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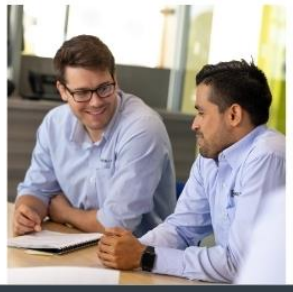

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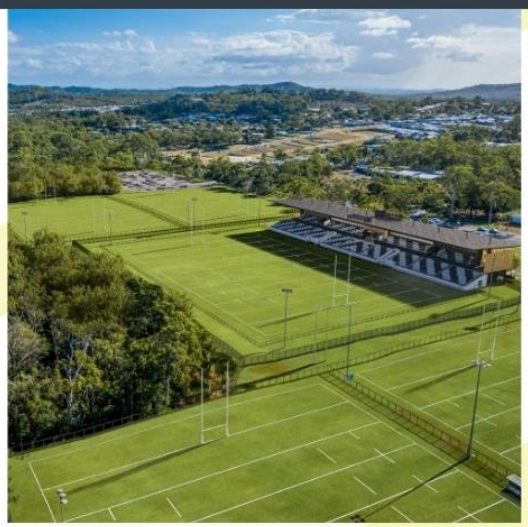

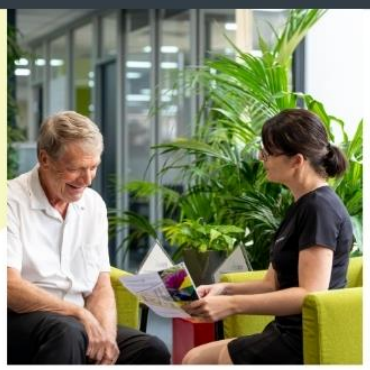

552-558 Chambers Flat Road, Logan Reserve
Park Land – Stage 6
Conceptual Stormwater Management Plan

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1. Introduction

MB Dev B Pty Ltd have engaged Burchills Engineering Solutions to prepare a Conceptual Stormwater Management Plan (CSMP) to be considered part of a Development Application to Logan City Council for the establishment of a 41-lot subdivision. The proposed development is located at 552 - 558 Chambers Flat Road, Logan Reserve and is to be Stage 6 of the Park Lane Development.

The subject site is situated within the Logan City Council (LCC) Local Government Area (LGA) and is zoned by the Logan Planning Scheme Version 9 as '*Emerging Community*'.

1.1 Background

1.1.1 Regulatory Requirements and Technical Guidelines

The strategies proposed in this CSMP have been developed to address the requirements of the Logan Planning Scheme Version 9.1 (LCC, 2015), and have also been prepared in accordance with the following guidelines:

- SC6.2.5 Logan Planning Scheme Policy 5– Infrastructure 3.6 Stormwater Infrastructure Standards – Logan Planning Scheme 2015 v.8.1 (LCC, 2015);
- State Planning Policy July 2014 (DSPIP, 2014);
- Queensland Urban Drainage Manual Fourth Edition (IPWEAQ, 2017);
- Australian Rainfall & Runoff: A Guide to Flood Estimation (Ball J, 2016);
- Australian Government – Bureau of Meteorology (Bureau of Meteorology, n.d.);
- MUSIC Modelling Guidelines (Water By Design, 2010);
- WSUD Technical Guidelines for South East Queensland – Version 1 (Healthy Waterways, BCC, MBWCP, 2006);
- Concept Design Guidelines for Water Sensitive Urban Design - Version 1 (Water By Design, 2009);
- Deemed to Comply Solutions – Stormwater Quality Management (Water By Design, 2010);
- Maintaining Vegetated Stormwater Assets - Version 1 (Water By Design, 2012);
- Bioretention Technical Design Guidelines - Version1.1 (Water By Design, 2014);
- Urban Stormwater Quality Planning Guidelines 2010 (DERM, 2010); and
- Best Practice Erosion and Sediment Control (IECA, 2008).

1.2 Purpose

The main objectives of this CSMP have been established from the criteria set out in the Logan Planning Scheme SC6.2.5 Planning Scheme Policy (LCC, 2015) and 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;
- Ensure no net increase in peak flows at the LPD;
- Maintain the natural hydraulic behaviour of catchments;
- Protect existing natural features and ecological processes; and
- Integrate stormwater management infrastructure carefully in the urban and natural landscape.

1.3 Scope

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

- Site description including:
  - Topography;
  - Soils; 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));
- Erosion and Sediment;
  - Best Practice Erosion and Sediment Control Measures (IECA 2008) for the construction phase of the development;
- Stormwater Quality:
  - Methods to ensure quality objectives of the receiving waters are achieved, and the existing hydrological regime is maintained to an acceptable level.

2. Site Details

2.1 Location

The subject site is located at 552 - 558 Chambers Flat Road, Logan Reserve, and is legally described as Lot 5 on RP 97736. The site is rectangular and occupies an area of 3.49 ha.

The site is identified by the Logan Planning Scheme 2015 (Version 9.1) as being located within an Emerging Community zone. Figure 2.1 below identifies the location of the subject site.

Figure 2.1 Site Locality Plan (MetroMap, 2024)

2.2 Existing Land Uses and Vegetation

The site generally grades uniformly from the east to west, with a height differential of approximately 8.5m. The highest point within the site is at the eastern boundary at RL 24.5m AHD, and the lowest point is in the western boundary at approximately 16.0m AHD. The western frontage of the site adjoins Chambers Flat Road. Currently the subject site is being utilised for construction access to the neighbouring residential subdivision (Council Ref: COM/60/2022, Park Lane Stages 1-3) and contains ancillary structures and temporary parking; where the remaining ground coverage is predominantly crop and grassed areas, with some minor tree coverage in the eastern-most portion of the site.

The site is bounded by the following existing land uses:

North: Neighbouring Rural Property, noting that this allotment is intended to be subdivided and is under Council Assessment (Council Ref: COM/60/2022);

South: Neighbouring Rural Property;
East: Neighbouring Rural Property; and
West: Chambers Flat Road.

2.3 Downstream Environment

Stormwater runoff from the site's internal and external catchments discharges from the site at its north-western corner to an adjacent drainage reserve and the drain parallel to Chambers Flat Road. The roadside drain conveys flows 60m to the north and then under Chambers Flat Road. From there, stormwater is conveyed through a series of private dams into Schmidts Creek.

2.3.1 Rainfall

The mean annual rainfall for the site has been estimated at 1091.8 mm from the data set obtained from the nearest Bureau of Meteorology (BOM) station number 040854 at Logan City Water Treatment Plant.

2.4 Proposed Development

The subject site is proposed to be reconfigured and developed from 1 into 41 lots, along with a bioretention basin and drainage reserve. The proposed development layout is shown below in Figure 2.2, and on the Master Plan prepared by Burchills Engineering Solutions (Drawing No. BE220314-SK01-F) which is included in Appendix A of this report. See also Appendix A which contains the full Concept Civil Engineering Plans.

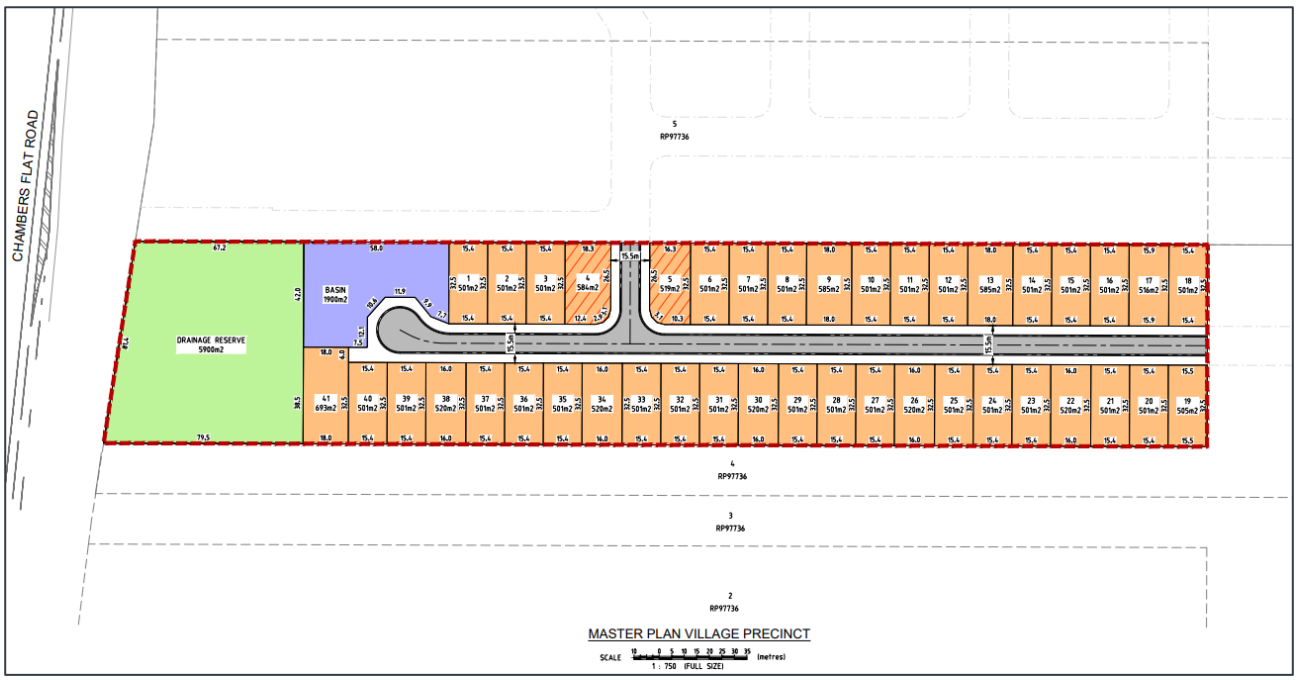


Figure 2.2 Subdivision Proposal Plan

3. Stormwater Quantity Management Plan

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) (QUDM, 2017)

Due to the increase in impervious areas within the proposed development, peak stormwater flow rates will increase. In order to mitigate these flow rates from the developed site it is proposed to implement an On-Site Detention (OSD) system. OSD systems temporarily store stormwater runoff and release flows at a controlled rate that is no greater than the pre-developed peak flow rate.

3.2 Drainage Catchment Parameters

Drainage catchments have been delineated using site survey, aerial imagery and development plans in the post developed scenario. Pre and post development catchment parameters are summarised in Table 3.1. Further catchment parameters used within the XP-SWMM model are included in Appendix C. Catchment plans are provided in Appendix E.

Table 3.1 Catchment Parameters

Scenario	Catchment ID	Total Area (ha)	Impervious %	Catchment Slope (%)
Pre-developed	A	3.488	43	1.3
	Ext_1	0.537	15	2.0
Post-developed	A1	2.898	74	1.0
	A2	0.59	0	1.0

3.2.1 Conveyance of Site Flows

In the current pre-developed scenario, runoff produced over the internal catchment sheet flows west to a mapped waterway that runs along Chambers Flat Road.

In the post-development scenario, runoff from the site's internal catchment will be conveyed by the internal stormwater network and road infrastructure to the proposed stormwater management device. From the stormwater management device, runoff will be discharged into the mapped waterway that runs along Chambers Flat Road

3.2.2 Lawful Points of Discharge

One (1) Lawful Point of Discharge (LPD) has been defined as the mapped waterway at the sites' western boundary.

3.2.3 Conveyance of External Flows

There is an existing 0.54 ha external catchment (EXT A) to the east of the subject site, contours derived from LiDAR data indicate that flows over this catchment are diverted and conveyed south along the subject sites eastern boundary. Catchment plans are provided in Appendix E.

3.3 XP-SWMM Analysis

XP-SWMM (version 2019.1) software was utilised to model the performance of the proposed stormwater quantity control measures. This modelling software is a link-node model capable of performing hydrology and hydraulics of stormwater drainage systems simultaneously.

Laurenson's Hydrology has been adopted as the runoff routing method within XP-SWMM. Sub-catchment routing in this method is carried out using the Muskingum procedure, which is a storage routing method based on the storage equation.

Details of the assumptions and input parameters used within the XP-SWMM model inputs are included in Appendix C.

3.3.1 Rational Method Comparison

The Rational Method has been used to gain an initial understanding of the relative impact of the proposed development on peak flow rates at the site's LPD. The Rational Method is a basic method for assessing peak flow rates and is considered suitable given the catchment area is less than 500 ha and the time of concentration within the contributing catchments is less than 30 minutes (IPWEAQ, 2017).

It should be noted that although the Rational Method has been used as an initial estimate of site peak flows, it has not been used for the design of any mitigation measures nor has been used for calibration of the runoff XP-SWMM model. A comparison between the peak discharge values obtained using the Rational Method and the XP-SWMM model for the 1% AEP event at the Lawful Point of Discharge is contained in Table 3.2 below.

Table 3.2 Rational Method vs XP-SWMM Generated Peak Discharges

Scenario	Catchment ID	Rational (m^3/s)	XP-SWMM (m^3/s)	Difference (%)
Pre-developed	A	1.52	1.51	1%
Post-developed	A1	1.80	1.63	9%
	A2	0.21	0.21	0%

The peak discharges generated by XP-SWMM, and the Rational Method compare well and are considered acceptable for this assessment.

3.4 XP-SWMM Results

3.4.1 Performance of OSD

To confirm the performance of the proposed OSD system, a pre and post-development model was constructed. These models compare the discharge hydrographs for a range of storm durations at the existing Lawful Points of Discharge. A full range of events have been simulated for critical events.

A summary of the modelling results for different ARI events is contained in Table 3.3 and Table 3.4.

Table 3.3 Pre-Development vs Post-Development (Unmitigated) Peak Discharges at LPD A

AEP Event (%)	Pre-Development		Post-Development	
	Median Critical Event	Peak Discharge (m^3/s)	Median Critical Event	Peak Discharge (m^3/s)
1%	30 min TP8	1.51	15 min TP9	1.67
2%	30 min TP8	1.32	10 min TP3	1.49
5%	45 min TP7	1.00	15 min TP2	1.29
10%	45 min TP7	0.85	15 min TP2	1.12
0.2 EY	10 min TP7	0.70	10 min TP3	0.92
0.5 EY	10 min TP7	0.54	10 min TP3	0.73
1 EY	10 min TP7	0.42	10 min TP3	0.58

Results of the modelling indicate the proposed system is capable of maintaining the pre-development peak discharges for the all storm events up to the 1% AEP event at LPD A.

