PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2024/1550

Date: 14 November 2024

Queensland Government

Owen.

ENGINEERING SERVICES REPORT



PREPARED FOR: CLARKES DESIGN & CONSTRUCT

LOT 28 WONGAWALLEN DRIVE, YARRABILBA

DOCUMENT CONTROL SHEET

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E: admin@owenconsulting.com.au	**Report Synopsis:** Engineering Services Report (ESR) prepared based on current site layout and preliminary engineering design.	

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TABLE OF CONTENTS

TABLE OF CONTENTS 2
TABLE OF FIGURES 3
TABLE OF TABLES 3
TABLE OF APPENDICES 3
1.0 INTRODUCTION 4
1.1 BACKGROUND 4
1.2 SCOPE 4
1.3 DESIGN BASIS 4
1.4 SITE CHARACTERISTICS 5
2.0 PROPOSED DEVELOPMENT 7
3.0 ROADWORKS 8
3.1 ROADWORKS 8
3.2 VEHICULAR CROSSOVER (VXO) / DRIVEWAYS 8
4.0 EARTHWORKS 9
4.1 GENERAL 9
4.2 ACID SULFATE SOILS 9
5.0 EROSION AND SEDIMENT MANAGEMENT 10
5.1 EROSION AND SEDIMENT MANAGEMENT DURING DEVELOPMENT PHASES 10
5.1.1 PRE-DEVELOPMENT 10
5.1.2 CONSTRUCTION 10
6.0 MONITORING AND MAINTENANCE DURING CONSTRUCTION 11
6.1 MONITORING AND MAINTENANCE – GENERAL 11
6.2 RESPONSIBILITY AND REPORTING 11
7.0 STORMWATER MANAGEMENT 12
7.1 STORMWATER QUALITY AND QUANTITY MANAGEMENT 12
7.2 FLOOD ASSESSMENT 12
7.3 LAWFUL POINT OF DISCHARGE 13
7.4 PROPOSED DRAINAGE WORKS 13
8.0 WATER RETICULATION 14
8.1 EXISTING WATER INFRASTRUCTURE 14
8.2 PROPOSED WATER CONNECTION 14
8.3 PROPOSED WATER RETICULATION WORKS 14
9.0 SEWER RETICULATION 15
9.1 EXISTING SEWER INFRASTRUCTURE 15
9.2 PROPOSED SEWER CONNECTION 15

9.3 PROPOSED SEWER RETICULATION WORKS 15
10.0 ELECTRICAL AND TELECOMMUNICATIONS 16
11.0 GAS 16
12.0 CONCLUSION 17
13.0 APPENDICES 18

TABLE OF FIGURES

FIGURE 1.1 – AERIAL VIEW AND LOCALITY PLAN 6
FIGURE 2.1 – PERSPECTIVE OF THE PROPOSED DEVELOPMENT 7

TABLE OF TABLES

TABLE 1.1 – EXISTING SITE CHARACTERISTICS 5

TABLE OF APPENDICES

APPENDIX A – EXISTING SITE SURVEY PLAN 18
APPENDIX B – PROPOSED DEVELOPMENT PLANS 18
APPENDIX C – DETAILED CIVIL ENGINEERING DESIGN PLANS 18
APPENDIX D – AS-CONSTRUCTED INFRASTRUCTURE ASSETS / DBYD INFORMATION 18
APPENDIX E –ASS AND FLOOD MAP (LOGAN CITY COUNCIL) 18
APPENDIX F – YARRABILBA PRECINCT 5 MIBA STAGE 1 SUBDIVISION PLANS 18
APPENDIX G - YARRABILBA PRECINCT 5A MIBA NORTH STORMWATER MANAGEMENT PLAN 18

1.0 INTRODUCTION

1.1 BACKGROUND

Owen Consulting has been engaged by Clarkes Design & Construct (The Applicant) to prepare an Engineering Services Report (ESR) in support of a Development Application to be submitted to Economic Development Queensland (EDQ) for the proposed Industrial Development at 99 Wongawallan Drive, Yarrabilba (referred to as the 'subject site' herein).

This report submitted to EDQ provides information to demonstrate that the existing water, sewer and stormwater infrastructure is available to service the development in accordance with the relevant EDQ guidelines and SEQ Water Supply and Sewerage Design and Construction Code. This report also addresses development earthworks and vehicular access/egress relevant to the aforementioned EDQ policies and codes.

1.2 SCOPE

This ESR provides the following.

- An assessment of the development earthworks and Erosion & Sediment Control.
- An assessment of the development vehicular access / egress.
- An assessment of the existing stormwater infrastructure and a Lawful Point of Discharge (LPD).
- Addresses the development proposed stormwater management in particular stormwater quality and quantity.
- An assessment of the existing water and sewer infrastructure and connection points.
- Addresses the development proposed water and sewer infrastructure.
- Identify potential modifications to existing infrastructure.
- An assessment of the existing electricity and telecommunications infrastructure within or adjacent to the subject site.

1.3 DESIGN BASIS

This ESR and the preliminary civil engineering drawings prepared by Owen Consulting has been undertaken based on a review of the:

- Existing Site Survey Plan (**Appendix A**) completed by *Schlencker Surveying (QLD).*
- Proposed Development Plans (**Appendix B**) completed by *Clarkes Design & Construct.*
- DBYD and as-constructed information (**Appendix D**).
- Yarrabilba Precinct 5 MIBA Stage 1 Subdivision Plans (**Appendix F**) completed by *KN Group*.
- Yarrabilba Precinct 5A MIBA North Stormwater Management Plan (**Appendix G**) completed by *DesignFlow*.

In accordance with relevant EDQ guidelines the following design standards are applicable:

- Water Supply Code of Australia (SEQ Edition – Version 1.3 – August 2019).
- Gravity Sewerage Code of Australia (SEQ Edition – Version 2.1 – September 2021).
- Water Sensitive Urban Design Technical Guidelines – Healthy Waterways.
- Queensland Urban drainage Manual (QUDM) Forth Edition 2016.
- Australian Standard AS2890 – Off-street Parking Set.
- International Erosion Control Association (IECA) – Best Erosion and Sediment Control.
- AS 3798 – Guidelines on Earthworks for Commercial and Residential Developments.

1.4 SITE CHARACTERISTICS

The subject site is located within the Yarrabilba Priority Development Area (PDA), administered by EDQ. The site comprises one (1) lot (Lot 28 on SP333768) at 99 Wongawallan Drive, Yarrabilba. The existing site characteristics have been summarised in Table 1.1 below. An aerial view / locality plan of the subject site is shown in Figure 1.1 which identifies the subject site's proximity to other proposed industrial / commercial developments that will be constructed in the future, along with a future surrounding road network. The subject site is a vacant lot.

TABLE 1.1 – EXISTING SITE CHARACTERISTICS

Feature	Description
Title	Lot 28 on SP333768
Street Address	99 Wongawallan Drive, Yarrabilba, QLD 4207
Site Area	3,180m^2 (0.318 ha)
Dimensions	Approximately 58m wide eastern (front) and western (rear) boundaries adjacent to the newly constructed extension of Wongawallan Drive and another industrial vacant Lot, respectively. Approximately 54m long northern (side) boundary adjacent to the newly constructed Edison Crescent and 54m long southern (side) boundary adjacent to a vacant industrial allotment.
Existing Dwellings or Structures	No dwelling or structure currently exists on the subject site.
Easement	No easements have been identified within the subject site.
Surrounding Land Use	The adjacent allotments are generally similar industrial / commercial type developments, being classified as 'Priority Development Area'.
Topography	Surveyed levels of the subject site range from RL:54.88 m AHD at the north-western corner of the site to RL:52.48m AHD at the south-eastern corner of the site which equates to an average grade of approximately 3%.
Vegetation	0% of the subject site is comprised of impervious surface (being roof, concrete pavement surfaces and gravel). The ground surface consists of exposed topsoil with no grassed or vegetated areas.
Vehicle Access	There is no current formalised vehicle access/egress to the subject site.
Information obtained from DBYD, as-constructed information and the detailed survey plan, identifies the following existing stormwater drainage, water reticulation and sewer infrastructure (see below).	
Stormwater Drainage	One (1) 900x900 field inlet (currently under construction) and the existing associated Ø375mm RCP pipe which exists within the site adjacent to the eastern (front) boundary of the subject site which

	connects to the existing stormwater gully pit within Wongawallan Drive and the associated Ø375mm RCP pipe. Existing stormwater drainage infrastructure located within Wongawallan Drive and Edison Crescent.
Water Reticulation	A Ø150mm mPVC potable water main is aligned within the Wongawallan Drive verge on the same side to the site frontage. A fire hydrant exists adjacent to the subject sites northern (side) boundary within the Edison Crescent road verge on the opposite side of the road.
Sewer Reticulation	One (1) Ø1050mm sewer manhole (currently under construction within the site boundary) and the associated existing Ø150mm uPVC SN8 sewer main aligned adjacent to the eastern (front) boundary of the subject site. One (1) Ø150mm uPVC sewer property connection is available to service the subject site.



FIGURE 1.1 – AERIAL VIEW AND LOCALITY PLAN

2.0 PROPOSED DEVELOPMENT

The proposed development comprises a Material Change of Use Development Application submission to EDQ, based on the following:

- Ten (10) industrial units.
- Twenty-six (26) dedicated carparking spaces.
- Dedicated hardstand pavement areas for vehicular manoeuvring and parking.
- Access / egress to the proposed development will be via two (2) 7.0m wide vehicle crossovers (VXOs) from Wongawallan Drive and Edison Crescent.
- Dedicated landscaping and grass turf areas at the site frontage and rear.
- The total site area is 3,180m^2 (or 0.318 ha).

Refer to Figure 2.1 below for the proposed development layout. And refer to **Appendix B** for the Proposed Development Plan/s.

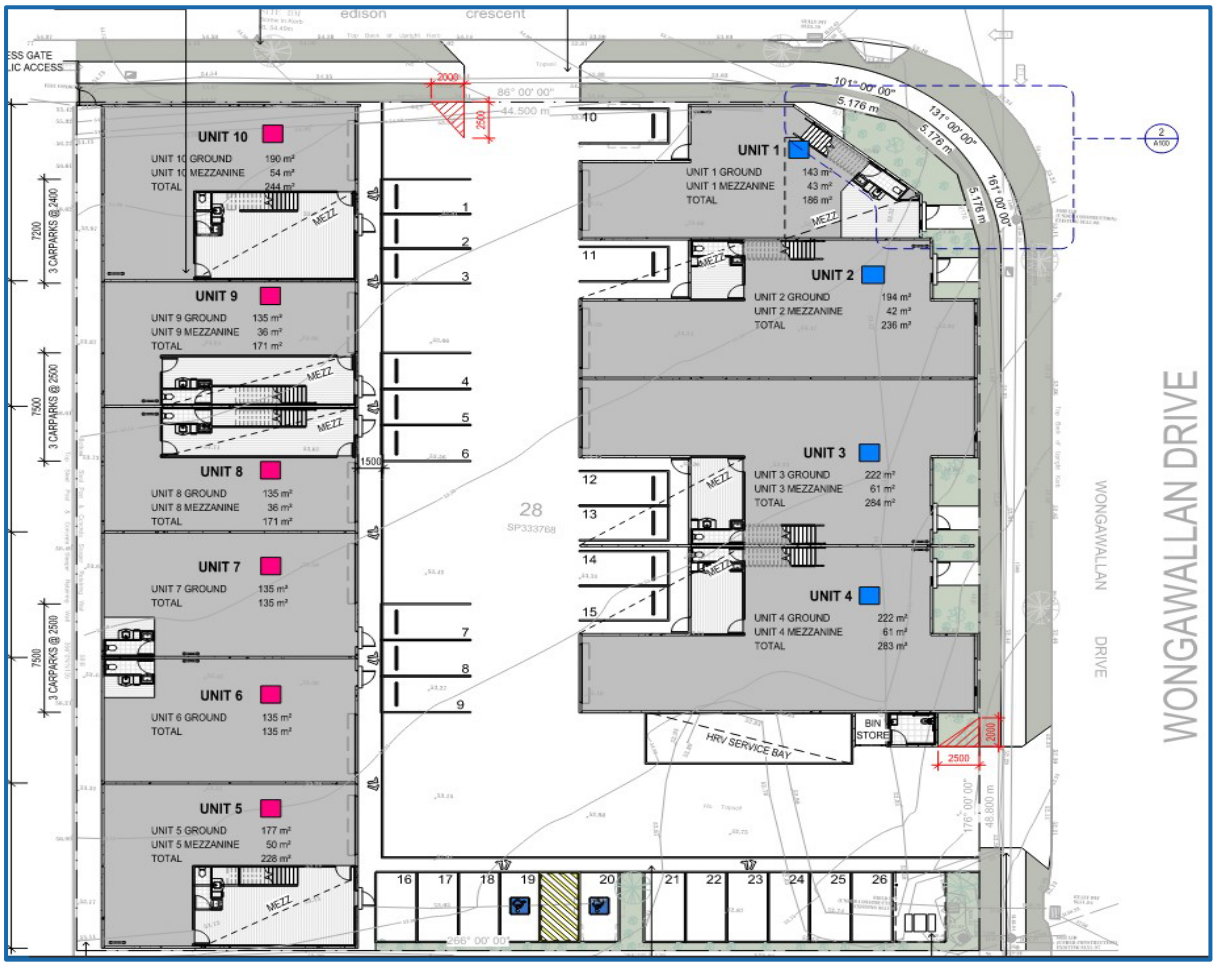


FIGURE 2.1 –PROPOSED DEVELOPMENT LAYOUT

3.0 ROADWORKS

3.1 ROADWORKS

The subject site has a total road frontage of 58.0m to Wongawallan Drive.

Wongawallan Drive is classified as an Industrial Access Street being a 24.5m wide road reserve comprising a 15.5m wide carriageway, including two (2) lanes. The verge profile is planned to be a standard cross-fall allowing for a 1.5m wide concrete footpath on both verges (footpaths currently under construction). The road seal appears to be dense-graded asphalt and considered to be in good condition.

Edison Crescent is classified as an Industrial Access Street being a 20.5m wide road reserve comprising a 11.5m wide carriageway, including two (2) lanes. The verge profile is planned to be a standard cross-fall allowing for a 1.5m wide concrete footpath on both verges (footpaths currently under construction). The road seal appears to be dense-graded asphalt and considered to be in good condition.

It is not anticipated that any road upgrading or widening will be required to Wongawallan Drive or Edison Crescent as a direct result of the proposed development nor will it be altering the existing road alignment, structure, material or the infrastructure layout provisions.

3.2 VEHICULAR CROSSOVER (VXO) / DRIVEWAYS

As part of this development, two (2) new concrete VXOs, being a 7.0m wide will be constructed in order to provide access / egress to the proposed development. The VXOs are to be constructed of concrete and interfaces with Wongawallan Drive and Edison Crescent at standard VXO longitudinal gradients.

The new VXOs will be designed in accordance with IPWEAQ standard drawing RS-051 and specifications. The new VXO shall ensure that any stormwater runoff falls back toward the Wongawallan Drive and Edison Crescent kerb and channel whilst maintaining the minimum and maximum longitudinal grades as per IPWEAQ standard drawing RS-051 and AS/NZ 2890.2, which can be achieved based on an assessment of the detail survey existing levels at the kerb & channel and the site boundary.

4.0 EARTHWORKS

4.1 GENERAL

The subject site has been cleared of any structures and all of the site consists of pervious areas, being exposed topsoil.

Bulk earthworks will be undertaken to achieve suitable building pads and hardstand pavement for a slab on-ground construction. Based on an assessment of the existing site levels and the proposed site levels, the earthworks cut / fill depths will range from +/- 0.5m in level difference from natural to proposed for a slab on-ground construction methodology.

A site geotechnical investigation and reporting by a suitably qualified Geotechnical Engineer is recommended to be completed prior to the detailed design phase of the development. The proposed earthworks over the subject site will be carried out under the appropriate level of geotechnical supervision and testing as set out in AS3798 – 2007 'Guidelines on Earthworks for Commercial and Residential Developments'.

4.2 ACID SULFATE SOILS

The site has been reviewed against Acid Sulfate Soil Mapping which has identified that the subject site is located on land well above the 20.0m AHD level. It is considered that the risk of ASS being present is low and therefore, it is unlikely to encounter any acid sulfate soils with the site.

Based on the geographical location of the subject site the disturbance and / or removal of ASS's is not anticipated. However, any geotechnical assessment should also include ASS investigation.

Refer to **Appendix E** for the Acid Sulfate Soil Mapping.

5.0 EROSION AND SEDIMENT MANAGEMENT

5.1 EROSION AND SEDIMENT MANAGEMENT DURING DEVELOPMENT PHASES

5.1.1 PRE-DEVELOPMENT

Prior to construction commencing, the following sediment and erosion control measures will be implemented to minimise disturbance and ensure water quality is maintained:

- Construction entry/exit to be installed and will comprise of a designed gravel pad or placement of hardwood logs in accordance with the IEAust Guidelines;
- Install sediment fences around the proposed bulk earthworks site (along toe of batter alignment); and
- Install dust control fences adjacent to the proposed bulk earthworks site (along property boundary).

5.1.2 CONSTRUCTION

The following measures will be undertaken to mitigate water quality impacts during construction phase:

- Sediment fences to be erected at the downstream site boundaries and at the base of all batters and stockpiles to prevent sediment transportation off site.
- All sediment control structures to be maintained in an effective manner and inspected after each storm event. No structure is to accumulate sediment above 40% of its capacity.
- During earthworks an excavated sediment trap located at the southeastern corner of the subject site will be constructed to prevent sediment transportation into stormwater management devices external to the site.
- One (1) vehicle shakedown will be implemented per site vehicle access/egress point to prevent sediment transportation off site.
- Sediment barriers will be adopted for each field inlet within the subject site to prevent sediment transportation into stormwater management devices external to the site.
- Sediment barriers will be adopted for the adjacent gully pits on Edison Cresent and Wongawallan Drive to prevent sediment transportation into stormwater management devices external to the site.

6.0 MONITORING AND MAINTENANCE DURING CONSTRUCTION

6.1 MONITORING AND MAINTENANCE – GENERAL

The following monitoring and maintenance procedures are to be undertaken by the site supervisor during all phases of the development:

- Inspections of Stormwater, Sediment and Erosion Controls are to be conducted at the end of each construction day and after each rainfall event (>25mm).
- If any validated complaints or evidence of water quality deterioration is reported downstream of the site, the following actions are to be taken:
    - Locate source of water quality deterioration
    - Construct temporary controls to prevent continuing short-term deterioration.
    - Repair existing controls, modify procedures or construct additional controls to prevent further deterioration.

The general requirement of monitoring during the construction phase will be:

- Work activities are restricted to designated construction areas;
- Erosion and sediment control devices are to be constructed/installed in accordance with the approved Erosion and Sediment Control Plans;
- Inspection of sediment fences and erosion and sediment control structures/devices on a weekly basis as well as after any rain event exceeding 25mm in 24hrs;
- Stormwater discharges from the site do not have any diverse effect on the downstream environment;
- Monitoring and recording of the performance of the drainage control devices including water quality testing where required;
- Any failure in the stormwater system shall be immediately rectified to prevent uncontrolled discharge from the site; and
- Any failure to the stormwater system causing damage to surroundings should implement immediate remedial work to the damaged areas.

6.2 RESPONSIBILITY AND REPORTING

- The contractor shall be responsible for monitoring the performance of all drainage control and erosion and sediment control devices;
- Records of any failures to devices should be kept and reported to the Construction Manager;
- Regular inspections of the devices shall be reported to the Construction Manager; and
- Inspections of the devices after heavy rainfall shall be reported to the Construction Manager.

7.0 STORMWATER MANAGEMENT

7.1 STORMWATER QUALITY AND QUANTITY MANAGEMENT

Detailed Design Plans for Yarrabilba Precinct 5 MIBA Stage 1 prepared by *KN Group* dated June 2023 was completed as part of the ultimate industrial subdivision (PDA Ref. DEV2022/1306). Refer to **Appendix F**.

In addition, an approved Stormwater Management Plan for Yarrabilba Precinct 5A MIBA North prepared by *DesignFlow* dated June 2022 was completed as part of the ultimate industrial subdivision (PDA Ref. DEV2022/1306). Refer to **Appendix G**.

As such, the following stormwater quality / quantity improvement devices apply to the proposed development of the subject site.

- Two (2) 800m^2 bioretention basins located to the south-east of the subject site which has been designed to treat flows from the subject site during the post-development scenario.
- The use of the natural terrain and constructed road crossings (over drainage features and watercourses) to attenuate increased runoff from development and use of detention zones that have been constructed as part of Precinct 1, 2 and 3 which address the development precinct requirements as part of the total site flood management strategy.

Therefore, as a stormwater quality and quantity treatment device exists, no onsite stormwater detention or stormwater quality treatment devices are required as part of this development. However, it is proposed to install the following Gross Pollutant Traps in order to satisfy engineering best practises.

- One (1) ATLAN 'Stormsack' to be installed within each of the stormwater field inlets as part of the internal stormwater drainage network.

Refer to **Appendix C** for the stormwater drainage plans for the proposed development.

7.2 FLOOD ASSESSMENT

Based on an assessment of LCC Interactive Mapping system the subject site has been identified to be within a flood hazard area, therefore the flood hazard overlay code is triggered for planning and development.

However, the approved Stormwater Management Plan for Yarrabilba Precinct 5A MIBA North prepared by *DesignFlow* dated June 2022 was completed as part of the ultimate industrial subdivision (PDA Ref. DEV2022/1306) states that no flood management infrastructure is required or proposed as part of the ultimate subdivision due to the use of the natural terrain and constructed road crossings (over drainage features and watercourses) to attenuate increased runoff from development and due to the detention zones that have been constructed as part of Precinct 1, 2 and 3 which addresses development precinct requirements as part of a total site flood management strategy. Therefore, no further flood impact assessment is required. The approved Stormwater Management Plan for Yarrabilba Precinct 5A MIBA North prepared by *DesignFlow* also shows that the subject site is above the 1% AEP flood level.

Refer to **Appendix E** for the LCC flood map.

Refer to **Appendix G** for the Stormwater Management Plan completed by *DesignFlow*.

7.3 LAWFUL POINT OF DISCHARGE

In accordance with the Queensland Urban Drainage Manual (QUDM) Fourth Edition 2016, when proposing a development, it must demonstrate that a lawful point of discharge (LPD) exists.

A lawful point of discharge exists at a particular location when the following two (2) tests can be demonstrated as per QUDM:

(i) The location of the discharge is under the lawful control of the local government or other statutory authority from whom permission to discharge has been received. This can include a park, drainage or road reserve, stormwater drainage easement; and

(ii) In discharging to that location, the discharge will not cause an actionable nuisance (i.e. a nuisance for which the current or some future neighbouring proprietor may bring an action or claim for damages arising out of the nuisance), or environmental or property damage.

Surface runoff from the existing site currently sheet flows from the north-western corner towards the south-eastern corner of the subject site. Stormwater runoff is then captured by one (1) 900x900 field inlet pit located within the site boundary at the south-eastern corner. Stormwater flows are then conveyed via Ø375mm RCP pipe to the existing stormwater gully pit within Wongawallan Drive.

Therefore, the existing 900x900 field inlet and associated Ø375mm RCP pipe located within the site at the eastern (front) boundary of the site will be considered the lawful point of discharge (LPD) for the site.

Furthermore, the existing 900x900 field inlet and associated Ø375mm RCP pipe located adjacent to the eastern (front) boundary will also satisfy points (i) and (ii) above.

7.4 PROPOSED DRAINAGE WORKS

As shown on the Preliminary Driveway and Drainage Plan (See **Appendix C**) all roofwater runoff from the new industrial units will be directed via downpipes to the internal stormwater drainage network under the hardstand pavement (driveway / car park). Stormwater will then be conveyed to the existing field inlet and associated Ø375mm RCP stormwater pipes adjacent to the eastern (front) boundary of the subject site. Surface runoff from the hardstand pavement and landscaping areas, will be collected by a series of field inlets (internal stormwater drainage network) and directed to the existing field inlet and associated Ø375mm RCP stormwater pipes adjacent to the eastern (front) boundary. Stormwater runoff from the site within the existing stormwater drainage infrastructure will then discharge to the existing stormwater gully pit within Wongawallan Drive where it will be conveyed downstream for stormwater quality / quantity management.

During major storm events (Q_{50} to Q_{100}) the hardstand pavement areas (car park) will be designed to contain overland flow (from the subject site only) within the pavement and will not be directed towards the new warehouse / self-storage buildings. The hardstand pavement area will be designed with grades / falls to direct all overland flow (in a safe manner) to the existing stormwater infrastructure located within Wongawallan Drive. All stormwater flows, up to and including the Q_{100} storm event (or 1% AEP), will be captured and conveyed by the existing stormwater infrastructure within Wongawallan Drive.

Refer to **Appendix C** for the stormwater drainage plans.

8.0 WATER RETICULATION

8.1 EXISTING WATER INFRASTRUCTURE

Information obtained from the detailed survey plan identifies the following existing water reticulation infrastructure:

- A Ø150mm mPVC potable water main is aligned within the Wongawallan Drive verge on the same side to the site frontage.
- A fire hydrant exists adjacent to the subject sites northern (side) boundary within the Edison Crescent road verge on the opposite side of the road.

Refer to **Appendix A** for the existing site survey plan.

Refer to **Appendix F** for the Yarrabilba Precinct 5 MIBA Stage 1 Subdivision Plans.

8.2 PROPOSED WATER CONNECTION

It is proposed to connect to the existing Ø150mm mPVC potable water main is aligned within the Wongawallan Drive verge on the same side to the site frontage in order to service the proposed development. Refer to **Appendix C** for the Sewer and Water Reticulation Plan, which identifies the proposed connection point.

8.3 PROPOSED WATER RETICULATION WORKS

As shown on the Sewer and Water Reticulation Plan prepared by *Owen Consulting* (Refer **Appendix C**) the following water reticulation works are proposed:

- A new water property service connection and water meter will be constructed in order service the proposed development for potable water and fire-fighting purposes.
- The exact size and arrangement of the water property service and water meter is to be confirmed by the hydraulic consultant. The design of the water property service and water meter will be in accordance with the Water Supply Code of Australia – SEQ Service Providers Edition – Version 1.3 (August 2019).

9.0 SEWER RETICULATION

9.1 EXISTING SEWER INFRASTRUCTURE

Information obtained from the detailed survey plan identifies the following existing sewer reticulation infrastructure:

- One (1) Ø1050mm sewer manhole (currently under construction within the site boundary) and the associated existing Ø150mm uPVC SN8 sewer main aligned adjacent to the eastern (front) boundary of the subject site.
- One (1) Ø150mm uPVC sewer property connection is available to service the subject site.

Refer to **Appendix A** for the existing site survey plan.

Refer to **Appendix F** for the Yarrabilba Precinct 5 MIBA Stage 1 Subdivision Plans.

9.2 PROPOSED SEWER CONNECTION

It is proposed to reuse the existing Ø150mm uPVC sewer property connection as identified within the Site Survey Plan. The sewer property connection connects to a Ø1050mm sewer manhole (currently under construction) located within the subject site. Refer to **Appendix C** for the Sewer and Water Reticulation plan, which shows the connection point.

Refer to **Appendix A** for the Site Survey which displays the adopted invert levels for the existing sewer infrastructure.

9.3 PROPOSED SEWER RETICULATION WORKS

As shown on the Sewer and Water Reticulation Plan prepared by *Owen Consulting* (Refer **Appendix C**) it is proposed to reuse the existing Ø150mm uPVC sewer property connection from the Ø1050mm sewer manhole (currently under construction) located within the subject site boundary in the southeast corner. A Ø150mm uPVC SN8 sewer main aligned adjacent to the eastern (front) boundary of the subject site shall connect the subject site to the broader sewer network within the ultimate subdivision. The existing Ø150mm uPVC sewer property connection will service the new industrial development in accordance with the Gravity Sewerage Code of Australia – SEQ Service Providers Edition – Version 2.1 (September 2021).

10.0 ELECTRICAL AND TELECOMMUNICATIONS

Information obtained from Dial Before you Dig (DBYD) indicates that the site can be serviced by electrical infrastructure at the following locations:

- Underground electricity (Energex) infrastructure is currently unavailable within Wongawallan Drive and Edison Crescent.

Information obtained from DBYD indicates that the site can be serviced by telecommunications at the following locations:

- Telstra infrastructure is currently unavailable within Wongawallan Drive and Edison Crescent.
- NBN infrastructure is currently unavailable within Wongawallan Drive and Edison Crescent.

It is anticipated that electrical and telecommunication services will be made available as part of the ultimate subdivision, however it is recommended that the aforementioned is confirmed with an Electrical Engineer and / or the relevant asset owner.

It is recommended that service locating via electronic location and / or potholing be completed prior to detailed design and construction in order to confirm the exact location and depth of the existing underground utilities, where any proposed works (disturbance) is to be undertaken within the vicinity of the existing infrastructure.

Refer to **Appendix D** for asset owner information obtained from DBYD.

11.0 GAS

Data obtained from DBYD indicates that there is no APA gas main infrastructure located adjacent to the subject site. Refer to **Appendix D** for asset owner information obtained from DBYD.

12.0 CONCLUSION

Following our review of the following:

- Roadworks including the existing surrounding road network and the proposed vehicular crossovers.
- Earthworks including bulk earthworks and acid sulfate soils assessment.
- Erosion and sediment management.
- Stormwater management including stormwater quality and quantity management, flood management, the lawful point of discharge and the proposed drainage works.
- Existing water infrastructure and proposed water infrastructure.
- Existing sewer infrastructure and proposed sewer infrastructure.

We hold the opinion that the subject site can be adequately serviced by the existing infrastructure / current site conditions without significant augmentation or modification.

13.0 APPENDICES

APPENDIX A – EXISTING SITE SURVEY PLAN

APPENDIX B – PROPOSED DEVELOPMENT PLANS

APPENDIX C – DETAILED CIVIL ENGINEERING DESIGN PLANS

APPENDIX D – AS-CONSTRUCTED INFRASTRUCTURE ASSETS / DBYD INFORMATION

APPENDIX E –ASS AND FLOOD MAP (LOGAN CITY COUNCIL)

APPENDIX F – YARRABILBA PRECINCT 5 MIBA STAGE 1 SUBDIVISION PLANS

APPENDIX G - YARRABILBA PRECINCT 5A MIBA NORTH STORMWATER MANAGEMENT PLAN

APPENDIX A

Existing Site Survey Plan

EDISON CRESCENT

WONGAWALLAN DRIVE

SITE BM
Screw in Kerb
RL 54.49m

28
SP333768

5001
SP333768

Emt AA
SP333768

No Topsoil

Top Back of Upright Kerb

Top Steel Post & Concrete Sleeper Retaining Wall

Bottom Steel Post & Concrete Sleeper Retaining Wall

ELEC CONDUITS

SMH LID (under construction) Existing SL53.06

SMH LID (under construction) Existing SL52.02

SMH LID (under construction) Existing SL50.97

Field Pit (under construction) Existing SL51.89

Gully Pit SL53.39

Gully Pit SL51.94

OMH SL53.54

VERTICAL CONDUIT

RECORDS

86°00' 44.5

101°00' 5.176

13°00' 5.176

16°00' 5.176

358°00' 58.8

266°00' 54.5

176°00' 46.8

Photo 1



Photo 2

Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



General Notes

This Plan has been prepared for the Client under specific instructions as per the Job Number & date of this plan. It is suitable for the purposes of Engineering & Architectural Design only and is not to be used by any other person or corporation or for any other purpose, and is subject to the following limitations:

1) The boundaries shown hereon have been determined from plan dimensions only and not by field survey. No search has been undertaken for Easements or other encumbrances on Title.

2) No report is made on any services or features other than those shown hereon. Services have been located from visible indicators and dwg x23-101base supplied by Clarkes Design & Construct (28/5/2024). No Records available from Before You Dig Australia (BYDA). Prior to any demolition, excavation or construction, relevant Authorities should be contacted for the possible location of further services and detailed location of all services.

3) Legend

1. Sewer
2. Water
3. Stormwater
4. Commun O/head
5. Commun U/ground
6. Electricity O/head
7. Electricity U/ground
8. Gas
9. Top of Bank
10. Toe of Bank
11. Surface & Level with No Topsoil — x 5.92

4) These notes form an integral part of this plan and no part of this plan may be reproduced in whole or in part without these notes.

AMENDMENTS

DESCRIPTION	DATE

SCHLENCKER SURVEYING (QLD)
Gold Coast ♦ Brisbane
Consultants in Surveying, Mapping & Development
A.B.N. 36 909 833 411
PO Box 41
Helensvale QLD 4212
Suite 206
Helensvale Professional Centre
3 Sir John Overall Dr
Helensvale QLD 4212
P: (07) 5573 6744
M: 0413 945 959
E: mail@ssq.net.au

DETAIL & LEVEL SURVEY

Lot 28 on SP333768

LOGAN CITY COUNCIL

99 WONGAWALLAN DRIVE, YARRABILBA

Level Datum : AHD Derived
Level Origin - PSM 186643 via Network RTK — RL 60.513m
Contours at 0.25m intervals.

SURVEYED	DATE
TB	14/6/2024

DRAWN	DATE	CHECKED	DATE
RJB	17.6.2024	TB	18.6.2024

SCALE @ A1: 1:150
DWG. NO.: 24059–02

Scale 1:150 @ A1 – Lengths are in metres.

2 0 2 4 6 8 10 12 14 16 18 20 22

J:\24059 CDC – Wongawallan L28\Drawings\24059–02 DTM.dwg

APPENDIX B

Proposed Development Plans

LOT 28 WONGAWALLAN DRIVE, YARRABILBA

PROPOSED DEVELOPMENT



Revisions

Rev	Date	By	Description
A	24/04/24	GP	PRELIMINARY UPDATE
B	20/05/24	TB	POD APPROVAL ISSUE
C	24/05/24	TB	COLOURS UPDATED
D	28/05/24	TB	PANELS UPDATED
E	05/06/24	TB	IR RESPONSE
F	05/08/24	TB	IR RESPONSE
G	18/09/24	TB	MCU ISSUE

Designer

CLARKE'S
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A: 1/19 Harrington Street, Arundel, QLD 4214

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www.clarkes.net.au
ABN: 716 186 319 31 **QBSA LIC:** 15054063

Project

PROPOSED DEVELOPMENT

Address

LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client

PJ DEVELOPMENTS

Drawing Title

COVER SHEET

Scale	Drawn	Checked	Approved
	TB	SA	AC
Date		**Project Reference No.**	
18/09/24		188PJD	
Revision	**Phase**		**Sheet No.**
G	DA		A000

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BIN STORE

ALUMINIMUM SLATS
- POWDERCOATED SURFMIST

SUN HOOD

ALUMINIUM 250 RHS
- POWDERCOATED SURFMIST

SUN SCREENS

ALUMINIUM 250 RHS
- POWDERCOATED COVE

ROLLER SHUTTER DOOR

STEEL
- COLORBOND FINISH BASALT

COMMERCIAL GRADE GLAZING
NON REFLECTIVE WITH GREY TINT

ALUMINIUM FRAMES
- POWDERCOATED SURFMIST

CONCRETE TILT PANEL WITH TEXTURE PAINT FINISH AND FALSE JOINTS

DULUX
- COVE
- MONUMENT
- DOMINO
- BASALT
- CHANSON
- SHALE GREY
- TERRACE WHITE
- SURFMIST





COVE

MONUMENT

DOMINO

BASALT

CHANSON

SHALE GREY

TERRACE WHITE

SURFMIST





FASCIA + GUTTER + FLASHING

COLORBOND
- BASALT

FOAM NUMBERS

TEXTURE DULUX
- COVE

LIGHTWEIGHT CLADDING

SCYON AXON
- BASALT

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Revisions

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Project

PROPOSED DEVELOPMENT

Address

LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client

PJ DEVELOPMENTS

Drawing Title

RENDERS

Scale	Drawn	Checked	Approved
1 : 20	TB	SA	AC

Date	Project Reference No.
18/09/24	188PJD

Revision	Phase	Sheet No.
G	DA	A001

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DEVELOPMENT DETAILS

SITE AREA	**3180m²**
SITE COVER AREA	**1769m²**
MEZZANINE RATIO	**≈ 20%**
SITE COVER PERCENTAGE	**55.62%**
SITE YIELD	**64.87%**
LANDSCAPED AREA	91m²
LANDSCAPED PERCENTAGE	3%
BIN STORAGE AREA	6.5m²

UNIT SCHEDULE

UNITS	AREA
UNIT 1 GROUND	143 m²
UNIT 1 MEZZANINE	43 m²
UNIT 2 GROUND	194 m²
UNIT 2 MEZZANINE	42 m²
UNIT 3 GROUND	222 m²
UNIT 3 MEZZANINE	61 m²
UNIT 4 GROUND	222 m²
UNIT 4 MEZZANINE	61 m²
UNIT 5 GROUND	177 m²
UNIT 5 MEZZANINE	50 m²
UNIT 6 GROUND	135 m²
UNIT 7 GROUND	135 m²
UNIT 8 GROUND	135 m²
UNIT 8 MEZZANINE	36 m²
UNIT 9 GROUND	135 m²
UNIT 9 MEZZANINE	36 m²
UNIT 10 GROUND	190 m²
UNIT 10 MEZZANINE	54 m²
TOTAL BUILDING AREA	2071 m²

CARPARK REQUIREMENTS

LOGAN CITY COUNCIL LOGAN PLANNING SCHEME 2015
GROSS FLOOR AREA (GFA) SC1.2 ADMINISTRATIVE DEFINITIONS
GROSS FLOOR AREA, FOR A BUILDING, MEANS THE TOTAL FLOOR AREA OF ALL STOREYS OF THE BUILDING, MEASURED FROM THE OUTSIDE OF THE EXTERNAL WALLS AND THE CENTRE OF ANY COMMON WALLS OF THE BUILDING, OTHER THAN AREAS USED FOR -

-BUILDING SERVICES, PLANT OR EQUIPMENT; OR
-ACCESS BETWEEN LEVELS; OR
-A GROUND FLOOR PUBLIC LOBBY; OR
-A MALL; OR
-PARKING, LOADING OR MANEUVERING VEHICLES; OR
-UNENCLOSED PRIVATE BALCONIES WHETHER ROOFED OR NOT.

CAR PARKING REQUIRED (SERVICE INDUSTRY)	
1 PER 50m² OF GFA (768m² GFA)	
CAR PARKING REQUIRED	16 OFF
CAR PARKING REQUIRED (WAREHOUSE)	
1 SPACE PER 100m² GFA (847m² GFA)	
CAR PARKING REQUIRED	9 OFF
TOTAL CAR PARKING REQUIRED	25 OFF
TOTAL CAR PARKING PROVIDED	26 OFF

SERVICE INDUSTRY - TBA

UNITS	AREA
UNIT 1 GROUND	143 m²
UNIT 1 MEZZANINE	43 m²
UNIT 2 GROUND	194 m²
UNIT 2 MEZZANINE	42 m²
UNIT 3 GROUND	222 m²
UNIT 3 MEZZANINE	61 m²
UNIT 4 GROUND	222 m²
UNIT 4 MEZZANINE	61 m²
TOTAL BUILDING AREA	988 m²

WAREHOUSE - TBA

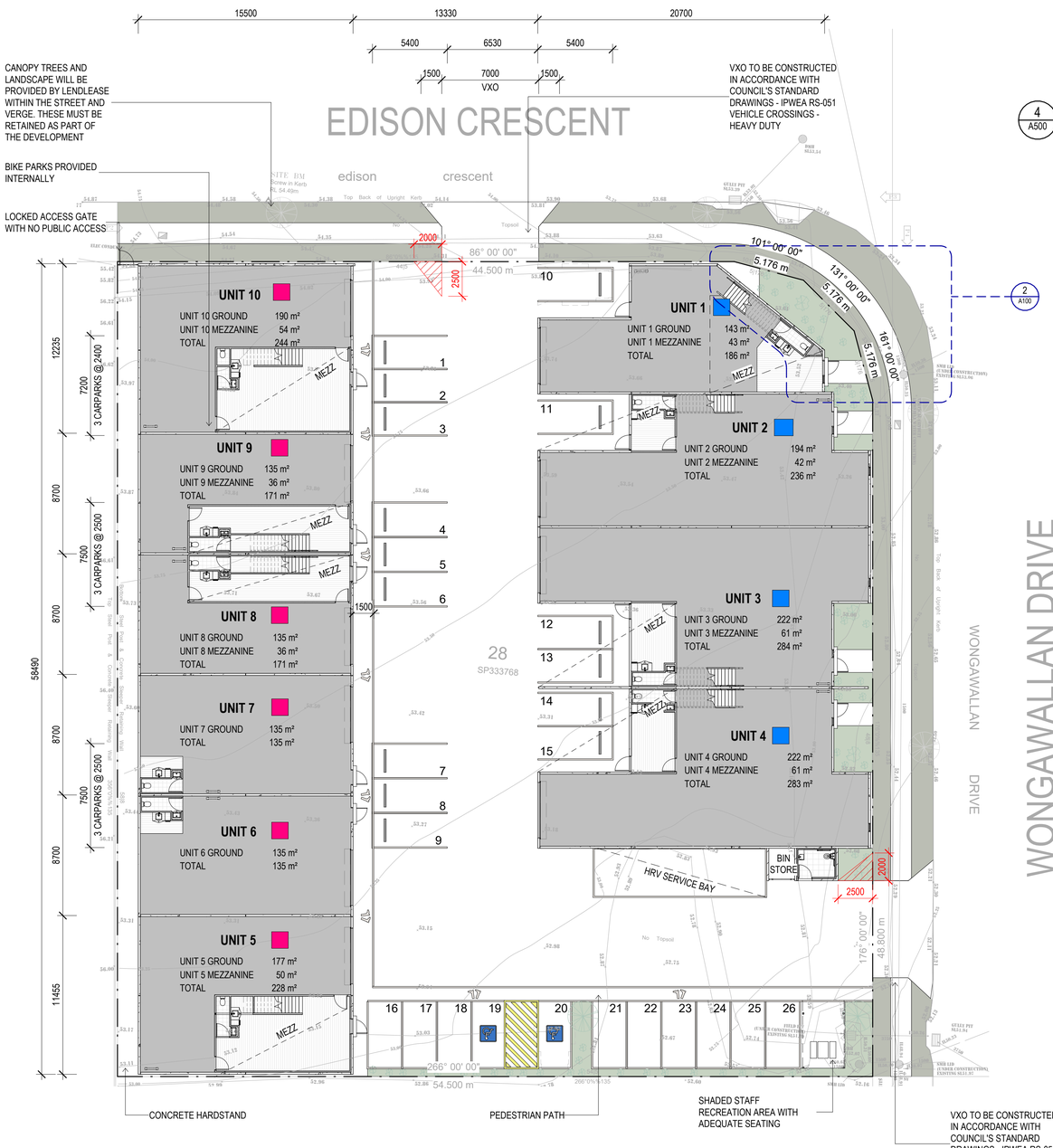
UNITS	AREA
UNIT 5 GROUND	177 m²
UNIT 5 MEZZANINE	50 m²
UNIT 6 GROUND	135 m²
UNIT 7 GROUND	135 m²
UNIT 8 GROUND	135 m²
UNIT 8 MEZZANINE	36 m²
UNIT 9 GROUND	135 m²
UNIT 9 MEZZANINE	36 m²
TOTAL BUILDING AREA	839 m²

BICYCLE SPACES REQUIREMENTS

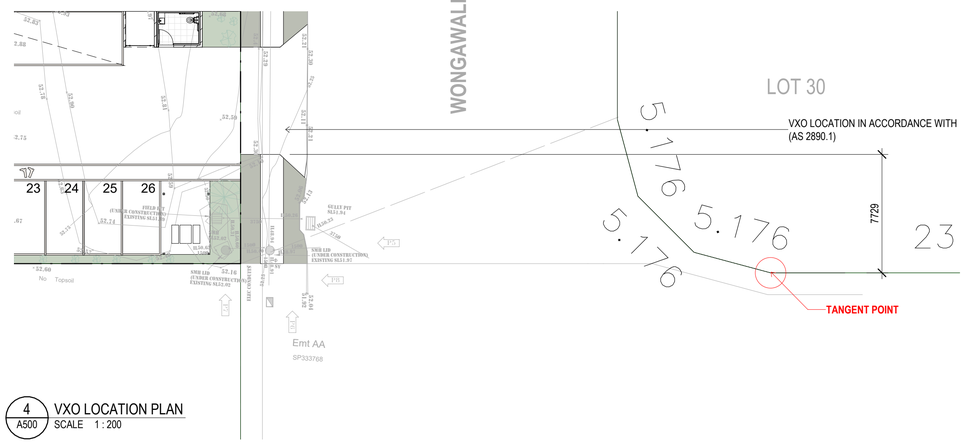
YARRABILBA MIBA
PRECINCT 2A & PART OF PRECINCT 5
PLAN OF DEVELOPMENT

BICYCLE PARKING WILL BE PROVIDED AT THE RATE OF ONE SPACE PER FIVE CAR PARKING SPACES (26/5 = 5.2)

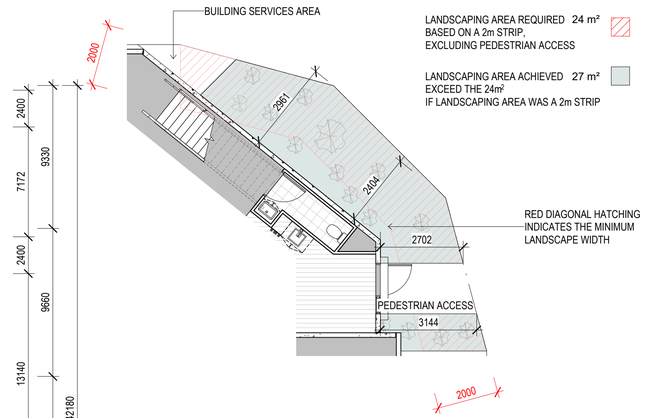
REQUIRED BICYCLE SPACES	6 OFF
PROVIDED BICYCLE SPACES	10 OFF

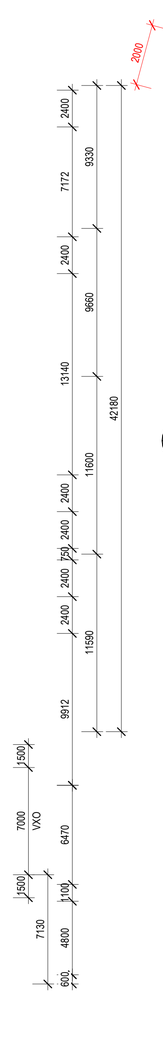


1 A500 SITE PLAN
SCALE 1 : 200



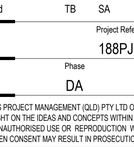
4 A500 VXO LOCATION PLAN
SCALE 1 : 200





2 A100 LANDSCAPING PLAN - CORNER OF WONGAWALLAN DR AND EDISON CRES
SCALE 1 : 100

North Point



Revisions

Rev	Date	By	Description
B	30/11/23	TB	PRELIMINARY UPDATE
C	31/11/23	TB	PRELIMINARY UPDATE
D	13/02/23	TB	PRELIMINARY UPDATE
E	24/04/24	GP	PRELIMINARY UPDATE
F	20/05/24	TB	POD APPROVAL ISSUE
G	28/05/24	TB	PANELS UPDATED
H	30/05/24	TB	SURVEY UPDATE
I	05/06/24	TB	IR RESPONSE
J	19/06/24	TB	SURVEY ADDED
K	05/08/24	TB	IR RESPONSE
L	12/09/24	TB	IR RESPONSE
M	18/09/24	TB	MCU ISSUE

Designer

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ABN: 716 186 319 31 **QBSA LIC:** 15054063

Project
PROPOSED DEVELOPMENT

Address
LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client
PJ DEVELOPMENTS

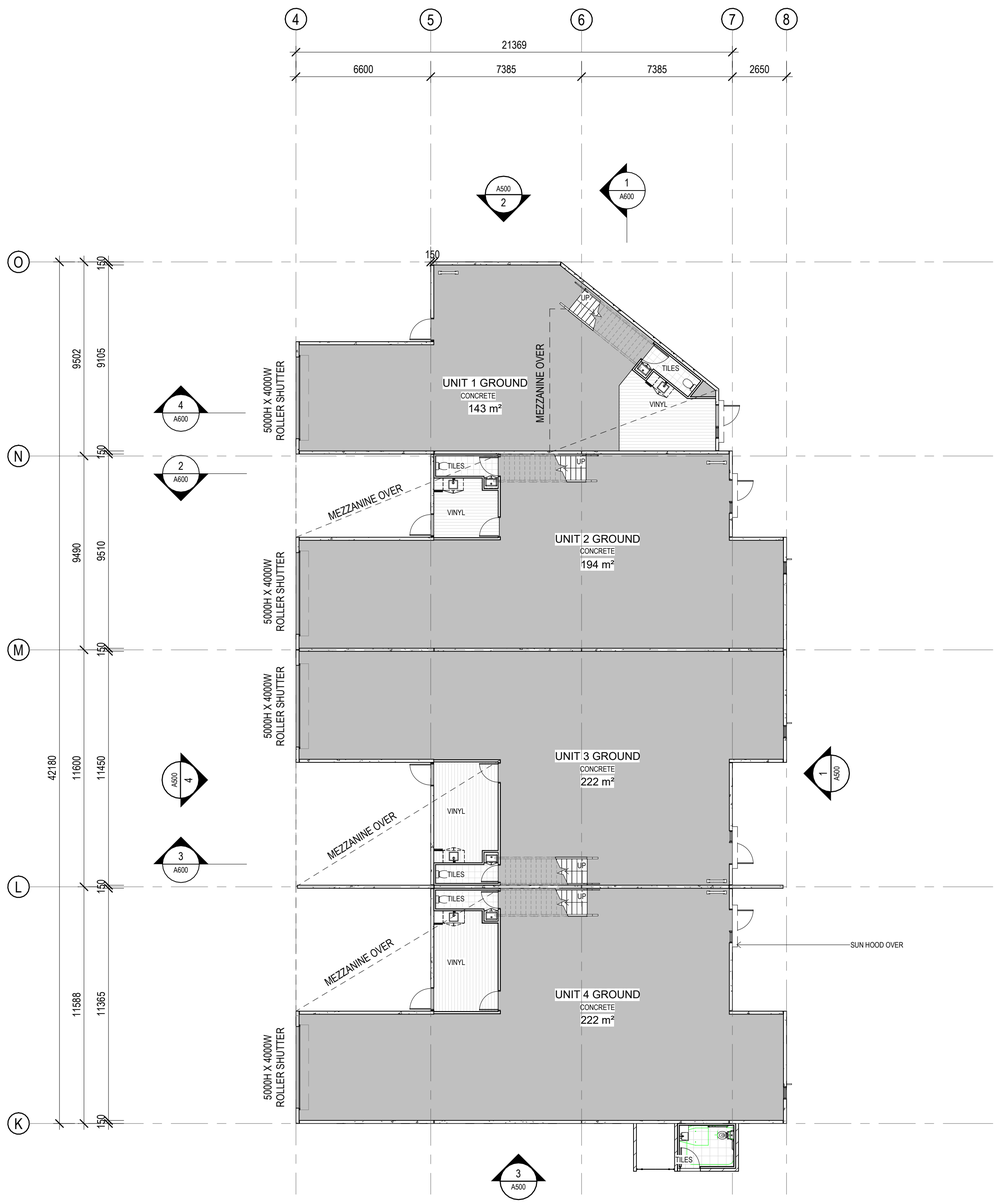
Drawing Title
SITE PLAN

Scale	Drawn	Checked	Approved
As indicated	TB	SA	AC
Date		Project Reference No.	
18/09/24		188PJD	
Revision	Phase		Sheet No.
M	DA		A100

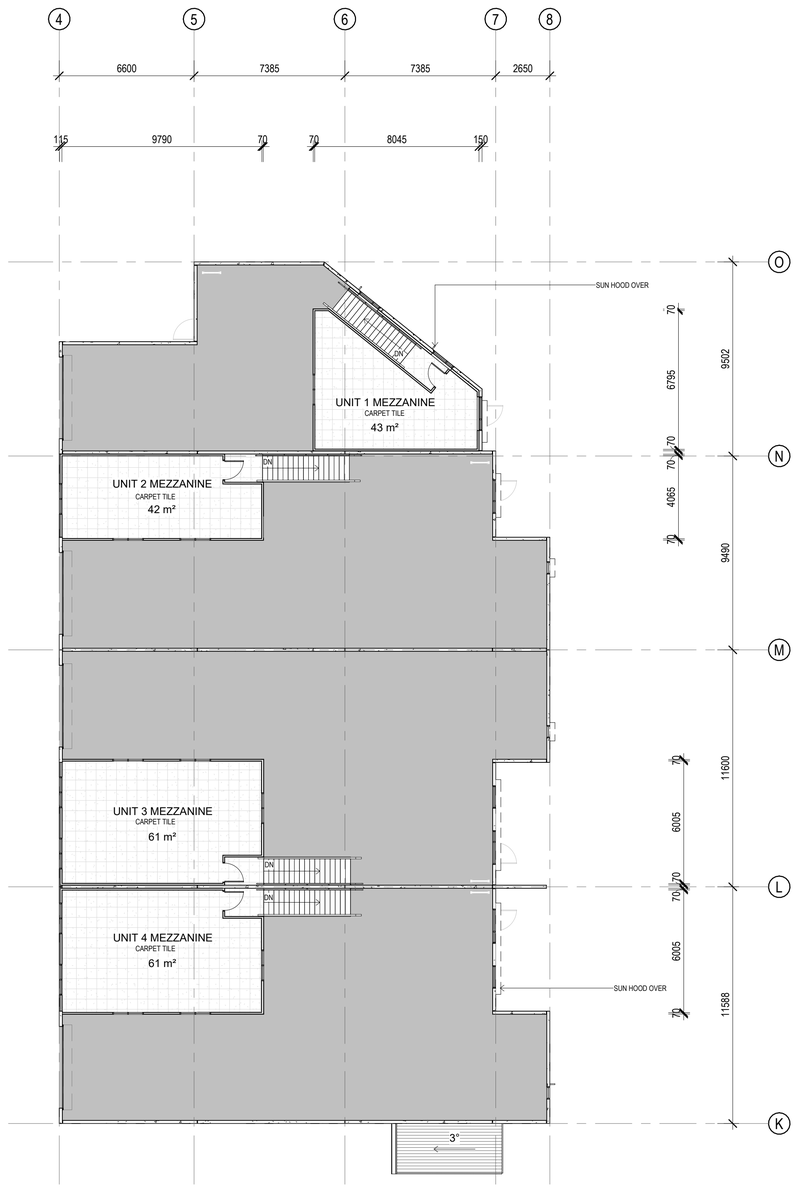
1:100 0 1 2 5m
1:200 0 2 4 10m

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1 A500 GROUND FLOOR - UNITS 1 - 4
SCALE 1 : 150



2 A500 MEZZANINE - UNITS 1 - 4
SCALE 1 : 150

1:50
0 1 2 3m

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North Point

Revisions

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A	24/04/24	GP	PRELIMINARY UPDATE
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Address
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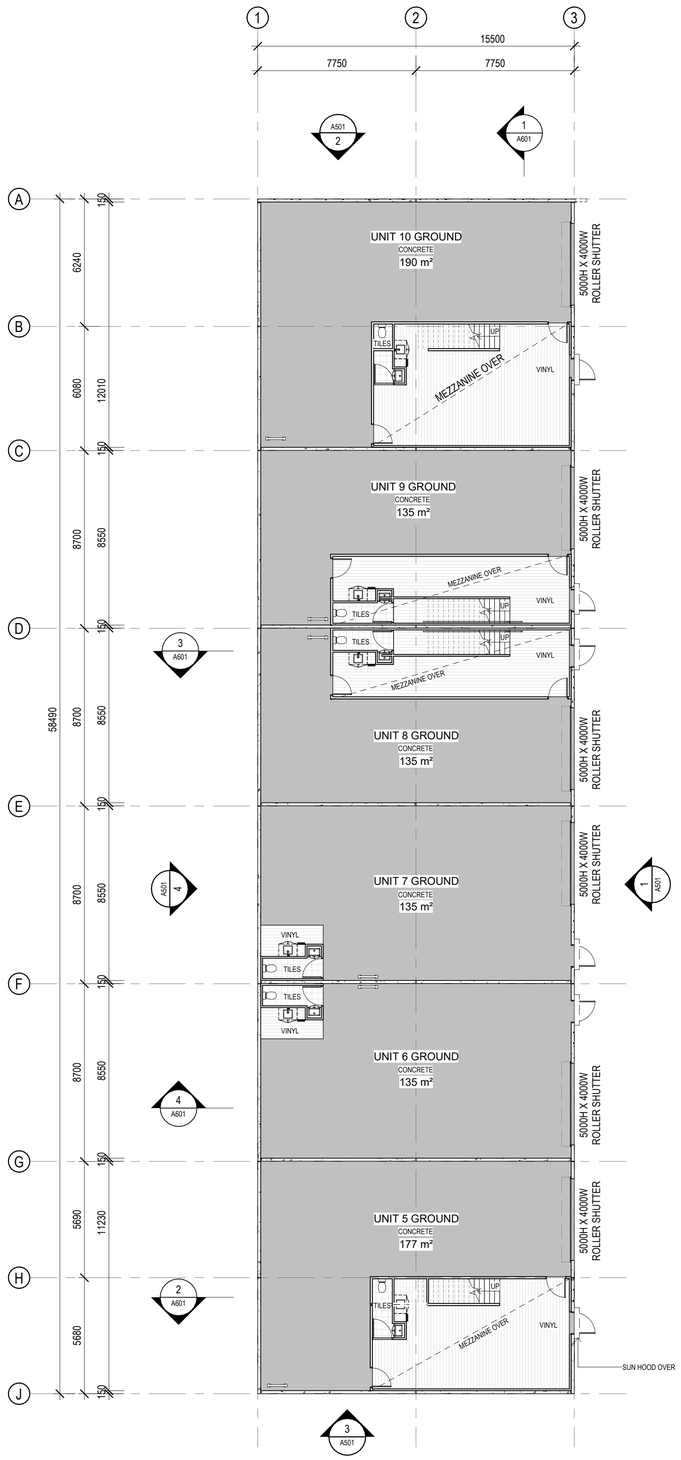
Client
PJ DEVELOPMENTS

Drawing Title
FLOOR PLANS - UNITS 1 - 4

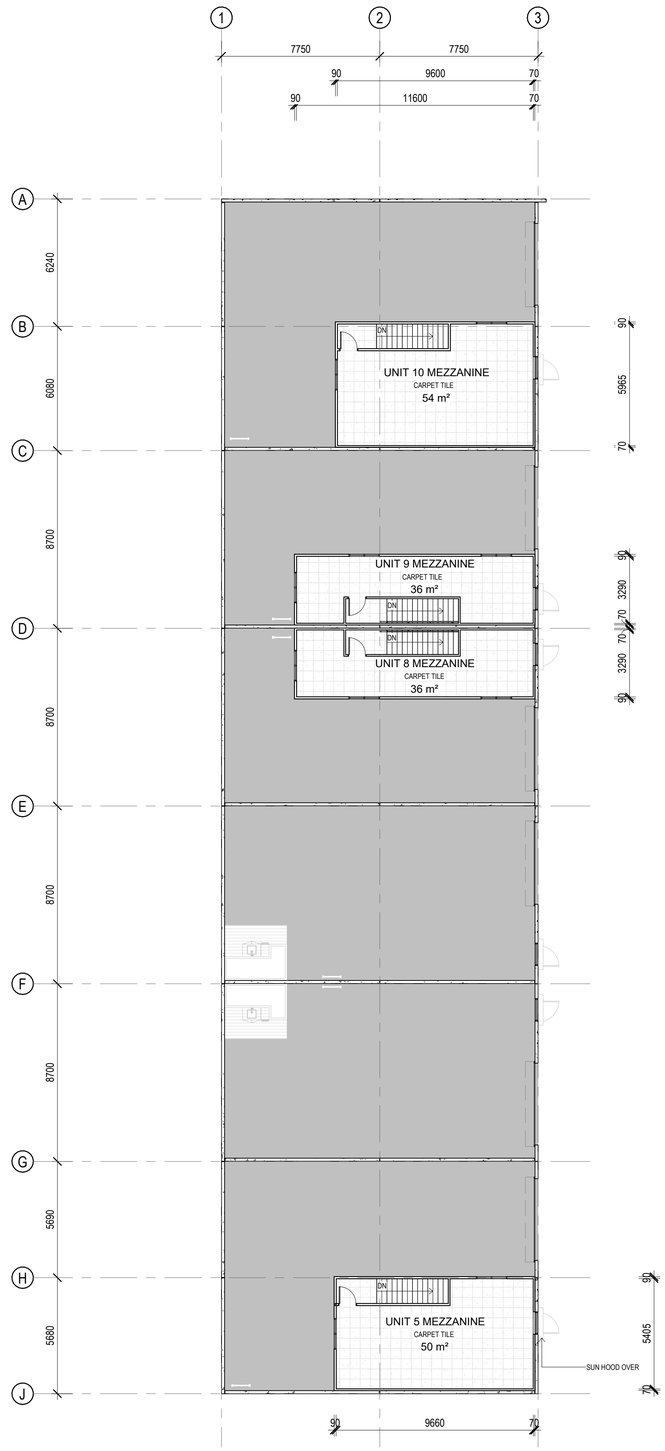
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1 : 150	TB	SA	AC
Date		Project Reference No.	
18/09/24		188PJD	
Revision	Phase	Sheet No.	
F	DA	A200	

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1 A500 GROUND FLOOR - UNITS 5 - 10
SCALE 1 : 150

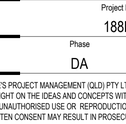


2 A500 MEZZANINE - UNITS 5 - 10
SCALE 1 : 150

1:50
0 1 2 3m

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North Point



Revisions

Rev	Date	By	Description
A	24/04/24	GP	PRELIMINARY UPDATE
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C	28/05/24	TB	PANELS UPDATED
D	05/06/24	TB	IR RESPONSE
E	20/06/24	TB	MEZZANINE UPDATE
F	05/08/24	TB	IR RESPONSE
G	18/09/24	TB	MCU ISSUE

Designer

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Project
PROPOSED DEVELOPMENT

Address
LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client
PJ DEVELOPMENTS

Drawing Title
FLOOR PLANS - UNITS 5 - 10

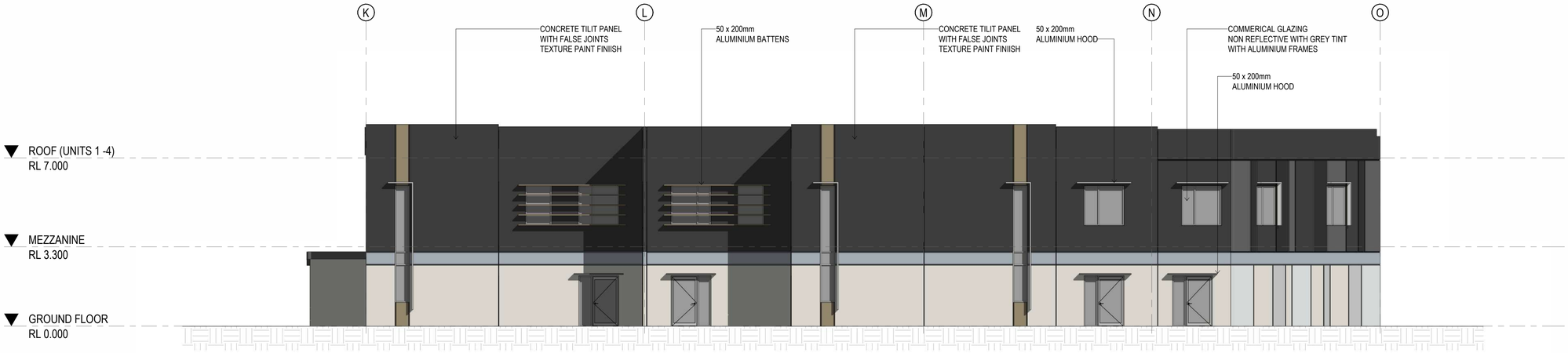
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Date	Project Reference No.
18/09/24	188PJD

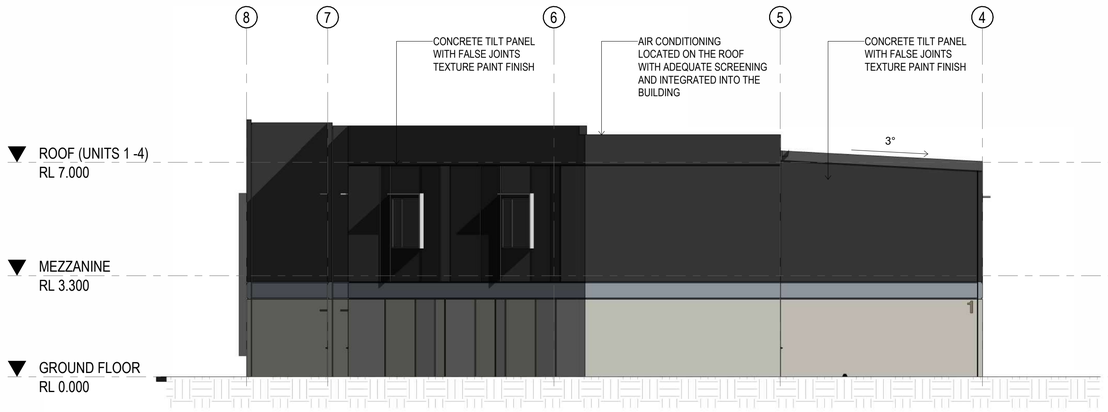
Revision	Phase	Sheet No.
G	DA	A201

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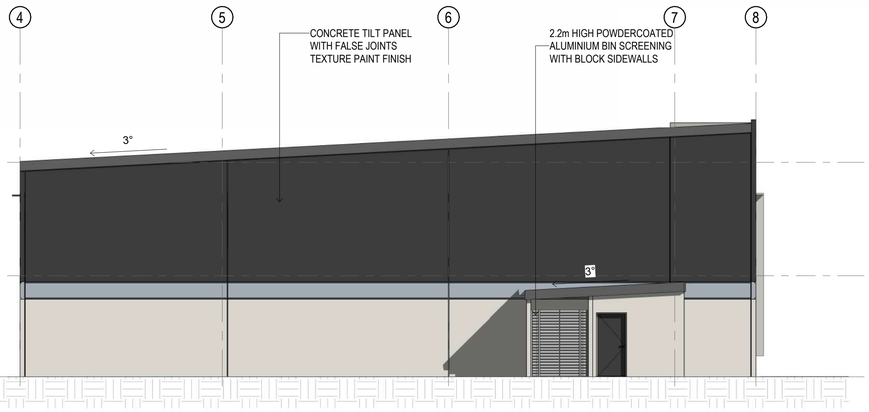
C:\Users\Tom\Desktop\Documents\188PJD_Lot 28 Wongawallan Drive, Yarrabilba\DPT-C_T_Emily.rvt



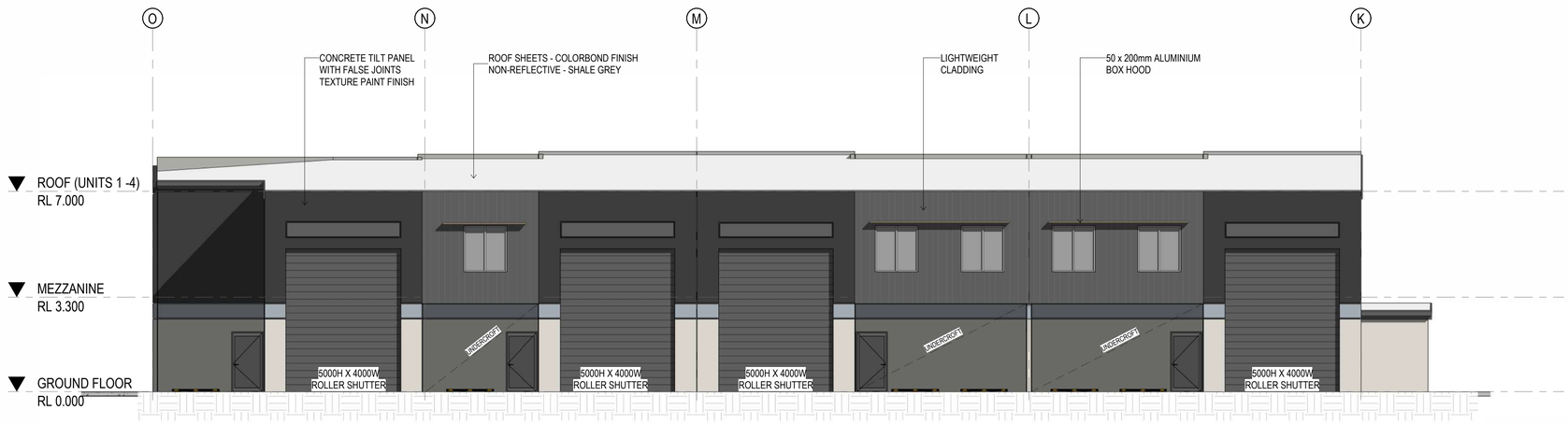
1 A200 EAST ELEVATION - UNITS 1 - 4
SCALE 1 : 100



2 A200 NORTH ELEVATION - UNITS 1 - 4
SCALE 1 : 100



3 A200 SOUTH ELEVATION - UNITS 1 - 4
SCALE 1 : 100



4 A200 WEST ELEVATION - UNITS 1 - 4
SCALE 1 : 100

1:100
0 1 2 5m

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NOT FOR CONSTRUCTION

Revisions

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Designer

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Project
PROPOSED DEVELOPMENT

Address
LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client
PJ DEVELOPMENTS

Drawing Title
ELEVATIONS - UNITS 1 - 4

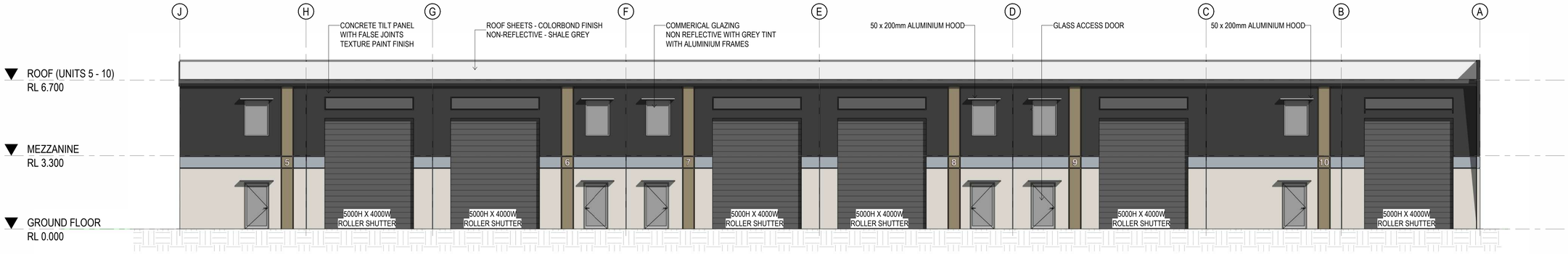
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Date	Project Reference No.
18/09/24	188PJD

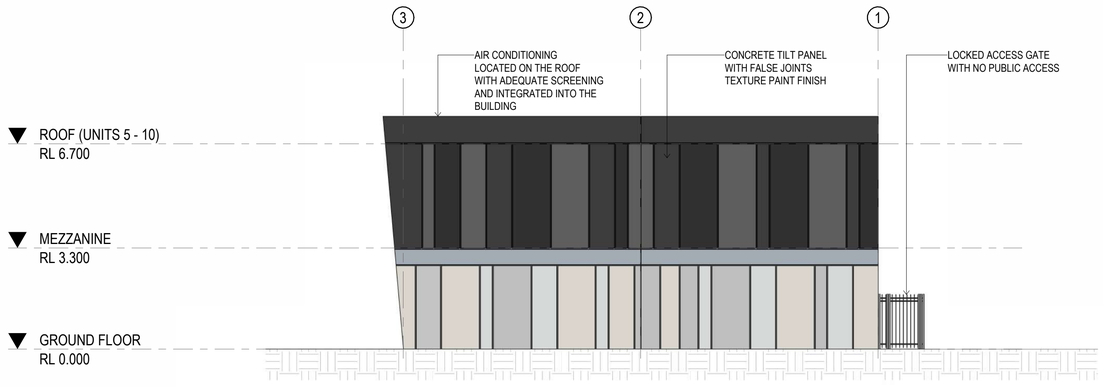
Revision	Phase	Sheet No.
G	DA	A500

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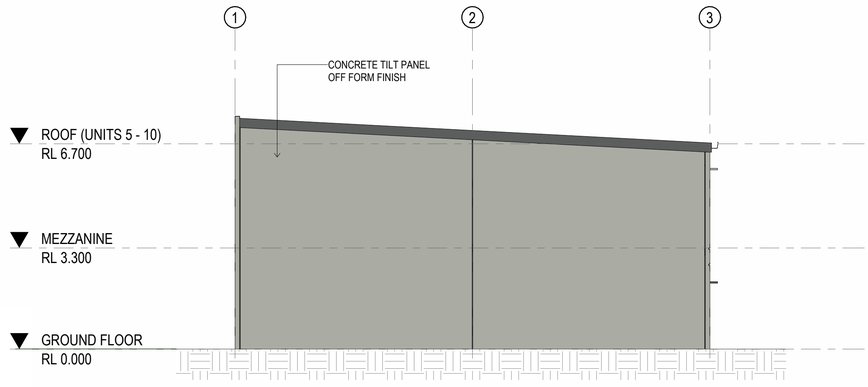
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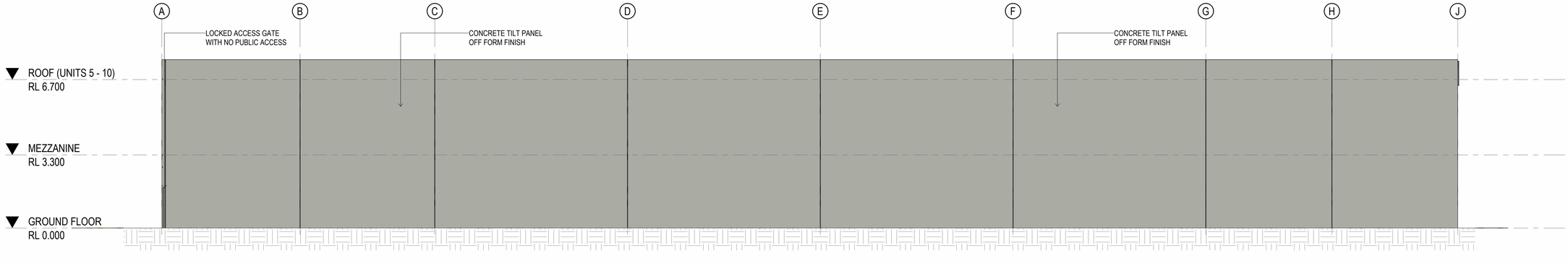
1 / A201 EAST ELEVATION - UNITS 5 - 10
SCALE 1 : 100



2 / A201 NORTH ELEVATION - UNITS 5 - 10
SCALE 1 : 100



3 / A201 SOUTH ELEVATION - UNITS 5 - 10
SCALE 1 : 100



4 / A201 WEST ELEVATION - UNITS 5 - 10
SCALE 1 : 100

1:100
0 1 2 5m

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Revisions

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Drawing Title
ELEVATIONS - UNITS 5 - 10

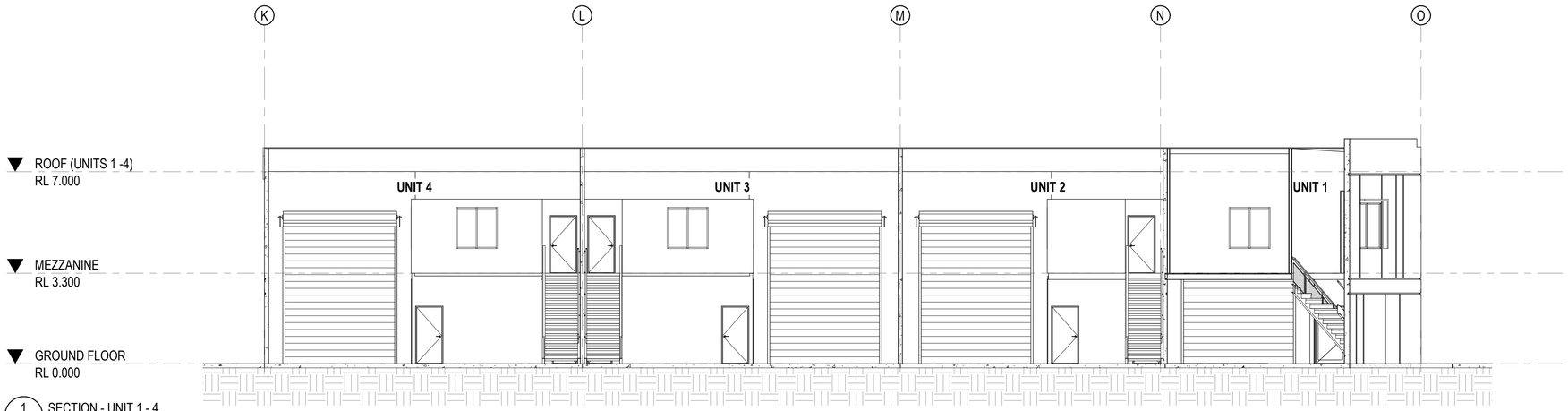
Scale	Drawn	Checked	Approved
1 : 100	TB	SA	AC

