PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2024/1581

Date: 8 May 2025

Queensland Government

MELIORA
CONSULTING ENGINEERS

Site 18A, 260 Macarthur Avenue, Hamilton

CIVIL ENGINEERING REPORT
(Stormwater Management, Infrastructure & Civil Services)

CLIENT:	Silverstone Developments
SITE ADDRESS:	Site 18A, 260 Macarthur Avenue, Hamilton
MCE No:	24125
DATE:	March 2025

DOCUMENT CONTROL

DOCUMENT TITLE:

Civil Engineering Report (CER) SITE 18A
Incorporating:
- *Engineering Services Report (ESR) &*
- *Site Based Stormwater Management Plan (SBSMP)*

MELIORA JOB No:

24125

CLIENT:

Silverstone Developments

AUTHOR:

SM

AUTHORISED:

MB (BEng, CPEng, NER, RPEQ, MIEAust, MIPWEAQ)

SPERO MELIORA ENTERPRISES P/L
T/A Meliora Engineering
ABN 46153772813

21 Mcleod St
Herston
Queensland 4030
Australia

T: 0429970345
E: info@meliorace.com

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GLOSSARY

GENERAL

- BCC – Brisbane City Council
- CER – Civil Engineering Report
- BYDA – Before You Dig Australia
- ESR – Engineering Services Report
- NCC - National Construction Code
- AS/NZS - Australian Standards/New Zealand Standards
- QUDM - Queensland Urban Drainage Manual
- WSAA - Water Services Association of Australia
- SBSMP – Site Based Stormwater Management Plan
- SPP - The State Planning Policy (Queensland)
- CMP – Construction Management Plan
- ha - Hectare (10,000m^2)
- kL - kilolitre (1,000L) or (1m^3)

EARTHWORKS & ESC

- ASS – Acid Sulfate Soil
- ASSIR – Acid Sulfate Soil Investigation Report
- GWI - Ground Water Inflow
- E&SC – Erosion and Sediment Control

DRAINAGE

- AEP - Annual Exceedance Probability
- ARI - Average Recurrence Interval
- Hydrology – The movement (and impact) of water run-off in relation to the site and surrounds
- OSD – On-Site Detention (Detention Storage System)
- Bioretention system - A system that collects and infiltrates urban stormwater through a prescribed filter media covered with vegetation to improve discharge quality
- GPT - Gross Pollutant Trap – Collects gross pollutants from a catchment to improve stormwater quality
- t_c – 'Time of Concentration' for a drainage catchment
- MUSIC - Water quality modelling software; Acronym stands for 'Model for Urban Stormwater Improvement Conceptualisation'
- Nitrogen - An important nutrient found in high concentrations in recycled waters, originating from human and domestic wastes. A useful plant nutrient that can also cause off-site problems of eutrophication in lakes, rivers and estuaries.
- Phosphorus - An important nutrient found in high concentrations in recycled waters, originating principally from detergents but also from other domestic wastes.
- WSUD – Acronym stands for 'Water Sensitive Urban Design'. WSUD Provides a strategy for the conservation and management of water resources through better management of stormwater.

SEWER & WATER

- DF - Design Flow
- EP - Equivalent Persons
- IIF - Inflow & Infiltration Flow
- PDWF - Peak Dry Weather Flow
- PWWF - Peak Wet Weather Flow
- ADWF - Average Dry Weather Flow
- SF - Sanitary Flow

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1 EXECUTIVE SUMMARY

Meliora Engineering has been engaged by Silverstone Developments to prepare a Civil Engineering Report suitable for submission to Brisbane City Council in support of a Development Application for a site located at Site 18A, 260 Macarthur Avenue, Hamilton. The Application proposes a MCU (Multi-tower residential project).

The purpose of this Engineering Report is to provide advice on the development proposal as detailed in the Carr Architecture architectural drawings, a selection of which is shown within Appendix A – Architectural Drawings. Commentary and relevant calculations cover works required to service the proposed development including earthworks, roadworks, stormwater drainage management (quantity and quality), sewerage and water reticulation, electricity, communications and gas.

The assessment has been carried out in accordance with Brisbane City Council Planning Scheme Policies and the proposed works described herein will be subject to the Conditions attached to the Development Approval to be provided by Council and any nominated referral agencies.

Meliora Engineering civil schematic sketches addressing Stormwater, Infrastructure & Services are shown within Appendix B – Schematic Civil Drawings.

A summary of civil engineering advice is as follows:

- A review of the potential for the Site to be inundated and the requisite minimum development levels has indicated that the proposed development will have a level of immunity well in excess of that nominally required to satisfy both the requirements of the LGA planning scheme and the higher immunity currently being adopted by EDQ with regard to the design of the road system within the PDA. Refer to Flood Study by WEP for further advice on flooding.
- The application proposes earthwork (mostly cutting) with associated shoring to reflect architectural design intent for basement and ground level layout. The site falls to the north-east direction.
- The development will require a new 7m wide commercial type B1 grade crossover to access Karakul Road. Existing gravel crossover will be removed with kerb/verge reinstated.
- The development will require in-ground pit & pipe drainage works to capture roof and surface water from developed areas to discharge flows to five different locations on both road frontages (catchment 1 to 5) via existing drainage stubs.
- The development proposes to discharge to the existing infrastructure within the Macarthur Avenue and Karakul Road, which is found to have sufficient hydraulic capacity to cater for developed site flows from each catchment. Hence, no detention is required nor proposed.
- The proposal triggers the SPP's Post-Development Stormwater Management (Water Quality) Design Objectives and therefore permanent tertiary treatment solutions/devices will be proposed within each catchment. This will feature OceanGuards (trash baskets) and StormFilter treatment cartridges within underground off-line tanks, prior to off-site discharge. This arrangement will also satisfy ESD findings and will deliver a stormwater management system delivering the principles of WSUD, and will be a far superior outcome for the receiving environment compared with the existing condition.
- The site appears to be adequately serviced by reticulated water, sewerage, gas, telecommunications, and electricity. These services will need to be connected via the associated authority works process during the development.

Information discussed in this report is inferred from several sources including BYDA records, site survey, design documents received from the client.

All relevant standards and guidelines are addressed in this report including criteria from:

- BCC Planning Scheme Policy
- Australian Rainfall and Runoff Guideline (ARR)
- Queensland Urban Drainage Manual (QUDM) 2013
- Plumbing and Drainage Code AS3500.3
- State Planning Policy (SPP)
- International Erosion Control Association of Australasia (IECA)

This report has demonstrated that the proposed development does not present any civil related engineering issues which would prevent the development from proceeding as proposed.

2 INTRODUCTION & BACKGROUND

Meliora Engineering has been engaged by Silverstone Developments to prepare a Civil Engineering Report suitable for submission to Brisbane City Council in support of a Development Application for a site located at Site 18A, 260 Macarthur Avenue, Hamilton. The proposed development is for a MCU (Multi-tower residential project).

The purpose of this Engineering Report is to provide advice on the development proposal as detailed in the Carr Architecture architectural drawings, a selection of which is shown within Appendix A – Architectural Drawings. Commentary and relevant calculations cover works required to service the proposed development including earthworks, roadworks, stormwater drainage management (quantity and quality), sewerage and water reticulation, electricity, communications and gas.

The assessment has been carried out in accordance with Brisbane City Council Planning Scheme Policies and the proposed works described herein will be subject to the Conditions attached to the Development Approval to be provided by Council and any nominated referral agencies.

2.1 BACKGROUND

Meliora is a civil engineering consultancy which specialises in residential and commercial projects within South East Queensland. We understand the commercial drivers behind projects whilst also having significant experience in compliance and construction of same.

This project presents an opportunity for urban densification in line with the current Council planning scheme, creating more dwellings to service the influx of residents and satisfy the growth of Brisbane.

This Civil Engineering Report has been supervised by a Registered Engineering of Queensland (RPEQ) and address the key civil engineering aspects in relation to the planning requirements relevant to the proposal. Section 4.4 & 4.5 of this Report forms a Site Based Stormwater Management Plan (an SBSMP), which outlines potential on and off-site impacts associated with stormwater for the proposed development. It also identifies a range of conceptual stormwater management strategies and actions for water quality, water quantity and environmental issues.

3 SITE CHARACTERISTICS

3.1 LOCATION & TITLES/EASEMENTS

Refer to below figures and tables for locality plan and specific title information for the property to be developed.

Figure 1 - Site Location (as accessed from Google Maps 13/03/2025)

Table 1 - Property Details

Lot Information	Lot 6 on SP326594
Street Address	Site 18A, 260 Macarthur Avenue, Hamilton
Site Area	8128m^2
Existing Easements	No

3.2 EXISTING FEATURES & TOPOGRAPHY

3.2.1 CONTEXT

The site appears to be adequately serviced by reticulated water, sewerage, gas, telecommunications, and electricity. These services will need to be connected via the associated authority works process during the development. Refer to Town Planning Report by Urban Strategies for further planning related context.

3.2.2 GRADING & CONTRIBUTING CATCHMENTS

The site is relatively flat (no significant grade) and there are no notable upstream contributing catchments which discharge into the developed area.

3.2.3 EXISTING FEATURES

The existing property boundaries, surface levels, site features and the location of the existing infrastructure & structures are identified on the survey plan drawing shown within Appendix C – Survey Plan within this report.

Appendix D – BYDA Results includes information as sourced from BYDA and Council Mapping.

It should be noted that site survey includes underground services 'plotted from records' ie from BYDA records. As per commentary within AS5488, BYDA and authority records are often Quality Level 'D'. BYDA plans only give an approximate indication of the underground conduits that exist and cannot not be relied upon. It is strongly suggested that prior to the start of the detailed/developed design phase, and to avoid damaging buried assets when excavating the subsurface, information relating to the location of existing services must be located to minimum quality Level 'B' with the position of any underground cables or services thoroughly checked and marked by a trained service locator.

3.3 GEOTECHNICAL FEATURES

At the time of authoring this report, a Geotechnical Report with associated soil testing had not been received by Meliora Engineering. It is strongly recommended that appropriate Geotechnical Investigation and testing by complete for the site to inform engineering for the proposed development.

3.3.1 POTENTIAL OR ACTUAL ACID SULFATE SOILS

The Brisbane City Council Mapping shows the site as being impacted by 'potential and actual acid sulfate soils' overlays. An Acid Sulfate Soils Investigation Report has been prepared by Core Consultants (dated December 24).

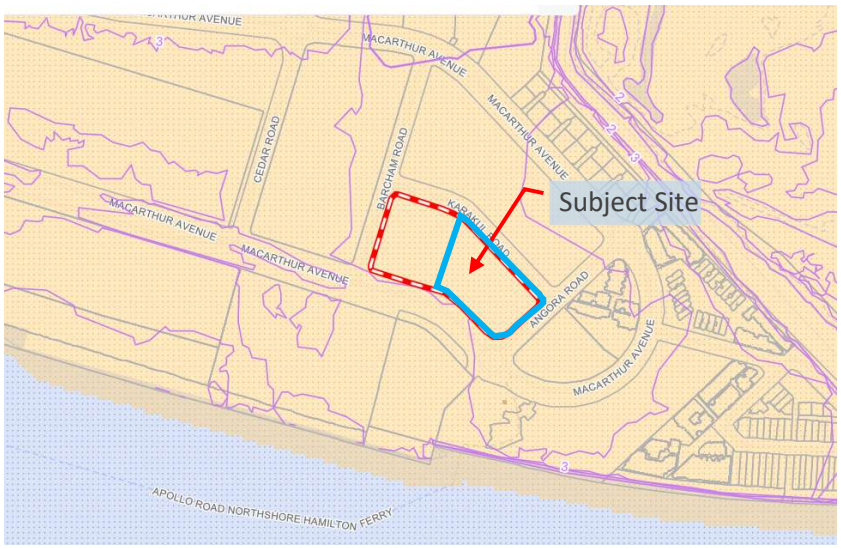


Figure 2 - Acid Sulfate Soil Overlay

3.4 FLOODING IMPACT

An authority Flooding Report has been generated and can be seen within Appendix E – Floodwise Report.

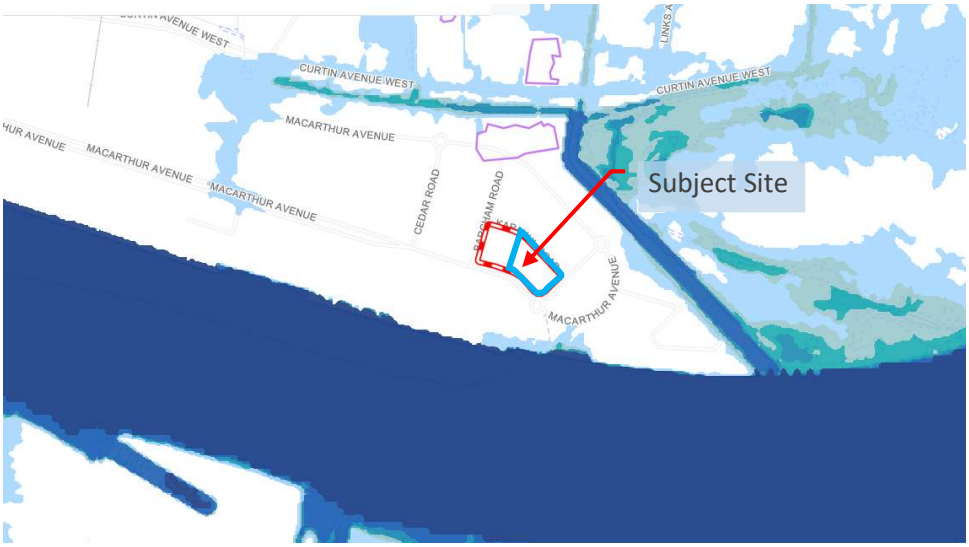


Figure 3 - Flooding Overlays from Council Mapping

A review of the potential for the Site to be inundated and the requisite minimum development levels has indicated that the proposed development will have a level of immunity well in excess of that nominally required to satisfy both the requirements of the LGA planning scheme and the higher immunity currently being adopted by EDQ with regard to the design of the road system within the PDA. Refer to Flood Study by WEP (dated November 24) for further advice on flooding.

3.5 LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGIP)

Review of the Council Priority Infrastructure Plan Maps indicates that no priority infrastructure upgrades are planned within close proximity to the subject site.

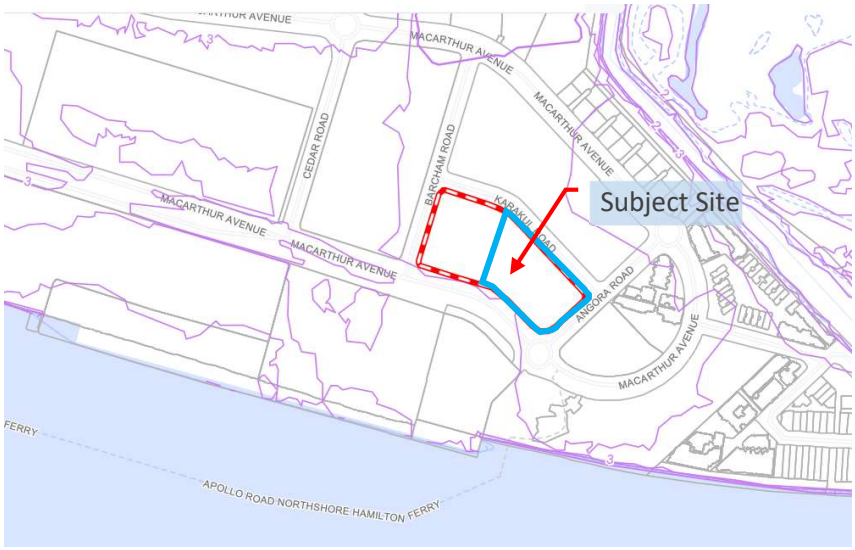


Figure 4 - Priority Infrastructure at Site

4 PROPOSED CIVIL ENGINEERING WORKS

Meliora Engineering accepts no responsibility for the accuracy of information supplied to them by second and third parties, including survey, authority mapping data and geotechnical testing information which may have been relied on to inform the civil engineering opinions and calculations presented within the advice below.

Consider that the assessment addresses the requirements for development of the subject site at the time the study was undertaken. If these conditions are known to change, the results of this assessment should be reviewed and amended as required.

The assessment has been carried out in accordance with the relevant Council Planning Scheme Policies and the proposed works described herein will be subject to the conditions attached to the Development Approval to be provided by Council and any nominated referral agencies.

4.1 DESCRIPTION OF WORKS

The proposed development is for MCU (Multi-tower residential project).

Please refer to Appendix A – Architectural Drawings for select architectural layout plans.

4.2 FILLING AND EXCAVATION

The application proposes earthwork (mostly cutting) with associated shoring to reflect architectural design intent for basement and ground level layout. The site is very flat but has slight fall to the north-east direction.

Refer to Appendix B – Civil Sketches – for preliminary earthworks plans and sections.

Refer to Appendix F – Code Response Tables for the Brisbane City Council Filling and Excavation Code & responses.

4.3 ACCESS & ROADWORKS

The subject site is adjacent to the following roads:

- Macarthur Avenue and Karakul Road – council road, with channel drainage on each side and a two-way crossfall
- Angora Road – access road, with kerb and channel drainage on both side and a two-way crossfall
- The site is currently accessed via one (1) vehicle crossover along Angora Road.

The development will require a new 7m wide commercial type B1 grade crossover to access Karakul Road. Existing crossover will be removed with kerb/verge reinstated. Refer to traffic report for further advice re access and impact on surrounding road network.

Refer to Appendix F – Code Response Tables for the Brisbane City Council Infrastructure Code & responses.

4.4 SITE-BASED STORMWATER DRAINAGE MANAGEMENT - QUANTITY

Refer to Appendix F – Code Response Tables for the Brisbane City Council Stormwater Management Code & responses.

4.4.1 ON-SITE DRAINAGE & RUNOFF QUANTITY TREATMENT OBJECTIVE

the stormwater management objectives that apply to the site have been derived from QUDM, State Planning Policy (2017), BCC Planning Scheme Policy and BCC Land Development Guidelines. The key stormwater parameters and desired outcomes are:

- Minimisation of storm-related nuisance to the public;
- Minimisation of legal disputes between neighbouring landowners and communities;
- Flood control & resilience to flooding in excess of nominated design events;
- Pedestrian and vehicular safety
- Integrate stormwater management infrastructure carefully in the urban and natural landscape, promoting retention of natural drainage system and protection/restoration of environmental values

Subsequently, the objectives of Stormwater Runoff Quantity Management for the subject site are;

1. Provide a stormwater conveyance system for minor (10% AEP) and major (2% AEP) storm events to discharge to the nominated Lawful Point of Discharge
2. Reduce the peak post-development flows discharged from the site to be equal to (or below) the existing condition peak flows for each storm event AEP.
3. Limit flooding of public and private property, both within the catchment and downstream, to acceptable levels.
4. To provide convenience and safety for pedestrians and traffic in frequent stormwater flows by controlling those flows within prescribed velocity/depth limits.

4.4.2 EXISTING DRAINAGE REGIME

A site survey documenting existing services within and surrounding the development site was performed by Landpartners and is shown within Appendix C – Survey Plan. The survey highlights the following existing features related to drainage:

- Multiple in-ground drainage stubs are available to the north and south frontages
- Flat grades however sheet flow from existing site generally flowing to pit at south-east corner of developed area

Upstream Catchments are described in Section 3.2.2 of this Report.

4.4.2.1 EXISTING LAWFUL POINT OF DISCHARGE

The site features multiple pits on both frontages – which are the Lawful Points of Discharge (LPODs) for the site.

Further information on existing Council Stormwater Infrastructure in the area of the site was received via a BYDA search and a Council Mapping search. Details are included in Appendix D – BYDA Results.

4.4.3 PROPOSED DRAINAGE REGIME

4.4.3.1 PROPOSED LAWFUL POINT OF DISCHARGE

In the post-developed case, the existing multiple drainage stubs into the site present themselves as suitable for re-use. All the existing stubs will be maintained and connected into for the development.

4.4.3.2 TAILWATER LEVELS

The tailwater level circumstance considered within the drainage analysis assumes water levels at 300mm below surface level at verge.

4.4.3.3 PROPOSED DRAINAGE NETWORK

Stormwater generated from the development will be conveyed through a pit and pipe network for minor stormwater events (10% AEP) and a combination of pits and pipes and overland (sheet) flow for major storm events (2% AEP). Podium level drainage will be design by hydraulics consultants.

All stormwater drainage will be designed in accordance with the requirements of QUDM 2016 or relevant Australian Standard for private drainage (in the case of the podium hydraulics).

There are no public pipes and pits required within the site, therefore no easements will be required over the drainage infrastructure within the site.

4.4.4 CATCHMENT HYDROLOGY

4.4.4.1 FLOW ESTIMATION METHODS & MODELLING

The choice of hydrologic method must be appropriate to the type of catchment and the required degree of accuracy.

As per Section 7.3 of BCC's current Infrastructure PSP, BCC allows flow estimations using Rational method. For this small-scale development Rational method was deemed suitable for use to estimate peak flows for catchments under existing and developed conditions. The Rational Method Calculations are summarised below.

4.4.4.2 RAINFALL DATA

Catchment hydrology has been estimated using rainfall specific for the site at Site 18A, 260 Macarthur Avenue, Hamilton. This is derived from the Bureau of Meteorology (BOM) Design Rainfall Data System (2016) using the following Latitude, Longitude:

- Latitude -27.44306, Longitude 153.08378

4.4.4.3 EXISTING CATCHMENTS DESCRIPTION

The existing catchment EX1 (total existing site discharges to multiple stubs) discharges to both Karakul Rd and Macarthur Avenue. Refer to below figure highlighting the existing discharge locations (stubs built with the subdivision works brought to edge of the lot).

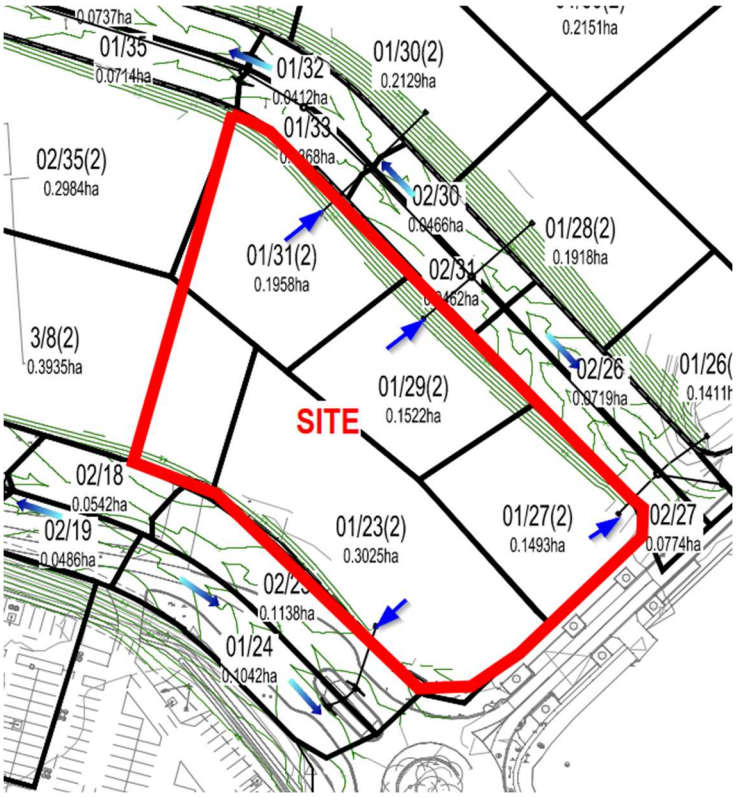


Figure 5 – Existing Catchments

4.4.4.4 PROPOSED CATCHMENTS DESCRIPTION

The proposed Catchments 1 to 4 will discharge to four different locations on both road frontages via existing drainage stubs.

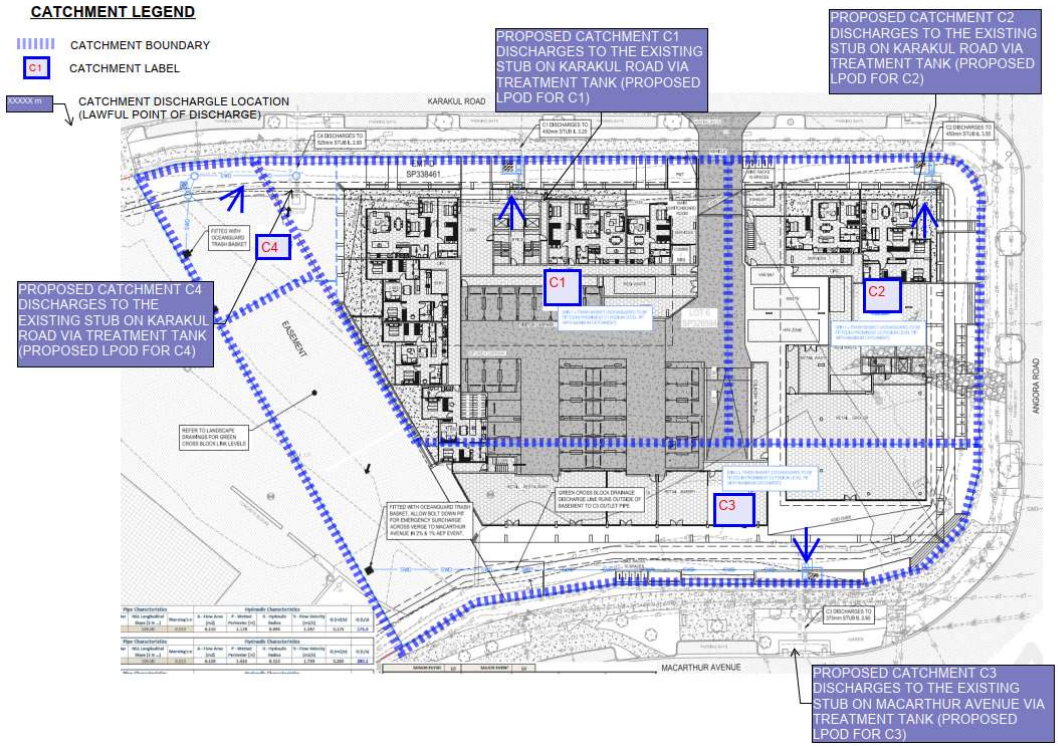


Figure 6 - Proposed Catchments

4.4.4.5 CATCHMENT HYDROLOGY - RATIONAL METHOD CALCULATIONS

EX1 –The existing catchment

CATCHMENT NAME	EX1	Design Storm Event (AEP & ARI)						
RATIONAL METHOD PARAMETERS	(units)	63% (Q1)	38% (Q2)	18% (Q5)	10% (Q10)	5% (Q20)	2% (Q50)	1% (Q100)
Catchment Area	ha				0.813			
Time of Concentration	min				10.0			
Fraction Impervious					0.00			
Runoff Coefficient (Cy)		0.53	0.56	0.63	0.66	0.69	0.76	0.79
Rainfall Intensity (Iy)	mm/hr	90.97	116.72	147.53	165.84	190.57	223.30	248.45
Peak Flow	L/s	108.4	147.8	208.9	247.1	298.2	382.7	444.3

C1 – Post-Development, C1 to Karakul Road.

CATCHMENT NAME	C1	Design Storm Event (AEP & ARI)						
RATIONAL METHOD PARAMETERS	(units)	63% (Q1)	38% (Q2)	18% (Q5)	10% (Q10)	5% (Q20)	2% (Q50)	1% (Q100)
Catchment Area	ha				0.276			
Time of Concentration	min				5.0			
Fraction Impervious					0.80			
Runoff Coefficient (Cy)		0.68	0.72	0.81	0.85	0.89	0.98	1.00
Rainfall Intensity (Iy)	mm/hr	118.99	152.32	191.54	214.52	245.74	287.11	318.81
Peak Flow	L/s	62.0	84.4	118.6	139.8	168.1	215.2	244.4

C2 – Post-Development, C2 to Karakul Road.

CATCHMENT NAME	C2	Design Storm Event (AEP & ARI)						
RATIONAL METHOD PARAMETERS	(units)	63% (Q1)	38% (Q2)	18% (Q5)	10% (Q10)	5% (Q20)	2% (Q50)	1% (Q100)
Catchment Area	ha				0.186			
Time of Concentration	min				5.0			
Fraction Impervious					0.80			
Runoff Coefficient (Cy)		0.68	0.72	0.81	0.85	0.89	0.98	1.00
Rainfall Intensity (Iy)	mm/hr	118.99	152.32	191.54	214.52	245.74	287.11	318.81
Peak Flow	L/s	41.8	56.9	79.9	94.2	113.3	145.0	164.7

C3 – Post-Development, C3 to Macarthur Avenue.

CATCHMENT NAME	C3	Design Storm Event (AEP & ARI)						
RATIONAL METHOD PARAMETERS	(units)	63% (Q1)	38% (Q2)	18% (Q5)	10% (Q10)	5% (Q20)	2% (Q50)	1% (Q100)
Catchment Area	ha				0.289			
Time of Concentration	min				7.0			
Fraction Impervious					0.70			
Runoff Coefficient (Cy)		0.66	0.70	0.78	0.82	0.86	0.94	0.98
Rainfall Intensity (Iy)	mm/hr	104.91	134.42	169.29	189.92	217.88	254.80	283.14
Peak Flow	L/s	55.3	75.3	105.9	125.1	150.7	193.0	223.8

C4 – Post-Development, C4 to Karakul Road

CATCHMENT NAME	C4	Design Storm Event (AEP & ARI)						
RATIONAL METHOD PARAMETERS	(units)	63% (Q1)	38% (Q2)	18% (Q5)	10% (Q10)	5% (Q20)	2% (Q50)	1% (Q100)
Catchment Area	ha				0.062			
Time of Concentration	min				5.0			
Fraction Impervious					0.50			
Runoff Coefficient (Cy)		0.62	0.66	0.74	0.78	0.82	0.90	0.94
Rainfall Intensity (Iy)	mm/hr	118.99	152.32	191.54	214.52	245.74	287.11	318.81
Peak Flow	L/s	12.8	17.4	24.4	28.8	34.7	44.4	51.4

4.4.4.6 PRE vs POST DEVELOPMENT (UNMITIGATED) – RESULTS SUMMARY

The existing catchment contributes circa 444 L/s to lower of the site as sheet flow.

Post–development, Proposed Catchment C1 – C4 will contribute circa 684L/s (at 1% AEP event) to the surrounding drainage network. So, there are 54% increase in flows due to development.

Total Site Catchment - Unmitigated Discharge Summary				
AEP	Predeveloped Flow	Developed (Unmitigated) Flow	Difference	% Increase in Flow
	(m3/s)	(m3/s)	(m3/s)	
63% (Q1)	0.108	0.172	0.063	59
38% (Q2)	0.148	0.234	0.086	58
18% (Q5)	0.209	0.329	0.120	57
10% (Q10)	0.247	0.388	0.141	57
5% (Q20)	0.298	0.467	0.169	57
2% (Q50)	0.383	0.598	0.215	56
1% (Q100)	0.444	0.684	0.240	54

The above results indicate that the proposed development results in an increase in the quantity of runoff to the lawful point of discharge.

However, as the development proposes to discharge to the existing drainage stubs around the edges of the site which have sufficient hydraulic capacity to cater for the post-development site flows from each catchment, no detention is required nor proposed.

Refer to catchment discharges within this report and on SK07. Also see SK07 for existing pipe stub capacities. You will note the outlet pipes have considerable capacity to cater for flows from catchment discharging to them. Catchment C1, C2 and C4 outlet pipes have greater pipe capacity than the major flows coming from these catchments. Catchment C3 outlet pipe has a full pipe capacity of approximately the 2% AEP event approaching it, and under head will further increase pipe capacity – however a surcharge pit (bolt down lid) will be designed within the green cross link in the rare case the C3 pipe stub capacity is exceeded.

4.4.5 CONSTRUCTION PHASE DRAINAGE INFRASTRUCTURE

During the construction phase of the development, the stormwater management design objectives for temporary drainage and basin spillways are to reference the Queensland Government State Planning Policy (SPP) 2017 Appendix 2 Table A (Part 1, 2 & 3).

Refer to Section 4.7 for further details on Construction Phase Erosion & Sediment Control details.

4.5 SITE BASED STORMWATER DRAINAGE MANAGEMENT - QUALITY

Refer to Appendix F – Code Response Tables for the Brisbane City Council Stormwater Management Code & responses.

4.5.1 WATER QUALITY TREATMENT OBJECTIVE

Urban stormwater run-off potentially contributes to adverse water quality in waterways, which impact aquatic ecosystems health and limit human water uses. Unless well managed, urban stormwater can release contaminants such as nutrients, sediment and solid waste to waterways. For the post-construction phase, the SPP's stormwater management design objectives require minimum reductions in the mean annual load for key pollutants.

The SPP contains specific assessment benchmarks for the Water quality state interest. The Performance Outcomes (PO) of the SPP apply to the following applications:

(1) a material change of use for an urban purpose that involves premises 2500m^2 or greater in size *and;*

(a) will result in six or more dwellings; *or*

(b) will result in an impervious area greater than 25% of the net developable area; or

(2) reconfiguring a lot for an urban purpose that involves premises 2500m^2 or greater in size and will result in six or more lots*; or*

The proposal triggers the SPP's Post-Development Stormwater Management (Water Quality) Design Objectives and therefore permanent tertiary treatment solutions/devices will be proposed within each catchment. This will feature OceanGuards (trash baskets) and StormFilter treatment cartridges within underground off-line tanks, prior to off-site discharge. This arrangement will also satisfy ESD findings and will deliver a stormwater management system delivering the principles of WSUD, and will be a far superior outcome for the receiving environment compared with the existing condition.

We have identified issues relating to stormwater runoff quality and determined methods of treatment.

The relevant measures proposed for stormwater quality treatment are:

- All runoff from roof areas discharging to treatment via SQIDs
- Runoff from podium and ground level discharging to treatment via SQIDs

4.5.1.1.1 POLLUTANTS OF CONCERN

Nutrients of concern that may contribute to increased occurrence, frequency or intensity of coastal algal blooms (particularly nitrogen, phosphorus, iron and organic matter) may be released during development in coastal areas.
The below table outlines pollutants that are expected form the proposed development.

Pollutants	Main Source	Target Pollutant
Litter	Public use on site	Yes
Oxygen demanding site	Dust accumulating on surfaces, wash off from garden beds, deposition from vehicular traffic	Yes
Nutrient, Phosphorous (P)	Garden bed fertilizer and bird droppings	Yes
Nutrient, Nitrogen (N)	Garden bed fertilizer and bird droppings and atmospheric nitrogen deposited in rainwater	Yes
Hydrocarbons (including oil and grease)	Vehicular traffic	Yes

Heavy metals	Vehicular traffic	Yes
Surfactants	Vehicle wash, and window cleaning	Yes

.

4.5.1.1.2 EXISTING CONDITION

The existing condition does not feature any SQID's. Development of the site presents and opportunity to provide a superior outcome and cleaner site runoff (than the existing case) through use of properly designed tertiary treatment systems to capture and treat rainfall runoff from the site.

4.5.1.1.3 PROPOSED TREATMENT STRATEGY & MODELLING

The State Planning Policy (2017) (SPP 2017) requires stormwater to meet certain design objectives. Performance Outcome (PO) 8 of the SPP requires:
PO8 -Manage stormwater during operational (post-construction) stages to protect drinking water supply environmental values and facilitate the achievement of water quality objectives for receiving waters.

Acceptable Outcome (AO) for P08 states;

> *Stormwater run-off generated during operation (postconstruction) demonstrates a minimum reduction in mean annual load from unmitigated development that achieves the following stormwater management design objectives:*
>
> *a) 80% reduction in total suspended solids*
> *b) 60% reduction in total phosphorus*
> *c) 45% reduction in total nitrogen*
> *d) 90% reduction in gross pollutants*

Compliance with the load reduction targets will typically be demonstrated using an accepted quantitative model (such as MUSIC – Model for Urban Stormwater Improvement Conceptualisation) with all model inputs and outputs provided to the approval authority to enable review and verification of the model results.

Section 4.5 of this Report is proposed to form a complete Stormwater Quality Management Plan (SQMP) to satisfy requirements of the SPP and local authority requirements, and an .sqz file is appended to this report submission reflecting the MUSIC model for the project.

4.5.1.1.4 SOURCE NODES

Catchments and source nodes derived from the civil drainage sketches as per Appendix B.

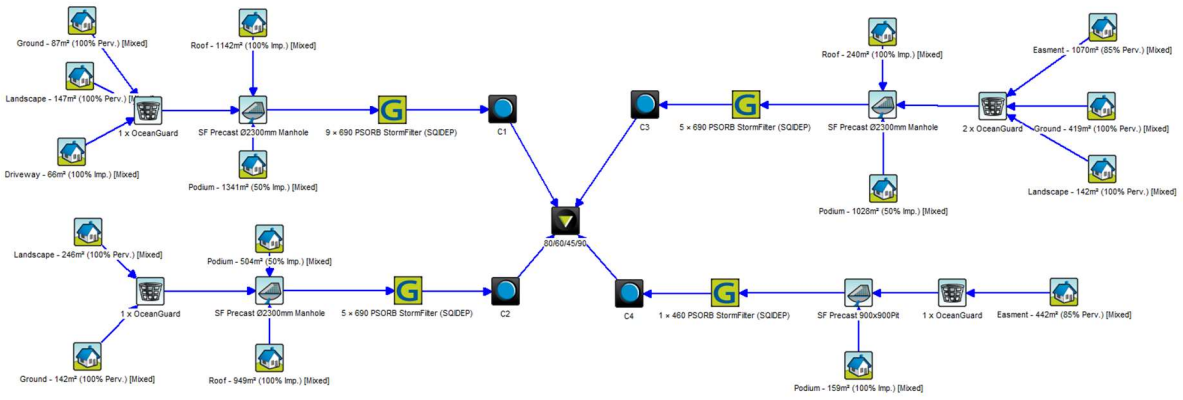


Figure 7 – MUSIC model nodes

4.5.1.1.5 TREATMENT NODES

Treatment nodes are the OceanGuards and StormFilter PSorb units, specifications of which can be seen in Appendix H. These products are accepted on Council register for SQIDs.

4.5.1.1.6 MUSIC MODELLING RESULTS

Results from the MUSIC model (.sqz is appended to this report submission) are presented as follows, showing the treatment train effectiveness at the downstream receiving node (Brisbane River).

	Sources	Residual Load	% Reduction
Flow (ML/yr)	6.1	6.1	0
Total Suspended Solids (kg/yr)	853	169	80.2
Total Phosphorus (kg/yr)	1.92	0.642	66.6
Total Nitrogen (kg/yr)	12.6	5.78	54.1
Gross Pollutants (kg/yr)	142	0	100

Figure 8 – MUSIC model results

The above results surpass the per cent reduction water quality objectives identified by the current State Planning Policy (SPP) 2017and Healthy Waterways guidelines and if the proposed treatment measures are adopted for the developed site, they will represent a major improvement to the existing site's run-off quality.

4.5.1.1.7 SQID MAINTENANCE

Refer attached Operations and Maintenance Manuals (Appendix J).

4.5.2 CONSTRUCTION PHASE STORMWATER QUALITY

During the construction phase of the development, the stormwater management design objectives for temporary water quality & ESC devices, including sediment basins, are to reference the Queensland Government State Planning Policy (SPP) 2017 Appendix 2 Table A (Part 1, 2 & 3).

Refer to Section 4.7 for further details on Construction Phase Erosion & Sediment Control details.

4.6 STORMWATER DRAINAGE INFRASTRUCTURE MAINTENANCE

The landowner is responsible for the ongoing operation and maintenance of all privately-owned stormwater management assets & devices to ensure the drainage facility continues to meet its design performance and are maintained for the life of the approved development and may be liable for damages as a result of drainage system malfunction caused by lack of proper maintenance.

Roof-water and quality treatment systems are classified as private drains with the responsibility for maintenance lying with the property owners.

4.7 SEDIMENT & EROSION CONTROL

Healthy Waterways have identified that the large and increasing amount of sediment entering our waterways is one of the major issues affecting waterway health across south-east Queensland. Sediment is a contaminant that can seriously degrade water quality and starve marine life of oxygen, leading to fish kills and damage to aquatic ecosystems.

During the construction phase of the development, the stormwater management design objectives for temporary water quality & ESC devices, including sediment basins, are to reference the Queensland Government State Planning Policy (SPP) 2017 Appendix 2 Table A (Part 1, 2 & 3).

IECA 2008 Best Practice Erosion and Sediment Control (as amended) is to be referenced for details on the application of the Construction Phase requirements.

For the construction phase, the SPP's stormwater management design objectives require that developments apply best practice erosion and sediment control. These objectives are derived from International Erosion Control Association of Australasia (IECA) 2008 Best Practice Erosion and Sediment Control.

All sediment and erosion controls will be designed in the detailed design phase to meet the relevant design objectives.

The erosion risk for the proposed development has been assessed against the BCC Erosion hazard guidelines and found that the site is classified MEDIUM risk for Erosion and Sediment Control Hazard.

Refer to Appendix G – BCC E&SC EHA Form for Certified & complete BCC E&SC EHA Form.

4.8 SEWERAGE RETICULATION

4.8.1 EXISTING SEWER INFRASTRUCTURE

The site does not seem to feature an existing sewer property connection. However, an existing DN160mm PE sewer reticulation main runs along Macarthur Ave.

Refer to the UU Asset Plan provided within Appendix D – BYDA Results for further information.