Table 3.4 Pre-Development vs Post-Development (Mitigated) Peak Discharges at LPD A

AEP Event (%)	Pre-Development		Post-Development			
	Median Critical Event	Peak Discharge (m^3/s)	Storm Adopted (Pre-Critical)	Peak Discharge (m^3/s)	Storm Adopted (Post-Critical)	Peak Discharge (m^3/s)
1%	30 min TP8	1.51	30 min TP8	1.48	15 min TP9	1.45
2%	30 min TP8	1.32	30 min TP8	1.28	10 min TP3	1.04
5%	45 min TP7	1.00	45 min TP7	0.84	15 min TP2	0.81
10%	45 min TP7	0.85	45 min TP7	0.74	15 min TP2	0.68
0.2 EY	10 min TP7	0.70	10 min TP7	0.58	10 min TP3	0.58
0.5 EY	10 min TP7	0.54	10 min TP7	0.46	10 min TP3	0.46
1EY	10 min TP7	0.42	10 min TP7	0.40	10 min TP3	0.39

3.5 On Site Detention (OSD) Details

The proposed OSD system is to be implemented to ensure a non-worsening of peak discharges at the LPD.

Table 3.5 below contains the details of the proposed OSD systems within the subject site.

Table 3.5 OSD Details

Detention ID	Outlet Structures			100yr ARI Total Detention Volume (m^3)
	Outlet Pipe (s)	Pit	High Flow Weir	
Basin 1	750mm dia. @ 1m below base	0.9m x .1.8m Crest @ 0.3m from base	4m Length Crest @ 0.51m from base	207

3.5.1 Basin Depths

QUDM specifies the maximum depth of water in the detention basin shall not exceed 1.2 m during the 5% AEP storm event, nor 1.5m in the 1% AEP event. Table 3.6 results demonstrates that the depth of water within the proposed basin does not exceed 1.2m under the 5% AEP storm event.

Table 3.6 Detention Basin Depths 5% AEP Event

Detention Base Level (m AHD)	Event	Peak Water Surface (m AHD)	Peak Depth of Water (m)
17.04	5% AEP	17.60	0.56
	1% AEP	17.71	0.67

3.5.2 Detention Basin Configuration

Figure 3.1 below shows the configuration of the stormwater basin.

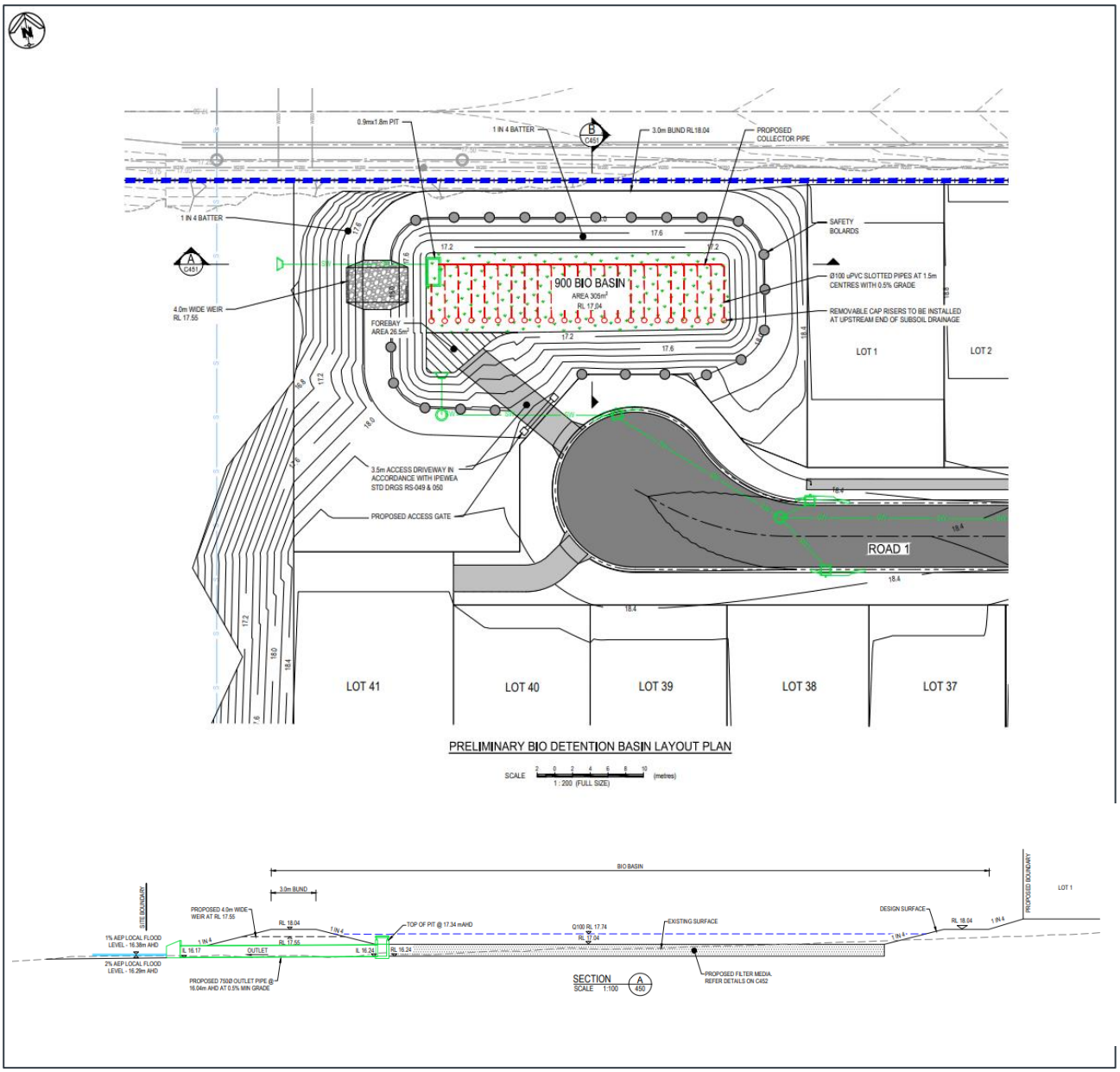


Figure 3.1 OSD Details

4. Erosion and Sediment Control Plan

4.1 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 at the detailed design stage when more information is available regarding in-situ soils and development staging.

4.2 Erosion Hazard Assessment

As part of the IECA guidelines, an erosion hazard assessment is 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 has been adopted in this CSMP as recommended by IECA. Table 4.1 below show the values used for the estimation of the TASK number.

Table 4.1 Erosion Hazard Assessment

Catchment ID	Area (m^2)	Duration of Disturbance (months)	Slope Factor	K Factor	TASK Number
A	28980	3	0.35	0.051	1552

From Table 4.1 the results show that the internal 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.

4.3 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.

4.4 Sediment Loss Estimate

As the site has been classified as high-risk, a sediment loss estimate has been included to indicate the recommended sediment control techniques.

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 4.2 Potential Sediment Loss (RUSLE)

Catch. ID	Area (ha)	Soil Type*	Slope length (m)	Slope Grade (%)	Intensity $^{6}I_{2}$ (mm/hr)	R	K	LS	C	P	A (t/ha/yr)	Yeild (m^3/yr)
A	2.90	-	200	2.00	11.8	3004	0.051	0.58	1	1.3	115.5	257.5

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

4.5 Sediment Control Standard

Table B1 of the guidelines (IECA, 2016) provides a method for determining the sediment control standard for construction activities based on the estimated soil loss rate. Based on the estimated soil loss rates and the size of the contributing catchment, Type 1 sediment controls are required for this site as a minimum. A list of Type 1 and supplementary sediment control techniques is provided in Table 4.3 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 4.3 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
Concentrated flow treatment	• Sediment Basin	• Straw Bale Barrier

		• Kerb Inlet Sediment Traps (on-grade and sag inlet traps, including Gully Bags)
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 of Type D sediment basin or high filtration system	• Straw Bale Barrier (short-term device only)
Other		• Construction exits (Rock Pads, Wash Bays)

4.5.1 Sediment Basin Requirements

Sediment basins are generally required where:

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

As presented in Table 4.2, it is expected that the potential soil loss over the site will exceed 75 t/ha/yr, Given the site area is also greater than 10,000 m^2, a sediment basin will be required during the construction phase of the project.

It is proposed to construct one (1) Type B temporary sediment basins during the construction phase to capture sediment laden stormwater runoff from each catchment. The temporary sediment basins have been sized in accordance with the Water By Design Simple Type D.

The chemical dosing system for the basin is to be designed by others at detailed design stage.

A summary of the basin design parameters is presented in Table 4.4.

Table 4.4 Sizing of Sediment Controls

Catch ID	Area (ha)	Length to Width Ratio L:W	Settling Volume (m^3)	Sediment Storage Volume (m^3)	Basin Depth (m)	Approximate Area (m^2)
A	2.89	1:3	1090	45	1.6	1398

5. Stormwater Quality Management Plan

5.1 Water Quality Objective (WQO)

In accordance with Schedule 6 of the Logan Planning Scheme, 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).

5.2 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.

The conceptual parameters of the proposed bio-retention basins are presented in Table 5.1, and further detail of the input parameters used within MUSIC are included in Appendix D. The location of the proposed treatment train elements is included within Appendix A.

Typical sections of a bioretention basin have been included in Figure 5.1, Figure 5.2. The bioretention system will been designed in accordance with the Water By Design Bioretention Technical Design Guidelines during the detailed design phase of the development (Water By Design, 2014).

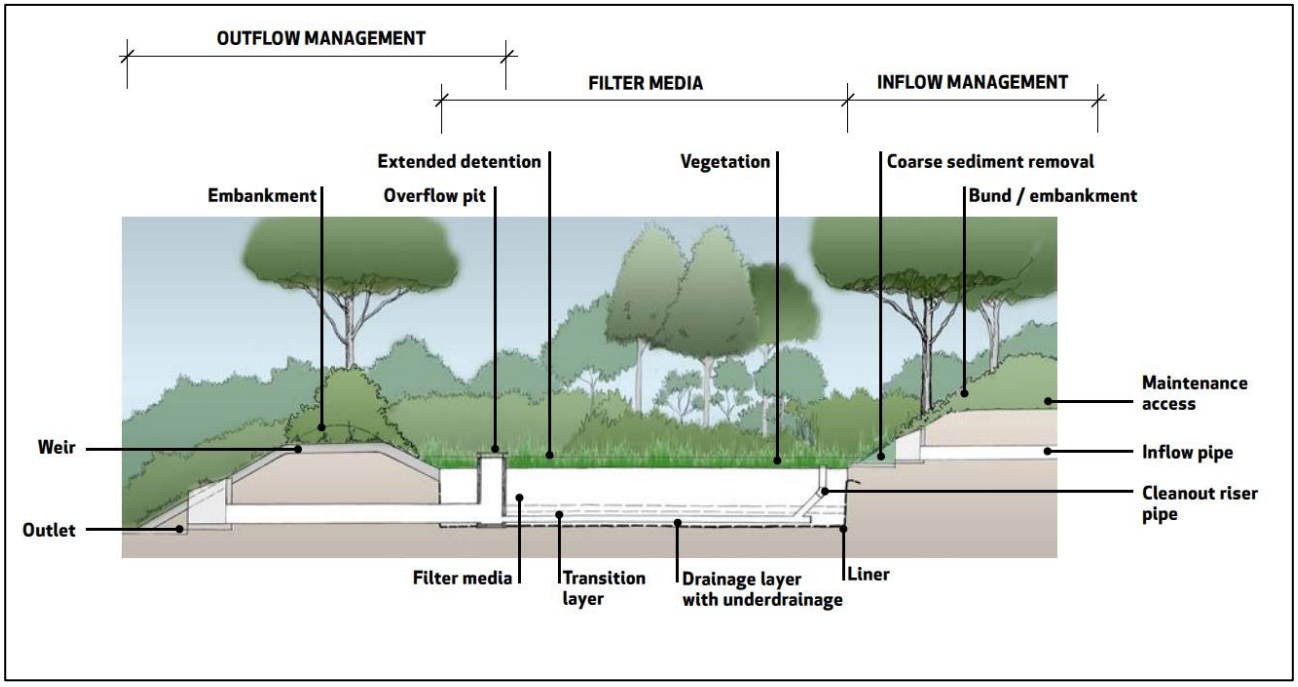


Figure 5.1 Typical bioretention basin (Water By Design, 2014)

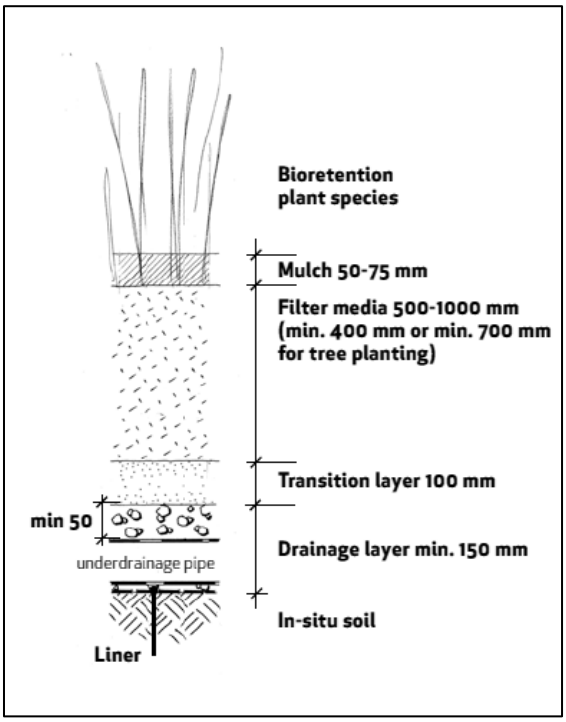


Figure 5.2 Typical Lined Bioretention Drainage Profile (Water By Design, 2014)

Table 5.1 Proposed Bio-retention Basin Parameters

Basin ID	Parameter	Value
A	Extended Detention Depth	0.3m
	Filter Media Area	305m^2
	Filter Media Depth	0.5m
	Transition Layer	100mm
	Drainage Layer	150mm

5.3 MUSIC Results

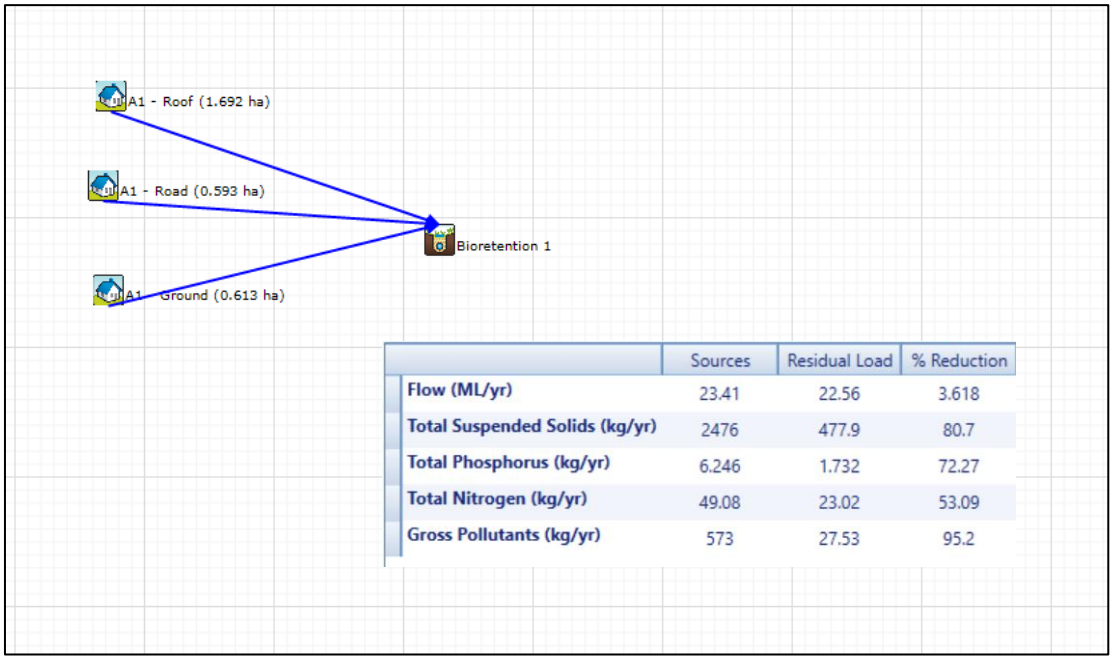
Results of the MUSIC modelling for the treatment train effectiveness are summarised in Table 5.2. The results indicate the 80%, 60%, 45% and 90% reduction target for TSS, TP, TN and gross pollutants respectively are achieved for the rainfall data set simulated.