Date	Project Reference No.
18/09/24	188PJD

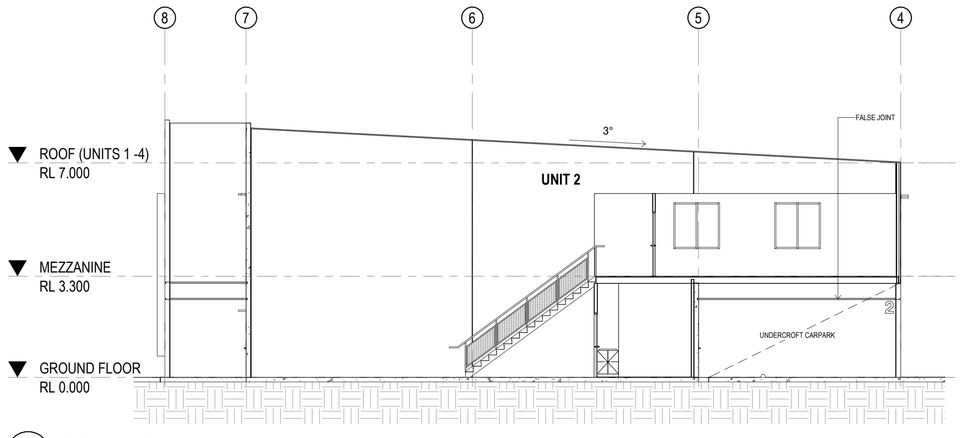
Revision	Phase	Sheet No.
G	DA	A501

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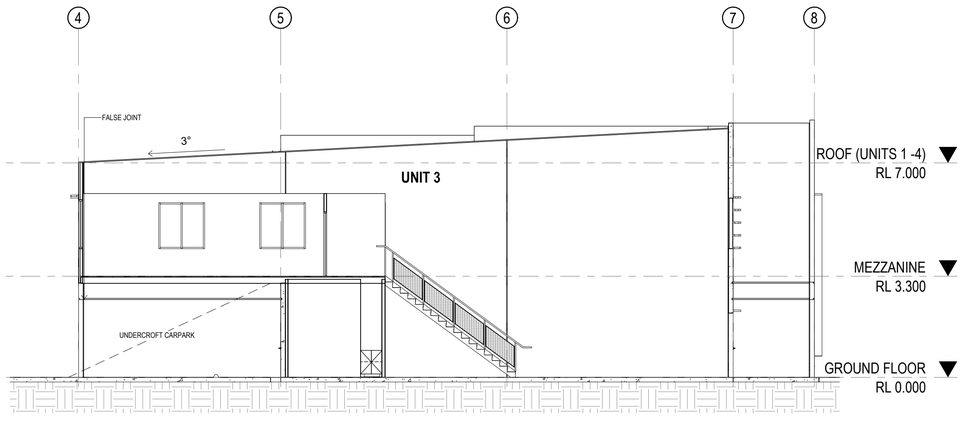
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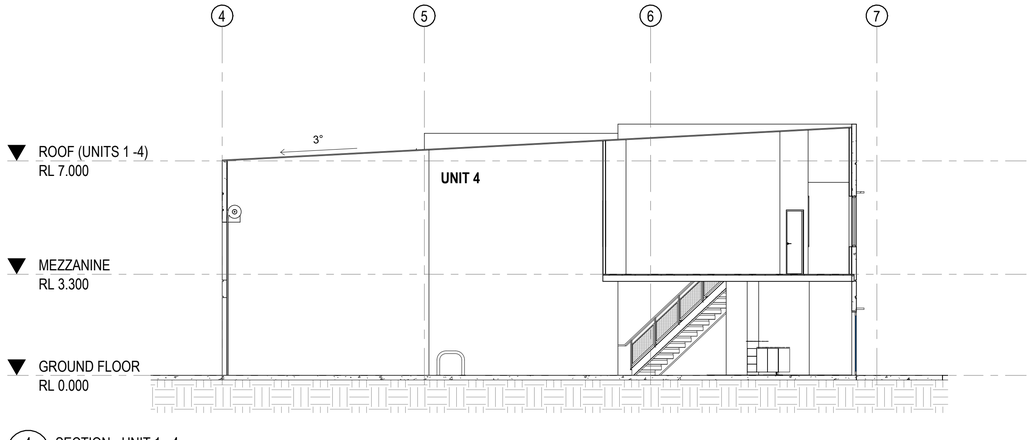
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SCALE 1 : 100



2 A200 SECTION - UNIT 1 - 4
SCALE 1 : 100



3 A200 SECTION - UNIT 1 - 4
SCALE 1 : 100



4 A200 SECTION - UNIT 1 - 4
SCALE 1 : 100

FOR APPROVAL
NOT FOR CONSTRUCTION

Revisions

Rev	Date	By	Description
A	20/05/24	TB	POD APPROVAL ISSUE
B	28/05/24	TB	PANELS UPDATED
C	05/06/24	TB	IR RESPONSE
D	05/08/24	TB	IR RESPONSE
E	18/09/24	TB	MCU ISSUE

Designer

CLARKE'S DESIGN & CONSTRUCT

A: 1/19 Harrington Street, Arundel, QLD 4214

P: 1300 11 25 11 **E:** info@clarkes.net.au

www.clarkes.net.au
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Project
PROPOSED DEVELOPMENT

Address
LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client
PJ DEVELOPMENTS

Drawing Title
SECTIONS

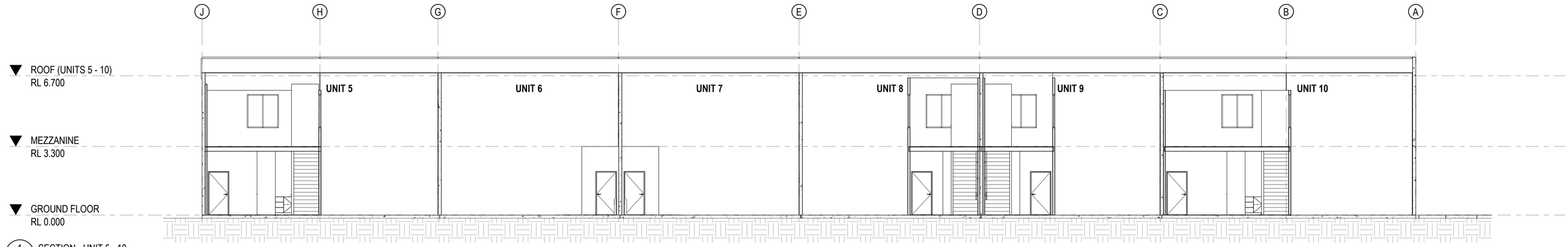
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Date	Project Reference No.
18/09/24	188PJD

Revision	Phase	Sheet No.
E	DA	A600

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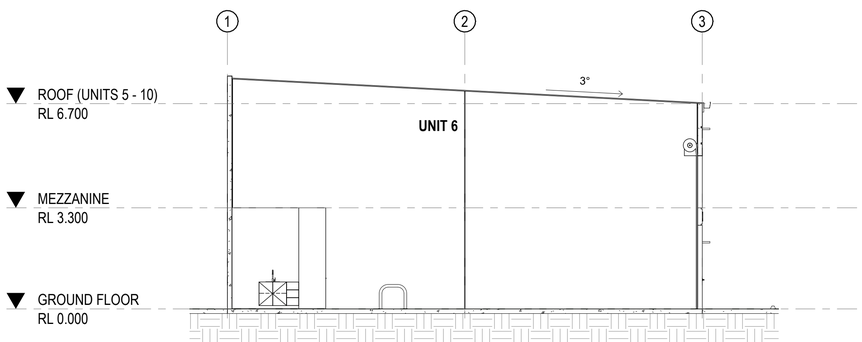
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1 / A201 SECTION - UNIT 5 - 10
SCALE 1 : 100

2 / A201 SECTION - UNIT 5 + 10
SCALE 1 : 100

3 / A201 SECTION - UNIT 8 - 9
SCALE 1 : 100



4 / A201 SECTION - UNIT 6 + 7
SCALE 1 : 100

Revisions

Rev	Date	By	Description
A	20/05/24	TB	POD APPROVAL ISSUE
B	28/05/24	TB	PANELS UPDATED
C	05/06/24	TB	IR RESPONSE
D	05/08/24	TB	IR RESPONSE
E	18/09/24	TB	MOU ISSUE

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ABN: 716 186 319 31 **QBSA LIC:** 15054063

Project
PROPOSED DEVELOPMENT

Address
LOT 28 WONGAWALLAN DRIVE, YARRABILBA

Client
PJ DEVELOPMENTS

Drawing Title
SECTIONS

Scale	Drawn	Checked	Approved
1 : 100	TB	SA	AC

Date	Project Reference No.
18/09/24	188PJD

Revision	Phase	Sheet No.
E	DA	A601

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APPENDIX C

Detailed Civil Engineering Design Plans

CLARKE'S DESIGN & CONSTRUCT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD 4207

DRAWING SCHEDULE

DRAWING No.	REV.	DRAWING TITLE
2024035-OPW-001	C	DRAWING SCHEDULE AND LOCALITY PLAN
2024035-OPW-002	C	DRAWING SET NOTES SHEET 1 OF 2
2024035-OPW-003	C	DRAWING SET NOTES SHEET 2 OF 2
2024035-OPW-004	C	EXISTING FEATURES PLAN
2024035-OPW-010	C	BULK EARTHWORKS PLAN
2024035-OPW-011	C	BULK EARTHWORK SECTIONS
2024035-OPW-020	C	DRIVEWAY AND DRAINAGE PLAN
2024035-OPW-021	C	DRIVEWAY GRADING PLAN SHEET 1 OF 2
2024035-OPW-022	C	DRIVEWAY GRADING PLAN SHEET 2 OF 2
2024035-OPW-023	C	LINEMARKING AND SIGNAGE PLAN
2024035-OPW-024	C	STORMWATER DRAINAGE CATCHMENT PLAN
2024035-OPW-027	C	SECTIONS AND DETAILS SHEET
2024035-OPW-030	C	SEWER AND WATER RETICULATION PLAN
2024035-OPW-100	C	VEHICLE CROSSOVER (VXO) PLAN AND DETAILS - VXO 1
2024035-OPW-101	C	VEHICLE CROSSOVER (VXO) PLAN AND DETAILS - VXO 2
2024035-ESC-001	C	DRAWING SET NOTES SHEET
2024035-ESC-002	C	EROSION AND SEDIMENT CONTROL PLAN - PHASE 1 PRE-CONSTRUCTION
2024035-ESC-003	C	EROSION AND SEDIMENT CONTROL PLAN - PHASE 2 EARTHWORKS
2024035-ESC-004	C	EROSION AND SEDIMENT CONTROL PLAN - PHASE 3 ROADWORKS & SERVICES
2024035-ESC-005	C	EROSION AND SEDIMENT CONTROL PLAN - PHASE 4 ESTABLISHMENT
2024035-ESC-006	C	EROSION AND SEDIMENT CONTROL DETAILS



SOURCE: NEARMAP/ JUNE-2024

LOCALITY PLAN
SCALE 1: 2000

PROPERTY DESCRIPTION:
LOT 28 ON SP333768

DETAIL AND LEVEL SURVEY
OWEN REV-B

SITE BENCHMARK: PSM186643
DATUM: RL. 60.513m (AHD)
THIS DRAWING SET AND DESIGN IS BASED UPON THE FOLLOWING DETAIL SURVEY BY:
SURVEYOR: SCHLENCKER SURVEYING (QLD)
DRAWING NUMBER: 24059-02
REVISION: A

NOTE - ARCHITECTURAL COORDINATION
OWEN REV-B

THIS DRAWING SET AND DESIGN IS BASED UPON THE FOLLOWING ARCHITECTURAL / BUILDING DESIGN LAYOUT BY:
CONSULTANT: CLARCKE'S DESIGN & CONSTRUCT
GROUND FLOOR / SITE PLAN NUMBER: 188PJD
REVISION: K ~~B~~
BASEMENT PLAN NUMBER: NOT APPLICABLE
REVISION: NOT APPLICABLE

DESIGN STANDARD AND SPECIFICATIONS (CURRENT EDITIONS)

SEWER AND WATER	• WATER SUPPLY CODE OF AUSTRALIA (WSA) • LOGAN CITY COUNCIL PLANNING POLICY 5 - INFRASTRUCTURE • SEQ W&S D&C CODE
STORMWATER MANAGEMENT	• WATER SENSITIVE URBAN DESIGN TECHNICAL DESIGN GUIDELINES - HEALTHY WATERWAYS • QUEENSLAND URBAN DRAINAGE MANUAL (QUDM) • LOGAN CITY COUNCIL PLANNING POLICY 5 - INFRASTRUCTURE
ROADWORKS, DRIVEWAYS, VEHICLE CROSSINGS, FOOTPATHS AND VEHICLE PARKING	• QUEENSLAND COMPLETE STREETS - GUIDELINES FOR URBAN STREET DESIGN • AUSTRALIAN STANDARD AS2890 • AUSTROADS - GUIDE TO TRAFFIC MANAGEMENT PART 6A: PEDESTRIAN AND CYCLIST • DTMR - MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES • LOGAN CITY COUNCIL PLANNING POLICY 5 - INFRASTRUCTURE
SOIL EROSION	• INTERNATIONAL EROSION CONTROL ASSOCIATION (IECA) - BEST PRACTICE EROSION & SEDIMENT CONTROL
EARTHWORKS	• AUSTRALIAN STANDARD AS3798 - GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS • LOGAN CITY COUNCIL PLANNING POLICY 5 - INFRASTRUCTURE

Owen.
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admin@owenconsulting.com.au
P.(07) 5572 0702 A.C.N 121 686 208
CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 20 10 0 20 40 60 80 100 1:2000 A1
DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT ASK
DESIGNED SK/FI APPROVED
DRAWN LAB/DS 16.10.24
REVIEWED SK
ON BEHALF OF OWEN CONSULTING PTY LTD
SIMON KEALLEY
RPEQ No. 29613
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NORTH
DATUM AHD(m)

ISSUE	DATE	ISSUE DESCRIPTION
C	16.10.24	ISSUED IN RESPONSE TO EDQ RFI
B	08.08.24	ISSUED IN RESPONSE TO EDQ RFI
A	25.06.24	ISSUED FOR EDQ APPROVAL

CLIENT
CLARKE'S DESIGN & CONSTRUCT
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRAWING SCHEDULE AND LOCALITY PLAN
PROJECT No
2024035
DRAWING No
2024035-OPW-001
AMDT
C

NOTES - GENERAL

OWEN REV-B

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS, ALL COUNCIL CONDITIONS (REFER TO NOTES - SUMMARY), ANY OTHER PROJECT CONSULTANT DRAWINGS & SPECIFICATIONS AND ANY WRITTEN INSTRUCTION.
2. IF CONTRACTOR IDENTIFIES ANY DISCREPANCIES BETWEEN ANY SPECIFICATION THEN IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE SUPERINTENDENT.
3. WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH CURRENT AUSTRALIAN STANDARDS AND COUNCIL / RELEVANT AUTHORITY STANDARD DRAWINGS AND SPECIFICATIONS UNLESS NOTED OTHERWISE IN THE PROJECT DRAWINGS OR SPECIFICATIONS.
4. COUNCIL'S STANDARD DRAWINGS AND ENGINEERING GUIDELINES ARE TO BE ADOPTED UNLESS STATED OR SHOWN OTHERWISE.
5. THE CONTRACTOR SHALL COORDINATE THEIR WORK WITH ELECTRICAL & TELECOMMUNICATION PROVIDERS TO ENABLE THE SERVICES TO BE INSTALLED WITHOUT INTERRUPTION.
6. SETOUT INFORMATION IN ELECTRONIC FORMAT IS AVAILABLE UPON REQUEST.
7. ALL LEVELS SHOWN ON THIS DRAWING SET ARE TO AHD.
8. LEVELS FOR CONNECTION TO ANY EXISTING SERVICES / ROAD PAVEMENTS / SURFACE LEVELS SHOWN ON THE DRAWINGS MAY BE VARIED ON-SITE WITH APPROVAL FROM THE SUPERINTENDENT TO ALLOW FOR NEAT FINISH.
9. ALL WORKS ARE TO MATCH NEATLY INTO EXISTING ROADS / PAVEMENTS, SERVICES AND SURFACE LEVELS TO THE SATISFACTION OF COUNCIL / RELEVANT AUTHORITY AND THE SUPERINTENDENT.
10. NOTWITHSTANDING THE EXTENT OF WORKS SHOWN ON THE DRAWINGS, THE CONTRACTOR IS NOT PERMITTED TO CARRY OUT WORKS OUTSIDE THE EXTENT OF THE SITE WITHOUT FIRST OBTAINING THE PERMISSION OF THE ADJOINING LANDOWNER AND SUPERINTENDENT APPROVAL.
11. ANY TREES OR VEGETATION OUTSIDE THE LIMIT OF WORKS THAT ARE TO BE REMOVED OR TRIMMED ARE TO BE IDENTIFIED BY THE CONTRACTOR. ANY WORK IS TO BE APPROVED BY THE SUPERINTENDENT.
12. NO CONSTRUCTION MATERIALS OR MACHINERY SHALL BE STOCKPILED OR STORED ON ANY ADJACENT PROPERTIES OR GOVERNMENT AGENCY / COUNCIL LAND OR ROAD RESERVE WITHOUT PRIOR APPROVAL.
13. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING COUNCIL'S CONSTRUCTION TOLERANCES. ANY WORKS DEEMED NON-ACCEPTABLE BY COUNCIL OR THE SUPERINTENDENT SHALL BE RECTIFIED BY THE CONTRACTOR AT THE CONTRACTORS EXPENSE.
14. ALL PERMITS AND APPROVALS REQUIRED FOR CONSTRUCTION AND TRAFFIC MANAGEMENT SHALL BE OBTAINED BY THE CONTRACTOR AT THE CONTRACTORS EXPENSE.
15. THE SUBSTITUTION OF A MATERIAL OR METHOD SHALL BE APPROVED BY THE SUPERINTENDENT. ANY SUBSTITUTION DOES NOT ALWAYS INDICATE A VARIATION AND THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT OF ANY ANTICIPATED VARIATION OF THE SUBSTITUTION.
16. A NETWORK OF SURVEY CONTROL MARKS (X,Y,Z) SHALL BE PROVIDED BY THE PRINCIPAL SURVEYOR (UNLESS AGREED OTHERWISE) PRIOR TO THE COMMENCEMENT OF WORKS.
17. THE PRINCIPAL CONTRACTOR IS TO ENSURE THAT SURVEY CONTROL STATIONS ARE NOT DAMAGED OR DISTURBED IN ANY WAY BY CONSTRUCTION ACTIVITIES. COST/S INCURRED BY THE PRINCIPAL'S SURVEYOR RESULTING FROM DAMAGE, MOVEMENT OR ALTERATION OF SURVEY PEGS SHALL BE THE RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR.
18. THE PRINCIPAL CONTRACTOR AND ANY SUB-CONTRACTORS SHALL GAIN ACCESS TO THE SITE AT LOCATIONS APPROVED BY THE SUPERINTENDENT AND THE RELEVANT AUTHORITY.
19. THE PRINCIPAL CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND PROVISION OF ANY TEMPORARY BRACING, SUPPORTING, PROTECTION TO ANY EXISTING FENCING, PIPEWORK, CONDUITS, CULVERTS AND ANY OTHER ABOVE OR UNDERGROUND STRUCTURE OR FEATURE.
20. DO NOT OBTAIN DIMENSIONS FROM SCALING. IF IN DOUBT ASK.
21. NATURAL SURFACE LEVELS SHOWN ON ANY DRAWINGS ARE INDICATIVE ONLY AND SUBJECT TO SITE INVESTIGATION.

WH&S AND ENVIRONMENTAL

OWEN REV-B

IT IS THE RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR TO ENSURE THAT ALL CONSTRUCTION WORKS COMPLIES WITH THE WH&S ACT 2011 AND THAT ENVIRONMENTAL CONTROL MEASURES ARE ALLOWED FOR TO THE SATISFACTION OF COUNCIL. THIS IS TO INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

- MAINTAIN SITE CONSTRUCTION DIARY
- ENSURE ALL PERSONS ENTERING THE SITE SATISFY ALL WH&S AND INSURANCE REQUIREMENTS
- INSTALLATION OF SITE SIGNAGE
- TEMPORARY FENCING TO THE FULL EXTENT OF THE SITE AS WOULD BE REASONABLY EXPECTED
- DUST AND NOISE CONTROL AND WORKING HOURS
- SAFE AND DEDICATED SITE ACCESS
- TRAFFIC MANAGEMENT - ALL APPROVED TRAFFIC MANAGEMENT PLAN/S ARE KEPT ON-SITE INCLUDING ALL RELEVANT TRAFFIC CONTROL PERMITS, QPS APPROVALS AND TMR PERMITS.

NOTES - EXISTING SERVICES

OWEN REV-C

1. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES BY A 'DIAL BEFORE YOU DIG' (DBYD) SEARCH, ELECTRONIC DETECTION AND POTHOLING. IT IS THE CONTRACTORS RESPONSIBILITY TO PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTORS EXPENSE.
3. THE CONTRACTOR IS TO CONFIRM THE ACTUAL LOCATIONS AND DEPTHS OF ALL EXISTING UNDERGROUND SERVICES PRIOR TO CONSTRUCTION WORKS AND COMPARE WITH CURRENT DESIGN PLANS. REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.
4. WHERE A CONNECTION IS MADE TO ANY ELEMENT OF EXISTING INFRASTRUCTURE, THEN THE LEVEL OF THAT INFRASTRUCTURE MUST BE CHECKED BY THE CONTRACTOR PRIOR TO CONSTRUCTION WORKS AND COMPARED WITH CURRENT DESIGN PLANS. REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.
5. WHERE NEW SERVICES CROSS OTHER NEW SERVICES OR WHERE NEW SERVICES CROSS EXISTING SERVICES THE CONTRACTOR SHALL CHECK MINIMUM RELEVANT AUTHORITY CLEARANCES BY CHECKING LEVELS ON-SITE AND ADVISE THE SUPERINTENDENT PRIOR TO CONSTRUCTION IF THE MINIMUM CLEARANCE CAN NOT BE ACHIEVED.
6. OWEN CONSULTING ACCEPTS NO RESPONSIBILITY FOR ANY EXISTING SERVICES / INFRASTRUCTURE LOCATED ON-SITE THAT ARE NOT SHOWN ON THESE DRAWINGS OR THE ACCURACY OF EXISTING SERVICES LOCATIONS AND LEVELS SHOWN ON THESE DRAWINGS.

EXISTING SERVICES LOCATION - DESIGN DEIFINTION

THIS DESIGN RELIES UPON EXISTING SERVICES INFORMATION DERIVED FROM THE FOLLOWING SOURCES:

- THE LOCATION OF EXISTING SERVICES AT THE GROUND SURFACE LOCATED BY THE PROJECT SURVEYOR (QL-A)
- DBYD SEARCH RESULTS (QL-D)
- INFORMATION PROVIDED BY SERVICE OWNER AND / OR RELEVANT AUTHORITY (DEEMED QL-C)

SUB-SURFACE INVESTIGATION HAS BEEN UNDERTAKEN IF SPECIFIED ON THE DESIGN PLANS BY:

POTHOLING (QL-A) - REFER: SUBSURFACE UTILITY INVESTIGATION

NOTES - ROADWORKS

OWEN REV-B

1. CONTRACTOR TO ALLOW FOR STAGING OF ROADWORKS (AS REQUIRED) TO LIMIT THE IMPACT OF THE CONSTRUCTION ON EXISTING TRAFFIC. CONTRACTOR TO MAKE DUE ALLOWANCE FOR ALL PERMIT MANAGEMENT.
2. CONTRACTOR TO CONFIRM CONDUIT REQUIREMENTS FROM LANDSCAPING AND ELECTRICAL/COMMS DRAWINGS AND ALLOW FOR THESE PRIOR TO ANY PAVEMENT CONSTRUCTION.
3. THE CONTRACTOR SHALL ENSURE THAT ALL KERB AND CHANNEL GRADES SHALL NOT FALL BELOW 0.2% AT ANY POINT IRRESPECTIVE OF ROAD CENTRELINE GRADING OR INTERSECTION DESIGN LEVELS.
4. THE CONTRACTOR IS TO ENSURE ALL KERBING DRAINS FREELY AND IS TO NOTIFY THE SUPERINTENDENT IMMEDIATELY IF THIS WILL NOT OCCUR.
5. PAVEMENT SUB-BASE TO EXTEND 150mm (MIN) BEHIND BACK OF KERB OR AS PER COUNCIL STANDARDS.
6. CONTRACTOR TO REINSTATE ANY DAMAGE TO THE EXISTING KERB / FOOTPATH AND PROVIDE 'B' GRADE TURF BEHIND ANY REINSTATED KERB AND TO ALL DISTURBED AREAS.
7. ALL LAYERS OF PAVEMENT WORKS ARE TO BE PROOF ROLLED AND TESTED IN ACCORDANCE WITH COUNCIL REQUIREMENTS, SPECIFICATIONS AND TO THE APPROVAL OF COUNCIL AND THE SUPERINTENDENT.
8. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE THE SUPERINTENDENT A MINIMUM OF 24 HOURS NOTICE TO ALLOW FOR PAVEMENT INSPECTIONS TO BE BOOKED.
9. SUB-SOIL DRAINAGE SHALL BE INSTALLED UNDER ALL NEW KERB & CHANNEL AND GRADED AT 0.5% (MIN) TO CONNECT WITH DRAINAGE PITS.

NOTES - STORMWATER DRAINAGE

OWEN REV-B

1. ALL DRAINAGE STRUCTURES ARE TO BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS:
   - DTMR STANDARD DRAWINGS AND SPECIFICATIONS (WHERE APPLICABLE).
   - COUNCIL DESIGN GUIDELINES, STANDARD DRAWINGS AND SPECIFICATIONS.
   - ANY MANUFACTURERS STANDARD DRAWINGS AND SPECIFICATIONS.
2. ALL STORMWATER RIGID PIPES ARE TO BE RCP CLASS 2 (MIN). ALL FLEXIBLE PIPES ARE TO BE uPVC CLASS SN8 RRJ OR AS SPECIFIED.
3. THE CLASS OF STORMWATER PIPE SPECIFIED DOES NOT ALLOW FOR ALL CONSTRUCTION VEHICLE LOADINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THERE IS NO DAMAGE TO STORMWATER PIPES ALREADY LAID DURING THE COURSE OF CONSTRUCTION.
4. VIBRATORY TRENCH ROLLER ALLOWED AT DEPTHS OVER 600mm ABOVE TOP OF PIPE.
5. VIBRATORY TRENCH RAMMER ALLOWED AT DEPTHS OVER 450mm ABOVE TOP OF PIPE.
6. COMPACTION WHEELS ARE NOT TO BE USED WITHOUT PERMISSION FROM THE SUPERINTENDENT.
7. ALL TRENCH BACKFILL MATERIAL UNDER THE PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT.
8. STEEL GRATES AND FRAMES ARE TO BE FABRICATED FROM MILD STEEL AND HOT DIP GALVANISED. ALL GRATES ARE TO BE CLASS D (UNO) AND BICYCLE SAFE IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3996 UNLESS NOTED OTHERWISE.
9. MANHOLE SETOUT POINTS TO CENTRE OF MH.
10. STORMWATER PIPE LENGTHS ARE CALCULATED FROM CENTRE OF PIT/CHAMBER. IT IS THE CONTRACTORS RESPONSIBILITY TO DETERMINE ACTUAL LENGTHS REQUIRED.
11. ANY TEMPORARY STORMWATER DIVERSIONS ARE TO BE APPROVED BY THE SUPERINTENDENT PRIOR TO CONSTRUCTION.

NOTES - EARTHWORKS - LEVEL 1 (GITA)

OWEN REV-B

1. ALL EARTHWORKS TO BE CONSTRUCTED TO COUNCIL STANDARDS AND SPECIFICATIONS, AS3798-2007 AND UNDER LEVEL 1 GEOTECHNICAL INSPECTION AND TESTING AUTHORITY (GITA) SUPERVISION.
2. THE PRINCIPAL CONTRACTOR IS TO ENGAGE A SUITABLY QUALIFIED (RPEQ) GEOTECHNICAL INSPECTION AND TESTING AUTHORITY (GITA) TO UNDERTAKE THE LEVEL 1 SUPERVISION AND THE GEOTECHNICAL ENGINEER SHALL ISSUE TO THE SUPERINTENDENT A LEVEL1 REPORT INCLUDING TEST RESULTS AND CERTIFICATION.
3. THE GITA AND / OR THE SUPERINTENDENT SHALL INSPECT ANY DISTURBED AREA SUBGRADE PRIOR TO FILLING WORKS AND ANY UNSUITABLE AREAS ARE TO BE REMOVED, REPLACED WITH CONTROLLED FILL AND COMPACTED AS SPECIFIED.
5. UNDERTAKE TESTING TO ROADS, ALLOTMENTS, BUILDING PADS AND ALL EARTHWORKS AREAS AS DEEMED NECESSARY BY THE GITA AND FORWARD RESULTS INCLUDING SITE PLAN SHOWING LOCATIONS OF TESTS TO THE SUPERINTENDENT AS PART OF THE LEVEL 1 REPORT.
6. THE CONTRACTOR SHALL REPEAT TESTING AT THE CONTRACTORS EXPENSE FOR ANY FAILED TEST.
7. FIELD DENSITY TESTING SHALL BE UNDERTAKEN BY A NATA APPROVED TESTING AUTHORITY IN ACCORDANCE WITH AS3798-2007 AND AS1289. THE FOLLOWING MINIMUM STANDARDS ARE REQUIRED TO BE ACHIEVED:
   - RESIDENTIAL ALLOTMENTS / PARKS = 95% DDR
   - GENERAL FILL AND EXCAVATED AREAS = 95% DDR
   - PAVEMENTS (>300mm BELOW SUBGRADE) = 95% DDR
   - PAVEMENTS (<300mm BELOW SUBGRADE) = 98% DDR
   - BUILDING PAD = 98% DDR
8. ALL EARTHWORKS TO BE CARRIED OUT AT +/-2% OF OPTIMUM MOISTURE CONTENT.
9. FILL OBTAINED FROM SITE CUT IS TO BE CLEAN MATERIAL FREE FROM ANY ORGANIC MATERIAL, ROCK (>75mmØ), DEBRIS AND BUILDING MATERIALS.
10. IMPORTED CONTROLLED FILL MATERIAL IS TO BE AS SPECIFIED AND MATERIALS QUALITY REPORT ISSUED TO THE SUPERINTENDENT.
11. PLACING OF FILL ON PREPARED AREAS SHALL NOT COMMENCE UNTIL THE AUTHORITY TO DO SO HAS BEEN OBTAINED FROM THE GITA .
12. FILL IS TO BE PLACED IN LAYERS NOT EXCEEDING 200mm LOOSE LAYER THICKNESS.
13. ALL ALLOTMENTS SHALL GRADE AT A MINIMUM SLOPE OF 1V IN 200H TO THE FRONT BOUNDARY UNLESS DESIGNED OTHERWISE.
14. MAXIMUM BATTER SLOPES TO ANY AREAS OF CUTTING / FILLING ARE TO BE 1V TO 4H UNLESS DESIGNED OTHERWISE.
15. ALL TOPSOIL STRIPPED FROM WORK AREAS SHALL BE STOCKPILED FOR LATER RE-SPREADING TO ALL ALLOTMENTS, VERGES, BATTERS AND DISTURBED AREAS.
16. SILT FENCING TO BE PLACED ON THE DOWNSTREAM SIDE OF ANY TOPSOIL STOCKPILE SITES.
17. METHOD OF DISPOSAL OF ALL WASTE MATERIAL SHALL MEET ALL COUNCIL AND RELEVANT AUTHORITY REQUIREMENTS AND IS THE RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR.
18. NOTWITHSTANDING THE LIMITS OF CUT AND FILL SHOWN ON THE DRAWINGS THE LIMITS AND FINAL PROFILE MAY BE VARIED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION.
19. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE SUPERINTENDENT IF EXISTING GROUND LEVELS SHOWN VARY FROM ACTUAL GROUND LEVEL ENOUGH TO SIGNIFICANTLY EFFECT EARTHWORKS QUANTITIES, TRIGGER A VARIATION OR ALTER DESIGN.

NOTES - AS CONSTRUCTED (ADAC)

OWEN REV-C
CoGC

1. THE PRINCIPAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL AS-CONSTRUCTED SURVEY AND PROVISION TO THE SUPERINTENDENT.
2. THE PRINCIPAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE AS-CONSTRUCTED SURVEY TO ENSURE THAT ALL CONSTRUCTED ELEMENTS ARE SURVEYED PRIOR TO ANY BACKFILLING.
3. AS-CONSTRUCTED INFORMATION IS TO REFLECT THE ACTUAL CONSTRUCTION AND ENDORSED BY A REGISTERED SURVEYOR.
4. THE AS-CONSTRUCTED POINTS/LEVELS SHALL BE TAKEN AT THE SAME POINTS/LEVELS LOCATIONS SHOWN ON DESIGN DRAWINGS AND ANY OTHER RELEVANT LOCATIONS TO ALLOW ASSESSMENT AGAINST THE DESIGN INTENT.
5. THE PRINCIPAL CONTRACTOR IS TO ISSUE AS-CONSTRUCTED SURVEY OF ALL WORKS DETAILED IN THESE DRAWINGS IN ACCORDANCE WITH COGC W&W AS-CONSTRUCTED DATA CAPTURE GUIDELINES VERSION 2 AND SEQ W&S D&C CODE ASSET INFORMATION SPECIFICATION VERSION 3.01.

NOTES - SUMMARY - TO BE READ

OWEN REV-B

1. FOR THE PURPOSE OF THESE NOTES THE TERM ' COUNCIL' REFERS TO THE LOCAL GOVERNMENT AUTHORITY THAT HAS JURISDICTION OVER THE AREA OF WORK.
2. FOR THE PURPOSE OF THESE NOTES THE TERM ' RELEVANT AUTHORITY' REFERS TO THE GOVERNMENT OR OTHERWISE AUTHORITY THAT HAS JURISDICTION OVER THE ELEMENT OF WORK BEING CONSTRUCTED.
3. BY UNDERTAKING ANY WORK ON-SITE IT IS ACCEPTED THAT THE PRINCIPAL CONTRACTOR AND ANY SUB-CONTRACTOR HAVE READ AND UNDERSTAND ALL NOTES.
4. THESE NOTES ARE COPYRIGHT OF OWEN CONSULTING.

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE N/A
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A1

DESIGNED	SK/FI	APPROVED	
DRAWN	LAB/DS		16.10.24
REVIEWED	SK	ON BEHALF OF OWEN CONSULTING PTY LTD SIMON KEALLEY RPEQ No. 29613	

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NORTH
DATUM AHD(m)

ISSUE	DATE	ISSUE DESCRIPTION
C	16.10.24	ISSUED IN RESPONSE TO EDQ RFI
B	08.08.24	ISSUED IN RESPONSE TO EDQ RFI
A	25.06.24	ISSUED FOR EDQ APPROVAL

CLIENT
CLARKE'S DESIGN & CONSTRUCT

PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRAWING SET NOTES SHEET 1 OF 2

PROJECT No
2024035
DRAWING No
2024035-OPW-002
AMDT
C

NOTES - WATER RETICULATION

OWEN REV-C

1. NOT WITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH WATER SUPPLY CODE OF AUSTRALIA SOUTH-EAST QUEENSLAND SERVICE PROVIDERS EDITION VERSION 1.30 (AUGUST 2019) AND THE SEQ CODE CIVIL IPAM PRODUCT LIST (CURRENT EDITION).
2. POTABLE WATER MAIN SPECIFIED AS 'PVC-M' IS TO BE PVC-M PIPE, SOCKET AND SPIGOT, RRJ CLASS 16, BLUE IN COLOUR TO COMPLY WITH AS/NZS 1477 AND BE COMPATIBLE WITH DICL PIPE FITTINGS TO AS 2280.
3. POTABLE WATER PROPERTY SERVICE PRESSURE PIPE IS TO BE POLYETHYLENE (PE) PE100 PN16 TO COMPLY WITH AS/NZS 4130.
4. DICL PIPES ARE TO BE PN35.
5. ALL DICL PIPES AND FITTINGS ARE TO BE TREATED INTERNALLY AND EXTERNALLY WITH CORROSION PROTECTIVE COATING AS PER AS 4198.
6. ALL FITTINGS ARE TO BE DICL CLASS K9 TO AS 2280.
7. DICL ROAD CROSSINGS ARE T0 EXTEND 0.5m BEHIND BACK OF KERB.
8. ALL FASTENERS ARE TO BE STAINLESS STEEL GRADE.316.
9. MARKER PLATES ARE TO BE INSTALLED FOR ALL VALVES, HYDRANTS AND WATER METERS IN ACCORDANCE WITH WSCA STD. DRG. SEQ-WAT-1300-2.
10. ALL HYDRANTS ARE TO BE POSITIONED DIRECTLY OPPOSITE COMMON PROPERTY BOUNDARIES WHERE POSSIBLE - UNO.
11. CONCRETE (STRENGTH GRADE N25) THRUST BLOCKS ARE TO BE CONSTRUCTED AT ALL UN-RESTRAINED VALVES, BENDS, TEES AND DEAD ENDS IN ACCORDANCE WITH WSCA STD. DRG. SEQ-WAT-1205-1. ADOPT BEARING CAPACITY OF: 100kPa. (UNO)
12. PIPE BEDDING AND TRENCH BACKFILL TO BE IN ACCORDANCE WITH WSCA STD. DRG. SEQ-WAT-1201-1.
13. ALL TRENCH BACKFILL MATERIAL UNDER ROAD PAVEMENT SHALL BE CBR 15 OR APPROVED EQUIVALENT. COMPACTION RESULTS SHALL BE PROVIDED WHERE WATER TRENCHES CROSS ROADWAYS.
14. WATER PROPERTY SERVICE LOCATIONS AND METERS AT PROPERTY BOUNDARIES ARE TO MAINTAIN THE MINIMUM CLEARANCE WITH ELECTRICAL / TELECOMMUNICATIONS PITS AND PILLARS. THE PRINCIPAL CONTRACTOR IS TO ADVISE THE SUPERINTENDENT IMMEDIATELY IF MINIMUM CLEARANCES CAN NOT BE ACHIEVED ON-SITE.
15. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL WATER CONSTRUCTION AND BACTERIAL TESTING REQUIREMENTS WITH COUNCIL / RELEVANT AUTHORITY.
16. IF THE PROJECT BILL OF QUANTITIES (BOQ) DOES NOT INCLUDE SEPARATE ITEM/S FOR ANY TESTING RATES - THEN THE CONTRACTOR'S RATES ARE ADOPTED AS INCLUDING ALL COSTS OF TESTING.
17. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING AND COORDINATING ANY REQUIRED INSPECTIONS - INCLUDING HOLD POINTS - WITH COUNCIL / RELEVANT AUTHORITY.
18. PRIOR TO ANY CONNECTION TO EXISTING 'LIVE' WATER INFRASTRUCTURE - THE CONTRACTOR IS TO ISSUE TO THE SUPERINTENDENT ANY REQUIRED QUALITY ASSURANCE DOCUMENTATION FOR REVIEW AND APPROVAL BY THE SUPERINTENDENT AND COUNCIL / RELEVANT AUTHORITY.

ABBREVIATIONS:

WSCA - WATER SUPPLY CODE OF AUSTRALIA SOUTH-EAST QUEENSLAND SERVICE PROVIDERS EDITION VERSION 1.30 (AUGUST 2019).
DICL - DUCTILE IRON CEMENT LINED

NOTES - SEWER (GRAVITY)

OWEN REV-C

1. NOT WITHSTANDING THE DETAILS SHOWN ON THE DRAWINGS ALL CONSTRUCTION AND MATERIALS TO BE IN ACCORDANCE WITH THE GRAVITY SEWERAGE CODE OF AUSTRALIA SOUTH-EAST QUEENSLAND SERVICE PROVIDERS EDITION VERSION 2.1 (SEPTEMBER 2021) AND THE SEQ CODE CIVIL IPAM PRODUCT LIST (CURRENT EDITION).
2. ALL SEWER LENGTHS AND GRADES SHOWN ON THE LONGITUDINAL SECTIONS ARE MEASURED FROM CENTRE OF STRUCTURE TO THE CENTRE OF STRUCTURE.
3. UNPLASTICISED PVC (uPVC) SEWER PIPE TO BE AS/NZS 1260 SN8 AND WITH RUBBER RING JOINT SPIGOT AND SOCKET JOINTS. ALL FITTINGS SHALL BE ELASTOMERIC SEAL JOINTED.
4. PIPE BEDDING AND BACKFILL TO BE IN ACCORDANCE WITH GSCA STD. DRG. SEQ-SEW-1200-2.
5. EMBEDMENT AND TRENCH BACKFILL TO BE IN ACCORDANCE WITH GSCA STD. DRG's. SEQ-SEW-1200-2 AND SEQ-SEW-1201-1 (TYPE 3 SUPPORT) AND ANY RELEVANT COUNCIL STANDARDS FOR ROAD CROSSINGS.
6. ALL TRENCH BACKFILL MATERIAL UNDER ROAD PAVEMENT TO BE CBR 15 (MINIMUM). COMPACTION DENSITY TESTING RESULTS ARE TO BE ISSUED TO THE SUPERINTEBDENT.
7. WHERE SEWER GRAVITY MAINS HAVE A LONGITUDINAL GRADE OF 5% (1 IN 20) OR STEEPER, BULKHEADS TO BE CONSTRUCTED IN ACCORDANCE WITH CLAUSES 8.10, 17.5 & 17.6 OF THE GSCA.
5. WHERE MAINTENANCE STRUCTURES ARE OF A CONCRETE CONSTRUCTION, THEN THE CONCRETE IS TO BE CALCAREOUS AGGREGATE CONCRETE IN ACCORDANCE WITH THE RELEVANT AUTHORITY SPECIFICATIONS.
6. ALL MAINTENANCE STRUCTURES ARE TO HAVE A 600mm CLEAR ACCESS OPENING.
7. MAINTENANCE STRUCTURE COVER FINISHED LEVEL IS TO BE IN ACCORDANCE WITH GSCA STD. DRG. SEQ-SEW-1308-1.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE ALL SEWER CONSTRUCTION TESTING REQUIREMENTS WITH COUNCIL / RELEVANT AUTHORITY.
9. IF THE PROJECT BILL OF QUANTITIES (BOQ) DOES NOT INCLUDE SEPARATE ITEM/S FOR ANY TESTING RATES - THEN THE CONTRACTOR'S RATES ARE ADOPTED AS INCLUDING ALL COSTS OF TESTING.
10. DURING CONSTRUCTION THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING AND COORDINATING ANY REQUIRED INSPECTIONS - INCLUDING HOLD POINTS - WITH COUNCIL / RELEVANT AUTHORITY.
11. PRIOR TO ANY CONNECTION TO EXISTING 'LIVE' SEWER INFRASTRUCTURE - THE CONTRACTOR IS TO ISSUE TO THE SUPERINTENDENT ANY REQUIRED QUALITY ASSURANCE DOCUMENTATION FOR REVIEW AND APPROVAL BY THE SUPERINTENDENT AND COUNCIL / RELEVANT AUTHORITY.

ABBREVIATIONS:

GSCA - GRAVITY SEWERAGE CODE OF AUSTRALIA SOUTH-EAST QUEENSLAND SERVICE PROVIDERS EDITION VERSION 2.1 (SEPTEMBER 2021) - STD DRG's TO BE CURRENT REVISION.

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE N/A A1
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DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS		
REVIEWED	SK	ON BEHALF OF OWEN CONSULTING PTY LTD SIMON KEALLEY RPEQ No. 29613	

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CLIENT
CLARKE'S DESIGN & CONSTRUCT

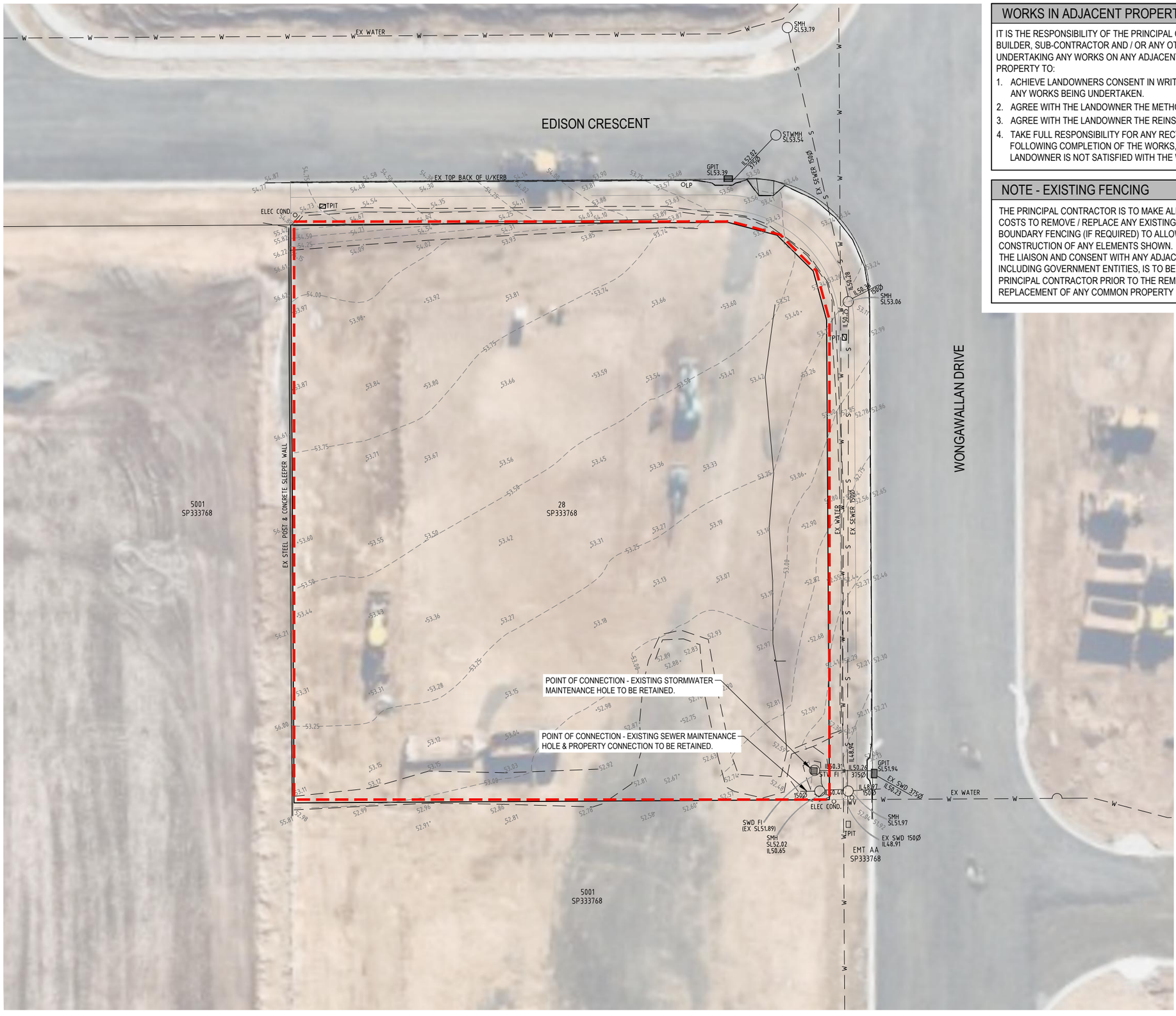
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRAWING SET NOTES SHEET 2 OF 2

PROJECT No
2024035

DRAWING No.
2024035-OPW-003

AMDT
C



WORKS IN ADJACENT PROPERTIES

OWEN REV-B

IT IS THE RESPONSIBILITY OF THE PRINCIPAL CONTRACTOR, BUILDER, SUB-CONTRACTOR AND / OR ANY OTHER CONTRACTOR UNDERTAKING ANY WORKS ON ANY ADJACENT ALLOTMENT / PROPERTY TO:

1. ACHIEVE LANDOWNERS CONSENT IN WRITTEN FORM PRIOR TO ANY WORKS BEING UNDERTAKEN.
2. AGREE WITH THE LANDOWNER THE METHOD OF WORKS.
3. AGREE WITH THE LANDOWNER THE REINSTATEMENT WORKS.
4. TAKE FULL RESPONSIBILITY FOR ANY RECTIFICATION WORKS FOLLOWING COMPLETION OF THE WORKS, WHERE THE LANDOWNER IS NOT SATISFIED WITH THE WORKS.

NOTE - EXISTING FENCING

OWEN REV-B

THE PRINCIPAL CONTRACTOR IS TO MAKE ALLOWANCE FOR ALL COSTS TO REMOVE / REPLACE ANY EXISTING COMMON PROPERTY BOUNDARY FENCING (IF REQUIRED) TO ALLOW FOR CONSTRUCTION OF ANY ELEMENTS SHOWN.
THE LIAISON AND CONSENT WITH ANY ADJACENT LANDOWNERS, INCLUDING GOVERNMENT ENTITIES, IS TO BE ACHIEVED BY THE PRINCIPAL CONTRACTOR PRIOR TO THE REMOVAL / REPLACEMENT OF ANY COMMON PROPERTY BOUNDARY FENCING.

LEGEND

3.0	EXISTING SURFACE CONTOURS (0.25m INTERVAL)
	EXISTING KERB AND CHANNEL
SWD	EXISTING STORMWATER DRAINAGE
S	EXISTING SEWER GRAVITY
HCB	EXISTING SEWER PROPERTY CONNECTION
W	EXISTING WATER RETICULATION
E-UG	EXISTING ELECTRICAL UNDERGROUND
T	EXISTING TELECOMMS CONDUIT
	EXISTING RETAINING WALL
STWMH	EXISTING STORMWATER MANHOLE
STW FI	EXISTING STORMWATER FIELD INLET
SMH	EXISTING SEWER MANHOLE
GPIT	EXISTING STORMWATER GULLY PIT
PP	EXISTING POWER POLE
TPIT	EXISTING TELSTRA PIT
FH	EXISTING FIRE HYDRANT
WM	EXISTING WATER METER
WV	EXISTING WATER VALVE
x1.45	EXISTING SURFACE LEVEL
	SUBJECT SITE BOUNDARY

NOTES - EXISTING SERVICES

OWEN REV-C

1. THE CONTRACTOR SHALL OBTAIN THE LOCATION OF ALL SERVICES BY A 'DIAL BEFORE YOU DIG' (DBYD) SEARCH, ELECTRONIC DETECTION AND POTHOLING. IT IS THE CONTRACTORS RESPONSIBILITY TO PROTECT THESE SERVICES PRIOR TO WORKING IN THE VICINITY. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTORS EXPENSE.
3. THE CONTRACTOR IS TO CONFIRM THE ACTUAL LOCATIONS AND DEPTHS OF ALL EXISTING UNDERGROUND SERVICES PRIOR TO CONSTRUCTION WORKS AND COMPARE WITH CURRENT DESIGN PLANS. REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.
4. WHERE A CONNECTION IS MADE TO ANY ELEMENT OF EXISTING INFRASTRUCTURE, THEN THE LEVEL OF THAT INFRASTRUCTURE MUST BE CHECKED BY THE CONTRACTOR PRIOR TO CONSTRUCTION WORKS AND COMPARED WITH CURRENT DESIGN PLANS. REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.
5. WHERE NEW SERVICES CROSS OTHER NEW SERVICES OR WHERE NEW SERVICES CROSS EXISTING SERVICES THE CONTRACTOR SHALL CHECK MINIMUM RELEVANT AUTHORITY CLEARANCES BY CHECKING LEVELS ON-SITE AND ADVISE THE SUPERINTENDENT PRIOR TO CONSTRUCTION IF THE MINIMUM CLEARANCE CAN NOT BE ACHIEVED.
6. OWEN CONSULTING ACCEPTS NO RESPONSIBILITY FOR ANY EXISTING SERVICES / INFRASTRUCTURE LOCATED ON-SITE THAT ARE NOT SHOWN ON THESE DRAWINGS OR THE ACCURACY OF EXISTING SERVICES LOCATIONS AND LEVELS SHOWN ON THESE DRAWINGS.

EXISTING SERVICES LOCATION - DESIGN DEIFINTION

THIS DESIGN RELIES UPON EXISTING SERVICES INFORMATION DERIVED FROM THE FOLLOWING SOURCES:

- THE LOCATION OF EXISTING SERVICES AT THE GROUND SURFACE LOCATED BY THE PROJECT SURVEYOR (QL-A)
- DBYD SEARCH RESULTS (QL-D)
- INFORMATION PROVIDED BY SERVICE OWNER AND / OR RELEVANT AUTHORITY (DEEMED QL-C)

SUB-SURFACE INVESTIGATION HAS BEEN UNDERTAKEN IF SPECIFIED ON THE DESIGN PLANS BY:

POTHOLING (QL-A) - REFER: SUBSURFACE UTILITY INVESTIGATION

DIAL BEFORE YOU DIG www.1100.com.au

CAUTION !! UNDERGROUND CABLES — energex — UNDERGROUND CABLES EXIST IN THIS VICINITY. CONTACT ENERGEX PRIOR TO EXCAVATION

CAUTION !! UNDERGROUND FIBRE OPTIC — UNDERGROUND CABLES EXIST IN THIS VICINITY. CONTACT ASSET OWNER FOR LOCATION PRIOR TO EXCAVATION

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 2 1 0 2 4 6 8 10 1:200 A1
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DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS		
REVIEWED	SK		

ON BEHALF OF OWEN CONSULTING PTY LTD
SIMON KEALLEY
RPEQ No. 29413

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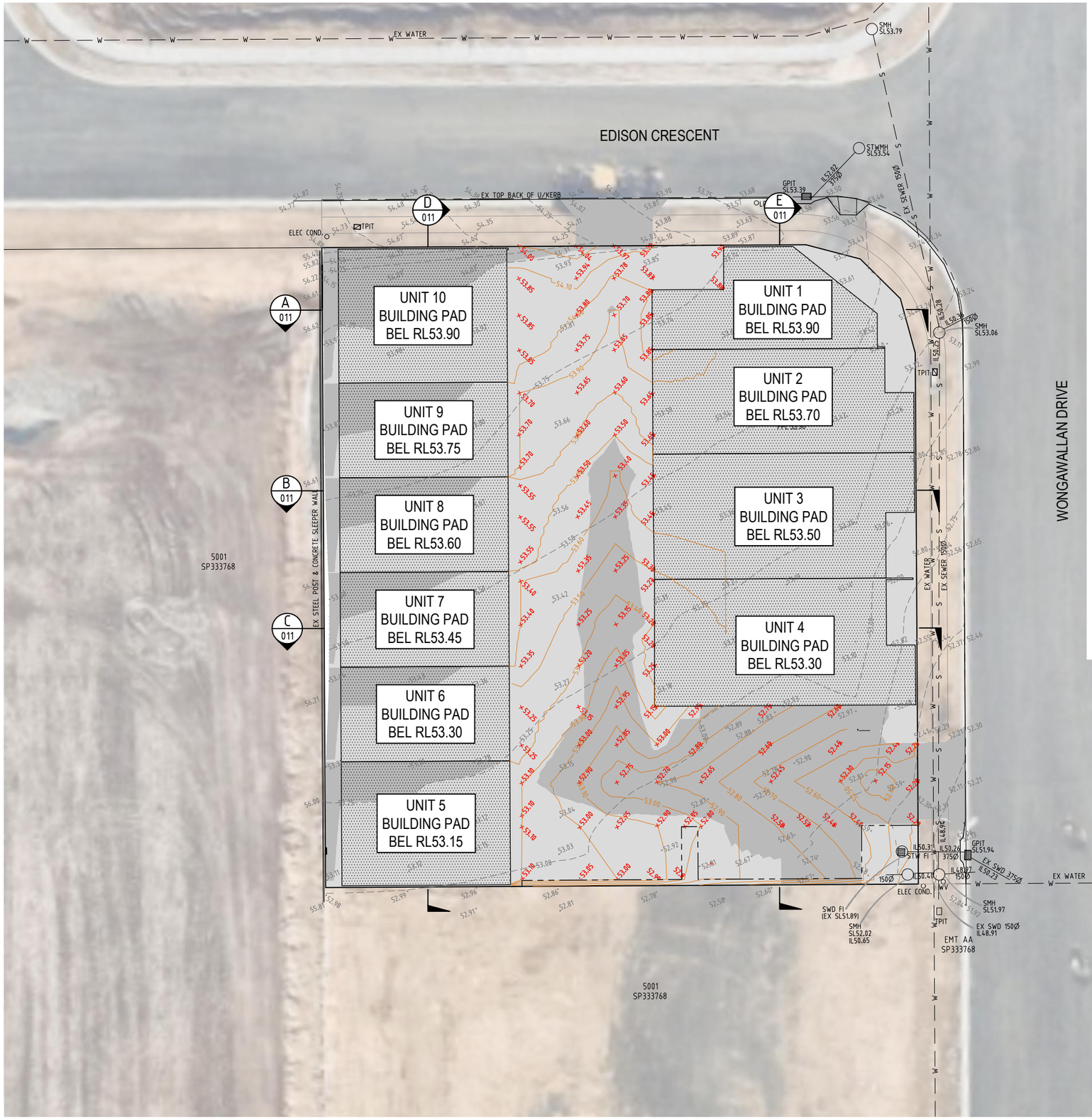
ISSUE	DATE	ISSUE DESCRIPTION
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CLIENT
CLARKE'S DESIGN & CONSTRUCT

PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
EXISTING FEATURES PLAN

PROJECT No.
2024035
DRAWING No
2024035-OPW-004
AMDT
C



NOTES - EARTHWORKS VOLUMES

OWEN REV-C

TOTAL CUT: 93m^3 TOTAL FILL: 410m^3

TOTAL CUT TO FILL: 317m^3

TOTAL CUT TO STOCKPILE: 0m^3

TOTAL CUT TO SPOIL (OR AS SPECIFIED): 0m^3

TOTAL IMPORT: 317m^3

QUANTITIES SHOWN ARE BASED ON THE FOLLOWING:

BULKING FACTOR

EXCLUDES ANY BULKING OR COMPACTION FACTORS (SOLID QTY's)

TOPSOIL

THE TOPSOIL THICKNESS IS BASED UPON A REVIEW OF ANY AVAILABLE GEOTECHNICAL TESTING AND REPORTING. WHERE NO REPORTING IS AVAILABLE - THEN 100mm THICKNESS IS ADOPTED. THEREFORE, THE ALLOWED THICKNESS IS AN ESTIMATE ONLY.

- TOPSOIL THICKNESS REMOVAL ALLOWANCE TO ALL AREAS SUBJECT TO WORKS = 100mm
- TOPSOIL SPREAD THICKNESS TO LANDSCAPING = 100mm TOPSOIL SPREAD THICKNESS TO VERGES = N/A
- TOPSOIL SPREAD THICKNESS TO BATTERS = N/A

BUILDING/S SLAB FORMATION - ALLOWED FOR

ALLOWANCE FOR BUILDING/S SLAB THICKNESS FORMATION IS BASED UPON THAT ADVISED BY THE PROJECT STRUCTURAL ENGINEER - OTHERWISE 150mm IS ADOPTED.

- 150mm THICK BUILDING SLAB
- 50mm THICK BASE LAYER

HARDSTAND PAVEMENT FORMATION - ALLOWED FOR

ALLOWANCE FOR PAVEMENT THICKNESS FORMATION IS BASED UPON THE PRELIMINARY PAVEMENT DESIGN/S AS IDENTIFIED IN THIS DRAWING SET OR AS ADVISED BY PROJECT STRUCTURAL ENGINEER - SUBJECT TO DESIGN SUBGRADE CBR TESTS.

- 150mm THICK RIGID (CONCRETE) PAVEMENT
- 50mm THICK BASE LAYER

SERVICE TRENCH SPOIL

SERVICES TRENCH SPOIL FOLLOWING EARTHWORKS IS NOT ALLOWED FOR IN THE QUANTITIES - UNLESS NOTED OTHERWISE. THE CONTRACTOR IS TO MAKE ALLOWANCE.

GEOTECHNICAL INSPECTION AND TESTING AUTHORITY (GITA)

QUANTITIES SHOWN ARE SUBJECT TO ANY INSTRUCTION BY THE PROJECT GITA DURING EARTHWORKS.

LEGEND

- EXISTING SURFACE CONTOURS (0.25m INTERVAL)
- EXISTING KERB AND CHANNEL
- EXISTING STORMWATER DRAINAGE
- EXISTING SEWER GRAVITY
- EXISTING SEWER PROPERTY CONNECTION
- EXISTING WATER RETICULATION
- EXISTING ELECTRICAL UNDERGROUND
- EXISTING TELECOMMS CONDUIT
- EXISTING RETAINING WALL
- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER FIELD INLET
- EXISTING SEWER MANHOLE
- EXISTING STORMWATER GULLY PIT
- EXISTING POWER POLE
- EXISTING TELSTRA PIT
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SURFACE LEVEL
- PROPOSED EARTHWORKS LEVEL
- DESIGN EARTHWORKS CONTOURS (0.10m INTERVALS)
- PROPOSED NOMINAL KERB LINE
- PROPOSED RETAINING WALL
- EARTHWORKS AREA OF CUT
- EARTHWORKS AREA OF FILL
- EARTHWORKS BUILDING PAD

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 2 1 0 2 4 6 8 10 1:200 A1

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DESIGNED	SK/FI	APPROVED
DRAWN	LAB/DS	16.10.24
REVIEWED	SK	ON BEHALF OF OWEN CONSULTING PTY LTD SIMON KEALLEY RPEQ No. 29613

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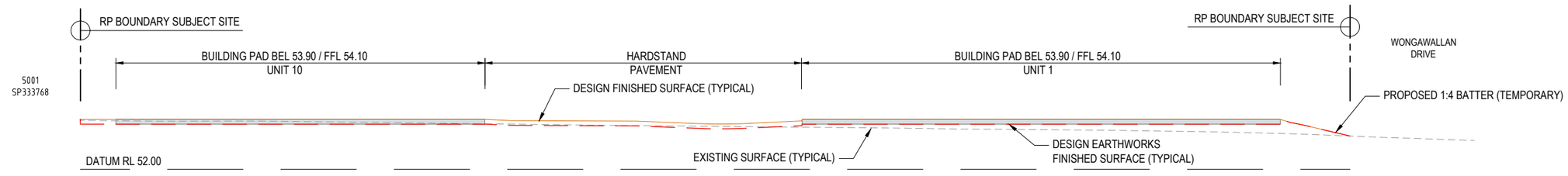
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
BULK EARTHWORKS PLAN

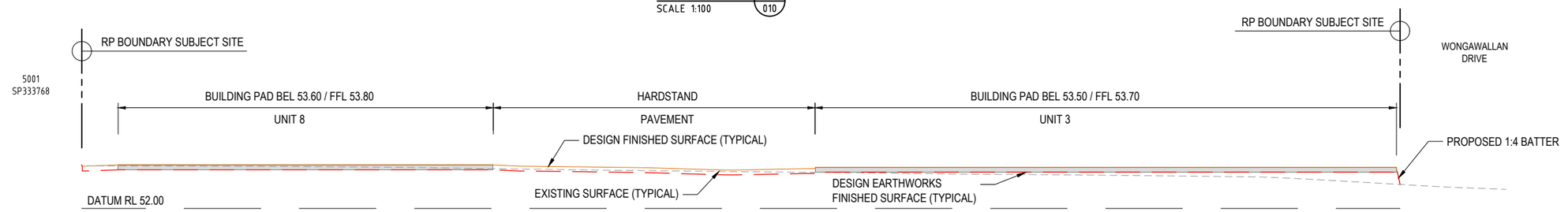
PROJECT No
2024035

DRAWING No
2024035-OPW-010

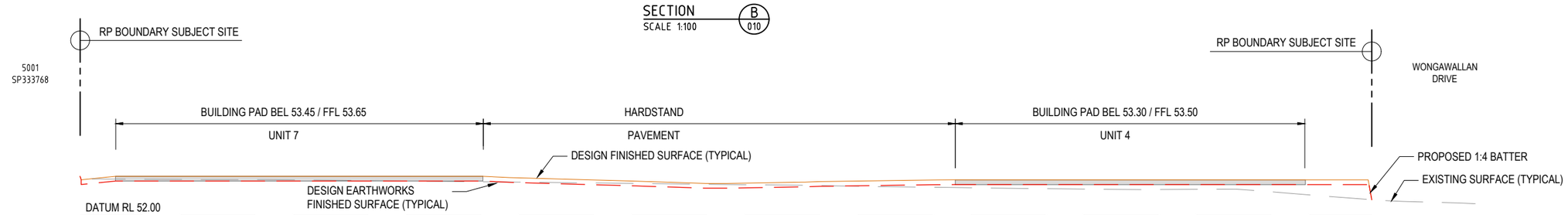
AMDT
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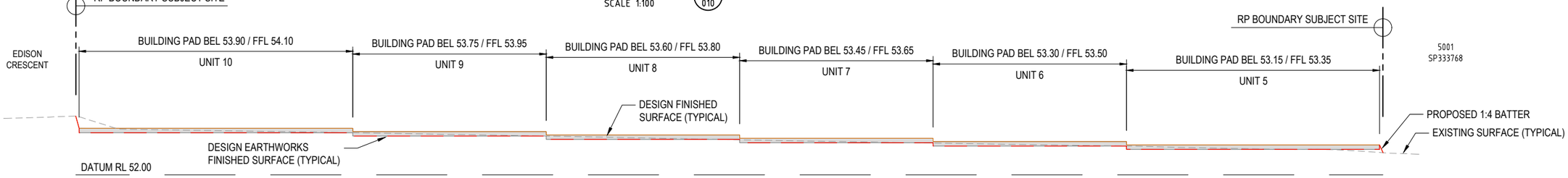
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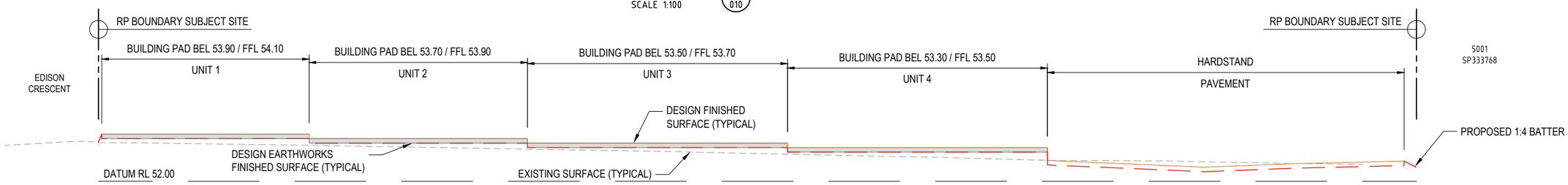
SECTION B
SCALE 1:100 010



SECTION C
SCALE 1:100 010



SECTION D
SCALE 1:100 010



SECTION E
SCALE 1:100 010

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LAND DEVELOPMENT

SCALE 1 0 1 2 3 4 5 SCALE 1:100
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DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS	ON BEHALF OF OWEN CONSULTING PTY LTD	
REVIEWED	SK	SIMON KEALLEY RPEQ No. 29413	

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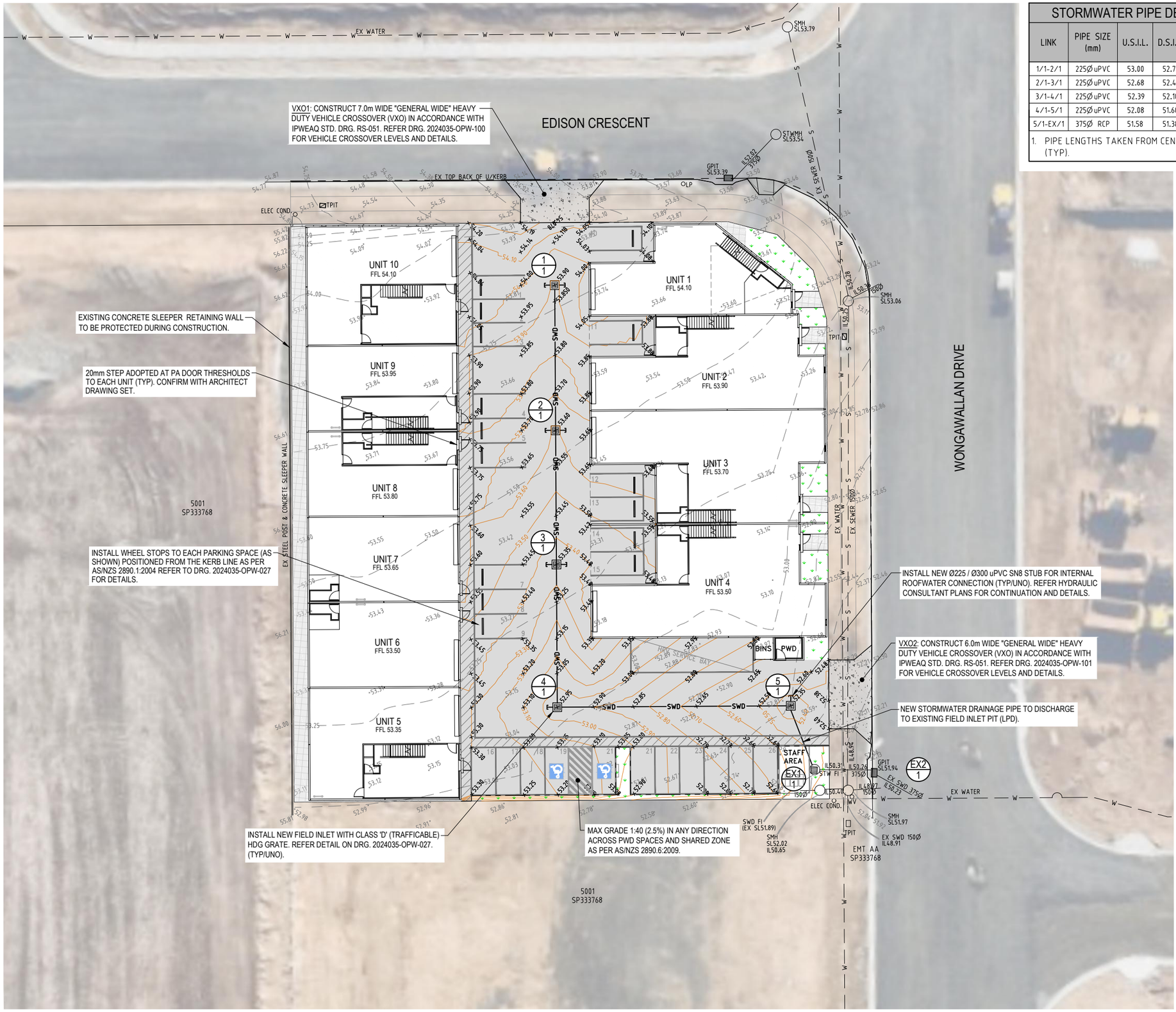
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INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
BULK EARTHWORK SECTIONS

PROJECT No
2024035
DRAWING No
2024035-OPW-011
AMDT
C



STORMWATER PIPE DETAILS

LINK	PIPE SIZE (mm)	U.S.I.L.	D.S.I.L.	LENGTH (m)	PIPE GRADE (%)
1/1-2/1	225Ø uPVC	53.00	52.70	14.75	2.00
2/1-3/1	225Ø uPVC	52.68	52.41	13.65	2.00
3/1-4/1	225Ø uPVC	52.39	52.10	14.40	2.00
4/1-5/1	225Ø uPVC	52.08	51.60	23.75	2.00
5/1-EX/1	375Ø RCP	51.58	51.38	6.84	3.00

1. PIPE LENGTHS TAKEN FROM CENTRE OF STRUCTURE (TYP).

LEGEND

- EXISTING SURFACE CONTOURS (0.25m INTERVAL)
- EXISTING KERB AND CHANNEL
- EXISTING STORMWATER DRAINAGE
- EXISTING SEWER GRAVITY
- EXISTING SEWER PROPERTY CONNECTION
- EXISTING WATER RETICULATION
- EXISTING ELECTRICAL UNDERGROUND
- EXISTING TELECOMMS CONDUIT
- EXISTING RETAINING WALL
- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER FIELD INLET
- EXISTING SEWER MANHOLE
- EXISTING STORMWATER GULLY PIT
- EXISTING POWER POLE
- EXISTING TELSTRA PIT
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING SURFACE LEVEL
- PROPOSED SURFACE LEVEL
- DESIGN SURFACE CONTOURS (0.10m INTERVAL)
- PROPOSED BARRIER KERB TYPE B2
- PROPOSED STORMWATER DRAINAGE AND STRUCTURE LABEL
- PROPOSED SEWER SERVICE
- PROPOSED WATER SERVICE
- PROPOSED WATER METER
- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE VEHICLE CROSSOVER (VXO)
- PROPOSED LANDSCAPING / TURF (BY OTHERS)
- PROPOSED PATHWAY

NOTES

1. FOR DRAWING SET NOTES REFER DRG. 2024035-OPW-002 & 003
2. DESIGN IS SUBJECT TO ANY EDQ APPROVALS.

STORMWATER STRUCTURE DETAILS

STRUCTURE NUMBER	STRUCTURE DETAILS
1/1	600x600mm FIELD INLET WITH CLASS D GRATE
2/1	600x600mm FIELD INLET WITH CLASS D GRATE
3/1	600x600mm FIELD INLET WITH CLASS D GRATE
4/1	600x600mm FIELD INLET WITH CLASS D GRATE
5/1	600x600mm FIELD INLET WITH CLASS D GRATE
EX/1	EXISTING STORMWATER MANHOLE CHAMBER

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CIVIL ENGINEERS
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		SIMON KEALLEY	
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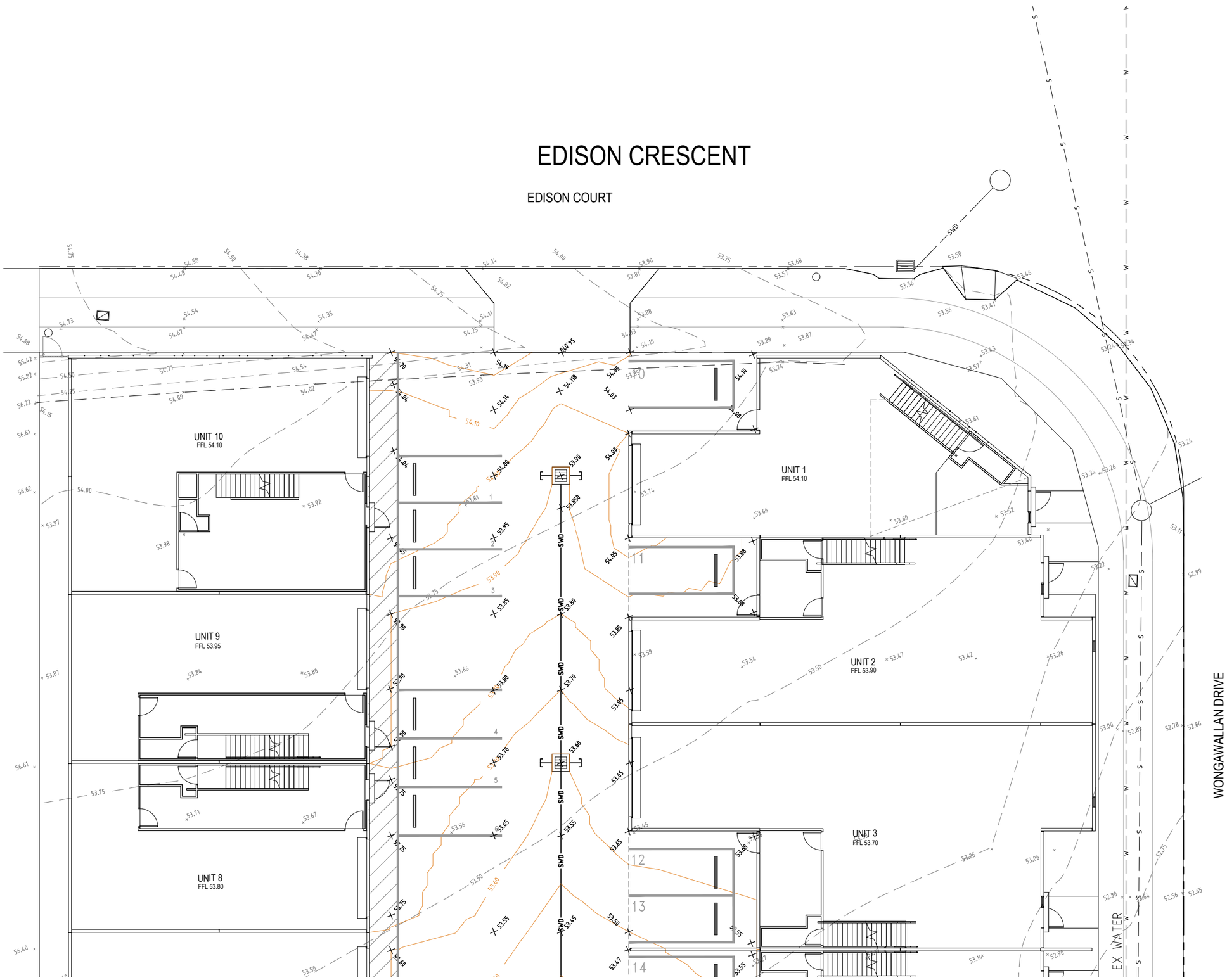
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRIVEWAY AND DRAINAGE PLAN

PROJECT No
2024035
DRAWING No
2024035-OPW-020
AMDT
C

EDISON CRESCENT

EDISON COURT



LEGEND

3.0	EXISTING SURFACE CONTOURS (0.25m INTERVAL)
	EXISTING KERB AND CHANNEL
SWD	EXISTING STORMWATER DRAINAGE
S	EXISTING SEWER GRAVITY
HCB	EXISTING SEWER PROPERTY CONNECTION
W	EXISTING WATER RETICULATION
E-UG	EXISTING ELECTRICAL UNDERGROUND
T	EXISTING TELECOMMS CONDUIT
	EXISTING RETAINING WALL
STWMH	EXISTING STORMWATER MANHOLE
STW FI	EXISTING STORMWATER FIELD INLET
SMH	EXISTING SEWER MANHOLE
GPIT	EXISTING STORMWATER GULLY PIT
PP	EXISTING POWER POLE
TPIT	EXISTING TELSTRA PIT
FH	EXISTING FIRE HYDRANT
WM	EXISTING WATER METER
WV	EXISTING WATER VALVE
+1.45	EXISTING SURFACE LEVEL
+1.45	PROPOSED SURFACE LEVEL
12.60	DESIGN SURFACE CONTOURS (0.10m INTERVAL)
BK	PROPOSED BARRIER KERB TYPE B2
SWD	PROPOSED STORMWATER DRAINAGE

NOTES

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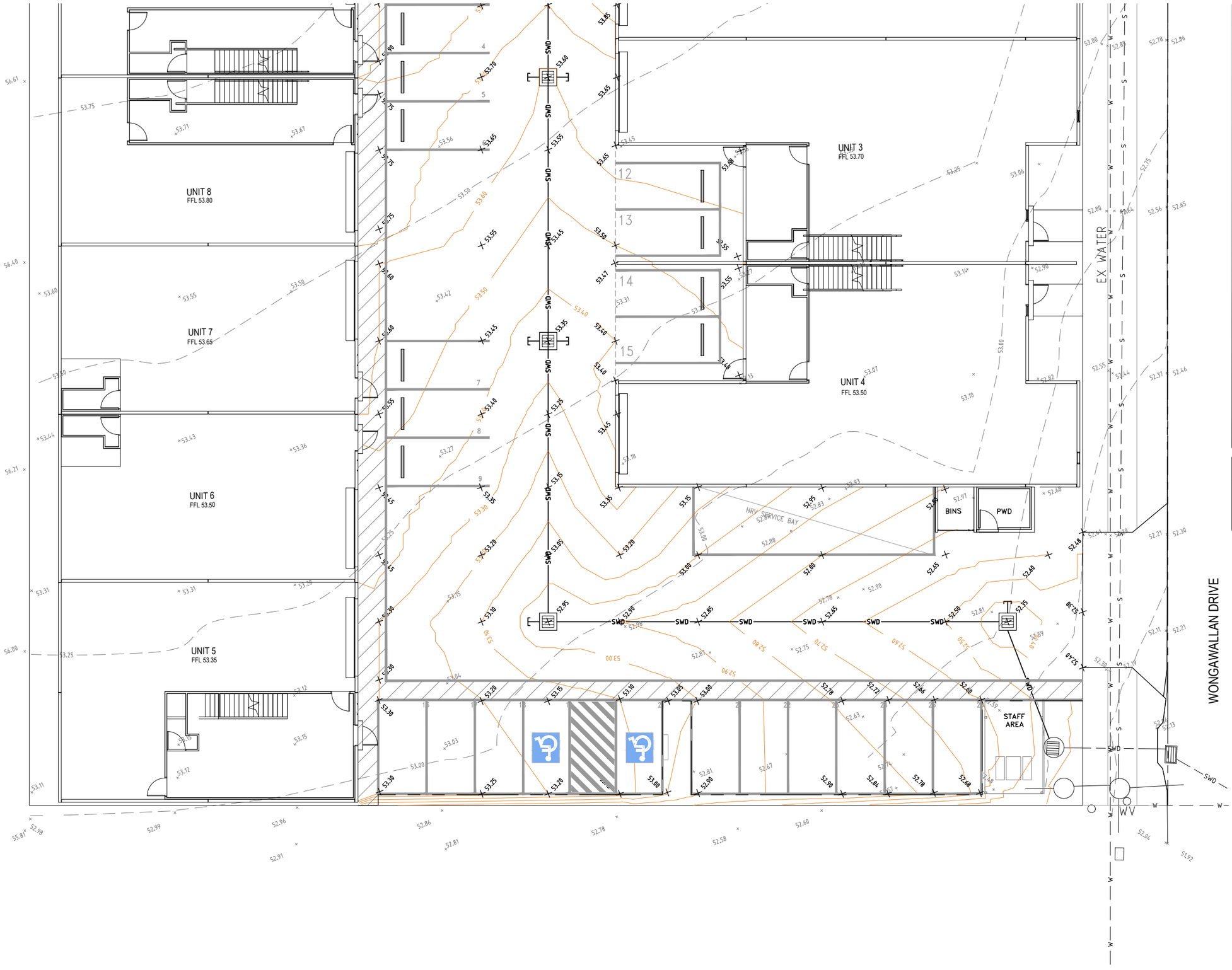
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRIVEWAY GRADING PLAN
SHEET 1 OF 2

PROJECT No
2024035

DRAWING No
2024035-OPW-021

AMDT
C



LEGEND

3.0	EXISTING SURFACE CONTOURS (0.25m INTERVAL)
	EXISTING KERB AND CHANNEL
SWD	EXISTING STORMWATER DRAINAGE
S	EXISTING SEWER GRAVITY
HCB	EXISTING SEWER PROPERTY CONNECTION
W	EXISTING WATER RETICULATION
E-UG	EXISTING ELECTRICAL UNDERGROUND
T	EXISTING TELECOMMS CONDUIT
	EXISTING RETAINING WALL
STWMH	EXISTING STORMWATER MANHOLE
STW FI	EXISTING STORMWATER FIELD INLET
SMH	EXISTING SEWER MANHOLE
GPIT	EXISTING STORMWATER GULLY PIT
PP	EXISTING POWER POLE
TPIT	EXISTING TELSTRA PIT
FH	EXISTING FIRE HYDRANT
WM	EXISTING WATER METER
WV	EXISTING WATER VALVE
×14.45	EXISTING SURFACE LEVEL
+14.45	PROPOSED SURFACE LEVEL
12.60	DESIGN SURFACE CONTOURS (0.10m INTERVAL)
BK	PROPOSED BARRIER KERB TYPE B2
SWD	PROPOSED STORMWATER DRAINAGE

NOTES

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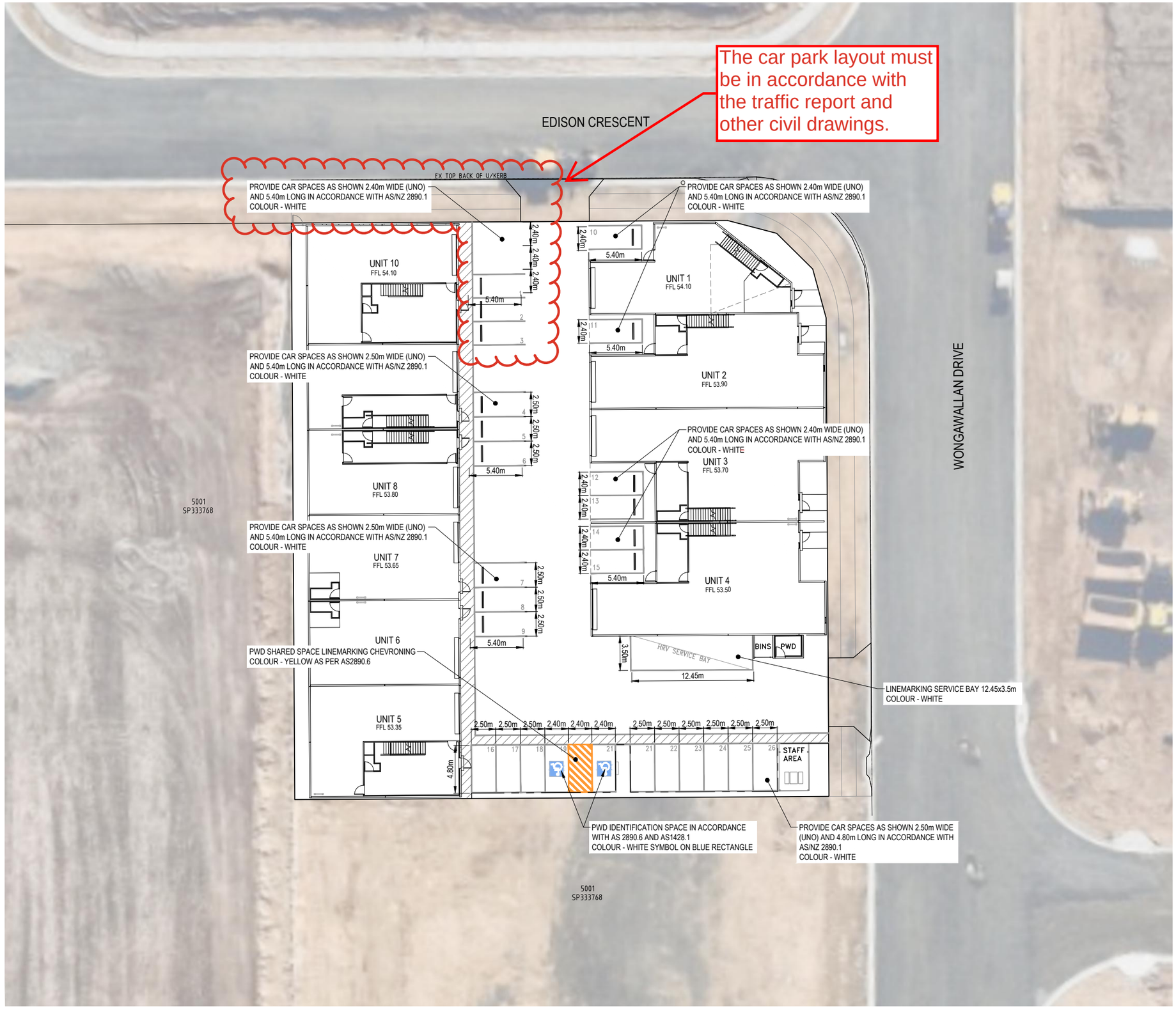
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRIVEWAY GRADING PLAN
SHEET 2 OF 2

PROJECT No
2024035

DRAWING No
2024035-OPW-022

AMDT
C



LEGEND - PAVEMENT MARKINGS

OWEN REV-C

CODE	LINE TYPE	LINE LENGTH (m)	GAP (m)	WIDTH (mm)
LLB	LANE-LINE (BROKEN)	3.0	9.0	100
LL	LANE-LINE (UNBROKEN)	-	-	100
EL	EDGE LINE	-	-	100
DBL	DOUBLE BARRIER LINE	-	-	100,100,100
BBL	BARRIER LINE (BROKEN)	3.0	9.0	100,100,100
CL	CONTINUITY LINE	1.0	3.0	150
GWL	GIVE-WAY LINE	0.6	0.6	450
SL	STOP LINE	-	-	450
TL	TURN LINE	0.6	0.6	100
CWL	CROSSWALK LINE	1.0	0.3	150
YL	YELLOW LINE	-	-	100

NOTES - LINEMARKING AND SIGNAGE

OWEN REV-B

1. ALL LINEMARKING - DIMENSIONAL REQUIREMENTS - IS TO BE IN ACCORDANCE WITH AS2890.1.
2. PAINT TO BE IN ACCORDANCE WITH AS4049.1 AND BE 'DULUX' ROADMASTER WHITE FINISH - FLAT OR APPROVED EQUIVALENT.
3. ALL PARKING SPACES SHALL BE MARKED IN THE SAME WAY BY THE USE OF TEMPLATES OR APPROVED METHOD.
4. PARKING BAY LINE MARKING SHALL BE 80 WIDE U.N.O AND THE WIDTH IS TO BE CONSISTENT FOR ALL PARKING BAYS.
5. PWD SYMBOLS AS INDICATED ON THE PLAN/S SHALL BE MARKED IN ACCORDANCE WITH AS2890.6 AND AS1428.1.
6. THE EXACT LOCATION OF ALL SIGNS IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO INSTALLATION.
7. ALL SIGNS ARE TO BE POSITIONED 300mm FROM THE FACE OF KERB.
8. ALL SIGNS ARE TO BE REFLECTORISED CLASS 1 TO AS1743.