4.8.2 PROPOSED SEWER WORKS

It is proposed to service the site via a new proposed sewer PC to connect to the existing sewer reticulation main in Macarthur Ave.

The details of this connection, including an analysis of the existing infrastructure capacity to cater for the proposed development sewer discharge will be subject to authority assessment via a future UU Water Approval Application (Non-standard connection). It is assumed that the surrounding network built with the subdivision was designed to cater for the proposed loading by the development, however, in order to assist EDQ checks to verify consistency with the demand allocated to the land as part of our infrastructure planning, the sewer flow estimate calculation is shown below.

Sewer Flow Estimate

Development Type	EPs	ADWF (kL/day)	PDWF (kL/day)	PWWF (kL/day)
Residential	308	55.44	202.664	313.544
		ADWF (L/sec)	PDWF (L/sec)	PWWF (kL/sec)
		0.64	2.35	3.63

Refer to Appendix F – Code Response Tables for the Brisbane City Council Infrastructure Code & responses.

4.9 WATER RETICULATION

4.9.1 EXISTING WATER INFRASTRUCTURE

Mapping suggests the site is currently serviced by multiple existing water services from the existing DN150mm uPVC water main in Macarthur Avenue, however on-site investigation has failed to find the meters.

Refer to the UU Asset Plan provided within Appendix D – BYDA Results for further information.

4.9.2 PROPOSED WATER WORKS

It is proposed to provide a new large diameter water service and meter assembly (fire and domestic) from the existing water main in the Karakul Road. The meter assembly will be located within the basement with remote reading (AMR) technology.

The details of this connection, including an analysis of the existing infrastructure capacity to cater for the proposed development sewer discharge will be subject to authority assessment via a future UU Water Approval Application (Non-standard connection). It is assumed that the surrounding network built with the subdivision was designed to cater for the proposed loading by the development, however, in order to assist EDQ checks to verify consistency with the demand allocated to the land as part of our infrastructure planning, the water demand estimate calculation is shown below.

Water Demand Estimate

Development Type	EP	AD (L/s)	MDMM (L/s)	PD (L/s)	PH (L/s)
Residential	308	0.82	1.23	1.64	2.87

Refer to Appendix F – Code Response Tables for the Brisbane City Council Infrastructure Code & responses.

4.10 ELECTRICITY, COMMUNICATIONS & GAS

4.10.1 ELECTRICTY INFRASTRUCTURE

Survey and BYDA suggest that the frontage road corridors at the site feature underground electrical infrastructure.

Refer to the Energex Asset Plans (obtained from the 'Before You Dig Australia' service) within Appendix D – BYDA Results for further details.

Electricity services required for the proposed development will be designed by the electrical engineer and will be assessed by Energex during the detailed design phase of the development.

Refer to Appendix F – Code Response Tables for the Brisbane City Council Infrastructure Code & responses.

4.10.2 COMMUNICATIONS INFRASTRUCTURE

Telstra BYDA map suggest that the frontage road corridor at the site features existing telecommunications infrastructure that connects directly to the site.

Refer to the Telstra, Optus and NBN Asset Plans within Appendix D – BYDA Results for details.
All works required to provide communication services to the proposed development will be undertaken with the appropriate server's approval and coordination.

Refer to Appendix F – Code Response Tables for the Brisbane City Council Infrastructure Code & responses.

4.10.3 GAS INFRASTRUCTURE

APA Group suggests that the Angora Road corridor at the site features existing underground gas infrastructure.

Refer to the APA Group within Appendix D – BYDA Results for details.
All works required to provide gas services to the proposed development will be undertaken by the appropriate consultant with APA Group's approval and coordination.

Refer to Appendix F – Code Response Tables for the Brisbane City Council Infrastructure Code & responses.

5 SUMMARY & CONCLUSIONS

5.1 WORKS SUMMARY AND ENGINEERING RECOMMENDATION

The purpose of this Civil Engineering Report is to provide engineering advice in support of the development proposal as detailed in the Carr Architecture architectural drawings, a selection of which is shown within Appendix A – Architectural Drawings. Commentary and relevant calculations cover civil works required to service the proposed development including earthworks, roadworks, stormwater drainage management (quantity and quality), sewerage and water reticulation, electricity, communications and gas.

This Report relating to the Development Application proposing a MCU (Multi-tower residential project) has shown the following in relation to the civil engineering elements:

- A review of the potential for the Site to be inundated and the requisite minimum development levels has indicated that the proposed development will have a level of immunity well in excess of that nominally required to satisfy both the requirements of the LGA planning scheme and the higher immunity currently being adopted by EDQ with regard to the design of the road system within the PDA. Refer to Flood Study by WEP for further advice on flooding.
- The application proposes earthwork (mostly cutting) with associated shoring to reflect architectural design intent for basement and ground level layout. The site falls to the north-east direction.
- The development will require a new 7m wide commercial type B1 grade crossover to access Karakul Road. Existing gravel crossover will be removed with kerb/verge reinstated.
- The development will require in-ground pit & pipe drainage works to capture roof and surface water from developed areas to discharge flows to five different locations on both road frontages (catchment 1 to 4) via existing drainage stubs.
- The development proposes to discharge to the existing infrastructure within the Macarthur Avenue and Karakul Road, which is found to have sufficient hydraulic capacity to cater for developed site flows from each catchment. Hence, no detention is required nor proposed.
- The proposal triggers the SPP's Post-Development Stormwater Management (Water Quality) Design Objectives and therefore permanent tertiary treatment solutions/devices will be proposed within each catchment. This will feature OceanGuards (trash baskets) and StormFilter treatment cartridges within underground off-line tanks, prior to off-site discharge. This arrangement will also satisfy ESD findings and will deliver a stormwater management system delivering the principles of WSUD, and will be a far superior outcome for the receiving environment compared with the existing condition.
- The site appears to be adequately serviced by reticulated water, sewerage, gas, telecommunications, and electricity. These services will need to be connected via the associated authority works process during the development.

Information discussed in this report is inferred from several sources including BYDA records, site survey, design documents received from the client.

Meliora Engineering civil schematic sketches addressing Stormwater and Services are shown within Appendix B – Schematic Civil Drawings.

The assessment has been carried out in accordance with the relevant Council Planning Scheme Policies and the proposed works described herein will be subject to the conditions attached to the Development Approval to be provided by Council and any nominated referral agencies.

This report has demonstrated that the proposed development does not present any civil related engineering issues which would prevent the development from proceeding as proposed.

5.2 COUNCIL CODE RESPONSES

The proposed development will trigger design & construction that will need to be assessed against the following Council Codes:

- Acid Sulfate Soils Overlay Code
- Filling and Excavation Code
- Stormwater Code
- Infrastructure Design Code

To aid in Council's Decision, Meliora Engineering has provided an RPEQ certified response to the engineering aspects of the above codes. The codes with associated responses can be found attached in Appendix F – Code Response Tables.

5.3 LIMITATIONS

Meliora Engineering accept no responsibility for the accuracy of information supplied to them by second and third parties, including survey, authority mapping data and geotechnical testing information which may have been relied on to inform the civil engineering opinions and calculations presented within this report.

We consider that the study addresses the requirements for development of the subject site at the time the study was undertaken. If these conditions are known to change, the results of this study should be reviewed.

This Civil Engineering Report has been prepared under the direct supervision of a Registered Professional Engineer of Queensland generally in accordance relevant guidelines and standards.

6 APPENDIX

6.1 APPENDIX A – ARCHITECTURAL DRAWINGS

Project no. 24047
Project Name Northshore Hamilton, Queensland
Date 7/03/2025

- The following areas relate to Site 18a, 260 Macarthur Ave, Hamilton QLD 4007

DEVELOPMENT SUMMARY - SITE 18a, 330 Macarthur Ave	
Area Summary	**Area (sqm)**
SITE AREA	8120
TOTAL GFA ABOVE GROUND	18,804
PLOT RATIO	2.32
TOTAL NSA	15,999
TOTAL APARTMENTS	176
TOTAL INDOOR AMENITY	532
TOTAL OUTDOOR AMENITY	2,292
TOTAL CARSPACES	270
TOTAL BIKE SPACES	221
TOTAL GLAR	782

SITE AREA 8120 sqm

					BUILDING ONE (EAST)				BUILDING TWO (NORTH)				TOTAL APARTMENTS											
LEVEL	TYPE	GFA (sqm)	NSA (sqm)	POS (sqm)	1 BED	2 BED	3 BED	TOTAL APT	1 BED	2 BED	3 BED	TOTAL APT	1 BED	2 BED	3 BED	TOTAL APT	TOTAL EDQ APARTMENTS	INDOOR AMENITY (sqm)	OUTDOOR AMENITY (sqm)	CIRCULATION (sqm)	SERVICES/PLANT/EQUIPMENT/STORE (sqm)	GLAR (sqm)	CARPARK AREA (sqm)	CAR SPACES (Residential Incl Visitors)	CAR SPACES (Retail / Visitors)	BICYCLE SPACES
12	AMENITIES / PLANT	170																170	92		269					
11	RESIDENTIAL	878	810	162	1	5	3	9					1	5	3	9	1			68	78					
10	RESIDENTIAL	878	810	162	1	5	3	9					1	5	3	9	1			68	78					
9	RESIDENTIAL	878	810	162	1	5	3	9					1	5	3	9	1			68	426					
8	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
7	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
6	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
5	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
4	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
3	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
2	RESIDENTIAL	1,758	1,623	324	1	5	3	9	1	7	1	9	2	12	4	18	2			135	156					
1	RESIDENTIAL	1,786	1,380	276	2	4	3	9		5	1	6	2	9	4	15	3	242	2,200	164	156					
G	RESIDENTIAL / RETAIL	1,908	828	308		1	1	2	1	3	2	6	1	4	3	8		120		178	722	782	978		31	38
TOTAL	**ABOVE GROUND**	**18,804**	**15,999**	**3,338**	**12**	**55**	**34**	**101**	**6**	**57**	**10**	**75**	**20**	**112**	**44**	**176**	**20**	**532**	**2292**	**1,491**	**2,821**	**782**	**978**		**31**	**38**
													APARTMENT MIX	11%	64%	25%	100%	11%							
B1	CARPARK	34																		34	679		6033	239		183
TOTAL	**BASEMENT**	**34**																		**34**	**679**		**6033**	**239**		**183**

General Notes:

1 Outdoor amenity includes Landscape and Courtyard
2 All area calculations are advisory only and all figures should be checked and verified by a licensed surveyor
3 Gross floor area, for a building, means the total floor area of all storeys of the building, measured from the outside of the external walls and the centre of any common walls of the building, other than areas used for—
   a. building services, plant or equipment; or
   b. access between levels; or
   c. a ground floor public lobby; or
   d. a mall; or
   e. parking, loading or manoeuvring vehicles; or
   unenclosed private balconies, whether roofed or not.
4 Plot ratio - Ratio of the gross floor area of a building on a site to the area of the site. Where the development includes dedication of land for a new roadway, the site area for calculating the plot ratio does not include the land to be dedicated for the new roadway.

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

+61 3 9665 2300

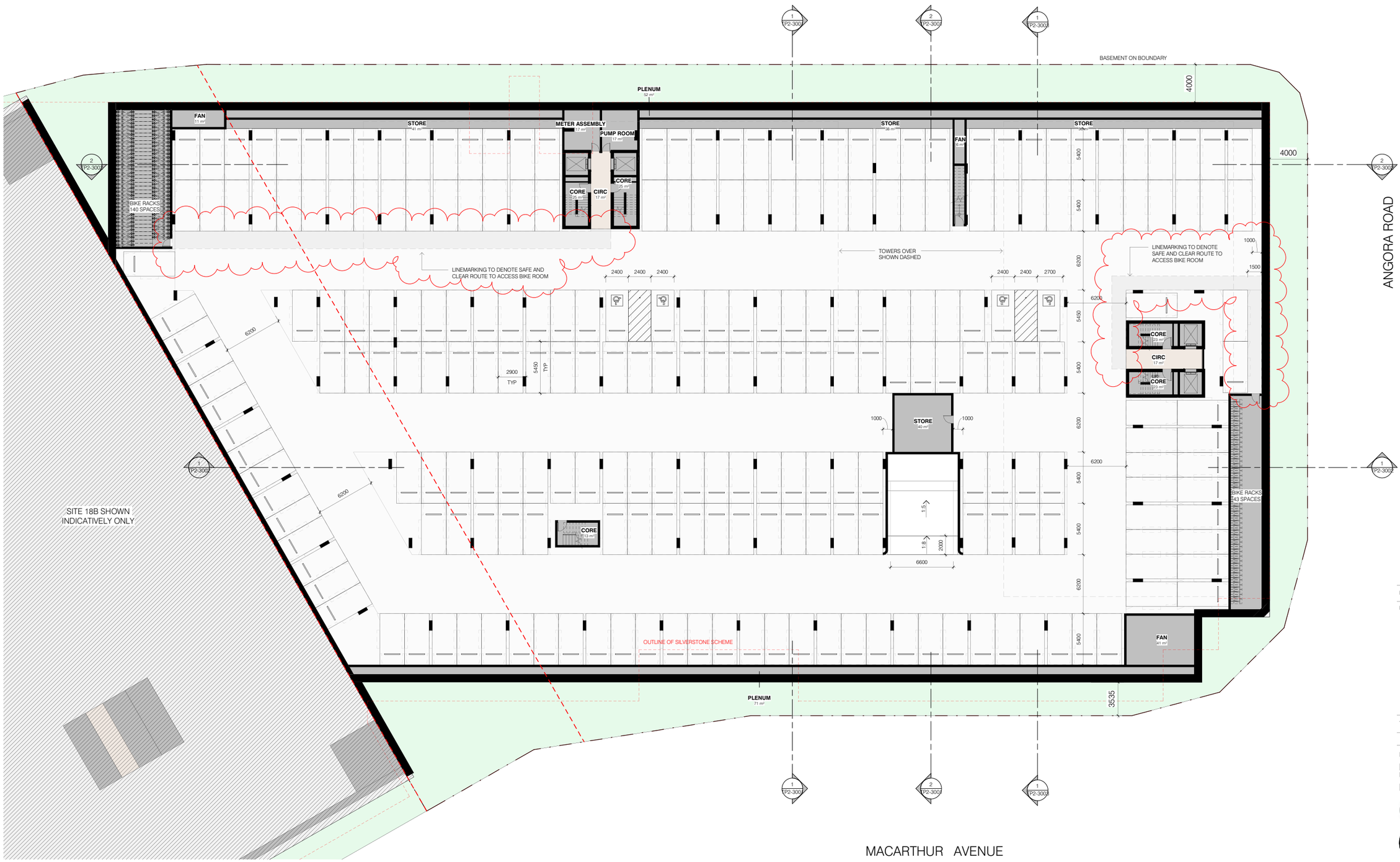
melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	DEVELOPMENT SUMMARY
Date	16/12/2024
Project No	24047
Scale @ A1	
Dwg No	TP2-0002
Drawn By	CE/ME Chkd ME
Rev	TP2

BIKE PARKING SCHEDULE				
TYPE	RESIDENTIAL	VISITOR	TOTAL REQ.	TOTAL SUPPLY
REQUIRED AS PER DA SCHEME	176 (36 HORIZONTAL)	44 (9 HORIZONTAL)	220	
SUPPLY - BASEMENT 1	176 (70 HORIZONTAL)	7		183
SUPPLY - GROUND		38 (29 HORIZONTAL)		38
			220	**221**

CAR PARKING SCHEDULE					
TYPE	RESI	SHARED RETAIL / VISITOR	DDA*	TOTAL REQ	TOTAL SUPPLY
REQUIRED AS PER DA SCHEME	198	31	4	229	
SUPPLY - BASEMENT 1	239	0	4		239
SUPPLY - GROUND		31			31
	239	**31**	**4**	**229**	**270**

*DDA INCLUDED IN TOTAL COUNT



Builders / Contractors shall verify all dimensions before any work commences. Dimensions shown are nominal. Figured dimensions shall take precedence over scaled dimensions. Any discrepancies are to be made known to the Architects / Designers studio prior to any works commencing on site. All shop drawings shall be submitted for review and manufacture shall not commence prior to the return of stamped shop drawings.

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

NORTH

SCALE 1:200 (0 2 4 10m)

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	BASEMENT 01
Date	16/12/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP2-1001
Drawn By	AK/CE
Chkd	CE
Rev	TP2

BIKE PARKING SCHEDULE				
TYPE	RESIDENTIAL	VISITOR	TOTAL REQ.	TOTAL SUPPLY
REQUIRED AS PER DA SCHEME	176 (36 HORIZONTAL)	44 (9 HORIZONTAL)	220	
SUPPLY - BASEMENT 1	176 (70 HORIZONTAL)	7		183
SUPPLY - GROUND		38 (29 HORIZONTAL)		38
			220	**221**

CAR PARKING SCHEDULE					
TYPE	RESI	SHARED RETAIL / VISITOR	DDA*	TOTAL REQ	TOTAL SUPPLY
REQUIRED AS PER DA SCHEME	198	31	4	229	
SUPPLY - BASEMENT 1	239	0	4		239
SUPPLY - GROUND		31			31
	239	**31**	**4**	**229**	**270**

*DDA INCLUDED IN TOTAL COUNT

KARAKUL ROAD

ANGORA ROAD

MACARTHUR AVENUE

CROSS-BLOCK LINK PARK
REFER TO LANDSCAPE DOCUMENTATION

SITE 18B SHOWN INDICATIVELY ONLY

VEHICLE ENTRY

7000

4000

BIKE RACKS 10 SPACES

BOOSTER

VOID OVER

PMT

MAIN SWITCHBOARD ROOM

SERVICES

COMMS / NBN

VAN BAY

WASTE

HRV ZONE

TOWERS OVER SHOWN DASHED

VISITOR/RETAIL CARPARK - 31 SPACES

LINEMARKING TO DENOTE SAFE AND CLEAR ROUTE TO ACCESS BIKE ROOM

BIKE RACKS 18 SPACES

IRRIGATION TANKS OVER RAMP

RETAIL AMENITIES

RETAIL WASTE

RESI WASTE

RETAIL - GROCER

RETAIL - RESTAURANT

RETAIL - HAIRDRESSER

RETAIL - BAKERY

RETAIL - BOTTLE SHOP

SETBACK 6000 ABOVE 4-STOREYS

SETBACK 4000 UP TO 4-STOREYS

5800

Builders / Contractors shall verify all dimensions before any work commences. Dimensions shown are nominal. Figured dimensions shall take precedence over scaled dimensions. Any discrepancies are to be made known to the Architects / Designers studio prior to any works commencing on site. All shop drawings shall be submitted for review and manufacture shall not commence prior to the return of stamped shop drawings.

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

NORTH

SCALE 1:200 (0 2 4 10m)

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON		
	SITE 18A		
Title	GROUND LEVEL		
Date	16/12/2024	Project No	24047
Scale @ A1	1 : 200	Dwg No	TP2-1002
Drawn By	CE	Chkd CE	Rev TP2

GENERAL NOTES

KARAKUL ROAD

ANGORA ROAD

MACARTHUR AVENUE

CROSS-BLOCK LINK PARK
REFER TO LANDSCAPE DOCUMENTATION

SITE 18B SHOWN INDICATIVELY ONLY

COMMUNAL TERRACE
REFER LANDSCAPE ARCHITECT FOR MORE DETAIL

POOL

GYM 151 m²

FLEXIBLE SPACE 76 m²

CHANGE ROOM 16 m²

EDQ UNIVERSAL

SETBACK 4000 UP TO 4-STOREYS

SETBACK 6000 ABOVE 4-STOREYS

4000

6000

5800

7800

6625

12540

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

NORTH

SCALE 1:200

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr

Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	LEVEL 1 PODIUM
Date	16/12/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP2-1003
Drawn By	CE/AK
Chkd	CE
Rev	TP2

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

NORTH

0 2 4 10m
SCALE 1:200

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	LEVEL 2-8 (TYP. TOWER)
Date	16/12/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP2-1004
Drawn By	CE/AK
Chkd	CE
Rev	TP2

GENERAL NOTES

KARAKUL ROAD

ANGORA ROAD

MACARTHUR AVENUE

SITE 18B SHOWN
INDICATIVELY ONLY

BUILDING TWO
ROOF

CORE
CORE
ROOF PLANT
298 m²

9400
9400
4500
8400

BUILDING ONE
1,200sqm

POS
2 BED
91 m²
3 BED
94 m²
1 BED
58 m²
WASTE
2 BED S
79 m²
SERV
CORE
SERVICE YARD
CIRC
68 m²
2 BED
87 m²
3 BED
135 m²
EDQ UNIVERSAL
3 BED
194 m²

6000
SETBACK 4000 ABOVE 4-STOREYS
SETBACK 4000 UP TO 4-STOREYS
SETBACK 4000 UP TO 4-STOREYS
SETBACK 6000 ABOVE 4-STOREYS
7800
24400
1200
50000
24400
13225
950
10025
24200
12540
SETBACK 6000 ABOVE 4-STOREYS
SETBACK 4000 UP TO 4-STOREYS

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

NORTH
0 2 4 10m
SCALE 1:200

TOWN PLANNING ISSUE

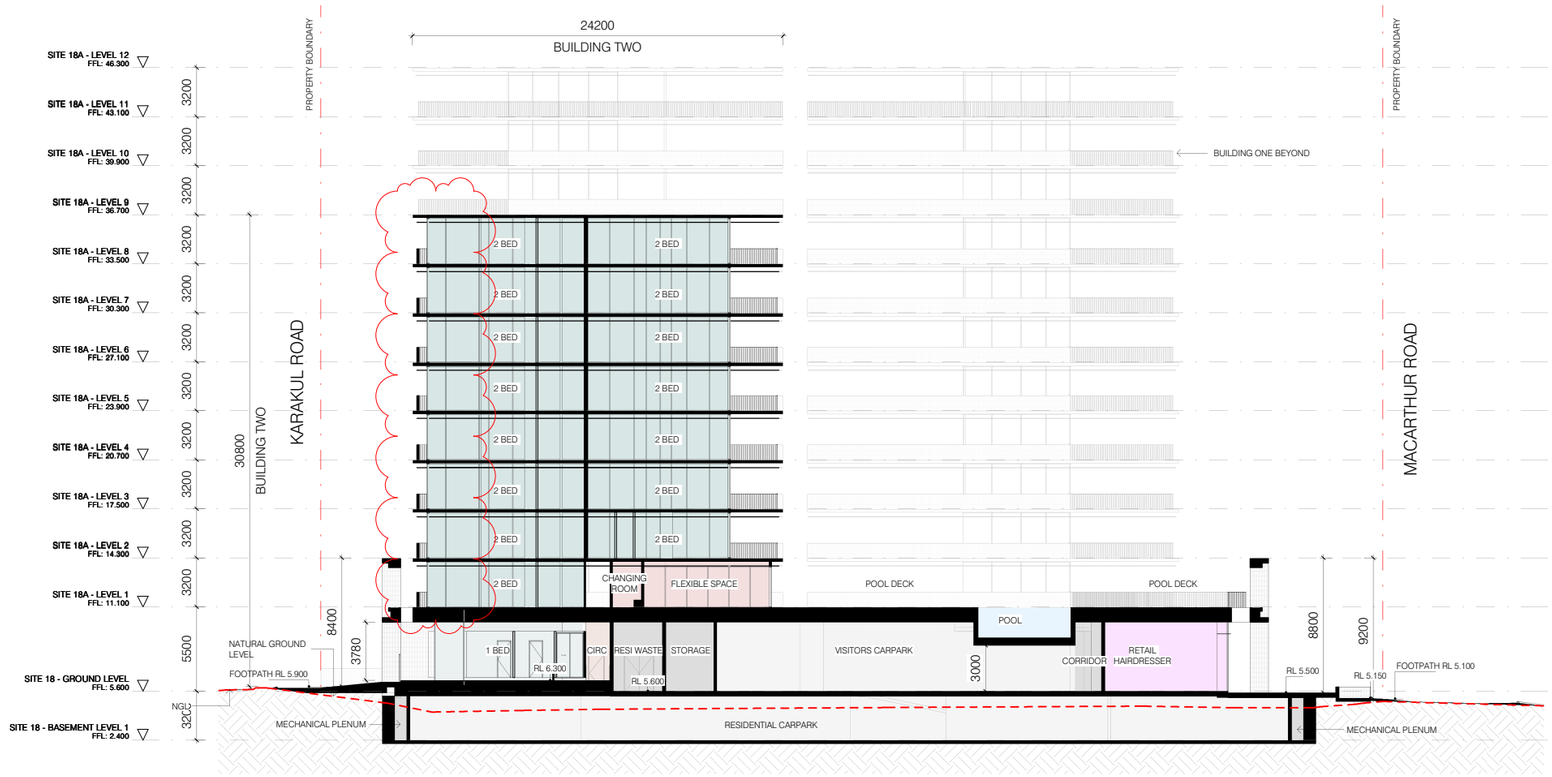
NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

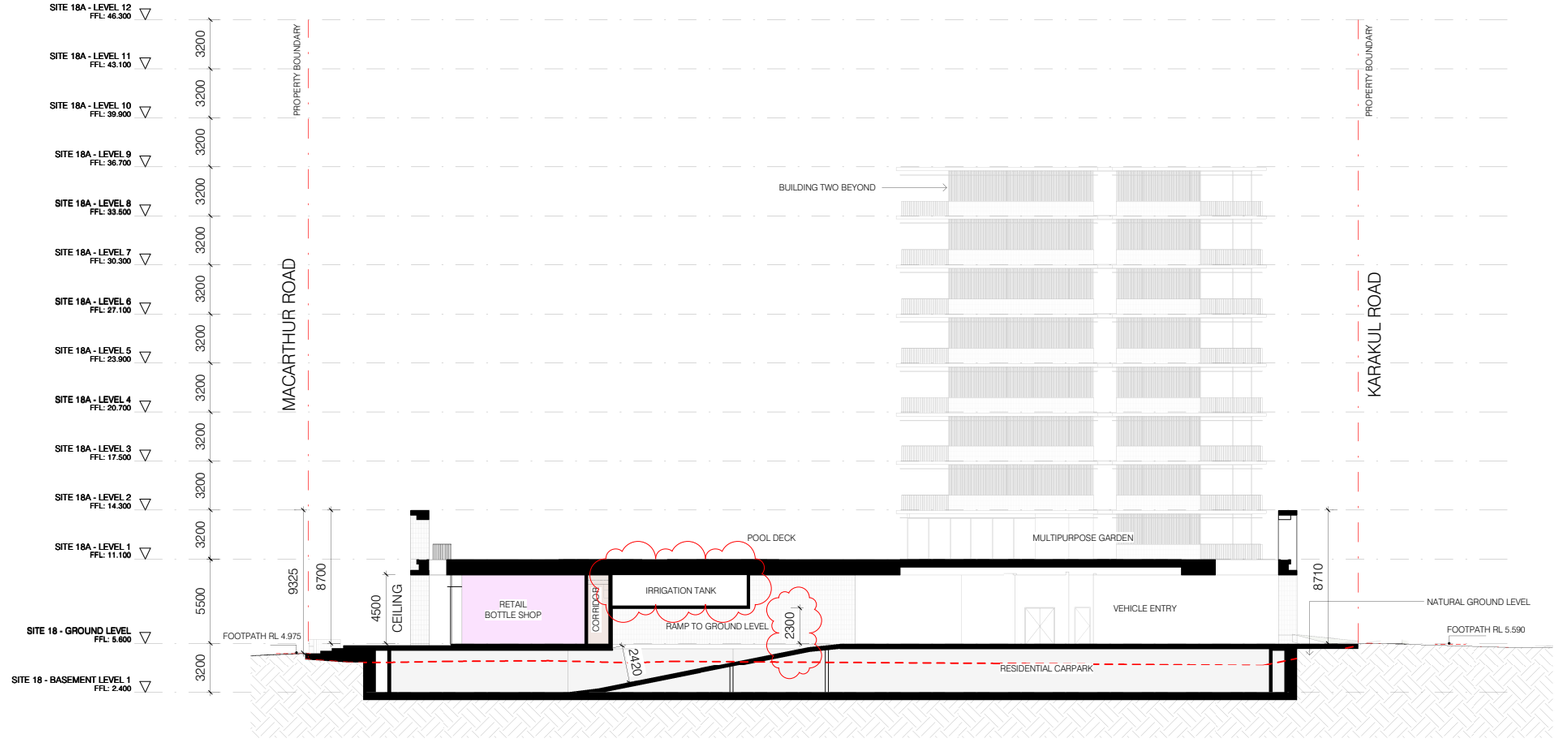
+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	LEVEL 9-11
Date	16/12/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP2-1013
Drawn By	CE/AK Chkd CE
Rev	TP2



1 TP SECTION AA
MP3-1001 SCALE 1 : 200



2 TP SECTION BB
MP3-1001 SCALE 1 : 200

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

0 2 4 10m
SCALE 1:200

TOWN PLANNING ISSUE

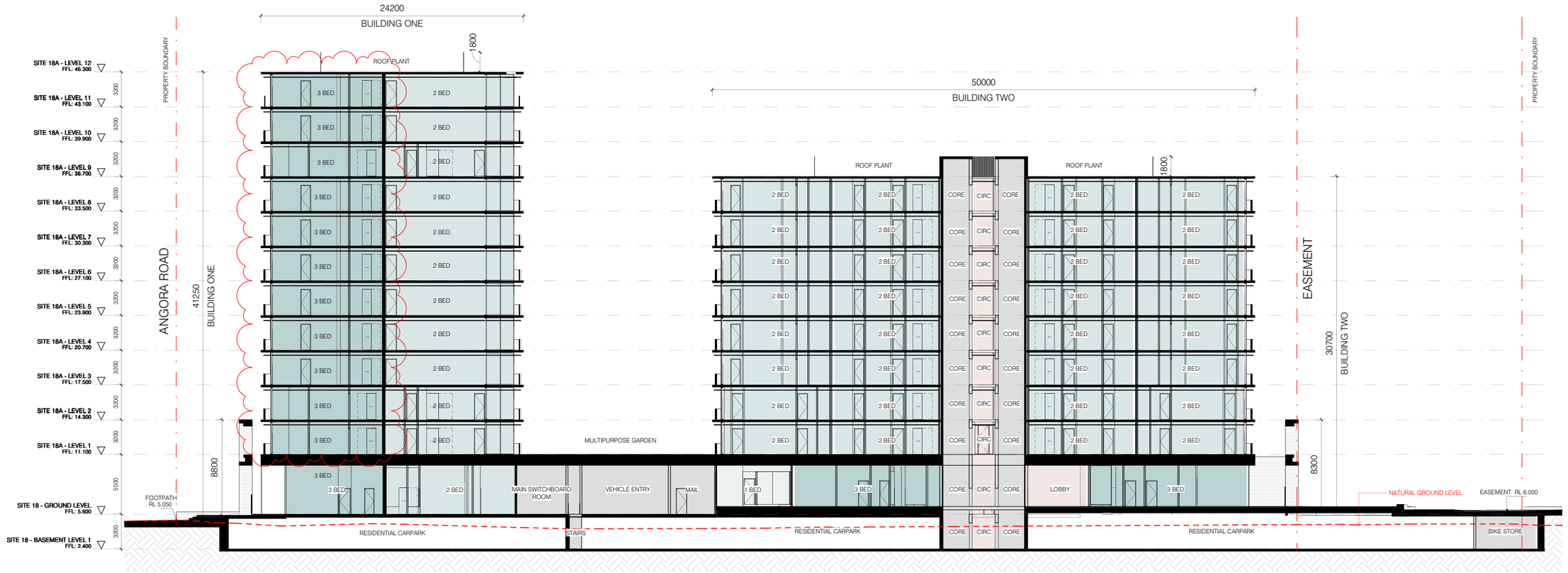
NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

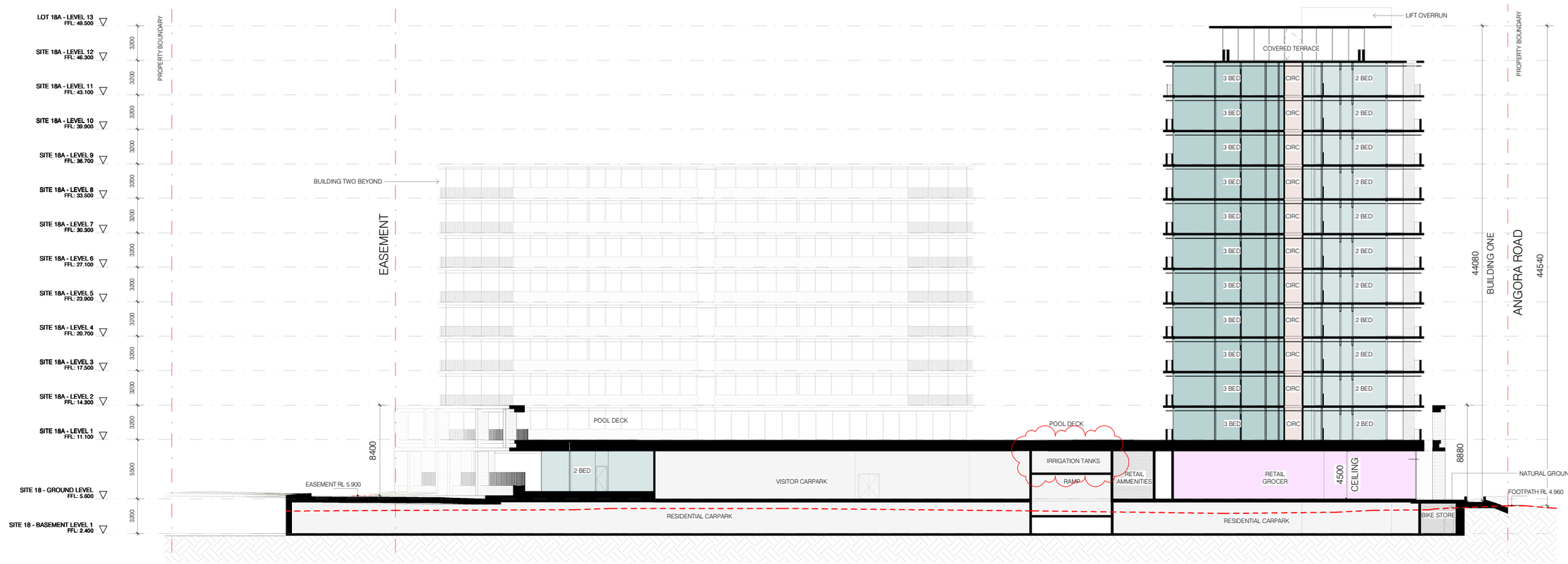
+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	BUILDING SECTIONS
Date	16/12/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP2-3001
Drawn By	AK/CE Chkd CE
Rev	TP2



2 TP SECTION CC
MP3-1007 SCALE 1 : 200



1 TP SECTION DD
TP2-3002 SCALE 1 : 200

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP2	07/03/2025		DA RFI RESPONSE
TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

0 2 4 10m
SCALE 1:200

TOWN PLANNING ISSUE

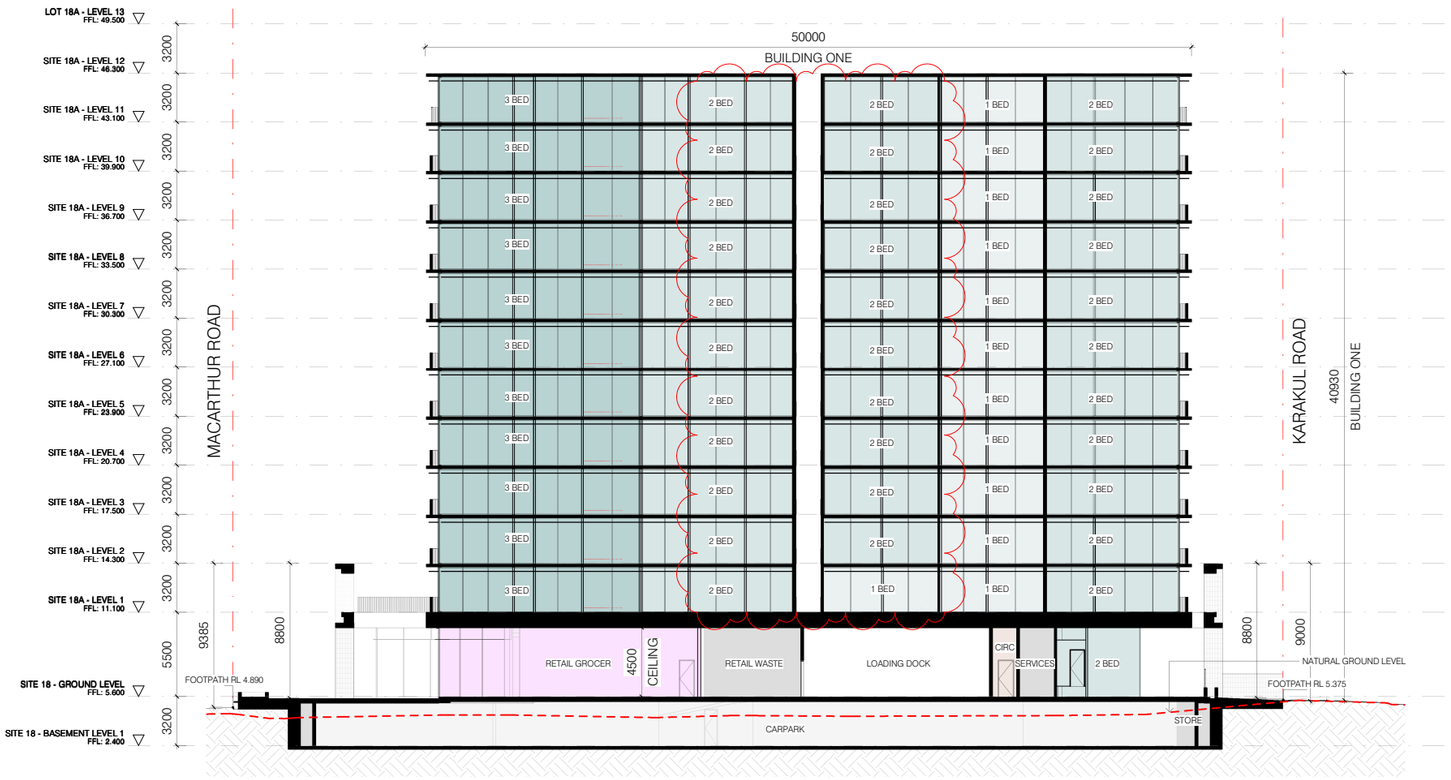
NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia

+61 3 9665 2300

melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 18A
Title	BUILDING SECTIONS
Date	16/12/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP2-3002
Drawn By	AK/CE
Chkd	CE
Rev	TP2



1 TP SECTION EE - BUILDING 1
TP2-3003 SCALE 1 : 200

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
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TP1	16/12/2024		DA ISSUE

Based on Drawings Received:

0 1 2 5m
SCALE 1:100

TOWN PLANNING ISSUE

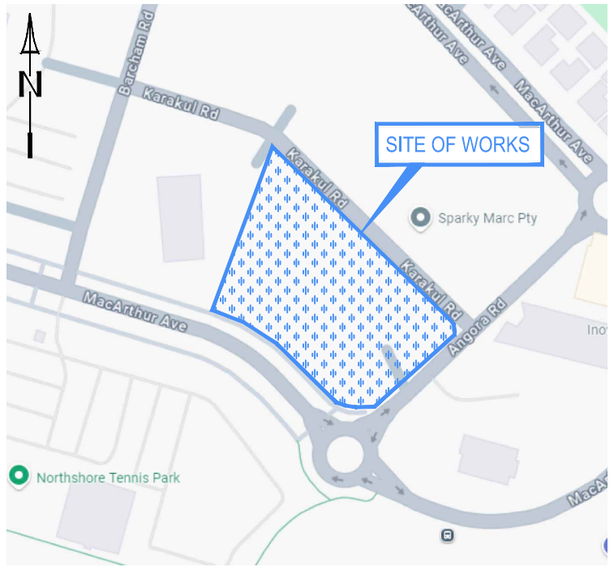
NOT FOR CONSTRUCTION

carr
Level 4
31 Flinders Lane
Melbourne VIC
3000 Australia
+61 3 9665 2300
melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON		
	SITE 18A		
Title	BUILDING SECTIONS		
Date	16/12/2024	Project No	24047
Scale @ A1	1 : 200	Dwg No	TP2-3003
Drawn By	AK/CE Chkd CE	Rev	TP2

6.2 APPENDIX B – SCHEMATIC CIVIL DRAWINGS

PROPOSED MULTI-TOWER RESIDENTIAL PROJECT
SITE 18A, 260 MACARTHUR AVE, HAMILTON
DA CIVIL ENGINEERING PACKAGE FOR SILVERSTONE DEVELOPMENTS



LOCALITY PLAN

EXTRACTED FROM GOOGLE MAPS © 2024
NOT TO SCALE

LOT DATA	
6	SP 326594

MELIORA ENGINEERING ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF EXISTING UNDERGROUND SERVICES WHICH ARE PLOTTED FROM AUTHORITY RECORDS BY THE SURVEYOR. DOCUMENTED DESIGNS MAY BE SUBJECT TO ONGOING CHANGES UNTIL RECEIPT AND REVIEW OF MINIMUM QUALITY 'LEVEL A' EXISTING SERVICE LOCATION RESULTS ALONG FULL LENGTH OF PROPOSED MAIN ALIGNMENTS. MELIORA WILL NOT BE HELD LIABLE FOR COST INCREASES OR TIME EXTENSION RESULTING FROM NECESSARY DESIGN CHANGES TO ACHIEVE AUTHORITY CODE COMPLIANCE.

