MELIORA
CONSULTING ENGINEERS

Site 17, 330 MacArthur Avenue, Hamilton

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

CLIENT:	Silverstone Developments
SITE ADDRESS:	Site 17, 330 MacArthur Avenue, Hamilton
MCE No:	2481
DATE:	December 2024

DOCUMENT CONTROL

DOCUMENT TITLE:

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

MELIORA JOB No:

2481

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Rev No	Date	Issue Details	By	Certified By RPEQ
01	04.12.24	Issued for Information	ND	**No. 21258**

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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 17, 330 MacArthur Ave, 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 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 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 four 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.

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 17, 330 MacArthur Ave, 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 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.

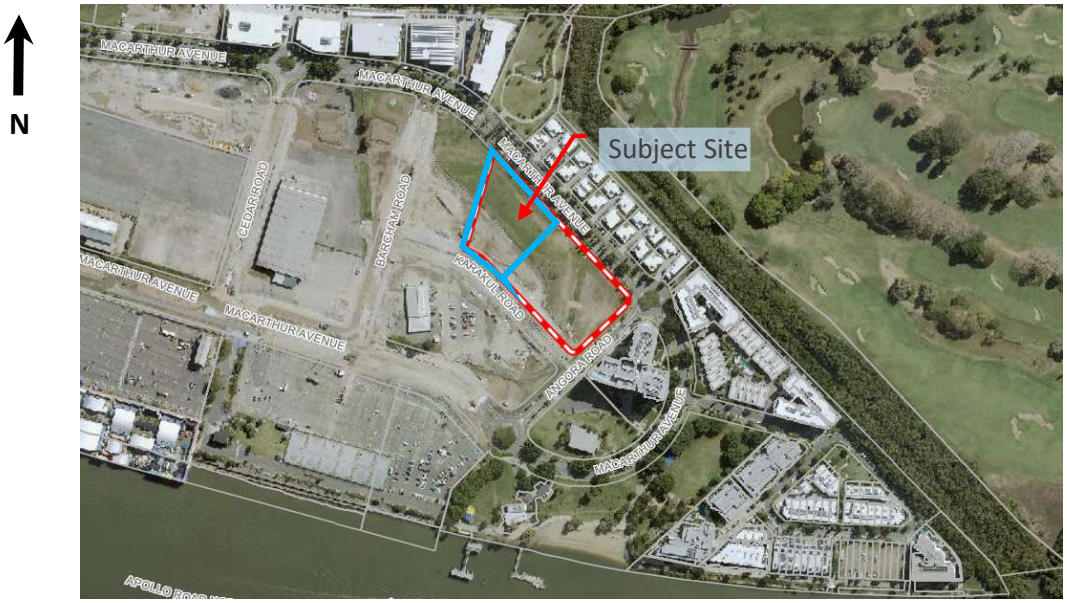


Figure 1 - Site Location (as accessed from Google Maps 5/12/2024)

Table 1 - Property Details

Lot Information	Lot 5 on SP337697
Street Address	Site 17, 330 MacArthur Ave, Hamilton
Site Area	7466m^2
Existing Easements	No

3.2 EXISTING FEATURES & TOPOGRAPHY

3.2.1 CONTEXT

The subject site is vacant with good grass coverage. The site features Council road reserve to the north and west and adjacent residential lots to the east and south. 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

The project features many design elements that will be influenced by the existing ground conditions. This includes a single level basement and in-ground services. To inform the design of this items a Geotechnical Report has been prepared by Core Consultants (dated December 24).

3.3.1 POTENTIAL OR ACTUAL ACID SULFATE SOILS

The Brisbane City Council Mapping show 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).

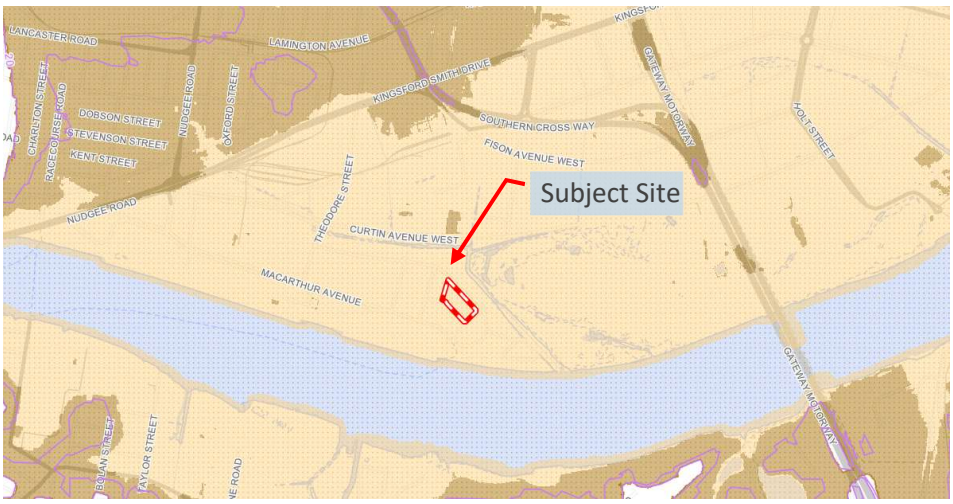


Figure 2 - Acid Sulfate Soil Overlay

3.4 FLOODING IMPACT

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

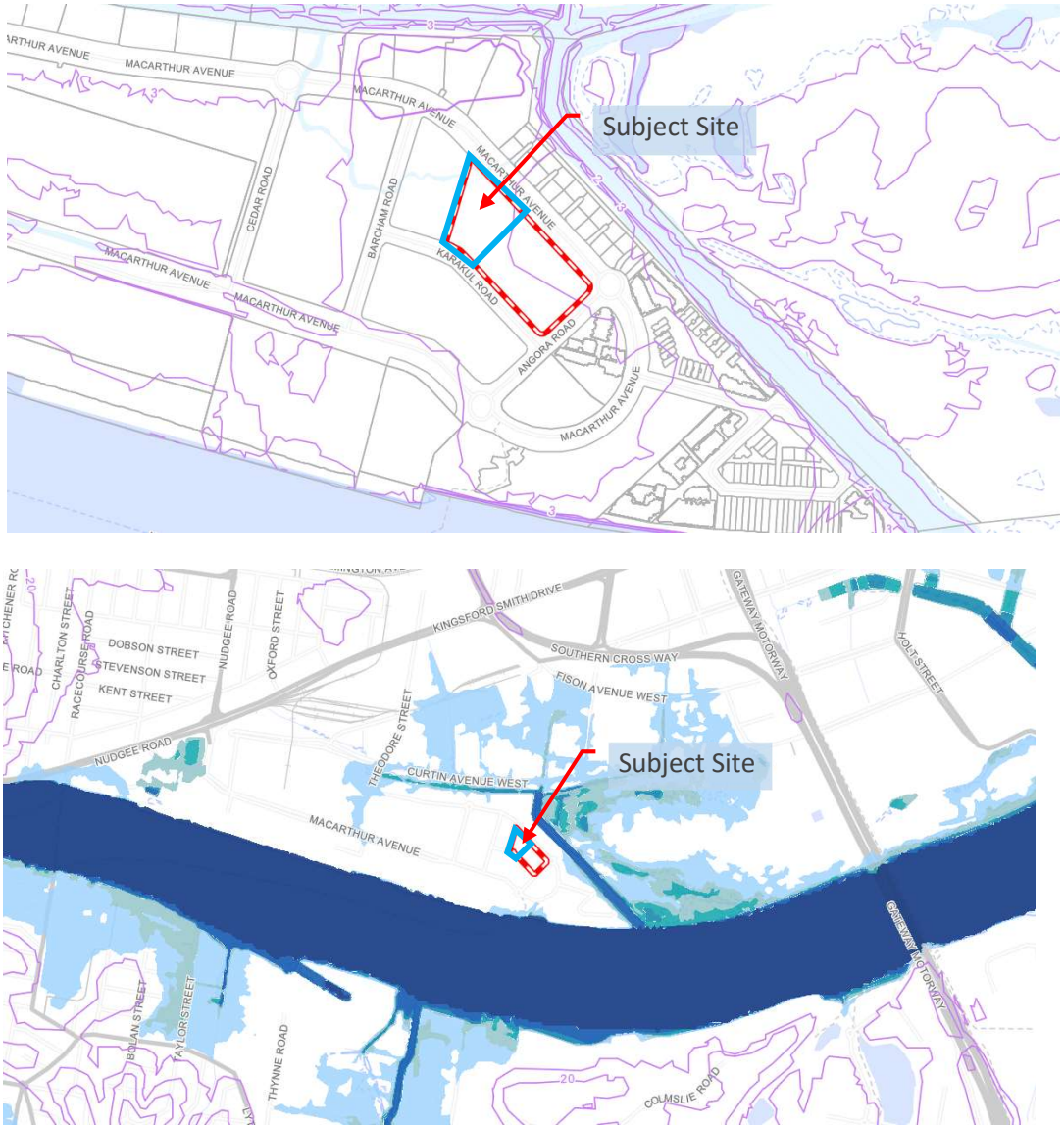


Figure 3 - Flooding Overlays from Council Mapping

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.

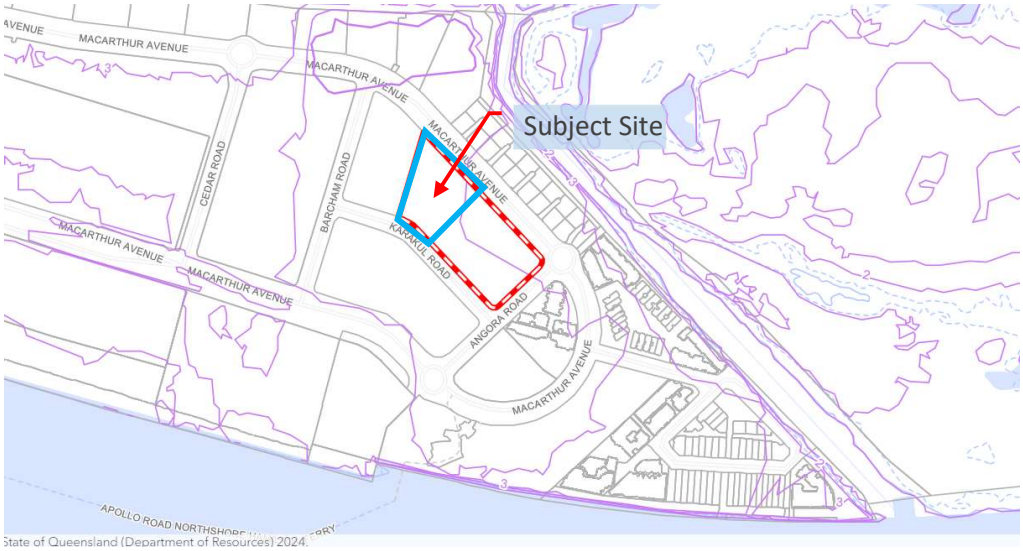


Figure 4 - Priority Infrastructure at Site

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 selection of 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 – Council road, with kerb & channel drainage on each side and a central median
- Karakul Road – Council road, with kerb & channel drainage on both side and a two-way crossfall
- The site is currently accessed via one (1) vehicle crossover along Karakul 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 B – Civil Sketches – for preliminary civil works arrangements.

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 north-east corner of developed area

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).

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 17, 330 MacArthur . This is derived from the Bureau of Meteorology (BOM) Design Rainfall Data System (2016) using the following Latitude, Longitude:

- Latitude -27.4464, Longitude 153.08461

4.4.4.3 EXISTING CATCHMENTS DESCRIPTION

The existing catchment EX1 (though very flat) within the site generally seems to sheet flow towards the existing pit at the north-eastern corner of the site which discharges to Macarthur Avenue.

However, the existing site features multiple drainage stubs (with pits over stub ends) coming into the site. While all these pits aren't used to drain the existing undeveloped site, they were obviously design to cater for post-development use of the site to discharge to multiple locations around the edge of the site.

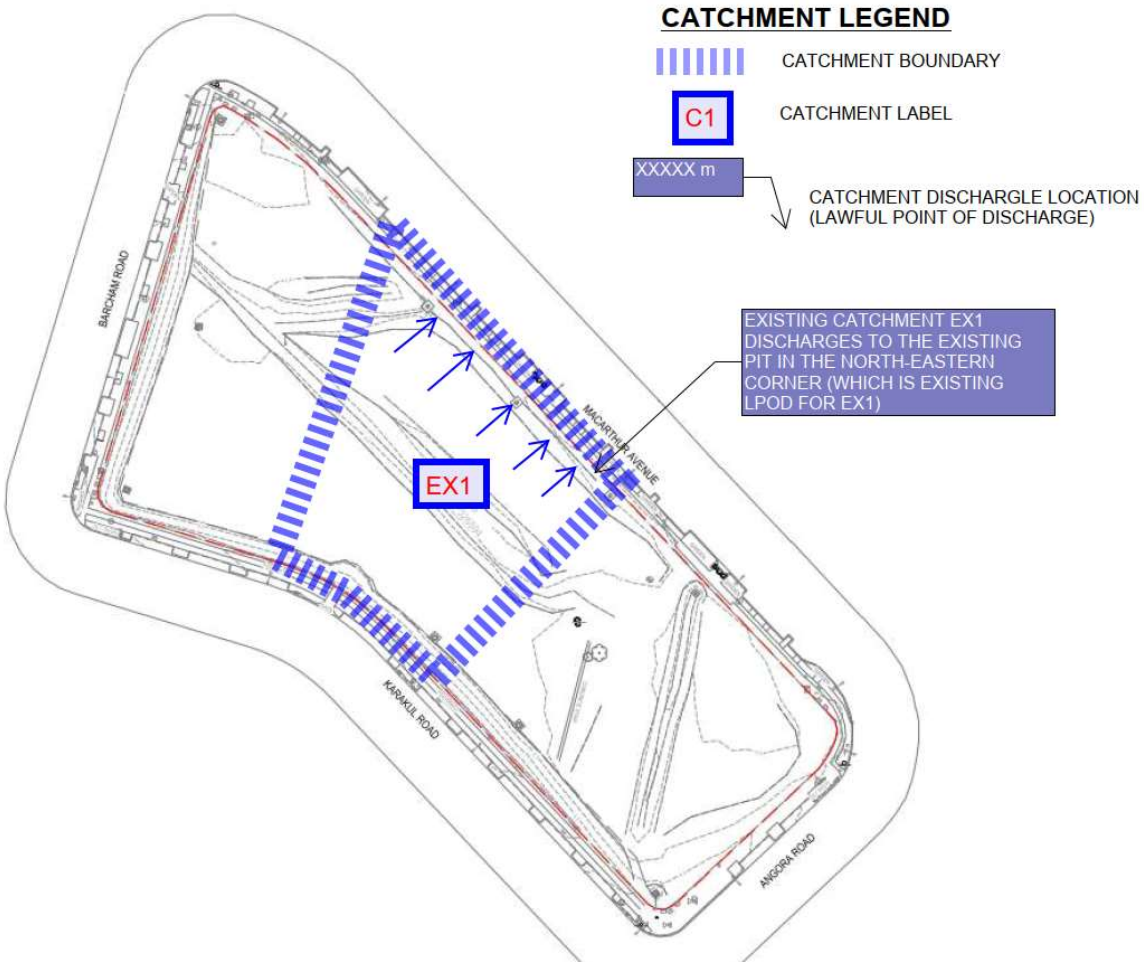


Figure 5 – Existing Catchments

4.4.4.4 PROPOSED CATCHMENTS DESCRIPTION

The development will require in-ground pit & pipe drainage works to capture roof and surface water from developed areas to discharge flows to four different locations on both road frontages (catchment 1 to 4) via existing drainage stubs.

Refer to Appendix B – Civil Sketches – SK07 for catchment plan (post development).

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				0.747			
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	99.6	135.8	191.8	227.0	273.9	351.5	408.1

C1 – Post-Development, C1 to Karakul Rd

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				0.175			
Time of Concentration	min				7.0			
Fraction Impervious					1.00			
Runoff Coefficient (Cy)		0.72	0.77	0.86	0.90	0.95	1.00	1.00
Rainfall Intensity (Iy)	mm/hr	104.91	134.42	169.29	189.92	217.88	254.80	283.14
Peak Flow	L/s	36.8	50.1	70.5	83.2	100.3	124.1	137.9

C2 – Post-Development, C2 to MacArthur Ave

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				0.203			
Time of Concentration	min				10.0			
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	90.97	116.72	147.53	165.84	190.57	223.30	248.45
Peak Flow	L/s	32.0	43.7	61.7	73.0	88.1	113.0	131.2

C3 – Post-Development, C3 to MacArthur Ave

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				0.167			
Time of Concentration	min				7.0			
Fraction Impervious					1.00			
Runoff Coefficient (Cy)		0.72	0.77	0.86	0.90	0.95	1.00	1.00
Rainfall Intensity (Iy)	mm/hr	104.91	134.42	169.29	189.92	217.88	254.80	283.14
Peak Flow	L/s	35.0	47.7	67.1	79.3	95.5	118.2	131.3

C4 – Post-Development, C4 to MacArthur Ave

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				0.201			
Time of Concentration	min				7.0			
Fraction Impervious					1.00			
Runoff Coefficient (Cy)		0.72	0.77	0.86	0.90	0.95	1.00	1.00
Rainfall Intensity (Iy)	mm/hr	104.91	134.42	169.29	189.92	217.88	254.80	283.14
Peak Flow	L/s	42.2	57.5	80.9	95.5	115.1	142.4	158.2

4.4.4.6 PRE vs POST DEVELOPMENT (UNMITIGATED) – RESULTS SUMMARY

The existing catchment contributes circa 408L/s to lower of the site as sheet flow.

Post–development, Proposed Catchment C1 – C4 will discharge 559L/s to the surrounding drainage network. So, there are 37% 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)	0.100	0.146	0.046	47
38% (Q2)	0.136	0.199	0.063	46
18% (Q5)	0.192	0.280	0.088	46
10% (Q10)	0.227	0.331	0.104	46
5% (Q20)	0.274	0.399	0.125	46
2% (Q50)	0.351	0.498	0.146	42
1% (Q100)	0.408	0.559	0.151	37

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 at min grade of 0.5%. You will note the outlet pipes have considerably more capacity than the major flows from each catchment discharging to them.

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 6 – 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 receiving node (frontage roads in multiple locations).

	Sources	Residual Load	% Reduction
Flow (ML/yr)	6.49	6.49	0
Total Suspended Solids (kg/yr)	783	155	80.1
Total Phosphorus (kg/yr)	1.87	0.627	66.5
Total Nitrogen (kg/yr)	13.6	6.34	53.3
Gross Pollutants (kg/yr)	139	0	100

Figure 7 – 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

A monitoring and maintenance plan will be provided at the OpW/Compliance phase of the project, in line with Council and SQID supplier requirements.

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 DN275mm GRP 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 will be subject to a future UU Application. However, a UU SAN has been obtained for the site (reference 24-SAN-74510) which features an analysis of the existing infrastructure capacity to cater for the proposed development, and the results suggest there is no issue to connect the development to the UU sewer network.

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 suggest 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 Macarthur Avenue. The meter assembly will be located within the basement with remote reading (AMR) technology.

The details of this service will be subject to a future UU Application. However, a UU SAN has been obtained for the site (reference 24-SAN-74510) which features an analysis of the existing infrastructure capacity to cater for the proposed development, and the results suggest there is no issue to connect the development to the UU water network.

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 Macarthur Ave 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 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 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 four 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

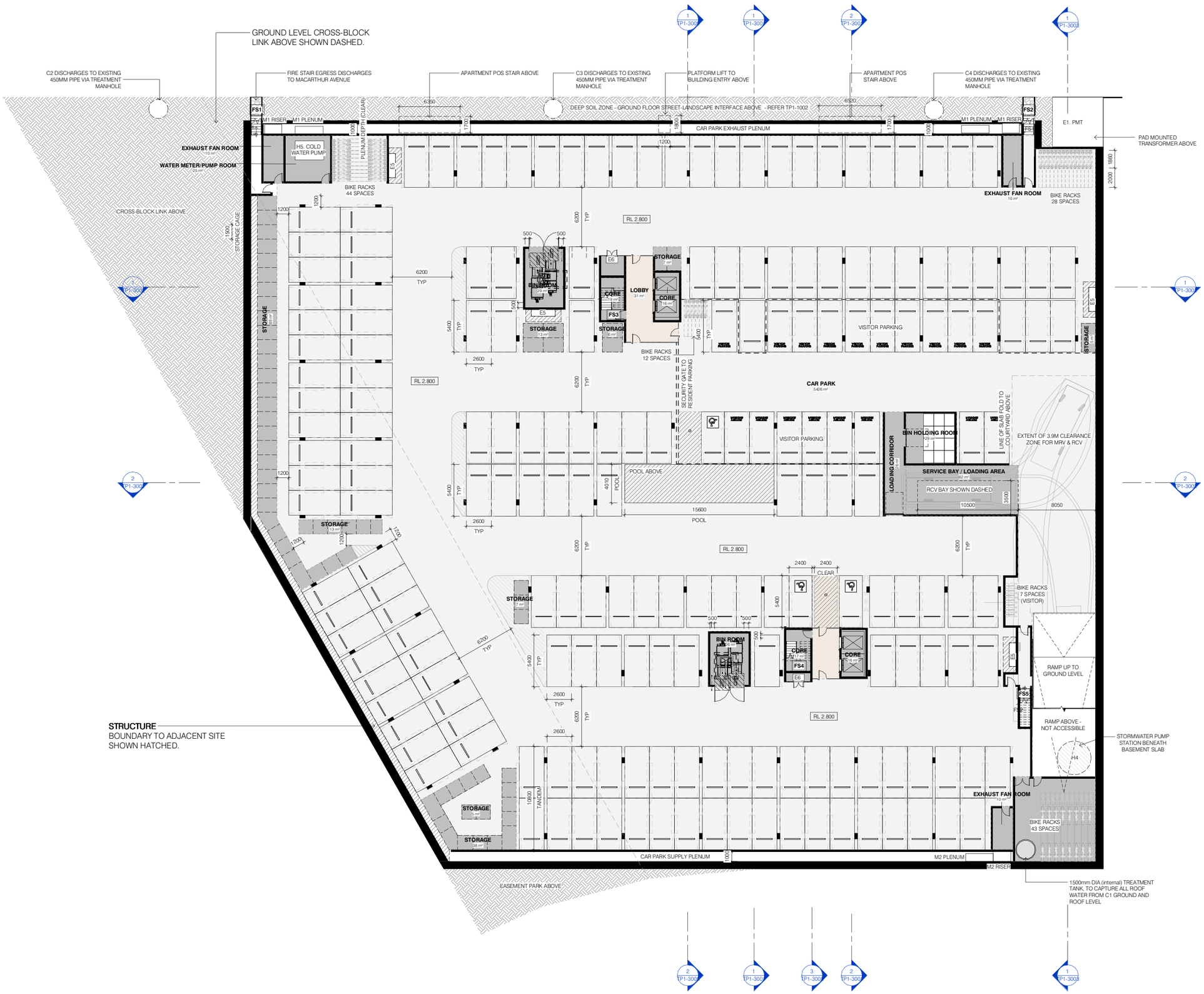
Meliora Engineering accept no responsibility for the accuracy of information supplied to them by second and third parties, including survey, authority mapping data and geotechnical testing information which may have been relied on to inform the civil engineering opinions and calculations presented within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



STRUCTURE
BOUNDARY TO ADJACENT SITE SHOWN HATCHED.