LINEMARKING - SETOUT

OWEN REV-B

LINEMARKING SET-OUT TO BE PROVIDED AS ELECTRONIC FILE.

CONTACT OWEN (07) 55720702 admin@owenconsulting.com.au

AMENDED IN RED

By: Vivian Lun

Date: 25 October 2024

Queensland Government

Owen.

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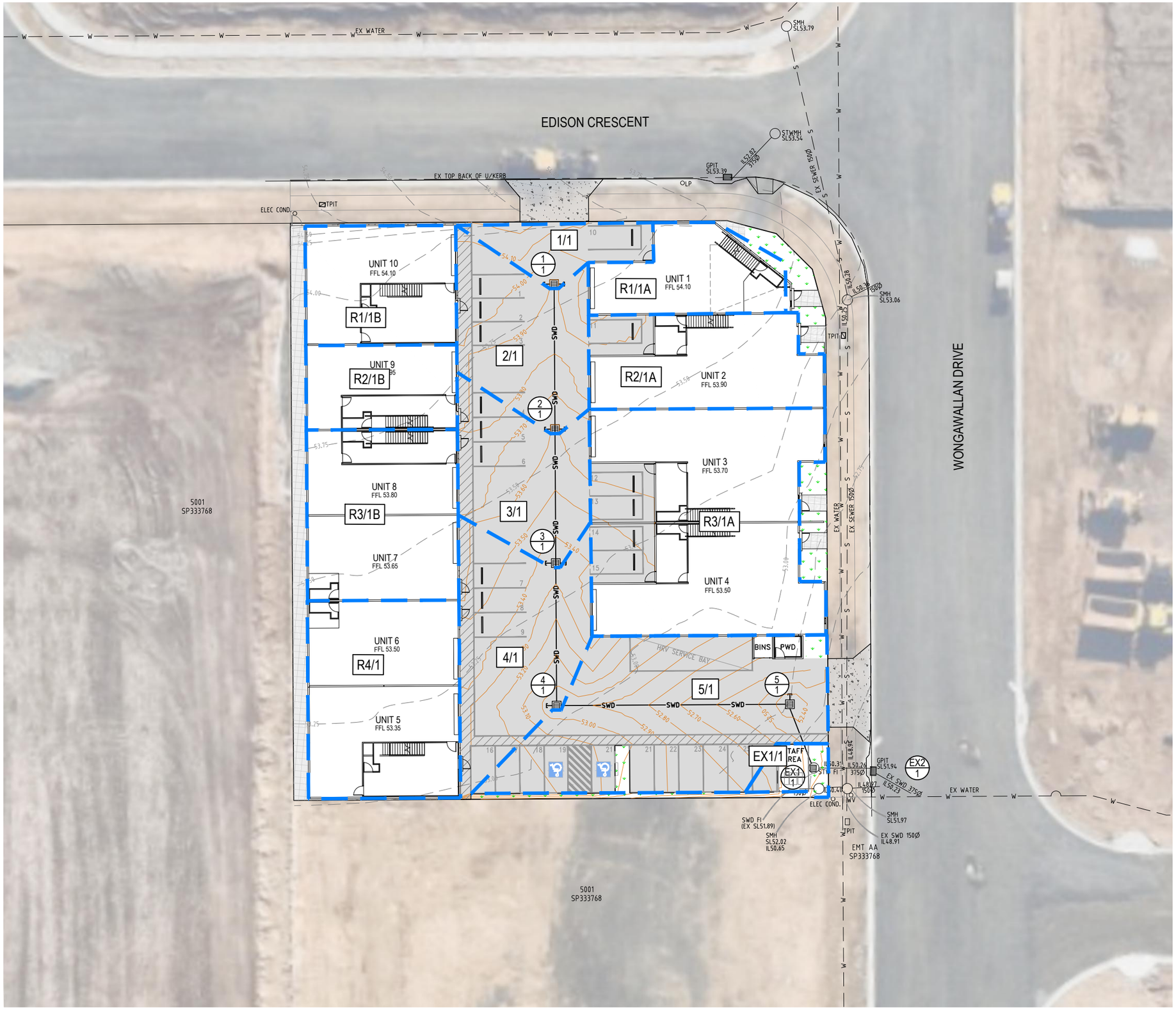
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
LINEMARKING AND SIGNAGE PLAN

PROJECT No
2024035

DRAWING No
2024035-OPW-023

AMDT
C



LEGEND

3.0	EXISTING SURFACE CONTOURS (0.25m INTERVAL)
12.60	DESIGN SURFACE CONTOURS (0.1m INTERVAL)
2/1 SWD	PROPOSED STORMWATER DRAINAGE AND STRUCTURE LABEL
	CATCHMENT BOUNDARY
1/1	CATCHMENT BOUNDARY LABEL

STORMWATER CATCHMENT AREA TABLE

OWEN REV-B

CATCHMENT LABEL	CATCHMENT AREA
1/1	0.008 Ha
2/1	0.020 Ha
3/1	0.018 Ha
4/1	0.026 Ha
5/1	0.043 Ha
R1/1A	0.015 Ha
R1/1B	0.019 Ha
R2/1A	0.022 Ha
R2/1B	0.013 Ha
R3/1A	0.052 Ha
R3/1B	0.027 Ha
R4/1	0.031 Ha
EX1/1	0.003 Ha

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DRAWN	LAB/DS		
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PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

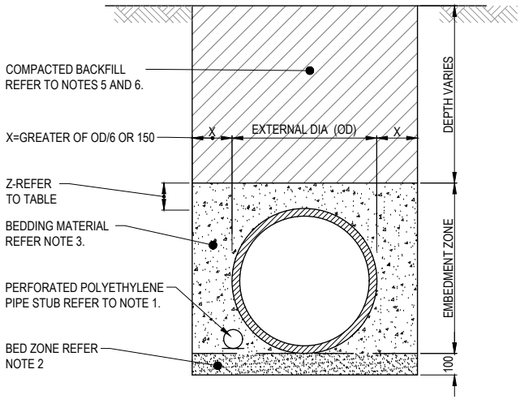
TITLE
STORMWATER DRAINAGE CATCHMENT PLAN

PROJECT No
2024035

DRAWING No
2024035-OPW-024

AMDT
C

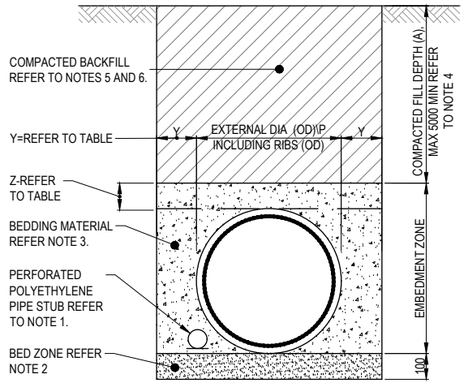
EXTERNAL DIAMETER (OD)	SPACING Y	SPACING Z
>150, <=300	150	150
>300, <=450	200	
>450, <=900	300	
>900, <=1500	350	200
>1500	OD/4	300



RIGID SINGLE PIPE - BEDDING DETAIL

SCALE N.T.S.

OWEN REV-B



FLEXIBLE SINGLE PIPE - BEDDING DETAIL

SCALE N.T.S.

OWEN REV-B

NOTES: COMPACTION METHOD

A. 15 TONNE EXCAVATOR AND COMPACTION WHEEL ALLOWED TO DEPTHS ABOVE THE CROWN OF THE PIPE AS PER TABLE BELOW.
B. VIBRATING RAMMER (UP TO 75kg) ALLOWED AT DEPTHS ABOVE THE CROWN AS PER TABLE BELOW
C. 2 TONNE VIBRATING TRENCH ROLLER ALLOWED AT DEPTHS ABOVE CROWN OF PIPE AS PER TABLE BELOW.

CLASS OF PIPE	COMPACTION METHOD	DEPTH ABOVE CROWN OF PIPE
CLASS 2	A	700mm MIN
	B	450mm MIN
	C	400mm MIN
CLASS 3	A	450mm MIN
	B	300mm MIN
	C	250mm MIN
CLASS 4	A	350mm MIN
	B	250mm MIN
	C	200mm MIN

NOTES: CONSTRUCTION METHOD AND BEDDING FOR R.C.P PIPES

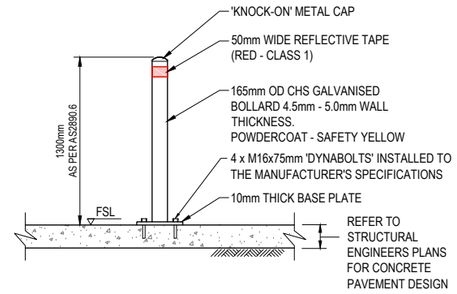
1. BED AND HAUNCH ZONES ARE TO BE 'COMPACTED SELECT FILL' AS PER TABLE 3 GRADING TO AS 3725.
2. SIDE ZONES ARE TO BE 'COMPACTED SELECT FILL' AS PER TABLE 4 GRADING TO AS 3725.
3. 'COMPACTED ORDINARY FILL' AND 'BACKFILL' TO BE AS DEFINED IN AS 3725.
4. 'D' (DIAMETER) REFERS TO THE OUTSIDE DIAMETER OF THE PIPE
5. ALL ZONES ARE TO BE COMPACTED BY APPROVED METHODS TO ACHIEVE DENSITIES AS SPECIFIED IN AS 3725
6. THE CONTRACTOR IN TO EXERCISE DUE CARE AND ATTENTION DURING PIPE INSTALLATION ENSURING PIPES ARE NOT DAMAGED DURING CONSTRUCTION. DAMAGED PIPES WILL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE.

NOTES: RIGID AND FLEXIBLE PIPE

1. UNLESS DIRECTED OTHERWISE, PROVIDE PIPE STUB TO DEWATER DRAINAGE TRENCH. STUB TO BE 1000mm LONG x 100mm DIA. CORRUGATED POLYETHYLENE PIPE CLASS 400 TO AS2439 (WITH END CAP) INSTALLED ON THE UPSTREAM FACE OF MANHOLES.
2. BED ZONE MATERIAL: 5mm OR 10mm SCREENINGS, OR ALTERNATIVELY WASHED SCREENED BEDDING SAND TO GRADING SPECIFIED BELOW TO BED ZONE.

SEIVE SIZE IN mm	PASSING (% BY WEIGHT)
9.5	100
4.75	95-100
2.36	75-90
1.18	15-25
0.60	10-20
0.30	5-10
0.15	0-5

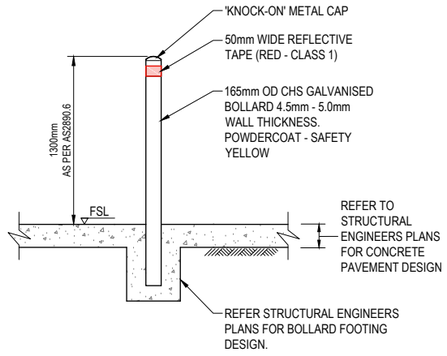
3. EMBEDMENT ZONE MATERIAL: 5mm OR 10mm SCREENINGS.
4. FOR FLEXIBLE PIPES, DEPTH OF COMPACTED BACKFILL (A) VARIES:
   - MINIMUM 600 TO UNDERSIDE OF CONSTRUCTED PAVEMENT OR;
   - MINIMUM 750 TO FINSIHED SURFACE LEVEL (WHICHEVER IS GREATER)
5. COMPACTED BACKFILL UNDER ROADS (RIGID AND FLEXIBLE PIPES): GRANULAR FILL COMPRISING CRUSHED ROCK (75mm MAXIMUM SIZE, NON PLASTIC OPEN GRADED MATERIAL) OR CRUSHED RUN RECYCLED CONCRETE. WHERE APPROVED UNDER SPECIAL CIRCUMSTANCES, STABILISED SAND (1 PART CEMENT TO 12 PARTS SAND BY VOLUME) OR CONTROLLED LOW STRENGTH MATERIAL OR LEAN MIX CONCRETE OR CLASS 3 MATERIAL MAY BE PERMITTED.
6. COMPACTED BACKFILL UNDER FOOTPATHS AND BIKEWAYS (RIGID AND FLEXIBLE PIPES): EXCAVATED MATERIAL PROVIDED ADEQUATE COMPACTION CAN BE OBTAINED. ALTERNATIVELY USE GRANULAR FILL.
7. INCREASE EXCAVATION LOCALLY AT SPIGOT AND SOCKET JOINTS (RIGID PIPES) TO ENSURE MINIMUM BOTTOM COVER AS SHOWN.
8. DIMENSIONS IN MILLIMETERS (U.N.O)



TYPICAL DETAIL - PWD SHARED SPACE - BOLLARD OPTION 2 - SURFACE MOUNTED

OWEN REV-B

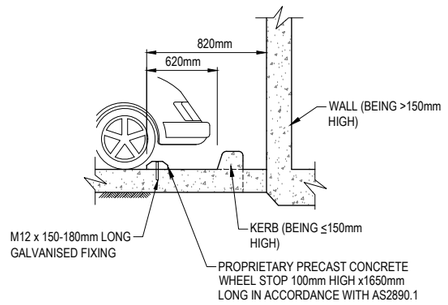
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TYPICAL DETAIL - PWD SHARED SPACE - BOLLARD OPTION 1 - CAST INSITU

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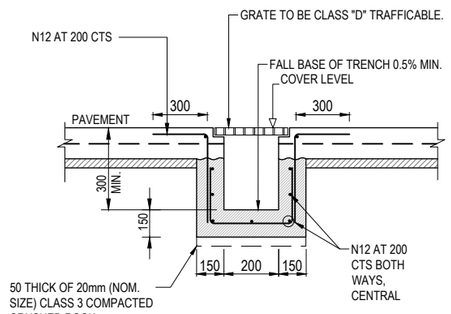
SCALE: NTS



TYPICAL DETAIL - WHEEL STOP

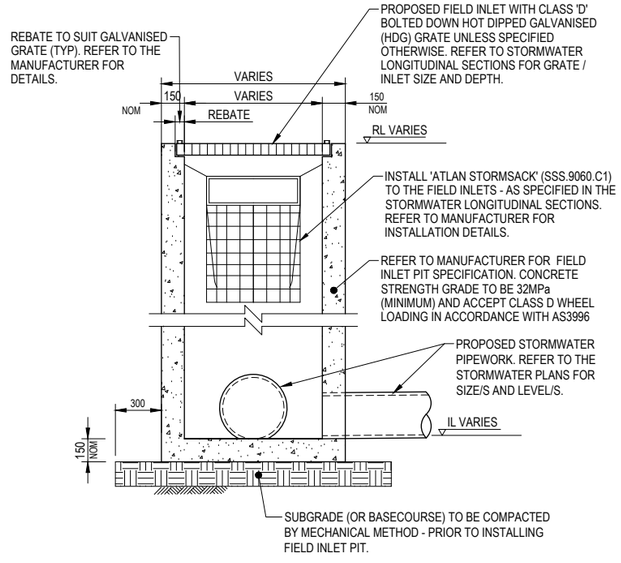
SCALE: NTS

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TRENCH DRAIN TYPICAL DETAIL

SCALE: NTS



TYPICAL DETAIL - PRE-CAST SWD FIELD INLET WITH QUALITY DEVICE

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SCALE: NTS

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		SIMON KEALLEY RPEQ No. 29613	

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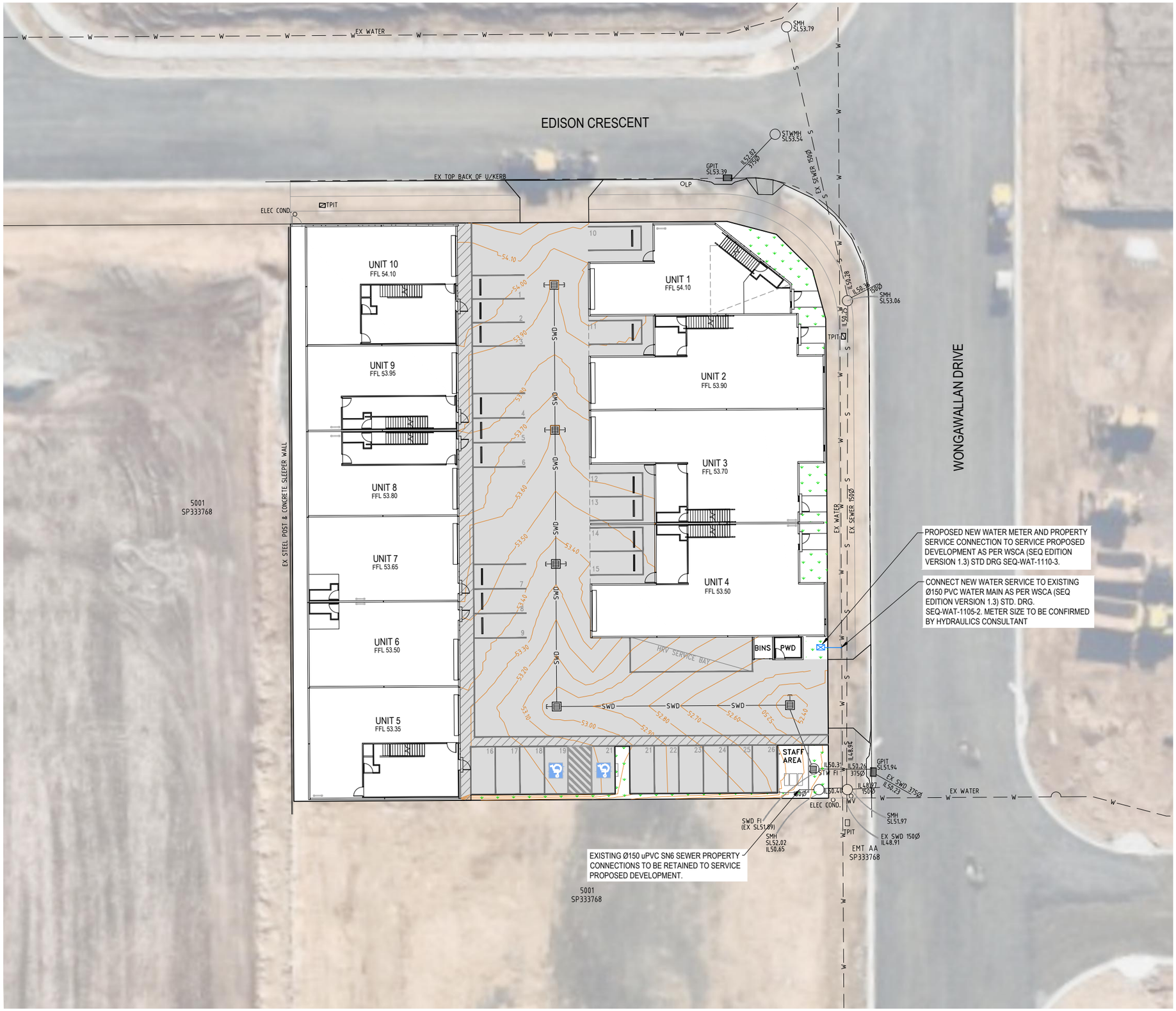
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
SECTIONS AND DETAILS SHEET

PROJECT No.
2024035

DRAWING No.
2024035-OPW-027

AMDT
C



LEGEND

- EXISTING KERB AND CHANNEL
- SWD — EXISTING STORMWATER DRAINAGE
- S — EXISTING SEWER GRAVITY
- HCB — EXISTING SEWER PROPERTY CONNECTION
- W — EXISTING WATER RETICULATION
- E-UG — EXISTING ELECTRICAL UNDERGROUND
- T — EXISTING TELECOMMS CONDUIT
- EXISTING RETAINING WALL
- STWMH — EXISTING STORMWATER MANHOLE
- STW FI — EXISTING STORMWATER FIELD INLET
- SMH — EXISTING SEWER MANHOLE
- GPIT — EXISTING STORMWATER GULLY PIT
- PP — EXISTING POWER POLE
- TPIT — EXISTING TELSTRA PIT
- FH — EXISTING FIRE HYDRANT
- WM — EXISTING WATER METER
- WV — EXISTING WATER VALVE
- 12.60 — DESIGN SURFACE CONTOURS (0.10m INTERVAL)
- PROPOSED BARRIER KERB TYPE B2
- SWD — PROPOSED STORMWATER DRAINAGE
- W — PROPOSED WATER SERVICE
- PROPOSED WATER METER
- PROPOSED CONCRETE PAVEMENT
- PROPOSED LANDSCAPING / TURF (BY OTHERS)

NOTES

1. REFER TO DRG. 2022031-OPW-002 & 003 FOR DRAWING SET NOTES.
2. GSCA (SEQ EDITION VER 2.1) STANDS FOR GRAVITY SEWERAGE CODE OF AUSTRALIA SOUTH-EAST QUEENSLAND SERVICE PROVIDERS EDITION VERSION 2.1 (SEPTEMBER 2021).
3. WSCA (SEQ EDITION VER 1.3) STANDS FOR WATER SUPPLY CODE OF AUSTRALIA SOUTH-EAST QUEENSLAND SERVICE PROVIDERS EDITION VERSION 1.30 (AUGUST 2019).
4. DESIGN IS SUBJECT TO EDQ APPROVAL.

Owen.

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 1:200 — A1

DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT ASK

DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS		
REVIEWED	SK		

ON BEHALF OF OWEN CONSULTING PTY LTD
SIMON KEALLEY
RPEQ No. 29413

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NORTH

DATUM AHD(m)

ISSUE	DATE	ISSUE DESCRIPTION
C	16.10.24	ISSUED IN RESPONSE TO EDQ RFI
B	08.08.24	ISSUED IN RESPONSE TO EDQ RFI
A	25.06.24	ISSUED FOR EDQ APPROVAL

CLIENT
CLARKE'S DESIGN & CONSTRUCT

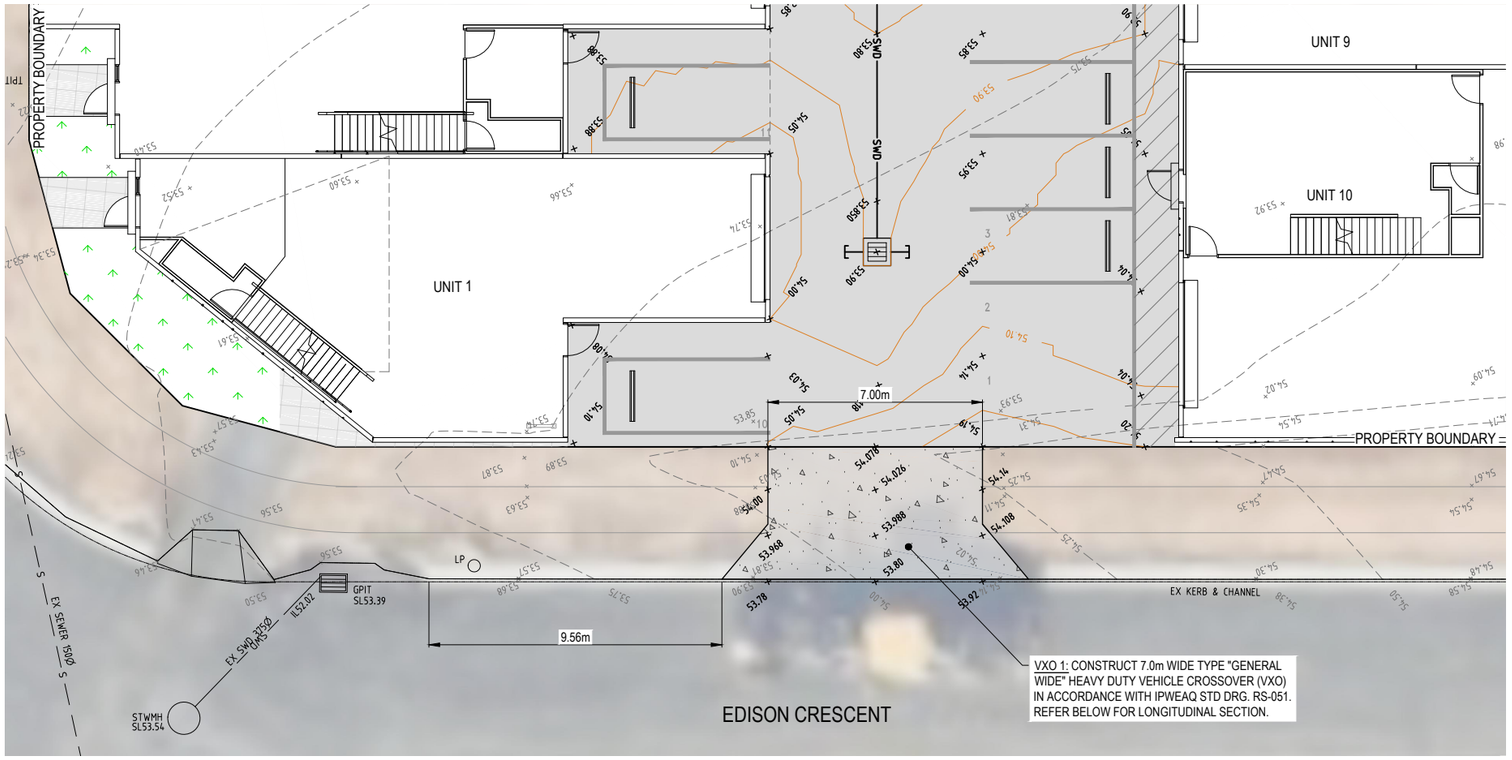
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
SEWER AND WATER RETICULATION PLAN

PROJECT No
2024035

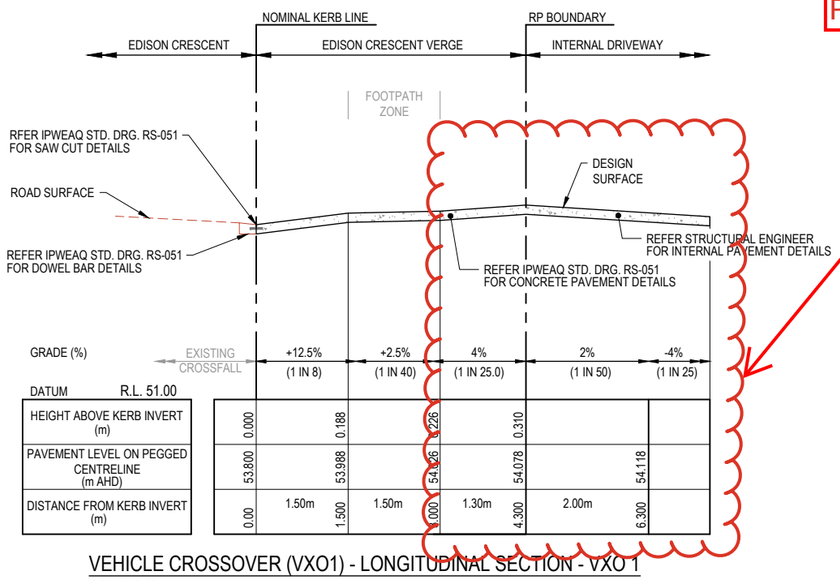
DRAWING No
2024035-OPW-030

AMDT
C



VEHICLE CROSS-OVER (VXO) PLAN - VXO 1

SCALE: 1:100



VEHICLE CROSSOVER (VXO1) - LONGITUDINAL SECTION - VXO 1

SCALE 1:50

Driveway grades must be consistent with the identified RL's on this section.

NOTES - CONCRETE WORKS

1. ALL CONCRETE CONSTRUCTION TO BE IN ACCORDANCE WITH AS3600.
2. ALL NEW CONCRETE WORK SHALL MATCH NEATLY TO EXISTING.
3. CONCRETE FINISHES SHALL BE AS FOLLOWS (UNO).
   - 3.1. KERB AND KERB & CHANNEL - SMOOTH FINISH
   - 3.2. FOOTPATHS AND DRIVEWAYS - BROOM FINISH IN PERPENDICULAR DIRECTION TO TRAFFIC
4. CONCRETE SPECIFICATION:
   - 4.1. SLUMP 80mm
   - 4.2. MAXIMUM AGGREGATE 20mm
   - 4.3. CEMENT TYPE "A" PORTLAND
5. ALL CONCRETE FOR KERBS, FOOTPATHS AND PAVEMENTS TO BE GRADE N32/20 UNLESS NOTED OTHERWISE.
6. ALL TOPSOIL TO BE STRIPPED PRIOR TO CONSTRUCTION OF ANY CONCRETE PLACED ON-GROUND.
7. ANY POOR, UNSUITABLE SUBGRADE MATERIAL IS TO BE REMOVED AND REPLACED WITH COMPACTED CBR15 FILL IN LAYERS NOT EXCEEDING 200mm LOOSE THICKNESS.
8. PROVIDE DAMP PROOF MEMBRANE UNDER CONCRETE (UNO).
9. ALL REINFORCEMENT TO BE SECURELY TIED PRIOR TO PLACEMENT OF CONCRETE. BAR CHAIRS ARE TO BE IN PLACE.
10. MIN 40mm CLEAR COVER FOR REINFORCEMENT TO TOP, BOTTOM AND SIDES (INCLUDING FITMENTS).
11. ALL SLABS ARE TO BE SPRAYED WITH ALIPHATIC ALCOHOL BARRIER AFTER INITIAL SCREENING AND BULLFLOATING. ALIPHATIC ALCOHOL TO BE RE-APPLIED AFTER EACH SUBSEQUENT FINISHING OPERATION.
12. NO CONCRETE IS TO BE POURED ON SITE WHEN TEMPERATURES EXCEED 35deg OR FALLS BELOW 5deg.
13. THE SUPERINTENDENT SHALL BE NOTIFIED PRIOR TO POURING OF ANY CONCRETE.
14. ALL WORKS ARE SUBJECT TO SUPERVISION AND INSPECTION AS DEEMED APPROPRIATE BY THE SUPERINTENDENT AND / OR COUNCIL. THE CONTRACTOR IS TO ADVISE THE SUPERINTENDENT PRIOR TO ANY WORKS BEING COMMENCED.
15. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE THE SUPERINTENDENT WITH 24HRS NOTICE PRIOR TO ANY REQUEST FOR A SITE VISIT.

NOTES - GENERAL

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8. DO NOT OBTAIN DIMENSIONS FROM SCALING. IF IN DOUBT ASK.

LEGEND

- EXISTING SURFACE CONTOURS (0.25m INTERVAL)
- EXISTING KERB AND CHANNEL
- EXISTING STORMWATER DRAINAGE
- EXISTING SEWER GRAVITY
- EXISTING STORMWATER MANHOLE
- EXISTING STORMWATER GULLY PIT
- EXISTING SURFACE LEVEL
- PROPOSED SURFACE LEVEL
- DESIGN SURFACE CONTOURS (0.1m INTERVAL)
- PROPOSED BARRIER KERB TYPE B2
- PROPOSED STORMWATER DRAINAGE
- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE VEHICLE CROSSOVER (VXO)
- PROPOSED LANDSCAPING / TURF (BY OTHERS)
- PROPOSED PATHWAY

NOTES - CONCRETE PAVEMENT TESTING

1. CONCRETE COMPRESSIVE STRENGTH TESTS (28 DAY) TO BE UNDERTAKEN AT 1 (ONE) TEST PER LOT WITH 1 LOT BEING ANY 1 (ONE) POUR.
2. CONTRACTOR TO ALLOW FOR TESTING AND TO ALLOW TO ISSUE RESULTS TO SUPERINTENDENT WITHOUT DELAY.

NOTES - INSPECTIONS

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NOTE - VERGE REINSTATEMENT

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AMENDED IN RED

By: Vivian Lun

Date: 25 October 2024

Queensland Government

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 1:100 / 1:50 A1

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DESIGNED	SK/FI	APPROVED
DRAWN	LAB/DS	16.10.24 ON BEHALF OF OWEN CONSULTING PTY LTD
REVIEWED	SK	SIMON KEALLEY RPEQ No. 29613

NORTH

DATUM AHD(m)

ISSUE	DATE	ISSUE DESCRIPTION
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CLIENT
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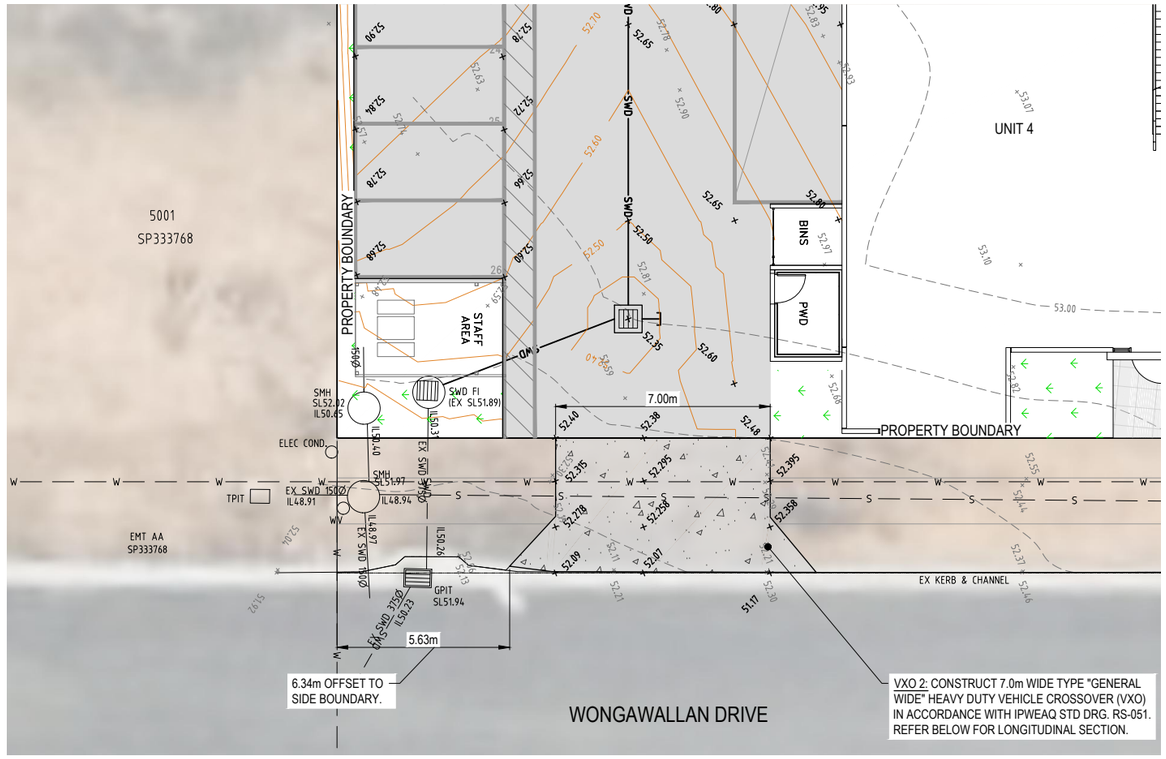
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
VEHICLE CROSSOVER (VXO) PLAN AND DETAILS - VXO 1

PROJECT No
2024035

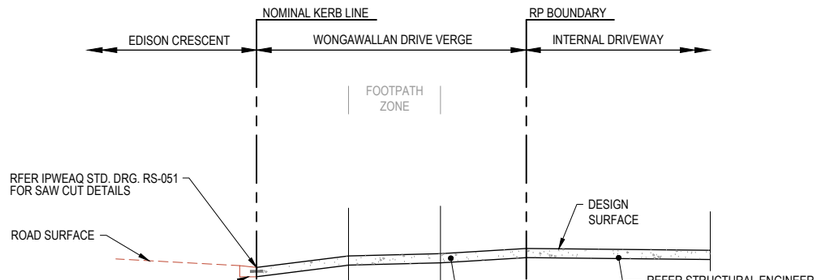
DRAWING No
2024035-OPW-100

AMDT
C



VEHICLE CROSS-OVER (VXO) PLAN - VXO 2

SCALE: 1:100



GRADE (%)	EXISTING CROSSFALL	+12.5% (1 IN 8)		+2.5% (1 IN 40)		6% (1 IN 16.67)	
DATUM R.L. 50.00							
HEIGHT ABOVE KERB INVERT (m)	0.000	0.188		0.225	0.310		0.280
PAVEMENT LEVEL ON PEGGED CENTRELINE (m AHD)	52.07	52.258		52.295	52.380		52.350
DISTANCE FROM KERB INVERT (m)	0.00	1.50m	1.500	1.50m	3.000	1.40m	4.400	3.00m	7.400

VEHICLE CROSSOVER (VXO1) - LONGITUDINAL SECTION - VXO 2

SCALE 1:50

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LEGEND

- 3.0 — EXISTING SURFACE CONTOURS (0.25m INTERVAL)
- EXISTING KERB AND CHANNEL
- SWD — EXISTING STORMWATER DRAINAGE
- S — EXISTING SEWER GRAVITY
- HCB — EXISTING SEWER PROPERTY CONNECTION
- W — EXISTING WATER RETICULATION
- E-UG — EXISTING ELECTRICAL UNDERGROUND
- T — EXISTING TELECOMMS CONDUIT
- STWMH — EXISTING STORMWATER MANHOLE
- STW FI — EXISTING STORMWATER FIELD INLET
- SMH — EXISTING SEWER MANHOLE
- GPIT — EXISTING STORMWATER GULLY PIT
- TPIT — EXISTING TELSTRA PIT
- WV — EXISTING WATER VALVE
- ×4.45 — EXISTING SURFACE LEVEL
- ×4.45 — PROPOSED SURFACE LEVEL
- 12.60 — DESIGN SURFACE CONTOURS (0.1m INTERVAL)
- BK — PROPOSED BARRIER KERB TYPE B2
- SWD — PROPOSED STORMWATER DRAINAGE
- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE VEHICLE CROSSOVER (VXO)
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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 1:100 / 1:50 — DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT ASK — A1

DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS	ON BEHALF OF OWEN CONSULTING PTY LTD	
REVIEWED	SK	SIMON KEALLEY RPEQ No. 29613	

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NORTH

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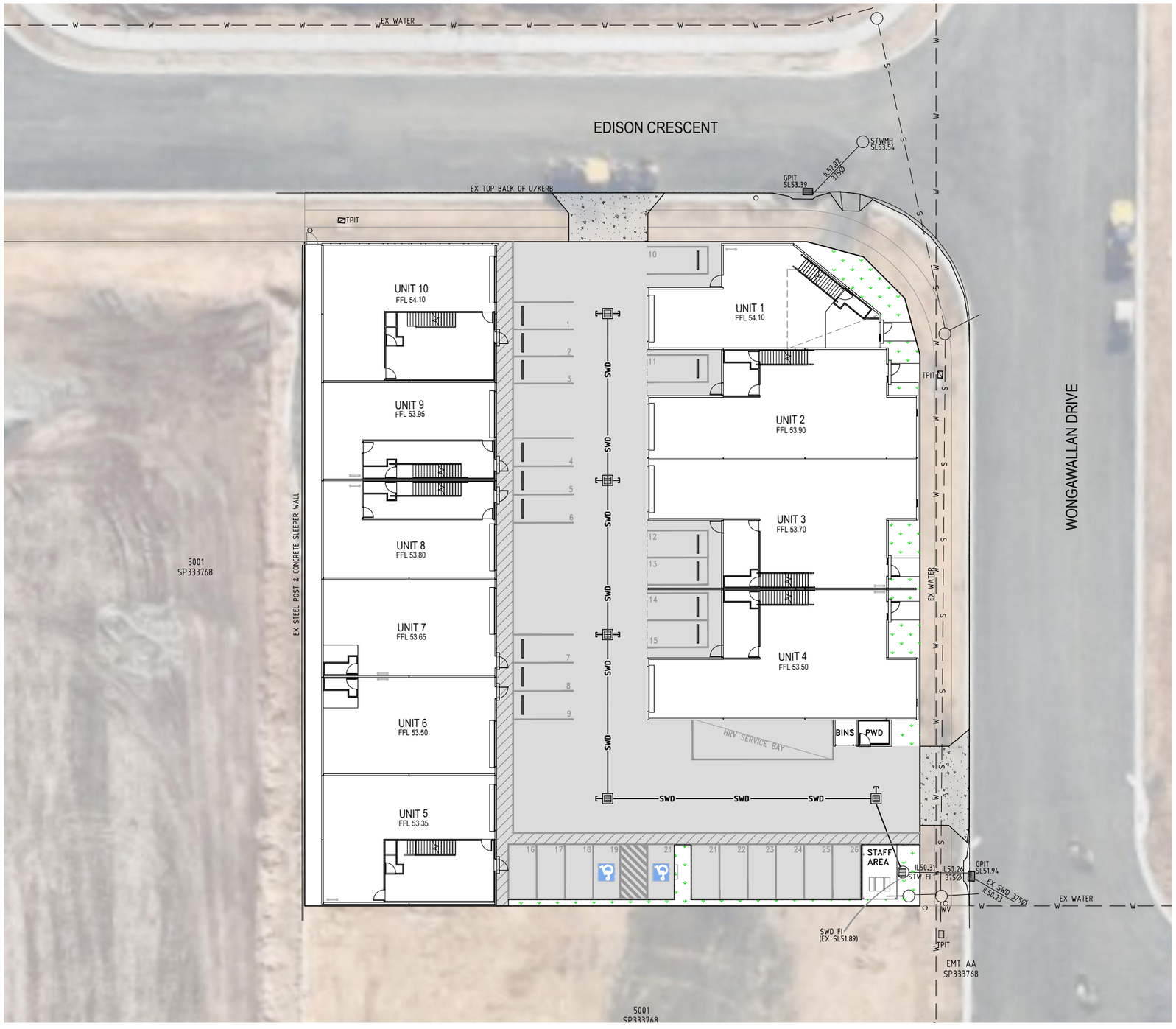
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
VEHICLE CROSSOVER (VXO) PLAN AND DETAILS - VXO 2

PROJECT No 2024035

DRAWING No 2024035-OPW-101

AMDT C



LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED LANDSCAPING (BY OTHERS)

PHASE 4 NOTES:

PRACTICAL COMPLETION INSPECTION THE CONTRACTOR IS TO ENGAGE A STORMWATER QUALITY CONSULTANT TO UNDERTAKE STORMWATER QUALITY AND EVENT MONITORING DURING THE "MAINTENANCE" PHASE, INCLUDING BUT NOT LIMITED TO REMEDIAL ACTION FOLLOWING EVENT MONITORING RESULTS.

PHASE 4 MEASURES:

1. REMOVE PHASE 3 TREATMENTS ONCE BELOW WORKS COMPLETED.
2. LANDSCAPE AREA TO EXTENTS SHOWN

NOTES:

1. THE MEASURES SHOWN ON THIS PLAN ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CARRY OUT ALL WORKS IN ACCORDANCE WITH THE CONTRACTORS SEDIMENT AND EROSION CONTROL PLAN. ALL RESPONSIBILITY FOR SEDIMENT AND EROSION CONTROL IS DELEGATED TO THE CONTRACTOR BY THE APPLICANT AND THE LAND OWNERS UNTIL THE ON MAINTENANCE INSPECTION.
2. THE CONTRACTOR AT A MINIMUM IS TO COMPLY WITH HEALTHY WATERWAYS "CONTROLLING STORMWATER POLLUTION ON YOUR BUILDING SITE" AND ALL ASSOCIATED DOCUMENTATION AND CHECKLISTS.

NOTES

1. REFER TO DWG 2024035-ESC-006 FOR NOTES AND DETAILS.

Owen.

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 2 1 0 2 4 6 8 10 1:200 — DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT ASK — A1

DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS	ON BEHALF OF OWEN CONSULTING PTY LTD	
REVIEWED	SK	SIMON KEALLEY RPEQ No. 29413	

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NORTH

DATUM AHD(m)

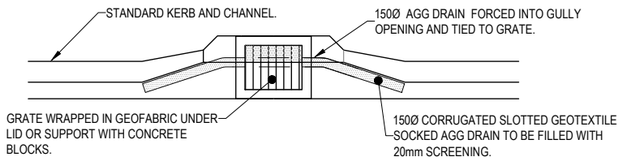
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CLIENT
CLARKE'S DESIGN & CONSTRUCT

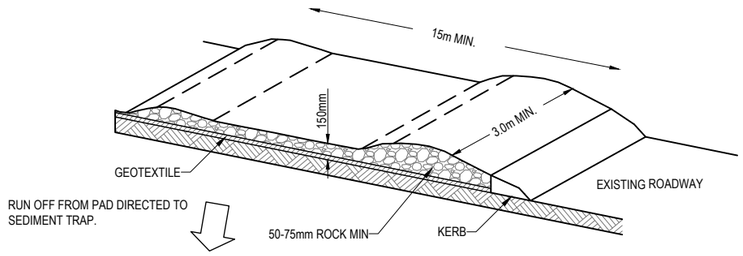
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
EROSION AND SEDIMENT CONTROL PLAN - PHASE 4 ESTABLISHMENT

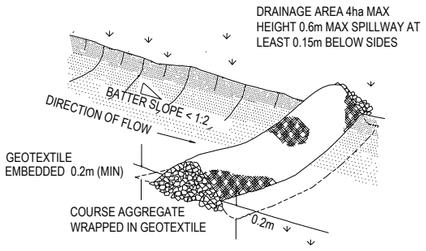
PROJECT No 2024035
DRAWING No 2024035-ESC-005
AMDT C



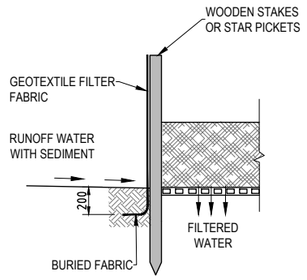
GULLY PIT SEDIMENT BARRIER DETAIL
SCALE: N.T.S.



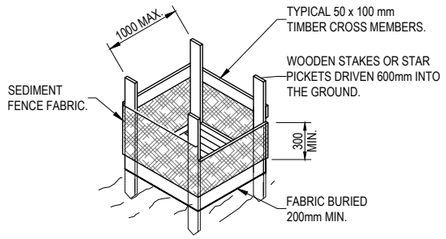
VEHICLE SHAKE DOWN DETAIL
SCALE N.T.S.



ROCK CHECK DAM
SCALE N.T.S.



FIELD INLET SEDIMENT BARRIER
SCALE N.T.S.



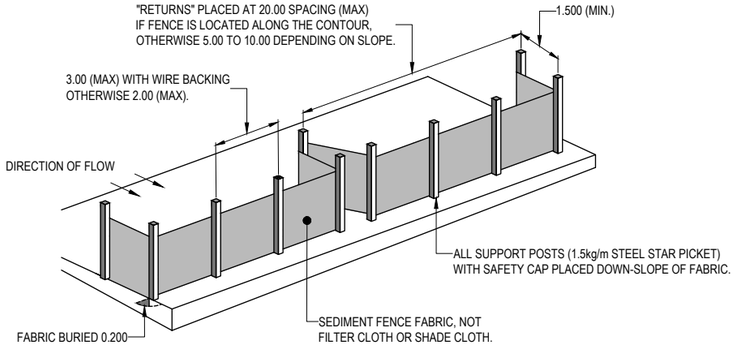
FIELD INLET SEDIMENT BARRIER
SCALE N.T.S.

NOTES - SILT FENCE

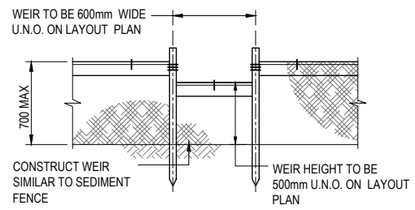
ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF A SPILL-THROUGH WEIR
1. LOCATE THE SPILL-THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.
2. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300MM THE GROUND ELEVATION.
3. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.
4. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

MAINTENANCE
1. INSPECT THE SEDIMENT FENCE AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.
2. REPAIR ANY TORN SECTIONS WITH A CONTINUOUS PIECE OF FABRIC FROM POST TO POST.
3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.
4. IF THE FENCE IS SAGGING BETWEEN POSTS, INSTALL ADDITIONAL SUPPORT POSTS.
5. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 1/3 THE HEIGHT OF THE FENCE.
6. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
7. REPLACE THE FABRIC IF THE SERVICE LIFE OF THE EXISTING FABRIC EXCEEDS 6-MONTHS.

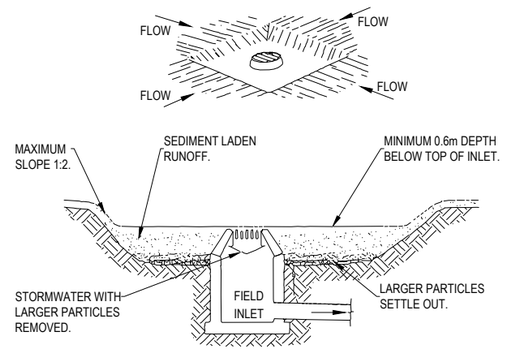
REMOVAL
1. WHEN DISTURBED AREAS UP-SLOPE OF THE SEDIMENT FENCE ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE FENCE MUST BE REMOVED.
2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.



GEOTEXTILE SEDIMENT FENCE
SCALE N.T.S.



SEDIMENT FENCE WEIR
SCALE N.T.S.



EXCAVATED SEDIMENT TRAP

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 0.2 0 0.2 0.4 0.6 0.8 1.0 1:20
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DRAWN	LAB/DS		16.10.24
REVIEWED	SK	ON BEHALF OF OWEN CONSULTING PTY LTD	
		SIMON KEALLEY	
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CLIENT
CLARKE'S DESIGN & CONSTRUCT

PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
EROSION AND SEDIMENT CONTROL DETAILS

PROJECT No
2024035
DRAWING No
2024035-ESC-006
AMDT
C

NOTES - SEDIMENT MANAGEMENT

ALL WORK TO BE IN ACCORDANCE WITH INTERNATIONAL EROSION CONTROL ASSOCIATION - AUSTRALASIA BEST PRACTICE MANAGEMENT GUIDELINES.

1. CONSTRUCTION OF All SEDIMENT MANAGEMENT DEVICES TO THE SATISFACTION OF COUNCIL'S REPRESENTATIVE. SHALL BE COMPLETED AND EFFECTIVE PRIOR TO:
   (a) STRIPPING OF TOPSOIL AND GRASS.
   (b) BULK EARTHWORKS TO THE SITE.
   (c) SERVICES INSTALLATION.
   (d) PAVEMENT CONSTRUCTION.
2. ALL SEDIMENT MANAGEMENT MEASURES ARE TO REMAIN IN PLACE UNTIL INSTRUCTION IS RECEIVED IFROM THE COUNCIL REPRESENTATIVE OR SUPERINTENDENT TO REMOVE ALL OR PART OF THE SILT CONTROL APPLICATIONS.
3. BOTH TEMPORARY AND PERMANENT SEDIMENT MANAGEMENT/EROSION CONTROL DEVICES SHALL BE MAINTAINED AT A SUITABLE LEVEL/CONDITION THROUGHOUT CONSTRUCTION TO THE SATISFACTION OF THE COUNCIL'S REPRESENTATIVE. SEDIMENT FENCES ARE TO BE CLEANED OUT WHEN CAPACITY IS REDUCED BY 30%.
4. SEDIMENT MANAGEMENT MEASURES ARE TO BE MAINTAINED THROUGHOUT THE MAINTENANCE PERIOD AS DIRECTED.
5. PRIOR TO COMMENCEMENT OF CONSTRUCTION APPROVAL IS TO BE OBTAINED FROM COUNCIL FOR THE LOCATION OF THE SITE ACCESS POINT AND SHAKE DOWN AREA WHICH ARE TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
6. IF SEDIMENT AND EROSION CONTROL DEVICES HAVE BEEN FOUND TO BE DEFECTIVE IN SERVICE, CORRECTIVE ACTION IS TO BE UNDERTAKEN IMMEDIATELY WHICH MAY INCLUDE AMENDMENTS/ADDITIONS TO THE ORIGINAL APPROVED SEDIMENT AND EROSION CONTROL PLANS.
7. ANY SILT OR SEDIMENT ON EXISTING ROADS CAUSED BY THE MOVEMENT OF CONSTRUCTION TRAFFIC IS TO BE REMOVED DAILY BY APPROVED METHODS.
8. TEMPORARY DRAINAGE CONTROL FLOW SHOULD BE DIVERTED AROUND THE WORK SITE WHERE POSSIBLE.
9. ALL DRAINAGE, EROSION AND SEDIMENT CONTROLS TO BE INSTALLED AND BE OPERATIONAL BEFORE COMMENCING "UP-SLOPE" EARTHWORKS.
10. ALL CONTROL MEASURES TO BE INSPECTED AT LEAST WEEKLY AND AFTER SIGNIFICANT RUNOFF PRODUCING STORMS.
11. CONTROL MEASURES MAY BE REMOVED WHEN ON-SITE EROSION IS CONTROLLED AND 70% OF PERMANENT SOIL COVERAGE IS OBTAINED OVER ALL UPSTREAM DISTURBED LAND.
12. IN AREAS WHERE RUNOFF TURBIDITY IS TO BE CONTROLLED, EXPOSED SURFACES TO BE EITHER MULCHED, COVERED WITH EROSION CONTROL BLANKETS OR TURFED IF EARTHWORKS ARE EXPECTED TO BE DELAYED FOR MORE THAN 14 DAYS.
13. STRAW BALE SEDIMENT TRAPS ARE A SECONDARY OPTION WHICH GENERALLY NOT BE USED IF OTHER OPTIONS ARE AVAILABLE.

NOTES - ROCK CHECK DAMS

INSTALLATION
1. REFER TO APPROVED EROSION AND SEDIMENT CONTROL PLANS FOR LOCATION AND INSTALLATION DETAILS.
2. PRIOR TO THE PLACEMENT OF THE CHECK DAMS, ENSURE THE TYPE AND SIZE OF EACH CHECK DAM WILL NOT CAUSE A SAFETY HAZARD OR CAUSE WATER TO SPILL OUT OF THE DRAIN.
3. LOCATE THE FIRST CHECKDAM AT THE DOWNSTREAM END OF THE SECTION OF CHANNEL BEING PROTECTED. LOCATE EACH SUCCESSIVE CHECK DAM SUCH THAT THE CREST OF THE IMMEDIATE DOWNSTREAM DAM IS LEVEL WITH THE TOE OF THE CHECK DAM BEING INSTALLED.
4. ENSURE THE CHANNEL SLOPE IS NO STEEPER THAN 10:1 (H:V). OTHERWISE CONSIDER THE USE OF A SUITABLE CHANNEL LINER INSTEAD OF THE CHECK DAMS.
5. WHERE SPECIFIED, THE CHECK DAMS SHALL BE CONSTRUCTED ON A SHEET OF GEOTEXTILE FABRIC USED AS A DOWNSTREAM SPLASH PAD.
6. EACH CHECK DAM SHALL BE EXTENDED UP THE CHANNEL BANK TO AN ELEVATION AT LEAST 150mm ABOVE THE CREST LEVEL OF THE DAM.

MAINTENANCE
1. INSPECT EACH CHECK DAM AND THE DRAINAGE CHANNEL AT LEAST WEEKLY AND AFTER RUNOFF PRODUCING RAINFALL.
2. CORRECT ALL DAMAGE IMMEDIATELY IF SIGNIFICANT EROSION OCCURS BETWEEN ANY OF THE CHECK DAMS, THEN CHECK THE SPACING OF DAMS AND WHERE NECESSARY INSTALL INTERMEDIATE CHECK DAMS OR SUITABLE CHANNEL LINER.
3. CHECK FOR DISPLACEMENT OF CHECK DAMS.
4. CHECK FOR SOIL SCOUR AROUND THE ENDS OF EACH CHECK DAM. IF SUCH EROSION IS OCCURRING, CONSIDER EXTENDING THE WIDTH OF THE CHECK DAM TO AVOID SUCH PROBLEMS.
5. REMOVE ANY SEDIMENT ACCUMULATED BY THE CHECK DAMS, UNLESS IT IS INTENDED THAT THIS SEDIMENT WILL REMAIN WITH THE CHANNEL.

REMOVAL
1. WHEN CONSTRUCTION WORK WITHIN THE DRAINAGE AREA ABOVE THE CHECK DAMS HAS BEEN COMPLETED, AND THE DISTURBED AREAS AND THE DRAINAGE CHANNEL ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, ALL TEMPORARY CHECK DAMS MUST BE REMOVED.
2. REMOVE THE COLLECTED SEDIMENT AND DISPOSE OF ACCUMULATED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. REMOVE AND APPROPRIATELY DISPOSE OF ALL MATERIALS INCLUDING ANY GEOTEXTILE FABRIC.
4. STABILISE THE DISTURBED CHANNEL WITH LINING OF FABRIC AND ROCK OR ESTABLISHED VEGETATION AS APPROPRIATE.

NOTES - SILT FENCE

MATERIALS
1. FABRIC: POLYPROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700MM IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140GSM. ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OR 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).
2. FABRIC REINFORCEMENT: WIRE OR STEEL MESH MAXIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200MM.
3. SUPPORT STAKES: 1.5KG/M (MIN) STEEL STAR PICKETS SUITABLE FOR ATTACHING FABRIC.

INSTALLATION
1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND REQUIRED TYPE OF FABRIC (IF SPECIFIED). IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, FABRIC TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. TO THE MAXIMUM DEGREE PRACTICAL AND WHERE THE PLANS ALLOW, ENSURE THE FENCE IS LOCATED:
   (i) TOTALLY WITHIN THE PROPERTY BOUNDARY;
   (ii) ALONG A LINE OF CONSTANT ELEVATION WHEREVER PRACTICAL;
   (iii) AT LEAST 2M FROM THE TOE OF ANY FILLING OPERATIONS THAT MAY RESULT IN SHIFTING SOIL/FILL DAMAGING FENCE.
3. INSTALL RETURNS WITHIN THE FENCE AT MAXIMUM 20M INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR, OR 5 TO 10M MAXIMUM SPACING (DEPENDING ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR THE 'RETURNS' SHALL CONSIST OF EITHER:
   (i) V-SHAPED SECTION EXTENDING AT LEAST 1.5M UP THE SLOPE; OR
   (ii) SANDBAG OR ROCK/AGGREGATE CHECKDAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5M UP THE SLOPE.
4. ENSURE THE EXTREME ENDS OF THE FENCE ARE TURNED UP THE SLOPE AT LEAST 1.5M, OR AS NECESSARY, TO MINIMISE WATER BYPASSING AROUND THE FENCE.
5. ENSURE THE SEDIMENT FENCE IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE FENCE, AND THE UNDESIRABLE DISCHARGE OF WATER AROUND THE END OF THE FENCE.
6. IF THE SEDIMENT FENCE IS TO BE INSTALLED ALONG THE EDGE OF EXISTING TREES, ENSURE CARE IS TAKEN TO PROTECT THE TREES AND THEIR ROOT SYSTEMS DURING INSTALLATION OF THE FENCE. DO NOT ATTACH THE FABRIC TO THE TREES.
7. UNLESS DIRECTED BY THE SUPERVISOR OR THE APPROVED PLANS, EXCAVATE A 200MM WIDE BY 200MM DEEP TRENCH ALONG THE PROPOSED FENCE LINE, PLACING THE EXCAVATED MATERIAL ON THE UP SLOPE SIDE OF THE TRENCH.
8. ALONG THE LOWER SIDE OF THE TRENCH, APPROPRIATELY SECURE THE POSTS INTO THE GROUND NO GREATER THAN 3M IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING, OTHERWISE NO GREATER THAN 2M.
9. IF SPECIFIED, SECURELY ATTACH THE ASUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE POSTS WITH THE MESH EXTENDING AT LEAST 200MM INTO THE EXCAVATED TRENCH. ENSURE THE MESH AND FABRIC IS ATTACHED TO THE UP-SLOPE SIDE OF THE POSTS EVEN WHEN DIRECTING A FENCE AROUND THE CORNER OF A SHARP CHANGE OF DIRECTION.
10. WHEREVER POSSIBLE, CONSTRUCT THE SEDIMENT FENCE FROM A CONTINUOUS ROLL OF FABRIC. TO JOIN FABRIC EITHER:
    (i) ATTACH EACH END TO TWO OVERLAPPING POSTS WITH FABRIC FOLDING AROUND THE ASSOCIATED POST ONE TURN, AND WITH THE TWO POSTS TIED TOGETHER WITH WIRE OR
    (ii) OVERLAP THE FABRIC TO THE NEXT ADJACENT SUPPORT POST.
11. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS USING TIE WIRE AT MAXIMUM 150MM SPACING.
12. ENSURE THE COMPLETED SEDIMENT FENCE IS AT LEAST 450MM, BUT NOT MORE THAN 700MM HIGH. IF A SPILL-THROUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300MM ABOVE THE GROUND LEVEL.
13. BACKFILL THE TRENCH AND TAMP THE FILL TO FIRMLY ANCHOR THE BOTTOM OF THE FABRIC AND MESH TO PREVENT WATER FROM FLOWING UNDER THE FENCE.

NOTES - GULLY GRATE/SAG PIT

MATERIAL
1. SOCKS: MINIMUM 200mm DIAMETER SYNTHETIC OR BIODEGRADABLE TUBES MANUFACTURED FROM NON-WOVEN OR COMPOSITE FABRIC SUITABLE FOR THE 'FILTRATION' OF COARSE SEDIMENT.

INSTALLATION
1. REFER TO APPROVED PLANS FOR THE LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. ENSURE THE SOCKS ARE PLACED INDIVIDUALLY OR COLLECTIVELY (AS A SINGLE SEDIMENT TRAP) SUCH THAT:(i)LEAKAGE AROUND OR UNDER THE SOCKS IS MINIMISED; (ii)ADJOINING SOCKS ARE TIGHTLY BUTTED OR OVERLAPPED AT LEAST 450mm;(iii)THE SURFACE AREA OF POTENTIAL WATER PONDING UP-SLOPE OF EACH SEDIMENT TRAP IS MAXIMISED; (iv) TO THE MAXIMUM DEGREE PRACTICAL, ALL SEDIMENT-LADEN WATER WILL PASS THROUGH THE FORMED POND BEFORE FLOWING OVER THE DOWN-SLOPE END OF THE SEDIMENT TRAP.
3. WHEN PLACED ACROSS THE INVERT OF MINOR DRAINS, ENSURE THE SOCKS ARE PLACED SUCH THAT: (i) THE CREST OF THE DOWNSTREAM SOCK IS LEVEL WITH THE CHANNEL INVERT AT THE IMMEDIATE UPSTREAM SOCK (IF ANY);(ii) EACH SOCK EXTENDS UP THE CHANNEL BANKS SUCH THAT THE CREST OF THE SOCK AT ITS LOWEST POINT IS LOWER THAN GROUND LEVEL AT EITHER END OF THE SOCK.
4. IF STAKES ARE REQUIRED TO ANCHOR THE SOCKS, THEIR SPACING DOES NOT EXCEED 1.2m OR SIX TIMES THE SOCK DIAMETER (WHICHEVER IS THE LESSER). A MAXIMUM STAKE SPACING OF 0.3m APPLIES WHEN USED TO FORM CHECK DAMS.

MAINTENANCE
1. INSPECT ALL FILTER SOCKS PRIOR TO FORECAST RAIN DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT WEEKLY INTERVALS.
2. REPAIR OR REPLACE DAMAGED SOCKS.
3. THE BULK OF THE SEDIMENT COLLECTED BEHIND THE FILTER SOCKS SHOULD BE REMOVED BY SHOVEL AFTER EACH STORM EVENT.
4. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL
1. ALL SAND, SOIL, SEDIMENT OR MUD MUST BE PHYSICALLY REMOVED FROM SEALED SURFACES, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.
2. IF NECESSARY FOR SAFETY REASONS, THE SEALED SURFACE SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIALS FROM THE SURFACE.
3. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
4. ALL SYNTHETIC (PLASTIC) MESH OR OTHER NON READILY BIODEGRADABLE MATERIALS MUST BE REMOVED FROM THE SITE ONCE THE SLOPE OR DRAIN IS STABILISED, OR THE SOCKS HAVE DETERIORATED TO A POINT WHERE THEY ARE NO LONGER PROVIDING THERE INTENDED DRAINAGE OR SEDIMENT CONTROL FUNCTION.

NOTES - CONSTRUCTION EXIT - VIBRATION GRID

INSTALLATION
1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE APPOINTED ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. CLEAR THE LOCATION OF THE VIBRATION GRID, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSED INTO SOFT GROUND. CLEAR SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
3. GRADE THE LOCATION OF THE VIBRATION GRID SO THAT RUNOFF FROM THE UNIT WILL NOT FLOW INTO THE STREET OR ADJOINING PROPERTIES, BUT WILL FLOW TOWARDS AN APPROPRIATE-TRAPPING DEVICE.
4. ENSURE THAT INSTALLATION OF THE VIBRATION GRID HAS ADEQUATE SEDIMENT STORAGE VOLUME UNDER THE GRID. WHERE NECESSARY, INSTALL SUITABLE PRECAST SEDIMENT COLLECTION CHAMBERS.
5. PLACE A ROCK PAD/RAMP FORMING A MINIMUM 200MM THICK LAYER OF CLEAN, OPEN-VOID ROCK OVER THE ROADWAY BETWEEN THE VIBRATION GRID AND THE SEALED STREET TO PREVENT TYRES FROM PICKING UP MORE SOIL AFTER THEY HAVE BEEN CLEANED.
6. THE TOTAL LENGTH OF THE VIBRATION GRID AND ROCK RAMPS SHOULD BE AT LEAST 15M WHERE PRACTICABLE, AND AS WIDE AS THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST 3M. THE ROCK RAMP SHOULD COMMENCE AT THE EDGE OF THE OFF-SITE SEALED ROAD OR PAVEMENT.
7. FLARE THE END OF THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.

NOTES - CONSTRUCTION EXIT - VIBRATION GRID

MAINTENANCE
1. INSPECT VIBRATION GRID PRIOR TO FORECAST RAIN, DAILY EXTENDED PERIODS OF RAINFALL AND AFTER SIGNIFICANT RUNOFF-PRODUCING RAINFALL OR OTHERWISE AFTER FORTNIGHTLY INTERVALS.
2. IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED OR WASHED ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MATERIAL MUST BE PHYSICALLY REMOVED, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM.
3. IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE ROADWAY.
4. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK RAMPS ARE REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE, A NEW 100MM LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.
5. ENSURE ALL ASSOCIATED DRAINAGE CONTROL MEASURES ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITION.
6. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL
1. THE VIBRATION GRID SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT CONTROL DEVICE.
2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. RE-GRADE AND STABILISE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE N/A
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DESIGNED	SK/FI	APPROVED	
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REVIEWED	SK	ON BEHALF OF OWEN CONSULTING PTY LTD SIMON KEALLEY RPEQ No. 29615	

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CLARKE'S DESIGN & CONSTRUCT

PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
DRAWING SET NOTES SHEET

PROJECT No
2024035
DRAWING No
2024035-ESC-001
AMDT
C



LEGEND

- EXISTING SURFACE CONTOURS
- SILT FENCE
- DIRTY WATER CATCH DRAINS
- XXXX — ROCK CHECK DAM
- DIRECTION OF OVERLAND FLOW
- VEHICLE SHAKE DOWN
- EXCAVATED SEDIMENT TRAP

NOTES

1. REFER TO DWG 2024035-ESC-006 FOR NOTES AND DETAILS.

PHASE 1 MEASURES:

1. INSTALL SHAKEDOWN
2. INSTALL SILT FENCES
3. CONSTRUCT TEMPORARY 'EXCAVATED SEDIMENT TRAP' AND ANY STORMWATER FIELD INLET/S - AS REQUIRED
4. CUT / PROFILE DIRTY WATER CATCH DRAIN
5. INSTALL ROCK CHECK DAM - IF INSTRUCTED ON-SITE BY SUPERINTENDENT

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CIVIL ENGINEERS
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PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
EROSION AND SEDIMENT CONTROL PLAN - PHASE 1 PRE-CONSTRUCTION

PROJECT No 2024035
DRAWING No 2024035-ESC-002
AMDT C



LEGEND

- EXISTING SURFACE CONTOURS
- SILT FENCE
- DIRTY WATER CATCH DRAINS
- XXXX ROCK CHECK DAM
- DIRECTION OF OVERLAND FLOW
- VEHICLE SHAKE DOWN
- BUILDING PAD
- EXCAVATED SEDIMENT TRAP

PHASE 2 NOTES:

DURING CONSTRUCTION THIS PHASE IS TO BE IN ACCORDANCE WITH THE CONTRACTOR'S SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR IS TO ENGAGE A STORMWATER QUALITY CONSULTANT TO UNDERTAKE STORMWATER QUALITY AND EVENT MONITORING DURING THE "CONSTRUCTION" PHASE, INCLUDING BUT NOT LIMITED TO REMEDIAL ACTION FOLLOWING EVENT MONITORING RESULTS.

PHASE 2 MEASURES:

1. MAINTAIN SEDIMENT FENCE AND REPLACE AS REQUIRED.
2. MAINTAIN DIRTY WATER CATCH DRAINS AND LINER
3. INSTALL CHECK DAMS - IF DIRECTED
4. MAINTAIN THE SEDIMENT TRAP DEVICE AND CLEAN CONSISTENTLY

NOTES:

1. THE MEASURES SHOWN ON THIS PLAN ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CARRY OUT ALL WORKS IN ACCORDANCE WITH THE CONTRACTORS SEDIMENT AND EROSION CONTROL PLAN. ALL RESPONSIBILITY FOR SEDIMENT AND EROSION CONTROL IS DELEGATED TO THE CONTRACTOR BY THE APPLICANT AND THE LAND OWNERS UNTIL THE ON MAINTENANCE INSPECTION.
2. THE CONTRACTOR AT A MINIMUM IS TO COMPLY WITH HEALTHY WATERWAYS "CONTROLLING STORMWATER POLLUTION ON YOUR BUILDING SITE" AND ALL ASSOCIATED DOCUMENTATION AND CHECKLISTS.

NOTES

1. REFER TO DWG 2024035-ESC-006 FOR NOTES AND DETAILS.

SEDIMENT BASIN NOTES:

1. THE REQUIREMENT FOR A SEDIMENT BASIN HAS BEEN ASSESSED IN ACCORDANCE WITH IECA (AUSTRALASIA) - BEST PRACTICE EROSION AND SEDIMENT CONTROL GUIDELINES.
2. THE SOIL LOSS (t/ha/yr) HAS BEEN CALCULATED AS BEING < 75 (t/ha/yr)
3. TYPE 3 SEDIMENT CONTROL TECHNIQUES HAVE BEEN ADOPTED - AS IDENTIFIED.