Table 5.2 Treatment Train Effectiveness

Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction Achieved (%)	Water Quality Objective (%)
TSS	2476	477.9	80.7	80.0
TP	6.246	1.732	72.27	60.0
TN	49.08	23.02	53.09	45.0
GP	573	27.53	95.2	90.0

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 is presented in Figure 5.3.



	Sources	Residual Load	% Reduction
Flow (ML/yr)	23.41	22.56	3.618
Total Suspended Solids (kg/yr)	2476	477.9	80.7
Total Phosphorus (kg/yr)	6.246	1.732	72.27
Total Nitrogen (kg/yr)	49.08	23.02	53.09
Gross Pollutants (kg/yr)	573	27.53	95.2

Figure 5.3 Treatment Train Layout & MUSIC Results

5.4 Coarse Sediment Removal

In accordance with Table 13 of the Bioretention Technical Design Guideline (Water by Design, 2014), bioretention systems with a catchment area greater than 2 ha but less than 5 ha should include Vegetated swale, coarse sediment forebay, inlet pond or gross pollutant trap for course sediment removal. A course sediment forebay has been selected as the pre-treatment measure for the proposed system and has been designed in accordance with the procedures outlined in the Water Sensitive Urban Design Guidelines (Water by Design, 2006) as outline below.

5.4.1 Sedimentation Forebay Area

This required sediment forebay area was determined using Equation 4 in Section 3.4.3.2 of the Bioretention Technical Design Guidelines (Water By Design, 2014) as shown below.

$$R = 1 - \left[1 + \frac{1}{n} \times \frac{v_s}{Q/A_f}\right]^n$$

Where:

R = fraction of target sediment removed (%)

v_s = settling velocity of target sediment (m/s)

Q = 3-month ARI flow rate (m3/s)

A_f = minimum forebay area for sediment capture (m²)

n = turbulence or short-circuiting parameter

The proposed sediment forebay design parameters are presented in Table 5.3. The proposed basin configuration provides a forebay area of 21 m^2.

Table 5.3 Sedimentation Basin Design Parameters (sediment forebay)

R	v_s	Q	As	n
80%	0.1 m/s	0.21 m^3/s	26.5 m^2	0.5

5.4.2 Sediment Storage Volume

The volume of accumulated sediment has been calculated considering a cleanout frequency of 1 year and a catchment loading rate of 1.6m^2/ha/year using the following equations:

$$V_s = A_c \times R \times L_0 \times F_C$$

Where:

V_s = volume of sediment storage required (m^2)

A_c = contributing catchment area (ha)

R = capture efficiency (%)

L_0 = sediment loading rate (m^3/ha/year)

F_c = desired cleanout frequency (years)

The sediment storage volume calculation is presented in Table 5.4. The proposed sediment forebay design has allowed for the calculated sediment volume of 2.73 m^3 to be captured.

Table 5.4 Sedimentation Forebay Volume Design Parameters

A_c	R	L_0	F_c	V_s
2.898 ha	80%	1.6 m^3/ha/year	1 year	3.71 m^3

6. Conclusion

This Conceptual Stormwater Management Plan (CSMP) has been prepared in accordance with the Logan Planning Scheme 2015 and is to accompany the development application over this site for forty-one (41) residential lots. The following conclusions have been made as a result of this report.

Stormwater Quantity

- The Lawful Point of Discharge (LPD) for the site has been defined as mapped waterway which traverses the site's northern-western extent.
- Stormwater runoff will be conveyed to the detention basin where it will be released at LPD A in a controlled manner to ensure that there is non-worsening peak flow in the post-developed scenario. This detention device will have a 1% AEP volume of 207 m^3.

Stormwater Quality

- To achieve Logan City Council's Water Quality Objectives, it is proposed to use a bioretention system to treat stormwater runoff.
- The bioretention device will have a total filter media footprint of 305m^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 a sediment basin with approximately 45 m^3 of sediment storage is required.

Appendix A Burchills Engineering Solutions Civil Design Drawings

CHAMBERS FLAT ROAD

5
RP97736

4
RP97736

3
RP97736

2
RP97736

DRAINAGE RESERVE
5900m2

BASIN
1900m2

15.5m

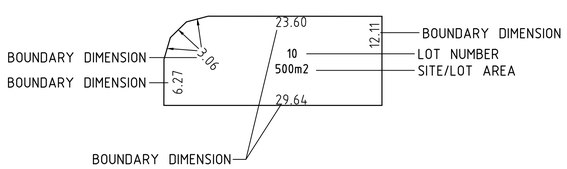
MASTER PLAN VILLAGE PRECINCT

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

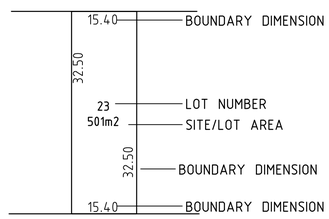
DEVELOPMENT SUMMARY

TOTAL SITE AREA:	3.489 ha
TOTAL AREA OF NEW ROAD:	0.599 ha
LENGTH OF NEW ROAD:	363.19 meters
TOTAL AREA ROAD PAVEMENT:	0.275 ha
TOTAL AREA OF BASIN :	0.19 ha
NET DEVELOPMENT AREA :	2.111 ha
NET SITE AREA DENSITY:	19.42 DWELLINGS/ha
GROSS SITE DENSITY:	11.75 DWELLINGS/ha

CORNER ALLOTMENT



STANDARD ALLOTMENT



LEGEND:

- TYPICAL ALLOTMENTS
- CORNER ALLOTMENTS
- DEVELOPMENT BOUNDARY

LOT FRONTAGE WIDTH BREAKDOWN

FRONTAGE WIDTH	No. ON LOTS
15-15.49m	30
16-16.99m	7
≥18m	4
TOTAL	41

YIELD BREAKDOWN

LOT SIZE	No. ON LOTS
500-549m2	37
550-599m2	3
≥600m2	1
TOTAL	41

PRELIMINARY

PARK LANE STAGE 6 - 552 CHAMBERS FLAT ROAD
LOT 5 RP178746
552-558 CHAMBERS FLAT ROAD
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
F	LAYOUT AMENDED	07.02.25
E	LAYOUT AMENDED	02.09.24
D	RFI AMENDMENTS	28.03.23
C	LAYOUT AMENDED	06.03.23
B	COLLECTOR ROAD ADDED	10.10.22
A	ISSUE FOR INFORMATION	01.07.22

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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
PARK LANE STAGE 6
552 CHAMBERS FLAT ROAD
PRELIMINARY CIVIL
ENGINEERING DESIGN

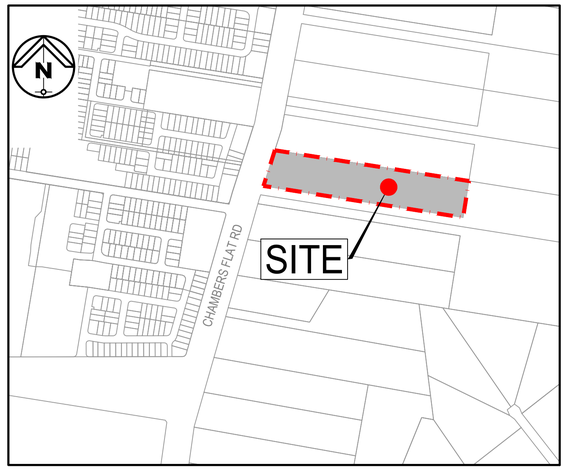
DRAWING TITLE :
MASTER PLAN
VILLAGE PRECINCT

DEVEL. APPLIC. No. :	DATE : 07.02.2025
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TN	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ:	
SCALE :	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : SK01 / VERSION: F

PROPOSED SUBDIVISION DEVELOPMENT
AT 552 CHAMBERS FLAT RD
LOGAN RESERVE QUEENSLAND
PARK LANE STAGE 6

PRELIMINARY CIVIL ENGINEERING DESIGN

CONTRACT BE220314



LOCALITY PLAN

N.T.S.

DRAWING INDEX	
DWG No.	DESCRIPTION
C000	COVER SHEET AND DRAWING SCHEDULE
C100	OVERALL SITE LAYOUT AND ROAD STRUCTURE PLAN
C101	TYPICAL CROSS SECTION, NOTES AND DETAILS
C200	PRELIMINARY EARTHWORKS LAYOUT PLAN
C210	PRELIMINARY EARTHWORKS SECTIONS
C220	EARTHWORKS NOTES AND DETAILS
C300	PRELIMINARY ROADWORKS & DRAINAGE LAYOUT PLAN
C302	PRELIMINARY ROAD 2 LONGITUDINAL SECTIONS
C301	PRELIMINARY ROAD LONGITUDINAL SECTIONS
C450	PRELIMINARY BIO DETENTION BASIN LAYOUT PLAN
C451	PRELIMINARY BIO BASIN SECTIONS
C452	TYPICAL BIO-RETENTION BASIN DETAILS
C600	PRELIMINARY SEWER & WATER LAYOUT PLAN

NOTE:

CONCEPT DESIGNS ARE BASED ON SITE SURVEY
DATA PROVIDED BY LANDPARTNERS.

PREPARED FOR

MB DEV B PTY LTD

PREPARED BY

BURCHILLS
ENGINEERING SOLUTIONS

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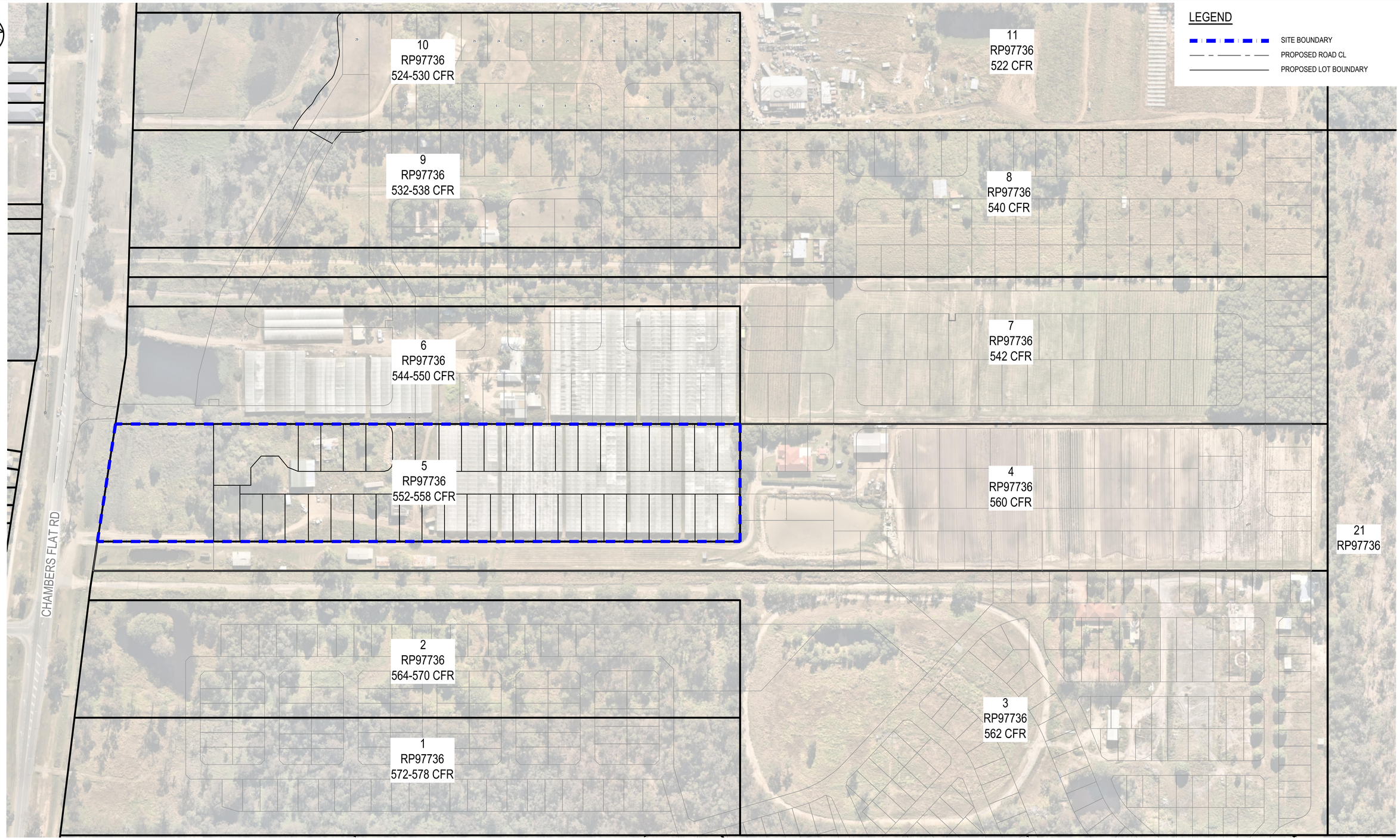
EMAIL: ADMIN@BURCHILLS.COM.AU
COOTE BURCHILLS ENGINEERING PTY LTD
ABN 76 166 942 365

DATE : 07-02-2025

PROJECT No.:	DRAWING No. :	VERSION:
BE220314	C000	B



OVERALL SITE LAYOUT AND ROAD STRUCTURE PLAN

SCALE 12.5 0 12.5 25 37.5 50 62.5 (metres)
1 : 1250 (FULL SIZE)

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
B	ISSUE FOR APPROVAL	07-02-25
A	ISSUE FOR INFORMATION	07-05-24

NOTE
This is an uncontrolled document issued for information purposes only, unless the checked sections are signed or completed.
Figured dimensions take precedence over scale. Do not scale reduced size drawings. Verify dimensions prior to commencing any on-site or off-site works or fabrication.