GENERAL NOTES

CARS	REQUIRED	PROVIDED
VISITOR (INCLUDING 1 ACCESSIBLE)	19	**19**
RESIDENT (INCLUDING 2 ACCESSIBLE)	156	**174**
TANDEMS (RESIDENTIAL ONLY)	41	42
TOTAL	176	**193**

BIKES	REQUIRED	PROVIDED
VISITOR	29	**29**
RESIDENT	115	**115**
TOTAL	144	**144**

Rev	Date	Chkd	Reason for Issue
19	02/12/2024		ISSUE FOR INFORMATION
18	27/11/2024		DRAFT TOWN PLANNING ISSUE
17	26/11/2024		ISSUE FOR INFORMATION
16	22/11/2024		DRAFT TOWN PLANNING ISSUE
15	20/11/2024		ISSUE FOR INFORMATION
14	19/11/2024		ISSUE FOR INFORMATION
13	15/11/2024		ISSUE FOR INFORMATION
12	13/11/2024		ISSUE FOR INFORMATION
11	06/11/2024		ISSUE FOR INFORMATION
10	01/11/2024		ISSUE FOR INFORMATION
9	23/10/2024		ISSUE FOR INFORMATION
8	16/10/2024		ISSUE FOR INFORMATION
7	12/09/2024		ISSUE FOR INFORMATION
6	05/09/2024		ISSUE FOR INFORMATION
5	05/09/2024		ISSUE FOR INFORMATION
4	29/08/2024		ISSUE FOR INFORMATION
3	29/08/2024		ISSUE FOR INFORMATION
2	20/08/2024		ISSUE FOR INFORMATION
1	13/08/2024	-	ISSUE FOR INFORMATION

Based on Drawings Received:

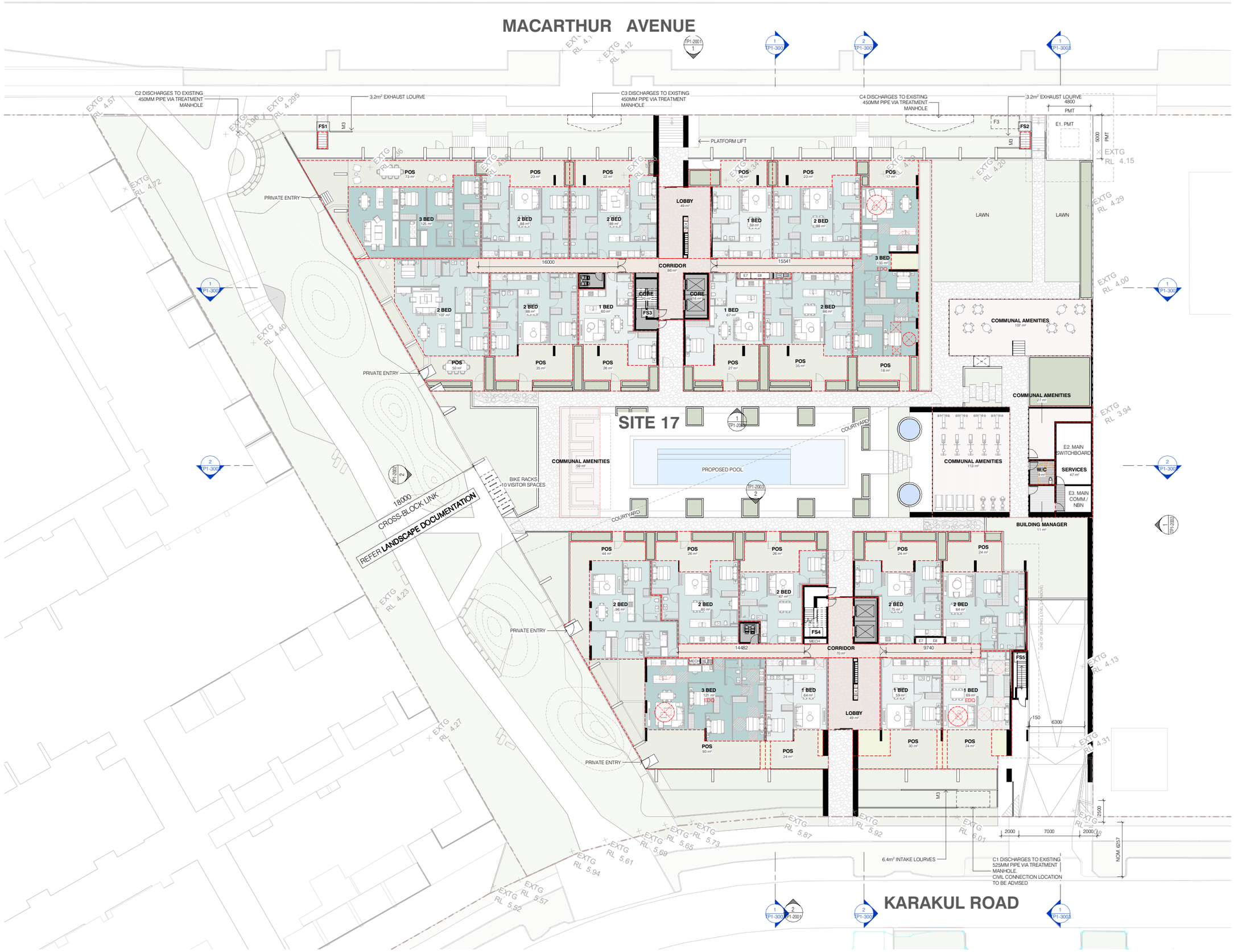
NORTH
0 2 4 10m
SCALE 1:200

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	LOT 17 NORTHSHORE HAMILTON
	Lot 17 280 Macarthur Avenue, Hamilton, Queensland
Title	BASEMENT 01
Date	22/11/2024
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP1-1001
Drawn By	MH/ME Chkd KW
Rev	19



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

18	02/12/2024		ISSUE FOR INFORMATION
17	28/11/2024		ISSUE FOR INFORMATION
16	27/11/2024		DRAFT TOWN PLANNING ISSUE
15	26/11/2024		ISSUE FOR INFORMATION
14	22/11/2024		DRAFT TOWN PLANNING ISSUE
13	20/11/2024		ISSUE FOR INFORMATION
12	19/11/2024		ISSUE FOR INFORMATION
11	15/11/2024		ISSUE FOR INFORMATION
10	13/11/2024		ISSUE FOR INFORMATION
9	23/10/2024		ISSUE FOR INFORMATION
8	16/10/2024		ISSUE FOR INFORMATION
7	14/10/2024		ISSUE FOR INFORMATION
6	11/10/2024		ISSUE FOR INFORMATION
5	12/09/2024		ISSUE FOR INFORMATION
4	10/09/2024		ISSUE FOR INFORMATION
3	05/09/2024		ISSUE FOR INFORMATION
2	28/08/2024		ISSUE FOR INFORMATION
1	13/08/2024	-	ISSUE FOR INFORMATION

Rev	Date	Chkd	Reason for 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

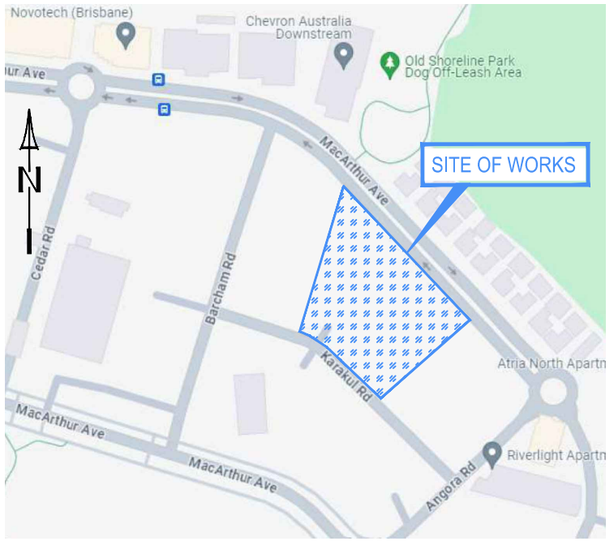
melb@carr.net.au
carr.net.au

Project	LOT 17 NORTHSHORE HAMILTON
	Lot 17 280 Macarthur Avenue, Hamilton, Queensland
Title	GROUND LEVEL

Date	26/11/2024	Project No	24047
Scale @ A1	1 : 200	Dwg No	TP1-1002
Drawn By	MH/JH/ME	Chkd KW	Rev 18

6.2 APPENDIX B – SCHEMATIC CIVIL DRAWINGS

PROPOSED MULTI-TOWER RESIDENTIAL PROJECT
SITE 17, 330 MACARTHUR AVENUE, HAMILTON
DA CIVIL ENGINEERING PACKAGE FOR SILVERSTONE DEVELOPMENTS



LOCALITY PLAN

EXTRACTED FROM GOOGLE MAPS © 2024
NOT TO SCALE

LOT DATA	
5	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
SK05	PRELIMINARY CIVIL SERVICES LAYOUT PLAN
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 — 18.0
EXISTING SURFACE CONTOURS — 18.0

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 — C —
DRAINAGE EXISTING CENTERLINE — SWD —
DRAINAGE EXISTING TEXT — dSWD —
ELECTRICAL EXISTING OVERHEAD — OE —
ELECTRICAL EXISTING UNDERGROUND — E —
ELECTRICAL EXISTING CENTERLINE DBYD — dE —
GAS EXISTING — G —
GAS EXISTING CENTERLINE DBYD — dG —
SEWER EXISTING CENTERLINE — S —
SEWER EXISTING RISING MAIN — RM —
SEWER EXISTING CENTERLINE DBYD — dS —
SEWER RISING MAIN EXISTING CENTERLINE DBYD — dSRM —
TELECOMMUNICATIONS EXISTING — T —
TELECOMMUNICATIONS EXISTING CENTERLINE DBYD — dT —
FIBER OPTIC CABLES EXISTING CENTERLINE DBYD — dOF —
WATER EXISTING CENTERLINE — W —
WATER EXISTING CENTERLINE DBYD — dW —
ABANDONED SERVICES
EXISTING RETAINING WALL - BOULDER
EXISTING RETAINING WALL - BLOCK
EARTHWORKS EXISTING DRAIN
EARTHWORKS EXISTING DRAIN CONCRETE
EXISTING VEGETATION

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

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

PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR APPROVAL	03.12.24	SD	MB

NORTH POINT
SCALE BAR(S)

DRAWN: AUGUST 2024
DESIGNED: AUGUST 2024
APPROVED: MBLYTH
RPEQ SIGNATURE
RPEQ No. 21258
DATE: AUGUST 2024

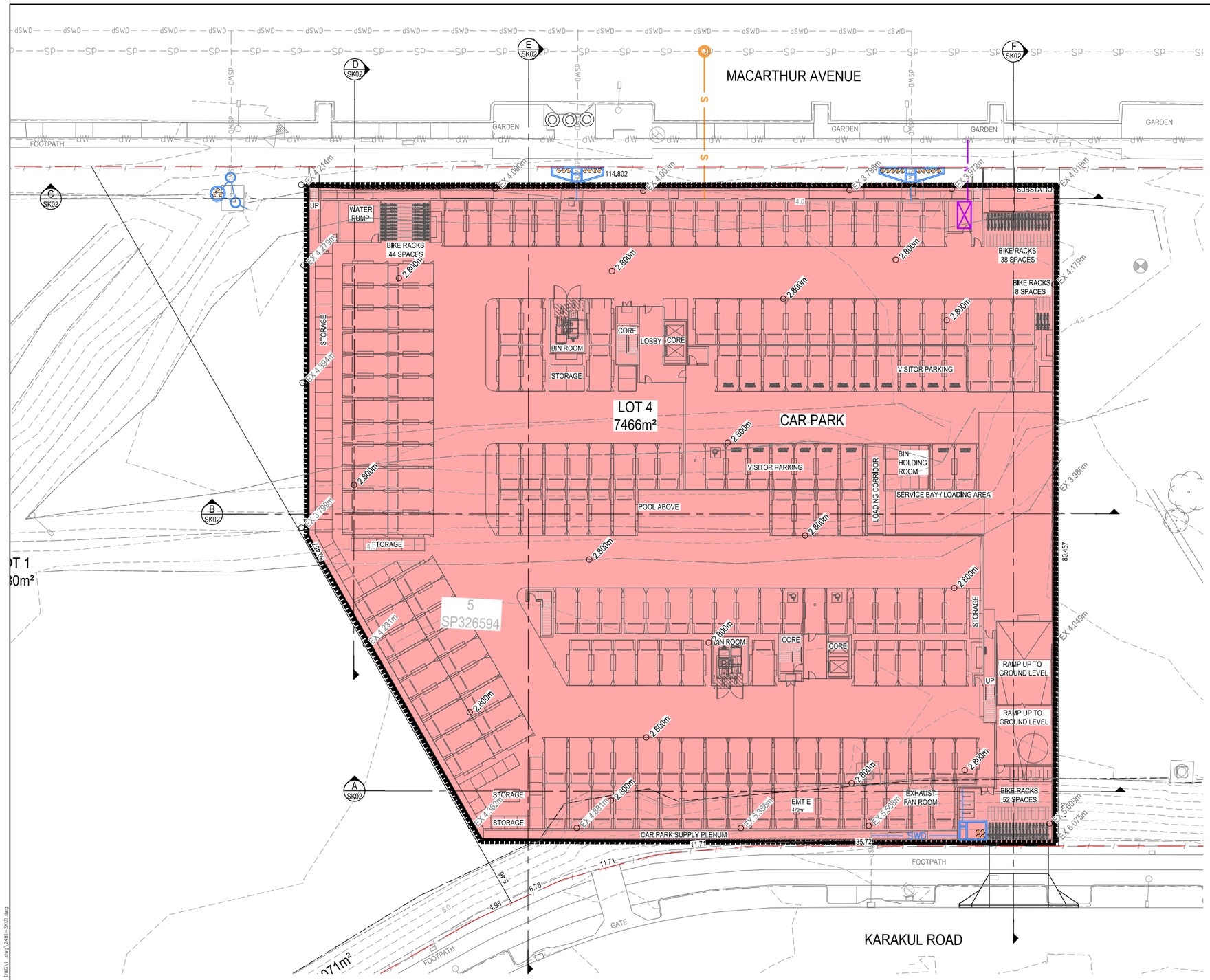
MELIORA CONSULTING ENGINEERS
ABN 46 153 772 813
E: INFO@MELIORACE.COM
21 McLEOD STREET
HERSTON, QLD 4006
PHONE: 0429970345

CLIENT: SILVERSTONE DEVELOPMENTS
PROJECT: SITE 17, 330 MACARTHUR AVENUE HAMILTON

DRAWING TITLE: LOCALITY, SCHEDULE & GENERAL NOTES EXISTING FEATURES LEGEND

MELIORA JOB No. 2481
DWG No SK00
REVISION 01

Dec 05, 2024 - 1:59pm M:\Civil Jobs\2481 LOT 17 NORTHSHORE, HAMILTON\04 DWG\1 dwg\2481-SK00.dwg



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. SK00

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 - 100 YR ARI RIVER FLOOD LEVEL = 2.5m AHD (SOURCED FROM BCC FLOOD PROPERTY REPORT). REFER TO FLOOD REPORT (BY OTHERS) FOR NOMINATION OF MINIMUM HABITABLE FLOOR LEVELS.
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

SECTIONS REFERENCE
FOR EARTHWORKS SECTIONS REFER DWG No SK02

PRELIMINARY VOLUMES

(UNSTRIPPED EXISTING SURFACE TO FINISHED SURFACE)

	CUT	9439m³
	FILL	0m³
BALANCE (CUT)		9439m³

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

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

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

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

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR APPROVAL	03.12.24	SD	MB

NORTH POINT

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

DRAWN: AUGUST 2024
DESIGNED: AUGUST 2024
APPROVED: MBLYTH
RPEQ No. 21258
DATE: AUGUST 2024
RPEQ SIGNATURE

MELIORA CONSULTING ENGINEERS
ABN 46 153 772 813
E: INFO@MELIORACE.COM
21 McLEOD STREET
HERSTON, QLD 4006
PHONE: 0429970345

CLIENT: SILVERSTONE DEVELOPMENTS

PROJECT: SITE 17, 330 MACARTHUR AVENUE HAMILTON

DRAWING TITLE: PRELIMINARY EARTHWORKS LAYOUT PLAN & NOTES

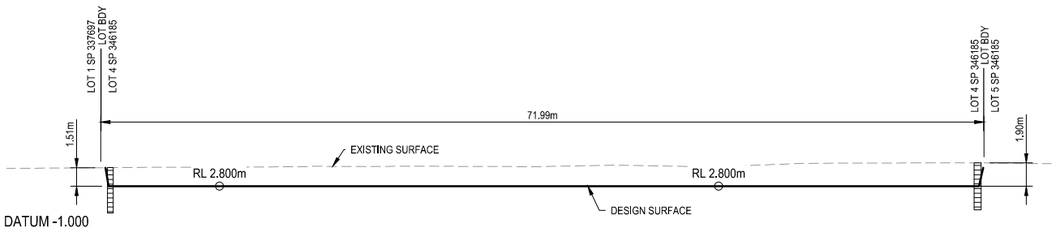
MELIORA JOB No. 2481

DWG No SK01

REVISION 01

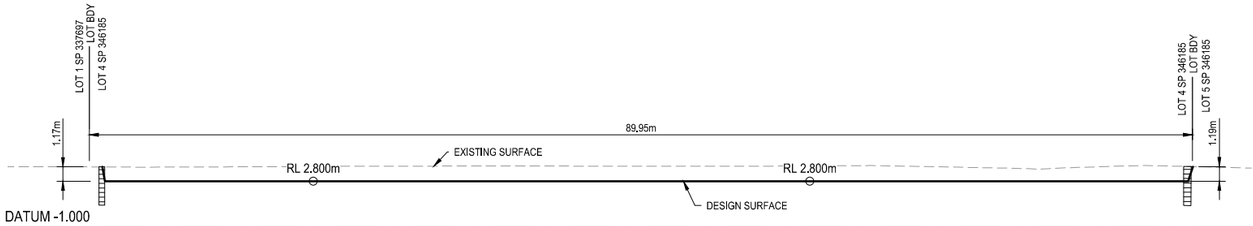
Dec 05, 2024 - 2:10pm M:\04 JOBS\2481 LOT 17 NORTHSHORE, HAMILTON\04 DWG\1 dwg\2481-SK01.dwg

LEGEND - SECTIONS
DESIGN (FINISHED) SURFACE
EXISTING (UNSTRIPPED) SURFACE
RETAINING STRUCTURES (INDICATIVE - TYPE TBC)



SECTION A

SECTION A
SCALE 1:250 SK01



SECTION B

SECTION B
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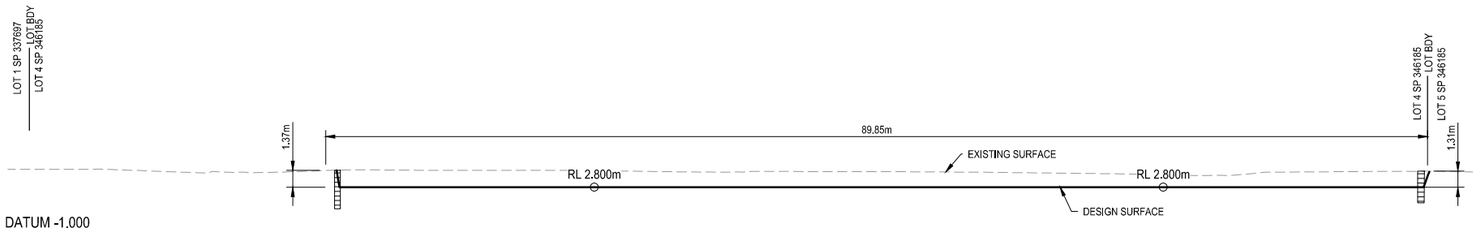

SECTION C

SECTION C
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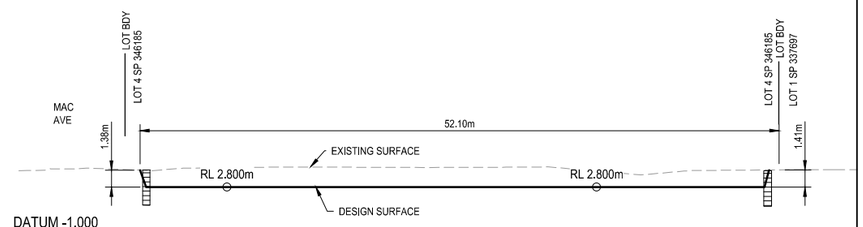

SECTION D

SECTION D
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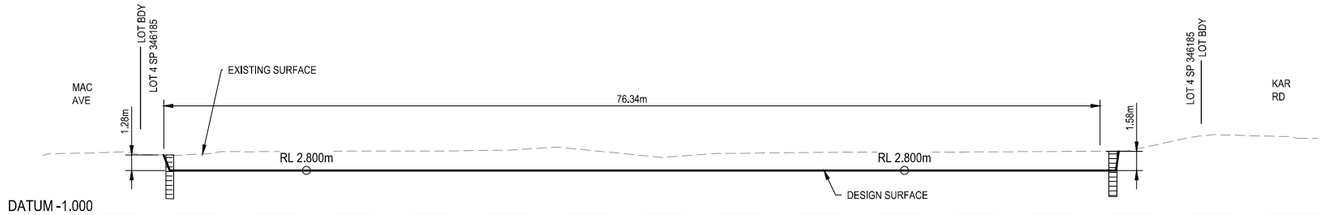
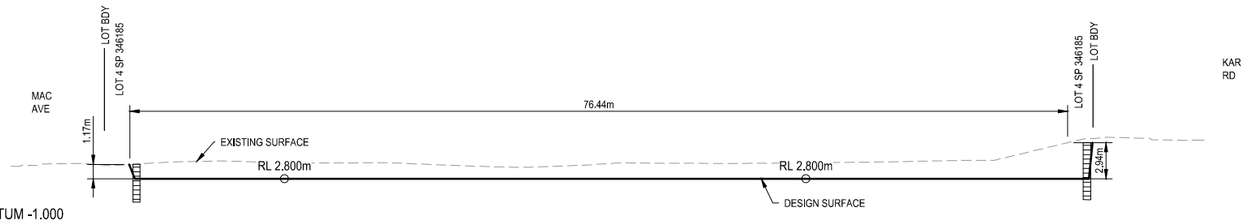


SECTION E

SECTION E
SCALE 1:250 SK01



SECTION F

SECTION F
SCALE 1:250 SK01

LAYOUT & NOTES REFERENCE
FOR EARTHWORKS LAYOUT PLAN REFER DWG No SK01.