DRAWING SCHEDULE

DRAWING No.	DRAWING TITLE
SK00	COVER, LOCALITY, SCHEDULE & GENERAL NOTES
SK01	PRELIMINARY EARTHWORKS LAYOUT PLAN & NOTES
SK02	PRELIMINARY EARTHWORKS SECTIONS - SHEET 1 OF 2
SK03	PRELIMINARY EARTHWORKS SECTIONS - SHEET 2 OF 2
SK05	PRELIMINARY CIVIL SERVICES LAYOUT PLAN
SK06	PRELIMINARY CIVIL TANK DETAILS
SK07	PRELIMINARY CIVIL DRAINAGE CATCHMENT PLAN

MANDATORY REFERENCE DOCUMENTATION

ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT COUNCIL (LOCAL AUTHORITY) DEVELOPMENT (DA) CONDITIONS), AS WELL AS THE WATER AUTHORITY CONDITIONS. ALL RELEVANT AUTHORITY APPROVALS AND CONDITIONS ARE TO BE REVIEWED (AND REQUESTED IF NOT ALREADY RECEIVED) BY CONTRACTOR PRIOR TO CONSTRUCTION.

READ THESE DRAWINGS IN CONJUNCTION WITH ARCHITECTURAL AND OTHER ENGINEERING DRAWING, SPECIFICATIONS AND WITH ALL OTHER WRITTEN INSTRUCTIONS ISSUED. REFER TO ARCHITECTURAL DRAWINGS FOR SETTING OUT AND DETAIL DIMENSIONS. IN CASE OF DISCREPANCY, PRECEDENCE IS GIVEN TO DRAWINGS, THEN NOTES, THEN SPECIFICATION. REFER DISCREPANCIES TO SUPERINTENDENT BEFORE PROCEEDING WITH WORK.

FURTHER, ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH
1. COUNCIL (LOCAL AUTHORITY) GUIDELINES, PLANNING SCHEME POLICIES (PSPs), SPECIFICATIONS AND STANDARD DRAWINGS
2. RELEVANT LEGISLATION INCLUDING (BUT NOT LIMITED TO):
   - 2.1. WORK HEALTH & SAFETY ACT 2011
   - 2.2. ENVIRONMENTAL PROTECTION & BIODIVERSITY ACT 1999
   - 2.3. BIOSECURITY ACT 2015. REFER TO WWW.DAF.QLD.GOV.AU
   - 2.4. SUSTAINABLE PLANNING ACT 1999
3. RELEVANT AUSTRALIAN STANDARDS INCLUDING (BUT NOT LIMITED TO):
   - 3.1. AS3500.3-2018 (PLUMBING & DRAINAGE)
   - 3.2. AS2865-2009 (CONFINED SPACES)
   - 3.3. AS3798-2007 (EARTHWORKS)
   - 3.4. AS/NZS 2890.1-2004 (PARKING FACILITIES)
   - 3.5. AS1742.3-2019 (SIGNAGE & LINE MARKING) - SS BY MUTCD
   - 3.6. AS4049.2-2005 (PAVEMENT MARKING MATERIALS)
4. INTERNATIONAL EROSION CONTROL AUTHORITY (IECA) & STANDARD DRAWINGS
5. AUSTROADS DESIGN MANUALS & STANDARD DRAWINGS
6. MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
7. SOUTH EAST QUEENSLAND WATER SUPPLY AND SEWERAGE DESIGN AND CONSTRUCTION CODE (OR THE SEQ CODE)

PRELIMINARY!

ALL CIVIL WORKS AS SHOWN ON MELIORA DA PLANS IS PRELIMINARY AND IS SUBJECT TO FURTHER DETAILED DESIGN AND COORDINATION POST DEVELOPMENT APPLICATION APPROVAL AND PRIOR TO CONSTRUCTION COMMENCING

CONTOURS LEGEND

- DESIGN/FINISHED SURFACE CONTOURS
- EXISTING SURFACE CONTOURS

BOUNDARIES LEGEND

- PROPOSED LOT BOUNDARIES
- PROPOSED EASEMENT

EXISTING FEATURES LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING BOUNDARY ADJACENT
- EXISTING EASEMENT
- EARTHWORKS EXISTING BATTER TOE
- EARTHWORKS EXISTING BATTER TOP
- BUILDING EXISTING
- BUILDING EXISTING ROOF/EAVE
- MISC FENCE / GATE EXISTING
- ROAD EXISTING KERB
- ROAD EXISTING CENTERLINE
- ROAD EXISTING EDGE BITUMEN
- COMMUNICATIONS EXISTING
- DRAINAGE EXISTING CENTERLINE
- DRAINAGE EXISTING TEXT
- ELECTRICAL EXISTING OVERHEAD
- ELECTRICAL EXISTING UNDERGROUND
- ELECTRICAL EXISTING CENTERLINE DBYD
- GAS EXISTING
- GAS EXISTING CENTERLINE DBYD
- SEWER EXISTING CENTERLINE
- SEWER EXISTING RISING MAIN
- SEWER EXISTING CENTERLINE DBYD
- SEWER RISING MAIN EXISTING CENTERLINE DBYD
- TELECOMMUNICATIONS EXISTING
- TELECOMMUNICATIONS EXISTING CENTERLINE DBYD
- FIBER OPTIC CABLES EXISTING CENTERLINE DBYD
- WATER EXISTING CENTERLINE
- WATER EXISTING CENTERLINE DBYD
- ABANDONED SERVICES
- EXISTING RETAINING WALL - BOULDER
- EXISTING RETAINING WALL - BLOCK
- EARTHWORKS EXISTING DRAIN
- EARTHWORKS EXISTING DRAIN CONCRETE
- EXISTING VEGETATION

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Zero Damage - Zero Harm

NOTE
ALL PLANS TO BE READ IN CONJUNCTION WITH INFORMATION AND NOTES ON DRG. No. SK00 AND ALL RELEVANT SPECIFICATIONS

PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
02	ISSUE FOR INFORMATION	13.03.25	SM	MB
01	ISSUE FOR INFORMATION	12.12.24	SM	MB

NORTH POINT | SCALE BAR(S)

DRAWN: DEC 2024
DESIGNED: DEC 2024
APPROVED: MITCHELL BLYTH
RPEQ No. 21258
DATE: 13.03.25
RPEQ SIGNATURE

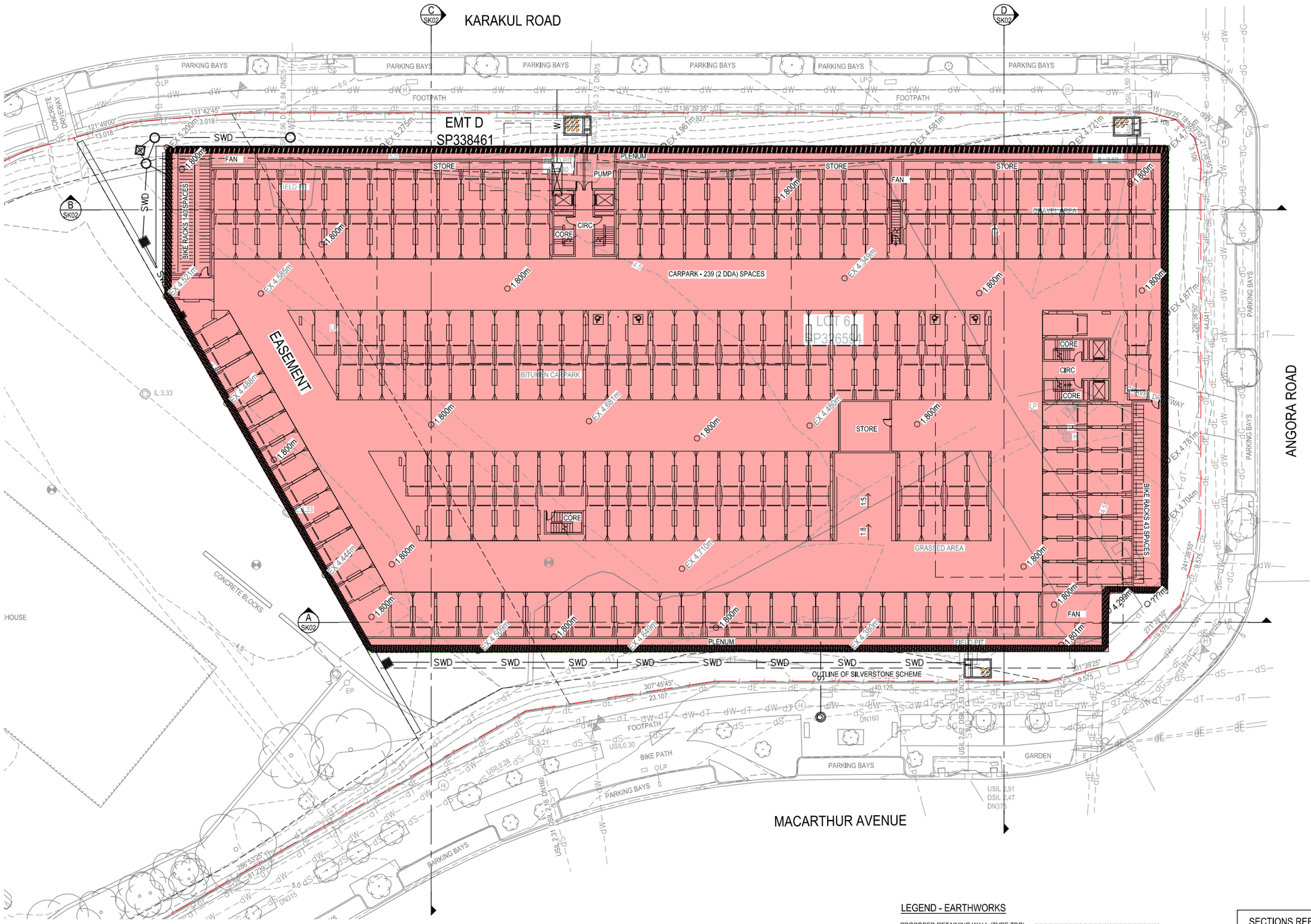
MELIORA ENGINEERING
INFO@MELIORACE.COM
ABN 46 153 772 813

CLIENT/DEVELOPER: SILVERSTONE DEVELOPMENTS
CLIENT/DEVELOPER LOGO: SILVERSTONE

PROJECT: SITE 18A, 260 MACARTHUR AVE, HAMILTON
ARCHITECT: CARR
BUILDER:

DRAWING TITLE: COVER, LOCALITY, SCHEDULE & GENERAL NOTES

MELIORA JOB No. 24125
DWG No SK00
REVISION 02



EARTHWORKS NOTES

1. ALL WORKS TO BE GENERALLY IN ACCORDANCE WITH COUNCIL APPROVED DEVELOPMENT APPLICATION DOCUMENTS AND ASSOCIATED APPROVAL CONDITIONS
2. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH ALL RELEVANT APPROVED MANAGEMENT PLANS
3. CONTRACTOR IS TO ALLOW FOR PROVISION OF ALL REQUIRED EROSION AND SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH IECA AND LOCAL COUNCIL POLICIES AND GUIDELINES AND IS TO BE AWARE OF THE REQUIREMENTS AND PENALTIES STIPULATED WITHIN ENVIRONMENTAL PROTECTION & BIODIVERSITY ACT 1999.
4. GRASS AND TOPSOIL SHALL BE STRIPPED TO A MINIMUM DEPTH OF 100mm OVER THE EXTENT OF THE WORKS UNLESS DIRECTED OTHERWISE AND STOCKPILED FOR FUTURE USE AS NON-STRUCTURAL FILL IF REQUIRED, OR REMOVED FROM SITE. WHERE SITE TOPSOIL IS TO BE RESPREAD ON SITE, CONTRACTOR TO ALLOW TO SCREEN THE TOPSOIL OF ALL UNSUITABLE AND OVERSIZED MATERIAL. ALL UNSUITABLE MATERIAL GENERATED FROM SCREENING TO BE REMOVED FROM SITE AT CONTRACTORS EXPENSE
5. ALL EARTHWORKS TO BE ALLOW FOR REQUIREMENTS OF LOCAL AUTHORITY EARTHWORKS SPECIFICATIONS. IN LIEU OF LOCAL AUTHORITY SPECIFICATIONS EARTHWORKS COMPACTION TO BE MONITORED BY FIELD DENSITY TESTS CARRIED OUT IN ACCORDANCE WITH REQUIREMENTS OF AS3798 AND AS1289. ALL EARTHWORKS UNDER BUILDING PADS TO BE CARRIED OUT IN ACCORDANCE WITH AS3798 APPENDIX B, GEOTECHNICAL TESTING AUTHORITY, 'LEVEL 1' SOIL ENGINEERING SUPERVISION. THE NOMINATED GEOTECHNICAL TESTING AUTHORITY SHALL PROVIDE CERTIFICATION THAT ALL GENERAL EARTHWORKS OPERATIONS HAVE BEEN CARRIED OUT IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS AND THE CONTROLLED FILL IS SUITABLE FOR ULTIMATE PURPOSE AND LOADING
6. IF DURING EARTHWORKS OPERATIONS UNSUITABLE MATERIAL IS ENCOUNTERED, AS DEFINED IN SECTION 4 OF AS3798, THEN REMOVE THIS MATERIAL PRIOR TO ANY FILLING OPERATION
7. ALL BATTERS TO BE KEYED/STEPPED INTO EXISTING MATERIAL AS DIRECTED BY GEOTECHNICAL ENGINEER CONTRACTOR TO ALLOW FOR ALL KEYING/STEPPING AS REQUIRED
8. THE CONTRACTOR IS TO ENSURE THAT THE SITE IS SELF-DRAINING THROUGHOUT THE EARTHWORKS OPERATIONS. DAMAGE RESULTING FROM EXPOSURE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE
9. ADEQUATE SAFETY FENCING TO BE APPLIED TO BATTERS OR RETAINING WALLS IN FILL AS PER RELEVANT AUSTRALIAN STANDARDS AND TO ARCHITECTS DETAILS
10. DUST CONTROL MEASURES ARE TO INCLUDE SPRAYING WATER ON UNPAVED ROADS, ACCESS TRACKS AND STOCKPILES AT A SUFFICIENT LEVEL TO SUPPRESS DUST GENERATION. ADDITIONALLY CONTRACTORS ARE TO COVER OR ENCLOSE STOCKPILES WHERE REASONABLY PRACTICAL TO RESTRICT DUST MOVEMENT
11. ALL UNPAVED, DISTURBED AREAS AT COMPLETION OF EARTHWORKS ARE TO BE LANDSCAPED/STABILISED IN ACCORDANCE WITH LANDSCAPING PLANS OR OTHERWISE COVERED WITH TOPSOIL AND GRASS SEEDED
12. ACID SULPHATE SOILS FOUND ON SITE ARE TO BE TREATED IN ACCORDANCE WITH REQUIREMENTS IDENTIFIED IN RELEVANT ACID SULPHATE MANAGEMENT PLANS AND RELEVANT AUTHORITY GUIDELINES
13. LEVELS AND GRADIENTS AT JUNCTIONS WITH EXISTING WORKS MAY BE VARIED WITH SUPERINTENDENTS APPROVAL AS REQUIRED TO ACHIEVE SATISFACTORY CONNECTIONS
14. EXISTING TREES TO BE RETAINED SHALL BE NO CLOSER THAN 450mm FROM THE TRAVEL PATH
15. FIRE ANT MOVEMENT CONTROLS: THE QUEENSLAND GOVERNMENT HAS IMPLEMENTED IMPROVEMENT CONTROLS IN AREAS OF QUEENSLAND (BIOSECURITY ZONES) WHERE THIS PEST SPECIES HAS BEEN DETECTED. THESE CONTROLS APPLY TO INDIVIDUALS AND COMMERCIAL OPERATORS AND RESTRICT THE MOVEMENT OF MATERIALS THAT COULD CARRY FIRE ANTS WHICH INCLUDE SOIL, TURF, POTTED PLANTS, MULCH, BALED HAY OR STRAW, ANIMAL MANURES, MINING OR QUARRY PRODUCTS. PENALTIES FOR NON-COMPLIANCE WITH MOVEMENT CONTROLS WITHIN FIRE ANT BIOSECURITY ZONES APPLY UNDER THE BIOSECURITY ACT 2014. CONTRACTORS AND SUB-CONTRACTORS WILL BE LIABLE FOR BREACHES AND ARE TO FOLLOW LEGISLATION AT ALL TIMES

LEVELS NOTES

1. EARTHWORKS LEVELS SHOWN ARE FINISHED SURFACE LEVELS (FSL) INCLUSIVE OF TOPSOIL LAYER / PAVEMENT DEPTHS IF RELEVANT.
2. FLOOD IMMUNITY - REFER TO FLOOD REPORT BY OTHERS FOR DETAILS.
3. ALL RETAINING WALL HEIGHT LABELS ARE CALCULATED TO FINISHED SURFACE LEVELS INCLUDING TOPSOIL (AND TO NEAREST 200mm HEIGHT). FINAL RETAINING WALL DESIGNS AND DETAILED STEPPING IS SUBJECT TO STRUCTURAL DESIGN BY OTHERS.
4. REFER TO ARCHITECTURAL DRAWINGS FOR BUILDING DETAILS

RETAINING NOTES

1. ALL RETAINING WALL/TERRACING TO SATISFY COUNCIL CODES & STANDARDS. REFER TO COUNCIL'S FILLING AND EXCAVATION CODE FOR FURTHER DETAILS. RETAINING WALL FINISHES THAT PRESENT TO ADJOINING LAND ARE TO BE OF HIGH QUALITY APPEARANCE AND COMPATIBLE WITH SURROUNDING DEVELOPMENT.
2. ANY PROPOSED RETAINING WALL WORKS (INCLUDING REAR OF RETAINING WALL DRAINAGE INFRASTRUCTURE) MUST BE WHOLLY WITHIN THE PROPERTY BOUNDARY OF THE SUBJECT SITE.
3. ALL RETAINING WALLS SHOWN ON MELIORA DRAWINGS ARE INDICATIVE ONLY WITH FINAL RETAINING WALL STRUCTURAL DESIGN & CONSTRUCTION CERTIFICATION BY MANUFACTURER / INSTALLER OR BY RPEQ STRUCTURAL ENGINEER
4. CONTRACTOR TO CONFIRM RETAINING WALL BACKSLOPE ANGLE (IF STEEPER THAN 1in4) WITH GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION
5. CONTRACTOR TO ENSURE FREE DRAINING (NO FINES) BACKFILL MATERIAL IS IMPLEMENTED BEHIND ALL RETAINING WALLS U.N.O BY RPEQ STRUCTURAL ENGINEER. SOCKED SUBSOIL DRAINAGE (SLOTTED PIPE) TO BE PLACED BEHIND BASE OF RETAINING WALL AND IS TO DISCHARGE TO SUITABLE POINT OF DISCHARGE, OR ALLOW FOR WEEP HOLES AT BASE OF WALL
6. ENSURE NO VEHICLE LOADING WITHIN A HORIZONTAL DISTANCE FROM TOP OF WALL EQUAL TO THE HEIGHT OF THE WALL DURING OR AFTER CONSTRUCTION, U.N.O BY RPEQ ENGINEERED DESIGN WHICH ALLOWS FOR LOADING

UNKNOWN GEOTECH PARAMETERS

ALLOW ADEQUATE PROVISIONAL AMOUNTS FOR OR CONTINGENCIES FOR THE FOLLOWING UNKNOWN EARTHWORKS/GEOTECH PARAMETERS:

- SWELLING /COMPACTION FACTORS - UNKNOWN
- SUBGRADE CBR - UNKNOWN
- SUBGRADE SUITABLE FOR FILLING/PAVEMENT - UNKNOWN
- CUT FROM SITE CAN BE USED FOR FILLING (STRUCTURAL OR OTHERWISE) - UNKNOWN
- ONSITE SOILS ARE DISPERSIVE/HIGHLY REACTIVE - UNKNOWN

PRELIMINARY VOLUMES

(UNSTRIPPED EXISTING SURFACE TO FINISHED SURFACE)

	CUT	18141m³
	FILL	0m³
BALANCE (CUT)		18141m³

NOTE: THE ABOVE VOLUMES ARE INDICATIVE ONLY AND SUBJECT TO DETAILED DESIGN

LEGEND - EARTHWORKS

PROPOSED RETAINING WALL (TYPE TBC)

FINISHED LEVELS 42.11m

EXISTING LEVELS 42.11m

DESIGN/FINISHED SURFACE CONTOURS 18,0

NOTE: FOR CONTOURS, BOUNDARIES & EXISTING FEATURES LEGEND REFER TO DRG No. C01

SECTIONS REFERENCE
FOR EARTHWORKS SECTIONS REFER DWG No SK02

REFERENCE PRECEDENCE

REFER TO REQUIREMENTS OF THE FOLLOWING MANDATORY REFERENCE DOCUMENTS (IN ORDER OF PRECEDENCE). REQUEST IF NOT RECEIVED DURING TENDER. CONTRACTOR WILL BE LIABLE FOR NON-COMPLIANT CONSTRUCTION. RAISE DISCREPANCIES WITH SUPERINTENDENT PRIOR TO CONSTRUCTION.

1. AUTHORITY APPROVED PLANS/DOCUMENTS
2. AUTHORITY APPROVAL CONDITIONS
3. RECOMMENDATIONS WITHIN SPECIALIST REPORTS INCLUDING GEOTECHNICAL REPORTS
4. AUTHORITY STANDARDS, GUIDELINES AND POLICY
5. DESIGN STANDARD & GUIDELINES (AS 3798, AS 1289)
6. PROJECT DRAWINGS, NOTES AND DETAILS (INCLUDING ALL MELIORA CIVIL DRAWINGS)
7. ENGINEERING SPECIFICATIONS (IF PUBLISHED)

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NOTE
ALL PLANS TO BE READ IN CONJUNCTION WITH INFORMATION AND NOTES ON DRG. No. SK00 AND ALL RELEVANT SPECIFICATIONS

PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
02	ISSUE FOR INFORMATION	13.03.25	SM	MB
01	ISSUE FOR INFORMATION	12.12.24	SM	MB

NORTH POINT

SCALE BAR(S)
0 2 4 6 8 10 12m
SCALE 1:250 @ A1

DRAWN: DEC 2024
DESIGNED: DEC 2024
APPROVED: MITCHELL BLYTH
RPEQ No. 21258
DATE: 13.03.25
RPEQ SIGNATURE

MELIORA ENGINEERING
INFO@MELIORACE.COM
ABN 46 153 772 813

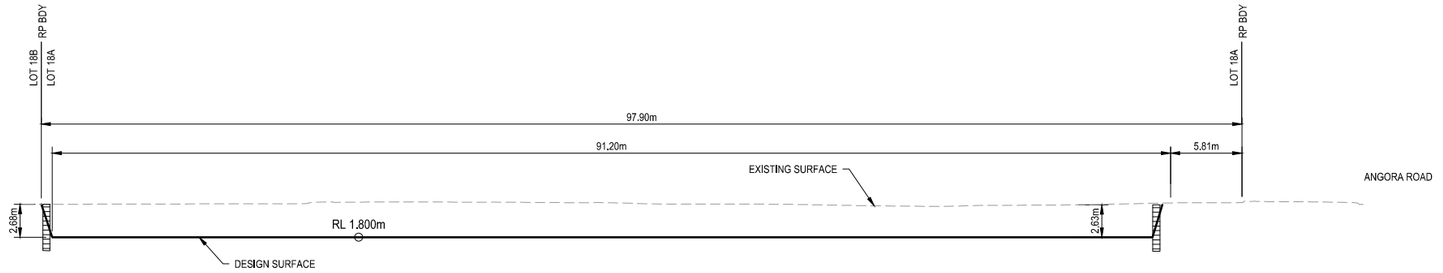
CLIENT/DEVELOPER: SILVERSTONE DEVELOPMENTS
CLIENT/DEVELOPER LOGO: SILVERSTONE

PROJECT: SITE 18A, 260 MACARTHUR AVE, HAMILTON
ARCHITECT: CARR
BUILDER:

DRAWING TITLE: PRELIMINARY EARTHWORKS LAYOUT PLAN & NOTES

MELIORA JOB No. 24125
DWG No SK01
REVISION 02

Mar 13, 2025 – 12:35pm M:\24_JOBS\24125_LOT 18A & 18B NORTHSHORE HAMILTON\04 DWG\1 dwg\24125_SK01.dwg



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SECTION A

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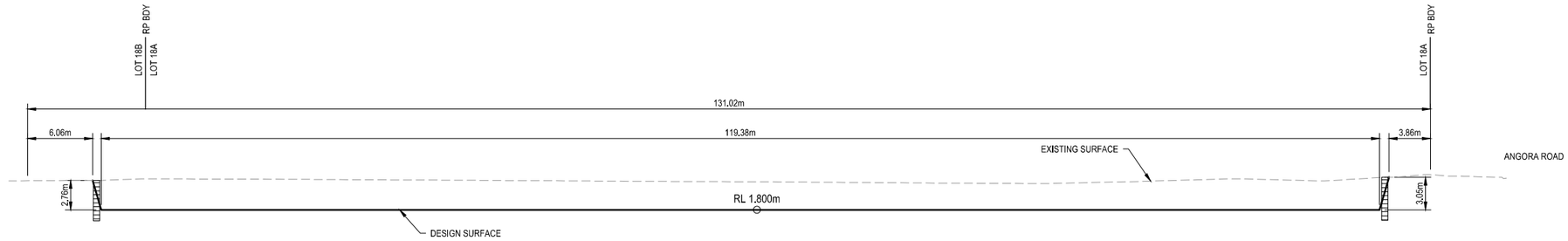

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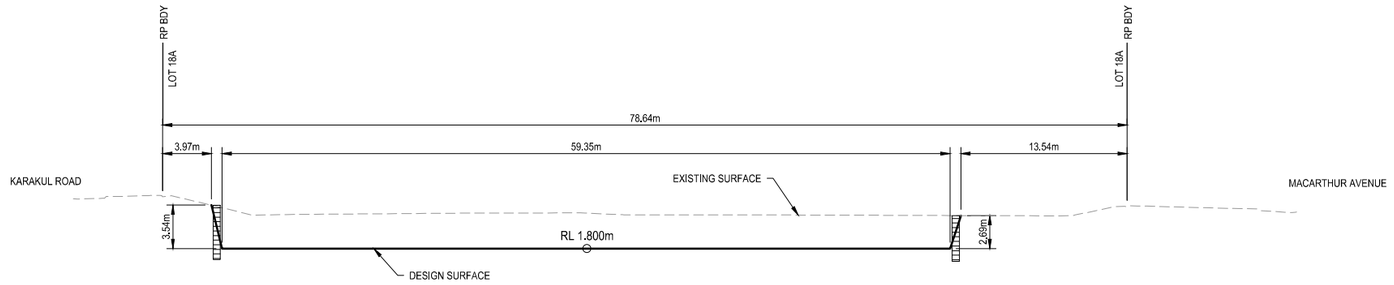
SECTION B

SECTION B / SCALE 1:250 / SK01



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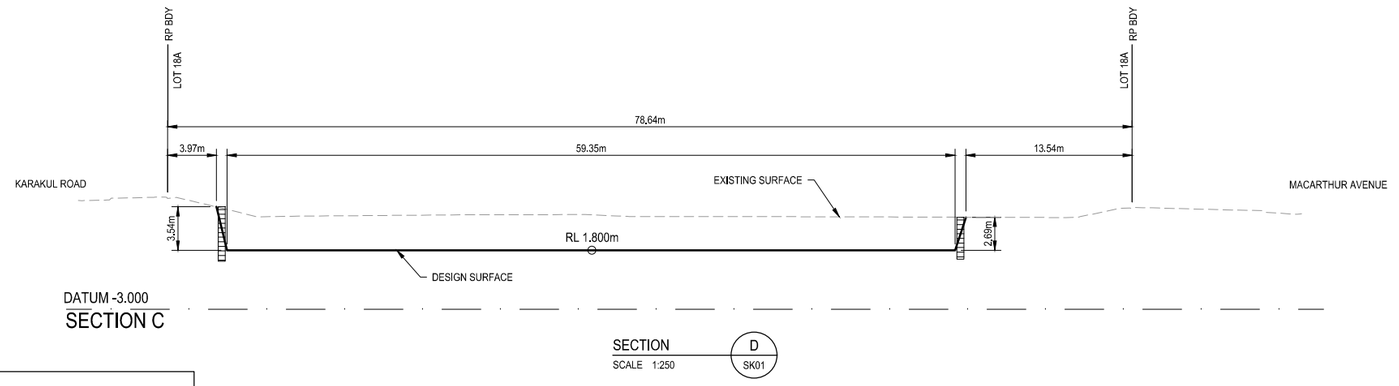
SECTION C

SECTION C / SCALE 1:250 / SK01



DATUM -3.000

SECTION C

SECTION D / SCALE 1:250 / SK01

LEGEND - SECTIONS

DESIGN (FINISHED) SURFACE

EXISTING (UNSTRIPPED) SURFACE

RETAINING STRUCTURES (INDICATIVE - TYPE TBC)

LAYOUT & NOTES REFERENCE

FOR EARTHWORKS LAYOUT PLAN REFER DWG No C20.

REFERENCE PRECEDENCE

REFER TO REQUIREMENTS OF THE FOLLOWING MANDATORY REFERENCE DOCUMENTS (IN ORDER OF PRECEDENCE). REQUEST IF NOT RECEIVED DURING TENDER. CONTRACTOR WILL BE LIABLE FOR NON-COMPLIANT CONSTRUCTION. RAISE DISCREPANCIES WITH SUPERINTENDENT PRIOR TO CONSTRUCTION.

1. AUTHORITY APPROVED PLANS/DOCUMENTS
2. AUTHORITY APPROVAL CONDITIONS
3. RECOMMENDATIONS WITHIN SPECIALIST REPORTS INCLUDING GEOTECHNICAL REPORTS
4. AUTHORITY STANDARDS, GUIDELINES AND POLICY
5. DESIGN STANDARD & GUIDELINES (AS 3798, AS 1289)
6. PROJECT DRAWINGS, NOTES AND DETAILS (INCLUDING ALL MELIORA CIVIL DRAWINGS)
7. ENGINEERING SPECIFICATIONS (IF PUBLISHED)

PRELIMINARY

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NOTE

ALL PLANS TO BE READ IN CONJUNCTION WITH INFORMATION AND NOTES ON DRG. No. SK00 AND ALL RELEVANT SPECIFICATIONS

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR INFORMATION	12.12.24	SM	MB

NORTH POINT

SCALE BAR(S)

0 2 4 6 8 10 12m

SCALE 1:250 @ A1

DRAWN: DEC 2024

DESIGNED: DEC 2024

APPROVED: MITCHELL BLYTH RPEQ No. 21258 DATE: 07/12/24

RPEQ SIGNATURE

MELIORA ENGINEERING
INFO@MELIORACE.COM
ABN 46 153 772 813

CLIENT/DEVELOPER: SILVERSTONE DEVELOPMENTS

CLIENT/DEVELOPER LOGO: SILVERSTONE

PROJECT: SITE 18A, 260 MACARTHUR AVE, HAMILTON

ARCHITECT:

BUILDER:

DRAWING TITLE: PRELIMINARY EARTHWORKS SECTIONS - SHEET 1 OF 2

MELIORA JOB No. 24125

DWG No SK02

REVISION 01

Dec 16, 2024 - 2:36pm M:\04_JOBS\24\24125_LOT 18A & 18B NORTHSHORE HAMILTON\04 DWG\1 dwg\24125-SK01.dwg

KARAKUL ROAD

PARKING BAYS

FOOTPATH

EMT D
SP338461

VEHICLE ENTRY

PMT

BIKE RACKS
10 SPACES

EXHAUST

MAIN SWITCHBOARD ROOM

SERVICES

COMMS / NBN

MAIL

VOID OVER

LOBBY

OFFICE

STORE

RESI WASTE

VISITOR CARPARK - 31 SPACES

BITUMEN CARPARK

LOT 6
SP326594

VAN BAY

WASTE

HRV ZONE

RETAIL WASTE

RETAIL AMENITIES

RETAIL - GROCER

RETAIL - RESTAURANT

RE. - HAIRDRESSER

RETAIL - BAKERY

RETAIL - BOTTLE SHOP

GRASSED AREA

GARDEN

BIKE PATH

CONCRETE BLOCKS

EASEMENT

FIELD PIT

PROPOSED QUALITY TREATMENT SYSTEM (OFFLINE) FOR CATCHMENT C1

PROPOSED QUALITY TREATMENT SYSTEM (OFFLINE) FOR CATCHMENT C2

PROPOSED QUALITY TREATMENT SYSTEM (OFFLINE) FOR CATCHMENT C3

PROPOSED QUALITY TREATMENT SYSTEM (OFFLINE) FOR CATCHMENT C4

LARGE DIAMETER WATER METER FOR DEVELOPMENT (LOCATED IN BASEMENT WITH AMR TECHNOLOGY FOR REMOTE METER READING)

BOLT DOWN GRATED PIT LID TO ACT AS 1% AEP EMERGENCY SURCHARGE POINT FOR CATCHMENT C3 (SHEET FLOWS TO MACARTHUR AVE VERGE)

PROPOSED SEWER PC FOR DEVELOPMENT

PROPOSED SEWER MANHOLE OVER EXISTING LINE

MACARTHUR AVENUE

LEGEND

- PROPOSED RETAINING WALL (TYPE TBC)
- PROPOSED DRAINAGE (PIPE) — SWD
- PROPOSED SEWER MAIN/CONNECTIONS — S
- PROPOSED WATER MAIN/SERVICE AND METERS — W
- PROPOSED FIELD INLET PIT
- PROPOSED CONCRETE ROAD/CROSSOVER
- PROPOSED FOOTPATHS
- PROPOSED BUILDINGS
- PROPOSED TURF OR LANDSCAPING AREA
- EXISTING EXTERNAL ROAD PAVEMENT
- EXISTING BUILDINGS

NOTE: FOR CONTOURS, BOUNDARIES & EXISTING FEATURES LEGEND REFER TO DRG No. SK00

PRELIMINARY ROADWORKS AND DRAINAGE NOTES

1. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH CURRENT COUNCIL STANDARD SPECIFICATIONS AND DRAWINGS, UNLESS NOTED OTHERWISE
2. CONTRACTOR TO CONDUCT A DIAL BEFORE YOU DIG SEARCH PRIOR TO COMMENCEMENT OF WORKS AND CONFIRM THE LOCATION OF ALL EXISTING SERVICES PRIOR TO ANY EXCAVATION SHOULD ANY OF THE PROPOSED SERVICES CLASH WITH THE IDENTIFIED EXISTING SERVICES, CONSULT ENGINEER FOR ADVICE
3. CONTRACTOR TO ENSURE ALL EXISTING SERVICES ARE PROTECTED DURING THE COURSE OF CONSTRUCTION IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS, ANY DAMAGE TO EXISTING SERVICES IS TO BE REINSTATED AT THE CONTRACTORS EXPENSE.
4. ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH COUNCILS EROSION AND SEDIMENT CONTROL GUIDELINES
5. ALL TRENCH EXCAVATION AND CONSTRUCTION SHALL COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 2011
6. CONTRACTOR TO REINSTATE DAMAGE TO ANY EXISTING INFRASTRUCTURE (KERB AND CHANNEL, ASPHALT, FOOTPATH, VERGE ETC) TO COUNCIL SATISFACTION
7. CONTRACTOR TO ENSURE ADJOINING PROPERTIES AND ROADS ARE PROTECTED FROM PONDING OR NUISANCE FROM STORMWATER RUNOFF AS A RESULT OF THE PROPOSED WORKS
8. CONTRACTOR TO REMOVE ANY REDUNDANT DRAINAGE OUTLETS FROM THE KERB AND CHANNEL INCLUDING ANY ASSOCIATED PIPEWORK ACROSS THE FOOTWAY AND REINSTATE THE KERB AND CHANNEL AND THE FOOTWAY AREA IN ACCORDANCE WITH COUNCIL'S INFRASTRUCTURE GUIDELINES

PRELIMINARY GENERAL CIVIL WORKS NOTES

1. ALL PROPOSED WORK IS TO BE DESIGNED & CONSTRUCTED IN ACCORDANCE WITH REQUIREMENTS OF ALL RELEVANT DEVELOPMENT APPROVAL CONDITIONS
2. RETAIN AND PROTECT TREES ON SITE OR WITHIN STREET AS PER N.A.L.L. (OR ANY OTHER RELEVANT VEGETATION MANAGEMENT PLAN) REQUIREMENTS U.N.O.
3. MINIMISE ON SITE EROSION AND RELEASE OF SEDIMENT AND SEDIMENT LADEN STORMWATER FROM THE SITE AT ALL TIMES IN ACCORDANCE WITH BEST PRACTICE ESC METHODS.
4. SERVICES AUTHORITIES (INCLUDING ELECTRICITY, COMMUNICATIONS, GAS, NBN) CONNECTION APPLICATIONS TO BE FACILITATED BY OTHERS WITH CONDUIT/ CONNECTION DESIGNS TO BE COORDINATED WITH CIVIL INFRASTRUCTURE AS REQUIRED
5. ENSURE SEWER AND WATER WORKS APPROVAL IS GRANTED BY THE RELEVANT WATER AUTHORITY PRIOR TO COMMENCING CONSTRUCTION OF CIVIL WORKS
6. NEW WORK MUST NOT DAMAGE OR COMPROMISE THE WORKING ABILITY OF EXISTING INFRASTRUCTURE. PROTECT EXISTING INFRASTRUCTURE AT ALL TIMES DURING CONSTRUCTION

BEFORE YOU DIG www.byda.com.au
Zero Damage - Zero Harm

NOTE
ALL PLANS TO BE READ IN CONJUNCTION WITH INFORMATION AND NOTES ON DRG. No. SK00 AND ALL RELEVANT SPECIFICATIONS

PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
02	ISSUE FOR INFORMATION	13.03.25	SM	MB
01	ISSUE FOR INFORMATION	12.12.24	SM	MB

NORTH POINT

SCALE BAR(S)
0 4 8 12m
SCALE 1:200 @ A1

DRAWN: DEC 2024
DESIGNED: DEC 2024
APPROVED: MITCHELL BLYTH
RPEQ No. 21258
DATE: 13.03.25
RPEQ SIGNATURE

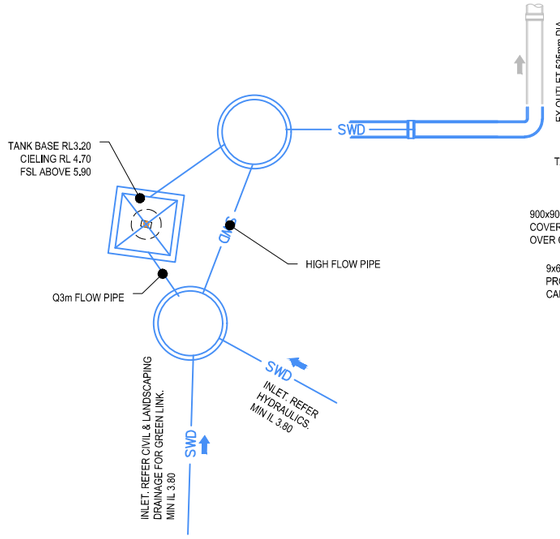
MELIORA ENGINEERING
INFO@MELIORACE.COM
ABN 46 153 772 813

CLIENT/DEVELOPER: SILVERSTONE DEVELOPMENTS
CLIENT/DEVELOPER LOGO: SILVERSTONE

PROJECT: SITE 18A, 260 MACARTHUR AVE, HAMILTON
ARCHITECT: CARR
BUILDER:

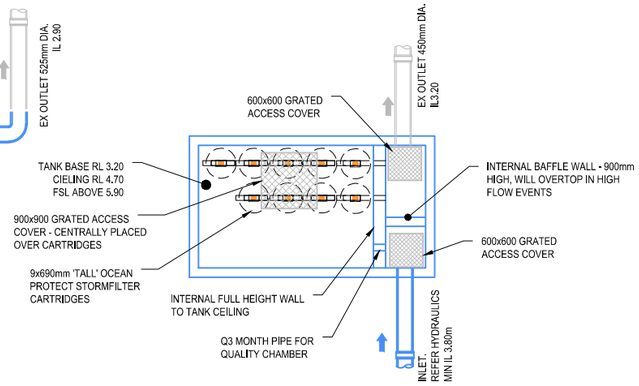
DRAWING TITLE: PRELIMINARY CIVIL SERVICES LAYOUT PLAN

MELIORA JOB No. 24125
DWG No SK05
REVISION 02



TREATMENT TANK 4 - LAYOUT

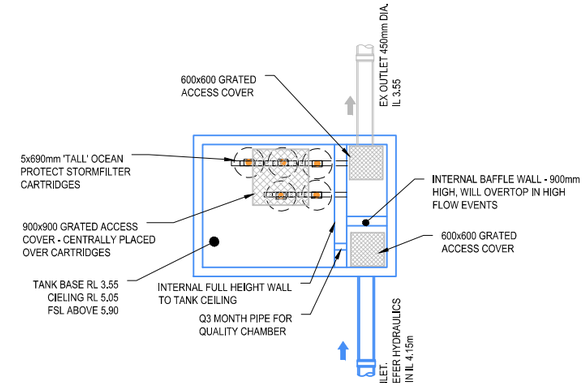
SCALE 1:50



TREATMENT TANK 1 - LAYOUT

SCALE 1:50

BASEMENT FFL 1.80m



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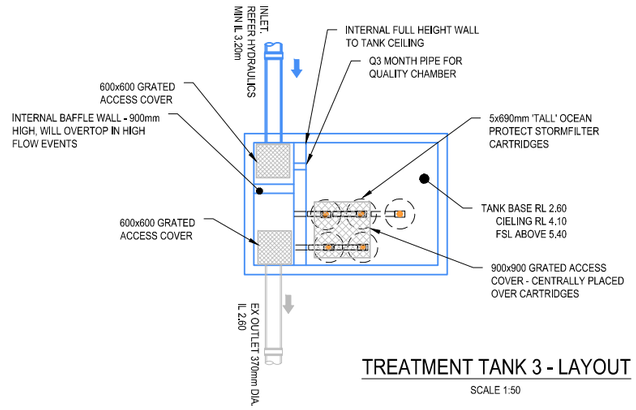

TREATMENT TANK 3 - LAYOUT

SCALE 1:50

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NOTE

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PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR APPROVAL	13.03.25	SD	MB

NORTH POINT

SCALE BAR(S)

0 1 2 3m

SCALE 1:50 @ A1

DRAWN: DEC 2024

DESIGNED: DEC 2024

APPROVED: MITCHELL BLYTH
RPEQ No. 21258
DATE: 13.03.25
RPEQ SIGNATURE

MELIORA ENGINEERING
INFO@MELIORACE.COM
ABN 46 153 772 813

CLIENT/DEVELOPER: SILVERSTONE DEVELOPMENTS

CLIENT/DEVELOPER LOGO: SILVERSTONE

PROJECT: SITE 18A, 260 MACARTHUR AVE, HAMILTON

ARCHITECT: CARR

BUILDER:

DRAWING TITLE: PRELIMINARY STORMWATER DRAINAGE TANK DETAILS

MELIORA JOB No. 24125

DWG No SK06

REVISION 01

KARAKUL ROAD

ANGORA ROAD

MACARTHUR AVENUE

C4 DISCHARGES TO 525mm STUB IL 2.90

C1 DISCHARGES TO 450mm STUB IL 3.20

C2 DISCHARGES TO 450mm STUB IL 3.55

C3 DISCHARGES TO 375mm STUB IL 2.60

EMT D
SP338461

LOT 6
SP326594

FITTED WITH OCEANGUARD TRASH BASKET

C4

C4 (GREEN CROSS BLOCK) SHEET FLOWS TOWARDS MACARTHUR AVENUE FRONTAGE BEFORE BEING CAUGHT IN LANDSCAPING SWALE/PIT/PIPE NETWORK AND FLOWING BACK TO TREATMENT SYSTEM ON KARAKUL FRONTAGE.

