Our Ref: 160-012-001L OPW
Your Ref:

25 August 2025

Chief Executive Officer
Mareeba Shire Council
PO Box 154,
MAREEBA QLD 4880

DEVELOPMENT APPLICATION - OPERATIONAL WORKS (CULVERT CONSTRUCTION)
LOT 200 ON SP342245, COUNTRY ROAD, MAREEBA
COUNTRY ROAD ESTATE

Please find attached the operational works submission for the above-mentioned subdivision in electronic format.

The Operational Works fee payable is $4,910.57 based on 1.5% the estimated cost of works (ex GST). This invoice is to be provided to the applicant for payment.

If you require any further clarification or additional information, please do not hesitate to contact the undersigned.

Yours faithfully

Mark Freeman
Senior Civil Designer

Enc: 160-012 Civil / Structural Drawing Set
160-012 OPW Application
160-012 SWMP Report

P05-F-DD01 Document Transmittal

Project: **Country Road Culvert Crossing**

Attention: Carl Ewin

Company: Mareeba Shire Council

From: ERSCON Consulting Engineers

ERSCON CONSULTING ENGINEERS

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Date of Issue	
Day	25
Month	08
Year	25

Dwg/Doc Number	Dwg/Doc Title	Revision
160-012-L001	Operational Works Letter	1
160-012-R001	Operational Works Report	1
160-012-R002	Stormwater Management Plan	1
160-012-C101	Cover Sheet, Locality Plan and Drawings List	1
160-012-C102	General Notes	1
160-012-C103	Culvert Plan	2
160-012-C104	Country Road Longitudinal Section	1
160-012-C105	Country Road Cross Sections (Sheet 1 of 3)	1
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160-012-S123	Culvert Precast Head Wall W4	3
160-012-S130	Stormwater Pit	2

Company Name	Attention	Number of Copies
Mareeba Shire Council	Sam Wakeford	1
Mareeba Shire Council	Brian Millard	1
Mareeba Shire Council	Carl Ewin	1
Mareeba Shire Council Planning	Planning	1
ConMat	Steven Lavis	1
ConMat	Roy Lavis	1
Tyrone Corp	Patrick McNamee	1
Tyrone Corp	Peter McNamee	1

			Reason for Issue
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ERSCON
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Country Road Estate

Country Road Culvert Crossing Operational Works Design Report

August 2025

www.erscon.com.au

Prepared by:

ERSCON PTY. LTD.
T/as ERSCON Consulting Engineers
PO Box 7890
CAIRNS QLD 4870

Telephone: (07) 4242 8479

DOCUMENT ISSUE RECORD

Revision Code	Date Revised	Revision Details	Author	Checked	Approved
1	22/08/25	Operational Works Application	MG	MF	JM

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1 SUMMARY

1.1 DEVELOPMENT APPLICATION DETAILS

Proposed development:	Construction of 2 / 2700 x 1500 culverts at the end of Stage 3 Country Road Estate and future works. Works include site clearing, bulk earthworks, roadworks, services and drainage.
Type of approval sought:	**Operational Works**
Site address:	Country Road Mareeba, QLD 4880
Real property description:	Lot 200 on SP342245
Site area:	3,500 m²
Assessment manager:	Mareeba Shire Council
Owner details:	Conmat Pty Ltd
Applicant details:	Conmat Pty Ltd C/-ERSCON PTY. LTD. PO BOX 7890 CAIRNS QLD 4870

1.2 PLANNING INSTRUMENT DETAILS

Planning scheme:	Mareeba Shire Council Planning Scheme 2016
Zone:	Rural Residential A – ZM016a
Local plan:	Nil
Level of assessment:	Code Assessment
Applicable codes:	Bushfire Overlay Code Flood Hazard Overlay

1.3 REFERRAL AGENCIES

Referral agency and role
Nil

2 SITE DETAILS

2.1 SITE DESCRIPTION

The site is located adjacent existing rural residential subdivision land to the North-east of the Mareeba township.

Table 1: Site description

Site characteristic	Description
Existing land use	The existing land consists of nearby rural residential allotments and generally sparse vegetation. A seasonally flowing creek runs under the proposed works.
Existing structures	There is no significant existing infrastructure on the site.
Frontage and access	Extensions to Country Road will provide frontage and access to all allotments.
Topography and views	Levels vary across the site from approximately RL400m AHD at the invert to RL 404m AHD at the end of the road.
Existing vegetation	There is sparse existing vegetation present.
Existing waterways	Site stormwater discharges to a seasonally flowing creek.

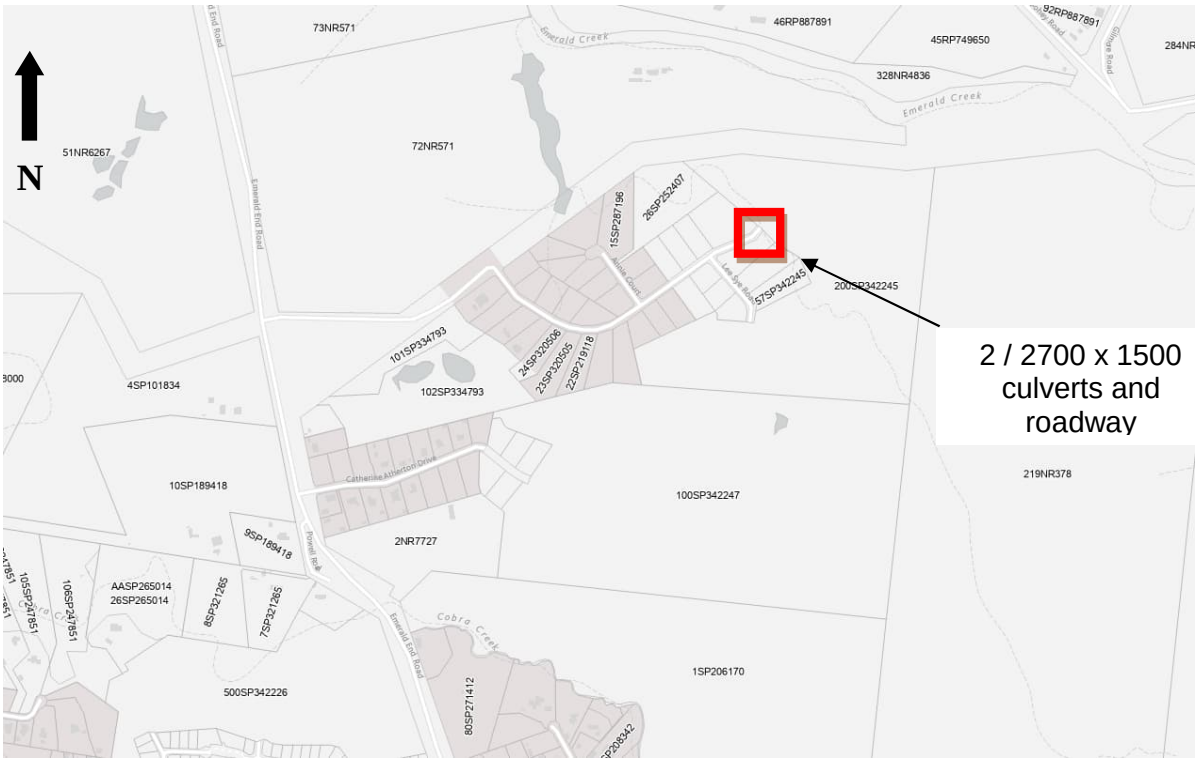


Figure 1: Aerial View of Site Identification
Source: DA Mapping System



Figure 2: Satellite View of Site Identification
Source: QLD Globe

2.2 SURROUNDING LAND USES

Table 2: Surrounding land uses

Surrounding land uses	
North	Existing vegetated area
South	Future development/cleared land
East	Existing vegetated area
West	Existing development/drainage

3 PROPOSED DEVELOPMENT DETAILS

The purpose of this application is for the development of a new culvert, including all municipal services (excluding sewer) and access road. This section is a continuation of the existing Stage 3 and is designed in accordance with Council's conditions, and relevant specifications and standards.

Table 3: Summary of development aspects

	Building or operational work	
	Operational work	Construction of 2 / 2700 x 1500 culverts at the end of Stage 3 Country Road Estate and future works. Works include site clearing, bulk earthworks, roadworks, and drainage.
	Value of proposed work by Developer	Approx $410,809.38 (Incl. GST)

4 DEVELOPMENT APPLICATION FORM 1

5 STORMWATER DRAINAGE

5.1 DESIGN METHOD

The stormwater design has been carried out using the Rational Method, in accordance with the Queensland Urban Drainage Manual (QUDM). Rainfall values from FNQROC Development Manual D4 (05/23) have been utilised. The majority of the hydrological and hydraulic computations undertaken during the development of the stormwater drainage system have been performed utilising the stormwater design module of Version 14 of 12d Model.

In accordance with the QUDM recommendations, the major system design has been calculated based on a 50-year recurrence interval, using overland flow. Minor flows in rural residential streets and overland flow have been designed to a 5-year recurrence interval for rural areas in accordance with QUDM and FNQROC.

Runoff has been calculated using Rainfall intensities that have been obtained from FNQROC Development Manual - D4 **Stormwater Drainage** - Chart 18 and checked against the Australian Government's - Bureau of Meteorology - Design Rainfall Data System (2016) for the area.

Overland road flow will be controlled by a kerb inlet pit on the upstream side and kerb and channel scupper breaks on the downward side. This will then be diverted across the verge and down the batter face towards the outlet stream.

Kerb pit capacities have been estimated using FNQROC Section D4 Appendix B "Kerb Inlet Capacity Charts". Roadway flow widths have been calculated using Manning's equation for both major and minor flows.

As a rural residential subdivision, pits have been spaced at intervals to ensure road flows do not exceed the reserve, typical of the adjacent development.

5.2 MINOR DRAINAGE

5.2.1 Hydrological Design Philosophy

The minor drainage system consists of a combination of overland flow through the culvert system and roads, and the kerb inlet pit has a capacity of Q5 plus 300mm freeboard.

The major drainage system involves overland flow on both the street surfaces and through the culvert. The major drainage system has a capacity of Q50 plus 300mm freeboard, as required by QUDM and confirmed with MSC.

5.2.2 Hydrological Analysis

12d Model requires various data to be input by the operator for it to perform hydrological computations as detailed below.

Coefficients of Runoff have been determined in accordance with Section 5.04 of QUDM assuming an Urban Residential Development Category. Rainfall intensities have been obtained from the Australian Government's - Bureau of Meteorology - Design Rainfall Data System (2016) for the area.

Times of Concentration have been determined in accordance with Section 4.6.11 of QUDM, specifically the Recommended Standard Inlet Times detailed in Table 4.6.2. Larger catchment Tc has been calculated on an average slope calculation using the Bransby- Williams' equation in accordance with QUDM.

The Hydrological Analysis for a Q5 and Q50 event have been undertaken including pit flow, catchment, bypass and flow widths for the pit layout are shown in the calculation tables contained in **Appendix D** and also in the SWMP. Stormwater longitudinal sections are referred to in **Appendix A**.

Results of the Hydraulic Analysis showing proposed culvert sizes and invert levels have been determined through the utilisation of 12d Model. Calculations and tables are contained in **Appendix D - Drawings**.

5.3 MAJOR DRAINAGE

5.3.1 Overland Flow

In accordance with the requirements of QUDM, the major drainage system, which incorporates overland flow along Country Road, has been designed for a recurrence interval of 100 years. Similarly to the minor drainage, major overland bypass flow will be directed to tip out over the batters to the downstream flow of the creek.

Depth by velocity calculations for half the road flow have been undertaken and produce satisfactory results regarding pedestrian safety ($dv < 0.6m^2/s$).

5.4 STORMWATER OUTLETS

Stormwater outlets have been designed to be in council owned land (drainage easements). Outlets have been designed to have outlet scour protection and energy dissipation through rock outlet pads. The flow from the upstream creek will be conveyed under Country Road using culverts. The outflow from Country Road will be directed towards the north-west overtopping into the creek.

Upstream flows have been calculated for the existing channels and crossroad drainage culverts to minimise the risk of disturbance to property.

5.5 WATER QUALITY

The design addresses the "State Planning Policy 4/10 Healthy Waterways" as below:

Part A – Urban Stormwater Management

Protecting Water Quality

Performance Outcome P01 The development is compatible with the land use constraints of the site for achieving stormwater design objectives.	**Acceptable outcome A01.1** The nature, design and stormwater management of the development is in accordance with design objectives stated in Chapter 4 (section 4.9) of the State Planning Policy Guideline for Healthy Waters (the guideline) **And** Prepare a site stormwater quality management plan (SQMP) that: a. Is consistent with any local area stormwater management planning; and b. Provides for achievable stormwater quality treatment measures reflecting land use constraints, such as soil type, landscape features (including landform), nutrient hazardous areas, acid sulfate soil, and rainfall erosivity.
Outcome achieved – Stormwater design has been undertaken to incorporate as much of the existing flow paths and dams as practical. All stormwater outlets are directed towards or directly into existing stormwater drainage paths/gullies. Stormwater flows exiting pipe networks have been designed with outlet scour and energy dissipation to reduce velocities to minimise impacts to existing ground. Previous development has shown that outlet drains have naturally re-vegetated to provide additional protection.	

Performance Outcome P02 The entry of contaminants into, and transport of contaminants, in stormwater is avoided and minimized.	**Acceptable outcome A02.1** Any development application incorporates: • Stormwater management measures to achieve relevant design objectives outlined in Chapter 4 of the guideline • Management of nutrients of concern and acid sulfate soils. **And** Prepare a site stormwater quality management plan (SQMP) that: a. Accounts for development type, construction phase, local landscape, climatic conditions and design objectives in accordance with the guideline; and b. Is consistent with the Queensland Acid Sulfate Soil Technical Manual.
Outcome achieved – The site is not expected to be subject to Acid Sulfate Soils. Should Acid Sulfate Soils be encountered, appropriate measures will be undertaken in accordance with Queensland Acid Sulfate Soil Technical Manual. An appropriate Erosion and Sediment Control (ESC) plan will be implemented during and post construction as part of the SQMP.	
Performance Outcome P03 Construction activities for the development avoid or minimize adverse impacts on stormwater quality.	**Acceptable outcome A03.1** Any development application for the development is accompanied by an erosion and sediment control plan (ESCP) prepared in accordance with the guideline that demonstrates release of sediment laden stormwater is avoided for the nominated design storm, and minimized when the nominated design storm is exceeded by addressing design objectives in the guideline, Chapter 4, for: • Drainage control; • Erosion control; • Sediment control; and • Water quality outcomes. Addressing the design objectives may include enhancing the achievement of some objectives if achievement of other objectives is impractical.

	And
	Acceptable outcome A03.2 Erosion and sediment control practices including any proprietary erosion and sediment control products are designed, installed, constructed, operated, monitored and maintained, and any other erosion and sediment control practices are carried out, in accordance with local conditions and appropriate recommendations from a suitable qualified person. Or The ESCP demonstrates how stormwater quality will be managed in accordance with an acceptable regional or local guideline so that target contaminants are treated to a design objective at least equivalent to Acceptable Outcome A03.1
Outcome achieved - An appropriate Erosion and Sediment Control (ESC) plan will be implemented during and post construction as part of the SQMP. The ESC is designed for the application of best practices to erosion and sediment control during and post construction. Stormwater flows exiting pipe networks have been designed with outlet scour and energy dissipation to reduce velocities to minimize impacts to existing ground.	
Protection of Natural flows	
Performance Outcome P04 Construction and operation activities for the development avoid or minimize changes to waterway hydrology from adverse impacts of altered stormwater quality and flow.	**Acceptable outcome A04.1** Development incorporates stormwater flow control measures to achieve at least the design objectives set out in Chapter 4 of the guideline. Both the construction and operational phases for the development comply with advice and the design objectives in Chapter 4 of the guideline including management of frequent flows, peak flows, and construction phase hydrological impacts.
Outcome achieved – Stormwater flows have been designed to be directed to existing stormwater flow paths, with post-development catchments remaining similar to pre-development. Stormwater outlets have been designed with energy dissipation to reduce velocities of flows out letting from piped networks. The existing flow regime to existing dams is generally unchanged.	

Part C – Non-tidal artificial waterways ('the waterway')

<table>
<tr><th colspan="2">Protecting Water Quality in existing natural waterways</th></tr>
<tr><td>Performance Outcome P01

The waterway is not designed only for stormwater flow management or stormwater quality management.</td><td>Acceptable outcome A01.1

The waterway is designed and managed for any of the following end use purposes:
• Amenity including aesthetics, landscaping, and recreation;
• Flood management;
• Stormwater harvesting as part of an integrated water cycle management plan;
• Aquatic habitat.
And
The end use purpose is designed and operated in a way that protects water environmental values.</td></tr>
<tr><td colspan="2">Outcome achieved – The waterway end use purposes have not changed from the pre-development case. Flows that were directed towards the existing dams in the pre-development case are still current post-development. Flows to the larger gullies also remain generally the same. No new dams are proposed as part of the development, and no flows to existing flow paths are proposed to be significantly altered.</td></tr>
<tr><td>Performance Outcome P02

The waterway is located in a way that is compatible with the land use constraints of the site for protecting water environmental values in existing natural waterways.</td><td>Acceptable outcome A02.1

Where relevant:
a. Environmental values in downstream waterways are protected;
b. Any groundwater recharge areas are not affected;
c. The location of the waterway incorporates low lying areas of a catchment connected to an existing waterway;
d. Any existing areas of ponded water are included.
And
Acceptable outcome A02.2
Waterways are located:</td></tr>
</table>

	a. Outside natural wetlands and any associated buffer areas; and b. To avoid disturbing soils or sediments and c. To avoid altering the natural hydrologic regime in acid sulfate soil and nutrient hazardous areas.
Outcome achieved – The catchments and flow directions on site remain generally the same between pre and post development. No additional dams are proposed, with the existing gullies being maintained toward existing dams and piped flows out letting to these. The larger gullies are also maintained with piped networks out letting toward these.	
Performance Outcome P03 The waterway is located in a way that is compatible with existing tidal waterways.	**Acceptable outcome A03.1** Where the waterway is located adjacent to, or connected to, a tidal waterway by means of a weir, lock, pumping system or similar: a. There is sufficient flushing or a tidal range of >0.3m; or b. Any tidal flow alteration does not adversely impact on the tidal waterway; or c. There is no introduction of salt water into freshwater environments.
Outcome achieved – Not adjacent tidal waterways.	
Performance Outcome P04 The construction phase for the waterway is compatible with protecting water environmental values in existing natural waterways.	**Acceptable outcome A04.1** Erosion and sediment control measures are incorporated during construction to achieve design objectives set out in Chapter 4 of the guideline.
Outcome achieved – Erosion and sediment control has been designed in accordance with best practices. The construction contractor will also be responsible for preparing an erosion and sediment control plan in reference to the civil design ESC to ensure appropriate controls are in place during and after construction.	
Performance Outcome P05 Stormwater overflows from the waterway provide for the achievement of water quality objectives in existing natural waterways	**Acceptable outcome A05.1** Stormwater run-off that may enter the non-tidal waterway is pre-treated in accordance with the guideline design objectives, water quality objectives of local waterways, and any relevant local area stormwater management plan.

Outcome achieved – Stormwater has been designed to be captured and conveyed to the existing stormwater flow paths as per previous stages of the development. Run-off quality is enhanced by large areas of natural grass and vegetation to prevent sediment runoff.	
Designing, managing and operating the non-tidal artificial waterway	
Performance Outcome P06 The waterway is designed, managed and operated by suitably qualified persons.	**Acceptable outcome A06.1** To help achieve water quality objectives in and downstream of the waterway, the waterway is designed, constructed and managed under the responsibility of a suitably qualified registered professional engineer, Queensland with specific experience in establishing and managing artificial waterways.
Outcome achieved – No additional artificial waterways are to be constructed as part of the works. Flows to existing artificial waterways and drainage paths have been designed under the responsibility of an RPEQ.	
Performance Outcome P07 The waterway Is managed and operated in ways that demonstrate achievement of water quality objectives in natural waterways.	**Acceptable outcome A07.1** Monitoring and maintenance programs adaptively manage water quality in the waterway to achieve relevant water quality objectives downstream of the waterway. **And** **Acceptable outcome A07.2** Aquatic weeds are managed in ways that achieve a low percentage of coverage of the water surface area (less than 10%). Pests and vectors (such as mosquitoes) are managed such as by avoiding stagnant water areas, providing for native fish predators, and if necessary, other best practices for monitoring and treating pests. **And** **Acceptable outcome A07.3** The waterway is managed and operated by a responsible entity under agreement for the life of the waterway. The responsibility entity is to implement a deed of agreement for the management and operation of the waterway that: a. Identifies the waterway; b. States a period of responsibility for the

	entity for the management and operation of the waterway; c. States a process for any transfer of responsibility for the waterway; d. States required actions under the agreement for monitoring of the water quality of the water and receiving waters; e. States required actions under the agreement for maintaining the waterway to achieve the outcomes of this policy and any relevant approval conditions of the development; and f. Identifies funding sources for the above including bonds, headworks charges or levies.
Outcome achieved – No additional artificial waterways are to be constructed as part of the works. Existing flow paths remain in place post development and no significant catchment changes are proposed.	

6 POTABLE WATER RETICULATION

6.1 DESIGN METHOD

The water reticulation in this development, is a continuation of the mains located in Stage 3. Due to the control levels of the road deck height and the negative fall across the verge towards the creek outlet, a cover of only 450mm was available for the laying of watermains above the culvert. Due to the minimum cover above the culvert, the watermains (and communications) have been directed to below the culvert.

There are no extra connections from allotments required in this project and calculations are based on the accepted Stage 3 submission. All reticulation mains have been designed in accordance with the FNQROC Development Manual for 500 litres/person/day as follows:

• Single Family Dwelling (>1500 m²)	= 3.7 EP/Connection	
• Average Day Consumption (AD)	= 1,850 L/day	
• Mean Day Maximum Month (MDMM)	= 1.5 x AD	= 2,775 L/day
• Maximum Day	= 2.25 x AD	= 4,163 L/day
• Maximum Hour	= 1/12 MD	= 347 L/hour
	= 0.0964 L/s	

The following design criterion was assessed:

• Pressure in system to remain above 22m and below 60m during Maximum Hour Demand.

• Pressure in system to remain above 12m during firefighting flows of 15 L/s.

6.2 GENERAL LAYOUT

6.2.1 Alignment

Water mains have been designed on an alignment of 2.0m from the RP boundary as per the Mareeba Shire requirement in Table D6.2 of the FNQROC Development Manual.

6.2.2 Cover

The minimum cover for mains located on the footpath is 600mm and 800mm for a road crossing, whilst complying with a maximum of 1200mm. Watermains (and communications) have been directed to below the culvert.

The minimum separation between the water main and other services is as follows:

Minimum Clearance for Water Mains ≤ 300mm diameter

Service	Horizontal Clearance (mm)	Vertical Clearance (mm)
Ergon	500	225
Telstra	300	150

Stormwater	300	150
Sewer	1000	500
Water Crossing	300	150

*Based on WSA 03 Table 4.1

6.2.3 Fittings

Road crossings shall be DICL with a minimum diameter of 100mm.

Rider Mains

Properties located on the opposite side of the road to the water main are serviced by a DN63mm MDPE pipe to serve a maximum of 15 allotments.

Hydrants

Fire hydrants shall be located opposite RP boundaries at a maximum spacing of 80m and shall be located on mains 100mm dia. or greater only.

Valves

Valves are installed throughout the system to provide minimum disturbance during maintenance. The maximum number of houses inconvenienced is no greater than 15.

6.2.4 Maximum Hour Demand

The local water network has been modelled with the proposed network and demands added. The network shows that the network complies with pressures between the minimum 22m and maximum 60m pressure requirements at maximum hour demand, in both the interim & ultimate development cases.

6.2.5 Fire Fighting Demand

The assessment undertaken as part of the design works shows that the network is able to operate at the minimum required pressure head of 12m at 15L/s flow, in both the interim & ultimate development cases. With future network upgrades planned for the water reticulation network in the area, this will only further improve the serviceability beyond the minimum as these are undertaken.

DA Form 1 – Development application details

Approved form (version 1.6 effective 2 August 2024) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving only building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development (i.e. material change of use, operational work or reconfiguring a lot)**, use this form (*DA Form 1*) **and** parts 4 to 6 of *DA Form 2 – Building work details.*

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008.* For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: *All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).*

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	Conmat No. 2 Pty Ltd C/O ERSCON Consulting Engineers
Contact name *(only applicable for companies)*	Mark Freeman
Postal address *(P.O. Box or street address)*	10/320 Sheridan Street
Suburb	Cairns North
State	QLD
Postcode	4870
Country	Australia
Contact number	0410 724 331
Email address *(non-mandatory)*	markfreeman@erscon.com.au
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	160-012

1.1) Home-based business

☐ Personal details to remain private in accordance with section 264(6) of *Planning Act 2016*

2) Owner's consent

2.1) Is written consent of the owner required for this development application?

☐ Yes – the written consent of the owner(s) is attached to this development application
☒ No – proceed to 3)

PART 2 – LOCATION DETAILS

3) Location of the premises *(complete 3.1) or 3.2), and 3.3) as applicable)*

***Note**: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see DA Forms Guide: Relevant plans.*

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (*all lots must be listed*), ***or***

☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises *(appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).*

a)	Unit No.	Street No.	Street Name and Type	Suburb
		200	Country Road	Mareeba
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4880	200	SP342245	Mareeba
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

3.2) Coordinates of premises *(appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)*

***Note**: Place each set of coordinates in a separate row.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ Other:	

3.3) Additional premises

☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application

☒ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

☒ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:	Unnamed Creek

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:	
Name of port authority for the lot:	

☐ In a tidal area

Name of local government for the tidal area *(if applicable)*:	
Name of port authority for tidal area *(if applicable)*	

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*	
Name of airport:	
☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*	
EMR site identification:	
☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*	
CLR site identification:	

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see DA Forms Guide.

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☒ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☒ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

Construction of 2 / 2700 x 1500 culverts, roadwork and service extension

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms guide: Relevant plans.*

☒ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

☐ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

☐ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

☐ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots)*:

e) Relevant plans

***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development
☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application
☒ Not required
6.4) Is the application for State facilitated development?
☐ Yes - Has a notice of declaration been given by the Minister?
☒ No

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☐ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☒ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

***Note**: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.*

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*

8.2) Does the proposed use involve the use of existing buildings on the premises?
☐ Yes
☐ No

8.3) Does the proposed development relate to temporary accepted development under the Planning Regulation?	
☐ Yes – provide details below or include details in a schedule to this development application	
☐ No	
Provide a general description of the temporary accepted development	Specify the stated period dates under the Planning Regulation

Division 2 – Reconfiguring a lot

***Note**: This division is only required to be completed if any part of the development application involves reconfiguring a lot.*

9.1) What is the total number of existing lots making up the premises?

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☐ Subdivision *(complete 10)*	☐ Dividing land into parts by agreement *(complete 11)*
☐ Boundary realignment *(complete 12)*	☐ Creating or changing an easement giving access to a lot from a constructed road *(complete 13)*

10) Subdivision				
10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☐ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment			
12.1) What are the current and proposed areas for each lot comprising the premises?			
Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)
12.2) What is the reason for the boundary realignment?			

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*				
Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

***Note**: This division is only required to be completed if any part of the development application involves operational work.*

14.1) What is the nature of the operational work?		
☒ Road work	☐ Stormwater	☐ Water infrastructure
☒ Drainage work	☒ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☐ Signage	☐ Clearing vegetation
☐ Other – please specify:		

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*	
☐ Yes – specify number of new lots:	
☒ No	

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*

$410,809.38

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application

Mareeba Shire Council

16) Has the local government agreed to apply a superseded planning scheme for this development application?

☐ Yes – a copy of the decision notice is attached to this development application
☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☒ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

☐ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **Chief Executive of the *Planning Act 2016*:**

☐ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*
☐ Environmentally relevant activities (ERA) *(only if the ERA has not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☒ Fisheries – waterway barrier works
☐ Hazardous chemical facilities
☐ Heritage places – Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure-related referrals – designated premises
☐ Infrastructure-related referrals – state transport infrastructure
☐ Infrastructure-related referrals – State transport corridor and future State transport corridor
☐ Infrastructure-related referrals – State-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure-related referrals – near a state-controlled road intersection
☐ Koala habitat in SEQ region – interfering with koala habitat in koala habitat areas outside koala priority areas
☐ Koala habitat in SEQ region – key resource areas
☐ Ports – Brisbane core port land – near a State transport corridor or future State transport corridor
☐ Ports – Brisbane core port land – environmentally relevant activity (ERA)
☐ Ports – Brisbane core port land – tidal works or work in a coastal management district
☐ Ports – Brisbane core port land – hazardous chemical facility
☐ Ports – Brisbane core port land – taking or interfering with water
☐ Ports – Brisbane core port land – referable dams
☐ Ports – Brisbane core port land – fisheries
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*
☐ SEQ development area
☐ SEQ regional landscape and rural production area or SEQ rural living area – tourist activity or sport and recreation activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – community activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – indoor recreation
☐ SEQ regional landscape and rural production area or SEQ rural living area – urban activity
☐ SEQ regional landscape and rural production area or SEQ rural living area – combined use
☐ SEQ northern inter-urban break – tourist activity or sport and recreation activity

☐ SEQ northern inter-urban break – community activity
☐ SEQ northern inter-urban break – indoor recreation
☐ SEQ northern inter-urban break – urban activity
☐ SEQ northern inter-urban break – combined use
☐ Tidal works or works in a coastal management district
☐ Reconfiguring a lot in a coastal management district or for a canal
☐ Erosion prone area in a coastal management district
☐ Urban design
☐ Water-related development – taking or interfering with water
☐ Water-related development – removing quarry material *(from a watercourse or lake)*
☐ Water-related development – referable dams
☐ Water-related development –levees *(category 3 levees only)*
☐ Wetland protection area

Matters requiring referral to the **local government:**
☐ Airport land
☐ Environmentally relevant activities (ERA) (*only if the ERA has been devolved to local government)*
☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity:**
☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:
- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council:**
☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the *Transport Infrastructure Act 1994*:**
☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*
☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator**:**
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority:**
☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority:**
☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service:**
☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

18) Has any referral agency provided a referral response for this development application?

☐ Yes – referral response(s) received and listed below are attached to this development application
☒ No

Referral requirement	Referral agency	Date of referral response

Identify and describe any changes made to the proposed development application that was the subject of the referral response and this development application, or include details in a schedule to this development application *(if applicable).*

PART 6 – INFORMATION REQUEST

19) Information request under the DA Rules

☒ I agree to receive an information request if determined necessary for this development application

☐ I do not agree to accept an information request for this development application

***Note**: By not agreeing to accept an information request I, the applicant, acknowledge:*

- *that this development application will be assessed and decided based on the information provided when making this development application and the assessment manager and any referral agencies relevant to the development application are not obligated under the DA Rules to accept any additional information provided by the applicant for the development application unless agreed to by the relevant parties*
- *Part 3 under Chapter 1 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules or*
- *Part 2under Chapter 2 of the DA Rules will still apply if the application is for state facilitated development*

Further advice about information requests is contained in the DA Forms Guide.

PART 7 – FURTHER DETAILS

20) Are there any associated development applications or current approvals? *(e.g. a preliminary approval)*

☒ Yes – provide details below or include details in a schedule to this development application

☐ No

List of approval/development application references	Reference number	Date	Assessment manager
☒ Approval ☐ Development application	REC/08/0096	28 March 2012 (As amended 20 June 2018)	Tablelands Regional Council (Now Mareeba Shire Council)
☒ Approval ☐ Development application	OPW/21/0001	8 February 2022	Mareeba Shire Council

21) Has the portable long service leave levy been paid? *(only applicable to development applications involving building work or operational work)*

☐ Yes – a copy of the receipted QLeave form is attached to this development application

☒ No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid

☐ Not applicable *(e.g. building and construction work is less than $150,000 excluding GST)*

Amount paid	Date paid (dd/mm/yy)	QLeave levy number (A, B or E)
$		

22) Is this development application in response to a show cause notice or required as a result of an enforcement notice?

☐ Yes – show cause or enforcement notice is attached

☒ No

23) Further legislative requirements

Environmentally relevant activities

23.1) Is this development application also taken to be an application for an environmental authority for an **Environmentally Relevant Activity (ERA)** under section 115 of the *Environmental Protection Act 1994*?

☐ Yes – the required attachment (form ESR/2015/1791) for an application for an environmental authority accompanies this development application, and details are provided in the table below

☒ No

***Note**: Application for an environmental authority can be found by searching "ESR/2015/1791" as a search term at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.*

Proposed ERA number:		Proposed ERA threshold:	
Proposed ERA name:			

☐ Multiple ERAs are applicable to this development application and the details have been attached in a schedule to this development application.

Hazardous chemical facilities

23.2) Is this development application for a **hazardous chemical facility**?

☐ Yes – *Form 536: Notification of a facility exceeding 10% of schedule 15 threshold* is attached to this development application

☒ No

***Note**: See www.business.qld.gov.au for further information about hazardous chemical notifications.*

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation that the chief executive of the *Vegetation Management Act 1999* is satisfied the clearing is for a relevant purpose under section 22A of the *Vegetation Management Act 1999*?

☒ Yes – this development application includes written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☐ No

***Note**: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.*

2. See https://www.qld.gov.au/environment/land/vegetation/applying for further information on how to obtain a s22A determination.

Environmental offsets

23.4) Is this development application taken to be a prescribed activity that may have a significant residual impact on a **prescribed environmental matter** under the *Environmental Offsets Act 2014*?

☐ Yes – I acknowledge that an environmental offset must be provided for any prescribed activity assessed as having a significant residual impact on a prescribed environmental matter

☒ No

***Note**: The environmental offset section of the Queensland Government's website can be accessed at www.qld.gov.au for further information on environmental offsets.*

Koala habitat in SEQ Region

23.5) Does this development application involve a material change of use, reconfiguring a lot or operational work which is assessable development under Schedule 10, Part 10 of the Planning Regulation 2017?

☐ Yes – the development application involves premises in the koala habitat area in the koala priority area

☐ Yes – the development application involves premises in the koala habitat area outside the koala priority area

☒ No

***Note**: If a koala habitat area determination has been obtained for this premises and is current over the land, it should be provided as part of this development application. See koala habitat area guidance materials at www.desi.qld.gov.au for further information.*

Water resources

23.6) Does this development application involve **taking or interfering with underground water through an artesian or subartesian bore, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water under the *Water Act 2000***?

☒ Yes – the relevant template is completed and attached to this development application and I acknowledge that a relevant authorisation or licence under the *Water Act 2000* may be required prior to commencing development

☐ No

***Note**: Contact the Department of Resources at www.resources.qld.gov.au for further information.*

*DA templates are available from planning.statedevelopment.qld.gov.au**. If the development application involves:***

- *Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1*
- *Taking or interfering with water in a watercourse, lake or spring: complete DA Form1 Template 2*
- *Taking overland flow water: complete DA Form 1 Template 3.*

Waterway barrier works

23.7) Does this application involve **waterway barrier works?**

☒ Yes – the relevant template is completed and attached to this development application

☐ No

DA templates are available from planning.statedevelopment.qld.gov.au. For a development application involving waterway barrier works, complete DA Form 1 Template 4.

Marine activities

23.8) Does this development application involve **aquaculture, works within a declared fish habitat area or removal, disturbance or destruction of marine plants?**

☐ Yes – an associated *resource* allocation authority is attached to this development application, if required under the *Fisheries Act 1994*

☒ No

***Note**: See guidance materials at www.daf.qld.gov.au for further information.*

Quarry materials from a watercourse or lake

23.9) Does this development application involve the **removal of quarry materials from a watercourse or lake** under the *Water Act 2000?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Resources at www.resources.qld.gov.au and www.business.qld.gov.au for further information.*

Quarry materials from land under tidal waters

23.10) Does this development application involve the **removal of quarry materials from land under tidal water** under the *Coastal Protection and Management Act 1995?*

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Environment, Science and Innovation at www.desi.qld.gov.au for further information.*

Referable dams

23.11) Does this development application involve a **referable dam** required to be failure impact assessed under section 343 of the *Water Supply (Safety and Reliability) Act 2008* (the Water Supply Act)?

☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application

☒ No

***Note**: See guidance materials at www.resources.qld.gov.au for further information.*

Tidal work or development within a coastal management district

23.12) Does this development application involve **tidal work or development in a coastal management district**?

☐ Yes – the following is included with this development application:
- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☒ No

***Note**: See guidance materials at www.desi.qld.gov.au for further information.*

Queensland and local heritage places

23.13) Does this development application propose development on or adjoining a place entered in the **Queensland heritage register** or on a place entered in a local government's **Local Heritage Register**?

☐ Yes – details of the heritage place are provided in the table below

☒ No

***Note**: See guidance materials at www.desi.qld.gov.au for information requirements regarding development of Queensland heritage places. For a heritage place that has cultural heritage significance as a local heritage place and a Queensland heritage place, provisions are in place under the Planning Act 2016 that limit a local categorising instrument from including an assessment benchmark about the effect or impact of, development on the stated cultural heritage significance of that place. See guidance materials at www.planning.statedevelopment.qldgov.au for information regarding assessment of Queensland heritage places.*

Name of the heritage place:		Place ID:	

Decision under section 62 of the *Transport Infrastructure Act 1994*

23.14) Does this development application involve new or changed access to a state-controlled road?

☐ Yes – this application will be taken to be an application for a decision under section 62 of the *Transport Infrastructure Act 1994* (subject to the conditions in section 75 of the *Transport Infrastructure Act 1994* being satisfied)

☒ No

Walkable neighbourhoods assessment benchmarks under Schedule 12A of the Planning Regulation

23.15) Does this development application involve reconfiguring a lot into 2 or more lots in certain residential zones (except rural residential zones), where at least one road is created or extended?

☐ Yes – Schedule 12A is applicable to the development application and the assessment benchmarks contained in schedule 12A have been considered

☒ No

***Note**: See guidance materials at www.planning.statedevelopment.qld.gov.au for further information.*

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist	
I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17 ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
If building work is associated with the proposed development, Parts 4 to 6 of *DA Form 2 – Building work details* have been completed and attached to this development application	☐ Yes ☒ Not applicable
Supporting information addressing any applicable assessment benchmarks is with the development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	☒ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*	☒ Yes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued *(see 21)*	☒ Yes ☐ Not applicable

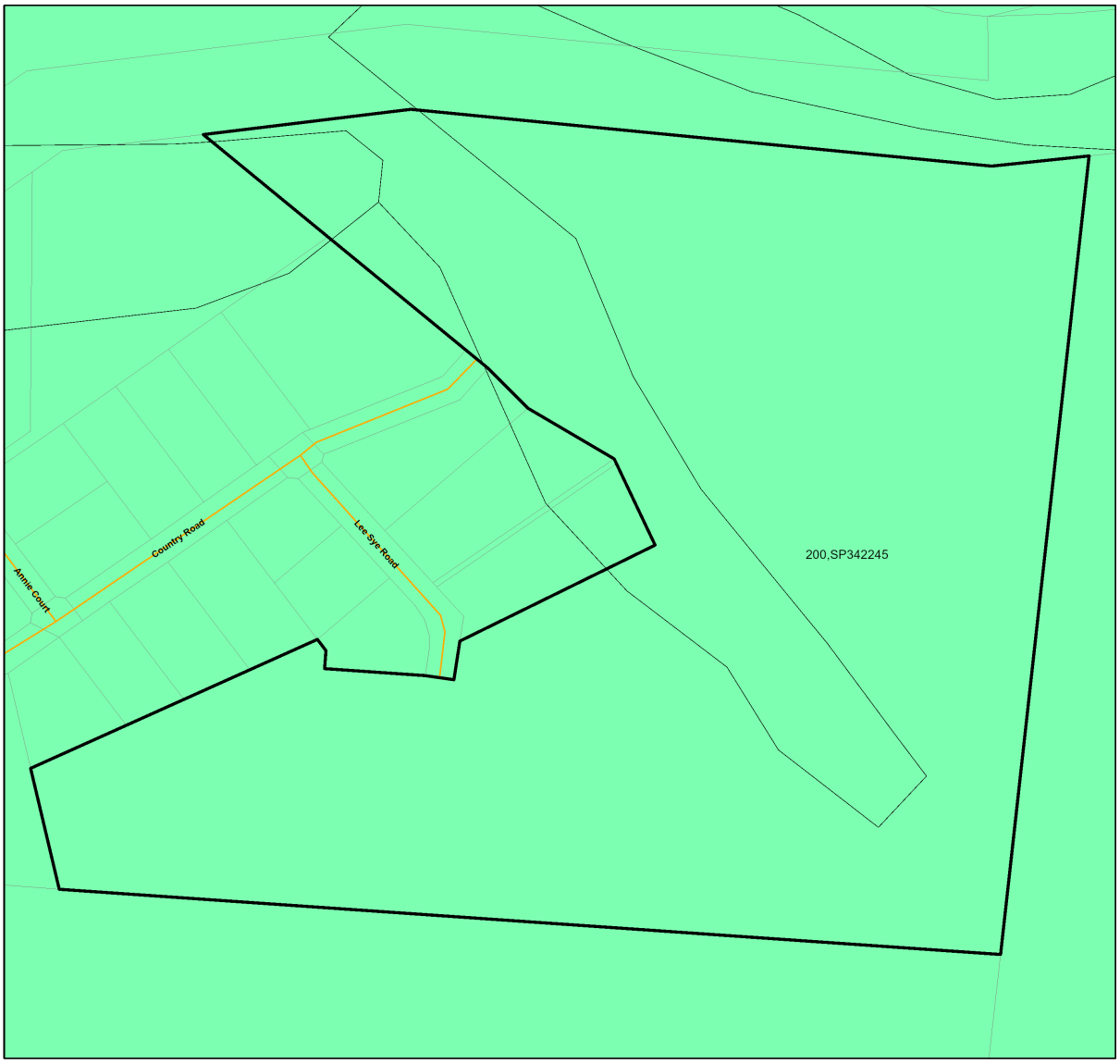
25) Applicant declaration
☒ By making this development application, I declare that all information in this development application is true and correct ☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001* ***Note**: It is unlawful to intentionally provide false or misleading information.*
Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website. Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where: • such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or • required by other legislation (including the *Right to Information Act 2009*); or • otherwise required by law. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002.*

PART 9 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: | Reference number(s):

Notification of engagement of alternative assessment manager	
Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	
Relevant licence number(s) of chosen assessment manager	

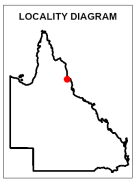
QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			



Vegetation Management Pre-clear Regional Ecosystem Map

- Highway
- Connector
- Street/Local Road
- Other land parcel boundaries
- Pre-clearing area containing Endangered RE
- Pre-clearing area containing Of Concern RE
- Pre-clearing area that is a Least Concern RE
- Water
- Selected Lot and Plan

LOCALITY DIAGRAM



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Pre-clearing regional ecosystem line-work reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only.

Digital data for the Pre-clearing regional ecosystem map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries shown are provided as a locational aid only.

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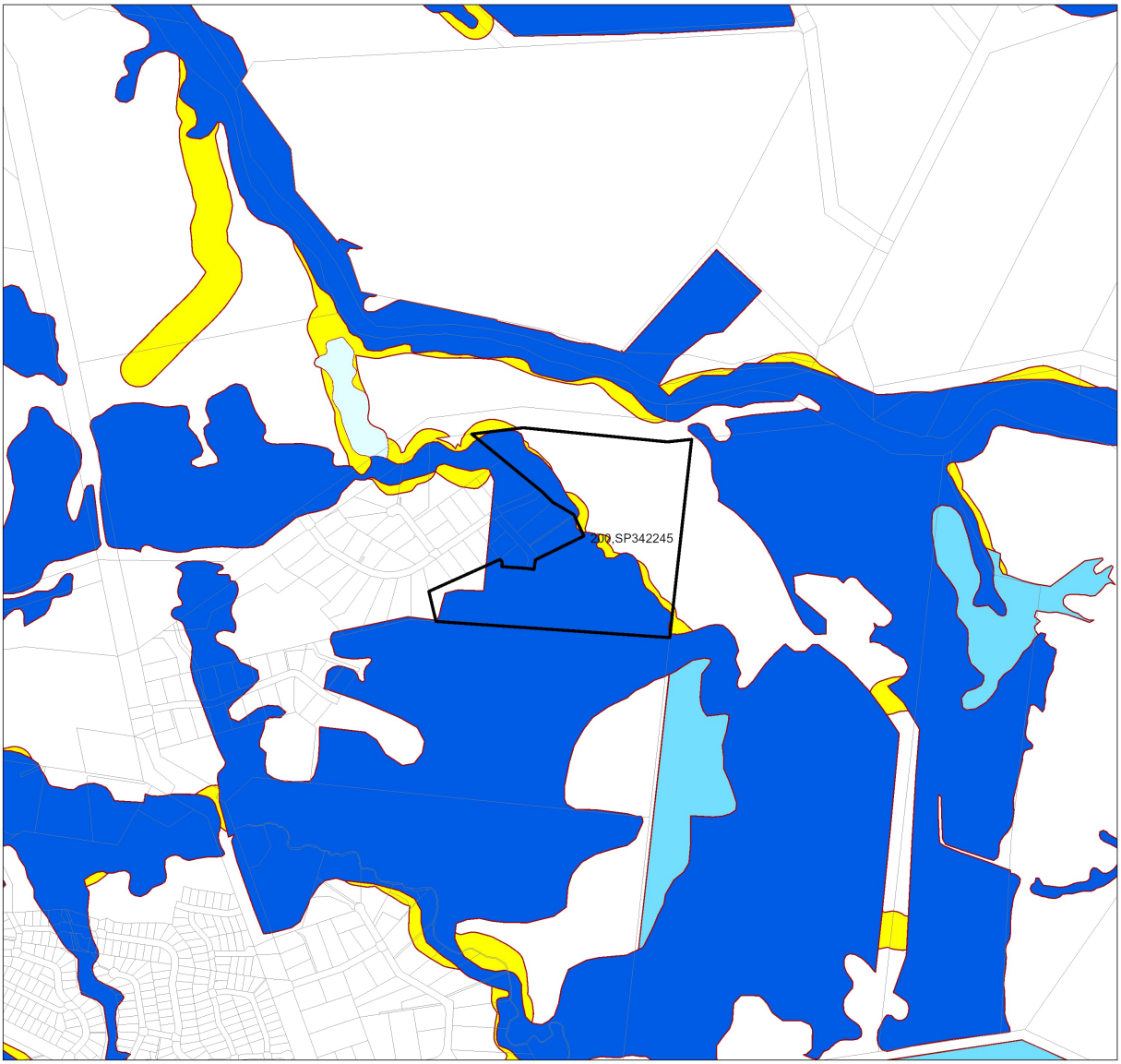
Queensland Government

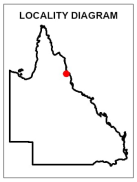


Regulated Vegetation Management Map

Queensland Government

- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Other land parcel boundaries
- Selected Lot and Plan

LOCALITY DIAGRAM



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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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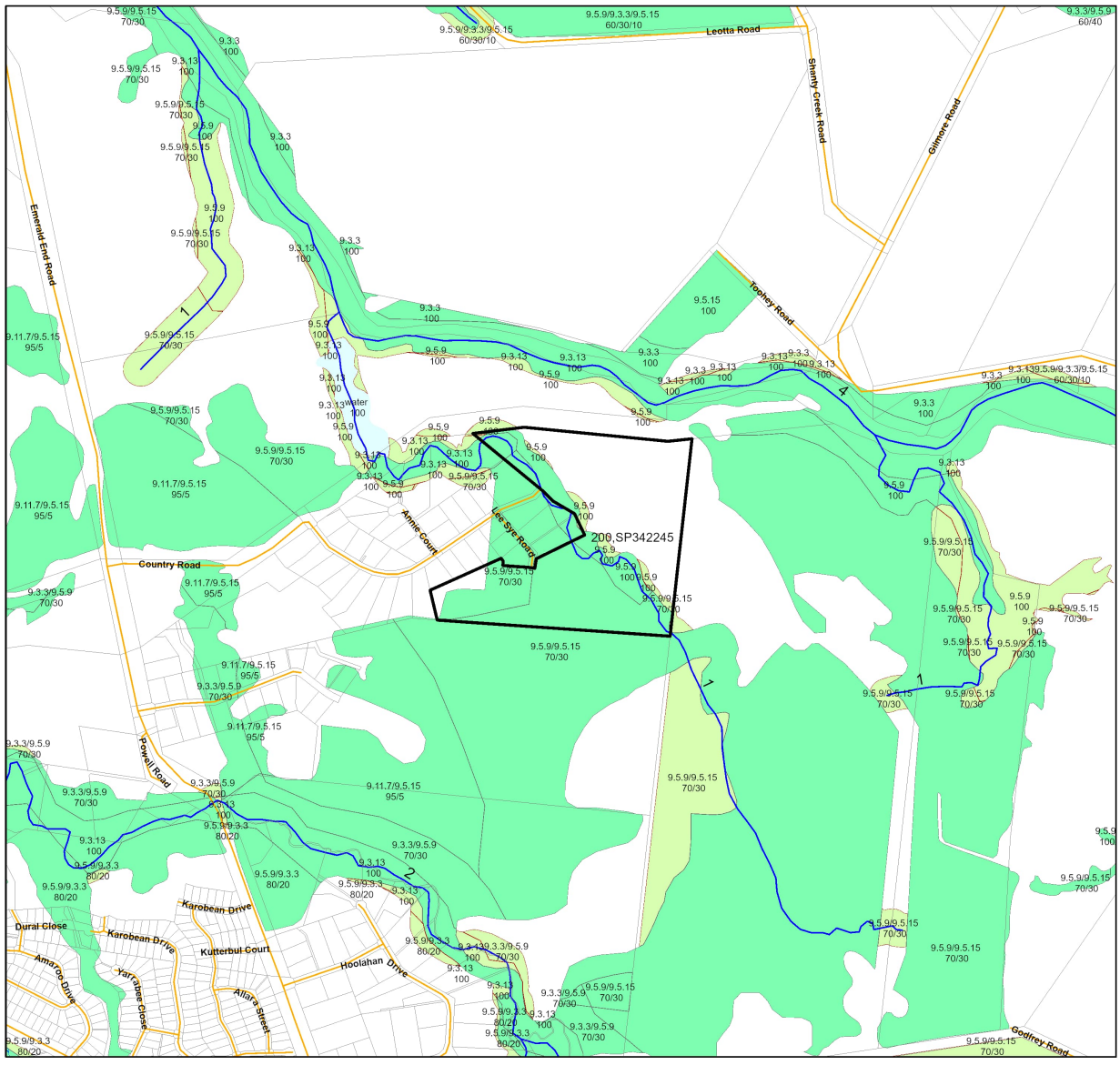

Vegetation Management Supporting Map

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

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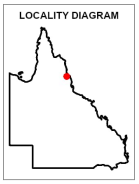
LOCALITY DIAGRAM



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This product is displayed in: GDA2020

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development website http://www.nrmmrrd.qld.gov.au has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1. that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
2. in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

No records

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Vegetation management report

For Lot: 200 Plan: SP342245
23/08/2025

nrmmrrd.qld.gov.au

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 200 Plan: SP342245 are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
200	SP342245	Freehold	272,800

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

Does the property Lot: 200 Plan: SP342245 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 200 Plan: SP342245, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Mareeba Shire	Barron	Einasleigh Uplands	Hodgkinson Basin

2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit https://www.resources.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 200 Plan: SP342245

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property

Vegetation category	Area (ha)
Category B	13.59
Category R	0.94
Category X	12.75

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property.
Reference number:
2010/000747

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
9.3.13	Least concern	B	0.50	Melaleuca spp., Eucalyptus camaldulensis and Casuarina cunninghamiana fringing open forest on streams and channels	Mid-dense
9.3.13	Least concern	R	0.02	Melaleuca spp., Eucalyptus camaldulensis and Casuarina cunninghamiana fringing open forest on streams and channels	Mid-dense
9.5.15	Least concern	B	3.10	Melaleuca monantha +/- M. viridiflora +/- Callitris intratropica mixed low woodland on valley infill	Sparse
9.5.15	Least concern	R	0.09	Melaleuca monantha +/- M. viridiflora +/- Callitris intratropica mixed low woodland on valley infill	Sparse
9.5.9	Least concern	B	10.00	Corymbia clarksoniana and/or Eucalyptus leptophleba and/or E. platyphylla woodland on plains	Sparse
9.5.9	Least concern	R	0.83	Corymbia clarksoniana and/or Eucalyptus leptophleba and/or E. platyphylla woodland on plains	Sparse
non-rem	None	X	12.75	None	None

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

No records

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

Class A (with urban areas masked as per SPP): 20.2 ha

Class B (with urban areas masked as per SPP): 0.58 ha

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 200 Plan: SP342245.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

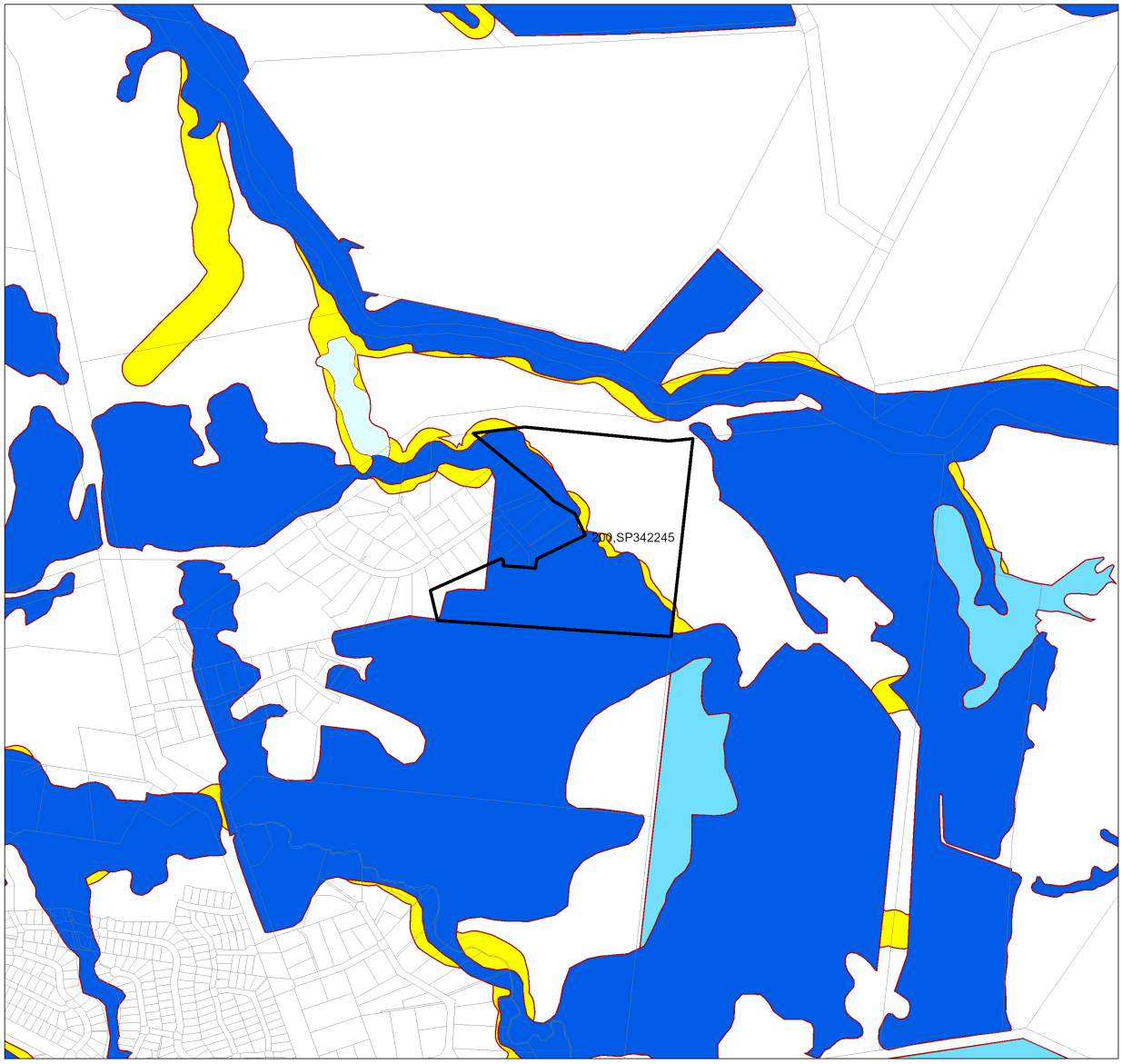
Regulated vegetation management map
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

Coastal/non-coastal map
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

4.1 Regulated vegetation management map



Regulated Vegetation Management Map

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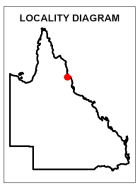
Category A area (Vegetation offsets/compliance notices/VDecs)
Category B area (Remnant vegetation)
Category C area (High-value regrowth vegetation)
Category R area (Reef regrowth watercourse vegetation)
Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
Water
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

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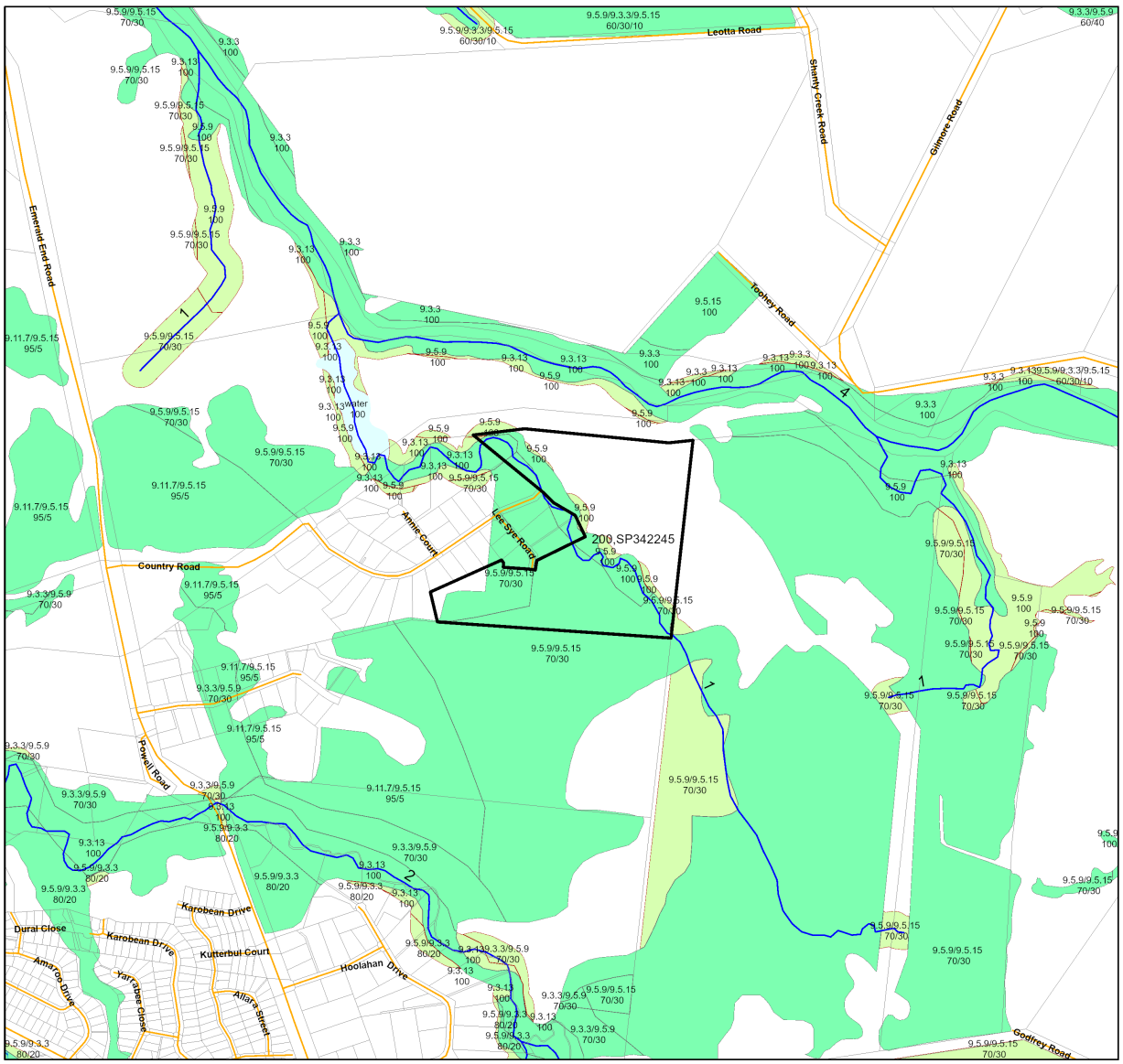
4.2 Vegetation management supporting map



Vegetation Management Supporting Map

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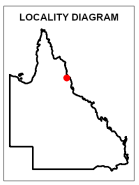

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Labels for Essential Habitat are centred on the area of enquiry.