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
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3. RECOMMENDATIONS WITHIN SPECIALIST REPORTS INCLUDING GEOTECHNICAL REPORTS
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6. PROJECT DRAWINGS, NOTES AND DETAILS (INCLUDING ALL MELIORA CIVIL DRAWINGS)
7. ENGINEERING SPECIFICATIONS (IF PUBLISHED)

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Zero Damage - Zero Harm

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

PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR APPROVAL	03.12.24	SD	MB

NORTH POINT

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

DRAWN: AUGUST 2024
DESIGNED: AUGUST 2024
APPROVED: MBLYTH
RPEQ No. 21258
DATE: AUGUST 2024
RPEQ SIGNATURE

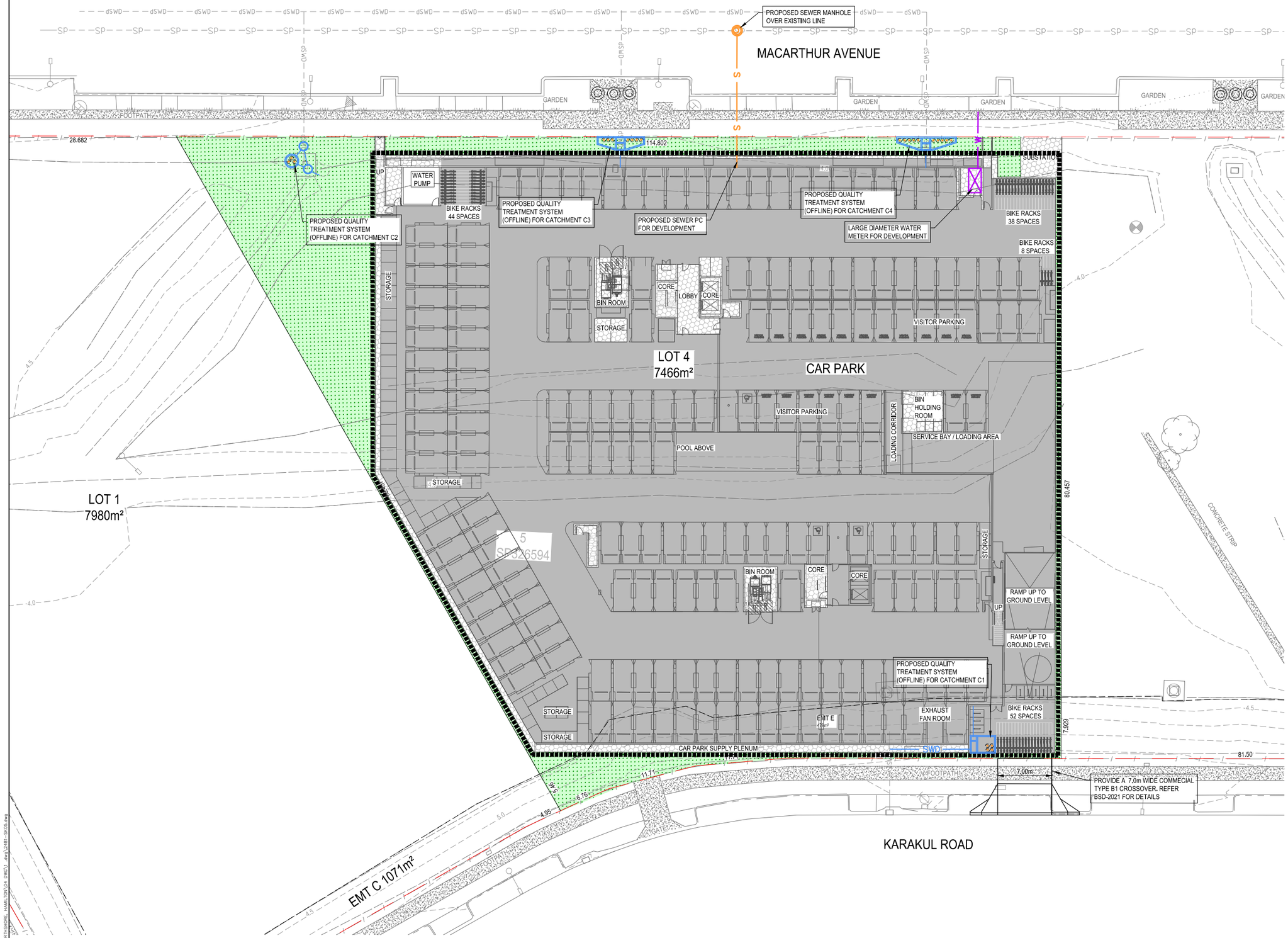
MELIORA CONSULTING ENGINEERS
ABN 46 153 772 813
E: INFO@MELIORACE.COM
21 McLEOD STREET
HERSTON, QLD 4006
PHONE: 0429970345

CLIENT: SILVERSTONE DEVELOPMENTS
PROJECT: SITE 17, 330 MACARTHUR AVENUE HAMILTON

DRAWING TITLE: PRELIMINARY EARTHWORKS SECTIONS

MELIORA JOB No. 2481
DWG No SK02
REVISION 01

Dec 05, 2024 - 2:03pm M:\04_JOBS\2481 LOT 17 NORTHSHORE, HAMILTON\04 DWG\1_dwg\2481-SK01.dwg



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 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

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

PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR APPROVAL	03.12.24	SD	MB

NORTH POINT

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

DRAWN: AUGUST 2024
DESIGNED: AUGUST 2024
APPROVED: MBLYTH RPEQ SIGNATURE
RPEQ No. 21258
DATE: AUGUST 2024

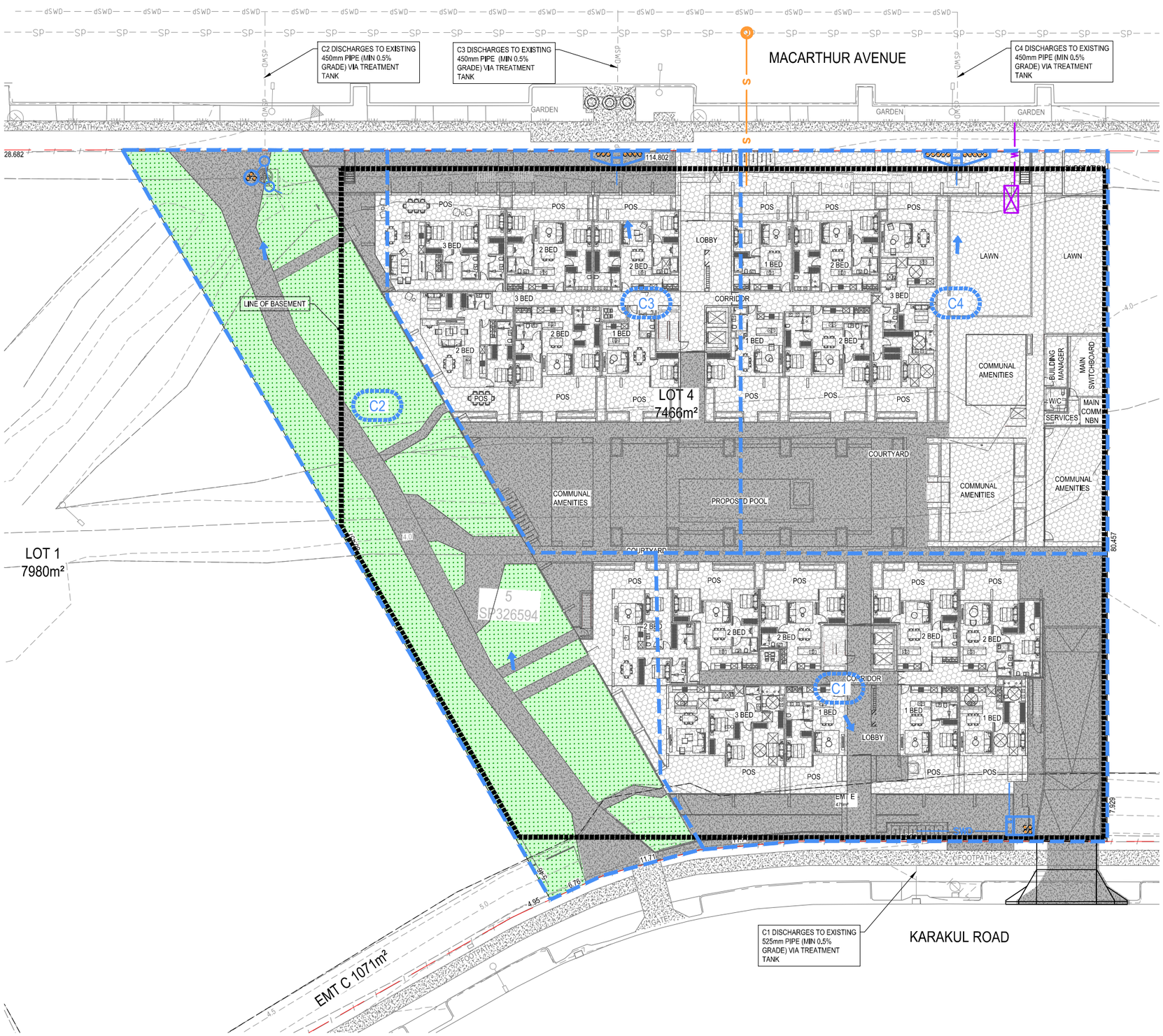
MELIORA CONSULTING ENGINEERS
ABN 46 153 772 813
E: INFO@MELIORACE.COM
21 McLEOD STREET
HERSTON, QLD 4006
PHONE: 0429970345

CLIENT: SILVERSTONE DEVELOPMENTS
PROJECT: SITE 17, 330 MACARTHUR AVENUE HAMILTON

DRAWING TITLE: PRELIMINARY CIVIL SERVICES LAYOUT PLAN

MELIORA JOB No. 2481
DWG No SK05
REVISION 01

Dec 05, 2024 - 2:11pm ian.lick J:\2481-SK05.dwg



LEGEND

POST DEVELOPMENT CATCHMENT BOUNDARY

PROPOSED CATCHMENT FLOW DIRECTION

C1 CATCHMENT LABEL

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

MINOR EVENT	10	MAJOR EVENT	50					
CATCHMENT NAME		C1		C2		C3		C4
RATIONAL METHOD PARAMETERS	Units	Design Storm (yrs) 10	50	Design Storm (yrs) 10	50	Design Storm (yrs) 10	50	Design Storm (yrs) 10	50
CATCHMENT AREA	ha	0.175		0.203		0.167		0.201	
TIME OF CONCENTRATION	min	7.0		10.0		7.0		7.0	
RUNOFF COEFFICIENT		0.90	1.00	0.78	0.90	0.90	1.00	0.90	1.00
RAINFALL INTENSITY (Iy)	mm/hr	189.92	254.80	165.84	223.30	189.92	254.80	189.92	254.80
PEAK FLOW	L/s	83.2	124.1	73.0	113.0	79.3	118.2	95.5	142.4

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	200.00	0.013	0.159	1.414	0.113	1.268	0.202	201.6

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	200.00	0.013	0.216	1.649	0.131	1.405	0.304	304.1

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

NOTE

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PRELIMINARY

REV	DESCRIPTION	DATE	DRAWN	APPR.
01	ISSUE FOR APPROVAL	03.12.24	SD	MB

NORTH POINT

SCALE BAR(S)

0 2 4 6 8 10 12m

SCALE 1:250 @ A1

DRAWN: AUGUST 2024

DESIGNED: AUGUST 2024

APPROVED: MBLYTH RPEQ SIGNATURE

RPEQ No. 21258

DATE: AUGUST 2024

MELIORA CONSULTING ENGINEERS
ABN 46 153 772 813
E: INFO@MELIORACE.COM

21 McLEOD STREET
HERSTON, QLD 4006
PHONE: 0429970345

CLIENT: SILVERSTONE DEVELOPMENTS

PROJECT: SITE 17, 330 MACARTHUR AVENUE HAMILTON

DRAWING TITLE: PRELIMINARY CIVIL DRAINAGE CATCHMENT PLAN

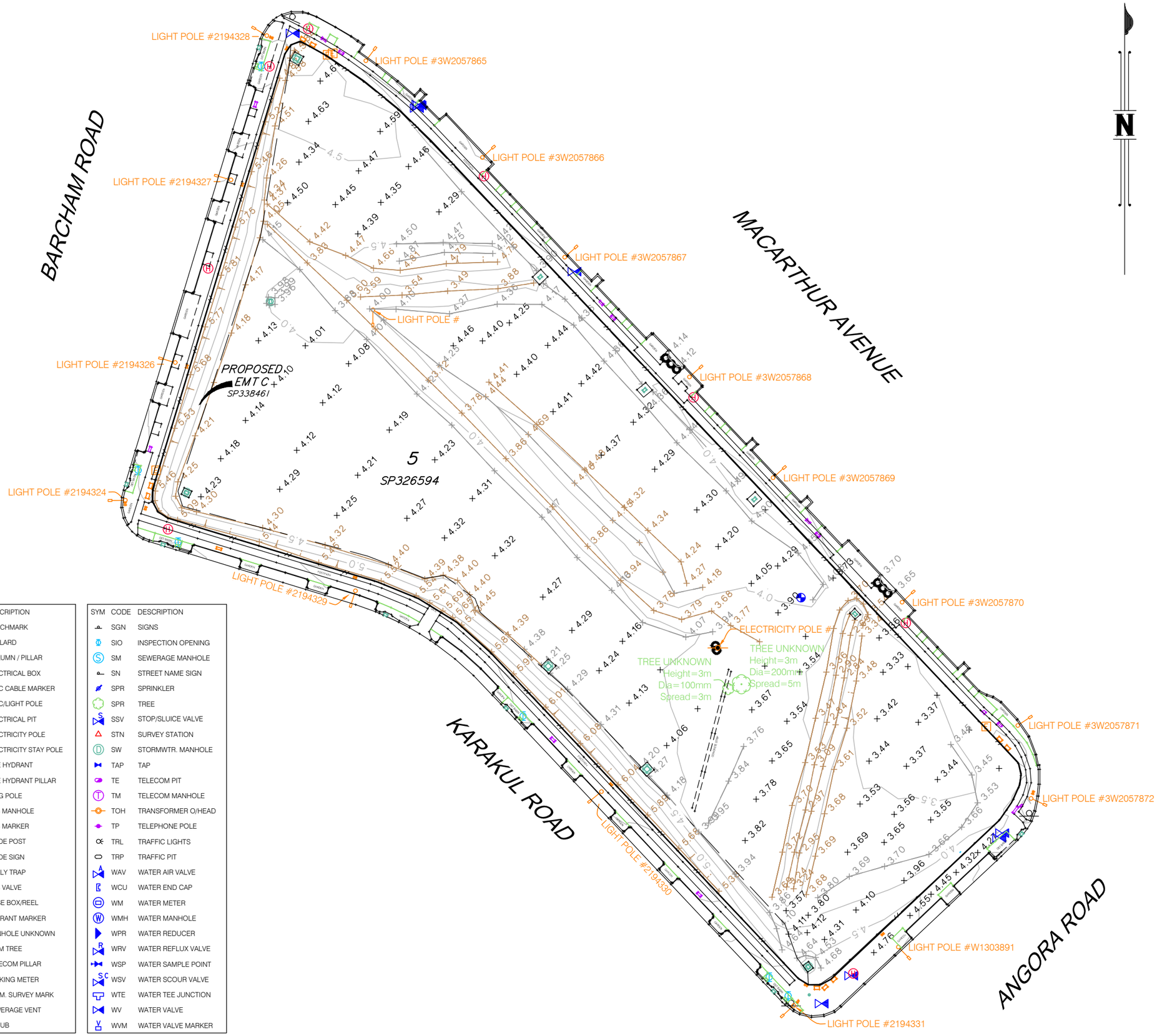
MELIORA JOB No. 2481

DWG No SK07

REVISION 01

Dec 05, 2024 – 2:12pm M:\04 JOBS\2481 LOT 17 NORTHSHORE, HAMILTON\04 ENG\1 dwg\2481-SK07.dwg

6.3 APPENDIX C – SURVEY PLAN



SYM	CODE	DESCRIPTION
	BM	BENCHMARK
	BOL	BOLLARD
	CP	COLUMN / PILLAR
E	EBX	ELECTRICAL BOX
E	ECM	ELEC CABLE MARKER
	ELP	ELEC/LIGHT POLE
	EM	ELECTRICAL PIT
	EP	ELECTRICITY POLE
	ESP	ELECTRICITY STAY POLE
H	FH	FIRE HYDRANT
	FHP	FIRE HYDRANT PILLAR
	FP	FLAG POLE
G	GMH	GAS MANHOLE
G	GMK	GAS MARKER
	GP	GUIDE POST
	GS	GUIDE SIGN
	GT	GULLY TRAP
	GV	GAS VALVE
	HB	HOSE BOX/REEL
	HM	HYDRANT MARKER
U	MHU	MANHOLE UNKNOWN
	PLM	PALM TREE
	PIL	TELECOM PILLAR
	PKM	PARKING METER
	PSM	PERM. SURVEY MARK
V	SEV	SEWERAGE VENT
	SHB	SHRUB

SYM	CODE	DESCRIPTION
	SGN	SIGNS
	SIO	INSPECTION OPENING
S	SM	SEWERAGE MANHOLE
	SN	STREET NAME SIGN
	SPR	SPRINKLER
	SPR	TREE
S	SSV	STOP/SLUICE VALVE
	STN	SURVEY STATION
D	SW	STORMWTR. MANHOLE
	TAP	TAP
	TE	TELECOM PIT
T	TM	TELECOM MANHOLE
	TOH	TRANSFORMER O/HEAD
	TP	TELEPHONE POLE
	TRL	TRAFFIC LIGHTS
	TRP	TRAFFIC PIT
A	WAV	WATER AIR VALVE
	WCU	WATER END CAP
W	WM	WATER METER
W	WMH	WATER MANHOLE
	WPR	WATER REDUCER
R	WRV	WATER REFLUX VALVE
	WSP	WATER SAMPLE POINT
SC	WSV	WATER SCOUR VALVE
	WTE	WATER TEE JUNCTION
	WV	WATER VALVE
V	WVM	WATER VALVE MARKER

NOTE: ALL DIMENSIONS AND AREAS ON THIS PLAN ARE SUBJECT TO SURVEY AND REQUIREMENTS FOR LODGEMENT OF SURVEY PLANS IN THE DEPARTMENT RESOURCES.

CLIENT
Economic Development Queensland

LOT LAYOUT
DETAIL SURVEY

REAL PROPERTY DESCRIPTION
Proposed
Lot 5 on SP326594

NOTES
i) This plan has been prepared for the exclusive use of EDQ and their consultants for design purposes and is not to be used for any other purpose or by any other entity without the express permission of LandPartners Pty Ltd.

ii) The title boundaries as shown hereon were not marked or surveyed at the time of survey and have been determined from the dimensions shown on plans of survey registered in the Department of Resources.

iii) The boundaries may change subject to survey, engineering design or council requirements.

iv) Services shown hereon have been located where visible by field survey. No investigation or location of underground services has been undertaken. 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.

v) This data should not be used for construction purposes without confirmation by LandPartners Pty Ltd.

vi) This data should not be reproduced in any way without the permission of LandPartners Pty Ltd. Any reproduction of this data must contain these notes

SCALE BAR
10m 0 20 50m

SCALE 1:1000 (A3)

1	AJG	6/10/2022	INITIAL ISSUE

LANDPARTNERS
built environment consultants

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

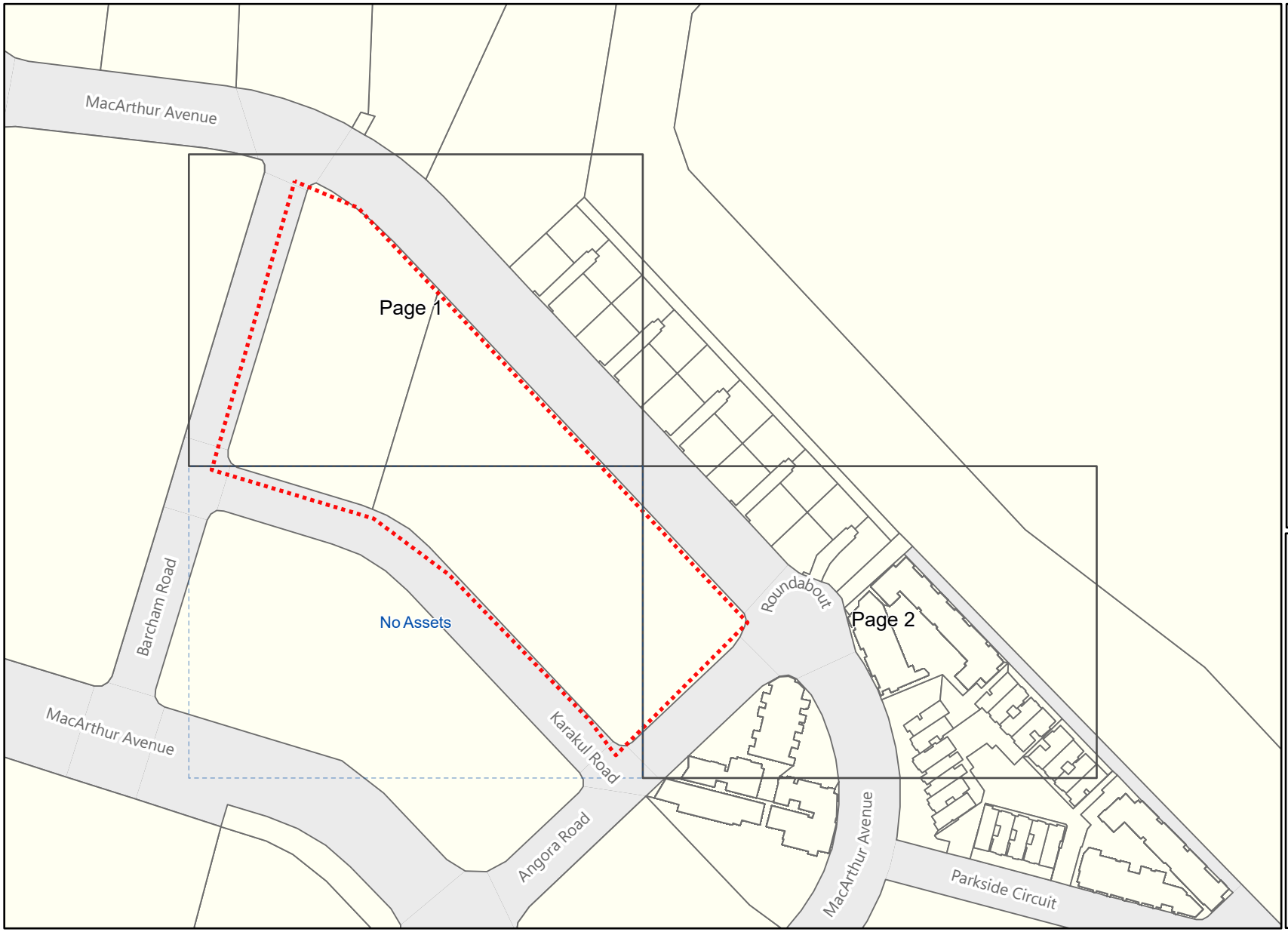
ISO 9001 Quality Management

HEIGHT DATUM AHD D	LOCAL AUTHORITY BRISBANE C.C.
HEIGHT ORIGIN PSM186779 RL 4.325m	SCALE 1:1000 (A3)
MERIDIAN SP326594	DRAWN AJG / DATE 6/10/2022
CO-ORD SYSTEM Arbitrary Plane	CHECKED MLM / DATE 6/10/2022
CAD FILE BRMM7695-000-240-2	APPROVED MLM / DATE 6/10/2022

UDN
BRMM7695-000-244-1

6.4 APPENDIX D – BYDA RESULTS

Job # 38005883
Seq # 247148726
Provider: Brisbane City Council
Telephone: (07) 3403 8888



Legend

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

Disclaimer:

Caution: This map may contain the locations of abandoned underground asbestos pipes. Council gives no warranty to the completeness or accuracy of these records. Appropriate care needs to be taken in all cases.

