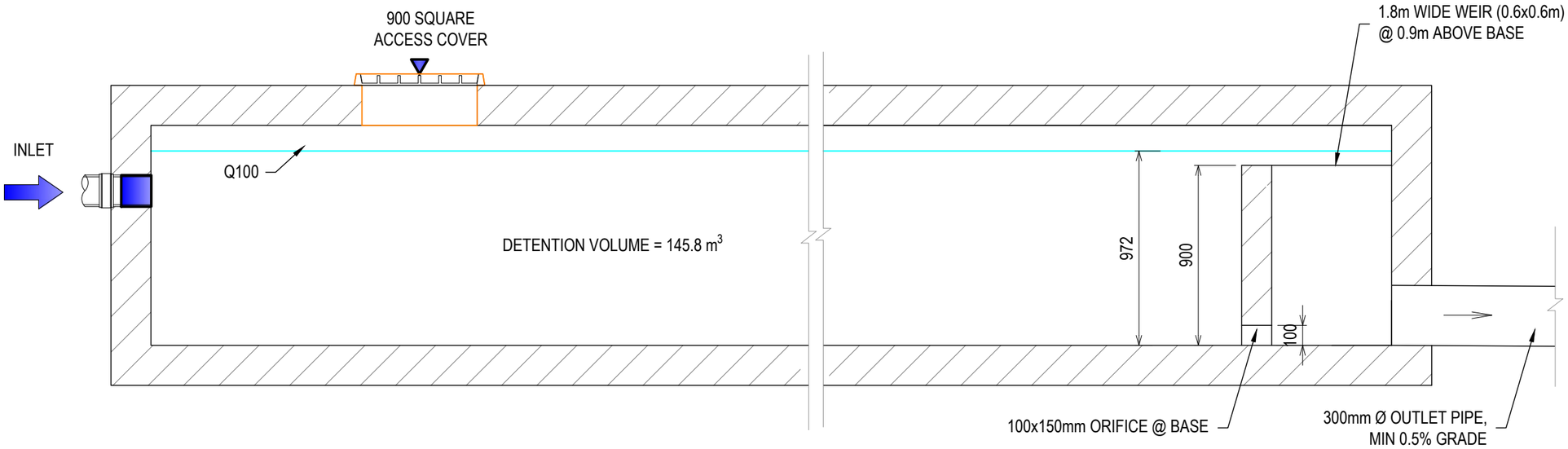
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

OPERATION CONTROL PLAN

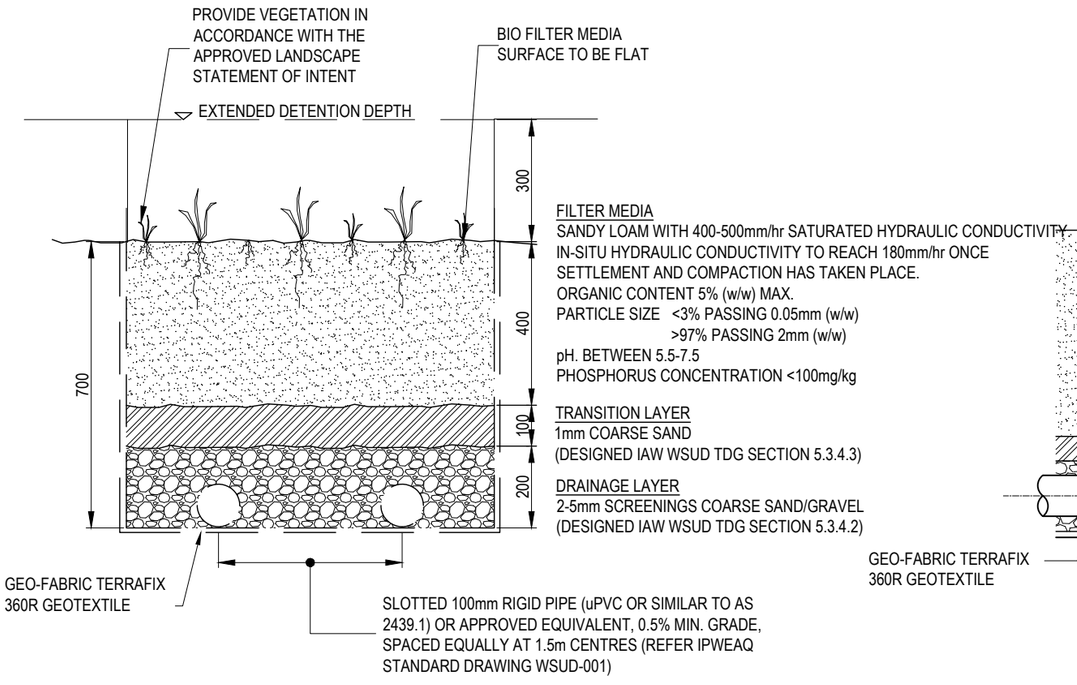
DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : AS SHOWN	DATUM : / FULL SIZE : A3
PROJECT No.: BE220566	DRAWING No. : N400 / VERSION: A



DETENTION TANK CROSS SECTION

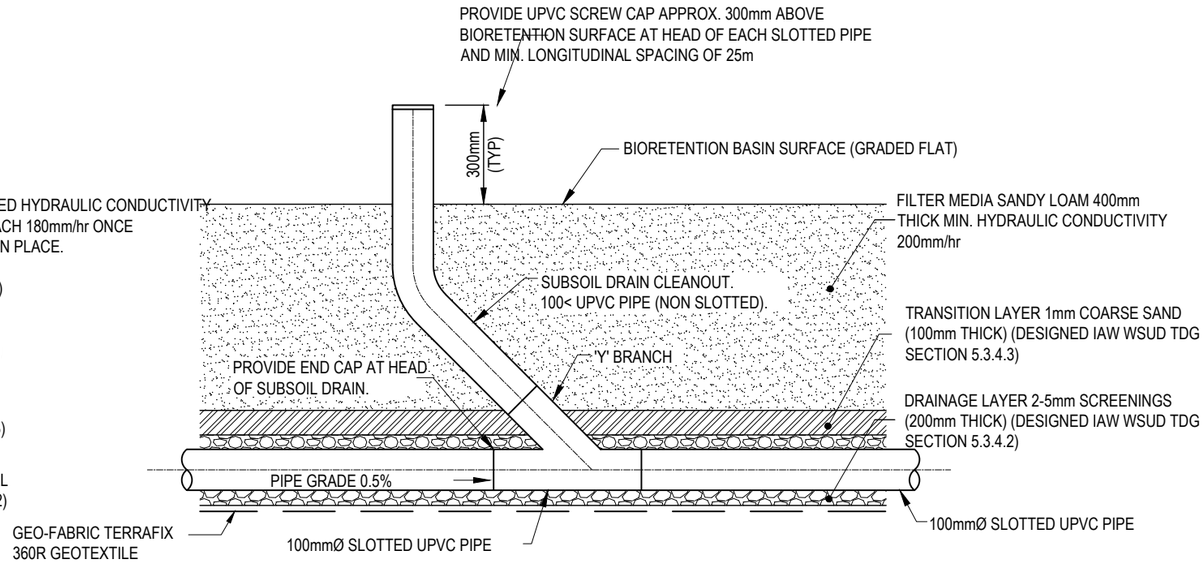
SCALE 0.5 0 0.5 1.0 (metres)