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admin@owenconsulting.com.au
P.(07) 5572 0702 A.C.N 121 686 208
CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 2 1 0 2 4 6 8 10 1:200 A1
DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT ASK

DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS	ON BEHALF OF OWEN CONSULTING PTY LTD	
REVIEWED	SK	SIMON KEALLEY RPEQ No. 29613	

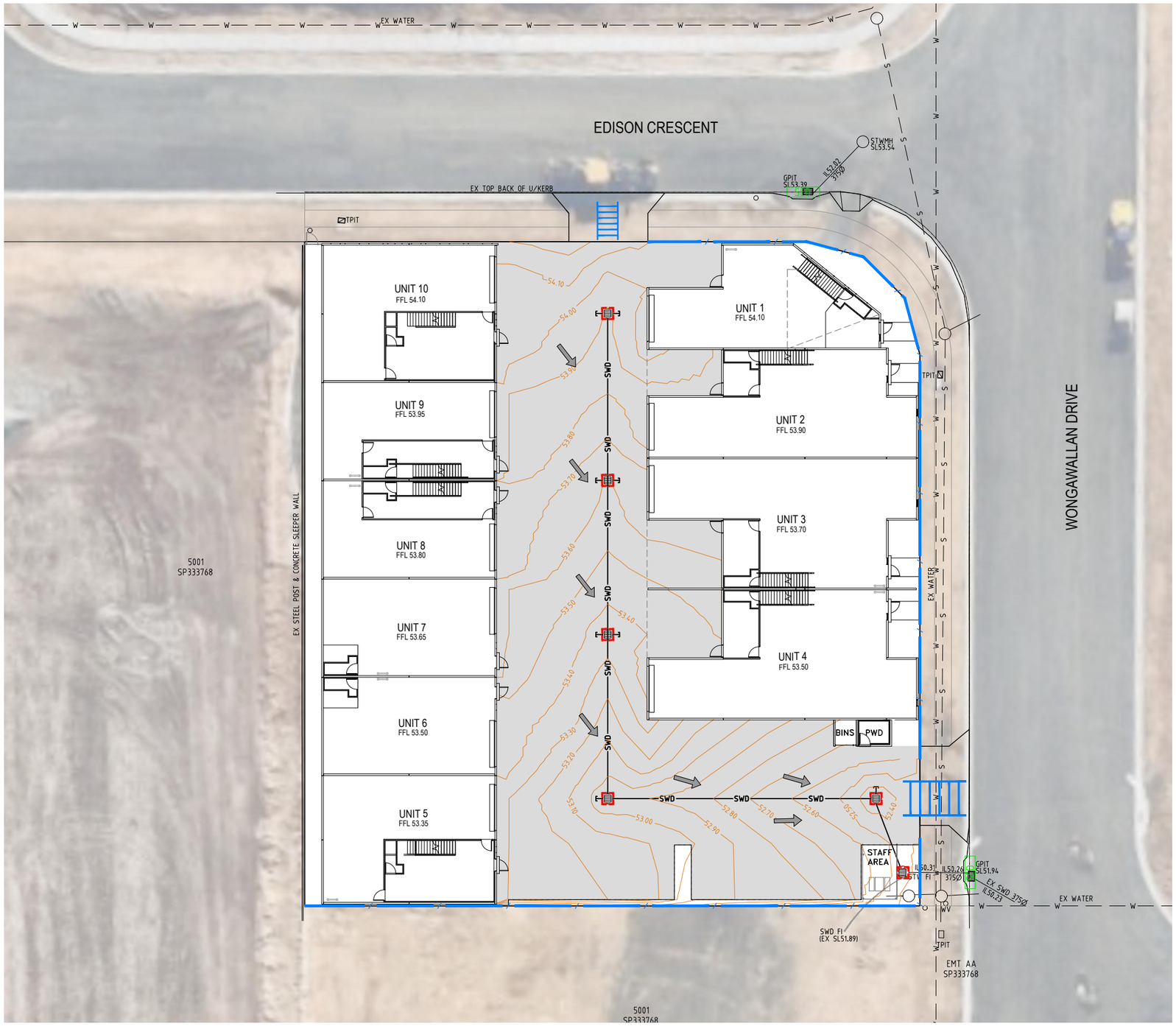
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NORTH
DATUM AHD(m)

ISSUE	DATE	ISSUE DESCRIPTION
C	16.10.24	ISSUED IN RESPONSE TO EDQ RFI
B	08.08.24	ISSUED IN RESPONSE TO EDQ RFI
A	25.06.24	ISSUED FOR EDQ APPROVAL

CLIENT
CLARKE'S DESIGN & CONSTRUCT
PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
EROSION AND SEDIMENT CONTROL PLAN - PHASE 2 EARTHWORKS
PROJECT No
2024035
DRAWING No
2024035-ESC-003
AMDT
C



LEGEND

- SILT FENCE
- DIRTY WATER CATCH DRAINS
- DIRECTION OF OVERLAND FLOW
- VEHICLE SHAKE DOWN
- SED — PROPOSED GULLY PIT SEDIMENT BARRIER
- FIELD INLET SEDIMENT BARRIER
- EXTENTS OF PROPOSED CONCRETE HARDSTAND

PHASE 3 NOTES:

DURING CONSTRUCTION THIS PHASE IS TO BE IN ACCORDANCE WITH THE CONTRACTOR'S SEDIMENT AND EROSION CONTROL PLAN. THE CONTRACTOR IS TO ENGAGE A STORMWATER QUALITY CONSULTANT TO UNDERTAKE STORMWATER QUALITY AND EVENT MONITORING DURING THE "CONSTRUCTION" PHASE, INCLUDING BUT NOT LIMITED TO REMEDIAL ACTION FOLLOWING EVENT MONITORING RESULTS.

PHASE 3 MEASURES:

1. MAINTAIN SEDIMENT FENCE AND REPLACE AS REQUIRED.
2. MAINTAIN DIRTY WATER CATCH DRAINS AND LINER.
3. INSTALL GULLY PIT SEDIMENT BARRIERS.
4. INSTALL FIELD INLET SEDIMENT BARRIERS.

NOTES:

1. THE MEASURES SHOWN ON THIS PLAN ARE INDICATIVE ONLY. THE CONTRACTOR SHALL CARRY OUT ALL WORKS IN ACCORDANCE WITH THE CONTRACTORS SEDIMENT AND EROSION CONTROL PLAN. ALL RESPONSIBILITY FOR SEDIMENT AND EROSION CONTROL IS DELEGATED TO THE CONTRACTOR BY THE APPLICANT AND THE LAND OWNERS UNTIL THE ON MAINTENANCE INSPECTION.
2. THE CONTRACTOR AT A MINIMUM IS TO COMPLY WITH HEALTHY WATERWAYS "CONTROLLING STORMWATER POLLUTION ON YOUR BUILDING SITE" AND ALL ASSOCIATED DOCUMENTATION AND CHECKLISTS.

NOTES

1. REFER TO DWG 2024035-ESC-006 FOR NOTES AND DETAILS.

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CIVIL ENGINEERS
PUBLIC WORKS
INFRASTRUCTURE
LAND DEVELOPMENT

SCALE 2 1 0 2 4 6 8 10 1:200
DO NOT SCALE FROM THIS DRAWING - IF IN DOUBT ASK
A1

DESIGNED	SK/FI	APPROVED	16.10.24
DRAWN	LAB/DS	ON BEHALF OF OWEN CONSULTING PTY LTD	
REVIEWED	SK	SIMON KEALLEY RPEQ No. 29413	

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NORTH
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CLIENT
CLARKE'S DESIGN & CONSTRUCT

PROJECT
INDUSTRIAL DEVELOPMENT - CIVIL WORKS
LOT 28 ON SP333768
No. 99 WONGAWALLAN DRIVE, YARRABILBA, QLD

TITLE
EROSION AND SEDIMENT CONTROL PLAN - PHASE 3 ROADWORKS & SERVICES

PROJECT No 2024035
DRAWING No 2024035-ESC-004
AMDT C

APPENDIX D

As-Constructed Infrastructure Assets / DBYD Information

Contact Details

Contact	Contact number	Company	Enquirer ID
Renee Beasley	(07) 5572 0702	Owen Consulting	3036394

Email
reneeb@owenconsulting.com.au

Address
The Rocket Building, Suite 903 203 Robina Town Centre Drive
Robina QLD 4226

Job Site and Enquiry Details

WARNING: The map below only displays the location of the proposed job site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

Enquiry date	Start date	End date	On behalf of	Job purpose	Locations	Onsite activities
18/06/2024	26/08/2024	29/11/2024	Private	Excavation	Both Road, Nature Strip, Footpath	Mechanical Excavation



Check that the location of the job site is correct. If not, you must submit a new enquiry.

If the scope of works change or plan validity dates expire, you must submit a new enquiry.

Do NOT dig without plans. Safe excavation is your responsibility. If you don't understand the plans or how to proceed safely, please contact the relevant asset owners.

User Reference	Address	Notes/description
Lot 28 Wongawallen Dr	Lot 101 Waterford - Tamborine Road Yarrabilba QLD 4207	-

Your Responsibility and Duty of Care

- **Lodging an enquiry does not authorise project commencement.** Before starting work, you must obtain all necessary information from all affected asset owners.
- If you don't receive plans within 2 business days, contact the asset owner & quote their sequence number.
- Always follow the 5Ps of Safe Excavation (page 2), and locate assets before commencing work.
- Ensure you comply with State legislative requirements for Duty of Care and safe digging.
- If you damage an underground asset, you MUST advise the asset owner immediately.
- By using the BYDA service, you agree to the Privacy Policy and Term of Use.
- For more information on safe digging practices, visit www.byda.com.au

Asset Owner Details

Below is a list of asset owners with underground infrastructure in and around your job site. It is your responsibility to identify the presence of these assets. Plans issued by Members are indicative only unless specified otherwise. Note: not all asset owners are registered with BYDA. You must contact asset owners not listed here directly.

Referral ID (Seq. no)	Authority Name	Phone	Status
240683942	APA Group Gas Networks (90073)	1800 085 628	NOTIFIED
240683944	Energex QLD	13 12 53	NOTIFIED
240683941	Logan City Council	(07) 3412 3412	NOTIFIED
240683940	NBN Co Qld	1800 687 626	NOTIFIED
240683943	Telstra QLD South East	1800 653 935	NOTIFIED

END OF UTILITIES LIST

Before You Dig Australia (BYDA)

Asset Location Response

PO Box 3226 Logan City DC QLD 4114 • 150 Wembley Road, Logan Central
p (07) 3412 3412 • **e** council@logan.qld.gov.au • www.logan.qld.qov.au • ABN 21-627-796 435

Owen Consulting - Renee Beasley
203 Robina Town Centre Drive The Rocket Building, Suite 903
Robina QLD 4226
reneeb@owenconsulting.com.au

Logan City Council has been advised that you have placed an enquiry through the Before You Dig Australia service with the following details. Logan City Council confirms that the proposed work(s) will not impact any of their assets in the reference area of your request.

Enquiry Details	
Sequence Number	240683941
Enquiry Date	18/06/2024 09:44
Response	**NOT AFFECTED**
Address	Lot 101 Waterford - Tamborine Road Yarrabilba
Location in Road	Road,Nature Strip,Footpath
Activity	Mechanical Excavation

Maps have been enclosed with your requested area highlighted to assist in identifying the location of Logan City Council Assets.

For any enquiries relating to this please contact Road Infrastructure Planning on (07) 3412 5282.

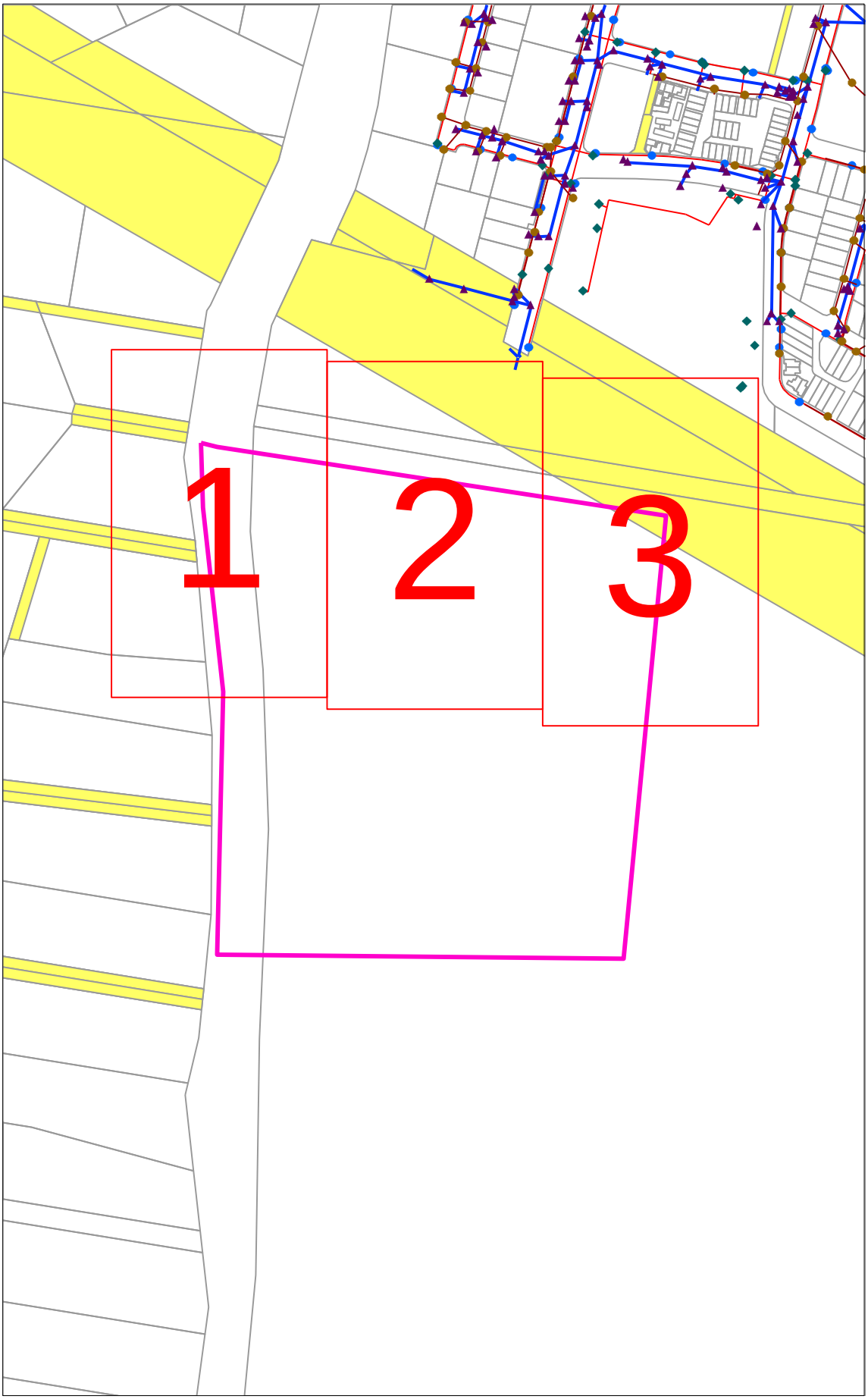
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Logan City Council's infrastructure dates back over many years and may include manufactured materials containing asbestos. You are solely responsible for ensuring that appropriate care is taken at all times and that you comply with all mandatory requirements relating to such matters, including but not limited to "workplace health and safety".

Overview Map

Sequence No: 240683941

Lot 101 Waterford - Tamborine Road Yarrabilba



LEGEND:

- Not Affected BYDA Work Area
- 1 Detail Map

Sewer Assets

- Sewerage Pump Station - Existing
- Sewerage Pump Station - Retired
- Sewerage Manhole - Existing
- Sewerage Manhole - Retired
- Sewerage Pipe - Existing
- Sewerage Pipe - Retired
- Sewerage Trunk Main - Existing
- Sewerage Trunk Main - Retired
- Sewerage Rising Main - Existing
- Sewerage Rising Main - Retired

Water Assets

- Hydrant - Existing
- Hydrant - Retired
- Valve - Existing
- Valve - Retired
- Water Supply Line - Existing
- Water Supply Line - Retired

Stormwater Assets

- Manholes, Gullies and Drainways
- Telemetry Gauge Station
- Stormwater Headwall
- Telemetry Air Line
- Stormwater Pipes and Culverts

Parcel Types

- Easement
- Base Lot (Type L)
- Water Body (Type W)

N

1:4000

0 0.05km

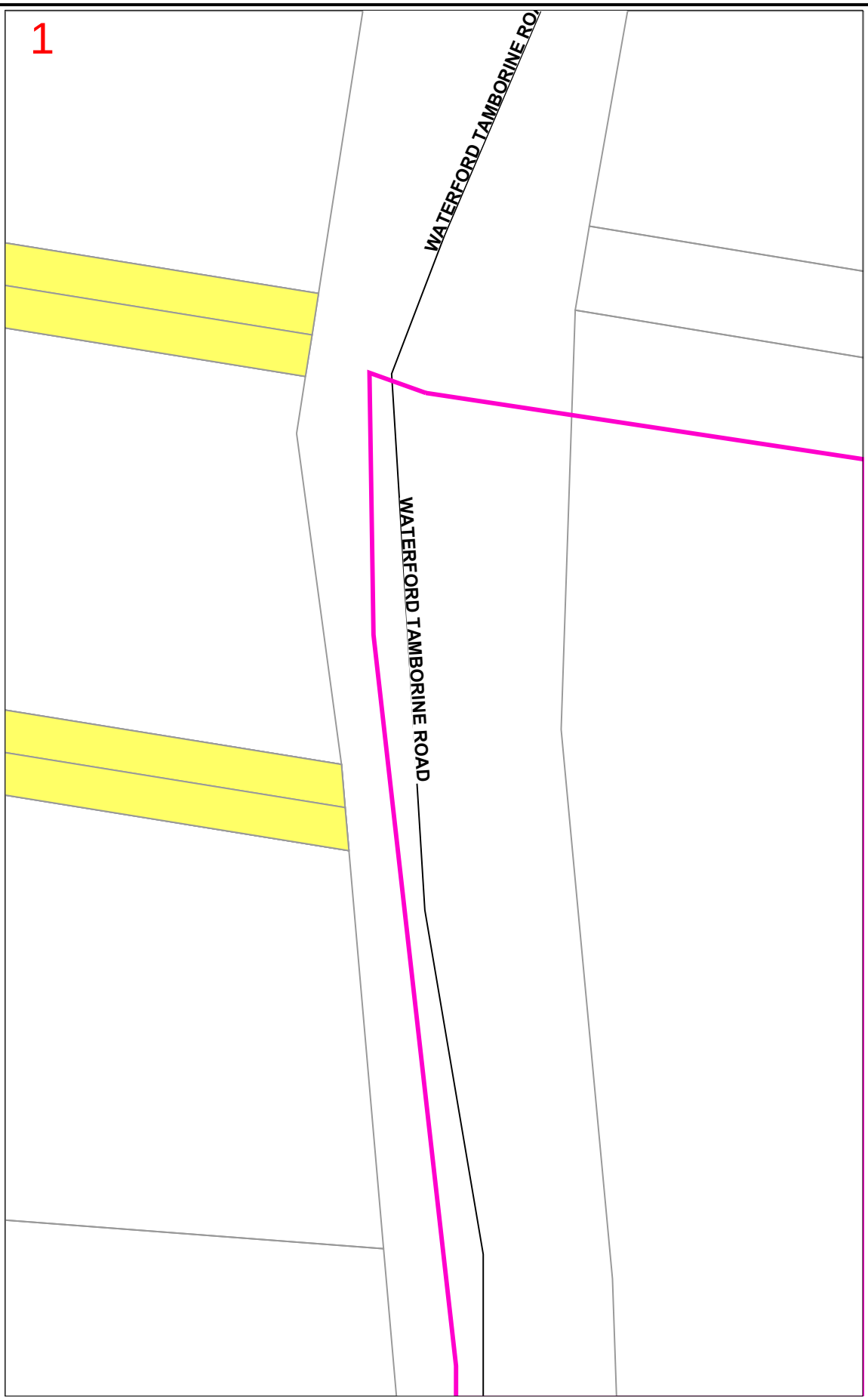
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Map 1

Sequence No: 240683941

Lot 101 Waterford - Tamborine Road Yarrabilba



LEGEND:

- Not Affected BYDA Work Area

Sewer Assets

- Sewerage Pump Station - Existing
- Sewerage Pump Station - Retired
- Sewerage Manhole - Existing
- Sewerage Manhole - Retired
- Sewerage Pipe - Existing
- Sewerage Pipe - Retired
- Sewerage Trunk Main - Existing
- Sewerage Trunk Main - Retired
- Sewerage Rising Main - Existing
- Sewerage Rising Main - Retired

Water Assets

- Hydrant - Existing
- Hydrant - Retired
- Valve - Existing
- Valve - Retired
- Water Supply Line - Existing
- Water Supply Line - Retired

Stormwater Assets

- Manholes, Gullies and Drainways
- Telemetry Gauge Station
- Stormwater Headwall
- Telemetry Air Line
- Stormwater Pipes and Culverts

Parcel Types

- Easement
- Base Lot (Type L)
- Water Body (Type W)

N

1:4000

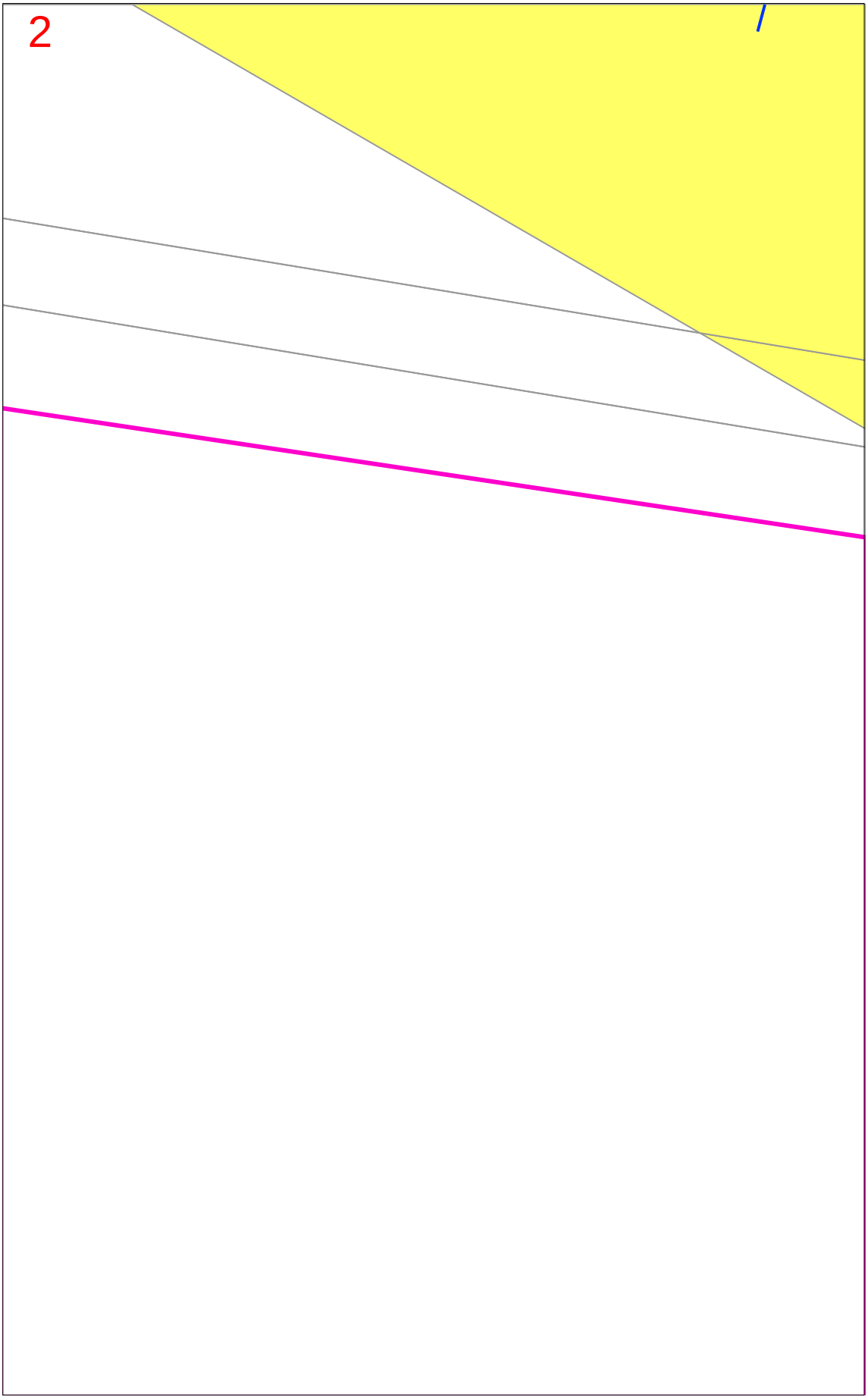
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Map 2

Sequence No: 240683941

Lot 101 Waterford - Tamborine Road Yarrabilba



LEGEND:

Not Affected BYDA Work Area

Sewer Assets

- Sewerage Pump Station - Existing
- Sewerage Pump Station - Retired
- Sewerage Manhole - Existing
- Sewerage Manhole - Retired
- Sewerage Pipe - Existing
- Sewerage Pipe - Retired
- Sewerage Trunk Main - Existing
- Sewerage Trunk Main - Retired
- Sewerage Rising Main - Existing
- Sewerage Rising Main - Retired

Water Assets

- Hydrant - Existing
- Hydrant - Retired
- Valve - Existing
- Valve - Retired
- Water Supply Line - Existing
- Water Supply Line - Retired

Stormwater Assets

- Manholes, Gullies and Drainways
- Telemetry Gauge Station
- Stormwater Headwall
- Telemetry Air Line
- Stormwater Pipes and Culverts

Parcel Types

- Easement
- Base Lot (Type L)
- Water Body (Type W)

N

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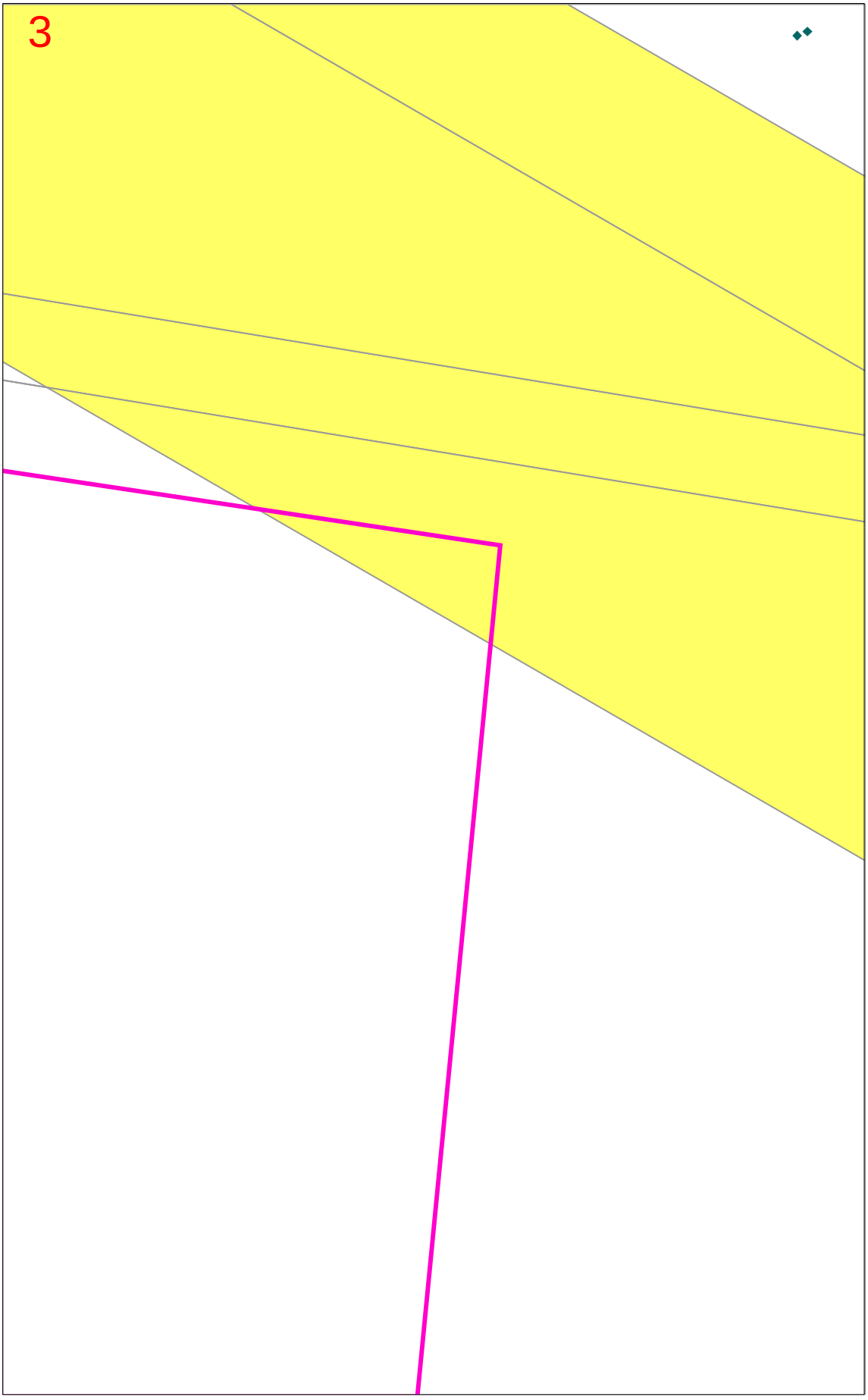
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Map 3

Sequence No: 240683941

Lot 101 Waterford - Tamborine Road Yarrabilba



LEGEND:

Not Affected BYDA Work Area

Sewer Assets

- Sewerage Pump Station - Existing
- Sewerage Pump Station - Retired
- Sewerage Manhole - Existing
- Sewerage Manhole - Retired
- Sewerage Pipe - Existing
- Sewerage Pipe - Retired
- Sewerage Trunk Main - Existing
- Sewerage Trunk Main - Retired
- Sewerage Rising Main - Existing
- Sewerage Rising Main - Retired

Water Assets

- Hydrant - Existing
- Hydrant - Retired
- Valve - Existing
- Valve - Retired
- Water Supply Line - Existing
- Water Supply Line - Retired

Stormwater Assets

- Manholes, Gullies and Drainways
- Telemetry Gauge Station
- Stormwater Headwall
- Telemetry Air Line
- Stormwater Pipes and Culverts

Parcel Types

- Easement
- Base Lot (Type L)
- Water Body (Type W)

N

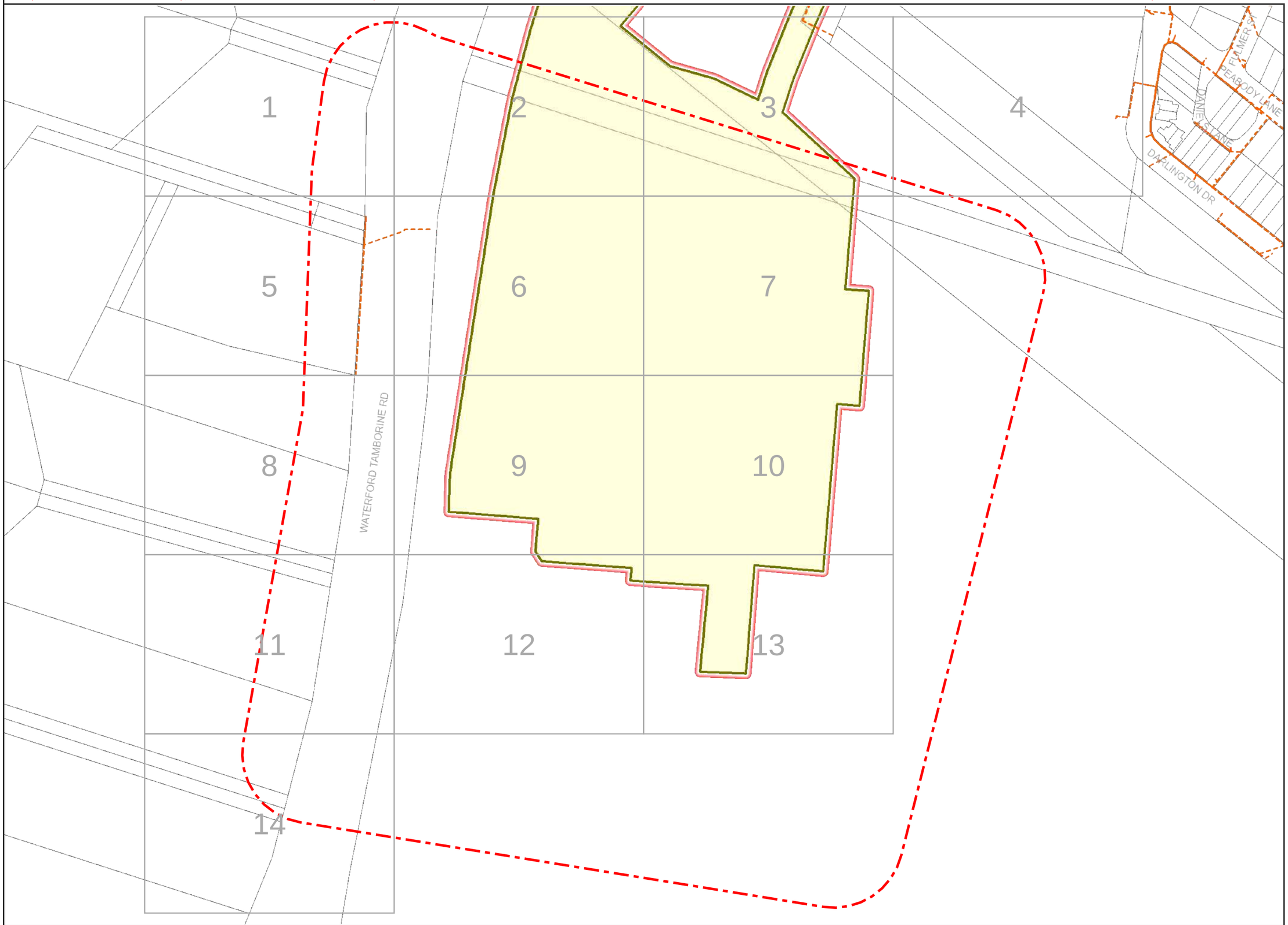
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All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX BYDA map, then ENERGEX shall be contacted immediately.

For Emergency Situations please call 13 19 62



energex

BYDA

Sequence: 240683944
Date: 18/06/2024

Scale: 1:2563

OVERVIEW

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

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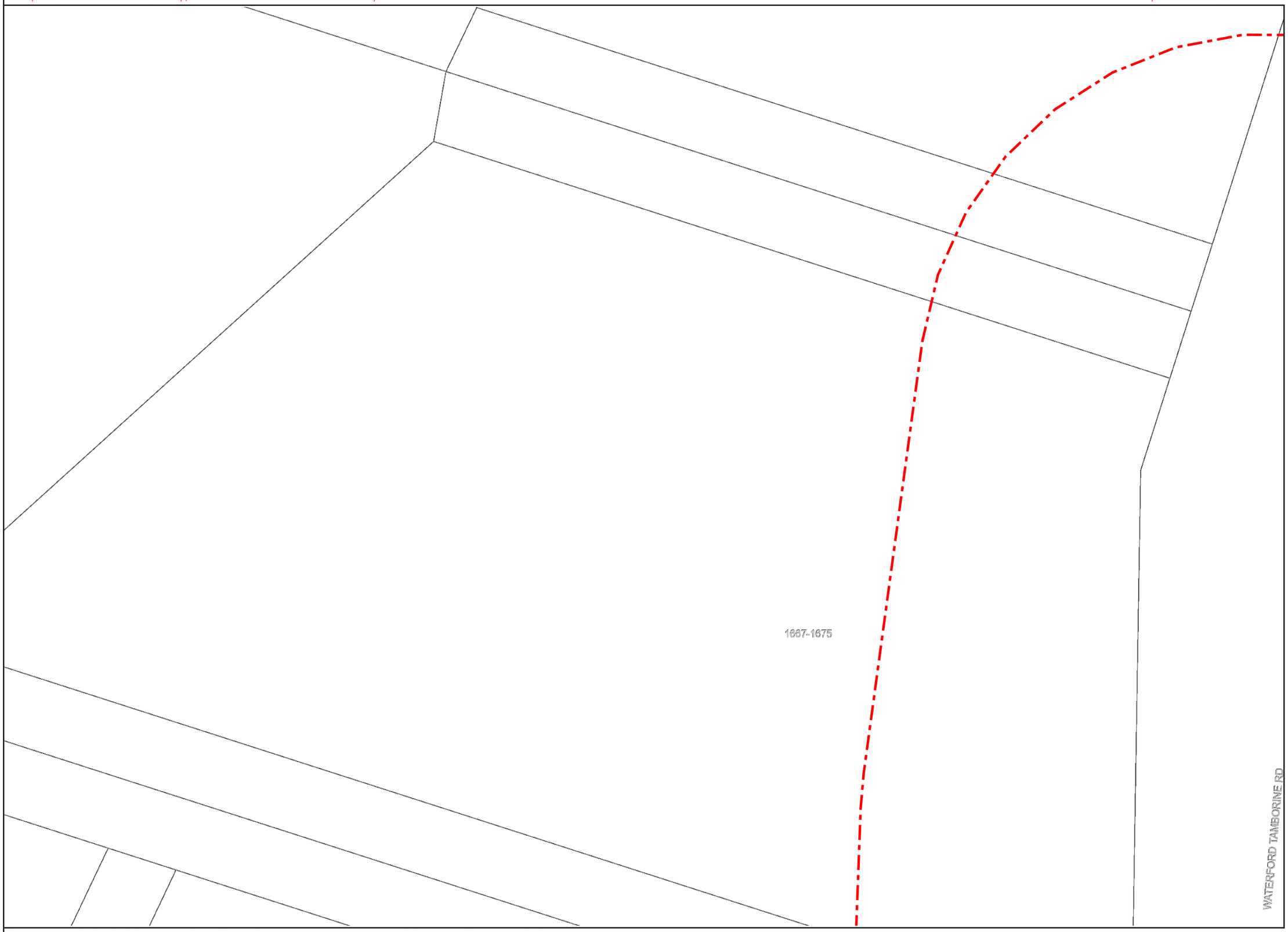
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W
E
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This output provides details of the ENERGEX electrical network. As variations map exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided.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

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BYDA

Sequence: 240683944
Date: 18/06/2024

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For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

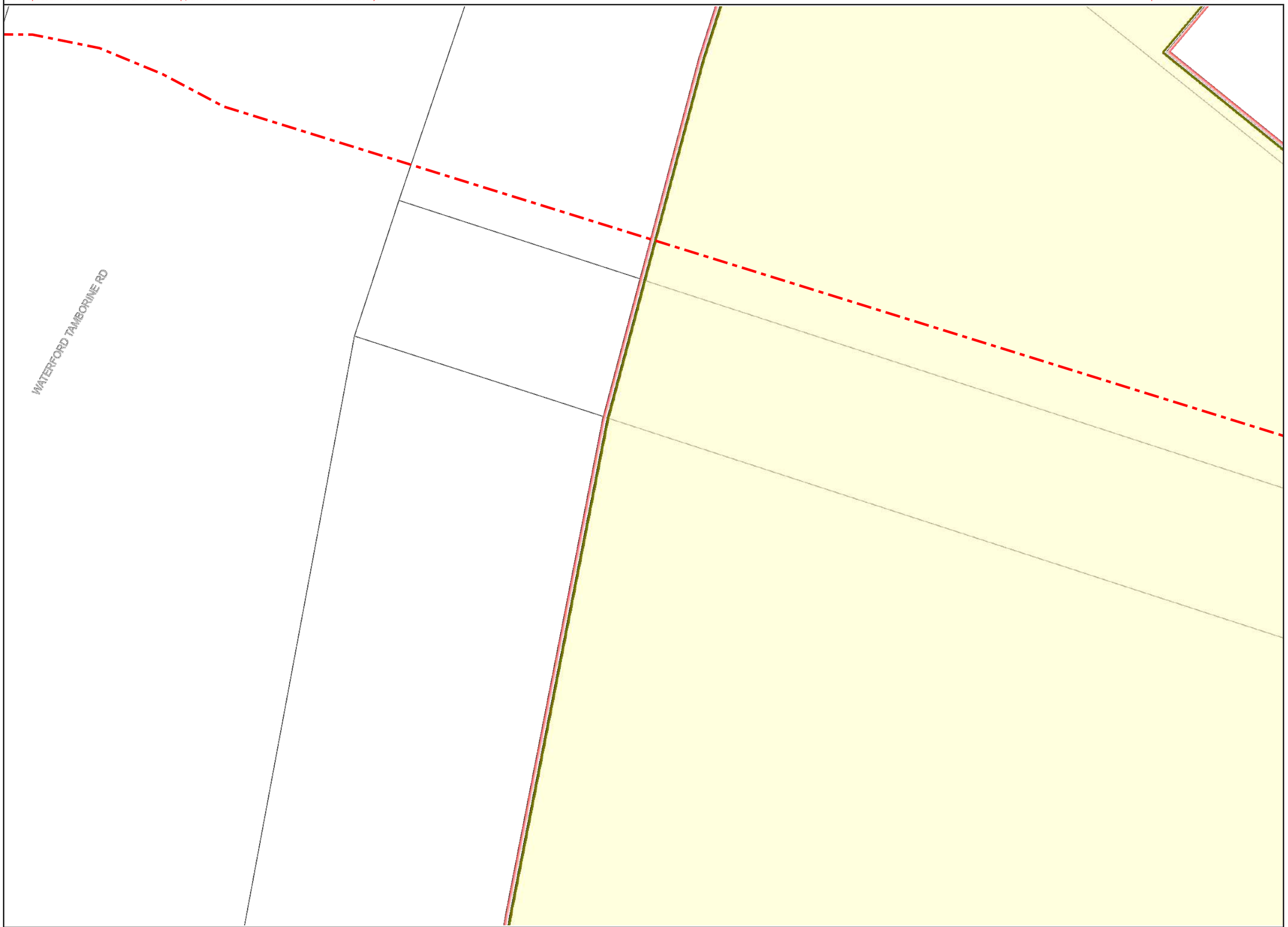
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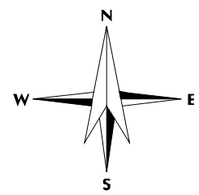
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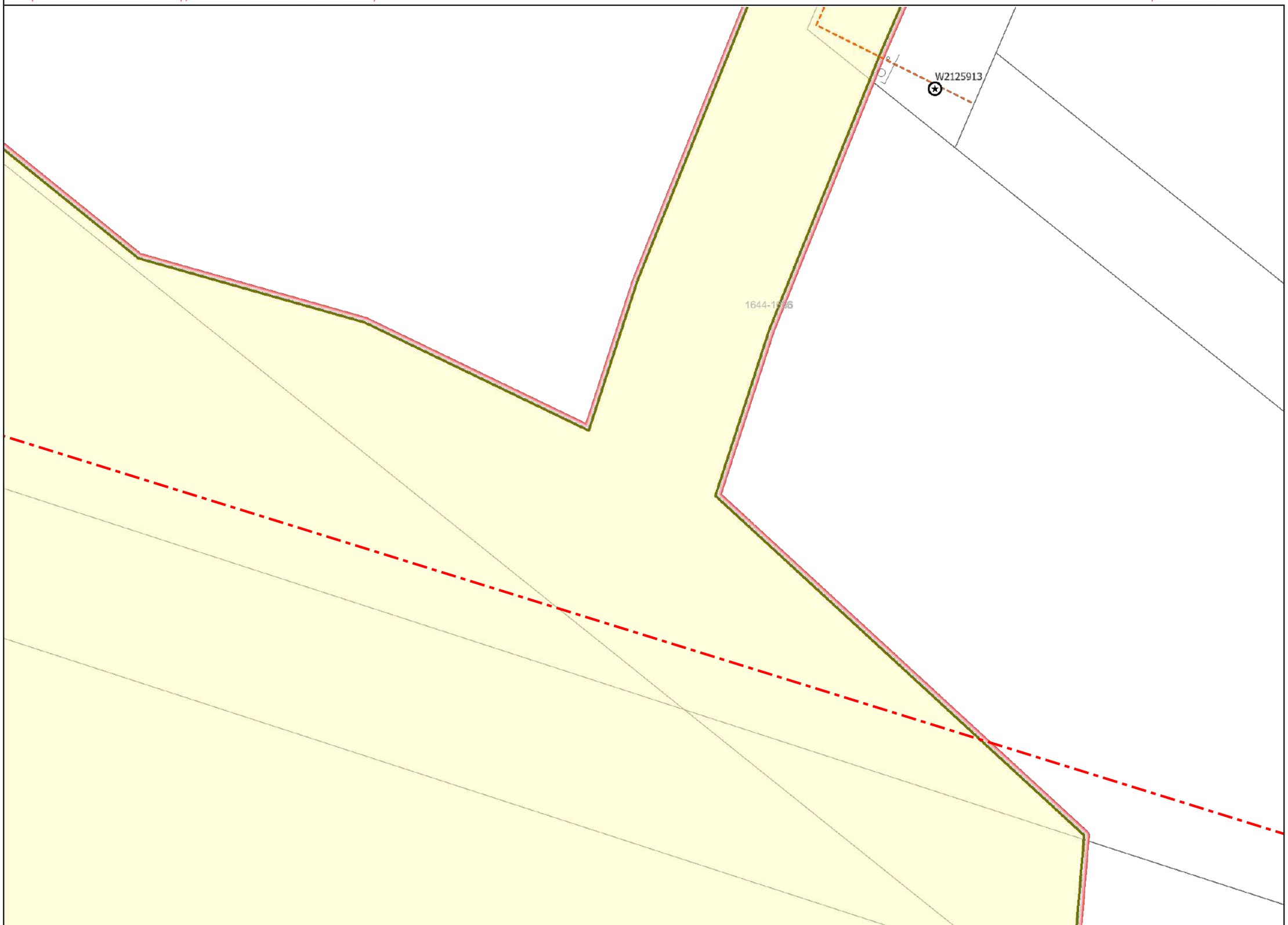


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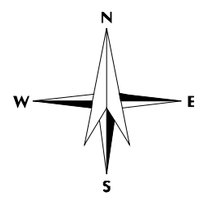
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For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

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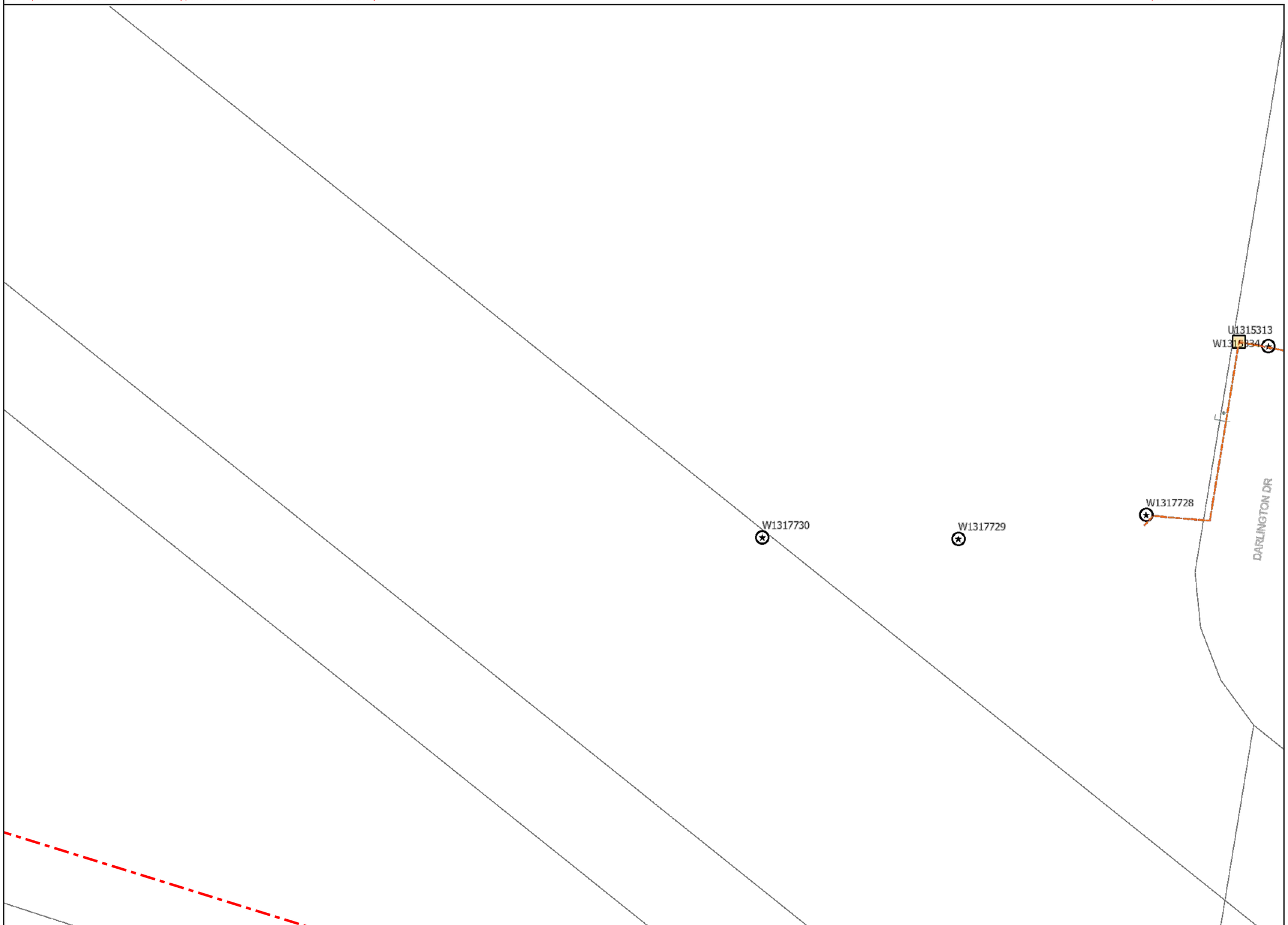


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For Emergency Situations please call 13 19 62



BYDA

Sequence: 240683944
Date: 18/06/2024

Scale: 1:500
Tile No: 4

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

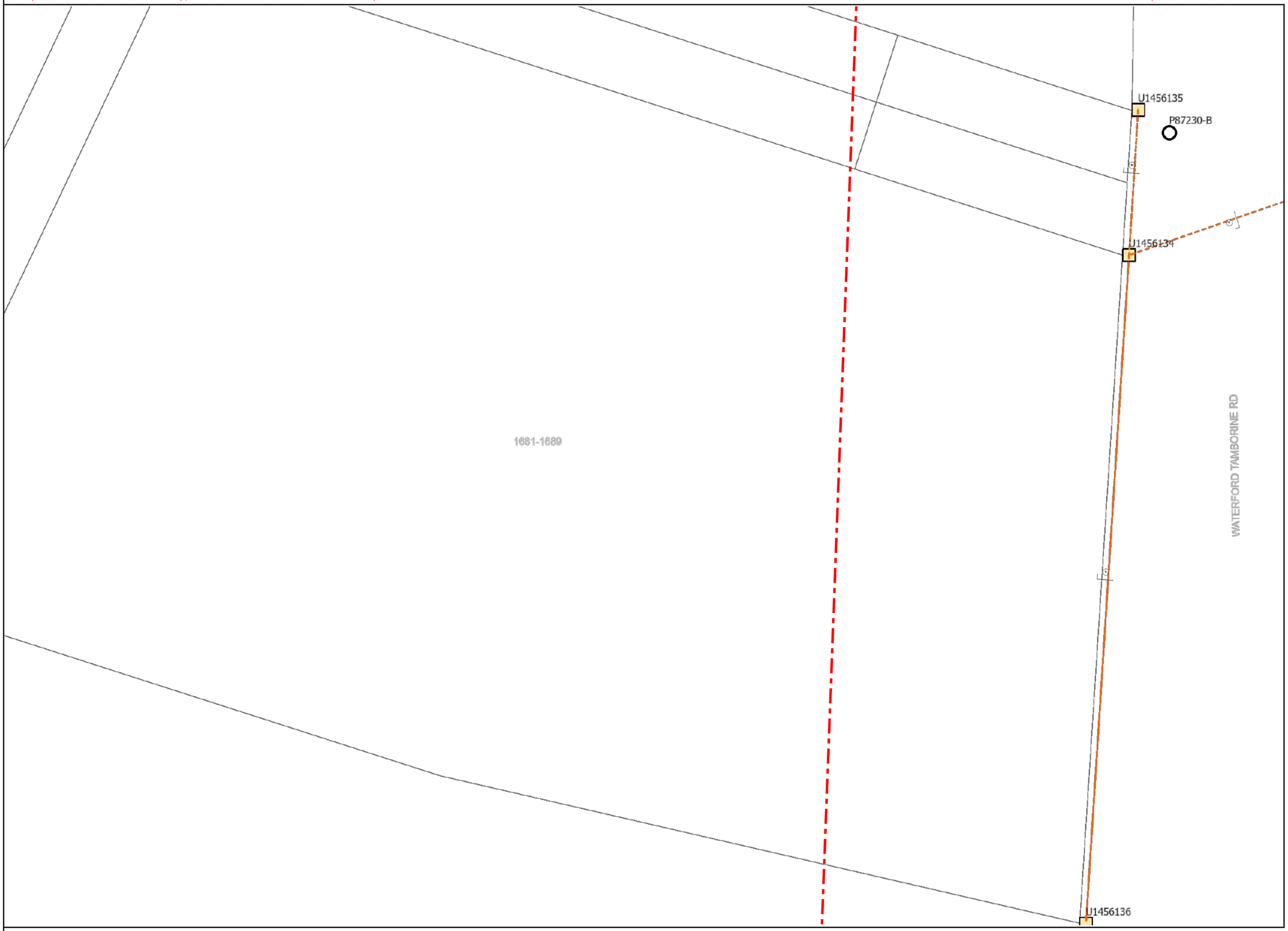
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W E
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DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor PelicanCorp shall have any liability whatsoever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

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energex

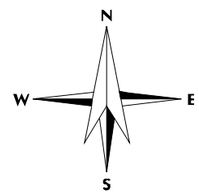
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Date: 18/06/2024

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For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

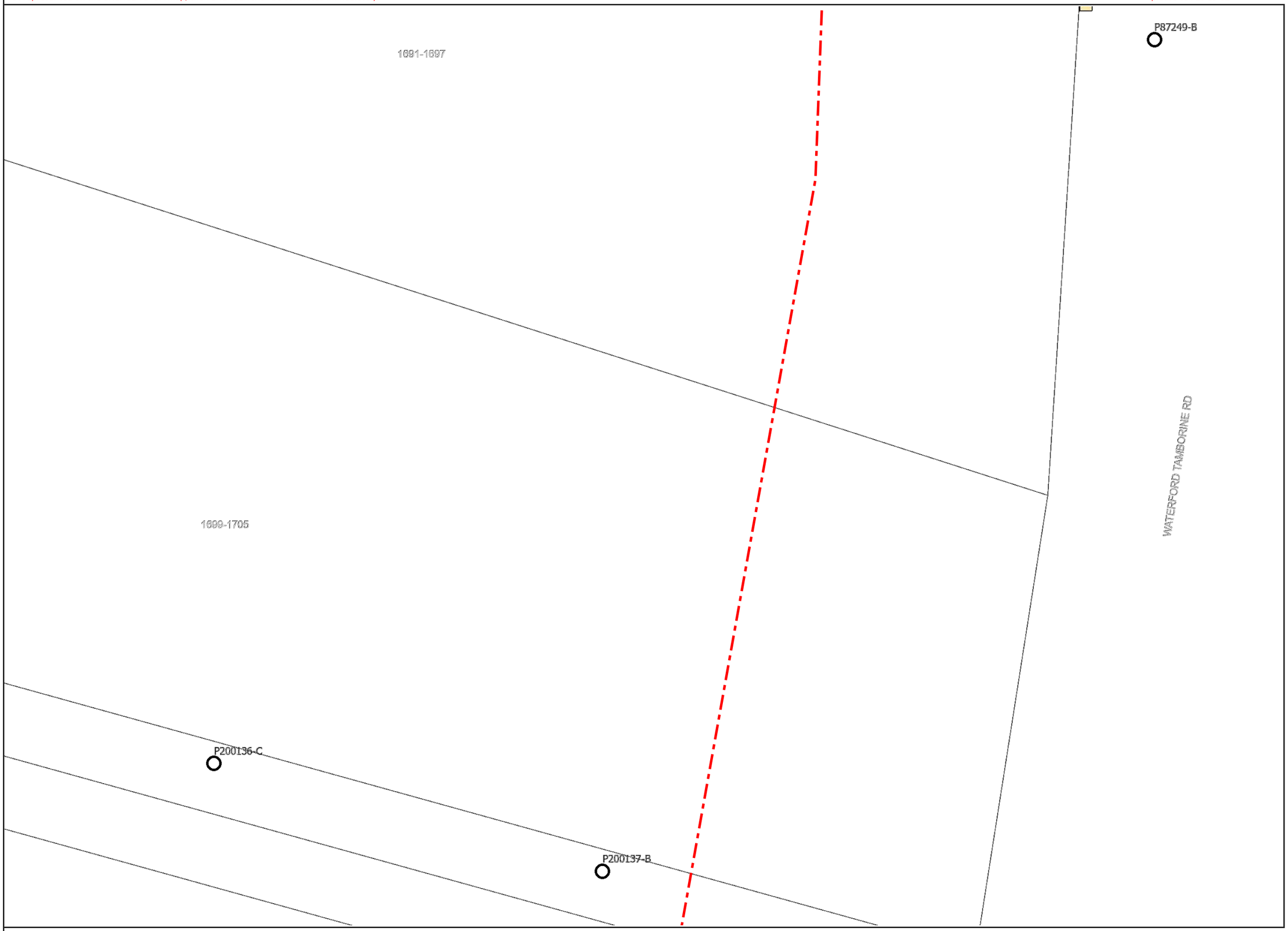


DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information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

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

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

For Emergency Situations please call 13 19 62



This output provides details of the ENERGEX electrical network. As variations map 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.

energex

BYDA

Sequence: 240683944
Date: 18/06/2024

Scale: 1:500
Tile No: 8

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

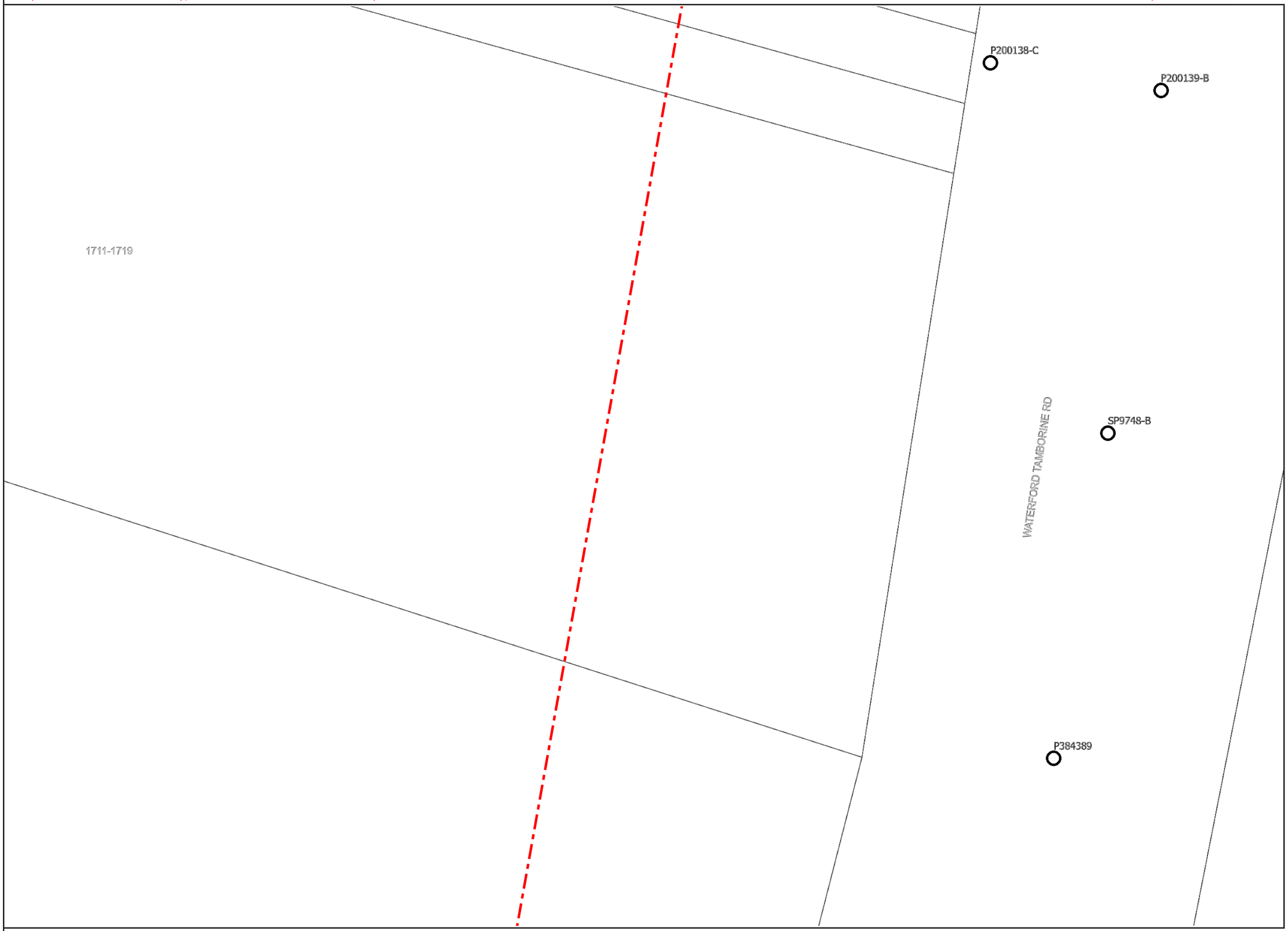
AS5488 Category "D" Plan

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 PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

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For Emergency Situations please call 13 19 62



energex

BYDA

Sequence: 240683944
Date: 18/06/2024

Scale: 1:500
Tile No: 11

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category "D" Plan

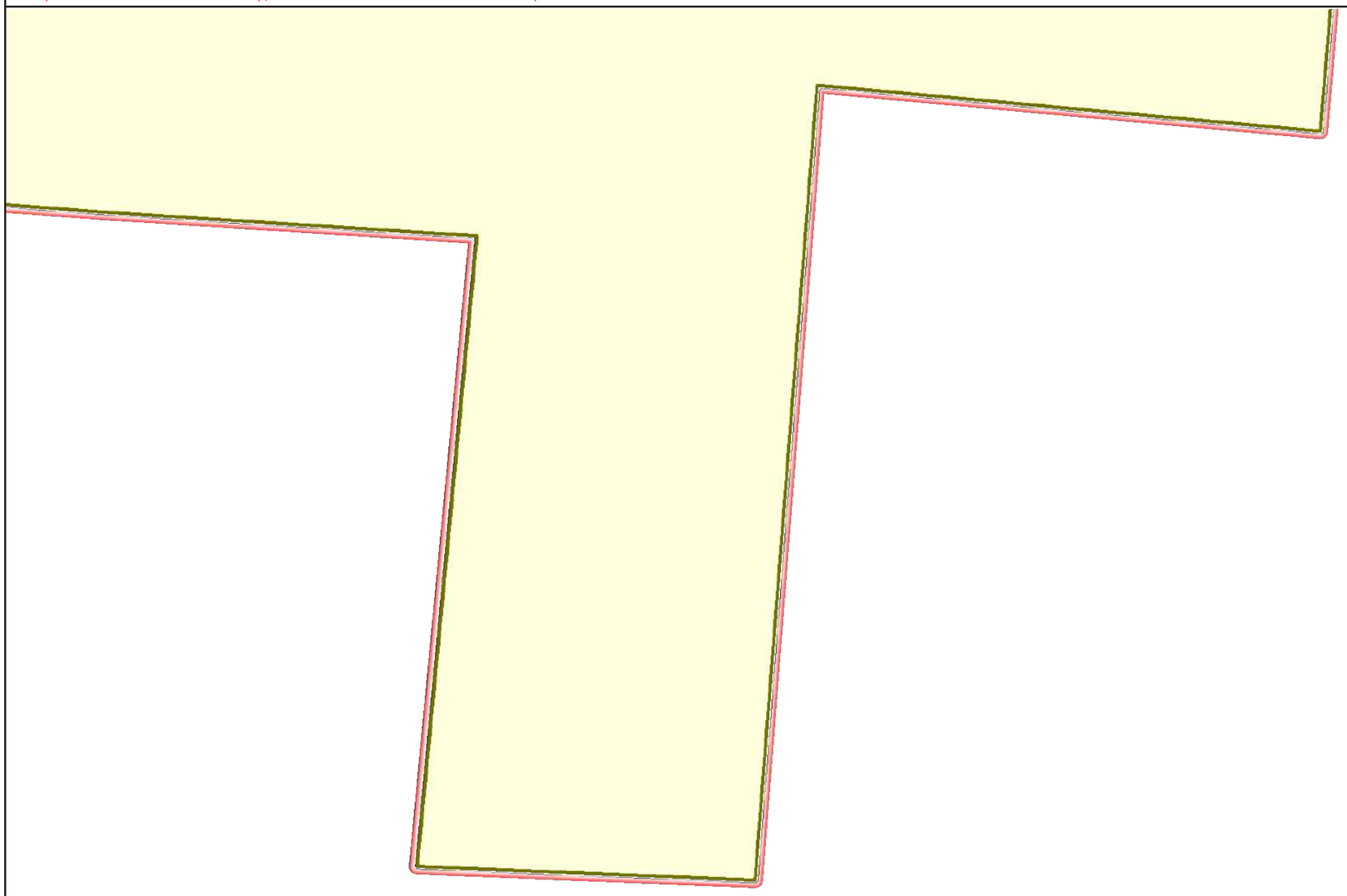
N
W E
S

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

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For Emergency Situations please call 13 19 62



energex

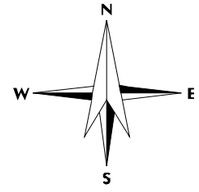
BYDA

Sequence: 240683944
Date: 18/06/2024

Scale: 1:500
Tile No: 13

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

AS5488 Category “D” Plan

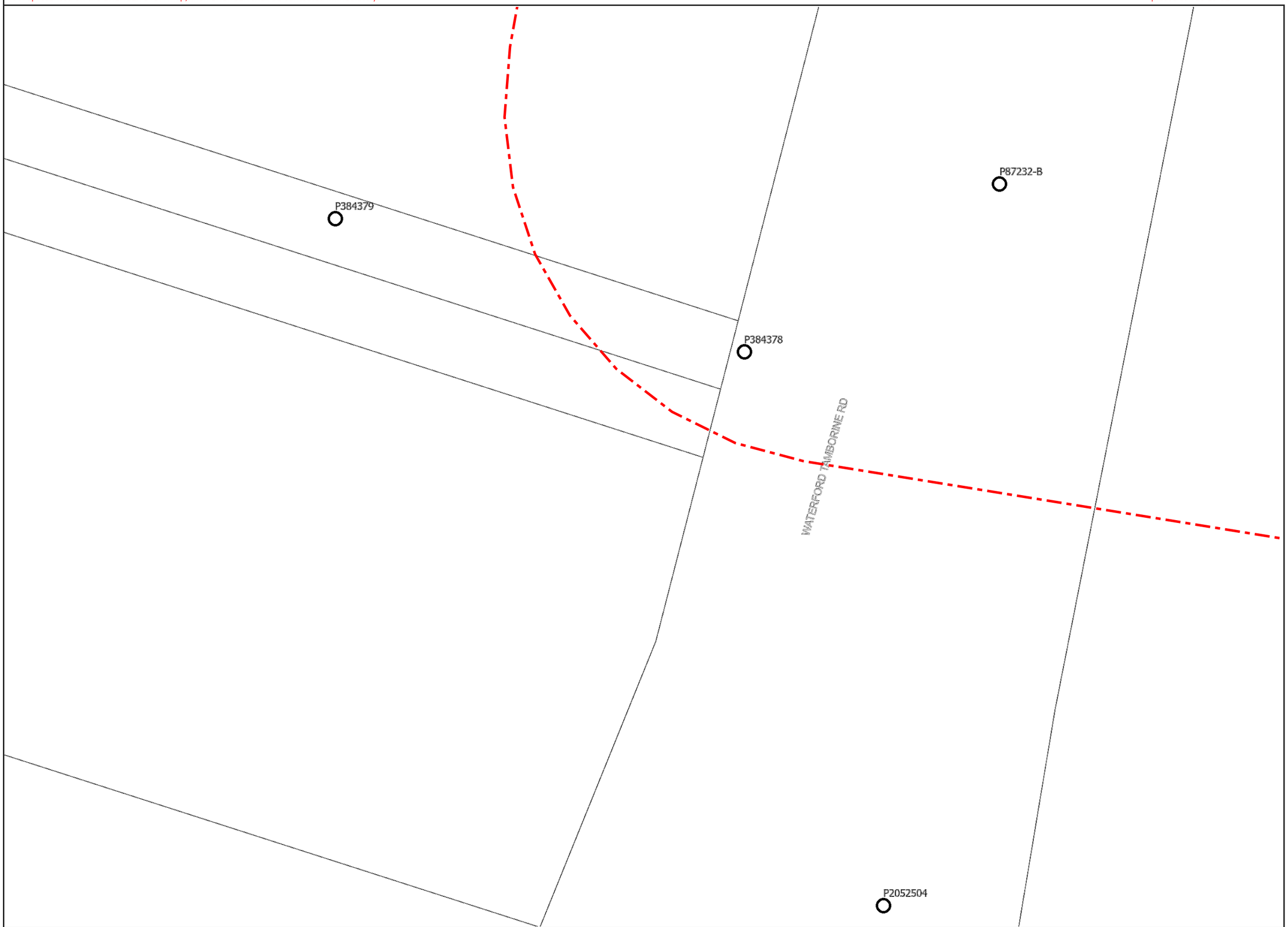


DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information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

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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: 240683944
Date: 18/06/2024

Scale: 1:500
Tile No: 14

For a full list of Map Symbols, please refer to the supplied BYDA Symbology Legend page

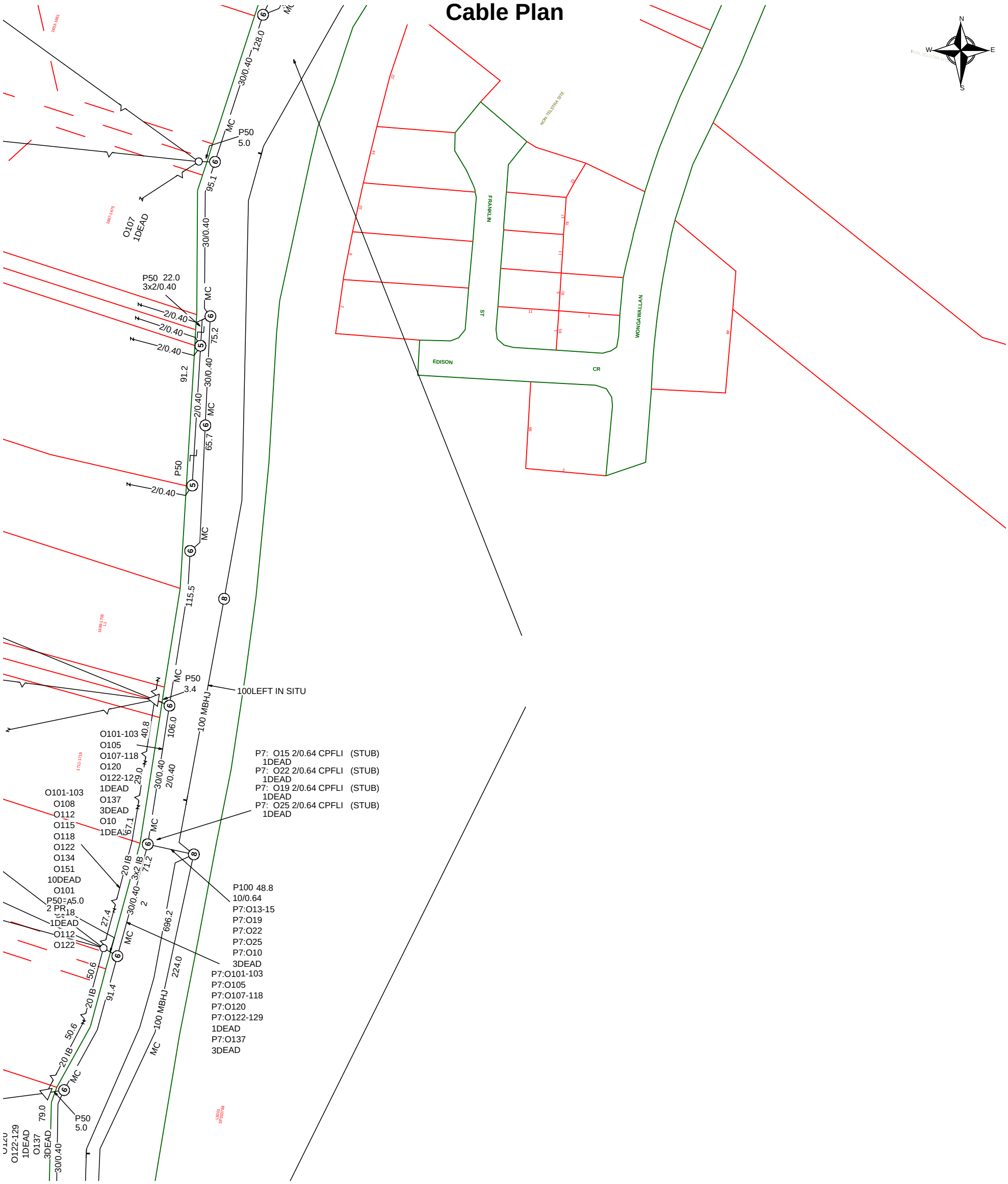
AS5488 Category "D" Plan

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 PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

This output provides details of the ENERGEX electrical network. As variations map 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.

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 18/06/2024 09:48:44

Sequence Number: 240683943

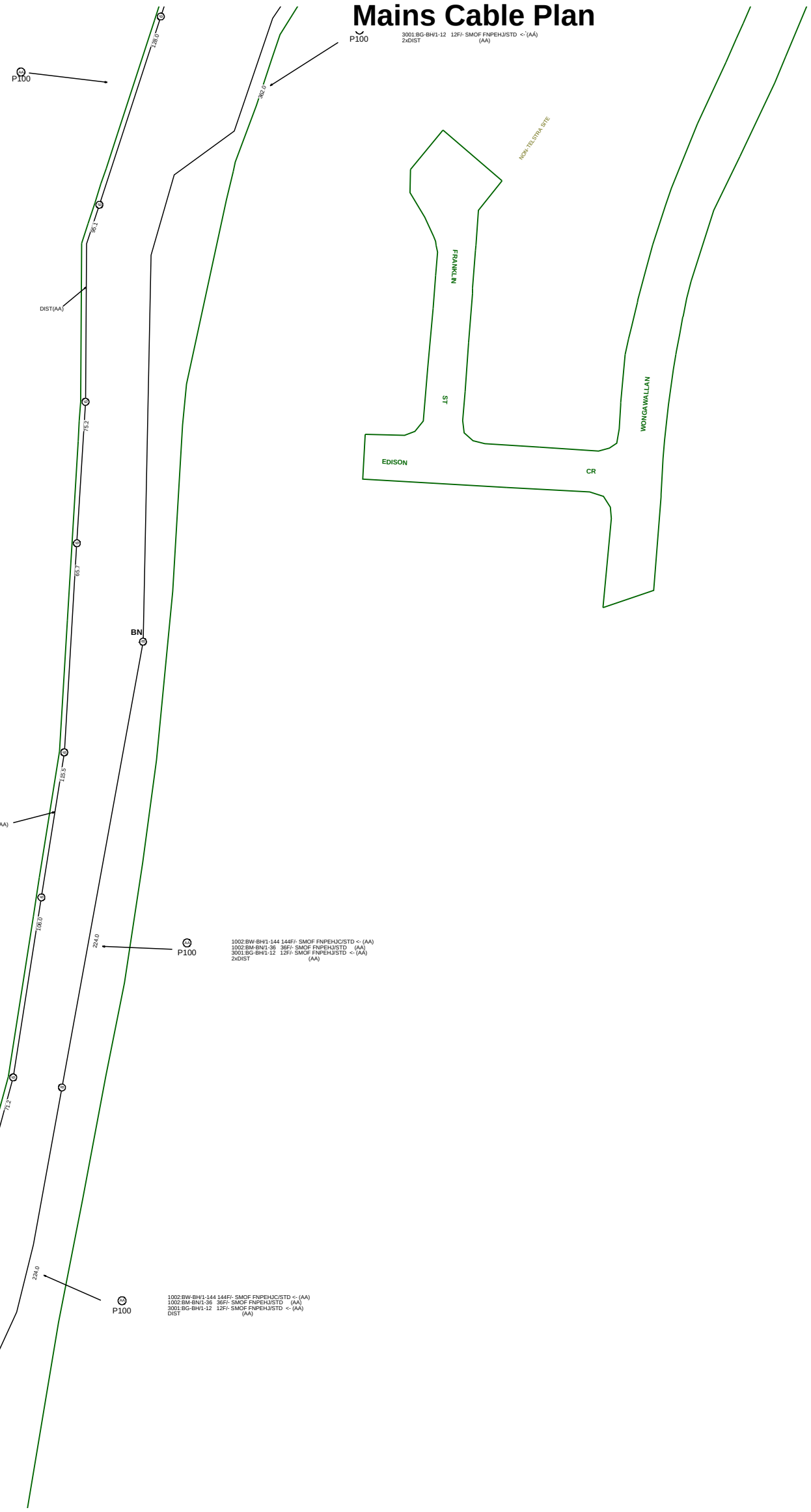
CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

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 18/06/2024 09:48:45

Sequence Number: 240683943

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.