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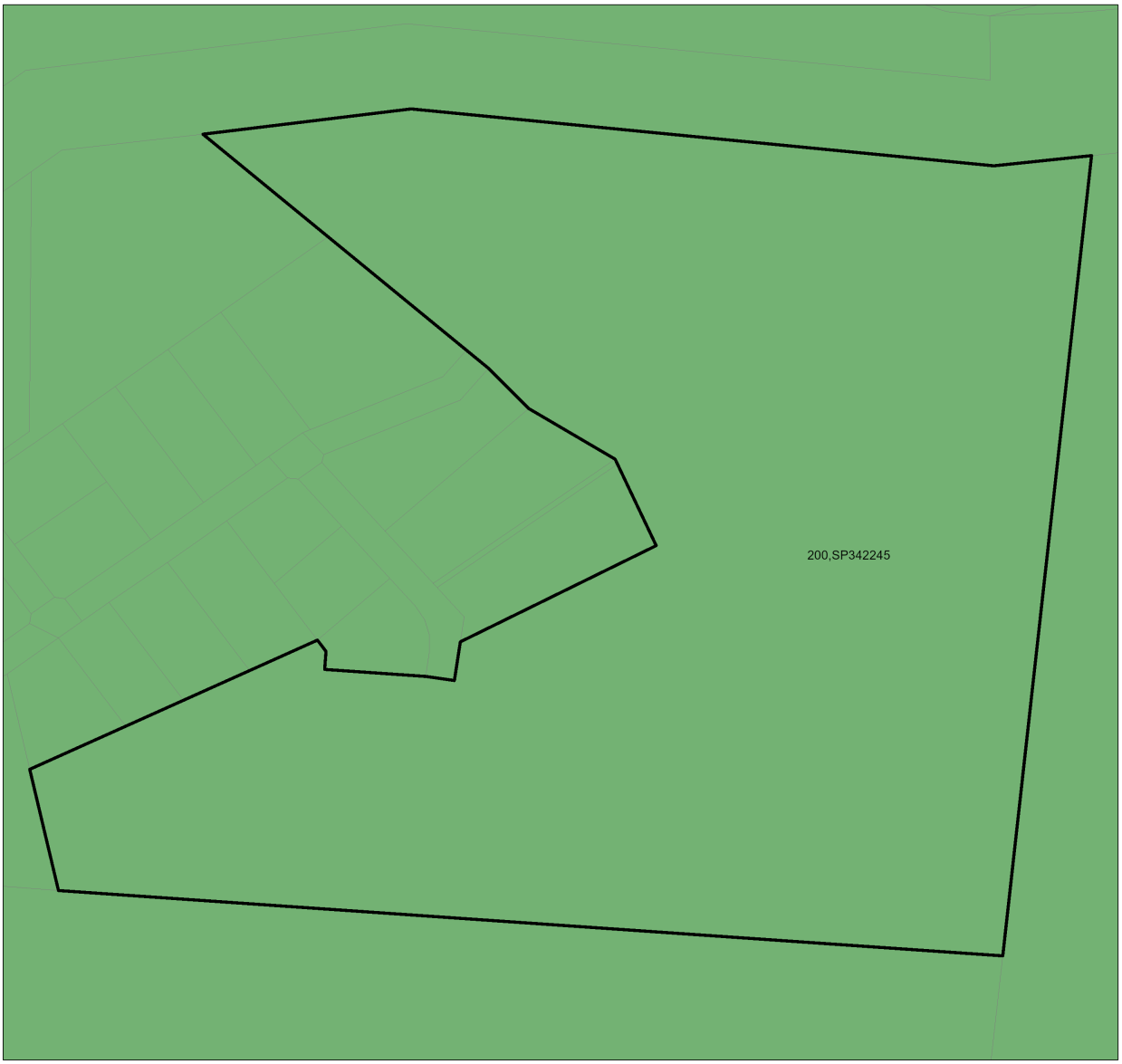
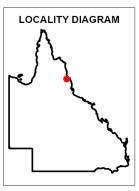
4.3 Coastal/non-coastal map



Coastal/Non Coastal Map

Coastal
Non Coastal
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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Disclaimer:
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Land parcel boundaries shown are provided as a locational aid only.

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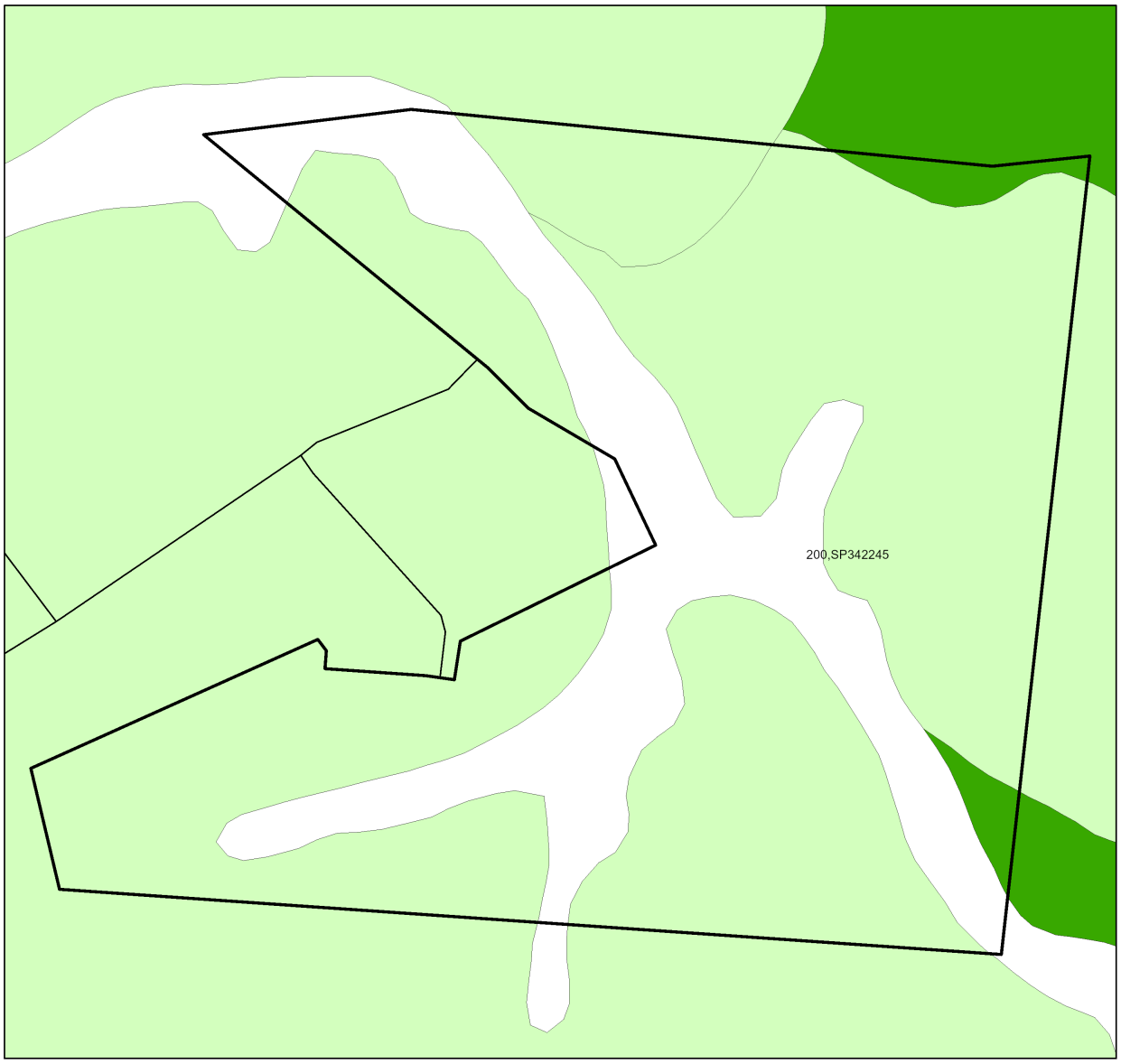
4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



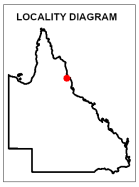
Agricultural Land Class A or B
as per State Planning Policy: State Interest for Agriculture

- Towns
- Rivers and creeks
- Freeways / motorways; Highways
- Secondary roads; Streets

Agricultural land class A or B

- A
- B
- Not class A or B
- Selected Lot and Plan

LOCALITY DIAGRAM



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5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DETSI

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@detsi.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

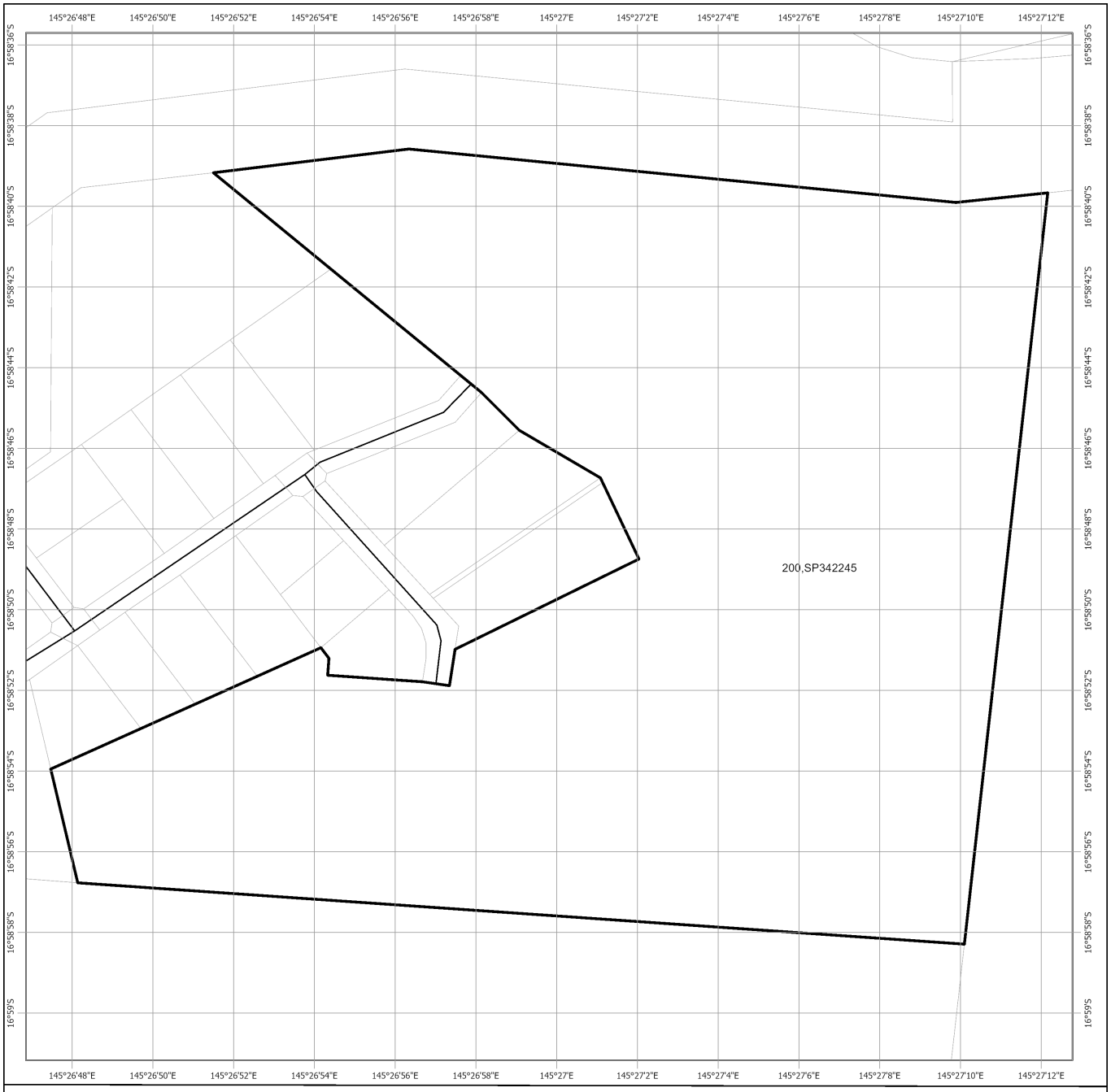
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

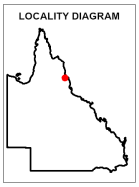
Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



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This product is displayed in:
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This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@detsi.qld.gov.au

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6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DETSI

For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@detsi.qld.gov.au
Visit https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 200 Plan: SP342245

7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



Koala priority area, koala habitat area and identified koala broad-hectare area map

- Koala habitat area (core)
- Koala habitat area (locally refined)
- Koala priority area
- Identified koala broad-hectare area
- Cadastral Boundaries
- Towns
- Major rivers/creeks
- Highway
- Connector
- Street/Local Road
- Queensland
- Selected Lot and Plan

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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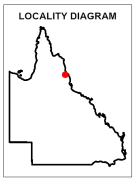
LOCALITY DIAGRAM



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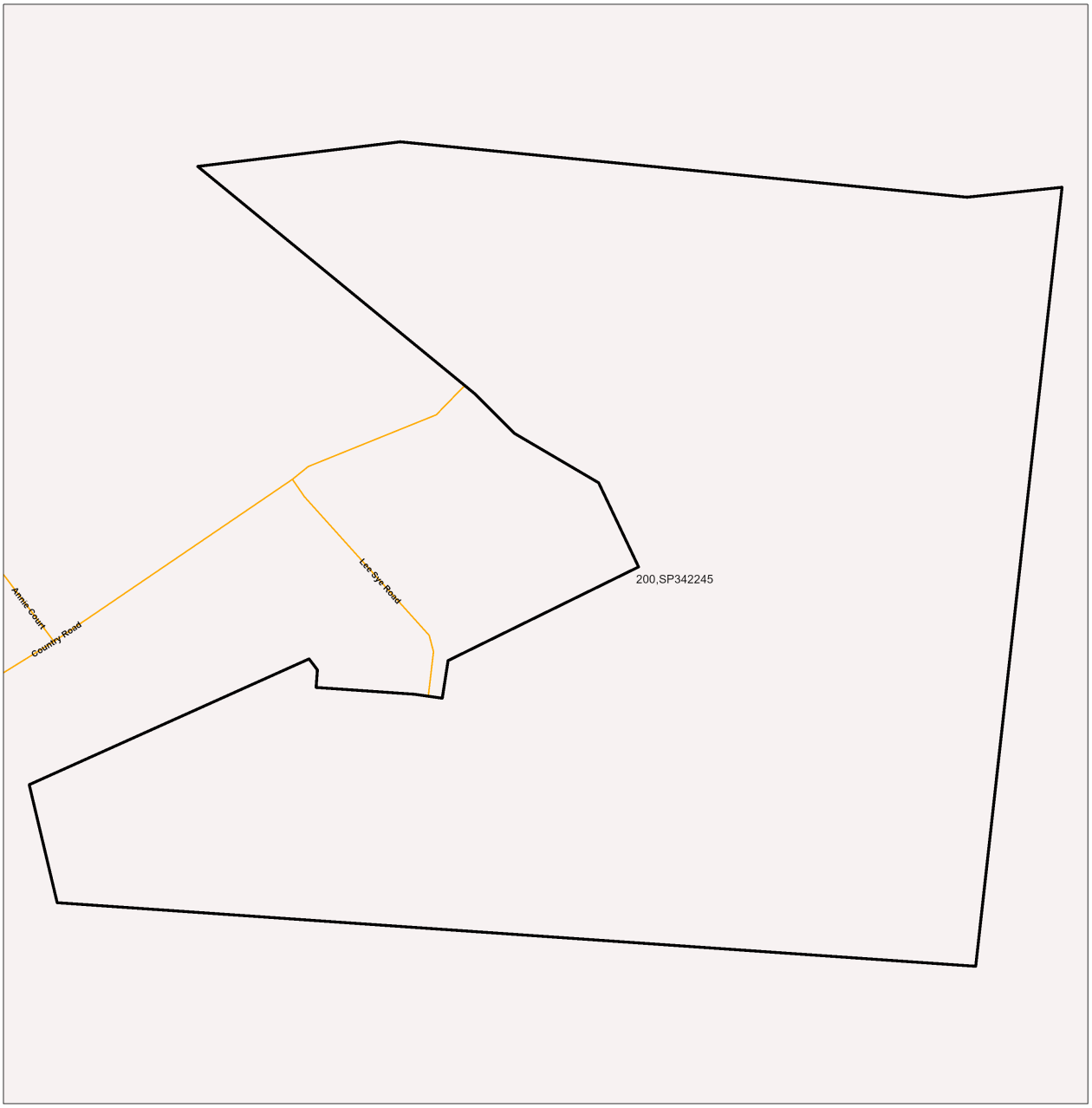
The koala conservation plan maps will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

In order to ensure that the most recent map for an area of interest can be accessed, prior to the annual update, a register of changes made to koala habitat areas as a result of the map amendment process will be available at: https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping/. The register will include lot on plan for the change, the date the decision was made and the map issued to the landholder which shows areas determined to be koala habitat areas.

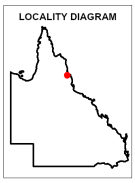
7.3 Koala habitat regional ecosystems for core koala habitat areas



Koala habitat regional ecosystems for core koala habitat areas

Koala habitat area (core)
Towns
Highway
Connector
Street/Local Road
Major rivers/creeks
Queensland
Selected Lot and Plan

LOCALITY DIAGRAM



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Due to varying sources of data, spatial locations may not coincide when overlaid.

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8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Department of Local Government, Water and Volunteers	Ph: 13 QGOV (13 74 68) www.dlgwv.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development	Ph: 13 QGOV (13 74 68) www.nrmmrrd.qld.gov.au
Fire Permits	*Fire and Emergency Services Act 1990*	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Ph: 13 QGOV (13 74 68) www.tatsipca.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) www.detsi.qld.gov.au
Protected plants and protected areas	*Nature Conservation Act 1992* *Planning Act 2016*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 1300 130 372 (option 4) palm@detsi.qld.gov.au www.detsi.qld.gov.au
Koala mapping and regulations	*Nature Conservation Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) Koala.assessment@detsi.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities	*Fisheries Act 1994* *Forestry Act 1959*	Queensland Department of Primary Industries	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Department of State Development, Infrastructure and Planning	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	*Wet Tropics World Heritage Protection and Management Act 1993*	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	*Transport Infrastructure Act 1994*	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Your relevant local government office	Local Government Contact Directory

Mark Freeman

From:	VMEnquiries@resources.qld.gov.au
Sent:	Saturday, 23 August 2025 11:20 AM
To:	Mark Freeman
Cc:	Mark Freeman
Subject:	Received Notification NVSA116753 for Lot 200 SP342245 for your accepted development clearing activity

Dear Mark Freeman

On 23/8/2025 Department of Resources received your notification of intent to clear vegetation under the following accepted development clearing code "Clearing for infrastructure".

An overview of lot 200 on plan number SP342245 is:

- Tenure: Freehold
- Vegetation Categories: B,R,X
- Bioregions: Einasleigh Uplands
- Local Government Areas: Mareeba Shire

You notified that you intend to clear vegetation:

- On lot 200 on plan number SP342245
- In Vegetation Category B
- For the purpose of Infrastructure
- For activities:
    - Drainage and erosion control structures
- For a total estimated area of: 0.0900 hectares

The location of the area you intend to clear was provided by map file(s)

- 160-012 CIVIL FULL SET.pdf
- 160-012-SK008 CULVERT PLAN - DES.pdf

Your notification is valid for 2 years and ends on 22/8/2027. You may only undertake the permitted clearing during this period.

Your notification reference number is NVSA116753

Your clearing must comply with all practices, area limits and requirements in the accepted development code "Clearing for infrastructure".

Note: Other legislation may also affect clearing activities. Before you clear vegetation under this code, it is strongly recommended that you contact the relevant agencies listed in the appendix of the code to determine whether your proposed clearing activity is allowable under other local, state and federal laws.

Disclaimer and acknowledgement

Any ‘lodgement’ kml file generated as part of this notification is merely a representation of the total estimated area notified under this notification. The ‘lodgement’ kml file is not verified against the total estimated area, and you should ensure the total clearing done under this notification is limited to the total estimated area notified.

The Department of Resources makes no representations about the accuracy of any kml file e.g. the ‘lodgement’ kml file accurately reflecting the total estimated area notified under this notification. Specifically, Department of Resources does not warrant, guarantee or make any representations regarding the correctness, accuracy, reliability, currency, or any other aspect regarding characteristics or use of the ‘lodgement’ kml file.

By commencing clearing under this notification, you acknowledge and accept the sole responsibility and risk associated with the use of any kml file, and agree that in no event shall Department of Resources be liable for any special, indirect or consequential damages or any damages whatsoever rising out of or in connection with the use of any kml file.

You have acknowledged that you have kept the following evidence as part of your notification:

- Evidence of any authorisations required under section 1.2 of the code - Acknowledged
- Landholder's consent (if relevant) - Acknowledged
- Evidence of landholder's consent, where relevant - Acknowledged
- Confirmation of notification - Acknowledged
- Appropriate records detailing the recognised best practice methods employed to protect soil and water quality as per the requirements of the code - Acknowledged
- GPS coordinates or map identifying the areas proposed to be cleared under the notification - Acknowledged
- Appropriate records detailing the progress and effectiveness of all exchange area works and management actions, where relevant - Acknowledged
- Copies of the regulated vegetation management map and a supporting map for the property obtained immediately prior to undertaking the clearing - Acknowledged
- Contractor details (name, address, contact details) where relevant - Acknowledged
- Pre-clearing photographs and GPS coordinates of the site that the pre-clearing photographs are taken - Acknowledged
- Instructions to contractors, detailing location, date, time and species, where relevant - Acknowledged
- Clearing commencement and completion dates - Acknowledged
- Appropriate records detailing the progress and effectiveness of all exchange area works and management actions - Acknowledged
- Contractor details name, address, contact details (if relevant) - Acknowledged
- Instructions to contractors, detailing location, date, time and species (if relevant) - Acknowledged

Please note that Department of Resources uses satellite imagery to monitor compliance with vegetation management regulations. Department of Resources may also contact you in regard to conducting an on-site audit of your clearing.

If you have any queries about this information or wish to seek advice on the practices and requirements in the accepted development code "Clearing for infrastructure", contact 135VEG or 135834.

The information in this email together with any attachments is intended only for the person or entity

to which it is addressed and may contain confidential and/or privileged material. There is no waiver of any confidentiality/privilege by your inadvertent receipt of this material.
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If you have received this message in error, you are asked to inform the sender as quickly as possible and delete this message and any copies of this message from your computer and/or your computer system network.

Template 2 – Taking or interfering with water in a watercourse, lake or spring

(version 1.1)

This template must be completed and submitted with *DA Form 1 – Development application details* for all development applications for operational works involving the taking or interfering with water in a watercourse, lake or spring by any of the following:

- Watercourse pump
- Water storage
- Gravity diversion from a watercourse
- Watercourse diversion, or
- Other work in a watercourse.

It is mandatory to complete the details in all applicable parts in this form and provide any supporting information identified on the form as being required to accompany your development application, unless stated otherwise.

Additional pages may be attached if there is insufficient space on this template for any questions.

Note: All terms used within this template have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the *Development Assessment Rules (DA Rules).*

Part 1 – DEVELOPMENT DETAILS

1) Are the works existing? *Note: Ensure that the relevant plans that accompany the development application identify the location of existing works and proposed works.*	☐ Yes – provide construction date (if known)	
	☒ No	

2) What is the proposed development for? *(tick all applicable boxes)*	☐ Watercourse pump	Complete part 2 only
	☐ Water storage	Complete part 3 only
	☐ Gravity diversion from a watercourse	Complete part 4 only
	☒ Watercourse diversion	Complete part 5 only
	☐ Other work in a watercourse	Complete part 6 only

Part 2 – WATERCOURSE PUMPS

3) What type of pump is proposed? *(tick all applicable boxes)*	☐ Centrifugal	☐ Turbine	☐ Helical rotor
	☐ Jet	☐ Submersible	☐ Piston
	☐ Cylinder pump and windmill		☐ Other – specify below

4) What is the motor type of the proposed pump? *(tick all applicable boxes)*	☐ Diesel	☐ Electric	☐ Hydro
	☐ Petrol	☐ Solar	☐ Wind
	☐ Other – please specify		

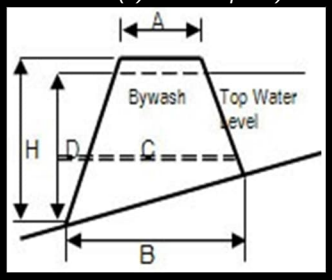
5) What are the details of the pump?	Inlet/bore (millimetres)	
	Outlet/stroke (millimetres)	
	Duty discharge (litres/sec)	
	Duty head (metres)	

6) Is there any filling or excavation proposed in the watercourse, lake or spring?	☐ Yes – additional information should be provided to assist with assessing the development application *(e.g. location and extent of filling or excavation)* ☐ No

Part 3 – WATER STORAGE

7) What type of water-storage facility is proposed?	☐ Dam ☐ Excavation in a watercourse ☐ Weir ☐ Other – please specify

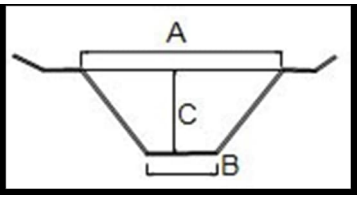
8) What is the proposed water-storage facility to be constructed from? *(tick all applicable boxes)*	☐ Earth ☐ Sand ☐ Rockfill ☐ Sandbag ☐ Earth and rockfill ☐ Sheetpile ☐ Concrete ☐ Timber ☐ Gabion ☐ Other – please specify

9) What are the dimensions of the proposed water-storage facility? *(give dimensions to one (1) decimal point)*  	Height to top (H)		metres
	Crest width (A)		metres
	Base width (B)		metres
	Crest length		metres
	Diameter of outlet pipe (C)		millimetres
	Height of bywash/spillway above bed level		metres
	Width of bywash/spillway		metres
	Distance of back up at top water level		metres
	Capacity of storage when at full supply level		megalitres
	Storage area at full supply level		hectares

10) If excavation works are proposed, what are the details of these works? *(give dimensions to one decimal point)*	**Top dimensions**		
	Width		metres
	Depth		metres
	Length		metres
	Capacity		megalitres
	Base dimensions		
	Length		metres
	Width		metres

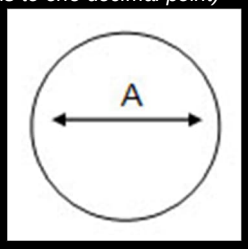
Part 4 – GRAVITY DIVERSION FROM A WATERCOURSE

11) If a gravity channel is proposed for this gravity diversion, what are the details of the proposed channel? *(give dimensions to one decimal point)*	Top width (A)		metres
	Bottom width (B)		metres
	Depth (C)		metres
	Length		metres



Bed slope		ratio
Side slope		ratio
Flow capacity		m^3/second

12) If a gravity pipeline is proposed for this gravity diversion, what are the details of the proposed pipeline?
(give dimensions to one decimal point)



Material type		
Diameter (A)		millimetres
Length		metres
Number of proposed pipes		
Bed slope		ratio
Flow capacity		m^3/second

13) Is there any filling or excavation proposed in the watercourse or water body?

☐ Yes – additional information should be provided to assist with assessment of the development application *(e.g. location and extent of filling or excavation)*

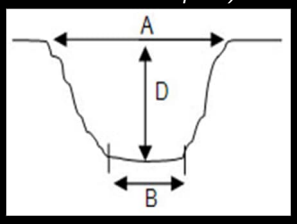
☐ No

14) What is the purpose of the proposed gravity diversion?

☐ Flood prevention	☐ Divert watercourse
☐ Erosion prevention	☐ Other – please specify

Part 5 – WATERCOURSE DIVERSION

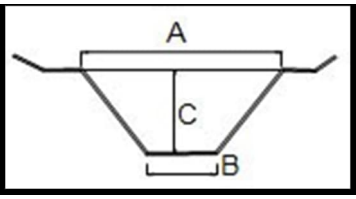
15) What are the details of the existing watercourse or water-body channel proposed to be diverted?
(give dimensions to one decimal point)

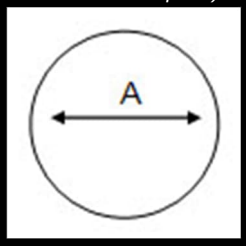


Top width (A)	8	metres
Bottom width (B)	2.8	metres
Depth (D)	1.5	metres
Length	32	metres
Bed slope		ratio
Side slope	1:167	ratio
Flow capacity	12.36	m^3/second

16) If the proposed method for diversion is earth or a lined channel, what are the details of the proposed channel?
(give dimensions to one decimal point)

Lining materials (e.g. PVC, steel)		
Top width (A)	5.4	metres
Bottom width (B)	5.4	metres
Depth (C)	1.5	metres
Length	35.9	metres

	Bed slope	1:150	ratio
	Side slope	1:2	ratio
	Flow capacity	12.36	m^3/second

17) If a pipeline is proposed for this watercourse diversion, what are the details of the proposed pipeline? *(give dimensions to one decimal point)* 	Pipe material (e.g. PVC, steel)		
	Diameter (A)		millimetres
	Length		metres
	Number of proposed pipes		
	Bed slope		ratio
	Flow capacity		m^3/second

18) What is the purpose of the proposed watercourse diversion?	☐ Flood prevention	☐ Divert watercourse
	☐ Erosion prevention	☒ Other – please specify
	Temporarily divert watercourse during construction of culverts to prevent flooding.	

Part 6 – OTHER WORK IN A WATERCOURSE

19) What are the details of the proposed works?	

20) What are the details of the proposed construction materials?	

Template 4 – Waterway barrier works

(version 1.1)

This template must be completed and submitted with *DA Form 1 – Development application details* for all development applications operational works involving waterway barrier works.

It is mandatory to complete the details in all applicable parts in this form and provide any supporting information that is required to accompany your development application, unless stated otherwise.

Additional pages may be attached if there is insufficient space on this template for any questions.

Note: All terms used within this template have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the *Development Assessment Rules (DA Rules), Fisheries Act 1994 and Fisheries Regulation 2008.*

Part 1 – DEVELOPMENT DETAILS

1) Has a Fish Movement Exemption Notice been issued for the proposed works?	☐ Yes – a copy of the Fish Movement Exemption Notice for the proposed work is attached ☒ No – details of how the proposed work provides for adequate fish movement is attached

2) What is the nature of the proposed waterway barrier(s)? *(tick all applicable boxes)*	☒ New construction	☐ Raise existing
	☐ Temporary	☐ Permanent
	☐ Partial	☐ Bank to bank

	Type	Number of barriers	Parts to complete
3) What type is the proposed work? *(tick all applicable boxes)* *Note: An individual section must be completed for each barrier relevant to this development application. Also ensure that the relevant plans that accompany the development application identify the location of existing works and proposed works.*	☐ Dam, weir or a barrage		2 only
	☒ Culvert		3 only
	☐ Causeway		4 only
	☐ Bridge pylon (abutments or pile foundations)		4 only
	☐ Flow-control structure such as a floodgate		4 only
	☐ Pollution-control device (e.g. trash rack or boom gate)		4 only
	☐ Levee bank across a waterway		4 only
	☐ Other – specify below (e.g. groyne, construction platform, sediment curtain, causeway)		4 only

Part 2 – CONSTRUCTING A NEW OR RAISING/MODIFYING AN EXISTING DAM, WEIR, BARRAGE, BUND WALL, COFFER DAM OR OTHER SIMILAR STRUCTURES

Note: If the development application involves more than one barrier relating to this part, generate another part 2 and attach to the application.

4) What is the proposed development application seeking approval for?	☐ New barrier	☐ Raising/modifying an existing barrier

5) Briefly describe the type of barrier proposed *(i.e. dam, weir, tidal barrage)*	

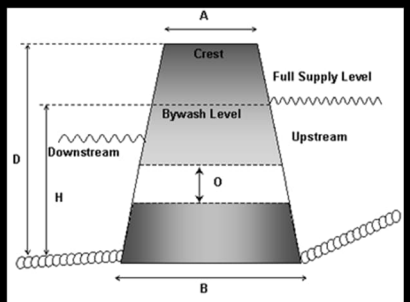
6) If the barrier is temporary *(in place less than 12 months)* how many days will the barrier be in place?	

7) Will the barrier extend across the waterway from bank to bank?	☐ Yes, go to question 8 ☐ No	
7.1) What is the length of the proposed barrier? *(across the waterway)*		metres
7.2) What is the width of the waterway? *(bank to bank)*		metres

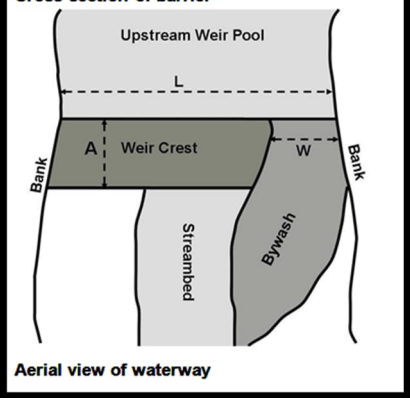
8) What is the purpose of the proposed barrier? *(e.g. creating a new or increasing the capacity of the existing water storage, maintenance work)*	

9) What are the details of the proposed construction materials? *(e.g. earth, concrete, rock fill, steel, timber, sand)*	

10) Provide the following details of the proposed barrier in reference to the diagrams below.



Cross section of barrier



Aerial view of waterway

Total crest height (D)		metres
Thickness (A) of crest		metres
Height of spillway/bywash (H)		metres
Width of spillway/bywash inlet (W)		metres
Base width (B)		metres
Internal diameter (O) of outlet pipe/works and discharge capacity		millimetres
Length of wall (L)		metres
Distance of backup from barrier wall at full supply level		metres
Volume of storage		megalitres
If raising an existing waterway barrier, additional height above existing crest		metres
If raising an existing waterway barrier, method of raising (e.g. capping crest, inflatable bag, gates etc.).		

Part 3 – CONSTRUCTING A NEW OR MODIFYING (INCLUDING MAINTENANCE AND REPLACEMENT OF) AN EXISTING CULVERT

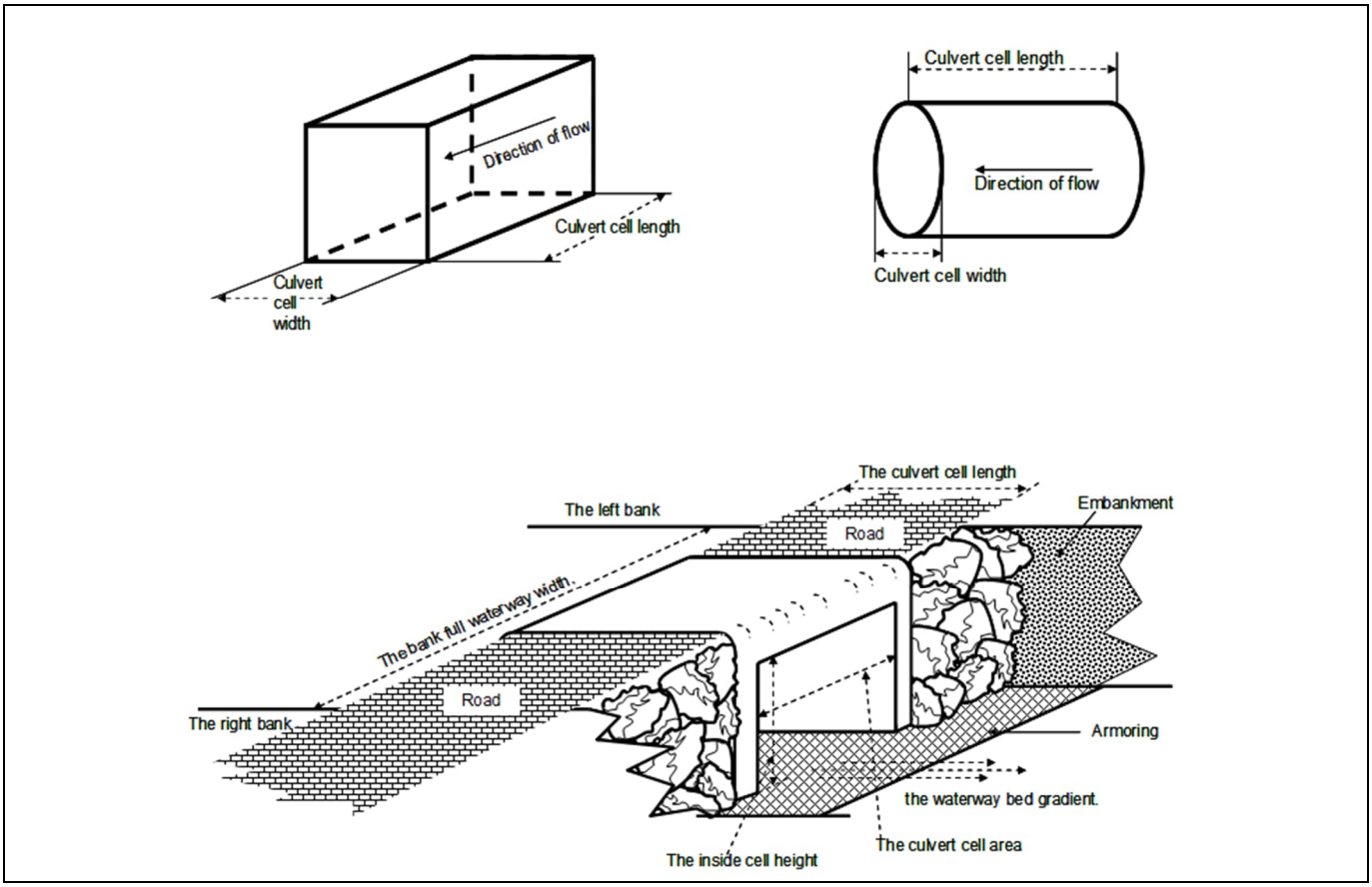
Note: If the development application involves more than one culvert relating to this part, please generate another part 3 and attach to the application.

11) What is the nature of the proposed work?	☒ Construction of a new culvert ☐ Maintenance of an existing culvert ☐ Replacement of an existing culvert
12) What is the purpose of the proposed culvert?	Extension of the existing road for a future subdivision.
13) If the culvert is temporary *(in place less than 12 months)* how many days will the culvert be in place?	NA

14) Will the culvert extend across the waterway from bank to bank?	☒ Yes, go to question 15 ☐ No	
14.1) What is the length of the proposed culvert? *(across the waterway)*	35.9	metres
14.2) What is the width of the waterway? *(bank to bank)*	6.03	metres

15) What type of culvert is proposed? *(Tick all applicable boxes)*	☒ Box culvert	☐ Arch culvert	☐ Pipe culvert
	☐ Combination culvert	☐ Other – please specify	

16) In reference to the diagrams below, provide the following details of the proposed culvert.	How many culvert cells are there?	22	
	What is the upstream downstream culvert cell length?	2.3	metres
	What is the inside cell width of each culvert (or diameter of pipe culvert)?	2.7	metres
	What is the internal height within the culvert cell?	1.5	metres



Part 4 – CONSTRUCTING NEW OR MODIFYING (INCLUDING MAINTENANCE AND REPLACEMENT) AN EXISTING WATERWAY BARRIER EXCEPT THOSE LISTED IN PARTS 2 AND 3

Note: If the development application involves more than one barrier relating to this part, please generate another part 4 and attach to the application.

17) What is the nature of the proposed work?	☐ Construction of a new barrier ☐ Maintenance of an existing barrier ☐ Replacement of an existing barrier

18) Briefly describe the proposed barrier.	

19) If the barrier is temporary *(in place less than 12 months)* how many days will the barrier be in place?	

20) Will the barrier extend across the waterway from bank to bank?	☐ Yes, complete question 20.1 and 20.2 ☐ No	
20.1) What is the length of proposed barrier? *(across the waterway)*		metres
20.2) What is the width of the waterway? *(bank to bank)*		metres

21) What is the purpose of the proposed barrier?	

22) What is the maximum height of the proposed barrier above the existing bed level?		metres

23) What are the proposed construction materials? *(e.g. earth, concrete, rock fill, timber, sand)*	

24) Does the barrier follow the natural gradient of the bed level?	☐ Yes ☐ No

7 SEWERAGE RETICULATION

The proposed rural residential lots are to be serviced by on-site effluent disposal systems that are to be approved on a lot-by-lot basis at the time of construction.

8 ROAD PAVEMENT DESIGN

All roadway pavements have been designed in accordance with the FNQROC Development Manual section D3 – Road Pavements.

8.1 DESIGN METHOD

8.1.1 Design Life

A Design Life of 20 years has been adopted for all streets and roads.

8.1.2 Subgrade

California Bearing Ratio (CBR) testing has not been completed as part of the design. The CBR testing is to be evaluated prior to construction by in situ CBR, and 4-day soaked CBR by a NATA registered materials testing authority using the procedures described by the Department of Main Roads and Standards Association of Australia. A value of 7% has been adopted for design purposes.

8.1.3 Flexible Pavement Design

In accordance with Table D3.1 of the FNQROC Development Manual the minimum allowable traffic loading for each pavement type has been reviewed and, in each case, the allowable traffic exceeds the minimum allowable.

The road classification is “Low Density Rural Road” which allows for a sealed carriageway, kerb and channel, and verge. The road reserve width is nominally 20.0m. Table D3.2 of the FNQROC Development Manual requires a minimum pavement thickness of 200mm and a minimum surfacing of 30mm AC.

9 SOIL AND WATER MANAGEMENT

A Soil and Water Management Strategy (SWMS) has been produced that identifies policies and development conditions relevant to the site and recommend measures required to satisfy those requirements. In accordance with the FNQROC Section D5. The strategy consists of:

- A Concept Report that identifies the constraints of the site and recommends measures to address those constraints; and
- Soil and Water Management Plan (SWMP) providing measures that can be adopted to address those constraints.

The following documents have been referenced in preparing this SWMP:

- ERSCON Pty Ltd construction drawings;
- FNQROC Development Manual;
- IEAust Soil Erosion and Sediment Control Guidelines;
- NSW DLWC – Construction and Sediment Control (Course Notes);
- Queensland Urban Drainage Manual; and
- Australian and New Zealand Guidelines for Freshwater and Marine Water Quality.

9.1 EROSION AND SEDMENT CONTROL STANDARDS

9.1.1 Duty of Care

In accordance with the Environmental Protection Act, 1994 (the Act), all Queenslanders have a legal duty to take all reasonable and practicable measures to minimise or prevent environmental harm.

In accordance with the Integrated Planning Act, 1997, it is a requirement to comply with Council's Planning Scheme and conditions issued in Development Permits.

This SWMP considers environmental harm caused by sediment-laden runoff from the subject site entering stormwater drains and/or waterways.

9.2 CONCEPT REPORT

9.2.1 Site Conditions

The subject site is currently generally well vegetated with medium slopes.

9.2.2 Control Measures

Erosion and sediment control measures are to be designed and constructed in accordance with the FNQROC Development Manual. Specific requirements are provided on drawing 160-012-C109 - C110**.**

9.2.3 Water Quality Strategy

In accordance with the requirements of the Queensland Urban Drainage Manual, management of water quality involves:

- Identifying and enhancing environmental values;
- Establishing objectives to achieve the required level of protection;
- Establishing water quality management strategies;
- Monitoring and surveillance programs;
- Research.

9.2.4 Water Quality Monitoring

The soil and water management strategy requires water sampling 50m downstream of the point where stormwater drainage discharges. Sampling is required only after significant rainfall i.e. 10mm.

9.3 EROSION AND SEDIMENT CONTROL PLAN

Erosion and sediment control measures are to be designed and constructed in accordance with the FNQROC Development Manual, as detailed in the Soil and Water Management Strategy, and 160-012-C109 “Erosion and Sediment Control Plan” and 160-012-C110 “Erosion and Sediment Control Notes”.

The Contractor shall take all reasonable precautions to minimise erosion and prevent sediment-laden runoff from leaving the site. This goal will be monitored to ensure minimal erosion on site and no visible siltation of waterways by implementing effective erosion and sediment control.

The purpose of this SWMP is to ensure the Contractor meets the following objectives:

- Comply with all relevant legislation;
- Ensure erosion and sedimentation is controlled in an appropriate and cost-effective manner;
- Maintain and if possible, enhance the existing environment;
- Reinforce and improve environmental awareness within the workforce and the general community.

9.3.1 Environmental Responsibilities of Key Staff

Inspection Officer

The Inspection Officer is to be nominated by the Contractor.

Project Manager (PM)

The Project Manager will be responsible for:

- Coordinating the response to any major environmental incident and reporting serious or material harm to the Inspection Officer, Council, EPA and/or other agencies as appropriate;
- Monitoring, review and continuous improvement of the SWMP;
- Assess the need and if required ensure the proper completion of all internal and sub-contractor audits;
- Ensuring compliance of construction activities with the EP Act and other relevant legislation, codes and specifications;
- Liaison with all external authorities and stakeholders;
- Investigating and addressing complaints in the shortest possible time frame;
- Ensuring appropriate document control is maintained and;
- Supporting and providing advice to the project team.

Contractor Environmental Representative (CER):

The Contractors Environmental Representative will be responsible for:

- The implementation and operation of the environmental control measures as detailed in the SWMP;
- Monitoring the effectiveness of control measures;
- Recording and reporting non-conformances to the SWMP;
- Recording and reporting environmental complaints and incidents;
- Advising the PM and Inspection Officer of all environmental issues;
- Ensuring all staff on-site receive an appropriate environmental induction;
- Taking all reasonable and practical measures to prevent or minimise environmental harm occurring at jobsites under his/her supervision and;
- Seeking advice from the Project Manager if uncertain of environmental requirements.

Works Supervisor (WS):

The Works Supervisor will assist the CER in the implementation of the SWMP, and the ongoing awareness of environmental issues for the Construction Workforce. The overseer shall:

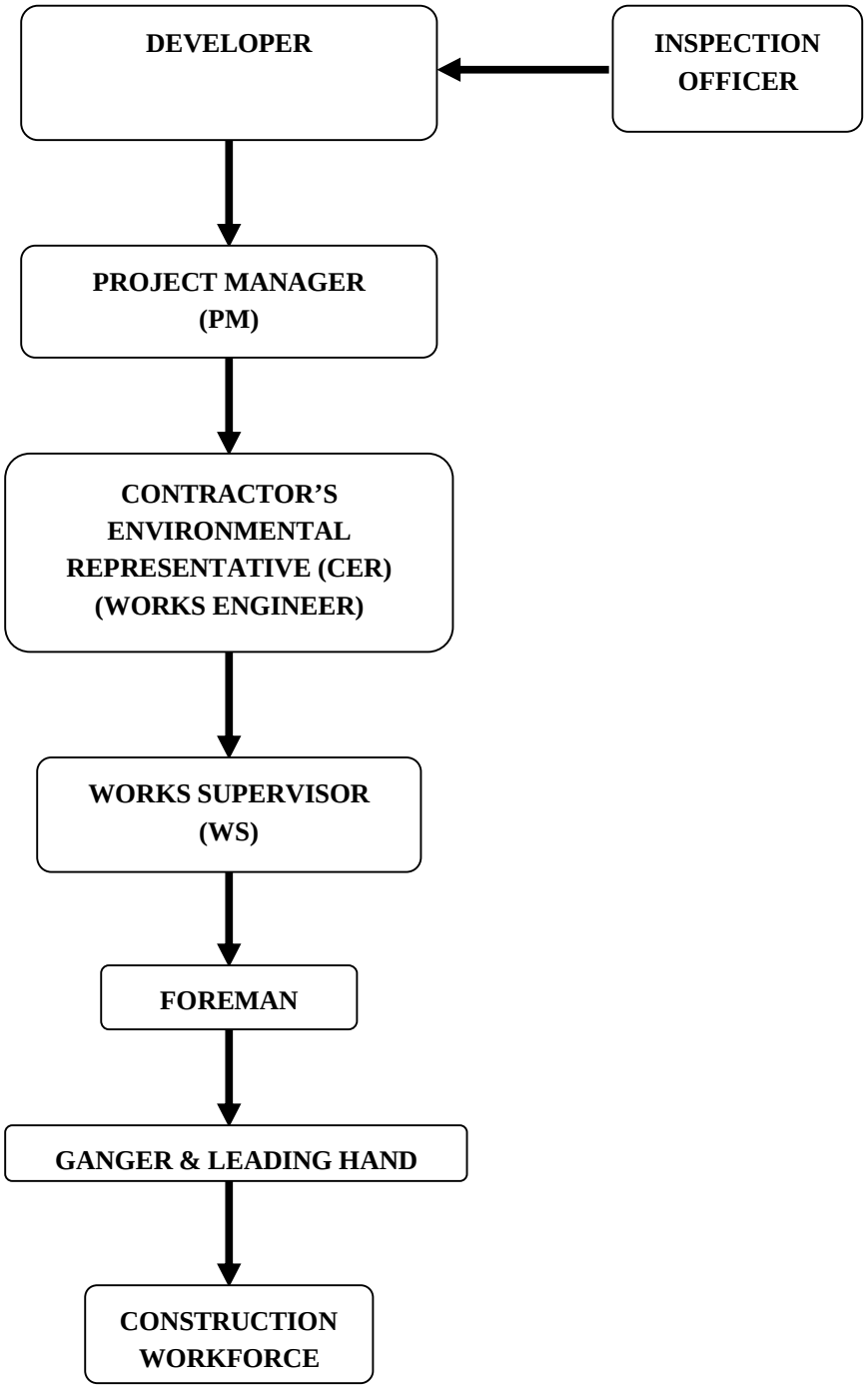
- Have a full understanding of the SWMP;
- Be fully aware of all environmental issues associated with the project; and
- Be responsible for the maintenance of control measures.

Construction Workforce:

Each member of the construction workforce will be responsible for:

- Ensuring they have a full understanding of their own environmental responsibilities;
- Assist in the implementation and maintenance of environmental protection measures in accordance with the SWMP and as directed by the CER; and
- Immediately reporting environmental complaints and incidents to the Environmental Supervisor.

Environmental Organisation Structure



9.3.2 Erosion Potential

Observations from site inspections concur that the risk of sediment laden runoff leaving site is low. The site is naturally well vegetated.

Short sharp rainfall events will create silt/sediment that can be trapped on site. In the event of catastrophic failure of sediment control structures (due to vandalism or other undefined event) clean up operations would quickly mitigate the impacts.

The risk of long-term environmental impacts due to sedimentation from the proposed works is considered very low if the SWMP is fully implemented.

9.3.3 Evaluation of the Project

Investigation into erosion and sedimentation control has been reviewed as follows:

Timing of the Works:

Construction works are will be timed to coincide with a moderate to low rainfall month. Stormwater and sewer works will be constructed first which provide a low risk in terms of erosion and sediment control. Once these works are completed, an assessment of the potential rainfall will be made in consultation with Council to determine if bulk earthworks and road construction will proceed immediately after.

Works Program:

It is expected the works will be completed as follows:

- Approval to proceed;
- Install erosion sediment control devices and site facilities;
- Strip and grub;
- Install Services;
- Commence bulk earthworks (after assessment of potential rainfall);
- Construct Roads;
- Turf batters;
- Grass footpath and other exposed areas;
- Complete works; and
- Hand over.

9.3.4 Best Management Practice

The review of this site has been made in conjunction with the Institute of Engineers Australia “Soil Erosion and Sediment Control Guidelines.” All erosion and sedimentation control works are to be completed in accordance with that publication.

The selection methodology for the most appropriate control methods has due regard to cost-effectiveness, availability of materials, feasibility, durability, and compatibility. The most significant of the above is compatibility (i.e. has the system been used and proved on previous local works).

Perimeter Channel and Bunds

Diversion Channels and Cut Off Bunds are to be constructed to direct clean water away from the works and through culvert structures. The surrounding landform is steep with good vegetal

cover. Overland flow velocities will be maintained at less than 2.31 m/s, which is considered acceptable (refer IEAust Table A8.5 given full cover).

Permanent Stabilisation Measures

The proposed works do not include hard "engineered" stabilisation methods. It is not considered appropriate (cost effective) to construct "engineered" stabilisation as the existing (where undisturbed) vegetation cover provides appropriate and visually attractive stabilisation.

As part of this SWMP, rehabilitation of vegetation by seeding, drill seeding, turfing and hydro mulching, at an early stage is considered vital to the successful control of erosion (and capture of sedimentation).

Site Office

The site office and plant compound shall be fully fenced with all fuels and hazardous liquids shall be stored in a bunded area 110% the volume of stored liquid. All parking areas shall be maintained in a stable condition including surfacing as required.

Site Entry Points

There shall be only one site entry and exit point. All vehicles must enter and leave the site at these locations only. Site entry points shall also have a wash down area adjacent when stripping, and clearing and grubbing works expose plant and equipment to transportation of weeds.

The following items are proposed for incorporation into the works and details of their use and limitations have been assessed as part of the design process:

- Construction Exits (A5-C3)
- Sediment Fences (A5-C10)
- Catch Drains and Perimeter Banks (A5-A1)
- Rock Check Dams (A5-A2)

9.3.5 Erosion and Sediment Control Plan

For ESCP drawing, refer 160-012-C109

9.3.6 Implementation, Monitoring and Review

It is the responsibility of the CER to correctly implement and monitor this ESCP. It is also critical that the CER reviews and documents and provide appropriate suggestions for improvements through the project life.

9.3.7 Implementation Strategies

To ensure the objectives of the Erosion and Sediment Control Plan (ESCP) check list of responsibilities and requirements are provided below.