1 : 25 (FULL SIZE)



BIO-RETENTION MEDIA CROSS SECTION

N.T.S



BIORETENTION BASIN SUBSOIL DRAIN CLEANOUT

N.T.S

PROPOSED INDUSTRIAL DEVELOPMENT

4733-4743 MOUNT LINDESAY HIGHWAY

FOR

ROUBAIX PROPERTIES

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		25.07.25

REVISIONS

BURCHILLS ENGINEERING SOLUTIONS

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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DRAWING TITLE :

OPERATIONAL CONTROL DETAILS

DEVEL. APPLIC. No. :	DATE : 25.07.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : LINH DAO	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : AS SHOWN	DATUM : FULL SIZE : A3

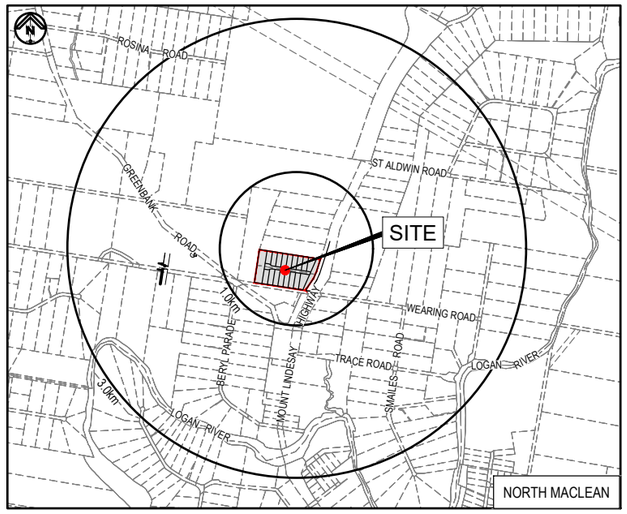
PROJECT No.:	DRAWING No. :	VERSION:
BE220566	N401	A

Appendix E – Burchills Engineering Solutions Civil Drawings

PROPOSED DEVELOPMENT AT

4733-4743 MOUNT LINDESAY HIGHWAY
NORTH MACLEAN, QUEENSLAND

PROJECT No. BE220566-DA
DA APPLICATION

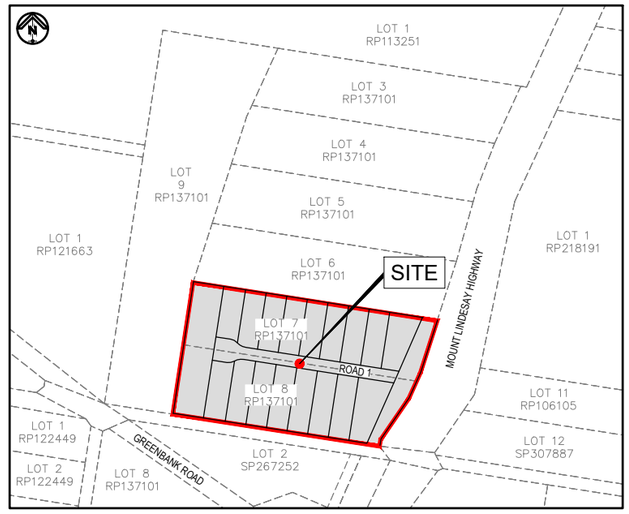


LOCALITY PLAN

N.T.S.

DRAWING INDEX		
DRG. No.	DRAWING TITLE	REVISON
C1000	COVER SHEET, LOCALITY PLAN & DRAWING INDEX	B
C1101	OVERALL LAYOUT PLAN	B
C2000	GENERAL NOTES AND TYPICAL DETAILS	B
C2101	EARTHWORKS LAYOUT PLAN	B
C2301	EARTHWORKS SECTIONS	B
C3201	20m INDUSTRIAL ACCESS ROAD - LONGITUDINAL SECTION	B
C5101	COMBINED SERVICES LAYOUT PLAN	B
C9000	HAZARD RISK REGISTER - DESIGN RISKS	B

SURVEY	
PROVIDED BY:	SUNRISE SURVEY
REPORT No:	22095 4001 001-A
DATE:	11-10-2024
SYSTEM:	MGA2020 ZONE 56



NEIGHBOURHOOD PLAN

N.T.S.