REFER TO LANDSCAPE DRAWINGS FOR GREEN CROSS BLOCK LINK LEVELS

FITTED WITH OCEANGUARD TRASH BASKET. ALLOW BOLT DOWN PIT FOR EMERGENCY SURCHARGE ACROSS VERGE TO MACARTHUR AVENUE IN 2% & 1% AEP EVENT.

GREEN CROSS BLOCK DRAINAGE DISCHARGE LINE RUNS OUTSIDE OF BASEMENT TO C3 OUTLET PIPE

C1

[MIN 1 x TRASH BASKET (OCEANGUARD) TO BE FITTED IN PROMINENT C1 PODIUM LEVEL PIT WITH MAXIMUM CATCHMENT]

C2

[MIN 1 x TRASH BASKET (OCEANGUARD) TO BE FITTED IN PROMINENT C2 PODIUM LEVEL PIT WITH MAXIMUM CATCHMENT]

C3

[MIN 2 x TRASH BASKET (OCEANGUARD) TO BE FITTED IN PROMINENT C3 PODIUM LEVEL PIT WITH MAXIMUM CATCHMENT]

PARKING BAYS · FOOTPATH · VEHICLE ENTRY · BIKE RACKS 10 SPACES · EXHAUST · PMT · MAIN SWITCHBOARD ROOM · SERVICES · COMMS / NBN · LOBBY · OFFICE · CIRC · RESI WASTE · VISITOR CARPARK · BITUMEN CARPARK · VAN BAY · WASTE · HRV ZONE · MAIL · RETAIL WASTE · RESI WASTE · RETAIL AMENITIES · RETAIL - GROCER · RETAIL - RESTAURANT · RETAIL - BAKERY · CORE · STORE · VOID OVER · FIELD PIT · SWD · BIKE PATH · GARDEN · CONCRETE BLOCKS · EASEMENT

Pipe Characteristics			Hydraulic Characteristics					
Pipe Diameter (m)	HGL Longitudinal Slope (1 in ...)	Manning's n	A - Flow Area (m2)	P - Wetted Perimeter (m)	R - Hydraulic Radius	V - Flow Velocity (m2/s)	Q (m3/s)	Q (L/s)
0.375	100.00	0.013	0.110	1.178	0.094	1.587	0.175	175.3

Pipe Characteristics			Hydraulic Characteristics					
Pipe Diameter (m)	HGL Longitudinal Slope (1 in ...)	Manning's n	A - Flow Area (m2)	P - Wetted Perimeter (m)	R - Hydraulic Radius	V - Flow Velocity (m2/s)	Q (m3/s)	Q (L/s)
0.450	100.00	0.013	0.159	1.414	0.113	1.793	0.285	285.1

Pipe Characteristics			Hydraulic Characteristics					
Pipe Diameter (m)	HGL Longitudinal Slope (1 in ...)	Manning's n	A - Flow Area (m2)	P - Wetted Perimeter (m)	R - Hydraulic Radius	V - Flow Velocity (m2/s)	Q (m3/s)	Q (L/s)
0.525	100.00	0.013	0.216	1.649	0.131	1.987	0.430	430.1

MINOR EVENT	10	MAJOR EVENT	50						
CATCHMENT NAME		C1		C2		C3		C4	
RATIONAL METHOD PARAMETERS	Units	Design Storm (yrs)		Design Storm (yrs)		Design Storm (yrs)		Design Storm (yrs)	
		10	50	10	50	10	50	10	50
CATCHMENT AREA	ha	0.276		0.186		0.289		0.062	
TIME OF CONCENTRATION	min	5.0		5.0		7.0		5.0	
RUNOFF COEFFICIENT		0.85	0.98	0.85	0.98	0.82	0.94	0.78	0.90
RAINFALL INTENSITY (Iy)	mm/hr	214.52	287.11	214.52	287.11	189.92	254.80	214.52	287.11
PEAK FLOW	L/s	139.8	215.2	94.2	145.0	125.1	193.0	28.8	44.4

LEGEND

POST DEVELOPMENT CATCHMENT BOUNDARY

PROPOSED CATCHMENT FLOW DIRECTION

C1 CATCHMENT LABEL

NOTE: FOR CONTOURS, BOUNDARIES & EXISTING FEATURES LEGEND REFER TO DRG No. SK00

PRELIMINARY

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Zero Damage - Zero Harm

NOTE
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REV	DESCRIPTION	DATE	DRAWN	APPR.
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NORTH POINT

SCALE BAR(S)

0 4 8 12m

SCALE 1:200 @ A1

DRAWN: DEC 2024
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APPROVED: MITCHELL BLYTH
RPEQ No. 21258
DATE: 13.03.25
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CLIENT/DEVELOPER: SILVERSTONE DEVELOPMENTS
CLIENT/DEVELOPER LOGO: SILVERSTONE

PROJECT: SITE 18A, 260 MACARTHUR AVE, HAMILTON
ARCHITECT: CARR
BUILDER:

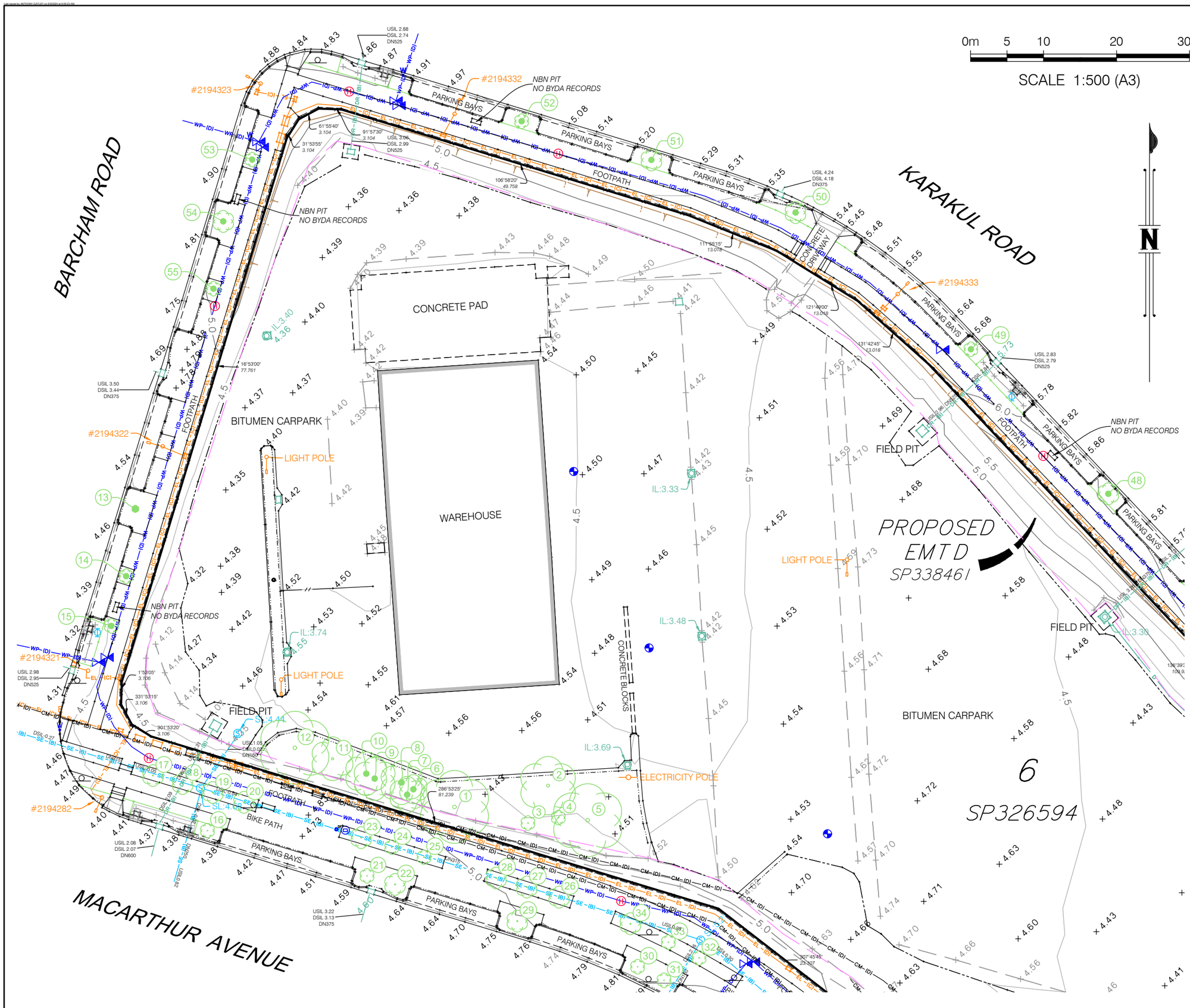
DRAWING TITLE: PRELIMINARY CIVIL DRAINAGE CATCHMENT PLAN

MELIORA JOB No. 24125

SK07 DWG No

02 REVISION

6.3 APPENDIX C – SURVEY PLAN



CLIENT

SILVERSTONE DEVELOPMENTS

PROJECT

DETAIL SURVEY
OF
LOT 6 ON SP326594
(MACARTHUR AVE, HAMILTON)

NOTES

(i) The title boundaries shown hereon were marked at the time of survey.

(ii) Survey data inside the subject lot fencing is taken from previous LandPartners plan BRMM7695-000-245-1, surveyed on 6/10/2022

(iii) Services shown hereon have been located where possible by field survey. If not able to be so located, services have been plotted from the records of relevant authorities where available and have been noted accordingly on the plan.

(iv) Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

REV	DATE	DRAWN	CHECKED	APPROVED	SURVEY DATE
1	6/09/2024	AJG	AJG	MLM	4/09/2024

LANDPARTNERS surveyors and planners

ISO 9001 Quality Management Systems CERTIFIED
ISO 45001 Occupational Health and Safety Management CERTIFIED
CERTIFIED LOCATOR

Brisbane Office
Level 1
18 Little Cribb Street
Milton QLD 4064

PO Box 1399
Milton
QLD 4064

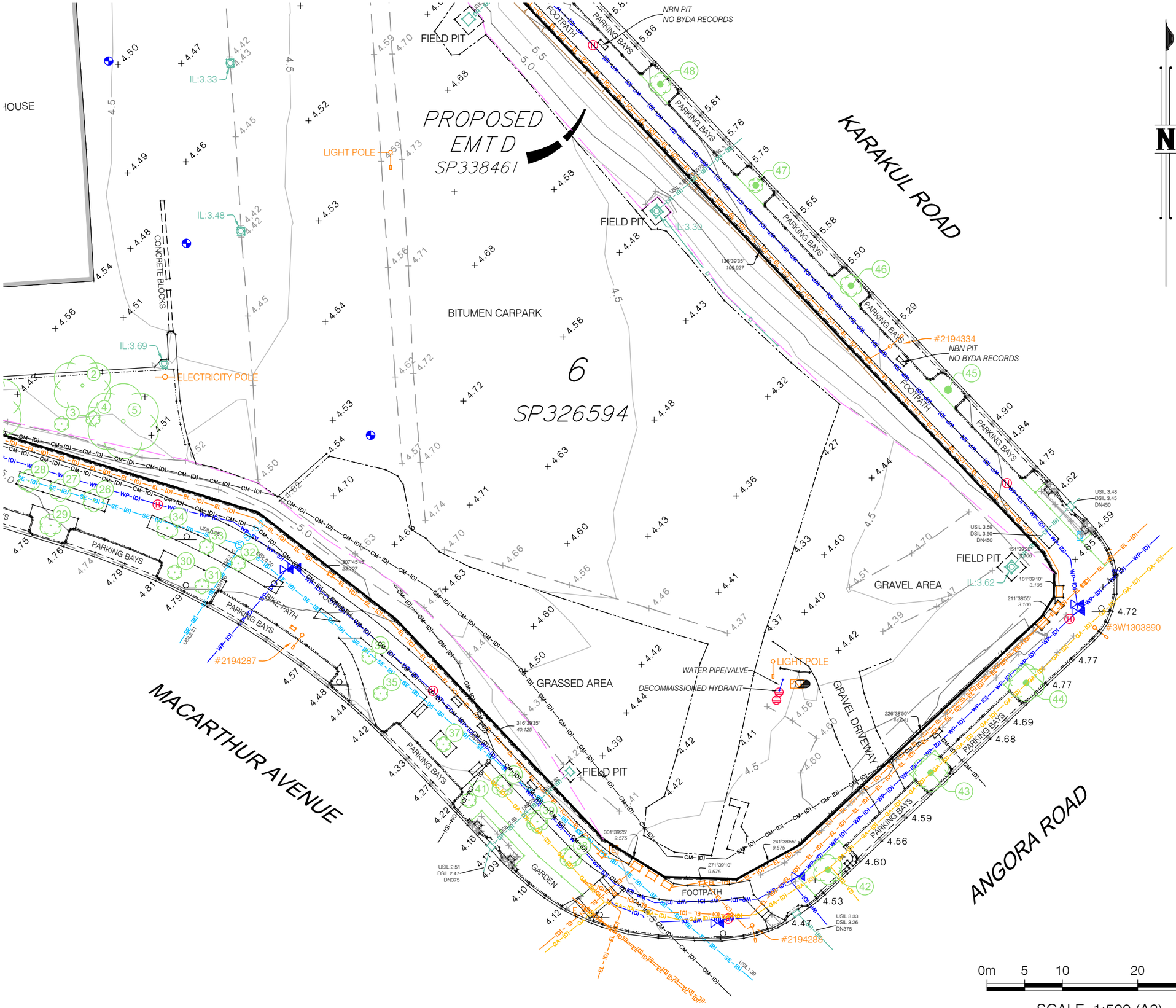
p: (07) 3842 1000
f: (07) 3842 1001
e: info@landpartners.com.au
w: www.landpartners.com.au

LEVEL DATUM	LOCAL AUTHORITY
AHD	BRISBANE C.C.
LEVEL ORIGIN PSM186779 RL 4.325m	CONTOUR INTERVAL 0.5 Metre
MERIDIAN MGA	CO-ORD SYSTEM LOCAL ARBITRARY

UDN

SHEET 1 OF 3

BRMM8547-000-3-1



CLIENT

SILVERSTONE DEVELOPMENTS

PROJECT

DETAIL SURVEY
OF
LOT 6 ON SP326594
(MACARTHUR AVE, HAMILTON)

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REV	DATE	DRAWN	CHECKED	APPROVED	SURVEY DATE
1	6/09/2024	AJG	AJG	MLM	4/09/2024

LANDPARTNERS surveyors and planners

ISO 9001 Quality Management Systems CERTIFIED — ISO 45001 Occupational Health and Safety Management CERTIFIED

CERTIFIED LOCATOR

Brisbane Office
Level 1
18 Little Cribb Street
Milton QLD 4064

PO Box 1399
Milton
QLD 4064

p: (07) 3842 1000
f: (07) 3842 1001
e: info@landpartners.com.au
w: www.landpartners.com.au

LEVEL DATUM AHD	LOCAL AUTHORITY BRISBANE C.C.
LEVEL ORIGIN PSM186779 RL 4.325m	CONTOUR INTERVAL 0.5 Metre
MERIDIAN MGA	CO-ORD SYSTEM LOCAL ARBITRARY

UDN

BRMM8547-000-3-1

TREE NUMBER	HEIGHT (m)	TRUNK DIAMETER (mm)	CANOPY SPREAD (m)
1	8	900	10
2	8	400	8
3	4	250	2
4	4	250	2
5	8	400	10
6	5	250	4
7	6	200	5
8	8	400	6
9	5	400	6
10	5	400	6
11	5	400	6
12	4	600	10
13	3	80	1
14	3	80	2
15	3	80	2
16	3	80	2
17	4	150	3
18	4	100	3
19	4	100	3
20	3	80	3
21	4	100	2
22	3	100	3
23	4	100	3
24	3	50	2
25	3	80	2
26	3	100	3
27	4	100	3
28	3	100	3
29	3	150	3
30	3	100	2
31	3	100	2
32	3	100	2
33	3	100	2
34	4	100	3
35	4	100	2
36	3	80	2
37	3	80	2
38	4	80	3
39	4	80	3
40	3	100	3
41	3	100	2
42	4	150	4
43	4	150	5
44	4	150	5
45	3	80	1
46	4	100	3
47	4	100	2
48	3	100	3
49	3	80	2
50	4	100	3
51	3	100	3
52	4	100	2
53	3	100	2
54	3	100	3
55	3	80	2

SYM	DESCRIPTION	SYM	DESCRIPTION
	BENCHMARK		SIGNS
	BOLLARD		INSPECTION OPENING
	COLUMN / PILLAR	S	SEWERAGE MANHOLE
E	ELECTRICAL BOX		STREET NAME SIGN
	ELEC CONDUIT MARKER		SPRINKLER
	ELEC/LIGHT POLE		TREE
	ELECTRICAL PIT	S	STOP/SLUICE VALVE
	ELECTRICITY POLE		SURVEY STATION
	ELECTRICITY STAY POLE	D	STORMWTR. MANHOLE
H	FIRE HYDRANT GROUND		TAP
	FIRE HYDRANT PILLAR		TELECOM PIT
	FLAG POLE	T	TELECOM MANHOLE
G	GAS MANHOLE		TRANSFORMER O/HEAD
	GAS MARKER		TELEPHONE POLE
	GAS VALVE		TRAFFIC LIGHTS
	GUIDE POST		TRAFFIC PIT
	GUIDE SIGN	A	WATER AIR VALVE
	GULLY TRAP		WATER END CAP
	HOSE BOX/REEL		WATER METER
	HYDRANT MARKER	W	WATER MANHOLE
U	MANHOLE UNKNOWN		WATER REDUCER
	PALM TREE	R	WATER REFLUX VALVE
	TELECOM PILLAR		WATER SAMPLE POINT
	PARKING METER	SC	WATER SCOUR VALVE
	PERM. SURVEY MARK		WATER TEE JUNCTION
V	SEWERAGE VENT		WATER VALVE
	SHRUB	V	WATER VALVE MARKER

Symbols shown are indicative only. The symbol size and orientation does not necessarily represent the real size or orientation of the feature.

LINE TYPE LEGEND

- AWNING/EAVE
- BANK BOTTOM
- BANK TOP
- BITUMEN EDGE
- BUILDING
- CHANGE OF GRADE
- CONCRETE EDGE
- CREEK CENTRELINE
- DRAIN CENTRELINE
- DRAIN CHANNEL CONCRETE
- ELECTRICAL CABLE OVERHEAD
- ELECTRICAL HIGH VOLTAGE
- FENCE
- GRAVEL ROAD EDGE
- GULLY CENTRELINE
- KERB AND CHANNEL INVERT
- KERB LIP
- KERB ONLY
- KERB TOP BACK
- KERB TOP FRONT
- LINE MARKING SINGLE CONTINUOUS
- LINE MARKING SINGLE BROKEN
- LINE MARKING CONTINUOUS/BROKEN
- LINE MARKING DOUBLE CONTINUOUS
- ROAD CENTRELINE
- ROAD CROWN
- ROAD DRIVEWAY
- STORMWATER PIPE
- TRACK CENTRELINE
- WATER EDGE
- WATER PIPE ABOVEGROUND
- WATER PIPE UNDERGROUND
- VEGETATION EDGE
- WALL BOTTOM
- WALL TOP

SUBSURFACE UTILITIES LEGEND

The Subsurface Utilities shown on this plan have been coloured, denoted and classified as per AS 5488.1.2019:

- Communications: CM–(B)
- Drainage: DR–(B)
- Electrical: EL–(B)
- Fire Service: FR–(B)
- Gas: GA–(B)
- Petroleum: PT–(B)
- Recycled Water: WR–(B)
- Sewer: SE–(B)
- Unidentified: UN–(B)
- Potable Water: WP–(B)

Linetype examples above are Quality B classification.

Refer to the *Subsurface Utilities Quality Classifications and Accuracies* notes below to understand accuracies and methods of location.

Refer to the colour, lettering and quality classification of the linework on this plan to understand the type of utility that was located and its accuracy limitations.

DISCLAIMER

LandPartners makes all reasonable efforts to locate sub-surface utilities, however some utilities can remain undetected for various reasons beyond our control. We note:

- LandPartners relies on Before You Dig Australia (BYDA) plans to indicate the presence of sub-surface utilities. BYDA plans do not necessarily document all the Underground Services within an area. BYDA plans are limited to public areas, not private land holdings. BYDA plans may not reflect recent installation activity by an asset owner.
- Electromagnetic Locators (EML) and/or Ground Penetrating Radar (GPR) instruments are used to locate the presence of underground services. The effectiveness of using EML and GPR instruments depends on site conditions including soil density, depth of the targeted underground service, moisture content of the soil, electrical interference from adjoining services and wire fences and the material / installation methodology of the targeted underground service. EML and GPR both have operating limitations and do not locate to infinite depths.

LandPartners advises our clients that:

- The BYDA search used to complete this work contains Duty Of Care conditions and advice from asset owners. The client is ultimately responsible for reviewing and ensuring compliance with asset owner's Duty of Care obligations. LandPartners can provide the BYDA search documentation that was used at the time of the locate.
- The position and depth of the sub-surface utilities shown hereon is not absolute. The Quality Classification for this data indicates the relative accuracy.
- For any digital CAD data that forms part of this plan: the Quality Classification of the data prevails over absolute co-ordinate values.
- The purpose of this plan / file is to assist in detailed design only. LandPartners recommends the underground services need to be re-located, confirmed and clearly marked out prior to mechanical excavation / construction.
- LandPartners are not liable for the accuracy and correctness of 3rd party datasets that may be shown on this plan, e.g. BYDA, Council GIS etc. LandPartners will note the source of 3rd party datasets.

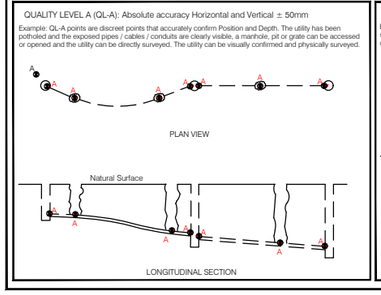
LandPartners has endeavoured to identify, locate and survey sub-surface utilities within the scope of works area. We have indicated the relative accuracies of the results, however the client is ultimately responsible for their own assessment of these results and decisions around managing latent condition risk.

SUBSURFACE UTILITIES QUALITY CLASSIFICATIONS AND ACCURACIES

The relative accuracies of Located Subsurface Utilities shown on this plan have been Classified as per AS 5488.1.2019 (Diagrams based on AS 5488.1.2019)

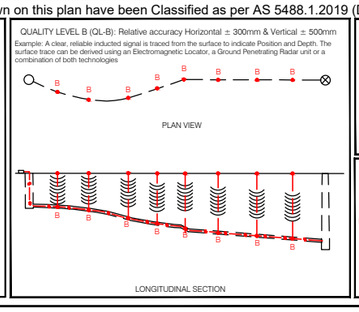
QUALITY LEVEL A (QL-A): Absolute accuracy Horizontal and Vertical ± 50mm

Example: QL-A points are discreet points that accurately confirm Position and Depth. The utility has been potholed and the exposed pipes / cables / conduits are clearly visible, a manhole, pit or grate can be accessed or opened and the utility can be directly surveyed. The utility can be visually confirmed and physically surveyed.



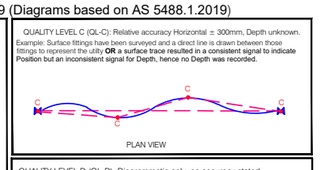
QUALITY LEVEL B (QL-B): Relative accuracy Horizontal ± 300mm & Vertical ± 500mm

Example: A clear, reliable inducted signal is traced from the surface to indicate Position and Depth. The surface trace can be derived using an Electromagnetic Locator, a Ground Penetrating Radar unit or a combination of both technologies



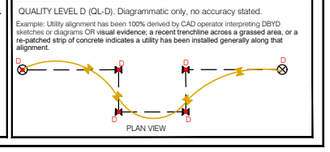
QUALITY LEVEL C (QL-C): Relative accuracy Horizontal ± 300mm, Depth unknown.

Example: Surface fittings have been surveyed and a direct line is drawn between those fittings to represent the utility **OR** a surface trace resulted in a consistent signal to indicate Position but an inconsistent signal for Depth, hence no Depth was recorded.



QUALITY LEVEL D (QL-D). Diagrammatic only, no accuracy stated.

Example: Utility alignment has been 100% derived by CAD operator interpreting DBYD sketches or diagrams OR visual evidence; a recent trenchline across a grassed area, or a re-patched strip of concrete indicates a utility has been installed generally along that alignment.



CLIENT

SILVERSTONE DEVELOPMENTS

PROJECT

DETAIL SURVEY
OF
LOT 6 ON SP326594
(MACARTHUR AVE, HAMILTON)

NOTES

(i) The title boundaries shown hereon were marked at the time of survey.

(ii) Survey data inside the subject lot fencing is taken from previous LandPartners plan BRMM7695-000-245-1, surveyed on 6/10/2022

(iii) Services shown hereon have been located where possible by field survey. If not able to be so located, services have been plotted from the records of relevant authorities where available and have been noted accordingly on the plan.

(iv) Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

REV	DATE	DRAWN	CHECKED	APPROVED	SURVEY DATE
1	6/09/2024	AJG	AJG	MLM	4/09/2024

LANDPARTNERS surveyors and planners

ISO 9001 Quality Management Systems CERTIFIED · ISO 45001 Occupational Health and Safety Management CERTIFIED

CERTIFIED LOCATOR www.certlocator.com

Brisbane Office
Level 1
18 Little Cribb Street
Milton QLD 4064

PO Box 1399
Milton
QLD 4064

p: (07) 3842 1000
f: (07) 3842 1001
e: info@landpartners.com.au
w: www.landpartners.com.au

LEVEL DATUM	LOCAL AUTHORITY
AHD	BRISBANE C.C.
LEVEL ORIGIN	CONTOUR INTERVAL
PSM186779 RL 4.325m	0.5 Metre
MERIDIAN	CO-ORD SYSTEM
MGA	LOCAL ARBITRARY

UDN

SHEET 3 OF 3

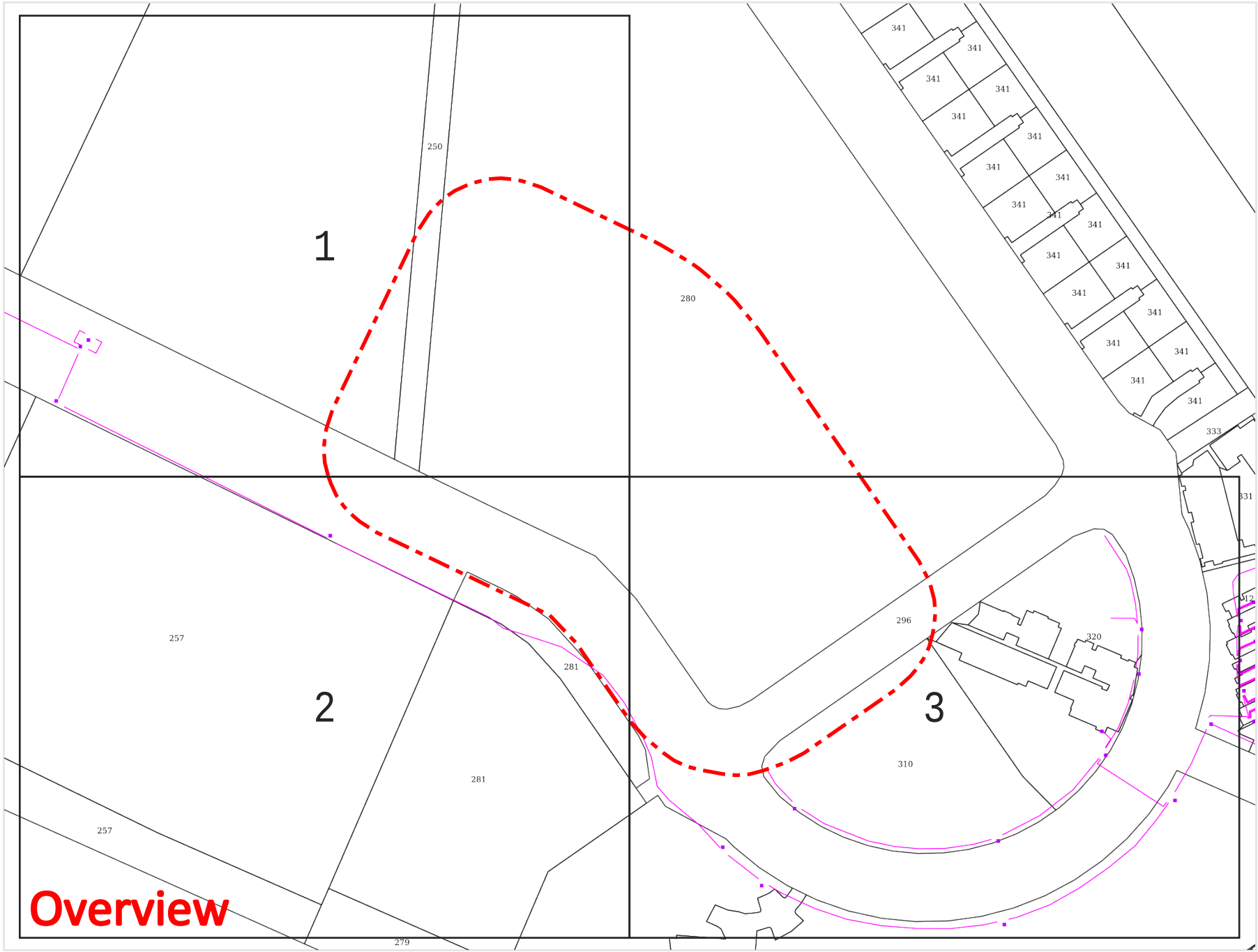
BRMM8547-000-3-1

6.4 APPENDIX D – BYDA RESULTS

OptiComm
National Broadband Fibre

Sequence No: 248615418
Job No: 38250469
Location: 260 Macarthur Av, Hamilton, QLD 4007

DIAL BEFORE YOU DIG www.1100.com.au
The Essential First Step.



Legend

- Pipes
- Pits

N

Scale: 1:2050
Expires: 07 Jan 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

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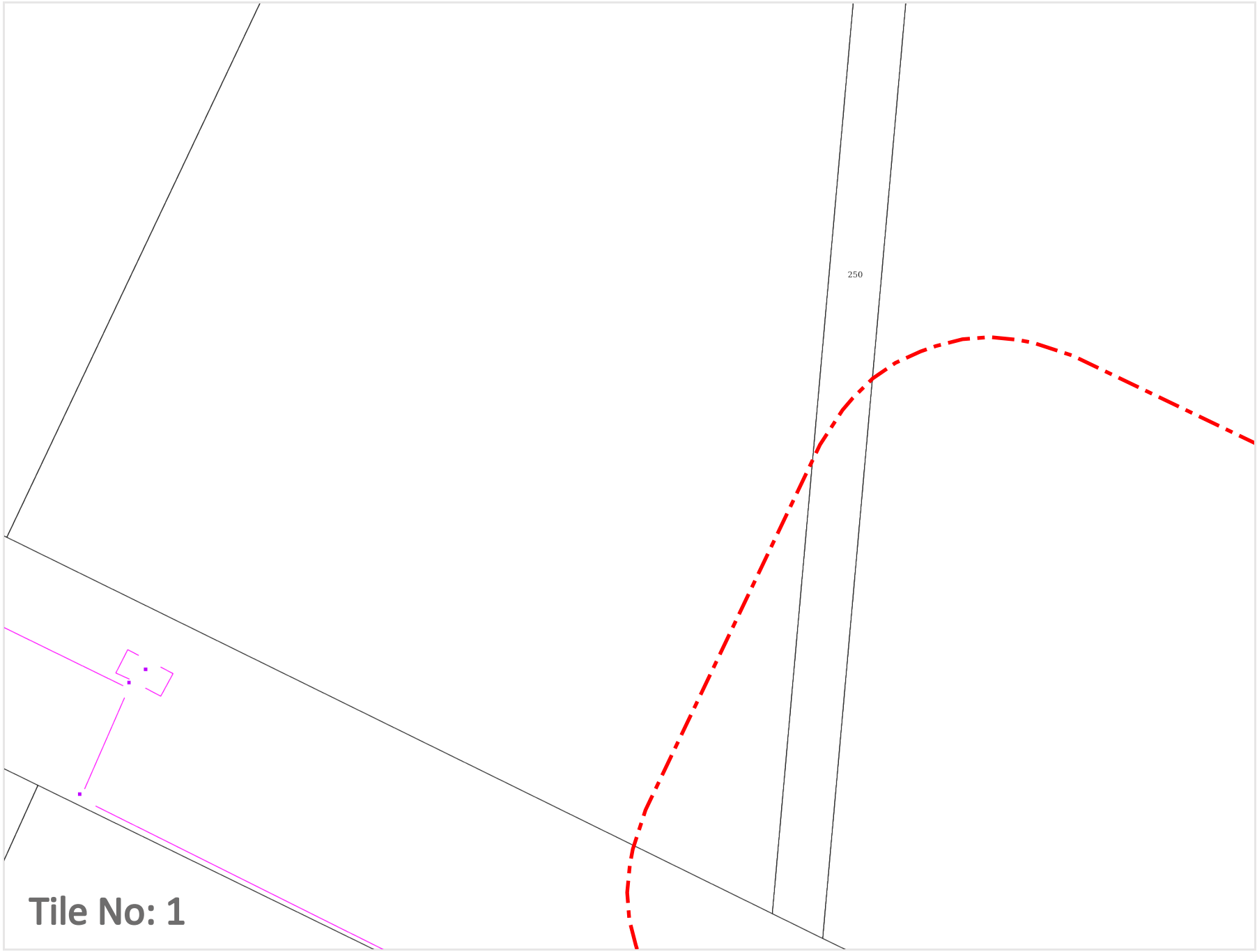

Legend

Pipes
Pits

N

Scale: 1:1000
Expires: 07 Jan 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

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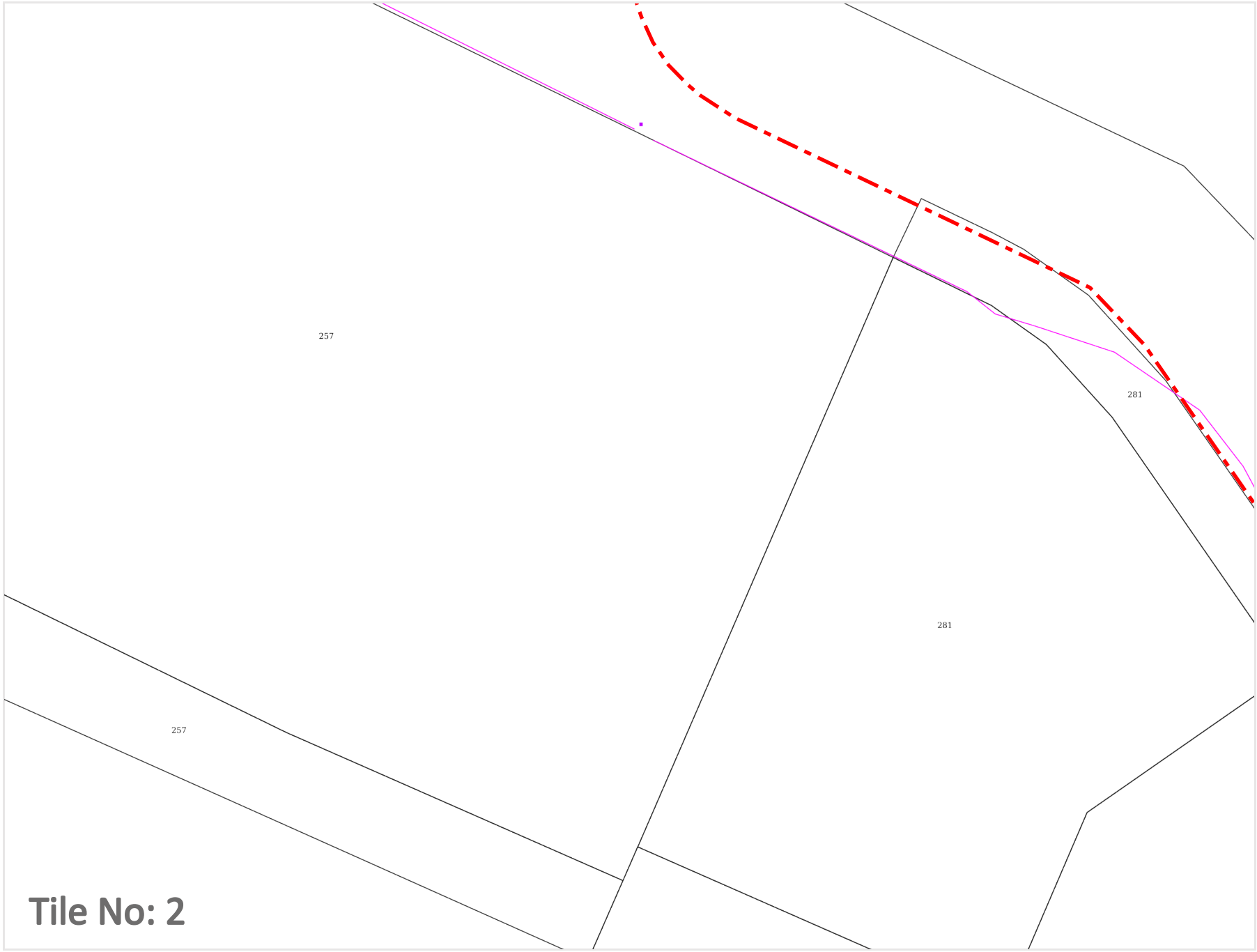
DIAL BEFORE YOU DIG www.1100.com.au
The Essential First Step.