Actions	Locations	Timing	Responsibility
Induct all personnel as appropriate	All	Prior to Disturbance	CER

Flag the limits of disturbance and advise workforce of these limits.	Each stage of excavation.	Prior to disturbance.	CER
Divert clean water around site using lined or vegetated drains.	Perimeter of site.	Prior to disturbance.	CER
Install sediment control devices.	As per ESCP.	Prior to disturbance.	CER
Flag limits of stockpile sites clear of drainage paths and enclose with sediment fence.	As approved	Duration of works	CER
Prevent stormwater from running over exposed batters by installing catch banks/drains and directing into a stabilized batter chute or off site.	All exposed batters.	As work progresses.	WS
Install check dams in bare earth table drains if required.	Bare earth table drains	As soon as practicable.	WS
Topsoil shall be stockpiled and respread over bare areas prior to grassing to assist re-vegetation.	Bare batters and footpaths	After earthworks are completed	WS
As far as possible, the surface of batters and drains should be left in a roughened state to reduce runoff velocity and promote re-vegetation.	Earth batters and drains	As earthworks proceed.	WS
Bare earth batters to be hydro mulched to protect the surfaces using suitable species mix and application rates.	Earth Batters	As works progress or immediately following final trim of an area.	WS
Footpaths and disturbed areas to be seeded within 1 week of final trim	All exposed areas	As works progress	WS
All ESC devices to remain in place until at least 70% vegetation cover	All exposed areas	At completion of project	WS

9.3.8 Monitoring Requirements

Parameter / Item	Locations	Timing	Responsibility
Visually assess condition of erosion and sediment control devices, clean out sediment (if required), and repair any damage.	All job sites	Daily	WS
Visually inspect the turbidity of runoff leaving the site to determine effectiveness of erosion and sediment controls devices.	All job sites.	During and following any significant rainfall/runoff event.	WS
Record turbidity (photo of turbidity tube) of water over topping sediment control devices.	Downstream of structure.	During and following any significant rainfall/runoff event.	CER
Measure turbidity 50m upstream and 50m downstream.	Downstream of site.	Following rainfall event >10mm	CER
Obtain regular weather forecasts from the Bureau of Meteorology to assess risk.	Forecasts for Cairns district.	Daily.	WS

9.3.9 Reporting

The CER shall maintain appropriate records of each inspection and/or action and shall report any non-conformance incidents to the PM and Inspection Officer for action.

9.3.10 Audit

Auditing shall be completed by the PM following a major non-conformance and during random inspections if deemed necessary.

The PM shall report audit findings to the CER for action.

9.3.11 Emergency Procedures

In the event that a significant failure occurs, and that sediment-laden runoff is leaving the site the CER shall immediately protect the erosion source by:

- Covering the affected area with plastic or geofabric if localised;
- Reducing the flow velocities by installing check dams;
- Rock armour channels where velocities and turbulence are excessive;
- Other methods as deemed appropriate;

The PM shall be notified to jointly assess clean up requirements and if further action is required.

9.3.12 Corrective Action

The CER shall record any non-conformance with the EMP(C) on the Non-Conformance Report (NCR) located within Council's Quality System and notify the Inspection Officer.

9.3.13 Environmental Site Induction

All personnel (staff, workforce, sub-contractors, and plant operators) working on site are to receive appropriate induction as to the requirements of this SWMP.

It is the responsibility of the CER to ensure all site personnel receive appropriate awareness training and induction prior to or as soon as practicable after, commencement on site. The induction shall include instruction regarding the following:

- Environmental objectives and policies;
- Due diligence;
- Environmental duty of care;
- Duties and responsibilities of environmental officers;
- Key environmental issues relating to this project;
- Project specific requirements contained in the Management Plans;

Where deemed appropriate for short-term personnel (including visitors), the CER may elect to provide a brief environmental explanation/induction and control access to the site.

The CER shall maintain a register, signed by all inductees. The CER shall also monitor the existing workforce to ascertain if additional training is required.

9.3.14 Environmental Reporting

The Inspection Officer shall submit an Environmental Report on a monthly basis that will cover the following items:

- Results of all monitoring;
- NCR's against the EMP(C) in accordance with the Quality procedures;
- Monthly EMP(C) review and revisions;
- Results of internal and external audits.

Where an event of potential or actual serious environmental harm is identified, the CER shall immediately inform the PM. The PM shall inform the Inspection Officer (or his representative), Council and the EPA as soon as practicable (but no later than 24 hours).

The PM shall monitor environmental performance throughout the project to determine if and when additional Environmental Audits are required.

9.3.15 Environmental Audits

Environmental Audits of the EMP(C) shall be completed by the PM at the following times:

- Following and event of potential or actual serious environmental harm;
- Prior to submission of "Practical Completion";
- As deemed necessary.

APPENDIX A

Conditions

Tablelands Regional Council
Atherton Service Centre
PO Box 573, Atherton QLD 4883
Telephone: 1300 362 242

Urban & Regional Planning Group
Brian Millard, Senior Planner
Telephone: (07) 4043 4830
Facsimile: (07) 4092 3323
Email: info@trc.qld.gov.au

File Ref: REC/08/0096
Our Ref: BN:BJM:nj

28 March 2012 (Amended on 20 June 2018)

Comaray Pty Ltd
C/- Planning Far North
PO Box 7801
CAIRNS QLD 4870

Negotiated Decision Notice Approval

Sustainable Planning Act 2009 s363

Dear Sir/Madam

APPLICATION FOR RECONFIGURING A LOT - (SUBDIVISION CREATING A FURTHER 64 LOTS IN FIVE (5) STAGES)
LOT 4 ON RP739487
SITUATED AT 200 EMERALD END ROAD, MAREEBA

I wish to advise that, at Council's Ordinary Meeting held on *7 March 2012*, a decision was made to issue a negotiated decision notice. This negotiated decision notice replaces the decision notice previously issued and dated *23 November 2011.*

The above development application was

- Approved in full with conditions.

The conditions relevant to this approval are detailed in **section** *6* of this notice. These conditions are clearly identified to indicate whether the Assessment Manager or a Concurrence Agency imposed them.

Approval under Section 331

This application **has not** been deemed to be approved under Section 331 of the Sustainable Planning Act 2009 (SPA).

1. Nature of the changes

The nature of the changes are:

(A) Condition 3.7 a) of Council's Decision Notice issued on 23 November 2011 be amended as follows:

3.7 Flood Immunity

a) All allotments must have a minimum area of 2,000 square metres 300mm above the Q100 level.

(B) Condition 3.8 of Council's Decision Notice issued on 23 November 2011 be amended as follows:

3.8 Bushfire Management

Firebreaks

Where new roads are not involved or it is impractical to use new roads as firebreaks, firebreaks are established that:-

- *have a minimum cleared width of 6m;*
- *have a maximum gradient of 12.5%;*
- *are constructed and maintained to prevent erosion and provide continuous access for fire fighting vehicles;*
- *have vehicular access at each end or have suitable clear manoeuvring areas for the turning of emergency fire fighting vehicles;*
- *all internal roads are to include fire hydrants;*
- *are within an easement in favour of Council and the Queensland Fire and Rescue Service or road reserve; and*
- *Are provided in at least the following situations:*

The required firebreaks will be established:

- *Along the eastern boundary of proposed Lots 38 and 41;*
- *Within the unnamed road reserve, for the entire northern road frontage of Lots 32 and 37, immediately adjacent to the agricultural buffer required under Condition 4.11.*
- *Along the southern boundary of proposed Lots 62 and 65.*
- *Long the entire eastern and western boundaries of the Vegetation Corridor identified on Drawing No. 11/4743 - Stages 3-6 (2B)*

Building and Structures (Lots greater than 2,500m2)

- *Are sited in location of lowest hazard within the lot;*
- *Achieve setbacks from hazardous vegetation of 1.5 times the predominant mature canopy tree height or 10 metres, whichever is the greater;*
- *Are 10 metres from any retained vegetation strips or small areas of vegetation;*
- *Are sited so that elements of the development least susceptible to fire are sited closest to the bushfire hazard.*

(C) Condition 3.10 of Council's Decision Notice issued on 23 November 2011 be amended as follows:

3.10 Prior to the approval for any operational works for Stage 6, the subdivision layout will be amended so that the internal road network connects to the common boundary with Lot 219 on NR378 generally in the location of the road network shown on the approved plans as part of any further development of the adjoining Lot 219 on NR378 the configuration of proposed Lot 41 will be effected such that the road provides suitable geometry to the adjoining road network satisfactory of Council's delegated officer.

(D) Conditions 3.11, 3.11 and 3.12 of Council's Decision Notice issued on 23 November 2011 be amended as follows:

3.11 Stage 8 Requirements

a) Prior to lodgement of an application for Operational Works for Stage 8, the applicant will:

i) in addition to any other Stormwater Management Plan requirements, provide a conceptual stormwater design for the stage that details how any threats or impacts from upstream dams will be addressed;

ii) demonstrate, through that stormwater design, how stormwater flows that: originate outside the site, flow through the site, and discharge downstream of the site, will be suitably directed and contained.

iii) demonstrate how stormwater infrastructure will be incorporated into the lot design in accordance with the requirements of this approval;

iv) demonstrate how it is intended to maintain water quality within that storage in accordance with the requirements of Appendix 1 Parts A & C of State Planning Policy 4/10 Healthy Waterways.

v) demonstrate that suitable building platforms can be provided on proposed lots with slopes greater than 1:6.

vi) demonstrate that average lot size for the entire development exceeds 3000 sq m.

These requirements will be to the satisfaction of Council's delegated officer.

b) The developer will prepare a management and operation plan for any artificial storage area within any proposed lot in accordance with Appendix 1 Part C of State Planning Policy 4/10 Healthy Waterways to the satisfaction of Council's delegated officer.

c) the registered owner of any lot containing an artificial storage area within any proposed lot will be responsible for the maintenance and operation of that storage area in accordance with the required management and operation plan.

~~*3.11*~~ ***3.12*** *Design Changes*

i) Prior to lodgement of an application for Operational Works for Stage 6, the developer will provide an amended layout plan for that stage which ensures that the connecting road to the eastern boundary is almost square to that boundary.

ii) Prior to lodgement of an application for Operational Works for Stage 8, the developer will provide an amended layout plan for that stage which complies with the requirements of any other conditions of this approval.

These requirements will be to the satisfaction of Council's delegated officer.

~~*3.12*~~ ***3.13*** *Charges*

All outstanding rates, charges and expenses pertaining to the land are to be paid in full.

(E) Condition 4.1 of Council's Decision Notice issued on 23 November 2011 be amended as follows:

4.1 Access

Access must be constructed to each allotment in accordance with the FNQROC Development Manual, to the satisfaction of Council's delegated officer. The provision of Layback Kerbing along the total frontage of the proposed lots will satisfy this condition, except in the case of axe handle lots).

Where axe handle lots are proposed, a concrete or bitumen sealed driveway shall be provided within any access handles. The driveway will:

- *Have a minimum width of 3 metres.*
- *Be constructed for the full length of the access handle.*
- *Be formed with one-way crossfall to cater for stormwater drainage such that any stormwater runoff is contained within the access strip.*
- *Service and utility conduits are to be provided for the full length of the sealed driveway constructed within the access handle of the battleaxe allotments.*

(F) Condition 4.5.2 of Council's Decision Notice issued on 23 November 2011 be amended as follows:

4.5.2 The following reticulated water supply infrastructure upgrades must be undertaken by the developer:

(i) Prior to the issue of any Development Permit for operational works, the developer must enter into an infrastructure agreement requiring the developer to contribute per additional allotment created (currently $487.00 per lot) towards the construction of the following water infrastructure upgrades:

- *A connection into the existing 375 mm diameter water main in Lloyd Street (at the corner of Constance Street). This connection must be a DN300 PN16 PVCO (or equivalent) pipe (Line A) to a point where the cross river boring commences (Line B).*

- *The cross river pipe must be a PE DN400 (Line B) which is to be directionally drilled under the Barron River, flanged at each end and extended to the eastern side of the Hastie Road reserve; a flanged Tee must be provided to connect the cross river pipe to the DN300 pipe to the left and the DN200 pipe to the right at the outlet on the eastern side of the Hastie Road reserve.*

- *From Line B, a DN200 PN16 PVCO (or equivalent) pipe (Line C) must extend to the current western end of the DN150 main on Hastie Road.*

- *Installation of a PVC DN200 main (Line D) from the current eastern end of the DN150 main on Hastie Rd to the proposed water pump station within the Godfrey Road road reserve.*

The amount of the contribution shall be adjusted on 30th June each financial year in accordance with the Consumer Price Index.

(G) Conditions 4.11 (i), (iii) and (v) must remain as per Council's Decision Notice issued on 23 November 2011.

(H) Condition 4.2(l) should be deleted.

2. Details of the approval –

~~This Decision Notice approves a **Development Permit** for **Reconfiguring a Lot** – *Subdivision creating a further 62 lots in five (5) stages* **made assessable by the Mareeba Shire Planning Scheme 2004.**~~

~~Stage 3 - creating 12 rural residential lots~~
~~Stage 4 - creating 13 rural residential lots~~
~~Stage 5 - creating 15 rural residential lots~~
~~Stage 6 - creating 9 rural residential lots~~
~~Stage 8 - creating 13 rural residential lots~~

~~Where the approved Stages are defined on approved Plan 11/4743 Stages 3-6 (2B), dated 23/8/2011.~~

At Council's Ordinary Meeting held on 20 June 2018, the details of the approval were amended to the extent below:

*This Decision Notice approves a **Development Permit** for **Reconfiguring a Lot** – Subdivision creating a further ~~62~~ **64** lots in five (5) stages **made assessable by the Mareeba Shire Planning Scheme 2004.***

Stage 3 - creating 12 rural residential lots
Stage 4 - creating 13 rural residential lots
Stage 5 - creating 15 rural residential lots
Stage 6 - creating 9 rural residential lots
*Stage 8 - creating ~~13~~ **15** rural residential lots*

*Where the approved Stages are defined on approved Plan 11/4743 Stages 3-6 (2B), dated 23/8/2011 **except for Stage 8 which is defined on amended Plan CRE17-018-C01, dated 29/01/18.***

3. Other necessary development permits and/or compliance permits–

Listed below are other development permits and/or compliance permits that are necessary to allow the development to be carried out –

- Development Permit for Operational Works

4. Other approvals required from Council

- Nil

5. Submissions -

Not applicable

6. Conditions –

(A) ASSESSMENT MANAGER'S CONDITIONS (COUNCIL)

(a) Development assessable against the Planning Scheme

1. Development must be carried out substantially in accordance with the approved plans and the facts and circumstances of the use as submitted with the application, subject to any alterations:

   - found necessary by Council's delegated officer at the time of examination of the engineering plans or during construction of the development because of particular engineering requirements; and
   - to ensure compliance with the following conditions of approval.

2. Timing of Effect

   The conditions of the development permit must be complied with to the satisfaction of Council's delegated officer prior to the endorsement of the plan of survey, except where specified otherwise in these conditions of approval.

3. General

   3.1 The applicant/developer is responsible for the cost of necessary alterations to existing public utility mains, services or installations required by works in relation to the proposed development or any works required by condition(s) of this approval.

   3.2 All payments or bonds required to be made to the Council pursuant to any condition of this approval or the Adopted Infrastructure Charges Notice must be made prior to the endorsement of the plan of survey and at the rate applicable at the time of payment.

   3.3 The developer must relocate (in accordance with FNQROC standards) any services such as water, sewer, drainage, telecommunications and electricity that are not wholly located within the lots that are being created/serviced where required by the relevant authority, unless approved by Council's delegated officer.

   3.4 Where utilities (such as sewers on non-standard alignments) traverse lots to service another lot, easements must be created in favour of Council for access and maintenance purposes. The developer is to pay all costs (including Council's legal expenses) to prepare and register the easement documents.

   3.5 The applicant must provide a letter from any Concurrence Agencies confirming that their conditions have been complied with.

   3.6 All works must be designed, constructed and carried out in accordance with FNQROC Development Manual requirements (as amended) and to the satisfaction of Council's delegated officer.

   3.7 Flood Immunity

      a) All allotments must have a minimum area of 2,000 square metres 300mm above the Q100 level.

      b) Any relevant Operational Works applications will include a Q100 analysis for the subject land. The applicant/developer must provide a plan showing the extent of a 100 ARI year flood event certified by a RPEQ (Registered Professional Engineer of Queensland).

      c) No filling is to occur below the 100 ARI flood level unless accompanied by evidence that filling below the 100 ARI level would

not detrimentally impact upon upstream or downstream properties to the satisfaction of Council's delegated officer.

3.8 Bushfire Management

Firebreaks

Where new roads are not involved or it is impractical to use new roads as firebreaks, firebreaks are established that:-

- have a minimum cleared width of 6m;
- have a maximum gradient of 12.5%;
- are constructed and maintained to prevent erosion and provide continuous access for fire fighting vehicles;
- have vehicular access at each end or have suitable clear manoeuvring areas for the turning of emergency fire fighting vehicles;
- all internal roads are to include fire hydrants;
- are within an easement in favour of Council and the Queensland Fire and Rescue Service or road reserve; and
- Are provided in at least the following situations:

The required firebreaks will be established:

- Along the eastern boundary of proposed Lots 38 and 41;
- Within the unnamed road reserve, for the entire northern road frontage of Lots 32 and 37, immediately adjacent to the agricultural buffer required under Condition 4.11.
- Along the southern boundary of proposed Lots 62 and 65.
- Long the entire eastern and western boundaries of the Vegetation Corridor identified on Drawing No. 11/4743 - Stages 3-6 (2B)

Building and Structures (Lots greater than 2,500m2)

- Are sited in location of lowest hazard within the lot;
- Achieve setbacks from hazardous vegetation of 1.5 times the predominant mature canopy tree height or 10 metres, whichever is the greater;
- Are 10 metres from any retained vegetation strips or small areas of vegetation;
- Are sited so that elements of the development least susceptible to fire are sited closest to the bushfire hazard.

3.9 Environmental Covenant

The applicant shall be responsible for the preparation and registration of a statutory covenant with Council pursuant to S97A of the Land Title Act for the purposes of native vegetation and habitat preservation including the preservation of native plants and natural features.

The covenant will be of a form that is acceptable to the Registrar of Titles and will apply to the area identified on Drawing No. 11/4743-Stages 3-6 (2B) as the Vegetation Corridor. The covenant location and the covenant document provisions will be to the satisfaction of Council's delegated officer.

The covenant agreement shall be signed by the registered owner prior to endorsement of the survey plan by Council and the signed covenant shall be jointly lodged for registration with the survey plan, in the Department of Environment and Resource Management.

The covenant shall require the registered owners of the site to obtain approval of the Council prior to undertaking any earthworks, clearing of vegetation, fencing or placement of water pumps and pipelines within or across the area of the Covenant. The placement of effluent waste disposal systems, building of structures and cultivation shall be specifically excluded from within the area of the Covenant. The maintenance of the area of the Covenant shall be the responsibility of the owner of the land.

Each Covenant must stipulate:-

(i) that it is for the express purpose of vegetation and habitat preservation, including the preservation of native plants and the natural features of the lot (including the water in Unnamed Creek and the soil contained in the covenant area).

(ii) that no building, fixtures, infrastructure or improvements over the Covenant Area shall be permitted, including water pipes and pumps;

(iii) Any maintenance required to be performed in respect of the Covenant Area shall be the responsibility of the lot owner.

The covenant shall be to the satisfaction of Council's delegated officer, and the applicant shall be responsible for the cost of preparation and registration of the Covenant.

3.10 Prior to the approval for any operational works for Stage 6, the subdivision layout will be amended so that the internal road network connects to the common boundary with Lot 219 on NR378 generally in the location of the road network shown on the approved plans as part of any further development of the adjoining Lot 219 on NR378 the configuration of proposed Lot 41 will be effected such that the road provides suitable geometry to the adjoining road network satisfactory of Council's delegated officer.

3.11 Stage 8 Requirements

a) Prior to lodgement of an application for Operational Works for Stage 8, the applicant will:

i) in addition to any other Stormwater Management Plan requirements, provide a conceptual stormwater design for the stage that details how any threats or impacts from upstream dams will be addressed;

ii) demonstrate, through that stormwater design, how stormwater flows that: originate outside the site, flow through the site, and discharge downstream of the site, will be suitably directed and contained.

iii) demonstrate how stormwater infrastructure will be incorporated into the lot design in accordance with the requirements of this approval;

iv) demonstrate how it is intended to maintain water quality within that storage in accordance with the requirements of Appendix 1 Parts A & C of State Planning Policy 4/10 Healthy Waterways.

v) demonstrate that suitable building platforms can be provided on proposed lots with slopes greater than 1:6.

vi) demonstrate that average lot size for the entire development exceeds 3000 sq m.

These requirements will be to the satisfaction of Council's delegated officer.

b) The developer will prepare a management and operation plan for any artificial storage area within any proposed lot in accordance with Appendix 1 Part C of State Planning Policy 4/10 Healthy Waterways to the satisfaction of Council's delegated officer.

c) the registered owner of any lot containing an artificial storage area within any proposed lot will be responsible for the maintenance and operation of that storage area in accordance with the required management and operation plan.

~~*3.11*~~ ***3.12*** Design Changes

i) Prior to lodgement of an application for Operational Works for Stage 6, the developer will provide an amended layout plan for that stage which ensures that the connecting road to the eastern boundary is almost square to that boundary.

ii) Prior to lodgement of an application for Operational Works for Stage 8, the developer will provide an amended layout plan for that stage which complies with the requirements of any other conditions of this approval.

These requirements will be to the satisfaction of Council's delegated officer.

~~*3.12*~~ ***3.13*** Charges

All outstanding rates, charges and expenses pertaining to the land are to be paid in full.

4. Infrastructure Services and Standards

4.1 Access

Access must be constructed to each allotment in accordance with the FNQROC Development Manual, to the satisfaction of Council's delegated officer. The provision of Layback Kerbing along the total frontage of the proposed lots will satisfy this condition, except in the case of axe handle lots).

Where axe handle lots are proposed, a concrete or bitumen sealed driveway shall be provided within any access handles. The driveway will:

- Have a minimum width of 3 metres.
- Be constructed for the full length of the access handle.
- Be formed with one-way crossfall to cater for stormwater drainage such that any stormwater runoff is contained within the access strip.
- Service and utility conduits are to be provided for the full length of the sealed driveway constructed within the access handle of the battleaxe allotments.

4.2 Stormwater Drainage

The applicant must ensure a non-worsening effect on surrounding land as a consequence of the development and the applicant must take all necessary steps to achieve this including the following:

a) The applicant must provide a Stormwater Management Plan prepared and certified by a RPEQ engineer that meets or exceeds

the standards of design and construction set out in the Queensland Urban Development Manual (QUDM) and the Far North Queensland Regional Organisation of Councils Manual (FNQROC).

b) The Stormwater Management Plan must include an erosion and sediment control plan that meets or exceeds the Soil Erosion and Sedimentation Control Guidelines (Institute of Engineers Australia 1996).

c) The Stormwater Management Plan must provide for:

(i) stormwater drainage from roofed and paved areas to be lawfully discharged to an approved drainage system within adjoining road reserves or where stormwater from roofed and paved areas cannot be drained into the approved drainage system within the adjoining road reserves, an inter-allotment drainage collection system must be provided;

(ii) overland flow paths and underground drainage is to be designed in accordance with water sensitive urban design solutions so as not to directly or indirectly cause nuisance or worsen peak flows to downstream or adjoining properties. The completed development discharge rate for a Q100 storm frequency must not exceed the pre-development discharge rates for a Q100 storm frequency;

(iii) The assumed increase in stormwater runoff associated with the construction of future dwelling houses and driveways within the development must provide for an ARI 100 years overland flow through roads, open space areas or easements over adjoining properties. Construction of drainage must be to FNQROC standards;

d) The Stormwater Management Plan must include a plan of the development showing the Q100 Flood Levels as well as a 2,000 square metre building envelope for each lot that is impacted by the Q100 Flow. The building envelopes must be above the Q100 Flood Levels.

e) The applicant must prepare a Stormwater Report, including an assessment of blockages, prepared and certified by a suitably qualified design engineer (RPEQ) clearly indicating measures taken and calculated impacts based upon the Stormwater Management Plan in accordance with the Queensland Urban Development Manual (QUDM) and the Far North Queensland Regional Organisation of Councils Manual (FNQROC).

f) All stormwater channels through private property must be located in a registered easement for drainage purposes, with the easement in favour of Council. Alternatively stormwater channels may be located with drainage reserves or other similar approved land tenure.

g) The applicant must submit the Stormwater Management Plan and Stormwater Report to council as part of the operational works application for its approval.

h) The applicant must construct the stormwater drainage infrastructure in accordance with the approved Stormwater Management Plan and Stormwater Report.

i) Deleted

j) Temporary drainage is to be provided and maintained during the construction phase of the development, discharged to a lawful point and not onto the construction site.

k) The applicant (at its cost) must video all stormwater lines and submit the video for inspection by Council's delegated officer prior to the development being taken "off maintenance" to ensure that no defects have occurred during the 12 month maintenance period.

l) A bond of 50% of the contract value of the drainage works must be lodged with Council during the 12 month maintenance period, as a guarantee for the satisfactory operation of the drainage works. The bond will be returned on satisfactory correction of any defective work after expiration of the maintenance period. During the maintenance period, Council may call up the bond and carry out any drainage repair work required.

m) All stormwater channels through private property must be registered, with the easement for drainage purposes in favour of Council. All documentation leading to the registration of the easement must be completed at no cost to Council.

4.3 Prior to endorsement of the plan of survey creating the first lot of this development, the plan of survey/s for Stages 1, 2 and 7 (Development Approvals RC2005/56, RC2006/27 and REC/08/0110) of Country Road Estate must be registered.

4.4 Roadworks – Internal – <u>All Stages</u>

Internal roads must be constructed to Residential Street standard in accordance with FNQROC Development Manual standards (as amended) for the applicable planning scheme area to the satisfaction of Council's delegated officer.

A temporary turnaround area, with gravel surface, must be provided at the end of the new road construction adjacent to the balance area of the overall subdivision to allow traffic manoeuvring.

4.5 Water Supply

4.5.1 Where the existing reticulated water supply does not currently service the site or is not at an adequate capacity, the developer is required to extend the reticulated water supply infrastructure to connect the site to Council's existing infrastructure at a point that has sufficient capacity to service the development in accordance with FNQROC Development Manual standards (as amended).

4.5.2 The following reticulated water supply infrastructure upgrades must be undertaken by the developer:

(i) Prior to the issue of any Development Permit for operational works, the developer must enter into an infrastructure agreement requiring the developer to contribute per additional allotment created (currently $487.00 per lot) towards the construction of the following water infrastructure upgrades:

- A connection into the existing 375 mm diameter water main in Lloyd Street (at the corner of Constance Street). This

connection must be a DN300 PN16 PVCO (or equivalent) pipe (Line A) to a point where the cross river boring commences (Line B).

- The cross river pipe must be a PE DN400 (Line B) which is to be directionally drilled under the Barron River, flanged at each end and extended to the eastern side of the Hastie Road reserve; a flanged Tee must be provided to connect the cross river pipe to the DN300 pipe to the left and the DN200 pipe to the right at the outlet on the eastern side of the Hastie Road reserve.

- From Line B, a DN200 PN16 PVCO (or equivalent) pipe (Line C) must extend to the current western end of the DN150 main on Hastie Road.

- Installation of a PVC DN200 main (Line D) from the current eastern end of the DN150 main on Hastie Rd to the proposed water pump station within the Godfrey Road road reserve.

The amount of the contribution shall be adjusted on 30th June each financial year in accordance with the Consumer Price Index.

4.5.3 A water service connection must be provided to each proposed lot in accordance with FNQROC Development Manual standards (as amended) to the satisfaction of Council's delegated officer.

4.6 On-Site Wastewater Management

The applicant must provide a site and soil evaluation report (or an evaluation report where existing on-site disposal), prepared by an accredited site and soil evaluator, demonstrating the ability of the lots to accommodate an on-site effluent disposal in compliance with the latest version of On-Site Domestic Wastewater Management Standard (ASNZ1547) to the satisfaction of the Council's delegated officer.

4.7 Electricity provision/supply

The applicant/developer must ensure that an appropriate level of electricity supply is provided to each allotment in accordance with FNQROC Development Manual standards (as amended) to the satisfaction of Council's delegated officer.

Written advice from an Electricity Service Provider is to be provided to Council indicating that an agreement has been made for the provision of **underground** power reticulation.

4.8 Telecommunications

The applicant/developer must enter into an agreement with a telecommunication carrier to provide telecommunication services to each allotment and arrange provision of necessary conduits and enveloping pipes.

4.9 Lighting

Street lighting must be provided to all roads in accordance with FNQROC Development Manual requirements (as amended) and to the satisfaction of Council's delegated officer.

4.10 Street trees

One street tree must be provided in the nature strip of each lot created. The plan depicting species must be submitted to Council's delegated officer for approval. The street trees must be planted in accordance with the approved plan.

4.11 Agricultural Buffering

(i) A 30 metre wide vegetation buffer, 20 metres planted and 10 metres clear on the southern side, is to be planted along northern road frontage of the following lots:

- That part of the northern road frontage of Lot 31, extending from the DERM vegetation corridor, east to the boundary with Lot 32.

- The entire northern road frontage of Lots 32 to 37.

(ii) Appropriate native species will be used in the plantings. A landscaping/planting plan will be developed by a suitably qualified professional in compliance with SPP1/92 Planning Guidelines on Separating Agricultural and Residential Land Uses and must be endorsed by Council's delegated officer prior to any plantings being undertaken.

(iii) The buffer vegetation will be established to a height of 4m on any relevant lot prior to Council signing the relevant plan of survey to the satisfaction of Council's delegated officer.

(iv) The developer will maintain the buffer for two (2) years, and a bond of 50% of the contract value of the works must be lodged with Council during the maintenance period, as a guarantee. The bond will be returned on satisfactory correction of any defective work after expiration of the maintenance period. During the maintenance period, Council may call up the bond and carry out any work required. The bond will be lodged with Council to secure those works prior to Council signing the relevant plan of survey.

(v) The applicant shall be responsible for the preparation and registration of a statutory covenant with Council pursuant to S97A of the Land Title Act for the purposes of establishment, protection and use of the land for a vegetated buffer over the required 30m buffer area.

The required covenant/s will be of a form that is acceptable to the Registrar of Titles and will contain provisions for:

- a management plan for the covenant area;
- protection of any vegetated buffer established as a result of this approval, including a requirement for cattle-proof fencing of the northern boundary of the vegetated buffer; and
- exclusion of buildings.

The covenant agreement shall be signed by the registered owner prior to signing of the relevant survey plan by Council and the signed covenant shall be jointly lodged for registration with the survey plan, in the Department of Environment and Resource Management.

The covenant location and the covenant document provisions will be to the satisfaction of Council's delegated officer. Maintenance of the area of the Covenant shall be the responsibility of the owner of the land.

The covenant shall be to the satisfaction of Council's delegated officer, and the applicant shall be responsible for the cost of preparation and registration of the Covenant.

4.12 Landscaping / Site Maintenance

The required buffer plantings shall be maintained as follows:

- replacement of plantings as required
- site maintenance shall include mowing / slashing of all areas outlined above
- landscaping / site maintenance is to be continued throughout the Defects Liability Period until date of Final Acceptance

Contrary to Section D9.23 Paragraph 7 of the FNQROC Manual, the maintenance period for irrigation works and landscaping shall be a minimum of twelve months.

At Council's Ordinary Meeting held on 20 June 2018, it was resolved to add Condition 4.13 to the extent below;

4.13 Roadworks - External Construction (Stage 8)

The intersection of Emerald End Road and the unnamed road servicing Stage 8 (as shown on Plan CRE-018-C01 dated 29/01/18) must be designed and constructed in accordance with the FNQROC Development Manual, to the satisfaction of Council's delegated officer.

The finished surface of the intersection is to be in asphalt, unless otherwise determined by Council's delegated officer.

Prior to works commencing, plans for the works described above must be approved as part of a subsequent application for operational works.

(B) ASSESSMENT MANAGER'S ADVICE

(a) An Adopted Infrastructure Charges Notice has been issued with respect to the approved development. The Adopted Infrastructure Charges Notice details the type of infrastructure charge/s, the amount of the charge/s and when the charge/s are payable.

(b) The Adopted Infrastructure Charges Notice does not include all charges or payments that are payable with respect to the approved development. A number of other charges or payments may be payable as conditions of approval. The applicable fee is set out in Council's Fees & Charges Schedule for each respective financial year.

(c) Environmental Protection and Biodiversity Conservation Act 1999

The applicant is advised that referral may be required under the *Environmental Protection and Biodiversity Conservation Act 1999* if the proposed activities are likely to have a significant impact on a matter of national environmental significance. Further information on these matters can be obtained from www.deh.gov.au.

(d) Cultural Heritage

In carrying out the activity the applicant must take all reasonable and practicable measures to ensure that no harm is done to Aboriginal cultural heritage (the "cultural heritage duty of care"). The applicant will comply with the cultural heritage duty of care if the applicant acts in accordance with gazetted cultural heritage duty of care guidelines. An assessment of the proposed activity against the duty of care guidelines will determine whether or to what extent Aboriginal cultural heritage may be harmed by the activity. Further information on cultural heritage, together with a copy of the duty of care guidelines and cultural heritage search forms, may be obtained from www.derm.qld.gov.au.

(e) Compliance with applicable codes/policies

The development must be carried out to ensure compliance with the provisions of Council's Local Laws, Planning Scheme Policies, Planning Scheme and Planning Scheme Codes to the extent they have not been varied by a condition of this approval.

(f) Transportation of Soil

All soil transported to or from the site must be covered to prevent dust or spillage during transport. If soil is tracked or spilt onto the road pavements as a result of works on the subject site, is must be removed prior to the end of the working day and within four (4) hours of a request from a Council Officer.

(g) Easement Documents

The Tablelands Regional Council has developed standard easement documentation to assist in the drafting of formal easement documents for Council easements. The applicant should contact the Urban & Regional Planning Section for more information regarding the drafting of easement documents for Council easements.

(h) Endorsement Fees

Please be advised that Council charges a fee for the endorsement of a Survey Plan, Community Management Statements, easement documents, and covenants. The fee is set out in Council's Fees & Charges Schedule applicable for each respective financial year.

(i) Notation on Rates Record

A notation will be placed on Council's Rate record with respect to each lot regarding the following conditions:

Conditions to be reflected as rates notations:
- Bushfire Management
- Flood Immunity
- Environmental Covenant
- Agricultural Buffering

(C) CONCURRENCE AGENCY CONDITIONS

Department of Transport and Main Roads conditions dated 4 March 2011

Department of Environment and Resource Management conditions dated 11 May 2011

7. IDAS referral agencies –

The IDAS Referral Agencies applicable to this application are –

For an application involving	Name of referral agency	Status	Address
RECONFIGURING A LOT			
On land not contiguous to a **State-controlled road**, for a purpose exceeding the thresholds set in schedule 5 of the *Integrated Planning Regulation 1998*	Department of Transport & Main Roads	Concurrence	Department of Main Roads Peninsula District PO Box 6185 CAIRNS QLD 4870
If the reconfiguring involves land with an area of 2 ha or above, 2 or more lots are created and the size of any lot created is 25 ha or smaller, and the land contains– (i) A category 1, 2 or 3 area shown on a property map of assessable vegetation; or (ii) **Remnant vegetation**	Department of Environment & Resource Management	Concurrence	Administration Officer Implementation & Support Unit Department of Environment & Resource Management GPO Box 15155 CITY EAST QLD 4002
If any part of the lot is situated in, or within 100m of, a **wetland** and (i) the reconfiguration results in more than 10 lots, or (ii) any lot resulting from the reconfiguring is less than 5 ha	Environmental Protection Agency	Advice	Administration Officer Implementation & Support Unit Department of Environment & Resource Management GPO Box 15155 CITY EAST QLD 4002

8. Approved Plans

The approved plans and/or documents for this development approval area listed in the following table.

~~Plan/Document Number~~	~~Plan/Document Title~~	~~Prepared by~~	~~Dated~~
~~11/4743-Stages 3-6 (2B)~~	~~Proposed Reconfiguration of Stages 3-6 & 8 Country Road Estate~~	~~Twine Surveys Pty Ltd~~	~~23.8.2011~~

At Council's Ordinary Meeting held on 20 June 2018, condition 1 was amended to the extent below:

Plan/Document Number	*Plan/Document Title*	*Prepared by*	*Dated*
11/4743-Stages 3-6 (2B)	*Proposed Reconfiguration of Stages 3-6 & 8 Country Road Estate*	*Twine Surveys Pty Ltd*	*23.8.2011*
CRE17-018-C01	***Layout Plan - Stage 8 - 1 Lot into 15 Lots***	***Benchmark Survey & Design***	***29/01/18***

9. When approval lapses if development not started (s341)

This development approval will lapse in accordance with Section 341 of the Sustainable Planning Act 2009 if development does not start within relevant period as stated below:

- Reconfiguring a Lot requiring Operational Works – four (4) years (starting the day the approval takes effect);

If there is one (1) or more subsequent related approvals' for a development approval for a Material Change of Use or a reconfiguration, the relevant period for the approval will be taken to have started on the day the latest related approval takes effect.

10. Appeal rights –

Appeals by applicants

An applicant for a development application may appeal to the Planning and Environment Court against the following:

- the refusal, or refusal in part of the development application
- any condition of a development approval, another matter stated in a development approval and the identification or inclusion of a code under section 242 of SPA
- the decision to give a preliminary approval when a development permit was applied for
- the length of a period mentioned in section 341
- a deemed refusal of the development application.

The timeframes for starting an appeal in the Planning and Environment Court are set out in section 461(2) of SPA.

Applicants may also have a right to appeal to the Building and Development Dispute Resolution Committee. For more details, see SPA, chapter 7, part 2.

Appeals by submitters

A submitter for a development application may appeal to the Planning and Environment Court against:

- the part of the approval relating to the assessment manager's decision about any part of the application requiring impact assessment
- the part of the approval relating to the assessment manager's decision under section 327.

Details about submitter appeal rights for the Planning and Environment Court are set out in sections 462, 463 and 464 of SPA.

Submitters may also have a right to appeal to the Building and Development Dispute Resolution Committee. For more details, see SPA, chapter 7, part 2.

Attachment 3 is an extract from SPA which details the applicant's appeal rights and the appeal rights of any submitters regarding this decision.

11. When the development approval takes effect –

This development approval takes effect –

- from the time the decision notice is given, if there is no submitter and the applicant does not appeal the decision to the court

OR

- subject to the decision of the court, when the appeal is finally decided, if an appeal is made to the court.

Should you require any further information please contact Council's **Senior Planner, Brian Millard** on the above telephone number.

Yours faithfully

22/6/2018

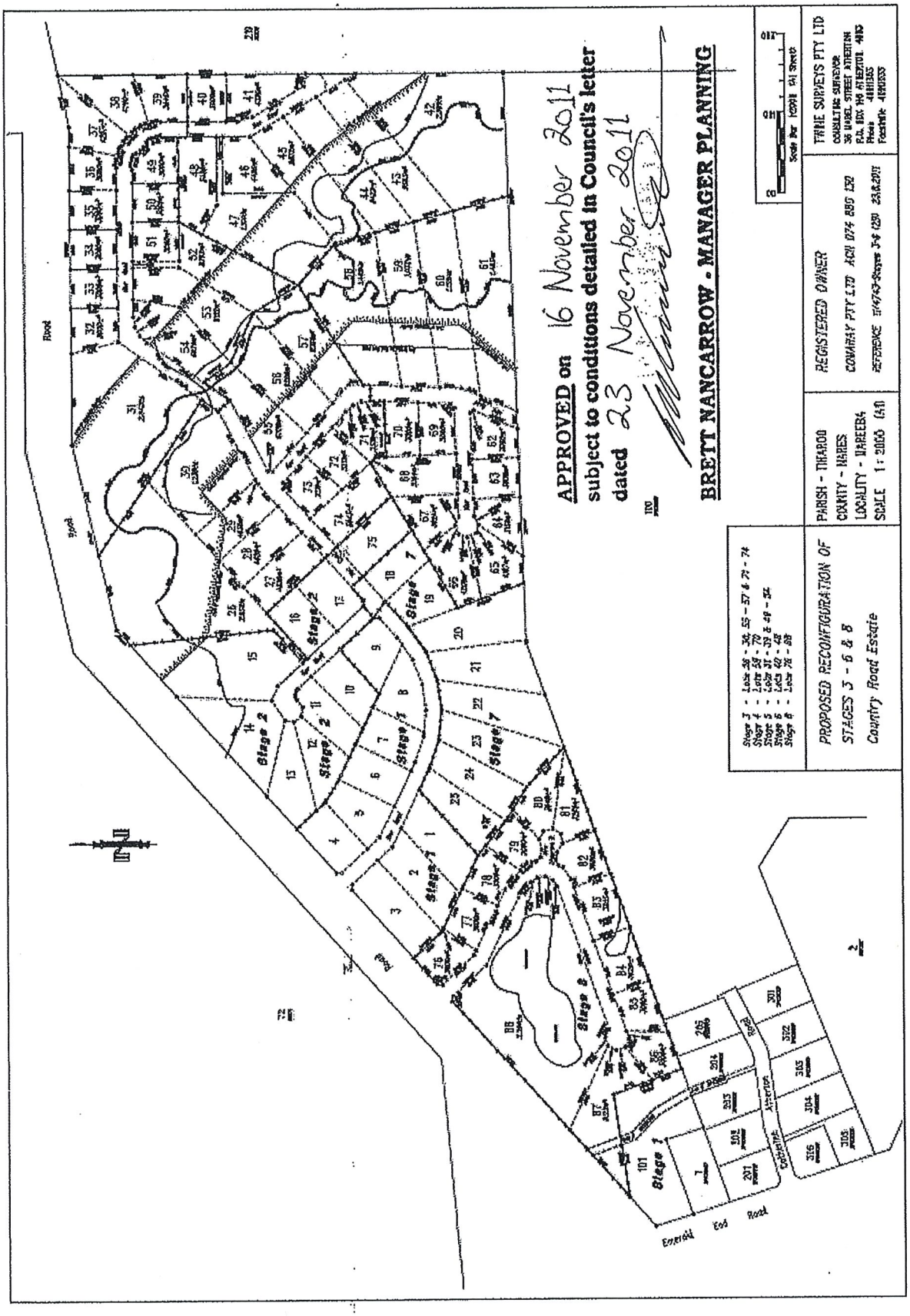
BRETT NANCARROW
MANAGER URBAN & REGIONAL PLANNING

Enclosures: **Attachment 1 - Approved Plans of Development**
Attachment 2 - Concurrence Agency Conditions
Attachment 3 - SPA Extract on Appeal Rights

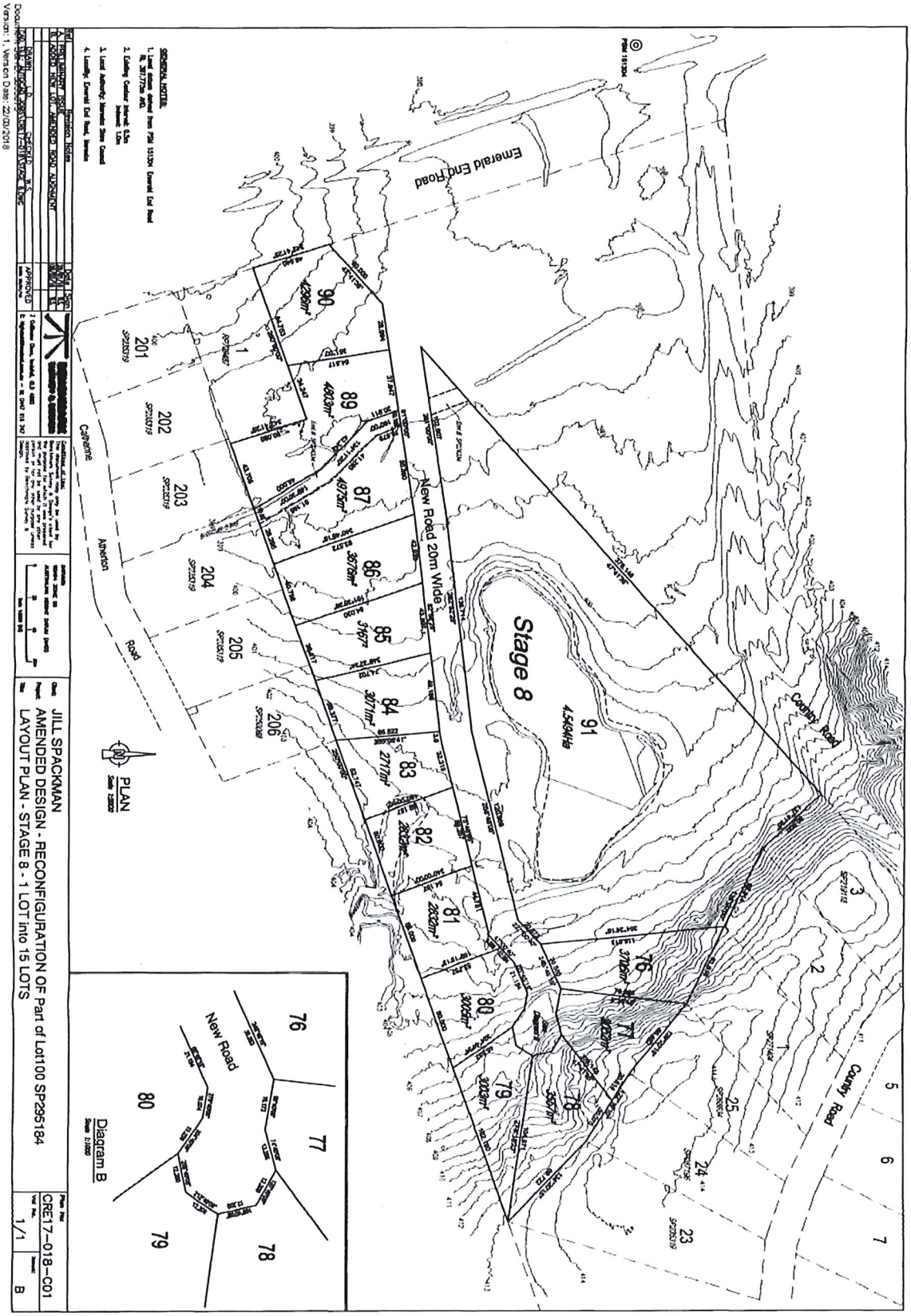
Copy: **Mr Malcolm Hardy**
Department of Transport Main Roads
Far North Region (Cairns)
PO Box 6185
CAIRNS QLD 4870

Administration Officer
Implementation and Support Group
Department of Environment and Resource Management
GPO Box 15155
CITY EAST QLD 4002

ATTACHMENT 1 - SUPERSEDED PLAN



APPROVED PLAN



ATTACHMENT 2 - CONCURRENCE AGENCY CONDITIONS

URP-ROL
B. Millard

Queensland Government

Council Ref: REC/08/0096

4 March 2011

THE **ORIGINAL** OF THIS DOCUMENT CAN BE FOUND ON **PHYSICAL FILE**
REC/08/0096
LOCATION ...PLANNING - MBA.....

RECORDS - 7 MAR 2011

Chief Executive Officer
Tablelands Regional Council
PO Box 154
Mareeba Qld 4880

Attention Mr Brian Millard

Dear Mr Millard

Amended Referral Agency Response – s. 287 of the *Sustainable Planning Act 2009*
Applicant: **Comaray Pty Ltd**
Application: **Reconfiguration of Lot (71 Residential Allotments & New Roads)**
Location: **Lot 4 on RP 739487, Parish of Tinaroo**
Emerald End Road, Mareeba

I refer to:

- the above application received at the former Department of Main Roads (DMR) 1 September 2008 requesting consideration of the above development,
- DMR letter 4 September 2008 of conditions of development, and
- request to review conditions received at the Department of Transport and Main Roads (TMR) 2 March 2011, with an amended lot layout.

Pursuant to section 287 of the *Sustainable Planning Act 2009*, TMR, as a Concurrence Agency, has reviewed the impact of the proposed development on the State-controlled road network and requests that Council include the following **amended** conditions of development for the subject application:

1. Layout

Unless otherwise approved in writing by TMR the development site layout must generally comply with Twine Surveys plan numbered 11/4743-Stages 3-6 (2) dated 18.2.2011.

2. Permitted Road Access Location

(i) Access between the State-controlled road (i.e. Kennedy Highway) and the subject land shall be via Emerald End Road and Hastie Road, to the satisfaction of Tablelands Regional Council.

(ii) No additional access between the State-controlled road (i.e. Kennedy Highway) and the subject land is permitted.

3. Intersection Works

(i) The intersection of the Kennedy Highway and Hastie Road shall be upgraded in

Department of Transport and Main Roads
Assets and Operations
Far North Region / Cairns Office
Floor 4 Cairns Corporate Tower 15 Lake Street
PO Box 6185 CAIRNS Queensland 4870
ABN 39 407 690 291

Enquiries MALCOLM HARDY
Our ref 264/32A/102(122.01)
Telephone +61 7 4050 5511
Facsimile +61 7 4050 5438
Website www.tmr.qld.gov.au
Email malcolm.r.hardy@tmr.qld.gov.au

accordance with:

- TMR *Road Planning and Design Manual (RP&DM)*, and
- current TMR standards,

and to the Department's satisfaction.

(ii) The intersection of the Kennedy Highway and Hastie Road shall be upgraded as specified below:

- Provide a channelised right turn treatment (CHR) in accordance with Figure 13.60 of RP&DM.

Design aspects that include or address the following:

- 1.5 metre wide shoulders and 3.5 metre wide traffic lanes and turn lanes shall be provided on the Kennedy Highway.
- Painted traffic islands shall be used between the Highway traffic lanes, and these islands shall have raised reflective pavement markers (RRPMs) installed in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).
- Redundant sections of existing white lining shall be "blacked out" with hot bitumen and 7mm chip.
- Intersection lighting shall be upgraded to V5 standard to ensure new works are appropriately lit. The completed lighting installation will need to comply with: The Electrical Act,
  - Australian Standards (AS1158, 3000), and
  - Chapter 17 of the RP&D manual.

  All works are to be certified by RPEQ (electrical).
- All associated works are to be completed to the Department's satisfaction [eg, services relocation, drainage (incl. extension of culverts), line marking (incl. RRPM's), and signage in accordance with the MUTCD].
- Any necessary relocation of Council water mains, Telstra and electrical services are to be undertaken at no cost to TMR and works completed to the service provider's satisfaction. No existing water mains within 3.0 m. of the new sealed shoulder edge shall be permitted.

(iii) The landowner/ applicant shall submit design drawings prepared and certified by a suitably experienced RPEQ (civil) engineer, for approval to the Cairns office of TMR prior to commencing any works within the State-controlled road reserve (i.e. Kennedy Highway). No works shall commence on site until TMR has approved the plans.

(iv) All required intersection works shall be completed to the satisfaction of the Director-General of TMR prior to Council approval and dating of the plan of survey creating the 30th Rural Residential allotment on the subject land.

4. Advertising

No advertising device for the proposed development is permitted within the Kennedy Highway road reserve.

Council is requested to reflect the above conditions on its Rates Record, to ensure that the planning intentions of the conditions are secured.

This Department would appreciate a copy of Council's decision notice regarding the application.

A copy of this letter has been sent to the applicant.

Yours sincerely

Malcolm Hardy
SENIOR PLANNER (ASSETS & OPERATIONS) FAR NORTH

Department of Environment and Resource Management

Notice

Amended Concurrence Agency Response

This notice is issued by the Department of Environment and Resource Management pursuant to section 3.3.17 of the Integrated Planning Act 1997 ("the Act").

The Chief Executive
Tablelands Regional Council
PO Box 154
Mareeba QLD 4880

cc. Comaray Pty Ltd
PO Box 146
Atherton QLD 4883

Our reference: 2008/007471

Re: Amended Concurrence Agency Response

1. **Application Details**

Assessment Manager ref.: REC/08/0096

Date application referred to DERM:

2 September 2008

Development approval applied for:

Reconfiguring a Lot – Clearing Vegetation

Aspect of development:

Schedule 2, table 2, item 4 of the *Integrated Planning Act 1997* (for Reconfiguring a Lot)

DERM ref. no: 328683
eLVAS: 20008/007471
RecFind: MBA/000617

Development description:

Reconfiguring a Lot – Public safety and infrastructure

Property/Location description:

Lot 4 RP739487 – Tablelands Regional Council

2. The Chief Executive, Department of Environment and Resource Management (DERM) has imposed conditions on this development. Conditions are attached to this Notice

Notice
Concurrence Agency Response

3. **Approved plans / specifications**

Document No.	Document Name	Date
RARP 2008/007471	Referral Agency Response Plan 2008/007471	15/04/2011

4. **General advice to assessment manager**

Pursuant to sections 3.5.15 and 3.5.17 of the Act, a copy of a decision notice or negotiated decision notice issued by the assessment manager must be forwarded to DERM as a referral agency for the relevant application at

Administration Officer
Vegetation Management and Use
Department of Environment and Resource Management
PO Box 156
Mareeba Qld 4880

and an electronic copy to *eco.access@derm.qld.gov.au*.

The State's Native Title Work Procedures provide that responsibility for assessment of native title issues for an IDAS application rests with the assessment manager. Therefore, DERM as a referral agency for the relevant application has not provided notification to native title parties.

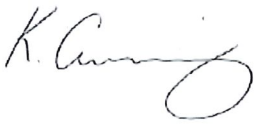
5. **Additional information for applicants**

This notification refers to the provisions of the *Vegetation Management Act 1999* and *Integrated Planning Regulation 1998* only and is based on the information you have provided regarding the proposed activities on the land. Should any issue subsequently emerge on site that requires further consideration by DERM, it is the responsibility of the landholder to contact DERM. Other legislation, including the acts listed below may affect clearing activities. You should contact the business units below to determine if your clearing activity will be affected.

It should be noted that all native plants in Queensland are protected under the *Nature Conservation Act 1992*. You must contact the QPWS Wildlife Branch of DERM on the details below before clearing vegetation.

Notice
Concurrence Agency Response

Act(s)	Agency	Contact details
• *Water Act 2000* • *Wild Rivers Act 2005* • *Soil Conservation Act 1986* • *Aboriginal Cultural Heritage Act 2003* • *Torres Strait Islander Cultural Heritage Act 2003* • *Nature Conservation Act 1992* • *Environmental Protection Act 1994* • *Coastal Protection and Management Act 1995* • *Queensland Heritage Act 1992* • *Forestry Act 1959*	Department of Environment and Resource Management (DERM)	Ph: 1300 130 372
• *Fisheries Act 1994*	Department of Employment, Economic Development and Innovation (DEEDI)	Ph: 13 25 23 Email: callweb@dpi.qld.gov.au
• *Environment Protection and Biodiversity Conservation Act 1999*	Department of Sustainability, Water, Population and Communities	Ph: (02) 6274 1111 Epbc.referals@environment.gov.au
• *Local Government Act 1993* • Sustainable *Planning Act 1997*	Local Government	Contact your nearest local government office.



Delegate
Kate Cumming
Delegate, Chief Executive administering the *Vegetation Management Act 1999*
Department of Environment and Resource Management
11 May 2011

Enquiries:
Rebecca Silcock
Department of Environment and Resource Management
PO Box 156
Mareeba Qld 4880
Phone: (07) 4048 4719
Fax: (07) 4092 2366
Email: Rebecca.silcock@derm.qld.gov.au

Attachment(s)
Amended Referral Agency Response (including conditions)
Referral Agency Response (Vegetation) Plan: 2008/007471

Amended Referral Agency Response – Reconfiguring a Lot

s 3.3.17 Integrated Planning Act 1997

1. Application information

1.1. **Applicant's name:** Comaray Pty. Ltd. C/- Twine Surveys Pty Ltd

1.2. **Property description:** 4 RP739487 - Tablelands Regional Council

1.3. **Assessment Manager/Reference:** REC/08/0096

1.4. **Date application was referred to Department:** 2 September 2008

1.5. **Departmental Reference:** eLVAS Case No: 2008/007471, File Ref. No: MBA/000617.

1.6. **Type of development sought by the application:**

- Reconfiguring a Lot

2. Concurrence Agency response:

The Chief Executive of the Department of Environment and Resource Management directs that the following conditions must be imposed on any approval given by the Assessment Manager:

2.1 No clearing of native vegetation as a result of this Reconfiguration of a Lot is to occur within Areas A1 and A2 shown on the Referral Agency Response (Vegetation) Plan 2008/007471 dated 15 April 2011.

2.2 The Reconfiguration of a Lot must be conducted in accordance with *the Reconfiguration Plan for Lot 4 RP739487, Twine Surveys Pty. Ltd., Reference No. 11/4743-Stages 3-6 (2),* dated 18 February 2011.

2.3 These conditions do not prevent vegetation being cleared for a purpose described in Schedule 8 of the *Integrated Planning Regulation 1997* (except where the extent of clearing is inconsistent with Conditions 2.1 and 2.3) or if cleared in accordance with any subsequent development approval.

3. Reasons:

A Statement of Reasons is attached at Schedule 1.

4. Additional comments or information:

Clearing not authorised under this Amended Referral Agency Response

Additional clearing within the subject area that is not authorised under this amended referral agency response, must be applied for as operational works, that is the clearing of native vegetation made assessable under Schedule 8, Part 1, Table 4 of the *Integrated Planning Act 1997.*

Clearing Regrowth Vegetation

The *Vegetation Management Act 1999* now regulates the clearing of certain regrowth vegetation as well as remnant vegetation. These regulations came into effect on the 8 October 2009. The aim of the new arrangement is to control the clearing of High Value Regrowth

Vegetation, particularly that which is associated with watercourses, wetlands, steep slopes and habitat for rare and threatened fauna.
The Regrowth Vegetation Map identifies Regulated Regrowth Vegetation on land that is subject to this application. The Regrowth Vegetation Map is available online at: http://www.derm.qld.gov.au/vegetation/regrowth_vegetation_regulations.html

While no permit is required to authorise clearing of regulated regrowth vegetation, the code requires landholders to notify DERM of their intention to clear before they start any clearing activity.