PREPARED FOR

ROUBAIX PROPERTIES

ROUBAIX PROPERTIES NO 4705 PTY LTD

PREPARED BY

BURCHILLS ENGINEERING SOLUTIONS

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IPSWICH | MORETON BAY
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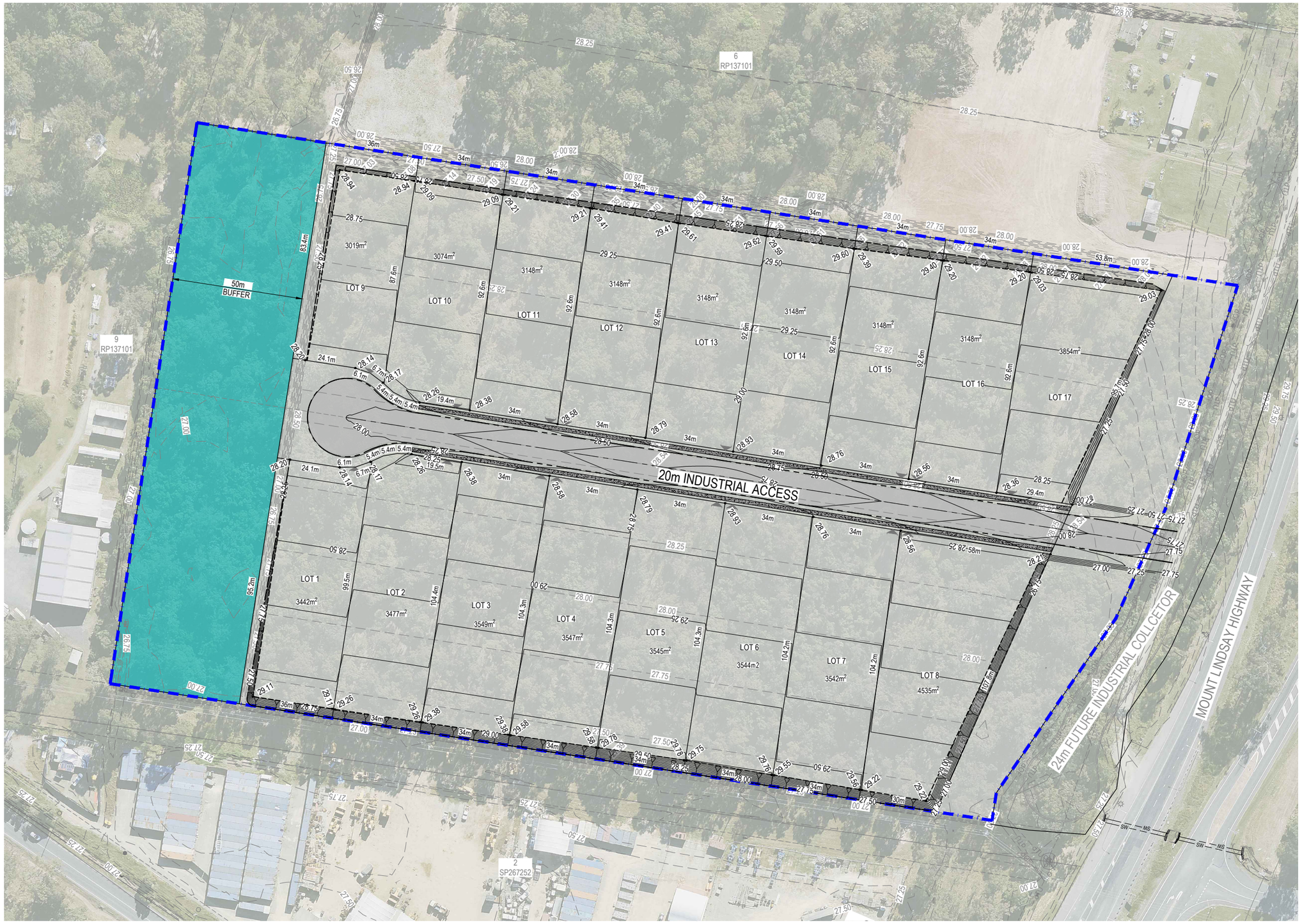
FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

PROJECT No.:	DRAWING No. :	VERSION:	DATE :
BE220566-DA	C1000	B	24-06-25

LEGEND

- 27.25 — DESIGN SURFACE CONTOURS
- 27.0 — EXISTING SURFACE CONTOURS
- EXISTING LOT BOUNDARY
- SW — EXISTING STORMWATER
- S — EXISTING SEWER
- OH — EXISTING OVERHEAD ELECTRIC
- C — EXISTING COMMS
- EXISTING ROAD CONTROL LINE
- EXISTING KERB
- EXISTING EDGE OF BITUMEN
- DEVELOPMENT SITE BOUNDARY
- PROPOSED LOT BOUNDARY
- 50m BUFFER AREA
- DEVELOPMENT SITE AREA



WARNING: UNDERGROUND SERVICES:
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

OVERALL LAYOUT PLAN

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
A	ISSUE FOR APPROVAL	24-02-25

BURCHILLS ENGINEERING SOLUTIONS
GOLD COAST | BRISBANE | TOOWOOMBA
IPSWICH | MORETON BAY
PHONE: +61 7 5509 6400
FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
OVERALL LAYOUT PLAN

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
10 0 5 10 15 20 25 30 35m
1 : 750 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 24-06-25
PROJECT LEADER : JACK SHAO
DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER
CHECKED : JACK SHAO
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE220566-DA
DRAWING No. : C1101
VERSION: B

GENERAL NOTES:

CONTRACT DOCUMENTATION
ALL DRAWINGS UNDER THIS CONTRACT ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATION.

SURVEY INFORMATION
CONTROL SURVEY INFORMATION WILL BE ESTABLISHED ON SITE BY THE PRINCIPAL'S SURVEYOR. SETOUT OF THE WORKS IS TO BE CARRIED OUT BY THE CONTRACTOR FROM THE CONTROL SURVEY PROVIDED.
SETOUT INFORMATION SHALL NOT BE OBTAINED BY SCALING FROM THESE DRAWINGS.

DATUM
ALL LEVELS SHOWN ON DRAWINGS ARE A.H.D. (DERIVED).

EXISTING SURVEY CONTROL STATIONS
THE CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES.

EXISTING SERVICES
EXISTING SERVICES LOCATIONS WHERE SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CONTACT THE RELEVANT AUTHORITIES IN ORDER TO VERIFY THE EXACT LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK ON SITE AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING SERVICES.

SITE ACCESS
THE CONTRACTOR SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT AND IS TO ALLOW FREEDOM OF ACCESS TO OTHER WORK AREAS ON THE SITE AT ALL TIMES.

PROVISION FOR TRAFFIC
PROVISION FOR TRAFFIC ON LOCAL ROADS IS TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND LOCAL AUTHORITY REQUIREMENTS.

WORK BOUNDARIES
THE CONTRACTOR IS TO RESTRICT ACTIVITIES TO THOSE AREAS DESIGNATED AS CONTRACT WORK AREAS. AT NO TIME SHALL THE CONTRACTOR ENTER OR CROSS ADJOINING AREAS WITHOUT WRITTEN AUTHORISATION FROM THE SUPERINTENDENT. SITE OFFICE FACILITIES MAY ONLY BE LOCATED WHERE AUTHORISED.

MAINTENANCE OF SITE CONDITION
AREAS BEYOND THE IMMEDIATE WORKS ARE TO BE PROTECTED AND NOT DAMAGED OR DISTURBED IN ANY WAY. EXISTING TREES ARE NOT TO BE REMOVED WITHOUT THE APPROVAL OF THE SUPERINTENDENT. AT COMPLETION OF WORKS THE SITE IS TO BE LEFT IN A CLEAN AND TIDY CONDITION TO THE SATISFACTION OF THE SUPERINTENDENT AND LOGAN CITY COUNCIL.