Legend

- Pipes
- Pits

N

Scale: 1:1000
Expires: 07 Jan 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

OptiComm
National Broadband Fibre

Sequence No: 248615418
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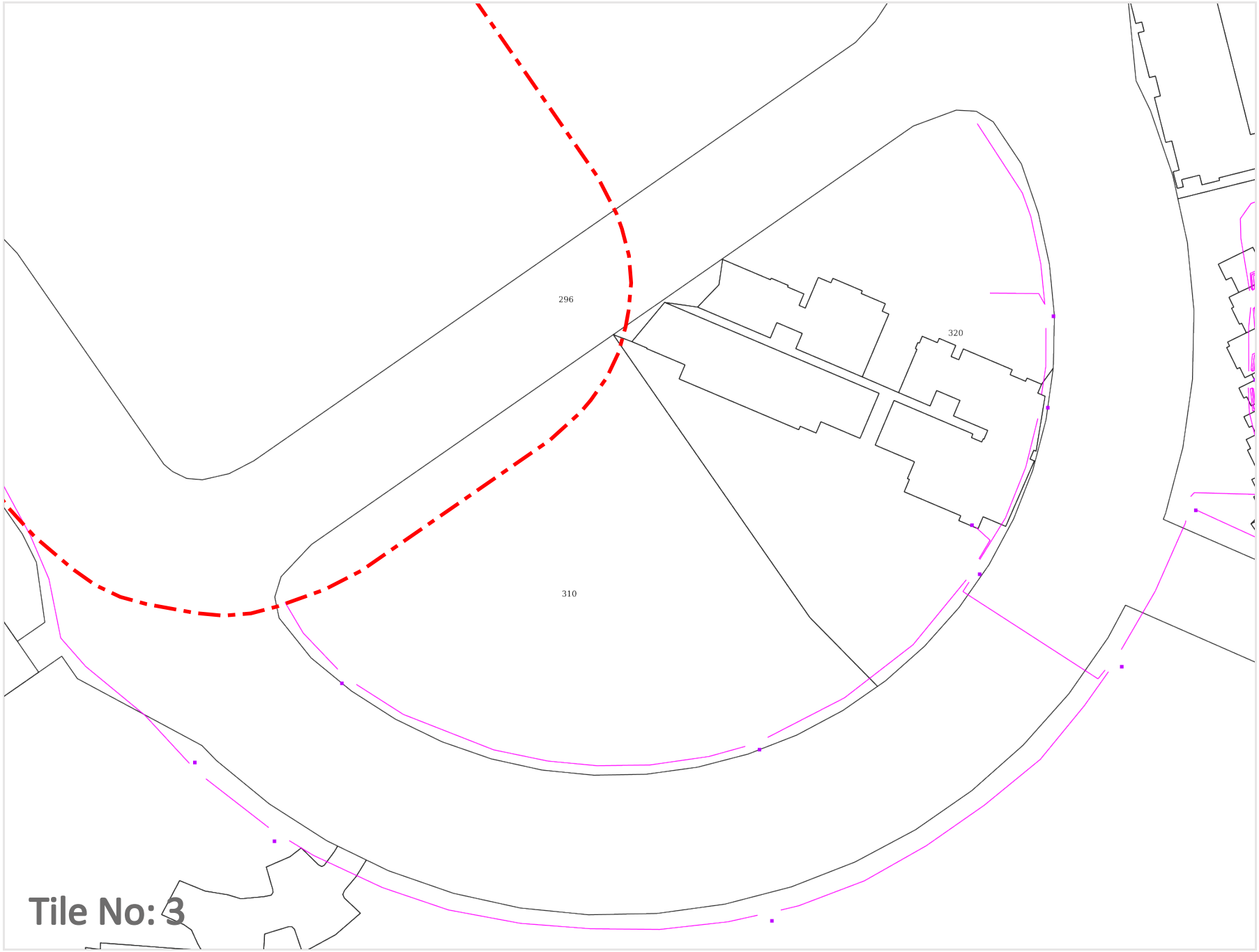
Location: 260 Macarthur Av, Hamilton, QLD 4007

DIAL BEFORE YOU DIG www.1100.com.au
The Essential First Step.



Legend

- Pipes
- Pits

N

Scale: 1:1000
Expires: 07 Jan 2025

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

Before You Dig Australia

Classification: Networks

Enquiry Date:	10/12/2024
Sequence Number:	248615419
Work Site Address:	260 Macarthur Av Hamilton QLD 4007

BEFORE YOU DIG
www.byda.com.au
Zero Damage - Zero Harm

For your immediate information THERE IS A GAS PIPELINE OR INFRASTRUCTURE (Gas Assets) located in close vicinity to your works.

Enquiry Date: 10/12/2024
Enquirer: Kousik De

Sequence Number: 248615419
Worksite Address: 260 Macarthur Av
Hamilton
QLD 4007

Thank you for your Before You Dig enquiry regarding the location of gas assets.

We confirm there are Gas Assets located in close vicinity of the above location. Damage to gas assets may result in explosion, fire and personal injury.

Please ensure you read all the relevant information contained in this response to your BYDA enquiry including reviewing the **APA Guidelines for Works Near Existing Gas Assets** and clearly understand and comply with all requirements relating to your scope of work.

If you have any queries relating to this information, contact the APA Before You Dig Officer for clarification. Refer to contact points listed on the following pages.

Before You Dig Checklist

1. Plan

- Review maps provided with this BYDA response and confirm the location of your work site is correct.
- Review the **APA Guidelines for Works Near Existing Gas Assets** and clearly understand requirements relating to my scope of work.

2. Prepare

- Electronically locate gas assets and mark locations.
- Note: Enquirers should still look for visible evidence of gas assets at the worksite not shown on plans.

3. Pothole

- Physically confirm ('prove') the location of gas assets by potholing by hand excavation or non- destructive vacuum excavation methods in accordance with **APA Guidelines for Works Near Existing Gas Assets**.
- Road authorities, councils, utilities and their authorised contractors and agents are responsible to pothole or use other suitable methods to verify the location and depth of all gas assets, including gas (inlet) services, prior to commencing any works.

4. Protect

- Protect gas assets by maintaining clearances whilst excavating and following conditions provided by APA.
- Where required by APA, only conducting work in proximity to gas assets while Site Watch is on site.
- Where applicable, APA Authority To Work permit conditions are clearly understood and complied with.
- Strap and support exposed mains and inlet services. Cover exposed mains to prevent damage until the excavation can be restored permanently.

5. Proceed

- Only proceed with your work once you have completed all the planning, preparation, potholing and protection requirements.
- APA BYDA response (including maps) are on site for reference at all times, and less than 30 days old.

Site Address	260 Macarthur Av Hamilton QLD 4007	Sequence No 248615419

Scale 1: 6000

Map Sources: Esri, Garmin, HERE, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

N

Enquiry Area

Map Key Area

1

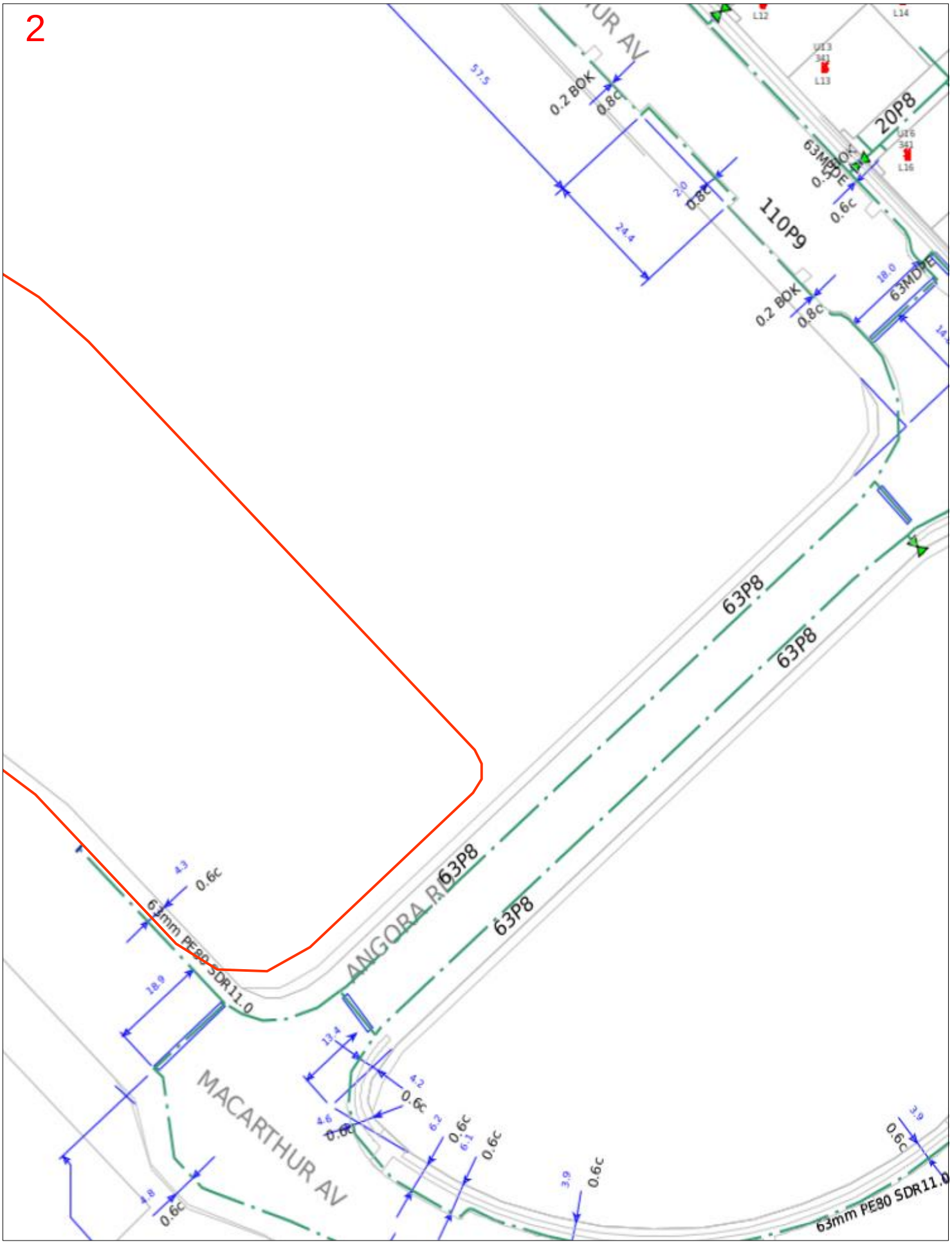
Scale 1: 700 map

Map Sources: Esri, Garmin, HERE, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

N

Enquiry Area

Map Key Area



Scale 1: 700 map

Map Sources: Esri, Garmin, HERE, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

N

Enquiry Area

Map Key Area

Map Symbology

Pipe

- Low pressure
- Medium pressure
- High pressure
- Transmission pressure
- Critical main (behind pipe)
- Proposed (pressure by colour)
- LPG (pressure by colour)
- Abandoned
- Idle/inactive
- Sleeve
- Casing (behind pipe)

Area

- BYDA area of interest

Pipe code and material

C* (for example, C2)	Cast iron
CU	Copper
N2	Nylon
P*	Polyethylene (PE)
P6, P7, P9–P12	Medium density PE
P2, P4, P8	High density PE
S*	Steel
W2	Wrought galv iron
W3	PE coat wrought galv iron

Object

- Valve
- Buried valve
- Regulator
- Gas supplied = yes
- CP rectifier terminal
- CP test station
- CP anode
- CP bond wire
- Syphon
- Trace wire point

Abbreviation

BoK	Back of kerb	FoK	Front of kerb
C	Depth of cover	Galv	Galvanized
CP	Cathodic protection	NTI	Not tied in

Example

Pipe	
40P6 in 80C2	40 mm high pressure medium density poly in an 80 mm cast iron casing
63S8	63 mm medium pressure steel

Pipe code

Pipe diameter in millimetres is shown before pipe code.
40P6 = 40 mm nominal diameter

This map was created in colour and should be printed in colour

Site Watch

Site Watch is where an APA field officer attends your work site to monitor and ensure controls are in place to protect critical gas assets from damage during work.

The following rates apply for this service (1 hour minimum charge):

Item	Rate (excl. gst)
Site Watch - Business Hours	$143.42 per hour
Site Watch - After Hours	$175.06 per hour
Cancellation Fee Fee applies where cancellations received after 12pm (midday) 1 business day prior to the booking	$286.84

- Contact APA - Before You Dig officer for state specific hours of business.

Contacts

Contacts APA Group	
Enquiry	Contact Numbers
General enquiries or feedback regarding this information or gas assets.	APA - Before You Dig Officer Phone: 1800 085 628 Email: BYDA_APA@apa.com.au
Gas Emergencies	Phone: 1800 GAS LEAK (1800 427 532)

Important Information

- Refer to requirements relating to construction, excavation and other work activities in the APA **Guidelines for Works Near Existing Gas Assets** document with this BYDA response.
- BYDA enquiries are valid for 30 days. If your works commence after 30 days from the date of this response a new enquiry is required to validate location information.
- For some BYDA enquiries, you may receive two (2) responses from APA. Please read both responses carefully as they relate to different assets.
- Gas (inlet) services connecting Gas Assets in the street to the gas meter on the property are not marked on the map. South Australia Only - if a meter box is installed on the property, a sketch of the gas service location may be found inside the gas meter box. APA does not guarantee the accuracy or completeness of these sketches.

Disclaimer and legal details

- This information is valid for 30 days from the date of this response.
- This information has been generated by an automated system based on the area highlighted in your BYDA request and has not been independently verified.
- Map location information is provided as AS5488-2022 Quality Level D, as such supplied location information is indicative only.
- Whilst APA has taken reasonable steps to ensure that the information supplied is accurate, the information is provided strictly on the condition that no assurance, representation, warranty or guarantee (express or implied) is given by APA in relation to the information (including without limitation quality, accuracy, reliability, completeness, currency, sustainability, or suitability for any particular purpose) except that the information has been disclosed in good faith.
- Any party who undertakes activities in the vicinity of APA operated assets has a legal duty of care that must be observed. This legal obligation requires all parties to adhere to a standard of reasonable care while performing any acts that could foreseeably harm these assets.

Job # 38250469
Seq # 248615420
Provider: Brisbane City Council
Telephone: (07) 3403 8888

Legend

- BYDA Enquiry
- Detailed map page
- No dig site assets

In an emergency contact Brisbane City Council on 07 3403 8888

Index Sheet

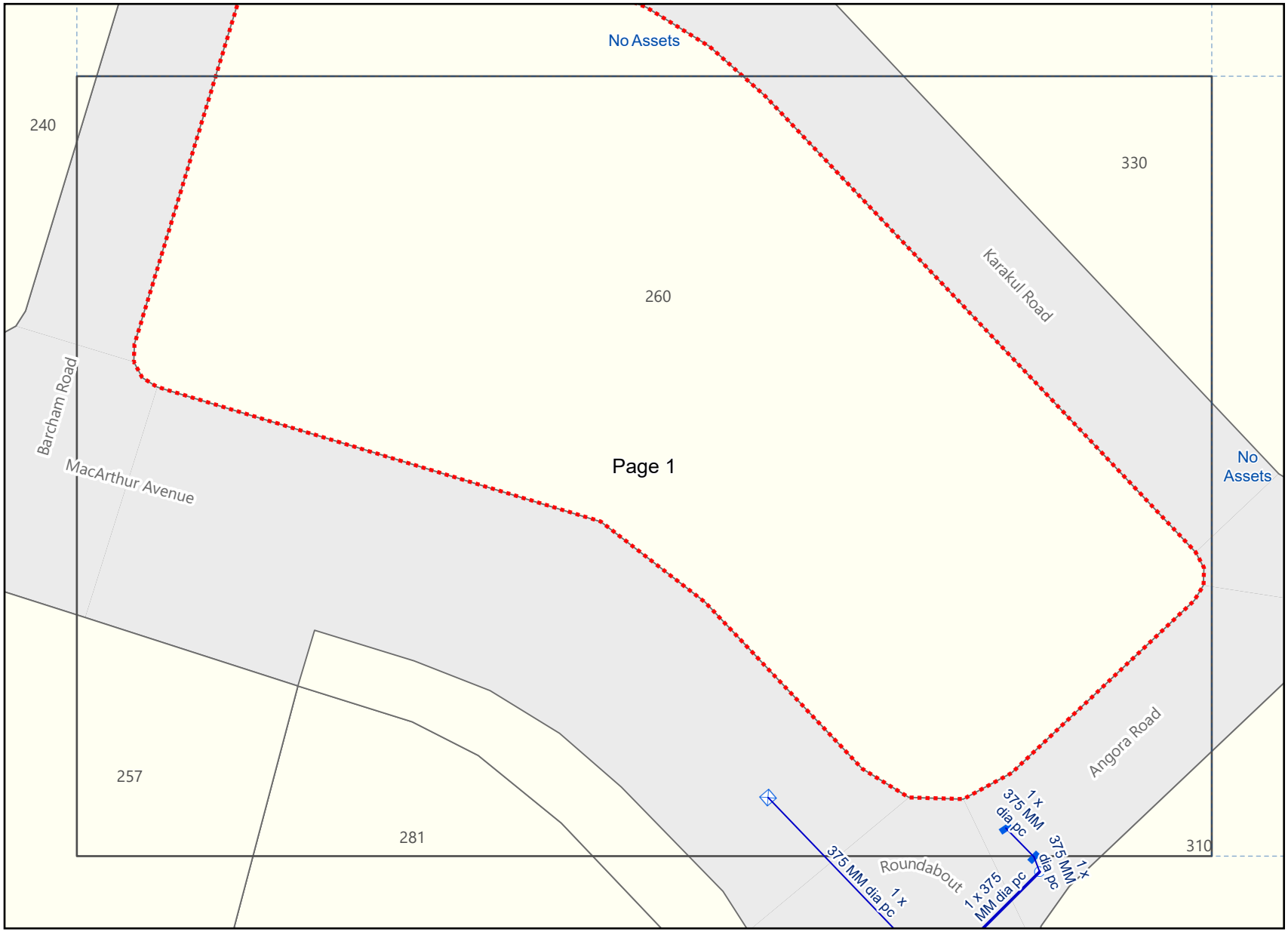
0 25 50 100 m

Scale 1:2,500

N

Plans generated by SmarterWX™ Automate

Job # 38250469
Seq # 248615420
Provider: Brisbane City Council
Telephone: (07) 3403 8888



Legend

BYDA Enquiry

Stormwater Network

- Stormwater Drain
- Stormwater Gully / Roofwater Connection
- Stormwater Maintenance Hole
- Stormwater Gully Pit
- Stormwater Field Inlet

In an emergency contact Brisbane City Council on 07 3403 8888
10/12/24 (valid for 30 days)

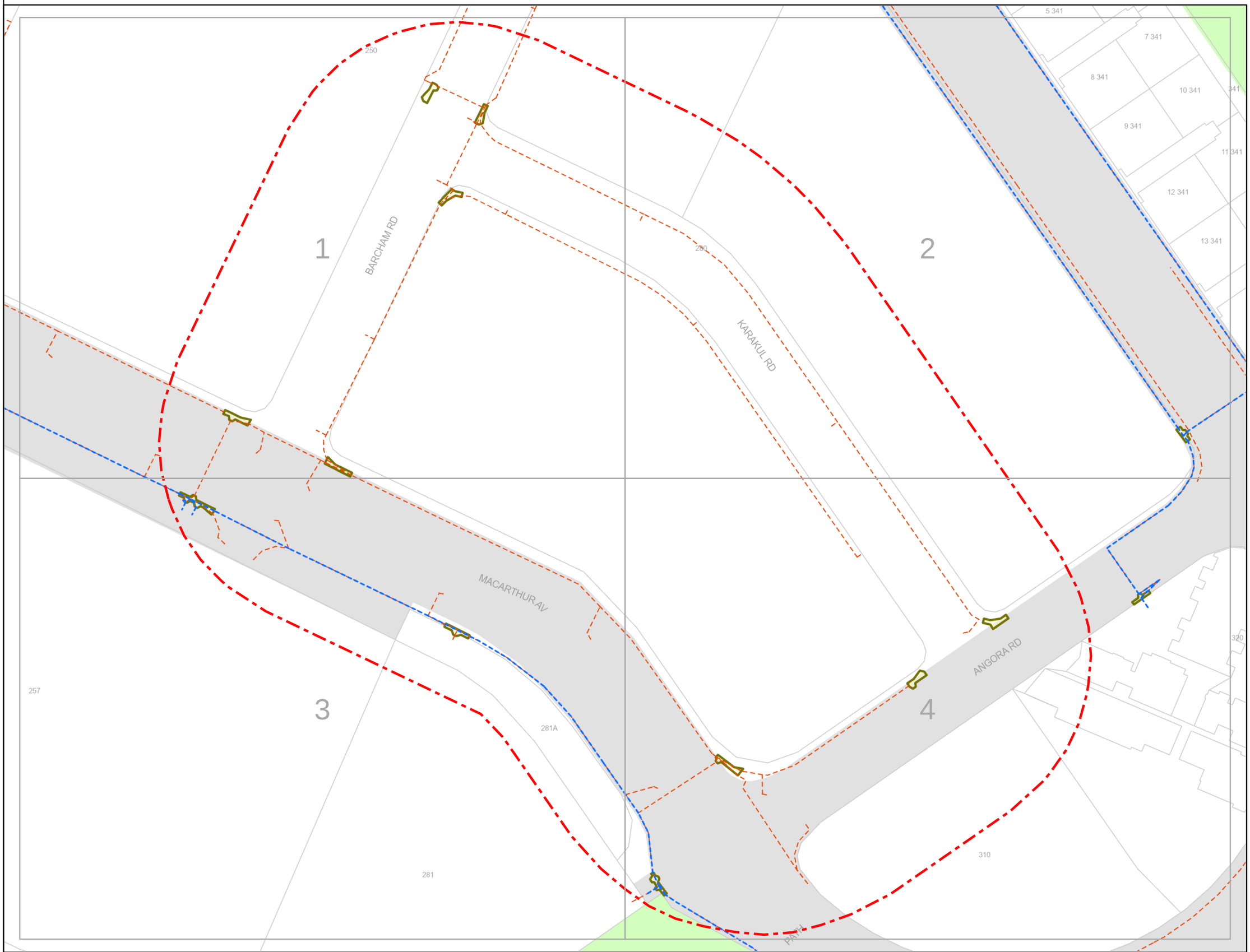
0 10 20 40 m

Scale 1:1,000

Plans generated by SmarterWX™ Automate

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX BYDA map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 248615421
Date: 10/12/2024

Scale: 1:1025
Tile No: **OVERVIEW**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

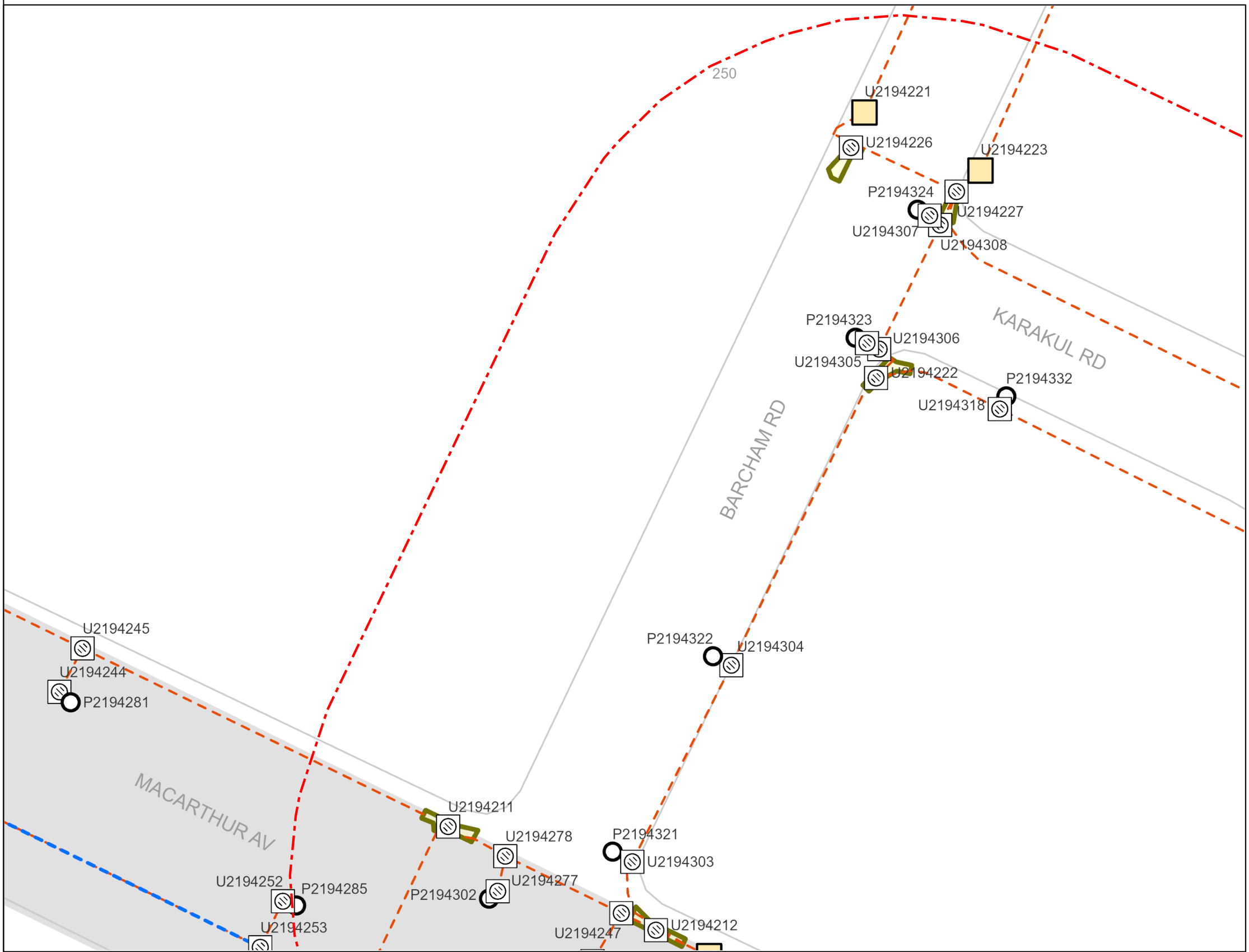
N
W E
S

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor Pelican Corp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX BYDA map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 248615421
Date: 10/12/2024

Scale: 1:500
Tile No: **Tile No: 1**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

N
W E
S

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For Emergency Situations
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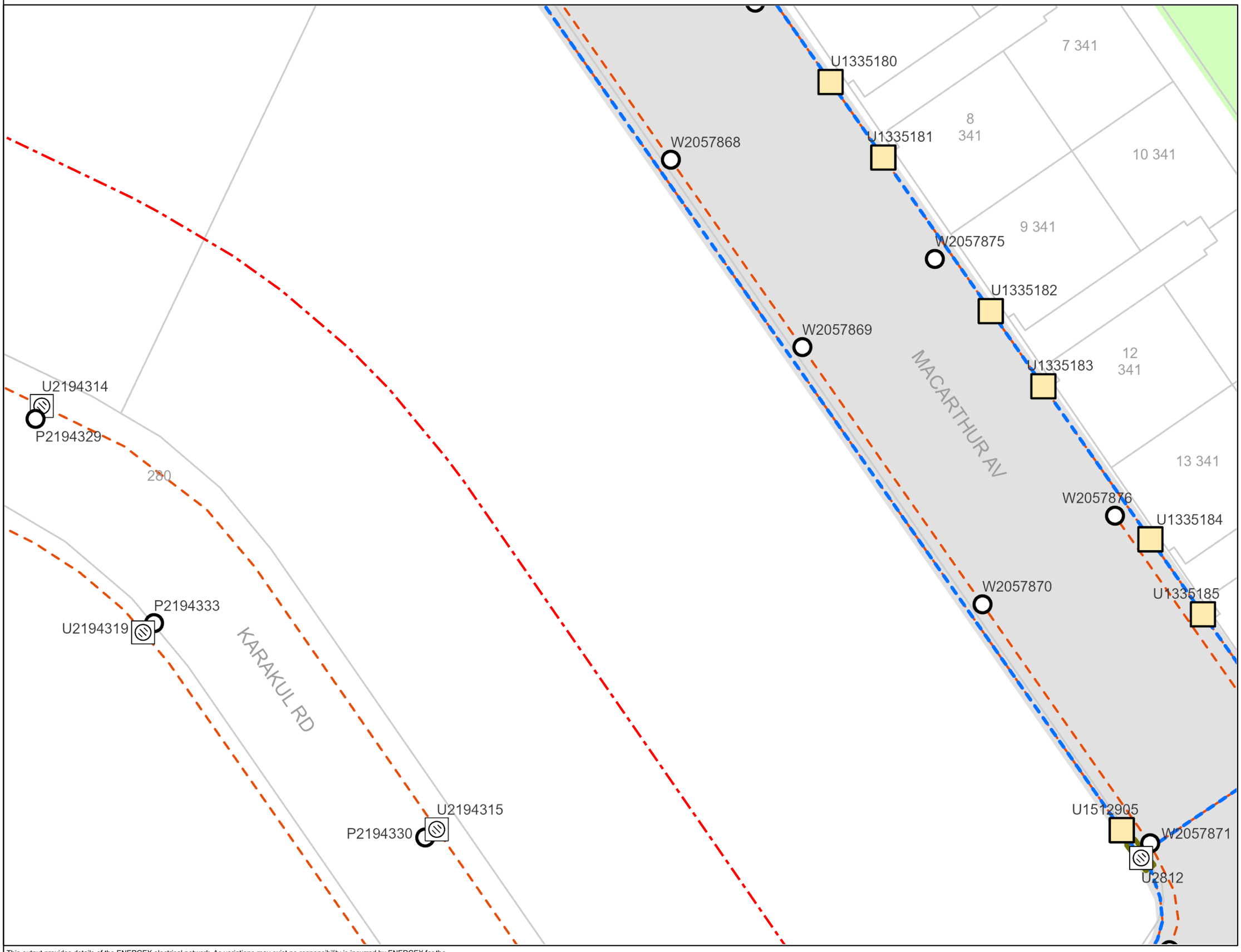

BYDA

Sequence: 248615421
Date: 10/12/2024

Scale: 1:500
Tile No: **Tile No: 2**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

N
W E
S

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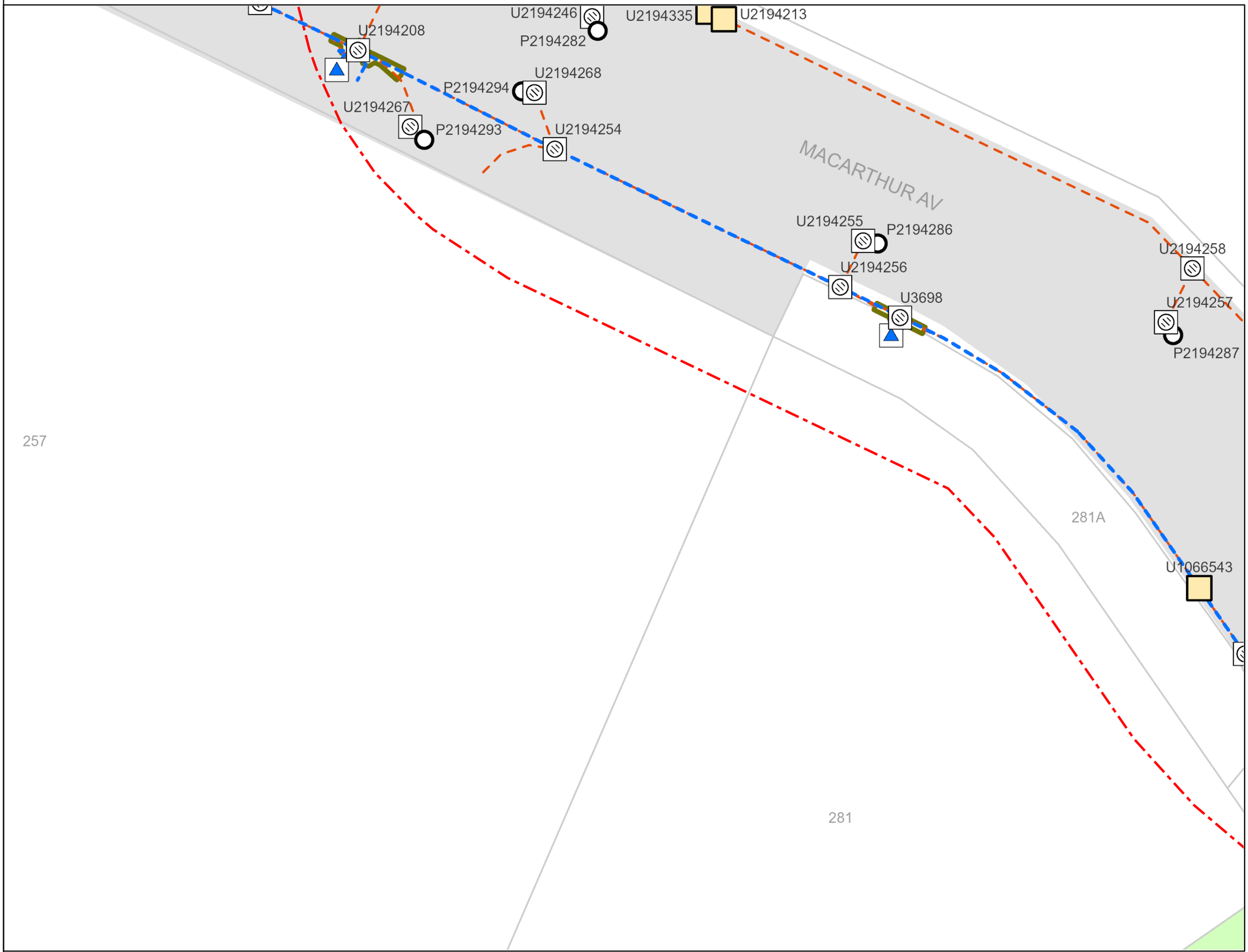
Please Call 13 19 62



energex

BYDA

Sequence: 248615421
Date: 10/12/2024

Scale: 1:500
Tile No: **Tile No: 3**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

N
W E
S

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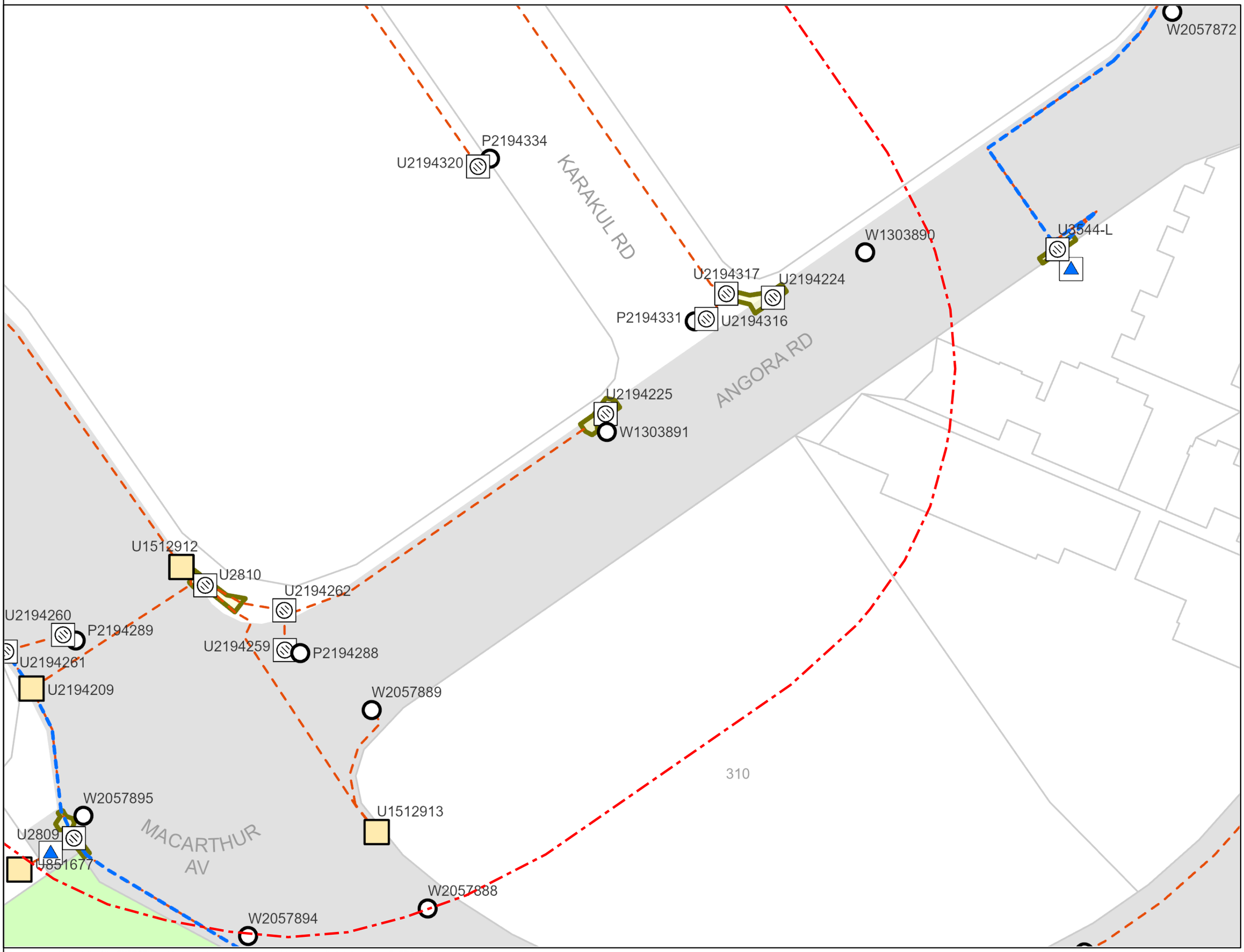
For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 248615421
Date: 10/12/2024

Scale: 1:500
Tile No: **Tile No: 4**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

N
W E
S

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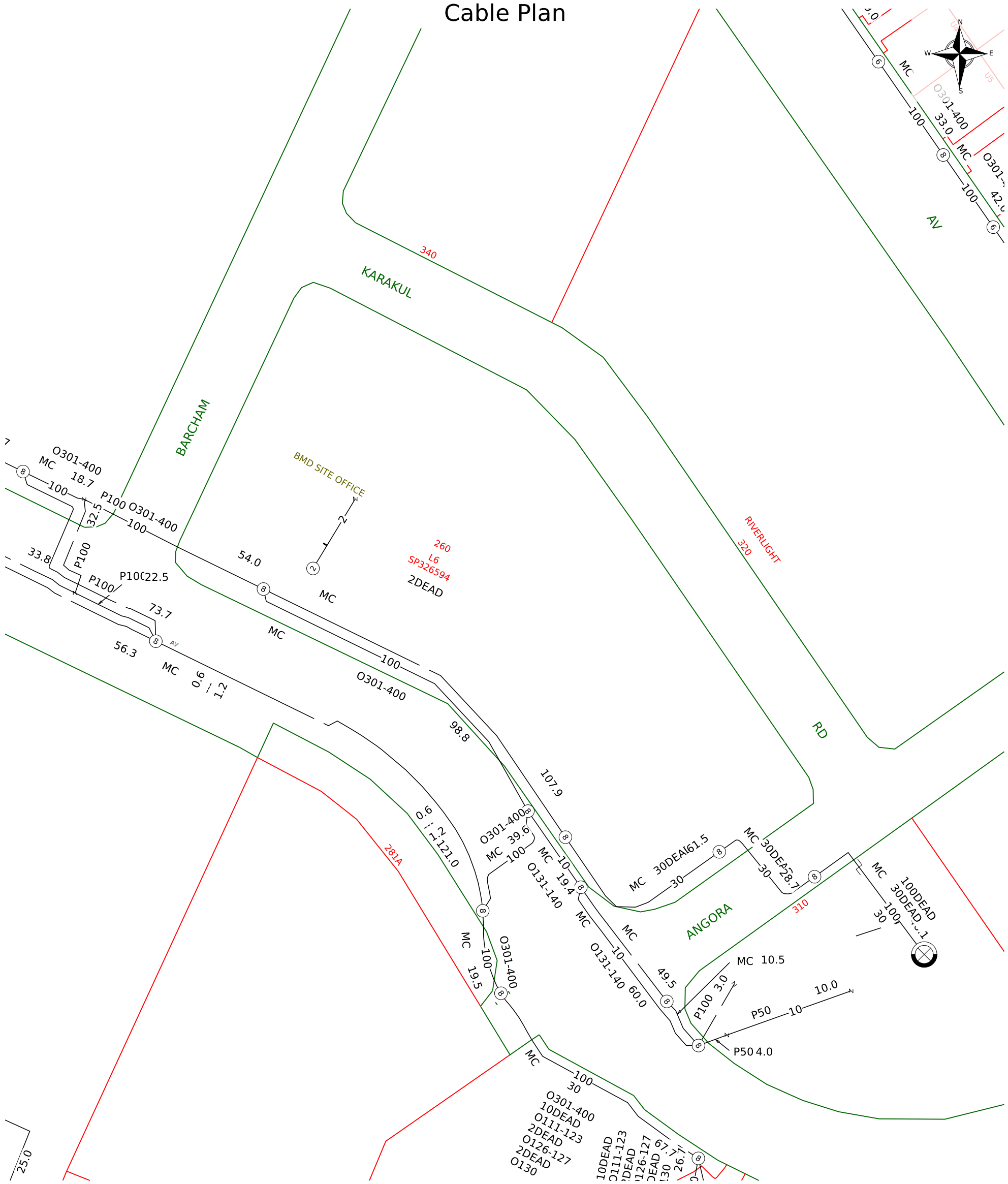
Cable Plan



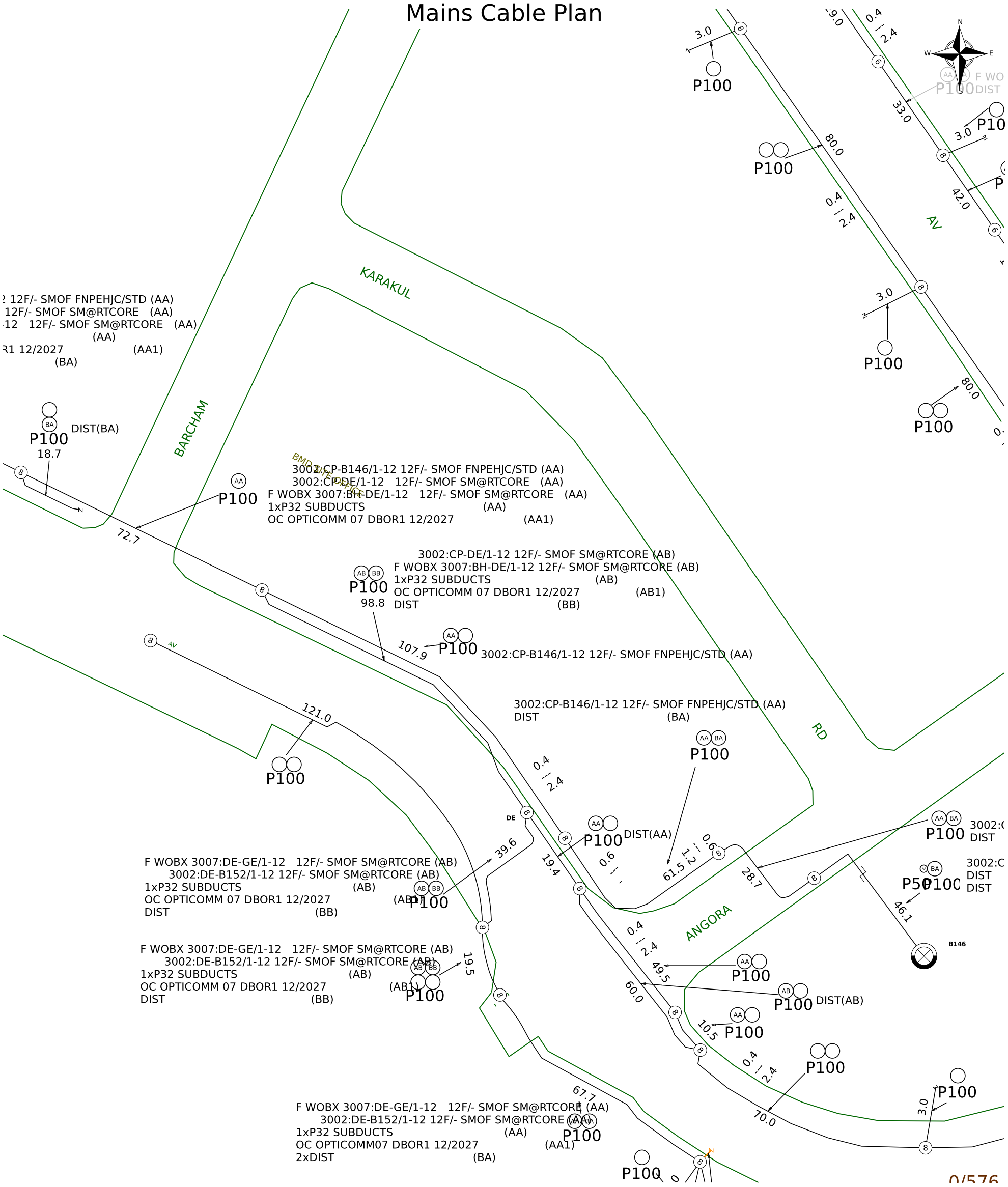
Report Damage: https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra- Ph - 13 22 03 Email - Telstra.Plans@team.telstra.com Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries	Sequence Number: 248615422
TELSTRA LIMITED A.C.N. 086 174 781	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.
Generated On 11/12/2024 06:17:56	

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING
Telstra plans and location information conform to Quality Level "D" of the Australian Standard AS 5488-Classification of Subsurface Utility Information.
As such,Telstra supplied location information is indicative only.Spatial accuracy is not applicable to Quality Level D.
Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing it.
Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy.
Further on site investigation is required to validate the exact location of Telstra plant prior to commencing construction work.
A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.