Clearing that does not comply with the code is unlawful and may be subject to a compliance response including the possibility of prosecution or the restoration of the cleared area.

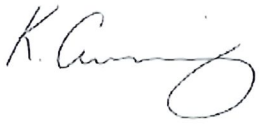
Cultural Heritage

A search has been performed on the inventory of recorded Aboriginal cultural heritage sites over subject area and no Aboriginal cultural heritage notings were found. However, the Chief Executive of DERM advises all Aboriginal cultural heritage in Queensland is protected under the *Aboriginal Cultural Heritage Act 2003*, and penalty provisions apply for any unauthorised harm. A person carrying out an activity must take all reasonable and practical measures to ensure the activity does not harm Aboriginal cultural heritage (the "cultural heritage duty of care"). Maximum penalties for breaching the duty of care are $750,000 for a corporation and $75,000 for an individual. This applies whether or not such places are recorded in an official register and whether or not they are located in, on or in under private land.

The gazetted cultural heritage Duty of Care Guidelines sets out how you can comply with the cultural heritage duty of care. An assessment of the proposed activity against the Duty of Care Guidelines will help determine whether, or to what extent, Aboriginal cultural heritage may be harmed. Upon assessment, if you believe cultural heritage may be harmed by the proposed activity, you should contact the Cultural Heritage Coordination Unit for further advice on (07) 3238 3838 or e-mail: cultural.heritage@derm.qld.gov.au.

Further information on cultural heritage a copy of the Duty of Care Guidelines or cultural heritage search forms visit: http://www.derm.qld.gov.au/cultural_heritage/index.html.

5. Authorised Officer Signature:



Kate Cumming
Senior Vegetation Management Officer

Date of Response: 11 May 2011

Att. Schedule 1 – Statement of Reasons

eLVAS Case No:	2008/007471
File Ref. No:	MBA/000617
Project No:	328683

Schedule 1

Statement of Reasons
Referral Agency Response
Application for Reconfiguring a Lot
Comaray Pty. Ltd. C/- Twine Surveys.

The following Statement of Reasons is provided pursuant to s. 3.3.18(8) of the *Integrated Planning Act 1997*

Introduction

1. The Department of Environment and Resource Management (DERM) received an application from Comaray Pty. Ltd. C/- Twine Surveys Pty. Ltd. on 2 September 2008.
2. The application is for Reconfiguring a Lot on 4 RP739487 - Tablelands Regional Council.
3. DERM refused the original application on 19 October 2009.
4. DERM received a request to amend the original RAR as well as amended layout plans from the applicant on 1 March 2011.
5. An Assessment Report was sent to the Delegate of the Chief Executive, Kate Cumming, on 11 May 2011.
6. The Delegate determined an Amended Referral Agency Response on 11 May 2011.

Evidence

1. Application dated 2 September 2008.
   a) Completed IDAS Form 1 Part "J".
   b) Property Vegetation Management Plan.
2. *Integrated Planning Act 1997& Integrated Planning Regulation 1998 (Schedule 2)*
3. *Vegetation Management Act 1999*
4. Department of Environment and Resource Management Concurrence Agency Policy for Reconfiguring a Lot dated 23 August 2007.
5. *State Planning Policy (SPP) 1/03 – Mitigating the Adverse Impacts of Flood, Bushfire, and Landslide.*
6. Letter from Matt Andrejic of Twine Surveys Pty Ltd, requesting an amended Referral Agency Response (with amended plans dated 18 February 2011) - dated 1 March 2011
7. The applicant's Reconfiguration Plan for Lot 4 RP739487, Twine Surveys Pty Ltd, Reference No. 11/4743-Stages 3-6 (2) dated 18 February 2011
8. Vegetation Information Network database (VIN)
9. Assessment Report dated 11 May 2011.

Findings of fact

1. The application confirmed that the purpose was to reconfigure lot 4 RP739487 into 72 lots.

2. Smartmap identifies the land tenure for the subject area is freehold
3. Regional ecosystem mapping identifies the subject area contains *Least Concern* and non remnant vegetation.
4. The applicant's Reconfiguration Plan for Lot 4 RP739487, Twine Surveys Pty Ltd, Reference No. 11/4743-Stages 3-6 (2) dated 18 February 2011 confirmed the location of the proposed roads & allotment boundaries.
5. The subject area has been identified as being located within a low bushfire risk hazard area within the Tablelands Regional Council Planning Scheme
6. VIN confirmed the location, extent and types of vegetation on lot 4 RP739487.
7. Topographic Mapping confirmed the location of stream order 1 and a stream order 2 water courses on lot 4 RP739487.
8. The application is assessable against Criteria Table H of the Concurrence Agency Policy for Reconfiguring a Lot: performance requirements where clearing will occur as a result of the RaL within assessable vegetation.

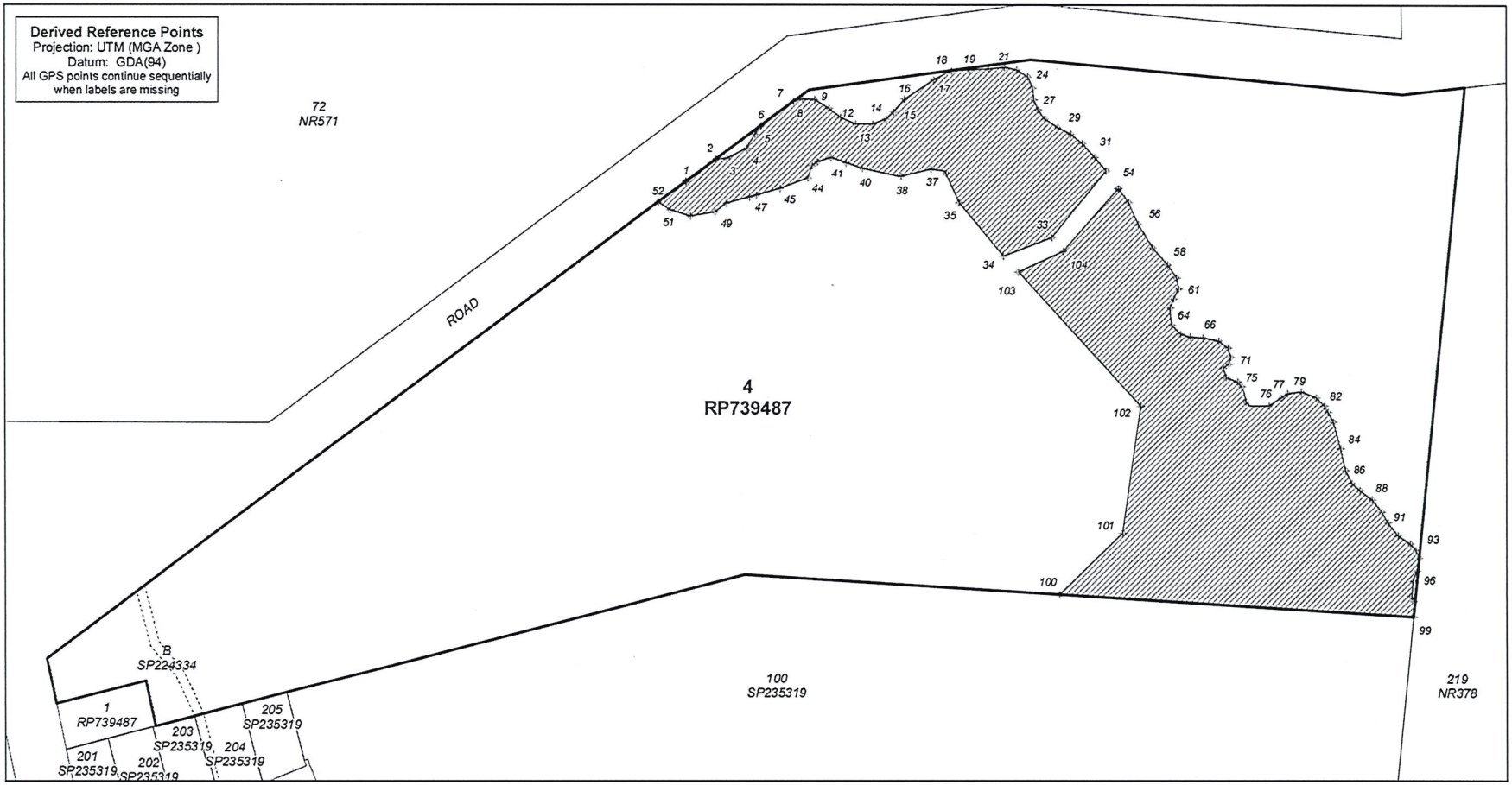
Reasons

1. The application complies with the performance requirement of Criteria Table H of the Concurrence Agency Policy – with the inclusion of conditions 2.1, 2.2 & 2.3 of the referral agency response – as clearing as a result of the RaL will occur within assessable vegetation.
2. The application is consistent with the purpose of the Concurrence Agency Policy for Reconfiguring a Lot which achieves the outcomes of the *Vegetation Management Act 1999*

To ensure that a decision regarding this development application is consistent with the *Vegetation Management Act 1999* it is required conditions 2.1, 2.2 & 2.3 of this referral agency response be applied to the development.

Kate Cumming
Senior Vegetation Management Officer
North Region

11 May 2011



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Projection: UTM (MGA Zone 55) Datum: GDA94

Note: Derived Reference Points are provided to assist in the location of the Referral Agency Response boundaries.
Responsibility for locating these boundaries lies solely with the landholder and delegated contractor(s).

The property boundaries shown on this plan are APPROXIMATE ONLY. They are NOT an accurate representation of the legal boundaries.

Note: This plan must be read in conjunction with the Referral Agency Response 2011/002003

LEGEND

- Derived Reference Points for GPS
- Subject Lot(s)
- Areas A1 and A2

Referral Agency Response (Vegetation) Plan

Plan of Areas A1 and A2 in Lot 4 on RP739487

N

Queensland Government

CENTRE: MAREEBA LOCALITY OF MAREEBA	REGION: NORTH LOCAL GOVT: TABLELANDS
Map Reference: 7964	Compiled from: DCDB, PVMP & VMO Notes
File Reference: MBA/000617	Prepared by: J4926 Jason Allen Date: 15 April 2011

RARP 2008/007471
Sheet 1 of 1



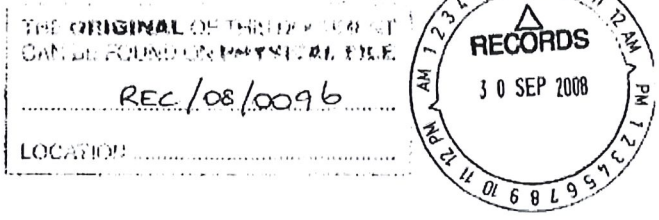
NOTICE

Advice Agency Response –Wetland

This notice is issued by the Environmental Protection Agency pursuant to sections 3.3.16 and 3.3.19 of the *Integrated Planning Act 1997.*

Tableland Regional Council
PO Box 154
MAREEBA QLD 4880

cc. Comaray Pty Ltd
C/- Planning Far North
PO Box 7801
CAIRNS QLD 4870



Your reference : REC/08/0096

Our reference : CNS7912

Attention: Mr Brian Millard

Dear Mr Brian Millard

Re: Advice concerning application for development at 200 Emerald End Road, Mareeba (Lot 4 on Plan RP739487). Please treat this response as a properly made submission.

EPA referral number: **IPAR01185308**

Response type: Advice Agency Response

Date application received by EPA: **03 September 2008**

ADVICE AGENCY JURISDICTION:	Item 38 of Table 2 of Schedule 2 of the *Integrated Planning Regulation 1998.*
ASSESSMENT MANAGER REFERENCE NUMBER:	**REC/08/0096**
APPLICANT:	**Comaray Pty ltd**
ACTIVITY DESCRIPTION:	**Development application for Reconfiguration of 1 Lot into 71 Lots in Four Stages.**
DESCRIPTION OF SUBJECT LAND:	**200 Emerald End Road, Mareeba**
	Lots: 4 Plan: RP739487

Response to Development Application

The lot is within 100m of a Wetland. The EPA, acting as an advice agency under the *Integrated Planning Act 1997*, provides the following advice to the application as detailed above.

EPA advice

The application is for the reconfiguration of Lot 4 on RP739487 (62.94ha), 200 Emerald End Road Mareeba, into 71 rural residential lots.The property has two swathes of 'not of concern' Regional Ecosytem with seasonally flowing gullies running through them and a patch of referrable wetlands near the north eastern boundary.

The Overall Layout and Staging Plan (drawing 0807COMRAY) shows that most of the 'not of concern' Regional Ecosystem, seasonal streamlines and all of the wetland will be subdivided. This will inevitably lead to a loss of natural values associated with these features. It is noted that new lots 15 and 16 in the mapped wetland area in Stage 2 have previously been approved.

From EPA's perspective, a better environmental outcome would result if the wetland parts of lots 17 – 21 and a gully riparian easement of around 40m in width were kept in a natural state, made public land and protected. The subdivision could then be configured around these natural features. Similarly, if the gully and associated vegetation of lot 101 and adjacent parts of lot 100 could be afforded protection, it would add to the natural amenity of the subdivision.

Considering the close proximity of the Barron River it is important to ensure that any on-site effluent disposal is of a high standard. The risks of contamination of the groundwater and potentially the Barron River should be kept to a minimum. Further details demonstrating that on site effluent disposal can take place with minimal risks should be supplied to the satisfaction of the Tableland Regional Council.

Additional information for applicants

It is a requirement of the *Environmental Protection Act 1994* that if the owner or occupier of this site becomes aware that a Notifiable Activity (as defined under Schedule 2 of the *Environmental Protection Act 1994*) is being carried out on this land or that the land has been affected by a hazardous contaminant, they must, within thirty (30) days after becoming aware the activity is being carried out, give notice to the Environmental Protection Agency. A list of Notifiable Activities is provided within Schedule 2 of the *Environmental Protection Act 1994*.

Yours sincerely



Signature

26 - SEP - 2008

Date

Gary Innis

Manager Planning

Far Northern Region

Environmental Protection Agency

Enquiries:
Mike Trenerry
Environmental Protection Agency
PO Box 2066
CAIRNS QLD 4870
Telephone: 4046 6694
Facsimile: 4046 6606

ATTACHMENT 3 - APPEAL RIGHTS

DIVISION 8 APPEALS TO COURT RELATING TO DEVELOPMENT APPLICATIONS AND APPROVALS

461 APPEALS BY APPLICANTS

(1) An applicant for a development application may appeal to the court against any of the following—

(a) the refusal, or the refusal in part, of the development application;

(b) any condition of a development approval, another matter stated in a development approval and the identification or inclusion of a code under section 242;

(c) the decision to give a preliminary approval when a development permit was applied for;

(d) the length of a period mentioned in section 341;

(e) a deemed refusal of the development application.

(2) An appeal under subsection (1)(a), (b), (c) or (d) must be started within 20 business days (the ***applicant's appeal period***) after—

(a) if a decision notice or negotiated decision notice is given—the day the decision notice or negotiated decision notice is given to the applicant; or

(b) otherwise—the day a decision notice was required to be given to the applicant.

(3) An appeal under subsection (1)(e) may be started at any time after the last day a decision on the matter should have been made.

462 APPEALS BY SUBMITTERS—GENERAL

(1) A submitter for a development application may appeal to the court only against—

(a) the part of the approval relating to the assessment manager's decision about any part of the application requiring impact assessment under section 314; or

(b) the part of the approval relating to the assessment manager's decision under section 327.

(2) To the extent an appeal may be made under subsection (1), the appeal may be against 1 or more of the following—

(a) the giving of a development approval;

(b) any provision of the approval including—

(i) a condition of, or lack of condition for, the approval; or

(ii) the length of a period mentioned in section 341 for the approval.

(3) However, a submitter may not appeal if the submitter—

(a) withdraws the submission before the application is decided; or

(b) has given the assessment manager a notice under section 339(1)(b)(ii).

(4) The appeal must be started within 20 business days (the ***submitter's appeal period***) after the decision notice or negotiated decision notice is given to the submitter.

463 ADDITIONAL AND EXTENDED APPEAL RIGHTS FOR SUBMITTERS FOR PARTICULAR DEVELOPMENT APPLICATIONS

(1) This section applies to a development application to which chapter 9, part 7 applies.

(2) A submitter of a properly made submission for the application may appeal to the court about a referral agency's response made by a prescribed concurrence agency for the application.

(3) However, the submitter may only appeal against a referral agency's response to the extent it relates to—

(a) if the prescribed concurrence agency is the chief executive (environment)—development for an aquacultural ERA; or

(b) if the prescribed concurrence agency is the chief executive (fisheries)—development that is—

(i) a material change of use of premises for aquaculture; or

(ii) operational work that is the removal, damage or destruction of a marine plant.

(4) Despite section 462(1), the submitter may appeal against the following matters for the application even if the matters relate to code assessment—

(a) a decision about a matter mentioned in section 462(2) if it is a decision of the chief executive (fisheries);

(b) a referral agency's response mentioned in subsection (2).

464 APPEALS BY ADVICE AGENCY SUBMITTERS

(1) Subsection (2) applies if an advice agency, in its response for an application, told the assessment manager to treat the response as a properly made submission.

(2) The advice agency may, within the limits of its jurisdiction, appeal to the court about—

(a) any part of the approval relating to the assessment manager's decision about any part of the application requiring impact assessment under section 314; or

(b) any part of the approval relating to the assessment manager's decision under section 327.

(3) The appeal must be started within 20 business days after the day the decision notice or negotiated decision notice is given to the advice agency as a submitter.

(4) However, if the advice agency has given the assessment manager a notice under section 339(1)(b)(ii), the advice agency may not appeal the decision.

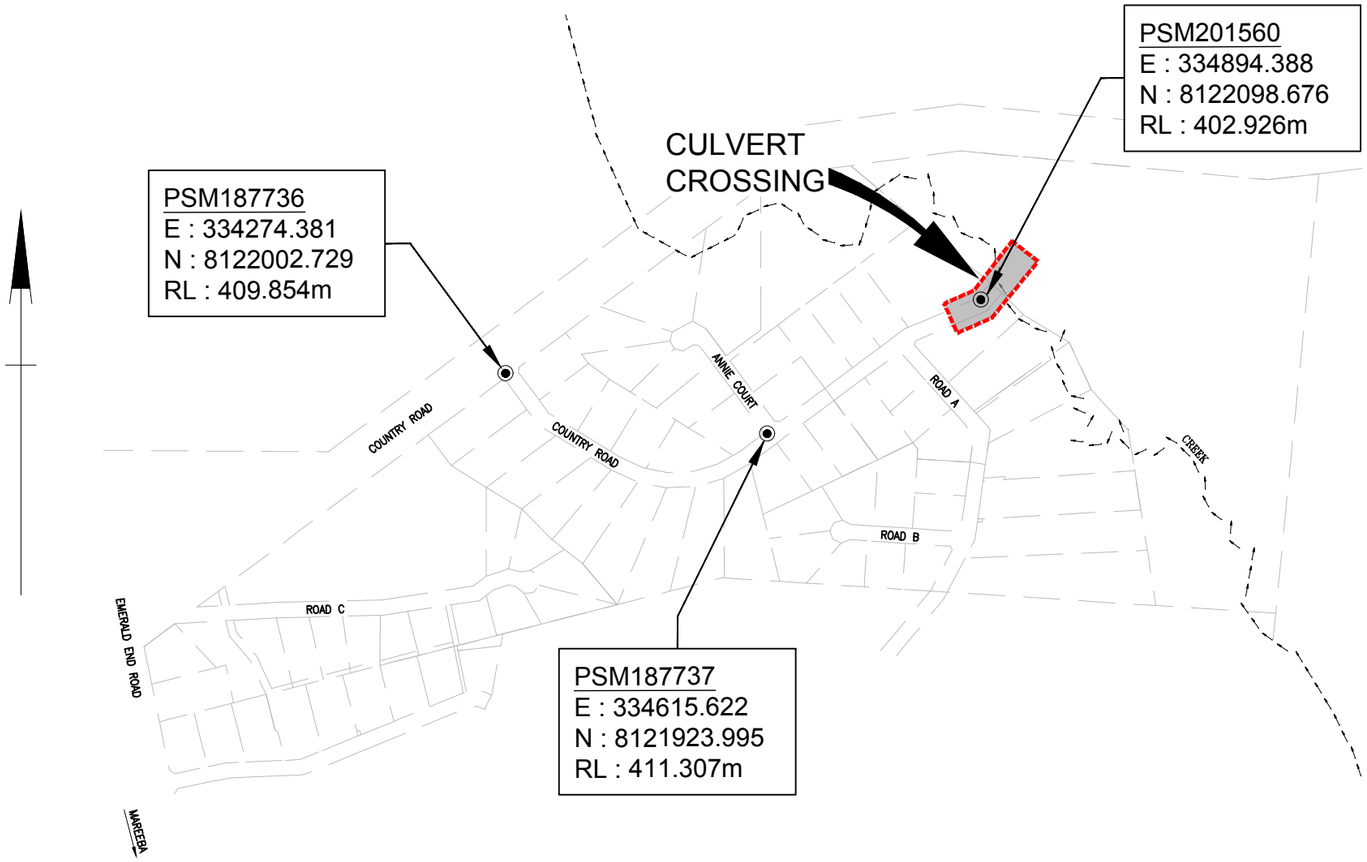
APPENDIX B

Design Drawings

CONMAT PTY. LTD.

COUNTRY ROAD ESTATE

COUNTRY ROAD CULVERT CROSSING



CIVIL DRAWINGS LIST

160-012-C101	COVER SHEET, LOCALITY PLAN AND DRAWINGS LIST
160-012-C102	GENERAL NOTES
160-012-C103	CULVERT PLAN
160-012-C104	COUNTRY ROAD LONGITUDINAL SECTION
160-012-C105	COUNTRY ROAD CROSS SECTIONS (SHEET 1 OF 3)
160-012-C106	COUNTRY ROAD CROSS SECTIONS (SHEET 2 OF 3)
160-012-C107	COUNTRY ROAD CROSS SECTIONS (SHEET 3 OF 3)
160-012-C108	TYPICAL ROAD CROSS SECTION AND DETAILS
160-012-C109	EROSION AND SEDIMENT CONTROL PLAN
160-012-C110	EROSION AND SEDIMENT CONTROL NOTES

STRUCTURAL DRAWINGS LIST

160-012-S101	WORKPLACE HEALTH AND SAFETY NOTES
160-012-S102	STRUCTURAL ENGINEERING NOTES SHEET 1 OF 2
160-012-S103	STRUCTURAL ENGINEERING NOTES SHEET 2 OF 2
160-012-S110	CULVERT SITE PLAN
160-012-S111	TYPICAL CULVERT SECTION A
160-012-S112	CULVERT DETAILS SHEET 1 OF 2
160-012-S113	CULVERT DETAILS SHEET 2 OF 2
160-012-S120	CULVERT PRECAST DECK PANELS P1-P6 & P9-P11
160-012-S121	CULVERT PRECAST DECK PANEL P7
160-012-S122	CULVERT PRECAST DECK PANEL P8
160-012-S123	CULVERT PRECAST HEAD WALL W4
160-012-S130	STORMWATER PIT

Client:

CONMAT
CONSTRUCTION MATERIALS

Prepared by:

ERSCON
CONSULTING ENGINEERS

FOR COUNCIL APPROVAL

PRINT IN COLOUR 160-012-C101 REV 1

GENERAL NOTES:

1. LEVEL DATUM : AHD
2. ORIGIN OF LEVELS: (GDA2020 ZONE 55):

NUMBER	EASTING	NORTHING	RL	LOCATION
PSM187736	334274.381	8122002.729	409.854m	COUNTRY ROAD, MAREEBA
PSM187737	334615.622	8121923.995	411.307m	COUNTRY ROAD, MAREEBA
PSM201560	334894.388	8122098.676	402.926m	COUNTRY ROAD, MAREEBA

3. EXISTING CONDITIONS HAVE BEEN BASED ON SURVEY DATA COLLECTED BY TWINE SURVEYORS. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF THE INFORMATION SHOWN.
4. THE CONTRACTOR IS TO LIAISE WITH TWINE SURVEYS TO ESTABLISH SITE SURVEY CONTROLS.
5. DETAILS OF SERVICES ARE PROVIDED FOR INFORMATION ONLY, AND NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION. POSITIONS OF SERVICE CROSSINGS SHALL BE RECORDED AND CHECKED BY THE CONTRACTOR. NOT ALL CROSSINGS HAVE NECESSARILY BEEN SHOWN ON THE DRAWINGS. THE CONTRACTOR IS TO CHECK SERVICES ON SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
6. FOR ALL SPECIFICATIONS REFER TO FNQROC STANDARD SPECIFICATIONS.
7. INSPECTION AND TEST PLANS ARE TO BE UNDERTAKEN BY CONTRACTOR IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.
8. AS CONSTRUCTED DATA TO BE PREPARED AND SUBMITTED BY THE CONTRACTOR IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.

EARTHWORKS NOTES:

1. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S1 'EARTHWORKS'.
2. FNQROC SPECIFICALLY REFERENCES AS 3798 'GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS' IN RELATION TO ALL EARTHWORK OPERATIONS INCLUDING APPROPRIATE METHODS OF TESTING, FREQUENCY OF TESTING AND REPORTING PROCEDURES. GEOTECHNICAL TESTING SERVICES SHALL BE AS DETERMINED BY LEVEL 1 IN ACCORDANCE WITH AS 3798. ALL CERTIFICATION AND TEST RESULTS ARE TO BE COMPILED AND PROVIDED TO THE SUPERINTENDENT PRIOR TO WORKS ACCEPTANCE.
3. ALL BATTERS SHALL BE 1 IN 3 MAX UNLESS NOTED OTHERWISE ON THE PROJECT DRAWINGS.
4. FINISHED SURFACE LEVELS SHOWN ON PROJECT DRAWINGS ARE AFTER ALL EARTHWORKS ARE COMPLETE INCLUDING TOPSOILING. ALL AREAS ARE TO BE GRADED EVENLY BETWEEN FINISHED SURFACE LEVELS UNLESS NOTED OTHERWISE.
5. DRY DENSITY RATIO AS REFERRED TO IN THESE NOTES IS THE RATIO DETERMINED IN ACCORDANCE WITH AS1289.5.4.1 OF COMPACTED DRY DENSITY IN ACCORDANCE WITH AS1289.5.3.1 OR AS1289.5.8.1 TO THE STANDARD MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1259.5.1.11 (STANDARD COMPACTION).
6. NO VEGETATION SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE SUPERINTENDENT UNLESS NOTED ON THE PROJECT DRAWINGS.
7. ALL VEGETAL MATTER, TOPSOIL AND OTHER UNSUITABLE MATERIAL SHALL BE STRIPPED/REMOVED FROM AREAS TO BE EXCAVATED OR FILLED. ALL VEGETAL MATTER AND UNSUITABLE MATERIAL SHALL BE DISPOSE OF OFF–SITE UNLESS ADVISED OTHERWISE BY THE SUPERINTENDENT. TOPSOIL SHALL BE STOCKPILED ON–SITE FOR REUSE. SURPLUS TOPSOIL SHALL BE DISPOSED OF OFF–SITE.
8. SHOULD ANY SOFT OR UNSUITABLE MATERIAL BE IDENTIFIED, THE CONTRACTOR SHALL INFORM THE SUPERINTENDENT IMMEDIATELY AND SEEK THE ADVICE OF THE SUPERINTENDENT OR GITA.
9. COMPACT FILL TO 95% DRY DENSITY RATIO IN LAYERS OF THICKNESS APPROPRIATE TO THE COMPACTION PLANT EMPLOYED BT NOT EXCEEDING 300mm.
10. ROAD VERGE SHALL BE FULLY TURFED ON COMPLETION OF TOPSOILING. ELSEWHERE, DISTURBED AREAS 1:3 OR FLATTER SHALL BE GRASS SEEDED AND AREAS STEEPER THAN 1:3 SHALL BE HYDROMULCHED (UNLESS NOTED OTHERWISE).

CONCRETE NOTES:

1. ALL CONCRETE WORKS INCLUDING SUPPLY, PLACEMENT, COMPACTION, REINFORCEMENT AND FINISHING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S7 CONCRETE WORKS.

DRAINAGE NOTES:

1. ALL STORMWATER DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S4 'STORMWATER DRAINAGE'.
2. ALL KERB INLET PITS TO BE CONSTRUCTED IN ACCORDANCE WITH FNQROC STD DRG'S S1050 AND S1060.

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO CONSTRUCTION COMMENCING, THE CONTRACTOR MUST PREPARE AN EROSION & SEDIMENT CONTROL PLAN (ESCP) TO MANAGE THE SITE DURING CONSTRUCTION AND THE DEFECT LIABILITY PERIOD.
2. THE ESCP MUST BE CONSISTENT WITH THE APPROVED EROSION & SEDIMENT CONTROL STRATEGY (ESCS) AND SHALL TAKE INTO CONSIDERATION THE CONTRACTOR'S PROPOSED CONSTRUCTION METHODOLOGY AND PROGRAM.
3. AN ESCP THAT DIFFERS TO THE APPROVED ESCS MUST BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO SUBMITTING TO COUNCIL.
4. NO EARTHWORKS SHALL COMMENCE ON ANY PART OF THE SITE PRIOR TO APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES BEING INSTALLED DOWNSTREAM OF THE SITE AND IN ACCORDANCE WITH THE APPROVED ESCP.
5. AT ALL TIMES THE CONTRACTOR SHALL MONITOR THE PREVAILING WEATHER CONDITIONS AND TAKE ALL NECESSARY PRECAUTIONS TO CONTROL EROSION AND DOWNSTREAM SEDIMENTATION DURING ALL STAGES OF CONSTRUCTION.
6. THE IMPACT ON THE ENVIRONMENT SHALL BE MINIMISED BY OBSERVING THE FOLLOWING CONSTRUCTION PRACTICES:
   - AREAS DISTURBED BY CONSTRUCTION TRAFFIC AND PROCEDURES SHALL BE MINIMISED.
   - MINIMISE TRAFFIC MOVEMENTS AND SPEEDS ON EXPOSED SURFACES.
   - REVEGETATION OF DISTURBED AREAS SHALL BE CARRIED OUT SOON AFTER THE COMPLETION OF TOPSOIL PLACEMENT.
   - FLOW DIVERSION SHALL BE CARRIED OUT BY EARLY INSTALLATION OF DRAINS ALONG TOPS OF BATTERS WITH APPROPRIATE SILTATION CONTROL DEVICES.
   - SEDIMENT INTERCEPTION BY THE PLACEMENT OF SUITABLE RETENTION SYSTEMS ACROSS DRAINAGE LINES AND AT INTERCEPTION POINTS FOR BOTH THE CONSTRUCTION AND STOCKPILE AREAS.
4. ALL ACCESS TO AND FROM THE SITE SHALL BE VIA A TEMPORARY CONSTRUCTION ENTRY/EXIT. THE CONTRACTOR SHALL NOMINATE A PROPOSED ACCESS LOCATION ON THE ESC PLAN FOR APPROVAL BY THE SUPERINTENDENT.
5. STOCKPILES SHALL ONLY BE LOCATED IN AREAS NOMINATED ON THE PROJECT DRAWINGS OR APPROVED BY THE SUPERINTENDENT. ALL STOCKPILES MUST HAVE APPROPRIATE ESC MEASURES INSTALLED TO PREVENT SEDIMENT TRANSPORT. THE MAXIMUM HEIGHT OF ALL STOCKPILES MUST BE LIMITED TO 2.0m
6. ALL PERMANENT AND TEMPORARY UNLINED SWALES AND DRAINS MUST HAVE APPROPRIATE TEMPORARY EROSION PROTECTION.
7. ALL PARTIALLY CONSTRUCTED DRAINAGE STRUCTURES MUST BE PROTECTED AGAINST SEDIMENT INFILTRATION DURING CONSTRUCTION.
8. ALL COMPLETED DRAINAGE STRUCTURES MUST BE PROTECTED AGAINST SEDIMENT INFILTRATION UNTIL GRASSING IS ESTABLISHED.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF DUST EMANATING FROM THE SITE AT ALL TIMES FOR THE DURATION OF CONSTRUCTION. WET SUPPRESSION METHODS TO BE USED.
10. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE CHECKED FOR DAMAGE, CLEANED OUT AND FULLY REINSTATED AFTER EACH RAINFALL EVENT RESULTING IN RUNOFF.
11. IF EROSION AND SEDIMENT CONTROL DEVICES HAVE BEEN FOUND TO BE DEFICIENT OR FAILED IN SERVICE, DUE TO UNFORESEEN CIRCUMSTANCES, CORRECTIVE ACTION IS TO BE UNDERTAKEN IMMEDIATELY WHICH MAY INCLUDE AMENDMENTS/ADDITIONS TO THE ORIGINAL APPROVED EROSION CONTROL PLANS.
12. THE INSTALLATION, REMOVAL, RELOCATION OR MODIFICATION TO EROSION AND SEDIMENT CONTROL DEVICES MAY BE MADE BY COUNCIL IF DEEMED NECESSARY AND RELEVANT.
13. EROSION AND SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE TREATMENT AREA IS SUITABLY STABILISED/VEGETATED.
14. THE CONTRACTOR SHALL UNDERTAKE A FORMAL COMPLIANCE AUDIT OF THE ESC AT SIX WEEKS INTERVALS DURING THE CONSTRUCTION PERIOD OF THE PROJECT. RECORDS OF THE AUDIT SHALL BE RETAINED ON SITE. WHERE IDENTIFIED AS PART OF THE AUDIT THE ESCP SHALL BE UPDATED AND PROVIDED TO THE SUPERINTENDENT.

COUNTRY ROAD CENTRELINE

CHAINAGE	EASTING	NORTHING	BEARING	LENGTH	RADIUS
260.000	334875.023	8122083.792	61°34'43.10"		
TC 274.074	334887.978	8122089.292	61°34'43.10"		
IP 283.498	334896.816	8122093.044		18.848	–39.997
CT 292.922	334902.989	8122100.400	39°59'54.50"		
300.538	334907.861	8122106.207	39°59'54.50"		

WATER NOTES:

1. ALL WATER RETICULATION WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S5 'WATER RETICULATION'.
2. ALL PVC AND PE PIPES SHALL BE CLASS PN16. PVC PIPES SHALL BE RUBBER RING JOINTED AND DUCTILE IRON COMPATIBLE.
3. FOR MAIN TRENCHING, BEDDING & ANCHORAGE DETAILS REFER FNQROC STD DRAWINGS S2015 & S2016. ENSURE COVER TO WATER MAINS IS 800mm MINIMUM UNDER ROADWAYS AND 600mm MINIMUM ELSEWHERE.
4. ALL WATER MAINS SHALL BE INSTALLED ON A STANDARD 2.0m OFFSET FROM THE PROPERTY BOUNDARY UNLESS NOTED OTHERWISE ON PLANS.
5. WHERE NON–METALLIC PIPES ARE LAID, A CONTINUOUS STEEL WIRE, 1.6mm MIN DIAMETER, SHALL BE LAID IMMEDIATELY ABOVE THE FILL SAND TO ASSIST IN FUTURE LOCATING. THIS WIRE IS TO BE WRAPPED ONCE AROUND ALL HYDRANTS AND VALVES.
6. COUNCIL MUST BE CONTACTED TO PERFORM ANY DIRECT CONNECTION OR ALTERATION TO LIVE WATER MAINS. THE CONTRACTOR SHALL LODGE WITH COUNCIL THE APPROPRIATE APPLICATION FORMS AND FEES FOR THESE WORKS TO BE COMPLETED. IT MAY BE POSSIBLE FOR SOME WORKS TO BE PERFORMED BY THE CONTRACTOR UNDER SPECIAL CIRCUMSTANCES AND SUBJECT TO APPROPRIATE CONDITIONS AGREED TO WITH COUNCIL.
7. ALL HYDRANTS AND VALVES TO BE LOCATED OPPOSITE PROPERTY BOUNDARY TRUNCATIONS AND CORNERS, UNLESS NOTED OTHERWISE ON PLANS. FOR VALVES & HYDRANT BOXES INSTALLATION DETAILS REFER FNQROC STD DRAWINGS S2000 AND S2005.
8. HYDRANTS OR VALVES CONSTRUCTED IN CONCRETE ARE TO HAVE A COMPRESSIBLE LAYER (ABLEFLEX) INSTALLED ON THE SURROUND. REFER FNQROC STD DRAWING S2000.
9. THE MINIMUM TEST PRESSURE FOR ALL PIPES SHALL BE 1250 KPa. THE CONTRACT SHALL GIVE COUNCILS WATER OFFICER 24 HOURS NOTICE PRIOR TO TESTING. PERIOD.

LANDSCAPING NOTES:

1. ALL LANDSCAPING WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S8 'LANDSCAPING'.
2. ALL PLANTS MUST BE ORDER SUPPLIED BY A REPUTABLE NURSERY, AND ORDERED WELL IN ADVANCE TO ENSURE AVAILABILITY.
3. TURF TO BE USED SHALL BE ROLLED B GRADE TURF MIX OF SPECIES 80% BUFFALO GRASS (AXONOPUS COMPRESSUS) AND 20% COUCH GRASS VARIETIES.
4. STREET TREES SHALL BE PROVIDED WHERE INDICATED ON PLAN. FINAL LOCATION TO BE DETERMINED ON SITE FOLLOWING INSTALLATION OF DRIVEWAYS AND CONFIRMATION OF SITE SERVICES
5. STREET TREES FINAL LOCATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
   a. GREATER THAN 4.0m FROM ELECTRICITY OR TELECOMMUNICATION POLES OR PILLARS.
   b. GREATER THAN 7.5m FROM STREET LIGHTS
   c. GREATER THAN 2.0m FROM STORMWATER DRAINAGE PITS
   d. GREATER THAN 3.0m FROM DRIVEWAYS
   e. A MINIMUM OF 0.8m AND A MAXIMUM OF 1.0m FROM THE BACK OF KERB
6. TEMPORARY IRRIGATION SHALL BE INSTALLED TO ENABLE WATERING DURING THE ESTABLISHMENT PERIOD.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:22/08/2025 3:52:17 PM
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REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	14/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: NTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MG
DRAWN APPROVED	MF	DESIGN APPROVED	MF

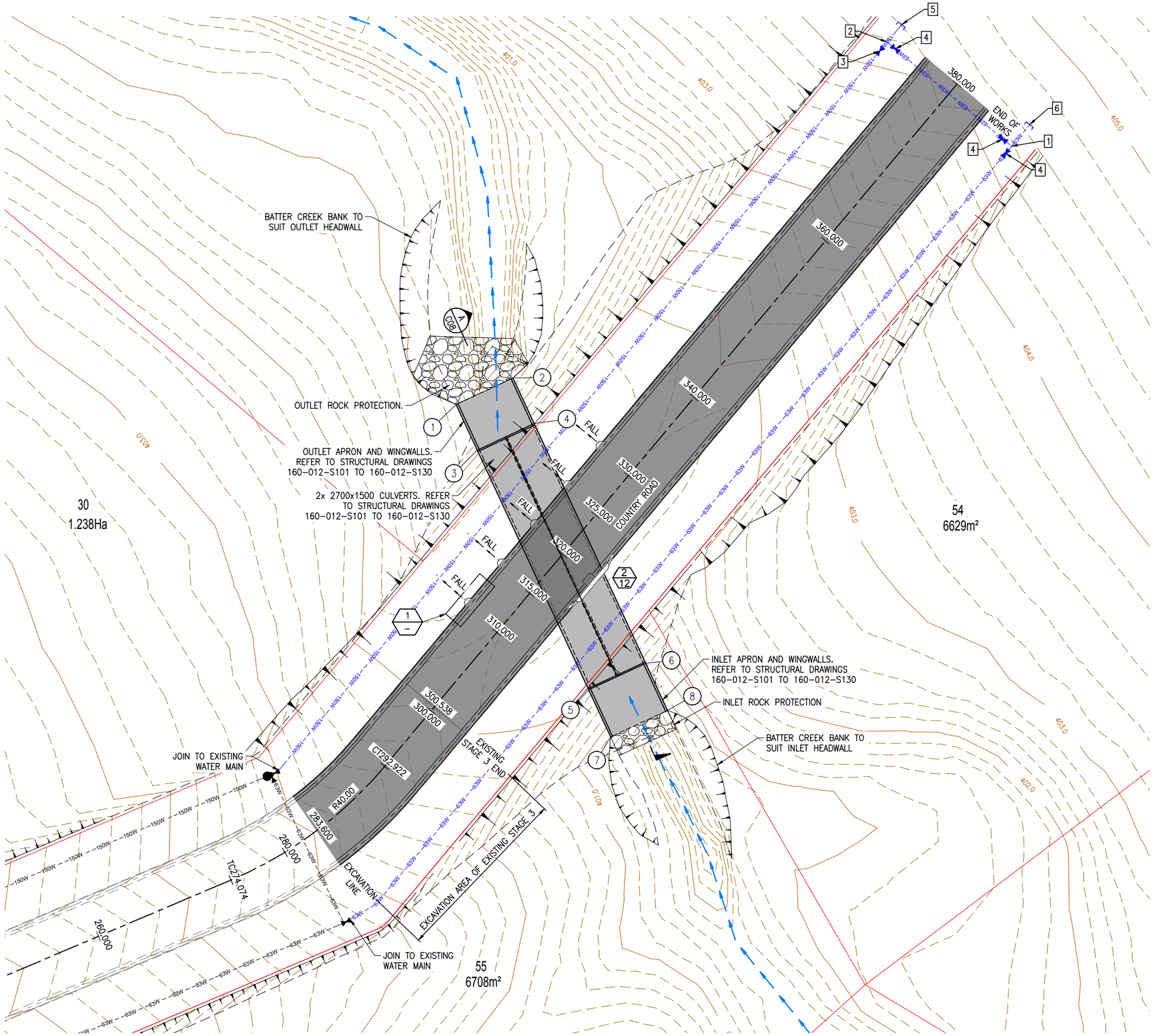
CIVIL SIGNOFF APPROVAL

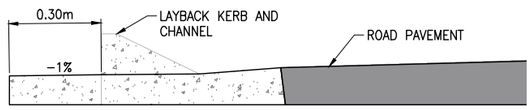
DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: GENERAL NOTES

DRAWING NO: 160-012-C102 | SIZE: A3 | REVISION: 1





KERB AND CHANNEL SCUPPERS SECTION B

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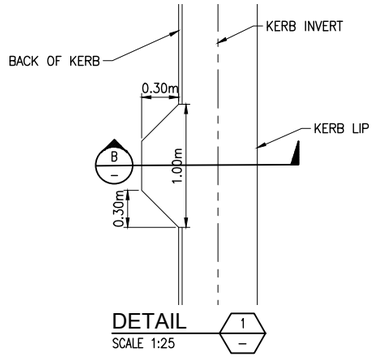


DETAIL 1

SCALE 1:25

CULVERT SETOUT

POINT NO	EASTING	NORTHING	HEIGHT
1	334909.973	8122135.776	399.320
2	334915.550	8122138.369	399.320
3	334912.046	8122131.318	399.350
4	334917.623	8122133.911	399.350
5	334922.945	8122107.877	399.500
6	334928.523	8122110.471	399.500
7	334925.086	8122103.278	399.530
8	334930.662	8122105.871	399.530

WATER CONNECTIONS

1		63 x 63 x 63 D.I.C.L TEE WITH CONCRETE THRUST BLOCK.
2		150 x 150 x 63 D.I.C.L TEE WITH CONCRETE THRUST BLOCK.
3	150SV	150 DIA. SLUICE VALVE CLASS 600 M.E. COMPLETE WITH C.I. COVER BOX MARGIN AND KERB MARKER.
4	63SV	63 DIA. GATE VALVE BRASS COMPLETE WITH C.I.. COVER BOX MARGIN AND KERB MARKER.
5		150 DIA. D.I.C.L. DEAD END CAP WITH CONCRETE THRUST BLOCK.
6		63 DIA. D.I.C.L. DEAD END CAP WITH CONCRETE THRUST BLOCK.

LEGEND

- PROPERTY BOUNDARY
- TOE OF BATTER
- TOP OF BATTER
- ROAD CENTERLINE
- 1.0 MAJOR CONTOURS (1m INTERVAL)
- MINOR CONTOURS (0.2m INTERVAL)
- EXISTING WATER FLOW
- 63W EXISTING ø63 uPVC WATER MAIN
- 150W EXISTING ø150 uPVC WATER MAIN
- 63W PROPOSED ø63 uPVC WATER MAIN (CLASS 16)
- 150W PROPOSED ø150 uPVC WATER MAIN (CLASS 16)

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:22/08/2025 4:02:36 PM
FILE LOCATION:K:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C103 CULVERT PLAN.dwg

REVISIONS				
2	21/03/25	REDUCED CULVERT LENGTH	MG	
1	21/01/25	INITIAL ISSUE		
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:400 0 2 4 6 8 10 12 A3
1:10 0 0.1 0.2 0.3 A3
1:25 0 0.25 0.5 0.75 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

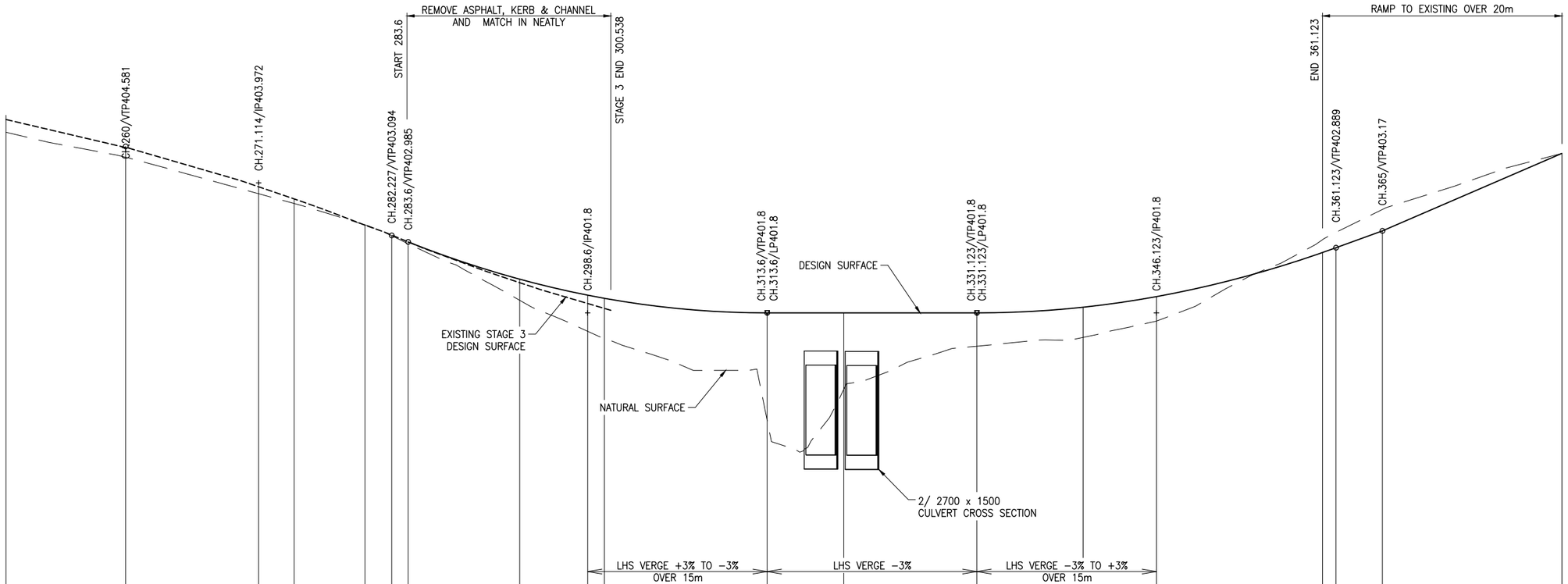
DRAWN	BW	DESIGNED	MF
DRAWN APPROVED	JM	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL
DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PLAN

DRAWING NO: 160-012-C103 | SIZE: A1 | REVISION: 2



Horizontal Curve Data

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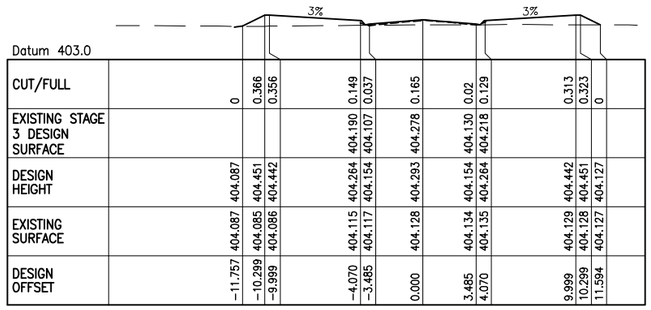

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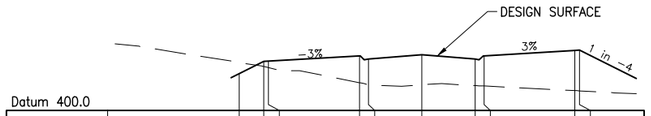

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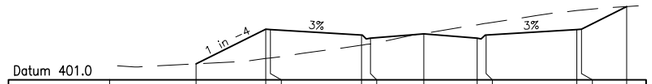
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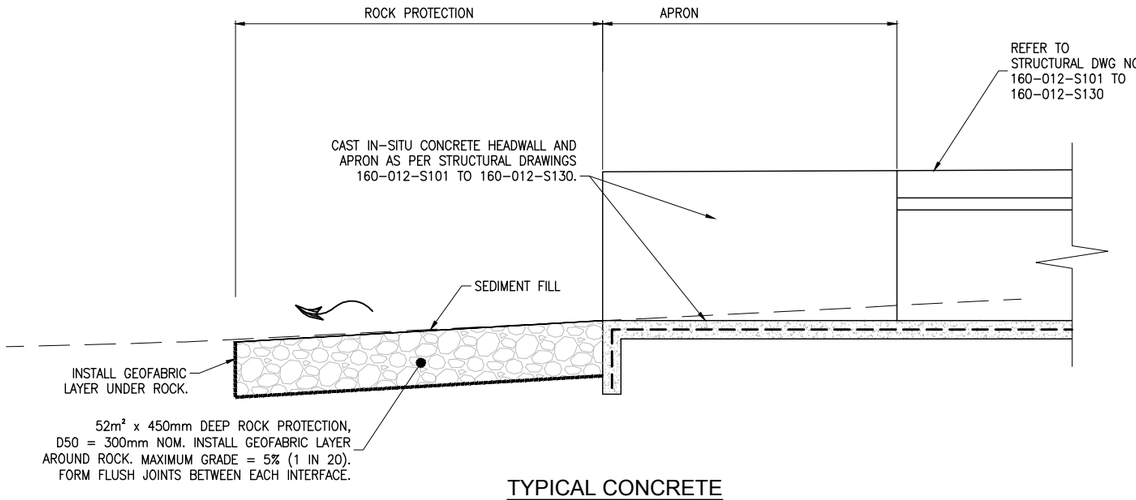
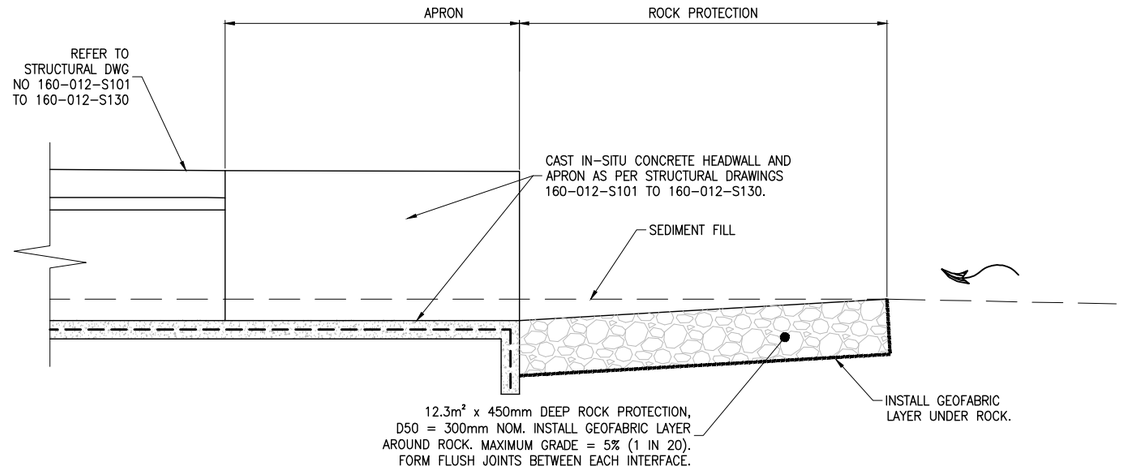


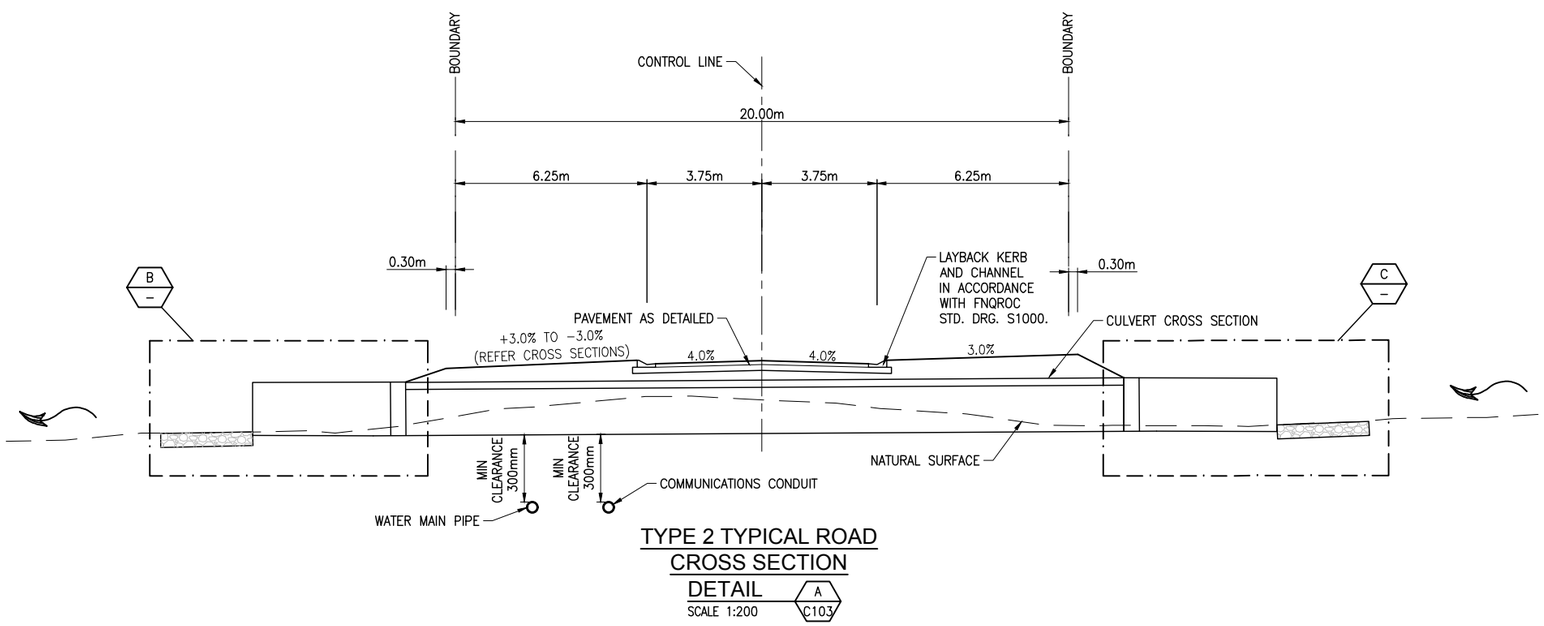
TYPICAL CONCRETE CAUSEWAY WITH CULVERT DETAIL B

SCALE 1:50



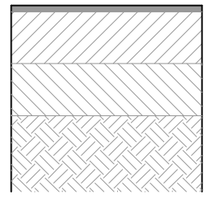
TYPICAL CONCRETE CAUSEWAY WITH CULVERT DETAIL C

SCALE 1:50



TYPE 2 TYPICAL ROAD CROSS SECTION DETAIL A

SCALE 1:200 — C103



PRIMER, PLUS 2 COAT SPRAYED BITUMEN SEAL (16mm/10mm AGGREGATE)

110mm BASE, TYPE 2.2 MINIMUM CBR 60% COMPACTED TO 100% SRDD.

140mm SUB BASE, TYPE 2.3 MINIMUM CBR 45% COMPACTED TO 100% SRDD.

SUB-GRADE CBR 7% (ASSUMED) COMPACTED TO 98% SRDD. (CBR TO BE CONFIRMED BY TAKING SAMPLES AT 100m INTERVALS, MINIMUM OF 3).

PAVEMENT DETAIL

N.T.S.

GENERAL NOTES:

1. CONCRETE CYLINDER TESTS TO BE PROVIDED FOR ALL LOTS.
2. HOLD POINTS: STEEL INSPECTION AND APPROVAL BY SUPERINTENDENT PRIOR TO ALL CONCRETE POURS.