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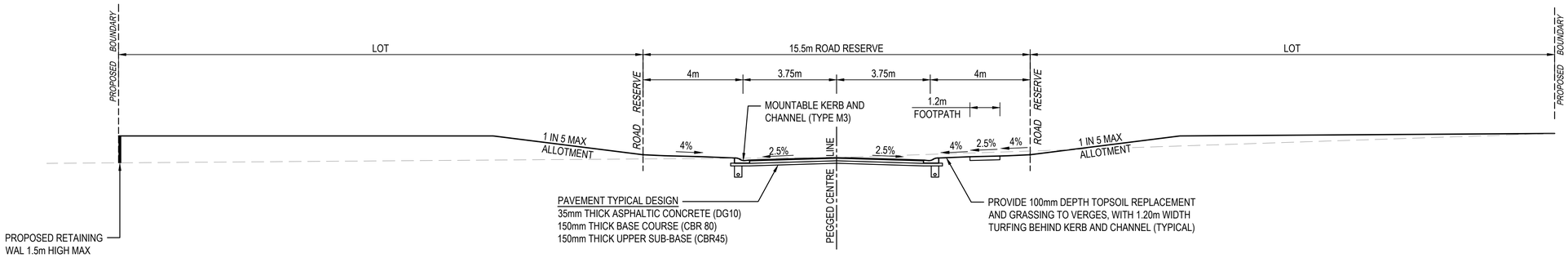
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
OVERALL SITE LAYOUT AND ROAD STRUCTURE PLAN

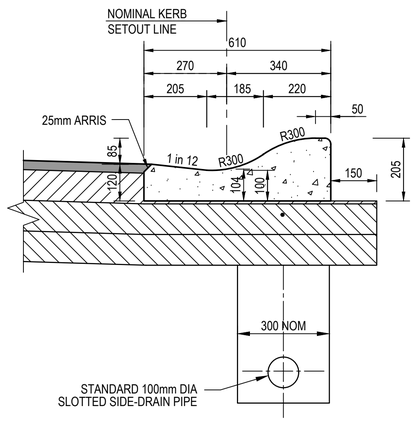
DEVEL. APPLIC. No. :	DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	

SCALE :	DATUM : AHD	FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C100	VERSION: B



ROADS 01-02 TYPICAL CROSS SECTION
7.5m K-K ACCESS STREET

SCALE 1 0 1 2 3 4 5 (metres)
1 : 100 (FULL SIZE)



MOUNTABLE KERB AND CHANNEL TYPE M3

SCALE 0.1 0 0.1 0.2 0.3 0.4 0.5 (metres)
1 : 10 (FULL SIZE)

PAVEMENT AND KERB NOTES:

1. BATTER SLOPES AND PAVEMENT CROSSFALLS SHOWN ON THIS DRAWING ARE TYPICAL ONLY. FOR VARIATION FROM THE STANDARD PROFILES REFER RELEVANT ROADWORKS DRAWINGS.
2. PAVEMENT DEPTHS SHOWN ON THIS DRAWING ARE DESIGN DEPTHS ONLY AND MAY BE VARIED ONCE SUBGRADE TESTS ARE TAKEN. TURNOUTS ARE TO BE PAVED WITH THE SAME MATERIAL AND COMPACTED TO THE SAME STANDARD AS THE ROAD ADJACENT.
3. KERB AND CHANNEL, MEDIAN KERB AND OTHER EDGE SECTIONS SHALL BE CONCRETE CLASS S25, AND THE MIX DESIGNED SPECIFICALLY FOR EXTRUSION.
4. REFER IPWEAQ STD DWG RS-080 FOR TYPICAL KERB DETAILS AND NOTES.
5. FOR DETAILS OF SIDE-DRAIN CONSTRUCTION REFER IPWEAQ STD DWGS RS-140 AND RS-142.
6. 1.2m WIDE REINFORCED CONCRETE FOOTPATH INCLUDING KERB RAMPS AND JOINTING TO BE CONSTRUCTED IN ACCORDANCE WITH IPWEAQ STD DWGS RS-065, RS-090 AND RS-094.

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
B	ISSUE FOR APPROVAL	07-02-25
A	ISSUE FOR INFORMATION	07-05-24

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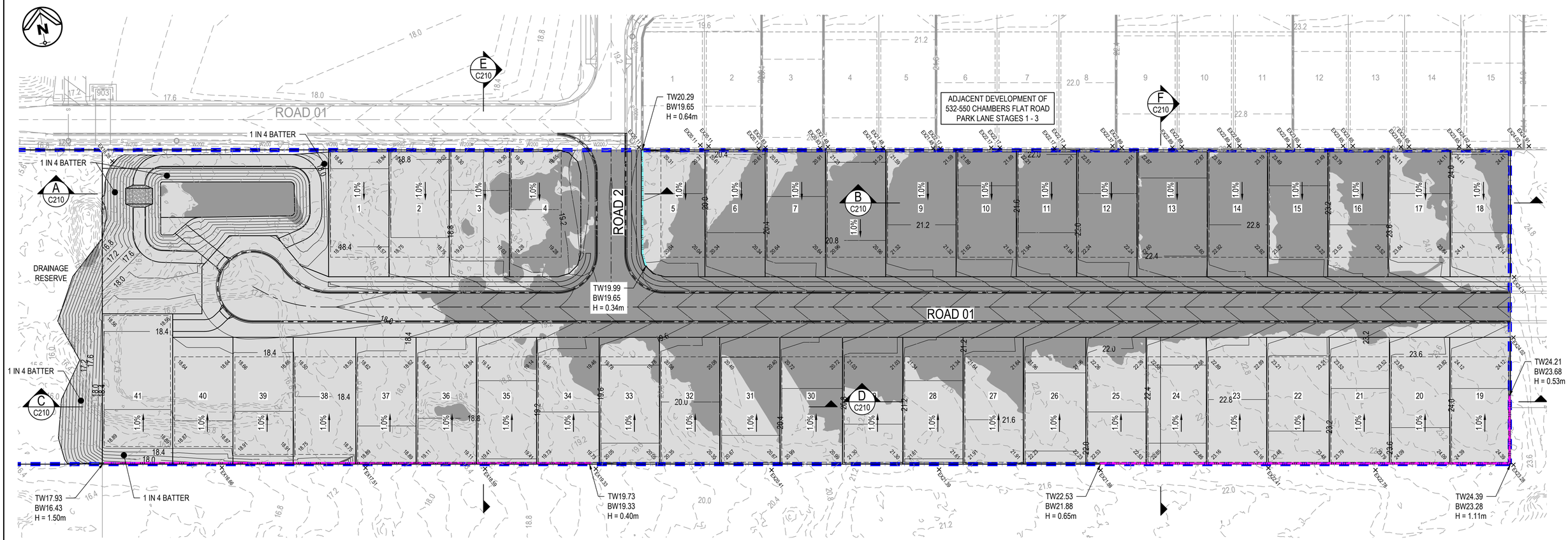
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
TYPICAL CROSS SECTION, NOTES AND DETAILS

DEVEL. APPLIC. No. :		DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG	
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365		
RPEQ No. :		
SCALE :	DATUM : AHD	FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C101	VERSION: B



PRELIMINARY EARTHWORKS LAYOUT PLAN

SCALE 5 0 5 10 15 20 25 (metres)
1 : 500 (FULL SIZE)

BULK EARTHWORKS SUMMARY

STRUCTURAL FILLING	
AREA	NETT SOLID FILL
OVERALL FILLING	
(ALLOTMENTS, BATTERS	10,810 cu.m.
TOTAL FILL REQUIRED	10,810 cu.m.
EXCAVATION	
AREA	NETT CUT
OVERALL EXCAVATION	4,537 cu.m.
TOTAL CUT	4,537 cu.m.

SUMMARY:
TOTAL MATERIAL ON LEADS (NETT FILL) = 6,273 cu.m.
i.e.10,810cu.m - 4,537 cu.m.. = 6,273 cu.m. EXCESS MATERIAL TO BE IMPORTED.
ALLOWANCE FOR 200mm TOPSOIL STRIP
ALLOWANCE FOR 325mm ROAD BOX DEPTH
ALLOWANCE FOR 800mm BIO SPOIL
ALLOWANCE FOR 200mm TOPSOIL RESPREAD TO LOTS, VERGES AND DRAINAGE RESERVE

LEGEND

- SITE BOUNDARY
- 15.0 DESIGN SURFACE CONTOURS
- EXISTING LOT BOUNDARY
- SW EXISTING STORMWATER
- W EXISTING WATER
- S EXISTING SEWER
- EXISTING ROAD CONTROL LINE
- EXISTING KERB
- 15.0 DESIGN SURFACE CONTOURS
- PROPOSED ROAD CONTROL LINE
- PROPOSED MOUNTABLE KERB AND CHANNEL (TYPE M3)
- PROPOSED BOULDER RETAINING WALL (1.5m MAX)
- PROPOSED SLEEPER RETAINING WALL (1.5m MAX)
- EARTHWORKS AREA OF FILL
- EARTHWORKS AREA OF CUT
- ×EX22.75 EXISTING SPOT LEVEL

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
B	ISSUE FOR APPROVAL	07-02-25
A	ISSUE FOR INFORMATION	07-05-24

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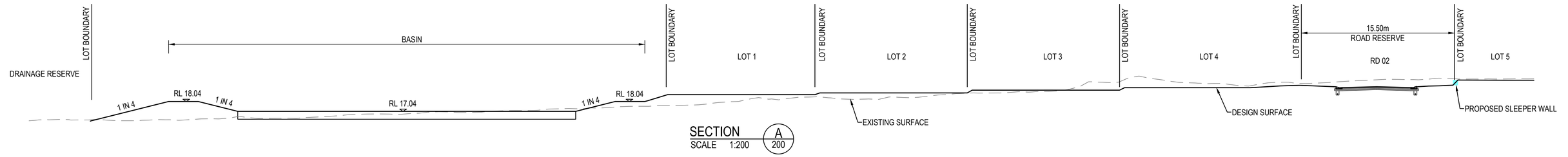
Email: admin@burchills.com.au
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

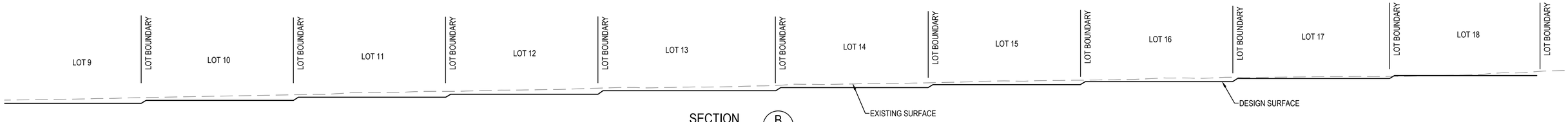
PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY EARTHWORKS LAYOUT PLAN

DEVEL. APPLIC. No. :	DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	
SCALE :	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C200 / VERSION: B



SECTION A
SCALE 1:200 A 200



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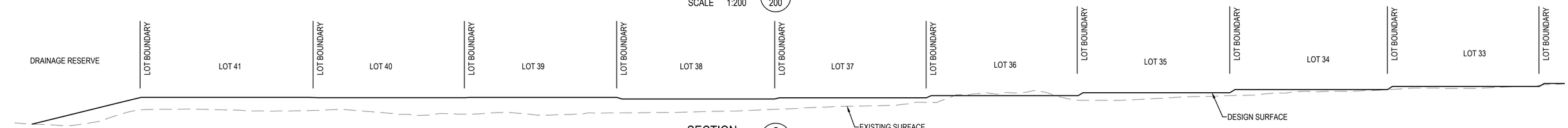
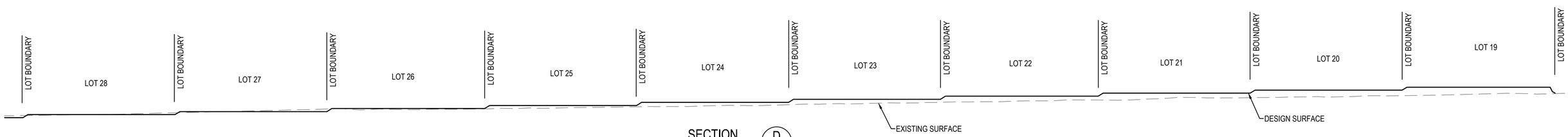
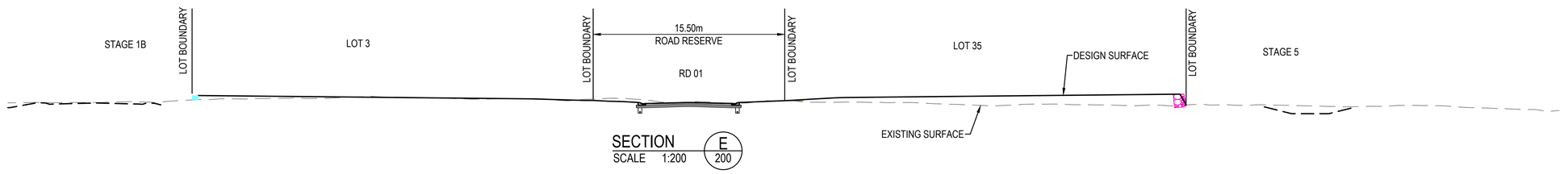
SCALE 1:200 B 200



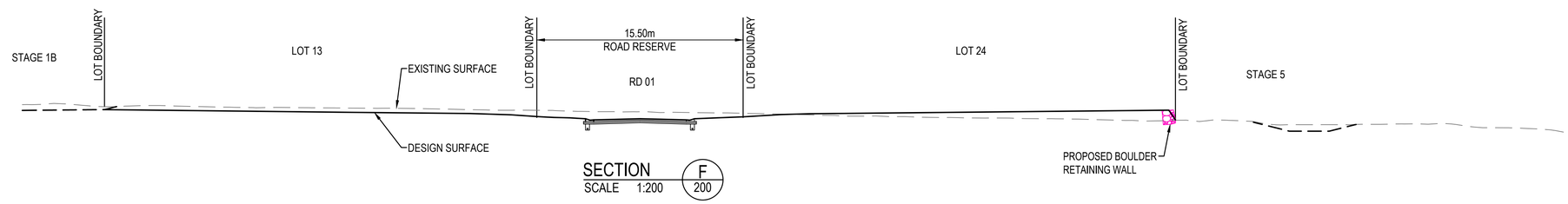
SECTION C
SCALE 1:200 C 200



SECTION D
SCALE 1:200 D 200



SECTION E
SCALE 1:200 E 200



SECTION F
SCALE 1:200 F 200

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
B	ISSUE FOR APPROVAL	07-02-25
A	ISSUE FOR INFORMATION	07-05-24

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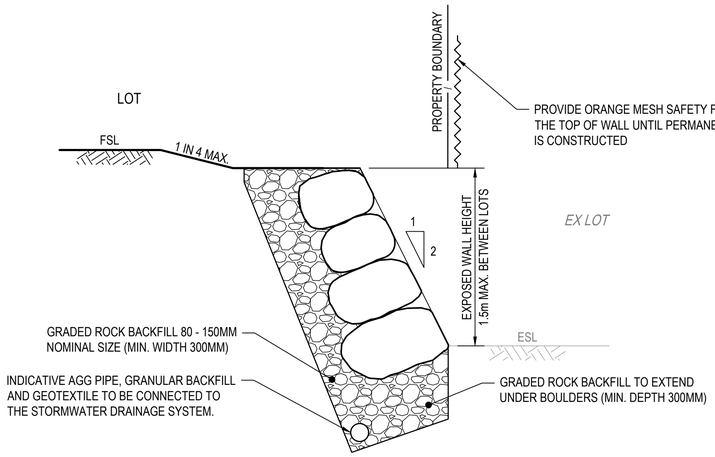
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