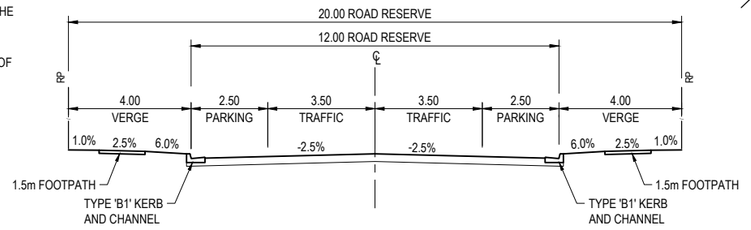
SITE CLEARING
CLEARING AND GRUBBING SHALL BE CARRIED OUT TO ALL WORK AREAS AS SPECIFIED AND SHALL INCLUDE THE REMOVAL OF ALL EXISTING TREES (UNLESS NOMINATED TO BE PRESERVED), EXISTING VEGETATION, TIMBER, FENCES AND ANY OTHER DEBRIS.

TOPSOIL STRIPPING
ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL FOOTPATHS, BATTERS AND FILL AREAS.

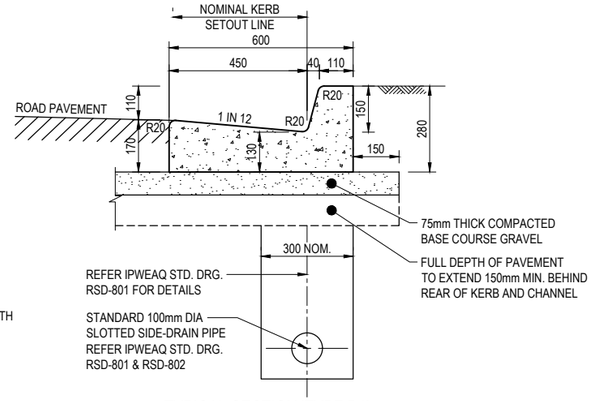
EARTHWORKS (GENERAL)
ALL FILL MATERIAL PLACED SHALL BE COMPACTED AND TRIMMED TO FINAL EARTHWORKS LEVELS AND PROFILES SHOWN ON THE CONTRACT DRAWINGS AND TESTED IN ACCORDANCE WITH THE PROJECT SPECIFICATION. ALL COMPACTION TESTING UNDER THIS CONTRACT IS TO BE CARRIED OUT TO AS3798 LEVEL 1 STANDARD BY A NATA-ACCREDITED TESTING AUTHORITY. CERTIFICATION FOR ALL EARTHWORKS CONSTRUCTION AND TESTING IS TO BE PROVIDED BY A REGISTERED PROFESSIONAL ENGINEER QUEENSLAND (RPEQ) ENGAGED BY THE CONTRACTOR.

EARTHWORKS MATERIALS
ANY EXCAVATED SILTS OR UNCOMPACTED FILLS ARE TO BE INCORPORATED IN STRUCTURAL FILLING BY SELECTIVELY MIXING WITH OTHER MATERIALS TO CONTROL THE MOISTURE CONTENT AND TO ACHIEVE THE REQUIRED COMPACTION STANDARDS.

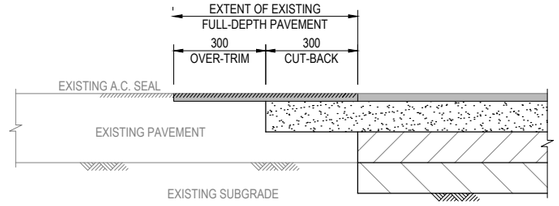
"AS CONSTRUCTED" SURVEY
"AS CONSTRUCTED" SURVEY SHALL BE CARRIED OUT BY THE PRINCIPAL'S SURVEYOR AS WORK PROCEEDS.



INDUSTRIAL ACCESS TYPICAL DETAIL
1 0 1 2 3 4 5m
1 : 100 (FULL SIZE)



TYPICAL SECTION 'TYPE B1' BARRIER KERB AND CHANNEL
SCALE 1:10



TYPICAL ROAD PAVEMENT TIE-IN DETAIL
N.T.S.

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
A	ISSUE FOR APPROVAL	24-02-25

BURCHILLS ENGINEERING SOLUTIONS
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EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
GENERAL NOTES AND TYPICAL DETAILS

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. :
DATE : 24-06-25
PROJECT LEADER : JACK SHAO
DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER
CHECKED : JACK SHAO
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE220566-DA
DRAWING No. : C2000
VERSION: B