PAVEMENT NOTES:

1. THE SUB-BASE LAYER SHALL EXTEND A MINIMUM OF 150MM BEHIND THE REAR FACE OF THE KERB AND CHANNEL.
2. THE BASE AND SURFACING SHALL EXTEND TO THE FACE OF ANY KERBING. WHERE THE TOP SURFACE OF THE SUB-BASE LAYER IS BELOW THE LEVEL OF THE UNDERSIDE OF THE KERB AND CHANNEL, THE BASE LAYER SHALL ALSO EXTEND A MINIMUM OF 150MM BEHIND THE REAR FACE OF THE KERB AND CHANNEL.
3. SUBGRADE CBR RESULTS AND FINAL PAVEMENT DESIGN ARE TO BE SUBMITTED TO COUNCIL FOR APPROVAL PRIOR TO PLACEMENT OF GRAVEL.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/03/25	REDUCED CULVERT LENGTH	MG	
1	13/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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1:50 0 0.25 0.5 0.75 1.0 1.25 1.50 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

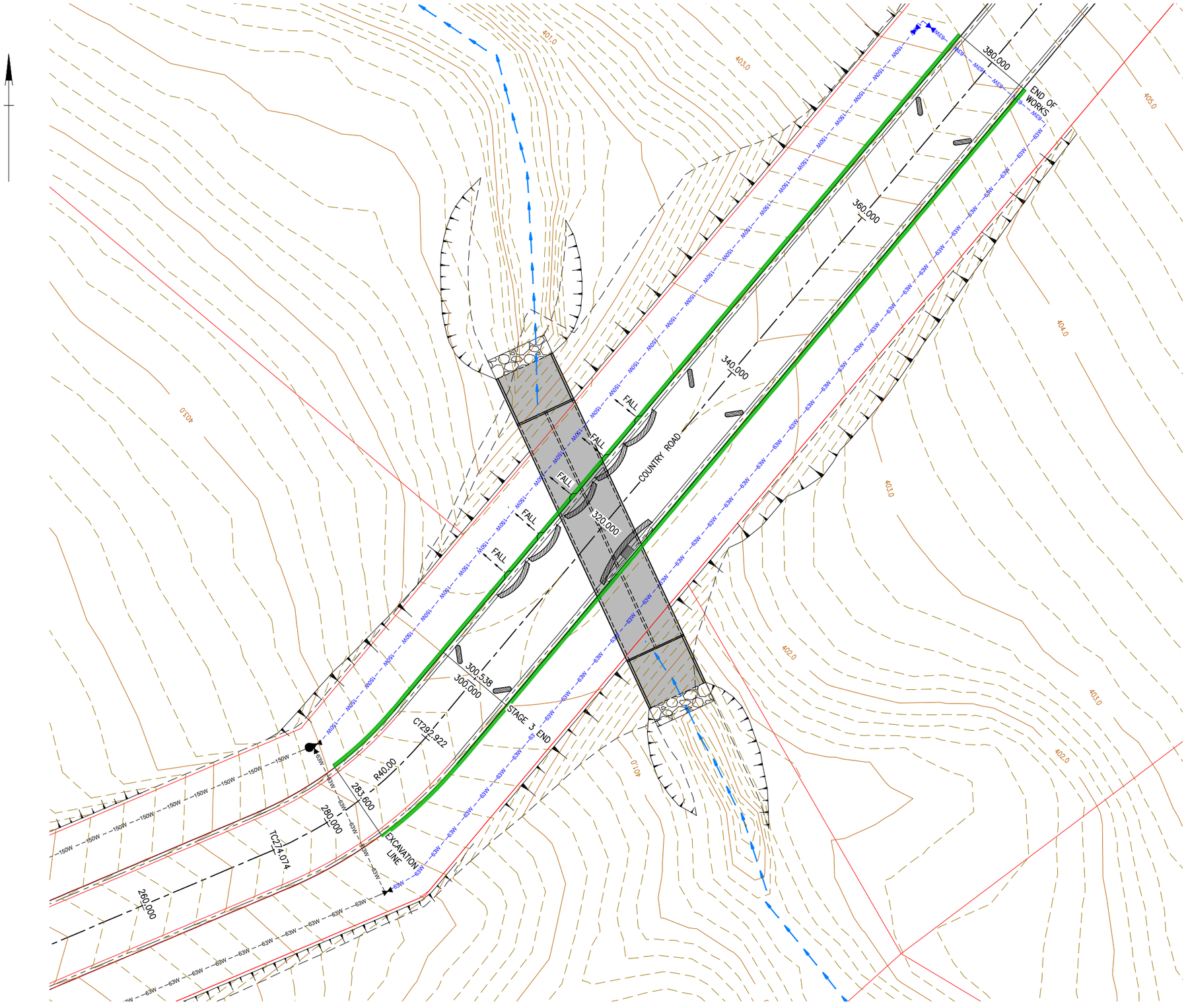
DRAWING REF: TYPICAL ROAD CROSS SECTION AND DETAILS

DRAWING NO: 160-012-C108

SIZE: A3

REVISION: 2

PLOT DATE:22/08/2025 4:11:49 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C108 TYPICAL CROSS SECTION DETAILS.dwg



LEGEND

- PROPERTY BOUNDARY
- EXISTING WATER FLOW
- TOE OF BATTER
- TOP OF BATTER
- ROAD CENTERLINE
- 1.0 MAJOR CONTOURS (1m INTERVAL)
- MINOR CONTOURS (0.2m INTERVAL)
- 63W EXISTING Ø63 uPVC WATER MAIN
- 150W EXISTING Ø150 uPVC WATER MAIN
- 63W PROPOSED Ø63 uPVC WATER MAIN (CLASS 16)
- 150W PROPOSED Ø150 uPVC WATER MAIN (CLASS 16)
- GRATED KERB INLET PIT WITH SAND BAG SURROUND IN ACCORDANCE WITH FNQROC STD DWG S5000.
- TEMPORARY ROCK/SHAKER GRID
- PROPOSED TURF
- PROPOSED HYDROMULCH
- PROPOSED GRASS/DRILL SEED
- SEDIMENT FENCING
- ROCK FILTER DAM
- SAND BAG CHECK DAM.
- TURF BATTER CHUTE

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:21/08/2025 4:22:28 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C109 ESCP.dwg

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	24/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:400 0 2 4 6 8 10 12 A3

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO: 160-012-C109 | SIZE: A1 | REVISION: 1

SEDIMENT FENCE

MATERIAL

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 OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT:
WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES:
1500mm² (MIN) HARDWOOD, 2500mm² (MIN) SOFTWOOD, OR 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 BOUNDARIES;
   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 THE 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 CHECK DAM 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 ENDS 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 SITE 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 STAKES INTO THE GROUND SPACED 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 SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES 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 STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR 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 STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH THE TWO STAKES 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 25 X 12.5mm STAPLES, OR TIE WIRE AT MAXIMUM 150mm SPACING.
12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.
13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THOUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.
14. 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.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF SPILL-THROUGH WEIR

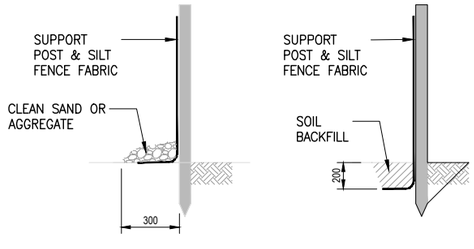
15. LOCATE THE SPILL -THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.
16. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.
17. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.
18. 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

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

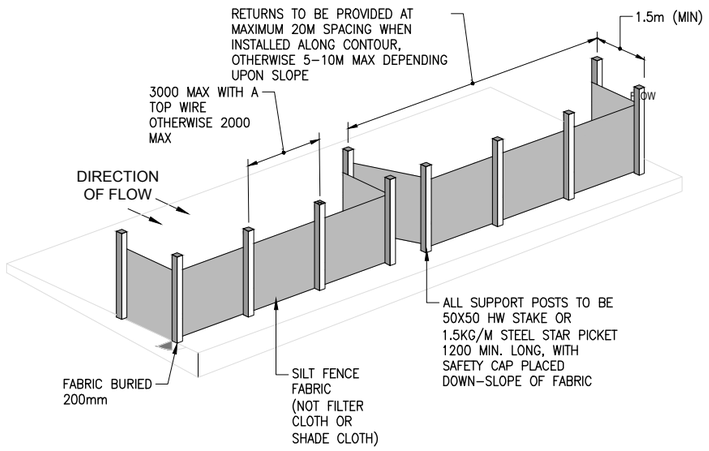
REMOVAL

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



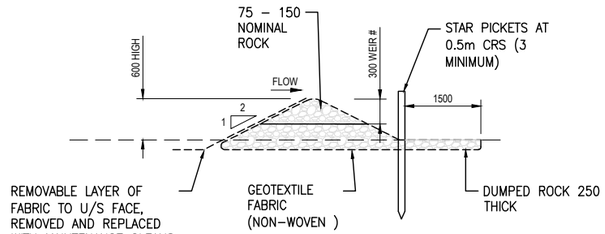
ANCHORING BASE OF FABRIC

NOT TO SCALE



SEDIMENT FENCE

NOT TO SCALE



ROCK FILTER DAM

NOT TO SCALE

MATERIALS

ROCK:
75 TO 150mm NOMINAL DIAMETER, HARD, EROSION RESISTANT ROCK.

GEOTEXTILE FABRIC:
HEAVY-DUTY, NEEDLE-PUNCHES, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

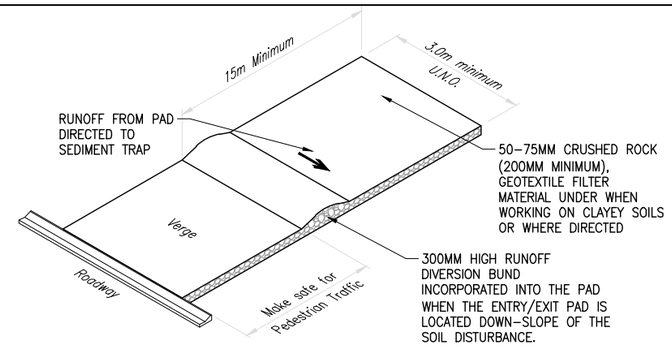
1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. PRIOR TO PLACEMENT OF THE FILTER DAM, ENSURE THE TYPE AND SIZE OF EACH CHECK DAMS WILL NOT CAUSE A SAFETY HAZARD OR CAUSE WATER TO SPILL OUT OF THE DRAIN.
3. CONSTRUCT THE FILTER DAM TO THE DIMENSIONS AND PROFILE SHOWN WITHIN THE APPROVED PLAN.
4. WHERE SPECIFIED, THE FILTER DAM SHALL BE CONSTRUCTED ON A SHEET OF GEOTEXTILE FABRIC USED AS A DOWNSTREAM SPLASH PAD.

MAINTENANCE

1. INSPECT EACH FILTER DAM AND THE DRAINAGE CHANNEL AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.
2. CHECK FOR DISPLACEMENT OF THE FILTER DAM
3. CHECK FOR SOIL SCOUR AROUND THE ENDS OF THE FILTER DAM. IF SUCH EROSION IS OCCURRING, CONSIDER EXTENDING THE WIDTH OF THE FILTER DAM TO AVOID SUCH PROBLEMS.
4. IF SEVERE SOIL EROSION OCCURS EITHER UNDER OR AROUND THE FILTER DAM, THEN SEEK EXPERT ADVICE ON AN ALTERNATIVE TREATMENT MEASURE.
5. REMOVE AND SEDIMENT ACCUMULATED BY THE FILTER DAM, UNLESS IT IS INTENDED THAT THIS SEDIMENT WILL REMAIN WITHIN THE CHANNEL.
6. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
7. REPLACE GEOFABRIC LAYER ON UPSTREAM FACE WITH A CLEAN LAYER AS REQUIRED.

REMOVAL

1. WHEN CONSTRUCTION WORK WITHIN THE DRAINAGE AREA ABOVE THE FILTER DAM 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 FILTER DAM AND ASSOCIATED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.



TEMPORARY ROCK/SHAKER GRID

NOT TO SCALE

MATERIAL

ROCK:
WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTURBANCES) OR 100 TO 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE:
25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC:
HEAVY-DUTY, NEEDLE-PUNCHES, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

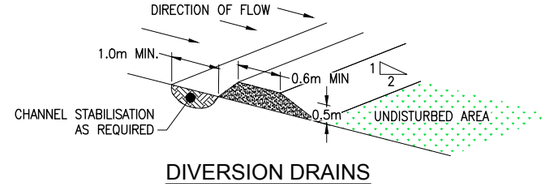
1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A 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 THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
3. IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.
4. PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.
5. IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCK PAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARDS THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.
6. THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15M WHERE PRACTICABLE, AND AS WISE AS THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST 3m. THE ROCK PAD 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.
8. IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THE COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

9. INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER RUNNOFF-PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.
10. 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, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.
11. 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.
12. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS 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.
13. ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITIONS.
14. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. THE ROCK PAD SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT TRAP.
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.



DIVERSION DRAINS

NOT TO SCALE

MAINTENANCE

1. SHOULD BE CHECKED WEEKLY
2. EXCESSIVE SEDIMENT SHOULD BE REMOVED TO AVOID PONDING
3. REPAIR ANY SLUMPS OR DAMAGE

SPACING

1. THE SPACING OF CATCH DRAINS DOWN EXPOSED SLOPES SHOULD NOT EXCEED THE DISTANCE DEFINED BY:

MAXIMUM SPACING ≈ 48 [LOG(H)] – 25 METRES
≡ 71 – 48 [LOG(% SLOPE)] METRES

WHERE: H IS THE HORIZONTAL SLOPE COMPONENT AS DEFINED BY H(H):1(V) AND (% SLOPE)= 100/H

FOR COUNCIL APPROVAL

PRINT IN COLOUR

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	24/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: NTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: EROSION AND SEDIMENT CONTROL NOTES

DRAWING NO: 160-012-C110 | SIZE: A3 | REVISION: 1

PLOT DATE:22/08/2025 4:13:23 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C110 ESC NOTES.dwg

WORKPLACE HEALTH AND SAFETY DESIGN REPORT

THESE NOTES SHOULD BE READ AND UNDERSTOOD BY ALL INVOLVED IN THIS PROJECT.
THIS INCLUDES (BUT IS NOT LIMITED TO): DESIGNERS, CLIENT, OWNER, OWNER BUILDER, PRINCIPAL CONTRACTOR, SUB-CONTRACTORS, TRADE CONTRACTORS, CONSULTANTS, MAINTENANCE WORKERS, DEMOLISHERS, GENERAL WORKERS AND ANY PERSON CONDUCTING A BUSINESS OR UNDERTAKING (PCBU) ON THIS PROJECT.

GENERAL

1. ANY CHANGES TO THE SPECIFICATIONS OF THE STRUCTURAL DESIGN OR LOADING OF THE STRUCTURE BEFORE, DURING OR AFTER CONSTRUCTION MUST BE APPROVED BY THE STRUCTURAL ENGINEER OR AN APPROPRIATELY QUALIFIED ENGINEER BEFORE PROCEEDING WITH ANY CONSTRUCTION OR ALTERATION WORKS.
2. PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE) SHOULD BE PROVIDED, USED, WORN AND CURRENT AT ALL TIMES.
3. AN ADEQUATE FIRST AID KIT SHOULD BE PRESENT AND MAINTAINED ON SITE AT ALL TIMES.
4. NO UNIQUE/NON-TYPICAL BUILDING TECHNIQUES OR METHODS ARE REQUIRED FOR CONSTRUCTION, MAINTENANCE OR DEMOLITION OF THIS PROJECT. AS SUCH, A SAFETY-IN-DESIGN REVIEW BY THE ENGINEER HAS IDENTIFIED NO RISKS REQUIRING UNIQUE CONSIDERATION OR ACTION BEYOND THE REQUIREMENTS OF THE NATIONAL WORKPLACE HEALTH AND SAFETY ACT, THE WORKPLACE HEALTH AND SAFETY REGULATIONS AND INDUSTRY CODES OF PRACTICE.

SLIPS, TRIPS AND FALLS

1. CONSTRUCTION, CLEANING AND MAINTENANCE OF THIS BUILDING MAY REQUIRE PERSONS TO BE SITUATED WHERE A FALL IN EXCESS OF 1.4m IS POSSIBLE WHERE THIS ACTIVITY CANNOT BE AVOIDED, SCAFFOLDING, LADDERS, FALL BARRIERS AND/OR PPE SHOULD BE USED IN ACCORDANCE WITH THE RELEVANT GUIDELINES, REGULATIONS OR LEGISLATION. CARE SHOULD BE TAKEN TO PREVENT A FALL FROM ANY HEIGHT.
2. THE SITE SHOULD BE KEPT TIDY AND FREE OF TRIP HAZARDS AT ALL TIMES, INCLUDING DURING CONSTRUCTION, MAINTENANCE AND EVERYDAY USE.
3. ADEQUATE LIGHTING SHOULD BE PROVIDED AT ALL TIMES DURING CONSTRUCTION AND MAINTENANCE AND WHEN THE BUILDING IS BEING USED TO ENSURE SAFE WORKING CONDITIONS.
4. ACCESSWAYS AND PATHS SHOULD BE MONITORED AT ALL TIMES TO ENSURE SURFACES ARE KEPT FREE OF ANY OBJECTS THAT MAY CAUSE A SLIP OR TRIP HAZARD.

MANUAL TASKS

1. ANY ITEMS WITH A MASS GREATER THAN 25kg SHOULD BE LIFTED BY TWO OR MORE WORKERS, OR WITH THE AID OF A MECHANICAL LIFTING DEVICE. WHERE POSSIBLE, COMPONENTS SHOULD BE STORED IN A WAY WHICH MINIMISES THE NEED FOR BENDING BEFORE LIFTING.
2. ALL PORTABLE TOOLS USED DURING CONSTRUCTION, MAINTENANCE AND DEMOLITION OF THIS BUILDING SHOULD BE PROPERLY MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

FALLING OBJECTS

1. CONSTRUCTION, MAINTENANCE OR DEMOLITION WORK ON OR AROUND THIS BUILDING IS LIKELY TO INVOLVE PERSONS WORKING ABOVE GROUND LEVEL. WHERE THIS OCCURS, ONE OR MORE OF THE FOLLOWING MEASURES SHOULD BE TAKEN TO PREVENT INJURY FROM FAILING OBJECTS.
   - PREVENT OR RESTRICT ACCESS TO AREAS BELOW WHERE THE WORK IS BEING CARRIED OUT BY THE USE OF APPROPRIATE BARRICADES.
   - PROVIDE TOE-BOARDS TO SCAFFOLDING OR WORK PLATFORMS.
   - PROVIDE MESH BARRICADES TO THE SIDE OF SCAFFOLDING OR WORK PLATFORMS.
   - PROVIDE PROTECTIVE STRUCTURES, HOARDING AND GANTRIES BELOW THE WORK AREA,
   - ENSURE ALL PERSONS BELOW THE WORK AREA HAVE SUITABLE PPE (HARD HATS, SAFETY FOOTWEAR, EYE PROTECTION ETC.) AND THAT IT IS USED CORRECTLY.
2. DURING CONSTRUCTION, RENOVATION OR DEMOLITION OF THIS BUILDING. PARTS OF THE STRUCTURE WILL REMAIN STANDING PRIOR TO OR AFTER SUPPORTING ELEMENTS ARE IN PLACE, CONTRACTORS SHOULD ENSURE THAT TEMPORARY BRACING OR OTHER REQUIRED SUPPORTS ARE IN PLACE AT ALL TIMES TO PREVENT COLLAPSE.
3. DURING CONSTRUCTION, RENOVATION, MAINTENANCE OR DEMOLITION MECHANICAL LIFTING OF MATERIALS MAY BE REQUIRED. WHERE SUCH LIFTING IS NECESSARY, ENSURE THAT APPROPRIATE LIFTING DEVICES ARE USED, THAT LOADS ARE APPROPRIATE AND ARE PROPERLY SECURED AND THAT ACCESS TO AREAS BELOW THE LOAD IS PREVENTED OR RESTRICTED.

PUBLIC ACCESS

1. PUBLIC ACCESS TO CONSTRUCTION AND DEMOLITION SITES AND AREAS UNDER MAINTENANCE CAN CAUSE RISK TO WORKERS AND THE PUBLIC. WARNING SIGNS AND BARRIERS SHOULD BE PROVIDED TO PREVENT UNAUTHORISED ACCESS. ELECTRICAL INSTALLATIONS, EXCAVATIONS, PLANT AND LOOSE MATERIAL SHOULD BE SECURED WHEN NOT FULLY SUPERVISED.

TRAFFIC MANAGEMENT

1. PARKING OF VEHICLES OR LOADING/UNLOADING OF VEHICLES ON THIS SITE/ROADWAY MAY CAUSE A TRAFFIC HAZARD. PARKING FOR WORKERS AND LOADING AREAS SHOULD BE PROVIDED AND SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
2. CONSTRUCTION OF THIS BUILDING MAY REQUIRE LOADING AND UNLOADING OF MATERIALS ON THE ROADWAY. DELIVERIES SHOULD BE WELL PLANNED TO AVOID CONGESTION OF LOADING AREAS. LOADING AND UNLOADING SHOULD BE SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
3. PLANT OPERATING ON THIS SITE MAY CAUSE A RISK OF COLLISION. A TRAFFIC MANAGEMENT PLAN SHOULD BE ADOPTED AND SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
4. ANY TEMPORARY ROAD CLOSURES ARE TO COMPLY WITH ALL LOCAL GOVERNMENT REQUIREMENTS. THE PRINCIPAL CONTRACTOR IS TO COMPLETE ALL NECESSARY DOCUMENTATION FOR TRAFFIC MANAGEMENT, SIGNAGE, BARRICADES, TRAFFIC CONTROLLERS ETC.

SERVICES

1. UNDERGROUND SERVICES MAY BE PRESENT AT THIS SITE. ALL SERVICES SHOULD BE LOCATED (USING DIAL BEFORE YOU DIG AND A SPECIALIST CONTRACTOR) AND CLEARLY MARKED PRIOR TO ANY WORKS COMMENCING.

BEFORE YOU DIG www.1100.com.au

2. WHERE THERE IS A RISK OF WORKERS OF PLANT COMING INTO CONTACT WITH POWER LINES THEY SHOULD BE DISCONNECTED OR RELOCATED. WHERE THIS IS NOT POSSIBLE, POWER LINES SHOULD BE CLEARLY MARKED WITH BRIGHT COLOURED MARKERS AND SIGNAGE SHOULD BE PROVIDED AT GROUND LEVEL.
3. DURING RENOVATION AND MAINTENANCE WORK, ALL EXISTING SERVICES WITHIN THE WORK AREA SHOULD BE LOCATED PRIOR TO WORK COMMENCING. IF DISCONNECTION IS NOT POSSIBLE, SERVICES SHOULD BE CLEARLY MARKED TO AVOID ANY RISK OF CONTACT OR RUPTURE.
4. ANY TEMPORARY SERVICES ARE TO BE CLEARLY MARKED AND HAVE ALL NECESSARY PROTECTIVE COVERINGS FOR THE PROPER PERFORMANCE OF THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES.

HAZARDOUS SUBSTANCES

1. MANY MATERIALS USED IN THE CONSTRUCTION OF THIS BUILDING CAN CAUSE HARM IF INHALED OR HANDLED. PERSONS WORKING ON OR IN THE BUILDING DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION AND WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING PROTECTION AGAINST INHALATION WHILE USING POWDERED MATERIALS OR WHEN SANDING, DRILLING, CUTTING OR OTHERWISE DISTURBING OR CREATING POWDERED MATERIAL.
2. TREATED TIMBER MAY BE USED IN THIS BUILDING. DUST OR FUMES FROM THIS MATERIAL CAN BE HARMFUL. PERSONS WORKING ON OR IN THIS BUILDING DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. DO NOT BURN TREATED TIMBER.
3. MANY TYPES OF GLUE, SOLVENTS, SPRAY PACKS, PAINTS, VARNISHES AND SOME CLEANING MATERIALS AND DISINFECTANTS HAVE DANGEROUS EMISSIONS. AREAS WHERE THESE ARE USED SHOULD BE KEPT WELL VENTILATED. PERSONAL PROTECTIVE EQUIPMENT MAY BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT ALL TIMES.
4. IF IBREGLASS, ROCKWOOL, CERAMIC AND OTHER MATERIAL USED FOR THERMAL OR SOUND INSULATION MAY CONTAIN SYNTHETIC MINERAL FIBRE WHICH MAY BE HARMFUL IF INHALED OR IF IT COMES INTO CONTACT WITH THE SKIN, EYES OR OTHER SENSITIVE PARTS OF THE BODY. APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT SHOULD BE WORN AT ALL TIMES WHEN INSTALLING, REMOVING OR WORKING WITH SUCH MATERIALS.
5. AREAS WHERE TIMBER FINISHES ARE APPLIED SHOULD BE KEPT WELL VENTILATED DURING SANDING AND APPLICATION AND FOR A PERIOD AFTER INSTALLATION. PERSONAL PROTECTIVE EQUIPMENT MAY BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT AI L TIMES.
6. WORKS INVOLVING EXPOSURE TO ASBESTOS SHALL ONLY BE CARRIED OUT BY LICENCED SPECIALISTS AND STRICTLY IN ACCORDANCE WITH THE WHS REGULATIONS.

OTHER HIGH-RISK ACTIVITY

1. ALL ELECTRICAL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE '*CODE OF PRACTICE MANAGING ELECTRICAL RISKS AT THE WORKPLACE, AS/NZ 3012*' AND ALL LICENSING REQUIREMENTS. NEW ELECTRICAL INSTALLATION ON CONSTRUCTION AND DEMOLITION SITES MUST BE IN ACCORDANCE WITH THE WIRING RULES OF AS/NZS 3000 AND APPROPRIATE REQUIREMENTS OF AS/NZA 3012.
2. ALL WORK USING PLANT SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE '*CODE OF PRACTICE MANAGING RISKS OF PLANT AT THE WORKPLACE*'.
3. ALL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE '*CODE OF PRACTICE MANAGING NOISE AND PREVENTING HEARING LOSS AT WORK*'.
4. DUE TO THE HISTORY OF SERIOUS INCIDENTS, IT IS RECOMMENDED THAT PARTICULAR CARE BE EXERCISED WHEN UNDERTAKING ANY WORK INVOLVING STEEL CONSTRUCTION AND CONCRETE PLACEMENT.

FIRE FIGHTING

1. THE CLIENT/OWNER IS TO ENSURE THAT APPROPRIATE FIRE FIGHTING EQUIPMENT IS PROVIDED ON SITE DURING CONSTRUCTION AND MAINTAINED FOR THE LIFE OF THE BUILDING.
2. ALL FIRE FIGHTING EQUIPMENT IS TO BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS.

GENERAL WORKPLACE HEALTH AND SAFETY REQUIREMENTS

1. THE CLIENT/OWNER IS TO ENSURE THAT THE PRINCIPAL CONTRACTOR COMPLIES WITH ALL REQUIREMENTS OF THE NATIONAL WH&S ACT 2011, WORKPLACE HEALTH AND SAFETY REGULATIONS 2011 AND CODES OF PRACTICE DURING THE CONSTRUCTION OF THE BUILDING.
2. THE PRINCIPAL CONTRACTOR MEANS THE BUILDER WHO HAS OBTAINED THE BUILDING PERMIT AND WHOSE LICENCE NUMBER IS BEING USED FOR THE CONTRACT.
3. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACT COMPLETES A CONSTRUCTION WORKPLACE PLAN AS APPLICABLE UNDER THE WH&S LEGISLATION.
4. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR AND ALL TRADE CONTRACTORS COMPLETE WORK METHOD STATEMENTS (WMS) AS APPLICABLE UNDER THE WH&S LEGISLSATION BEFORE ANY WORK COMMENCES.
5. THE CLIENT/OWNER MUST ENSURE THAT WORKERS HAVE A CURRENT GENERAL SAFETY INDUCTION (WHITE OR BLUE) CARD.
6. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR CONDUCTS THE NECESSARY SITE-SPECIFIC INDUCTION AS REQUIRED BY WH&S LEGISLATION.
7. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR HAS THE APPROPRIATE FIRST AID KITS AND THAT THEY ARE MAINTAINED AND KEPT ON SITE FOR THE DURATION OF THE CONSTRUCTION.
8. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR, TRADE CONTRACTORS AND WORKERS MEET ALL OF THEIR WH&S OBLIGATIONS DURING CONSTRUCTION.
9. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR AND TRADE CONTRACTORS ENSURE THAT ONLY EXPERIENCED, QUALIFIED, LICENSED PERSONS ARE EMPLOYED TO CARRY OUT THE WORK.
10. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR HAS PUT IN PLACE THE WORKPLACE HEALTH AND SAFETY CONTROL MEASURES IN ACCORDANCE WITH WHA&S REGULATION FOR ALL HIGH RISK CONSTRUCTION WORK INCLUDING BUT NOT LIMITED TO: CONSTRUCTION SAFETY PLAN, WORK METHOD STATEMENTS, ROOF EDGE PROTECTION, SCAFFOLDS AND WORK PLATFORMS, WORK PLATFORMS ON TRESTLE LADDERS, FALL ARREST PLATFORMS, TRAVEL RESTRAINT SYSTEMS, FALL ARREST HARNESS SYSTEMS, STAIR VOID PROTECTION, BALCONY EDGE PROTECTION, INDUSTRIAL SAFETY NETS AND EXCAVATION FALLS PROTECTION.

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REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: WORKPLACE HEALTH AND SAFTEY NOTES

DRAWING NO: 160-012-S101 | SIZE: A1 | REVISION: 3

A. GENERAL NOTES

A1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE WORK. ALL DISCREPANCIES SHALL BE REFERRED FOR 'APPROVAL BY THE ENGINEER' BEFORE PROCEEDING WITH THE WORK.

A2. THE TERM 'ENGINEER' REFERRED TO IN THESE NOTES IS TAKEN TO MEAN THE CERTIFYING RPEQ ENGINEER WHOSE NAME APPEARS ON THE STRUCTURAL DESIGN CERTIFICATE ISSUED WITH THESE DRAWINGS.

A3. WHERE THE 'APPROVAL OF THE ENGINEER' IS SPECIFIED OR REQUIRED IN THESE NOTES, APPROVAL IS TO BE PROVIDED IN WRITING. SUBSTITUTIONS OR ADJUSTMENTS ARE NOT PERMITTED WITHOUT THE 'APPROVAL OF THE ENGINEER'.

A4. **WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF FNQROC, STANDARDS AUSTRALIA CODES AND THE WORKPLACE HEALTH AND SAFETY ACT.** ALL LOCAL AND STATUTORY AUTHORITY'S REQUIREMENTS AND BYLAWS ARE TO BE ADHERED TO.

A5. **AS CONSTRUCTED DATA TO BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE COUNCIL IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.**

A6. THE CONTRACTOR SHALL PROVIDE (TO THE CONTRACTOR'S COSTS AND CERTIFICATION) AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED, SUCH TEMPORARY BRACING ELEMENTS AS IS NECESSARY TO STABILIZE THE STRUCTURE AND ANY ADJACENT STRUCTURES DURING CONSTRUCTION, TRANSPORTATION, EXCAVATIONS AND ERECTION, ENSURING NO PART SHALL BE OVERSTRESSED DURING THESE ACTIVITIES.

A7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES ON THE SITE, SERVICES WHERE SHOWN ON THESE DRAWINGS ARE INDICATIVE LOCATIONS ONLY. THE CONTRACTOR IS TO RECTIFY IMMEDIATELY ANY OBSTRUCTION OR DAMAGE TO SUCH SERVICES AND PROVIDE TEMPORARY AND ADEQUATE SERVICES WHILST REPAIRS ARE CARRIED OUT.

A8. ANY DRAINAGE WORKS SHOWN ON THE STRUCTURAL DRAWINGS ARE INDICIATIVE ONLY AND DO NOT FORM PART OF ERSCON's STRUCTURAL CERTIFICATION, EXCEPT DRAINAGE BEHIND RETAINING WALLS. DRAINAGE WORKS ARE TO BE BY THE CIVIL ENGINEERING DOCUMENTATION.

A9. **INSPECTIONS** AND CERTIFICATION: THE INSPECTOR MUST BE A REGISTERED PROFESSIONAL ENGINEER OF QLD AND INSPECT AND CERTIFY ALL STRUCTURE RELATED CONSTRUCTION WORKS. CONTRACTOR TO ARRANGE REQUIRED INSPECTIONS FOR THE FOLLOWING **HOLD POINTS:**

1. **AFTER EXCAVATION TO NATURAL GROUND BEFORE CONSTRUCTING ANY SOIL IMPROVEMENT WORKS OR FILL. CONTRACTOR MUST PROVIDE DCP TEST RESULTS TO THE CERTIFYING ENGINEER LATEST AT THIS STAGE OF WORKS.**
2. **AFTER ANY SOIL IMPROVEMENT WORKS OR FILL HAS BEEN CONSTRUCTED AND BASE SLAB SET UP HAS NOT BEEN STARTED YET**
3. **AFTER COMPLETED SET UP OF FORMWORK FOR BASE SLAB AND/OR APRON SLAB AND PLACEMENT OF BASE SLAB REINFORCEMENT AND/OR HEAD WALL /WING WALLS STARTER BARS** (MIN. 24h BEFORE THE CONCRETE POUR)
4. **AFTER COMPLETED SET UP OF FORMWORK FOR THE CULVERT WALLS AND PLACEMENT OF THE WALL REINFORCEMENT. FURTHER WALL SECTION INSPECTIONS CAN BE DONE VIA PHOTOS PROVIDED BY THE BUILDER TO THE ENGINEER FOR APPROVAL 24h BEFORE THE CONCRETE POUR.**
5. **AFTER COMPLETED SET UP OF FORMWORK FOR THE WING WALLS AND PLACEMENT OF THE REINFORCEMENT** (MIN. 24h BEFORE THE CONCRETE POUR).
6. **AFTER COMPLETED SET UP OF FORMWORK FOR THE CULVERT DECK PANELS AND PLACEMENT OF THE REINFORCEMENT AND ALL ANCHILLARY ITEMS** (MIN. 24h BEFORE THE CONCRETE POUR).
7. **AFTER COMPLETED SET UP OF FORMWORK FOR THE HEAD WALL AND PLACEMENT OF THE REINFORCEMENT AND ALL ANCHILLARY ITEMS** (MIN. 24h BEFORE THE CONCRETE POUR).
8. **AFTER PLACEMENT OF THE CULVERT DECK PANELS AND THE HEAD WALL PANEL BUT BEFORE GROUTING OF THE CONNECTION POINTS OF THE DECK PANELS TO THE WALLS.**

A10. PERMISSION IS GIVEN TO COPY THESE PLANS FOR USE ON THIS SPECIFIC PROJECT ONLY. PLANS MAY ONLY BE REPRODUCED AS A COMPLETE SET AND MUST INCLUDE THE STRUCTURAL DESIGN CERTIFICATE.

A11. IF ANY PART OF THIS DOCUMENTATION IS UNCLEAR OR ILLEGIBLE, PLEASE CONTACT THIS OFFICE.

A12. DO NOT OBTAIN DIMENSIONS BY SCALING FROM THESE DRAWINGS.

A13. ABBREVIATIONS:

ABBR.	DESCRIPTION	ABBR	DESCRIPTION
CBR	CALIFORNIA BEARING RATIO	RCBC	REINFORCED CONCRETE BOXED
CL	CENTRE LINE	REIN	REINFORCEMENT
C.J.	CONSTRUCTION JOINT	S.C.	SAW CUT
CM	CONRETE MASONRY (BLOCKWORK)	SRDD	STANDARD RELATIVE DRY DENSITY
CRS	CENTRES	T.B.A	TO BE ADVISED
DCP	DYNAMIC CONE PENETROMETER	T/O	TOP OVER (REINFORCING LAYER)
E/W	EACH WAY (REINFORCING LAYERS)	T/U	TOP UNDER (REINFORCING LAYER)
HORI	HORIZONTAL	TYP	TYPICAL
MAX	MAXIMUM	ULS	ULTIMATE LIMIT STATE
MIN	MINIMUM	U.N.	UNLESS NOTED OTHERWISE
QA	QUALITY ASSURANCE	VERT	VERTICAL
RC	REINFORCED CONCRETE	WH&	WORKPLACE HEALTH & SAFETY

B. ELECTRONICALLY TRANSFERRED DRAWINGS

B1. *ERSCON* ACCEPTS NO RESPONSIBILITY FOR A DRAWING THAT HAS BEEN AMENDED IN ANY WAY BY OTHER PARTIES.

B2. ANY PART OF *ERSCON's* DRAWINGS COPIED FROM ELECTRONICALLY TRANSFERRED DRAWINGS BECOMES THE RESPONSIBILITY OF THE RECIPIENT TO DISTRIBUTE ONLY TO THE PARTICIPATING PARTIES AS COMPLETE SET OF DRAWINGS.

C. HEALTH & SAFETY

C1. THE CONTRACTOR SHALL DEVELOP, IMPLEMENT AND ADMINISTER A WORKPLACE HEALTH AND SAFETY PROGRAM THAT WILL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE PERFORMED TO THE RELEVANT WORKPLACE HEALTH AND SAFETY REQUIREMENTS AND ANY OTHER RELEVANT STATUTORY REQUIREMENTS.

C2. THE WORKPLACE HEALTH AND SAFETY PROGRAM MUST BE COORDINATED WITH ADJOINING PROPERTY OWNERS AND ALL RELEVANT PARTIES AS NECESSARY TO ENSURE A SAFE BUILDING ENVIRONMENT AT ALL TIMES.

C3. CONTRACTOR TO ARRANGE THE DESIGN AND CERIFICATION OF ANY LIFTING ARRANGEMENT FOR ON-SITE PRECAST ELEMENTS BY A SUITABLY QUALIFIED ENGINEER.

C4. CONTRACTOR TO BE FULLY LICENSED & REGISTERED FOR THE TYPES OF CONSTRUCTION WORKS. WORKS TO BE UNDERTAKEN ONLY BY SUITABLY QUALIFIED/ TRAINED STAFF IN ACCORDANCE WITH THE MANUFACTURER's WH&S AND QA PROCEDURES.

D. DESIGN PARAMETERS AND SERVICE LOADS

D1. THE REINFORCED CONCRETE CULVERT STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT ISSUES OF AS 5100.2-2017 BRIDGE DESIGN – DESIGN LOADS, AS 5100.5-2017 BRIDGE DESIGN – CONCRETE, AND STANDARDS MENTIONED WITHIN THOSE CODES AS APPLICABLE AND SUBSEQUENTLY THE DESIGN WILL SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL VERSION 9.

D2. DESIGN CRITERIA AND ASSUMPTIONS USED IN THE DESIGN AMONGST OTHERS:

i. PERMANENT, IMPOSED AND OTHER ACTIONS TO AS/NZS 1170.0: 2002 AND AS/NZS 1170.1: 2002
ii. VEHICLE LOADING TO AS 5100.2
iii. EARTHQUAKE LOADS TO AS 1170.4: 2024
iv. EXPOSURE CLASSIFICATION, CONCRETE PROPERTIES & CURING, CONCRETE STRENGTH AND REINFORCEMENT COVER TO AS 5100.5

D3. THE CULVERT HAS BEEN DESIGNED FOR THE STANDARD ROAD TRAFFIC LOADS AS DEFINED IN AS5100.2.

D4. THE CULVERT HAS BEEN DESIGNED FOR AN EXPOSURE CLASSIFICATION B2.

D5. ALL THE ABOVE DO NOT INCLUDE LOADS WHICH MAY BE APPLIED DURING CONSTRUCTION. THE BUILDER IS TO MAINTAIN THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION AT ALL TIMES.

E. SITE PREPARATIONS, EARTHWORKS AND FOUNDATION NOTES

E1. EARTHWORKS SHALL BE IN ACCORDANCE WITH AS3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS" AND AS FOLLOWS, AND SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL SPECIFICATION 'S1 EARTHWORKS'.

E2. REFER TO THE 'GENERAL NOTES' OF THE CIVIL ENGINEERING DESIGN DOCUMENTION BY *ERSCON* CONSULTING ENGINEERS FOR FURTHER NOTES.

E3. **THE DESIGN OF THE STRUCTURE HAS BEEN BASED ON THE FOUNDATION HAVING A MINIMUM BEARING CAPACITY OF 150 kPa AND THE SOIL BEING OF GRANULAR TYPE.**

E4. BEFORE ANY CONSTRUCTION COMMENCES, THE SAFE BEARING CAPACITY OF THE GROUND AND SOIL PROPERTIES SHALL BE VERIFIED WITH A GEOTECHNICAL INVESTIGATION AND THE REPORT FORWARDED TO THE ENGINEER. IF THE BEARING PRESSURE AND SOIL TYPE IS ASSESSED AS BEING LESS AND DIFFERENT THAN ASSUMED, THE ENGINEER WILL NEED TO BE CONTACTED TO PROVIDE A SUITABLE AMENDED DESIGN.

E5. UNLESS NOTED OTHERWISE IN SPECIFICATIONS, THE BASE SLAB SHALL BE FOUNDED ON COMPACTED NATURAL GROUND INCLUDING THE FOUNDATION PREPARATION WORKS AS SPECIFIED ON THE CULVERT SECTION DRAWING. DO NOT PROVIDE A DAMP PROOF MEMBRANE UNDER THE BASE SLABS. MOISTEN GROUND BEFORE CONCRETE POUR.

E6. IF COMPACTED CONTROLLED FILL IS TO BE USED AS FOUNDING MATERIAL, THIS IS TO BE CONFIRMED WITH THE ENGINEER BEFORE CONSTRUCTION COMMENCES AND THE ENGINEER WILL NEED TO BE ASKED TO PROVIDE A SUITABLE DESIGN.

E7. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN STABLE CONDITIONS. PROTECT SURROUNDING PROPERTY AND SERVICES FROM ADVERSE EFFECTS OF GROUND WORKS. PROVIDE TEMPORARY WORKS AS REQUIRED. PROVIDE SHORING CERTIFIED BY SUITABLY QUALIFIED STRUCTURAL ENGINEER TO ALL DEEP EXCAVATIONS WHERE REQUIRED.

E8. KEEP EXCAVATIONS FREE OF WATER. PROVIDE ADEQUATE DRAINAGE TO ENSURE FOUNDATION IS NOT AFFECTED BY MOISTURE. PREVENT FOUNDATION DRYING OUT DUE TO EXPOSURE. PLACE BLINDING, FOOTINGS AND BACKFILL AS SOON AS PRACTICABLE AFTER EXCAVATION.

E9. STRIP BUILDING PLATFORM OF ALL TOPSOIL AND VEGETATION TO A MINIMUM DEPTH OF 150mm AND STOCKPILE. REMOVE ALL DELETERIOUS MATTER.

E10. ALL TREES AND LARGER VEGETATION SHALL BE KEPT MIN. 5m AWAY FROM THE CULVERT STRUCTURE.

E11. THE CONTRACTOR SHALL CHECK ALL EXCAVATIONS FOR ORGANIC MATERIAL AND RUBBISH. IF ANY OF THIS MATERIAL IS FOUND, IT SHALL BE REMOVED FROM THE WORKS TO A PLACE DESIGNATED BY THE SUPERINTENDENT.

E12. EXPOSURE OF EXCAVATED FOOTINGS SHALL BE MINIMISED TO PREVENT LOCALISED MOISTURE CHANGES DURING THE CONSTRUCTION PERIOD.

E13. TREE REMOVAL: WHERE A TREE IS REMOVED, EXCAVATE 200mm BELOW EXTENT OF ROOT BALL. COMPACT EXPOSED SURFACE TO 98% SRDD TO A DEPTH OF AT LEAST 250mm. PLACE APPROVED COMPACTED FILL AND REQUEST THE SPECIFICATION FROM THE ENGINEER BEFORE COMMENCING CONSTRUCTION.

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REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS | APPROVED: RQ
DESIGN: RQ | APPROVED: RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STRUCTURAL ENGINEERING NOTES
SHEET 1 OF 2
DRAWING NO: 160-012-S102 | SIZE: A1 | REVISION: 3

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E14. WHERE THE SUITABLE FOUNDING MATERIAL IS DEEPER THAN REQUIRED FOR THE FOOTING, THE EXCAVATION IS TO BE BACKFILLED WITH A WEAK MIX CONCRETE (N10) TO THE UNDERSIDE OF THE FOOTING BUT THIS IS TO BE CONFIRMED WITH THE ENGINEER BEFORE COMMENCING ANY BUILDING WORKS.

E15. **BACKFILLING** SHALL NOT TAKE PLACE UNTIL THE BASE SLAB AND THE CULVERT WALLS HAVE REACHED THEIR FULL 28-DAY CONCRETE STRENGTH AND THE DECK PANELS HAVE BEEN PLACED WITH THE GROUT FILLING OF THE CONNECTION POINTS HAVING ATTAINED MIN. 40 MPa STRENGTH.

F. CONCRETE AND REINFORCEMENT NOTES

F1. ALL WORKMANSHIP AND MATERIALS SHALL BE GENERALLY IN ACCORDANCE WITH AS3600 CONCRETE STRUCTURES AND AS5100 BRIDGE DESIGN, AND STANDARDS MENTIONED WITHIN THOSE DOCUMENTS AS APPLICABLE; AND SHALL SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL SPECIFICATION 'S7 CONCRETE WORKS'.

F2. ALL FORMWORK SHALL BE IN ACCORDANCE WITH AS 3610 FORMWORK FOR CONCRETE.

F3. MINIMUM COVER TO ALL REINFORCEMENT SHALL BE 50mm EXCEPT WHERE CAST AGAINST GROUND IT SHALL BE 80mm.

F4. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. ALL CONCRETE THICKNESSES SHOWN ARE MINIMUM STRUCTURAL REQUIREMENTS; NO REDUCTION IN THICKNESS DUE TO FALLS OR TOPPING IS PERMITTED. REFER CIVIL DRAWINGS FOR CONFIRMATION OF ALL SLAB FALLS AND STEPS.

F5. NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

F6. WET CONCRETE TO BE UNIFORM, HOMOGENEOUS, COHESIVE AND ABLE TO WORK READILY INTO CORNERS AND AROUND REINFORCEMENT COMPLETELY FILLING FORMWORK WITHOUT SEGREGATION, EXCESS FREE WATER ON SURFACE, LOSS OF MATERIAL OR CONTAMINATION. CONCRETE TO HAVE GOOD DIMENSIONAL STABILITY AND ABLE TO RESIST PLASTIC SETTLEMENT CRACKING, THERMAL CRACKING AND SHRINKAGE CRACKING.

F7. USE CEMENTITIOUS MATERIALS LESS THAN SIX MONTHS OLD. USE BAGGED CEMENT IN ORDER OF RECEIPT.

F8. DO NOT ADD WATER TO CONCRETE AFTER TRUCK HAS LEFT BATCHING PLANT.

F9. CONSTRUCTION JOINTS SHALL BE LOCATED AND CONSTRUCTED AS PER THE DETAILS ON THE DRAWINGS.

F10. CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES.
CONCRETE SPECIFICATION, U.N.O. ON DRAWINGS:

ELEMENT	GRADE	SLUMP	MAX AGGREGATE SIZE
CULVERT BASE SLAB, APRON SLAB, WALLS, WINGWALLS, DECK SLAB PANEL AND HEADWALLS	**S50**	80 +/-15	20 mm
	▪ **MIN. CEMENTITIOUS MATERIAL CONTENT 450 kg/m³** ▪ **MAX. THE WATER / CEMENT RATIO 0.4** ▪ **CURE CONCRETE CONTINUOUSLY FOR AT LEAST 14 DAYS** ▪ **MIN. 32 MPa CONCRETE STRENGTH AT TIME OF STRIPPING AND CURING** ▪ **RECOMMENDATION: ADD PENETRON ADMIX-SB OR XYPEX ADMIC C-Series TO THE CONCRETE AT TIME OF BATCHING AS PER THE DRAWINGS SPECIFICATION AND STRICTLY IN ACCORDANCE WITH THE MANUFACTURER's SPECIFICATIONS.**		

METHOD OF PLACEMENT BY PUMP.
PROJECT ASSESSMENT IS NOT REQUIRED.

F11. PROVIDE A 10mm x 10mm CHAMFER TO EXPOSED EDGES ON CONCRETE UNO.

F12. NON-SHRINK GROUT SHALL BE Parchem CONBEXTRA CB CEMENTITIOUS, OR APPROVED

FORMWORK

F13. RESPONSIBILITY FOR DESIGN, CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF FORMWORK AND FALSEWORK LIES WITH THE CONTRACTOR.

F14. FORMWORK TO BE DESIGNED AND CONSTRUCTED TO AS3610.

F15. APPLY RELEASE AGENT COMPATIBLE WITH CONTACT SURFACES TO INTERIOR OF FORMWORK. WHERE NECESSARY CLEAN REINFORCEMENT TO REMOVE TRACES OF RELEASE AGENT. SEAL JOINTS BETWEEN FORMWORK PANELS, AND TO HARDENED CONCRETE WITH A FLEXIBLE RUBBER STRIP.

F16. DO NOT STRIP FORMWORK PRIOR TO 36 HOURS AFTER PLACEMENT.

REINFORCEMENT

F17. STEEL REINFORCEMENT IS TO COMPLY WITH AS/NZS4671. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:
R: STRUCTURAL GRADE 250 PLAIN ROUND BAR TO AS/NZS4671
N: HOT ROLLED GRADE 500 DEFORMED (RIBBED) BAR DUCTILITY CLASS N TO AS/NZS4671
L: HOT ROLLED GRADE 500 DEFORMED BAR DUCTILITY CLASS L TO AS/NZS4671
SL: HARD DRAWN WIRE GRADE 500 SQUARE MESH DUCTILITY CLASS L TO AS/NZS4671
RL: HARD DRAWN WIRE GRADE 500 RECTANGULAR MESH DUCTILITY CLASS L TO AS/NZS4671
TM: HARD DRAWN STEEL GRADE 500 TRENCH MESH DUCTILITY CLASS L TO AS/NZS4671
W: GRADE 500 STEEL REINFORCING WIRE TO AS/NZS4671

F18. FOLLOWING ABBREVIATIONS APPLY TO DESCRIBE THE PLACEMENT OF REINFORCEMENT:
E/W: EACH WAY FF: FAR FACE NF: NEAR FACE
EF: EACH FACE BTM: BOTTOM

F19. PROVIDE ACRS (AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEEL LTD) CERTIFICATION OF COMPLIANCE WITH AS/NZS4671 FOR ALL REINFORCEMENT.

F20. PROVIDE DOCUMENTATION TO SHOW THAT REINFORCEMENT SUPPLIER AND MILL COMPLIES WITH AS/NZS4671.

F21. REINFORCEMENT MUST HAVE UNIQUE MARKS TO IDENTIFY SUPPLIER.

F22. DO NOT SPLICE REINFORCEMENT OTHER THAN SHOWN ON THE DRAWINGS.

F23. DO NOT BEND OR STRAIN REINFORCEMENT IN A WAY THAT MAY CAUSE DAMAGE. BEND DIAMETERS TO BE TO AS3600. BARS TO BE BENT COLD UNO. DO NOT COOL HEATED BARS BY QUENCHING.

F24. WELDING OR SITE BENDING OF REINFORCEMENT IS NOT PERMITTED WITHOUT APPROVAL OF THE ENGINEER.

F25. ALL REINFORCEMENT SHALL BE SUPPORTED IN ITS CORRECT POSITION BEFORE CONCRETING (BY APPROVED CHAIRS, SPACERS, LIGATURES OR TIES AT 800 mm MAXIMUM CENTRES EACH WAY UNO.) TO PREVENT DISPLACEMENT OF REINFORCEMENT BY WORKMEN OR EQUIPMENT DURING CONCRETE PLACEMENT.

F26. FOR CONCRETE SURFACES WITH B2 EXPOSURE CLASSIFICATION OR GREATER, ONLY USE PROPRIETARY HIGH STRENGTH FIBRE REINFORCED CEMENT SPACER BLOCKS OR SUPPORTS.

F27. SECURELY TIE REINFORCEMENT WITH WIRE TIES. TURN ENDS OF TIE WIRES INTO CONCRETE, CLEAR OF COVER ZONE.

CONCRETE TESTING

F28. TEST SLUMP OF EACH BATCH OF CONCRETE DELIVERED BEFORE PLACING CONCRETE FROM THAT DELIVERY. SLUMP MEASURED TO BE NO GREATER THAN TARGET SLUMP WITHIN TOLERANCES GIVEN IN AS1379 CLAUSE 5.2.3.

F29. CONCRETE TESTING RESULTS TO BE PROVIDED AT 1 SAMPLE PER 25m³. EACH SAMPLE TO COMPRISE FOUR CYLINDERS: TEST TWO AT 7 DAYS AND TWO AT 28 DAYS.

F30. CONCRETE TESTING TO BE BY AN APPROVED INDEPENDENT NATA REGISTERED LABORATORY.

DELIVERABLES

F31. **AT LEAST ONE WEEK PRIOR TO CONCRETE PLACEMENT SUBMIT DETAILS OF PROPOSED CONCRETE MIX DESIGNS**, SEQUENCE AND TIMES FOR CONCRETE POURS, CONSTRUCTION JOINT LOCATIONS FOR ENGINEER's/INSPECTORS's APPROVAL. NOMINATE FOR EACH MIX DESIGN THE TYPE AND PROPORTIONS OF CONSTITUENTS, AGGREGATE GRADINGS, ADDITIVES AND ADMIXTURES, MAXIMUM WATER CONTENT AND MAXIMUM WATER/CEMENT RATIO, TARGET SLUMP, TARGET CHARACTERISTIC STRENGTH (f'c), AND TARGET DRYING SHRINKAGE.

F32. USE READY MIXED CONCRETE MIXED BY BATCH PRODUCTION PROCESS DELIVERED IN AGITATING TRUCKS. FOR EACH BATCH SUPPLY A DOCKET LISTING INFORMATION REQUIRED BY AS1379 CLAUSE 1.8.3 AND FOLLOWING:
- SERIAL NUMBER OF IDENTIFICATION CERTIFICATES OF EACH BATCH
- NAME OF CONCRETE DELIVERY SUPERVISOR
- ELEMENT FOR WHICH CONCRETE WAS ORDERED AND WHERE IT WAS PLACED
- METHOD OF PLACEMENT AND CLIMATIC CONDITIONS DURING POUR
- PROJECT ASSESSMENT CARRIED OUT
- TOTAL AMOUNT OF WATER REQUIRED BY MIX DESIGN
- TOTAL AMOUNT OF WATER ADDED AT PLANT

F33. PROVIDE RECORD OF SLUMP TESTING TO SUPERINTENDENT.

F34. FORWARD CONCRETE PRODUCTION ASSESSMENT INFORMATION TO SUPERINTENDENT AS PER AS1379 CLAUSE 6.4 WHEN PRODUCTION ASSESSMENT IS UNDERTAKEN.

F35. REPORT DRYING SHRINKAGE TESTING RESULTS TO SUPERINTENDENT.

G. PRECAST CONCRETE ELEMENTS

G1. ALL PRECAST CONCRETE WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3850 PREFABRICATED CONCRETE ELEMENTS, AS 5100 BRIDGE DESIGN AND AS 3610 FORMWORK FOR CONCRETE AS APPLICABLE.

G2. REINFORCEMENT OF PRECAST CONCRETE UNITS HAVE BEEN DESIGNED FOR 'IN-SERVICE' CONDITIONS ONLY. THE BUILDING CONTRACTOR IS RESPONSIBLE TO ENGAGE A QUALIFIED CONTRACTOR E.G. *REID CONSTRUCTION SYSTEMS* TO DESIGN, DOCUMENT AND CERTIFY ANY ADDITIONAL REINFORCEMENT REQUIRED FOR LOADS DURING HANDLING, LIFTING AND TRANSPORTATION, ANY LIFTERS, BRACES ETC.

G3. USE CAST IN FERRULES FOR STRUCTURAL FIXINGS, NOT MECHANICAL OR CHEMICAL ANCHORS

G4. ENSURE THAT PRECAST UNITS REMAIN UNCRACKED AND UNDAMAGED DURING HANDLING, ERECTION AND INSTALLATION OPERATIONS. USE FORMWORK BOND BREAKERS AND STRONG BACKS AS REQUIRED. PROTECT UNITS FROM STAINING, DISCOLOURATION AND OTHER DAMAGE.

G5. USE RIGID FORMWORK AND INTENSE COMPACTION, SUCH AS VIBRATING TABLES OR FORM VIBRATORS, TO AS 5100.

G6. PRECAST UNIT TOLERANCES TO BE TO AS3850 EXCEPT WHERE VARIED BY SPECIFICATION.

G7. CONTRACTOR TO PROVIDE COMPONENTS, MATERIALS, FASTENERS, BRACES, STRONGBACKS, SHIMS, JOINTING STRIPS, SEALANTS, FLASHING, GROUT AND MORTAR, BEARING PADS AND STRIPS, TIES, DOWELS, CLIPS, FIXINGS etc AS REQUIRED.

G8. CAST UNITS WITH OUTER FACE OFF FORM.

G9. REMOVE TEMPORARY ATTACHMENTS AFTER ERECTION, MAKE GOOD AND SEAL.