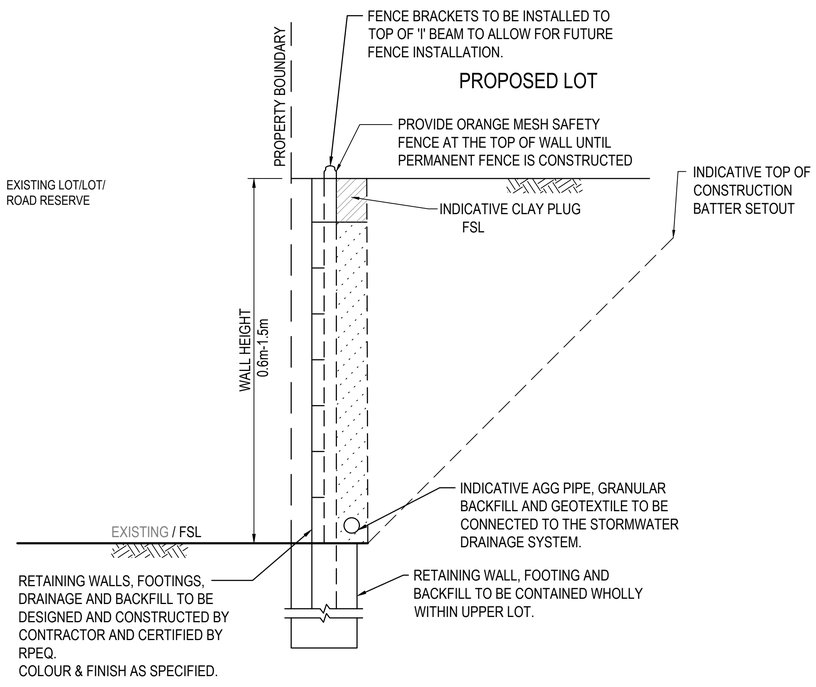
PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY EARTHWORKS SECTIONS

DEVEL. APPLIC. No. :	DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	
SCALE :	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C210 / VERSION: B



BOULDER RETAINING WALL CONFIGURATION BETWEEN LOTS & EXISTING LOTS (1.5m MAX.)



RETAINING WALL CONFIGURATION - BETWEEN PROPOSED LOTS

NTS

NOTE:
RETAINING WALL DESIGN, CONSTRUCTION, SUPERVISION AND CERTIFICATION TO BE PROVIDED BY SPECIALIST SUB-CONTRACTOR.

GENERAL EARTHWORKS NOTES:

1. ALL EARTHWORKS CONSTRUCTION UNDER THIS CONTRACT IS TO BE PERFORMED STRICTLY IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT PREPARED BY THE PRINCIPAL'S GEOTECHNICAL CONSULTANT.
2. 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.
3. ALL DESIGN LEVELS SHOWN ON THE CONTRACT DRAWINGS ARE FINISHED SURFACE LEVELS FOLLOWING TOPSOIL REPLACEMENT.
4. ALL STRUCTURAL FILL MATERIAL PLACED SHALL BE COMPACTED TO THE FOLLOWING MINIMUM DENSITY IN ACCORDANCE WITH THE SPECIFICATION AND THE GEOTECHNICAL REPORT:

   a) 95% DENSITY RATIO FOR GENERAL STRUCTURAL FILL (COHESIVE MATERIAL)
   b) 98% DENSITY RATIO FOR THE TOP 300mm DEPTH BELOW PAVEMENT SUBGRADE LEVEL
   (COHESIVE MATERIAL)
5. FILL MATERIAL USED IN WETLAND BATTERS IS TO BE STIFF TO HARD CLAYS OR OTHER SUITABLE MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER.
6. ALL EARTHWORKS BATTERS STEEPER THAN 1 IN 4 ARE TO BE LANDSCAPED IN ACCORDANCE WITH LANDSCAPE ARCHITECTS PLANS.
7. EXISTING DAMS ARE TO BE DE-WATERED AND CLEANED-OUT. ALL UNSUITABLE OR SATURATED MATERIAL IS TO BE REMOVED AND REPLACED WITH SELECTED ON-SITE STRUCTURAL FILL MATERIAL AND COMPACTED AS SPECIFIED.
8. PROVIDE CONDITION SURVEY OF ADJACENT RESIDENTIAL BUILDINGS FOR ALL PROPERTIES LOCATED WITHIN NOMINAL 100m OF EARTHWORKS OPERATIONS. CONDITION SURVEY TO BE UNDERTAKEN BY QUALIFIED PERSONNEL WITH BUILDING EXPERIENCE.

RETAINING WALL NOTES:

1. RETAINING WALLS, FOOTINGS, DRAINAGE, BACKFILL AND CONNECTION OF AGGREGATE DRAINS TO STORMWATER DRAINAGE SYSTEM TO BE DESIGNED AND CONSTRUCTED BY THE CONTRACTOR AND CERTIFIED BY AN SUITABLY QUALIFIED RPEQ
2. THESE DRAWINGS IDENTIFY SURFACE PROFILES, RETAINING WALL LOCATIONS, AND SETOUT INFORMATION ONLY. REFER TO CONTRACTOR SUPPLIED DRAWINGS FOR RPEQ STRUCTURAL DETAILS, WALL MATERIALS AND COMPACTION SPECIFICATIONS AND CONSTRUCTIBILITY INFORMATION.
3. RETAINING WALL DESIGN ENGINEER TO PROVIDE RPEQ FORM 15 STRUCTURAL CERTIFICATE INCLUDING GEOTECHNICAL GLOBAL STABILITY CERTIFICATION BY GEOTECHNICAL ENGINEER. WALL DESIGN TO ASSUME SURCHARGE LOADING BEHIND WALL. DESIGN TO BE IN ACCORDANCE WITH AS4678 INCLUDING ALL REQUIRED DESIGN LOAD CASES AND COMBINATIONS.
4. RETAINING WALLS TO BE DESIGNED TO CONSIDER ALL LOADS INCLUDING CONSTRUCTION LOADS AND OPERATIONAL LOADS.
5. ANY GEOTECHINCAL INFORMATION PROVIDED BY THE PRINCIPAL OR THE SUPERINTENDENT SHALL BE FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR AND THE RETAINING WALL DESIGN ENGINEER SHOULD SATISFY THEMSELVES OF THE DESIGN SOIL PARAMETERS AND UNDERTAKE AND ADDITIONAL GEOTECHNICAL INVESTIGATION DEEMED NECESSARY BY THE DESIGN ENGINEER.
6. THE CONTRACTOR SHALL ENSURE THAT ANY CONFLICT BETWEEN THESE PROJECT DRAWINGS AND THE RETAINING WALL DRAWINGS PREPARED BY THE RETAINING WALL DESIGN ENGINEER IS RESOLVED WITH THE SUPERINTENDENT PRIOR TO CONSTRUCTION COMMENCING.
7. A COPY OF THE RETAINING WALL DESIGN DRAWINGS, INCLUDING CONNECTION OF AGGREGATE DRAINS TO THE STORMWATER DRAINAGE SYSTEM, DESIGN PARAMETERS AND CERTIFICATION BE PROVIDED TO THE SUPERINTENDENT AT THE PRE-START MEETING PRIOR TO CONSTRUCTION COMMENCING.
8. ANY RETAINING WALL AND BATTER EXCEEDING THE HEIGHT OF 1.5m, THE CONTRACTOR SHALL UNDERTAKE A THIRD PARTY RPEQ REVIEW OF THE PROPOSED DESIGN.

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

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B	ISSUE FOR APPROVAL	07-02-25
A	ISSUE FOR INFORMATION	07-05-24

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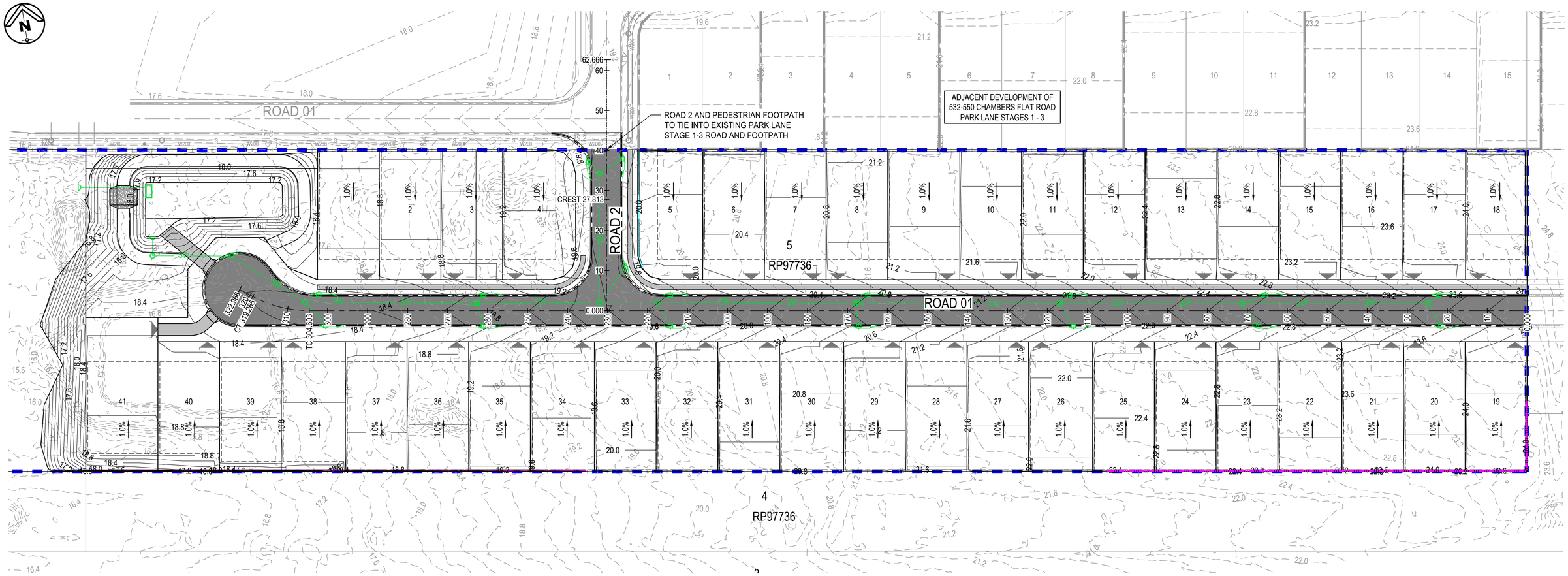
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
EARTHWORKS NOTES AND DETAILS

DEVEL. APPLIC. No. :		DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG	
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365		
RPEQ No. :		
SCALE :	DATUM : AHD	FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C220	VERSION: B



PRELIMINARY ROADWORKS & DRAINAGE LAYOUT PLAN

SCALE 5 0 5 10 15 20 25 (metres)
1 : 500 (FULL SIZE)

LEGEND

- SITE BOUNDARY
- 15.0 DESIGN SURFACE CONTOURS
- EXISTING LOT BOUNDARY
- SW EXISTING STORMWATER
- W EXISTING WATER
- S EXISTING SEWER
- EXISTING ROAD CONTROL LINE
- EXISTING KERB
- 15.0 DESIGN SURFACE CONTOURS
- PROPOSED ROAD CONTROL LINE
- PROPOSED MOUNTABLE KERB AND CHANNEL (TYPE M3)
- PROPOSED BOULDER RETAINING WALL (1.5m MAX)
- PROPOSED SLEEPER RETAINING WALL (1.5m MAX)
- SW PROPOSED STORMWATER
- GULLY PIT / MANHOLE STORMWATER
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT
- VXO LOCATION

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

VER.	DESCRIPTION	DATE
B	ISSUE FOR APPROVAL	07-02-25
A	ISSUE FOR INFORMATION	07-05-24

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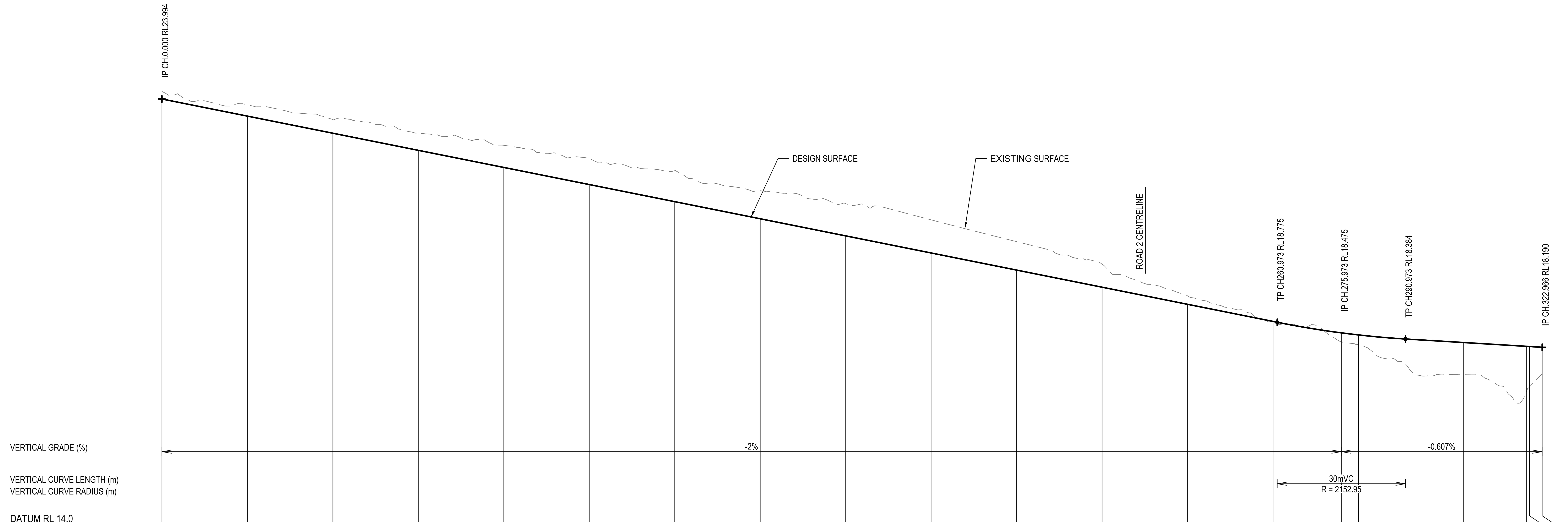
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY ROADWORKS & DRAINAGE LAYOUT PLAN

DEVEL. APPLIC. No. :	DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	
SCALE :	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C300 / VERSION: B



DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve)	-0.18	-0.27	-0.32	-0.40	-0.52	-0.61	-0.72	-0.66	-0.75	-0.77	-0.67	-0.54	-0.20	0.02	0.21	0.22	0.78	0.75	1.06	0.95	0.62
FINISHED SURFACE LEVEL	23.994	23.594	23.194	22.794	22.394	21.994	21.594	21.194	20.794	20.394	19.994	19.594	19.194	18.794	18.527	18.479	18.329	18.301	18.212	18.208	18.190
EXISTING SURFACE LEVEL	24.17	23.87	23.51	23.19	22.91	22.60	22.32	21.85	21.55	21.17	20.66	20.13	19.39	18.77	18.32	18.25	17.55	17.55	17.15	17.26	17.57
CONTROL LINE CHAINAGE	0.000	20.000	40.000	60.000	80.000	100.000	120.000	140.000	160.000	180.000	200.000	220.000	240.000	260.000	275.973	280.000	300.000	304.603	319.265	320.000	322.966

HORIZONTAL GEOMETRY

R30m
14.66m

PRELIMINARY ROAD LONGITUDINAL SECTIONS

SCALES

5 0 5 10 15 20 25 — 1 : 500 HORIZ.