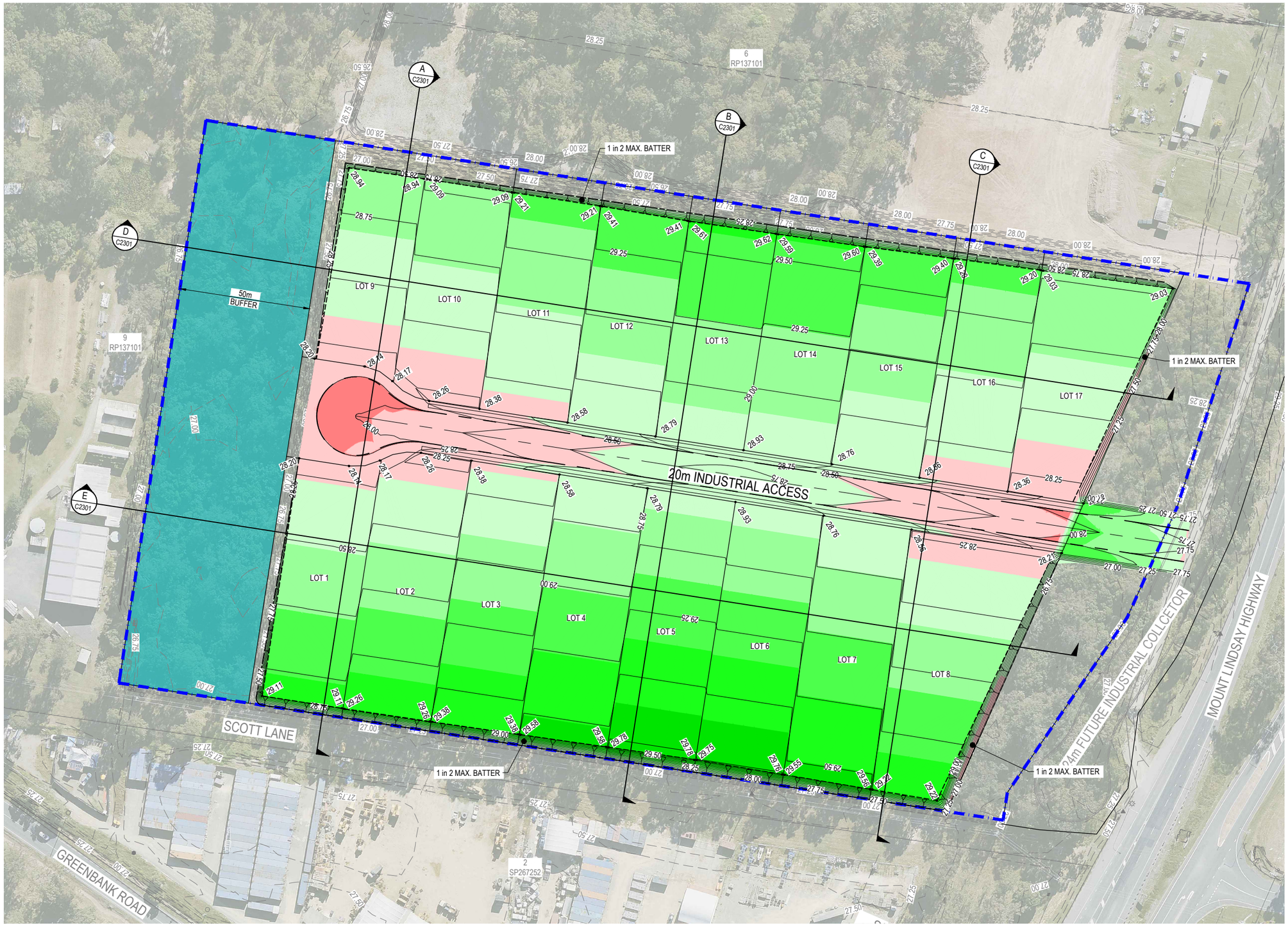
LEGEND

- 27.25 — DESIGN SURFACE CONTOURS
- 27.0 — EXISTING SURFACE CONTOURS
- EXISTING LOT BOUNDARY
- SW — SW — EXISTING STORMWATER
- EXISTING EDGE OF BITUMEN
- DEVELOPMENT SITE BOUNDARY
- PROPOSED LOT BOUNDARY
- 50m BUFFER AREA

CONCEPT BULK EARTHWORKS SUMMARY	
STRUCTURAL FILLING	
AREA	NETT SOLID FILL
OVERALL FILLING	45,871 cu.m.
EXCAVATION	
AREA	NETT CUT
OVERALL EXCAVATION	1,673 cu.m.

SUMMARY:
45,871 cu.m - 1,673 cu.m = 44,198 cu.m IMPORTED MATERIAL
NO ALLOWANCE FOR BOXING HAS BEEN CONSIDERED
NO ALLOWANCE HAS BEEN MADE FOR TOPSOIL STRIP / REPLACEMENT.
NO ALLOWANCE FOR COMPACTION HAS BEEN CONSIDERED

EARTHWORKS DEPTH ANALYSIS LEGEND			
LOWER		UPPER	COLOUR
-4.0m	TO	-3.5m	
-3.5m	TO	-3.0m	
-3.0m	TO	-2.5m	
-2.5m	TO	-2.0m	
-2.0m	TO	-1.5m	
-1.5m	TO	-1.0m	
-1.0m	TO	-0.5m	
-0.5m	TO	0.0m	
0.0m	TO	0.5m	
0.5m	TO	1.0m	
1.0m	TO	1.5m	
1.5m	TO	2.0m	
2.0m	TO	2.5m	
2.5m	TO	3.0m	
3.0m	TO	3.5m	
3.5m	TO	4.0m	



WARNING: UNDERGROUND SERVICES:
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
A	ISSUE FOR APPROVAL	24-02-25

BURCHILLS ENGINEERING SOLUTIONS
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COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
EARTHWORKS LAYOUT PLAN

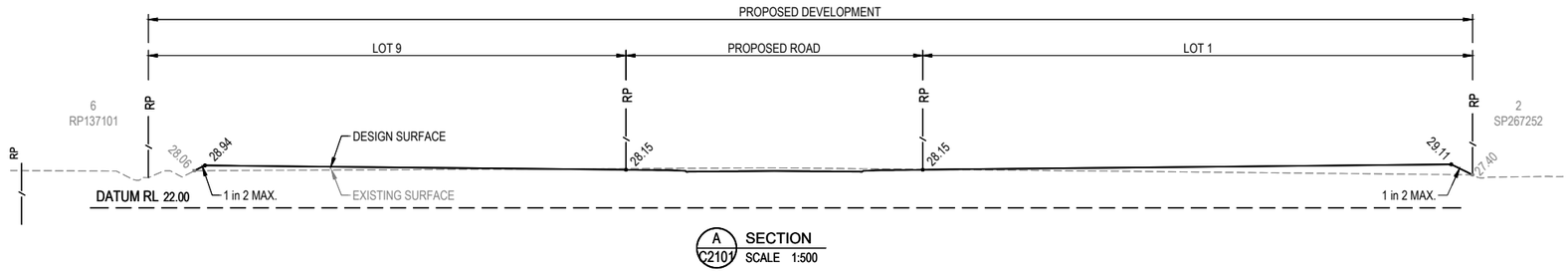
PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

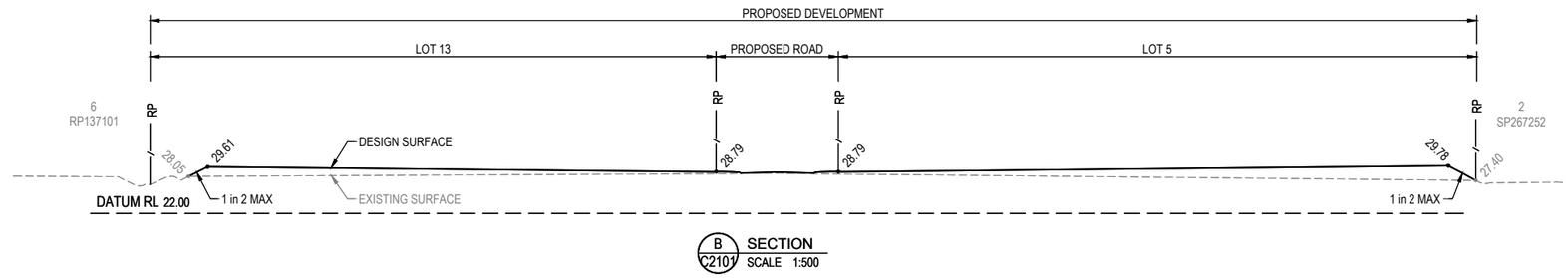
SCALE AT FULL SIZE (A1) :
10 0 5 10 15 20 25 30 35m
1 : 750 (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 24-06-25
PROJECT LEADER : JACK SHAO
DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER
CHECKED : JACK SHAO
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE220566-DA
DRAWING No. : C2101
VERSION: B