G10. NON-SHRINK GROUT SHALL BE OF 28 DAY CHARACTERISTIC STRENGTH OF 40 MPa e.g. Parchem CONBEXTRA CB CEMENTITIOUS, OR APPROVED EQUIVALENT INSTALLED IN ACCORDANCE WITH MANUFACTURER 's SPECIFICATIONS. SUBMIT PRODUCT DETAILS FOR APPROVAL.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS | APPROVED: RQ
DESIGN: RQ | APPROVED: RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STRUCTURAL ENGINEERING NOTES
SHEET 2 OF 2
DRAWING NO: 160-012-S103 | SIZE: A1 | REVISION: 3

25/08/2025 10:03:39 AM
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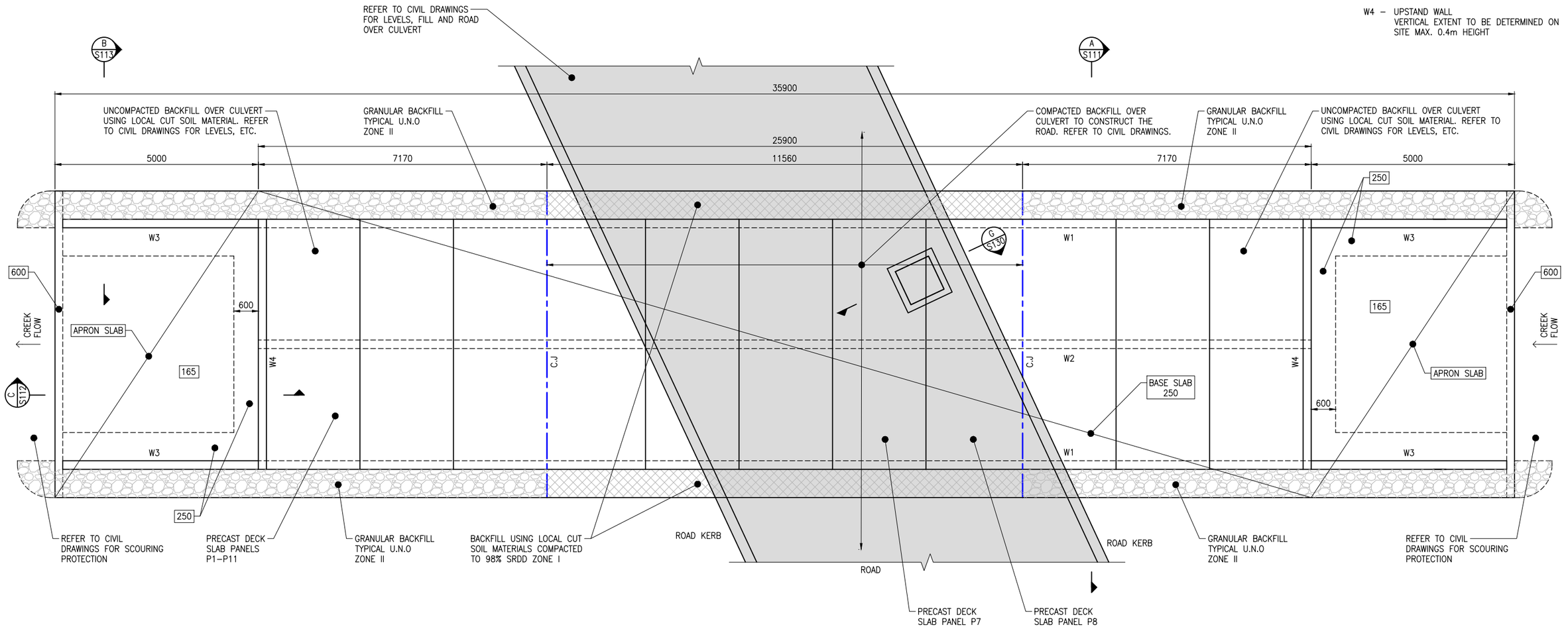
MEMBER SCHEDULE

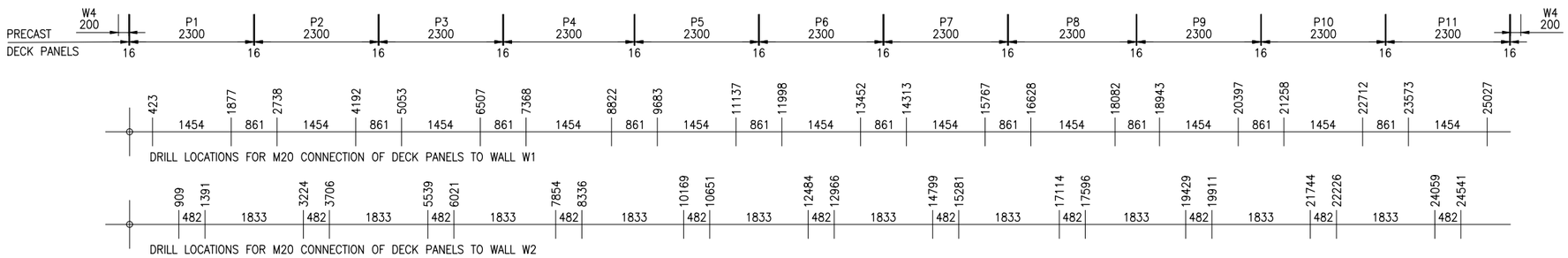
W1 – EXTERNAL WALL, 210 THICK

W2 – INTERMEDIATE WALL, 210 THICK

W3 – WING WALLS 210 THICK
VERTICAL EXTENT TO BE DETERMINED ON SITE MAX. 2m RETAINED HEIGHT

W4 – UPSTAND WALL
VERTICAL EXTENT TO BE DETERMINED ON SITE MAX. 0.4m HEIGHT





CULVERT SITE PLAN

SCALE 1:50

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF	
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF	
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF	
NO.	DATE	DESCRIPTION	DESIGN	APPROVED	

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:100 / 1:50 — 0 1 2 3 — A3 / A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL

DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT SITE PLAN

DRAWING NO: 160-012-S110 | SIZE: A1 | REVISION: 3

25/08/2025 10:03:39 AM
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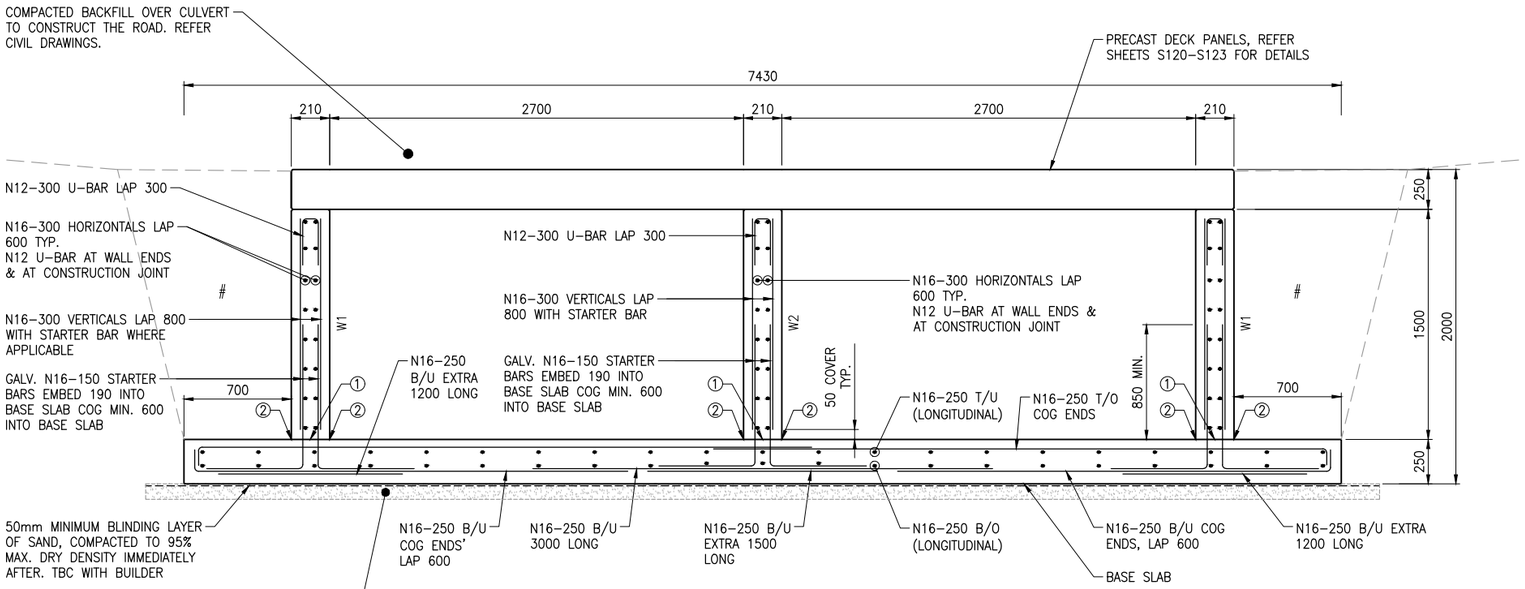

A S110 TYPICAL CULVERT SECTION
SCALE 1:20

NOTES:

REINFORCEMENT COVER
50mm TOP, BTM & SIDES TYP. U.N.O.
BASE SLAB 80 BTM (CAST AGAINST GROUND)

CONCRETE
S50
MIN. CEMENTITIOUS CONTENTS 450 kg/m³
MAX. WATER/CEMENT RATIO 0.4
CURE FOR MIN. 14 DAYS
MIN. STRENGTH AT TIME OF STRIPPING 32 MPa

WATER PROOFING – RECOMMENDATONS
PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURERS SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m^3 OF CONCRETE = 3.6–4.5 kg/m^3.
ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' E.G. ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.

BASE SLAB
TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREENING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' CAN BE USED. THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATION.

MEMBER SCHEDULE

W1 – EXTERNAL WALL, 210 THICK
W2 – INTERMEDIATE WALL, 210 THICK
PRECAST DECK PANELS, 250 THICK
BASE SLAB, 250 THICK

LEGEND

\# ZONE I BACKFILL:
LOCAL CUT SOIL MATERIAL COMPACTED TO 98% SRDD.
ZONE II BACKFILL:
REFER SHEET 'SECTION THROUGH WING WALL'

WATER PROOFING RECOMMENDATION

① THOROUGHLY CLEAN JOINT SURFACE & APPLY 2 COATS OF "XUPEX CONCENTRATE" SLURRY TO JOINT SURFACE AT A RATE OF 1.0 kg/sqm.

② APPLY ONE SLURRY COAT OF "XUPEX CONCENTRATE" AT A RATE OF 0.8 kg/sqm. THEN FILL SLOT TO SURFACE WITH "XUPEX CONCENTRATE" IN DRY–PAC FORM. PROVIDE 10x10 CHAMFER AT THIS LOCATION.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:40 / 1:20 — 0 0.2 0.4 0.6 0.8 1 1.2 — A3 / A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS	APPROVED: RQ		
DESIGN: RQ	APPROVED: RQ		
STRUCTURAL SIGNOFF APPROVAL: R.Q.			
DATE: 20/03/2025	RPEQ: 15306		

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: TYPICAL CULVERT SECTION A

DRAWING NO: 160-012-S111 | SIZE: A1 | REVISION: 3

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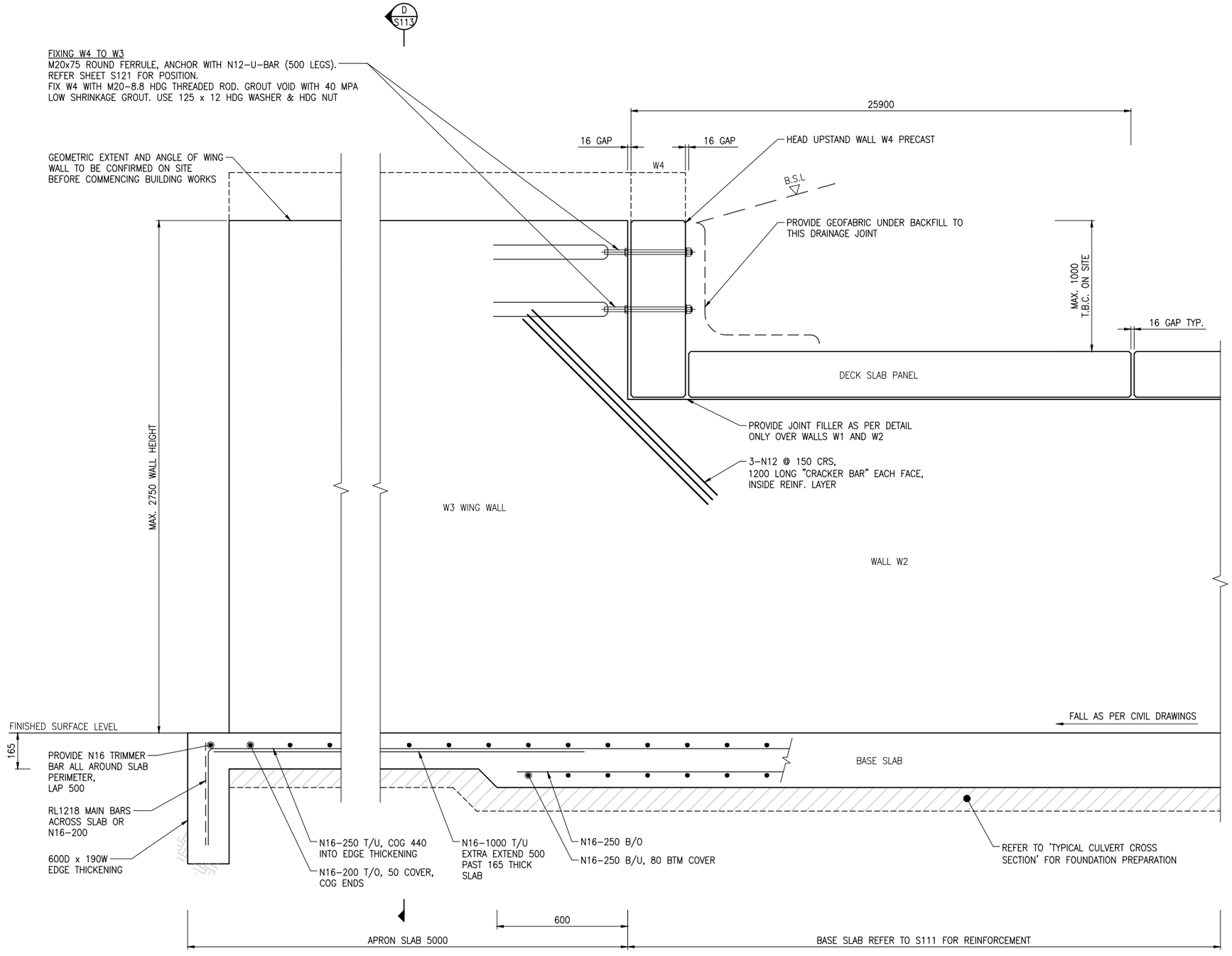

C S110 TYPICAL SECTION THROUGH APRON SLAB

SCALE 1:10

NOTES:

REINFORCEMENT COVER
50mm TOP, BTM & SIDES TYP. U.N.O.
BASE SLAB 80 BTM (CAST AGAINST GROUND)

CONCRETE
S50
MIN. CEMENTITIOUS CONTENTS 450 kg/m³
MAX. WATER/CEMENT RATIO 0.4
CURE FOR MIN. 14 DAYS
MIN. STRENGTH AT TIME OF STRIPPING 32 MPa

WATER PROOFING – RECOMMENDATONS
PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURERS SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.

MEMBER SCHEDULE:

W3 – WING WALLS 210 THICK
VERTICAL EXTENT TO BE DETERMINED ON SITE
MAX. 2m–RETAINED HEIGHT

W4 – UPSTAND WALL
VERTICAL EXTENT TO BE DETERMINED ON SITE
MAX. 0.4m HEIGHT

APRON SLAB

TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREENING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' CAN BE USED. THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATION.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:20 1:10 0 0.1 0.2 0.3 0.4 0.5 0.6
A3 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
R.Q.
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT DETAILS
SHEET 1 OF 2
DRAWING NO: 160-012-S112
SIZE: A1
REVISION: 3

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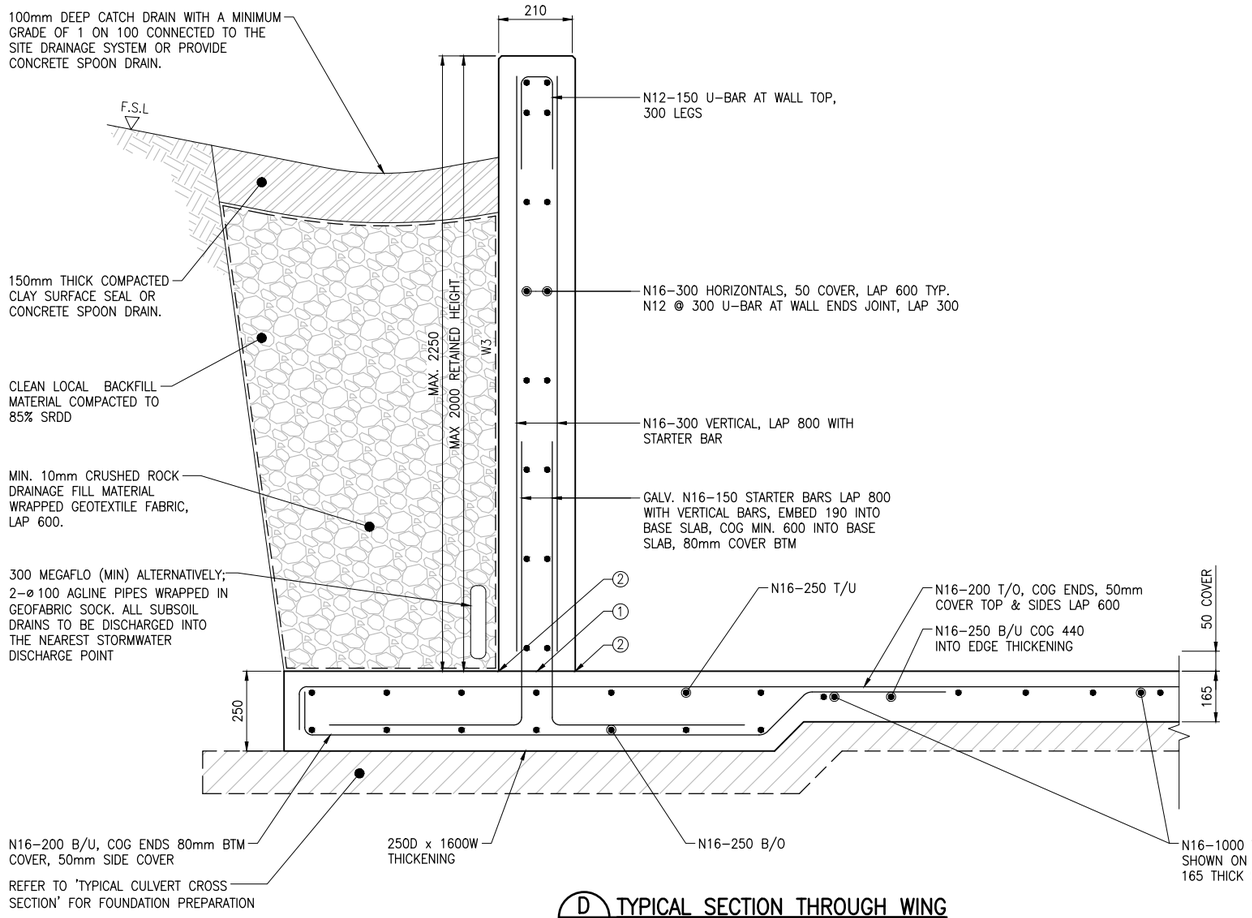


D S112 **TYPICAL SECTION THROUGH WING WALL (W3) AND APRON SLAB**

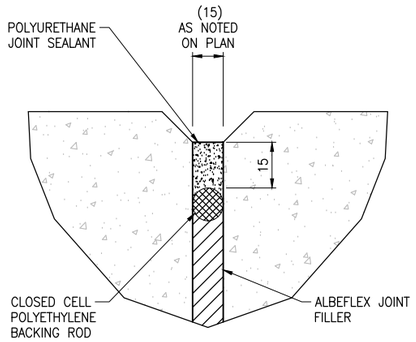
SCALE 1:10

LEGEND

WATER PROOFING RECOMMENDATION

① THOROUGHLY CLEAN JOINT SURFACE & APPLY 2 COATS OF "XUPEX CONCENTRATE" SLURRY TO JOINT SURFACE AT A RATE OF 1.0 kg/sqm.

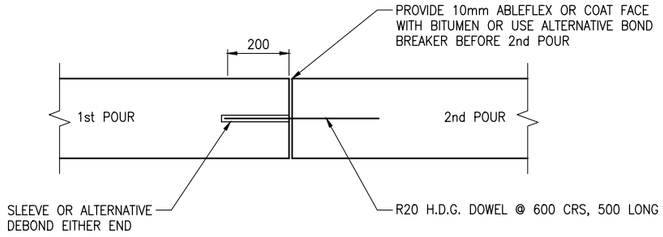
② APPLY ONE SLURRY COAT OF "XUPEX CONCENTRATE" AT A RATE OF 0.8 kg/sqm. THEN FILL SLOT TO SURFACE WITH "XUPEX CONCENTRATE" IN DRY–PAC FORM. PROVIDE 10x10 CHAMFER AT THIS LOCATION.



NOTE:
PROVIDE TEMPORARY SHIN PLATES IN GAP DURING PLACEMENT OF DECK PANELS

TYPICAL DECK PANEL JOINT DETAIL

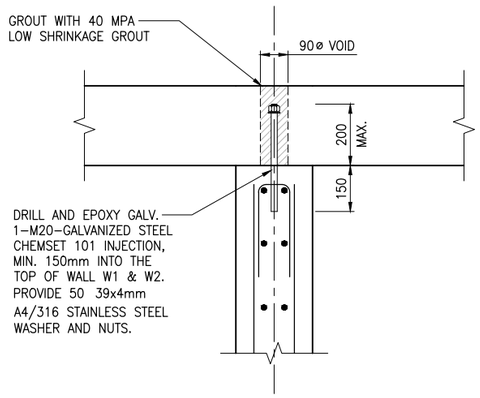
SCALE 1:1



TYPICAL CONSTRUCTION JOINT IN BASE SLAB AND WALLS

SCALE 1:10

NOTE: WALL JOINTS CAN BE CONSTRUCTED WITHOUT DOWELS



TYPICAL CONNECTION DECK PANELS TO TOP OF WALL (W1 & W2)

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE

1:20 0 0.1 0.2 0.3 0.4 0.5 0.6 A3
1:10 A1

1:2 0 0.01 0.02 0.03 0.04 0.05 0.06 A3
1:1 A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL

DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT DETAILS
SHEET 2 OF 2

DRAWING NO: 160-012-S113 | SIZE: A1 | REVISION: 3

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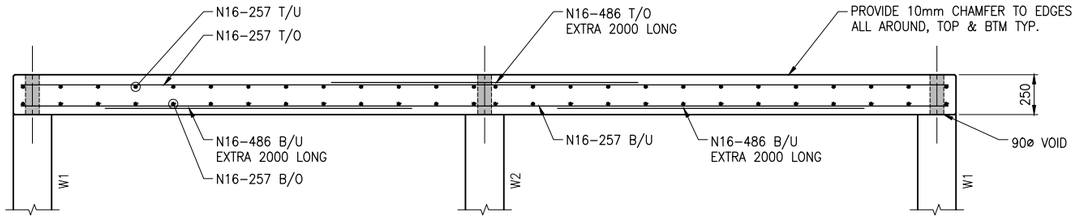
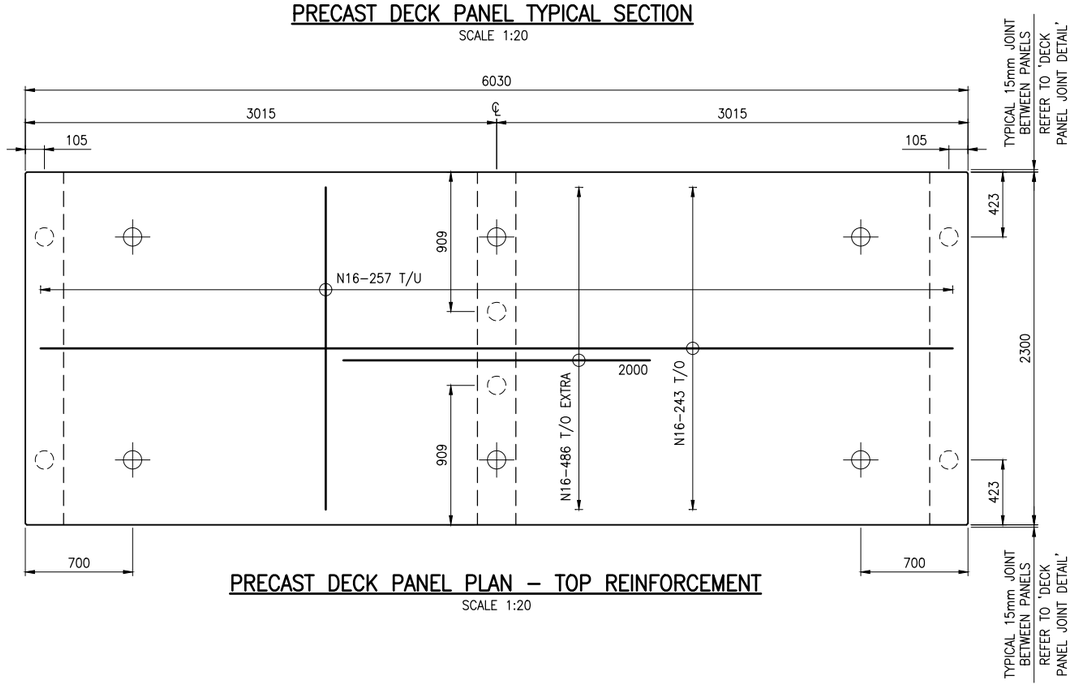


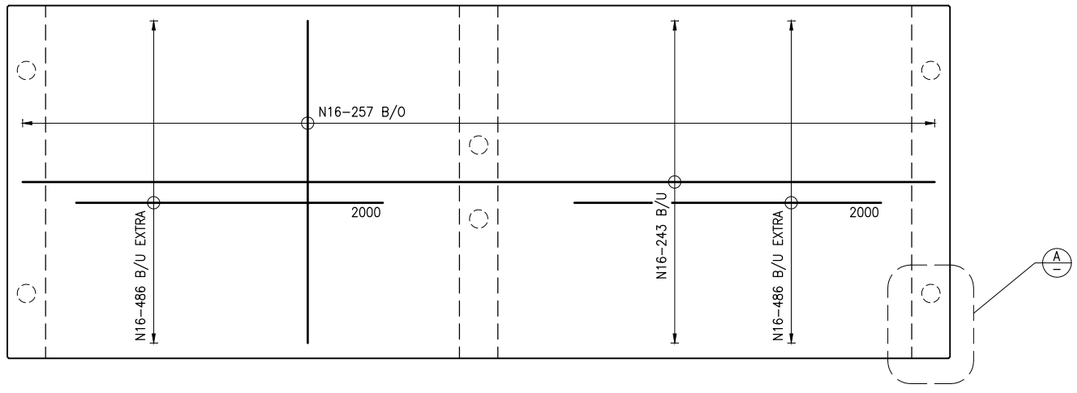
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

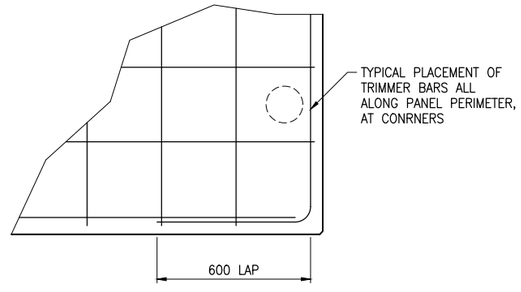
SCALE 1:20

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 9
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



DETAIL A

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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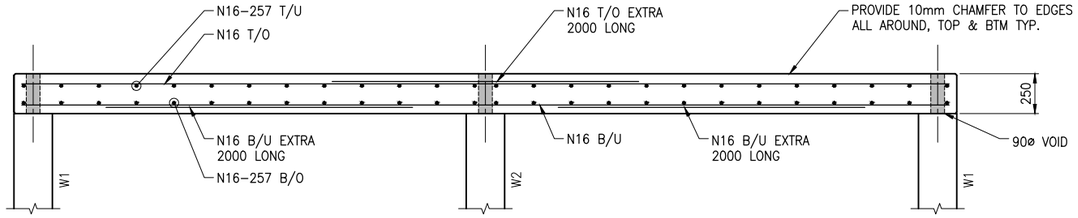
1:10 A1
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

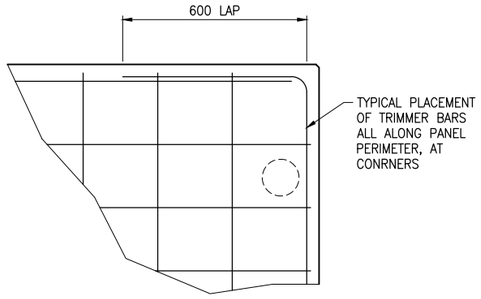
DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT PRECAST DECK PANELS P1-P6 & P9-P11
DRAWING NO: 160-012-S120
SIZE: A1
REVISION: 3

25/08/2025 10:03:45 AM
D:\ERSCON Dropbox\Erscon\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\Structural\Working dgws\160-012-S120-DECK SLAB P1-P6 & P9-P11.dwg





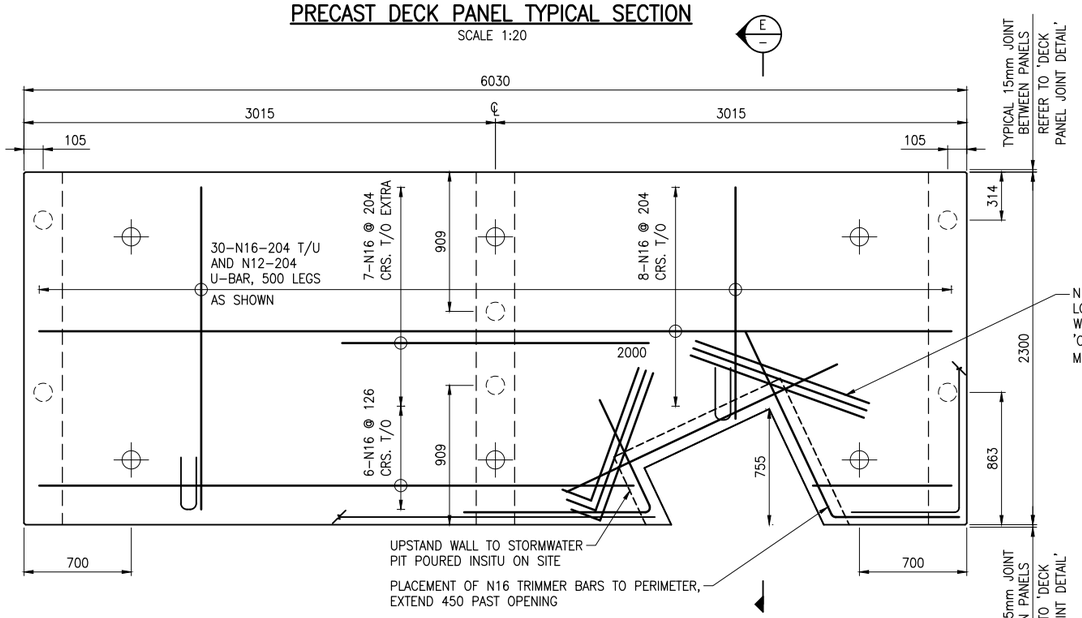
DETAIL B
SCALE 1:10

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 1
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

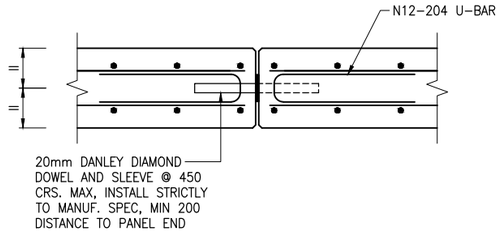
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20

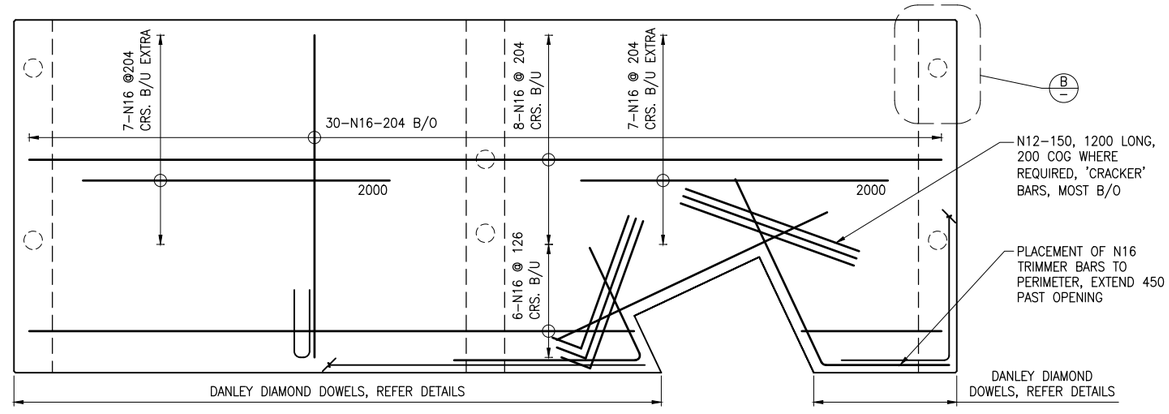


P7 TO P8 CONNECTION DETAIL

SCALE 1:10

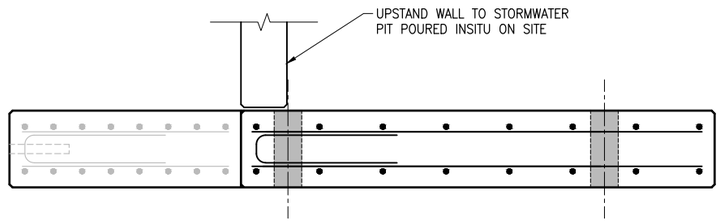
LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20



E SECTION
SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/08/25	COUNCIL APPROVAL	RQ	MF
1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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1:10 A1
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PRECAST DECK PANEL P7

DRAWING NO: 160-012-S121 | SIZE: A1 | REVISION: 2

25/08/2025 10:03:42 AM
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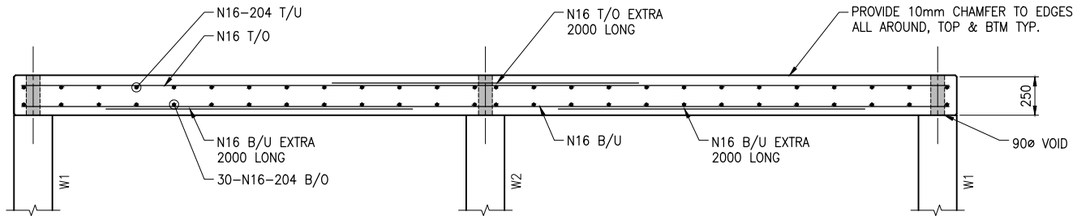
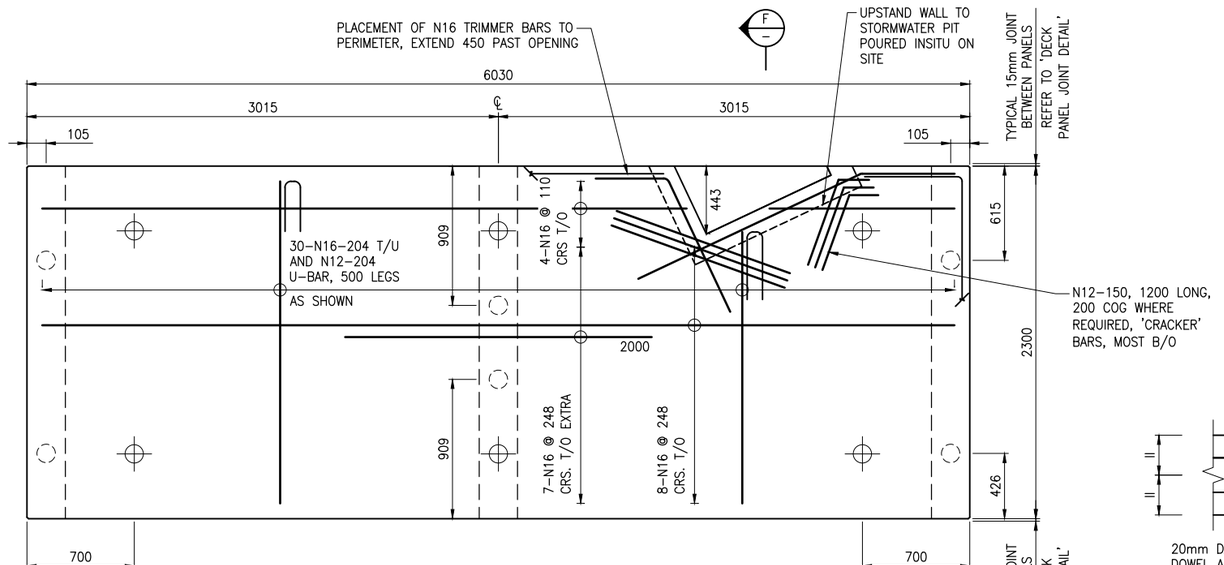


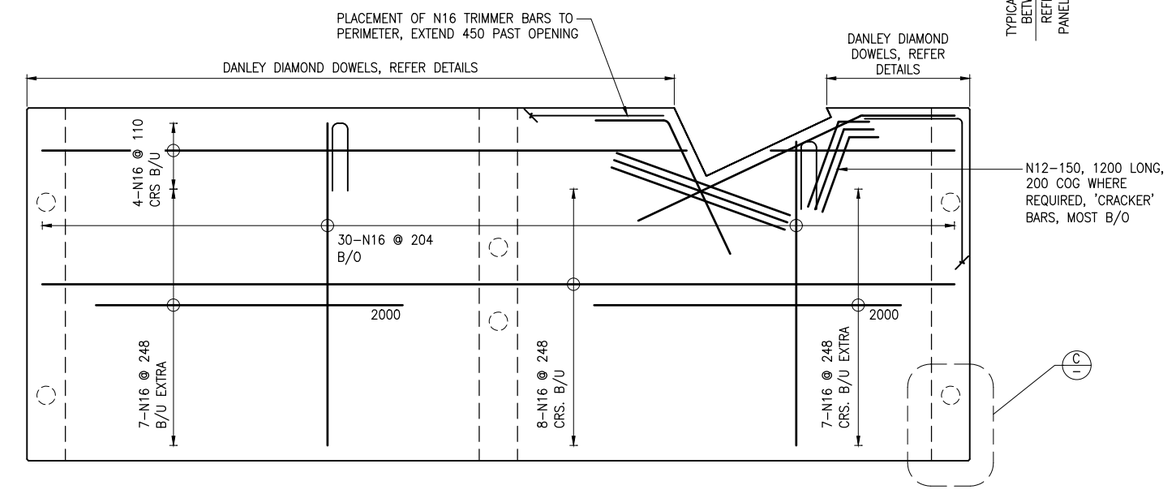
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



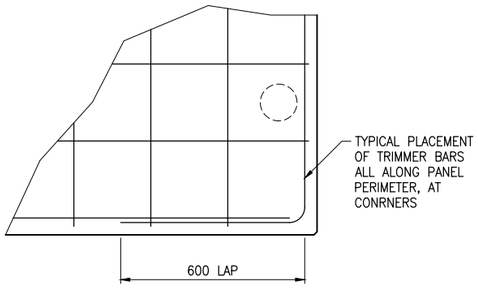
PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



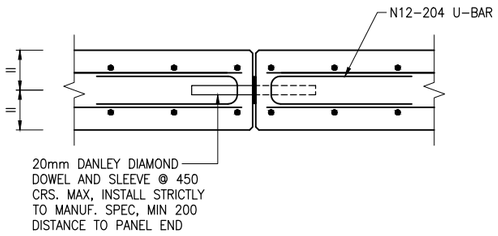
PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20



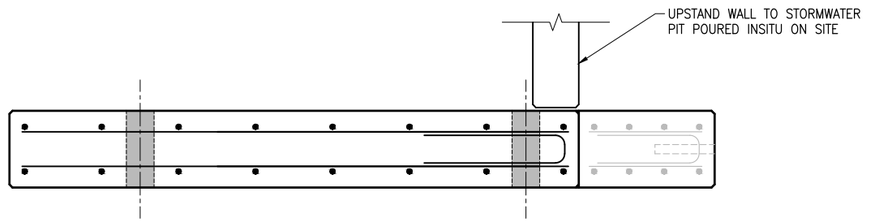
DETAIL C

SCALE 1:10



P7 TO P8 CONNECTION DETAIL

SCALE 1:10



F SECTION

SCALE 1:20

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 1
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/08/25	COUNCIL APPROVAL	RQ	MF
1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

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1:10 A1
1:40 0 0.2 0.4 0.6 0.8 1 1.2 A3
1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PRECAST DECK PANEL P8

DRAWING NO: 160-012-S122 | SIZE: A1 | REVISION: 2

25/08/2025 10:03:43 AM
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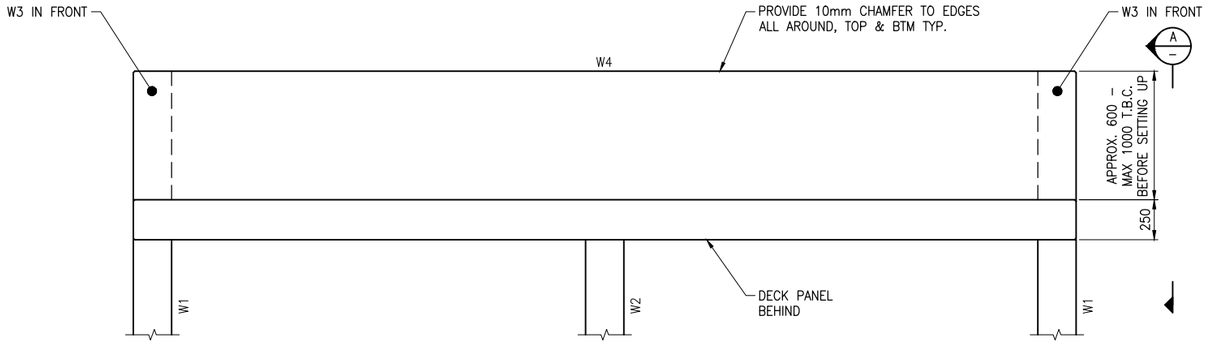
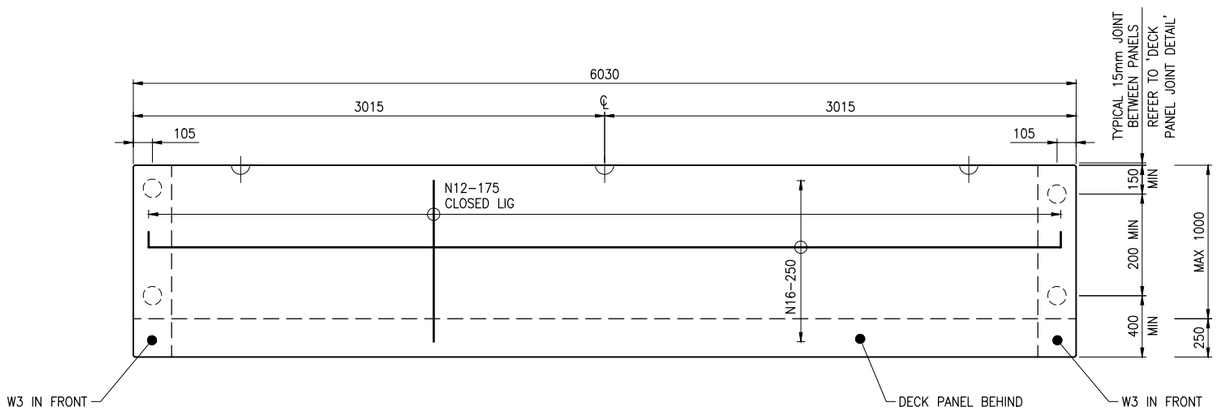


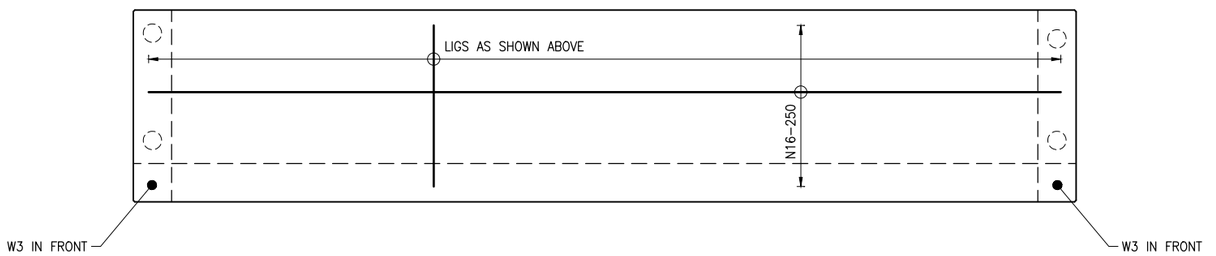
PRECAST HEAD WALL PANEL TYPICAL ELEVATION

SCALE 1:20



PRECAST HEAD WALL PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



PRECAST HEAD WALL PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20

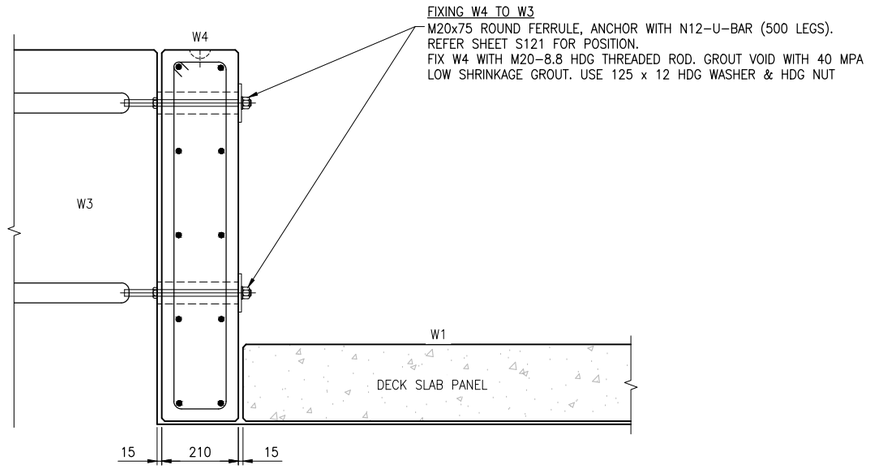
PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 210mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 2
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: MAX 4t
13. PANEL VOLUME: 1.58m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE AFTER THE CONCRETE POUR, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

PROVIDE 90 DIA. VOIDS IN PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED. MATCH ROUND FERRULES IN W3 TO VOID POSITION

LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



SECTION A–A THROUGH HEAD UPSTAND WALL W4

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

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1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 30/06/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT PRECAST HEAD WALL W4
DRAWING NO: 160-012-S123
SIZE: A1
REVISION: 3

25/08/2025 10:03:45 AM
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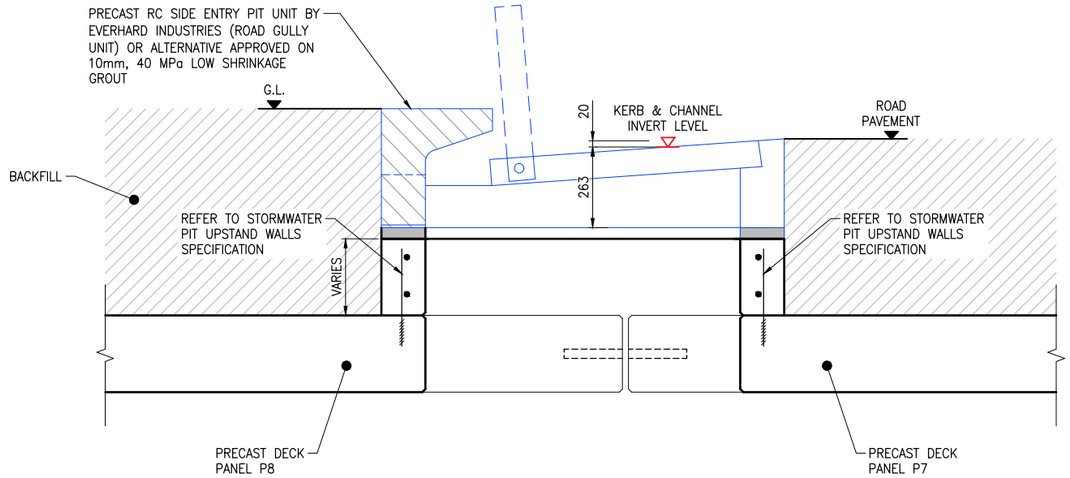
STORMWATER PIT UPSTAND WALLS SPECIFICATIONS

1. POUR INSITU ON SITE
2. 160mm THICK
3. N12–200 GALV. STARTER BARS DRILL EXPOXY 110mm INTO TOP OF DECKS SLAB WITH CHEMSET RE0502
4. N12–150 HORIZONTAL, COG 300 AT CORNERS OR USE CORNER 'L' BARS WITH LEGS LAPPING MIN. 400 WITH HORIZONTAL BARS
5. S40 CONCRETE STRENGTH, SLUMP 80 +/–15, MAX 20mm AGGREGATE SIZE, CURE CONTINOUS FOR 7 DAYS, MIN 25 MPa CONCRETE STRENGTH AT STRIPPING USE BLENDED CEMENTS COMPRISING OF 25–30% FLY ASH (FLY ASH TO COMPLY WITH AS 3582.1) TIME
6. MIN. 60mm COVER
7. PROVIDE 5x5 CHAMFER TO EXTERNAL EDGES
8. BACKFILL UPSTAND WALL NOT EARLIER THAN 28 DAYS AFTER CONCRETE POUR



G S110 SECTION STORMWATER PIT
SCALE 1:20

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
2	21/08/25	COUNCIL APPROVAL	RQ	MF
1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STORMWATER PIT
DRAWING NO: 160-012-S130
SIZE: A1
REVISION: 2

25/08/2025 10:03:40 AM
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APPENDIX C

Statement of Compliance

FNQROC DEVELOPMENT MANUAL

Council .....Mareeba Shire Council.....
(INSERT COUNCIL NAME)

STATEMENT OF COMPLIANCE
OPERATIONAL WORKS DESIGN

This form duly completed and signed by an authorised agent of the Designer shall be submitted with the Operational Works Application for Council Approval.

Name of Development .....Country Road Estate Stage 3-5 Culvert.....

Location of Development ..... Country Road, Mareeba**.....**

Applicant .....ConMat Pty Ltd.....

Designer .....ERSCON Consulting Engineers.....

It is hereby certified that the Calculations, Drawings, Specifications and related documents submitted herewith have been prepared, checked and amended in accordance with the requirements of the FNQROC Development Manual and that the completed works comply with the requirements therein, **except** as noted below.

Compliance with the requirements of the Operational Works Design Guidelines	Non-Compliance refer to non-compliance report / drawing number
Plan Presentation	
Geotechnical requirements	NA
Geometric Road Design	
Pavements	
Structures / Bridges	NA
Subsurface Drainage	
Stormwater Drainage	
Site Re-grading	
Erosion Control and Stormwater Management	
Pest Plant Management	NA

Cycleway / Pathways	NA
Landscaping	NA
Water Source and Disinfection/Treatment Infrastructure (if applicable)	NA
Water Reticulation, Pump Stations and water storages	
Sewer Reticulation and Pump Stations	NA
Electrical Reticulation and Street Lighting	
Public Transport	NA
Associated Documentation/ Specification	
Priced Schedule of Quantities	
Referral Agency Conditions	NA
Supporting Information (AP1.08)	NA
Other	

Conscientiously believing the above statements to be true and correct, signed on behalf of:

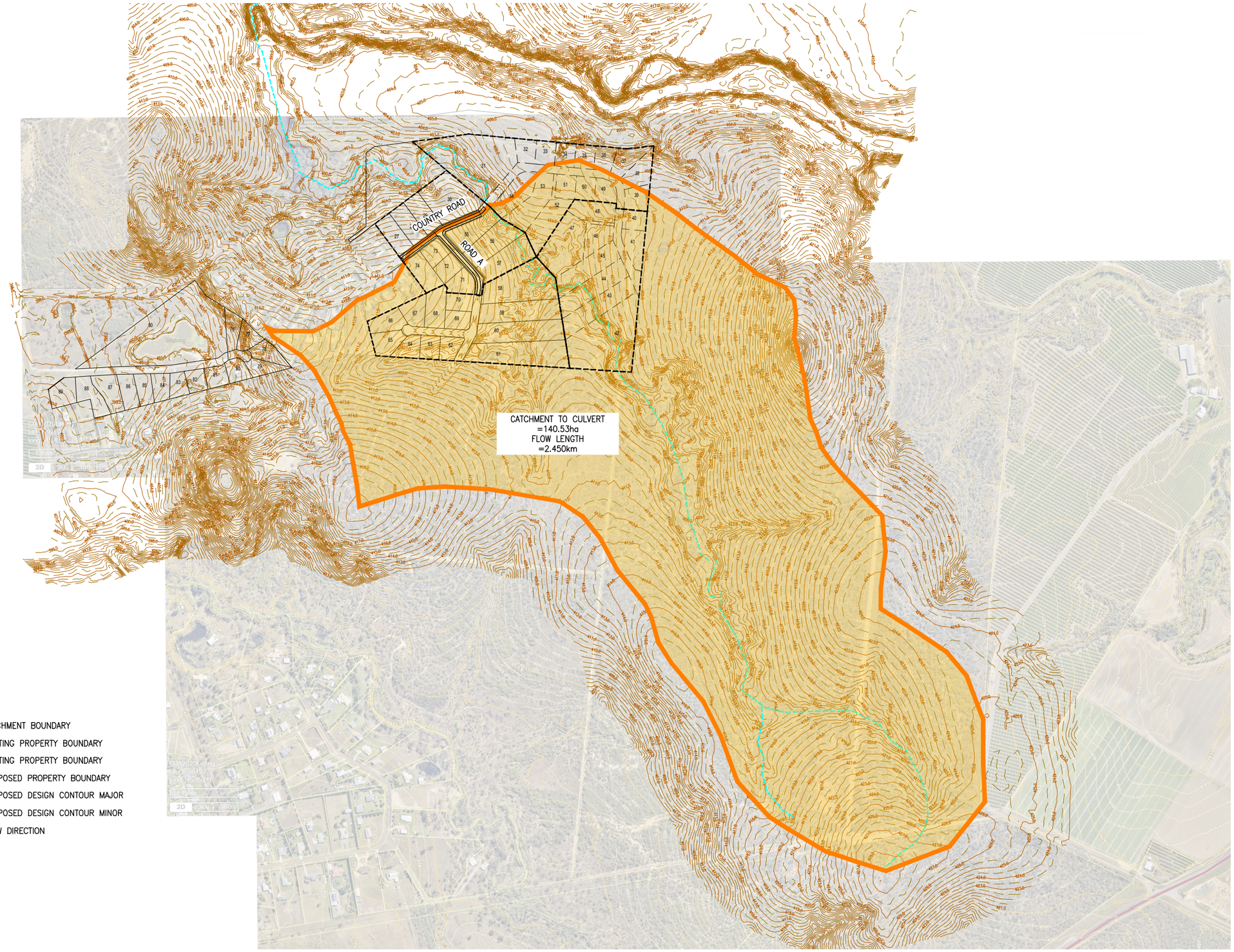
Designer .....ERSCON Consulting Engineers..... **RPEQ No** ..05085..

Name in Full .....John Martin..... .....

Signature ..... **Date** ....10/06/25..