Mains Cable Plan



Report Damage: https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-c Ph - 13 22 03 Email - Telstra.Plans@team.telstra.com Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries	Sequence Number: 248615422
TELSTRA LIMITED A.C.N. 086 174 781	CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.
Generated On 11/12/2024 06:17:59	

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING
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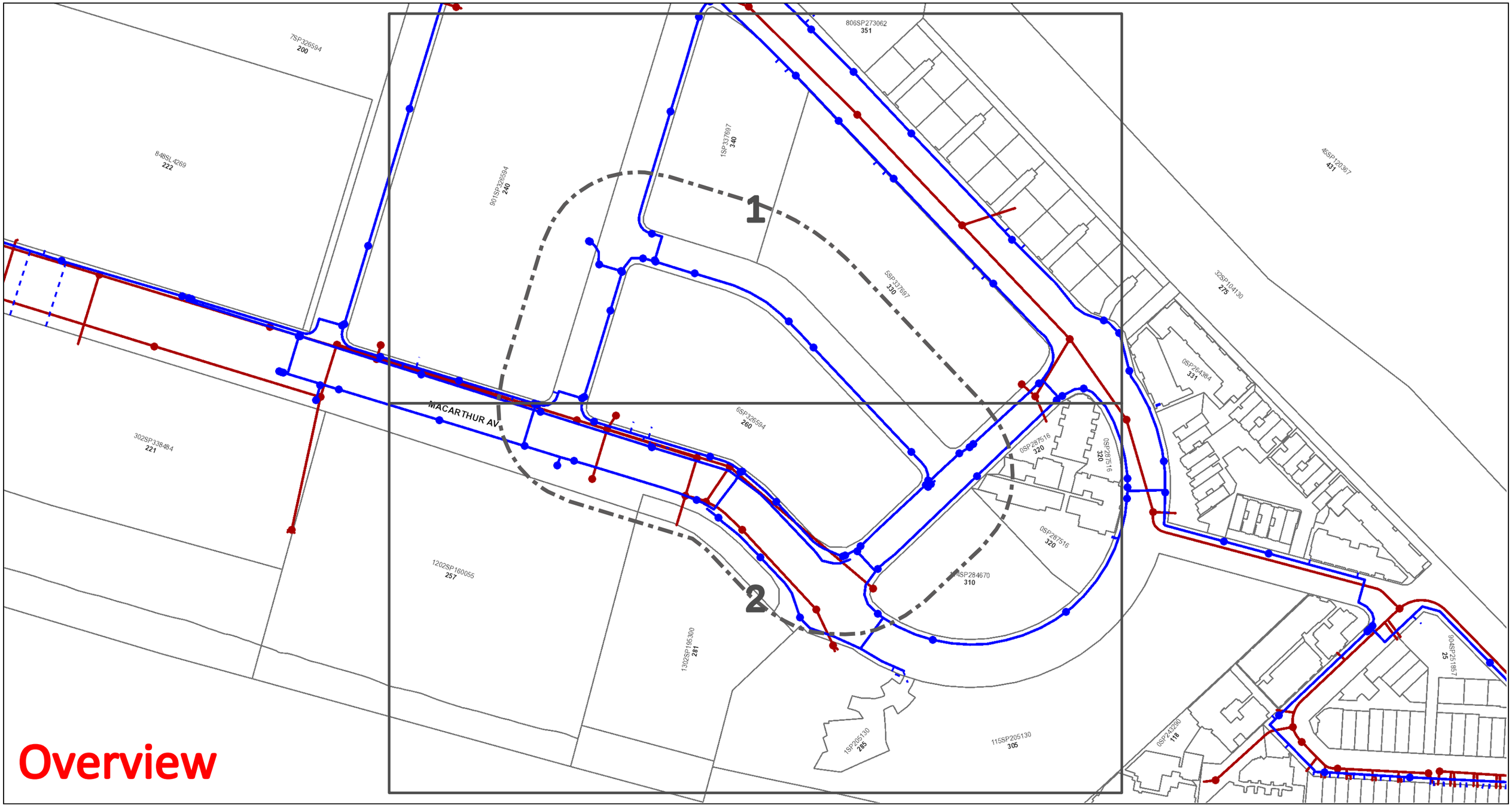
Urban Utilities - Water, Recycled Water and Sewer Infrastructure



UrbanUtilities

N

Map Scale
1:2050

Before You Dig Australia- Urban Utilities Water, Recycled Water and Sewer Infrastructure

BYDA Reference No: 248615423

Date BYDA Ref Received: 10/12/2024

Date BYDA Job to Commence: 13/12/2024

Date BYDA Map Produced: 10/12/2024

This Map is valid for 30 days

Produced By: Urban Utilities

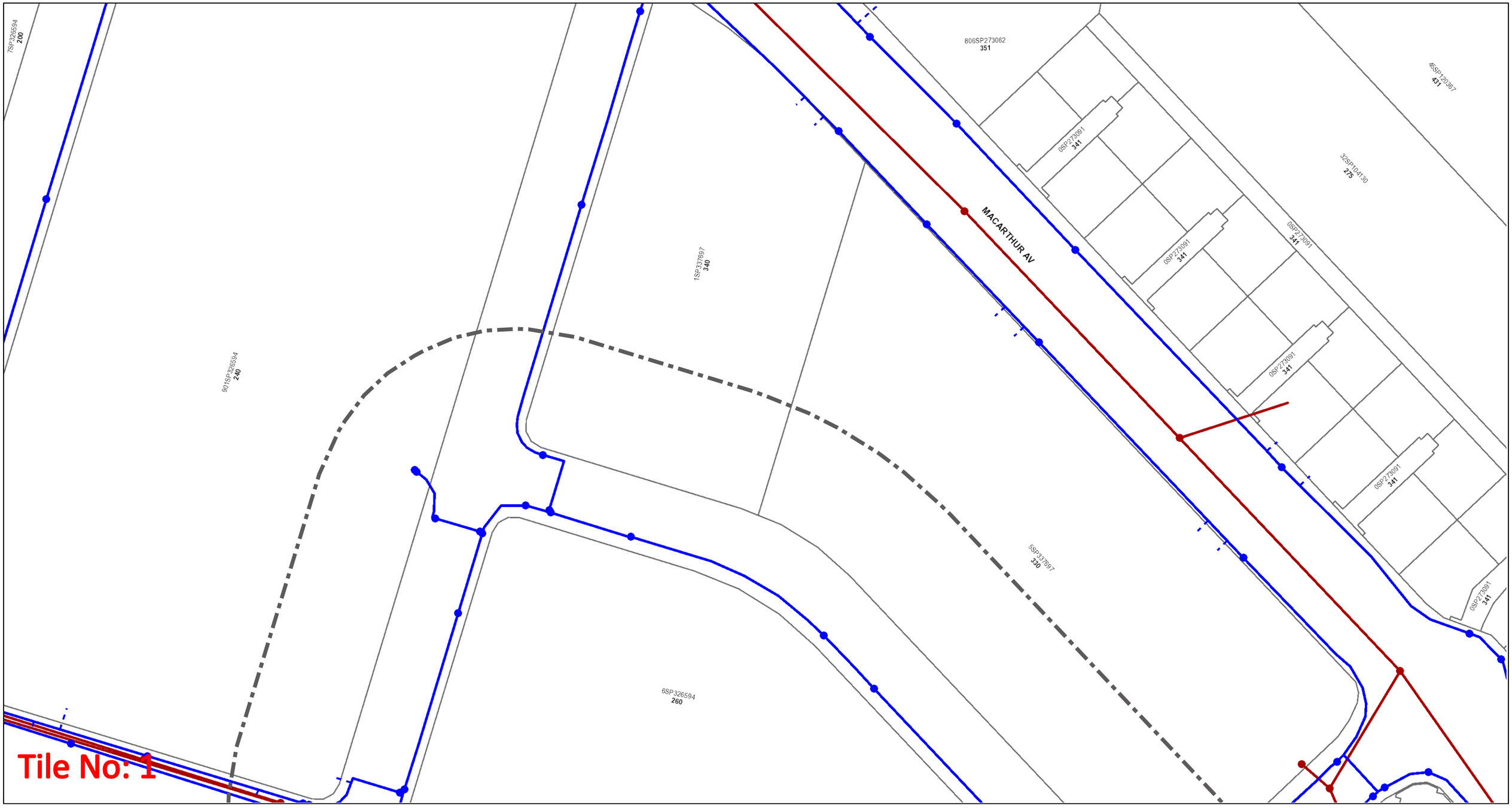
Sewer	Water	Recycled Water
Infrastructure	Infrastructure	Infrastructure
Major Infrastructure	Major Infrastructure	Major Infrastructure
Network Pipelines	Network Pipelines	Network Pipelines
Network Structures	Network Structures	Network Structures
	Water Service (Indicative only)	

For further information, please call Urban Utilities on 13 26 57 (8am-6pm weekdays). Faults and emergencies 13 23 64 (24/7).

www.urbanutilities.com.au

ABN 86 673 835 011

Urban Utilities - Water, Recycled Water and Sewer Infrastructure



UrbanUtilities

N

Map Scale
1:1000

Before You Dig Australia- Urban Utilities Water, Recycled Water and Sewer Infrastructure

BYDA Reference No: 248615423

Date BYDA Ref Received: 10/12/2024

Date BYDA Job to Commence: 13/12/2024

Date BYDA Map Produced: 10/12/2024

This Map is valid for 30 days

Produced By: Urban Utilities

Sewer	Water	Recycled Water
Infrastructure	Infrastructure	Infrastructure
Major Infrastructure	Major Infrastructure	Major Infrastructure
Network Pipelines	Network Pipelines	Network Pipelines
Network Structures	Network Structures	Network Structures
	Water Service (Indicative only)	

For further information, please call Urban Utilities on 13 26 57 (8am-6pm weekdays). Faults and emergencies 13 23 64 (24/7).

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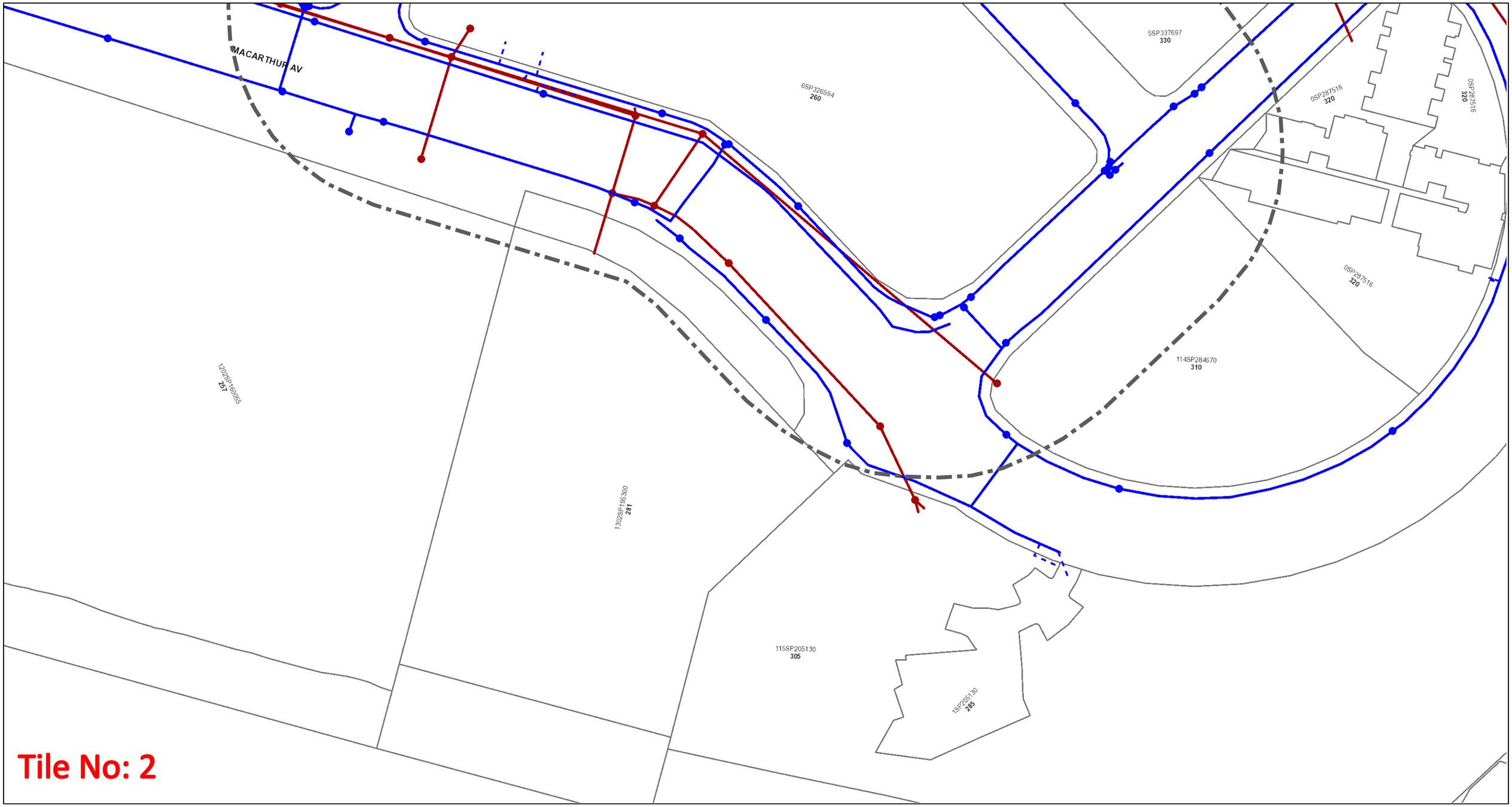

UrbanUtilities

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Map Scale
1:1000

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For further information, please call Urban Utilities on 13 26 57 (8am-6pm weekdays). Faults and emergencies 13 23 64 (24/7).

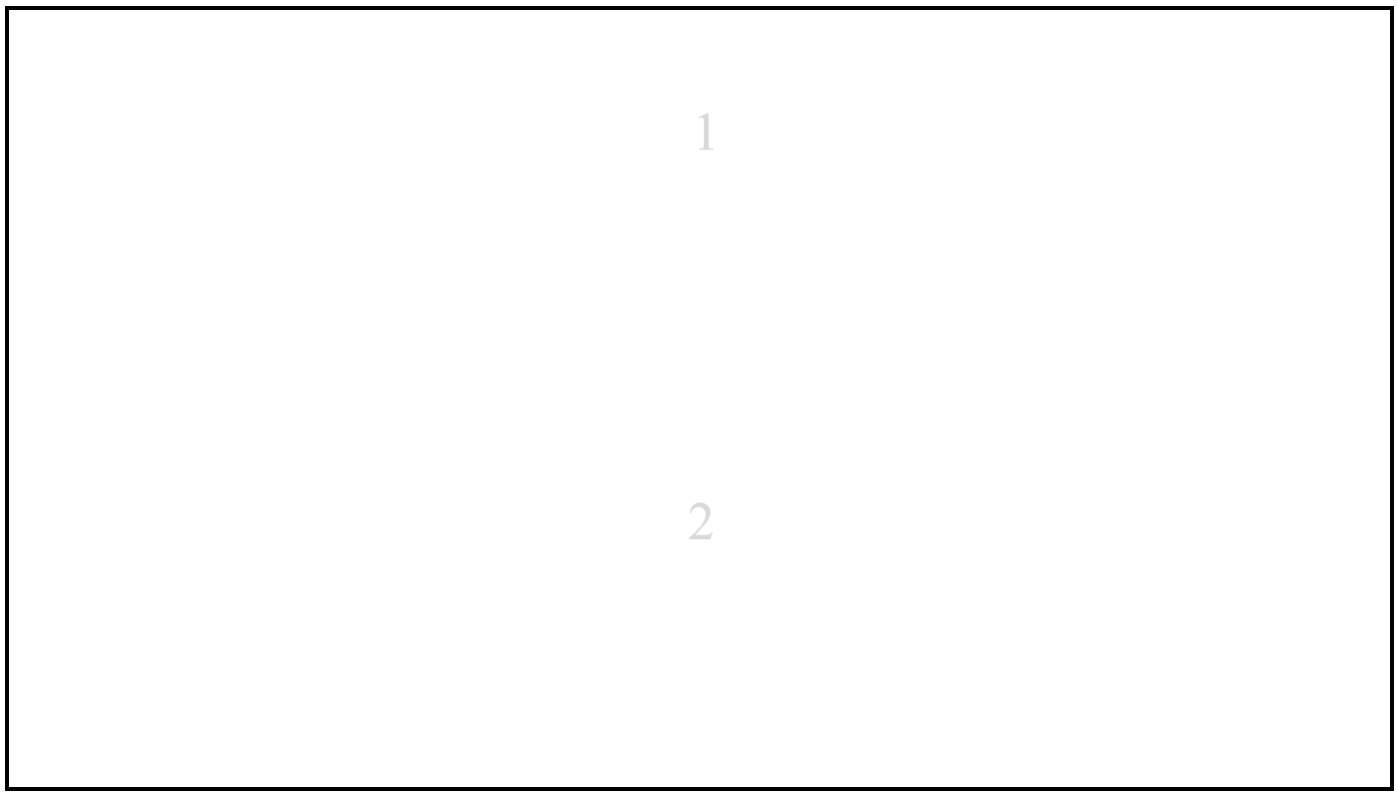
www.urbanutilities.com.au ABN 86 673 835 011

To:	Kousik De
Phone:	Not Supplied
Fax:	Not Supplied
Email:	admin@meliorace.com

Dial before you dig Job #:	38250469
Sequence #	248615417
Issue Date:	10/12/2024
Location:	260 Macarthur Av , Hamilton , QLD , 4007

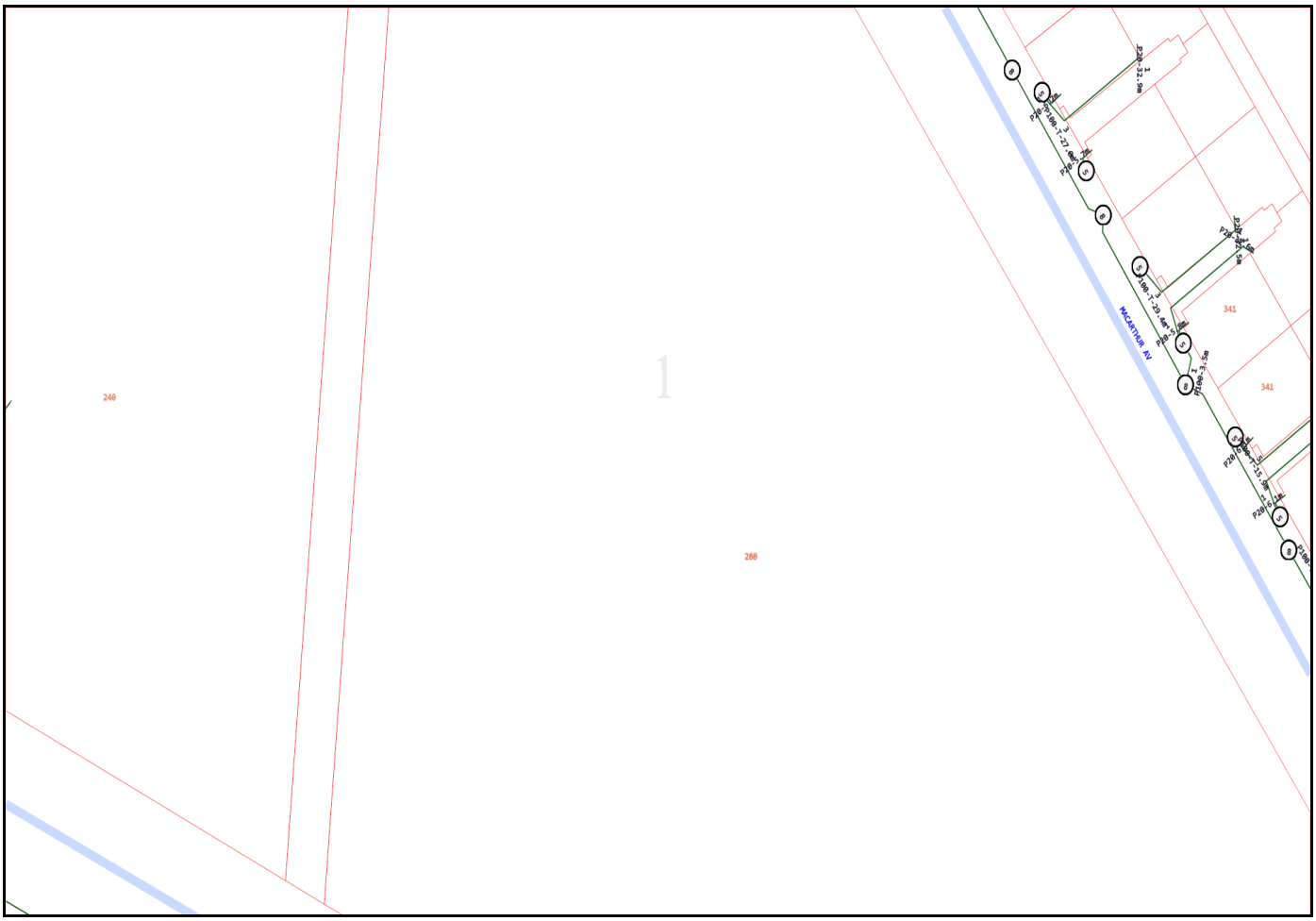
BEFORE YOU DIG www.byda.com.au Zero Damage - Zero Harm

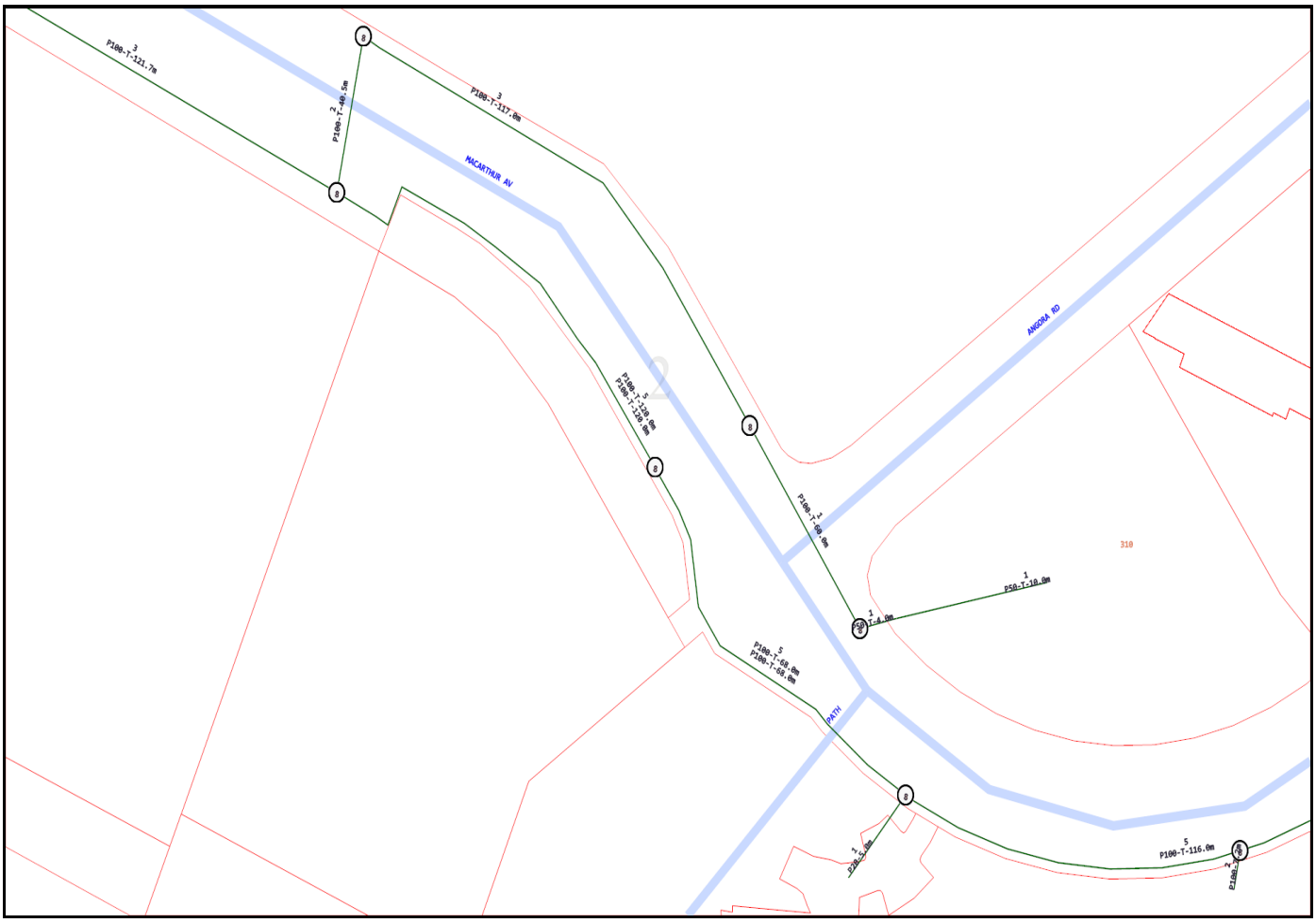
Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans



LEGEND

34	Parcel and the location
5	Pit with size "5"
2E	Power Pit with size "2E". Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
	Manhole
	Pillar
2 PO – T- 25.0m P40 – 20.0m 5 9	Cable count of trench is 2. One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart. One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
2 10.0m 5 9	2 Direct buried cables between pits of sizes ,"5" and "9" are 10.0m apart.
5 9	Trench containing any INSERVICE/CONSTRUCTED (Copper/RF/Fibre) cables.
5 9	Trench containing only DESIGNED/PLANNED (Copper/RF/Fibre/Power) cables.
5 9	Trench containing any INSERVICE/CONSTRUCTED (Power) cables.
BROADWAY ST	Road and the street name "Broadway ST"
Scale	0 20 40 60 Meters 1:2000 1 cm equals 20 m


1
240
200
341
341
MACARTHUR AV



Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.

6.5 APPENDIX E – FLOODWISE REPORT

FloodWise Property Report

260 MACARTHUR AVE, HAMILTON 4007
Lot 6 on SP326594

Dedicated to a better Brisbane

THE PURPOSE OF THIS REPORT IS FOR BUILDING AND DEVELOPMENT

Brisbane City Council's FloodWise Property Report **provides technical flood planning information** including estimated flood levels, habitable floor level requirements and more. **This report uses the adopted flood planning information in Brisbane City Plan 2014**, that guides how land in Brisbane is used and developed for the future. Find out more about planning and building. To understand how to be **resilient and prepare for floods**, visit Council's Be Prepared webpage. Find more information about how to read a FloodWise Property Report.

This property has no flood levels

Brisbane City Council has not assigned flood level information for this property however it may be affected by one or more flood or property development flags. Please refer to the Flood Planning and Development Information below for details. The property may have 0.2% AEP flood level which will appear on the Flood Planning Information table if applicable. For professional advice or detailed assessment of a property contact a Registered Professional Engineer of Queensland.

Visit the Be Prepared page to find more information on how to prepare your home or business for potential flooding.

Combined 1% AEP for river, creek and storm tide flood extent (if applicable) from the adopted Brisbane City Plan 2014.
Read more about Brisbane City Plan 2014.

Are you resilient and ready for flood?

- Sign up to the Brisbane Severe Weather Alert at **brisbane.qld.gov.au/beprepared**
- Visit bom.gov.au for the latest weather updates.
- Have an evacuation plan, emergency kit and important phone numbers ready.
- Observe where water flows from and to during heavy rain.
- Consider how flood-resilient building techniques will have you home faster and with less damage.

Life threatening emergencies **000** Police/fire/ambulance (mobiles **000** and **112**)	State Emergency Service (SES) **132 500** Energex **13 19 62** Brisbane City Council **3403 8888**

Technical Summary

This section of the FloodWise Property Report contains more detailed flood information for this property so **surveyors, builders, certifiers, architects, and engineers can plan and build** in accordance with Council's planning scheme.

Find more information about planning and building in Brisbane or talk to a Development Services Planning Information Officer via Council's Contact Centre on (07) 3403 8888.

Flood Planning and Development Information

This section of the FloodWise Property Report contains information about Council's planning scheme overlays. Overlays identify areas within the planning scheme that reflect distinct themes that may include constrained land and/or areas sensitive to the effects of development.

Flood overlay code

The Flood overlay code of Council's planning scheme uses the following information to provide guidelines when developing properties. The table below summarises the flood planning areas (FPAs) that apply to this property. Development guidelines for the FPAs are explained in **Council's planning scheme**.

Flood planning areas (FPA)		
River	**Creek / waterway**	**Overland flow**
		Not Applicable

To find more information about Council's flood planning areas (FPAs) for Brisbane River and Creek/waterway flooding to guide future building and development in flood prone areas, please review **Council's Flood Planning Provisions**.

Coastal hazard overlay code

The Coastal hazard overlay code of Council's planning scheme uses the following information to provide guidelines when conducting new developments. The table below summarises the coastal hazard categories that apply to this property. Development guidelines for the following Coastal hazard overlay sub-categories are explained in Council's **planning scheme**.

Coastal hazard overlay sub-categories
There are currently no Coastal hazard overlay sub-categories that apply to this property.

Note: Where land is identified within one for more flood planning areas on the Flood overlay or is identified within one of the Storm tide inundation area sub-categories on the Coastal hazard overlay, the assessment criteria that provides the highest level of protection from any source of flooding applies.

Property development flags
Large allotment - This property is either a Large Allotment of over 1000 square metres or is located within a Large Allotment. Flood levels may vary significantly across allotments of this size. Further investigations may be warranted in determining the variation in flood levels and the minimum habitable floor level across the site. For more information or advice, please consult a Registered Professional Engineer of Queensland (RPEQ).

Useful Flood Information Definitions

Australian Height Datum (AHD) - The reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.

Annual Exceedance Probability (AEP) - The probability of a flood event of a given size occurring in any one year, usually expressed as a percentage annual chance.

- **0.2% AEP** - A flood event of this size is considered rare but may still occur. A flood of size or larger has a 1 in 500 chance or a 0.2% probability of occurring in any year.
- **1% AEP** - A flood of this size or larger has a 1 in 100 chance or a 1% probability of occurring in any year.
- **2% AEP** - A flood of this size or larger has a 1 in 50 chance or a 2% probability of occurring in any year.
- **5% AEP** - A flood of this size or larger has a 1 in 20 chance or a 5% probability of occurring in any year.
- **20% AEP** - A flood of this size or larger has a 1 in 5 chance or a 20% probability of occurring in any year.

Data quality

- **Data Quality Code A** - Level data based on recent surveyor report or approved as-constructed drawings.
- **Data Quality Code B** - Level data based on ground-based mobile survey or similar.
- **Data Quality Code C** - Level data derived from Airborne Laser Scanning or LiDAR information.

Defined Flood Level (DFL) - The DFL is used for commercial and industrial development. The Defined flood level (DFL) for Brisbane River flooding is a level of 3.7m AHD at the Brisbane City Gauge based on a flow of 6,800 m/s. DFL is only applicable for non-residential uses affected by Brisbane River flooding.

Flood planning area (FPA) - Council has developed five Flood planning areas (FPAs) as part of Brisbane City Plan 2014 Flood overlay mapping for Brisbane River, Creek/waterway flooding and Overland flow to guide future building and development in flood prone areas. Storm tide flooding is mapped separately. The FPAs are designed to recognise the flood hazard for different flooding types. Flood hazard is a combination of frequency of flooding, the flood depth, and the speed at which the water is travelling. **Find more information here**.

Maximum and minimum ground level - Highest and lowest ground levels on the property based on available ground level information. A Registered Surveyor can confirm exact ground levels.

Minimum habitable floor level (dwelling house) - The minimum level in metres AHD at which habitable areas of development (generally induding bedrooms, living rooms, kitchen, study, family, and rumpus rooms) must be constructed as required by the Brisbane City Plan 2014.

Indicative existing floor level - The approximate level in metres AHD of the lowest habitable floor in the existing building (excluding apartments). The data is sourced from a range of sources with varying accuracy levels.

Property - A property will contain 1 or more lots. The multiple lot warning is shown if you have selected a property that contains multiple lots.

Residential flood level (RFL) - This flood level for the Brisbane River equates to the 1% annual exceedance probability (AEP) flood level.

To learn more, visit **Brisbane City Council's Flood Information Hub**

Brisbane City Council's Online Flood Tools

Council provides several online flood tools:

- to guide planning and development
- to help residents and businesses understand their flood risk and prepare for flooding.

Council's online flood tools for planning and development purposes indude:

- **FloodWise Property Report**
- **Flood Overlay Code**

For more information on Council's planning scheme and online flood tools for planning and development:

- phone (07) 3403 8888 and ask to talk to a Development Services Planning Information Officer

- visit brisbane.qld.gov.au/planning-building

Council's Planning Scheme - The Brisbane City Plan 2014 (planning scheme) has been prepared in accordance with the Sustainable Planning Act as a framework for managing development in a way that advances the purpose of the Act. In seeking to achieve this purpose, the planning scheme sets out the Council's intention for future development in the planning scheme area, over the next 20 years.

Disclaimer

1. Defined flood levels and residential flood levels, minimum habitable floor levels and indicative existing floor levels are determined from the best available information to Council at the date of issue. These levels, for a particular property, may change if more detailed information becomes available or changes are made in the method of calculating levels.
2. Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disdaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.

Planning to build or renovate?

For information, guidelines, tools and resources to help you track, plan or apply for your development visit brisbane.qld.gov.au/planning-building

You can also find the Brisbane City Plan 2014 and Neighbourhood Plans as well as other information and training videos to help, with your building and development plans.