In an emergency contact Brisbane City Council on 07 3403 8888

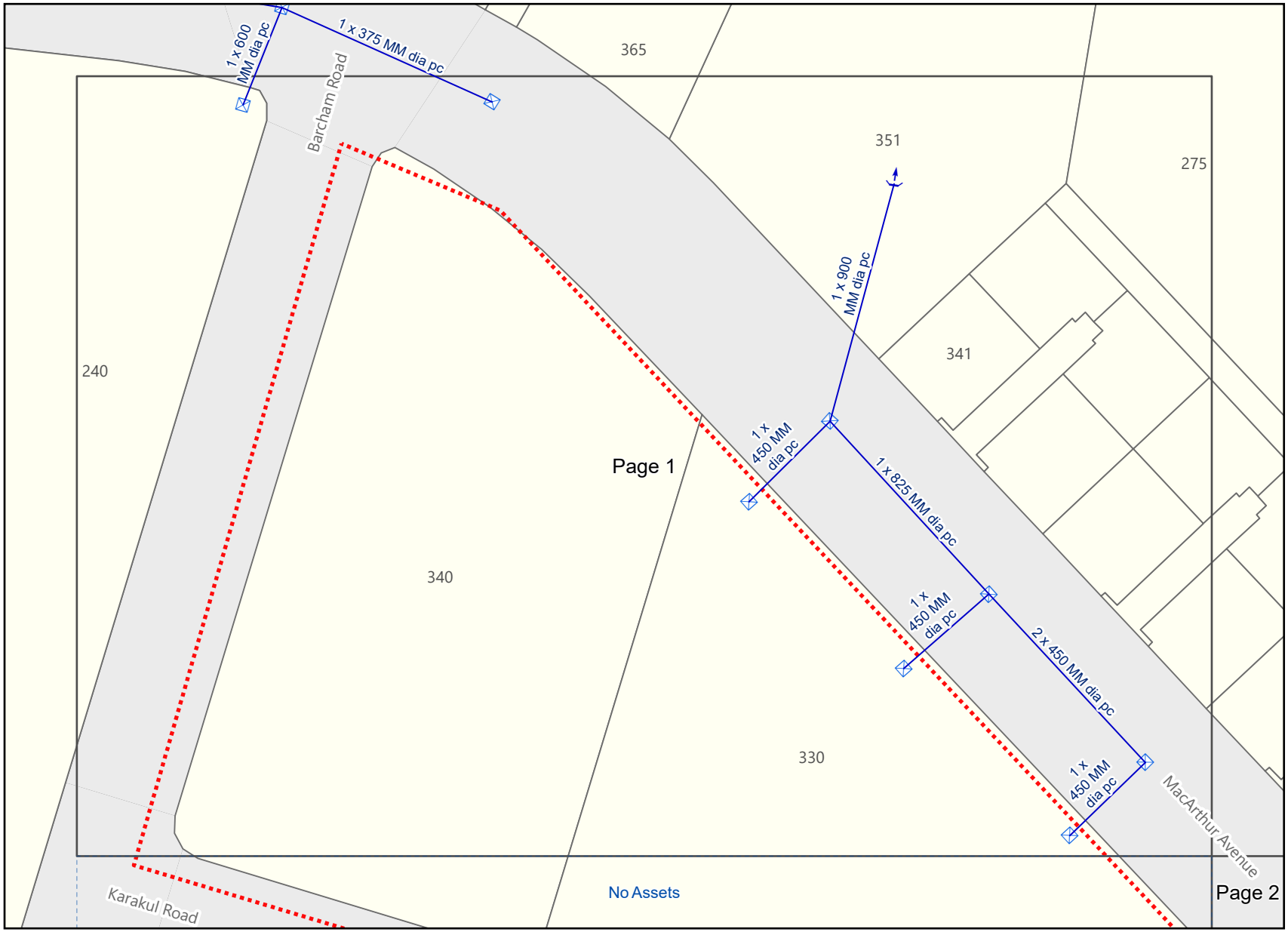
Index Sheet

0 25 50 100 m

Scale 1:2,500

Plans generated by SmarterWX™ Automate

Job # 38005883
Seq # 247148726
Provider: Brisbane City Council
Telephone: (07) 3403 8888



Legend

BYDA Enquiry

Stormwater Network

- Stormwater Gully / Roofwater Connection
- Stormwater Field Inlet
- Pipe End Outlet

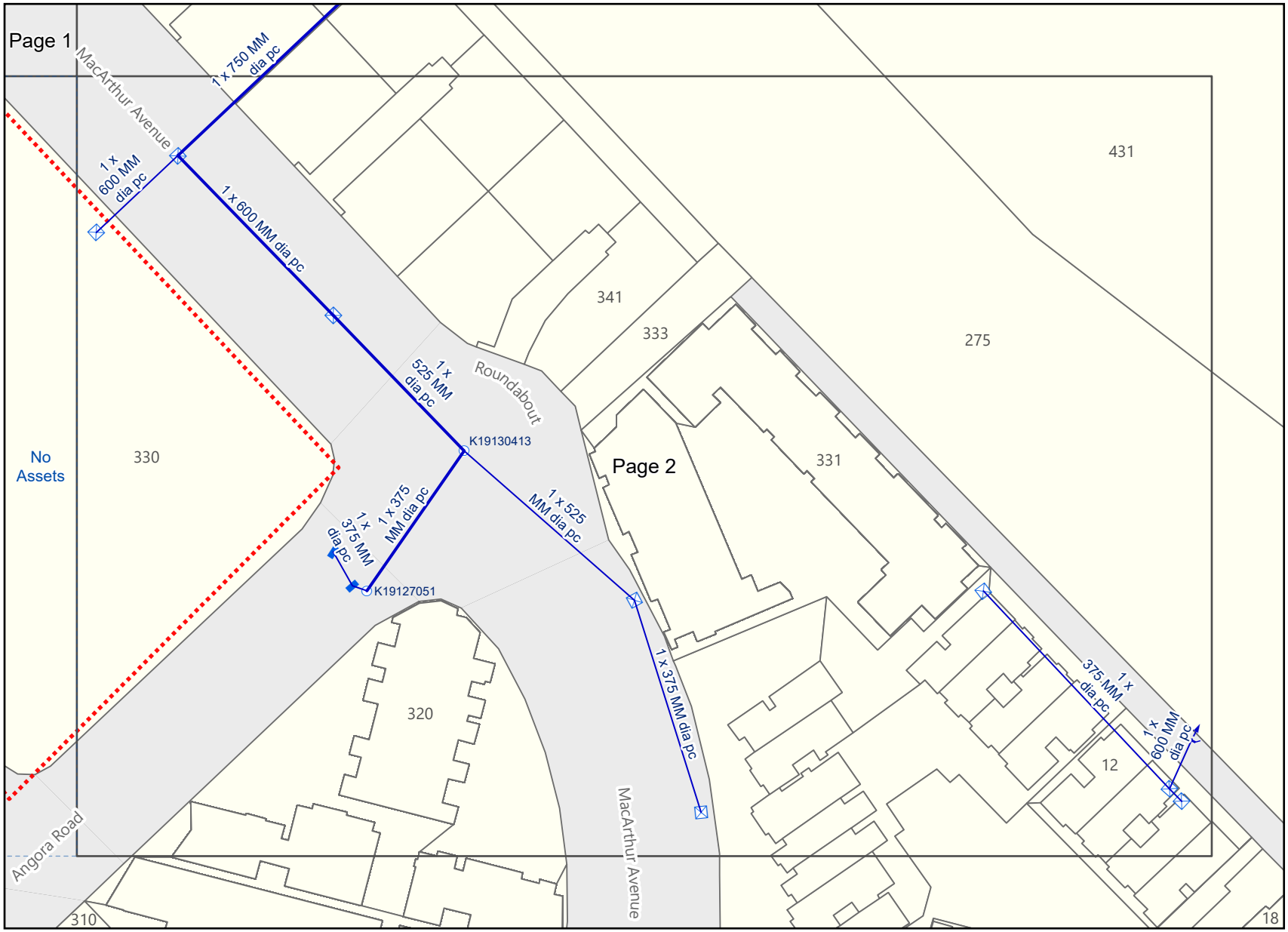
In an emergency contact Brisbane City Council on 07 3403 8888
08/11/24 (valid for 30 days)

0 10 20 40 m

Scale 1:1,000

Plans generated by SmarterWX™ Automate

Job # 38005883
Seq # 247148726
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
- Pipe End Outlet

In an emergency contact Brisbane City Council on 07 3403 8888
08/11/24 (valid for 30 days)

0 10 20 40 m

Scale 1:1,000

Plans generated by SmarterWX™ Automate

Before You Dig Australia

Classification: Networks

Enquiry Date:	08/11/2024
Sequence Number:	247148724
Work Site Address:	280 Macarthur Avenue 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: 08/11/2024
Enquirer: Kousik De

Sequence Number: 247148724
Worksite Address: 280 Macarthur Avenue
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	280 Macarthur Avenue Hamilton QLD 4007	Sequence No 247148724

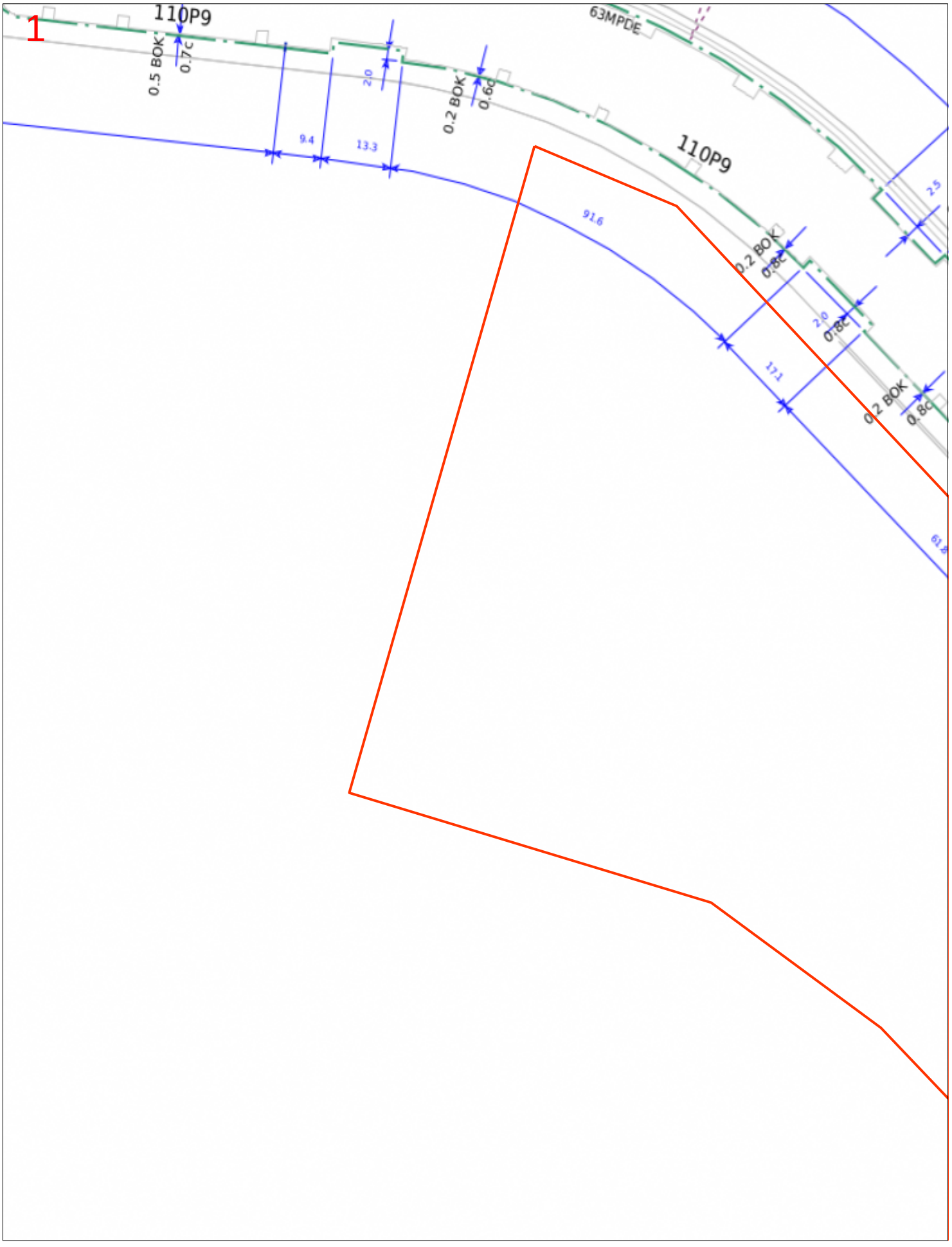
Scale 1: 6000

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

N

Enquiry Area

Map Key Area



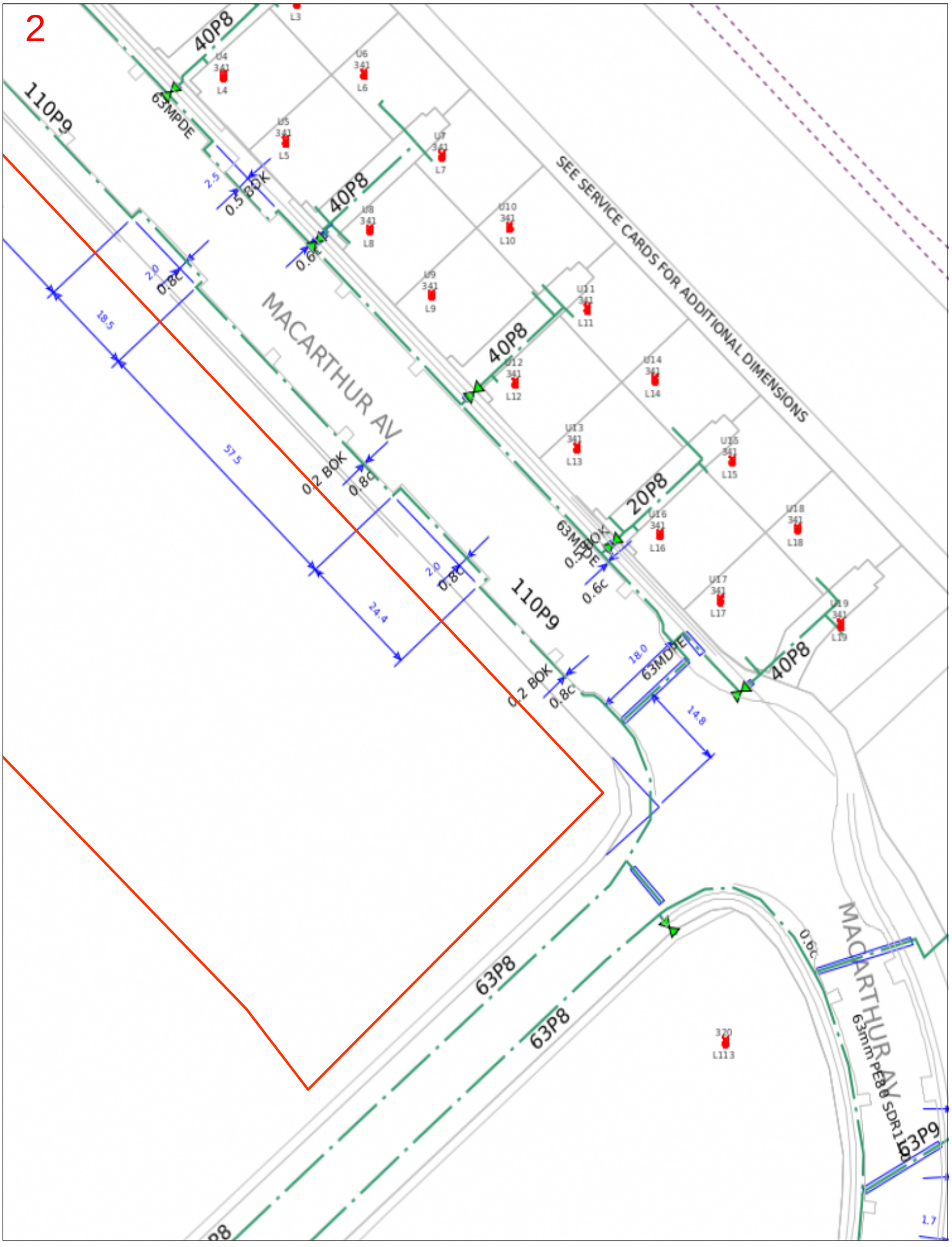
Scale 1: 700 map

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

N

Enquiry Area

Map Key Area



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)

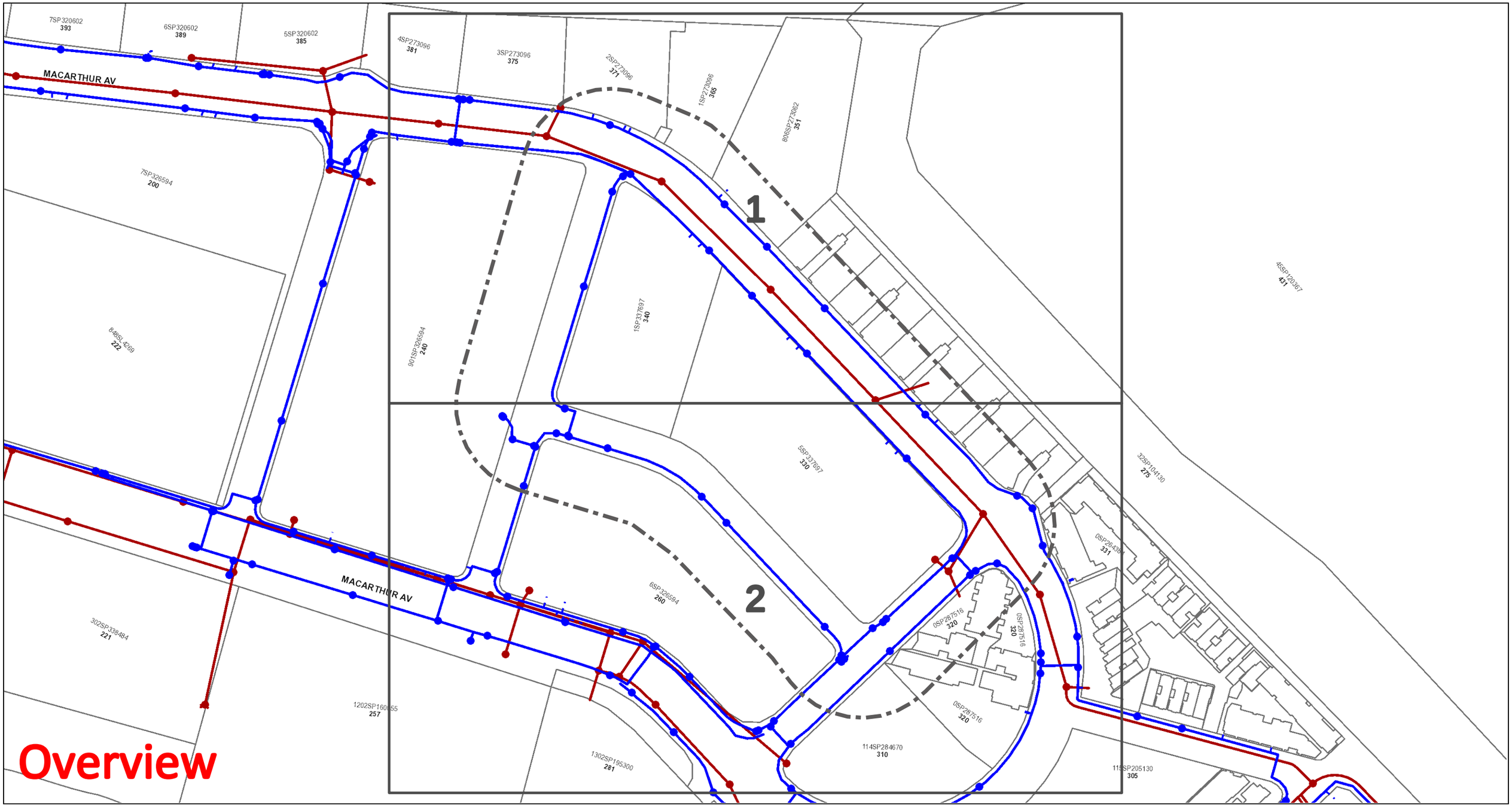
Important Information

- 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.