APPENDIX D

Hydrological Analysis



LEGEND

- CATCHMENT BOUNDARY
- EXISTING PROPERTY BOUNDARY
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 51.0 PROPOSED DESIGN CONTOUR MAJOR
- PROPOSED DESIGN CONTOUR MINOR
- FLOW DIRECTION

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	16/01/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT

SCALE

1:10000 0 100 200 300 A3

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN MF	DESIGNED MF
DRAWN APPROVED	DESIGN APPROVED
CIVIL SIGNOFF APPROVAL	
DATE:	RPEQ:

PROJECT REF: COUNTRY ROAD ESTATE STAGE 3 -5

DRAWING REF: CULVERT CROSSING CATCHMENT PLAN

DRAWING NO: 160-005-SK001 | SIZE: A3 | REVISION: 1

PLOT DATE:22/08/2025 10:02:08 AM
FILE LOCATION:X:\160 Commal\012 Country Rd Stage 3-5 Culvert\Drawings\Sketch\160-005-SK001 CATCHMENT.dwg

JOB NO: 160-005
JOB: Country Road Estate - between Stage 3 and 5
12d Long Section - In-Situ Culvert Design -
TITLE : Country Road Estate -
DATE: 20/01/2025

ERSCON CONSULTING ENGINEERS

Time of concentration Calculation
(Using Bransby-Williams' Equation)

Proportionality Factor P= 58 (for Ha)

Length of Flow Path L= 2.450 km
Top of Catchment (RL) RL = 428.35 m
Area of Catchment A = 140.53 Ha

Catchment Profile 399 [to utilise graph area better]

Chainage	RL	RL	Area under Graph (m²)
0	399.495	0.495	-----
30	399.732	0.732	18
40	400.3	1.3	10
642	402.8	3.8	1535
1588	411.35	12.35	7639
2021	417.35	18.35	6647
2239	421.85	22.85	4491
2370	427.1	28.1	3337
2433	428.097	29.097	1802
2453	428.35	29.35	584

Average Slope Calculation	
Outlet Chainage	0
Catchment length	2450
Outlet RL	0
Top RL (Av Slope)	20.8

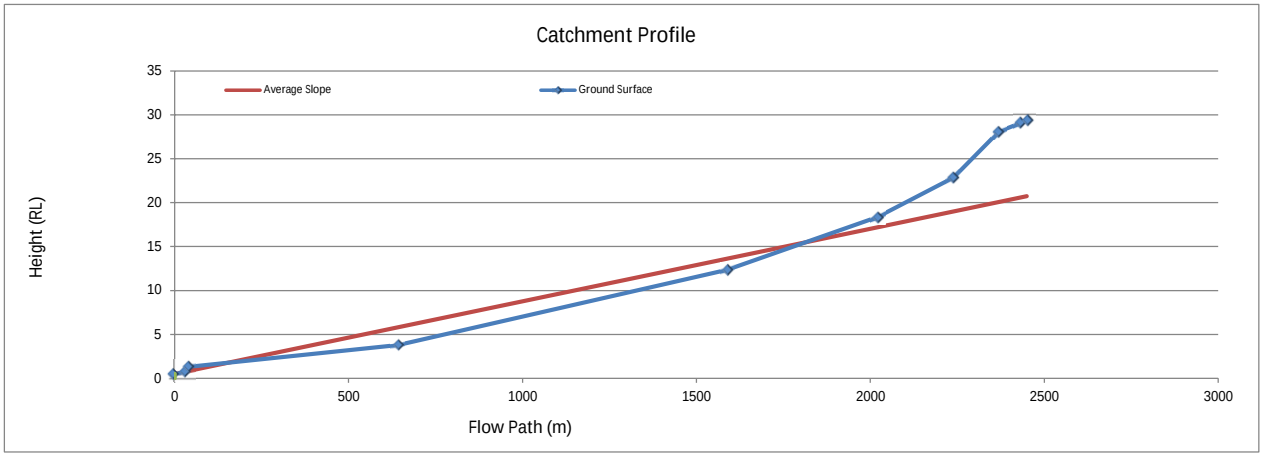
$$Tc = \frac{P \times L}{(A \wedge 0.1) \times (S \wedge 0.2)}$$

Tc = 90.0 min

Adopted Tc 90.0 min

Total area under graph **26063** m^2
Area below outlet level 1214 m^2
Area above outlet 24849 m^2

Height for average slope 20.26 m
Average Slope S = 0.8 %

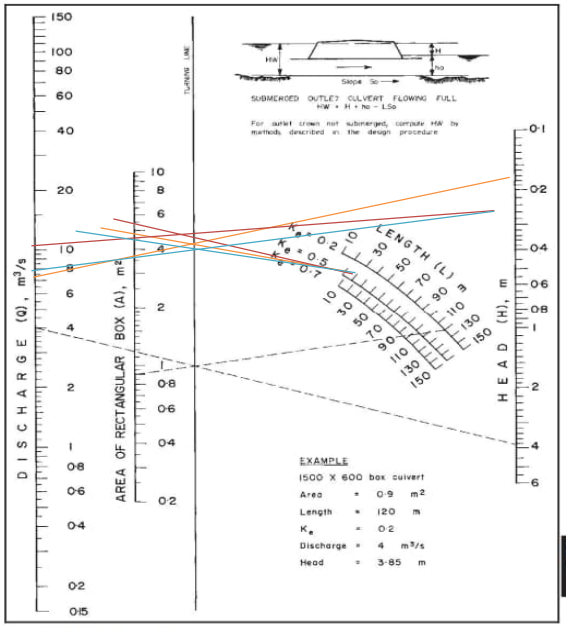


Flow Calculation for Upstream Catchment

Catchment 1

Fraction Impervious = f_i = 0.2 Table Below (QUDM Table 4.5.1)
1 hour @ 10 year ARI = $^{1}I_{10}$ = 63.5 mm/hr (IFD CHARTS)
C_{10} = 0.65 (QUDM Table 4.5.3)

AEP		63%	39%	18%	10%	5%	2%	1%		
Design ARI		**1**	**2**	**5**	**10**	**20**	**50**	**100**		
Frequency Factor	F_Y	0.8	0.85	0.95	1	1.05	1.15	1.2		(QUDM Table 4.5.2)
Coefficient of Discharge	C_Y	0.52	0.5525	0.6175	0.65	0.6825	0.7475	0.78		(QUDM Equation 4.3)
Time of Concentration	T_C	90	90	90	90	90	90	90	min	
Rainfall Intensity	$^{90min}I_{10}$	28.0	31.5	42.0	48.7	54.9	62.8	68.5	mm/hr	(IFD CHARTS)
Area	A	140.53	140.53	140.53	140.53	140.53	140.53	141	Ha	
Path A Flow		**5.68**	**6.79**	**10.12**	**12.36**	**14.63**	**18.32**	**20.86**	**m^3/s**	
Velocity		**2.061**	**2.213**	**2.596**	**2.812**	**3.009**	**3.292**	**3.467**	**m/s**	Taken from ERSCON Super Drain Table
Height		**0.510**	**0.568**	**0.722**	**0.814**	**0.900**	**1.031**	**1.114**	**m**	



Note: Q is Discharge per culvert cell

9A-5 Outlet Control - Head for concrete box culverts flowing full (n=0.012)

Hw=H+ho-LSo

where	Hw = 2.8	2.8
	ho = 1.8	1.8
	L = 30m	30
	So = 0.8%	0.008

H= Hw - (ho+Lso)

H **0.76 m**

K = V2/1296a

Where	K=	Length of VC
	a=	0.05 g (vertical accelration)
	V=	40 km/h

K= **24.7 m**

Q10

Given	Q10 discharge	12.36	m³/s
	Head (H)	0.2	m
	Length	30	m

Where Ke : 0.5 Entry Loss co-efficent (assume 0.5 if unknown) (see 10.8 QUDM)

	No. of Cells	2	No	
	Q10/ Cell	6.18	m³/s/cell	
Cell 1	Area of RCBC =	4.10	m²	(from 9A-5 on graph)
Where	Height =	1.50	m	(Given - road height above invert less min. pavement and roof slab)
	Width =	2.73	m²	

Therefore use **2 No** **2700 x 1500**

Q50

Given	Q100 discharge	18.32	m³/s
	Head (H)	0.3	m
	Length	30	m

Where Ke : 0.5 Entry Loss co-efficent (assume 0.5 if unknown) (see 10.8 QUDM)

	No. of Cells	2	No	
	Q50/ Cell	9.2	m³/s/cell	
Cell 1	Area of RCBC =	4.90	m²	(from 9A-5 on graph)
Where	Height =	1.80	m	(Given - road height above invert less min. pavement and roof slab)
	Width =	2.72	m	

Therefore use **2 No** **2700 x 1800**

Q100

Given	Q100 discharge	20.86	m³/s
	Head (H)	0.3	m
	Length	30	m

Where Ke : 0.5 Entry Loss co-efficent (assume 0.5 if unknown) (see 10.8 QUDM)

	No. of Cells	3	No	
	Q100/ Cell	7.0	m³/s/cell	
Cell 1	Area of RCBC =	3.80	m²	(from 9A-5 on graph)
Where	Height =	1.80	m	(Given - road height above invert less min. pavement and roof slab)
	Width =	2.11	m	

Therefore use **3 No** **2100 x 1800**

APPENDIX E

Hydraulic Analysis

Q5 STORMWATER CALCULATIONS

		tc	I	C	A	(CxA)	Q	Qa			Wf	dg	Vg	dg.Vg			Qg	Qb		tc	I	(CxA)	Qrat	Qrc	Qb(net)	Qo	L	S		V	Vt		S/Do	Qg/Qo	Du/Do	V2/2g	Ku	hu	Kw	hw	Sf	hf	dn	Vn						
STRUCTURE NO.	DRAIN SECTION	SUB-CATCHMENT TIME OF CONCENTRATION	RAINFALL INTENSITY	COEFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	TOTAL CONTRIBUTING EQUIVALENT AREA	SUB-CATCHMENT DISCHARGE	FLOW IN K & C (INCLUDING BYPASS)	ROAD GRADE AT INLET	ROAD XFALL AT INLET	FLOW WIDTH	FLOW DEPTH AT INVERT	GUTTER FLOOD VELOCITY	VELOCITY-DEPTH	STRUCTURE TYPE	INLET CAPACITY CURVE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE NO.	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	TOTAL CONTRIBUTING EQUIVALENT AREA	TOTAL PEAK FLOW	HALF ROAD CAPACITY	NET BYPASS FLOW	FLOW IN PIPE	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS	FULL-PIPE FLOW VELOCITY	PIPE TRAVEL TIME VELOCITY	1/2D Ku / Kw CHART IDENTIFIERS	SUBMERGENCE RATIO	FLOW RATIO	DIAMETER RATIO	VELOCITY HEAD	U/S PRESSURE HEAD CHANGE COEFFICIENT	CHANGE IN U/S PRESSURE HEAD	W.S.E. COEFFICIENT	CHANGE IN W.S.E.	PIPE FRICTION SLOPE	PIPE FRICTION TOTAL HEAD LOSS	DEPTH	VELOCITY	PIPE U/S INVERT LEVEL	PIPE D/S INVERT LEVEL	PIPE U/S H.G.L.	PIPE D/S H.G.L.	W.S.E.	SURFACE OR K & C INVERT LEVEL	FREEBOARD	STRUCTURE NO.
		min	mm/hr		ha	ha	m3/s	m3/s	%	%	m	m	m/s	m2/s			m3/s	m3/s		min	mm/hr	ha	m3/s	m3/s	m3/s	m3/s	m	%	mm	m/s	m/s						m			m	%	m	m	m/s	m	m	m	m	m	m	m	
2/11															HW OUT																																			400.613	401.085		2/11
1/11	1/11 to 2/11	15	115	0.677	140.000	94.799	30.230	30.230							HW IN		30.23			15	115	94.799	30.230			30.230	25.550	0.59	(2x)2700x1500	3.73	3.62	Inlet Control	1.16			0.273	2.44	0.664		0.664		0.108	0.891	6.28	399.500	399.350	400.571	400.613	401.235	401.235		1/11
2-12	2-12 to 1-12	5	156	0.677	0.205	0.139	0.060	0.060							AL4D		0.06			5	156	0.139	0.060			0.060	22.180	1.13	900	0.12	3.4	G2	1.01	1		0.001	9.7	0.007		0.007	1.26	0.232	0.109	1.37	400.400	400.150	400.539	400.259	400.546	401.641	1.10	2-12
1-12															HW OUT																																	400.259	400.800		1-12

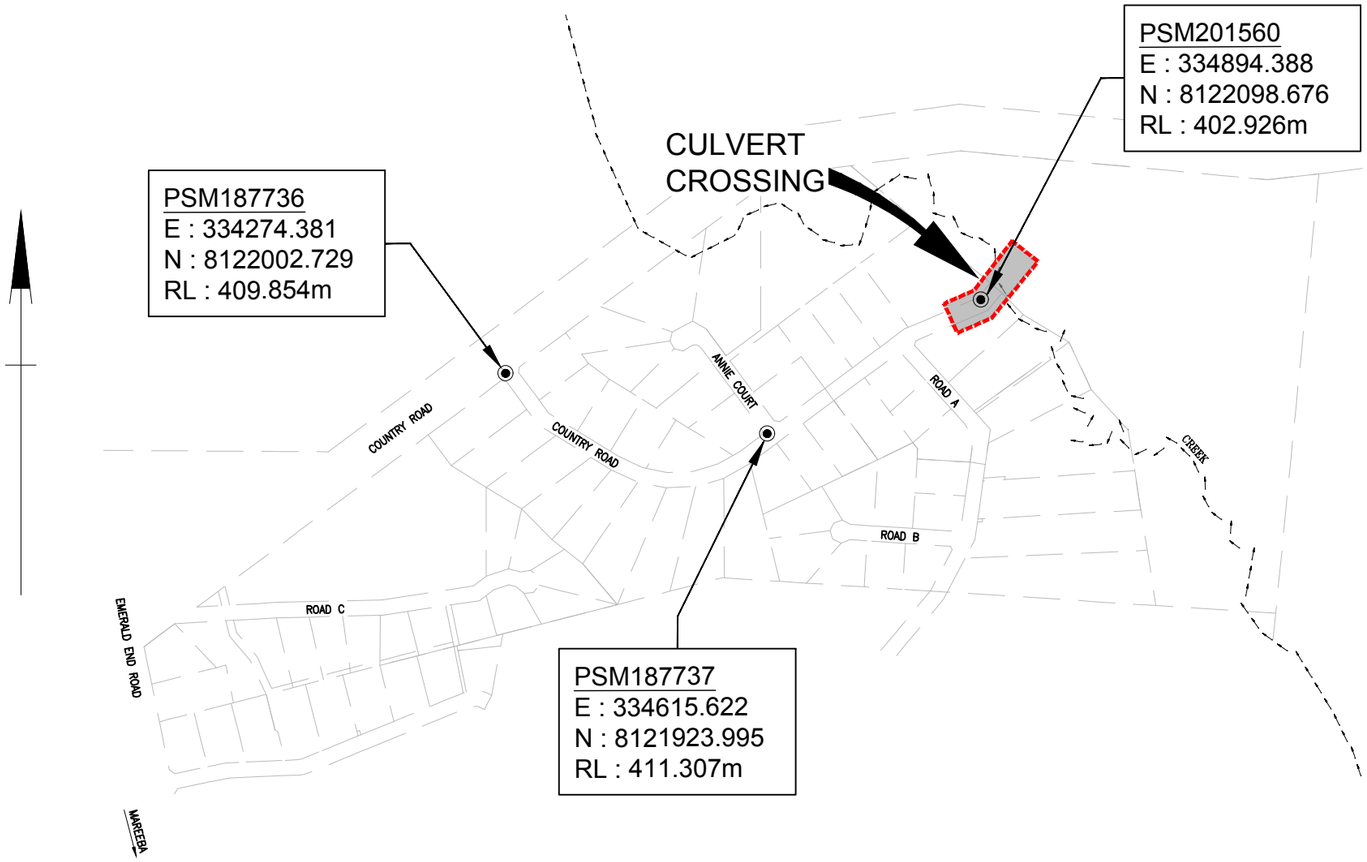
Q50 STORMWATER CALCULATIONS

		tc	I	C	A	(CxA)	Q	Qa			Wf	dg	Vg	dg.Vg			Qg	Qb		tc	I	(CxA)	Qrat	Qrc	Qb(net)	Qo	L	S		V	Vt		S/Do	Qg/Qo	Du/Do	V2/2g	Ku	hu	Kw	hw	Sf	hf	dn	Vn								
STRUCTURE NO.	DRAIN SECTION	SUB-CATCHMENT TIME OF CONCENTRATION	RAINFALL INTENSITY	COEFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	TOTAL CONTRIBUTING EQUIVALENT AREA	SUB-CATCHMENT DISCHARGE	FLOW IN K & C (INCLUDING BYPASS)	ROAD GRADE AT INLET	ROAD XFALL AT INLET	FLOW WIDTH	FLOW DEPTH AT INVERT	GUTTER FLOOD VELOCITY	VELOCITY-DEPTH	STRUCTURE TYPE	INLET CAPACITY CURVE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE NO.	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	TOTAL CONTRIBUTING EQUIVALENT AREA	TOTAL PEAK FLOW	HALF ROAD CAPACITY	NET BYPASS FLOW	FLOW IN PIPE	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS	FULL-PIPE FLOW VELOCITY	PIPE TRAVEL TIME VELOCITY	12D Ku / Kw CHART IDENTIFIERS	SUBMERGENCE RATIO	FLOW RATIO	DIAMETER RATIO	VELOCITY HEAD	U/S PRESSURE HEAD CHANGE COEFFICIENT	CHANGE IN U/S PRESSURE HEAD	W.S.E. COEFFICIENT	CHANGE IN W.S.E.	PIPE FRICTION SLOPE	PIPE FRICTION TOTAL HEAD LOSS	DEPTH	VELOCITY	PIPE U/S INVERT LEVEL	PIPE D/S INVERT LEVEL	PIPE U/S H.G.L.	PIPE D/S H.G.L.	W.S.E.	SURFACE OR K & C INVERT LEVEL	FREEBOARD	STRUCTURE NO.
		min	mm/hr		ha	ha	m3/s	m3/s	%	%	m	m	m/s	m2/s			m3/s	m3/s		min	mm/hr	ha	m3/s	m3/s	m3/s	m3/s	m	%	mm	m/s	m/s					m		m		m	%	m	m	m/s	m	m	m	m	m	m	m	
2/11															HW OUT																																		400.850	401.085		2/11
1/11	1/11 to 2/11	15	167	1.000	140.000	140.000	64.944	64.944							HW IN		64.944			15	167	140.000	64.944			64.944	25.55	0.59	(2x)2700x1500	8.02	3.62	Outlet Control	1.16			0.23	1.82	0.418		0.418		0.035	0.839	14.3	399.500	399.350	400.817	400.850	401.235	401.235		1/11
2-12	2-12 to 1-12	5	225	1.000	0.205	0.205	0.128	0.128							AL4D		0.128			5	225	0.205	0.128			0.128	22.18	1.13	900	0.26	3.4	G2	1.04	1		0.003	9.7	0.034		0.034	1.34	0.218	0.158	1.72	400.400	400.150	400.604	400.308	400.638	401.641	1.003	2-12
1-12															HW OUT																																		400.308	400.800		1-12

CONMAT PTY. LTD.

COUNTRY ROAD ESTATE

COUNTRY ROAD CULVERT CROSSING



CIVIL DRAWINGS LIST

160-012-C101	COVER SHEET, LOCALITY PLAN AND DRAWINGS LIST
160-012-C102	GENERAL NOTES
160-012-C103	CULVERT PLAN
160-012-C104	COUNTRY ROAD LONGITUDINAL SECTION
160-012-C105	COUNTRY ROAD CROSS SECTIONS (SHEET 1 OF 3)
160-012-C106	COUNTRY ROAD CROSS SECTIONS (SHEET 2 OF 3)
160-012-C107	COUNTRY ROAD CROSS SECTIONS (SHEET 3 OF 3)
160-012-C108	TYPICAL ROAD CROSS SECTION AND DETAILS
160-012-C109	EROSION AND SEDIMENT CONTROL PLAN
160-012-C110	EROSION AND SEDIMENT CONTROL NOTES

STRUCTURAL DRAWINGS LIST

160-012-S101	WORKPLACE HEALTH AND SAFETY NOTES
160-012-S102	STRUCTURAL ENGINEERING NOTES SHEET 1 OF 2
160-012-S103	STRUCTURAL ENGINEERING NOTES SHEET 2 OF 2
160-012-S110	CULVERT SITE PLAN
160-012-S111	TYPICAL CULVERT SECTION A
160-012-S112	CULVERT DETAILS SHEET 1 OF 2
160-012-S113	CULVERT DETAILS SHEET 2 OF 2
160-012-S120	CULVERT PRECAST DECK PANELS P1-P6 & P9-P11
160-012-S121	CULVERT PRECAST DECK PANEL P7
160-012-S122	CULVERT PRECAST DECK PANEL P8
160-012-S123	CULVERT PRECAST HEAD WALL W4
160-012-S130	STORMWATER PIT

Client:

CONMAT
CONSTRUCTION MATERIALS

Prepared by:

ERSCON
CONSULTING ENGINEERS

FOR COUNCIL APPROVAL

PRINT IN COLOUR 160-012-C101 REV 1

GENERAL NOTES:

1. LEVEL DATUM : AHD
2. ORIGIN OF LEVELS: (GDA2020 ZONE 55):

NUMBER	EASTING	NORTHING	RL	LOCATION
PSM187736	334274.381	8122002.729	409.854m	COUNTRY ROAD, MAREEBA
PSM187737	334615.622	8121923.995	411.307m	COUNTRY ROAD, MAREEBA
PSM201560	334894.388	8122098.676	402.926m	COUNTRY ROAD, MAREEBA

3. EXISTING CONDITIONS HAVE BEEN BASED ON SURVEY DATA COLLECTED BY TWINE SURVEYORS. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF THE INFORMATION SHOWN.
4. THE CONTRACTOR IS TO LIAISE WITH TWINE SURVEYS TO ESTABLISH SITE SURVEY CONTROLS.
5. DETAILS OF SERVICES ARE PROVIDED FOR INFORMATION ONLY, AND NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION. POSITIONS OF SERVICE CROSSINGS SHALL BE RECORDED AND CHECKED BY THE CONTRACTOR. NOT ALL CROSSINGS HAVE NECESSARILY BEEN SHOWN ON THE DRAWINGS. THE CONTRACTOR IS TO CHECK SERVICES ON SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
6. FOR ALL SPECIFICATIONS REFER TO FNQROC STANDARD SPECIFICATIONS.
7. INSPECTION AND TEST PLANS ARE TO BE UNDERTAKEN BY CONTRACTOR IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.
8. AS CONSTRUCTED DATA TO BE PREPARED AND SUBMITTED BY THE CONTRACTOR IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.

EARTHWORKS NOTES:

1. ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S1 'EARTHWORKS'.
2. FNQROC SPECIFICALLY REFERENCES AS 3798 'GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS' IN RELATION TO ALL EARTHWORK OPERATIONS INCLUDING APPROPRIATE METHODS OF TESTING, FREQUENCY OF TESTING AND REPORTING PROCEDURES. GEOTECHNICAL TESTING SERVICES SHALL BE AS DETERMINED BY LEVEL 1 IN ACCORDANCE WITH AS 3798. ALL CERTIFICATION AND TEST RESULTS ARE TO BE COMPILED AND PROVIDED TO THE SUPERINTENDENT PRIOR TO WORKS ACCEPTANCE.
3. ALL BATTERS SHALL BE 1 IN 3 MAX UNLESS NOTED OTHERWISE ON THE PROJECT DRAWINGS.
4. FINISHED SURFACE LEVELS SHOWN ON PROJECT DRAWINGS ARE AFTER ALL EARTHWORKS ARE COMPLETE INCLUDING TOPSOILING. ALL AREAS ARE TO BE GRADED EVENLY BETWEEN FINISHED SURFACE LEVELS UNLESS NOTED OTHERWISE.
5. DRY DENSITY RATIO AS REFERRED TO IN THESE NOTES IS THE RATIO DETERMINED IN ACCORDANCE WITH AS1289.5.4.1 OF COMPACTED DRY DENSITY IN ACCORDANCE WITH AS1289.5.3.1 OR AS1289.5.8.1 TO THE STANDARD MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1259.5.1.11 (STANDARD COMPACTION).
6. NO VEGETATION SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE SUPERINTENDENT UNLESS NOTED ON THE PROJECT DRAWINGS.
7. ALL VEGETAL MATTER, TOPSOIL AND OTHER UNSUITABLE MATERIAL SHALL BE STRIPPED/REMOVED FROM AREAS TO BE EXCAVATED OR FILLED. ALL VEGETAL MATTER AND UNSUITABLE MATERIAL SHALL BE DISPOSE OF OFF–SITE UNLESS ADVISED OTHERWISE BY THE SUPERINTENDENT. TOPSOIL SHALL BE STOCKPILED ON–SITE FOR REUSE. SURPLUS TOPSOIL SHALL BE DISPOSED OF OFF–SITE.
8. SHOULD ANY SOFT OR UNSUITABLE MATERIAL BE IDENTIFIED, THE CONTRACTOR SHALL INFORM THE SUPERINTENDENT IMMEDIATELY AND SEEK THE ADVICE OF THE SUPERINTENDENT OR GITA.
9. COMPACT FILL TO 95% DRY DENSITY RATIO IN LAYERS OF THICKNESS APPROPRIATE TO THE COMPACTION PLANT EMPLOYED BT NOT EXCEEDING 300mm.
10. ROAD VERGE SHALL BE FULLY TURFED ON COMPLETION OF TOPSOILING. ELSEWHERE, DISTURBED AREAS 1:3 OR FLATTER SHALL BE GRASS SEEDED AND AREAS STEEPER THAN 1:3 SHALL BE HYDROMULCHED (UNLESS NOTED OTHERWISE).

CONCRETE NOTES:

1. ALL CONCRETE WORKS INCLUDING SUPPLY, PLACEMENT, COMPACTION, REINFORCEMENT AND FINISHING SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S7 CONCRETE WORKS.

DRAINAGE NOTES:

1. ALL STORMWATER DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S4 'STORMWATER DRAINAGE'.
2. ALL KERB INLET PITS TO BE CONSTRUCTED IN ACCORDANCE WITH FNQROC STD DRG'S S1050 AND S1060.

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO CONSTRUCTION COMMENCING, THE CONTRACTOR MUST PREPARE AN EROSION & SEDIMENT CONTROL PLAN (ESCP) TO MANAGE THE SITE DURING CONSTRUCTION AND THE DEFECT LIABILITY PERIOD.
2. THE ESCP MUST BE CONSISTENT WITH THE APPROVED EROSION & SEDIMENT CONTROL STRATEGY (ESCS) AND SHALL TAKE INTO CONSIDERATION THE CONTRACTOR'S PROPOSED CONSTRUCTION METHODOLOGY AND PROGRAM.
3. AN ESCP THAT DIFFERS TO THE APPROVED ESCS MUST BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO SUBMITTING TO COUNCIL.
4. NO EARTHWORKS SHALL COMMENCE ON ANY PART OF THE SITE PRIOR TO APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES BEING INSTALLED DOWNSTREAM OF THE SITE AND IN ACCORDANCE WITH THE APPROVED ESCP.
5. AT ALL TIMES THE CONTRACTOR SHALL MONITOR THE PREVAILING WEATHER CONDITIONS AND TAKE ALL NECESSARY PRECAUTIONS TO CONTROL EROSION AND DOWNSTREAM SEDIMENTATION DURING ALL STAGES OF CONSTRUCTION.
6. THE IMPACT ON THE ENVIRONMENT SHALL BE MINIMISED BY OBSERVING THE FOLLOWING CONSTRUCTION PRACTICES:
   - AREAS DISTURBED BY CONSTRUCTION TRAFFIC AND PROCEDURES SHALL BE MINIMISED.
   - MINIMISE TRAFFIC MOVEMENTS AND SPEEDS ON EXPOSED SURFACES.
   - REVEGETATION OF DISTURBED AREAS SHALL BE CARRIED OUT SOON AFTER THE COMPLETION OF TOPSOIL PLACEMENT.
   - FLOW DIVERSION SHALL BE CARRIED OUT BY EARLY INSTALLATION OF DRAINS ALONG TOPS OF BATTERS WITH APPROPRIATE SILTATION CONTROL DEVICES.
   - SEDIMENT INTERCEPTION BY THE PLACEMENT OF SUITABLE RETENTION SYSTEMS ACROSS DRAINAGE LINES AND AT INTERCEPTION POINTS FOR BOTH THE CONSTRUCTION AND STOCKPILE AREAS.
4. ALL ACCESS TO AND FROM THE SITE SHALL BE VIA A TEMPORARY CONSTRUCTION ENTRY/EXIT. THE CONTRACTOR SHALL NOMINATE A PROPOSED ACCESS LOCATION ON THE ESC PLAN FOR APPROVAL BY THE SUPERINTENDENT.
5. STOCKPILES SHALL ONLY BE LOCATED IN AREAS NOMINATED ON THE PROJECT DRAWINGS OR APPROVED BY THE SUPERINTENDENT. ALL STOCKPILES MUST HAVE APPROPRIATE ESC MEASURES INSTALLED TO PREVENT SEDIMENT TRANSPORT. THE MAXIMUM HEIGHT OF ALL STOCKPILES MUST BE LIMITED TO 2.0m
6. ALL PERMANENT AND TEMPORARY UNLINED SWALES AND DRAINS MUST HAVE APPROPRIATE TEMPORARY EROSION PROTECTION.
7. ALL PARTIALLY CONSTRUCTED DRAINAGE STRUCTURES MUST BE PROTECTED AGAINST SEDIMENT INFILTRATION DURING CONSTRUCTION.
8. ALL COMPLETED DRAINAGE STRUCTURES MUST BE PROTECTED AGAINST SEDIMENT INFILTRATION UNTIL GRASSING IS ESTABLISHED.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE CONTROL OF DUST EMANATING FROM THE SITE AT ALL TIMES FOR THE DURATION OF CONSTRUCTION. WET SUPPRESSION METHODS TO BE USED.
10. ALL EROSION AND SEDIMENT CONTROL MEASURES MUST BE CHECKED FOR DAMAGE, CLEANED OUT AND FULLY REINSTATED AFTER EACH RAINFALL EVENT RESULTING IN RUNOFF.
11. IF EROSION AND SEDIMENT CONTROL DEVICES HAVE BEEN FOUND TO BE DEFICIENT OR FAILED IN SERVICE, DUE TO UNFORESEEN CIRCUMSTANCES, CORRECTIVE ACTION IS TO BE UNDERTAKEN IMMEDIATELY WHICH MAY INCLUDE AMENDMENTS/ADDITIONS TO THE ORIGINAL APPROVED EROSION CONTROL PLANS.
12. THE INSTALLATION, REMOVAL, RELOCATION OR MODIFICATION TO EROSION AND SEDIMENT CONTROL DEVICES MAY BE MADE BY COUNCIL IF DEEMED NECESSARY AND RELEVANT.
13. EROSION AND SEDIMENT CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE TREATMENT AREA IS SUITABLY STABILISED/VEGETATED.
14. THE CONTRACTOR SHALL UNDERTAKE A FORMAL COMPLIANCE AUDIT OF THE ESC AT SIX WEEKS INTERVALS DURING THE CONSTRUCTION PERIOD OF THE PROJECT. RECORDS OF THE AUDIT SHALL BE RETAINED ON SITE. WHERE IDENTIFIED AS PART OF THE AUDIT THE ESCP SHALL BE UPDATED AND PROVIDED TO THE SUPERINTENDENT.

COUNTRY ROAD CENTRELINE

CHAINAGE	EASTING	NORTHING	BEARING	LENGTH	RADIUS
260.000	334875.023	8122083.792	61°34'43.10"		
TC 274.074	334887.978	8122089.292	61°34'43.10"		
IP 283.498	334896.816	8122093.044		18.848	–39.997
CT 292.922	334902.989	8122100.400	39°59'54.50"		
300.538	334907.861	8122106.207	39°59'54.50"		

WATER NOTES:

1. ALL WATER RETICULATION WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S5 'WATER RETICULATION'.
2. ALL PVC AND PE PIPES SHALL BE CLASS PN16. PVC PIPES SHALL BE RUBBER RING JOINTED AND DUCTILE IRON COMPATIBLE.
3. FOR MAIN TRENCHING, BEDDING & ANCHORAGE DETAILS REFER FNQROC STD DRAWINGS S2015 & S2016. ENSURE COVER TO WATER MAINS IS 800mm MINIMUM UNDER ROADWAYS AND 600mm MINIMUM ELSEWHERE.
4. ALL WATER MAINS SHALL BE INSTALLED ON A STANDARD 2.0m OFFSET FROM THE PROPERTY BOUNDARY UNLESS NOTED OTHERWISE ON PLANS.
5. WHERE NON–METALLIC PIPES ARE LAID, A CONTINUOUS STEEL WIRE, 1.6mm MIN DIAMETER, SHALL BE LAID IMMEDIATELY ABOVE THE FILL SAND TO ASSIST IN FUTURE LOCATING. THIS WIRE IS TO BE WRAPPED ONCE AROUND ALL HYDRANTS AND VALVES.
6. COUNCIL MUST BE CONTACTED TO PERFORM ANY DIRECT CONNECTION OR ALTERATION TO LIVE WATER MAINS. THE CONTRACTOR SHALL LODGE WITH COUNCIL THE APPROPRIATE APPLICATION FORMS AND FEES FOR THESE WORKS TO BE COMPLETED. IT MAY BE POSSIBLE FOR SOME WORKS TO BE PERFORMED BY THE CONTRACTOR UNDER SPECIAL CIRCUMSTANCES AND SUBJECT TO APPROPRIATE CONDITIONS AGREED TO WITH COUNCIL.
7. ALL HYDRANTS AND VALVES TO BE LOCATED OPPOSITE PROPERTY BOUNDARY TRUNCATIONS AND CORNERS, UNLESS NOTED OTHERWISE ON PLANS. FOR VALVES & HYDRANT BOXES INSTALLATION DETAILS REFER FNQROC STD DRAWINGS S2000 AND S2005.
8. HYDRANTS OR VALVES CONSTRUCTED IN CONCRETE ARE TO HAVE A COMPRESSIBLE LAYER (ABLEFLEX) INSTALLED ON THE SURROUND. REFER FNQROC STD DRAWING S2000.
9. THE MINIMUM TEST PRESSURE FOR ALL PIPES SHALL BE 1250 KPa. THE CONTRACT SHALL GIVE COUNCILS WATER OFFICER 24 HOURS NOTICE PRIOR TO TESTING. PERIOD.

LANDSCAPING NOTES:

1. ALL LANDSCAPING WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT FNQROC DEVELOPMENT MANUAL SPECIFICATION – S8 'LANDSCAPING'.
2. ALL PLANTS MUST BE ORDER SUPPLIED BY A REPUTABLE NURSERY, AND ORDERED WELL IN ADVANCE TO ENSURE AVAILABILITY.
3. TURF TO BE USED SHALL BE ROLLED B GRADE TURF MIX OF SPECIES 80% BUFFALO GRASS (AXONOPUS COMPRESSUS) AND 20% COUCH GRASS VARIETIES.
4. STREET TREES SHALL BE PROVIDED WHERE INDICATED ON PLAN. FINAL LOCATION TO BE DETERMINED ON SITE FOLLOWING INSTALLATION OF DRIVEWAYS AND CONFIRMATION OF SITE SERVICES
5. STREET TREES FINAL LOCATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING:
   a. GREATER THAN 4.0m FROM ELECTRICITY OR TELECOMMUNICATION POLES OR PILLARS.
   b. GREATER THAN 7.5m FROM STREET LIGHTS
   c. GREATER THAN 2.0m FROM STORMWATER DRAINAGE PITS
   d. GREATER THAN 3.0m FROM DRIVEWAYS
   e. A MINIMUM OF 0.8m AND A MAXIMUM OF 1.0m FROM THE BACK OF KERB
6. TEMPORARY IRRIGATION SHALL BE INSTALLED TO ENABLE WATERING DURING THE ESTABLISHMENT PERIOD.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:22/08/2025 3:52:17 PM
FILE LOCATION:X:\160 Commat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C102 NOTES.dwg

REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	14/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: NTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MG
DRAWN APPROVED	MF	DESIGN APPROVED	MF

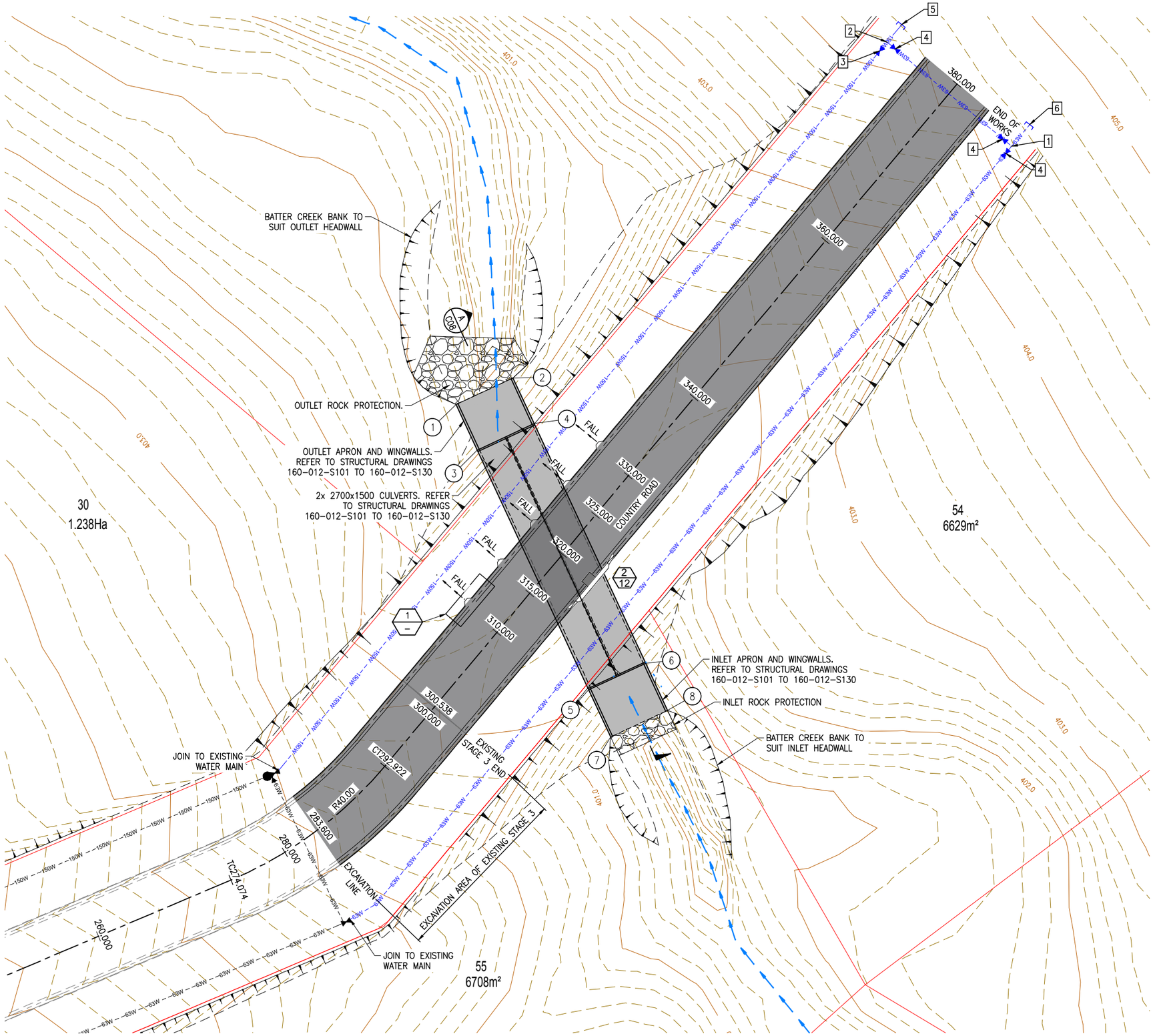
CIVIL SIGNOFF APPROVAL

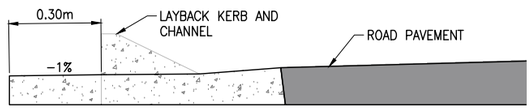
DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: GENERAL NOTES

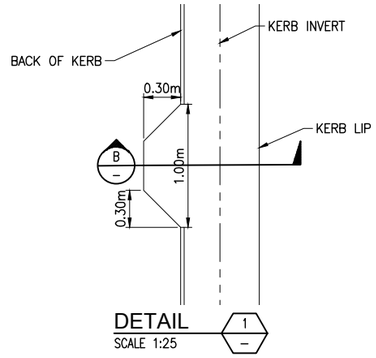
DRAWING NO: 160-012-C102 | SIZE: A3 | REVISION: 1





KERB AND CHANNEL SCUPPERS SECTION B

SCALE 1:10



DETAIL 1

SCALE 1:25

CULVERT SETOUT

POINT NO	EASTING	NORTHING	HEIGHT
1	334909.973	8122135.776	399.320
2	334915.550	8122138.369	399.320
3	334912.046	8122131.318	399.350
4	334917.623	8122133.911	399.350
5	334922.945	8122107.877	399.500
6	334928.523	8122110.471	399.500
7	334925.086	8122103.278	399.530
8	334930.662	8122105.871	399.530

WATER CONNECTIONS

1		63 x 63 x 63 D.I.C.L TEE WITH CONCRETE THRUST BLOCK.
2		150 x 150 x 63 D.I.C.L TEE WITH CONCRETE THRUST BLOCK.
3	150SV	150 DIA. SLUICE VALVE CLASS 600 M.E. COMPLETE WITH C.I. COVER BOX MARGIN AND KERB MARKER.
4	63SV	63 DIA. GATE VALVE BRASS COMPLETE WITH C.I.. COVER BOX MARGIN AND KERB MARKER.
5		150 DIA. D.I.C.L. DEAD END CAP WITH CONCRETE THRUST BLOCK.
6		63 DIA. D.I.C.L. DEAD END CAP WITH CONCRETE THRUST BLOCK.

LEGEND

- PROPERTY BOUNDARY
- TOE OF BATTER
- TOP OF BATTER
- ROAD CENTERLINE
- 1.0 MAJOR CONTOURS (1m INTERVAL)
- MINOR CONTOURS (0.2m INTERVAL)
- EXISTING WATER FLOW
- 63W 63W EXISTING ø63 uPVC WATER MAIN
- 150W 150W EXISTING ø150 uPVC WATER MAIN
- 63W 63W PROPOSED ø63 uPVC WATER MAIN (CLASS 16)
- 150W 150W PROPOSED ø150 uPVC WATER MAIN (CLASS 16)

PRINT IN COLOUR

FOR COUNCIL APPROVAL

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/03/25	REDUCED CULVERT LENGTH	MG	
1	21/01/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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1:10 0 0.1 0.2 0.3 A3
1:25 0 0.25 0.5 0.75 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	BW	DESIGNED	MF
DRAWN APPROVED	JM	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PLAN

DRAWING NO: 160-012-C103 | SIZE: A1 | REVISION: 2

PLOT DATE:22/08/2025 4:02:36 PM
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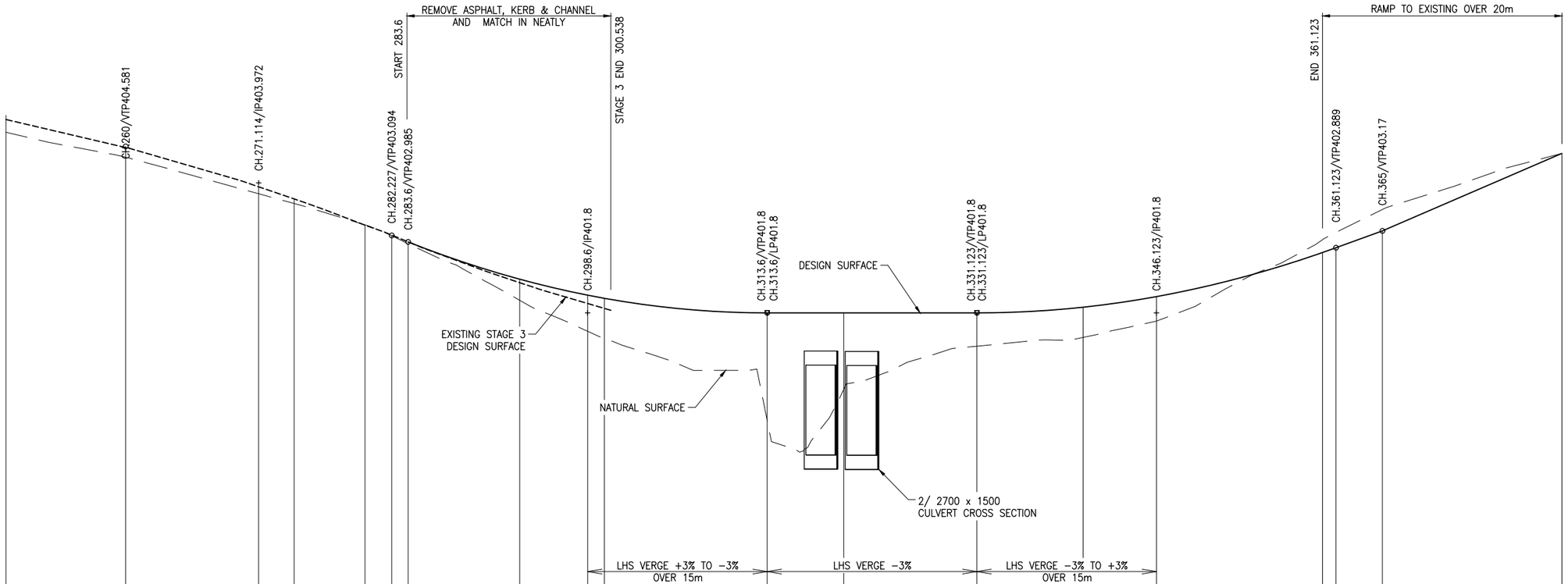

Horizontal Curve Data

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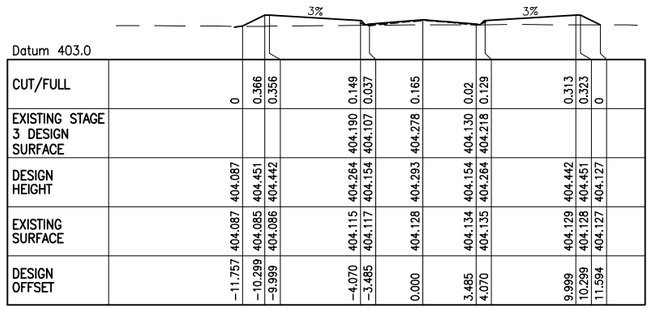

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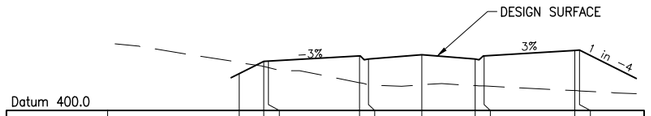

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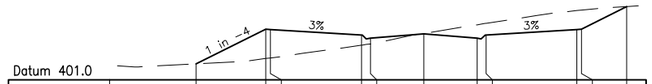
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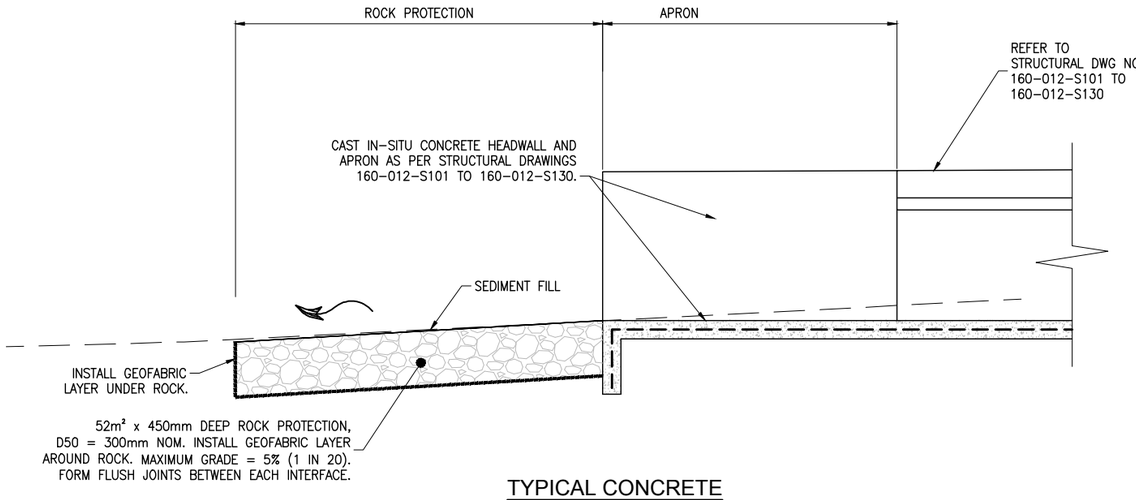
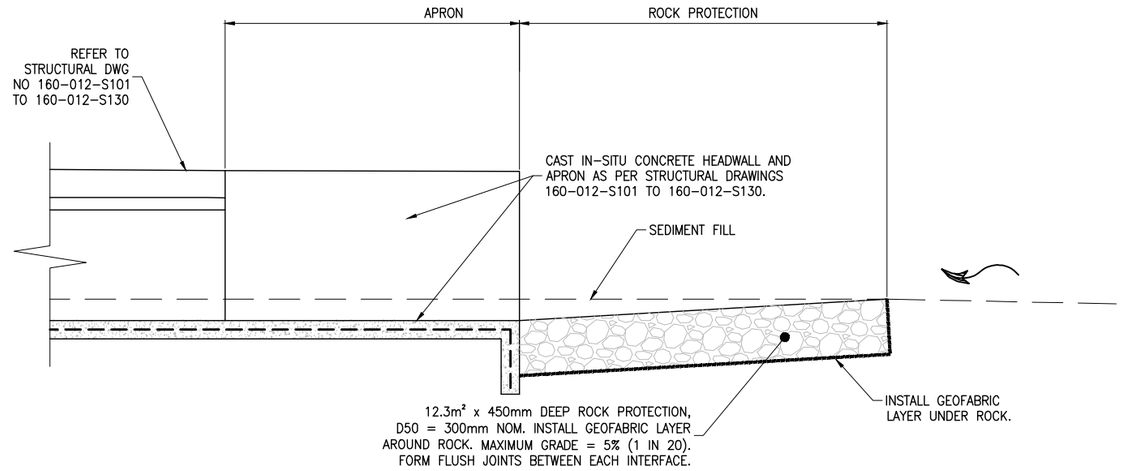


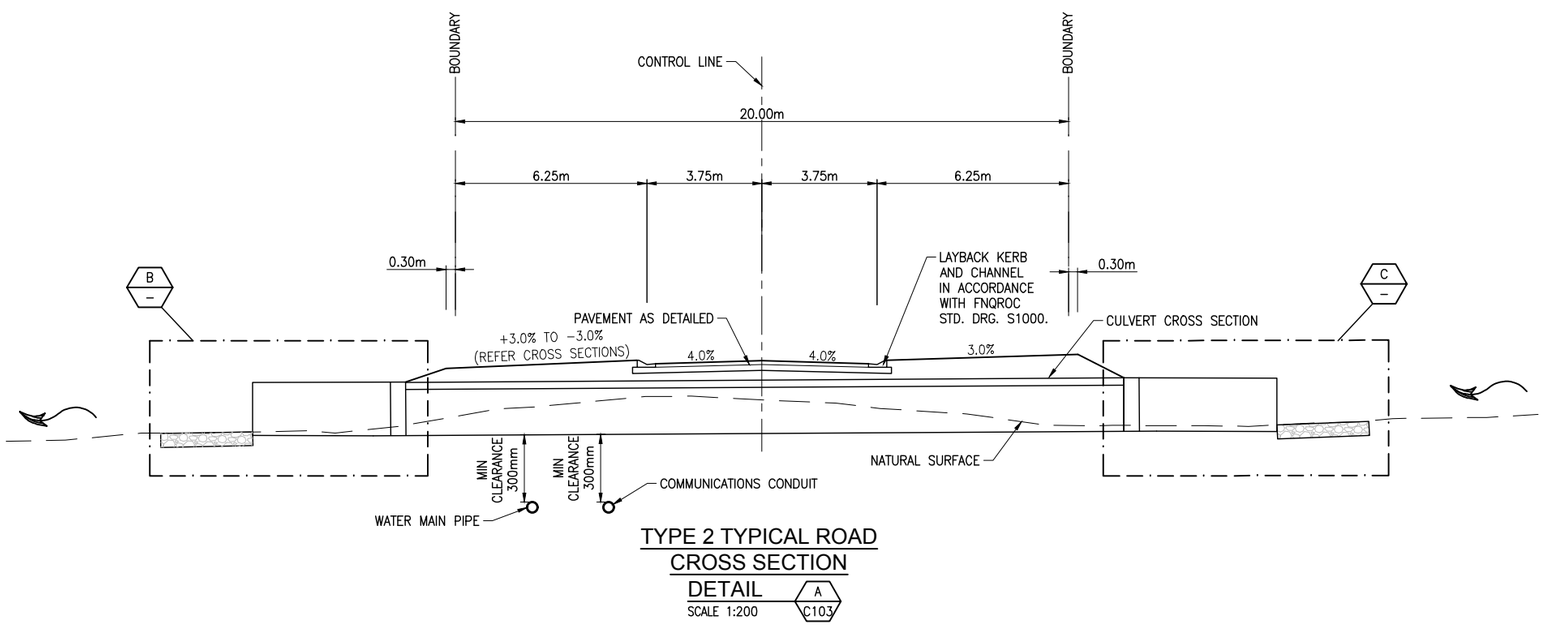
TYPICAL CONCRETE CAUSEWAY WITH CULVERT DETAIL B

SCALE 1:50



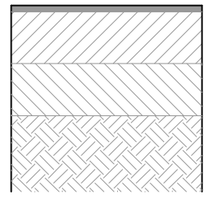
TYPICAL CONCRETE CAUSEWAY WITH CULVERT DETAIL C

SCALE 1:50



TYPE 2 TYPICAL ROAD CROSS SECTION DETAIL A

SCALE 1:200 — C103



PRIMER, PLUS 2 COAT SPRAYED BITUMEN SEAL (16mm/10mm AGGREGATE)

110mm BASE, TYPE 2.2 MINIMUM CBR 60% COMPACTED TO 100% SRDD.

140mm SUB BASE, TYPE 2.3 MINIMUM CBR 45% COMPACTED TO 100% SRDD.

SUB-GRADE CBR 7% (ASSUMED) COMPACTED TO 98% SRDD. (CBR TO BE CONFIRMED BY TAKING SAMPLES AT 100m INTERVALS, MINIMUM OF 3).

PAVEMENT DETAIL

N.T.S.

GENERAL NOTES:

1. CONCRETE CYLINDER TESTS TO BE PROVIDED FOR ALL LOTS.
2. HOLD POINTS: STEEL INSPECTION AND APPROVAL BY SUPERINTENDENT PRIOR TO ALL CONCRETE POURS.