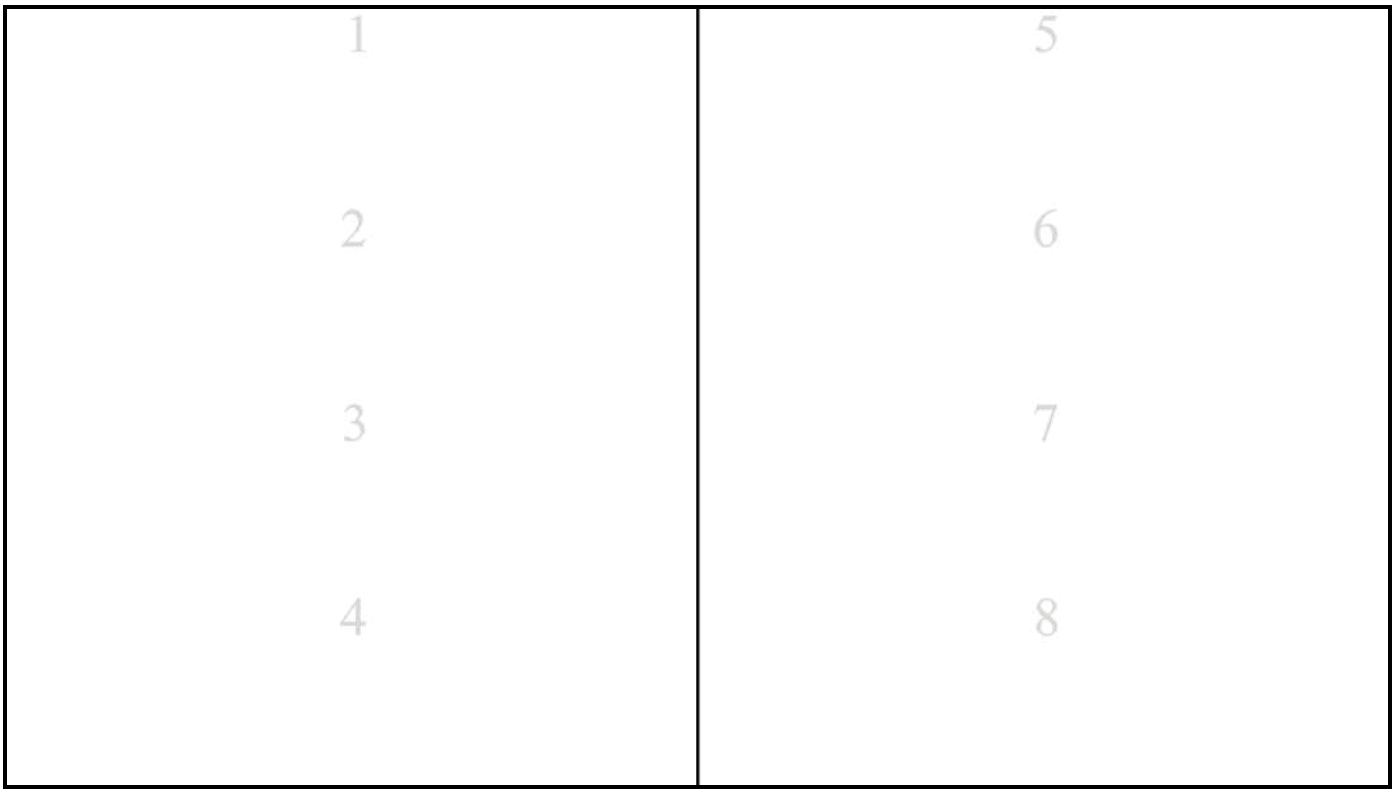
See the Steps- Telstra Duty of Care that was provided in the email response.

To:	Renee Beasley
Phone:	Not Supplied
Fax:	Not Supplied
Email:	reneeb@owenconsulting.com.au

Dial before you dig Job #:	36926062
Sequence #	240683940
Issue Date:	18/06/2024
Location:	Lot 101 Waterford - Tamborine Road , Yarrabilba , QLD , 4207

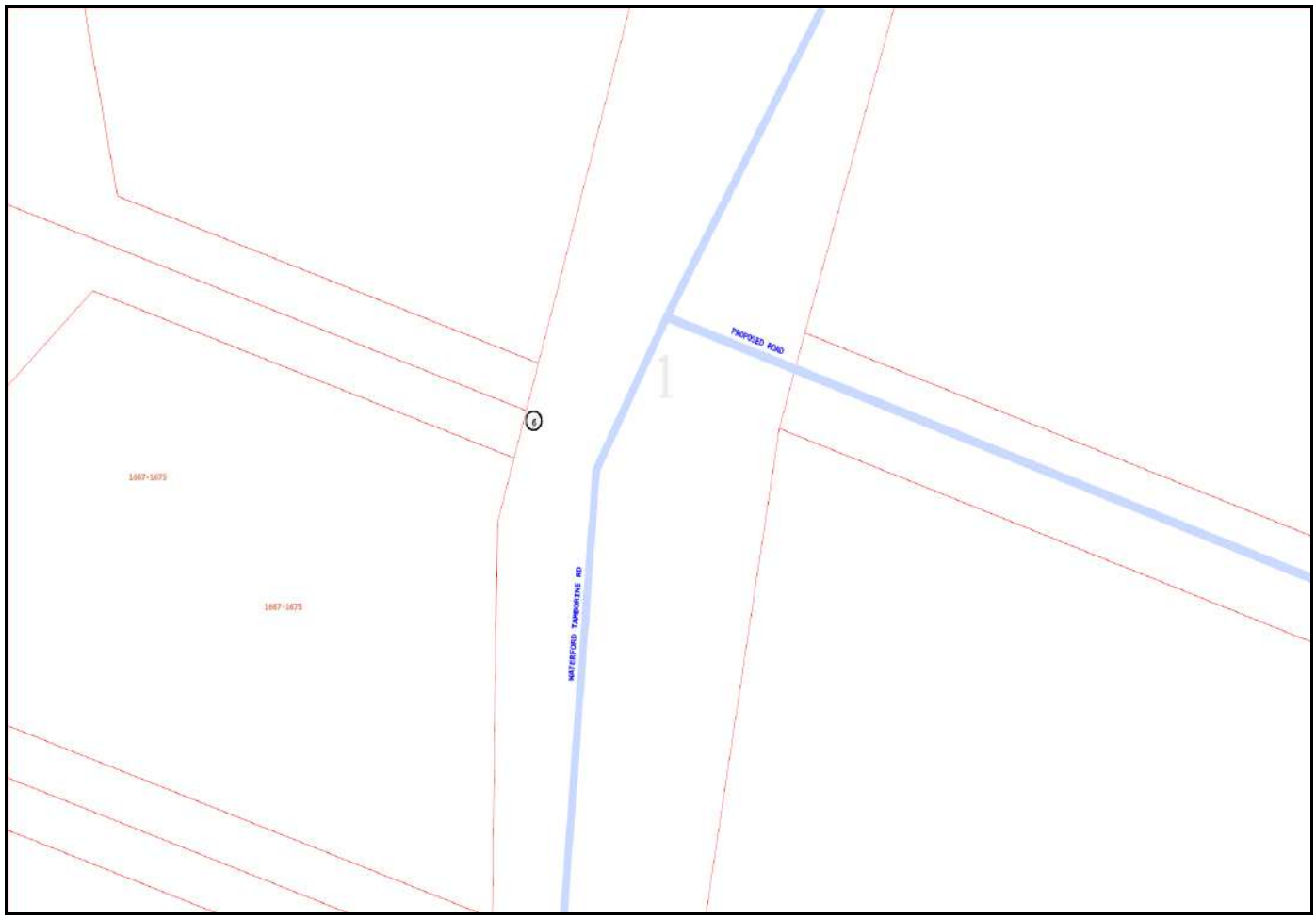
BEFORE YOU DIG www.byda.com.au
Zero Damage - Zero Harm

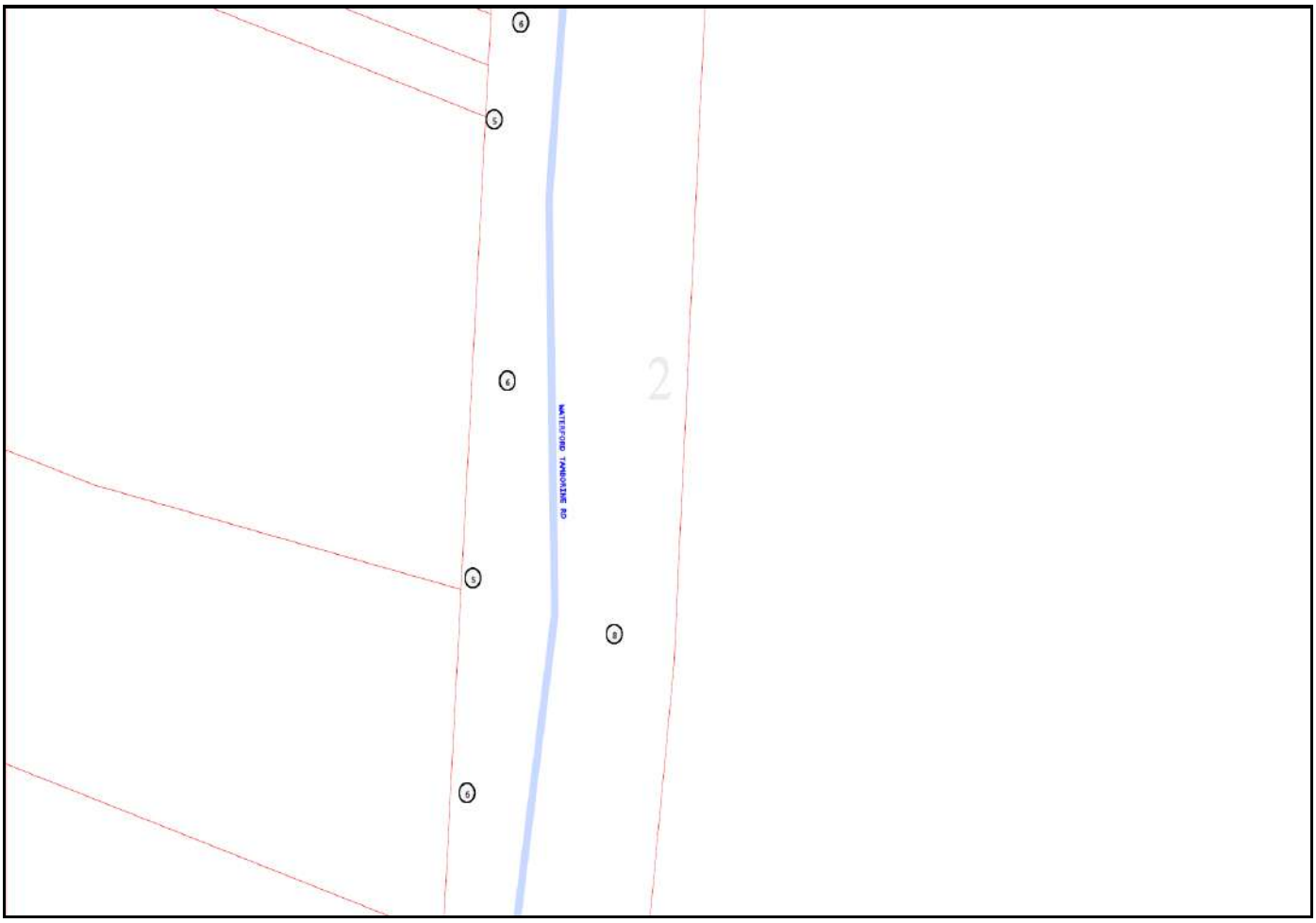
Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans

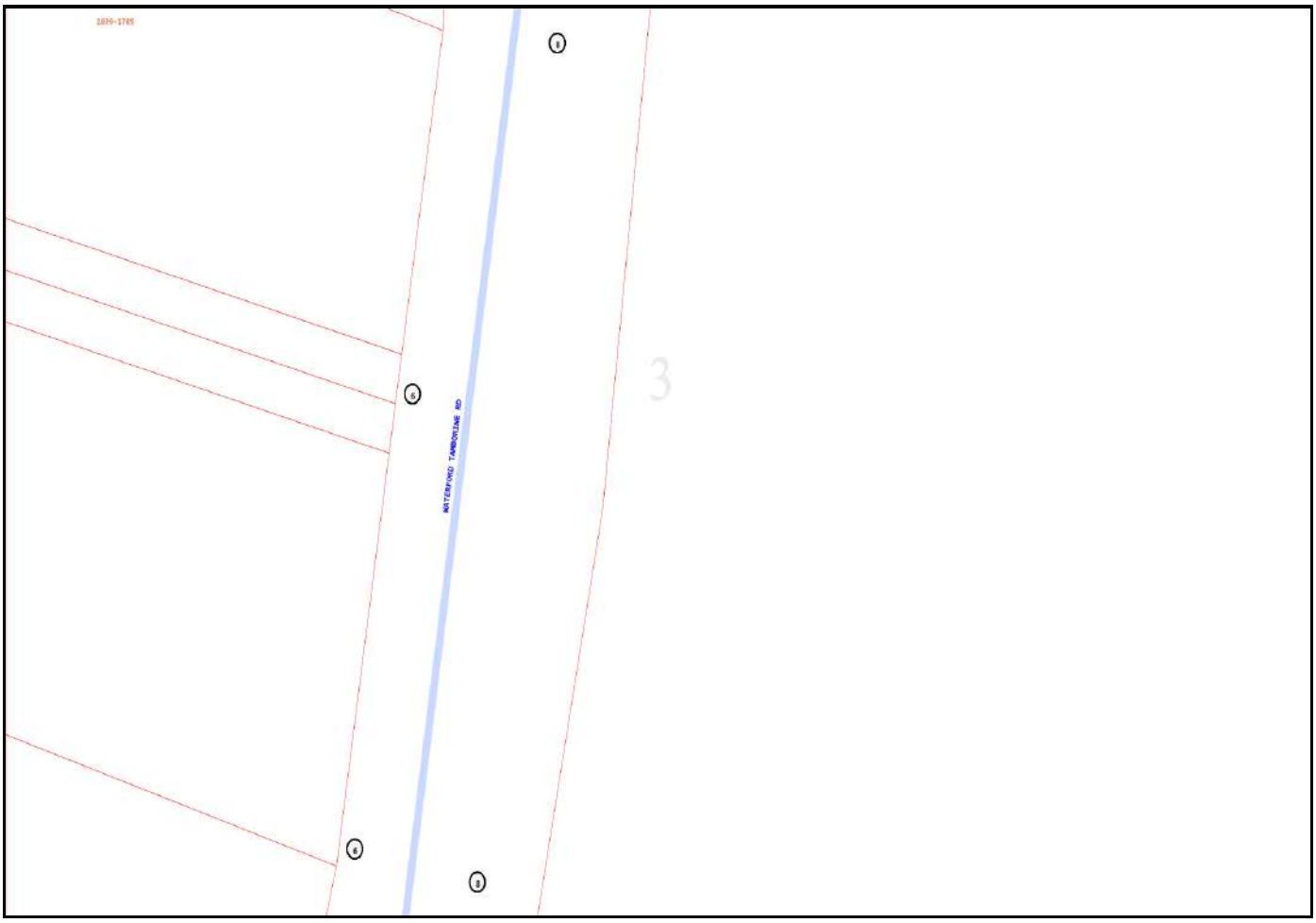


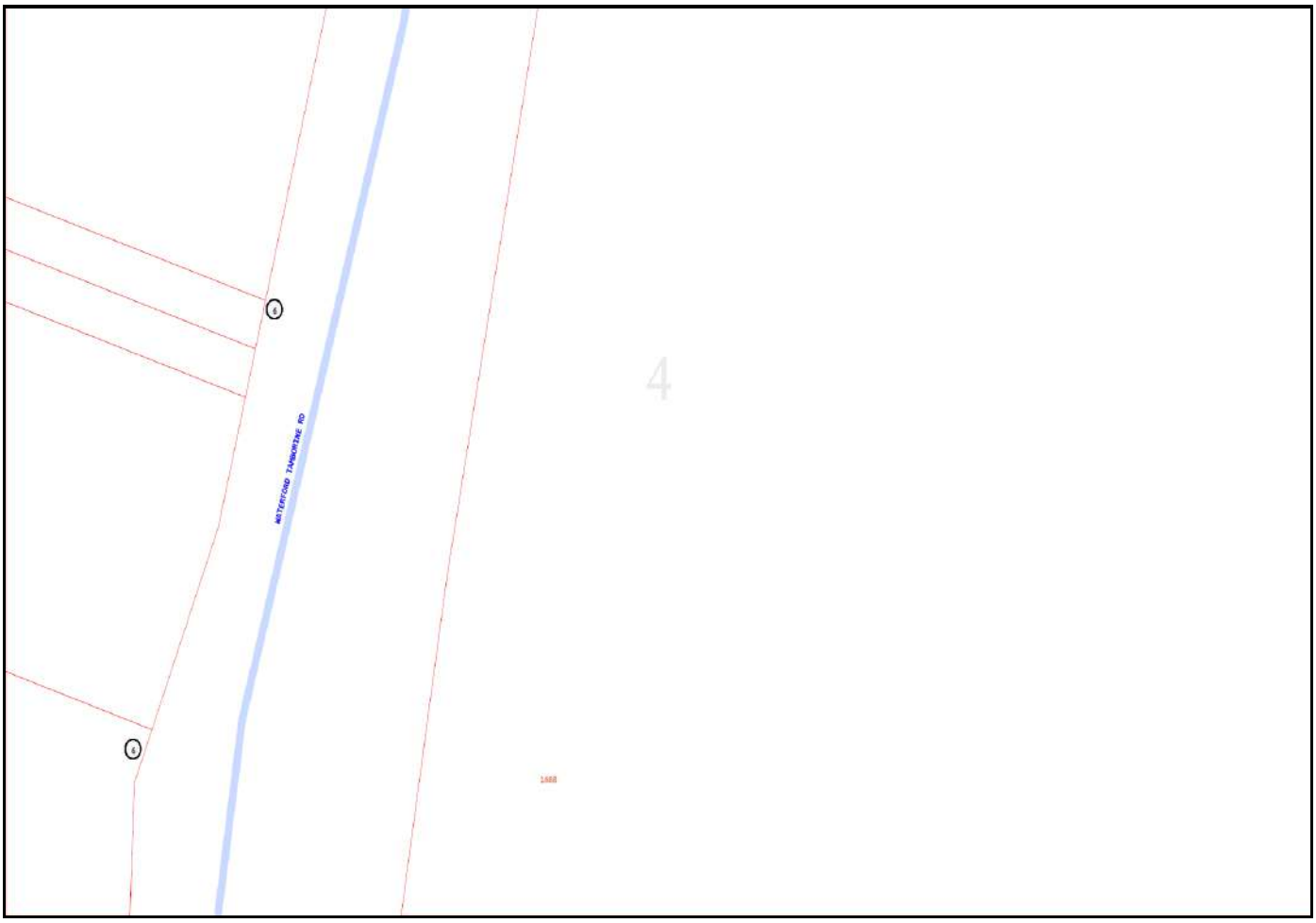
LEGEND

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


PROPOSED ROAD
WATERFORD TANNORTINE RD
1667-1675
1667-1675
6


6
5
6
2
WATERFORD TANNORSIDE RD
5
8
6


1899-1785
WATERFORD TAMBORINE RD
3


4
WATERFORD TAMWORTH RD
6
6
1488

APA Group
PO Box 6014 Halifax Street,
South Australia 5000

18/06/2024

Company: Owen Consulting
Renee Beasley
The Rocket Building, Suite 903,203 Robina Town Centre Drive
Robina
QLD 4226

reneeb@owenconsulting.com.au

Dear Renee Beasley

Sequence Number: 240683942
Worksite Address: Lot 101 Waterford - Tamborine Road
Yarrabilba
QLD 4207

Thank you for your Before You Dig enquiry regarding the location of APA Group (APA) operated Gas Assets.

We confirm there are **NO** Gas Assets in the vicinity of the above location.

Caution - Damage to gas assets may result in explosion, fire and personal injury.

You are hereby notified the Duty of Care requirements described below apply to any activity in the vicinity of APA operated Gas Assets. Please ensure you read and comply with all the relevant requirements where applicable.

Contacts – APA Group	
Enquiry Type	**Contact Numbers**
General enquiries or feedback regarding this information or gas assets. QLD Only All other States	**APA - Before You Dig Officer** Phone: 1800 085 628 Email: PermitsQld@apa.com.au Phone: 1800 085 628 Email: DBYDNetworksAPA@apa.com.au
Gas Emergencies	Phone: 1800 GAS LEAK (1800 427 532)

Please find below the following information:

1. **Duty of Care** - If you are unclear of your obligations under these requirements please contact the Before You Dig officer for clarification.
2. **An overview map** highlighting the area of your intended works.
3. **Map(s) showing APA operated Gas Assets** within the area of your intended works.

Site Address	Lot 101 Waterford - Tamborine Road Yarrabilba 4207	**Sequence No**	240683942
Name	Renee Beasley		
Email	reneeb@owenconsulting.com.au		

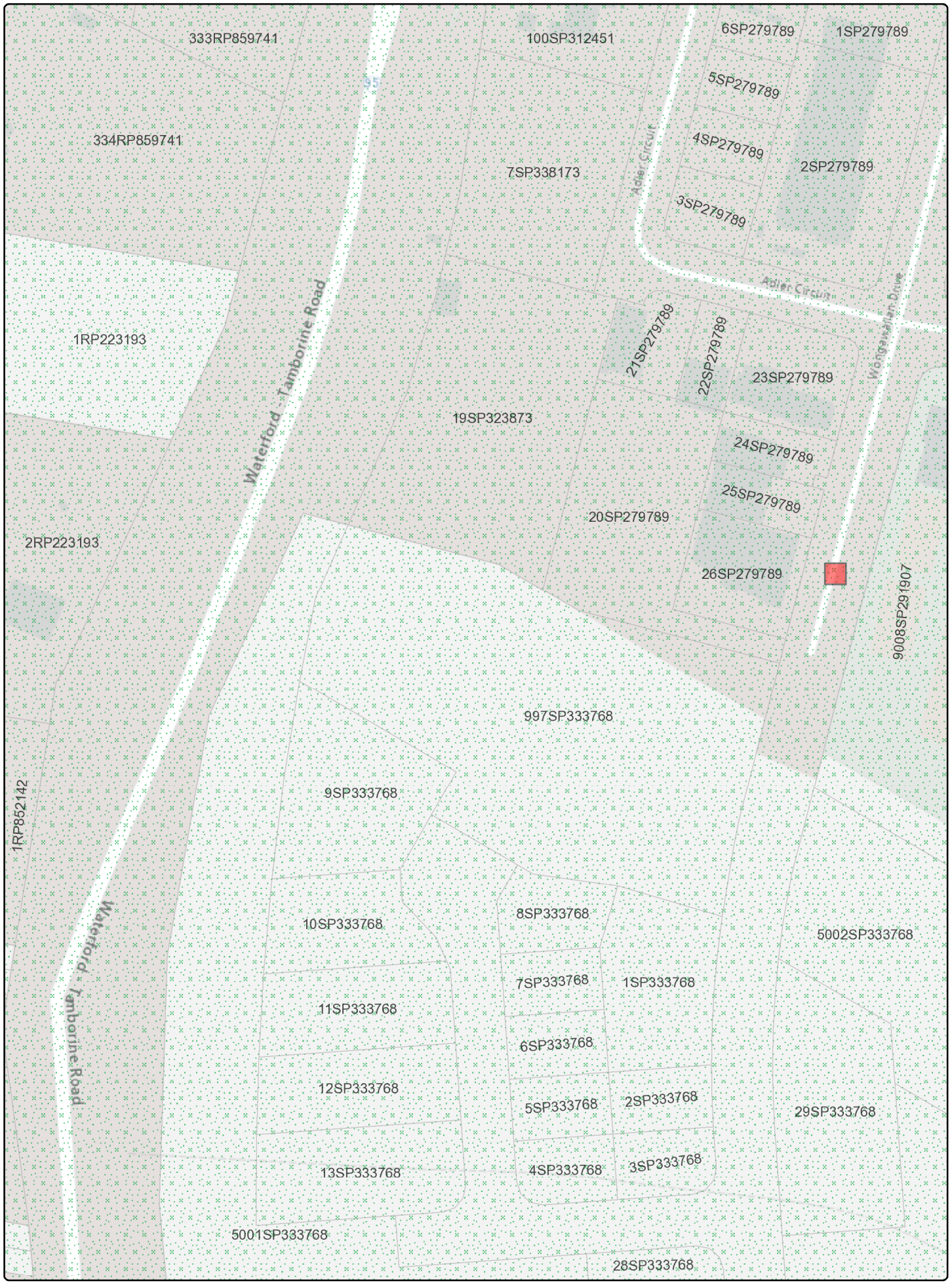


Map Sources: Esri, Garmin, HERE, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Scale 1: 6000	N	Enquiry Area / Map Key Area

APPENDIX E

ASS and Flood Maps (LOGAN CITY COUNCIL)



DA Mapping System – Print Screen

Date: 02/08/2024

0 30 60 90 120

Metres

Queensland Government

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N

Disclaimer:
This map has been generated from the information supplied to the Queensland Government for the purposes of the Development Assessment Mapping System. Note that this is a print screen only. The map generated has been prepared with due care based on the best available information at the time of publication. The State of Queensland holds no responsibility for any errors, inconsistencies or omissions within this document. Any decisions made by other parties based on this document are solely the responsibility of those parties. This information is supplied subject to the full terms and conditions available on the department's website.

Queensland Government

Legend

Cadastre

Cadastre

Flood hazard area - local Government flood mapping area

Flood hazard area - local Government flood mapping area

Flood hazard area - Level 1 - Queensland floodplain assessment overlay

Flood hazard area - Level 1 - Queensland floodplain assessment overlay

DA Mapping System – Print Screen

Queensland Government

© The State of Queensland 2024.

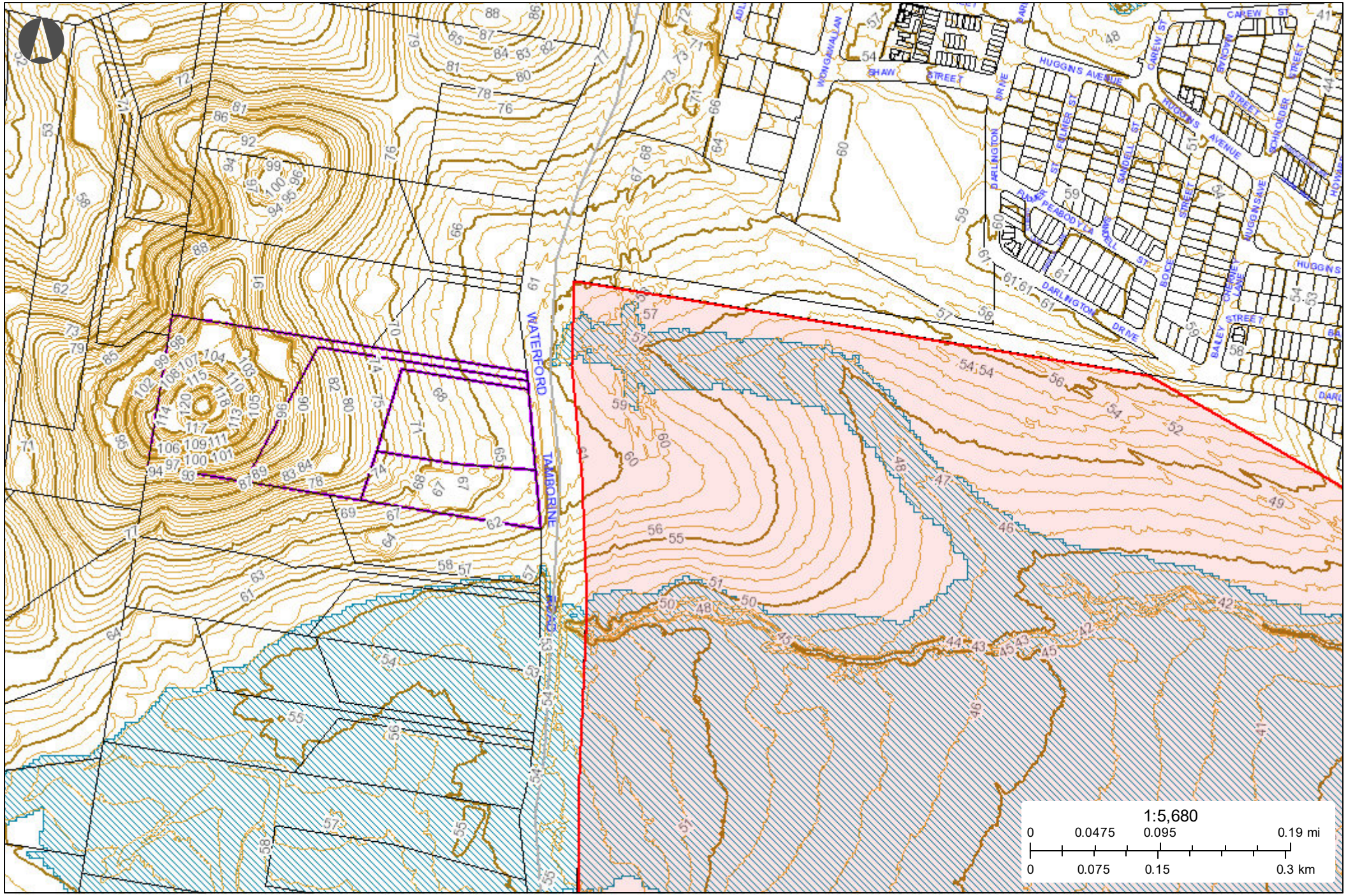
Date: 02/08/2024

Disclaimer:
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Queensland Government

Logan City Council - Logan Planning Scheme 2015

My Print

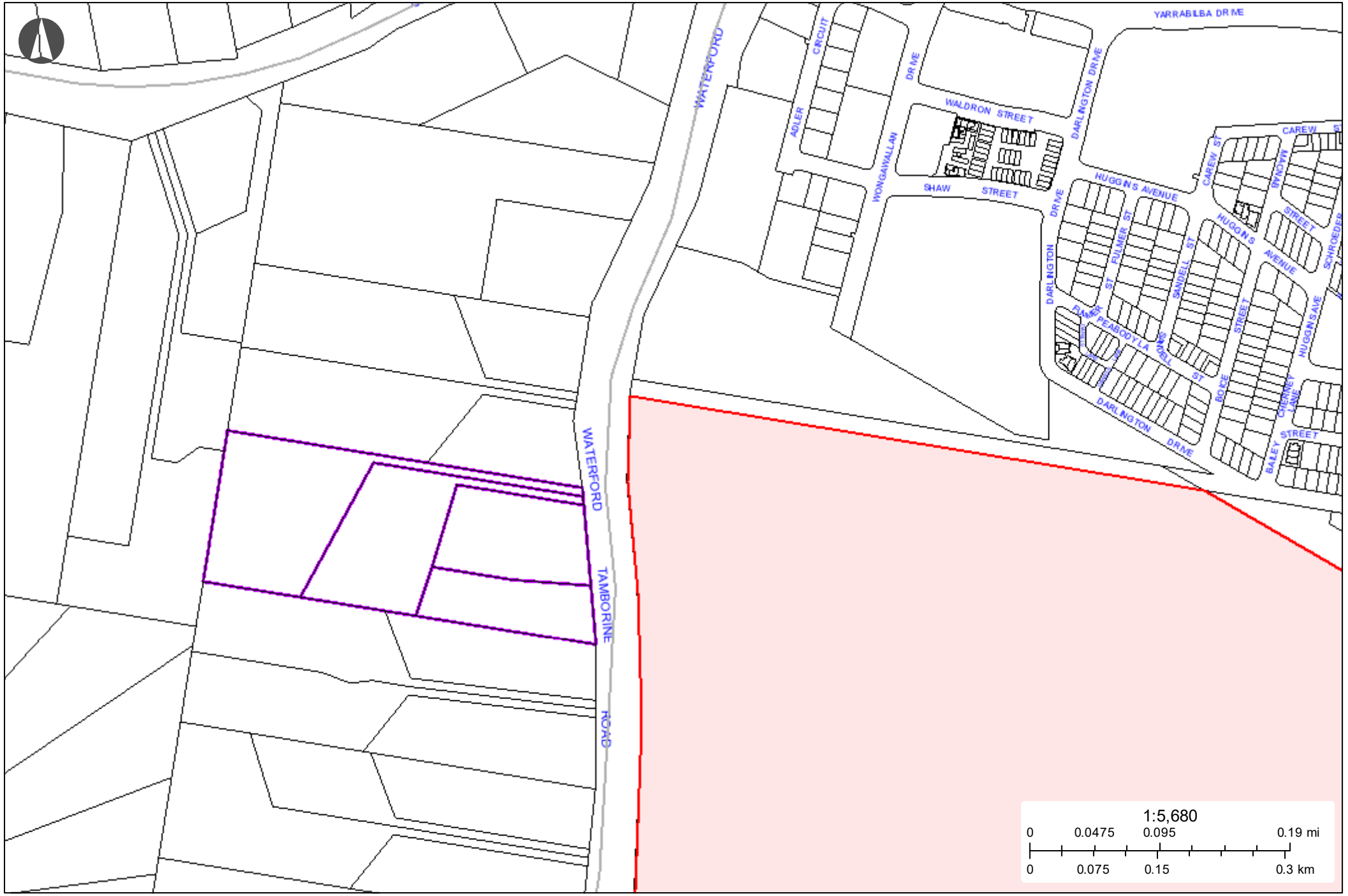


.Printed: June 23, 2024

Logan City Council © The State of Queensland, 2017. Includes material © Planet Labs

Logan City Council - Logan Planning Scheme 2015

My Print



.Printed: June 23, 2024

Logan City Council © The State of Queensland, 2017. Includes material © Planet Labs

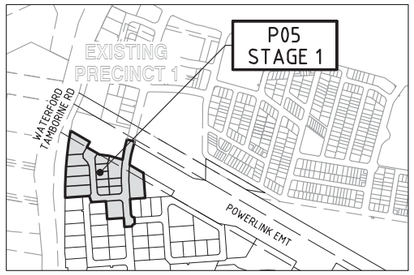
APPENDIX G

Yarrabilba Precinct 5 MIBA Stage 1 Subdivision Plans

APPLICATION No.
DEV 2022/1306

YARRABILBA

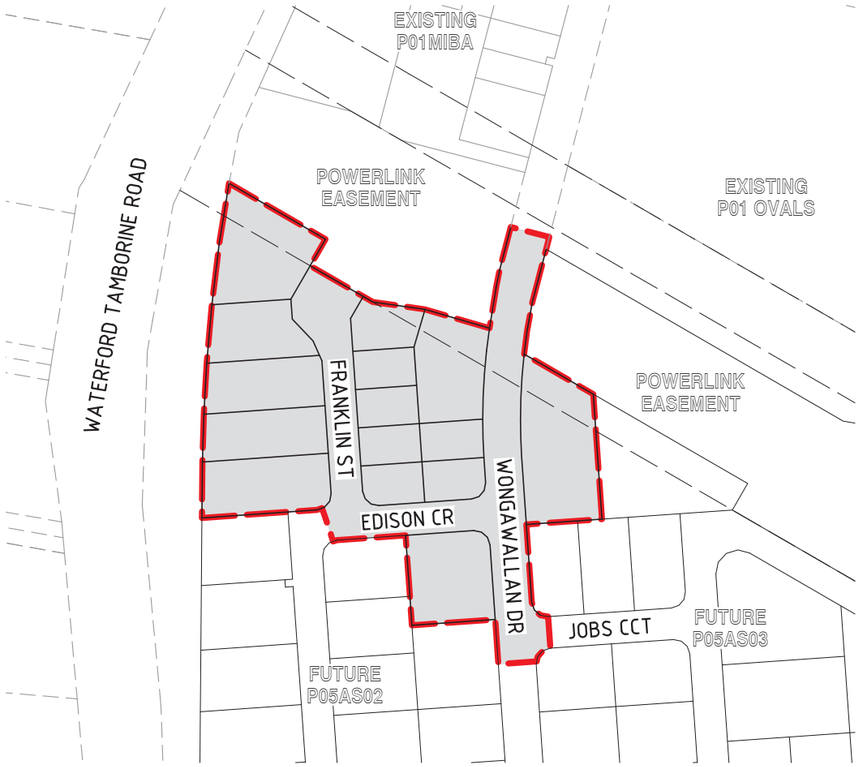
PRECINCT 5
MIBA STAGE 1



LOCALITY PLAN
SCALE 1:10000

DRAWING INDEX

DRAWING NO.	DRAWING TITLE
23-101-01	GENERAL - LOCALITY PLAN, DRAWING INDEX AND NOTES
23-101-02	GENERAL - SETOUT PLAN - SHEET 1
23-101-03	GENERAL - SETOUT PLAN - SHEET 2
23-101-04	GENERAL - LAYOUT PLAN - SHEET 1
23-101-05	GENERAL - LAYOUT PLAN - SHEET 2
23-101-06	GENERAL - LAYOUT PLAN - SHEET 3
23-101-07	EARTHWORKS - CONTOUR PLAN - SHEET 1
23-101-08	EARTHWORKS - CONTOUR PLAN - SHEET 2
23-101-09	EARTHWORKS - SPOT LEVELS PLAN - SHEET 1
23-101-10	EARTHWORKS - SPOT LEVELS PLAN - SHEET 2
23-101-11	EARTHWORKS - SPOT LEVELS PLAN - SHEET 3
23-101-12	EARTHWORKS - SPOT LEVELS PLAN - SHEET 4
23-101-13	EARTHWORKS - DETAILS
23-101-14	ROADWORKS - LONGITUDINAL SECTION - WONGAWALLAN DR
23-101-15	ROADWORKS - CROSS SECTIONS - WONGAWALLAN DR
23-101-16	ROADWORKS - LONGITUDINAL SECTION - EDISON CR
23-101-17	ROADWORKS - CROSS SECTIONS - EDISON CR
23-101-18	ROADWORKS - LONG & CROSS SECTION - FRANKLIN ST
23-101-19	ROADWORKS - LONG & CROSS SECTION - JOBS CCT
23-101-20	ROADWORKS - INTERSECTION DETAILS - SHEET 1
23-101-21	ROADWORKS - INTERSECTION DETAILS - SHEET 2
23-101-22	ROADWORKS - SIGNS AND LINEMARKING PLAN
23-101-23	STORMWATER - CATCHMENT PLAN
23-101-24	STORMWATER - CALCULATION TABLE - SHEET 1
23-101-25	STORMWATER - CALCULATION TABLE - SHEET 2
23-101-26	STORMWATER - CALCULATION TABLE - SHEET 3
23-101-27	STORMWATER - CALCULATION TABLE - SHEET 4
23-101-28	STORMWATER - CALCULATION TABLE - SHEET 5
23-101-29	STORMWATER - CALCULATION TABLE - SHEET 6
23-101-30	STORMWATER - CALCULATION TABLE - SHEET 7
23-101-31	STORMWATER - CALCULATION TABLE - SHEET 8
23-101-32	STORMWATER - LONGITUDINAL SECTIONS - SHEET 1
23-101-33	STORMWATER - LONGITUDINAL SECTIONS - SHEET 2
23-101-34	STORMWATER - LONGITUDINAL SECTIONS - SHEET 3
23-101-35	STORMWATER - LONGITUDINAL SECTIONS - SHEET 4
23-101-36	STORMWATER - LONGITUDINAL SECTIONS - SHEET 5
23-101-37	STORMWATER - LONGITUDINAL SECTIONS - SHEET 6
23-101-38	STORMWATER - LONGITUDINAL SECTIONS - SHEET 7
23-101-39	STORMWATER - LONGITUDINAL SECTIONS - SHEET 8
23-101-40	STORMWATER - MANHOLE DETAILS - SHEET 1
23-101-41	STORMWATER - MANHOLE DETAILS - SHEET 2
23-101-42	STORMWATER - MANHOLE DETAILS - SHEET 3
23-101-43	STORMWATER - MANHOLE DETAILS - SHEET 4
23-101-44	STORMWATER - MANHOLE DETAILS - SHEET 5
23-101-45	STORMWATER - MANHOLE DETAILS - SHEET 6
23-101-46	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 1
23-101-47	EROSION AND SEDIMENT CONTROL - LAYOUT PLAN - POST CONSTRUCTION PHASE - SHEET 2
23-101-48	EROSION AND SEDIMENT CONTROL - NOTES
23-101-49	EROSION AND SEDIMENT CONTROL - DETAILS
23-101-50	SEWERAGE RETICULATION - LAYOUT PLAN - SHEET 1
23-101-51	SEWERAGE RETICULATION - LAYOUT PLAN - SHEET 2
23-101-52	SEWERAGE RETICULATION - LAYOUT PLAN - SHEET 3
23-101-53	SEWERAGE RETICULATION - LIVE CONNECTIONS AND NOTES
23-101-54	SEWERAGE RETICULATION - LONGITUDINAL SECTION - SHEET 1
23-101-55	SEWERAGE RETICULATION - LONGITUDINAL SECTION - SHEET 2
23-101-56	SEWERAGE RETICULATION - LONGITUDINAL SECTION - SHEET 3
23-101-57	SEWERAGE RETICULATION - LONGITUDINAL SECTION - SHEET 4
23-101-58	SEWERAGE RETICULATION - LONGITUDINAL SECTION - SHEET 5
23-101-59	WATER RETICULATION - LAYOUT PLAN - SHEET 1
23-101-60	WATER RETICULATION - LAYOUT PLAN - SHEET 2
23-101-61	WATER RETICULATION - LIVE CONNECTIONS AND NOTES
23-101-62	TRUNK WATER RETICULATION - LAYOUT PLAN - SHEET 1
23-101-63	TRUNK WATER RETICULATION - LAYOUT PLAN - SHEET 2
23-101-64	TRUNK WATER RETICULATION - LIVE CONNECTIONS AND NOTES
23-101-65	SAFETY IN DESIGN



PLAN
SCALE 1:2000

DATUM A.H.D.
P.S.M. No 59068
E 2125.967
N 26685.151
RL 46.040

GENERAL NOTES

1. ALL WORK SHALL BE JOINED NEATLY TO EXISTING CONSTRUCTION.
2. WHERE REFERENCE IS MADE ON THESE DRAWINGS TO A KERB LINE, IT SHALL BE TAKEN TO MEAN THE KERB INVERT LINE.
3. LEVELS FOR KERB AND CHANNEL CONSTRUCTION ARE SHOWN AT LIP OF CHANNEL UNLESS SHOWN OTHERWISE.
4. KERB AND CHANNEL AND SPOON DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA STANDARD DWG NO SEQ RS-80. SPOON DRAINS ACROSS ROAD INTERSECTIONS SHALL BE IN ACCORDANCE WITH INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA STD DWG NO SEQ RS-80. THE CONCRETE SHALL BE CLASS N32 AND THE DEPTH INCREASED BY 50mm TO 175mm AT INVERT. FLUSH KERB TO BE INCREASED IN DEPTH BY 50mm TO 280mm.
5. IF MACHINE MADE KERB AND CHANNEL IS USED, EXTRA FINES AND 20mm SLUMP IS REQUIRED.
6. ALL DRAINAGE CENTRE LINES ARE 2m FROM INVERT OF KERB UNLESS OTHERWISE SHOWN.
7. GULLY CONNECTIONS AND STORM WATER PIPES SHALL BE 375mm DIAMETER CLASS '2' R.C. PIPES UNLESS SHOWN OTHERWISE.
8. THE CONTRACTOR SHALL INITIALLY EXCAVATE THE PAVEMENT BOX TO 445mm BELOW THE FINISHED PAVEMENT LEVEL SHOWN ON THE DRAWINGS. HE SHALL THEN NOTIFY THE ENGINEER WHO WILL FIX THE PAVEMENT THICKNESS TO BE CONSTRUCTED FOLLOWING THE RESULTS OF SUB-GRADE TESTING.
9. NOTWITHSTANDING THE LIMITS OF CUTTING AND FILLING SHOWN ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE DETERMINED ON SITE BY THE ENGINEER AND SIMILARLY THE FINISHED SURFACE CONTOURS MAY BE ADJUSTED BY WRITTEN DIRECTION OF THE ENGINEER DURING CONSTRUCTION.
10. THE MINIMUM CLEARANCE BETWEEN OUTER WALLS OF PIPES IN MANHOLES SHALL BE 150mm.
11. SUBSURFACE DRAIN CLEANING POINTS SHALL BE INSTALLED IN ACCORDANCE WITH IPWEAQ STD DWG NO SEQ RS-142.
12. CONSTRUCTION LOAD CONTROL ON THE INSTALLATION OF REINFORCED CONCRETE STORMWATER PIPE WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE RECOMMENDATIONS DEFINED IN THE CONCRETE PIPE ASSOCIATIONS OF AUSTRALASIA'S "THE INSTALLATIONS OF STEEL REINFORCED CONCRETE PIPES - MINIMUM PIPE COVER REQUIRED FOR VARIOUS COMPACTORS".
13. PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL ERECT A 2 STRAND WIRE FENCE INCLUDING SAFETY BARRIER MESH TO THE PERIMETER OF VEGETATION TO BE RETAINED AND/OR EXCLUSION ZONES.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF EXISTING SERVICES WITH RELEVANT AUTHORITIES/DIAL BEFORE YOU DIG PRIOR TO COMMENCING WORKS.
15. THE CONTRACTOR SHALL NOTE THE PRESENCE OF EXISTING SERVICES ASSOCIATED WITH THE WORKS. SPECIAL CARE MUST BE TAKEN BY THE CONTRACTOR IN THE VICINITY OF ALL SERVICES.

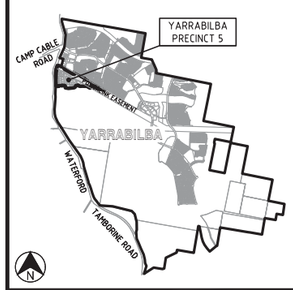
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1 : 2000 (A1 UNREDUCED)

SCALE
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1 : 10000 (A1 UNREDUCED)

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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants
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lendlease

Project
YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved
Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:43+10'00'

Drawing Title
GENERAL
LOCALITY PLAN,
DRAWING INDEX AND NOTES

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	01 of 65

	Drawing No	Revision
A1	23-101-01	A

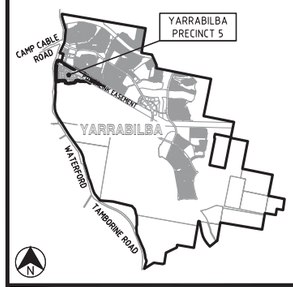
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LOCALITY PLAN



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Project

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PRECINCT 5
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Date: 2023.07.27 12:58:44+10'00'

Drawing Title

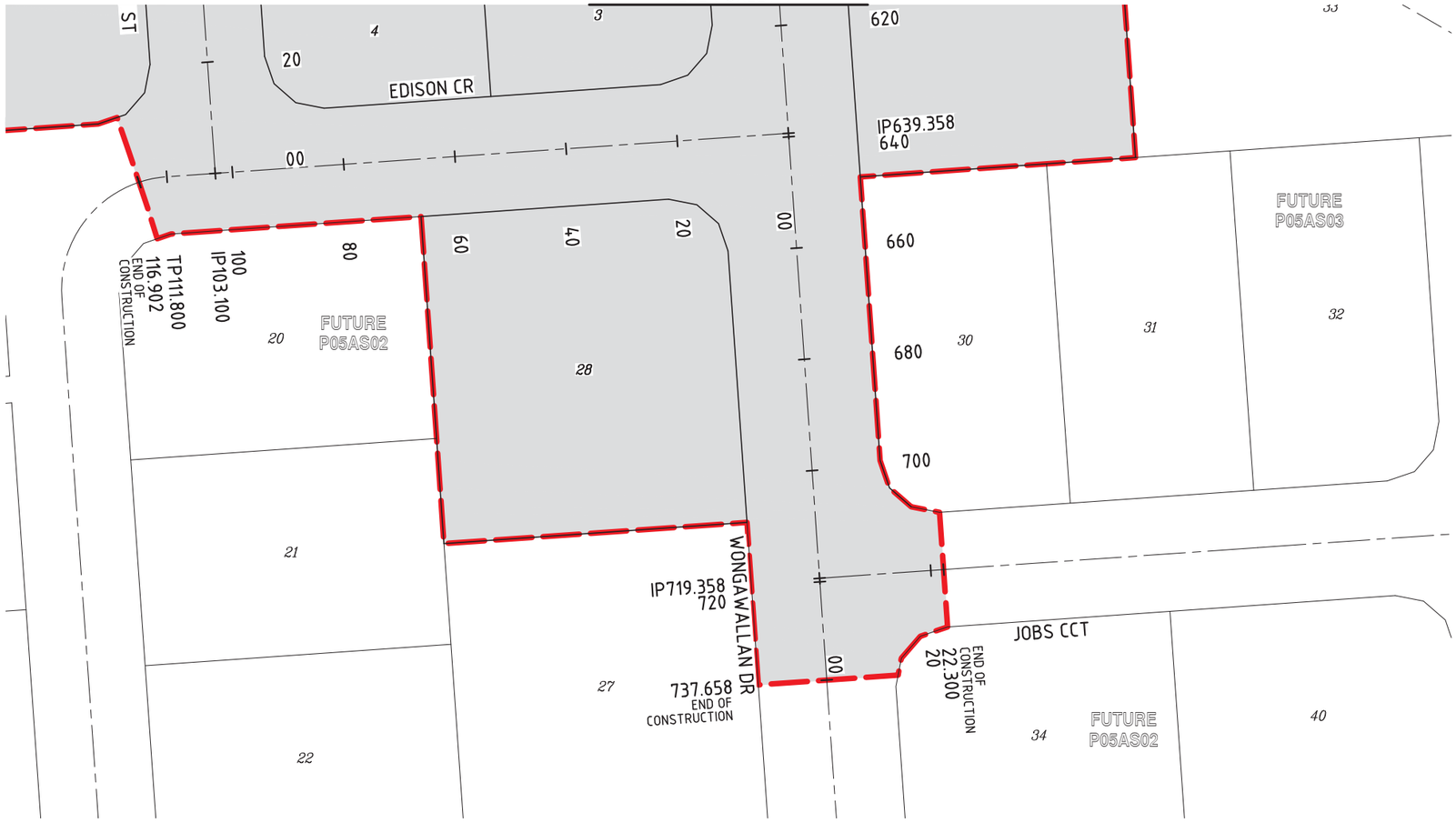
GENERAL
SETOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	02 of 65

	Drawing No	Revision
A1	23-101-02	A

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LEGEND

STAGE BOUNDARY

ROAD CENTRELINE

SETOUT PLAN

SCALE 1:500

CONTROL LINE DETAILS - WONGAWALLAN DR

PT	CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	1622.253	27513.220	207°56'21.23"			
TC	2.166	1621.238	27511.306	207°56'21.23"			
IP 2	72.027	1588.357	27449.308		R = -600.000	139.721	13°20'32.40"
CT	141.887	1570.671	27381.396	194°35'48.83"			
TC	476.862	1486.252	27057.233	194°35'48.83"			
IP 3	541.777	1469.747	26993.856		R = -400.000	129.831	18°35'48.83"
CT	606.692	1474.316	26928.524	176°00'00.00"			
TC	976.036	1500.080	26560.079	176°00'00.00"			
IP 4	1110.051	1509.794	26421.154		R = -400.000	268.029	38°23'32.47"
CT	1244.066	1603.687	26318.301	137°36'27.53"			
TC	1427.252	1727.192	26183.009	137°36'27.53"			
IP 5	1564.521	1823.552	26077.453		R = 400.000	274.539	39°19'29.43"
CT	1701.791	1831.201	25934.733	176°55'56.96"			
IP 6	1938.465	1843.866	25698.398	176°55'56.96"			

CONTROL LINE DETAILS - JOBS CCT

PT	CHAINAGE	EASTING	NORTHING	BEARING
IP 1	0.000	1482.175	26816.133	86°00'00.00"
IP 2	123.100	1604.975	26824.720	86°00'00.00"

CONTROL LINE DETAILS - EDISON CR

PT	CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	1476.594	26895.938	266°00'00.00"			
TC	111.800	1365.067	26888.139	266°00'00.00"			
IP 2	127.744	1344.816	26886.723		R = -20.300	31.887	90°00'00.00"
CT	143.687	1346.232	26866.473	176°00'00.00"			
TC	314.487	1358.146	26696.089	176°00'00.00"			
IP 3	330.431	1359.562	26675.838		R = -20.300	31.887	90°00'00.00"
CT	346.374	1379.813	26677.254	86°00'00.00"			
IP 4	458.174	1491.341	26685.053	86°00'00.00"			

CONTROL LINE DETAILS - FRANKLIN ST

PT	CHAINAGE	EASTING	NORTHING	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	1373.745	26888.746	356°00'00.00"			
TC	107.067	1366.277	26995.552	356°00'00.00"			
IP 2	125.445	1364.972	27014.204		R = -81.306	36.756	25°54'07.04"
CT	143.823	1355.651	27030.413	330°05'52.96"			
IP 3	158.823	1348.174	27043.416	330°05'52.96"			

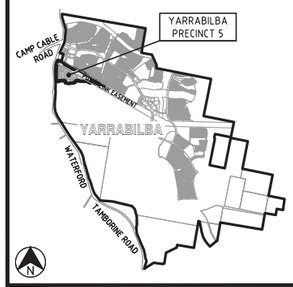
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1 : 500 (A1 UNREDUCED)

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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

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Client

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Project

YARRABILBA

PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:45+10'00'

Drawing Title

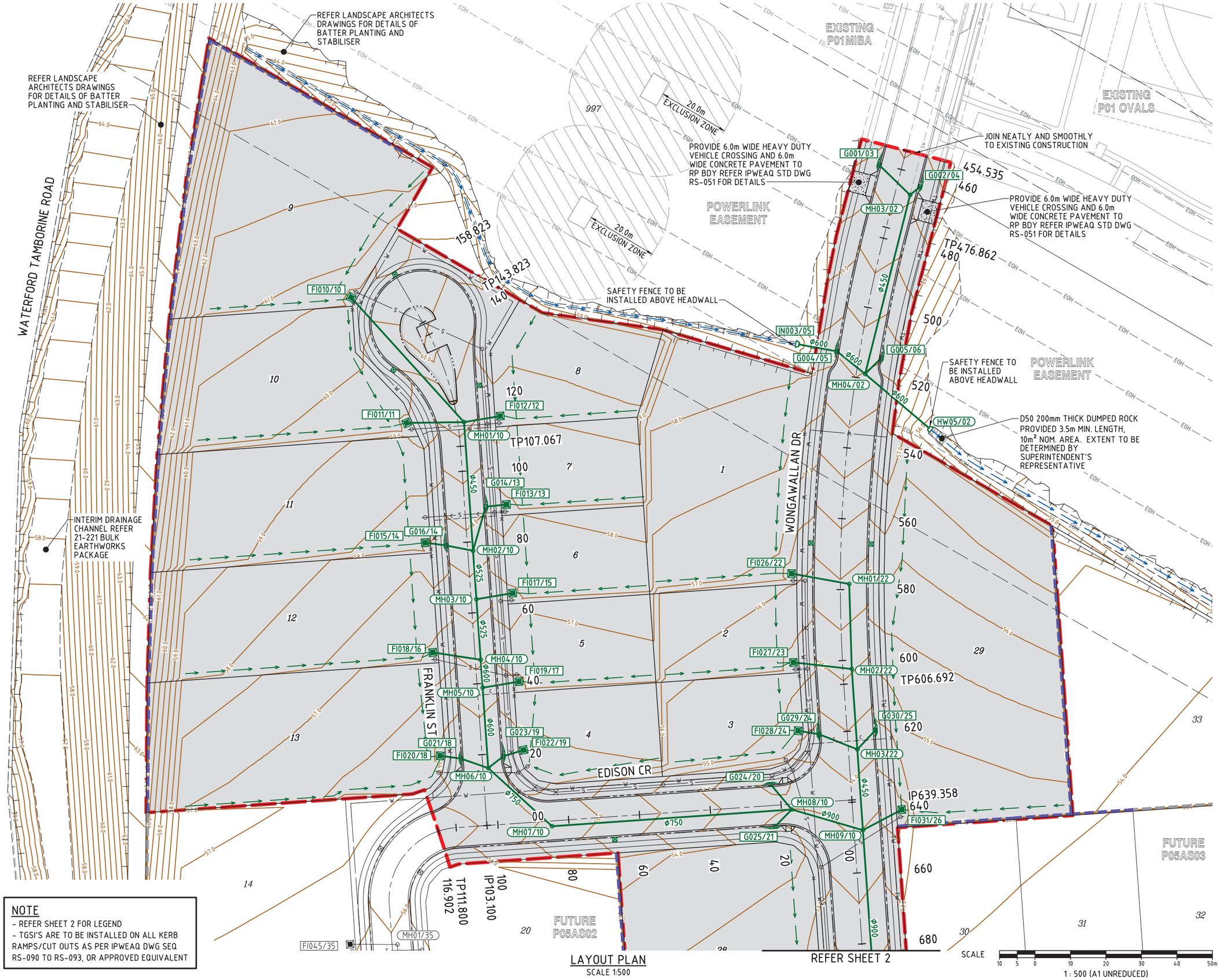
GENERAL
SETOUT PLAN
SHEET 2

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	03 of 65

	Drawing No	Revision
A1	23-101-03	A

M:\2023\23101 Yarrabilba Precinct 5 MIBA Stage 1\Engineering\Acad\23-101-02-03-GE-SETOUT.dwg Plotted by: JS on 27/07/2023 12:24:19 PM



NOTE
- REFER SHEET 2 FOR LEGEND
- TGSI'S ARE TO BE INSTALLED ON ALL KERB RAMPS/CUT OUTS AS PER IPWEAQ DWG SEQ RS-090 TO RS-093, OR APPROVED EQUIVALENT

LAYOUT PLAN
SCALE 1:500

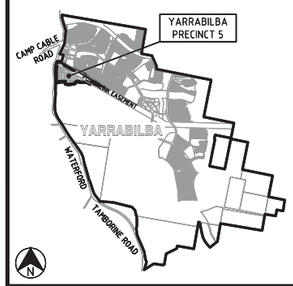
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LOCALITY PLAN



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YARRABILBA
PRECINCT 5
MIBA STAGE 1

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Drawing Title

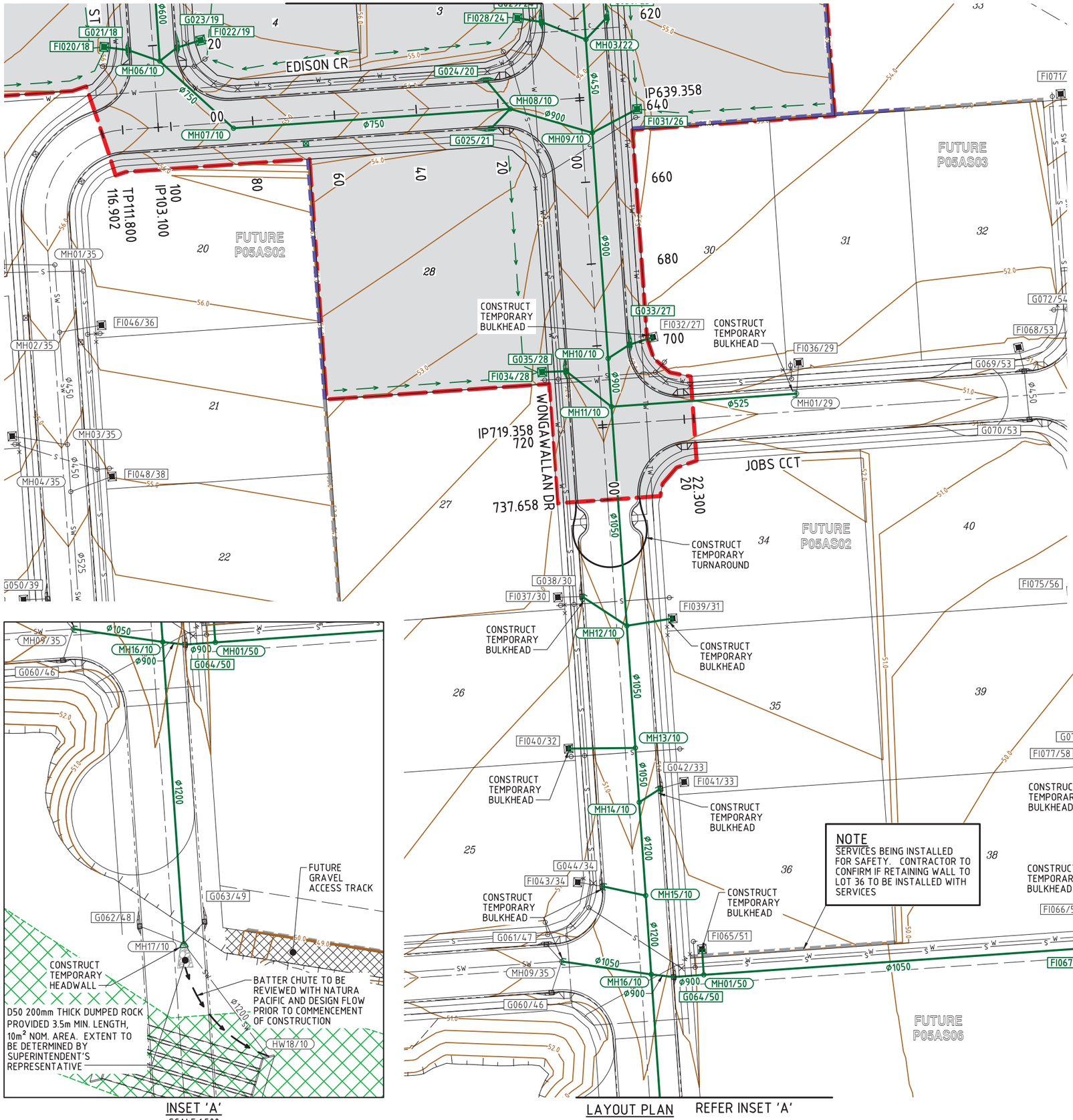
GENERAL
LAYOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	04 of 65

A1	Drawing No	Revision
	23-101-04	A

REFER SHEET 1


EDISON CR
WONGAWALLAN DR
JOBS CCT
FUTURE P05AS02
FUTURE P05AS03
FUTURE P05AS06
CONSTRUCT TEMPORARY BULKHEAD
CONSTRUCT TEMPORARY TURNAROUND
IP639.358
640
IP719.358
720
737.658
TP111.800
116.902
IP103.100
100
700
680
660
620
737.300
MH01/35
MH02/35
MH03/35
MH04/35
MH06/10
MH07/10
MH08/10
MH09/10
MH10/10
MH11/10
MH12/10
MH13/10
MH14/10
MH15/10
MH16/10
MH01/50
MH01/29
MH02/50
MH03/50
MH04/50
MH04/53
MH05/53
MH07/35
MH09/35
MH17/10
FI020/18
FI022/19
FI028/24
FI031/26
FI032/27
FI034/28
FI035/28
FI037/30
FI039/31
FI040/32
FI041/33
FI043/34
FI044/34
FI046/36
FI048/38
FI050/39
FI065/51
FI066/52
FI067/50
FI068/53
FI071/
FI075/56
FI076/57
FI077/58
FI080/60
FI082/61
FI1036/29
G021/18
G023/19
G024/20
G025/21
G033/27
G035/28
G038/30
G042/33
G044/34
G050/39
G060/46
G061/47
G062/48
G063/49
G064/50
G069/53
G070/53
G072/54
G078/58
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G081/60
G083/61
HW18/10
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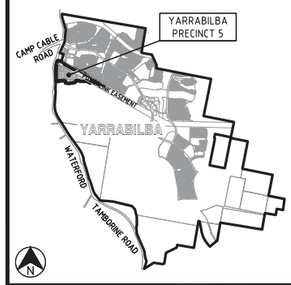


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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

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Client

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Project

YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:47+10'00'

Drawing Title

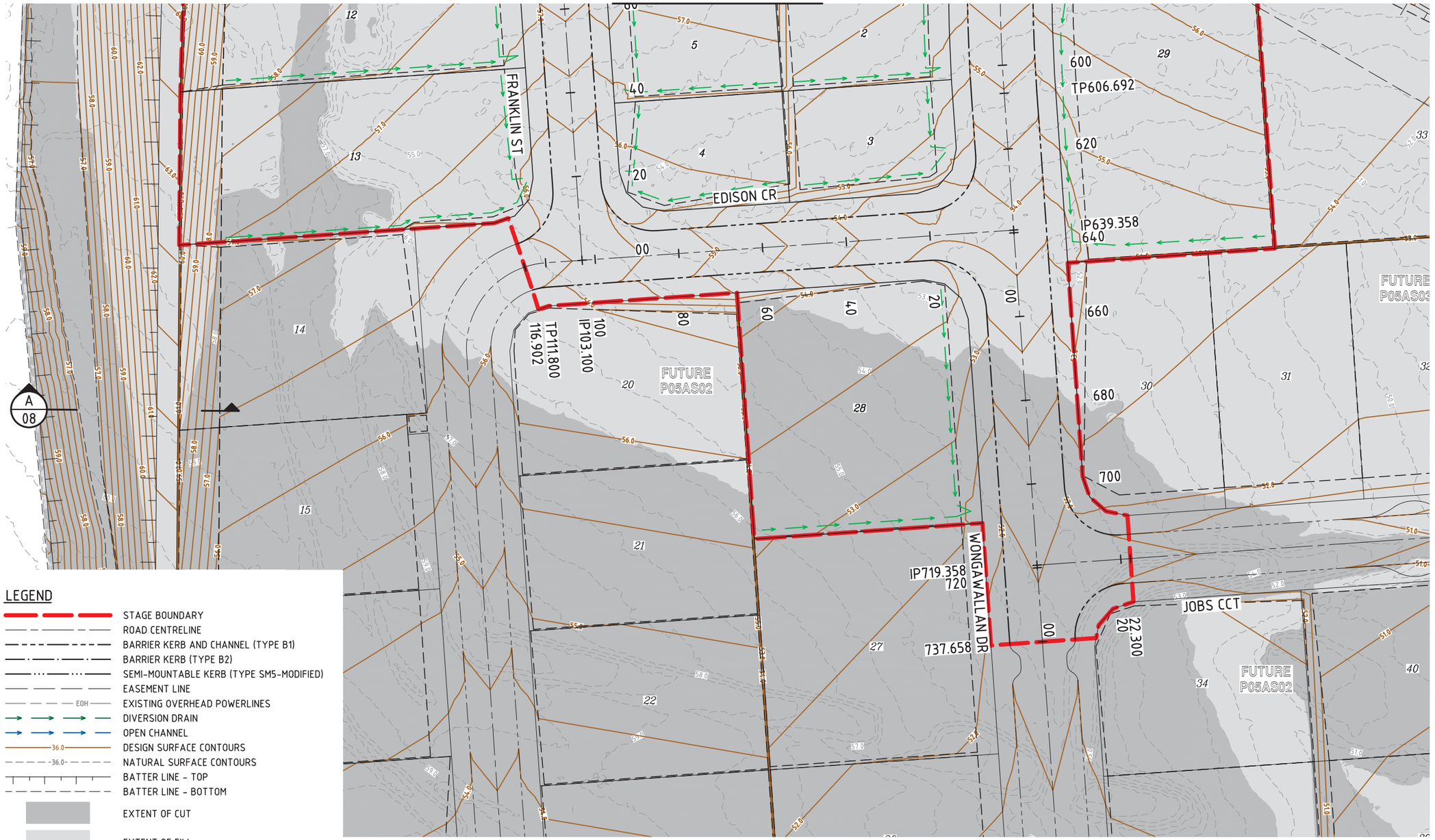
EARTHWORKS
CONTOUR PLAN
SHEET 1

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	07 of 65

A1	Drawing No	Revision
	23-101-07	A

REFER SHEET 1

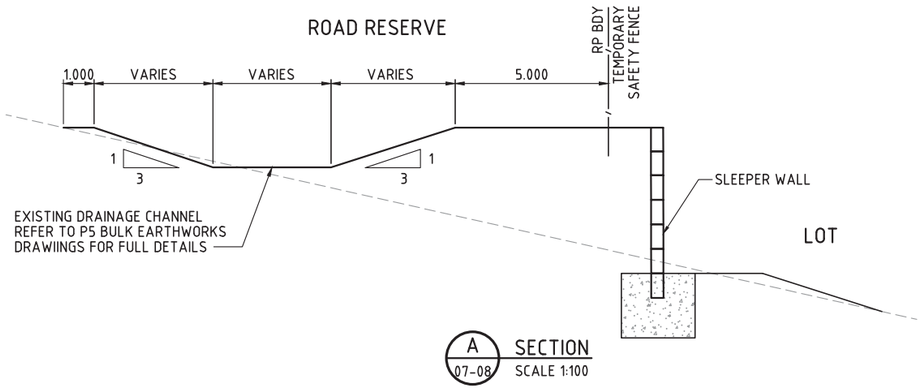


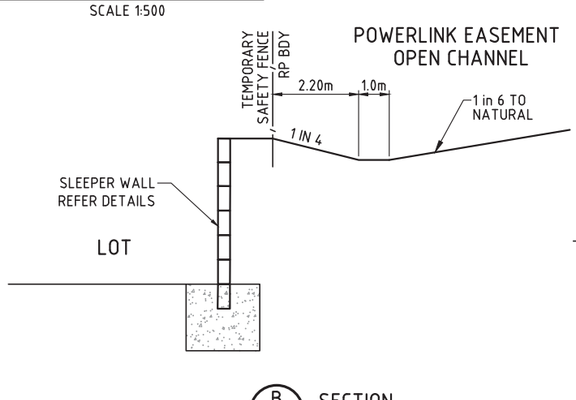
LEGEND

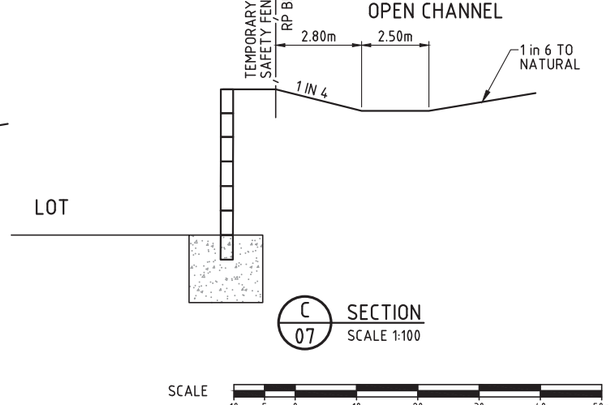
- STAGE BOUNDARY
- ROAD CENTRELINE
- BARRIER KERB AND CHANNEL (TYPE B1)
- BARRIER KERB (TYPE B2)
- SEMI-MOUNTABLE KERB (TYPE SM5-MODIFIED)
- EASEMENT LINE
- EOH — EXISTING OVERHEAD POWERLINES
- DIVERSION DRAIN
- OPEN CHANNEL
- 36.0 — DESIGN SURFACE CONTOURS
- 36.0 — NATURAL SURFACE CONTOURS
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- EXTENT OF CUT
- EXTENT OF FILL

EARTHWORKS CONTOUR PLAN

SCALE 1:500





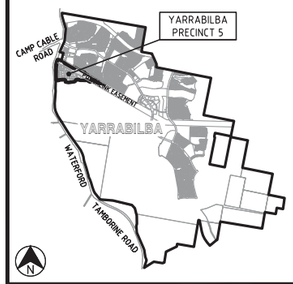


SCALE
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Drawing Title

EARTHWORKS
CONTOUR PLAN
SHEET 2

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	08 of 65

Drawing No	Revision
23-101-08	A

A1

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REFER SHEET 3

REFER SHEET 2

EDISON CR

WONGAWALLAN DR

JOBS CCT

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IP719.358

737.658

22.300

NOTE
FOR LEGEND
REFER TO SHEET 1

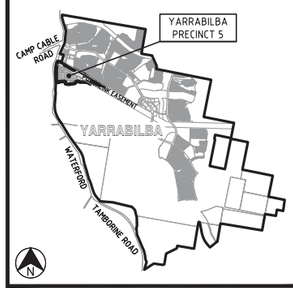
EARTHWORKS SPOT LEVELS PLAN
SCALE 1:250

SCALE
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1 : 250 (A1 UNREDUCED)

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LOCALITY PLAN



REVISIONS

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Drawing Title

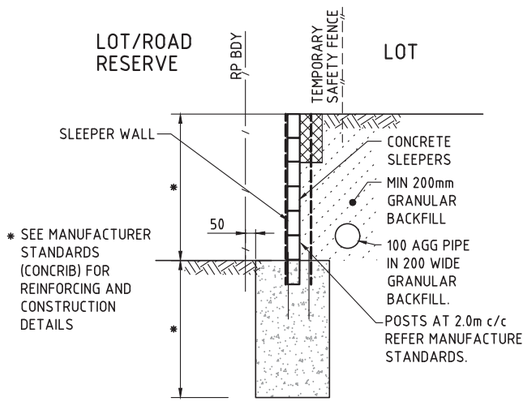
EARTHWORKS
SPOT LEVELS PLAN
SHEET 4

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	12 of 65

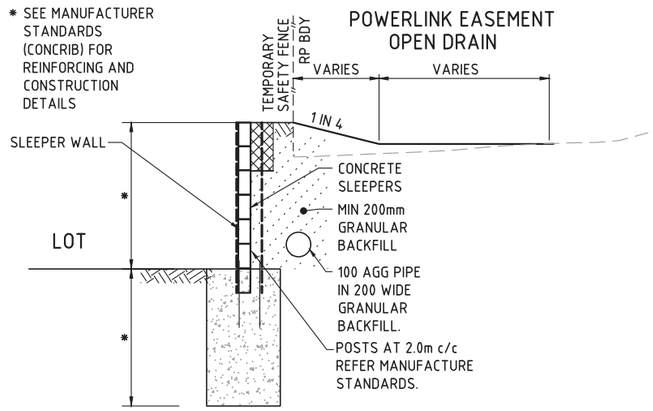
A1	Drawing No	Revision
	23-101-12	A

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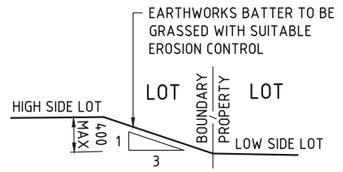
I-BEAM SLEEPER WALL DETAIL - BETWEEN LOTS AND ROAD RESERVE

F 09-12 SECTION
SCALE NTS

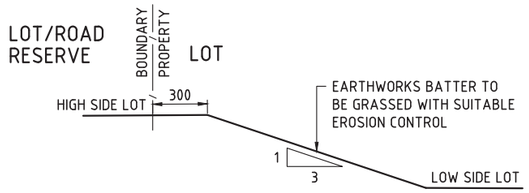


I-BEAM SLEEPER WALL DETAIL - BETWEEN LOTS AND POWERLINK EASEMENT

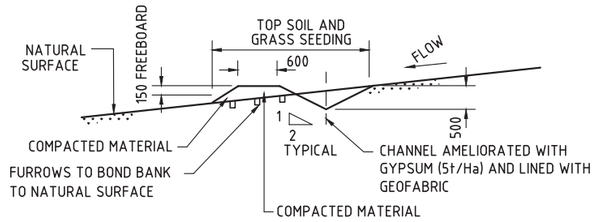
D 09 SECTION
SCALE NTS



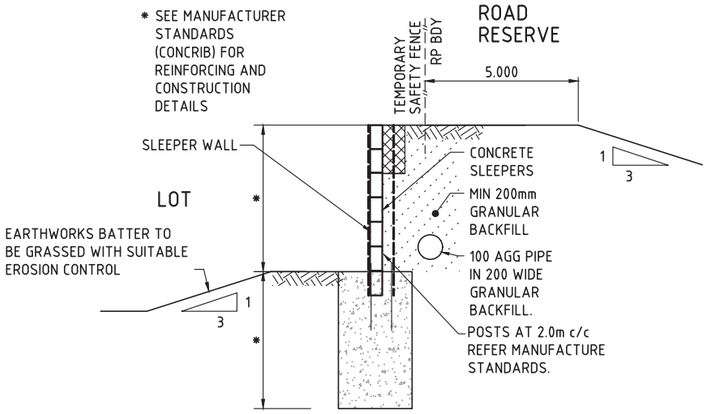
SIDE BOUNDARY BATTER
SCALE: NTS



REAR BOUNDARY BATTER
SCALE: NTS



TYPICAL SECTION - DIVERSION CHANNEL
N.T.S.



I-BEAM SLEEPER WALL DETAIL - BETWEEN LOTS AND ROAD RESERVE

E 09-10 SECTION
SCALE NTS

SUBSOIL DRAINS ARE TO BE CONNECTED TO KERB ADAPTERS WHERE POSSIBLE. AS-CONSTRUCTED DRAWING TO BE PROVIDED BY CONTRACTOR - PRIOR TO ACCEPTANCE OF WORKS BEING ON-MAINTENANCE.

PERFORMANCE REQUIREMENTS FOR RETAINING WALLS

THE CONTRACTOR IS TO PROVIDE CERTIFICATION FROM AN APPROVED STRUCTURAL/GEOTECHNICAL ENGINEER FOR THE DESIGN AND CONSTRUCTION OF THE RETAINING WALL. THE CERTIFICATION MUST STATE COMPLIANCE WITH AS4678 AND ALL RELEVANT AUTHORITY REQUIREMENTS AND ARE STRUCTURALLY ADEQUATE FOR ALL RELEVANT LOADING CONDITIONS.
GEOTECH TO PROVIDE CERTIFICATION ON STABILITY OF RETAINING WALLS.
STRUCTURAL DESIGN TO INCLUDE STATEMENT OF COMPLIANCE FOR DESIGN LIFE > 50 YEARS AS PER THE RELEVANT DEVELOPMENT CONDITION.
ALL WALLS TO BE DESIGNED FOR 10KPa SURCHARGE.

I-BEAM SLEEPER RETAINING WALLS STRUCTURAL REQUIREMENTS

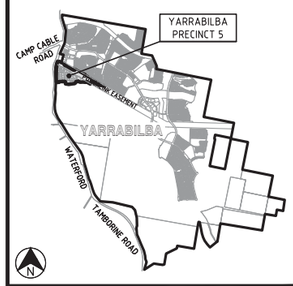
THE CONTRACTOR IS TO PROVIDE CERTIFICATION, FROM AN APPROVED STRUCTURAL/GEOTECHNICAL ENGINEER FOLLOWING COMPLETION OF THE I-BEAMCSLEEPER RETAINING WALL CONSTRUCTION, THAT THE WALLS ARE STRUCTURALLY ADEQUATE FOR ALL RELEVANT LOADING CONDITIONS (INCLUDING REQUIREMENTS).

AS A MINIMUM THE FOLLOWING CONSTRUCTION STANDARD IS REQUIRED:

- AS1726, AS4678 AND AS1170;
- 10kPa SURCHARGE LOADING;
- IMPERVIOUS BACKFILL TO WALL CONTAINED WITHIN EMBEDDMENT TRENCH;
- PROVIDE GEOFABRIC LAYER TO REAR OF BOULDERS AND FREE DRAINING BACKFILL BEHIND;
- A MINIMUM 100mm DIAMETER SLOTTED PVC DRAINAGE PIPE FULL LENGTH OF WALL, INSTALLED ABOVE IMPERVIOUS BACKFILL WITH CONNECTION TO DRAINAGE OUTLET.