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: 247148728

Date BYDA Ref Received: 08/11/2024

Date BYDA Job to Commence: 11/11/2024

Date BYDA Map Produced: 07/11/2024

This Map is valid for 30 days

Produced By: Urban Utilities

Sewer
- Infrastructure
- Major Infrastructure
- Network Pipelines
- Network Structures

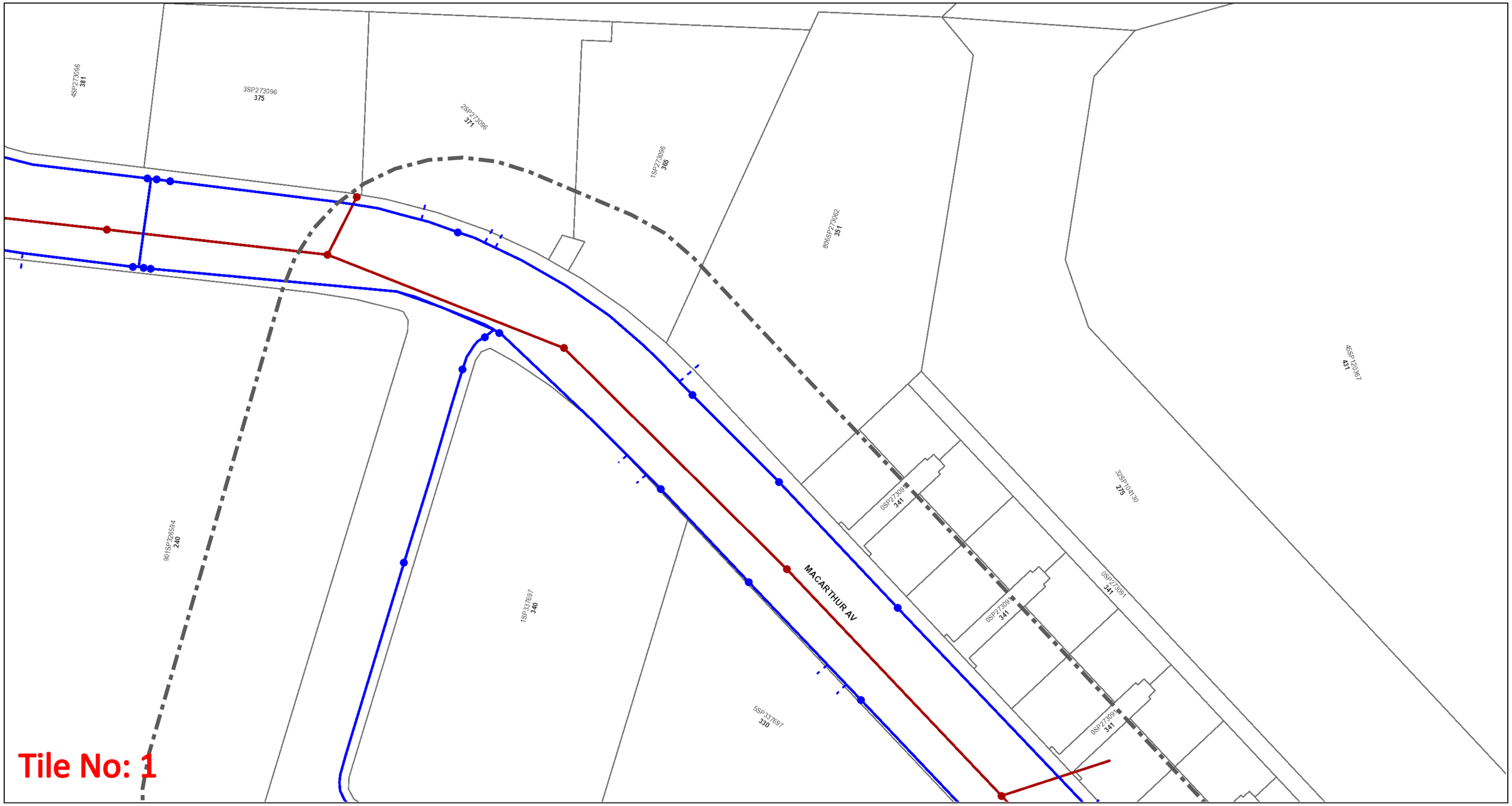
Water
- Infrastructure
- Major Infrastructure
- Network Pipelines
- Network Structures
- Water Service (Indicative only)

Recycled Water
- Infrastructure
- Major Infrastructure
- Network Pipelines
- Network Structures

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



Tile No: 1

UrbanUtilities

N

Map Scale
1:1000

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

BYDA Reference No: 247148728

Date BYDA Ref Received: 08/11/2024

Date BYDA Job to Commence: 11/11/2024

Date BYDA Map Produced: 07/11/2024

This Map is valid for 30 days

Produced By: Urban Utilities

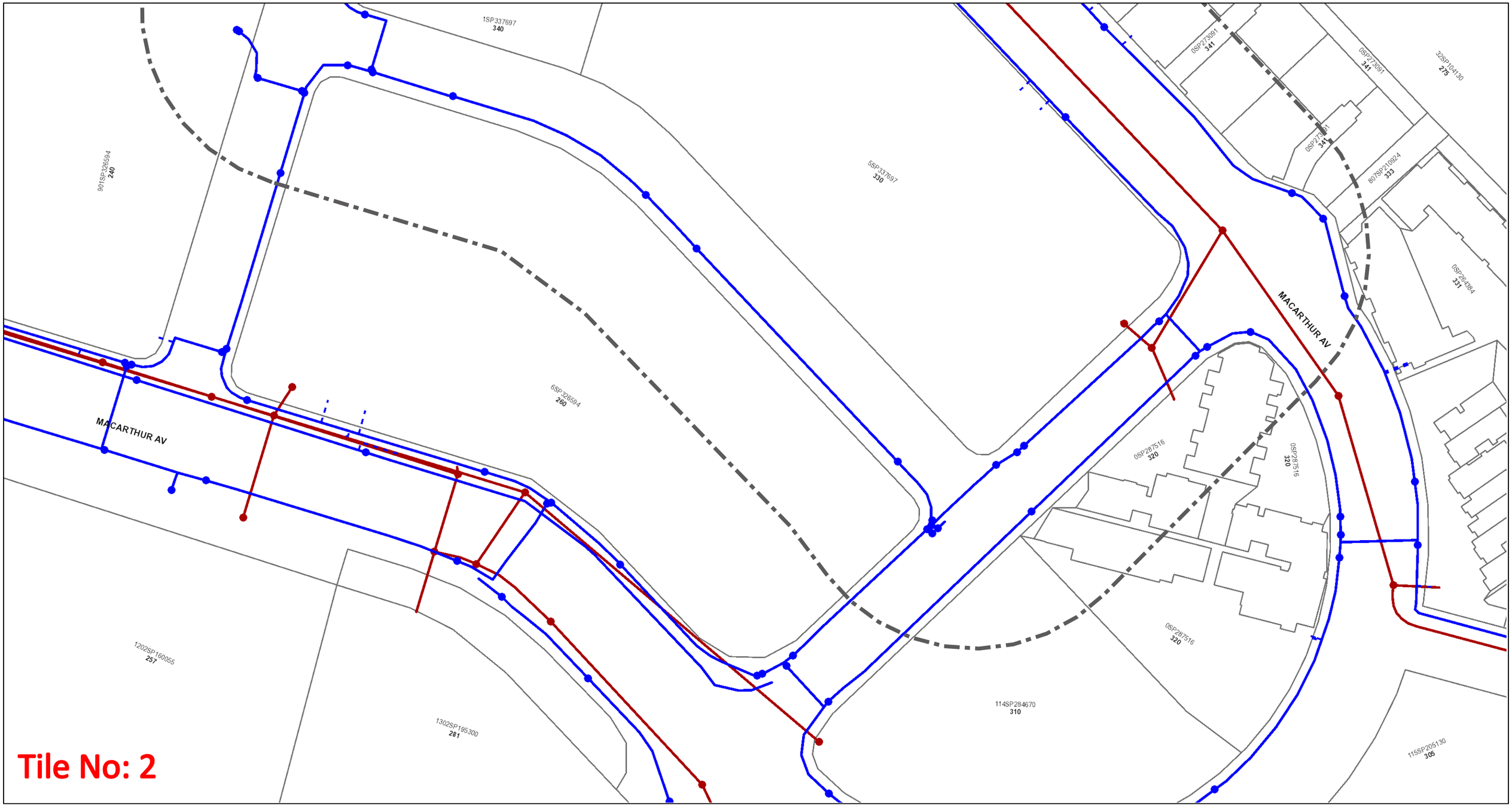
Sewer	Water	Recycled Water
Infrastructure	Infrastructure	Infrastructure
Major Infrastructure	Major Infrastructure	Major Infrastructure
Network Pipelines	Network Pipelines	Network Pipelines
Network Structures	Network Structures	Network Structures
	Water Service (Indicative only)	

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



Tile No: 2

UrbanUtilities

N

Map Scale
1:1000

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

BYDA Reference No: 247148728

Date BYDA Ref Received: 08/11/2024
Date BYDA Job to Commence: 11/11/2024
Date BYDA Map Produced: 07/11/2024

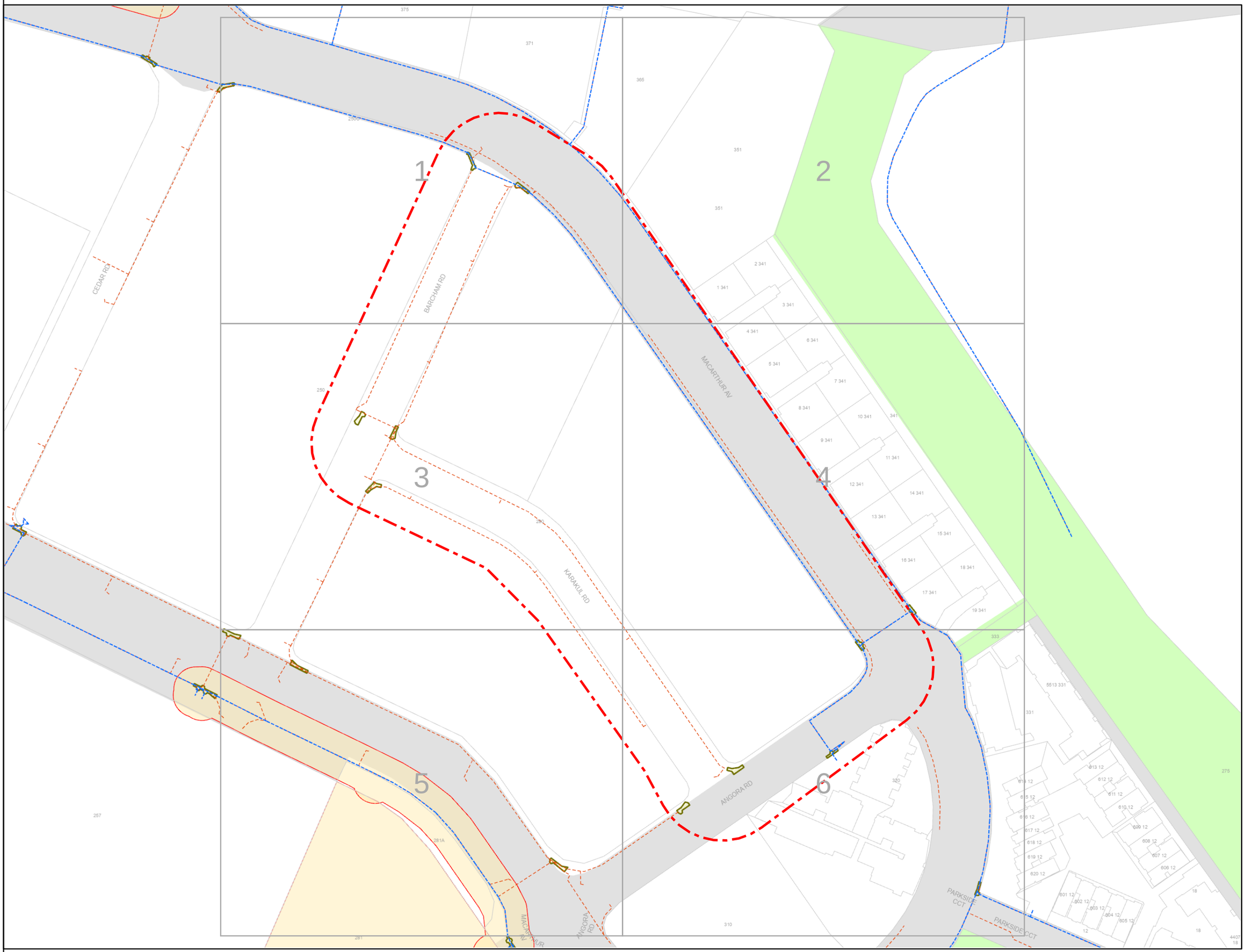
This Map is valid for 30 days Produced By: Urban Utilities

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

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: 247148727
Date: 07/11/2024

Scale: 1:1538
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.

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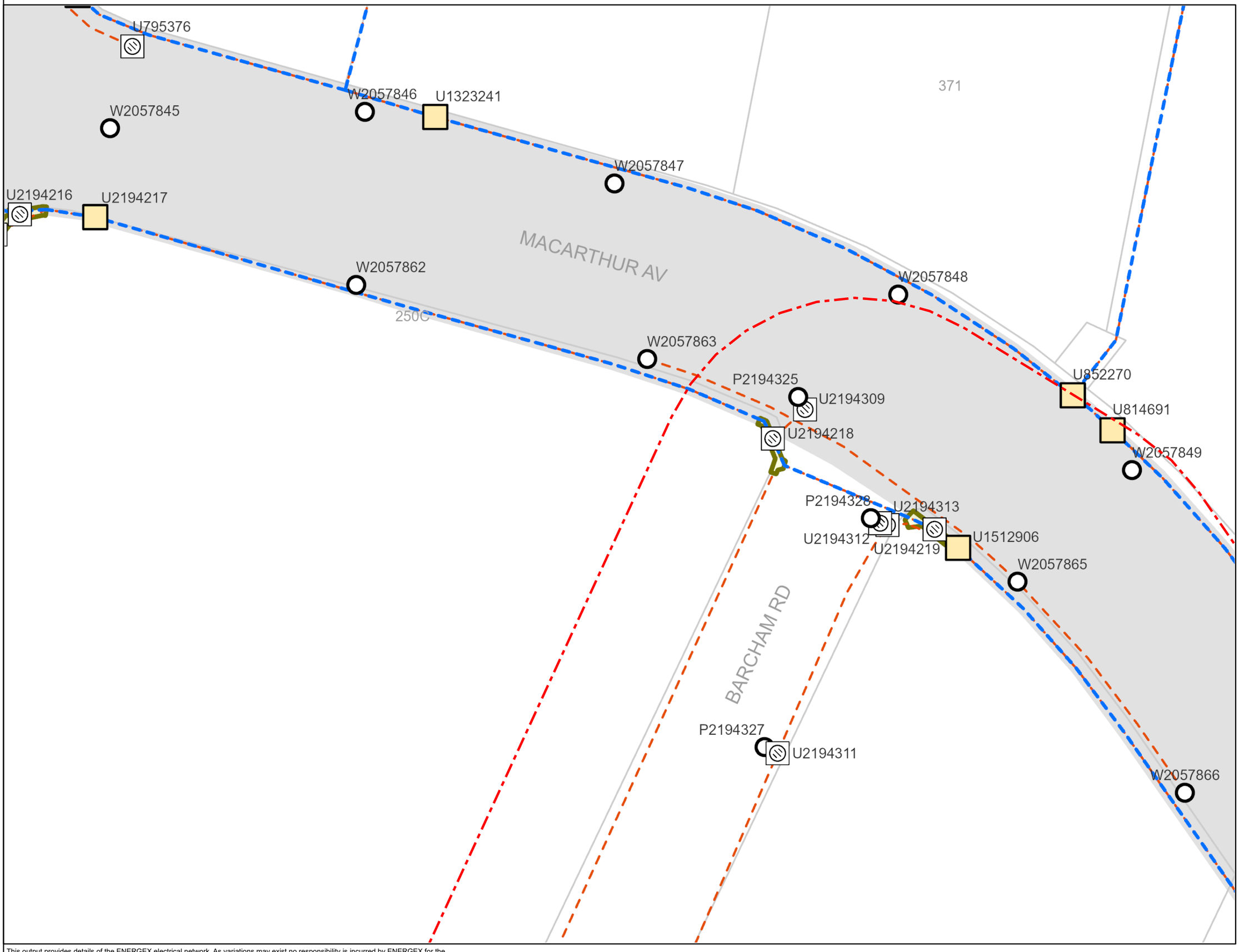
For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 247148727
Date: 07/11/2024

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
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S

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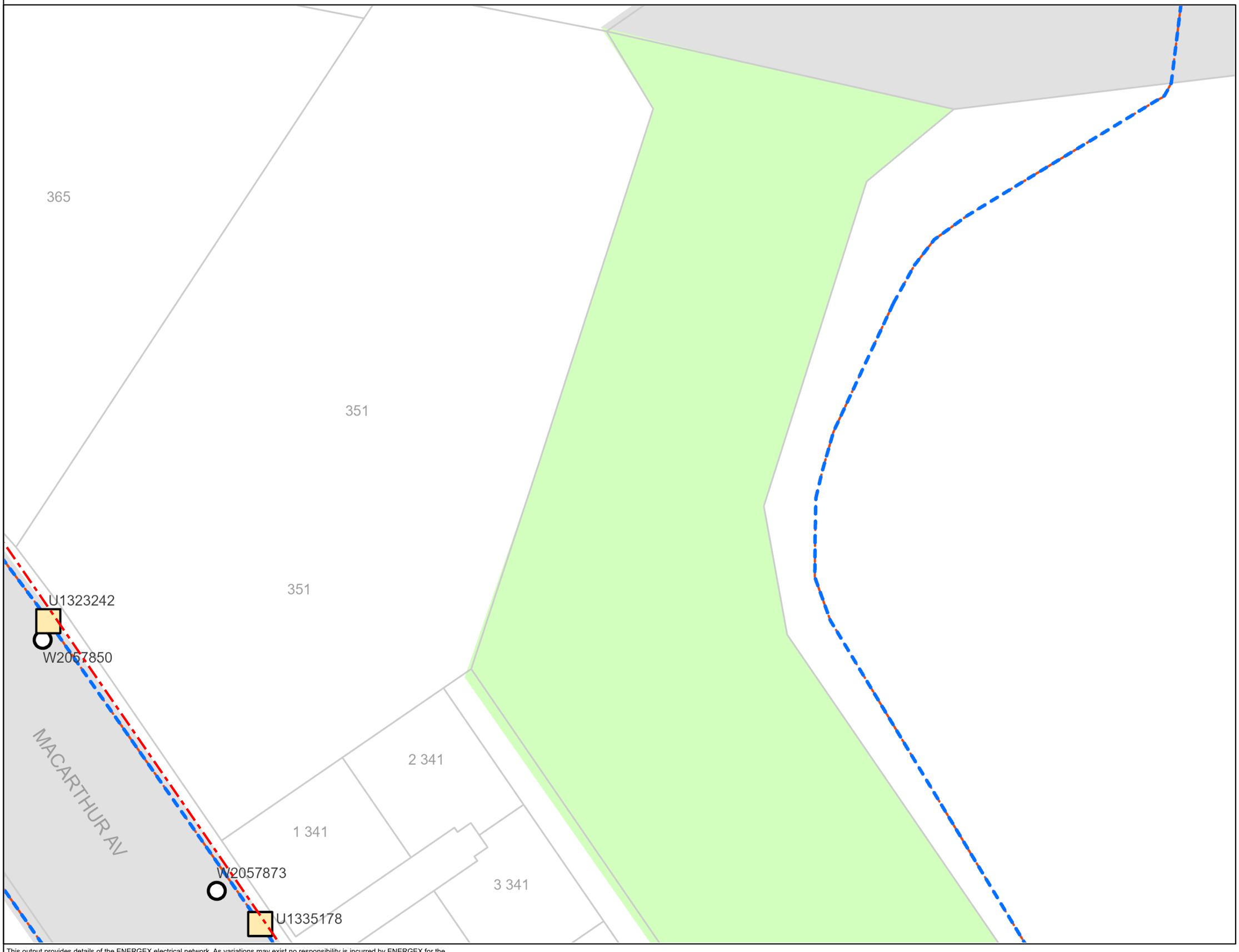
For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 247148727
Date: 07/11/2024

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
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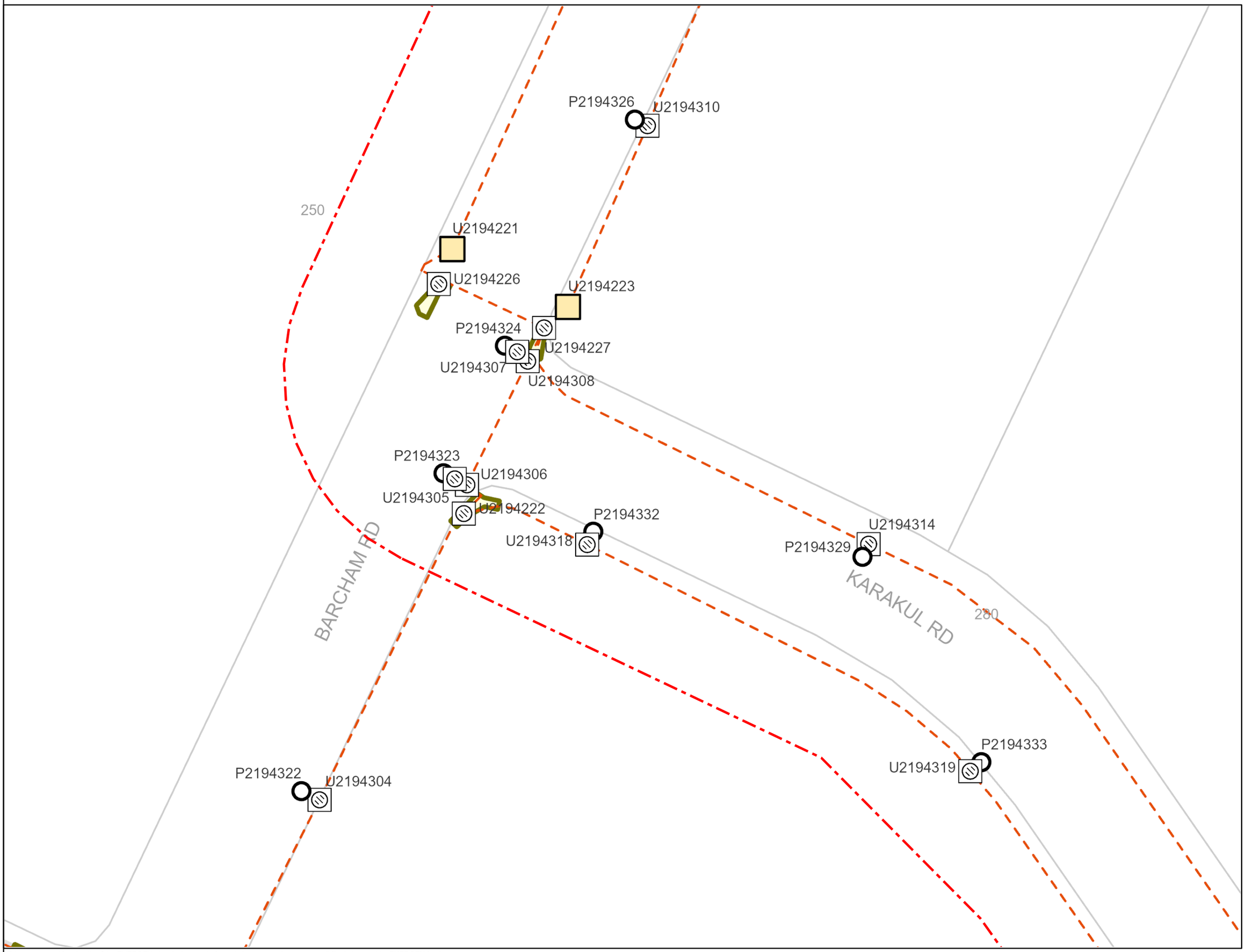
For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 247148727
Date: 07/11/2024

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: 247148727
Date: 07/11/2024

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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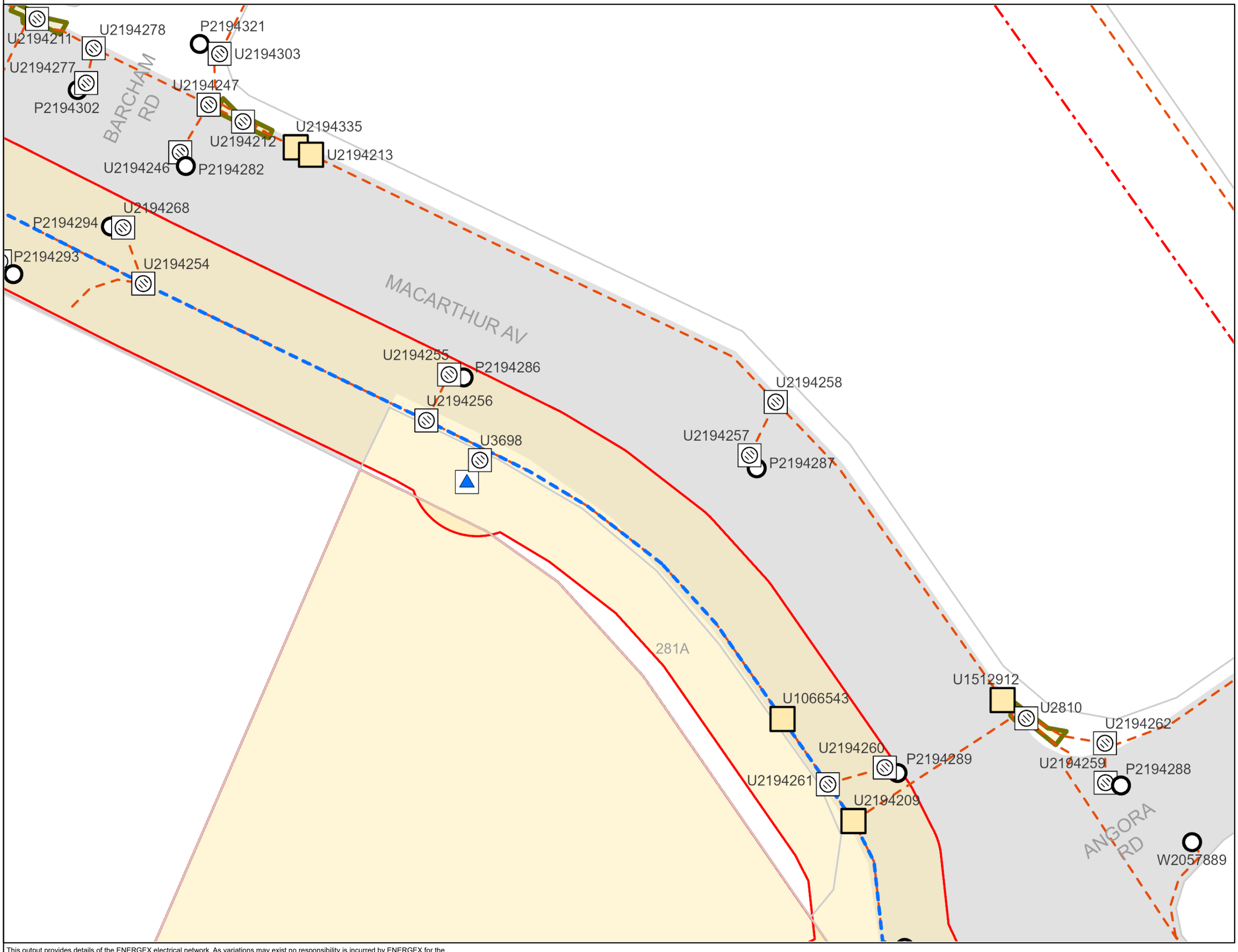
For Emergency Situations
Please Call 13 19 62



BYDA

Sequence: 247148727
Date: 07/11/2024

Scale: 1:500
Tile No: **Tile No: 5**

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.