6.6 APPENDIX F – CODE RESPONSE TABLES

BCC Potential and Actual Acid Sulfate Soils Overlay Code – Responses

Performance outcomes	Acceptable outcomes	Reponses
PO1 Development protects the environmental values and ecological health of receiving waters and does not subject assets to accelerated corrosion.	**AO1** Development ensures that: (a) no potential or actual acid sulfate soils are disturbed; or Note—This can be demonstrated through the submission of an acid sulfate soil investigation report with reference to the Potential and actual acid sulfate soils planning scheme policy. (b) the disturbance impacts in an area that hosts potential acid sulfate soils are appropriately managed, if less than 500m^3 of soil is disturbed and the watertable is not affected; or Note—This can be demonstrated through the submission of an acid sulfate soil investigation report and a preliminary acid sulfate soil management plan, with reference to the Potential and actual acid sulfate soils planning scheme policy. (c) impacts are appropriately managed if 500m^3 or more of soil is disturbed or the watertable in an area that hosts potential or actual acid sulfate soils is affected. te—This can be demonstrated through the submission of an acid sulfate soil investigation report and a full acid sulfate soil management plan, with reference to the Potential and actual acid sulfate soils planning scheme policy using levels of testing commensurate with the level of risk. If the investigation demonstrates that an acid sulfate soil management plan is not required, only an investigation report is required.	**Complies with PO1 & AO1** An ASS Investigation Report will be developed during Detail Design phase to reference during Construction

BCC Filling & Excavation Code – Responses

Performance outcomes	Acceptable outcomes	Responses
PO1 Development for filling or excavation minimises visual impacts from retaining walls and earthworks.	**AO1** Development ensures that the total height of any cut and fill, whether or not retained, does not exceed: 2.5m in a zone in the Industry zones category; 1m in all other zones, or if adjoining a sensitive zone.	**DOES NOT COMPLY with PO1 & AO1** Earthworks is proposed, with to height of cut retaining >1m – but is in cut and will not impact neighbours. Refer to earthworks plans for details.
PO2 Development of a retaining wall proposed as a result of filling or excavation: is designed and constructed to be fit for purpose; does not impact adversely on significant vegetation; is capable of easy maintenance. Editor's note—A retaining wall also needs to comply with the Building Regulation and embankment gradients will need to comply with the Building Regulation. Note—Guidance on the protection of native vegetation is included in the Biodiversity areas planning scheme policy.	**AO2.1** Development of a retaining structure, including footings, surface drainage and subsoil drainage: is wholly contained within the site; if the total height to be retained is greater than 1m, then: the retaining wall at the property boundary is no greater than 1m above the ground level; all further terracing from the 1m high boundary retaining wall is 1 vertical unit:1 horizontal unit; the distance between each successive retaining wall (back of lower wall to face of higher wall) is no less than 1m horizontally to incorporate planting areas.	**DOES NOT COMPLY with PO1 & AO1** Earthworks is proposed, with to height of cut retaining >1m – but is in cut and will not impact neighbours. Refer to earthworks plans for details.
	AO2.2 Development of a retaining wall over 1m in height protects significant vegetation on the site and on adjoining land and is designed and constructed in accordance with the structures standards in the Infrastructure design planning scheme policy and certified by a Registered Professional Engineer Queensland.	**NA**
	AO2.3 Development provides a retaining wall finish that presents to adjoining land that is maintenance free if the setback is less than 750mm from the boundary.	**Complies with PO2 & AO2.3**
	AO2.4 Development for filling only uses clean fill that does not include any construction rubble, debris, weed seed or viable parts of plant species listed as an undesirable plant species in the Planting species planning scheme policy .	**Complies with PO2 & AO2.4** Refer notes on earthworks plans.
PO3 Development ensures that a rock anchor is designed and constructed to be fit for purpose.	**AO3** Development ensures that a rock anchor: is constructed in accordance with the standards in the Infrastructure design planning scheme policy; where it extends beyond the property boundary, is supported by a letter of consent from the adjoining land and building owners.	**NA**
PO4 Development protects all services and public utilities.	**AO4** Development protects services and public utilities and ensures that any alteration or relocation of services or public utilities meets the standard design specifications of the responsible service authorities.	**Complies with PO4 & AO4**

PO5 Development provides surface and sub-surface drainage to prevent water seepage, concentration of run-off or ponding of stormwater on adjacent land.	**AO5** Development ensures all flows and subsoil drainage are directed to a lawful point of discharge of a surface water diversion drain, including to the top or toe of a retaining wall in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy.	**Complies with PO5 & AO5** Retaining Walls will drain to existing drainage infrastructure, or otherwise have seep holes at base
PO6 Development ensures that the design and construction of all open drainage works is undertaken in accordance with natural channel design principles, being the development of a stormwater conveyance system for major flows, by using a vegetated open channel or drain that approximates the features and functions of a natural waterway to enhance or improve riparian values of those stormwater conveyance systems. Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design guidelines.	**AO6** Filling or excavation does not involve the construction of open drainage.	**Complies with PO6 & AO6**
PO7 Development for filling or excavation: does not degrade water quality or adversely affect environmental values in receiving waters; ensures site sediment and erosion control standards are best practice.	**AO7.1** Development for filling or excavation provides water quality treatment that complies with the stormwater drainage section of the Infrastructure design planning scheme policy.	**Complies with PO7 & AO7.1** Details to be nominated post DA within ESC plans
	AO7.2 Development provides erosion and sediment control standards that are in accordance with the stormwater drainage section of the Infrastructure design planning scheme policy.	**Complies with PO7 & AO7.2** Details to be nominated post DA within ESC plans
PO8 Development for filling or excavation is conducted such that adverse impacts at a sensitive use due to noise and dust are prevented or minimised. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO8.1** Development ensures that no dust emissions extend beyond the boundary of the site, including dust from construction vehicles entering and leaving the site.	**Complies with PO8 & AO8.1** Details to be nominated post DA within ESC plans
	AO8.2 Development for filling or excavation activity only occurs between the hours of 6:30am and 6:30pm Monday to Saturday, excluding public holidays.	**Complies with PO8 & AO8.2**
PO9 Development ensures that vibration generated by the filling or excavation operation does not exceed the vibration criteria in Table 9.4.3.3.B, Table 9.4.3.3.C, Table 9.4.3.3.Dand Table 9.4.3.3.E. Note—A noise management report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO9** Development involving filling or excavation does not cause a ground-borne vibration beyond the boundary of the site.	**Complies with PO9 & AO9**
PO10 Development ensures that heavy trucks hauling material to and from the site do not affect the amenity of established areas and limits environmental nuisance impact on adjacent land.	**AO10** Development ensures that heavy trucks hauling material to and from the site: occur for a maximum of 3 weeks; use a major road to access the site;	**Complies with PO10 & AO10**

	only use a minor road for the shortest-most-direct route that has the least amount of environmental nuisance if there is no major road alternative.	
PO11 Development for filling or excavation protects the environment and community health and wellbeing from exposure to contaminated land and contaminated material.	**AO11** Development does not involve: excavation on land previously occupied by a notifiable activity or on land listed on the Environmental Management Register or the Contaminated Land Register; filling with material containing a contaminant.	**Complies with PO11 & AO11**
PO12 Development provides for: landscaping for water conservation purposes; water sensitive urban design measures which are employed within the landscape design to maximise stormwater use and to reduce any adverse impacts on the landscape; stormwater harvesting to be maximised and any adverse impacts of stormwater minimised.	**AO12.1** Development provides landscaping which is designed using the standards in the Landscape design guidelines for water conservation planning scheme policy.	**Complies with PO12 & AO12.1**
	AO12.2 Development ensures that the design and requirements for irrigation are in compliance with the standards in the Landscape design guidelines for water conservation planning scheme policy.	**Complies with PO12 & AO12.2**
	AO12.3 Development provides areas of pavement, turf and mulched garden beds which are drained. Note—This may be achieved through the provision and/or treatment of swales, spoon drains, field gullies, sub-surface drainage and stormwater connections.	**Complies with PO12 & AO12.3**
PO13 Development ensures cutting and filling for the development of canals or artificial waterways avoids adverse impacts on coastal resources and processes.	**AO13** Development does not involve the creation of canals or artificial waterways.	**NA**

BCC Infrastructure Design Code – Responses

Performance outcomes	Acceptable outcomes	Response
PO1 Development provides roads, pavement, edging and landscaping which: are designed and constructed in accordance with the road hierarchy; provide for safe travel for pedestrians, cyclists and vehicles; provide access to properties for all modes; provide utilities; provide high levels of aesthetics and amenity, improved liveability and future growth; provide for the amelioration of noise and other pollution; provide a high-quality streetscape; provide a low-maintenance asset with a minimal whole-of-life cost. Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO1** Development provides roads and associated pavement, edging and landscaping which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	**Complies with PO1 & AO1** BCC standard crossovers will be constructed to service proposed development
PO2 Development provides road pavement surfaces which: are well designed and constructed; durable enough to carry the wheel loads of the intended types and numbers of travelling and parked vehicles; ensures the safe passage of vehicles, pedestrians and cyclists, the discharge of stormwater run-off and the preservation of all-weather access; allows for reasonable travel comfort.	**AO2** Development provides road pavement surfaces which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	**Complies with PO2 & AO2**
PO3 Development provides a pavement edge which is designed and constructed to: control vehicle movements by delineating the carriageway for all users; provide for people with disabilities by allowing safe passage of wheelchairs and other mobility aids.	**AO3** Development provides pavement edges which are designed and constructed in compliance with the road corridor design standards in the Infrastructure design planning scheme policy.	**Complies with PO3 & AO3**
PO4 Development provides verges which are designed and constructed to: provide safe access for pedestrians clear of obstructions and access areas for vehicles onto properties; provide a sufficient area for public utility services; be maintainable by the Council.	**AO4** Development provides verges which are designed and constructed in compliance with the road corridor design and streetscape locality advice standards in the Infrastructure design planning scheme policy.	**Complies with PO4 & AO4**
PO5	**AO5**	**NA**

Development provides a lane or laneway identified on the Streetscape hierarchy overlay map or in a neighbourhood plan which: allows equitable access for all modes; is safe and secure; has 24-hour access; is a low-speed shared zone environment; has a high-quality streetscape.	Development provides a lane or laneway identified on the Streetscape hierarchy overlay map or in a neighbourhood plan which is embellished in compliance with the streetscape locality advice standards in the Infrastructure design planning scheme policy.	
PO6 Development of an existing premises provides at the frontage to the site, if not already provided, the following infrastructure to an appropriate urban standard: an effective, high-quality paved roadway; an effective, high-quality roadway kerb and channel; safe, high-quality vehicle crossings over channels and verges; safe, accessible, high-quality verges compatible and integrated with the surrounding environment; safe vehicle access to the site that enables ingress and egress in a forward gear; provision of and required alterations to public utilities; effective drainage; appropriate conduits to facilitate the provision of required street-lighting systems and traffic signals.	**AO6** Development of an existing premises provides at the frontage of the site, if not already existing, the following infrastructure to the standard that would have applied if the development involved new premises as stated in the road corridor design standards in the Infrastructure design planning scheme policy: concrete kerb and channel; forming and grading to verges; crossings over channels and verges; a constructed bikeway; a constructed verge or reconstruction of any damaged verge; construction of the carriageway; payment of costs for required alterations to public utility mains, services or installations; construction of and required alterations to public utility mains, services or installations; drainage works; nstallation of electrical conduits.	**Complies with PO6 & AO6**
PO7 Development provides both cycle and walking routes which: are located, designed and constructed to their network classification (where applicable); provide safe and attractive travel routes for pedestrians and cyclists for commuter and recreational purposes; provide safe and comfortable access to properties for pedestrians and cyclists; incorporate water sensitive urban design into stormwater drainage; provide for utilities; provide for a high level of aesthetics and amenity, improved liveability and future growth; are a low-maintenance asset with a minimal whole-of-life cost; minimise the clearing of significant native vegetation. Note—This can be demonstrated in an engineering report prepared and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	**AO7** Development provides cycle and walking routes which are located, designed and constructed in compliance with the road corridor design and off-road pathway design standards in the Infrastructure design planning scheme policy.	**NA**

PO8 Development provides refuse and recycling collection, separation and storage facilities that are located and managed so that adverse impacts on building occupants, neighbouring properties and the public realm are minimised.	**AO8.1** Development provides refuse and recycling collection and storage facilities in accordance with the Refuse planning scheme policy.	**Complies with PO8 & AO8.1**
	AO8.2 Development ensures that refuse and recycling collection and storage location and design do not have any adverse impact including odour, noise or visual impacts on the amenity of land uses within or adjoining the development. Note—Refer to the Refuse planning scheme policy for further guidance.	**Complies with PO8 & AO8.2**
PO9 Development ensures that: land used for an urban purpose is serviced adequately with regard to water supply and waste disposal; the water supply meets the stated standard of service for the intended use and fire-fighting purposes.	**AO9.1** Development ensures that the reticulated water and sewerage distribution system for all services is in place before the first use is commenced.	**Complies with PO9 & AO9.1** Via QUU process
	AO9.2 Development provides the lot with reticulated water supply and sewerage to a standard acceptable to the distributor–retailer.	**Complies with PO9 & AO9.2** Via QUU process
PO10 Development provides public utilities and street lighting which are the best current or alternative technology and facilitate accessibility, easy maintenance, minimal whole-of-life costs, and minimal adverse environmental impacts.	**AO10.1** Development provides public utilities and street lighting which are located and aligned to: avoid significant native vegetation and areas identified within the Biodiversity areas overlay map; minimise earthworks; avoid crossing waterways, waterway corridors and wetlands or if a crossing is unavoidable, tunnel-boring techniques are used to minimise disturbance, and a disturbed area is reinstated and restored on completion of the work. Note—Guidance on the restoration of habitat is included in the Biodiversity areas planning scheme policy.	**Complies with PO10 & AO10.1** Will comply as required
	AO10.2 Development provides compatible public utility services and street-lighting services which are co-located in common trenching for underground services.	**Complies with PO10 & AO10.2** Will comply as required
	AO10.3 Development provides public utilities and street lighting which are designed and constructed in compliance with the public utilities standards in the Infrastructure design planning scheme policy.	**Complies with PO10 & AO10.3** Will comply as required
PO11 Development ensures that land used for urban purposes is serviced adequately with telecommunications and energy supply.	**AO11** Development provides land with the following services to the standards of the approved supplier: electricity; telecommunications services; gas service where practicable.	**Complies with PO11 & AO11** Will comply as required
PO12	**AO12** Development provides conduits which are provided in all major Council and government works projects to enable the future provision of fibre optic cabling, if:	**NA**

Development ensures that major public projects promote the provision of affordable, high-bandwidth telecommunications services throughout the city.	the additional expense is unlikely to be prohibitive; or further major work is unlikely or disruption would be a major concern, such as where there is a limited capacity road; or there is a clear gap in the telecommunications network; or there is a clear gap in the bandwidth available to the area. Editor's note—An accurate, digital 'as built' three-dimensional location plan is to be supplied for all infrastructure provided in a road.	
PO13 Development provides public art identified in a neighbourhood plan or park concept plan which: is provided commensurate with the status and scale of the proposed development; is sited and designed: as an integrated part of the project design; as conceptually relevant to the context of the location; to reflect and respond to the cultural values of the community; to promote local character in a planned and informed manner.	**AO13** Development provides public art identified in a neighbourhood plan or park concept plan which is sited and designed in compliance with the public art standards in the Infrastructure design planning scheme policy.	**NA**
PO14 Development provides signage of buildings and spaces which promote legibility to help users find their way.	**AO14** Development provides public signage: at public transport interchanges and stops, key destinations, public spaces, pedestrian linkages and at entries to centre developments; which details the location of the key destinations, public spaces and pedestrian linkages in the vicinity, the services available within the development and where they are located. Editor's note—Signage is to be in accordance with Local Law Number 1 (Control of Advertisements Local Law).	**NA**
PO15 Development that provides community facilities which form part of the development is functional, safe, low maintenance, and fit for purpose.	**AO15** Development that provides community facilities which form part of the development is designed in compliance with the community facilities standards in the Infrastructure design planning scheme policy.	**NA**
PO16 Development provides public toilets which: are required as part of a community facility or park; are located, designed and constructed to be: safe; durable; resistant to vandalism; able to service expected demand; fit for purpose.	**AO16** Development that provides public toilets is designed and constructed in compliance with the public toilets standards in the Infrastructure design planning scheme policy.	**NA**
PO17	**AO17**	**NA**

Development provides bridges, tunnels, elevated structures and water access structures that are designed and constructed using proven methods, materials and technology to provide for: safe movement of intended users; an attractive appearance appropriate to the general surroundings and any adjacent structures; functionality and easy maintenance; minimal whole-of-life cost; longevity; current and future services. Note—All bridges and elevated and associated elements must be designed and certified by a Registered Professional Engineer Queensland in accordance with the Infrastructure design planning scheme policy.	Development that provides bridges, tunnels, elevated structures and water access structures is designed and constructed in compliance with the standards in the Infrastructure design planning scheme policy.	
PO18 Development provides culverts which are designed and constructed using proven methods, materials and technology to provide for: safety; an attractive appearance appropriate to the general surroundings; functionality and easy maintenance; minimal whole-of-life cost; longevity; future widening; current and future services; minimal adverse impacts, such as increase in water levels or flow velocities, and significant change of flood patterns. Note—All culverts and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.	**AO18** Development that provides culverts is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	**NA**
PO19 Development provides batters, retaining walls, and seawalls and river walls which are designed and constructed using proven methods, materials and technology to provide for: safety; an attractive appearance appropriate to the surrounding area; easy maintenance; minimal whole-of-life cost; longevity; minimal water seepage.	**AO19** Development that provides batters, retaining walls, seawalls and river walls is designed and constructed in compliance with the structures standards in the Infrastructure design planning scheme policy.	**Complies with PO19 & AO19** Will comply

Note—All retaining walls and associated elements are to be designed and certified by a Registered Professional Engineer Queensland in accordance with the applicable design standards.		
If for development with a gross floor area greater than 1,000m^2		**NA**
PO20 Development ensures that construction is managed so that use of public spaces and movement on pedestrian, cyclist and other traffic routes is not unreasonably disrupted and existing landscaping is adequately protected from short- and long-term impacts. Note—The preparation of a construction management plan can assist in demonstrating achievement of this performance outcome. Note—The Transport, access, parking and servicing planning scheme policy provides advice on the management of vehicle parking and deliveries during construction.	**AO20** Development ensures that during construction: the ongoing use of adjoining and surrounding parks and public spaces, such as malls and outdoor dining, is not compromised; adjoining and surrounding landscaping is protected from damage; safe, legible, efficient and sufficient pedestrian, cyclist and vehicular accessibility and connectivity to the wider network are maintained.	
PO21 Development ensures that construction and demolition activities are guided by measures that prevent or minimise adverse impacts including sleep disturbance at a sensitive use, due to noise and dust, including dust from construction vehicles entering and leaving the site. Note—A noise and dust impact management plan prepared in accordance with the Management plans planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO21.1** Development ensures that demolition and construction: only occur between 6:30am and 6:30pm Monday to Saturday, excluding public holidays; do not occur over periods greater than 6 months.	
	AO21.2 Development including construction and demolition does not release dust emissions beyond the boundary of the site.	
	AO21.3 Development construction and demolition does not involve asbestos-containing materials.	
PO22 Development ensures that: construction and demolition do not result in damage to surrounding property as a result of vibration; vibration levels achieve the vibration criteria in Table 9.4.4.3.B, Table 9.4.4.3.C, Table 9.4.4.3.D and Table 9.4.4.3.E. Note—A vibration impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.	**AO22** Development ensures that the nature and scale of construction and demolition do not generate noticeable levels of vibration.	
If for a material change of use or reconfiguring a lot in an urban area (as defined in the Regulation) involving premises that is, or will be, accessed by common private title, where involving buildings, either attached or detached, that are not covered by other legislation mandating fire hydrants		**na**
PO23 Development ensures that fire hydrants are: installed and located to enable fire services to access water safely, effectively and efficiently; suitably identified so that fire services can locate them at all hours.	**AO23.1** Above or below ground fire hydrants are provided on residential, commercial and industrial streets and private roads, at not more than 90m intervals, and at each street intersection. Note—On residential streets, above ground fire hydrants may be single outlet. On commercial and industrial streets above ground fire hydrants should have dual valved outlets.	**Complies with PO & AO**

	AO23.2 Fire hydrants are identified by: raised reflectorised pavement markers (RRPM) on sealed roads; marker posts at the fence line where on an unsealed road, as road (HR) or path (HP) hydrants.	
PO24 Development ensures road widths and construction within the development, are adequate for refuse vehicles and for fire emergency vehicles to gain access to a safe working area close to buildings and near water supplies whether or not on-street parking spaces are occupied.	**AO24** Internal private roads have a minimum roadway clearance between obstructions of 3.5m wide and 4.8m high in addition to any width required for on-street parking.	
Development for major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System **where not in the Utility services zone precinct of the Special purpose zone**		**NA**
PO25 Development avoids or otherwise minimises adverse impacts on surrounding land uses through the use of buffers and setbacks and the appropriate design and location of plant and operational areas within the site.	**AO25** No acceptable outcome is prescribed.	
Development potentially impacting on major electricity infrastructure and bulk water supply infrastructure identified on the State Planning Policy Interactive Mapping System **where the infrastructure is not in the Utility services zone precinct of the Special purpose zone**		**NA**
PO26 Development is sited and designed to: avoid safety risks to people or property; minimise noise and visual impacts to people and property; ensure the physical integrity and operation, maintenance and expansion of the infrastructure is not compromised.	**AO26** No acceptable outcome is prescribed.	

BCC Stormwater Code - Responses

Performance outcomes	Acceptable outcomes	Response
Section A—If for a material change of use, reconfiguring a lot, operational work or building work Note—Compliance with the performance outcomes and acceptable outcomes in this section should be demonstrated by the submission of a site-based stormwater management plan for high risk development only.		
PO1 Development provides a stormwater management system which achieves the integrated management of stormwater to: minimise flooding; protect environmental values of receiving waters; maximise the use of water sensitive urban design; minimise safety risk to all persons; maximise the use of natural waterway corridors and natural channel design principles. Editor's note—The stormwater management system to be developed to address PO1 is not intended to require management of stormwater quality.	**AO1** Development provides a stormwater management system designed in compliance with the Infrastructure design planning scheme policy.	**Complies with PO1 & AO1** Refer stormwater layout within civil services schematics
PO2 Development ensures that the stormwater management system and site work does not adversely impact flooding or drainage characteristics of premises which are up slope, down slope or adjacent to the site.	**AO2.1** Development does not result in an increase in flood level or flood hazard on up slope, down slope or adjacent premises.	**Complies with PO2 & AO2.1** Refer stormwater layout within civil services schematics
	AO2.2 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	**Complies with PO2 & AO2.2** Refer stormwater layout within civil services schematics
PO3 Development ensures that the stormwater management system does not direct stormwater run-off through existing or proposed lots and property where it is likely to adversely affect the safety of, or cause nuisance to properties.	**AO3.1** Development ensures that the location of the stormwater drainage system is contained within a road reserve, drainage reserve, public pathway, park or waterway corridor.	**Complies with PO3 & AO3.1** Refer stormwater layout within civil services schematics. Proposal will not trigger nuisance flows
	AO3.2 Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	**Complies with PO3 & AO3.2** Refer stormwater layout within civil services schematics
	AO3.3 Development obtains a lawful point of discharge in compliance with the standards in the Infrastructure design planning scheme policy.	**Complies with PO3 & AO3.3** Refer stormwater layout within civil services schematics
	AO3.4 Where on private land, all underground stormwater infrastructure is secured by a drainage easement.	**Complies with PO3 & AO3.4** Refer stormwater layout within civil services schematics

PO4 Development provides a stormwater management system which has sufficient capacity to safely convey run-off taking into account increased run-off from impervious surfaces and flooding in local catchments.	**AO4.1** Development provides a stormwater conveyance system which is designed to safely convey flows in compliance with the standards in the Infrastructure design planning scheme policy.	**Complies with PO4 & AO4.1** Refer stormwater layout within civil services schematics
	AO4.2 Development provides sufficient area to convey run-off which will comply with the standards in the Infrastructure design planning scheme policy.	**Complies with PO4 & AO4.2** Refer stormwater layout within civil services schematics
PO5 Development designs stormwater channels, creek modification works, bridges, culverts and major drains to protect and enhance the value of the waterway corridor or drainage path for fauna movement.	**AO5** Development ensures the design of stormwater channels, creek modifications or other infrastructure, permits terrestrial and aquatic fauna movement.	**NA**
PO6 Development ensures that location and design of stormwater detention and water quality treatment: (a) minimises risk to people and property; (b) provides for safe access and maintenance; (c) minimises ecological impacts to creeks and waterways.	**AO6.1** Development locates stormwater detention and water quality treatment: outside of a waterway corridor; offline to any catchment not contained within the development.	**Complies with PO6 & AO6.1** Refer stormwater layout within civil services schematics
	AO6.2 Development providing for stormwater detention and water quality treatment devices are designed in compliance with the standards in the Infrastructure design planning scheme policy.	**Complies with PO6 & AO6.2** Refer stormwater layout within civil services schematics
PO7 Development is designed, including any car parking areas and channel works to: (a) reduce property damage; (b) provide safe access to the site during the defined flood event.	**AO7.1** Development (including any ancillary structures and car parking areas) is located above minimum flood immunity levels in Table 9.4.9.3.B, Table 9.4.9.3.C, Table 9.4.9.3.D, Table 9.4.9.3.E and Table 9.4.9.3.F. Note—Compliance with this acceptable outcome can be demonstrated by the submission of a hydraulic and hydrology report identifying flood levels and development design levels (as part of a site-based stormwater management plan).	**Complies with PO3 & AO3.4** Refer stormwater layout within civil services schematics
	AO7.2 Development including the road network provides a stormwater management system that provides safe pedestrian and vehicle access in accordance with the standards in the Infrastructure design planning scheme policy.	**Complies with PO7 & AO7.2** Access is safe during storm event
PO8 Development designs stormwater channels, creek modification works and the drainage network to protect and enhance the environmental values of the waterway corridor or drainage path.	**AO8.1** Development ensures natural waterway corridors and drainage paths are retained.	**Complies with PO8 & AO8.1** Refer stormwater layout within civil services schematics
	AO8.2 Development provides the required hydraulic conveyance of the drainage channel and floodway, while maximising its potential to maximise environmental benefits and minimise scour.	**Complies with PO8 & AO8.2** Refer stormwater layout within civil services schematics

	Editor's note—Guidance on natural channel design principles can be found in the Council's publication Natural channel design guidelines.	
	AO8.3 Development provides stormwater outlets into waterways, creeks, wetlands and overland flow paths with energy dissipation to minimise scour in compliance with the standards in the Infrastructure design planning scheme policy.	**NA**
	AO8.4 Development ensures that the design of modifications to the existing design of new stormwater channels, creeks and major drains is in compliance with the standards in the Infrastructure design planning scheme policy.	**NA**
PO9 Development is designed to manage run-off and peak flows by minimising large areas of impervious material and maximising opportunities for capture and re-use.	**AO9** No acceptable outcome is prescribed.	**Complies with PO9 & AO9** Refer stormwater layout within civil services schematics. Post-Dev impervious are not considered 'large'.
PO10 Development ensures that there is sufficient site area to accommodate an effective stormwater management system. Note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for high-risk development only.	**AO10** No acceptable outcome is prescribed.	**Complies with PO10 & AO10** Refer stormwater layout within civil services schematics
PO11 Development provides for the orderly development of stormwater infrastructure within a catchment, having regard to the: (a) existing capacity of stormwater infrastructure within and external to the site, and any planned stormwater infrastructure upgrades; (b) safe management of stormwater discharge from existing and future up-slope development; (c) implication for adjacent and down-slope development.	**AO11.1** Development with up-slope external catchment areas provides a drainage connection sized for ultimate catchment conditions that is directed to a lawful point of discharge.	**Complies with PO11 & AO11.1** Refer stormwater layout within civil services schematics
	AO11.2 Development ensures that existing stormwater infrastructure that is undersized is upgraded in compliance with the Infrastructure design planning scheme policy.	**Complies with PO3 & AO3.4** There is no stormwater infrastructure on site
PO12 Development provides stormwater infrastructure which: (a) remains fit for purpose for the life of the development and maintains full functionality in the design flood event; (b) can be safely accessed and maintained cost effectively; (c) ensures no structural damage to existing stormwater infrastructure.	**AO12.1** The stormwater management system is designed in compliance with the Infrastructure design planning scheme policy.	**Complies with PO12 & AO12.1** Refer stormwater layout within civil services schematics
	AO12.2 Development provides a clear area with a minimum of 2m radius from the centre of an existing manhole cover and with a minimum height clearance of 2.5m.	**Will Complies with PO12 & AO12.2** Refer stormwater layout within civil services schematics
PO13 Development ensures that all reasonable and practicable measures are taken to manage the impacts of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation	**AO13** No acceptable outcome is prescribed.	**Complies with PO13 & AO13** Refer stormwater layout within civil services schematics

clearing, earthworks, civil construction, installation of services, rehabilitation, revegetation and landscaping to protect: (a) the environmental values and water quality objectives of waters; (b) waterway hydrology; the maintenance and serviceability of stormwater infrastructure. Note—The Infrastructure design planning scheme policy outlines the appropriate measures to be taken into account to achieve the performance outcome.		
PO14 Development ensures that: (a) unnecessary disturbance to soil, waterways or drainage channels is avoided; (b) all soil surfaces remain effectively stabilised against erosion in the short and long term.	**AO14** No acceptable outcome is prescribed.	**Complies with PO14 & AO14** Refer stormwater layout within civil services schematics
PO15 Development does not increase: (a) the concentration of total suspended solids or other contaminants in stormwater flows during site construction; (b) run-off which causes erosion either on site or off site.	**AO15** No acceptable outcome is prescribed.	**Complies with PO15 & AO15** Details to be supplied during Detailed Design within ESC plans. Run-off will no cause erosion.
Section B—Additional performance outcomes and acceptable outcomes which apply to high-risk development, being one or more of the following: (a) a material change of use for an urban purpose which involves greater than 2,500m^2 of land that: (i) will result in an impervious area greater than 25% of the net developable area; or (ii) will result in 6 or more dwellings. (b) reconfiguring a lot for an urban purpose that involves greater than 2,500m^2 of land and will result in 6 or more lots; (c) operational work for an urban purpose which involves disturbing greater than 2,500m^2 of land.		**NA**
PO16 Development ensures that the entry and transport of contaminants into stormwater is avoided or minimised to protect receiving water environmental values. Note—Prescribed water contaminants are defined in the *Environmental Protection Act 1994*. Note—Compliance with the performance outcome should be demonstrated by the submission of a site-based stormwater management plan for high-risk development only.	**AO16** Development provides a stormwater management system which is designed in compliance with the standards in the Infrastructure design planning scheme policy.	
PO17 Development ensures that: (a) the discharge of wastewater to a waterway or external to the site is avoided; or (b) if the discharge cannot practicably be avoided, the development minimises wastewater discharge through re-use, recycling, recovery and treatment. Note—The preparation of a wastewater management plan can assist in demonstrating achievement of this performance outcome.	**AO17** No acceptable outcome is prescribed.	

Editor's note—This code does not deal with sewerage which is the subject of the Wastewater code.		
Section C—Additional performance outcomes and acceptable outcomes for assessable development for a material change of use or reconfiguring a lot		
PO18 Development protects stormwater infrastructure to ensure the following are not compromised: (a) the long term infrastructure for the stormwater network in the Long term infrastructure plans; (b) the existing and planned infrastructure for the stormwater network in the Local government infrastructure plan; (c) the provision of long term, existing and planned infrastructure for the stormwater network which: (i) is required to service the development or an existing and future urban development in the planning scheme area; or (ii) is in the interests of rational development or the efficient and orderly planning of the general area in which the site is situated. Editor's note—A condition which requires a proposed development to keep permanent improvements and structures associated with the approved development clear of the area of long term infrastructure, may be imposed.	**AO18** Development protects stormwater infrastructure in compliance with the following: (a) for long term infrastructure for the stormwater network, the Long term infrastructure plans; (b) for existing and planned infrastructure for the stormwater network, the Local government infrastructure plan; (c) the standards for stormwater drainage in the Infrastructure design planning scheme policy.	**Complies with PO18 & AO18** Refer stormwater layout within civil services schematics
PO19 Development provides for the payment of extra trunk infrastructure costs for the following: (a) for development completely or partly outside the priority infrastructure area in the Local government infrastructure plan; (b) for development completely inside the priority infrastructure area in the Local government infrastructure plan involving: (i) trunk infrastructure that is to be provided earlier than planned in the Local government infrastructure plan; (ii) long term infrastructure for the stormwater network which is made necessary by development that is not assumed future urban development; (iii) other infrastructure for the stormwater network associated with development that is not assumed future urban development which is made necessary by the development. Editor's note—The payment of extra trunk infrastructure costs for development completely inside the priority infrastructure area in the Local government infrastructure plan is to be worked out in accordance with the Charges Resolution. Editor's note—See section 130 Imposing Development conditions (Conditions for extra trunk infrastructure costs) of the *Planning Act 2016*.	**AO19** No acceptable outcome is prescribed.	**NA** Site is outside LGIP

6.7 APPENDIX G – BCC E&SC EHA FORM

BRISBANE CITY COUNCIL ABN 72 002 765 795

Erosion Hazard Assessment - June 2014

Brisbane City Council (BCC), *Erosion Hazard Assessment* form must be read in conjunction with the *Erosion Hazard Assessment- Supporting Technical Notes* (June 2014 or later version) for explanatory terms and Certification information.

What is an Erosion Hazard Assessment?
Soil erosion and sediment from urban development, particularly during construction activities, is a significant source of sediment pollution in Brisbane's waterways. The Erosion Hazard Assessment determines whether the risk of soil erosion and sediment pollution to the environment is 'low' , 'medium' or 'high'.

When is the EHA required?
An *Erosion Hazard Assessment* form must be completed and lodged with BCC for any Development Application (ie MCU or ROL) that will result in soil disturbance OR Operational Works or Compliance Assessment Application for 'Filling' or Excavation.

Failure to submit this form during lodgement of an application may result in assessment delays or refusal of the application.

Privacy Statement
The personal information collected on this form will be used by Brisbane City Council for the purposes of fulfilling your request and undertaking associated Council functions and services. Your personal information will not be disclosed to any third party without your consent, unless this is required or permitted by law.

Assessment Details

1 Please turn over and complete the erosion hazard assessment.

2 Based on the erosion hazard assessment overleaf, is the site:

☐ ***A 'low' risk site***

Best practice erosion and sediment control (ESC) must be implemented but no erosion and sediment control plans need to be submitted with the development application. Factsheets outlining best practice ESC can be found at http://www.waterbydesign.com.au/factsheets

☑ ***A 'medium' risk site***

If the development is approved, the applicant will need to engage a Registered Professional Engineer (RPEQ) or Certified Professional in Erosion and Sediment Control (CPESC) to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy.

☐ ***A 'high' risk site***

If the development is approved, the applicant will need to engage a RPEQ and CPESC to prepare an ESC Program and Plan and supporting documentation — in accordance with the requirements of the Infrastructure Design Planning Scheme Policy. The plans and program will need to be certified by a CPESC.

3 Site Information and Certification

Application number (if known)

Site address

18A, 260 Macarthur Avenue

Hamilton

Postcode 4007

I certify that:

☑ I have made all relevant enquiries and am satisfied no matters of significance have been withheld from the assessment manager.

☑ I am a person with suitable qualifications and/or experience in erosion and sediment control.

☑ The Erosion Hazard Assessment was completed in accordance with the Erosion Hazard Assessment Supporting Technical Notes and the BCC Infrastructure Design Planning Scheme Policy.

☑ The Erosion Hazard Assessment accurately reflects the site's overall risk of soil erosion and sediment pollution to the environment.

☑ I acknowledge and accept that the BCC, as assessment manager, relies, in good faith, on this certification as part of its development assessment process and the provision of false or misleading information to the BCC constitutes an offence for which BCC may take punitive steps/ action against me/ enforcement action against me.

Certified by *Print name*

MITCH BLYTH

Certifier's signature

Date

10 / 12 / 2024

Assessment Table

Table 1: Low Risk Test

		Yes	*No*
1.1	is the area of land disturbance > 1000 m^2	✔	
1.2	does any land disturbance occur in a BCC mapped waterway corridor		✔
1.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 5%		✔
1.4	does any land disturbance occur below 5 m AHD		✔
1.5	does development involve endorsement of a staging plan		✔
1.6	is there an upstream catchment passing through the site > 1 hectare		✔

	Yes	*No*	
Have you answered 'yes' to any of the questions in Table 1?	✔		**If '*No*' then site is <u>low risk</u> with respect to erosion and sediment control**

If '*Yes*' then proceed to Table 2

Table 2: Medium Risk Test

		Yes	*No*	
2.1	is the area of land disturbance > 1 hectare		✔	**If '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control**

If '*Yes*' then proceed to Table 3

Table 3: High Risk Test

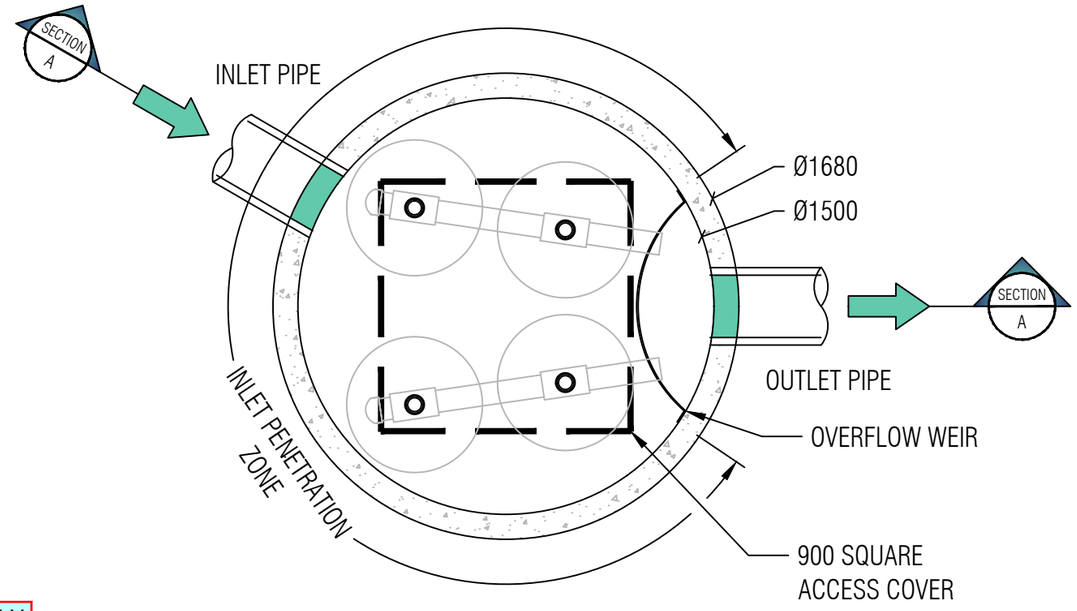
		Yes	*No*
3.1	is there an upstream catchment passing through the site > 1 hectare		
3.2	does any land disturbance occurs in a BCC mapped waterway corridor		
3.3	is there any slope on site (longer than three metres in length) before, during or after construction that is steeper than 15%		

	Yes	*No*	
Have you answered 'yes' to any of the questions in Table 3?			**If '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control**

If '*Yes*' then site is <u>high risk</u> with respect to erosion and sediment control

6.8 APPENDIX H – OCEAN PROTECT DEVICE INFORMATION

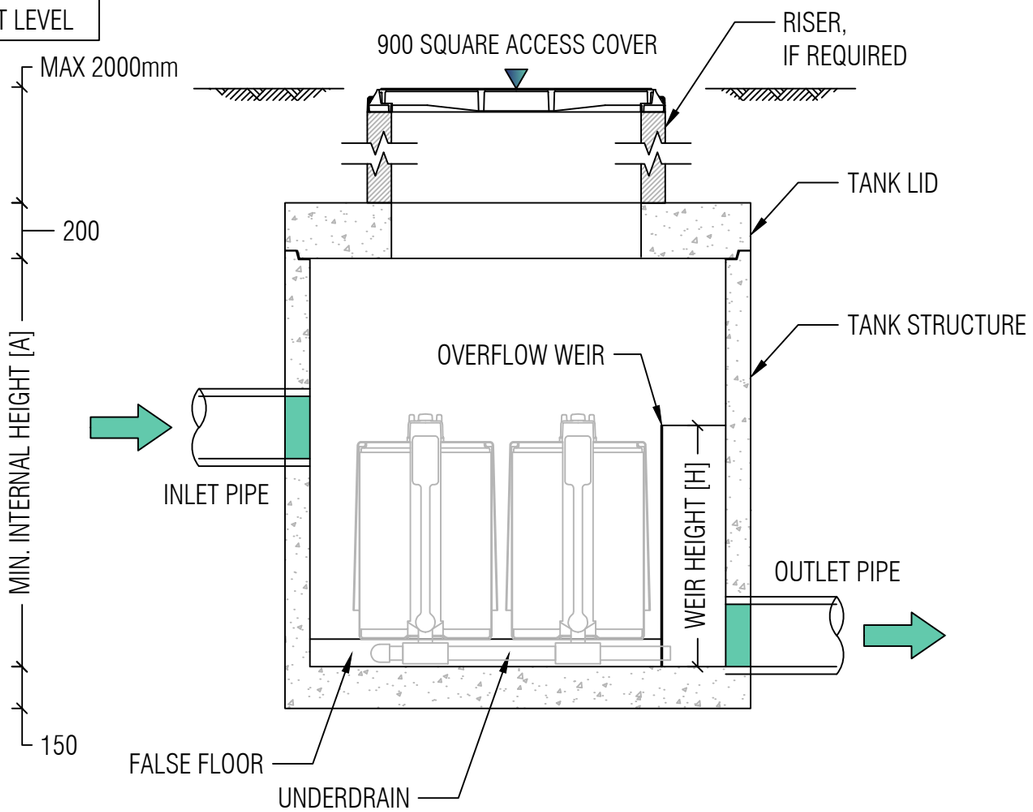
NOT FOR CONSTRUCTION



EXAMPLE ONLY

PLAN LAYOUT

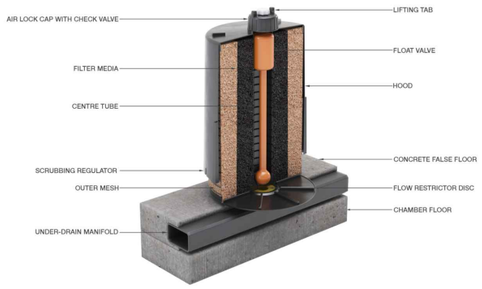
INLET INVERT LEVEL MINIMUM 100mm ABOVE OUTLET INVERT LEVEL



SECTION A

LAST MODIFIED: 26-06-24

STORMFILTER DESIGN PARAMETERS



- STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED.
- THE STANDARD CONFIGURATION IS SHOWN. ACTUAL CONFIGURATION OF THE SPECIFIED STRUCTURE(S) PER CERTIFYING ENGINEER WILL BE SHOWN ON SUBMITTAL DRAWING(S).
- FILTER CARTRIDGES SHALL BE MEDIA-FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 178mm.

NUMBER OF CARTRIDGES	UP TO 4
HYDRAULIC CAPACITY (L/S)	90
MAX. COMPONENT WEIGHT (kg) *MASS VARIABLE	7000
TANK LID WEIGHT (kg)	900

CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
TYPICAL WEIR HEIGHT [H] (mm)	920	690	540
MINIMUM INTERNAL HEIGHT [A] (mm)	1100	850	850
CARTRIDGE FLOW RATE FOR NPSORB MEDIA (L/s)	1.60	1.10	0.70
CARTRIDGE FLOW RATE FOR PSORB (MCC) MEDIA (L/s)	0.90	0.46	0.39
CARTRIDGE FLOW RATE FOR PSORB (SQIDEP) MEDIA (L/s)	1.26	0.86	0.60
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.60	1.10	0.70

GENERAL NOTES/ STRUCTURAL DESIGN CRITERIA

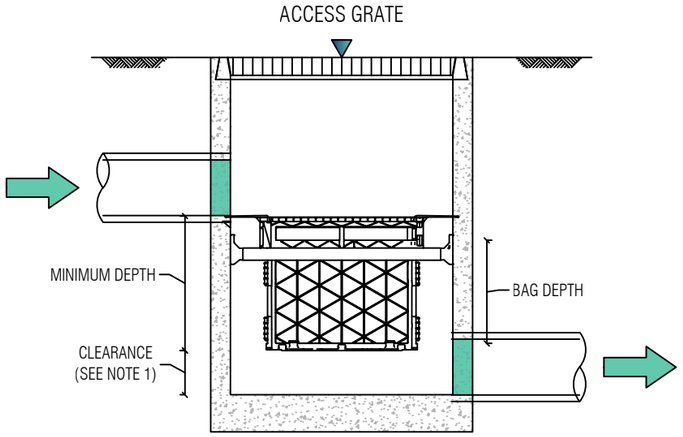
1. PRECAST STRUCTURE SUPPLIED WITH PENETRATIONS TO SUIT OUTER DIAMETER OF NOMINATED PIPE SIZE / MATERIAL.
2. PRECAST STRUCTURE SHALL MEET W80 WHEEL LOAD RATING ASSUMING A MAXIMUM EARTH COVER OF 2.0m AND A GROUND WATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. CERTIFYING ENGINEER TO CONFIRM ACTUAL GROUNDWATER ELEVATION. PRECAST STRUCTURE SHALL BE IN ACCORDANCE WITH AS3600.
3. PRECAST STRUCTURE SHALL BE PLACED ON A STABLE GROUND WITH A MINIMUM SOIL BEARING CAPACITY OF 125kPa UNDER NORMAL SERVICE CONDITION.
4. IF THE PEAK FLOW RATE, AS DETERMINED BY THE SITE CERTIFYING ENGINEER, EXCEEDS THE PEAK HYDRAULIC CAPACITY OF THE SYSTEM, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.
5. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE. REFER TO THE OPERATION AND MAINTENANCE MANUAL FOR GUIDELINES AND ACCESS REQUIREMENTS.
6. SITE-SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED UPON PLACEMENT OF ORDER.
7. DRAWING NOT TO SCALE.