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

rps

Client

lendlease

Project

YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:50+10'00'

Drawing Title

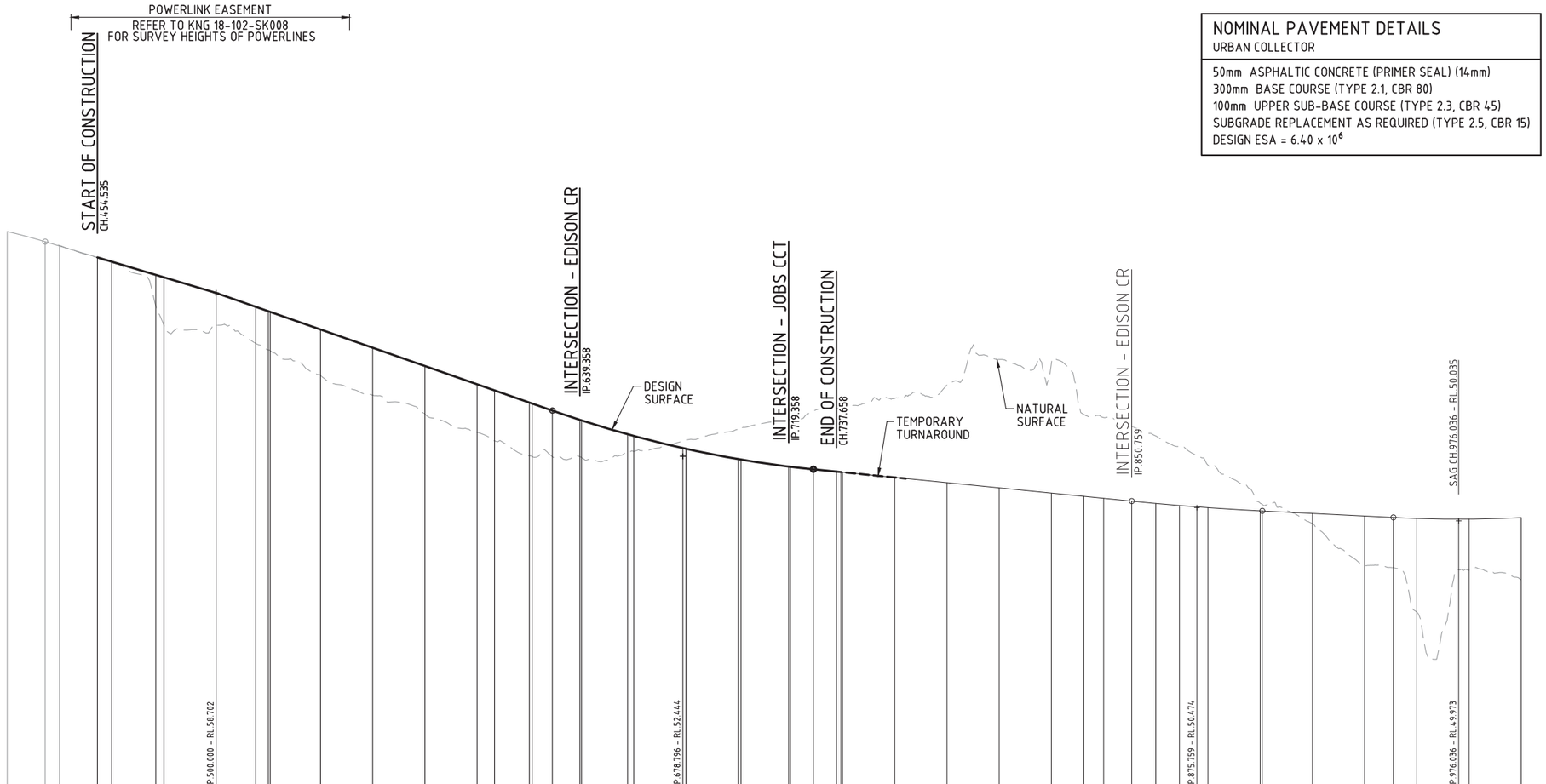
EARTHWORKS DETAILS

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	13 of 65

	Drawing No	Revision
A1	23-101-13	A

M:\2023\23101 Yarrabilba Precinct 5 MIBA Stage 1\Engineering\Acad\23-101-09-13-EW-SPOT-PLAN.dwg Plotted by: JS on 27/07/2023 12:24:52 PM

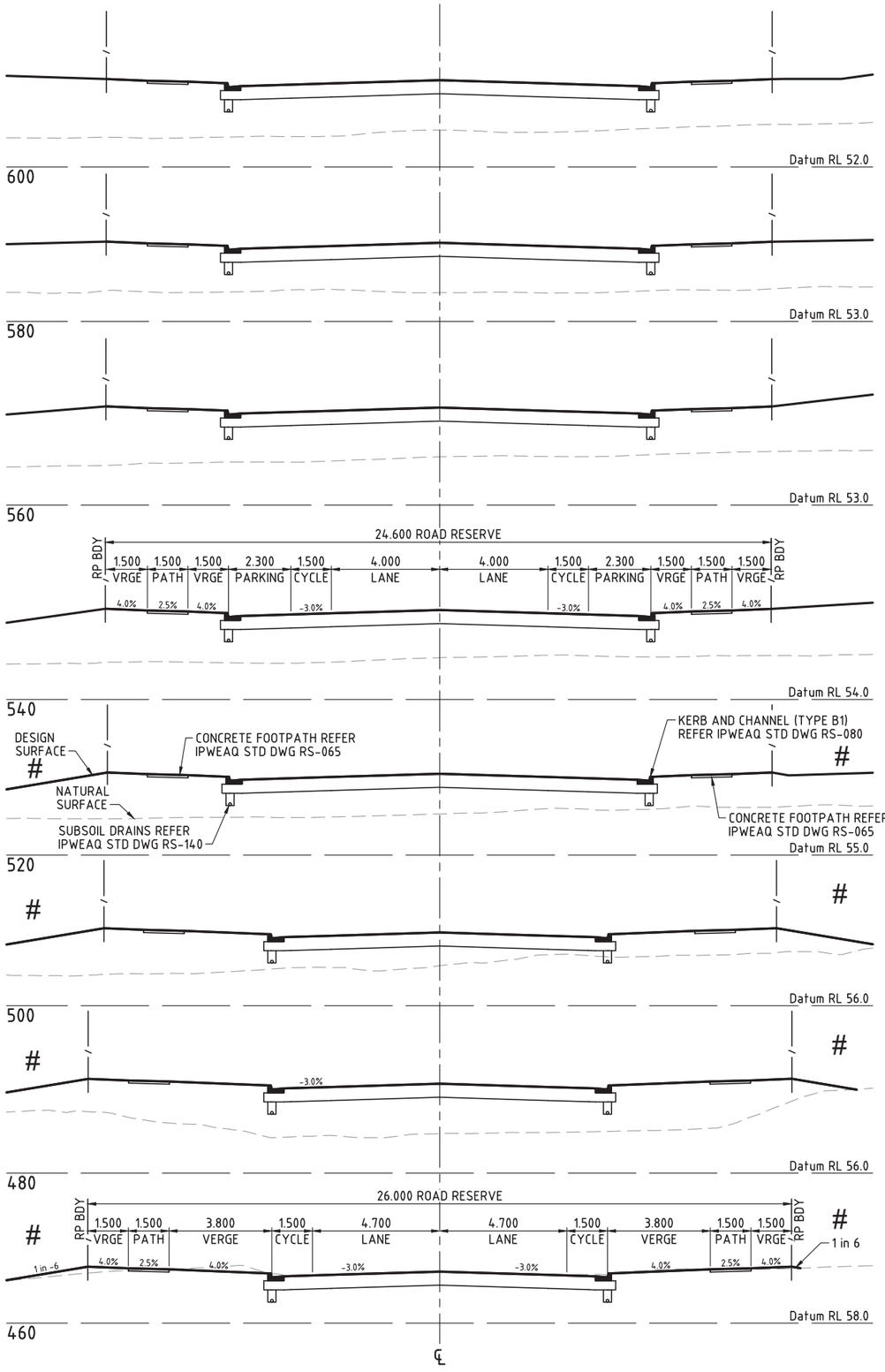


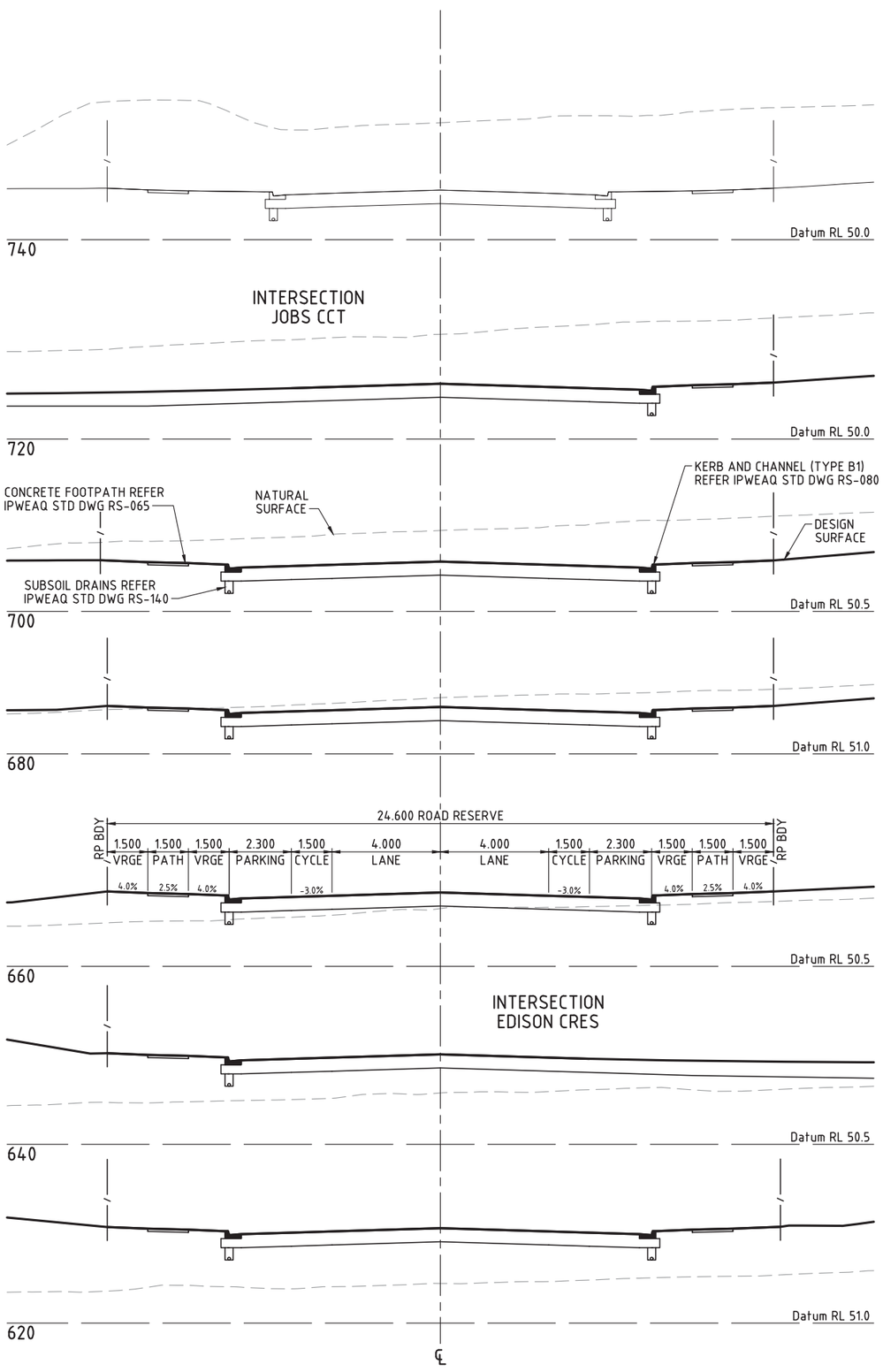
NOMINAL PAVEMENT DETAILS

URBAN COLLECTOR

50mm ASPHALTIC CONCRETE (PRIMER SEAL) (14mm)
300mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)
DESIGN ESA = 6.40 x 10^6

| | | |





CROSS SECTIONS - WONGAWALLAN DR

SCALE 1:100

REFER TO RPS LANDSCAPE DOCUMENTATION FOR BATTER TREATMENT IN POWERLINK EASEMENT

SCALE

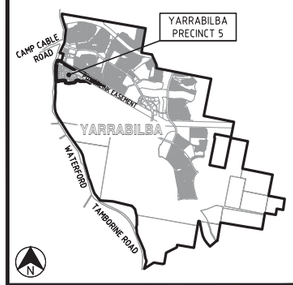
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DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

rps

Client

lendlease

Project

YARRABILBA

PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:51+10'00'

Drawing Title

ROADWORKS
CROSS SECTIONS
WONGAWALLAN DR

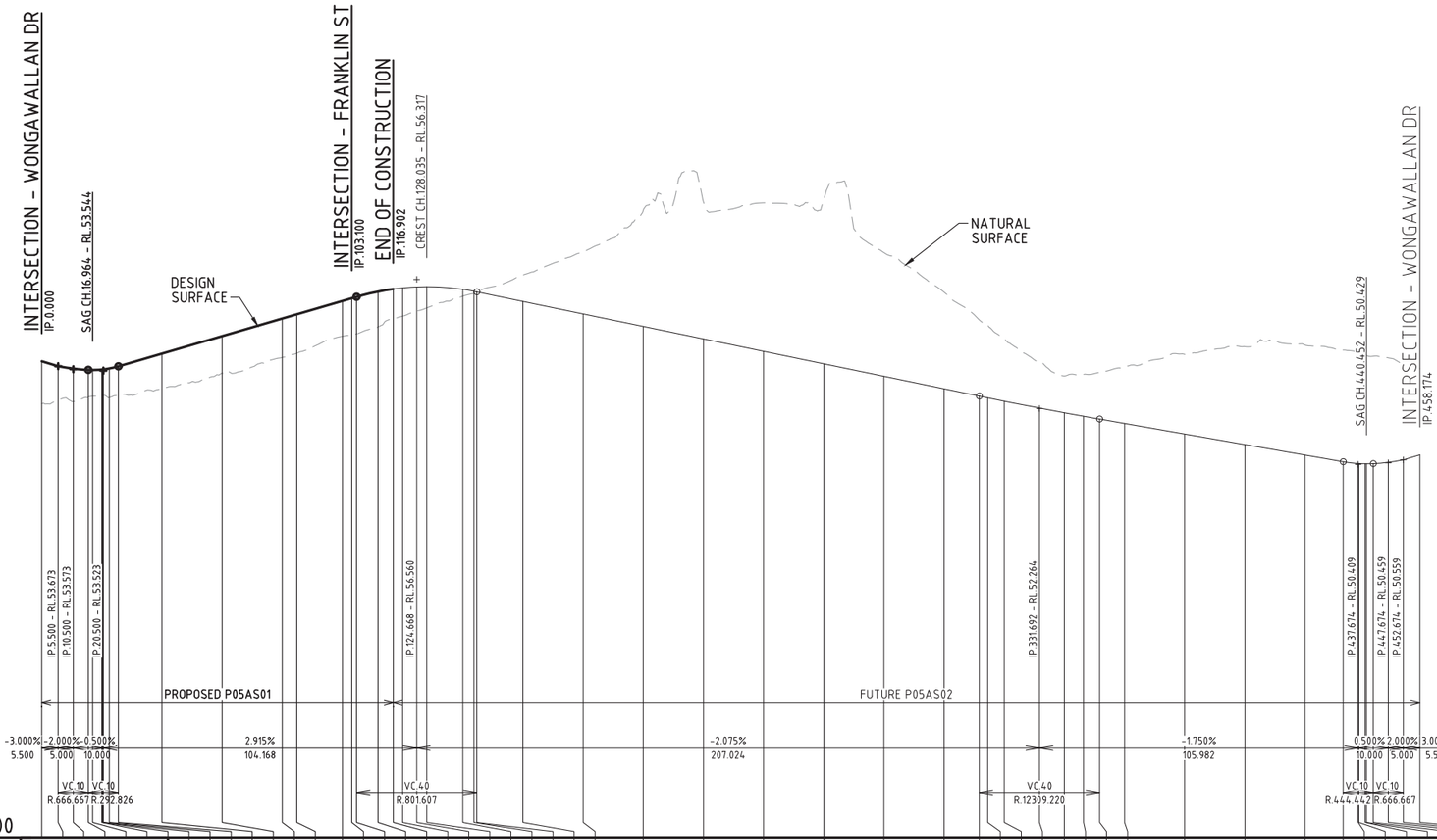
Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	15 of 65

A1	Drawing No	Revision
	23-101- 15	A

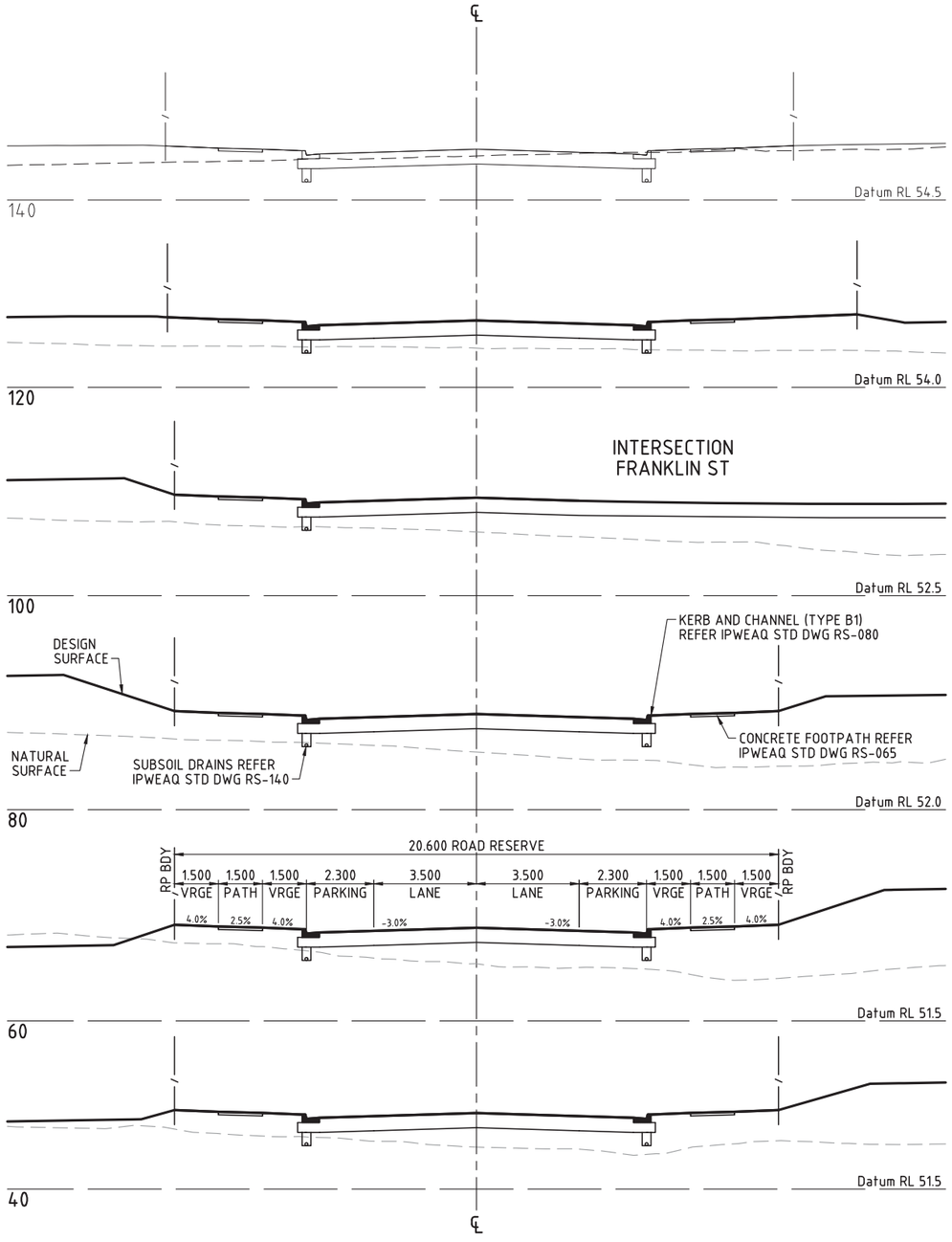
NOMINAL PAVEMENT DETAILS
INDUSTRIAL ACCESS ROAD

50mm ASPHALTIC CONCRETE (PRIME) 14mm MIX
300mm BASE COURSE (TYPE 2.1, CBR 80)
100mm UPPER SUB-BASE COURSE (TYPE 2.3, CBR 45)
SUBGRADE REPLACEMENT AS REQUIRED (TYPE 2.5, CBR 15)
DESIGN ESA = 5.40 x 10^6



DATUM R.L.38.000

| | | |



CROSS SECTIONS - EDISON CR

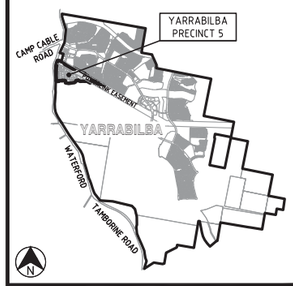
SCALE 1:100

SCALE 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

1 : 100 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

rps

Client

lendlease

Project

YARRABILBA

PRECINCT 5
MIBA STAGE 1

kn group

ABN 35 112 53 611
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Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:52+10'00'

Drawing Title

ROADWORKS
CROSS SECTIONS
EDISON CR

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	17 of 65

	Drawing No	Revision
A1	23-101- 17	A

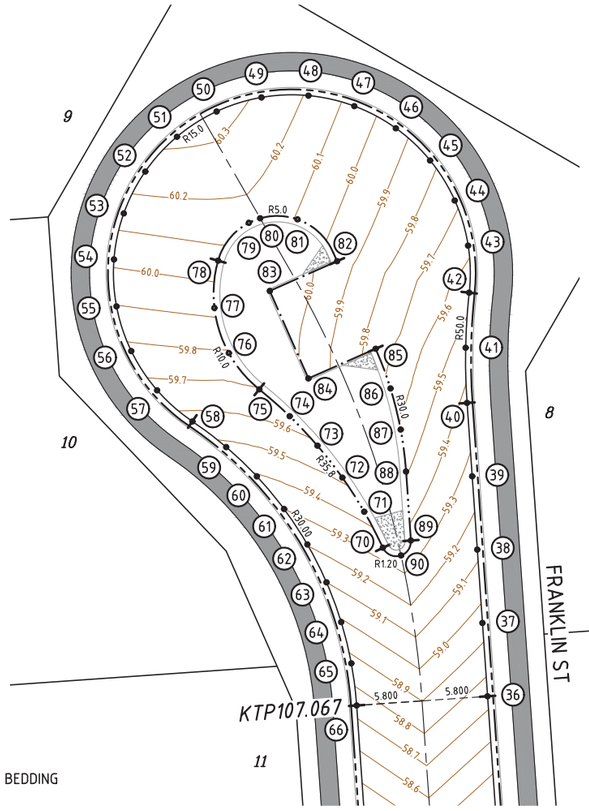
M:\2023\23101 Yarrabilba Precinct 5 MIBA Stage 1\Engineering\Acad\23-101-14-19-RD-LONG-CROSS.dwg Plotted by: JS on 27/07/2023 12:25:00 PM

SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
36	1371.614	26995.925	58.741
37	1371.195	27001.906	58.951
38	1370.777	27007.886	59.125
39	1370.359	27013.866	59.262
40	1369.941	27019.846	59.373
41	1369.828	27024.345	59.454
42	1370.116	27028.835	59.539
43	1370.025	27032.669	59.623
44	1368.936	27036.347	59.718
45	1366.924	27039.612	59.823
46	1364.129	27042.238	59.940
47	1360.745	27044.042	60.065
48	1357.007	27044.900	60.188
49	1353.175	27044.751	60.281
50	1349.515	27043.605	60.334
51	1346.281	27041.544	60.320
52	1343.698	27038.709	60.253
53	1341.946	27035.297	60.146
54	1341.146	27031.547	60.021
55	1341.353	27027.717	59.896
56	1342.554	27024.075	59.774
57	1344.665	27020.873	59.663
58	1347.540	27018.334	59.563
59	1350.298	27016.245	59.477
60	1352.802	27013.856	59.390
61	1355.018	27011.199	59.301
62	1356.919	27008.307	59.205
63	1358.479	27005.218	59.101
64	1359.679	27001.972	58.988
65	1360.503	26998.612	58.869
66	1360.940	26995.179	58.741

CONCRETE PAVEMENT WORKS

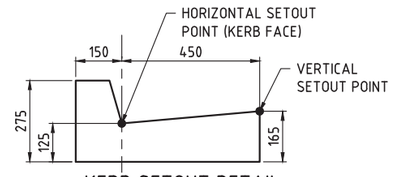
ISLANDS / MEDIANS
N32 CONCRETE
150mm THICK SL92 FABRIC
TOP COVER 40mm OVER 25mm SAND BEDDING
100mm CBR 45 SUBBASE.



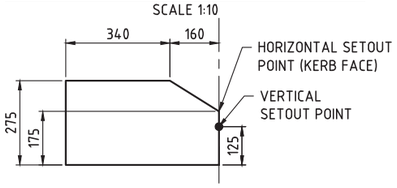
SETOUT DETAIL - FRANKLIN ST
SCALE 1:250

SETOUT TABLE

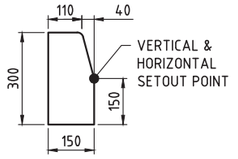
PT No.	EASTING	NORTHING	LEVEL
70	1363.075	27008.043	59.347
71	1361.556	27010.975	59.482
72	1359.772	27013.755	59.550
73	1357.740	27016.359	59.636
74	1355.477	27018.764	59.676
75	1353.001	27020.951	59.695
76	1350.514	27023.911	59.790
77	1349.335	27027.593	59.927
78	1349.641	27031.447	60.058
79	1352.148	27034.531	60.152
80	1353.071	27034.900	60.156
81	1356.113	27034.812	60.092
82	1359.345	27031.399	59.949
83	1353.855	27028.979	60.098
84	1357.002	27021.842	59.968
85	1362.492	27024.263	59.757
86	1363.701	27021.028	59.671
87	1364.530	27017.676	59.587
88	1364.969	27014.251	59.509
89	1365.362	27008.629	59.360
90	1364.562	27007.413	59.357



KERB SETOUT DETAIL
BARRIER KERB AND CHANNEL (TYPE B1)
SCALE 1:10



KERB SETOUT DETAIL
SEMI - MOUNTABLE KERB
(TYPE SM5 - MODIFIED)
SCALE 1:10



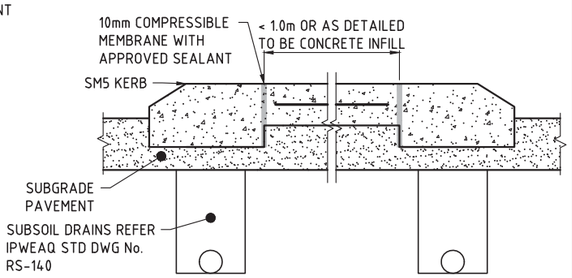
KERB SETOUT DETAIL
KERB - B2
SCALE 1:10

LEGEND

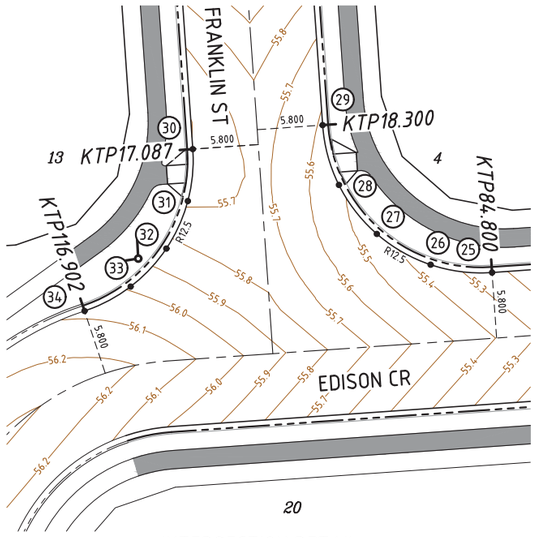
- PROPOSED ROAD CENTRELINE
- BARRIER KERB AND CHANNEL (TYPE B1)
- BARRIER KERB (TYPE B2)
- SEMI-MOUNTABLE KERB (TYPE SM5-MODIFIED)
- 36.0 FINISHED SURFACE CONTOURS
- 16.771 OFFSET TO KERB FACE

GENERAL NOTES

1. SETOUT TABLES ARE GIVEN AT KERB LIP LEVELS.
2. KERB LIP LEVELS ARE GIVEN AT QUARTER POINTS, TP'S AND EQUAL PARTS U.N.O.
3. KERB RADII AND OFFSETS ARE GIVEN AT HORIZONTAL SETOUT POINT
4. EXTRA DETAIL FOR SETTING OUT IS AVAILABLE ON CAD FILE.



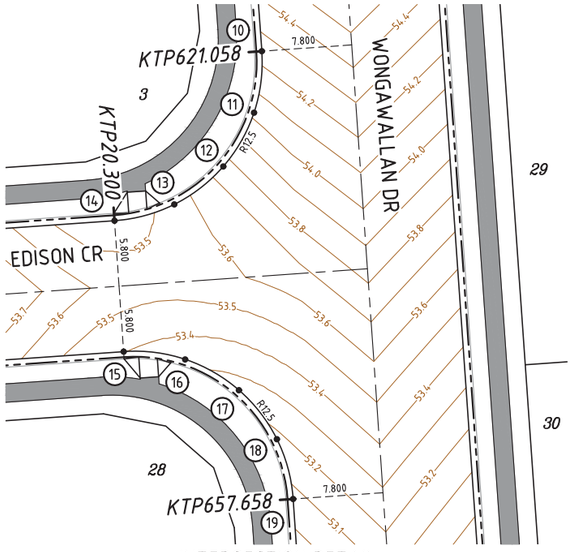
TYPICAL CONCRETE ISLAND SECTION
SCALE NTS



SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
25	1391.628	26895.360	55.237
26	1386.615	26895.997	55.352
27	1382.228	26898.505	55.436
28	1379.135	26902.500	55.520
29	1377.806	26907.375	55.587
30	1367.216	26905.418	55.604
31	1366.813	26901.185	55.683
32	1365.059	26897.311	55.834
33	1362.146	26894.214	55.987
34	1358.386	26892.227	56.079

INTERSECTION DETAIL -
EDISON CR AND FRANKLIN ST
SCALE 1:250



INTERSECTION DETAIL -
WONGAWALLAN DR AND EDISON CR
SCALE 1:250

SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
10	1467.986	26913.681	54.244
11	1467.348	26908.668	54.023
12	1464.841	26904.281	53.760
13	1460.845	26901.188	53.548
14	1455.970	26899.859	53.443

PT No.	EASTING	NORTHING	LEVEL
15	1456.717	26889.185	53.403
16	1461.729	26888.547	53.333
17	1466.116	26886.040	53.255
18	1469.210	26882.045	53.176
19	1470.539	26877.170	53.067

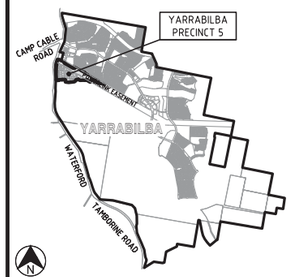
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1 : 10 (A1 UNREDUCED)

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
IF IN DOUBT - ASK!

NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants
rps

Client
lendlease

Project
YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved
Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:54+10'00'

Drawing Title
ROADWORKS
INTERSECTION DETAILS
SHEET 1

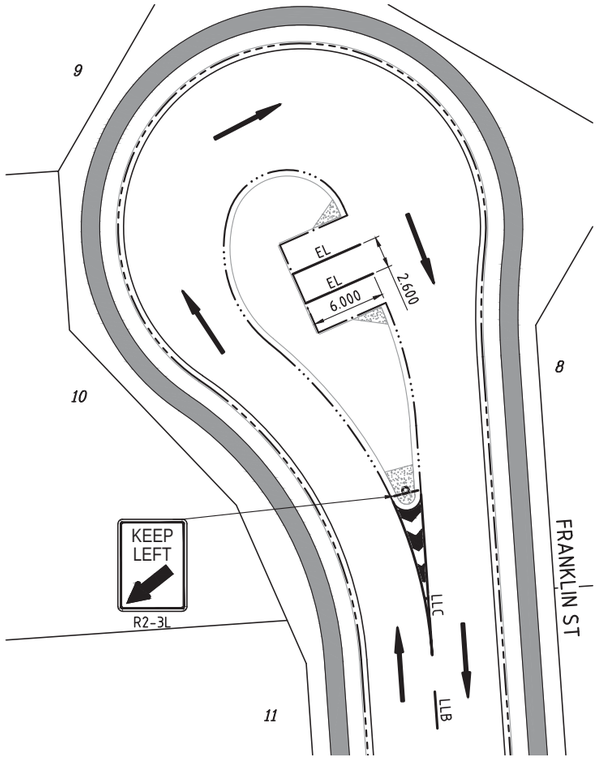
Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	20 of 65

	Drawing No	Revision
A1	23-101-20	A

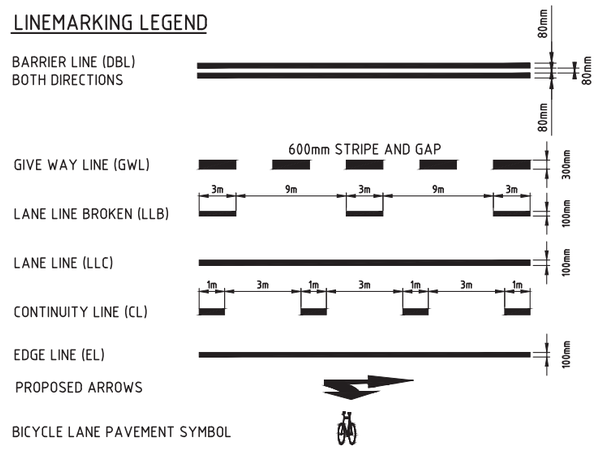
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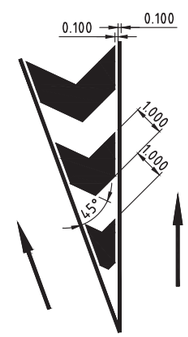
NOTE:
RETROREFLECTIVE RAISED PAVEMENT MARKERS (RRPM'S) REQUIRED TO ALL LANE LANES AND ALL PERIMETER OF CHEVRONS AS PER MAIN ROADS 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (MUTCD).



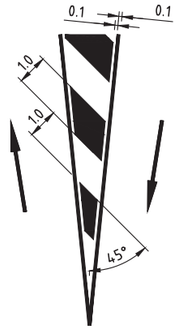
SIGNS AND LINEMARKING PLAN - FRANKLIN ST
SCALE 1:250

LINEMARKING LEGEND

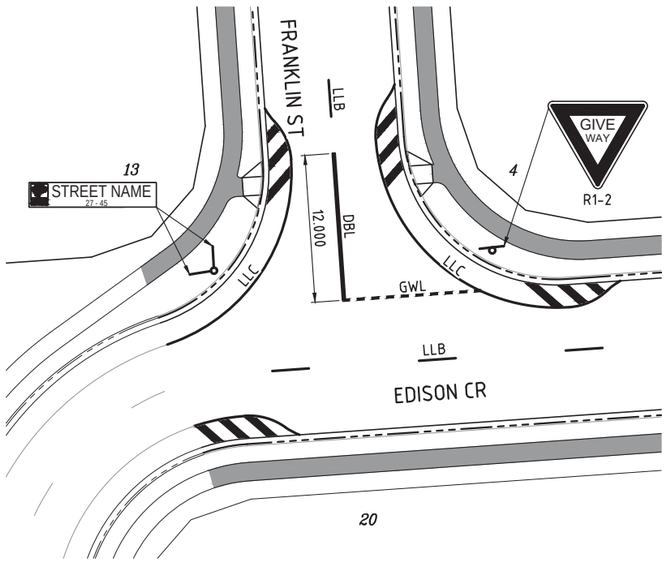




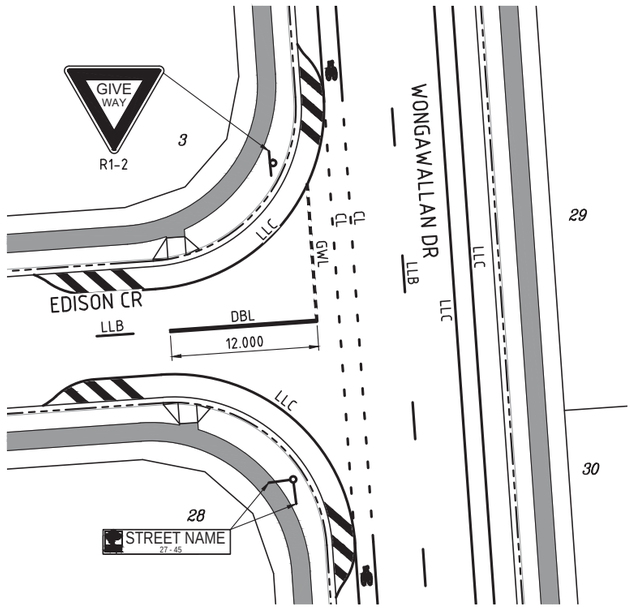
TYPICAL CHEVRON DETAIL
DIVERGING TRAFFIC
SCALE 1 : 100



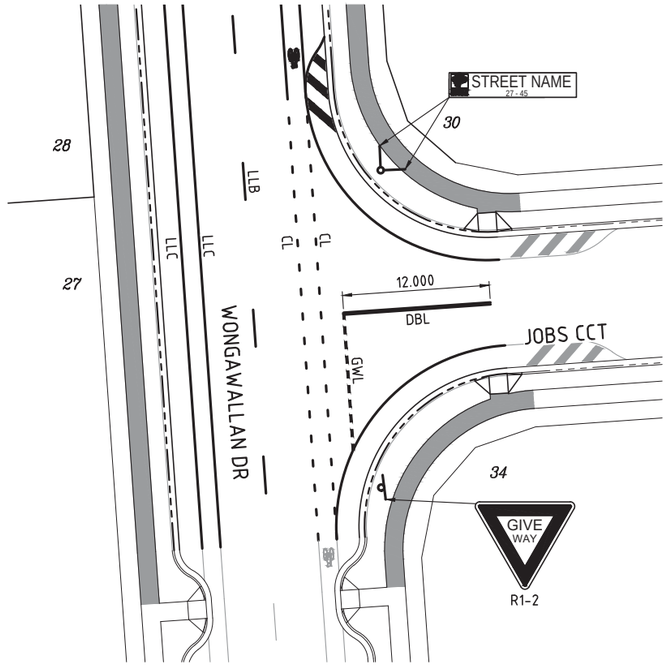
TYPICAL CHEVRON DETAIL
MERGING TRAFFIC
SCALE 1 : 100



SIGNS AND LINEMARKING PLAN -
EDISON CRES AND FRANKLIN ST
SCALE 1:250



SIGNS AND LINEMARKING PLAN -
EDISON CR AND WONGAWALLAN DR
SCALE 1:250



SIGNS AND LINEMARKING PLAN -
WONGAWALLAN DR AND JOBS CCT
SCALE 1:250

SCALE 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
1 : 100 (A1 UNREDUCED)

SCALE 5 0 5 10 15 20 25m
1 : 250 (A1 UNREDUCED)

LEGEND

- BARRIER KERB AND CHANNEL (TYPE B1)
- BARRIER KERB (TYPE B2)
- SEMI - MOUNTABLE KERB (TYPE SM5 - MODIFIED)

SIGN NOTES

1. ALL SIGNS TO BE INSTALLED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES - CURRENT EDITION
2. THE LOCATION OF EXISTING SIGNS ARE INDICATED ON PLAN.
3. THE LOCATIONS OF PROPOSED SIGNS ARE INDICATED ON PLAN.

   ALL SIGNS TO BE INSTALLED WITH THE FOLLOWING MINIMUM CLEARANCES TO EDGE OF SIGN FACE:

NO KERB	- 600mm BEHIND GUIDEPOSTS
BARRIER KERB	- 300mm FROM FACE OF KERB
MOUNTABLE KERB	- 500mm FROM FACE OF KERB.

4. CHECK FOR ALL IN GROUND SERVICES PRIOR TO PLACING SIGN SUPPORTS.
5. SIGN SUPPORT CONSTRUCTION TO BE IN ACCORDANCE WITH MAIN ROADS STANDARD DRAWING 1368 FOR SIGN SUPPORTS AND FOR MULTIPLE SUPPORT. REUSE EXISTING SIGN SUPPORTS WHERE POSSIBLE.
6. EXACT LOCATION OF ALL SIGNS IS TO BE VERIFIED ON SITE WITH THE SUPERINTENDENT PRIOR TO INSTALLATION.

PAVEMENT MARKING NOTES

ALL PAVEMENT MARKING TO BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES - CURRENT EDITION.
OUTLINE MARKINGS, OFFSET 75mm MINIMUM FROM THE KERB FACE SHALL BE PROVIDED AROUND ALL RAISED ISLANDS AND MEDIANS.

WHITE REFLECTIVE PAINT SHALL BE USED FOR ALL LANE AND EDGE LINES, CHEVRONS AND OUTLINE MARKINGS.

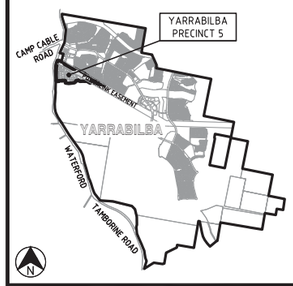
WHITE REFLECTIVE THERMOPLASTIC MATERIAL SHALL BE USED FOR ALL CONTINUITY, TURNING, HOLDING, GIVE WAY, STOP, CROSSWALK MARKINGS AND TURN ARROWS.

ALL EXISTING PAVEMENT MARKINGS THAT SHALL BE MADE OBSOLETE BY THESE WORKS SHALL BE REMOVED FROM THE ROAD SURFACE BY APPROVED METHOD.

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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants
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Client
lendlease

Project
YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved
Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:58:55+10'00'

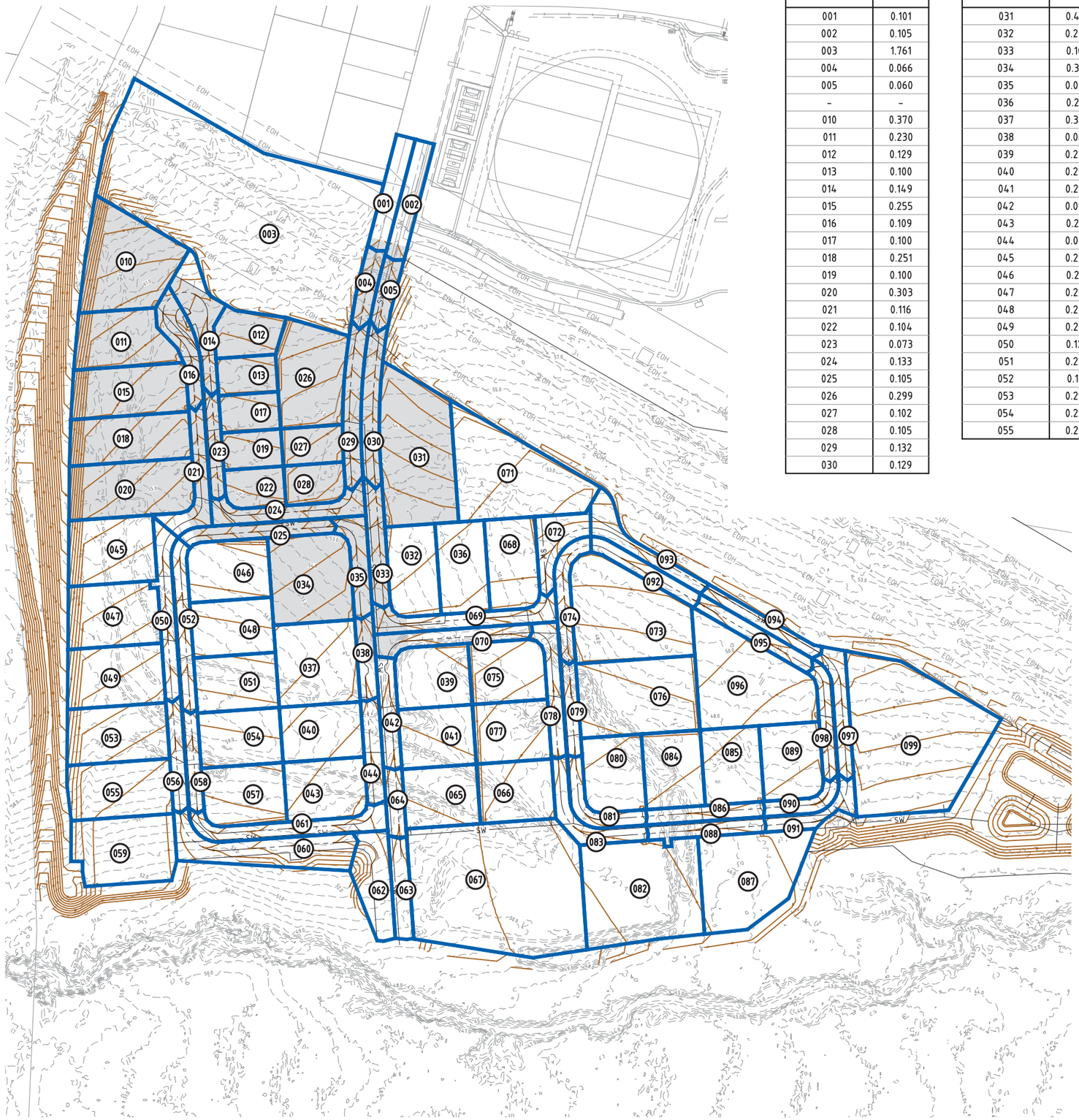
Drawing Title
ROADWORKS
SIGNS AND LINEMARKING PLAN

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	22 of 65

	Drawing No	Revision
A1	23-101-22	A

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CATCHMENT PLAN
SCALE 1:1500

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
001	0.101
002	0.105
003	1.761
004	0.066
005	0.060
–	–
010	0.370
011	0.230
012	0.129
013	0.100
014	0.149
015	0.255
016	0.109
017	0.100
018	0.251
019	0.100
020	0.303
021	0.116
022	0.104
023	0.073
024	0.133
025	0.105
026	0.299
027	0.102
028	0.105
029	0.132
030	0.129

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
031	0.471
032	0.202
033	0.100
034	0.318
035	0.095
036	0.201
037	0.300
038	0.069
039	0.202
040	0.202
041	0.200
042	0.092
043	0.215
044	0.086
045	0.255
046	0.217
047	0.255
048	0.203
049	0.258
050	0.129
051	0.203
052	0.118
053	0.253
054	0.203
055	0.257

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
056	0.077
057	0.217
058	0.069
059	0.297
060	0.247
061	0.154
062	0.154
063	0.084
064	0.057
065	0.200
066	0.202
067	0.970
068	0.205
069	0.152
070	0.117
071	0.465
072	0.110
073	0.462
074	0.093
075	0.205
076	0.400
077	0.202
078	0.104
079	0.065
080	0.203

CATCHMENT TABLE

CATCHMENT No.	AREA (ha)
081	0.086
082	0.531
083	0.108
084	0.200
085	0.200
086	0.081
087	0.394
088	0.084
089	0.203
090	0.059
091	0.075
092	0.084
093	0.111
094	0.073
095	0.090
096	0.447
097	0.100
098	0.081
099	0.794

LEGEND

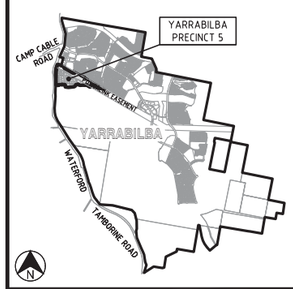
- 001 — PROPOSED CATCHMENT BOUNDARY
- 001 — CATCHMENT NUMBER
- KERB AND CHANNEL
- SW — PROPOSED STORMWATER DRAINAGE
- 36.0 — FINISHED SURFACE CONTOURS
- 36.0 — NATURAL SURFACE CONTOURS

SCALE
15 0 15 30 45 60 75 90 105 120 135 150m
1 : 1500 (A1 UNREDUCED)

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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

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YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
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Date: 2023.07.27 12:58:55+10'00'

Drawing Title

STORMWATER
CATCHMENT PLAN

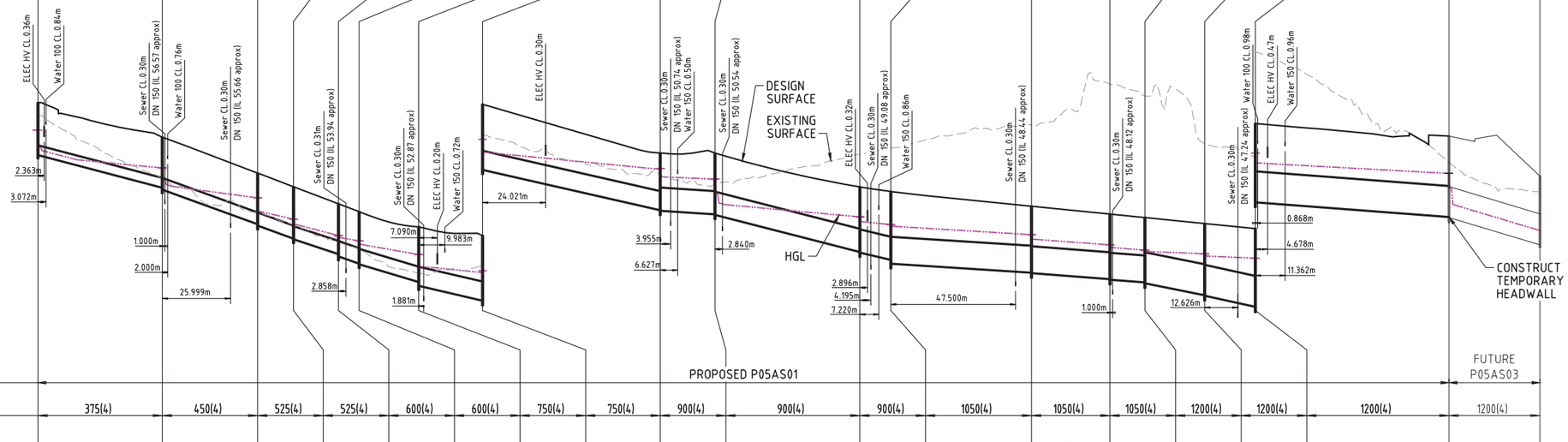
Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	23 of 65

	Drawing No	Revision
A1	23-101-23	A

M:\2023\23101 Yarrabilba Precinct 5 MIBA Stage 1\Engineering\Acad\23-101-23-SW-CATCHMENT.dwg Plotted by: JS on 27/07/2023 12:25:20 PM

STRUCTURE NAME	FI010/10	MH01/10	MH02/10	MH03/10	MH04/10	MH05/10	MH06/10	MH07/10	MH08/10	MH09/10	MH10/10	MH11/10	MH12/10	MH13/10	MH14/10	MH15/10	MH16/10	MH17/10	HW18/10
STRUCTURE DESCRIPTION	STD TYPE 1 FIELD INLET 900mm x 900mm OVER STD Φ1050 MH	MANHOLE	REFER DETAIL	MANHOLE	REFER DETAIL	STD MANHOLE 1050mm DIAMETER	MANHOLE	REFER DETAIL	STD MANHOLE 1050mm DIAMETER	MANHOLE	REFER DETAIL	MANHOLE	REFER DETAIL	MANHOLE	REFER DETAIL	MANHOLE	REFER DETAIL	MANHOLE	REFER DETAIL	MANHOLE	REFER DETAIL	CULVERT WINGALL



STAGE		PROPOSED P05AS01																		FUTURE P05AS03	
PIPE SIZEmm (Class)		375(4)	450(4)	525(4)	525(4)	600(4)	600(4)	750(4)	750(4)	900(4)	900(4)	900(4)	1050(4)	1050(4)	1050(4)	1200(4)	1200(4)	1200(4)		1200(4)	
PIPE GRADE %		2.62%	3.62%	3.65%	3.31%	3.55%	2.99%	2.33%	2.27%	0.65%	2.56%	2.40%	0.63%	0.77%	0.77%	2.01%	2.19%	0.76%		3.00%	
PIPE SLOPE 1 in X		38.19	27.61	27.37	30.23	28.19	33.39	42.98	44.11	153.50	39.01	41.68	157.65	130.57	130.02	49.78	45.72	131.96		33.38	
FULL PIPE FLOW VELOCITY (m/s)		1.56	2.08	2.92	3.13	2.70	2.84	2.49	2.49	1.87	2.68	2.84	2.41	2.66	2.72	2.16	2.25	2.51		2.55	
PART FULL FLOW VELOCITY (m/s)		2.69	3.58						3.99		4.69									5.68	
DATUM RL		RL 44.0							39.0									35.0			
WATER LEVEL IN STRUCTURE	59.368		57.926		56.786		55.976	55.354	55.154	54.634	54.014	52.909	52.504	51.067	50.770	50.387	49.999	49.799	49.659	49.492	48.725	46.542
HYDRAULIC GRADE LEVEL	59.368	58.790	57.926	57.549	56.786	56.290	55.976	55.801	55.350	55.280	55.154	55.030	54.628	54.189	53.942	53.582	52.874	52.592	52.500	52.024	51.063	50.891	50.770	50.711	50.387	50.218	49.999	49.901	49.799	49.751	49.659	49.576	49.492	49.120	48.718	48.218	46.542
PIPE FLOW (Cumecs)		0.172		0.331		0.578		0.619		0.727		0.767		1.043		1.043		1.142		1.639		1.740		1.994		2.195		2.251		2.362		2.453		2.743		2.785	
PIPE CAPACITY AT GRADE (Cumecs)		0.284		0.542		0.729		0.694		1.085		0.997		1.579		1.559		1.388		2.753		2.664		2.044		2.246		2.251		5.269		5.498		3.236		6.436	
DEPTH TO INVERT		2.000	1.925	2.000	1.948	2.000	1.980	2.000	1.916	2.000	1.980	2.000	2.106	2.250	2.480	2.500	2.180	2.200	2.330	2.350	2.480	2.500	2.607	2.750	2.530	2.550	2.480	2.500	2.469	2.500	2.730	2.750	2.980	3.000	3.080	3.100	2.619
INVERT LEVEL OF DRAIN		58.415	57.174	57.099	55.784	55.732	55.232	55.212	54.646	54.562	54.282	54.262	53.582	53.438	52.872	52.852	51.317	51.297	51.161	51.141	49.726	49.706	49.423	49.280	48.940	48.920	48.691	48.671	48.569	48.538	48.080	48.060	47.638	47.618	47.059	47.039	46.000
DESIGN SURFACE LEVEL	60.415		59.099		57.732		57.212		56.562		56.262		55.688		55.352		53.497		53.491		52.206		52.030		51.470		51.171		51.038		50.810		50.618		50.139		48.619
SETOUT CO-ORDINATE	E:1335.485 N:270374.490		E:1367.303	N:27002.373	E:1369.836	N:26966.149	E:1370.791	N:26952.495	E:1371.985	N:26935.429	E:1372.535	N:26927.556	E:1374.119	N:26904.906	E:1392.105	N:26888.526	E:1459.645	N:26893.249	E:1479.695	N:26887.434	E:1483.546	N:26832.363	E:1484.369	N:26820.597	E:1488.108	N:26767.127	E:1490.193	N:26737.300	E:1491.121	N:26724.028	E:1492.712	N:26701.283	E:1494.058	N:26682.035	E:1499.203	N:26608.448	E:1519.959	N:26580.669
RUNNING CHAINAGE	0.000	47.388	47.388	36.312	83.700	13.687	97.387	17.108	114.495	7.892	122.387	22.705	145.092	24.327	169.419	67.705	237.124	20.876	258.000	55.205	313.205	11.795	325.000	53.601	378.601	29.900	408.501	13.304	421.805	22.801	444.606	19.295	463.901	73.767	537.668	34.677	572.345

LINE 10

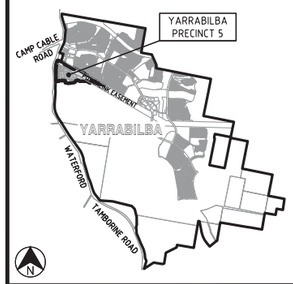
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B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

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Client

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Project

YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

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Drawing Title

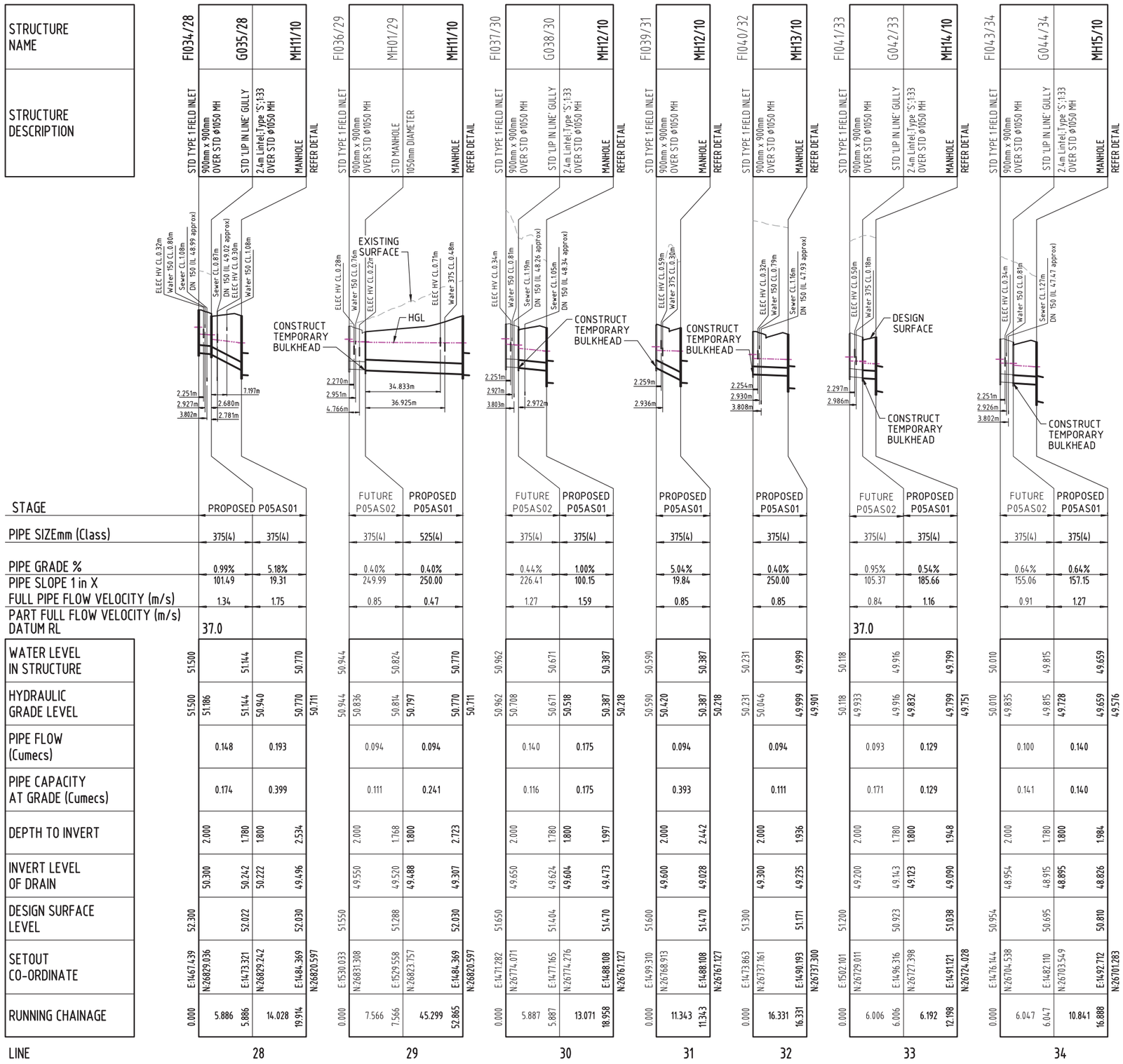
STORMWATER
LONGITUDINAL SECTIONS
SHEET 2

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	33 of 65

A1	Drawing No	Revision
	23-101-33	A

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SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m

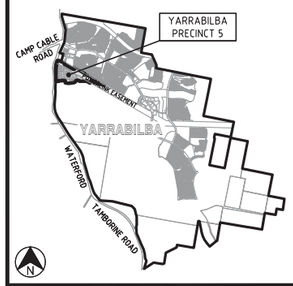
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m

(A1 UNREDUCED)

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PRECINCT 5
MIBA STAGE 1

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Drawing Title

STORMWATER
LONGITUDINAL SECTIONS
SHEET 5

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	36 of 65

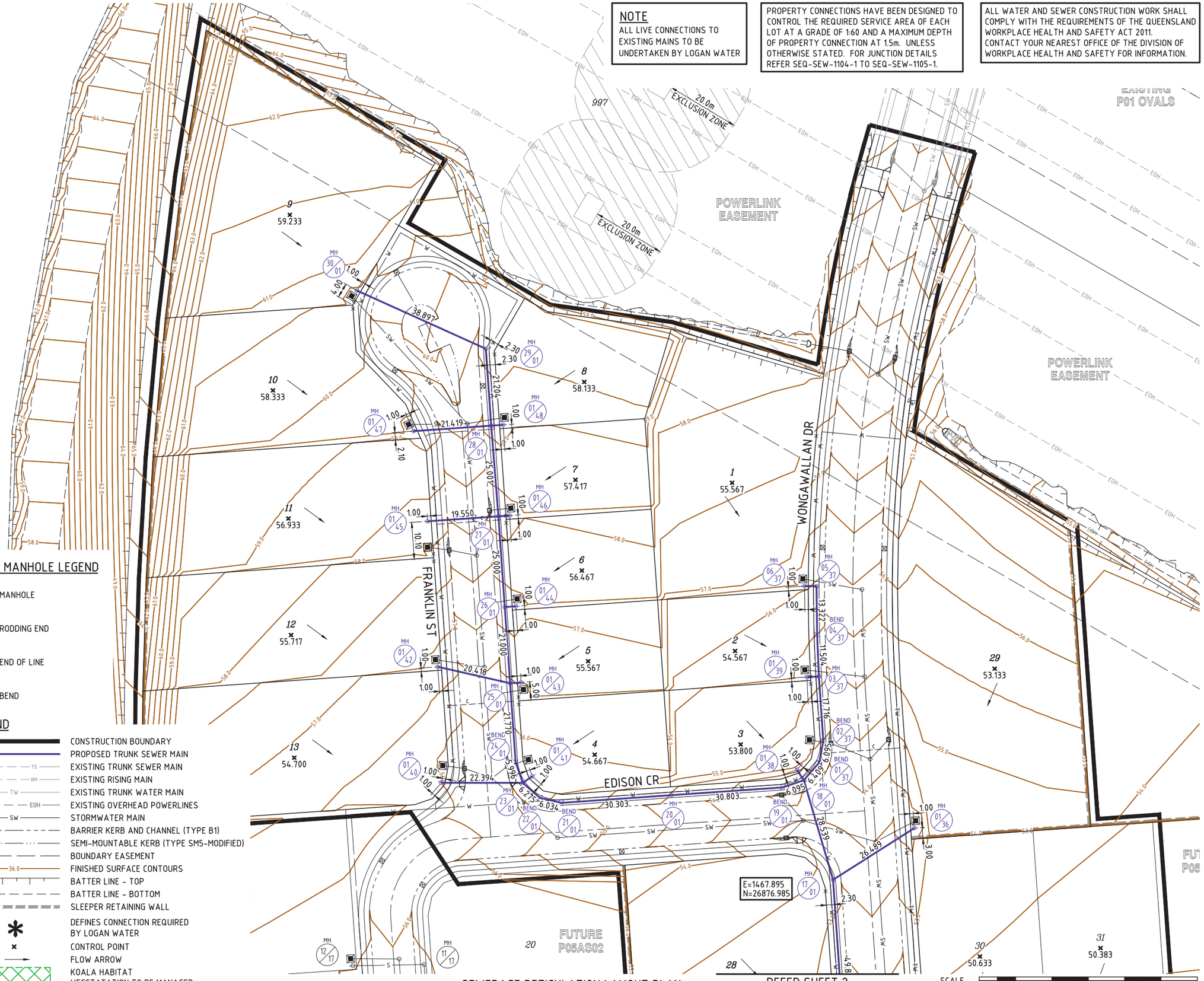
A1	Drawing No	Revision
	23-101-36	A

NOTE

ALL LIVE CONNECTIONS TO EXISTING MAINS TO BE UNDERTAKEN BY LOGAN WATER

PROPERTY CONNECTIONS HAVE BEEN DESIGNED TO CONTROL THE REQUIRED SERVICE AREA OF EACH LOT AT A GRADE OF 1:60 AND A MAXIMUM DEPTH OF PROPERTY CONNECTION AT 1.5m. UNLESS OTHERWISE STATED. FOR JUNCTION DETAILS REFER SEQ-SEW-1104-1 TO SEQ-SEW-1105-1.

ALL WATER AND SEWER CONSTRUCTION WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORKPLACE HEALTH AND SAFETY ACT 2011. CONTACT YOUR NEAREST OFFICE OF THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION.



SEWER MANHOLE LEGEND

- MH 03/15 — MANHOLE
- RE 04/15 — RODDING END
- END E/15 — END OF LINE
- BEND 02/15 — BEND

LEGEND

- CONSTRUCTION BOUNDARY
- PROPOSED TRUNK SEWER MAIN
- EXISTING TRUNK SEWER MAIN
- EXISTING RISING MAIN
- EXISTING TRUNK WATER MAIN
- EXISTING OVERHEAD POWERLINES
- STORMWATER MAIN
- BARRIER KERB AND CHANNEL (TYPE B1)
- SEMI-MOUNTABLE KERB (TYPE SM5-MODIFIED)
- BOUNDARY EASEMENT
- FINISHED SURFACE CONTOURS
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- SLEEPER RETAINING WALL
- DEFINES CONNECTION REQUIRED BY LOGAN WATER
- CONTROL POINT
- FLOW ARROW
- KOALA HABITAT VEGETATATION TO BE MANAGED

SEWERAGE RETICULATION LAYOUT PLAN

SCALE 1:500

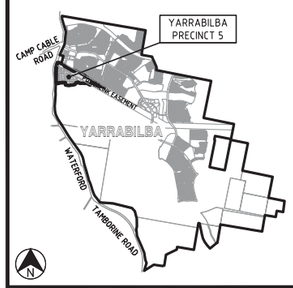
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No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

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PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
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Date: 2023.07.27 12:59:12+10'00'

Drawing Title

SEWERAGE RETICULATION LAYOUT PLAN SHEET 1

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	50 of 65

	Drawing No	Revision
A1	23-101-50	A

REFER SHEET 1

REFER SHEET 3

WONGAWALLAN DR

JOBS CCT

FUTURE P05AS02

FUTURE P05AS03

FUTURE P05AS06

PROVIDE STUB FOR FUTURE CONNECTION

PROVIDE STUB FOR FUTURE CONNECTION

E=1606.098
N=26693.972

E=1664.974
N=26680.597

E=1704.396
N=26683.103

G063/49

G062/48

MH17/10

NOTE

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SEWER MANHOLE LEGEND

- MH 03/15 — MANHOLE
- RE 04/15 — RODDING END
- END E/15 — END OF LINE
- BEND 02/15 — BEND

LEGEND

- CONSTRUCTION BOUNDARY
- PROPOSED TRUNK SEWER MAIN
- EXISTING TRUNK SEWER MAIN (TS)
- EXISTING RISING MAIN (RM)
- EXISTING TRUNK WATER MAIN (TW)
- EXISTING OVERHEAD POWERLINES (EOH)
- STORMWATER MAIN (SW)
- BARRIER KERB AND CHANNEL (TYPE B1)
- BOUNDARY EASEMENT
- FINISHED SURFACE CONTOURS (36.0)
- BATTER LINE - TOP
- BATTER LINE - BOTTOM
- SLEEPER RETAINING WALL
- * DEFINES CONNECTION REQUIRED BY LOGAN WATER
- × CONTROL POINT
- → FLOW ARROW
- KOALA HABITAT VEGETATATION TO BE MANAGED

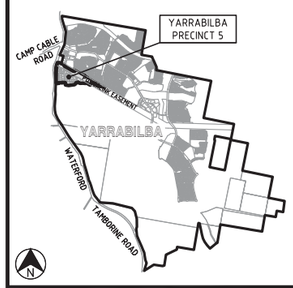
SEWERAGE RETICULATION LAYOUT PLAN
SCALE 1:500

SCALE 10 5 0 10 20 30 40 50m
1 : 500 (A1 UNREDUCED)

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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

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Date: 2023.07.27 12:59:13+10'00'

Drawing Title

SEWERAGE RETICULATION LAYOUT PLAN SHEET 2

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	51 of 65

	Drawing No	Revision
A1	23-101-51	A

M:\2023\23101 Yarrabilba Precinct 5 MIBA Stage 1\Engineering\Acad\23-101-50-53-SEW-LAYOUT.dwg Plotted by JS on 27/07/2023 12:27:05 PM

MAINTENANCE HOLE/SHAFT No.	31	32	33	34	35	36	37	38
MH/MS COVER TYPE	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ	Ⓑ
MH/MS TYPE	A	A	A	A	A	A	A	A
BRANCH DROP TYPE	V	X	V	X	X	V	X	X
BRANCH LINE No.	32	31	35	33	33	33	38	37
HC TYPE	I	V	I	V	V	I	I	I
HC DEPTH TO INVERT	1.500	1.500	1.500	1.500	1.500	1.500	1.500	1.500
HC CH. TO DS MH/MS	23.300	3.300	3.300	3.300	3.300	26.489	3.299	3.417
HC INVERT LEVEL	50.200	50.200	50.100	50.700	50.850	52.250	54.800	53.050
HC LOT No.	34	27	31	30	28	29	1	3

LEGEND:

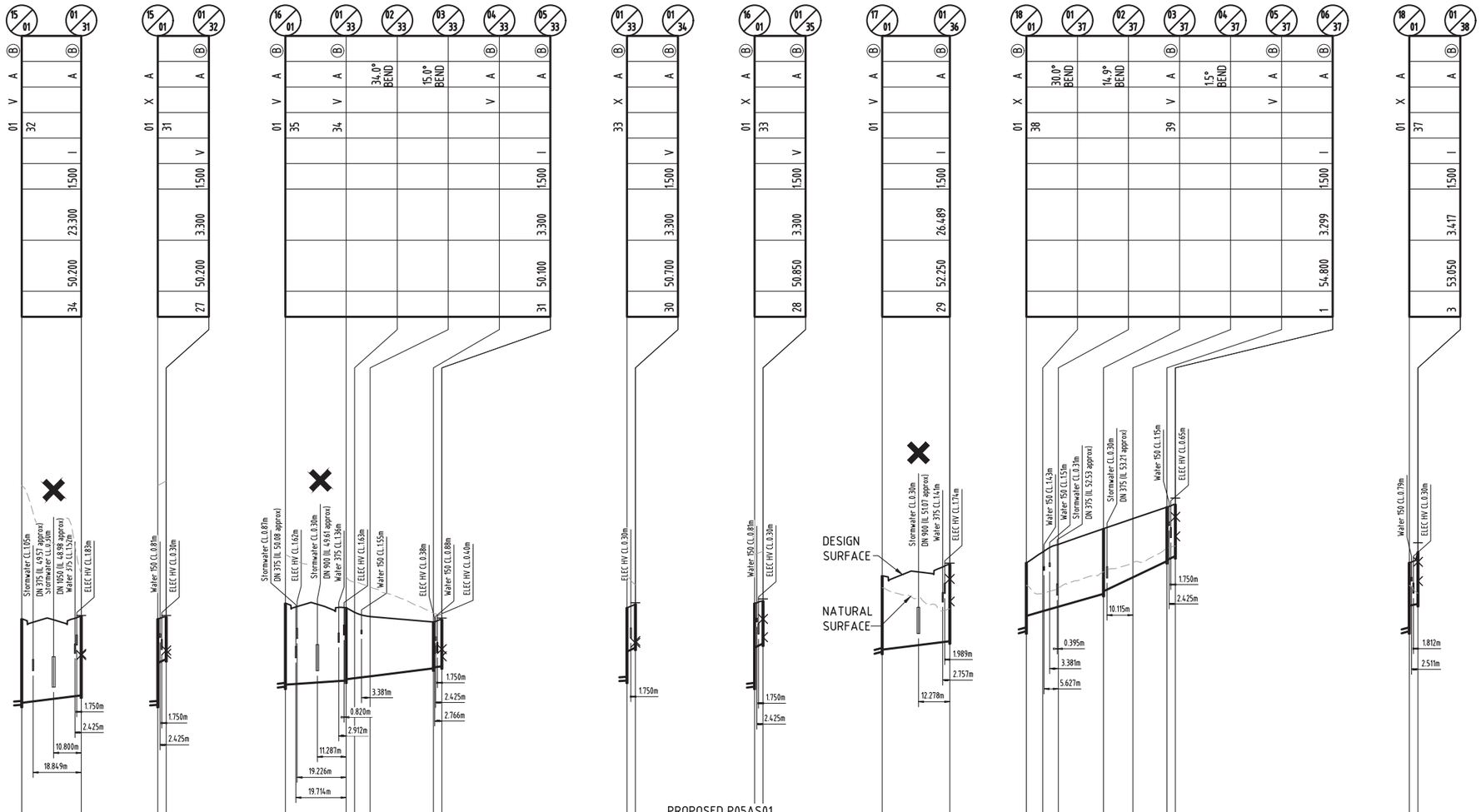
COVER TYPES
Ⓑ = CLASS B NON-TRAFFICABLE
Ⓓ = CLASS D TRAFFICABLE
BD = BOLT DOWN
REFER STD. DWG. No. SEQ-SEW-1308-1 & SEQ-SEW-1308-5 to SEQ-SEW-1308-11

MAINTENANCE HOLE TYPES
A = CAST IN-SITU CONC. 1.050Φ
B = CAST IN-SITU CONC. 1.200Φ
C = CAST IN-SITU CONC. 1.500Φ
C+ = REFER TO DWG. No. 22003-S01 & S02
D = CAST IN-SITU CONC. 1.800Φ
REFER STD. DWG. No. SEQ-SEW-1307-1
PE LINING FOR MANHOLES ⩾1.500Φ OR >4m DEPTH. REFER TO SEQ-SEW & SPS CODE CLAUSES - 4.7.2 & 18.8

HOUSE CONNECTION TYPES
REFER STD. DWG. No. SEQ-SEW-1104-1, SEQ-SEW-1105-1 & SEQ-SEW-1303-1
KN DWG No. 11-121-SK1
ALLOWS FOR HV POWER SUPPLY

* FINISHED SURFACE LEVELS ARE INDICATIVE ONLY. REFER 'DIMENSION H' TABLE AS PER STD. DWG. No. SEQ-SEW-1308-1

✕ BRIDGING OF SEWER REQUIRED REFER DETAIL ON KN DWG 23-101-53

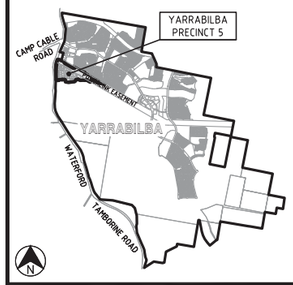


DATUM RL 41.0	31	32	33	34	35	36	37	38
LOCATION	ROAD	FOOTPATH	ROAD	FOOTPATH	FOOTPATH	ROAD	FOOTPATH	FOOTPATH
PIPE DIAMETER	150(SN8) PVC	150(SN8) PVC	150(SN8) PVC	150(SN8) PVC	150(SN8) PVC	150(SN8) PVC	150(SN8) PVC	150(SN8) PVC
GRADE	1 : 80.000	1 : 21.000	1 : 150.000	1 : 21.000	1 : 21.000	1 : 80.000	1 : 35.000	1 : 50.000
LENGTH	23.300	3.300	23.787	3.300	3.300	26.489	6.409	3.417
EMBEDMENT TYPE	TYPE 3	TYPE 3	1 : 80.000 3.285	TYPE 3	TYPE 3	TYPE 3	1 : 35.000 6.096	TYPE 3
			1 : 80.000 6.095				1 : 35.000 17.715	
			1 : 80.000 24.803				1 : 21.000 11.504	
			1 : 80.000 3.300				1 : 21.000 13.323	
			TYPE 3				1 : 21.000 3.299	
							TYPE 3	
JUNCTION INVERT LEVEL	48.233 49.838	48.233 48.283	48.944 50.446 50.287	49.202	48.944 48.994	50.312	51.126 52.085 53.416	51.126 51.686
DEPTH OF INVERT BELOW FSL	3.364 3.284 3.104	3.364 1.729 1.650	3.261 3.181 2.851 2.801 2.581 2.337 1.816 1.776 1.832	2.851 1.716 1.701	3.261 1.729 1.664	2.967 2.887 3.014	2.683 2.083 2.315 2.442 2.552 2.452 2.297 2.117 2.077 2.022	2.683 1.684 2.035
INVERT LEVEL (IL)	48.203 48.283 48.575	48.203 49.838 49.995	48.914 48.994 49.152 49.202 49.244 49.320 49.630 49.670 49.711	49.152 50.287 50.444	48.914 50.446 50.603	50.282 50.362 50.694	51.086 51.686 51.869 52.043 52.549 52.649 53.197 53.831 53.871 54.028	51.086 52.085 52.153
FINISHED SURFACE LEVEL (FSL) *	51.567 51.679	51.567 51.645	52.175 52.003 51.825 51.657 51.446 51.543	52.003 52.145	52.175 52.267	53.249 53.708	53.769 54.184 54.485 55.101 55.494 55.948 56.050	53.769 54.188
EXISTING SURFACE LEVEL (ESL)	56.789 53.351	56.789 56.969	54.092 53.213 53.005 52.834 51.787 51.759	53.213 52.907	54.092 54.210	52.793 51.962	52.864 52.570 52.764 53.414 53.774 54.348 54.422	52.864 52.573
CHAINAGE (CH)	0.000 23.300	0.000 3.300	0.000 23.787 27.072 33.167 57.970 61.270	0.000 3.300	0.000 3.300	0.000 26.489	0.000 6.409 12.505 30.220 41.724 55.047 58.346	0.000 3.417
LINE	31	32	33	34	35	36	37	38

SCALE A 1:1000 (Horiz.) 10 5 0 10 20 30 40 50 60 70 80 90 100m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

DO NOT SCALE THIS DRAWING
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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants
rps

Client
lendlease

Project
YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved
Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:59:17+10'00'

Drawing Title
SEWERAGE RETICULATION
LONGITUDINAL SECTION
SHEET 4

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	57 of 65

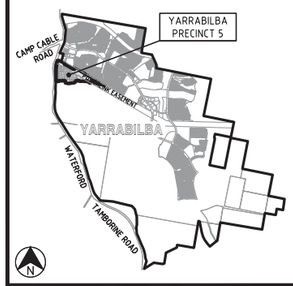
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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

rps

Client

lendlease

Project

YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:59:18+10'00'

Drawing Title

WATER RETICULATION
LAYOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
AS SHOWN	59 of 65

A1	Drawing No	Revision
	23-101-59	A

WATERFORD TAMBORINE ROAD

FRANKLIN ST

WONGAWALLAN DR

EDISON CR

REFER 23-101-67
FOR TRUNK WATER
LIVE CONNECTION

20.0m EXCLUSION ZONE

20.0m EXCLUSION ZONE

DN100x90° BEND (19.8KN)
FH
1.425
0.80m SEW CLEARANCE
0.84m SW CLEARANCE
DN100x22.5° BEND (5.5KN)
DN100x11.25° BEND (2.7KN)
DN100x45° BEND (10.7KN)
DN100x22.5° BEND (5.5KN)
0.78m SW CLEARANCE
1.62m SEW CLEARANCE
DN100x11.25° BEND (2.7KN)
DN100x22.5° BEND (5.5KN)
1.52m SEW CLEARANCE
0.80m SW CLEARANCE
0.76m SW CLEARANCE
1.82m SEW CLEARANCE
0.81m SW CLEARANCE
0.68m SEW CLEARANCE
DN100x90° BEND (19.8KN)
Ø100 DICL
Ø100 M-PVC
0.76m SW CLEARANCE
1.68m SEW CLEARANCE
DN100x11.25° BEND (2.7KN)
1.94m SEW CLEARANCE
DN100x22.5° BEND (5.5KN)
DN100x11.25° BEND (2.7KN)
DN100x45° BEND (10.7KN)
0.79m SW CLEARANCE
Ø150 DICL
Ø150 M-PVC
0.72m SW CLEARANCE
1.90m SEW CLEARANCE
DN150x90° BEND (41.7KN)
Ø150 DICL
Ø150 M-PVC
REFER DETAIL 'B'
0.80m SW CLEARANCE
1.150m SEW CLEARANCE
REFER DWG 23-101-62 TO 64 FOR TRUNK WATER LAYOUT
0.80m SW CLEARANCE
0.79m SEW CLEARANCE
0.79m SW CLEARANCE
DN100x45° BEND (10.7KN)
DN100x22.5° BEND (5.5KN)
DN100x11.25° BEND (2.7KN)
0.79m SEW CLEARANCE
DN150x11.25° BEND (5.8KN)
0.50m SW CLEARANCE
2.03m SEW CLEARANCE
REFER DWG 23-101-62 TO 64 FOR TRUNK WATER LAYOUT
Ø150 DICL
Ø150 M-PVC
Ø375 M-PVC
375 FL-SOC CONNECTOR
375 DI FL-FL PIPE 1m LONG C/W THRUST FLANGE CENTRAL
375x375x200 FL-FL-TEE
375x100 FL-FL HYDRANT
375 FL-FL VALVE
375 FL-SOC CONNECTOR
Ø375 M-PVC
Ø150 DICL
150 VALVE FL-FL
200-150 FL-FL REDUCER

DETAIL B
NOT TO SCALE

NOTE
WATER SERVICE CONDUITS MUST MAINTAIN MINIMUM CLEARANCES AS PER TABLE 5.5 OF THE SEQ D&C CODE

NOTE
ALL LIVE CONNECTIONS TO EXISTING MAINS TO BE UNDERTAKEN BY LOGAN WATER AT DEVELOPERS COST

NOTE
1. ALL CROSS ROAD WATER CONDUITS TO BE Ø150 ONE PER LOT.
2. ALL METER LOCATIONS ARE PROVIDED FOR TEMP CONSTRUCTION PURPOSES. ONLY INDEPENDENT HYDRAULIC DESIGN REQUIRED FOR ALL COMMERCIAL AND INDUSTRIAL LOTS.