A C2101 SECTION
SCALE 1:500



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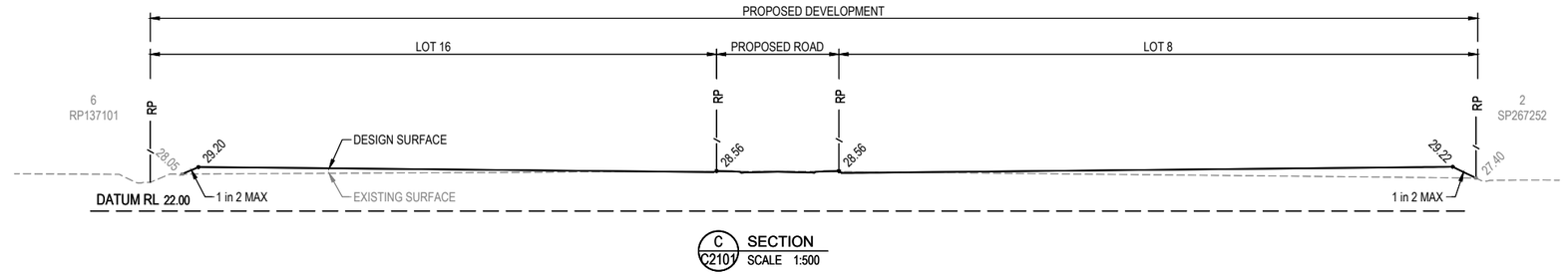

C C2101 SECTION
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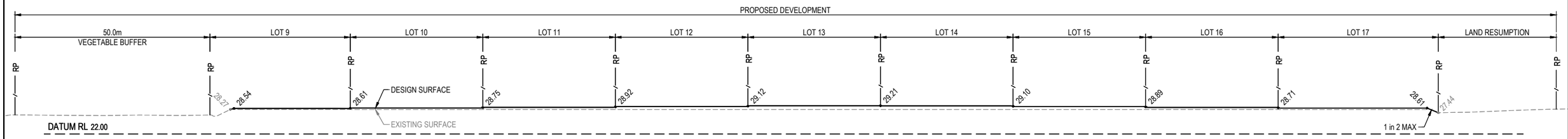
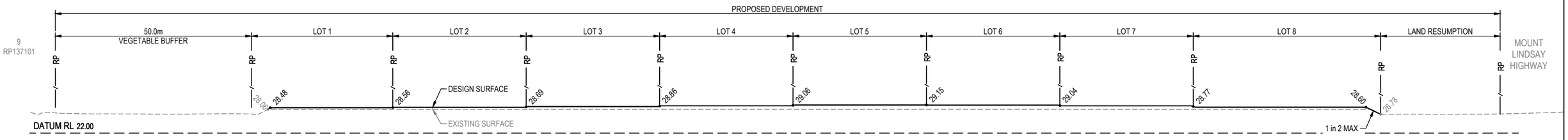


D C2101 SECTION
SCALE 1:500



E C2101 SECTION
SCALE 1:500

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
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BURCHILLS ENGINEERING SOLUTIONS
GOLD COAST | BRISBANE | TOOWOOMBA
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EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
EARTHWORKS SECTIONS

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

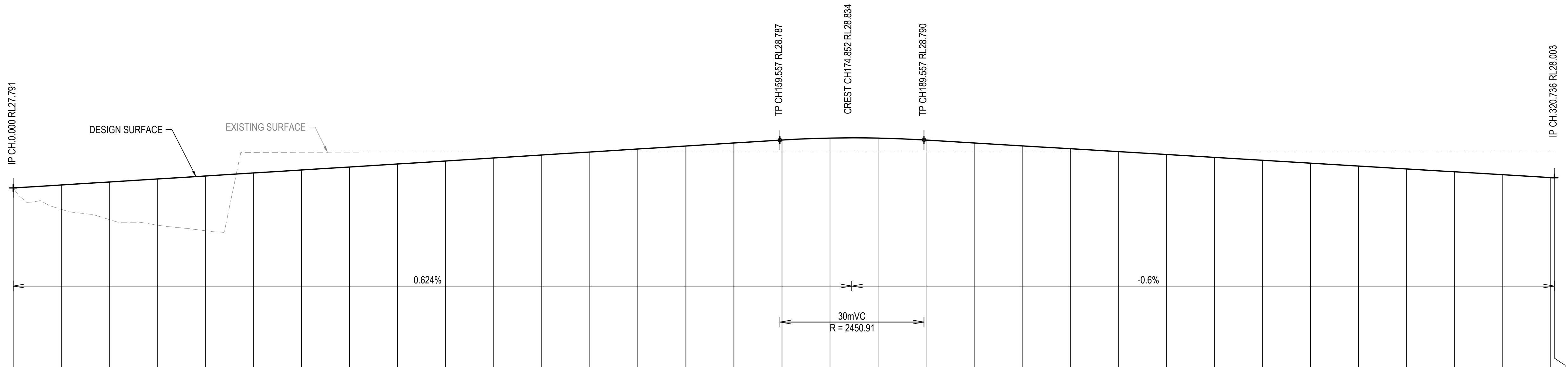
PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
5 0 5 10 15 20 25m
1 : 500 (FULL SIZE)

DEVEL. APPLIC. No. :	DATE : 24-06-25
PROJECT LEADER : JACK SHAO	DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER	CHECKED : JACK SHAO

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.:	DRAWING No. :	VERSION:
BE220566-DA	C2301	B



VERTICAL GRADE (%)

VERTICAL CURVE LENGTH (m)
VERTICAL CURVE RADIUS (m)