INSTALLATION NOTES

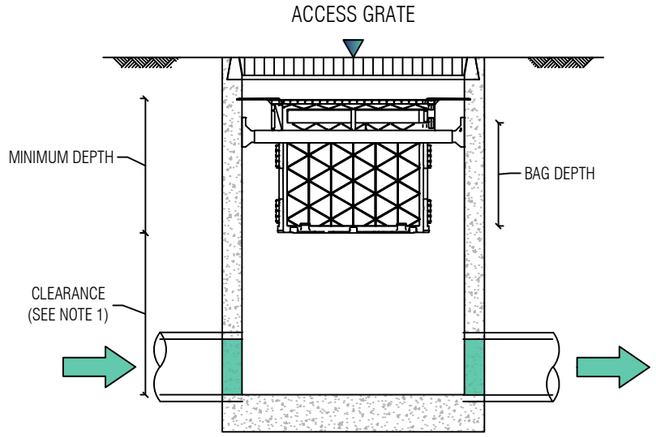
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY CERTIFYING ENGINEER.
2. CONTRACTOR TO PROVIDE ALL EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE (LIFTING DETAIL PROVIDED SEPARATELY).
3. CONTRACTOR TO APPLY SEALANT TO ALL JOINTS AND TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPES.

OCEAN PROTECT
PHONE: 1300 354 722
www.oceanprotect.com.au

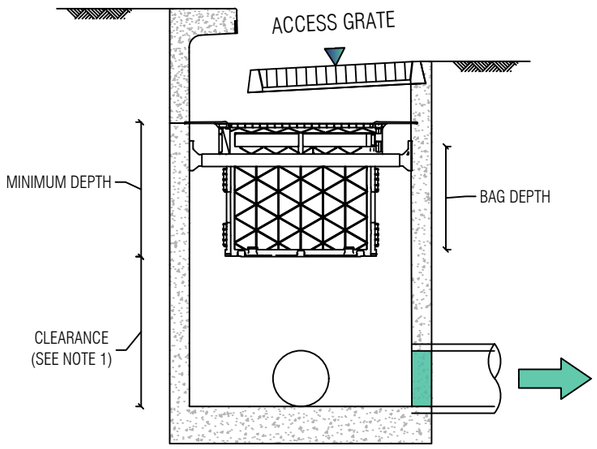
OCEAN PROTECT
4 CARTRIDGE STORMFILTER SYSTEM
DN1500 MANHOLE
SPECIFICATION DRAWING



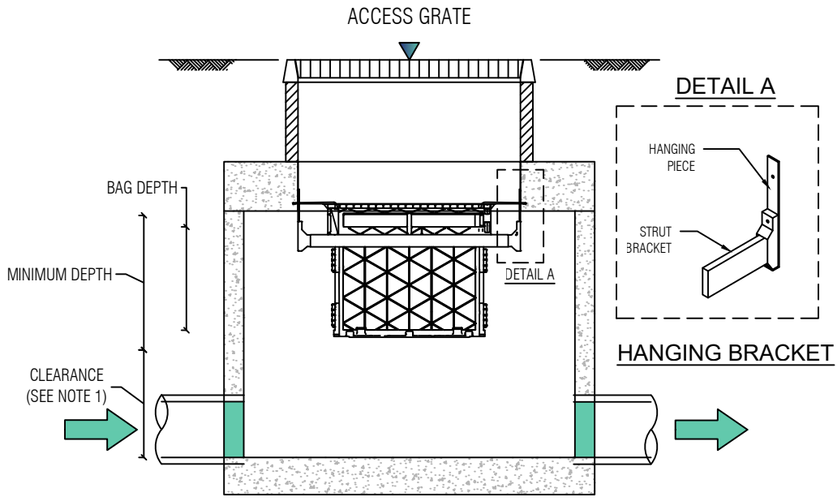
PIPE FLOW
CONFIGURATION



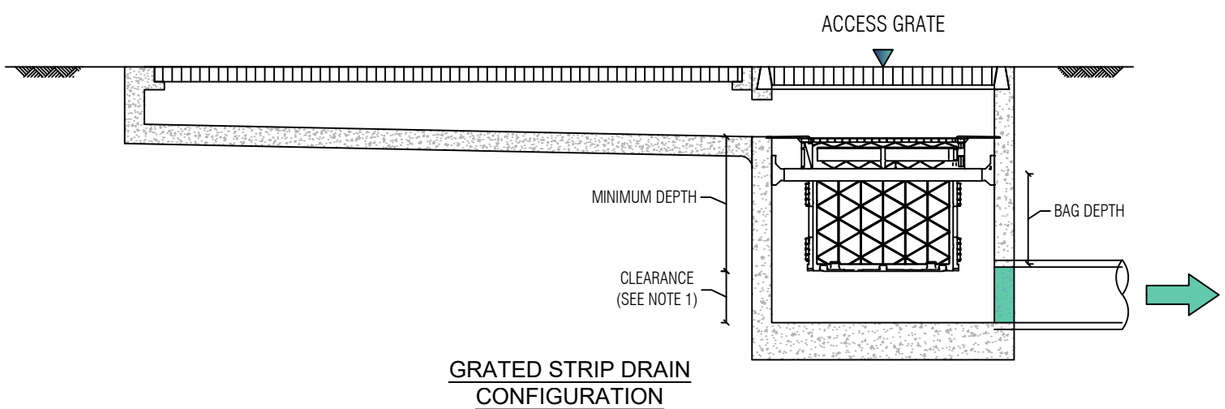
SURFACE FLOW
CONFIGURATION



SURFACE FLOW
CONFIGURATION



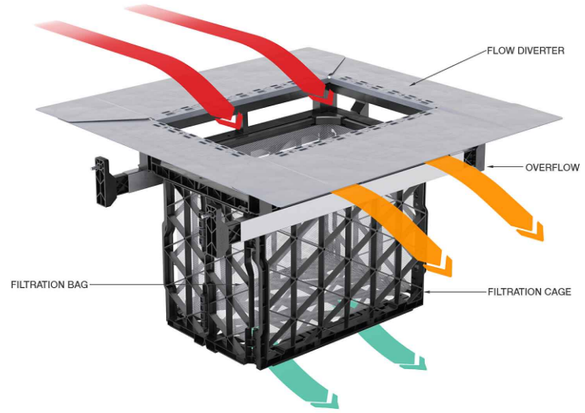
HANGING BRACKET



GRATED STRIP DRAIN
CONFIGURATION

OCEANGUARD

PRODUCT ID	MAX. PIT DIMENSIONS (mm × mm)	MINIMUM DEPTH (mm)	BAG DEPTH (mm)
OG4	450 × 450	350	200
OG6-S	600 × 600	350	200
OG6-D	600 × 600	475	300
OG9-S	600 × 900	400	300
OG9-S	900 × 900	400	300
OG9-D	900 × 900	600	500
OG12-S	1200 × 1200	420	300
OG12-D	1200 × 1200	600	500



GENERAL NOTES

1. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO INHIBIT HYDRAULIC CAPACITY.
2. OCEAN PROTECT PROVIDES TWO FILTRATION BAG TYPES:
   a. 200 MICRON BAGS FOR HIGHER WATER QUALITY FILTERING
   b. COARSE BAG FOR TARGETING GROSS POLLUTANTS.
3. DRAWINGS NOT TO SCALE.

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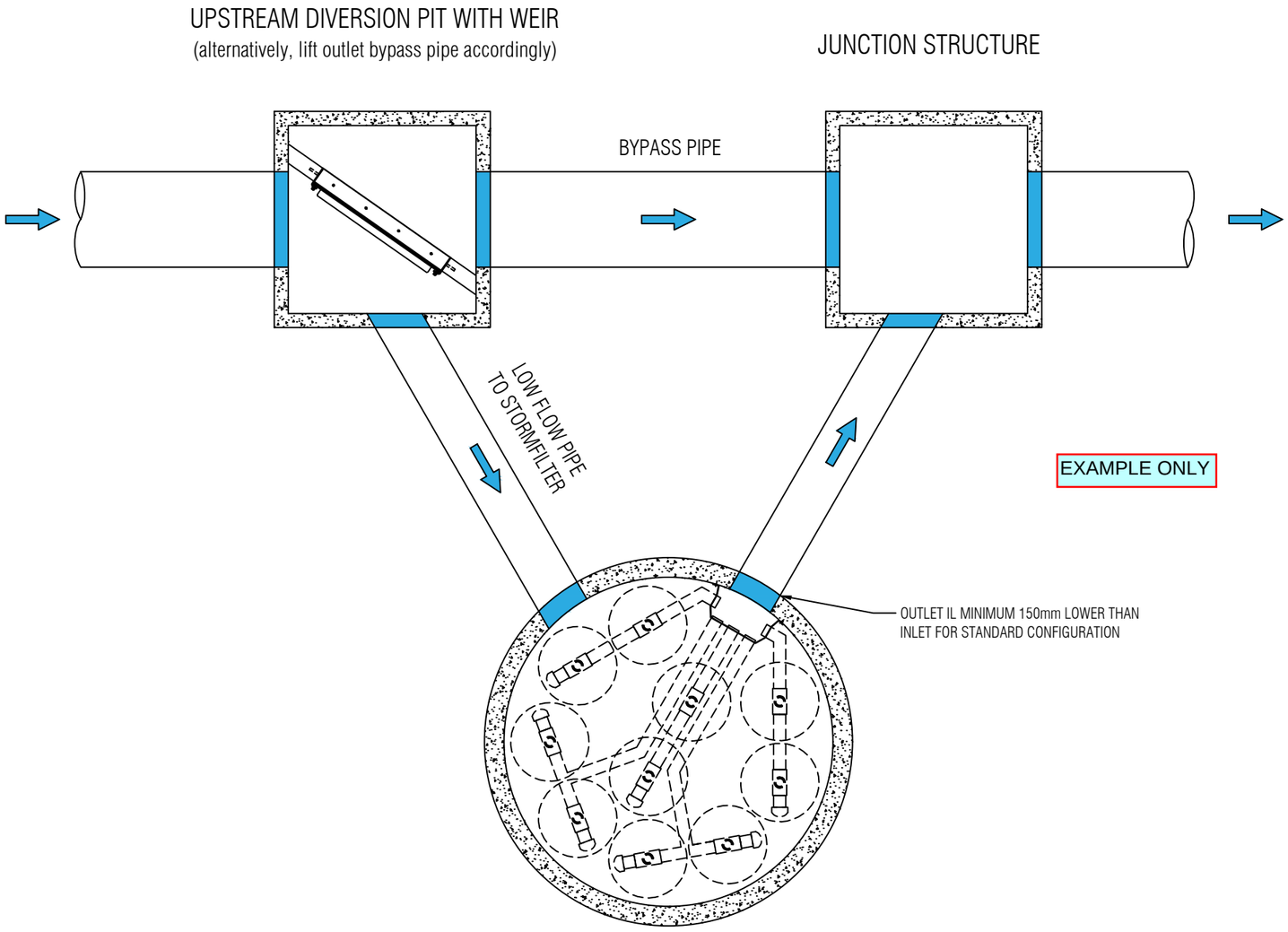
OCEAN PROTECT
OCEANGUARD
TYPCIAL ARRANGEMENTS
SPECIFICATION DRAWING



PLAN OF TYPICAL OFFLINE LAYOUT

REFER TO PRODUCT DRAWING .....
FOR SYSTEM DETAILS

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OCEAN PROTECT

TYPICAL OFFLINE LAYOUT
HIGH FLOW BYPASS
WITH PRECAST MANHOLE STORMFILTER

DRAWING	
1	
A	

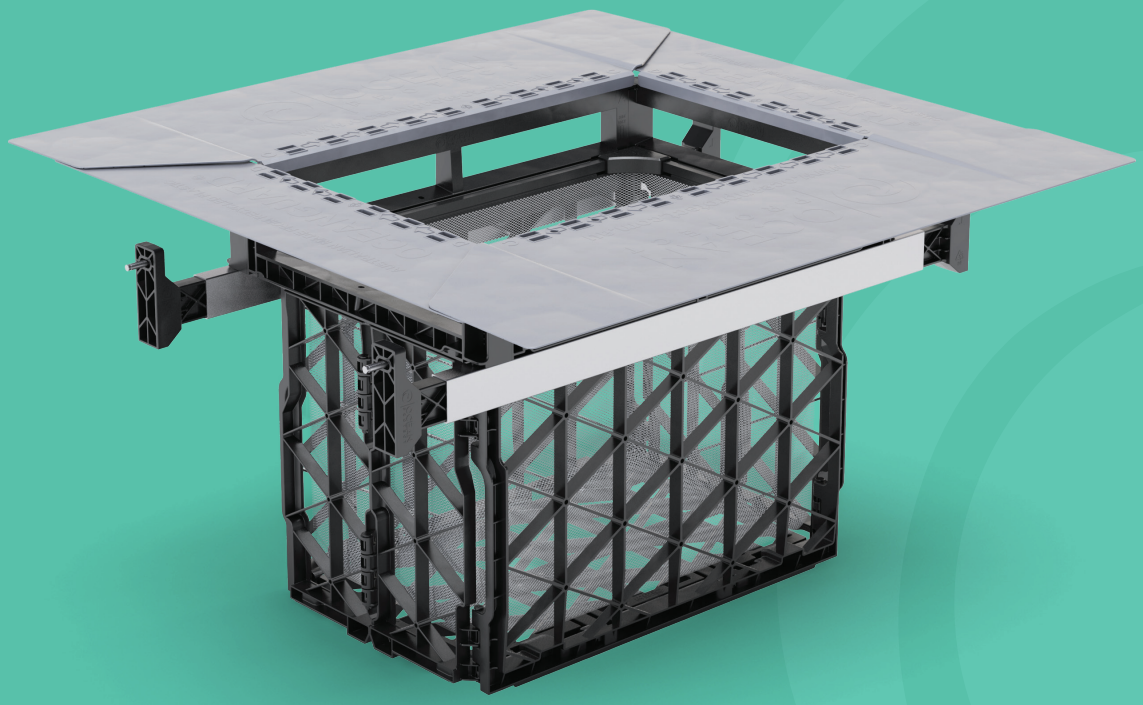
DATE: 21.05.19	SCALE: N.T.S.	FILE NAME: SFMH_OFFLINE_TYP	DRN: R.P.	CHK: M.W.

6.9 APPENDIX J – OCEAN PROTECT MAINTENANCE MANUALS

OCEAN PROTECT

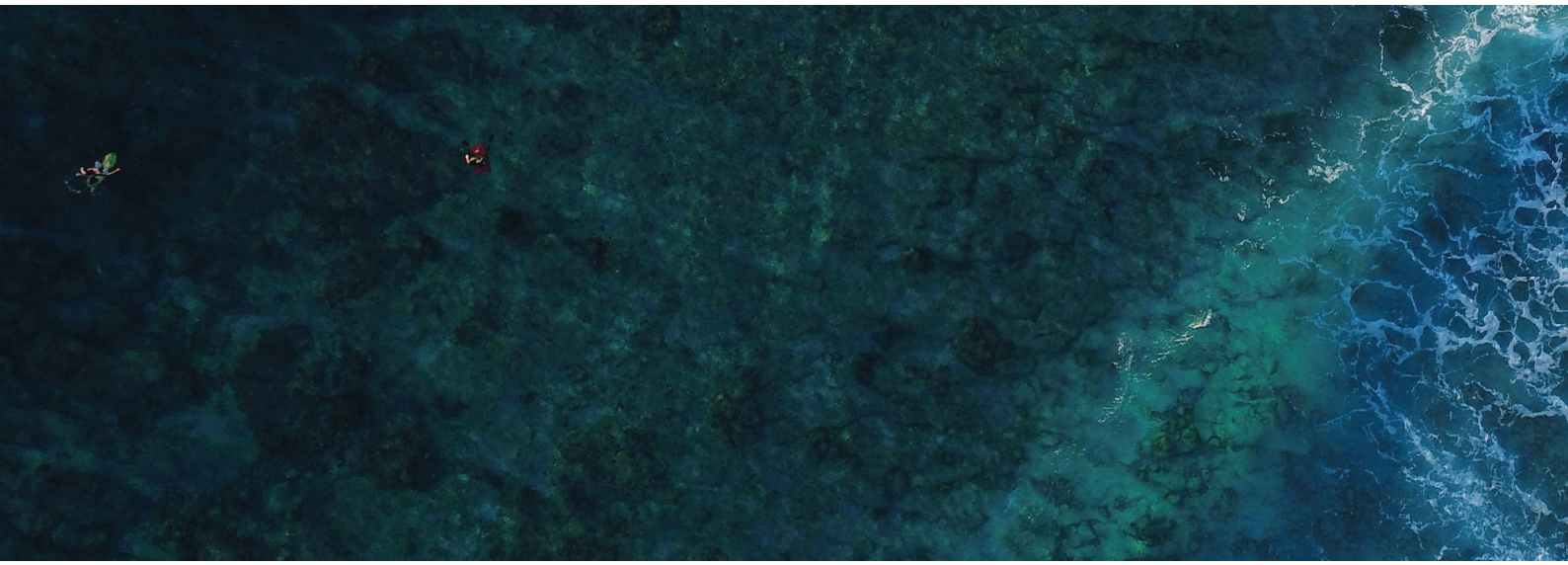
OceanGuard®

Operations & Maintenance Manual



Stopping Pollution Entering Waterways

09/22



www.oceanprotect.com.au

Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes for the OceanGuard® as recommended by the manufacturer (Ocean Protect).

The OceanGuard® technology is a gully pit basket designed to fit within new and existing gully pits to remove pollution from stormwater runoff. The system has a choice of filtration liners, designed to remove gross pollutants, solids, and other attached pollutants as either a standalone technology or as part of a 'treatment train' (e.g. with StormFilter®, Jellyfish® or biofiltration). OceanGuards are highly effective, easy to install and simple to maintain.

Stormwater professionals should note that Ocean Protect is not permitted to supply OceanGuard® technologies to provide pre-treatment to proprietary stormwater treatment assets that are not provided by Ocean Protect.

Why do I need to perform maintenance?

Adhering to the inspection and maintenance schedule of any stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most importantly ensures the long term effective operation of the OceanGuard®.

Health and Safety

Access to pits containing an OceanGuard® typically requires removing (heavy) access covers/grates, but typically it is not necessary to enter into a confined space. Pollutants collected by the OceanGuard® will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or sharp objects such as broken glass and syringes. For these reasons, there should be no primary contact with the waste collect and all aspects of maintaining and cleaning your OceanGuard® require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel, as a result it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the OceanGuard®, precautions should be taken in order to minimise (or when possible prevent) contact with sediment and other captured pollutants by maintenance personnel. In order to achieve this the following personal protective equipment (PPE) is recommended:

- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

The OceanGuard® is designed to be maintained from surface level, without the need to enter the pit. However depending on the installation configuration, location and site specific maintenance requirements it may be necessary to enter a confined space occasionally. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry.

How does it work?

OceanGuard® is designed to intercept stormwater as it enters the stormwater pits throughout a site. The OceanGuard® has diversion panels that sit flush with the pit walls, this ensures that as stormwater enters at the top of the pit it is directed to the middle of the insert where the Filtration bag is situated. The filtration bag allows for screening to occur removing 100% of pollutants greater than the opening of the filtration material (200micron, 1600micron bags available).

During larger rain events the large flows overflow slots in the flow diverter of the OceanGuard® ensure that the conveyance of stormwater is not impeded thus eliminating the potential for surface flooding. As the flow subsides, the captured pollutants are held in the OceanGuard® filtration bag. The waste then starts to dry which reduces the magnitude of organic material decomposition transitioning between maintenance intervals.

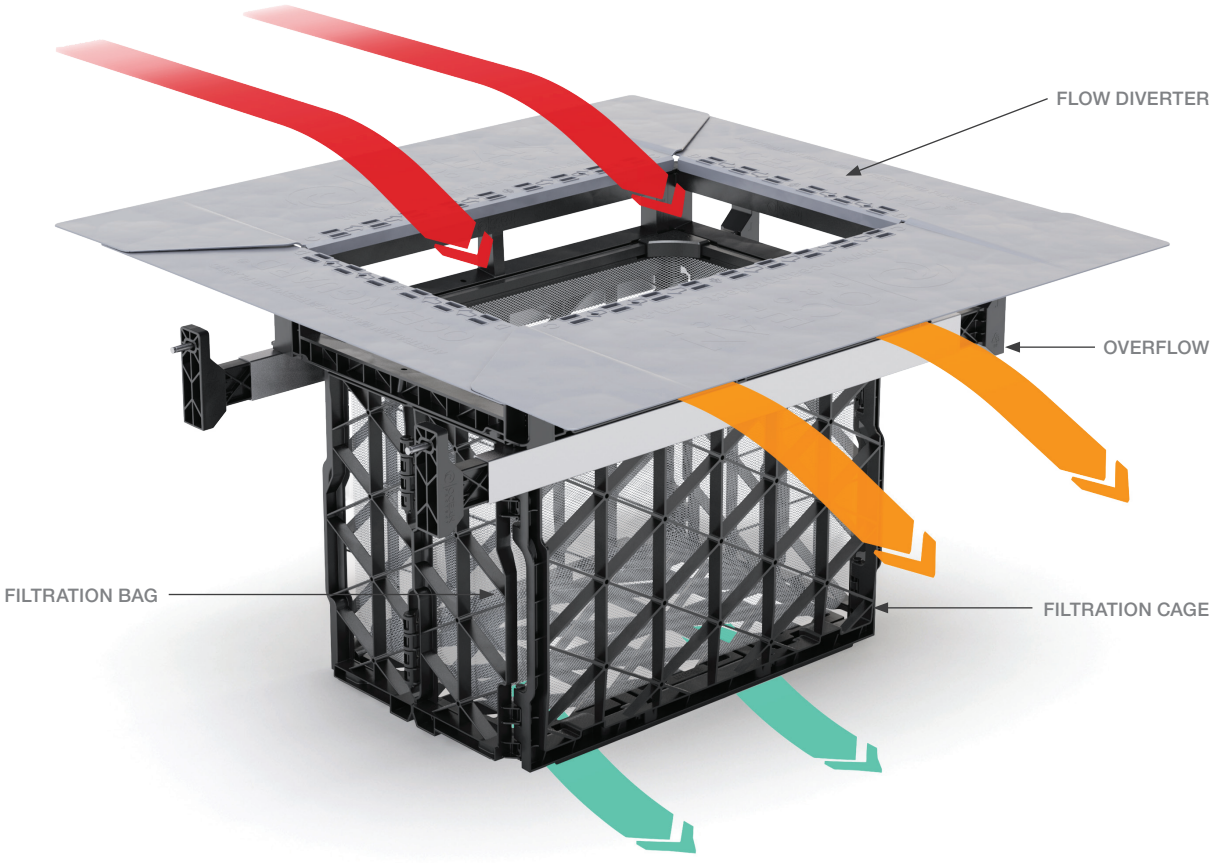


Figure 1: OceanGuard® components

Maintenance Procedures

To ensure that each OceanGuard® achieves optimal performance, it is advisable that regular maintenance is performed. The OceanGuard® requires 1-6 minor services annually (3 to 4 typical). Pending the outcome of these inspections, additional maintenance servicing may be required.

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the OceanGuard®.

Service Type	Description of Typical Activities	Frequency
Minor Service	Filter bag inspection and evaluation Removal of capture pollutants Disposal of material	1-6 Times Annually
Major Service	Filter Bag Replacement Support frame rectification	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Minor Service

This service is designed to return the OceanGuard® back to optimal operating performance. This type of service can be undertaken either by hand or with the assistance of a Vacuum unit.

Hand Maintenance

1. Establish a safe working area around the OceanGuard®
2. Remove access cover/grate
3. Use two lifting hooks to remove the filtration bag
4. Empty the contents of the filtration bag into a disposal container
5. Inspect and evaluate the filtration bag
6. Inspect and evaluate remaining OceanGuard® components (i.e. flow diverter, filtration cage and supporting frame)
7. Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
8. Re-install filtration bag and replace access cover/grate

Vacuum Maintenance

1. Establish a safe working area around the OceanGuard®
2. Remove access cover/grate
3. Vacuum captured pollutants from the filtration bag
4. Remove filtration bag
5. Inspect and evaluate the filtration bag
6. Inspect and evaluate remaining OceanGuard® components (i.e. flow diverter, filtration cage and supporting frame)
7. Rejuvenate filtration bag by removing pollutant build up with a stiff brush, additionally the filtration bag can be washed using high pressure water
8. Re-install filtration bag and replace access cover/grate

Major Service (Filter Bag Replacement)

For the OceanGuard®, a major service is a reactionary process based on the outcomes from the minor service.

Trigger Event from Minor Service	Maintenance Action
Filtration bag inspection reveals damage	Replace the filtration bag[1]
Component inspection reveals damage	Perform rectification works and if necessary replace components[1]

[1] Replacement filtration bags and components are available for purchase from Ocean Protect

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, all OceanGuard® pits that potentially received flow should be inspected and cleaned. Specifically, all captured pollutants from within the filtration bag should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. All filtration bags should be rejuvenated (replaced if required) and re-installed.

Blockages

The OceanGuard's internal high flow bypass functionality is designed to minimise the potential of blockages/ flooding and this configuration has been field proven for over twenty years. Flooding caused by an OceanGuard® style of pit basket is extremely rare and in the unlikely event that flooding occurs around the stormwater pit the following steps should be undertaken to assist in diagnosing the issue and implementing the appropriate response.

1. Inspect the OceanGuard® flow diverter, ensuring that they are free of debris and pollutants
2. Perform a minor service on the OceanGuard®
3. Remove the OceanGuard® to access the pit and inspect both the inlet and outlet pipes, ensuring they are free of debris and pollutants

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the OceanGuard® after a major storm event. The inspection should focus on checking for damage and higher than normal sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants disposed.

Disposal of Waste Materials

The accumulated pollutants found in the OceanGuard® must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filtration bag has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

Maintenance Services

With over a decade and a half of maintenance experience Ocean Protect has developed a systematic approach to inspecting, cleaning and maintaining a wide variety of stormwater treatment devices. Our fully trained and professional staff are familiar with the characteristics of each type of system, and the processes required to ensure its optimal performance.

Ocean Protect has several stormwater maintenance service options available to help ensure that your stormwater device functions properly throughout its design life. In the case of our OceanGuard®, we offer long term pay-as-you-go contracts, pre-paid once off servicing and replacement filter bags.

For more information please visit www.oceanprotect.com.au

Ocean Protect supplies and maintains a complete range of filtration, hydrodynamic separation, screening and oil/water separation technologies.

Call 1300 354 722

www.oceanprotect.com.au

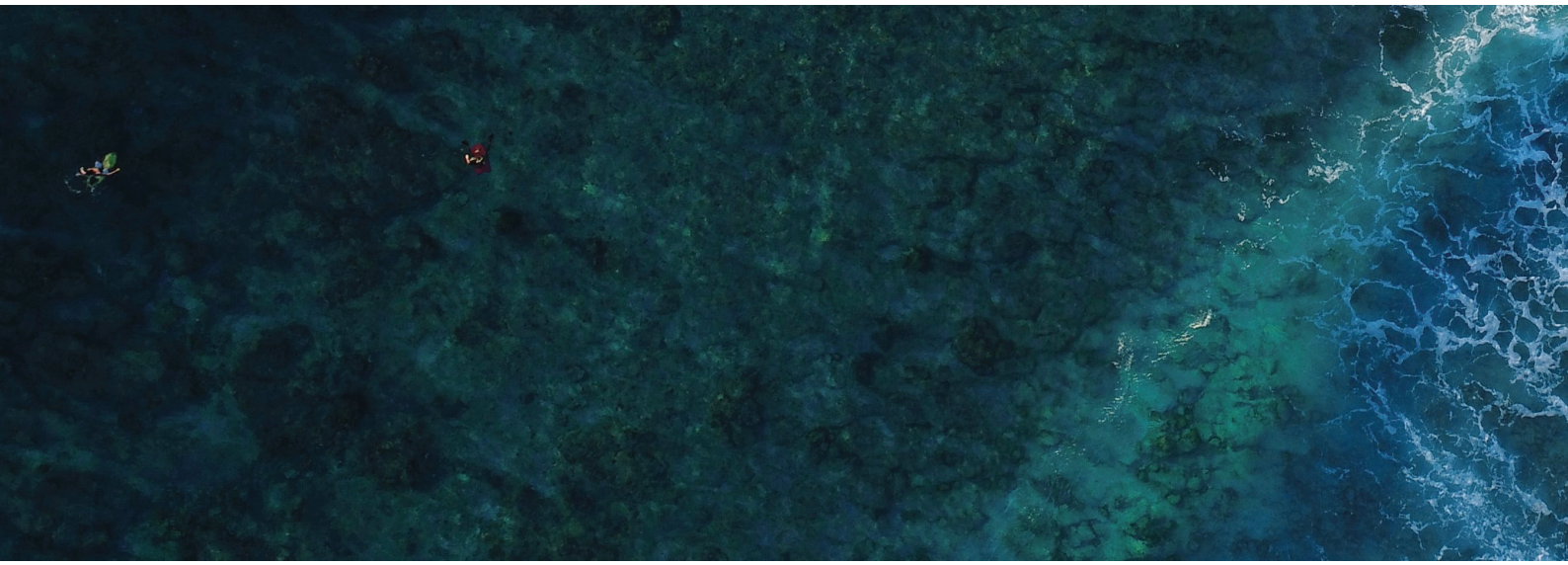
OCEAN PROTECT

StormFilter®

Operations & Maintenance Manual

Stopping Pollution Entering Waterways

09/22



www.oceanprotect.com.au

Introduction

The primary purpose of stormwater treatment devices is to capture and prevent pollutants from entering waterways, maintenance is a critical component of ensuring the ongoing effectiveness of this process. The specific requirements and frequency for maintenance depends on the treatment device and pollutant load characteristics of each site. This manual has been designed to provide details on the cleaning and maintenance processes for the StormFilter®, as recommended by the manufacturer (Ocean Protect).

The StormFilter® is designed and sized to meet stringent regulatory requirements. It removes the most challenging target pollutants (including fine solids, soluble heavy metals, oil, and soluble nutrients) using a variety of media. For more than two decades, StormFilter® has helped clients meet their regulatory needs and, through ongoing product enhancements, the design continues to be refined for ease of use and improved performance.

Why do I need to perform maintenance?

Adhering to the inspection and maintenance schedule of any stormwater treatment device is essential to ensuring that it functions properly throughout its design life.

During each inspection and clean, details of the mass, volume and type of material that has been collected by the device should be recorded. This data will assist with the revision of future management plans and help determine maintenance interval frequency. It is also essential that qualified and experienced personnel carry out all maintenance (including inspections, recording and reporting) in a systematic manner.

Maintenance of your stormwater management system is essential to ensuring ongoing at-source control of stormwater pollution. Maintenance also helps prevent structural failures (e.g. prevents blocked outlets) and aesthetic failures (e.g. debris build up), but most of all ensures the long term effective operation of the StormFilter®.

Health and Safety

Access to a StormFilter® unit requires removing heavy access covers/grates, and it is necessary to enter a confined space. Pollutants collected by the StormFilter® will vary depending on the nature of your site. There is potential for these materials to be harmful. For example, sediments may contain heavy metals, carcinogenic substances or objects such as broken glass and syringes. For these reasons, all aspects of maintaining and cleaning your StormFilter® require careful adherence to Occupational Health and Safety (OH&S) guidelines.

It is important to note that the same level of care needs to be taken to ensure the safety of non-work personnel. As a result, it may be necessary to employ traffic/pedestrian control measures when the device is situated in, or near areas with high vehicular/pedestrian activity.

Personnel health and safety

Whilst performing maintenance on the StormFilter®, precautions should be taken in order to minimise (or, if possible, prevent) contact with sediment and other captured pollutants by maintenance personnel. The following personal protective equipment (PPE) is subsequently recommended:

- Puncture resistant gloves
- Steel capped safety boots
- Long sleeve clothing, overalls or similar skin protection
- Eye protection
- High visibility clothing or vest

During maintenance activities, it may be necessary to implement traffic control measures. Ocean Protect recommend that a separate site-specific traffic control plan is implemented as required to meet the relevant governing authority guidelines.

Whilst some aspects of StormFilter® maintenance can be performed from surface level, there will be a need to enter the StormFilter® system (confined space) during a major service. It is recommended that all maintenance personnel evaluate their own needs for confined space entry and compliance with relevant industry regulations and guidelines. Ocean Protect maintenance personnel are fully trained and carry certification for confined space entry applications.

How does it work?

Stormwater enters the cartridge chamber, passes through the filtration media and begins filling the cartridge center tube. When water reaches the top of the cartridge the float valve opens and filtered water is allowed to drain at the designed flow rate. Simultaneously, a one-way check valve closes activating a siphon that draws stormwater evenly throughout the filter media and into the center tube. Treated stormwater is then able to discharge out of the system through the underdrain manifold pipework.

As the rain event subsides, the water level outside the cartridge drops and approaches the bottom of the hood, air rushes through the scrubbing regulators releasing the water column and breaking the siphon. The turbulent bubbling action agitates the surface of the cartridge promoting trapped sediment to drop to the chamber floor. After a rain event, the chamber is able to drain dry by way of an imperfect seal at the base of the float valve.

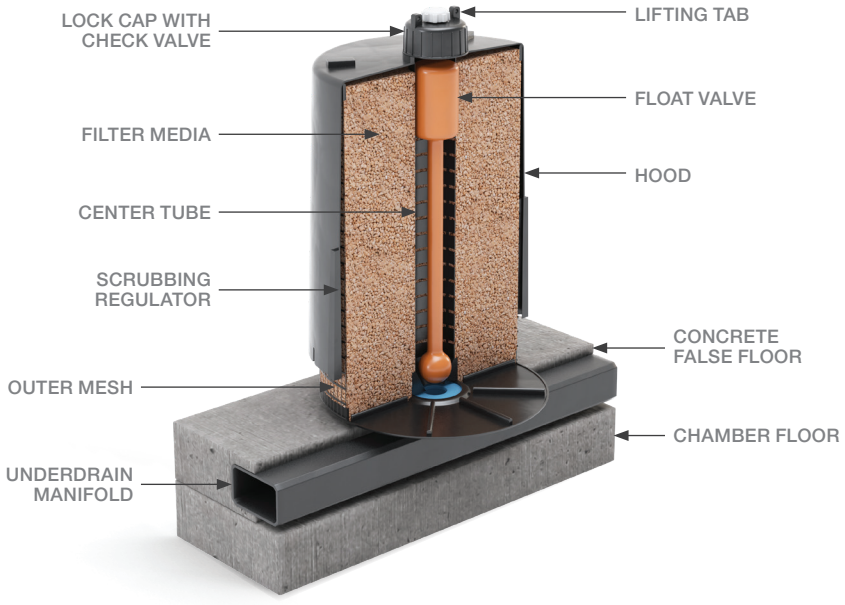


Figure 1: StormFilter® components

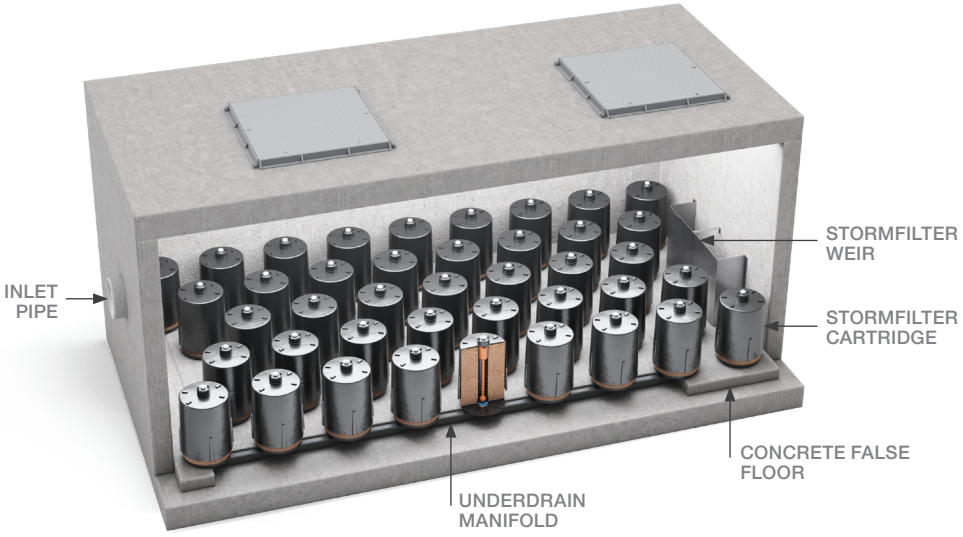


Figure 2: Example conceptual diagram of a StormFilter® system

Maintenance Procedures

To ensure optimal performance, it is advisable that regular maintenance is performed. Typically, the StormFilter® requires an inspection every 6 months with a minor service at 12 months. Additionally, as the StormFilter® cartridges capture pollutants the media will eventually become occluded and require replacement (expected media life is 1-3 years).

Primary types of maintenance

The table below outlines the primary types of maintenance activities that typically take place as part of an ongoing maintenance schedule for the StormFilter®.

Service Type	Description of Typical Activities	Frequency
Inspection	Visual Inspection of cartridges & chamber Remove larger gross pollutants Perform minimal rectification works (if required)	Every 6 Months
Minor Service	Evaluation of cartridges and media Removal of accumulated sediment (if required) Wash-down of StormFilter® chamber (if required)	Every 12 Months
Major Service	Replacement of StormFilter® cartridge media	As required

Maintenance requirements and frequencies are dependent on the pollutant load characteristics of each site. The frequencies provided in this document represent what the manufacturer considers to be best practice to ensure the continuing operation of the device is in line with the original design specification.

Inspection

The purpose of the inspecting the StormFilter® system is to assess the condition of the StormFilter® chamber and cartridges. When inspecting the chamber, particular attention should be taken to ensure all cartridges are firmly connected to the connectors. It is also an optimal opportunity to remove larger gross pollutants and inspect the outlet side of the StormFilter® weir.

Minor Service

This service is designed to ensure the ongoing operational effectiveness of the StormFilter® system, whilst assessing the condition of the cartridge media.

1. Establish a safe working area around the access point(s)
2. Remove access cover(s)
3. Evaluate StormFilter® cartridge media (if exhausted schedule major service within 6 months)
4. Measure and record the level of accumulated sediment in the chamber (if sediment depth is less than 100 mm skip to step 9)
5. Remove StormFilter® cartridges from the chamber
6. Use vacuum unit to removed accumulated sediment and pollutants in the chamber
7. Use high pressure water to clean StormFilter® chamber
8. Re-install StormFilter® cartridges
9. Replace access cover(s)

Major Service (Filter Cartridge Replacement)

For the StormFilter® system a major service is reactionary process based on the outcomes from the minor service, specifically the evaluation of the cartridge media.

Trigger Event	Maintenance Action
Cartridge media is exhausted[1]	Replace StormFilter® cartridge media[2]

[1] Multiple assessment methods are available, contact Ocean Protect for assistance

[2] Replacement filter media and components are available for purchase from Ocean Protect

This service is designed to return the StormFilter® device back to optimal operating performance.

1. Establish a safe working area around the access point(s)
2. Remove access cover(s)
3. By first removing the head cap, remove each individual cartridge hood to allow access to the exhausted media
4. Utilise a vacuum unit to remove exhausted media from each cartridge
5. Use vacuum unit to remove accumulated sediment and pollutants in the chamber
6. Use high pressure water to clean StormFilter® chamber
7. Inspect each empty StormFilter® cartridges for any damage, rectify damage as required
8. Re-fill each cartridge with media in line with project specifications
9. Re-install replenished StormFilter® cartridges
10. Replace access cover(s)

Additional Types of Maintenance

Occasionally, events on site can make it necessary to perform additional maintenance to ensure the continuing performance of the device.

Hazardous Material Spill

If there is a spill event on site, the StormFilter® unit should be inspected and cleaned. Specifically, all captured pollutants and liquids from within the unit should be removed and disposed in accordance with any additional requirements that may relate to the type of spill event. Additionally, it will be necessary to inspect the filter cartridges and assess them for contamination – and, depending on the type of spill event, it may be necessary to replace the filtration media.

Blockages

In the unlikely event that flooding occurs upstream of the StormFilter® system, the following steps should be undertaken to assist in diagnosing the issue and determining the appropriate response.

1. Inspect the upstream diversion structure (if applicable) ensuring that it is free of debris and pollutants
2. Inspect the StormFilter® unit checking the underdrain manifold as well as both the inlet and outlet pipes for obstructions (e.g. pollutant build-up, blockage), which if present, should be removed

Major Storms and Flooding

In addition to the scheduled activities, it is important to inspect the condition of the StormFilter® after a major storm event. The focus is to inspect for damage and abnormally high sediment accumulation that may result from localised erosion. Where necessary damaged components should be replaced and accumulated pollutants should be removed and disposed

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Disposal of Waste Materials

The accumulated pollutants found in the StormFilter® must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes. If the filter media has been contaminated with any unusual substance, there may be additional special handling and disposal methods required to comply with relevant government/authority/industry regulations.

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MELIORA
CONSULTING ENGINEERS

E: info@meliorace.com
W: www.meliorace.com

21 Mcleod St
Herston
QLD 4006
Australia