LEGEND

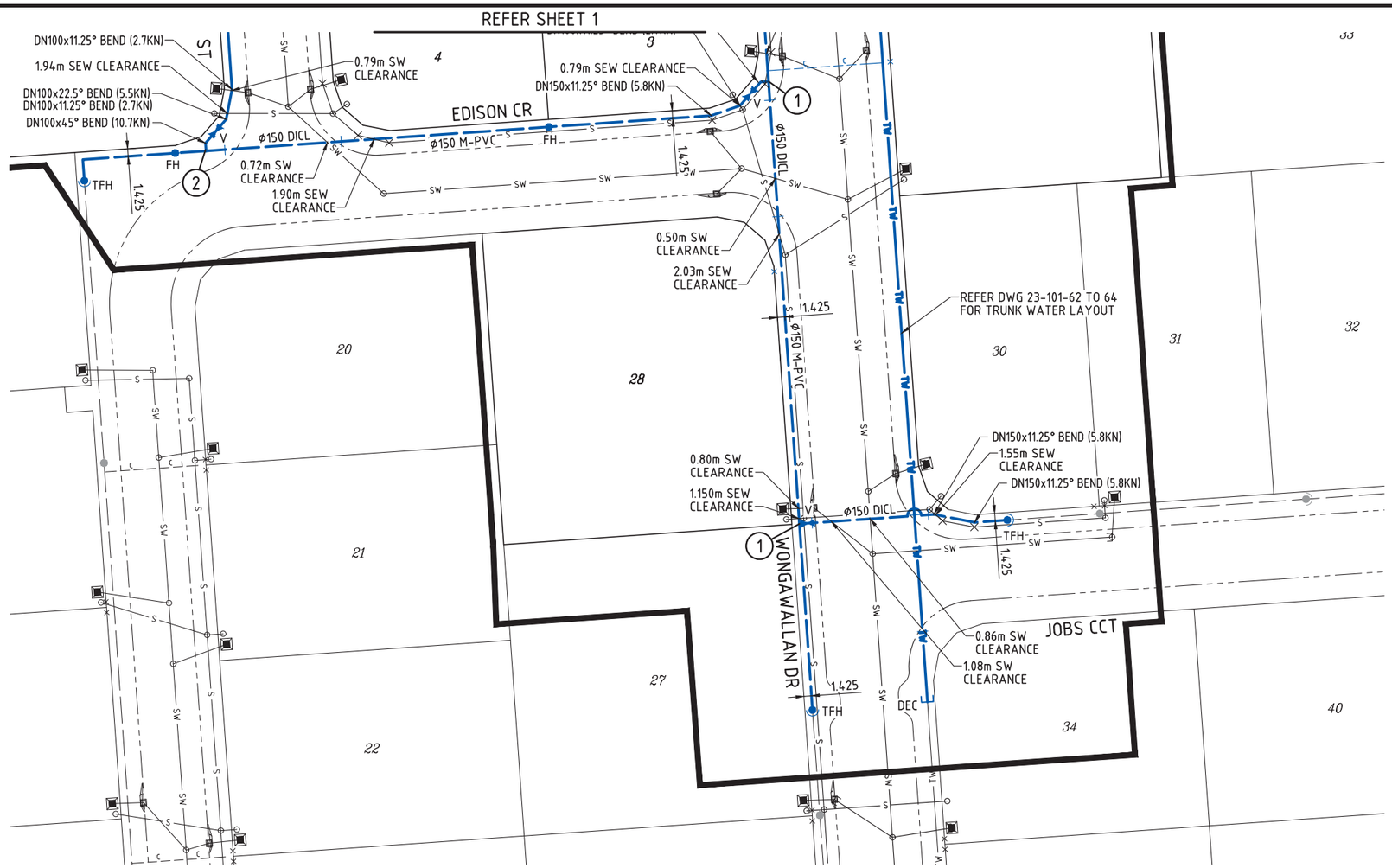
- EXTENT OF WORKS
- W — PROPOSED Ø100 WATER MAIN
- PROPOSED Ø150 WATER MAIN
- TW — TRUNK WATER
- C C C — PROPOSED Ø150 CONDUIT
- EOH — EXISTING OVERHEAD POWERLINES
- TW — TRUNK WATER EXISTING
- FH — FIRE HYDRANT
- TFH — TEMPORARY FIRE HYDRANT
- V — VALVE
- R — REDUCER
- KERB AND CHANNEL (TYPE B1)
- SW — PROPOSED/FUTURE STORMWATER MAIN
- S — PROPOSED/FUTURE SEWER MAIN
- * — CONNECTION REQUIRED BY LOGAN WATER

WATER RETICULATION LAYOUT PLAN
SCALE 1:500

REFER SHEET 2

SCALE
10 5 0 10 20 30 40 50m
1 : 500 (A1 UNREDUCED)

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WATER RETICULATION LAYOUT PLAN
SCALE 1:500

LEGEND

- EXTENT OF WORKS
- W — PROPOSED Ø100 WATER MAIN
- PROPOSED Ø150 WATER MAIN
- TW — TRUNK WATER
- C — PROPOSED Ø150 CONDUIT
- EOH — EXISTING OVERHEAD POWERLINES
- TW — TRUNK WATER EXISTING
- FH — FIRE HYDRANT
- TFH — TEMPORARY FIRE HYDRANT
- V — VALVE
- R — REDUCER
- KERB AND CHANNEL (TYPE B1)
- SW — PROPOSED/FUTURE STORMWATER MAIN
- S — PROPOSED/FUTURE SEWER MAIN
- * — CONNECTION REQUIRED BY LOGAN WATER

NOTE
1. ALL CROSS ROAD WATER CONDUITS TO BE Ø150 ONE PER LOT.
2. ALL METER LOCATIONS ARE PROVIDED FOR TEMP CONSTRUCTION PURPOSES ONLY INDEPENDENT HYDRAULIC DESIGN REQUIRED FOR ALL COMMERCIAL AND INDUSTRIAL LOTS.

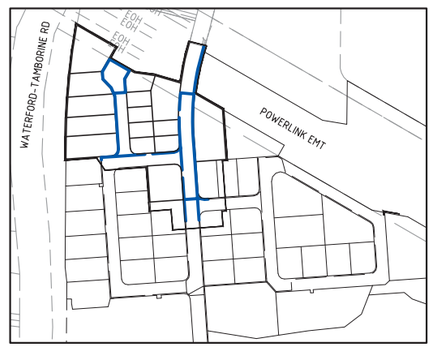
SCHEDULE OF FITTINGS STAGE 1

1	Ø150 x Ø150 x Ø150 TEE	2 REQUIRED (29.5 kN)
2	Ø150 x Ø150 x Ø100 TEE	1 REQUIRED (14.0 kN)
3	Ø100 x Ø100 x Ø100 TEE	1 REQUIRED (14.0 kN)
4	Ø375 x Ø375 x Ø200 TEE	1 REQUIRED (171.0 kN)
5	Ø200-Ø150 REDUCER	1 REQUIRED

SCHEDULE OF PIPES

PIPE SIZE	LENGTH(m)
Ø100 M-PVC	247.329
Ø100 DICL	16.500
Ø150 M-PVC	346.450
Ø150 DICL	60.500
Ø375 M-PVC	263.588
Ø375 DICL	22.000

NOTE - "DUCTILE IRON" PIPEWORK UNDER ROAD CARRIAGEWAYS DENOTES DICL CLASS PN35



LOCALITY PLAN
SCALE 1:5000

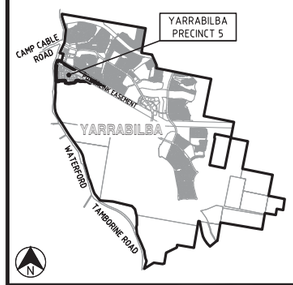
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1 : 500 (A1 UNREDUCED)

SCALE 100 50 0 100 200 300 400 500m
1 : 5000 (A1 UNREDUCED)

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NORTH

LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants

rps

Client

lendlease

Project

YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
www.kngroup.com.au

Approved

Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:59:19+10'00'

Drawing Title

WATER RETICULATION LAYOUT PLAN SHEET 2

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

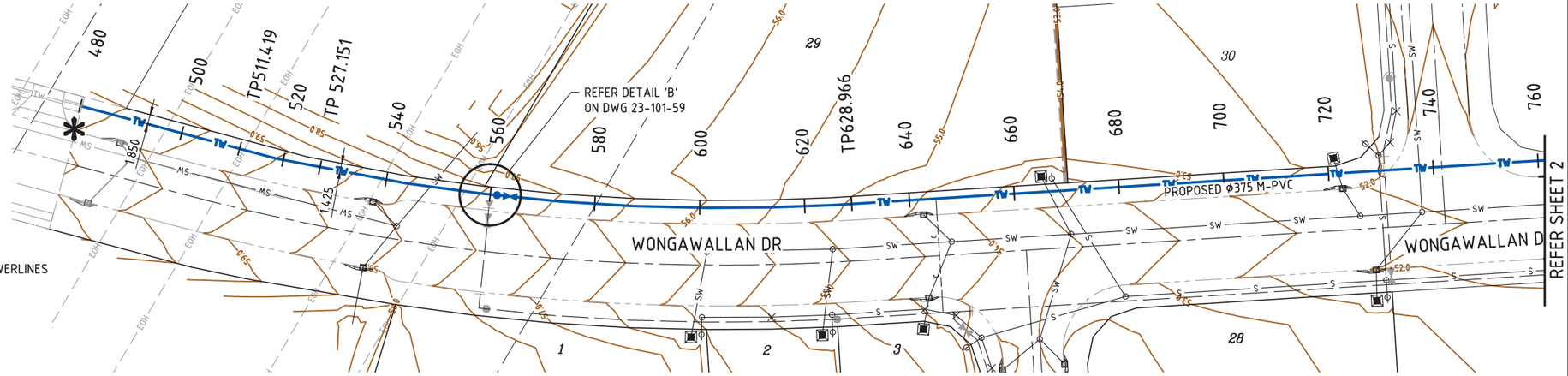
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AS SHOWN	60 of 65

	Drawing No	Revision
A1	23-101-60	A

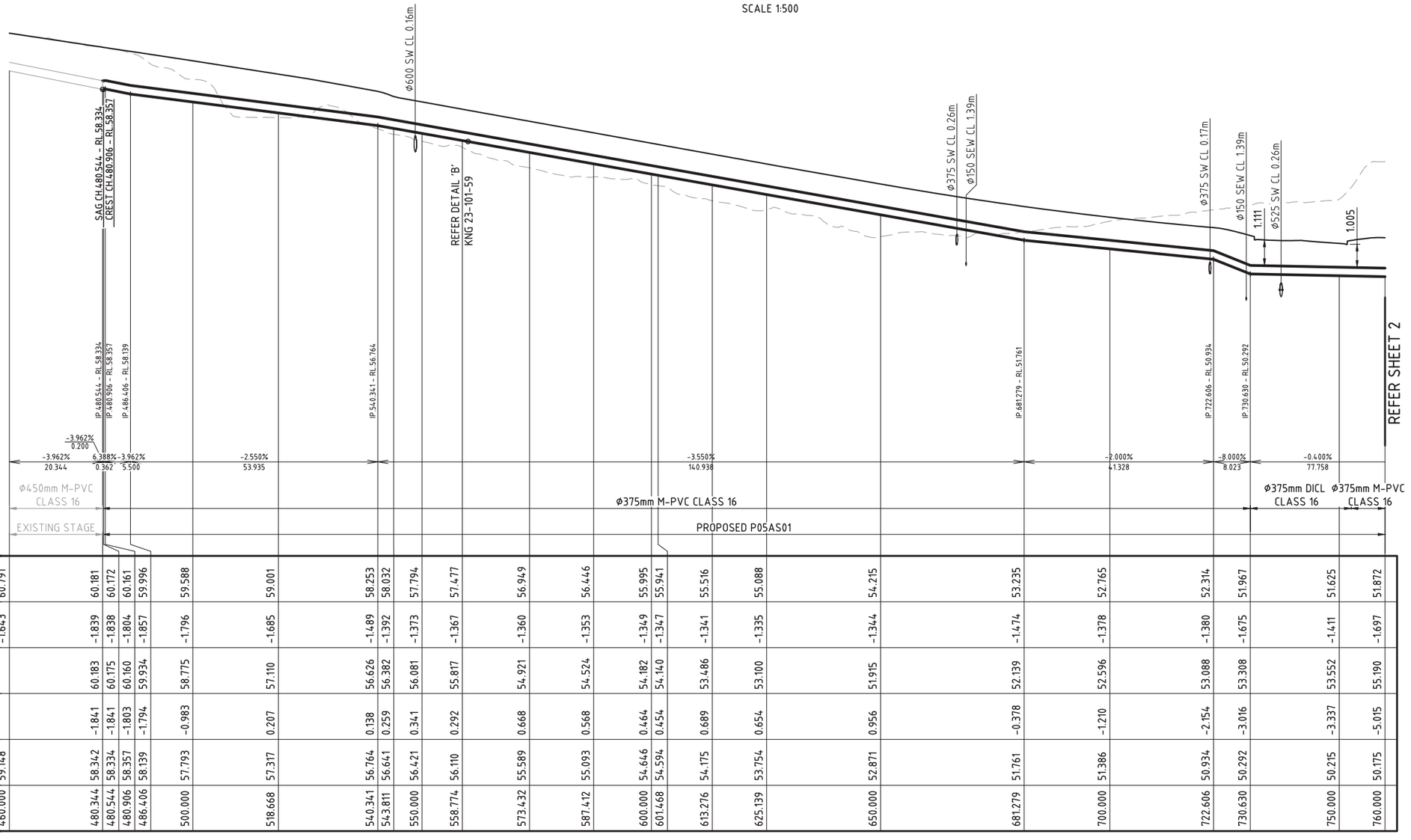
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LEGEND

- PROPOSED Ø100 MAIN
- PROPOSED Ø150 MAIN
- PROPOSED Ø375 TRUNK MAIN
- FH — FIRE HYDRANT
- FH DEC — FIRE HYDRANT AND DEAD END CAP
- V — VALVE
- R — REDUCER
- SCOUR VALVE
- PROPOSED Ø150 CONDUIT
- SEWER MAIN
- WATER MAIN
- STORMWATER DRAINAGE
- EXISTING OVERHEAD POWERLINES
- CONNECTION REQUIRED BY LOGAN WATER



LAYOUT PLAN
SCALE 1:500



DATUM R.L.38.000

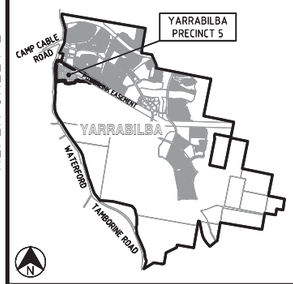
DESIGN SURFACE	60.791		60.181	60.172	60.161	59.996	59.588		59.001		58.253	58.032	57.794	57.477		56.949		56.446		55.995	55.941	55.516	55.088		54.215		53.235		52.765		52.314	51.967		51.625	51.872
DEPTH TO INVERT LEVEL	-1.643		-1.839	-1.838	-1.804	-1.857	-1.796		-1.685		-1.489	-1.392	-1.373	-1.367		-1.360		-1.353		-1.349	-1.347	-1.341	-1.335		-1.344		-1.474		-1.378		-1.380	-1.675		-1.411	-1.697
NATURAL SURFACE			60.183	60.175	60.160	59.934	58.775		57.110		56.626	56.382	56.081	55.817		54.921		54.524		54.182	54.140	53.486	53.100		51.915		52.139		52.596		53.088	53.308		53.552	55.190
DEPTH TO NATURAL			-1.841	-1.841	-1.803	-1.794	-0.983		0.207		0.138	0.259	0.341	0.292		0.668		0.568		0.464	0.454	0.689	0.654		0.956		-0.378		-1.210		-2.154	-3.016		-3.337	-5.015
INVERT LEVEL	59.148		58.342	58.334	58.357	58.139	57.793		57.317		56.764	56.641	56.421	56.110		55.589		55.093		54.646	54.594	54.175	53.754		52.871		51.761		51.386		50.934	50.292		50.215	50.175
PEGGED CHAINAGE	460.000		480.344	480.544	480.906	486.406	500.000		518.668		540.341	543.811	550.000	558.774		573.432		587.412		600.000	601.468	613.276	625.139		650.000		681.279		700.000		722.606	730.630		750.000	760.000

DN375 TRUNK WATER MAIN - LONGITUDINAL SECTION
SCALE - 1:500 (H)
1:100 (V)

SCALE A 1:500 (Horiz.) 10 5 0 10 20 30 40 50m
B 1:100 (Vert.) 1 0.5 0 1 2 3 4 5 6 7 8 9 10m
(A1 UNREDUCED)

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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

Associated Consultants
rps

Client
lendlease

Project
YARRABILBA
PRECINCT 5
MIBA STAGE 1

kn group
ABN 35 112 53 611
L1, 62 Astor Tce
Spring Hill Q 4000
07 3017 1900
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Approved
Digitally signed by Robert William Mander BEng (Civil), CPEng, RPEQ 12805
Date: 2023.07.27 12:59:20+10'00'

Drawing Title
TRUNK WATER RETICULATION LAYOUT PLAN
SHEET 1

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

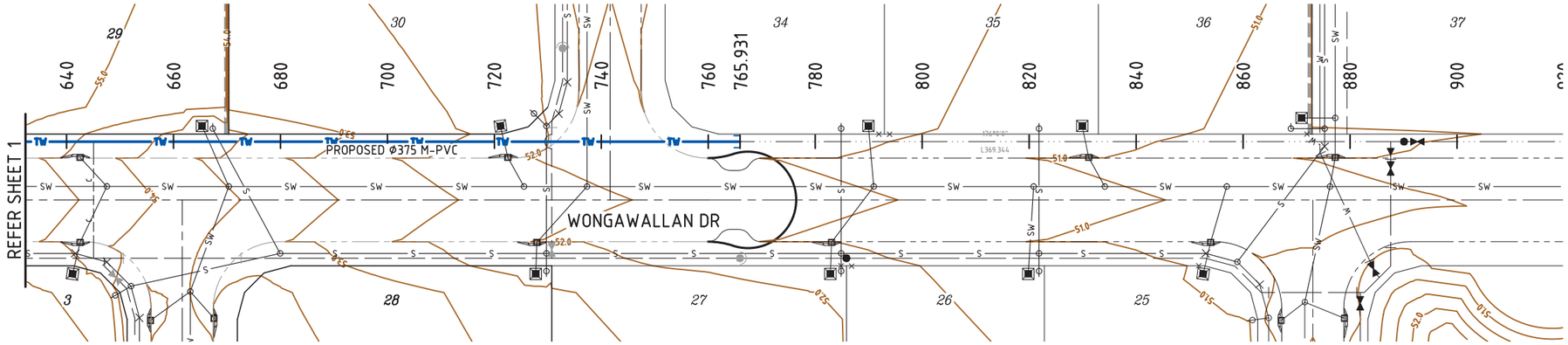
Scale	Sheet
AS SHOWN	62 of 65

	Drawing No	Revision
A1	23-101-62	A

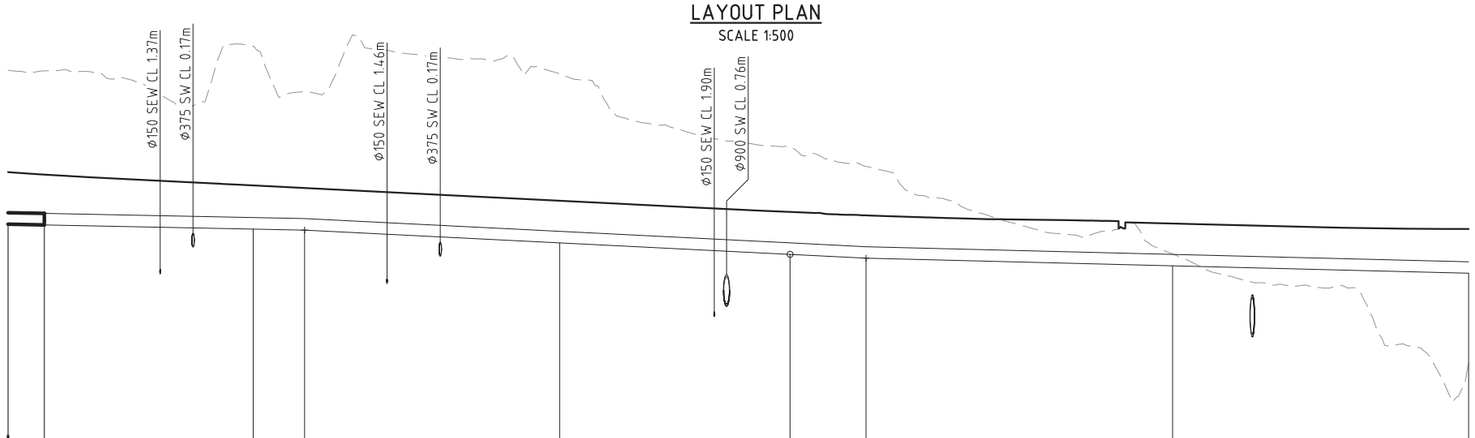
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LEGEND

- PROPOSED ø100 MAIN
- PROPOSED ø150 MAIN
- PROPOSED ø375 TRUNK MAIN
- FIRE HYDRANT
- FIRE HYDRANT AND DEAD END CAP
- VALVE
- REDUCER
- SCOUR VALVE
- PROPOSED ø150 CONDUIT
- SEWER MAIN
- WATER MAIN
- STORMWATER DRAINAGE
- CONNECTION REQUIRED BY LOGAN WATER



LAYOUT PLAN
SCALE 1:500



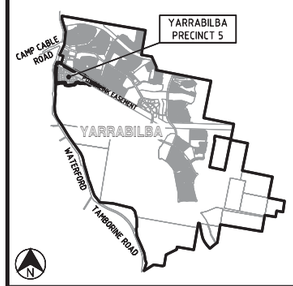
Vertical Geometry Grade		-0.400%			-1.000%		-1.000%		-0.500%		
Vertical Geometry Length (m)		77.758			79.207		12.405		98.311		
PIPE SIZE/CLASS	ø375mm M-PVC CLASS 16										
STAGE	PROPOSED P05AS01		FUTURE P05AS02					FUTURE STAGE			
DATUM R.L.32.000											
DESIGN SURFACE	51.872	51.792	51.439	51.355	50.939	50.573	50.461	50.196	50.017		
DEPTH TO INVERT LEVEL	-1.697	-1.697	-1.424	-1.373	-1.373	-1.384	-1.396	-1.381	-1.443		
NATURAL SURFACE	55.190	55.175	55.973	54.499	55.081	52.695	52.055	49.203	45.615		
DEPTH TO NATURAL	-5.015	-5.023	-5.958	-4.518	-5.516	-3.506	-2.990	-0.387	2.958		
INVERT LEVEL	50.175	50.151	50.015	49.981	49.565	49.189	49.065	48.815	48.574		
PEGGED CHAINAGE	760.000	765.931	800.000	808.388	850.000	887.595	900.000	950.000	998.311		

DN375 TRUNK WATER MAIN - LONGITUDINAL SECTION
SCALE - 1:500 (H)
1:100 (V)

SCALE A 1:500 (Horiz.) 10 5 0 10 20 30 40 50m
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LOCALITY PLAN



REVISIONS

No	Description	Date	By
A	FOR APPROVAL	27.07.23	JJH

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Drawing Title
TRUNK WATER RETICULATION LAYOUT PLAN
SHEET 2

Drawn	Designed	Checked	Date
JJH	JAS	RWM	JUN 23

Scale	Sheet
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APPENDIX G

Yarrabilba Precinct 5A MIBA North Stormwater Management Plan

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2022/1306

Date: 3 February 2023

Queensland Government

YARRABILBA PRECINCT 5A MIBA NORTH STORMWATER MANAGEMENT PLAN

VERSION 1

DesignFlow

Prepared for Lendlease

June 2022

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Inherent natural variability in soils and plants
Where particular types of soils are recommended, such recommendations are based on information provided by soils suppliers, laboratories and published industry guidelines. There can be inconsistencies in the behaviour of soils under field conditions compared to laboratory conditions, and, for both natural and blended soils, many soils are non-homogenous and properties and behaviour can be variable. Where particular plant species have been recommended, such recommendations are based on botanical knowledge and observations of similar species growing in similar, but not identical conditions. Plants can be sensitive to subtle changes in climate, hydrology, soil and surrounding ecological conditions. Further to this, plant health is often closely linked to the level of maintenance provided. No warranty or guarantee, whether explicit or implied is made with respect to the suitability or performance of soils or plant species recommended in this report

Table of Contents

1 INTRODUCTION 1
2 SITE CHARACTERISTICS 2
2.1 LOCATION 2
2.2 TOPOGRAPHY, CATCHMENTS AND DDRAINAGE 2
2.3 GEOLOGY AND SOILS 4
2.4 VEGETATION 4
2.5 WATERWAYS 5
2.6 PROPOSED DEVELOPMENT 5
3 STORMWATER QUALITY 7
3.1 DESIGN OBJECTIVES 7
3.2 STORMWATER QUALITY MANAGEMENT STRATEGY 7
3.3 STORMWATER QUALITY ASSESSMENT 1
3.4 COMPLIANCE AND CERTIFICATION 5
4 STORMWATER QUANTITY 6
5 EROSION AND SEDIMENT CONTROL 8
5.1 DESIGN OBJECTIVES 8
5.2 MANAGEMENT STRATEGY 9
5.3 MONITORING AND AUDITING 11
6 CONCLUSION 13
7 REFERENCES 14

List of Tables

Table 1: Stormwater quality objectives 7
Table 2: Stormwater treatment elements 8
Table 3: Stormwater treatment basins concept design levels summary 8
Table 4: MUSIC modelling parameters 2
Table 5: MUSIC model catchment split data 4
Table 6: MUSIC results 4
Table 7: Construction phase stormwater quality 8

List of Figures

Figure 1: Yarrabilba Precinct 5A MIBA North locality 3
Figure 2: Existing topography, catchments and drainage 3
Figure 3: Geology and soils 4
Figure 4: Precinct 5A MIBA North proposed layout (RPS) 6
Figure 5: Precinct 5A MIBA North stormwater quality management strategy 1
Figure 6: MUSIC model layout 1
Figure 7: 1% AEP Flood levels and preliminary earthworks 6
Figure 8: Drainage diversion external to development footprint 7
Figure 9: ESC strategy – existing levels 10
Figure 10: ESC Strategy – final levels 10

1 INTRODUCTION

The Yarrabilba Priority Development (PDA) is located within the Logan City Council area and occupies a former pine plantation located south of Logan Village. The Yarrabilba PDA was declared by regulation under the Economic Development Act (2012). Yarrabilba is part of a regional growth area identified in the South East Queensland Regional Plan, which identifies a need for a further 70,000 dwellings across a number a localities in the Logan City Council area by 2031. The Yarrabilba development aims to provide approximately 17,000 dwellings for a population of 45,000.

Precinct 5A MIBA North (subject site) covers an area of approximately 31.3 hectares (ha) which includes just under 14 ha of development lots, 4 ha of roads and around 13.2 ha of powerline easement and stormwater treatment areas.

This document presents the stormwater management strategy for the subject site to meet the requirements set out in the Context Planning Area Strategy. These are generally consistent with the S*tate Planning Policy*, *Yarrabilba Total Water Cycle Management Strategy* (DesignFlow, 2021) and *Yarrabilba Stormwater Infrastructure Master Plan* (DesignFlow, 2021). This report provides details of the proposed stormwater treatment measures including location, conceptual sizing and functional earthworks.

This report focusses on the construction phase erosion/sediment control, stormwater quality and waterway elements specific to Precinct 5A. Flood management has been addressed separately in *the Yarrabilba (Quinzeh Creek) Flood Study – Version 1* (DesignFlow, 2017) as the flood management strategy spans numerous current and future precincts requiring site wide planning. No flood infrastructure is required within the subject precinct.

2 SITE CHARACTERISTICS

2.1 LOCATION

Development Precinct 5A MIBA North lies in the western portion of the Lendlease site bordering the southern edge of existing Precinct 1 and Waterford Tamborine Road as shown in Figure 1. The precinct covers a total area of 31.3 ha across 5 stages which includes a significant area of existing powerline easement and buffer defining the northern extent of the precinct.

2.2 TOPOGRAPHY, CATCHMENTS AND DDRAINAGE

The existing topography across the precinct ranges from low-moderate grades (approximately 2% on ridgeline increasing to around 5% in drainage gullies and up to 7% in the south-west corner near Waterford Tamborine Road). Elevations range from approximately 45 mAHD at the eastern development edge up to 60 mAHD at the western interface with Waterford Tamborine Road.

As illustrated in Figure 2, the northern portion of the subject site drains in a southward direction from the powerline easement to a broad shallow gully running eastward through the site. This also captures a 15 ha external catchment from west of Waterford Tamborine Road. The southern portion of site is characterised by a low ridgeline separating the gully described above and the main ephemeral waterway forming the western tributary of upper Quinzeh Creek. This waterway extends west under Waterford Tamborine Road and drains the external rural residential catchment through the Yarrabilba site.

2.2.1 Lawful Point of Discharge

The lawful point of discharge for stormwater from Precinct 5A MIBA North is South into the western tributary of Quinzeh Creek as illustrated in Figure 2. This watercourse is a drainage feature under the Water Act (2000) and a moderate risk waterway under the Fisheries Act 1994. This waterway remains within the Yarrabilba site until such time as it discharges north of the site (between Precinct 3A and 3C) near Steele Road approximately 3 km downstream.

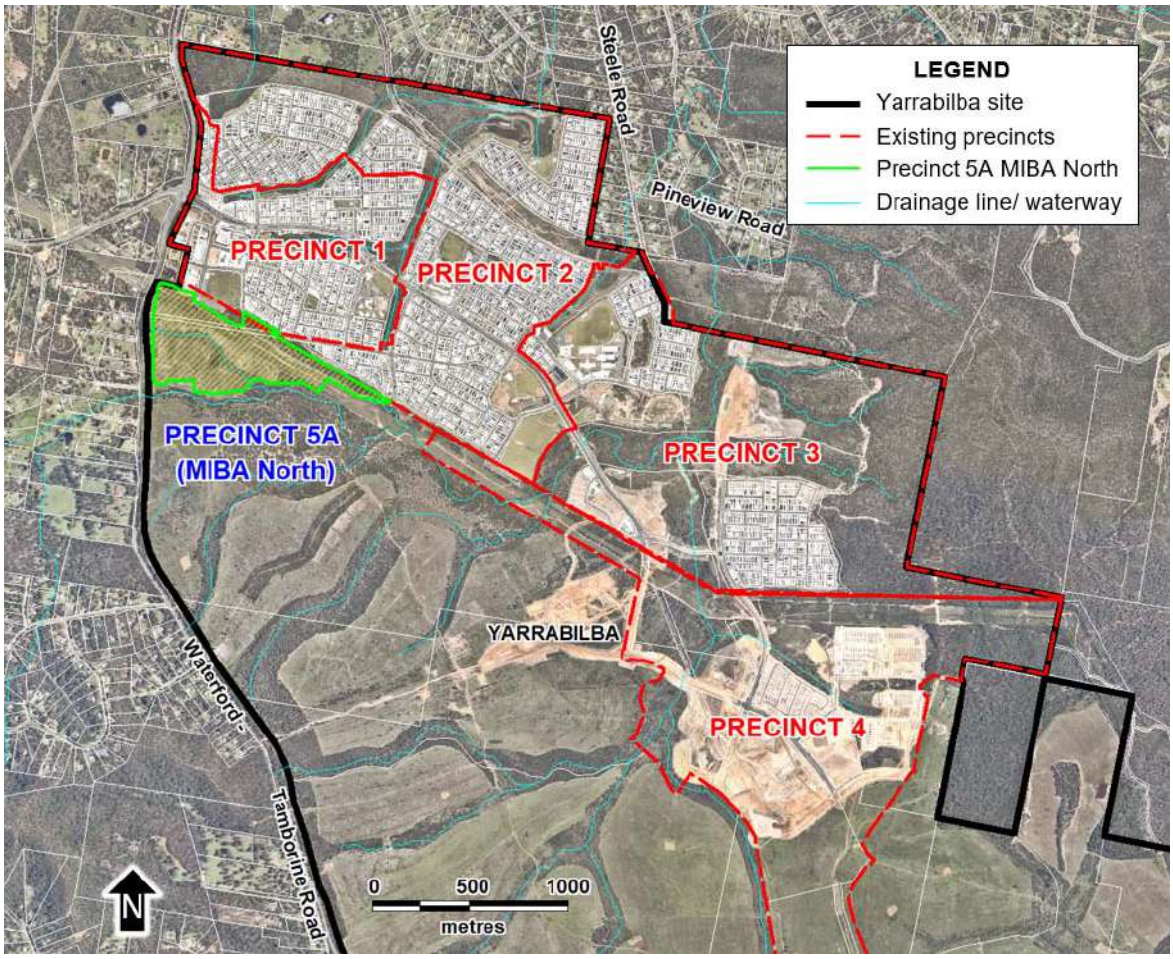


Figure 1: Yarrabilba Precinct 5A MIBA North locality

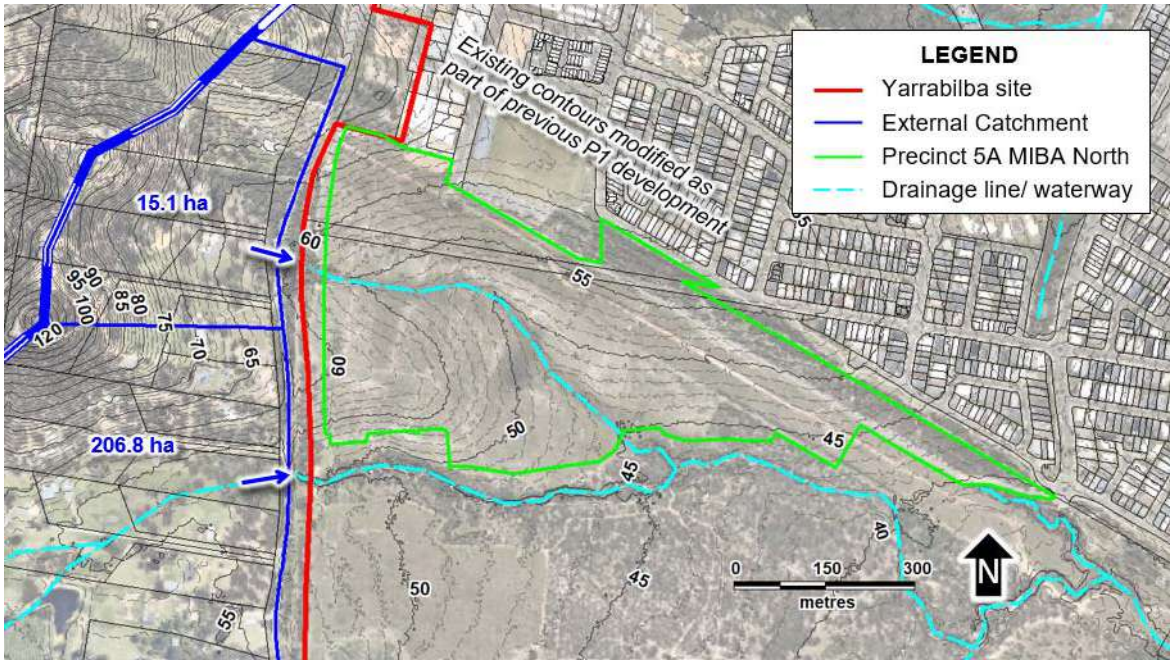


Figure 2: Existing topography, catchments and drainage

2.3 GEOLOGY AND SOILS

Geological mapping indicates Precinct 5A is located across two geological units:

- Woogaroo sub-group (RJbw)
- Alluvium (Qa)

Broad scale geotechnical investigations completed across the site (Bowler, 2004) indicate subsurface soils are typically sands overlying silty clays and weathered sandstones. The soil conditions for much of Precinct 5A MIBA are not expected to vary significantly from those encountered in the balance of Precinct 3 and 4 previously (i.e. those within the lower slope development zones). The alluvium zones (southern edge of P5 MIBA north) have often displayed deep sand zones in localised areas of previous precincts where historic channel/creek incisions have been filled with sediment eroded from upslope catchments. Further site specific geotechnical investigations will occur within Precinct 5A MIBA North to confirm soil conditions for civil engineering design.

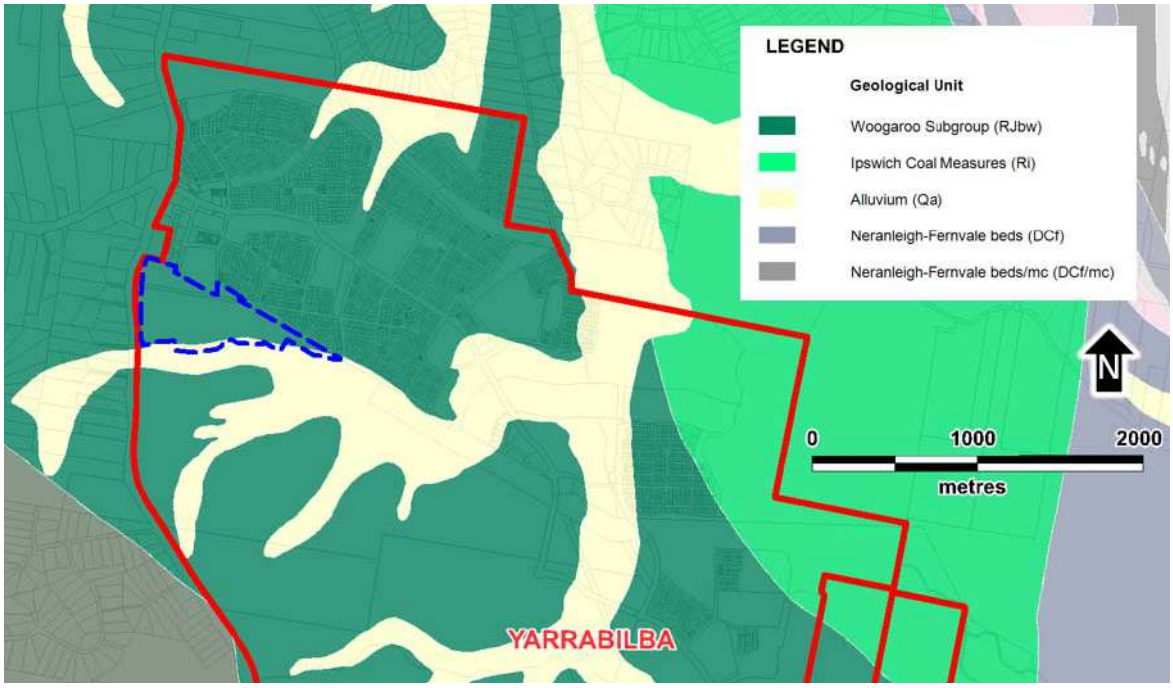


Figure 3: Geology and soils

2.4 VEGETATION

The majority of the Yarrabilba site was previously pine plantation, with most vegetation associated with grassland or pine and eucalypt/acacia regrowth of limited ecological value. Historical aerial imagery illustrates grassland and pine areas represent roughly 80% of the existing land use across the Yarrabilba site, which have subsequently been covered with regrowth. Moderate to dense vegetation generally occurs along drainage lines in the development area.

Vegetation management will generally be undertaken in accordance with *Yarrabilba Development: Natural Environment Site Strategy* (Natura Consulting, 2012) which

highlights vegetation management procedures with regards to clearing approvals, revegetation, monitoring/compliance and design requirements. Strategy 14 in the CPAS provides the individual mapping for waterway, flora and fauna constraints as well as bushfire setbacks for the Precinct 5A MIBA North development.

2.5 WATERWAYS

There are no mapped waterways within Precinct 5A MIBA north boundary that are to be retained. The existing drainage line through the centre of the site (Figure 2) has been reviewed by Natura Pacific and not deemed a waterway for the purpose of ecological protection, buffering or rehabilitation as it was primarily a drainage overland path dominated by exotic pine (*Pinus elliottii*) and lantana (*Lantana camara*). These weeds were subsequently cleared as part of land management practices between 2017 and 2019. As part of development, this drainage (largely from external catchment west of Waterford Tamborine Road) is to be diverted south along the western boundary of the development via an open grassed drain towards the main waterway. Ultimately, this will be formalised further as part of the future Waterford Tamborine Road realignment and upgrade (currently in planning and design phase). This is discussed further in Section 4.

The main waterway (western tributary of upper Quinzeh Creek) lies south of and outside the Precinct 5A MIBA North boundary and while not forming part of this development application, has been included in the site planning for the purpose of waterway setbacks. A detailed survey was undertaken for this waterway and vegetation in order to assign the minimum waterway buffers set out in the *Stormwater Infrastructure Master Plan* (DesignFlow, 2021). In conjunction with existing vegetation and bushfire considerations, the development extent has been defined outside this waterway corridor.

As described in the approved CPAS, no part of MIBA North extends into the retained waterway (or buffers) to the south so no further assessment or reporting of waterway management will be mased in this report. It does, however, acknowledge the future rehabilitation works that need to be managed as part of the subsequent expansion of the MIBA area to the south. The overall condition of this waterway is generally rated as 'poor' in the *Yarrabilba General Waterway Condition Assessment* (DesignFlow, 2021) and future rehabilitation will be critical to the improvement of this waterway for long term ecological and geomorphological benefits.

2.6 PROPOSED DEVELOPMENT

The proposed development includes lots, roads and drainage reserve to support mixed industry and business land use. The precinct boundary also includes an existing major powerline easement traversing the northern extent. The total precinct covers 31.3 hectares including approximately 14 hectares of lots, 4 hectares of roads, 1.3 hectares stormwater treatment and the balance 12 hectares of powerline easement. The precinct layout is shown in Figure 4.

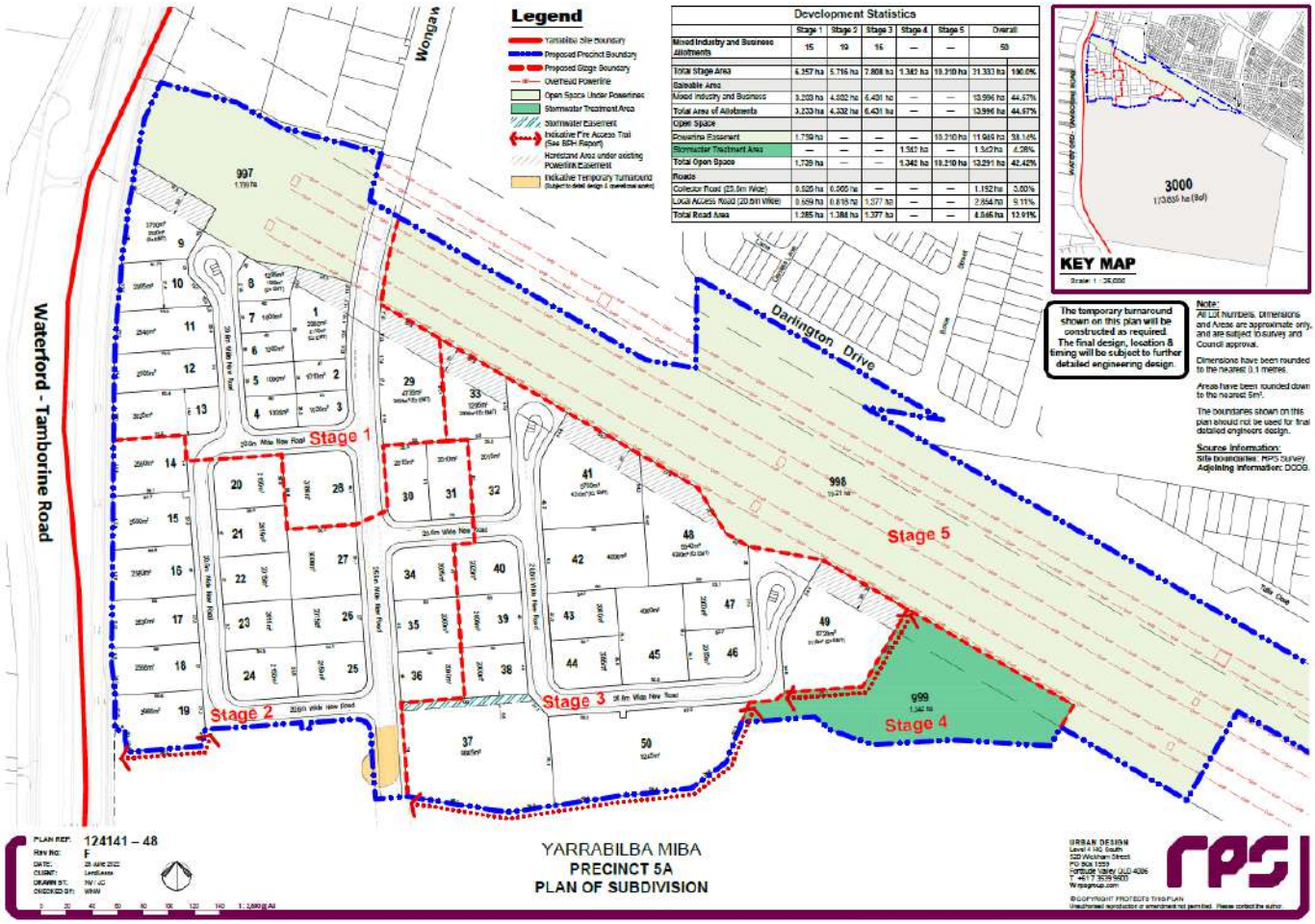


Figure 4: Precinct 5A MIBA North proposed layout (RPS)

3 STORMWATER QUALITY

3.1 DESIGN OBJECTIVES

The stormwater quality management objectives that apply to the operational phase of Yarrabilba Precinct 5A are listed in Table 5 as defined by *the Yarrabilba – Stormwater Infrastructure Master Plan* (DesignFlow, 2021), which are consistent with the State Planning Policy (DSDIP, 2017).

These objectives require the reduction of pollutant loads discharged from the development site once all construction works are complete. These load reductions are aimed at protecting the environmental values of downstream receiving waterways from the impacts of urban stormwater runoff.

Table 1: Stormwater quality objectives

Pollutant	Discharge criteria (% reduction in mean annual load)
Total suspended solids (TSS)	80%
Total phosphorous (TP)	60%
Total nitrogen (TN)	45%
Gross pollutants (GP)	90%

3.2 STORMWATER QUALITY MANAGEMENT STRATEGY

A stormwater management strategy has been developed for Precinct 5A MIBA north based on a review of the site characteristics, constraints, masterplan for the proposed development zones and discussions with Lendlease. The proposed strategy has been developed in collaboration with the design team to ensure the proposed strategy is well integrated with both engineering and landscape aspects of the design.

When developing the treatment strategy, a number of guiding principles were considered:

- Adopt multiple use open space principles where possible
- Locate treatments in waterway buffer zones, where applicable, as per *Yarrabilba – Stormwater Infrastructure Master Plan* (DesignFlow, 2021) and the *MIBA North Context Plan Area Strategy* (RPS, 2021).
- Adopt similar treatment philosophy as per Precinct 1, 2 and 3 developments to retain consistency across the development
- Integrate with landscape outcomes
- Minimise the impact on existing vegetation and adjacent aquatic ecosystems

Being a comparatively small and contained local catchment, the stormwater quality strategy relies on a single end-of-pipe treatment system capturing the majority of the developed parts of the precinct. Secondary to this is the drainage management of the northern powerline easement interface (undeveloped zone requiring clean water diversion around site) and the western interface with Waterford Tamborine Road (future road upgrade corridor by the Department of Transport and Mian Roads (DTMR). A very minor area of road at the southern boundary will discharge untreated in the short-term until future precinct expansion to the south occurs at which time this catchment will drain to future treatment areas.

Figure 5 shows the overall proposed treatment strategy for Precinct 5A with details of treatment provided in Table 2 and the relevant flood immunity provided in Table 3. Further details of performance assessments of the proposed treatment strategy are presented in Section 6.3.

Table 2: Stormwater treatment elements

Treatment Type and ID	Size	Catchments	Comment
Sediment Pond 5A1	350m²	5A1	Inlet pond to Bioretention basins 5A2 and 5A3
Bioretention Basins 5A2 - 5A3	2 x 800m²	5A1	Split inflow to each basin from sediment pond
Swale 1A	Varies	1A, E1, E2	Manages part of existing Precinct 1 plus diverts easement runoff around development

The concept design for the sediment pond and bioretention basins has been documented in the functional design plans by KN Group (Appendix A). Key design parameters are summarised in Table 3. These are subject to detailed design as part of operational works.

Table 3: Stormwater treatment basins concept design levels summary

	Design Level (mAHD)
Sediment pond (NWL)	45.6
Bioretention surface	45.5
Embankment (external)	46.5 (min.)
1% AEP Flood level (adjacent waterway)	44.0 (approx.)

Notes:
NWL = Normal water level

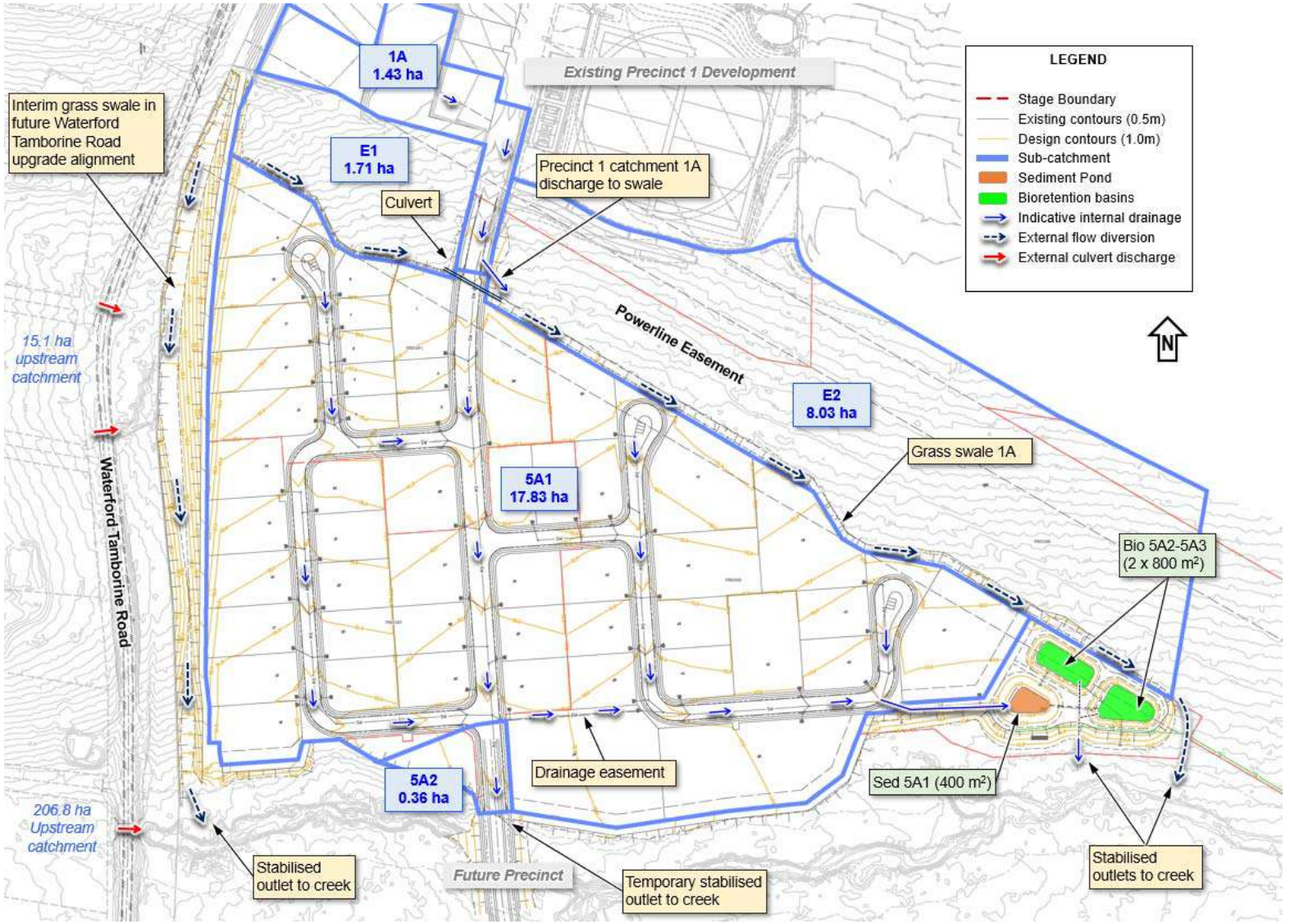


Figure 5: Precinct 5A MIBA North stormwater quality management strategy

3.3 STORMWATER QUALITY ASSESSMENT

MUSIC modelling was conducted to assess the stormwater treatment performance of the proposed treatment strategy. MUSIC Version 6.3 was used for the assessments.

3.3.1 Model Structure

The structure of the MUSIC model is shown in Figure 6 with the general data provided in Table 4.

MUSIC model parameters were adopted generally in accordance with the *MUSIC Modelling Guidelines* (Water by Design, 2010) using 10 years (1990-2000) of modified Shailer Park meteorological data. Six minute rainfall data and monthly average evapotranspiration data was used. The Shailer Park station was selected for adoption as it is the closest rainfall station to the site with 6 minute data. The rainfall data set was modified to generate a data set closer representing Logan Village rainfall. The Shailer Park 6 minute rainfall was reduced by a factor of 0.849 to produce a rainfall data set with a similar annual total to Logan Village (950mm) for the period considered. Discussion of this was provided in Section 5.1 of the *Precinct 1 Stormwater Management Plan* (DesignFlow, 2011) and has been consistently used in all subsequent applications since that time.

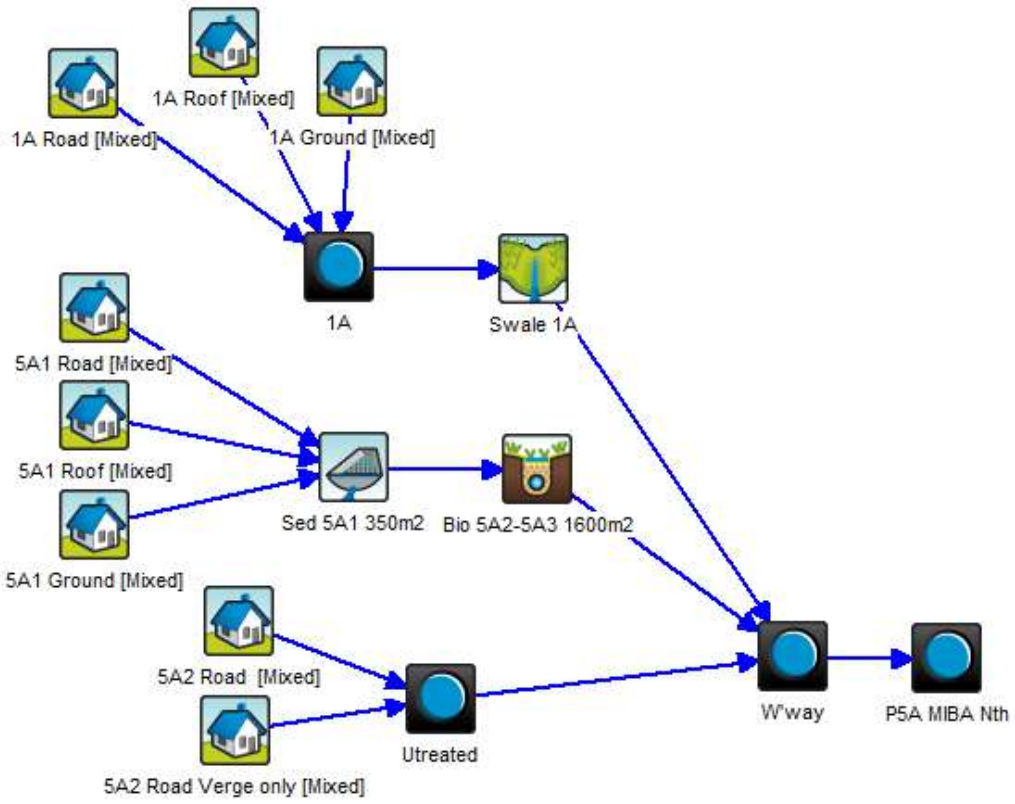


Figure 6: MUSIC model layout

Table 4: MUSIC modelling parameters

Parameter	Value
Source Data	
Rainfall data set	1990-99– Modified Shailer Park Station 040715
Modelled time step	6 minute
Mean annual rainfall 1990-2000	950 mm
Potential evapotranspiration	1,446 mm
Soil properties (runoff generation parameters)	Table 3.7 Music Modelling Guidelines (as appropriate depending on land use)
Pollutant concentrations (base flow and storm flow concentration)	Table 3.8 Music Modelling Guidelines (as appropriate depending on land use)
Percent impervious	Table 3.5 and 3.6 Music Modelling Guidelines (as appropriate depending on land use)
Treatment Devices	
Bioretention	Filter media depth = 0.6 m Extended detention depth = 0.3 m Extended detention area = Bio + sed pond Seepage = 0 mm/hr TN content 400 mg/kg Orthophosphate content 30mg/kg
Sediment Basin	Extended detention depth (EDD) = 0.01 m (extended detention area included in bio basin – see above) Evaporative loss 75% of PET Notional detention time = <0.1hr (upstream of bio)
Swale	Length = 100m [1] Slope = 2% Base width = 5m Top width = 8m Depth = 0.5m Vegetation height = 50mm (assume mowed)

Notes:

1. Actual swale length is in the order of 580m, however combined site objectives (excluding easement catchment) can be readily achieved with a swale length of 100m so this is used for conservative modelling.

3.3.2 Assumptions

1. Water quality management measures are sized only for the portion of each catchment undergoing development (i.e. excludes undeveloped/revegetated powerline easement)

2. While the combined catchments of 1A, E1 and E2 discharge via a grassed swale approximately 580m in length, a conservative modelling approach has adopted only developed catchment 1A discharging into a 100m section of swale to illustrate more than adequate swale length exists. If the full easement catchment was included (as a developed source load) discharging to the full swale length (or even 50% of swale given distributed inflow), overall pollutant load reductions would be higher than reported in Section 3.3.4 below. This approach therefore remains conservative at this concept design phase.

3. A split catchment approach was adopted for industrial areas. Split land use percent imperviousness is generally in accordance with Table 3.5 in MUSIC Modelling Guidelines (Water by Design, 2010/2019) with ground level imperviousness adopted as 80% (commercial) as the more conservative approach than industrial.

4. Lot and road reserve areas were measured from development layout with roof area proportion assigned as 65% of lot areas (which equates to approximately 50% of overall catchment area, in line with MUISC Guidelines) and balance as ground level (see item 3 above). This is conservative for the purpose of initial assessment. Where roof areas are lower (and correspondingly impervious ground areas are higher), treatment performance will improve from that reported in Section 3.3.4 below.

5. Bioretention default values for TN and OP content have been adopted as 400mg/kg and 30mg/kg respectively as per Water by Design advice (and in line with MUSIC Guideline 2019)

6. Sediment ponds have been modelled with large unrestricted outlet to bioretention (i.e. inlet zone to bioretention basins). Extended detention (ED) area for bioretention therefore includes area of sediment pond (with sediment pond ED depth set to minimum depth of 0.01m)

3.3.3 Catchment Data

The catchment areas draining to each treatment system have been derived from the urban design and drainage layouts for sub-stages where available. Table 2 previously identified catchments areas contributing to each treatment element. Table 5 below lists the catchment area, land use and percent impervious for each sub-catchment modelled with the detailed breakdown of surface types. Catchment E1 and E2 are identified below but excluded from MUSIC source catchment as these are not undergoing development. They do however discharge to Swale 1A as discussed previously in Section 3.3.2.

Table 5: MUSIC model catchment split data

Catchment ID	Total Area (ha)	Surface Type	Sub-Area (ha)	Impervious %
5A1	17.83	Road	3.84	75%
		Roof	9.09	100%
		Ground	4.90	80%
5A2	0.36	Road	0.18	75%
		Verge only	0.18	0%
1A	1.43	Road	0.34	75%
		Roof	0.71	100%
		Ground	0.38	80%
E1 [1]	*1.71*	*Open Space*	1.71	*0%*
E2 [1]	*8.03*	*Open Space*	8.03	*0%*
Total	*29.36*		*29.36*	*57%*

Notes:

1. Catchment E1 and E2 excluded from MUSIC source catchment as these are not undergoing development. They do however discharge to Swale 1A as discussed previously in Section 3.3.2.

3.3.4 Results

The results of the MUSIC modelling are presented in Table 6. All water quality objectives can be readily achieved with the proposed treatment strategy including offset for the minor catchment 5A2 which discharges untreated.

Table 6: MUSIC results

Catchments	Treatment ID	Pollutant	Inflows (kg/yr)	Outflows (kg/yr)	Reduction (%)
5A1	Sed 5A1+Bio 5A2/5A3	TSS	20500	3390	83.5
		TP	48.9	13.2	72.9
		TN	336	163	51.5
		GP	3600	0	100
1A	Swale 1A	TSS	1730	275	84.1
		TP	3.95	1.73	56.3
		TN	27	21.8	19.1
		GP	288	0	100
5A2	No treatment	TSS	956	956	0
		TP	1.55	1.55	0
		TN	4.87	4.87	0
		GP	33.4	33.4	0
Total Precinct 5A MIBA North (✓ denotes compliance with water quality objectives)		TSS	23200	4620	80.1 ✓
		TP	54.4	16.5	69.6 ✓
		TN	368	190	48.4 ✓
		GP	3920	33.4	99.1 ✓

3.4 COMPLIANCE AND CERTIFICATION

Design and construction certification of operational stormwater quality measures is to occur in accordance with the following guidelines:

- Water by Design (2104). *Bioretention Technical Design Guidelines (Version 1.1)* Healthy Waterways Ltd, Brisbane
- Water by Design (2009), Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands, SEQ Healthy Waterways Partnership. Brisbane, Queensland.
- Water by Design (2012), *Transferring Ownership of Vegetated Stormwater Assets Version 1*. Healthy Waterways Partnership. Brisbane, Queensland.

4 STORMWATER QUANTITY

In line with the CPAS prepared for P5 MIBA North, flood management will generally be undertaken in accordance with the *Yarrabilba Development: Flood Risk Management Strategy* (BMTWBM, 2012) (as referenced in the *Yarrabilba – Stormwater Infrastructure Master Plan* (DesignFlow, 2021)) which beneficially exploits the use of the natural terrain and constructed road crossings (over drainage features and watercourses) to attenuate increased runoff from development. It should be noted that flood mitigation infrastructure is not constructed solely for a single stage or precinct, but functions as part of a total site flood management strategy that addresses current and future development precinct requirements. A number of these detention zones have been constructed in Precinct 1, 2 and 3 to date in advance of the urban development within the catchment. No flood management infrastructure is required or proposed as part of the Precinct 5A MIBA North area and no further flood impact assessment is therefore required as part of this stormwater management plan.

A review of the preliminary earthworks design of the proposed development area in relation to local flood levels is provided in Figure 7. This indicates that P5A MIBA North is well above the 1% AEP flood level being conveyed through the western tributary of upper Quinzeh Creek. This is based on the latest available flood model data (with consideration of the future ultimate Waterford Tamborine Road upgrade and drainage) and will be subject to ongoing review as part of the expansion of the master planned developed of Yarrabilba.

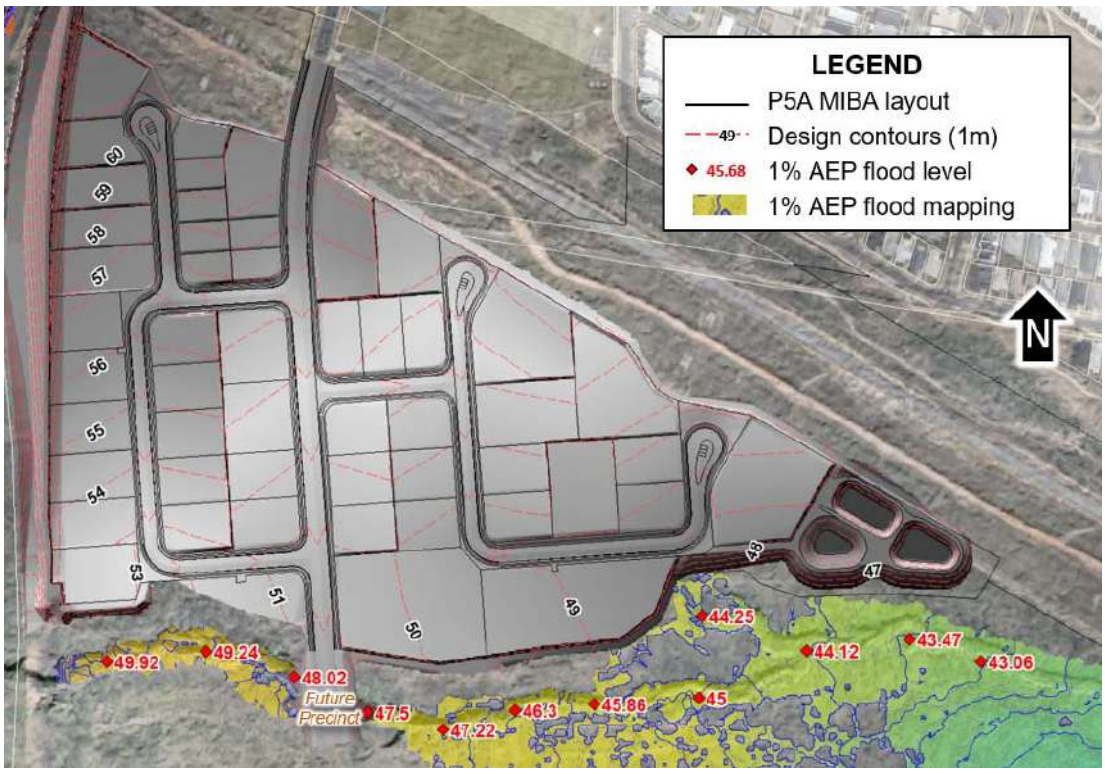


Figure 7: 1% AEP Flood levels and preliminary earthworks

As noted previously in Section 3.2, two key areas exist for drainage management from non-development areas due to the filling of the P5A MIBA north zone to create lots. These drainage diversions are the northern edge of development (power line easement) and western edge (Waterford Tamborine Road).

The northern powerline easement drain simply functions to capture clean water runoff from the vegetated easement corridor as well as a small portion of the existing precinct 1 development immediately north and divert it east around the MIBA development (and stormwater treatment basins) and discharge to the existing waterway. This diversion will comprise a grassed swale combined with stabilised outlet zone interfacing the waterway corridor). Indicative layout and sizing of this swale has been provided on the KN Group functional design drawings in Appendix A.

The western diversion drain will be provided as an interim drain until such time as the Waterford Tamborine Road upgrade/realignment occurs. This drain functions similar to the proposed ultimate road duplication design by capturing all localised crossroad culvert drainage and conveying it south towards the main creek line (western tributary of upper Quinzeh Creek). This drain will have major 1% AEP storm capacity of approximately 5.2 m^3/s to account for current external catchment discharge under Waterford Tamborine Road. This open drain be grassed with localised rock stabilised outlet zone interfacing the waterway corridor.

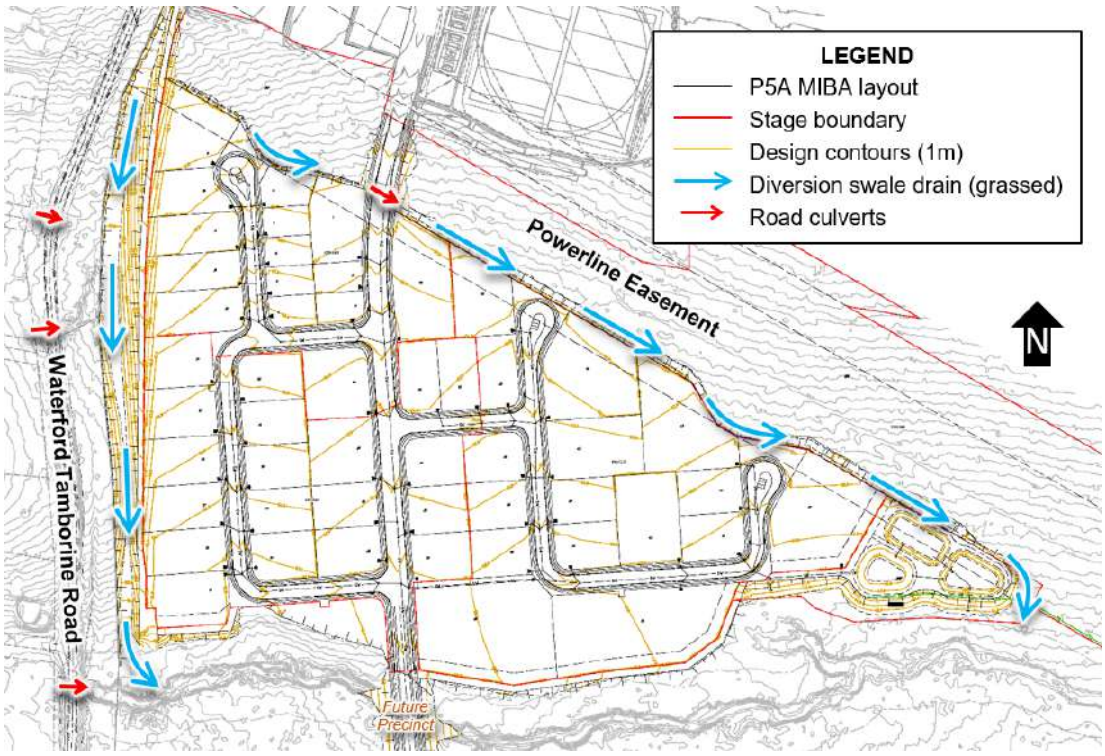


Figure 8: Drainage diversion external to development footprint

5 EROSION AND SEDIMENT CONTROL

5.1 DESIGN OBJECTIVES

The management of stormwater runoff during the construction phase is a critical part of protecting the Yarrabilba waterways and drainage lines. Construction phase design objectives for Precinct 5A are provided in Table 7 which are generally in accordance with the *Yarrabilba – Stormwater Infrastructure Master Plan* (DesignFlow, 2021) and the State Planning Policy (DSDIP, 2017).

Table 7: Construction phase stormwater quality

Issue	Desired outcomes
Drainage control	1. Manage stormwater flows around or through areas of exposed soil to avoid contamination. 2. Manage sheet flows in order to avoid or minimise the generation of rill or gully erosion. 3. Provide stable concentrated flow paths to achieve the construction phase stormwater management design objectives for temporary drainage works (part 2). 4. Provide emergency spillways for sediment basins to achieve the construction phase stormwater management design objectives for emergency spillways on temporary sediment basins (part 3).
Erosion control	1. Stage clearing and construction works to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised* using methods which will achieve effective short-term stabilisation.
Sediment control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500 metres2 must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).
Litter, hydrocarbons and other contaminants	1. Remove gross pollutants and litter. 2. Avoid the release of oil or visible sheen to released waters. 3. Dispose of waste containing contaminants at authorised facilities.
Waterway stability and flood flow management	1. Where measures are required to meet post-construction waterway stability objectives (specified in table B), these are either installed prior to land disturbance and are integrated with erosion and sediment controls, or equivalent alternative measures are implemented during construction. 2. Earthworks and the implementation of erosion and sediment controls are undertaken in ways which ensure flooding characteristics (including stormwater quantity characteristics) external to the development site are not worsened during construction for all events up to and including the 1 in 100 year ARI (1% AEP).

*Note: An effectively stabilised surface is defined as one that does not, or is not likely to result in visible evidence of soil loss caused by sheet, rill or gully erosion or lead to sedimentation water contamination.

5.2 MANAGEMENT STRATEGY

5.2.1 Local Erosion and Sediment Control

Erosion and sediment control (ESC) will occur on a development stage by stage basis in accordance with *Best Practice Erosion and Sediment Control* (IECA, 2008) to achieve the objectives listed in Table 1. This will involve a combination of:

- Erosion control - Ensuring that all exposed surfaces are stabilised as soon as possible and that erosion of un-stabilised areas of works are minimised
- Drainage control - Ensuring that provision is made to control all on site runoff to designated treatment areas and to enable appropriate bypass of external flows which do not require treatment
- Sediment capture - Ensuring that mobilised sediment is captured through a combination of source controls such as silt fences and appropriately designed sediment basins. Where possible sediment basins for construction will be located within the voids required for the future stormwater quality treatment systems (sediment basins, bioretention basins, wetlands etc.).

The details of the local erosion and sediment controls for each stage of development are not provided in this report given the high level nature of the document. However, prior to any works commencing on a particular development stage in Precinct 5A MIBA North, a site specific Erosion and Sediment Control Plan (E&SCP) will be documented for the development stage in question prior to works starting. This will occur as part of the operational works application but can be adjusted by the contractor and site supervisor prior to commencement of construction provided the E&SCP complies with Best Practice Erosion and Sediment Control (IECA, 2008) and delivers the objectives listed previously in Table 7.

A current bulk earthworks application has occurred across the subject site to enable the placement of fill from another works precinct. To support this, an existing Erosion and Sediment Control Strategy (ESCS) was prepared and is provided in Appendix B. This strategy will continue to be implemented as part of ongoing bulk earthworks works (with detailed works specific erosion and sediment control plans to be prepared and periodically updated by the principal contractor in line with works program). Extracts from the existing and ultimate levels earthworks and ESC approach are provided in Figure 9 and Figure 10 respectively.

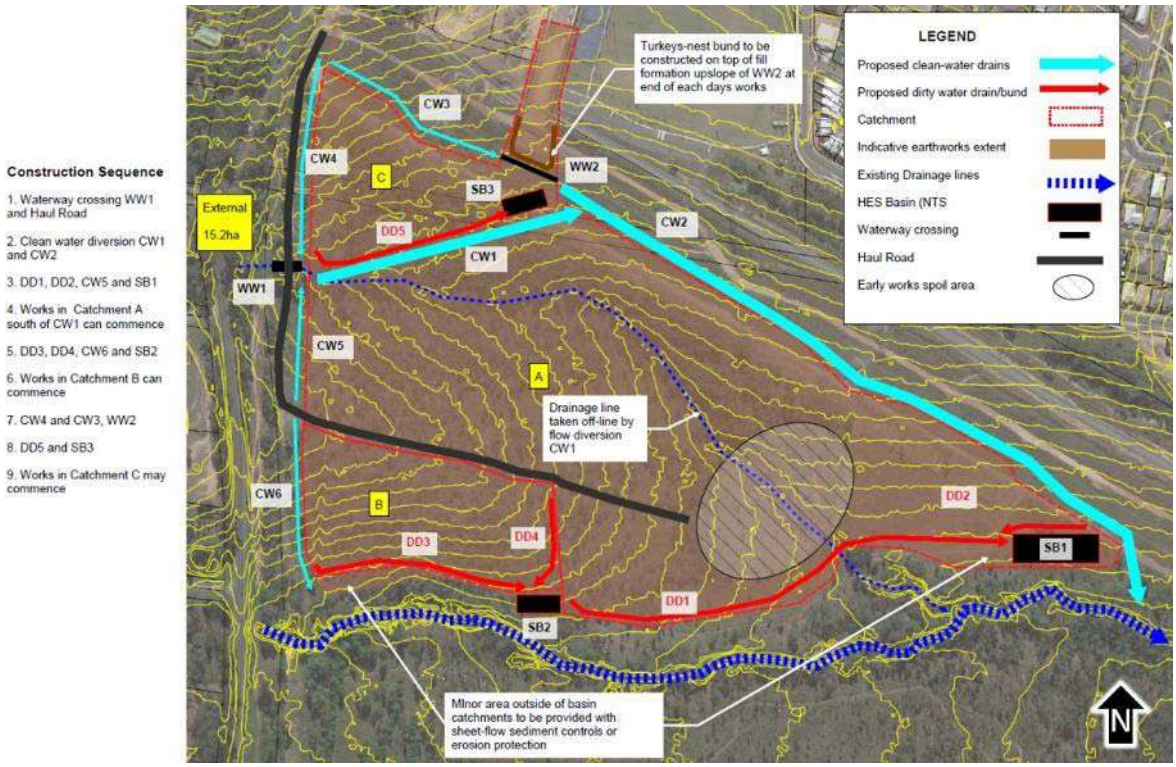


Figure 9: ESC strategy – existing levels

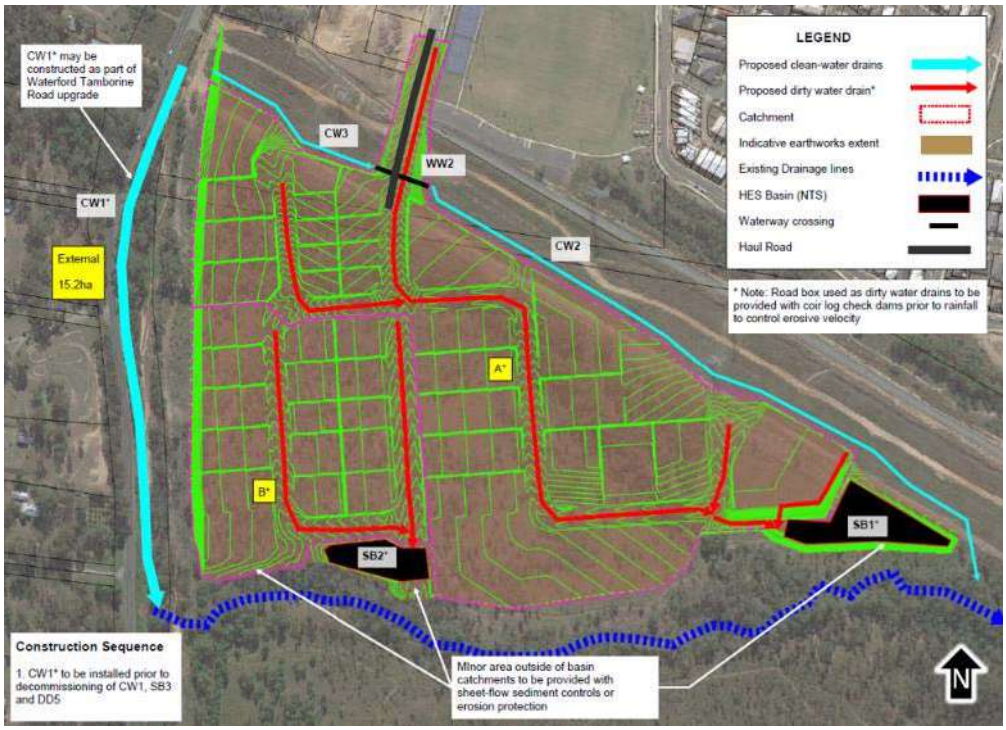


Figure 10: ESC Strategy – final levels

5.2.2 High Efficiency Sediment (HES) Basins

Given the importance of managing construction runoff into the waterways downstream of Yarrabilba and the potential impact on the ecology and residents, HES sediment basins are being strategically adopted (where practical) across Precinct 5A MIBA North. HES basins offer an improved technology for construction sediment management which essentially converts batch sediment basins into continuous flow treatment systems that respond in real time to storm events. The design sought to be achieved by HES basins that ensures at least 80% of the average annual runoff volume treated to 50mg/L TSS or less

The HES basin essentially comprises:

- Flocculent dosing system
- Inlet zone for mixing, flow distribution and efficient removal of coarse sediment
- Settling basin
- Outlet(s)

Implementation of HES basins have the potential to significantly reduce the fine and dispersive sediment load discharge from the site by a further 50% compared to traditional batch sediment basins.