0.5 0 0.5 1.0 1.5 2.0 2.5 — 1 : 50 VERT. (FULL SIZE)

(metres)

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

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PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY ROAD LONGITUDINAL SECTIONS

DEVEL. APPLIC. No. : | DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS | DESIGNER : TG
DRAFTSPERSON : TT | CHECKED : FRASER LUCAS
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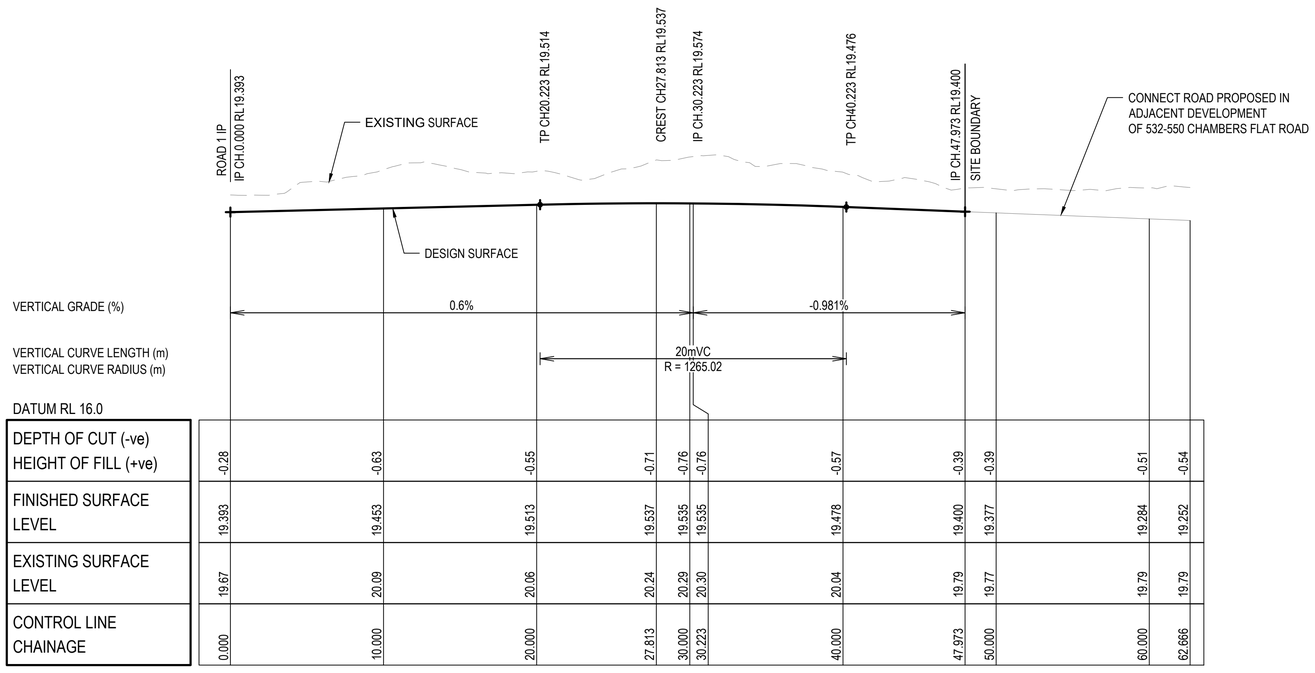
RPEQ No. :
SCALE : | DATUM : AHD | FULL SIZE : A1
PROJECT No.: BE220314 | DRAWING No. : C301 | VERSION: B



DEPTH OF CUT (-ve) HEIGHT OF FILL (+ve)	-0.28	-0.63	-0.55	-0.71	-0.76	-0.76	-0.57	-0.39	-0.39	-0.51	-0.54	
FINISHED SURFACE LEVEL	19.393	19.453	19.513	19.537	19.535	19.535	19.478	19.400	19.377	19.284	19.252	
EXISTING SURFACE LEVEL	19.67	20.09	20.06	20.24	20.29	20.30	20.04	19.79	19.77	19.79	19.79	
CONTROL LINE CHAINAGE	0.000	10.000	20.000	27.813	30.000	30.223	40.000	47.973	50.000	60.000	62.666	

HORIZONTAL GEOMETRY

PRELIMINARY ROAD 2 LONGITUDINAL SECTIONS

VERTICAL SCALE 0.5 0 0.5 1 1.5 2 2.5 1:50 (meters)

HORIZONTAL SCALE 2 0 2 4 6 8 10 1:200 (meters)

(FULL SIZE)

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
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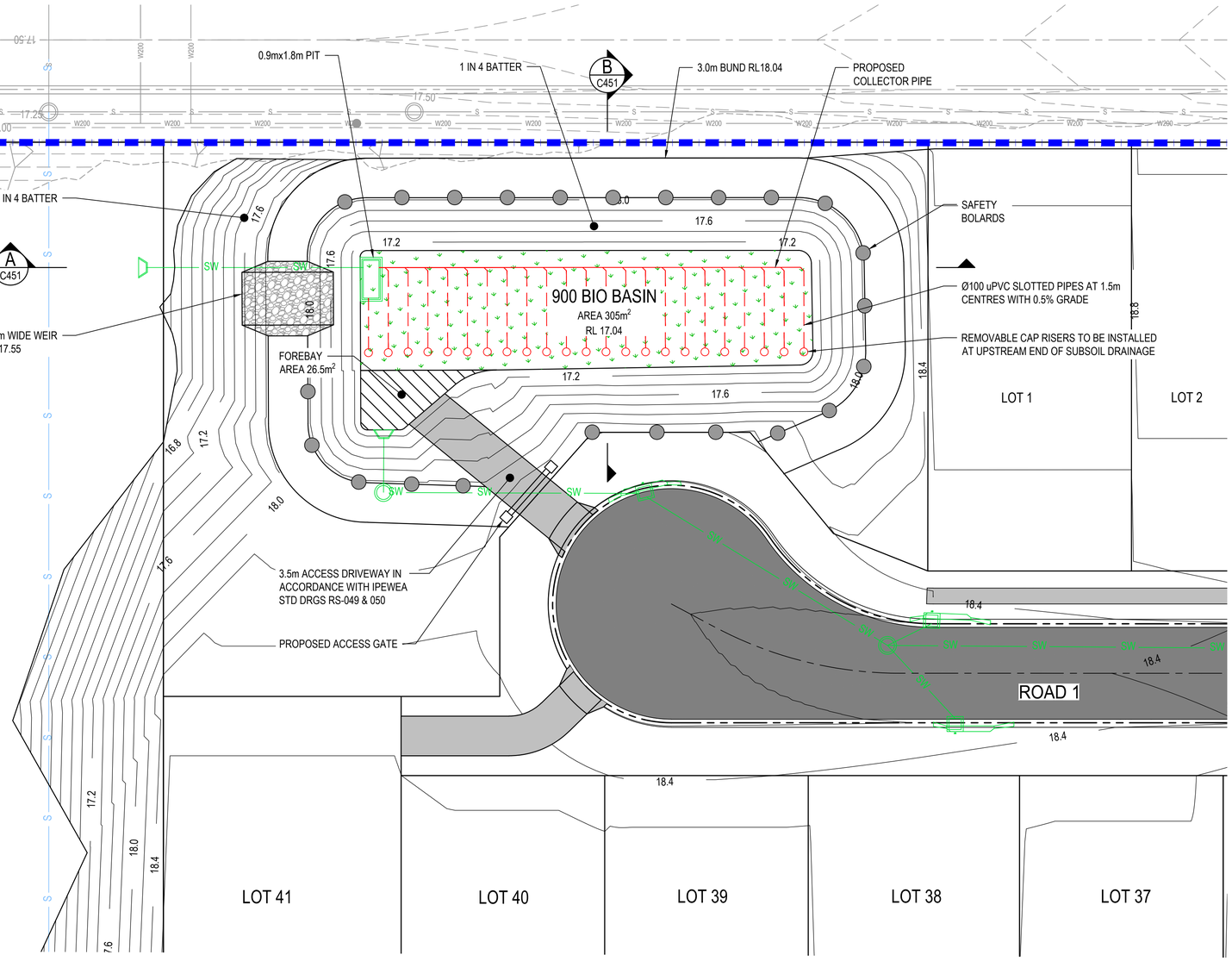
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY ROAD 2
LONGITUDINAL SECTIONS

DEVEL. APPLIC. No. :		DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG	
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365		
RPEQ No. :		
SCALE :	DATUM : AHD	FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C302	VERSION: B



LEGEND

- SITE BOUNDARY
- EXISTING SURFACE CONTOURS
- PROPOSED ROAD CENTRELINE
- PROPOSED SURFACE CONTOURS
- PROPOSED LOT BOUNDARY
- PROPOSED STORMWATER PIPE
- PROPOSED PAD LEVEL
- PROPOSED FIELD INLET PIT
- PROPOSED KERB INLET PIT
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT

PRELIMINARY BIO DETENTION BASIN LAYOUT PLAN

SCALE 2 0 2 4 6 8 10 (metres)
1 : 200 (FULL SIZE)

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

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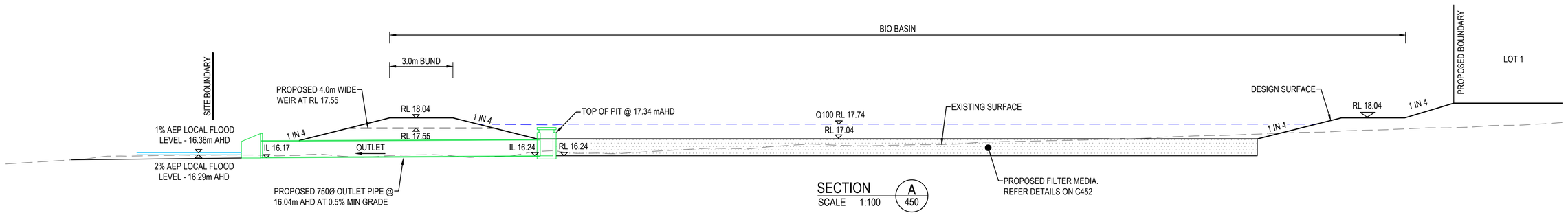
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

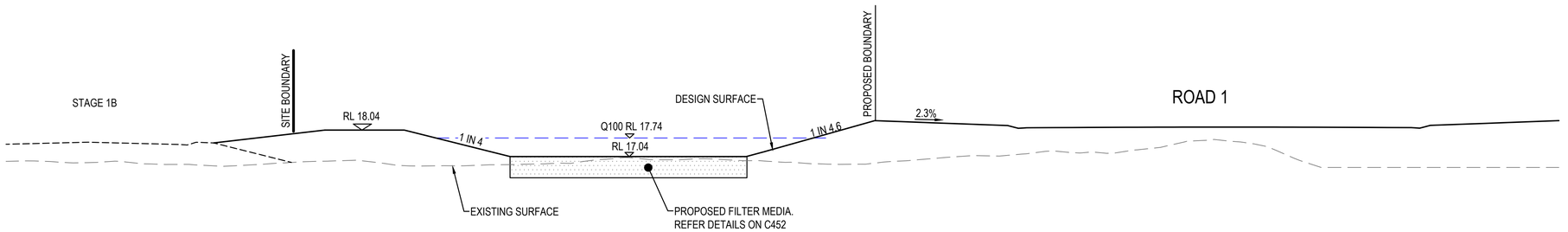
PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY BIO DETENTION BASIN LAYOUT PLAN

DEVEL. APPLIC. No. :	DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	
SCALE :	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C450 / VERSION: B



SECTION A
SCALE 1:100 450



SECTION B
SCALE 1:100 450

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

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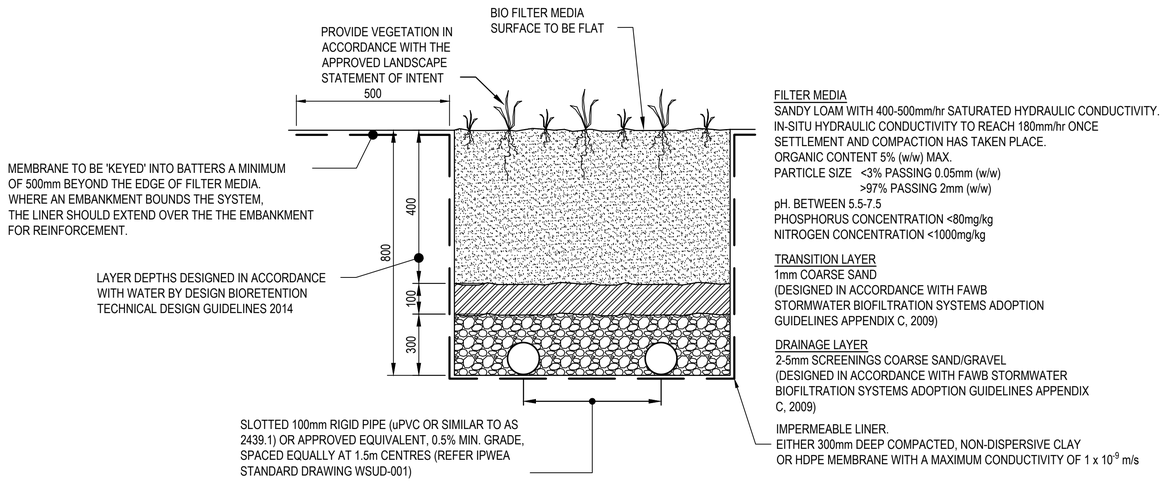
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

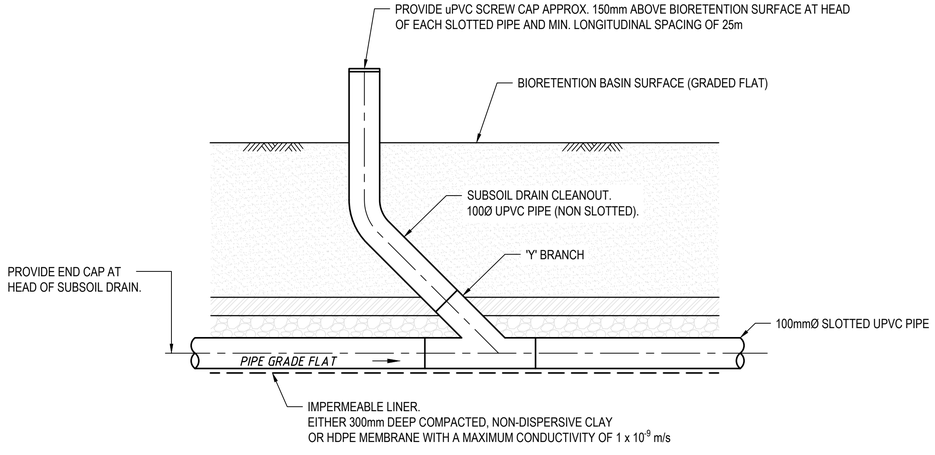
DRAWING TITLE :
PRELIMINARY BIO BASIN SECTIONS

DEVEL. APPLIC. No. :		DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG	
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365		
RPEQ No. :		
SCALE :	DATUM : AHD	FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C451	VERSION: B



TYPICAL BIO-RETENTION MEDIA CROSS SECTION

SCALE 0.1 0 0.1 0.2 0.3 0.4 0.5 (metres)
1 : 10 (FULL SIZE)



TYPICAL BIO-RETENTION BASIN SUBSOIL DRAIN CLEANOUT

N.T.S.