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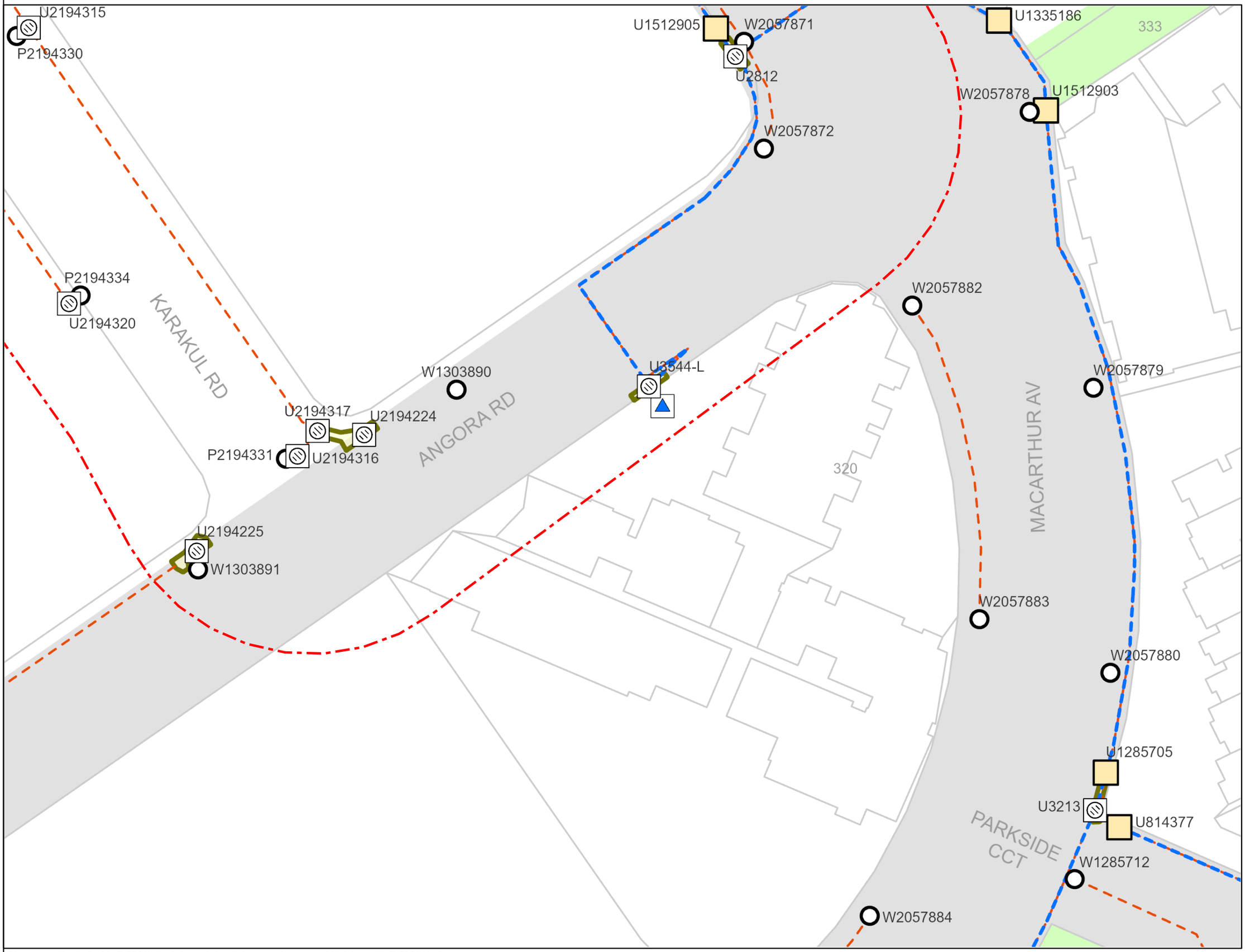
For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 247148727
Date: 07/11/2024

Scale: 1:500
Tile No: **Tile No: 6**

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.

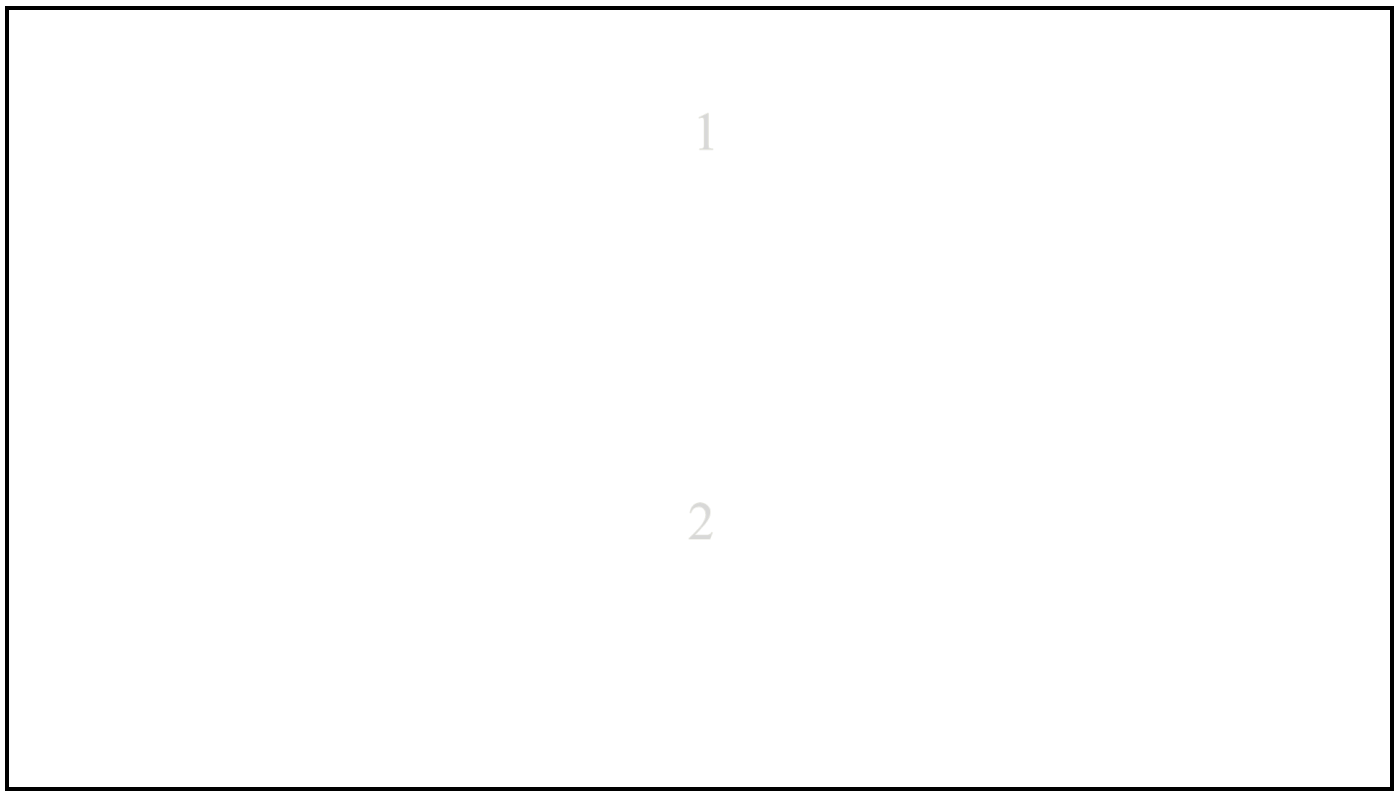
This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

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

Dial before you dig Job #:	38005883
Sequence #	247148723
Issue Date:	07/11/2024
Location:	280 Macarthur Avenue , Hamilton , QLD , 4007

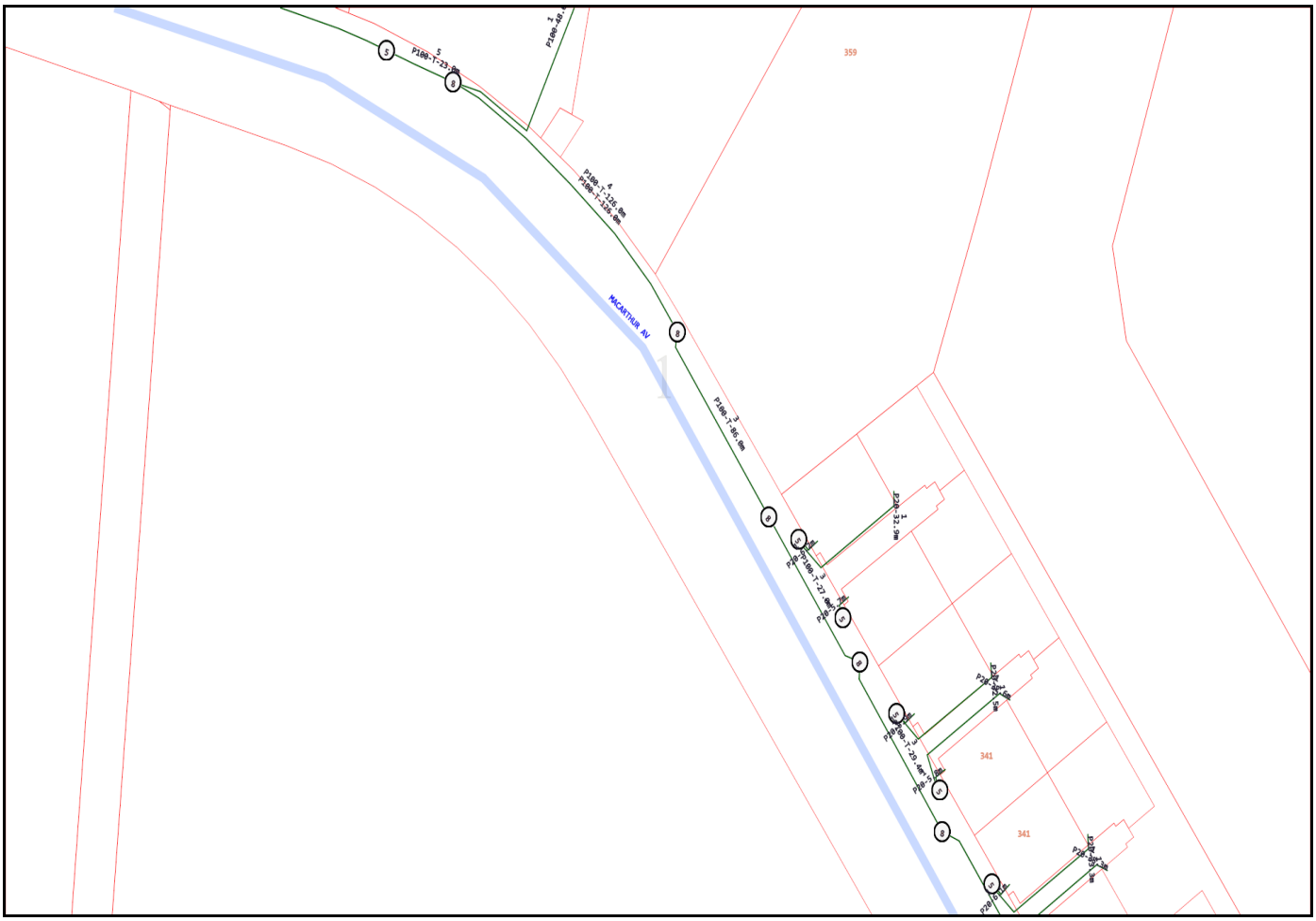
BEFORE YOU DIG www.byda.com.au Zero Damage - Zero Harm

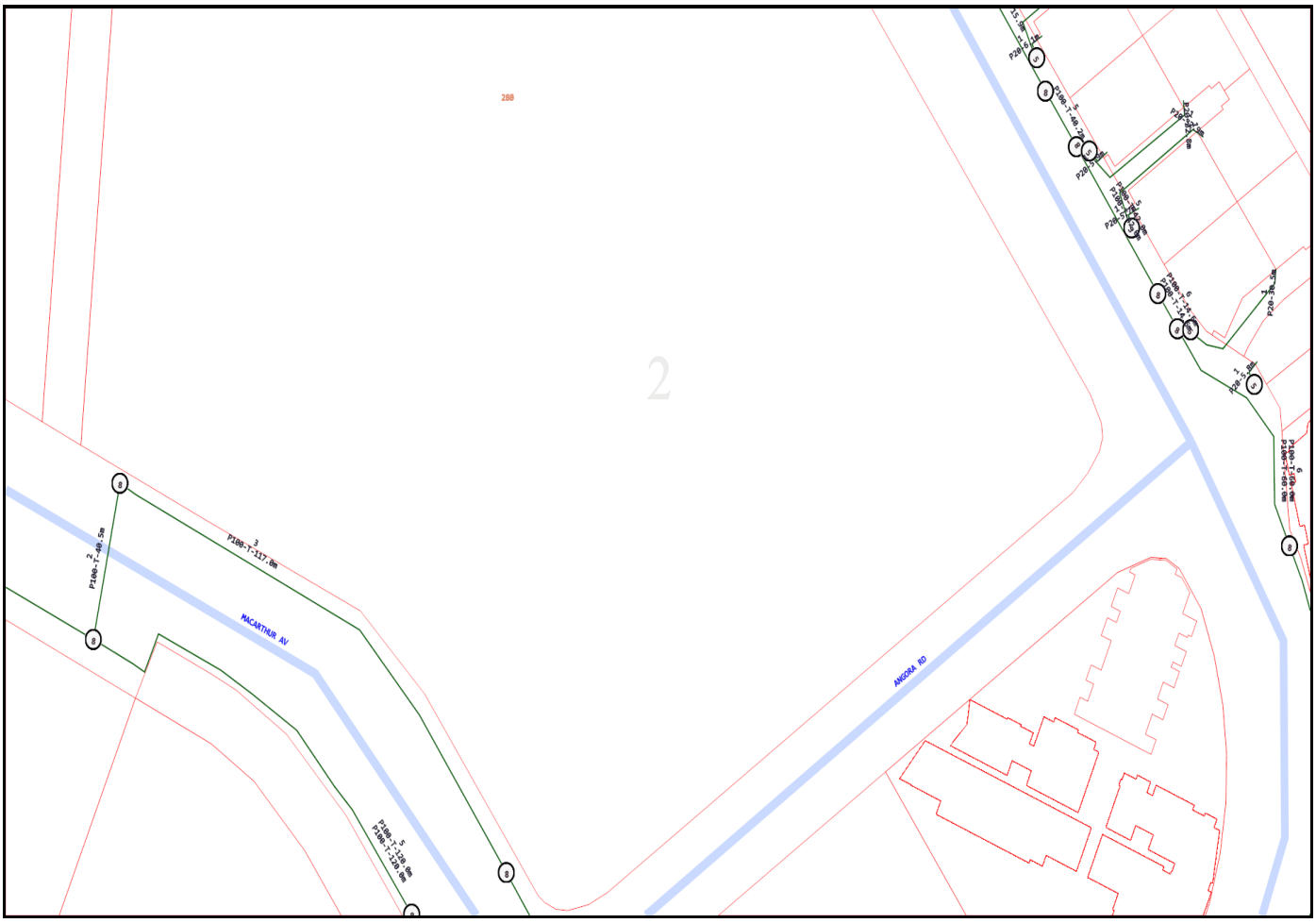
Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans



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

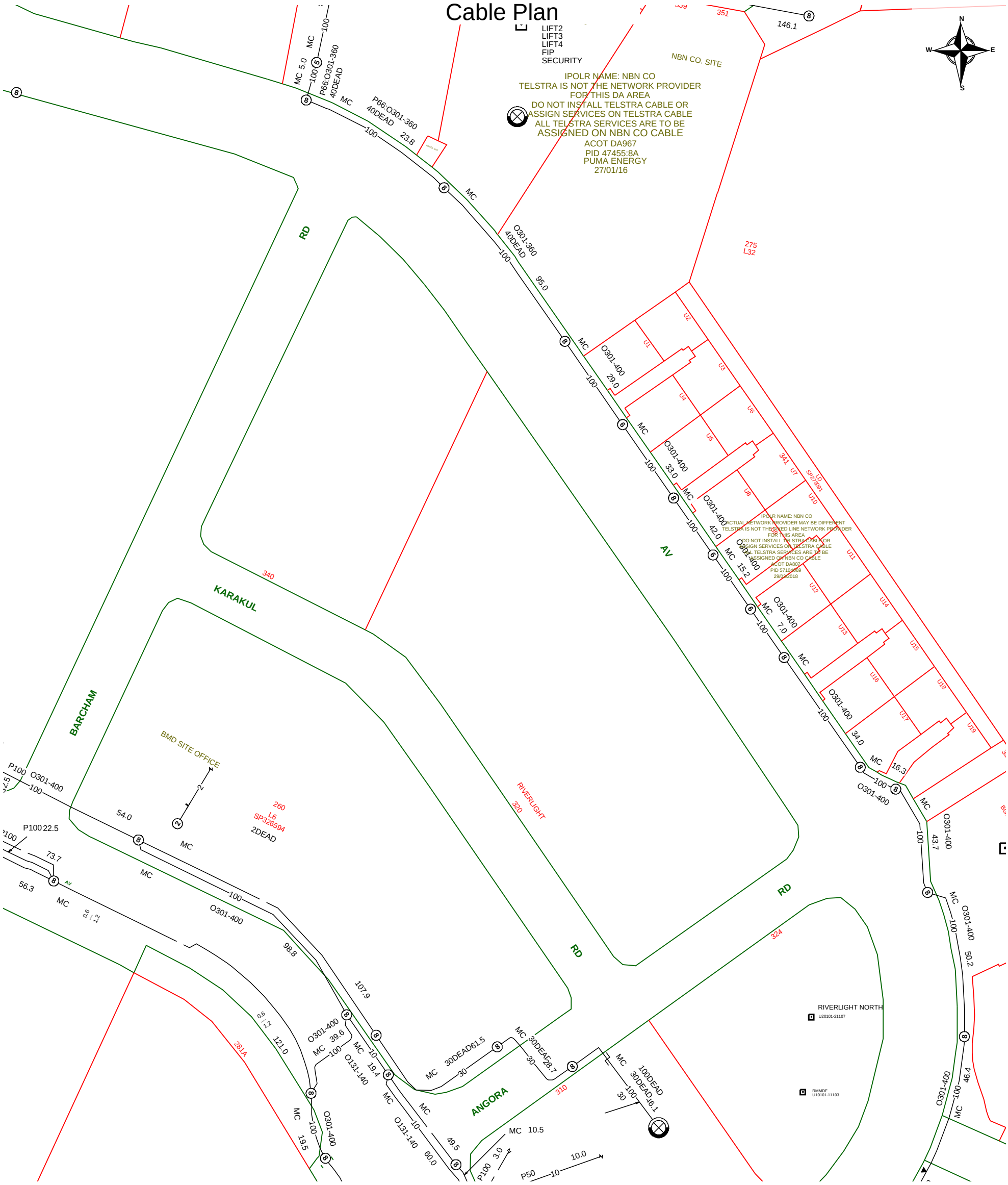

MACARTHUR AV
359
341
341



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.

Cable Plan



Report Damage: https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment
Ph - 13 22 03
Email - Telstra.Plans@team.telstra.com
Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries

TELSTRA LIMITED A.C.N. 086 174 781

Generated On 08/11/2024 01:23:07

Sequence Number: 247148725

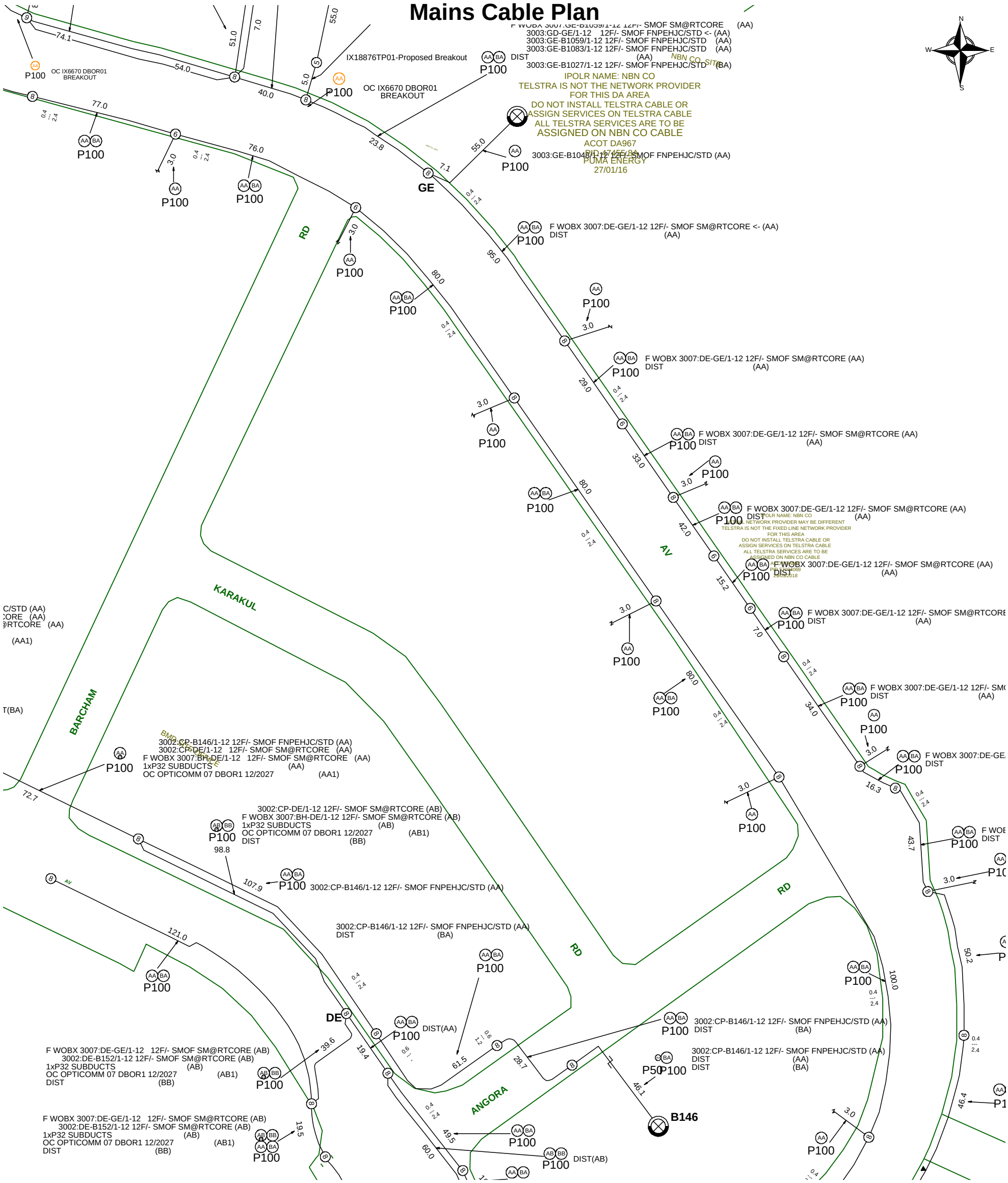
CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

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-equipment
Ph - 13 22 03
Email - Telstra.Plans@team.telstra.com
Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries

TELSTRA LIMITED A.C.N. 086 174 781

Generated On 08/11/2024 01:23:09

Sequence Number: 247148725

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.