5.3 MONITORING AND AUDITING

5.3.1 Principal Contractor

Site inspections and monitoring are to be undertaken by the principal contractor in accordance with Sections 6.17 and 7.4 of *the Best Practice Erosion and Sediment Control Document* (IECA, 2008) as detailed below. Best practice site management requires all ESC measures to be inspected at the following frequencies and include the following checks as a minimum:

Daily site inspections (during rainfall):

- All drainage, erosion and sediment control measures
- Occurrences of excessive sediment deposition (whether on-site or off-site)
- All site discharge points (including dewatering activities as appropriate)

Weekly site inspections (even if work is not occurring on-site)

- All drainage, erosion and sediment control measures
- Occurrences of excessive sediment deposition (whether on-site or off-site)
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements
- Litter and waste receptors
- Oil, fuel and chemical storage facilities

Prior to anticipated runoff producing rainfall (within 24 hours of expected rainfall)

- All drainage, erosion and sediment control measures
- All temporary flow diversion and drainage works

Following runoff producing rainfall (within 18 hours of rainfall event)

- All drainage, erosion and sediment control measures
- Occurrences of excessive sediment deposition (whether on-site or off-site)
- Occurrences of construction materials, litter or sediment placed, deposited, washed or blown from the site, including deposition by vehicular movements

5.3.2 CPESC Compliance Audits

The ESC measures implemented at the site are proposed to be inspected on a bi-monthly to quarterly basis by a CPESC (Certified Professional in Erosion and Sediment Control) who is independent of the principal contractor and an audit report kept on file. The purpose of the audits to is to ensure the developer and the contractors are meeting their obligations for ESC under the Environmental Protection Act (EP Act). The site will be assessed against these requirements in accordance with *Procedural Guideline: Standard work method for the assessment of the lawfulness of releases to waters from construction sites in South East Queensland EM1135* (DEHP, 2011).

The compliance audits will involve:

- Site inspection with the contractors to assess ESC actions on the site against the ESC plans and the requirements of EP Act and DEHP Procedural Guideline.
- Identifying non-compliances on the site, photographing and recording these for reporting.
- Where the rectification action is simple, these will be recorded and verbally communicated to the contractor for action.
- Review of any water quality and rainfall information for the site
- Compilation of a ESC Audit report which:
    - Identifies the ESC obligations
    - ESC issue and non-compliances
    - Actions (simple) to be taken to rectify the issues and non-compliances.

The triggers for inspections and reporting by the CPESC are as follows:

- Prior to the commencement of clearing works in each catchment
- Prior to the commencement of bulk earthworks;
- Prior to the commencement of civil works; and
- At regular monthly intervals during works.

6 CONCLUSION

A stormwater management strategy for Yarrabilba Precinct 5A MIBA North development has been prepared to meet the requirements of the Yarrabilba Stormwater Infrastructure Master Plan (DesignFlow, 2021) and Precinct 5A Context Plan Area Strategy.

The strategy includes a range of treatment measures including sediment ponds, bioretention systems and swales that integrate with the local urban and natural environment to ensure the stormwater quality objectives are achieved for the overall precinct while providing protection or enhancement to the local waterways and amenity. Sufficient space has been allowed for in the development layout for the stormwater treatment measures which have been verified via preliminary earthworks plans. Site design has also ensured all development lots are above the local 1% AEP flood level and provided with adequate flow conveyance drains for external catchment discharge.

Setback to local waterway and vegetation corridors have guided the development layout with due consideration for future development expansion and waterway rehabilitation to the south of the subject site.

Construction phase stormwater management objectives have been established for the site, in accordance with State Planning Policy (DSDIP, 2017). The preliminary locations of sediment basins have been provided with an Erosion and Sediment Control strategy to be developed as part of detailed design for operational works. Audits will be completed during construction to ensure compliance with State Planning Policy and Environment Protection Act.

7 REFERENCES

DesignFlow (2021) *Yarrabilba Total Water Cycle Management Strategy*

DesignFlow (2021) *Yarrabilba Stormwater Infrastructure Master Plan*

DesignFlow (2021) *Yarrabilba General Waterway Condition Assessment*

DesignFlow (2017) *Yarrabilba (Quinzeh Creek) Flood Study - Version 1*

DSDIP (2017) *State Planning Policy*

Lendlease (2021) *Yarrabilba MIBA North Context Planning Area Strategy – Precinct 2A & Part of Precinct 5*

Natura Consulting (2012) *Yarrabilba Development: Natural Environment Site Strategy*

Natura Consulting (2012) *Natural Environment Site Strategy (NESS)*

Water by Design (2010). *MUSIC Modelling Guidelines. SEQ Healthy Waterways Partnership.*

APPENDIX A FUNCTIONAL DESIGN PLANS



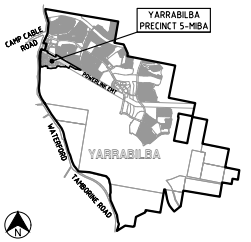
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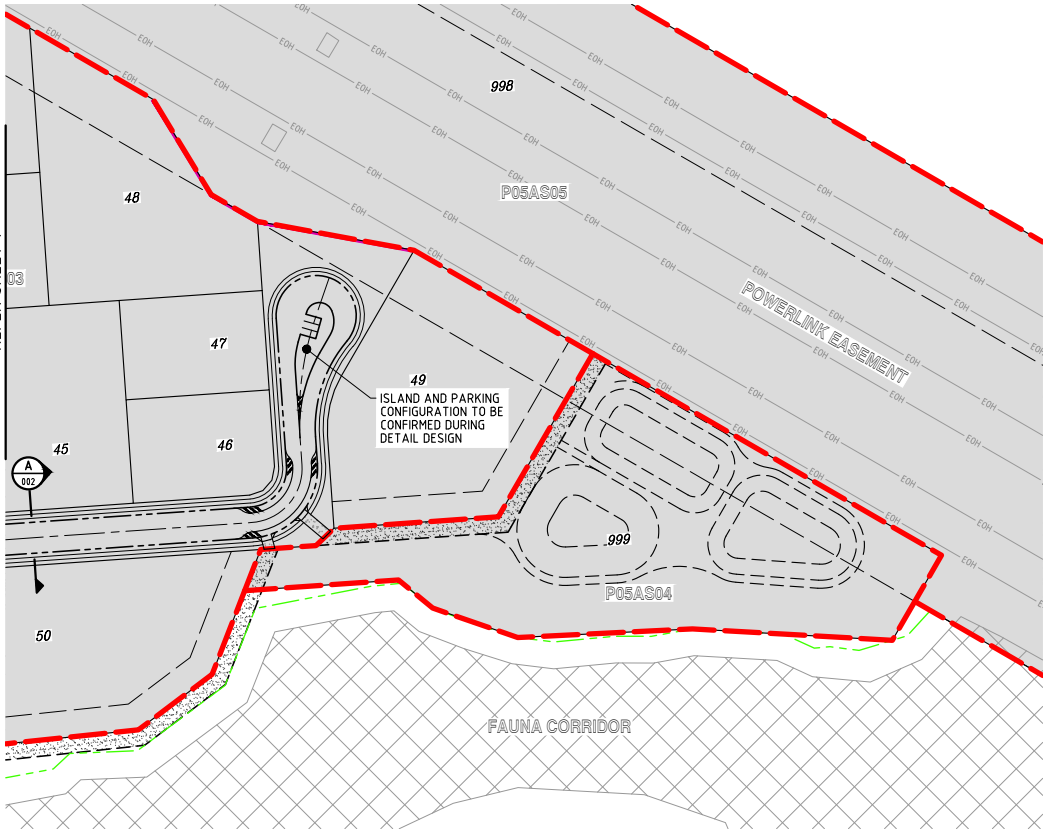
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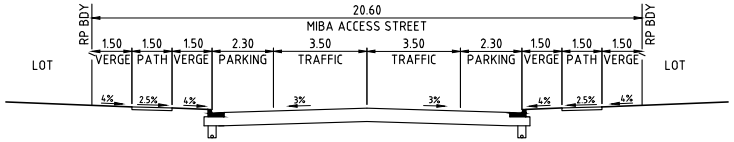
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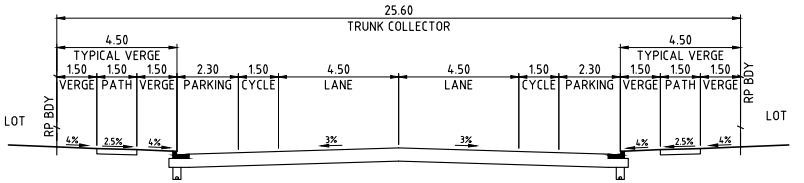
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- EOH — EXISTING ELECTRICAL OVERHEAD
- FAUNA OFFSET
- ENVIRONMENTAL DRIPLINE
- FIRE ACCESS TRACK (GRAVEL)



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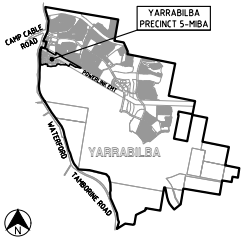
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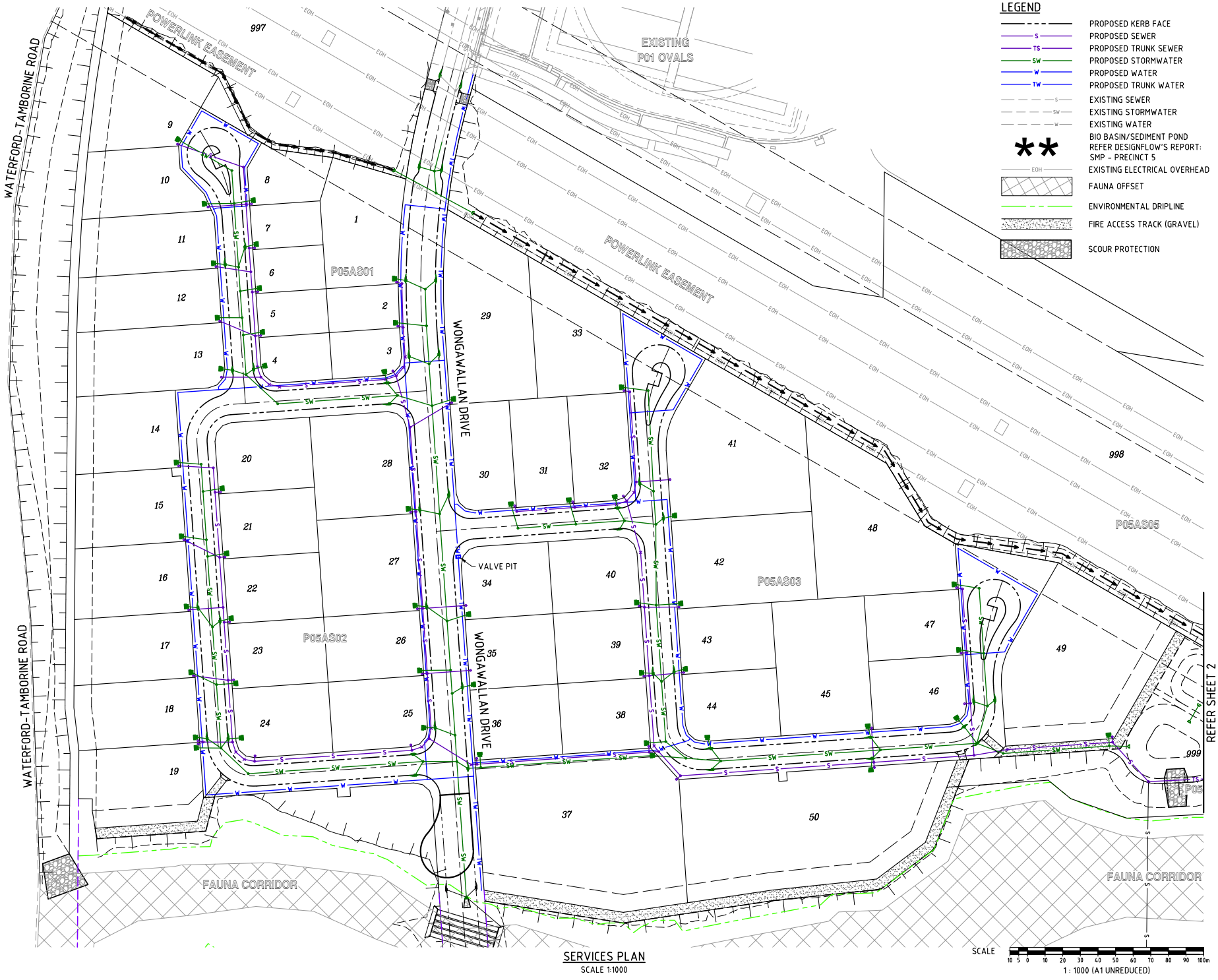
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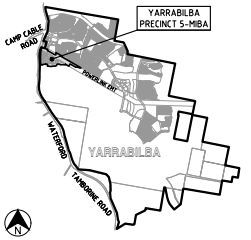
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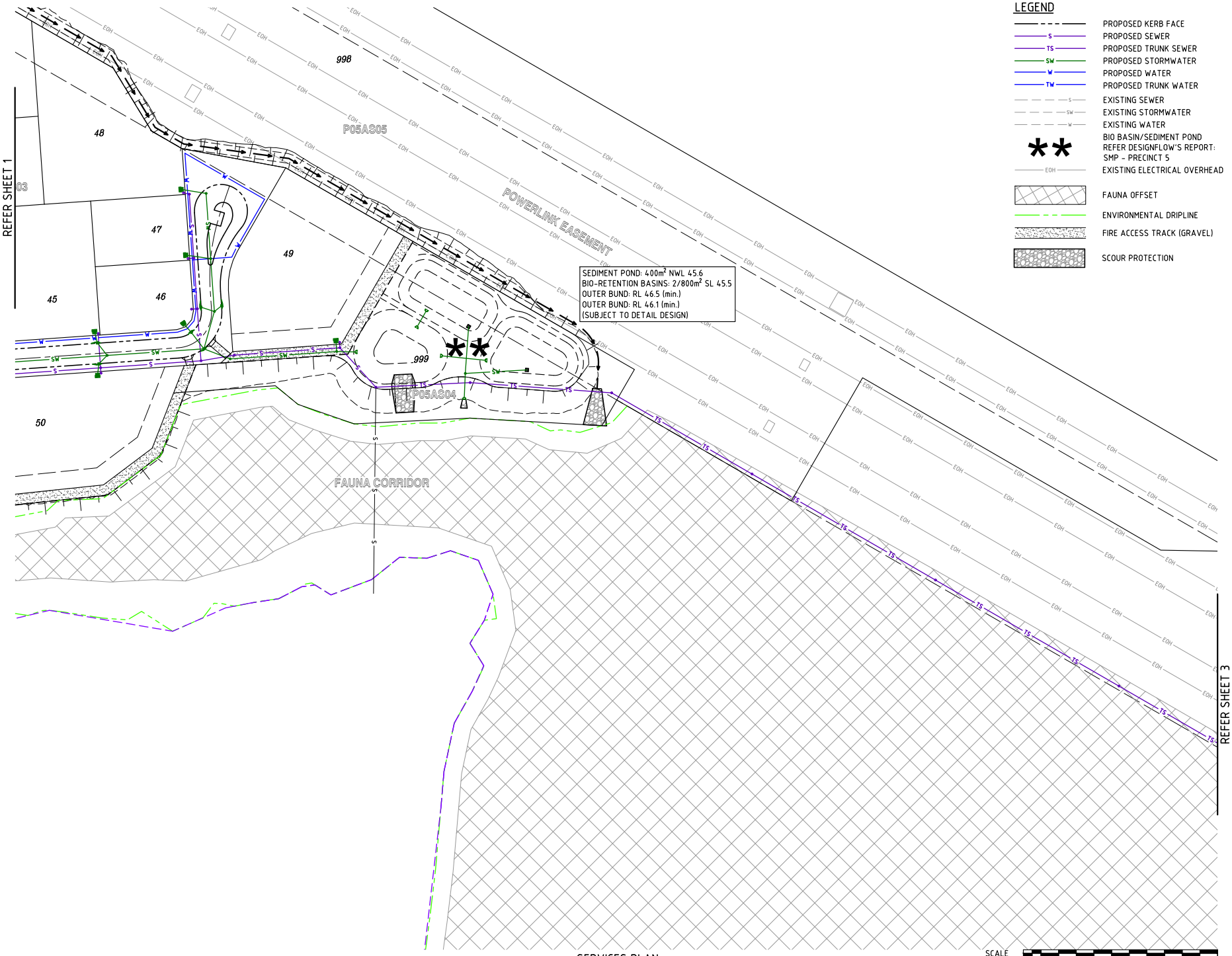
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- PROPOSED STORMWATER
- PROPOSED WATER
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- EXISTING STORMWATER
- EXISTING WATER
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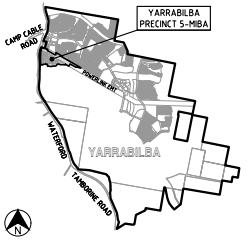
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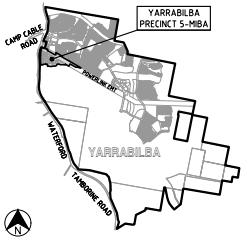


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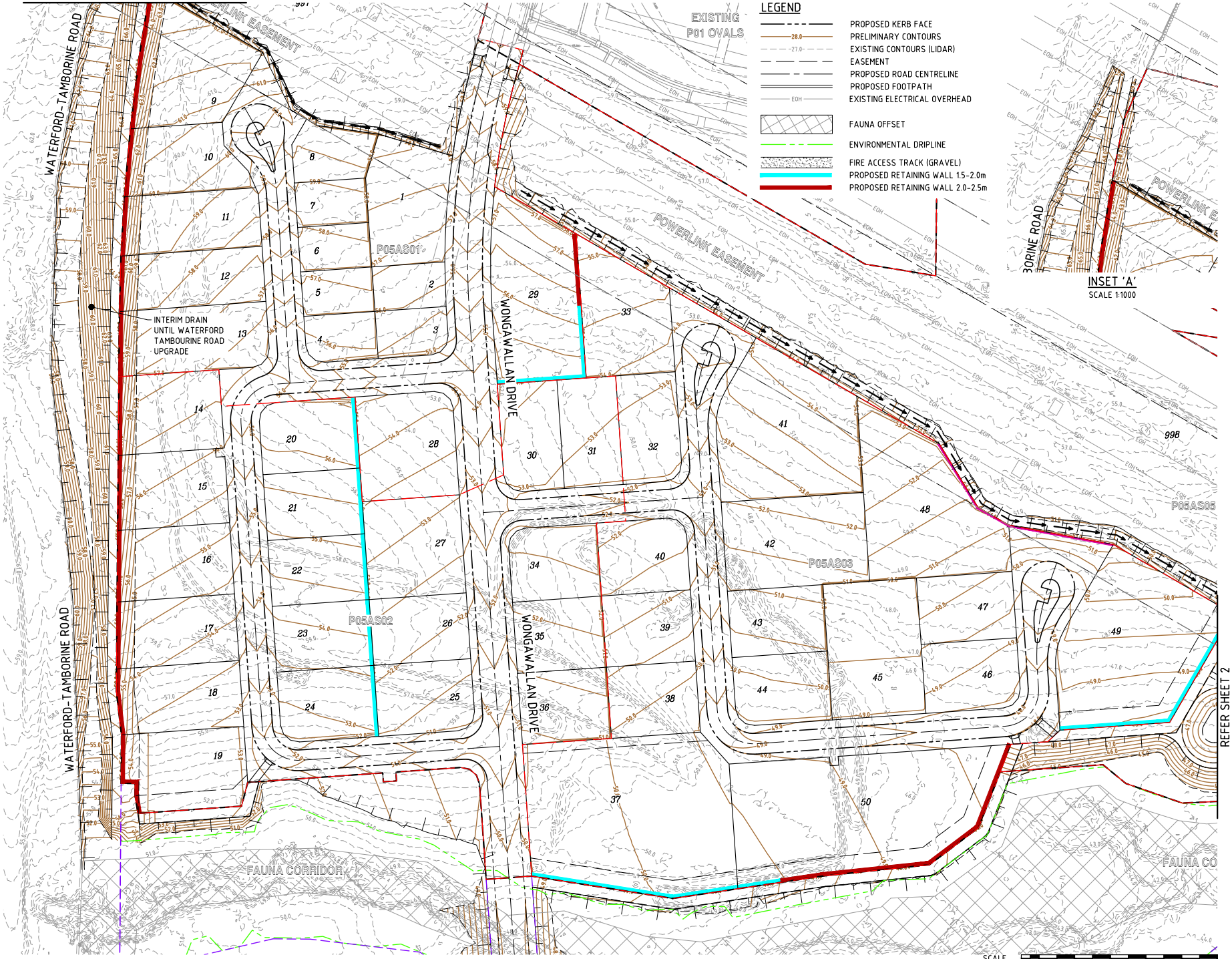
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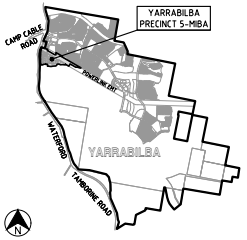
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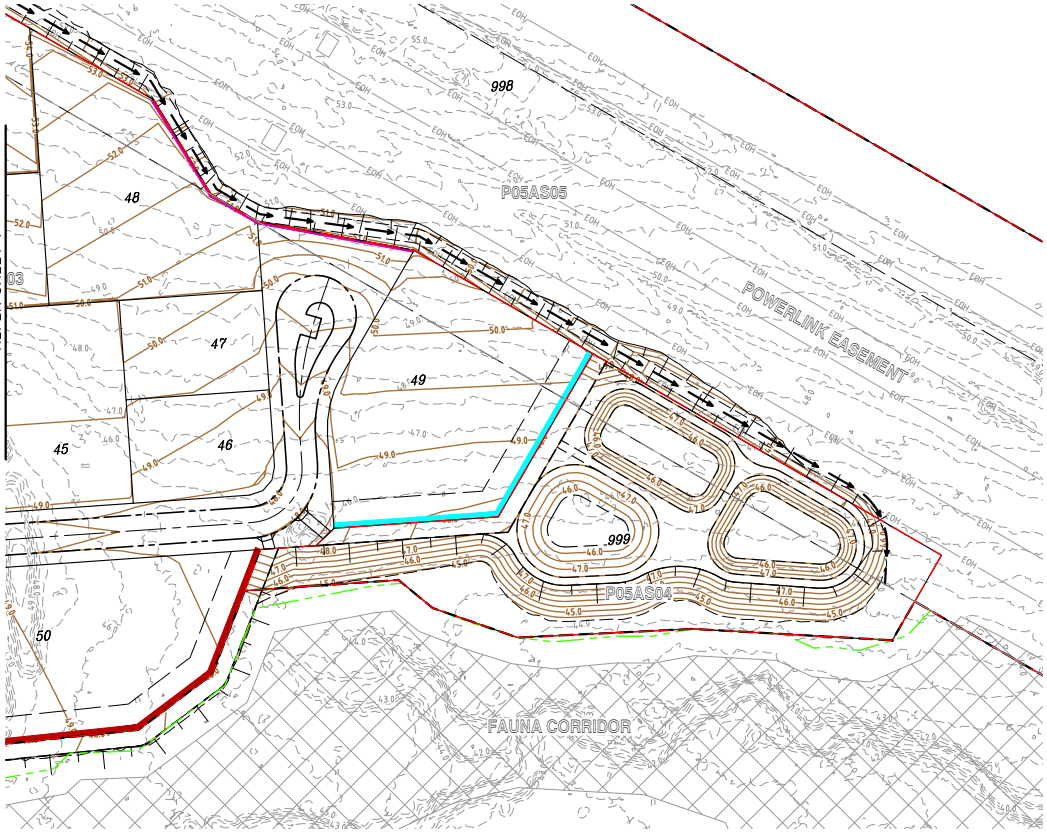
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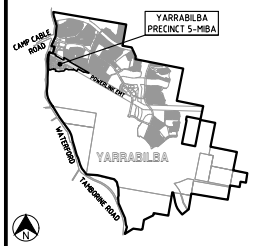
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- FAUNA OFFSET
- ENVIRONMENTAL DRIPLINE
- FIRE ACCESS TRACK (GRAVEL)
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APPENDIX B EROSION AND SEDIMENT CONTROL STRATEGY (BEW)

YARRABILBA
PRECINCT 5 MIBA NORTH
EROSION AND SEDIMENT CONTROL STRATEGY

VERSION 1

DesignFlow

Prepared for Lendlease
October 2021

Document Control Sheet

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Table of Contents

1 INTRODUCTION 1
1.1 SCOPE AND FRAMEWORK 1
1.2 PROPOSED DEVELOPMENT 1
2 SITE CHARACTERISTICS 3
2.1 TOPOGRAPHY, CATCHMENTS AND DRAINAGE 3
2.2 SOILS 3
2.3 CLIMATE 6
2.4 FLOODING 7
3 DESIGN OBJECTIVES 8
4 EROSION AND SEDIMENT CONTROL STRATEGY 12
4.1 STRATEGIES FOR SPECIFIC SITE SUB-CATCHMENTS 12
4.2 EXISTING LEVELS 12
4.3 FINAL LEVELS 14
4.4 EROSION CONTROL 14
4.5 DRAINAGE CONTROL 16
4.6 SEDIMENT CONTROL 18
4.7 RIPARIAN WORKS 19
4.8 CONSTRUCTION SEQUENCE 20
5 MONITORING 21
6 REFERENCES 22
APPENDIX A HES BASIN SIZING CALCULATIONS A-2
APPENDIX B STANDARD DRAWINGS B-1

List of Tables

Table 1: Construction Phase Stormwater Design Objectives 8
Table 2: Construction Phase Stormwater Design Objectives for temporary drainage works . 9
Table 3: Construction Phase Stormwater Design Objectives for emergency spillways on temporary sediment basins 9
Table 4: Erosion risk by time of year 14
Table 5: Erosion performance targets and example methods 16
Table 6: Preliminary Type-B HES Basin Properties 18

List of Figures

Figure 1: Site locality 2
Figure 2: Bulk earthworks extent 2
Figure 3: Bulk earthworks sub-catchments – existing levels 4
Figure 4: Bulk earthworks sub-catchments – final levels 5
Figure 5: Rainfall Statistics 6
Figure 6: 1% AEP flood extent (DesignFlow, 2020) 7
Figure 7: Conceptual High-Efficiency Sediment (HES) Basin Type-B Functional Layout 10
Figure 8: Strategy Elements (Existing Levels) 13
Figure 9: Strategy Elements (Final Levels) 15

1 INTRODUCTION

1.1 SCOPE AND FRAMEWORK

MIBA North is located immediately south of the existing powerline easement and immediately west of Waterford Tamborine Road within the Yarrabilba PDA. The location of the works is shown in Figure 1.

This Erosion and Sediment Control Strategy (ESCS) has been prepared to support a bulk earthworks application over the area and demonstrates how best practice erosion and sediment control will be delivered over the area. Sizing is provided for major controls such as sediment basins and major drainage features. The ESCS will be supported by detailed Erosion and Sediment Control Plans (ESCP's) which will be prepared by the Contractor for individual works areas before works commence and will contain detailed sizing for all components.

This ESCS therefore documents the following:

- Site characteristics and constraints relevant to ESC management
- Design objectives to be achieved by the ESCS and individual ESCPs
- ESC strategy elements for major site catchments, including:
    - location and size of major sediment controls (i.e. basins),
    - key phasing considerations,
    - strategies for riparian works and
    - approaches to revegetation

1.2 PROPOSED DEVELOPMENT

The development layout and ultimate stormwater drainage and treatment strategy is still under development. The earthworks are required at this time in order to commence removal of material from other areas of the Yarrabilba development. Ultimately the MIBA North works will provide a mix of business and industry uses and link to the existing MIBA South development through the extension of Wongawallen Drive.

The works include the filling of an existing drainage line which flows diagonally through the works area and has a catchment which extends west of Waterford Tamborine Road. Temporary diversion of this external catchment is required to facilitate the proposed earthworks, with the ultimate diversion to occur in conjunction with the duplication of Waterford Tamborine Rad.

The extent of earthworks encompassed by this ESCS is shown in Figure 2.



Figure 1: Site locality



Figure 2: Bulk earthworks extent

2 SITE CHARACTERISTICS

2.1 TOPOGRAPHY, CATCHMENTS AND DRAINAGE

The bulk earthworks catchments based on existing and final earthworks levels and provided in Figure 3 and Figure 4 respectively. Major existing and proposed drainage features are included in these figures to aid interpretation. The sub-catchment areas are similar between earthworks phases, with the most significant change occurring when sub-catchment C becomes part of sub-catchment A* when the ~15ha external catchment which originates West of Waterford Tamborine Road is diverted around the works area. This diversion is expected to occur as part of the duplication of Waterford Tamborine Road.

For this ESCS a conservative approach has been adopted and sediment controls have been sized for each sub-catchment based on the largest of either the existing or final sub-catchment areas. The footprint provided by the end-of-line ultimate bioretention basin system provides an excellent opportunity for locating sediment basins to control water quality during the construction phase of the development for sub-catchments A/A* and B/B* and are a crucial part of the ESCS documented in Section 4.

For sub-catchment C, there is no space provided for an ultimate bioretention system within this sub-catchment, so a sediment basin will necessarily impede the works to some extent.

2.2 SOILS

No specific sampling and laboratory testing of soils has been undertaken for the ESCS. It is recommended that prior to works commencing in a specific area, the Contractor should undertake soil sampling and laboratory analysis to inform the detailed ESCP's. Soil testing should be undertaken in accordance with IECA (2008) Chapter 3 and Appendix C9, and should include as a minimum 2 boreholes for each works area and testing of a representative topsoil and sub-soil sample for the following:

- Topsoil:
    - Soil pH
    - EC
    - Organic carbon
    - TN, nitrate
    - Exchangeable basic and acidic cations (Ca, Mg, K, Na, Al)
    - Plant available phosphorus and potassium
- Subsoil
    - PSD
    - pH and EC
    - Emerson Class number
    - Dispersion percentage

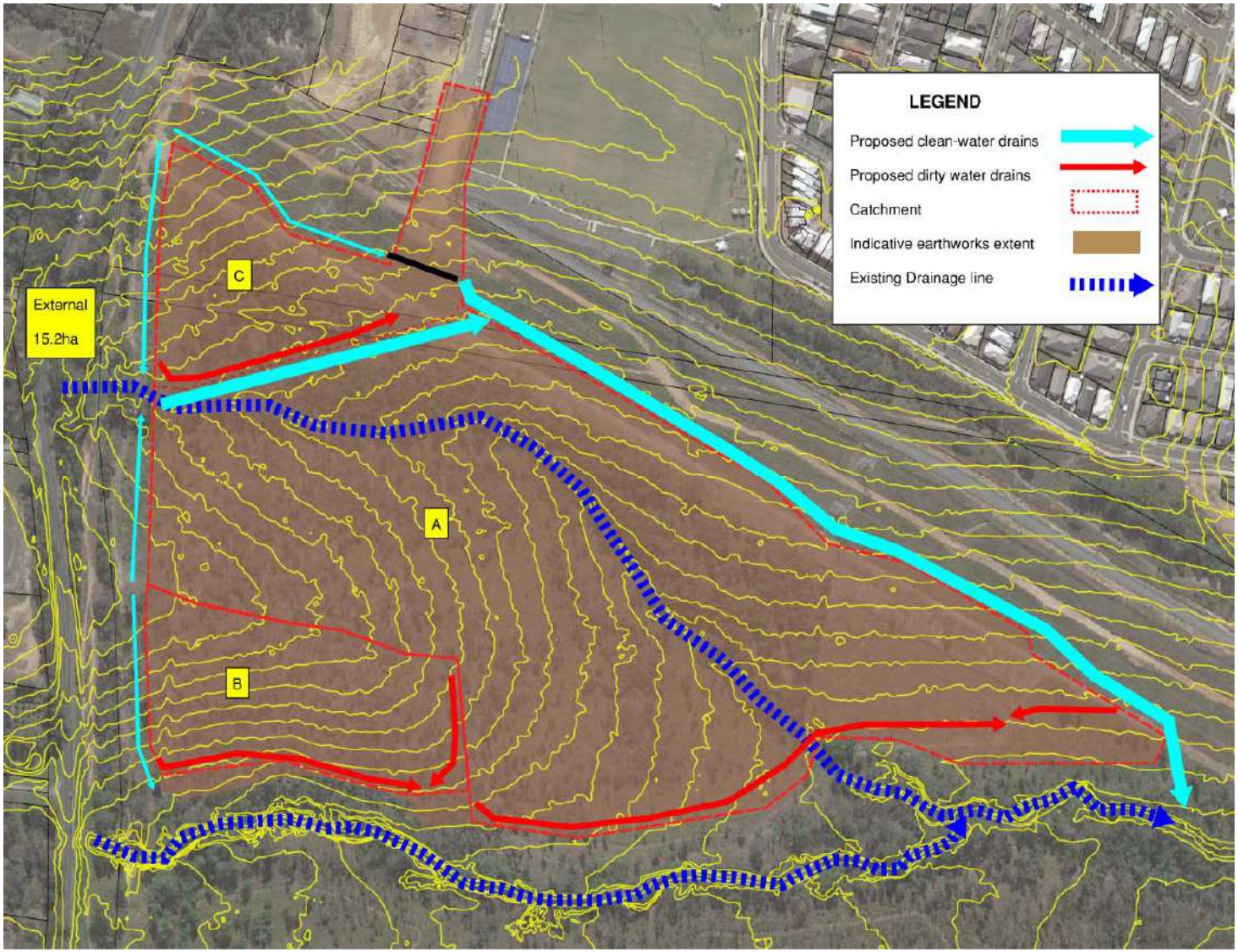


Figure 3: Bulk earthworks sub-catchments – existing levels

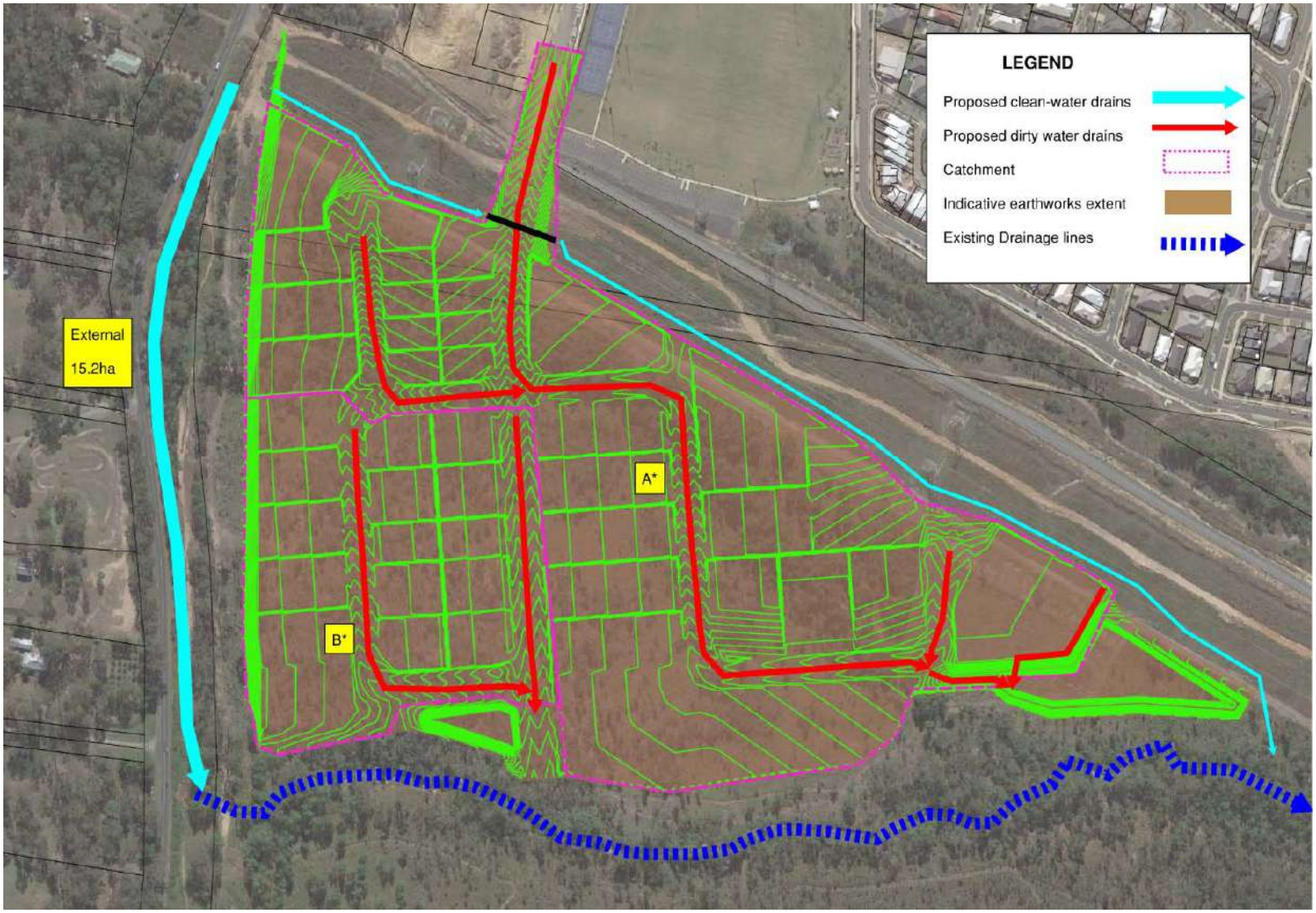


Figure 4: Bulk earthworks sub-catchments – final levels

Topsoil testing is particularly important in order to ensure successful revegetation and the contractor is to apply ameliorants to topsoil as required based on the results of testing.

In the absence of other information, it has been assumed for this ESCS that site soils will be dispersive and construction runoff will require treatment with a chemical flocculent/coagulant to remove fine and dispersive sediment prior to discharge.

Visually, there are clear signs of dispersive soils within the site, with severe gully erosion present in places. This has specific implications for drainage controls and the construction of sediment basin embankments from in-situ material. These structures can suffer from failure if dispersive soils are not managed appropriately and specific geotechnical advice, based on soil testing, should be sought.

2.3 CLIMATE

Average rainfall data is plotted in Figure 5. It can be seen that the lowest rainfall months based on the long-term average are July – September, and high risk works such as riparian activities should be programmed to occur during this part of the year.

It should however be noted that high rainfall can occur at any time of year in South-East Queensland and controls are still required for works regardless of the month in which they occur.

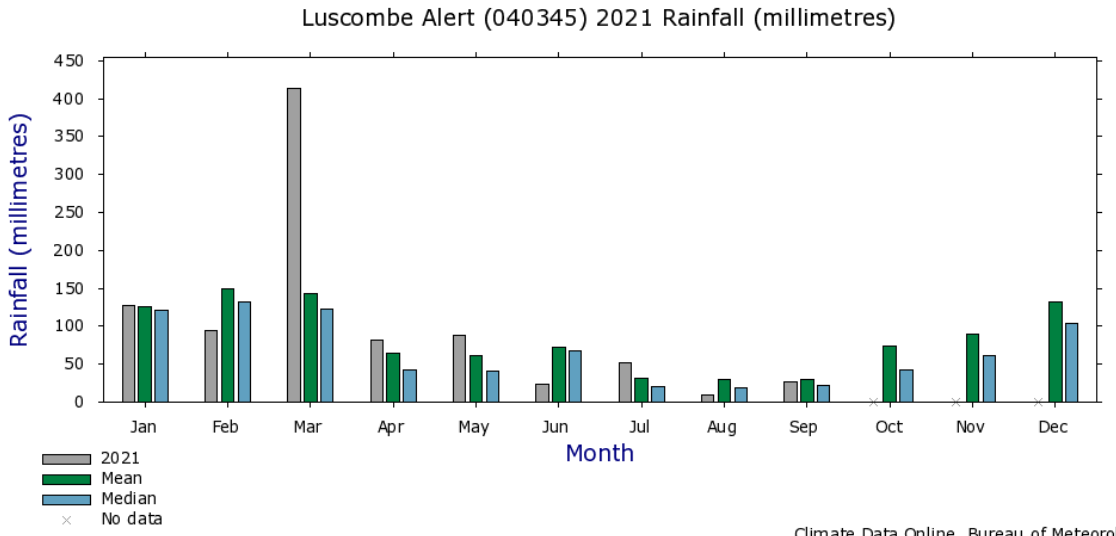


Figure 5: Rainfall Statistics

2.4 FLOODING

Flooding characteristics at the site have been established by modelling undertaken by DesignFlow (2020). The ultimate 1%AEP flood event inundation plan is shown below in Figure 6. It can be seen that the majority of the bulk earthworks areas are outside of the 1%AEP flood extent. Quinzeh Creek, located immediately South of the works, is a heavily incised channel and there is little overbank flows to the North.

The local drainage line which flows through the works has an estimated Q2 (39% AEP) flowrate of 1.9m3/s which will need to be diverted around the active works area. This flowrate is significant, and care will need to be taken where this flow diversion re-enters Quinzeh Creek to avoid scour and erosion of the creek channel. Entering at an oblique angle and providing adequate energy dissipation and scour protection will be key to minimising this risk.

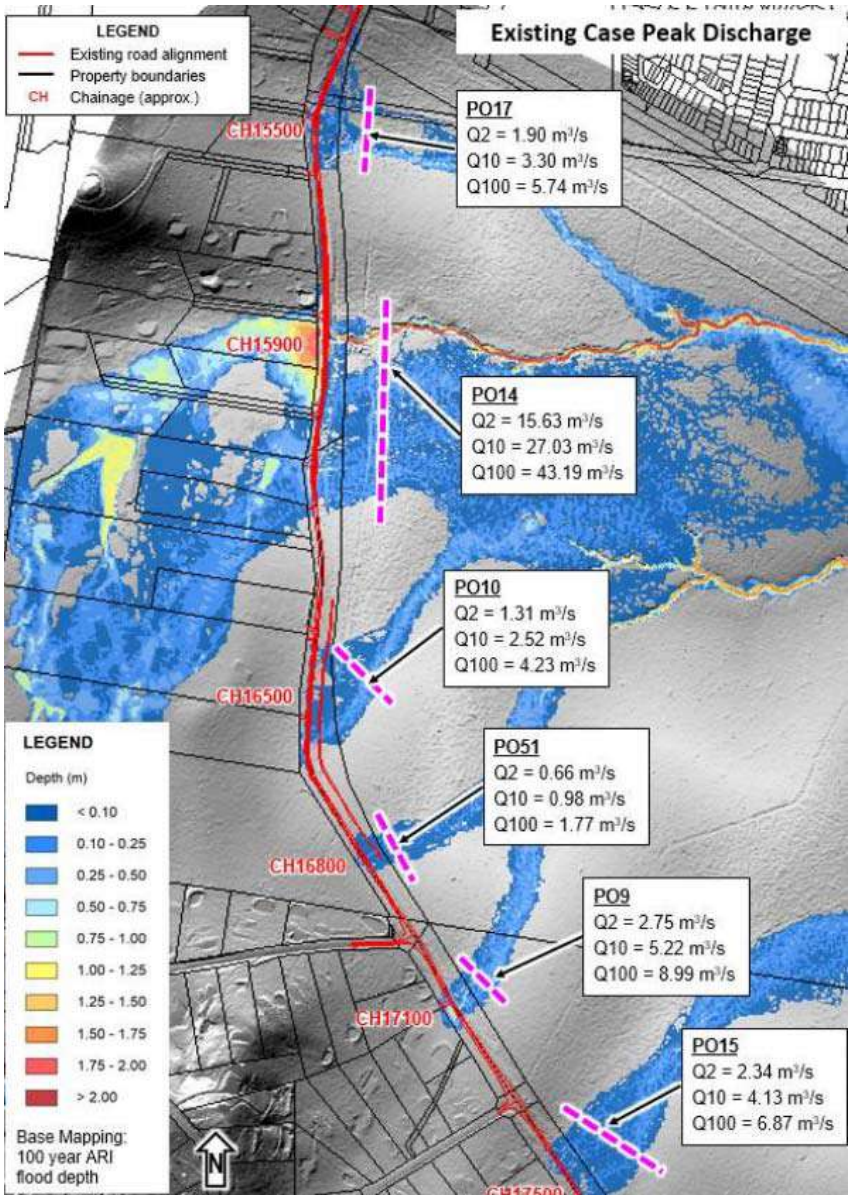


Figure 6: 1% AEP flood extent (DesignFlow, 2020)

3 DESIGN OBJECTIVES

The design objectives relevant to the construction phase of development works are specified in Appendix 2 of the State Planning Policy 2017 (SPP2017). These are reproduced in Table 1, Table 2 and Table 3 below.

Table 1: Construction Phase Stormwater Design Objectives

Issue	Desired outcomes
Drainage control	1. Manage stormwater flows around or through areas of exposed soil to avoid contamination. 2. Manage sheet flows in order to avoid or minimise the generation of rill or gully erosion. 3. Provide stable concentrated flow paths to achieve the construction phase stormwater management design objectives for temporary drainage works (part 2). 4. Provide emergency spillways for sediment basins to achieve the construction phase stormwater management design objectives for emergency spillways on temporary sediment basins (part 3).
Erosion control	1. Stage clearing and construction works to minimise the area of exposed soil at any one time. 2. Effectively cover or stabilise exposed soils prior to predicted rainfall. 3. Prior to completion of works for the development, and prior to removal of sediment controls, all site surfaces must be effectively stabilised[13] using methods which will achieve effective short-term stabilisation.
Sediment control	1. Direct runoff from exposed site soils to sediment controls that are appropriate to the extent of disturbance and level of erosion risk. 2. All exposed areas greater than 2500 metres^2 must be provided with sediment controls which are designed, implemented and maintained to a standard which would achieve at least 80% of the average annual runoff volume of the contributing catchment treated (i.e. 80% hydrological effectiveness) to 50mg/L Total Suspended Solids (TSS) or less, and pH in the range (6.5–8.5).
Litter, hydrocarbons and other contaminants	1. Remove gross pollutants and litter. 2. Avoid the release of oil or visible sheen to released waters. 3. Dispose of waste containing contaminants at authorised facilities.
Waterway stability and flood flow management	1. Where measures are required to meet post-construction waterway stability objectives (specified in table B), these are either installed prior to land disturbance and are integrated with erosion and sediment controls, or equivalent alternative measures are implemented during construction. 2. Earthworks and the implementation of erosion and sediment controls are undertaken in ways which ensure flooding characteristics (including stormwater quantity characteristics) external to the development site are not worsened during construction for all events up to and including the 1 in 100 year ARI (1% AEP).

Table 2: Construction Phase Stormwater Design Objectives for temporary drainage works

Temporary drainage works	Anticipated operation design life and minimum design storm event		
	< 12 months	12–24 months	> 24 months
Drainage structure	1 in 2 year ARI/39% AEP	1 in 5 year ARI/18% AEP	1 in 10 year ARI/10% AEP
Where located immediately up-slope of an occupied property that would be adversely affected by the failure or overtopping of the structure	1 in 10 year ARI/10% AEP		
Culvert crossing	1 in 1 year ARI/63% AEP		

Table 3: Construction Phase Stormwater Design Objectives for emergency spillways on temporary sediment basins

Drainage structure	Anticipated operation design life and minimum design storm event		
	< 3 months	3–12 months	> 12 months
Emergency spillways on temporary sediment basins	1 in 10 year ARI/10% AEP	1 in 20 year ARI/5% AEP	1 in 50 year ARI/2% AEP

The design objectives specified in the SPP2017 generally reflect accepted best practice in Australia, however the Sediment Control (2) objective is a higher standard than required in other states and is reflective of both the pronounced wet season and degree of development activity which occur in Queensland.

Healthy Land and Water (2017) provide a range of strategies for achieving the requirements of the sediment control design objective which are summarised below:

1. **High Efficiency Sediment (HES) Basins:**

   Install and operate Type-A or Type-B sediment basins designed in accordance with IECA Appendix B (2019), described as High-Efficiency Sediment (HES) basins. These are sediment basins which have automated dosing of chemicals which assist flocculation/coagulation of fine and dispersive sediment and which operate on a continuous-flow basis. Type-A basins incorporate a floating decant as the primary outlet while Type-B basins can remain full between events and have only a spillway outlet. A conceptual layout for a Type-B HES basin is provided in Figure 7.

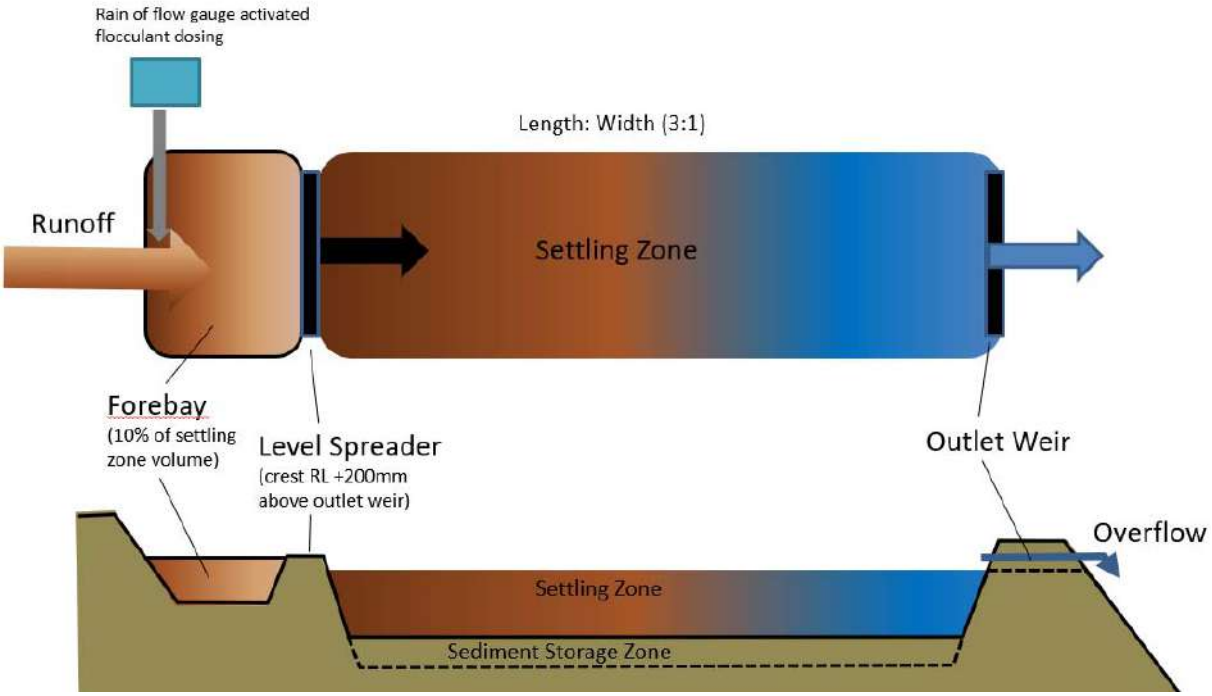


Figure 7: Conceptual High-Efficiency Sediment (HES) Basin Type-B Functional Layout

2. **Large Batch Basins:**

Batch sediment basins (Type D) designed in accordance with IECA (2008) will not comply with the SPP2017 design objective. Modified batch basin designs may be possible for some sites, however for most sites the batch basins would need to be impractically large or require impractical treatment and dewatering strategies to meet the design objective. If the batch basin is proposed to be treated and emptied within 2 days of rainfall ceasing, then the required basin settling volume is 650m^3/ha for SkyRidge Estate. Sediment storage volumes need to be provided in addition to the above volumes, consistent with IECA Appendix B (2019).

3. **Total Capture:**

For flat sites, with no external catchment, perimeter bunding may be appropriate where it can be shown that the bund height is sufficient to capture the anticipated (average) wet season rainfall completely (i.e. total capture). A simple water-balance calculation and earthworks sections showing the bund arrangements and capture volumes will be sufficient to show that this strategy can be implemented. However careful consideration will be required for how this strategy can continue to operate beyond earthworks stage to when civil construction is being undertaken or nearing completion.

4. **Alternative Innovative Measures:**

Alternative measures may be implemented where it can be shown through long-term water-balance modelling that the measures will achieve the release criteria of

50mg/L TSS for at least 80% of the average annual runoff volume. This would need to be documented and justified in the detailed ESC Plan(s).

5. **Erosion Control:**

Effective erosion control can be implemented in lieu of requiring sediment control specified above. For small areas, which are unable to drain to a basin, this could be achieved by implementing contingency measures prior to rainfall, such as covering exposed soil with blankets (mulch or synthetic) or spray-on soil binders. In these circumstances the erosion controls must result in an effectively stabilised surface prior to rainfall to justify the exclusion of sediment controls.

Each of the above approaches has been considered and specific recommendations provided for the site catchments in Section 4.1.

4 EROSION AND SEDIMENT CONTROL STRATEGY

4.1 STRATEGIES FOR SPECIFIC SITE SUB-CATCHMENTS

The overall strategy during construction for each of the site sub-catchments and discharge locations are discussed below and shown in Figure 8 and Figure 9. Considerations for the detailed design of erosion, drainage and sediment controls are provided in Sections 4.4 to 4.6.

The overall strategy is provided based on two phases – existing levels and final levels. Transition between these two phases is a gradual process and the detailed construction ESCP's may need to show a number of interim plans to cover this transition.

4.2 EXISTING LEVELS

A key feature of this strategy is the diversion of the existing drainage line which currently bisects the works area. This diversion (CW1 and CW2) needs to occur prior to any other works within sub-catchment A.

Within each of the site sub-catchments (A, B and C), the strategy is simple, with Type-B HES basins provided at the low-point of each sub-catchment. The basins are fed through the provision of dirty-water diversion drains, while external 'clean' catchments are diverted around the works by clean water diversion drains. Small areas which fall outside of the sediment basin catchments can be managed with sheet-flow sediment controls such as sediment fencing.

Sediment basin SB1 (sub-catchment A and SB2 (Sub-catchment B) are located in the ultimate footprint of WSUD treatment systems. The basin locations can remain static throughout construction and should be constructed based on the maximum catchment size which will occur at any point during construction. For SB1, this will be the catchment based on existing levels, while for SB2 this is the catchment based on final levels.

Both SB1 and SB2 are located in areas which will ultimately be filled. It is important to note that this basin (as for all controls listed in this section) needs to be functional before topsoil stripping occurs throughout the contributing sub-catchments. The basin are likely to be constructed as a combination of cut and filling in order to command the identified sub-catchments based on existing levels. Filling for the bioretention footprint would therefore need to be delayed until the last phase of earthworks, once the contributing catchments have been stabilised and the sediment basin can be decommissioned.

Sediment basin SB3 (sub-catchment C) is not located within any future WSUD footprint and is a temporary basin which will ultimately need to eb removed to facilitate filling. The removal of SB3 is dependent on the decommissioning of CW1 and the commissioning of CW1*.

Construction Sequence

1. Waterway crossing WW1 and Haul Road
2. Clean water diversion CW1 and CW2
3. DD1, DD2, CW5 and SB1
4. Works in Catchment A south of CW1 can commence
5. DD3, DD4, CW6 and SB2
6. Works in Catchment B can commence
7. CW4 and CW3, WW2
8. DD5 and SB3
9. Works in Catchment C may commence

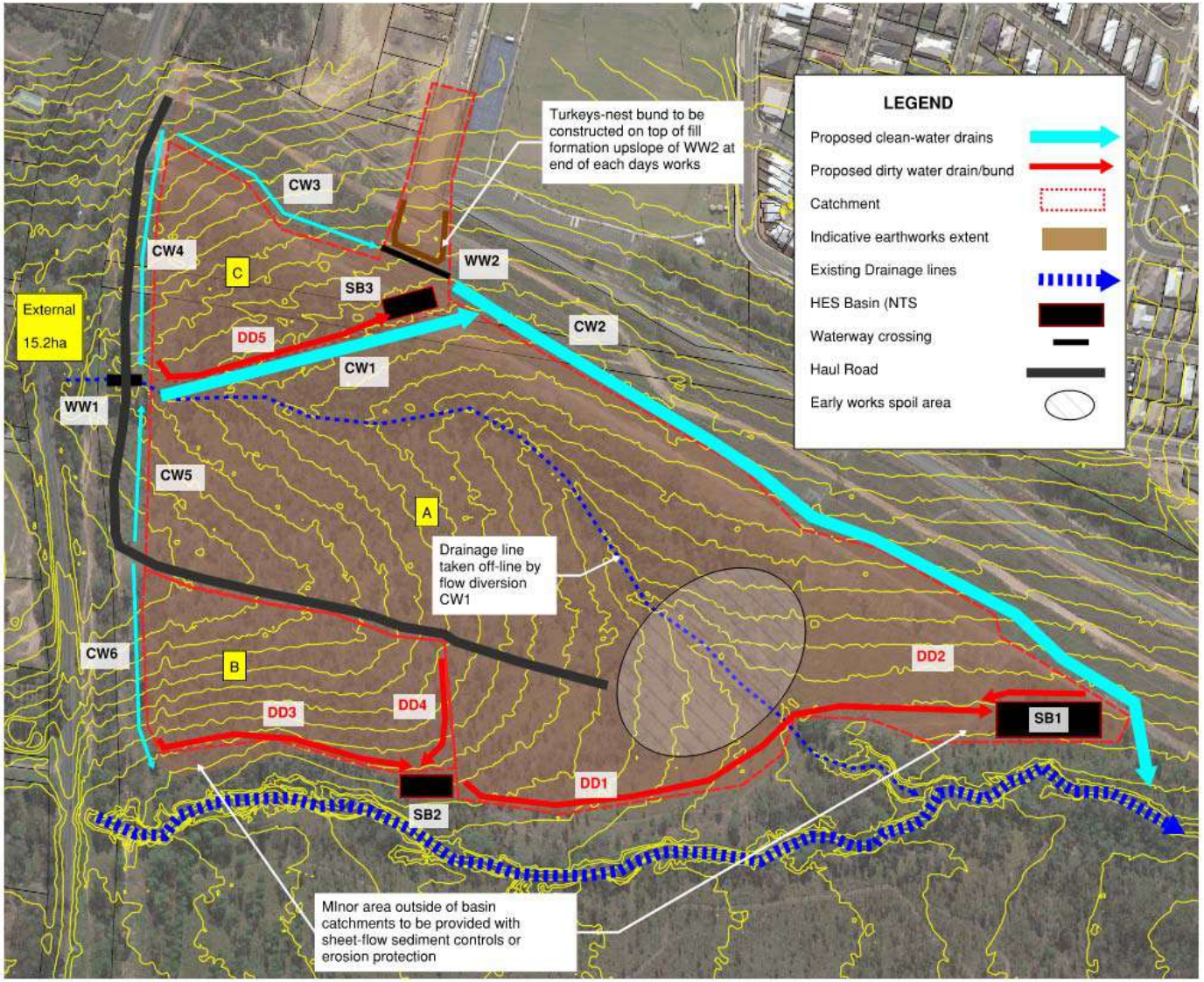


Figure 8: Strategy Elements (Existing Levels)

4.3 FINAL LEVELS

The key difference between the 'existing levels' and 'final levels' strategy is the management of the external catchment west of Waterford Tamborine Road. The final levels strategy relies on this external catchment being diverted through clean water channel CW1* which remains west of the works area and diverts the catchment to Quinzeh Creek.

This channel (CW1*) may be constructed as part of the Waterford Tamborine Road upgrade. However, if the earthworks needs to eb completed ahead of this upgrade, then an equivalent of CW1* will need to be constructed within the site as part of the earthworks.

Once CW1* (or equivalent) is delivered, then SB3 and the previous diversion channel (CW1) may be decommissioned and earthworks can progress in the area previously occupied by these features.

Sediment controls within sub-catchments A* and B* remain as Type-B HES basins, with small areas which fall outside of the sediment basin catchments managed by sheet-flow sediment controls such as sediment fencing. Dirty-water drains will be provided by the road box (as it is formed), with coir-log check dams provided within the road box prior to rainfall, in order to minimise erosion within the road box itself.

4.4 EROSION CONTROL

The following discussion relates to general earthworks areas. Specific discussion on riparian works are provided in Section 4.7.

IECA (2008) identifies erosion risk based on average monthly rainfall and provides best practice rehabilitation requirements for different times of the year based on this risk. The erosion risk for the subject site for different times of the year is shown in Table 4.

Table 4: Erosion risk by time of year

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High	High	High	High	High	Moderate	Very Low	Very Low	Very Low	Moderate	Moderate	High

The requirements for land clearing and rehabilitation vary depending on the time of year (i.e. level of risk). The performance targets, based broadly on IECA (2008) and example methods of achieving those targets are provided in Table 5. The detailed ESCPs for each works area are to provide specific details on how the performance targets are to be achieved.

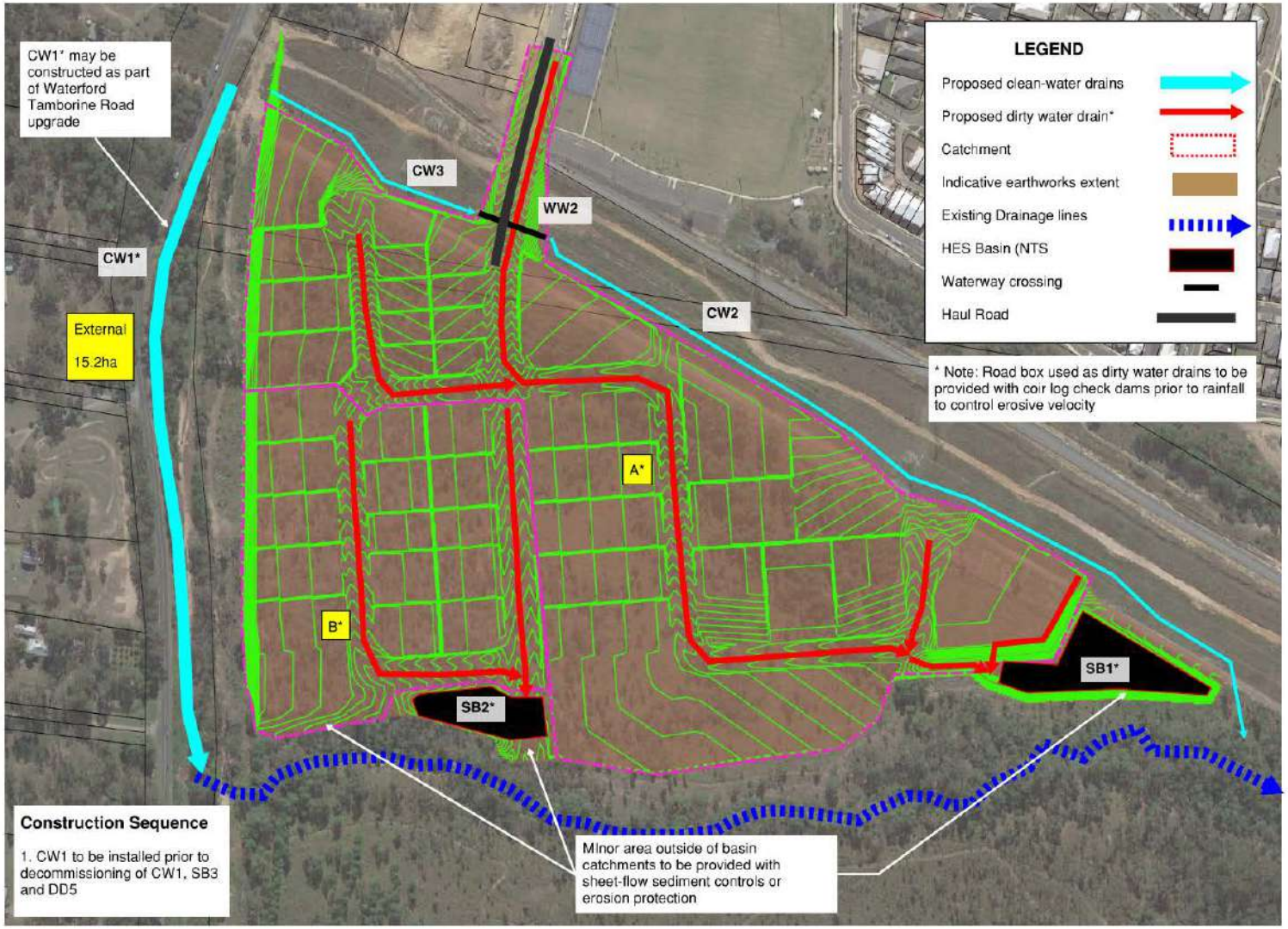


Figure 9: Strategy Elements (Final Levels)

Table 5: Erosion performance targets and example methods

Erosion Risk	Performance Target	Example Method
Very Low	• Land clearing limited to 8 weeks worth of construction work. • Disturbed areas stabilised with 60% cover within 30 days of finished levels being reached or works delayed for more than 30 days	• Future lots stabilised with drill seeding of annual and perennial grass species, with soil amelioration based on soil tests. • Steep areas where drill seeding not possible stabilised with hydromulch
Moderate	• Land clearing limited to 6 weeks worth of construction work. • Disturbed areas stabilised with 70% cover within 20 days of finished levels being reached or works delayed for more than 20 days	• Future lots stabilised with drill seeding of annual and perennial grass species, with soil amelioration based on soil tests. Soil binder provided for short-term stabilisation over seeded areas. • Steep areas where drill seeding not possible stabilised with bonded-fibre matrix. • Provided within 20 days of final levels being reached.
High	• Land clearing limited to 4 weeks worth of construction work. • Disturbed areas stabilised with 75% cover within 10 days of finished levels being reached or works delayed for more than 10 days	• Future lots stabilised with drill seeding of annual and perennial grass species, with soil amelioration based on soil tests. Soil binder provided for short-term stabilisation over seeded areas. • Steep areas where drill seeding not possible stabilised with bonded-fibre matrix. • Provided within 10 days of final levels being reached.

Table 5 refers to short-term stabilisation requirements. As the earthworks areas may remain undeveloped for an extended period of time, the sediment controls will need to remain in place and continue to be actively managed until effective long-term erosion control (i.e. vegetative cover) is achieved based on the cover requirements for the highest monthly erosion risk (i.e. 75% cover).

4.5 DRAINAGE CONTROL

Drainage controls are required to limit flow path lengths in order to prevent or minimise rill erosion and to ensure clean external catchments are diverted around the works and disturbed catchments are directed to appropriate sediment controls such as HES basins.

Table 2 and Table 3 provide design standards for drainage controls. As the site exhibits visual signs of the presence of dispersive soils, specific measures will need to be applied

to drainage controls to prevent severe erosion, such as topsoil capping or addition of gypsum to diversion drains prior to lining.

Details of drainage controls will be provided with the detailed ESCP's. Preliminary sizing is however provided for two key aspects which can be used as a comparison for the sizing in the detailed ESCPs:

1. Culvert crossing WW1 of the Haul Road, which is necessary for the early works to commence; and
2. Diversion channel CW1/CW2.

4.5.1 Culvert Crossing WW1

Table 3 specifies a design standard of 1:1yr ARI for the conveyance of the waterway crossing. However, the crossing should also be constructed to remain stable durign overtopping flows between the 1:1yr to 1:10yr ARI (IECA, 2008). For this reason, the standard drawing for waterway crossings (TCC-01 – refer Appendix B) identifies the culverts to be placed in rock fill rather than earth or fine aggregate.

The 1:1yr ARI peak flow has been estimated usign the modified rational method and based on an external catchment area of 15.2ha and a time of concentration of ?? minutes. This provided a peak flow estimate of 1.6m3/s.

Inidicate culvert sizing can be determined based on inlet control design nomographs and assuming a nominal cover of 500mm above the culvert obvert. This results in a culvert size of 2/675RCP.

This sizing is preliminary and survey of the crossing location will be required to refine the sizing based on actual available head (cover). Sizing of culverts may also need to be increased dependent on the waterway corssing cross-section, in order to ensure that the 1:10yr flow is contained to over-top only in the area of rock fill.

4.5.2 Diversion Channel CW1

Table 3 specifies a design standard of 1:2yr ARI for draiange controls which are required to operate for 12 months or less. DesignFlow (2020) provie an estimate of Q2 at this location of 1.90m3/s.

Based on existing contours, the available fall for CW1 is 2m, resulting in an average logitudinal grade for CW1 of 0.4%. Preliminary channel properties to convey this flow would be base width 3m, side slopes 1:3, channel depth min 0.52m and geofabric lining.

It is however recommended that a lager channel is installed where possible in roder to provide for the conveyance of larger events and greater construction flexibility. For example, if the channel is to remain in palce for greater than 24 months, then a 1:10yr ARI design standard is required. This would increase the channel base width by 2m (to 5m) and the depth by 20mm (to 0.54m)

4.6 SEDIMENT CONTROL

4.6.1 High Efficiency Sediment Basins

Type-B Basins

Appendix A contains full calculations for each of the HES basins identified in Figure 8 and Figure 9. The HES basins are Type-B, with sizing determined from the procedures documented in IECA (2019). The basin and catchment properties are summarised below in Table 6.

The scour velocity checks provided in Appendix A indicate that for some basins the velocity may be an issue. It is recommended that permeable baffles be implemented in all HES basins in order to improve the distribution of velocities across the basin section and minimise the risk of resuspension.

Table 6: Preliminary Type-B HES Basin Properties

Basin ID	Sub-Catchments	Catchment Area (ha)	Existing or Final Contours?	Basin Volume (m^3)	Basin Area (m^2)
SB1	A	15.2	Existing	4,425	2,883
SB1*	A*	14.4	Final	4,278	2,801
SB2	B	2.6	Existing	876	796
SB2*	B*	5.7	Final	2,040	1,518
SB3	C	2.6	Existing	858	784

Each Type-B basin should be provided with an automatic dosing unit. Flow-based dosing would be preferrable for Basins SB1/1* and SB2/2* compared to rainfall-activated dosing due to the extent of earthworks and changes to the contributing catchment which will occur. For basin SB3 a rainfall activated doser would be appropriate.

A suitable flocculant and dosing rate will need to be determined based on jar testing. Suitable candidate products would be chitosan and aluminium-chloro-hydrate (ACH).

Standard drawings for HES basins are provided in Appendix B.

Sheet flow controls

Small areas which cannot drain to sediment basins (for example, fill batters) should be provided with sheet-flow sediment controls such as sediment fencing. These areas are expected to be small based on the current earthworks design.

Wongawallan Drive Controls

The northern section of the Wongawollan Drive extension consists of a fill embankment which will be cut-off from the sediment basins SB3 or SB1 by the clean-water diversion channel until the final formation levels are achieved.

As the embankment levels come up, a turkeys nest bund should be created at the top of the formation to fully contain any runoff generated by the formation. Captured runoff can either be treated in-situ prior to discharge or pumped to SB3 for treatment.

The batters of the formation which cannot flow to a sediment basin should be provided with sheet-flow sediment controls such as sediment fencing. These areas should also be progressively stabilised as final levels are achieved.

4.7 RIPARIAN WORKS

Riparian works are required for the construction of CW1 and WW1.

For WW1, it is proposed that this area is isolated using a cofferdam (earth bund – geofabric covered) on the upslope side of works and either a gravity or pumped flow diversion is provided to convey minor flows around the works area. A contingency should be kept on site consisting of geofabric/erosion control blankets and if rain is forecast then the channel invert in the works area should be stabilised using these blankets in order to prevent erosion caused by overtopping of the upslope bund.

Diversion channel CW1 should be constructed offline, with the existing drainage line kept in place and conveying all flows until CW1 is complete.

In terms of rehabilitation once WW1 and the haul road is removed, IECA (2008) provides minimum requirements for land clearing and rehabilitation associated with riparian works. These requirements provide generous timeframes for rehabilitation which are inconsistent with the significant water quality risk posed by these types of works.

It is proposed that the following land clearing and rehabilitation performance requirements are adopted instead:

1. Waterway works are scheduled to occur during periods of very low erosion risk (July-September), or at other times of the year only where the exposed area which may be exposed to flows can be limited to an area which can be stabilised prior to forecast rainfall
2. Flow diversions are to remain in place until the area of work has been stabilised (90% cover) using methods suitable for the expected velocity

Where possible, stabilisation should utilise the ultimate landscape outcome proposed for the riparian area. Where this is not specified, then methods which are suitable for the expected velocities and degree of inundation should be implemented, such as erosion control blankets.

4.8 CONSTRUCTION SEQUENCE

Specific construction and ESC sequencing requirements identified as part of this strategy are summarised below.

- Construction of the riparian works (WW1 and CW1) are high risk and need to be given priority and should be scheduled to occur in the driest time of the year (June-September).
- Before works (apart from ESC) in Catchment A commence, the following is required (in order):
    - Waterway crossing WW1 and Haul Road
    - Clean water diversion CW1 and CW2
    - DD1, DD2, CW5 and SB1
    - Works in Catchment A south of CW1 can commence
- Before works (apart from ESC) in Catchment B commence, the following is required (in order):
    - DD3, DD4, CW6 and SB2
    - Works in Catchment B can commence
- Before works (apart from ESC) in Catchment C commence, the following is required (in order):
    - CW4 and CW3, WW2
    - DD5 and SB3
    - Works in Catchment C may commence
- Clean water drain CW1* is required to be installed prior to decommissioning and filling in the area of CW1, SB3 and DD5. For all other areas, controls are required to remain in place until 75% vegetative surface cover is achieved in each sub-catchment.

5 MONITORING

Automatic monitoring of water quality (turbidity and pH) should be implemented at the discharge of each Type-B sediment basin and an alert generated if the water quality targets specified in Table 1 are exceeded.

It is recommended that monthly audits are undertaken of the works by a CPESC independent of the Principal Contractor. Monthly auditing should be undertaken following the procedures which would be followed should a compliance inspection be undertaken by Department of Environment and Science (DES) officers.

These procedures are documented in *Procedural guide – Releases to waters from land development sites and construction sites 2500m2 and greater* (DES, 2021).

6 REFERENCES

Department of Environment and Science (2021) *Procedural guide – Releases to waters from land development sites and construction sites 2500m2 and greater* https://environment.des.qld.gov.au/__data/assets/pdf_file/0021/215418/procedural-guide-water-release-large-sites.pdf

DesignFlow (2020) *Waterford Tamborine Road Upgrade – Hydraulic Assessment version 2*

International Erosion Control Association (2008) *Best Practice Erosion and Sediment Control*

International Erosion Control Association (2019) *Appendix B – Sediment Basin Design and Construction*

The State of Queensland (2017) *State Planning Policy*

APPENDIX A HES BASIN SIZING CALCULATIONS

Table A1: HES Basin sizing calculations

		Q3mth Design Flowrate Calc.						Settling Zone						Forebay		Sediment Storage Zone			Overall Dimensions relative to spillway crest (excl. Forebay)						Spillway Calculations								
Basin ID	Catchment Area (Ha)	C_{10}	C_1	tc	$I_{1yr,tc}$ (mm/hr)	Q1yr (m^3/s)	Q3mth (m^3/s)	Residence Time (hr)	Settling Zone Depth (m)	Ave. settling zone area (m2)	Settling Volume (m3)	W:L (1:X)	Scour Velocity (m/s)	Forebay Min. Depth (m)	Forebay Vol (m3)	Sed Storage Vol (m3)	Sed Storage depth (approx.) (m3)	Batter (1:X)	Width (m)	Length (m)	Depth (m)	Area (m2)	Vol Total (m3)	Vol Total (m3/ha)	Basin Design Life	Design ARI	C	I (mm/hr)	Q (m^3/s)	Head over spillway (m)	Spillway crest length (m)	Spillway Crest RL (m)	Min Embankment RL (m)
SB-1	15.21	0.7	0.56	24	55.8	1.32	0.66	1.33	1.5	2107	3161	3	0.042	1	316	948	0.5	3	31.0	93.0	2.0	2883	4425	291	3-12 months	1:20yr	0.74	117	3.63	0.2	23.9	0	0.65
SB-2	2.58	0.7	0.56	18	65.1	0.26	0.13	1.33	1.5	417	625	3	0.018	1	63	188	0.6	3	16.3	48.9	2.1	796	876	339	3-12 months	1:20yr	0.74	136	0.72	0.2	4.7	0	0.65
SB-3	2.6	0.7	0.56	19	63.3	0.26	0.13	1.33	1.5	409	613	3	0.018	1	61	184	0.6	3	16.2	48.5	2.1	784	858	330	3-12 months	1:20yr	0.74	133	0.71	0.2	4.6	0	0.65
SB-1*	14.37	0.7	0.56	23	57.1	1.28	0.64	1.33	1.5	2037	3056	3	0.041	1	306	917	0.5	3	30.6	91.7	2.0	2801	4278	298	3-12 months	1:20yr	0.74	120	3.52	0.2	23.2	0	0.65
SB-2*	5.67	0.7	0.56	16	69	0.61	0.30	1.33	1.5	971	1457	3	0.028	1	146	437	0.6	3	22.5	67.5	2.1	1518	2040	360	3-12 months	1:20yr	0.74	144	1.67	0.2	11.0	0	0.65

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