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
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A	ISSUE FOR INFORMATION	07-05-24

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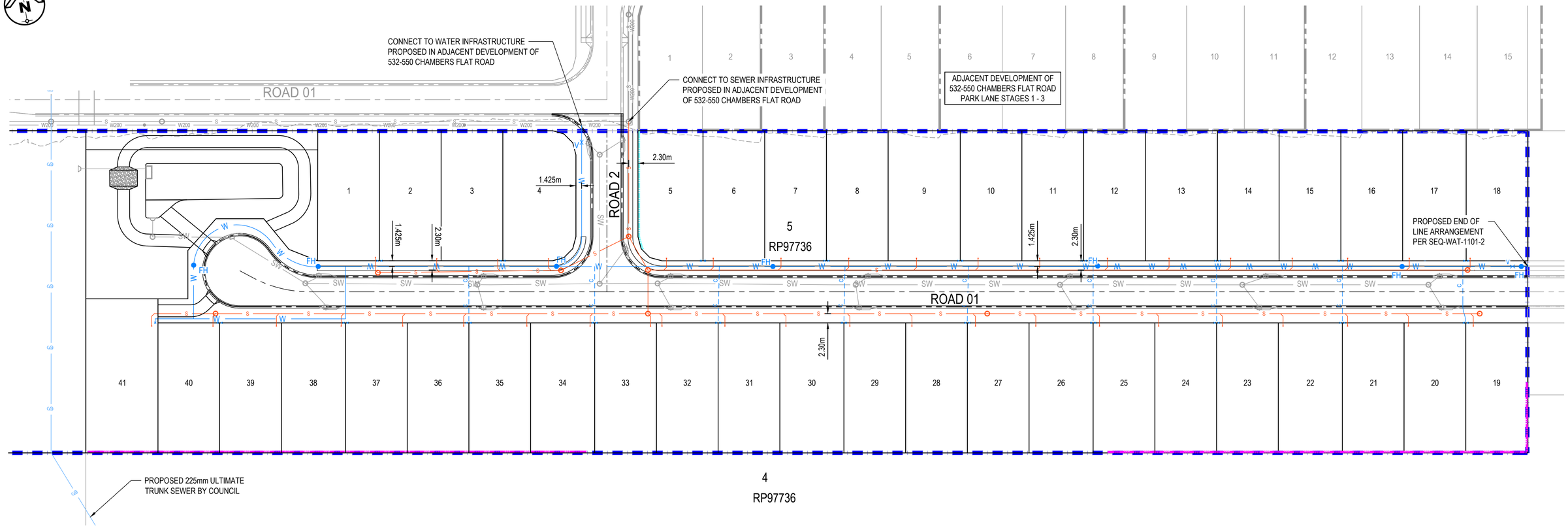
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
TYPICAL BIO-RETENTION BASIN DETAILS

DEVEL. APPLIC. No. :		DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG	
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365		
RPEQ No. :		
SCALE :	DATUM : AHD	FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C452	VERSION: B



PRELIMINARY SEWER & WATER LAYOUT PLAN

SCALE 5 0 5 10 15 20 25 (metres)
1 : 500 (FULL SIZE)

LEGEND

- SITE BOUNDARY
- EXISTING LOT BOUNDARY
- EXISTING STORMWATER
- EXISTING WATER
- EXISTING SEWER
- EXISTING ROAD CONTROL LINE
- EXISTING KERB
- PROPOSED ROAD CONTROL LINE
- PROPOSED MOUNTABLE KERB AND CHANNEL (TYPE M3)
- PROPOSED BOULDER RETAINING WALL (1.5m MAX)
- PROPOSED SLEEPER RETAINING WALL (1.5m MAX)
- PROPOSED WATER
- HYDRANT / VALVE
- WATER SERVICE LOCATION
- PROPOSED SEWER AND MANHOLE
- PROPOSED DN225 ULTIMATE TRUNK SEWER
- PROPOSED STORMWATER
- GULLY PIT / MANHOLE STORMWATER

552-558 CHAMBERS FLAT ROAD, LOGAN RESERVE
RPD: LOT 5 ON RP 178746
FOR
MB DEV B PTY LTD

A1 ORIGINAL SIZE BEFORE REDUCTION

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B	ISSUE FOR APPROVAL	07-02-25
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Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

PROJECT:
552-558 CHAMBERS FLAT ROAD
LOGAN RESERVE
PARK LANE STAGE 6

DRAWING TITLE :
PRELIMINARY SEWER & WATER LAYOUT PLAN

DEVEL. APPLIC. No. :	DATE : 07-02-25
PROJECT LEADER : FRASER LUCAS	DESIGNER : TG
DRAFTSPERSON : TT	CHECKED : FRASER LUCAS
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	
SCALE :	DATUM : AHD / FULL SIZE : A1
PROJECT No.: BE220314	DRAWING No. : C600 / VERSION: B

Appendix B Time of Concentration and Rational Method Calculations

Pre-Development Hydrology

The natural hydrology of the site has been assessed in accordance with QUDM 2016 Section 4.06.3. The time of concentration for all catchments has been determined using Friend's Equation as per QUDM Table 4.06.3, combined with a channel time flow calculation.

Friend's Equation $tc = (107nL^{0.333})/S^{0.2}$

Table B.1 presents a summary of the catchment parameters used within Friend's Equation and the calculated time of concentration for the pre-development scenario.

Table B.1 Time of Concentration for Pre-Development Scenario

Catchment ID	**A**	**Ext 1**
Overland Flow		
Estimated Sheet flow Length (Table 4.06.3)	100	100
Horton's Roughness Value	0.035	0.035
Slope (%)	2.3	2
tc (minutes)	14.69	15.11
Channel Flow		
Length of Channel Flow (m)	361	32
Velocity (m/s)	1.5	1.5
tc (minutes)	4.01	0.36
TOTAL tc (minutes)	18.70	15.46

Post-Development Hydrology – Unmitigated

Table B.2 presents a summary of the catchment parameters used for the calculated time of concentration for the post-development scenario.

Table B.2 Time of Concentration for Post-Development Scenario

Catchment ID	**Post A1**	**Post A2**
Standard Inlet Time	5	
Overland Flow		
Estimated Sheet flow Length (Table 4.06.3)	-	120
Horton's Roughness Value	-	0.035
Slope (%)	-	1
tc (minutes)	-	18.44
Pipe Flow Time		
Slope (%)	1%	-
Length of Pipe Flow (m)	357	-
Velocity (m/s)	1	-
tc (minutes)	5.95	-
TOTAL tc (minutes)	10.95	18.44

Design storm event flows across the site were derived using the Rational Method as per the above-mentioned manuals. This involved:

- Determination of a C10 value (derived in accordance with QUDM Table 4.05.3(b) and Council guidelines).
- Adoption of design rainfall using BoM IFD data; and
- Calculation of design flows through the site for Q100, Q50, Q20, Q10, Q5, Q2, Q1 and $Q3_{month}$, where $Q3_{month}$ is deemed to be 50% of Q1.

Summaries of the hydrologic calculations are contained in Table B.3 and Table B.4 for pre and post-development (un-mitigated) scenarios respectively.

Table B.3 Pre-Development Hydrology

Catch.	Area (ha)	tc (min)	I_{100} (mm/hr)	C	Q_{100} (m^3/s)	I_{50} (mm/hr)	C	Q_{50} (m^3/s)	I_{20} (mm/hr)	C	Q_{20} (m^3/s)	I_{10} (mm/hr)	C	Q_{10} (m^3/s)	I_5 (mm/hr)	C	Q_5 (m^3/s)	I_2 (mm/hr)	C	Q_2 (m^3/s)	I_1 (mm/hr)	C	Q_1 (m^3/s)
A	3.49	18.70	179.48	0.88	**1.52**	161.96	0.84	**1.32**	139.18	0.77	**1.03**	121.41	0.73	**0.86**	104.89	0.69	**0.71**	83.16	0.62	**0.50**	65.89	0.58	**0.37**
Ext 1	0.54	15.46	195.68	0.71	**0.21**	176.86	0.68	**0.18**	152.14	0.62	**0.14**	132.42	0.59	**0.12**	114.61	0.56	**0.10**	91.07	0.50	**0.07**	72.11	0.47	**0.05**

Table B.4 Un-Mitigated Post-Development Hydrology

Catch.	Area (ha)	tc (min)	I_{100} (mm/hr)	C	Q_{100} (m^3/s)	I_{50} (mm/hr)	C	Q_{50} (m^3/s)	I_{20} (mm/hr)	C	Q_{20} (m^3/s)	I_{10} (mm/hr)	C	Q_{10} (m^3/s)	I_5 (mm/hr)	C	Q_5 (m^3/s)	I_2 (mm/hr)	C	Q_2 (m^3/s)	I_1 (mm/hr)	C	Q_1 (m^3/s)
Post A1	2.90	10.95	227.16	0.98	**1.80**	205.73	0.94	**1.56**	176.68	0.86	**1.22**	153.44	0.82	**1.01**	133.01	0.78	**0.83**	105.81	0.70	**0.59**	83.61	0.66	**0.44**
Post A2	0.59	18.44	180.79	0.71	**0.21**	163.16	0.68	**0.18**	140.23	0.62	**0.14**	122.30	0.59	**0.12**	105.67	0.56	**0.10**	83.80	0.50	**0.07**	66.39	0.47	**0.05**

Appendix C XP-SWMM Input Parameters

Laurenson Routing Parameters

In this study, the "Laurenson" routing method was applied to XP-SWMM for hydrograph generation. To enable this method to be used, each catchment must be split into pervious (undeveloped) and impervious (developed) portions. Adopted parameters for the Laurenson routing method included:

The fraction impervious has been determined by analysis of aerial photographs and the proposed development layout;

- Manning Roughness coefficient (n):
- Pervious portion: 0.035 to 0.05; and
- Impervious portion: 0.015.

Initial Loss (IL) and Continuing Losses (CL) have been applied to the hydrologic model. Details of IL and CL parameters applied in the XP-SWMM model are presented in Table C.1.

Table C.1 Adopted Initial & Continuing Losses

Impervious Area		Pervious Area	
IL (mm)	**CL (mm/hr)**	**IL (mm)**	**CL (mm/hr)**
1	0	20	1.5

Analysis of the catchment has been undertaken to determine the average slope, with the results of this being applied to the model.

Table C.2 Pre-Development Catchment Parameters

Catchment	Impervious Area			Pervious Area		
	Area (ha)	**Fraction Impervious (%)**	**Slope (%)**	**Area (ha)**	**Fraction Impervious (%)**	**Slope (%)**
Pre A	1.5	100	2.3	1.99	0	2,3

Table C.3 Post-Development Catchment Parameters

Catchment	Impervious Area			Pervious Area		
	Area (ha)	**Fraction Impervious (%)**	**Slope (%)**	**Area (ha)**	**Fraction Impervious (%)**	**Slope (%)**
Post A1	2.17	100	1.5	0.73	0	1.5
Post A2	-	-	-	0.59	0	1

Appendix D MUSIC Input Parameters

Rainfall and Evapotranspiration Parameters

MUSIC modelling was based on 6-minute interval data obtained from the eWater for rainfall station 040312 New Beith, as summarised in Table D.1.

Table D.1 Meteorological and Rainfall Runoff Data Reporting Table

Input	Data Used in Modelling
Rainfall station	040406 – BEENLEIGH BOWLS
Time step	6 minute
Modelling period	10 years
Rainfall runoff parameters	Residential
Pollutant export parameters	Residential

Catchment Parameters

Based on the proposed land uses within the development, the subject site has been modelled as mixed land use as detailed in Table D.2. The site has been divided into road, roof and ground level source nodes. Individual lot areas were assumed to have 75% roofed area and 25% ground area.

Table D.2 Land Use Parameters

Catchment ID	Area (ha)	Land use	Total Impervious (%)
A - Roof	1.692	Residential	100
A - Ground	0.613	Residential	20
A - Road & Carpark	0.593	Residential	60

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 Table D.3 and Table D.4.

Table D.3 Rainfall Runoff Parameters

Parameter	All Nodes
Landuse	Residential
Rainfall threshold (mm)	1
Soil storage capacity (mm)	500
Initial storage (% capacity)	10
Field capacity (mm)	200
Infiltration capacity coefficient a	211
Infiltration capacity exponent b	5
Initial depth (mm)	50
Daily recharge rate (%)	28
Daily baseflow rate (%)	27
Daily deep seepage rate (%)	0

Table D.4 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) 2.18(3)	0.39	-0.89(1) -0.30(2) -0.47(3)	0.31	0.26	0.23
Base Flow Concentration	0(1) 1(2,3)	0(1) 0.34(2,3)	0(1) -0.97(2,3)	0(1) 0.31	0(1) 0.20(2,3)	0(1) 0.20(2,3)

NOTE: (1) Values applied to “Roof” areas
(2) Values applied to “Road” areas
(3) Values applied to “Ground” areas

Treatment Node Parameters

The following sections describe the modelling parameters applied to MUSIC for each of the treatment nodes included as part of the water quality assessment.