DATUM RL 24.0

CONTROL LINE CHAINAGE	EXISTING SURFACE LEVEL	FINISHED SURFACE LEVEL	DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve)
0.000	27.79	27.791	0.00
10.000	27.35	27.853	0.51
20.000	27.13	27.916	0.78
30.000	27.02	27.978	0.96
40.000	26.90	28.041	1.14
50.000	28.53	28.103	-0.43
60.000	28.53	28.165	-0.37
70.000	28.54	28.228	-0.31
80.000	28.54	28.290	-0.25
90.000	28.54	28.353	-0.19
100.000	28.54	28.415	-0.12
110.000	28.54	28.477	-0.06
120.000	28.54	28.540	-0.00
130.000	28.54	28.602	0.06
140.000	28.54	28.665	0.12
150.000	28.54	28.727	0.19
160.000	28.54	28.789	0.25
170.000	28.54	28.830	0.29
180.000	28.54	28.829	0.29
190.000	28.54	28.788	0.25
200.000	28.54	28.728	0.19
210.000	28.54	28.668	0.13
220.000	28.54	28.608	0.07
230.000	28.54	28.548	0.01
240.000	28.54	28.488	-0.05
250.000	28.54	28.428	-0.11
260.000	28.54	28.368	-0.17
270.000	28.54	28.308	-0.23
280.000	28.54	28.248	-0.29
290.000	28.54	28.188	-0.35
300.000	28.54	28.128	-0.41
310.000	28.54	28.068	-0.47
320.000	28.54	28.008	-0.53
320.736	28.54	28.003	-0.54

HORIZONTAL GEOMETRY

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
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GOLD COAST | BRISBANE | TOOWOOMBA
IPSWICH | MORETON BAY
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FAX: +61 7 5509 6411
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES
NO 4705 PTY LTD

DRAWING TITLE :
20M INDUSTRIAL ACCESS ROAD
LONGITUDINAL SECTION

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

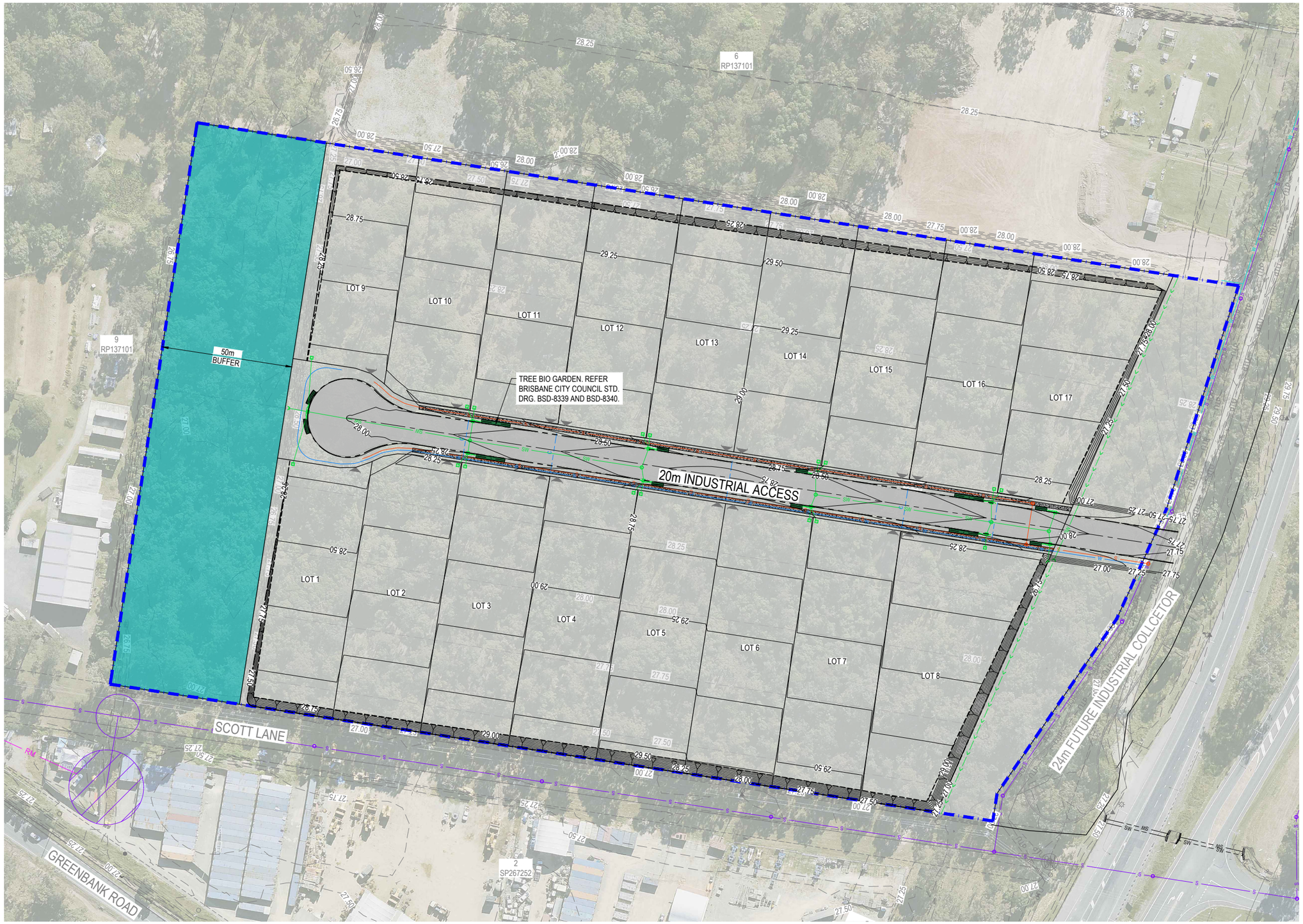
SCALE AT FULL SIZE (A1) :
1 : 50 VERTICAL (FULL SIZE)
5 0 5 10 15 20 25m
0.5 0 0.5 1.0 1.5 2.0 2.5m
1 : 500 HORIZONTAL (FULL SIZE)

DEVEL. APPLIC. No. :
DATE : 24-06-25
PROJECT LEADER : JACK SHAO
DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER
CHECKED : JACK SHAO
APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE220566-DA
DRAWING No. : C3201
VERSION: B

LEGEND

- EXISTING SURFACE CONTOURS
- DESIGN SURFACE CONTOURS
- EXISTING LOT BOUNDARY
- EXISTING STORMWATER
- EXISTING KERB
- EXISTING EDGE OF BITUMEN
- PROPOSED LOT BOUNDARY
- INDICATIVE FUTURE DRIVEWAY LOCATION
- PROPOSED STORMWATER
- PROPOSED WATER
- PROPOSED CONDUIT
- PROPOSED SEWER
- EXTERNAL SEWER RISING MAIN (BY OTHERS)
- EXTERNAL SEWER (BY OTHERS)
- EXTERNAL WATER (BY OTHERS)
- PROPOSED ROAD CONTROL LINE
- PROPOSED KERB
- DEVELOPMENT SITE BOUNDARY
- 50m BUFFER AREA
- DEVELOPMENT SITE AREA



WARNING: UNDERGROUND SERVICES:
UNDERGROUND SERVICES EXIST IN THIS VICINITY. THE CONTRACTOR IS TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM EXACT LOCATION OF SERVICES ON SITE PRIOR TO ANY EXCAVATION OR CONSTRUCTION COMMENCING.