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.

6.5 APPENDIX E – FLOODWISE REPORT

FloodWise Property Report

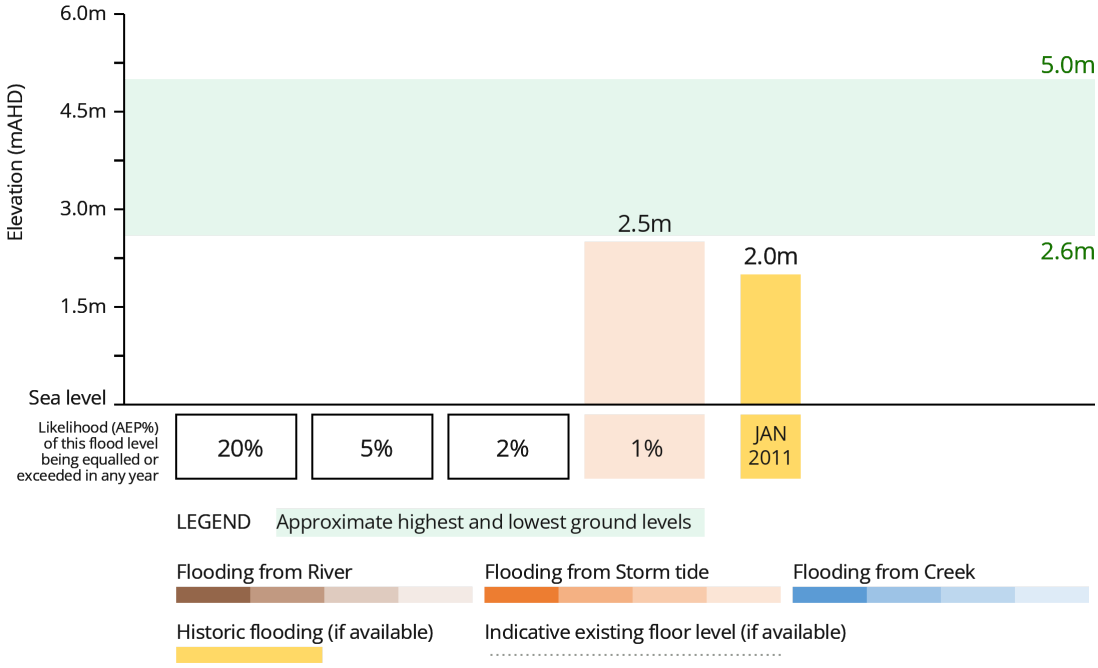
Lot 5 on SP337697

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.

Graph showing only the highest source/type of flooding for 1%, 2%, 5% and 20% likelihoods. Also shows historic flood levels. Other flood types and levels may be present and will be listed in the Flood Planning Information table below. This graph does not include overland flow flooding. If applicable, overland flow information is shown in the Planning and Development Information section below.
NOTE: See Useful Definitions section to explain terminology.



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.

Property Information Summary

The following table provides a summary of flood information for this property. More detailed flood level information is provided in the following sections of this report.

Property Summary	Level (mAHD) / Comment	Data Quality Code
Minimum ground level	2.6	C
Maximum ground level	5.0	C
Source of highest flooding	Storm tide	

Flood Planning Information

The table below displays the peak estimated flood levels by probability for this property. Estimated flood level data should be used in conjunction with applicable planning scheme requirements - Refer to Flood Planning and Development Information section below for further information.

Note this table does not include overland flow. If overland flow is applicable to this property, refer to the Flood Planning and Development section below for further information.

Likelihood / Description	Level (mAHD)	Source
20%	N/A	
5%	N/A	
2%	N/A	
1%	2.5	Stormtide (Moreton Bay)
0.2%	N/A	
January 2011	2.0	River (Brisbane River)
Minimum Habitable Floor Level (dwelling house)	N/A*	

* Council may not have this data available. Customers are recommended to engage a Registered Professional Engineer of QLD (RPEQ) for further advice. For information on seeking Planning Advice, please visit www.brisbane.qld.gov.au/planning-and-building.

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**
		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
Overland flow path - Mapping indicates this property may be located within an overland flow path. Overland flow flooding usually occurs when the capacity of the underground piped drainage system is exceeded and/or when the overland flow path is blocked. It is recommended you consult a Registered Professional Engineer of Queensland (RPEQ) to determine this property's habitable floor level and flooding depth. Please refer to Council's planning scheme for further information.
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 (exduding 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

330 Macarthur Ave

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

07 / 11 / 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		✔

Have you answered 'yes' to any of the questions in Table 1?	*Yes*	*No*
	✔	

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

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%		

Have you answered 'yes' to any of the questions in Table 3?	*Yes*	*No*

If '*No*' then site is <u>medium risk</u> with respect to erosion and sediment control

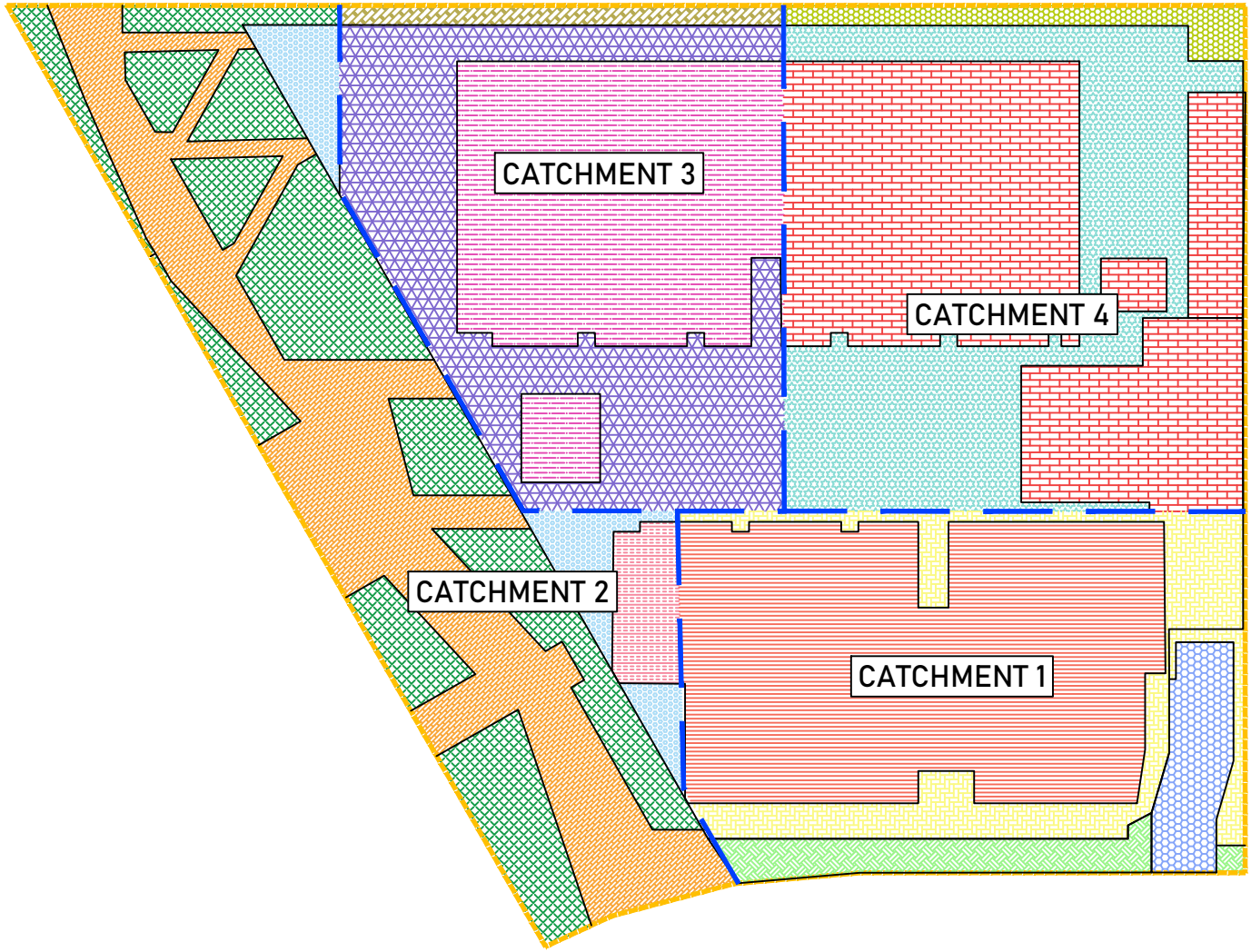
If '*Yes*' then site is <u>high risk</u> with respect to erosion and sediment control

6.8 APPENDIX H – OCEAN PROTECT DEVICE INFORMATION

WSUD SITE AREA BREAK-UP

23525 - 80 Macarthur Ave, Hamilton

November 6, 2024



CATCHMENT 1

- ROOF: 1109m² *100% IMPERVIOUS*
- DRIVEWAY: 127m² *100% IMPERVIOUS*
- LANDSCAPE: 142m² *100% PERVIOUS*
- PODIUM: 365m² *100% IMPERVIOUS*

CATCHMENT AREA: 1743m²

CATCHMENT 2

- ROOF: 90m² *100% IMPERVIOUS*
- LANDSCAPE: 900m² *100% PERVIOUS*
- GROUND: 873m² *100% IMPERVIOUS*
- PODIUM: 175m² *100% PERVIOUS*

CATCHMENT AREA: 2038m²

CATCHMENT 3

- ROOF: 830m² *100% IMPERVIOUS*
- PODIUM: 773m² *100% IMPERVIOUS*
- GROUND: 75m² *100% IMPERVIOUS*

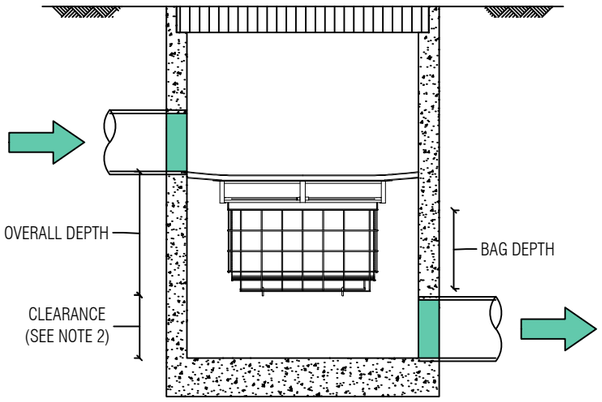
CATCHMENT AREA: 1678m²

CATCHMENT 4

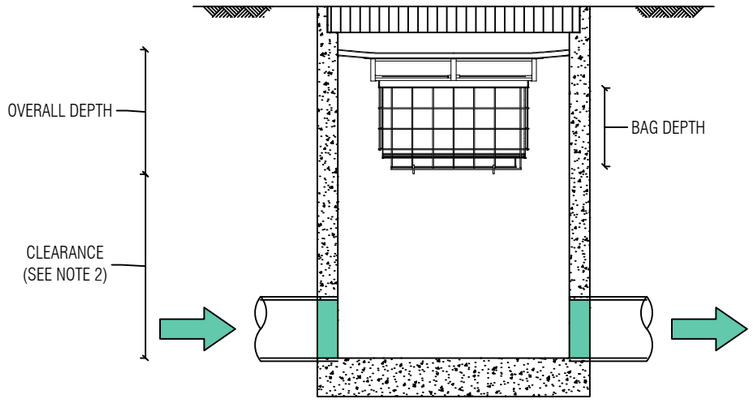
- ROOF: 1165m² *100% IMPERVIOUS*
- PODIUM: 739m² *100% IMPERVIOUS*
- GROUND: 102m² *100% PERVIOUS*

CATCHMENT AREA: 2006m²

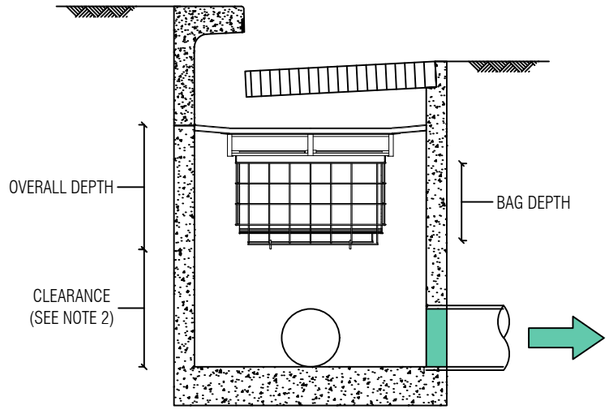
TOTAL AREA: 7465m²



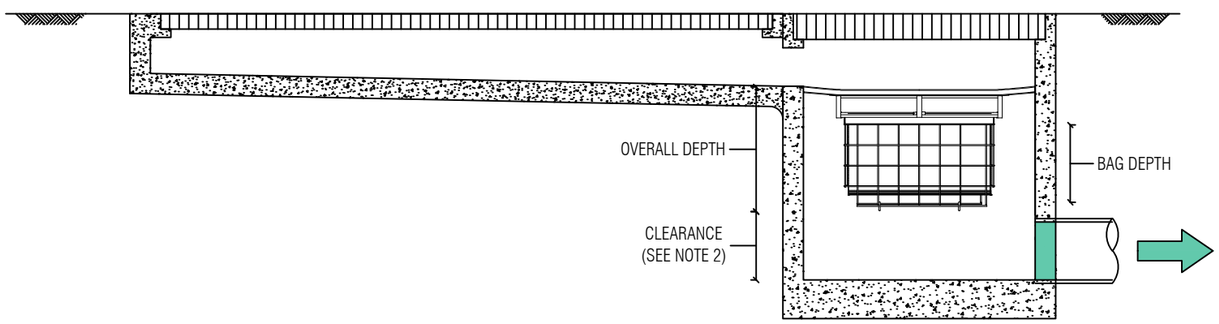
PIPE FLOW CONFIGURATION



SURFACE FLOW CONFIGURATION



SURFACE FLOW CONFIGURATION

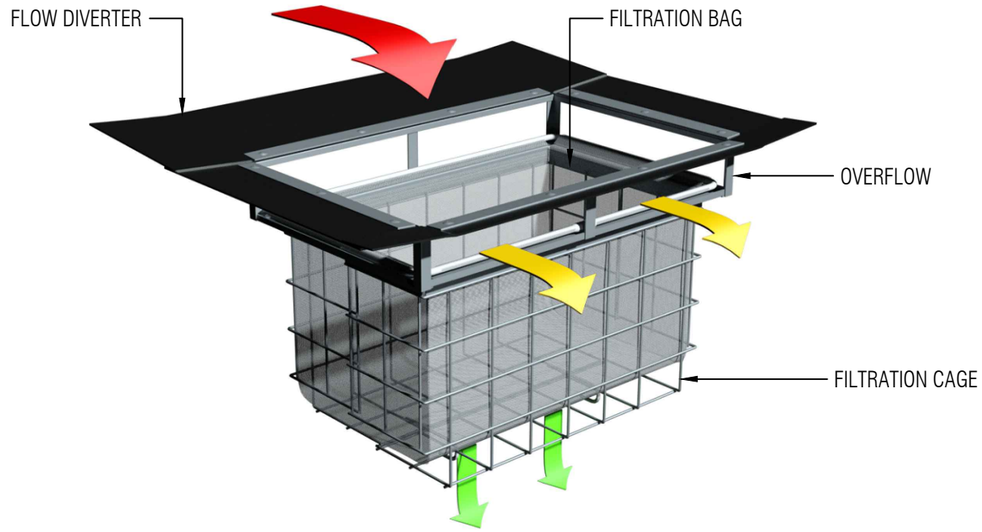


GRATED STRIP DRAIN CONFIGURATION

PLAN ID	MAXIMUM PIT PLAN DIMENSIONS
S	450mm x 450mm
M	600mm x 600mm
L	900mm x 900mm
XL	1200mm x 1200mm

DEPTH ID	BAG DEPTH	OVERALL DEPTH
1	170	270
2	300	450
3	600	700

		DEPTH ID		
		1	2	3
PLAN ID	S	■		
	M	■	■	
	L	■	■	■
	XL	■	■	■



GENERAL NOTES

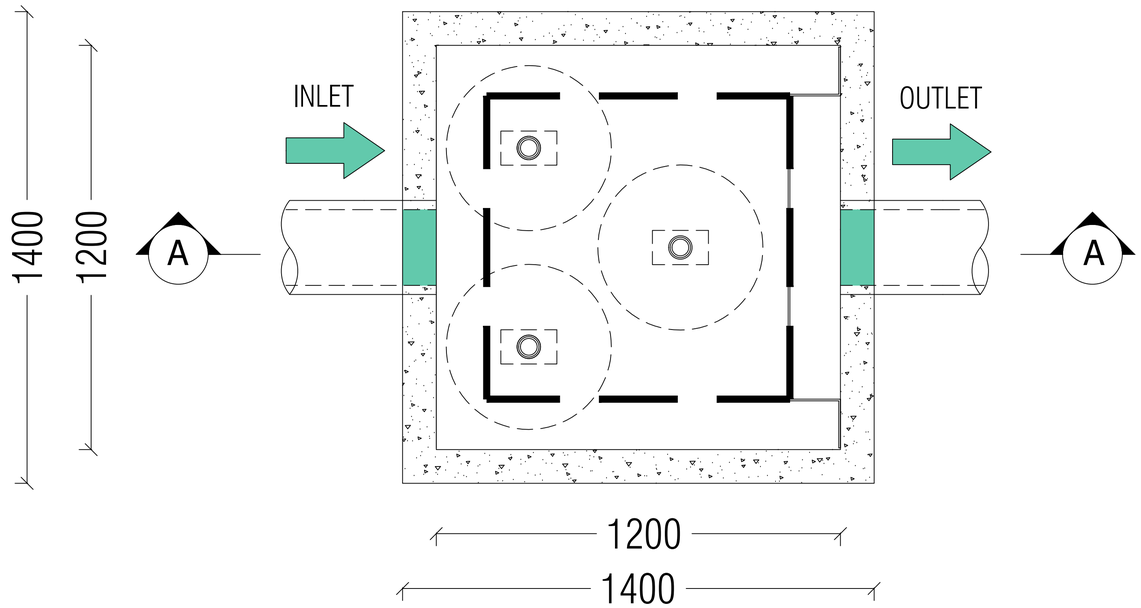
1. THE MINIMUM CLEARANCE DEPENDS ON THE CONFIGURATION (SEE NOTE 2) AND THE LOCAL COUNCIL REQUIREMENTS.
2. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO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

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

OCEAN PROTECT
OCEANGUARD
TYPCIAL ARRANGEMENTS
SPECIFICATION DRAWING

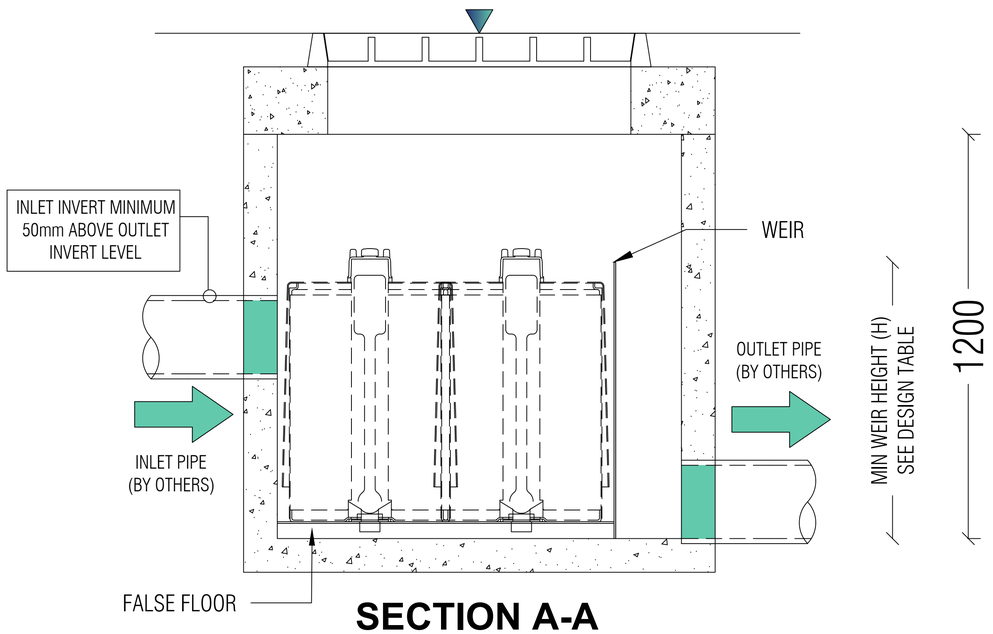
LAST MODIFIED: 15-10-19

NOT FOR CONSTRUCTION



PLAN LAYOUT

900 SQUARE CAST-IRON SOLID TOP
ACCESS COVER SUPPLIED LOOSE
(OR CAST INTO LID IF REQUIRED)

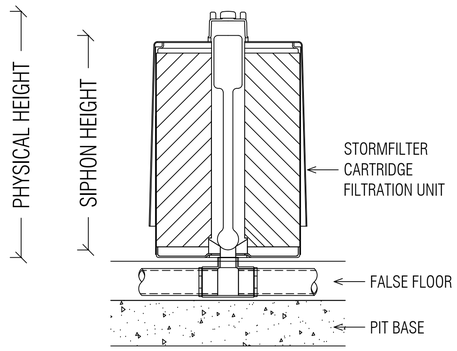


SECTION A-A

STORMFILTER DESIGN TABLE

- 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.

CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
MINIMUM WEIR HEIGHT [H] (mm)	820	590	440
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.6	1.1	0.7
CARTRIDGE FLOW RATE FOR PSORB MEDIA (L/s)	0.9	0.46	0.39



STORMFILTER CARTRIDGE DETAIL

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	[ ]
NUMBER OF CARTRIDGES REQ'D	[ ]
SIPHON HEIGHT (310 / 460 / 690)	[ ]
MEDIA TYPE (ZPG / PSORB)	[ ]
WATER QUALITY FLOW RATE (L/S)	[ ]
HYDRAULIC CAPACITY (L/S)	[ ]

PIPE DATA:	I.L.	MATERIAL	DIAMETER
INLET PIPE #1	[ ]	[ ]	[ ]
INLET PIPE #2	[ ]	[ ]	[ ]
INLET PIPE #3	[ ]	[ ]	[ ]
OUTLET PIPE	[ ]	[ ]	[ ]

PRECAST PIT WEIGHT	TBA
LID WEIGHT	TBA

GENERAL NOTES

1. PRECAST STRUCTURE SUPPLIED WITH CORE HOLES 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. 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.
4. ALL WATER QUALITY TREATMENT DEVICES REQUIRE PERIODIC MAINTENANCE. REFER TO OPERATION AND MAINTENANCE MANUAL FOR GUIDELINES AND ACCESS REQUIREMENTS.
5. SITE SPECIFIC PRODUCTION DRAWING WILL BE PROVIDED ON PLACEMENT OF ORDER.
6. 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.