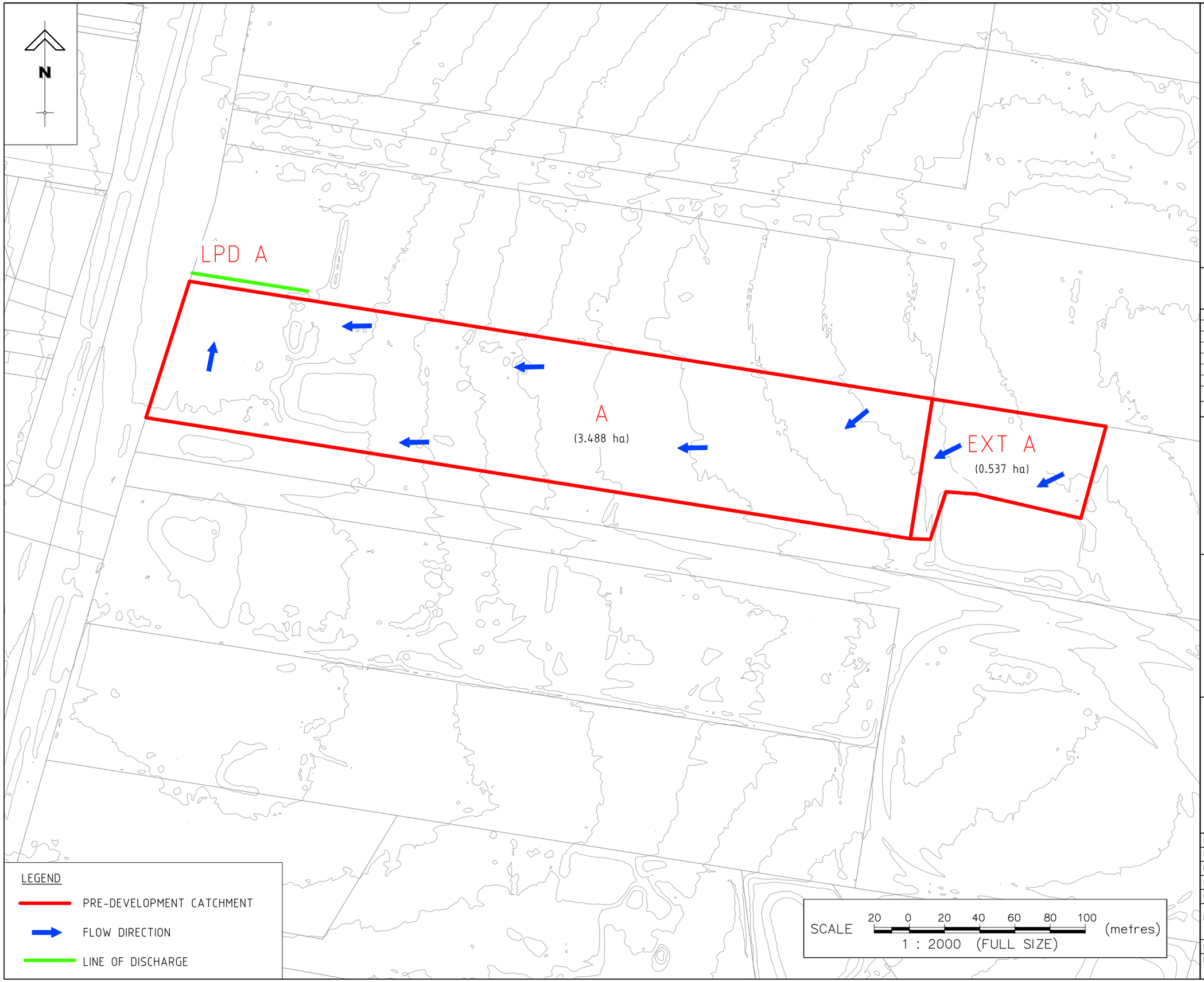
Bioretention System

The input parameters for the bioretention system are summarised in Table D.5.

Table D.5 Bioretention Parameters

ID	A
Surface area (m2)	305
Has the filter area been calculated appropriately? (Y / N / N/A)	Y
Extended detention depth (m)	0.3
Filter area (m^2)	305
Unlined filter media perimeter (m)	0.01
Saturated hydraulic conductivity (mm/hour)	200
Filter depth (m)	0.5
TN content of filter media (mg/kg)	400
Orthophosphate content of filter media (mg/kg)	30
Is the base lined? (Y/N)	Yes
Effectiveness of plant TN removal (effective/ineffective/unvegetated)	Effective
Overflow weir width (m)	2
Exfiltration rate (mm/hr)	0
If an exfiltration rate has been used, have node water balance losses been used in calculation of treatment train effectiveness? (Y / N / N/A)	N/A
If exfiltration rate has been used, is the exfiltration rate justified? (Y / N / N/A)	N/A
Underdrain present? (Y/N)	Yes
Submerged zone with carbon present?	No
Depth of submerged zone (m)	N/A
Confirmation that K and C* remain default? (Y/N)	Yes

Appendix E Catchment Plans



PROPOSED

552 CHAMBERS FLAT ROAD, LOGAN RESERVE

FOR

MB DEV B PTY LTD

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		03.02.25

REVISIONS

BURCHILLS ENGINEERING SOLUTIONS

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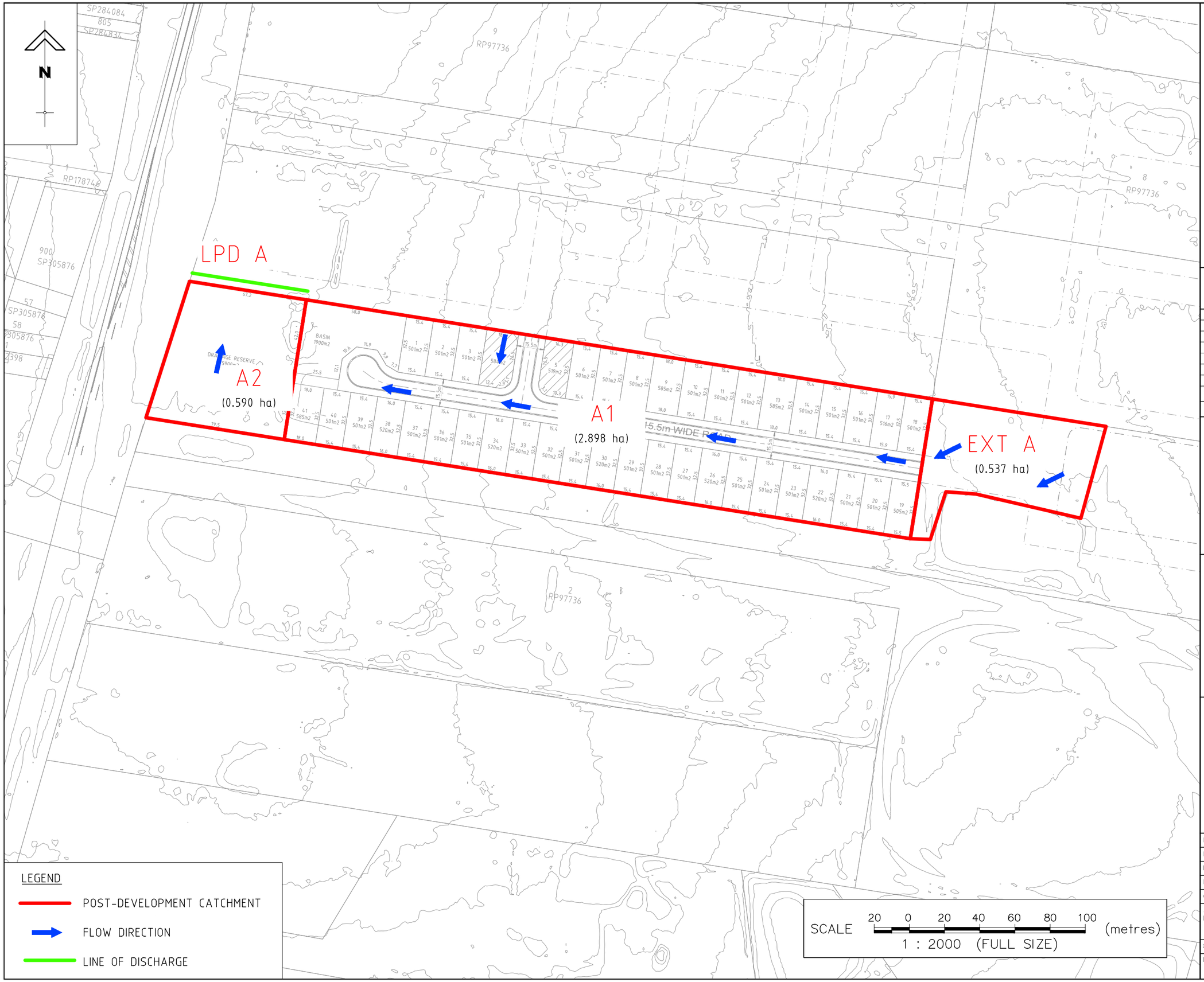
Coote Burchills Engineering Pty Ltd
ABN 76 166 942 365

DRAWING TITLE :

PRE-DEVELOPMENT CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 03.02.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : TK	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365	
RPEQ No. :	

SCALE : 1:2000	DATUM :	FULL SIZE : A3
PROJECT No.: BE220314	DRAWING No. : N200	VERSION: A



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552 CHAMBERS FLAT ROAD, LOGAN RESERVE

FOR

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A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		03.02.25

REVISIONS

NOTE

This is an uncontrolled document issued for information purposes only, unless the checked sections are signed or completed. Figured dimensions take precedence over scale. Do not scale reduced size drawings. Verify dimensions prior to commencing any on-site or off-site works or fabrication.

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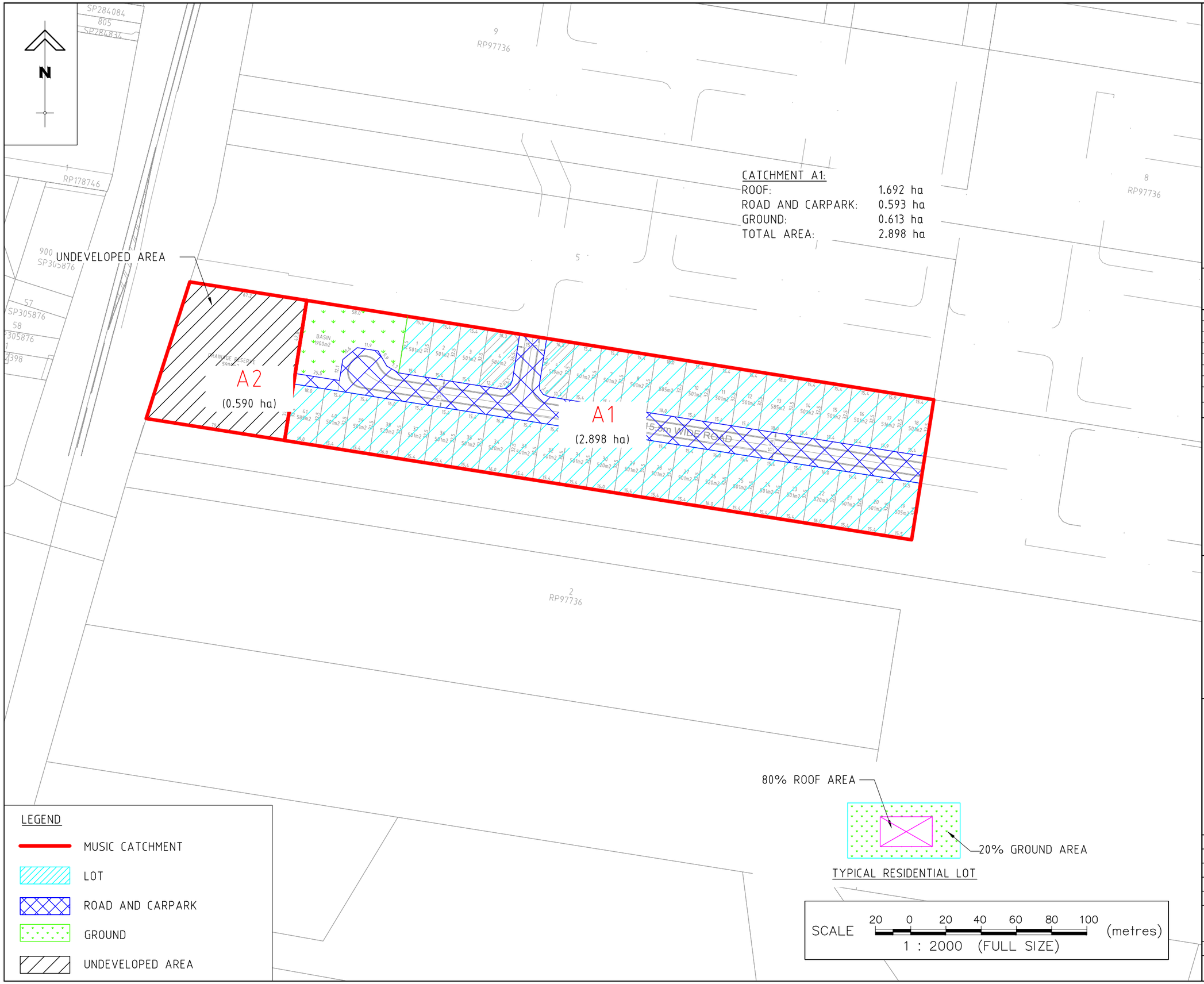
DRAWING TITLE :

POST-DEVELOPMENT CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 03.02.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : TK	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : 1:2000	DATUM : FULL SIZE : A3
PROJECT No.: BE220314	DRAWING No. : N201 VERSION: A



PROPOSED

552 CHAMBERS FLAT ROAD, LOGAN RESERVE

FOR

MB DEV B PTY LTD

ORIGINAL SCALE BEFORE REDUCTION

A3 0 10 20 30 40mm.

VER.	DESCRIPTION	APPR.	DATE
A	ORIGINAL ISSUE		03.02.25

REVISIONS

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DRAWING TITLE :

MUSIC CATCHMENT PLAN

DEVEL. APPLIC. No. :	DATE : 03.02.25
PROJECT LEADER :	
DESIGNER :	
DRAFTSPERSON : HD	
CHECKED :	
APPROVED FOR AND ON BEHALF OF BURCHILLS ENGINEERING SOLUTIONS ABN 76 166 942 365 RPEQ No. :	
SCALE : 1:2000	DATUM : FULL SIZE : A3
PROJECT No.: BE220314	DRAWING No. : N202 VERSION: A