COMBINED SERVICES LAYOUT PLAN

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
A	ISSUE FOR APPROVAL	24-02-25

BURCHILLS ENGINEERING SOLUTIONS
GOLD COAST | BRISBANE | TOOWOOMBA
IPSWICH | MORETON BAY
PHONE: +61 7 5509 6400
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EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
COMBINED SERVICES LAYOUT PLAN

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :
10 0 5 10 15 20 25 30 35m
1 : 750 (FULL SIZE)

DEVEL. APPLIC. No. :	DATE : 24-06-25
PROJECT LEADER : JACK SHAO	DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER	CHECKED : JACK SHAO

APPROVED FOR AND ON BEHALF OF
BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.:	DRAWING No. :	VERSION:
BE220566-DA	C5101	B

QMS RISK & OPPORTUNITIES REGISTER
SAFETY IN DESIGN – NORMAL DESIGN RISKS - CIVIL

Design Element	Associated risks & opportunities	Raw risk assessment		Raw risk rating	Treatment Measures to avoid, minimize or treat the risk.	Responsibility	Residual risk rating
		Likelihood	Consequence				
CONSTRUCTION PHASE							
SITE ACCESS	Unsafe site access and egress point, restricted access, flooding, unauthorised access from persons or animals	L	M	L-M	Prepare site specific Construction Traffic Management Plan and Workplace Health and Safety Management Plan	Principal Contractor	L
CLEARING & DEMOLITION	Removal of existing structures, decommision of services, vegetation clearing and fauna management	M	H	M-H	Contractor to obtain Demolition Permit, arrange all service disconnections with asset ownerand carry out vegetation works in accordance with Vegetation and Fauna Management Plan	Principal Contractor	L
EXISTING SERVICES	Distrub or damage existing services and infrastructure, overhead powerlines, work adjacent to existing services, existing service relocations	M	H	M-H	Client to commission detailed site survey and service potholing at critical locations. Contractor to undertake Dial Before You Dig and service verification with service authoritiy providers and undertake additional potholing prior to construction	Client and Principal Contractor	L-M
EXCAVATION & TRENCHING	Unstable existing slopes and landslip, steep cut profiles, deep trench excavations, working at heights, intercept water table, dispersive soils, acid sulphate soils	M	H	M-H	Client to commission a geotechnical investigation and contractors to undertake own investigations. Temporary and final earthworks profiles confirmed by client's geotechnical consultant. Tempory earthworks profile to be confirmed by Contractor's geotechnical consultant. Contractor to provide temporary benching, fencing, stabilisation and shoring.	Client and Principal Contractor	L
MATERIALS HANDLING	Manual handling, handling and disposal of sharps, repeative work processeds, hazardous substances	H	M	M-H	Contractor or provide a site specific Workplace Health and Safety Management Plan including Material Safety Data Sheets	Principal Contractor	L
PLANT & EQUIPMENT	Operation of plant and machinery, site access by visitors, material deliveries and waste removal	M	H	M-H	Contractor or provide a site specific Workplace Health and Safety Management Plan including register of operator machinery tickets. Contractor to maintain a site visitor register and provide site specific induction to all visitors	Principal Contractor	L
OPERATIONAL PHASE							
ROADS & PATHWAYS	General road safety, flood free access, pedestrian and cyclist injuries, inadequate signage	L	H	M	Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice	Asset Owner	L
STORWATER / FLOODING	Hazard from storm and flood water depths and velocities, ponding and access to inlets, outlets and basins	M	H	M-H	Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice	Asset Owner	L
WATER & SEWER	Blockages, contamination, interuption to service, access to fittings, confined space access	L	M	L-M	Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice	Asset Owner	L
WALLS & FENCING	Risk of falls, unauthoried access from persons and animals, structural failure	M	M	M	Design, approvals and construction undertaken in accordance with Australian, State Government and Local Authority standards, codes, guidelines and best practice	Asset Owner	L
MAINTENANCE PHASE							
ROADS & PATHWAYS	All as for construction and operation phases					Asset Owner	
STORWATER / FLOODING	All as for construction and operation phases					Asset Owner	
WATER & SEWER	All as for construction and operation phases					Asset Owner	
WALLS & FENCING	All as for construction and operation phases					Asset Owner	
REFURBISHMENT PHASE							
ROADS & PATHWAYS	All as for construction and operation phases					Asset Owner	
STORWATER / FLOODING	All as for construction and operation phases					Asset Owner	
WATER & SEWER	All as for construction and operation phases					Asset Owner	
WALLS & FENCING	All as for construction and operation phases					Asset Owner	
DEMOLITION PHASE							
ROADS & PATHWAYS	All as for construction and operation phases					Asset Owner	
STORWATER / FLOODING	All as for construction and operation phases					Asset Owner	
WATER & SEWER	All as for construction and operation phases					Asset Owner	
WALLS & FENCING	All as for construction and operation phases					Asset Owner	

VER.	DESCRIPTION	DATE
B	CHANGE TO LAYOUT	24-06-25
A	ISSUE FOR APPROVAL	24-02-25

BURCHILLS ENGINEERING SOLUTIONS
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COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

CLIENT :
ROUBAIX PROPERTIES NO 4705 PTY LTD

DRAWING TITLE :
HAZARD RISK REGISTER - DESIGN RISKS

PROJECT :
DEVELOPMENT APPROVAL
4733-4743 MT LINDESAY HWY

PRELIMINARY
NOT FOR CONSTRUCTION OR TENDER

SCALE AT FULL SIZE (A1) :

DEVEL. APPLIC. No. :
DATE : 24-06-25
PROJECT LEADER : JACK SHAO
DESIGNER : CARL KRUGER
DRAFTSPERSON : CARL KRUGER
CHECKED : JACK SHAO
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365

PROJECT No.: BE220566-DA
DRAWING No. : C9000
VERSION: B