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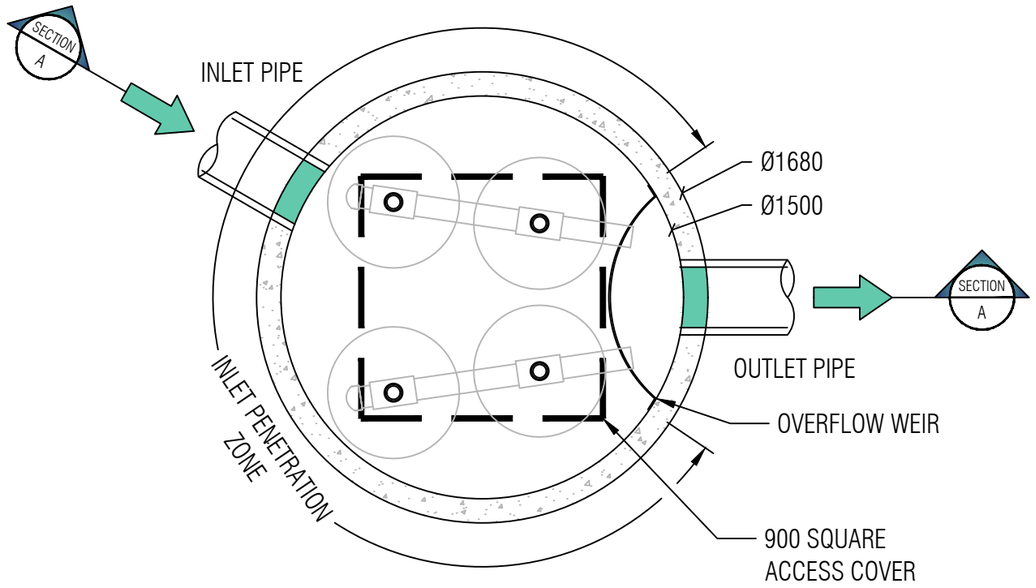
OCEAN PROTECT
3 CARTRIDGE STORMFILTER SYSTEM
1200 PIT
SPECIFICATION DRAWING

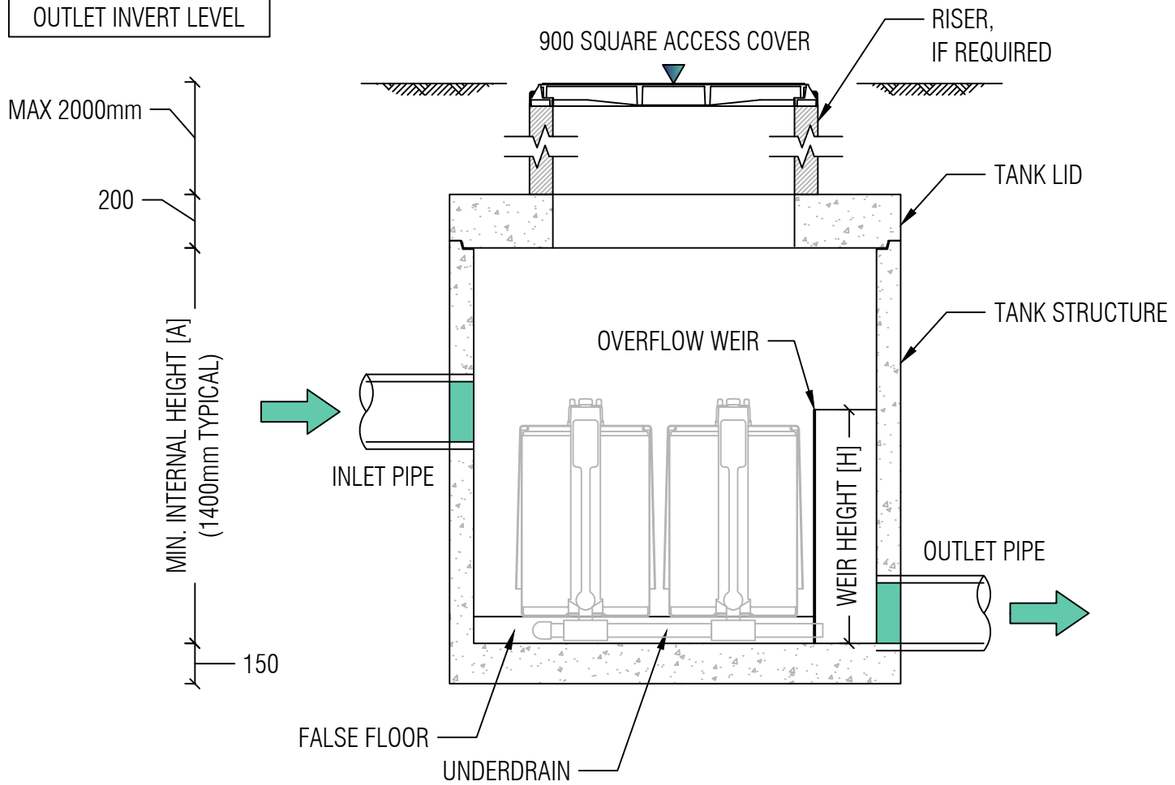
LAST MODIFIED: 18.10.2023

NOT FOR CONSTRUCTION



PLAN LAYOUT

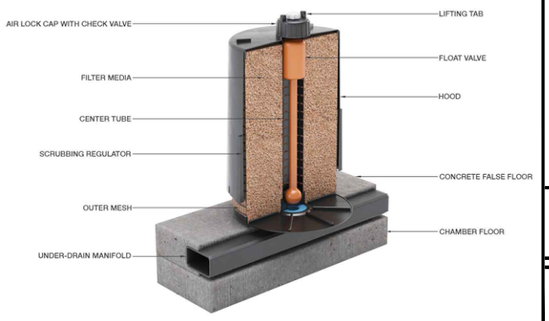
INLET INVERT LEVEL
MINIMUM 100mm ABOVE
OUTLET INVERT LEVEL



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	TBA
TANK LID WEIGHT (kg)	TBA

CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
TYPICAL WEIR HEIGHT [H] (mm)	910	680	530
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.60	1.10	0.70
CARTRIDGE FLOW RATE FOR PSORB (SQIDEP) MEDIA (L/s)	1.26	0.86	0.60
CARTRIDGE FLOW RATE FOR PSORB MEDIA (L/s)	0.90	0.46	0.39
MINIMUM INTERNAL HEIGHT [A] (mm)	1100	850	850

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.

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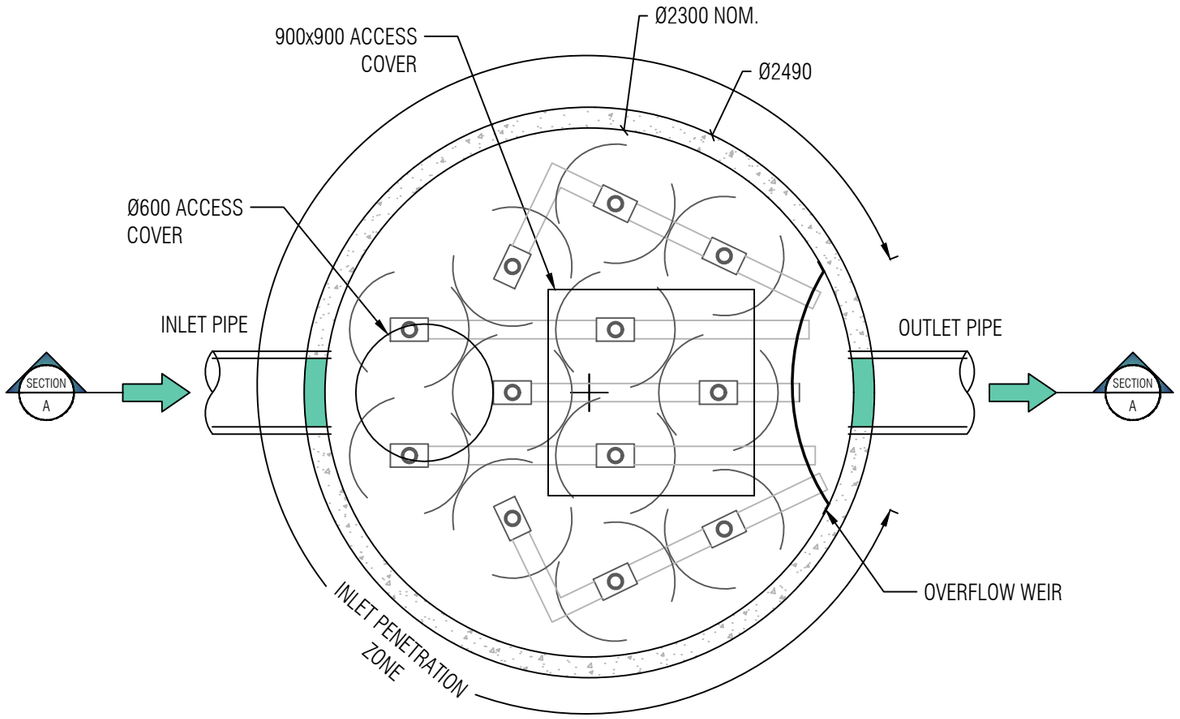
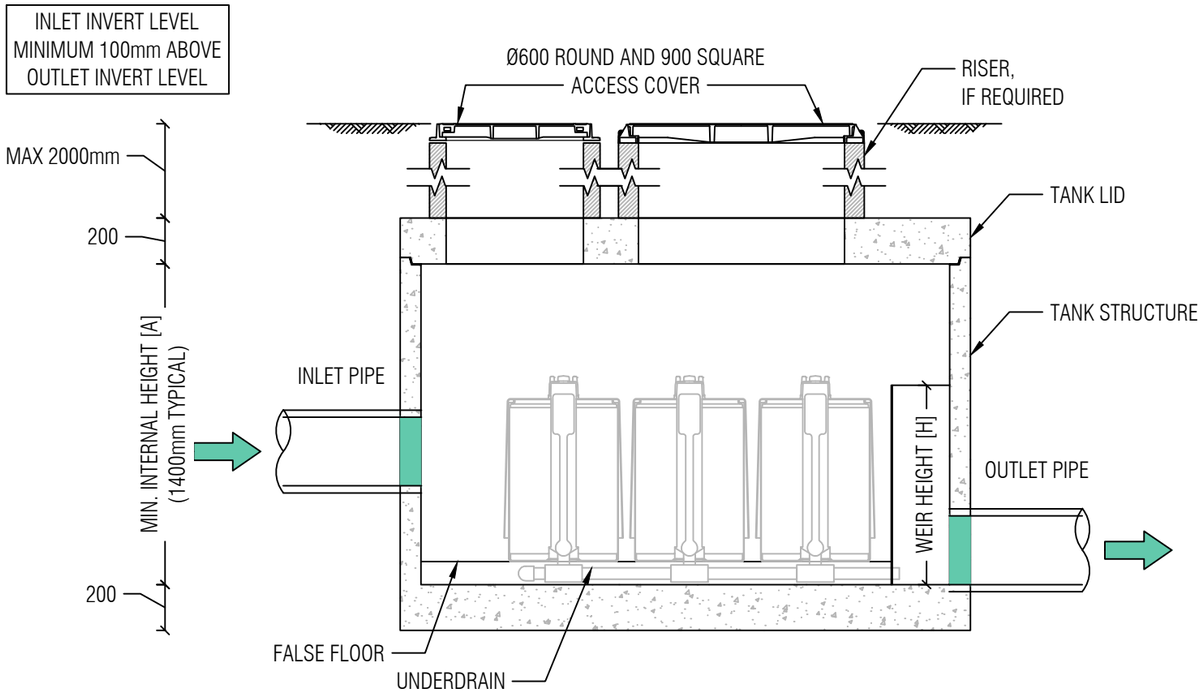
OCEAN PROTECT
4 CARTRIDGE STORMFILTER SYSTEM
DN1500 MANHOLE
SPECIFICATION DRAWING

NOT FOR CONSTRUCTION

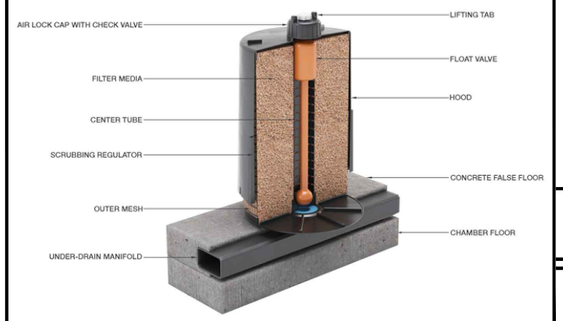


PLAN LAYOUT



SECTION A

STORMFILTER DESIGN PARAMETERS



- STORMFILTER TREATMENT CAPACITY VARIES BY NUMBER OF FILTER CARTRIDGES INSTALLED.
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- 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 12
HYDRAULIC CAPACITY (L/S)	90
MAX. COMPONENT WEIGHT (kg) *MASS VARIABLE	7000
TANK LID WEIGHT (kg)	1900

CARTRIDGE NAME / SIPHON HEIGHT (mm)	690	460	310
CARTRIDGE PHYSICAL HEIGHT (mm)	840	600	600
TYPICAL WEIR HEIGHT [H] (mm)	910	680	530
CARTRIDGE FLOW RATE FOR ZPG MEDIA (L/s)	1.60	1.10	0.70
CARTRIDGE FLOW RATE FOR PSORB (SQIDEP) MEDIA (L/s)	1.26	0.86	0.60
CARTRIDGE FLOW RATE FOR PSORB MEDIA (L/s)	0.90	0.46	0.39
MINIMUM INTERNAL HEIGHT [A] (mm)	1100	850	850

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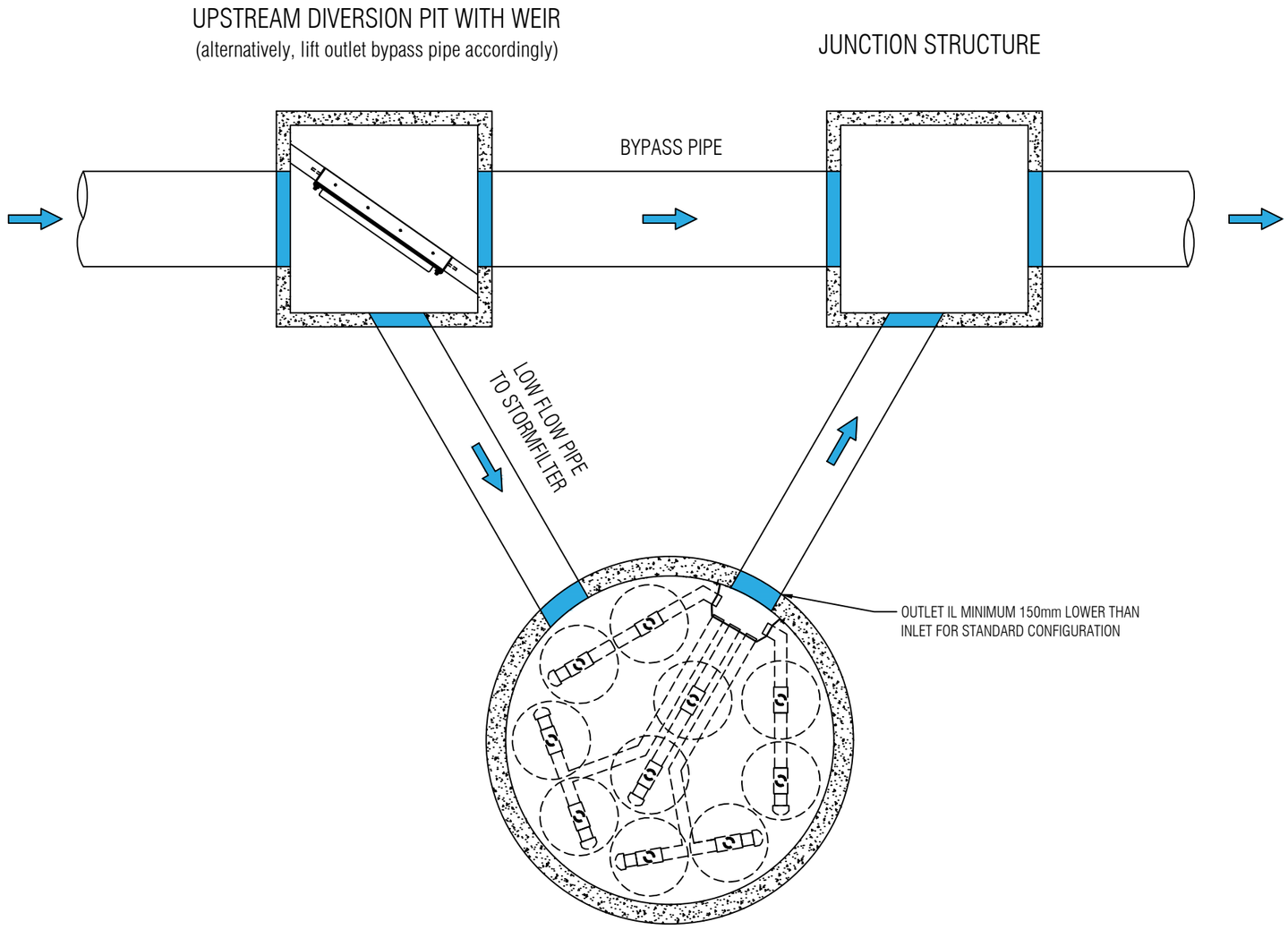
OCEAN PROTECT
12 CARTRIDGE STORMFILTER SYSTEM
DN2300 MANHOLE
SPECIFICATION DRAWING

LAST MODIFIED: 26-06-24



PLAN OF TYPICAL OFFLINE LAYOUT

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

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

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 – UU SAN RESULTS

Urban Utilities
GPO Box 2765
BRISBANE QLD 4001
Phone: 07 3432 2200
www.urbanutilities.com.au/development

14 May 2024

Ali Al-Najjar
Lucid Consulting Engineers (QLD) Pty Ltd
9/215 Adelaide Street,
Brisbane QLD 4000

Via Email: Ali.Al-Najjar@lucidconsulting.com.au

Dear Ali,

Urban Utilities Services Advice Notice

Application number:	24-OTH-71812
Applicant name:	Ali Al-Najjar, Lucid Consulting Engineers (QLD) Pty Ltd
Street address:	17 Karakul Rd, Hamilton QLD 4007
Real Property Description:	Lot 1 on SP337697

Proposed service connection/alteration/disconnection type:

Drinking water	☑
Non-drinking water/Recycled water	☐

Urban Utilities provides this Services Advice Notice in response to the request received on 03 May 2024. In accordance with section 99BRAC(3) of the *South East Queensland Water (Distribution and Retail Restructuring) Act 2009,* this Services Advice Notice provides advice about the proposed connection having regard to the connections policy in the Urban Utilities Water Netserv Plan, the charges and conditions that may apply to the connection and other relevant matters about the connection. All terms used in this Services Advice Notice are defined by reference to the Urban Utilities Water Netserv Plan.

Indicative flow and pressure advice has been requested for the existing water main adjacent to the subject site.

Urban Utilities Services Advice

Infrastructure and Design

Water

The subject site is currently serviced by an existing 2 x 20mm water services via existing 150mm Unplasticised Polyvinyl Chloride (uPVC) reticulation main at Macarthur Avenue (constructed in 2012).

In addition to the above, there is also an existing 180mm Polyethylene (PE) reticulation main at Barcham and Karakul Road (constructed in 2023).

Figure 1: Water supply infrastructure in the vicinity of the subject site

Note that design of any water infrastructure is to be undertaken in accordance with QUU requirements, including but not limited to the SEQ Water Supply *and Sewerage Design and Construction Code* (SEQ WS&S D&C Code, 2013), or current equivalent.

Network Demand and Capacity

Water

Indicative flow and pressure advice (Test 1) for the existing 150mm Unplasticised Polyvinyl Chloride (uPVC) reticulation main at Macarthur Avenue (constructed in 2012) is provided in Table 1, below.

Please note:

- The maximum available flow is 42 L/s (within permissible pressure drops in the network).

Table 1: Indicative Flow and Pressure Advice

Assumed Point of Connection	Estimated RL Connection (m AHD)	Hydraulic Grade Line (m AHD)					
		0 L/s	10 L/s	20 L/s	30 L/s	40 L/s	42 L/s
150mm (uPVC) constructed in 2012	4.19	75.2	74.2	72.2	69.2	66.2	65.2
		Pressure (kPa) [1]					
		0 L/s	10 L/s	20 L/s	30 L/s	40 L/s	42 L/s
		697	687	667	638	608	598

Indicative flow and pressure advice (Test 2) for the existing 180mm Polyethylene (PE) reticulation main at Karakul Road (constructed in 2023) is provided in Table 2, below.

Please note:

- The maximum available flow is 43 L/s (within permissible pressure drops in the network).

Table 2: Indicative Flow and Pressure Advice

Assumed Point of Connection	Estimated RL Connection (m AHD)	Hydraulic Grade Line (m AHD)					
		0 L/s	10 L/s	20 L/s	30 L/s	40 L/s	43 L/s
180mm (PE) constructed in 2023	4.20	75.2	74.2	72.2	70.2	66.2	65.2
		Pressure (kPa) [1]					
		0 L/s	10 L/s	20 L/s	30 L/s	40 L/s	43 L/s
		697	687	667	647	608	598

Notes: [1] Modelled pressure in supply main.

[2] Designers are required to adjust the Hydraulic Grade Line/Pressure model results for site/building RL differences and calculate the extra hydraulic losses from point of connection with the main.

[3] Field performance of cast iron spun (or cement) lined mains can be variable. Field testing to ascertain actual pressure drops may be advisable.

[4] Indicative flow and pressure results assume a background demand of 2/3 Peak Hour has been applied throughout the network.

Disclaimer

Information provided by Urban Utilities is based on hydraulic modelling ("Hydraulic Modelling Information"). Model results are for the anticipated performance. The Hydraulic Modelling Information has not been verified by field measurements and may be inaccurate due to field conditions.

As such, users relying on Hydraulic Modelling Information do so at their own risk and should make their own independent investigations to verify model outputs.

The Hydraulic Modelling Information does not state nor imply a guaranteed level of service. Designers are referred to Urban Utilities' Customer Charter and Customer Service Standards for facility hydraulic service considerations. Urban Utilities does not provide a service of minimum flows and pressures to private fire-fighting systems.

Due to changing operational circumstances, pressure and flows delivered to a service may vary. Designers are advised to make adequate provisions within the fire system installation for the pressure, flow and reliability requirements, for the life of the system.

Designs incorporating flows above the maximum rates specified will have a detrimental impact on other properties in the area and are not supported by Urban Utilities.

This *Services Advice Notice* is current for a period of twelve (12) months from the date of issue. Should you wish to proceed with applying for a service connection please lodge your application via Urban Utilities Developer Applications Portal at http://www.urbanutilities.com.au/development. Please include your Services Advice reference number in your application.

If you have any questions in relation to this Services Advice Notice, please do not hesitate to contact your account manager, Nagendra Kafley on Nagendra.Kafley@urbanutilities.com.au or 07 3856 7815.

Alternatively, please email DevelopmentEnquiries@urbanutilities.com.au.

Yours sincerely

Omid Hayati
Development Engineer
Urban Utilities

MELIORA
CONSULTING ENGINEERS

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