PAVEMENT NOTES:

1. THE SUB-BASE LAYER SHALL EXTEND A MINIMUM OF 150MM BEHIND THE REAR FACE OF THE KERB AND CHANNEL.
2. THE BASE AND SURFACING SHALL EXTEND TO THE FACE OF ANY KERBING. WHERE THE TOP SURFACE OF THE SUB-BASE LAYER IS BELOW THE LEVEL OF THE UNDERSIDE OF THE KERB AND CHANNEL, THE BASE LAYER SHALL ALSO EXTEND A MINIMUM OF 150MM BEHIND THE REAR FACE OF THE KERB AND CHANNEL.
3. SUBGRADE CBR RESULTS AND FINAL PAVEMENT DESIGN ARE TO BE SUBMITTED TO COUNCIL FOR APPROVAL PRIOR TO PLACEMENT OF GRAVEL.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/03/25	REDUCED CULVERT LENGTH	MG	
1	13/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
1:200 0 1 2 3 4 5 6 A3
1:50 0 0.25 0.5 0.75 1.0 1.25 1.50 A3
ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: TYPICAL ROAD CROSS SECTION AND DETAILS

DRAWING NO: 160-012-C108

SIZE: A3

REVISION: 2

PLOT DATE:22/08/2025 4:11:49 PM
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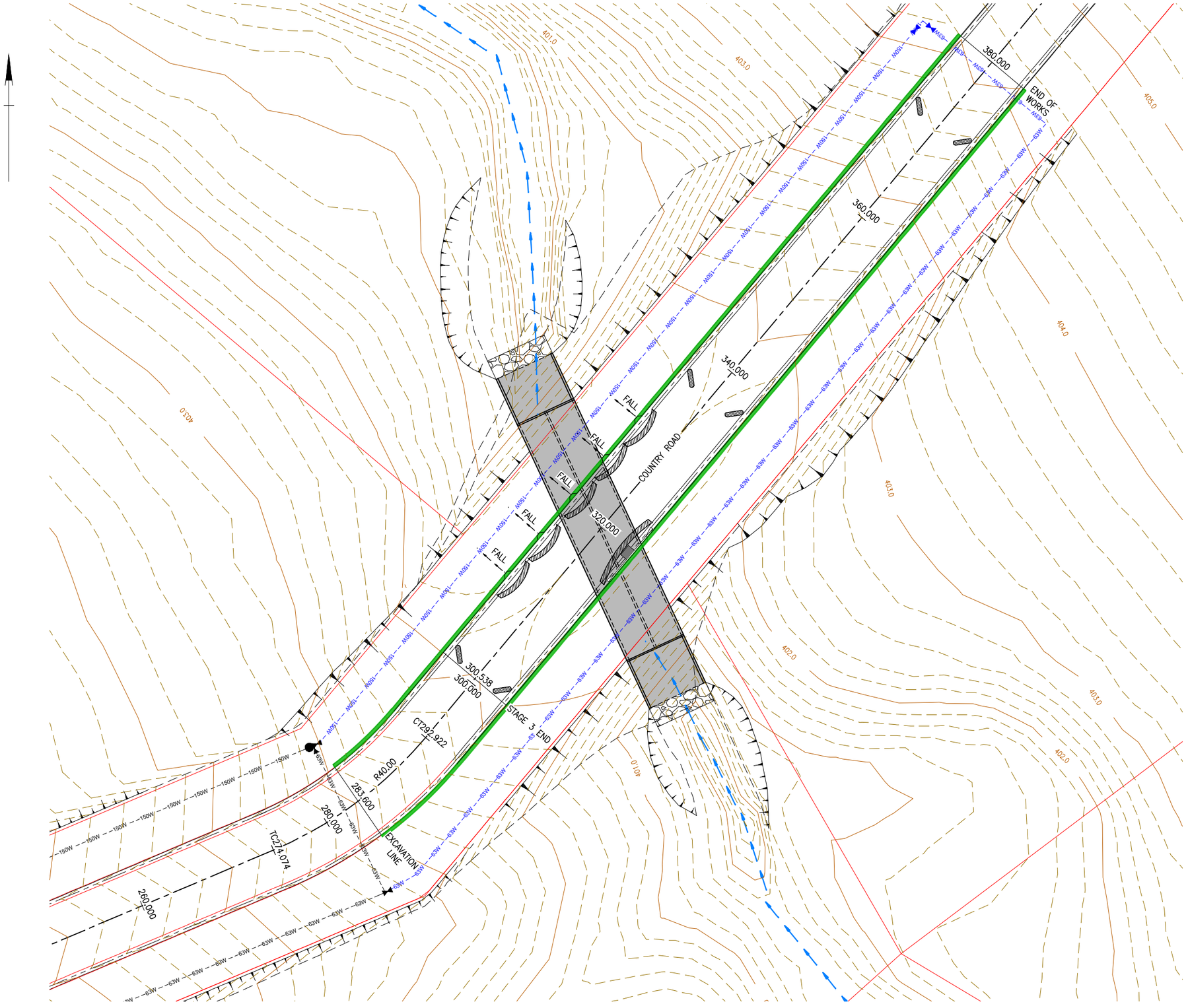


LEGEND

- PROPERTY BOUNDARY
- EXISTING WATER FLOW
- TOE OF BATTER
- TOP OF BATTER
- ROAD CENTERLINE
- 1.0 MAJOR CONTOURS (1m INTERVAL)
- MINOR CONTOURS (0.2m INTERVAL)
- 63W EXISTING Ø63 uPVC WATER MAIN
- 150W EXISTING Ø150 uPVC WATER MAIN
- 63W PROPOSED Ø63 uPVC WATER MAIN (CLASS 16)
- 150W PROPOSED Ø150 uPVC WATER MAIN (CLASS 16)
- GRATED KERB INLET PIT WITH SAND BAG SURROUND IN ACCORDANCE WITH FNQROC STD DWG S5000.
- TEMPORARY ROCK/SHAKER GRID
- PROPOSED TURF
- PROPOSED HYDROMULCH
- PROPOSED GRASS/DRILL SEED
- SEDIMENT FENCING
- ROCK FILTER DAM
- SAND BAG CHECK DAM.
- TURF BATTER CHUTE

PRINT IN COLOUR

FOR COUNCIL APPROVAL

PLOT DATE:21/08/2025 4:22:28 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C109 ESCP.dwg

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	24/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:400 0 2 4 6 8 10 12 A3

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO: 160-012-C109 | SIZE: A1 | REVISION: 1

SEDIMENT FENCE

MATERIAL

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 OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT:
WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES:
1500mm² (MIN) HARDWOOD, 2500mm² (MIN) SOFTWOOD, OR 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 BOUNDARIES;
   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 THE 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 CHECK DAM 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 ENDS 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 SITE 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 STAKES INTO THE GROUND SPACED 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 SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES 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 STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR 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 STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH THE TWO STAKES 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 25 X 12.5mm STAPLES, OR TIE WIRE AT MAXIMUM 150mm SPACING.
12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.
13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THOUGH WEIR IS INSTALLED, ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.
14. 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.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF SPILL-THROUGH WEIR

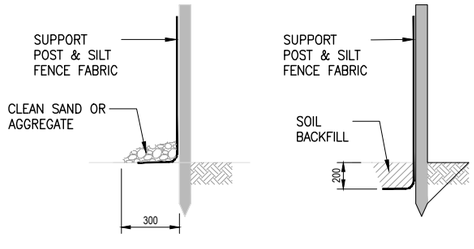
15. LOCATE THE SPILL -THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.
16. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.
17. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.
18. 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

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

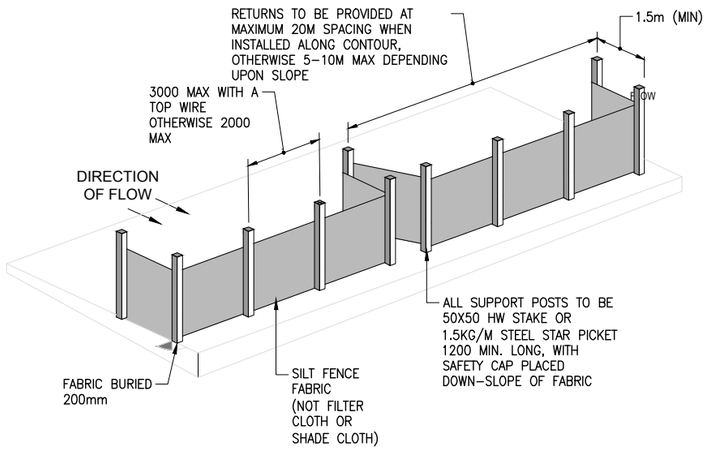
REMOVAL

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



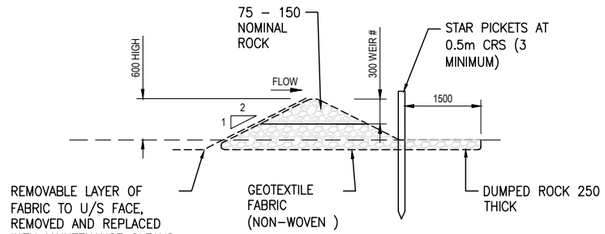
ANCHORING BASE OF FABRIC

NOT TO SCALE



SEDIMENT FENCE

NOT TO SCALE



ROCK FILTER DAM

NOT TO SCALE

MATERIALS

ROCK:
75 TO 150mm NOMINAL DIAMETER, HARD, EROSION RESISTANT ROCK.

GEOTEXTILE FABRIC:
HEAVY-DUTY, NEEDLE-PUNCHES, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

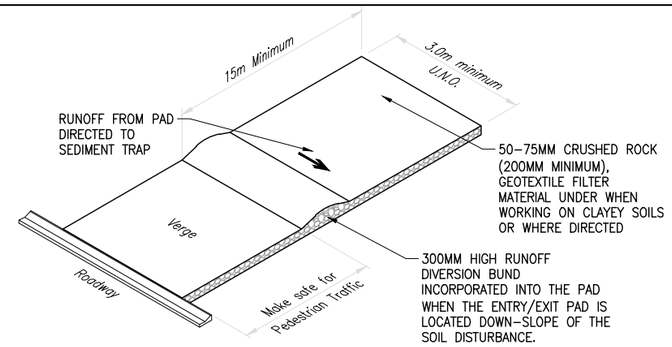
1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. PRIOR TO PLACEMENT OF THE FILTER DAM, ENSURE THE TYPE AND SIZE OF EACH CHECK DAMS WILL NOT CAUSE A SAFETY HAZARD OR CAUSE WATER TO SPILL OUT OF THE DRAIN.
3. CONSTRUCT THE FILTER DAM TO THE DIMENSIONS AND PROFILE SHOWN WITHIN THE APPROVED PLAN.
4. WHERE SPECIFIED, THE FILTER DAM SHALL BE CONSTRUCTED ON A SHEET OF GEOTEXTILE FABRIC USED AS A DOWNSTREAM SPLASH PAD.

MAINTENANCE

1. INSPECT EACH FILTER DAM AND THE DRAINAGE CHANNEL AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.
2. CHECK FOR DISPLACEMENT OF THE FILTER DAM
3. CHECK FOR SOIL SCOUR AROUND THE ENDS OF THE FILTER DAM. IF SUCH EROSION IS OCCURRING, CONSIDER EXTENDING THE WIDTH OF THE FILTER DAM TO AVOID SUCH PROBLEMS.
4. IF SEVERE SOIL EROSION OCCURS EITHER UNDER OR AROUND THE FILTER DAM, THEN SEEK EXPERT ADVICE ON AN ALTERNATIVE TREATMENT MEASURE.
5. REMOVE AND SEDIMENT ACCUMULATED BY THE FILTER DAM, UNLESS IT IS INTENDED THAT THIS SEDIMENT WILL REMAIN WITHIN THE CHANNEL.
6. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
7. REPLACE GEOFABRIC LAYER ON UPSTREAM FACE WITH A CLEAN LAYER AS REQUIRED.

REMOVAL

1. WHEN CONSTRUCTION WORK WITHIN THE DRAINAGE AREA ABOVE THE FILTER DAM 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 FILTER DAM AND ASSOCIATED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.



TEMPORARY ROCK/SHAKER GRID

NOT TO SCALE

MATERIAL

ROCK:
WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTURBANCES) OR 100 TO 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE:
25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC:
HEAVY-DUTY, NEEDLE-PUNCHES, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

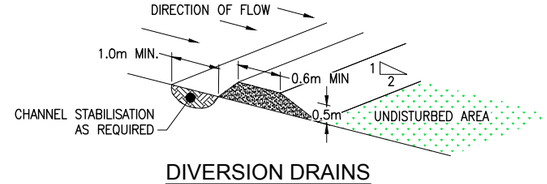
1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A 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 THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
3. IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.
4. PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.
5. IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCK PAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARDS THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.
6. THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15M WHERE PRACTICABLE, AND AS WISE AS THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST 3m. THE ROCK PAD 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.
8. IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THE COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

9. INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER RUNNOFF-PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.
10. 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, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.
11. 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.
12. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS 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.
13. ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITIONS.
14. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. THE ROCK PAD SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT TRAP.
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.



DIVERSION DRAINS

NOT TO SCALE

MAINTENANCE

1. SHOULD BE CHECKED WEEKLY
2. EXCESSIVE SEDIMENT SHOULD BE REMOVED TO AVOID PONDING
3. REPAIR ANY SLUMPS OR DAMAGE

SPACING

1. THE SPACING OF CATCH DRAINS DOWN EXPOSED SLOPES SHOULD NOT EXCEED THE DISTANCE DEFINED BY:

MAXIMUM SPACING ≈ 48 [LOG(H)] – 25 METRES
≡ 71 – 48 [LOG(% SLOPE)] METRES

WHERE: H IS THE HORIZONTAL SLOPE COMPONENT AS DEFINED BY H(H):1(V) AND (% SLOPE)= 100/H

FOR COUNCIL APPROVAL

PRINT IN COLOUR

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	24/03/25	INITIAL ISSUE		

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: NTS

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

DRAWN	MG	DESIGNED	MF
DRAWN APPROVED	MF	DESIGN APPROVED	JM

CIVIL SIGNOFF APPROVAL

DATE: 02/06/25 RPEQ: 05085

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: EROSION AND SEDIMENT CONTROL NOTES

DRAWING NO: 160-012-C110 | SIZE: A3 | REVISION: 1

PLOT DATE:22/08/2025 4:13:23 PM
FILE LOCATION:X:\160 Conmat\012 Country Rd Stage 3-5 Culvert\Drawings\160-012-C110 ESC NOTES.dwg

WORKPLACE HEALTH AND SAFETY DESIGN REPORT

THESE NOTES SHOULD BE READ AND UNDERSTOOD BY ALL INVOLVED IN THIS PROJECT.
THIS INCLUDES (BUT IS NOT LIMITED TO): DESIGNERS, CLIENT, OWNER, OWNER BUILDER, PRINCIPAL CONTRACTOR, SUB-CONTRACTORS, TRADE CONTRACTORS, CONSULTANTS, MAINTENANCE WORKERS, DEMOLISHERS, GENERAL WORKERS AND ANY PERSON CONDUCTING A BUSINESS OR UNDERTAKING (PCBU) ON THIS PROJECT.

GENERAL

1. ANY CHANGES TO THE SPECIFICATIONS OF THE STRUCTURAL DESIGN OR LOADING OF THE STRUCTURE BEFORE, DURING OR AFTER CONSTRUCTION MUST BE APPROVED BY THE STRUCTURAL ENGINEER OR AN APPROPRIATELY QUALIFIED ENGINEER BEFORE PROCEEDING WITH ANY CONSTRUCTION OR ALTERATION WORKS.
2. PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE) SHOULD BE PROVIDED, USED, WORN AND CURRENT AT ALL TIMES.
3. AN ADEQUATE FIRST AID KIT SHOULD BE PRESENT AND MAINTAINED ON SITE AT ALL TIMES.
4. NO UNIQUE/NON-TYPICAL BUILDING TECHNIQUES OR METHODS ARE REQUIRED FOR CONSTRUCTION, MAINTENANCE OR DEMOLITION OF THIS PROJECT. AS SUCH, A SAFETY-IN-DESIGN REVIEW BY THE ENGINEER HAS IDENTIFIED NO RISKS REQUIRING UNIQUE CONSIDERATION OR ACTION BEYOND THE REQUIREMENTS OF THE NATIONAL WORKPLACE HEALTH AND SAFETY ACT, THE WORKPLACE HEALTH AND SAFETY REGULATIONS AND INDUSTRY CODES OF PRACTICE.

SLIPS, TRIPS AND FALLS

1. CONSTRUCTION, CLEANING AND MAINTENANCE OF THIS BUILDING MAY REQUIRE PERSONS TO BE SITUATED WHERE A FALL IN EXCESS OF 1.4m IS POSSIBLE WHERE THIS ACTIVITY CANNOT BE AVOIDED, SCAFFOLDING, LADDERS, FALL BARRIERS AND/OR PPE SHOULD BE USED IN ACCORDANCE WITH THE RELEVANT GUIDELINES, REGULATIONS OR LEGISLATION. CARE SHOULD BE TAKEN TO PREVENT A FALL FROM ANY HEIGHT.
2. THE SITE SHOULD BE KEPT TIDY AND FREE OF TRIP HAZARDS AT ALL TIMES, INCLUDING DURING CONSTRUCTION, MAINTENANCE AND EVERYDAY USE.
3. ADEQUATE LIGHTING SHOULD BE PROVIDED AT ALL TIMES DURING CONSTRUCTION AND MAINTENANCE AND WHEN THE BUILDING IS BEING USED TO ENSURE SAFE WORKING CONDITIONS.
4. ACCESSWAYS AND PATHS SHOULD BE MONITORED AT ALL TIMES TO ENSURE SURFACES ARE KEPT FREE OF ANY OBJECTS THAT MAY CAUSE A SLIP OR TRIP HAZARD.

MANUAL TASKS

1. ANY ITEMS WITH A MASS GREATER THAN 25kg SHOULD BE LIFTED BY TWO OR MORE WORKERS, OR WITH THE AID OF A MECHANICAL LIFTING DEVICE. WHERE POSSIBLE, COMPONENTS SHOULD BE STORED IN A WAY WHICH MINIMISES THE NEED FOR BENDING BEFORE LIFTING.
2. ALL PORTABLE TOOLS USED DURING CONSTRUCTION, MAINTENANCE AND DEMOLITION OF THIS BUILDING SHOULD BE PROPERLY MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

FALLING OBJECTS

1. CONSTRUCTION, MAINTENANCE OR DEMOLITION WORK ON OR AROUND THIS BUILDING IS LIKELY TO INVOLVE PERSONS WORKING ABOVE GROUND LEVEL. WHERE THIS OCCURS, ONE OR MORE OF THE FOLLOWING MEASURES SHOULD BE TAKEN TO PREVENT INJURY FROM FAILING OBJECTS.
   - PREVENT OR RESTRICT ACCESS TO AREAS BELOW WHERE THE WORK IS BEING CARRIED OUT BY THE USE OF APPROPRIATE BARRICADES.
   - PROVIDE TOE-BOARDS TO SCAFFOLDING OR WORK PLATFORMS.
   - PROVIDE MESH BARRICADES TO THE SIDE OF SCAFFOLDING OR WORK PLATFORMS.
   - PROVIDE PROTECTIVE STRUCTURES, HOARDING AND GANTRIES BELOW THE WORK AREA,
   - ENSURE ALL PERSONS BELOW THE WORK AREA HAVE SUITABLE PPE (HARD HATS, SAFETY FOOTWEAR, EYE PROTECTION ETC.) AND THAT IT IS USED CORRECTLY.
2. DURING CONSTRUCTION, RENOVATION OR DEMOLITION OF THIS BUILDING. PARTS OF THE STRUCTURE WILL REMAIN STANDING PRIOR TO OR AFTER SUPPORTING ELEMENTS ARE IN PLACE, CONTRACTORS SHOULD ENSURE THAT TEMPORARY BRACING OR OTHER REQUIRED SUPPORTS ARE IN PLACE AT ALL TIMES TO PREVENT COLLAPSE.
3. DURING CONSTRUCTION, RENOVATION, MAINTENANCE OR DEMOLITION MECHANICAL LIFTING OF MATERIALS MAY BE REQUIRED. WHERE SUCH LIFTING IS NECESSARY, ENSURE THAT APPROPRIATE LIFTING DEVICES ARE USED, THAT LOADS ARE APPROPRIATE AND ARE PROPERLY SECURED AND THAT ACCESS TO AREAS BELOW THE LOAD IS PREVENTED OR RESTRICTED.

PUBLIC ACCESS

1. PUBLIC ACCESS TO CONSTRUCTION AND DEMOLITION SITES AND AREAS UNDER MAINTENANCE CAN CAUSE RISK TO WORKERS AND THE PUBLIC. WARNING SIGNS AND BARRIERS SHOULD BE PROVIDED TO PREVENT UNAUTHORISED ACCESS. ELECTRICAL INSTALLATIONS, EXCAVATIONS, PLANT AND LOOSE MATERIAL SHOULD BE SECURED WHEN NOT FULLY SUPERVISED.

TRAFFIC MANAGEMENT

1. PARKING OF VEHICLES OR LOADING/UNLOADING OF VEHICLES ON THIS SITE/ROADWAY MAY CAUSE A TRAFFIC HAZARD. PARKING FOR WORKERS AND LOADING AREAS SHOULD BE PROVIDED AND SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
2. CONSTRUCTION OF THIS BUILDING MAY REQUIRE LOADING AND UNLOADING OF MATERIALS ON THE ROADWAY. DELIVERIES SHOULD BE WELL PLANNED TO AVOID CONGESTION OF LOADING AREAS. LOADING AND UNLOADING SHOULD BE SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
3. PLANT OPERATING ON THIS SITE MAY CAUSE A RISK OF COLLISION. A TRAFFIC MANAGEMENT PLAN SHOULD BE ADOPTED AND SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL.
4. ANY TEMPORARY ROAD CLOSURES ARE TO COMPLY WITH ALL LOCAL GOVERNMENT REQUIREMENTS. THE PRINCIPAL CONTRACTOR IS TO COMPLETE ALL NECESSARY DOCUMENTATION FOR TRAFFIC MANAGEMENT, SIGNAGE, BARRICADES, TRAFFIC CONTROLLERS ETC.

SERVICES

1. UNDERGROUND SERVICES MAY BE PRESENT AT THIS SITE. ALL SERVICES SHOULD BE LOCATED (USING DIAL BEFORE YOU DIG AND A SPECIALIST CONTRACTOR) AND CLEARLY MARKED PRIOR TO ANY WORKS COMMENCING.

BEFORE YOU DIG www.1100.com.au

2. WHERE THERE IS A RISK OF WORKERS OF PLANT COMING INTO CONTACT WITH POWER LINES THEY SHOULD BE DISCONNECTED OR RELOCATED. WHERE THIS IS NOT POSSIBLE, POWER LINES SHOULD BE CLEARLY MARKED WITH BRIGHT COLOURED MARKERS AND SIGNAGE SHOULD BE PROVIDED AT GROUND LEVEL.
3. DURING RENOVATION AND MAINTENANCE WORK, ALL EXISTING SERVICES WITHIN THE WORK AREA SHOULD BE LOCATED PRIOR TO WORK COMMENCING. IF DISCONNECTION IS NOT POSSIBLE, SERVICES SHOULD BE CLEARLY MARKED TO AVOID ANY RISK OF CONTACT OR RUPTURE.
4. ANY TEMPORARY SERVICES ARE TO BE CLEARLY MARKED AND HAVE ALL NECESSARY PROTECTIVE COVERINGS FOR THE PROPER PERFORMANCE OF THE WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT AUTHORITIES.

HAZARDOUS SUBSTANCES

1. MANY MATERIALS USED IN THE CONSTRUCTION OF THIS BUILDING CAN CAUSE HARM IF INHALED OR HANDLED. PERSONS WORKING ON OR IN THE BUILDING DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION AND WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING PROTECTION AGAINST INHALATION WHILE USING POWDERED MATERIALS OR WHEN SANDING, DRILLING, CUTTING OR OTHERWISE DISTURBING OR CREATING POWDERED MATERIAL.
2. TREATED TIMBER MAY BE USED IN THIS BUILDING. DUST OR FUMES FROM THIS MATERIAL CAN BE HARMFUL. PERSONS WORKING ON OR IN THIS BUILDING DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION AND WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. DO NOT BURN TREATED TIMBER.
3. MANY TYPES OF GLUE, SOLVENTS, SPRAY PACKS, PAINTS, VARNISHES AND SOME CLEANING MATERIALS AND DISINFECTANTS HAVE DANGEROUS EMISSIONS. AREAS WHERE THESE ARE USED SHOULD BE KEPT WELL VENTILATED. PERSONAL PROTECTIVE EQUIPMENT MAY BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT ALL TIMES.
4. IF IBREGLASS, ROCKWOOL, CERAMIC AND OTHER MATERIAL USED FOR THERMAL OR SOUND INSULATION MAY CONTAIN SYNTHETIC MINERAL FIBRE WHICH MAY BE HARMFUL IF INHALED OR IF IT COMES INTO CONTACT WITH THE SKIN, EYES OR OTHER SENSITIVE PARTS OF THE BODY. APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT SHOULD BE WORN AT ALL TIMES WHEN INSTALLING, REMOVING OR WORKING WITH SUCH MATERIALS.
5. AREAS WHERE TIMBER FINISHES ARE APPLIED SHOULD BE KEPT WELL VENTILATED DURING SANDING AND APPLICATION AND FOR A PERIOD AFTER INSTALLATION. PERSONAL PROTECTIVE EQUIPMENT MAY BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT AI L TIMES.
6. WORKS INVOLVING EXPOSURE TO ASBESTOS SHALL ONLY BE CARRIED OUT BY LICENCED SPECIALISTS AND STRICTLY IN ACCORDANCE WITH THE WHS REGULATIONS.

OTHER HIGH-RISK ACTIVITY

1. ALL ELECTRICAL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE '*CODE OF PRACTICE MANAGING ELECTRICAL RISKS AT THE WORKPLACE, AS/NZ 3012*' AND ALL LICENSING REQUIREMENTS. NEW ELECTRICAL INSTALLATION ON CONSTRUCTION AND DEMOLITION SITES MUST BE IN ACCORDANCE WITH THE WIRING RULES OF AS/NZS 3000 AND APPROPRIATE REQUIREMENTS OF AS/NZA 3012.
2. ALL WORK USING PLANT SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE '*CODE OF PRACTICE MANAGING RISKS OF PLANT AT THE WORKPLACE*'.
3. ALL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE '*CODE OF PRACTICE MANAGING NOISE AND PREVENTING HEARING LOSS AT WORK*'.
4. DUE TO THE HISTORY OF SERIOUS INCIDENTS, IT IS RECOMMENDED THAT PARTICULAR CARE BE EXERCISED WHEN UNDERTAKING ANY WORK INVOLVING STEEL CONSTRUCTION AND CONCRETE PLACEMENT.

FIRE FIGHTING

1. THE CLIENT/OWNER IS TO ENSURE THAT APPROPRIATE FIRE FIGHTING EQUIPMENT IS PROVIDED ON SITE DURING CONSTRUCTION AND MAINTAINED FOR THE LIFE OF THE BUILDING.
2. ALL FIRE FIGHTING EQUIPMENT IS TO BE PROVIDED AND MAINTAINED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS.

GENERAL WORKPLACE HEALTH AND SAFETY REQUIREMENTS

1. THE CLIENT/OWNER IS TO ENSURE THAT THE PRINCIPAL CONTRACTOR COMPLIES WITH ALL REQUIREMENTS OF THE NATIONAL WH&S ACT 2011, WORKPLACE HEALTH AND SAFETY REGULATIONS 2011 AND CODES OF PRACTICE DURING THE CONSTRUCTION OF THE BUILDING.
2. THE PRINCIPAL CONTRACTOR MEANS THE BUILDER WHO HAS OBTAINED THE BUILDING PERMIT AND WHOSE LICENCE NUMBER IS BEING USED FOR THE CONTRACT.
3. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACT COMPLETES A CONSTRUCTION WORKPLACE PLAN AS APPLICABLE UNDER THE WH&S LEGISLATION.
4. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR AND ALL TRADE CONTRACTORS COMPLETE WORK METHOD STATEMENTS (WMS) AS APPLICABLE UNDER THE WH&S LEGISLSATION BEFORE ANY WORK COMMENCES.
5. THE CLIENT/OWNER MUST ENSURE THAT WORKERS HAVE A CURRENT GENERAL SAFETY INDUCTION (WHITE OR BLUE) CARD.
6. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR CONDUCTS THE NECESSARY SITE-SPECIFIC INDUCTION AS REQUIRED BY WH&S LEGISLATION.
7. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR HAS THE APPROPRIATE FIRST AID KITS AND THAT THEY ARE MAINTAINED AND KEPT ON SITE FOR THE DURATION OF THE CONSTRUCTION.
8. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR, TRADE CONTRACTORS AND WORKERS MEET ALL OF THEIR WH&S OBLIGATIONS DURING CONSTRUCTION.
9. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR AND TRADE CONTRACTORS ENSURE THAT ONLY EXPERIENCED, QUALIFIED, LICENSED PERSONS ARE EMPLOYED TO CARRY OUT THE WORK.
10. THE CLIENT/OWNER MUST ENSURE THAT THE PRINCIPAL CONTRACTOR HAS PUT IN PLACE THE WORKPLACE HEALTH AND SAFETY CONTROL MEASURES IN ACCORDANCE WITH WHA&S REGULATION FOR ALL HIGH RISK CONSTRUCTION WORK INCLUDING BUT NOT LIMITED TO: CONSTRUCTION SAFETY PLAN, WORK METHOD STATEMENTS, ROOF EDGE PROTECTION, SCAFFOLDS AND WORK PLATFORMS, WORK PLATFORMS ON TRESTLE LADDERS, FALL ARREST PLATFORMS, TRAVEL RESTRAINT SYSTEMS, FALL ARREST HARNESS SYSTEMS, STAIR VOID PROTECTION, BALCONY EDGE PROTECTION, INDUSTRIAL SAFETY NETS AND EXCAVATION FALLS PROTECTION.

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FOR COUNCIL APPROVAL

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REVISIONS

NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: WORKPLACE HEALTH AND SAFTEY NOTES

DRAWING NO: 160-012-S101 | SIZE: A1 | REVISION: 3

A. GENERAL NOTES

A1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DRAWINGS, SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE WORK. ALL DISCREPANCIES SHALL BE REFERRED FOR 'APPROVAL BY THE ENGINEER' BEFORE PROCEEDING WITH THE WORK.

A2. THE TERM 'ENGINEER' REFERRED TO IN THESE NOTES IS TAKEN TO MEAN THE CERTIFYING RPEQ ENGINEER WHOSE NAME APPEARS ON THE STRUCTURAL DESIGN CERTIFICATE ISSUED WITH THESE DRAWINGS.

A3. WHERE THE 'APPROVAL OF THE ENGINEER' IS SPECIFIED OR REQUIRED IN THESE NOTES, APPROVAL IS TO BE PROVIDED IN WRITING. SUBSTITUTIONS OR ADJUSTMENTS ARE NOT PERMITTED WITHOUT THE 'APPROVAL OF THE ENGINEER'.

A4. **WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF FNQROC, STANDARDS AUSTRALIA CODES AND THE WORKPLACE HEALTH AND SAFETY ACT.** ALL LOCAL AND STATUTORY AUTHORITY'S REQUIREMENTS AND BYLAWS ARE TO BE ADHERED TO.

A5. **AS CONSTRUCTED DATA TO BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE COUNCIL IN ACCORDANCE WITH FNQROC DEVELOPMENT MANUAL.**

A6. THE CONTRACTOR SHALL PROVIDE (TO THE CONTRACTOR'S COSTS AND CERTIFICATION) AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED, SUCH TEMPORARY BRACING ELEMENTS AS IS NECESSARY TO STABILIZE THE STRUCTURE AND ANY ADJACENT STRUCTURES DURING CONSTRUCTION, TRANSPORTATION, EXCAVATIONS AND ERECTION, ENSURING NO PART SHALL BE OVERSTRESSED DURING THESE ACTIVITIES.

A7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL EXISTING SERVICES ON THE SITE, SERVICES WHERE SHOWN ON THESE DRAWINGS ARE INDICATIVE LOCATIONS ONLY. THE CONTRACTOR IS TO RECTIFY IMMEDIATELY ANY OBSTRUCTION OR DAMAGE TO SUCH SERVICES AND PROVIDE TEMPORARY AND ADEQUATE SERVICES WHILST REPAIRS ARE CARRIED OUT.

A8. ANY DRAINAGE WORKS SHOWN ON THE STRUCTURAL DRAWINGS ARE INDICIATIVE ONLY AND DO NOT FORM PART OF ERSCON's STRUCTURAL CERTIFICATION, EXCEPT DRAINAGE BEHIND RETAINING WALLS. DRAINAGE WORKS ARE TO BE BY THE CIVIL ENGINEERING DOCUMENTATION.

A9. **INSPECTIONS** AND CERTIFICATION: THE INSPECTOR MUST BE A REGISTERED PROFESSIONAL ENGINEER OF QLD AND INSPECT AND CERTIFY ALL STRUCTURE RELATED CONSTRUCTION WORKS. CONTRACTOR TO ARRANGE REQUIRED INSPECTIONS FOR THE FOLLOWING **HOLD POINTS:**

1. **AFTER EXCAVATION TO NATURAL GROUND BEFORE CONSTRUCTING ANY SOIL IMPROVEMENT WORKS OR FILL. CONTRACTOR MUST PROVIDE DCP TEST RESULTS TO THE CERTIFYING ENGINEER LATEST AT THIS STAGE OF WORKS.**
2. **AFTER ANY SOIL IMPROVEMENT WORKS OR FILL HAS BEEN CONSTRUCTED AND BASE SLAB SET UP HAS NOT BEEN STARTED YET**
3. **AFTER COMPLETED SET UP OF FORMWORK FOR BASE SLAB AND/OR APRON SLAB AND PLACEMENT OF BASE SLAB REINFORCEMENT AND/OR HEAD WALL /WING WALLS STARTER BARS** (MIN. 24h BEFORE THE CONCRETE POUR)
4. **AFTER COMPLETED SET UP OF FORMWORK FOR THE CULVERT WALLS AND PLACEMENT OF THE WALL REINFORCEMENT. FURTHER WALL SECTION INSPECTIONS CAN BE DONE VIA PHOTOS PROVIDED BY THE BUILDER TO THE ENGINEER FOR APPROVAL 24h BEFORE THE CONCRETE POUR.**
5. **AFTER COMPLETED SET UP OF FORMWORK FOR THE WING WALLS AND PLACEMENT OF THE REINFORCEMENT** (MIN. 24h BEFORE THE CONCRETE POUR).
6. **AFTER COMPLETED SET UP OF FORMWORK FOR THE CULVERT DECK PANELS AND PLACEMENT OF THE REINFORCEMENT AND ALL ANCHILLARY ITEMS** (MIN. 24h BEFORE THE CONCRETE POUR).
7. **AFTER COMPLETED SET UP OF FORMWORK FOR THE HEAD WALL AND PLACEMENT OF THE REINFORCEMENT AND ALL ANCHILLARY ITEMS** (MIN. 24h BEFORE THE CONCRETE POUR).
8. **AFTER PLACEMENT OF THE CULVERT DECK PANELS AND THE HEAD WALL PANEL BUT BEFORE GROUTING OF THE CONNECTION POINTS OF THE DECK PANELS TO THE WALLS.**

A10. PERMISSION IS GIVEN TO COPY THESE PLANS FOR USE ON THIS SPECIFIC PROJECT ONLY. PLANS MAY ONLY BE REPRODUCED AS A COMPLETE SET AND MUST INCLUDE THE STRUCTURAL DESIGN CERTIFICATE.

A11. IF ANY PART OF THIS DOCUMENTATION IS UNCLEAR OR ILLEGIBLE, PLEASE CONTACT THIS OFFICE.

A12. DO NOT OBTAIN DIMENSIONS BY SCALING FROM THESE DRAWINGS.

A13. ABBREVIATIONS:

ABBR.	DESCRIPTION	ABBR	DESCRIPTION
CBR	CALIFORNIA BEARING RATIO	RCBC	REINFORCED CONCRETE BOXED
CL	CENTRE LINE	REIN	REINFORCEMENT
C.J.	CONSTRUCTION JOINT	S.C.	SAW CUT
CM	CONRETE MASONRY (BLOCKWORK)	SRDD	STANDARD RELATIVE DRY DENSITY
CRS	CENTRES	T.B.A	TO BE ADVISED
DCP	DYNAMIC CONE PENETROMETER	T/O	TOP OVER (REINFORCING LAYER)
E/W	EACH WAY (REINFORCING LAYERS)	T/U	TOP UNDER (REINFORCING LAYER)
HORI	HORIZONTAL	TYP	TYPICAL
MAX	MAXIMUM	ULS	ULTIMATE LIMIT STATE
MIN	MINIMUM	U.N.	UNLESS NOTED OTHERWISE
QA	QUALITY ASSURANCE	VERT	VERTICAL
RC	REINFORCED CONCRETE	WH&	WORKPLACE HEALTH & SAFETY

B. ELECTRONICALLY TRANSFERRED DRAWINGS

B1. *ERSCON* ACCEPTS NO RESPONSIBILITY FOR A DRAWING THAT HAS BEEN AMENDED IN ANY WAY BY OTHER PARTIES.

B2. ANY PART OF *ERSCON's* DRAWINGS COPIED FROM ELECTRONICALLY TRANSFERRED DRAWINGS BECOMES THE RESPONSIBILITY OF THE RECIPIENT TO DISTRIBUTE ONLY TO THE PARTICIPATING PARTIES AS COMPLETE SET OF DRAWINGS.

C. HEALTH & SAFETY

C1. THE CONTRACTOR SHALL DEVELOP, IMPLEMENT AND ADMINISTER A WORKPLACE HEALTH AND SAFETY PROGRAM THAT WILL ENSURE THAT ALL CONSTRUCTION ACTIVITIES ARE PERFORMED TO THE RELEVANT WORKPLACE HEALTH AND SAFETY REQUIREMENTS AND ANY OTHER RELEVANT STATUTORY REQUIREMENTS.

C2. THE WORKPLACE HEALTH AND SAFETY PROGRAM MUST BE COORDINATED WITH ADJOINING PROPERTY OWNERS AND ALL RELEVANT PARTIES AS NECESSARY TO ENSURE A SAFE BUILDING ENVIRONMENT AT ALL TIMES.

C3. CONTRACTOR TO ARRANGE THE DESIGN AND CERIFICATION OF ANY LIFTING ARRANGEMENT FOR ON-SITE PRECAST ELEMENTS BY A SUITABLY QUALIFIED ENGINEER.

C4. CONTRACTOR TO BE FULLY LICENSED & REGISTERED FOR THE TYPES OF CONSTRUCTION WORKS. WORKS TO BE UNDERTAKEN ONLY BY SUITABLY QUALIFIED/ TRAINED STAFF IN ACCORDANCE WITH THE MANUFACTURER's WH&S AND QA PROCEDURES.

D. DESIGN PARAMETERS AND SERVICE LOADS

D1. THE REINFORCED CONCRETE CULVERT STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE CURRENT ISSUES OF AS 5100.2-2017 BRIDGE DESIGN – DESIGN LOADS, AS 5100.5-2017 BRIDGE DESIGN – CONCRETE, AND STANDARDS MENTIONED WITHIN THOSE CODES AS APPLICABLE AND SUBSEQUENTLY THE DESIGN WILL SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL VERSION 9.

D2. DESIGN CRITERIA AND ASSUMPTIONS USED IN THE DESIGN AMONGST OTHERS:

i. PERMANENT, IMPOSED AND OTHER ACTIONS TO AS/NZS 1170.0: 2002 AND AS/NZS 1170.1: 2002
ii. VEHICLE LOADING TO AS 5100.2
iii. EARTHQUAKE LOADS TO AS 1170.4: 2024
iv. EXPOSURE CLASSIFICATION, CONCRETE PROPERTIES & CURING, CONCRETE STRENGTH AND REINFORCEMENT COVER TO AS 5100.5

D3. THE CULVERT HAS BEEN DESIGNED FOR THE STANDARD ROAD TRAFFIC LOADS AS DEFINED IN AS5100.2.

D4. THE CULVERT HAS BEEN DESIGNED FOR AN EXPOSURE CLASSIFICATION B2.

D5. ALL THE ABOVE DO NOT INCLUDE LOADS WHICH MAY BE APPLIED DURING CONSTRUCTION. THE BUILDER IS TO MAINTAIN THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION AT ALL TIMES.

E. SITE PREPARATIONS, EARTHWORKS AND FOUNDATION NOTES

E1. EARTHWORKS SHALL BE IN ACCORDANCE WITH AS3798 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS" AND AS FOLLOWS, AND SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL SPECIFICATION 'S1 EARTHWORKS'.

E2. REFER TO THE 'GENERAL NOTES' OF THE CIVIL ENGINEERING DESIGN DOCUMENTION BY *ERSCON* CONSULTING ENGINEERS FOR FURTHER NOTES.

E3. **THE DESIGN OF THE STRUCTURE HAS BEEN BASED ON THE FOUNDATION HAVING A MINIMUM BEARING CAPACITY OF 150 kPa AND THE SOIL BEING OF GRANULAR TYPE.**

E4. BEFORE ANY CONSTRUCTION COMMENCES, THE SAFE BEARING CAPACITY OF THE GROUND AND SOIL PROPERTIES SHALL BE VERIFIED WITH A GEOTECHNICAL INVESTIGATION AND THE REPORT FORWARDED TO THE ENGINEER. IF THE BEARING PRESSURE AND SOIL TYPE IS ASSESSED AS BEING LESS AND DIFFERENT THAN ASSUMED, THE ENGINEER WILL NEED TO BE CONTACTED TO PROVIDE A SUITABLE AMENDED DESIGN.

E5. UNLESS NOTED OTHERWISE IN SPECIFICATIONS, THE BASE SLAB SHALL BE FOUNDED ON COMPACTED NATURAL GROUND INCLUDING THE FOUNDATION PREPARATION WORKS AS SPECIFIED ON THE CULVERT SECTION DRAWING. DO NOT PROVIDE A DAMP PROOF MEMBRANE UNDER THE BASE SLABS. MOISTEN GROUND BEFORE CONCRETE POUR.

E6. IF COMPACTED CONTROLLED FILL IS TO BE USED AS FOUNDING MATERIAL, THIS IS TO BE CONFIRMED WITH THE ENGINEER BEFORE CONSTRUCTION COMMENCES AND THE ENGINEER WILL NEED TO BE ASKED TO PROVIDE A SUITABLE DESIGN.

E7. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN STABLE CONDITIONS. PROTECT SURROUNDING PROPERTY AND SERVICES FROM ADVERSE EFFECTS OF GROUND WORKS. PROVIDE TEMPORARY WORKS AS REQUIRED. PROVIDE SHORING CERTIFIED BY SUITABLY QUALIFIED STRUCTURAL ENGINEER TO ALL DEEP EXCAVATIONS WHERE REQUIRED.

E8. KEEP EXCAVATIONS FREE OF WATER. PROVIDE ADEQUATE DRAINAGE TO ENSURE FOUNDATION IS NOT AFFECTED BY MOISTURE. PREVENT FOUNDATION DRYING OUT DUE TO EXPOSURE. PLACE BLINDING, FOOTINGS AND BACKFILL AS SOON AS PRACTICABLE AFTER EXCAVATION.

E9. STRIP BUILDING PLATFORM OF ALL TOPSOIL AND VEGETATION TO A MINIMUM DEPTH OF 150mm AND STOCKPILE. REMOVE ALL DELETERIOUS MATTER.

E10. ALL TREES AND LARGER VEGETATION SHALL BE KEPT MIN. 5m AWAY FROM THE CULVERT STRUCTURE.

E11. THE CONTRACTOR SHALL CHECK ALL EXCAVATIONS FOR ORGANIC MATERIAL AND RUBBISH. IF ANY OF THIS MATERIAL IS FOUND, IT SHALL BE REMOVED FROM THE WORKS TO A PLACE DESIGNATED BY THE SUPERINTENDENT.

E12. EXPOSURE OF EXCAVATED FOOTINGS SHALL BE MINIMISED TO PREVENT LOCALISED MOISTURE CHANGES DURING THE CONSTRUCTION PERIOD.

E13. TREE REMOVAL: WHERE A TREE IS REMOVED, EXCAVATE 200mm BELOW EXTENT OF ROOT BALL. COMPACT EXPOSED SURFACE TO 98% SRDD TO A DEPTH OF AT LEAST 250mm. PLACE APPROVED COMPACTED FILL AND REQUEST THE SPECIFICATION FROM THE ENGINEER BEFORE COMMENCING CONSTRUCTION.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS | APPROVED: RQ
DESIGN: RQ | APPROVED: RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STRUCTURAL ENGINEERING NOTES
SHEET 1 OF 2
DRAWING NO: 160-012-S102 | SIZE: A1 | REVISION: 3

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E14. WHERE THE SUITABLE FOUNDING MATERIAL IS DEEPER THAN REQUIRED FOR THE FOOTING, THE EXCAVATION IS TO BE BACKFILLED WITH A WEAK MIX CONCRETE (N10) TO THE UNDERSIDE OF THE FOOTING BUT THIS IS TO BE CONFIRMED WITH THE ENGINEER BEFORE COMMENCING ANY BUILDING WORKS.

E15. **BACKFILLING** SHALL NOT TAKE PLACE UNTIL THE BASE SLAB AND THE CULVERT WALLS HAVE REACHED THEIR FULL 28-DAY CONCRETE STRENGTH AND THE DECK PANELS HAVE BEEN PLACED WITH THE GROUT FILLING OF THE CONNECTION POINTS HAVING ATTAINED MIN. 40 MPa STRENGTH.

F. CONCRETE AND REINFORCEMENT NOTES

F1. ALL WORKMANSHIP AND MATERIALS SHALL BE GENERALLY IN ACCORDANCE WITH AS3600 CONCRETE STRUCTURES AND AS5100 BRIDGE DESIGN, AND STANDARDS MENTIONED WITHIN THOSE DOCUMENTS AS APPLICABLE; AND SHALL SATISFY THE MINIMUM REQUIREMENTS SET OUT IN THE FNQROC DEVELOPMENT MANUAL SPECIFICATION 'S7 CONCRETE WORKS'.

F2. ALL FORMWORK SHALL BE IN ACCORDANCE WITH AS 3610 FORMWORK FOR CONCRETE.

F3. MINIMUM COVER TO ALL REINFORCEMENT SHALL BE 50mm EXCEPT WHERE CAST AGAINST GROUND IT SHALL BE 80mm.

F4. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. ALL CONCRETE THICKNESSES SHOWN ARE MINIMUM STRUCTURAL REQUIREMENTS; NO REDUCTION IN THICKNESS DUE TO FALLS OR TOPPING IS PERMITTED. REFER CIVIL DRAWINGS FOR CONFIRMATION OF ALL SLAB FALLS AND STEPS.

F5. NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

F6. WET CONCRETE TO BE UNIFORM, HOMOGENEOUS, COHESIVE AND ABLE TO WORK READILY INTO CORNERS AND AROUND REINFORCEMENT COMPLETELY FILLING FORMWORK WITHOUT SEGREGATION, EXCESS FREE WATER ON SURFACE, LOSS OF MATERIAL OR CONTAMINATION. CONCRETE TO HAVE GOOD DIMENSIONAL STABILITY AND ABLE TO RESIST PLASTIC SETTLEMENT CRACKING, THERMAL CRACKING AND SHRINKAGE CRACKING.

F7. USE CEMENTITIOUS MATERIALS LESS THAN SIX MONTHS OLD. USE BAGGED CEMENT IN ORDER OF RECEIPT.

F8. DO NOT ADD WATER TO CONCRETE AFTER TRUCK HAS LEFT BATCHING PLANT.

F9. CONSTRUCTION JOINTS SHALL BE LOCATED AND CONSTRUCTED AS PER THE DETAILS ON THE DRAWINGS.

F10. CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES.
CONCRETE SPECIFICATION, U.N.O. ON DRAWINGS:

ELEMENT	GRADE	SLUMP	MAX AGGREGATE SIZE
CULVERT BASE SLAB, APRON SLAB, WALLS, WINGWALLS, DECK SLAB PANEL AND HEADWALLS	**S50**	80 +/-15	20 mm
	▪ **MIN. CEMENTITIOUS MATERIAL CONTENT 450 kg/m³** ▪ **MAX. THE WATER / CEMENT RATIO 0.4** ▪ **CURE CONCRETE CONTINUOUSLY FOR AT LEAST 14 DAYS** ▪ **MIN. 32 MPa CONCRETE STRENGTH AT TIME OF STRIPPING AND CURING** ▪ **RECOMMENDATION: ADD PENETRON ADMIX-SB OR XYPEX ADMIC C-Series TO THE CONCRETE AT TIME OF BATCHING AS PER THE DRAWINGS SPECIFICATION AND STRICTLY IN ACCORDANCE WITH THE MANUFACTURER's SPECIFICATIONS.**		

METHOD OF PLACEMENT BY PUMP.
PROJECT ASSESSMENT IS NOT REQUIRED.

F11. PROVIDE A 10mm x 10mm CHAMFER TO EXPOSED EDGES ON CONCRETE UNO.

F12. NON-SHRINK GROUT SHALL BE Parchem CONBEXTRA CB CEMENTITIOUS, OR APPROVED

FORMWORK

F13. RESPONSIBILITY FOR DESIGN, CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF FORMWORK AND FALSEWORK LIES WITH THE CONTRACTOR.

F14. FORMWORK TO BE DESIGNED AND CONSTRUCTED TO AS3610.

F15. APPLY RELEASE AGENT COMPATIBLE WITH CONTACT SURFACES TO INTERIOR OF FORMWORK. WHERE NECESSARY CLEAN REINFORCEMENT TO REMOVE TRACES OF RELEASE AGENT. SEAL JOINTS BETWEEN FORMWORK PANELS, AND TO HARDENED CONCRETE WITH A FLEXIBLE RUBBER STRIP.

F16. DO NOT STRIP FORMWORK PRIOR TO 36 HOURS AFTER PLACEMENT.

REINFORCEMENT

F17. STEEL REINFORCEMENT IS TO COMPLY WITH AS/NZS4671. SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:
R: STRUCTURAL GRADE 250 PLAIN ROUND BAR TO AS/NZS4671
N: HOT ROLLED GRADE 500 DEFORMED (RIBBED) BAR DUCTILITY CLASS N TO AS/NZS4671
L: HOT ROLLED GRADE 500 DEFORMED BAR DUCTILITY CLASS L TO AS/NZS4671
SL: HARD DRAWN WIRE GRADE 500 SQUARE MESH DUCTILITY CLASS L TO AS/NZS4671
RL: HARD DRAWN WIRE GRADE 500 RECTANGULAR MESH DUCTILITY CLASS L TO AS/NZS4671
TM: HARD DRAWN STEEL GRADE 500 TRENCH MESH DUCTILITY CLASS L TO AS/NZS4671
W: GRADE 500 STEEL REINFORCING WIRE TO AS/NZS4671

F18. FOLLOWING ABBREVIATIONS APPLY TO DESCRIBE THE PLACEMENT OF REINFORCEMENT:
E/W: EACH WAY FF: FAR FACE NF: NEAR FACE
EF: EACH FACE BTM: BOTTOM

F19. PROVIDE ACRS (AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEEL LTD) CERTIFICATION OF COMPLIANCE WITH AS/NZS4671 FOR ALL REINFORCEMENT.

F20. PROVIDE DOCUMENTATION TO SHOW THAT REINFORCEMENT SUPPLIER AND MILL COMPLIES WITH AS/NZS4671.

F21. REINFORCEMENT MUST HAVE UNIQUE MARKS TO IDENTIFY SUPPLIER.

F22. DO NOT SPLICE REINFORCEMENT OTHER THAN SHOWN ON THE DRAWINGS.

F23. DO NOT BEND OR STRAIN REINFORCEMENT IN A WAY THAT MAY CAUSE DAMAGE. BEND DIAMETERS TO BE TO AS3600. BARS TO BE BENT COLD UNO. DO NOT COOL HEATED BARS BY QUENCHING.

F24. WELDING OR SITE BENDING OF REINFORCEMENT IS NOT PERMITTED WITHOUT APPROVAL OF THE ENGINEER.

F25. ALL REINFORCEMENT SHALL BE SUPPORTED IN ITS CORRECT POSITION BEFORE CONCRETING (BY APPROVED CHAIRS, SPACERS, LIGATURES OR TIES AT 800 mm MAXIMUM CENTRES EACH WAY UNO.) TO PREVENT DISPLACEMENT OF REINFORCEMENT BY WORKMEN OR EQUIPMENT DURING CONCRETE PLACEMENT.

F26. FOR CONCRETE SURFACES WITH B2 EXPOSURE CLASSIFICATION OR GREATER, ONLY USE PROPRIETARY HIGH STRENGTH FIBRE REINFORCED CEMENT SPACER BLOCKS OR SUPPORTS.

F27. SECURELY TIE REINFORCEMENT WITH WIRE TIES. TURN ENDS OF TIE WIRES INTO CONCRETE, CLEAR OF COVER ZONE.

CONCRETE TESTING

F28. TEST SLUMP OF EACH BATCH OF CONCRETE DELIVERED BEFORE PLACING CONCRETE FROM THAT DELIVERY. SLUMP MEASURED TO BE NO GREATER THAN TARGET SLUMP WITHIN TOLERANCES GIVEN IN AS1379 CLAUSE 5.2.3.

F29. CONCRETE TESTING RESULTS TO BE PROVIDED AT 1 SAMPLE PER 25m³. EACH SAMPLE TO COMPRISE FOUR CYLINDERS: TEST TWO AT 7 DAYS AND TWO AT 28 DAYS.

F30. CONCRETE TESTING TO BE BY AN APPROVED INDEPENDENT NATA REGISTERED LABORATORY.

DELIVERABLES

F31. **AT LEAST ONE WEEK PRIOR TO CONCRETE PLACEMENT SUBMIT DETAILS OF PROPOSED CONCRETE MIX DESIGNS**, SEQUENCE AND TIMES FOR CONCRETE POURS, CONSTRUCTION JOINT LOCATIONS FOR ENGINEER's/INSPECTORS's APPROVAL. NOMINATE FOR EACH MIX DESIGN THE TYPE AND PROPORTIONS OF CONSTITUENTS, AGGREGATE GRADINGS, ADDITIVES AND ADMIXTURES, MAXIMUM WATER CONTENT AND MAXIMUM WATER/CEMENT RATIO, TARGET SLUMP, TARGET CHARACTERISTIC STRENGTH (f'c), AND TARGET DRYING SHRINKAGE.

F32. USE READY MIXED CONCRETE MIXED BY BATCH PRODUCTION PROCESS DELIVERED IN AGITATING TRUCKS. FOR EACH BATCH SUPPLY A DOCKET LISTING INFORMATION REQUIRED BY AS1379 CLAUSE 1.8.3 AND FOLLOWING:
- SERIAL NUMBER OF IDENTIFICATION CERTIFICATES OF EACH BATCH
- NAME OF CONCRETE DELIVERY SUPERVISOR
- ELEMENT FOR WHICH CONCRETE WAS ORDERED AND WHERE IT WAS PLACED
- METHOD OF PLACEMENT AND CLIMATIC CONDITIONS DURING POUR
- PROJECT ASSESSMENT CARRIED OUT
- TOTAL AMOUNT OF WATER REQUIRED BY MIX DESIGN
- TOTAL AMOUNT OF WATER ADDED AT PLANT

F33. PROVIDE RECORD OF SLUMP TESTING TO SUPERINTENDENT.

F34. FORWARD CONCRETE PRODUCTION ASSESSMENT INFORMATION TO SUPERINTENDENT AS PER AS1379 CLAUSE 6.4 WHEN PRODUCTION ASSESSMENT IS UNDERTAKEN.

F35. REPORT DRYING SHRINKAGE TESTING RESULTS TO SUPERINTENDENT.

G. PRECAST CONCRETE ELEMENTS

G1. ALL PRECAST CONCRETE WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3850 PREFABRICATED CONCRETE ELEMENTS, AS 5100 BRIDGE DESIGN AND AS 3610 FORMWORK FOR CONCRETE AS APPLICABLE.

G2. REINFORCEMENT OF PRECAST CONCRETE UNITS HAVE BEEN DESIGNED FOR 'IN-SERVICE' CONDITIONS ONLY. THE BUILDING CONTRACTOR IS RESPONSIBLE TO ENGAGE A QUALIFIED CONTRACTOR E.G. *REID CONSTRUCTION SYSTEMS* TO DESIGN, DOCUMENT AND CERTIFY ANY ADDITIONAL REINFORCEMENT REQUIRED FOR LOADS DURING HANDLING, LIFTING AND TRANSPORTATION, ANY LIFTERS, BRACES ETC.

G3. USE CAST IN FERRULES FOR STRUCTURAL FIXINGS, NOT MECHANICAL OR CHEMICAL ANCHORS

G4. ENSURE THAT PRECAST UNITS REMAIN UNCRACKED AND UNDAMAGED DURING HANDLING, ERECTION AND INSTALLATION OPERATIONS. USE FORMWORK BOND BREAKERS AND STRONG BACKS AS REQUIRED. PROTECT UNITS FROM STAINING, DISCOLOURATION AND OTHER DAMAGE.

G5. USE RIGID FORMWORK AND INTENSE COMPACTION, SUCH AS VIBRATING TABLES OR FORM VIBRATORS, TO AS 5100.

G6. PRECAST UNIT TOLERANCES TO BE TO AS3850 EXCEPT WHERE VARIED BY SPECIFICATION.

G7. CONTRACTOR TO PROVIDE COMPONENTS, MATERIALS, FASTENERS, BRACES, STRONGBACKS, SHIMS, JOINTING STRIPS, SEALANTS, FLASHING, GROUT AND MORTAR, BEARING PADS AND STRIPS, TIES, DOWELS, CLIPS, FIXINGS etc AS REQUIRED.

G8. CAST UNITS WITH OUTER FACE OFF FORM.

G9. REMOVE TEMPORARY ATTACHMENTS AFTER ERECTION, MAKE GOOD AND SEAL.

G10. NON-SHRINK GROUT SHALL BE OF 28 DAY CHARACTERISTIC STRENGTH OF 40 MPa e.g. Parchem CONBEXTRA CB CEMENTITIOUS, OR APPROVED EQUIVALENT INSTALLED IN ACCORDANCE WITH MANUFACTURER 's SPECIFICATIONS. SUBMIT PRODUCT DETAILS FOR APPROVAL.

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FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS | APPROVED: RQ
DESIGN: RQ | APPROVED: RQ
STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STRUCTURAL ENGINEERING NOTES
SHEET 2 OF 2
DRAWING NO: 160-012-S103 | SIZE: A1 | REVISION: 3

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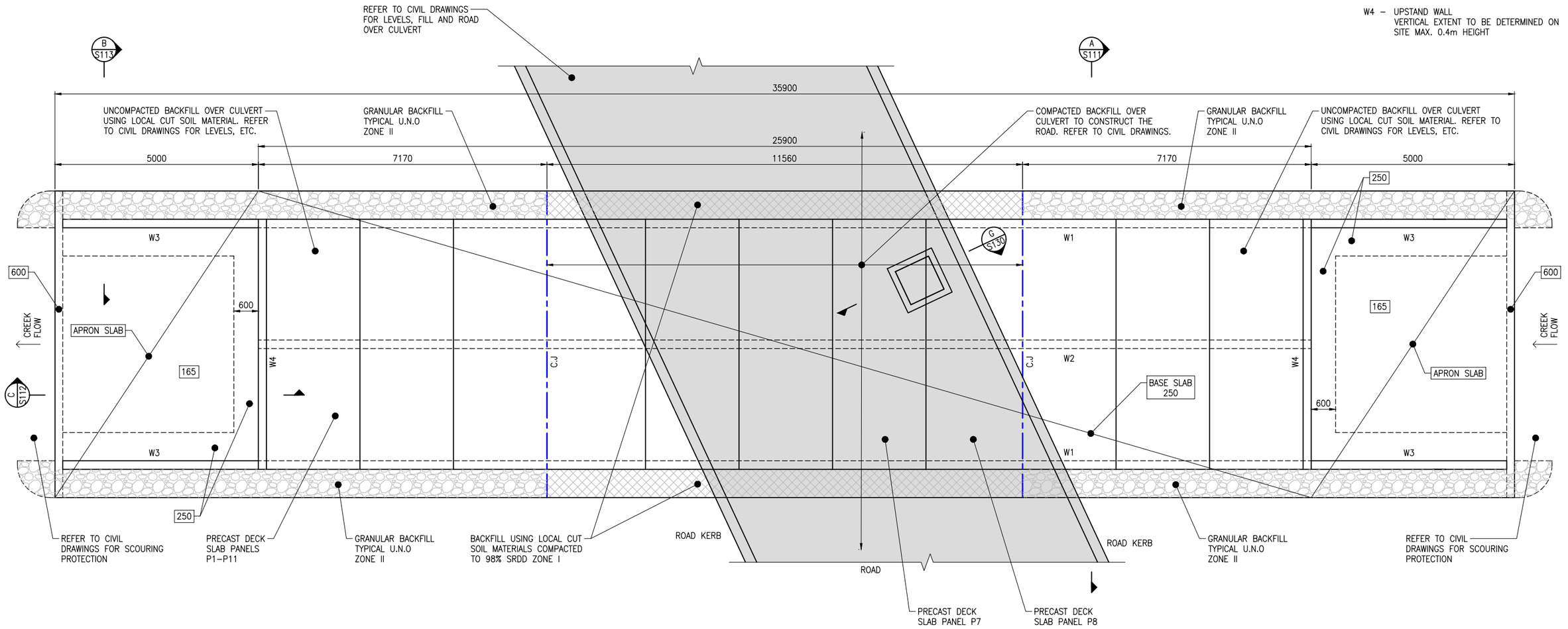
MEMBER SCHEDULE

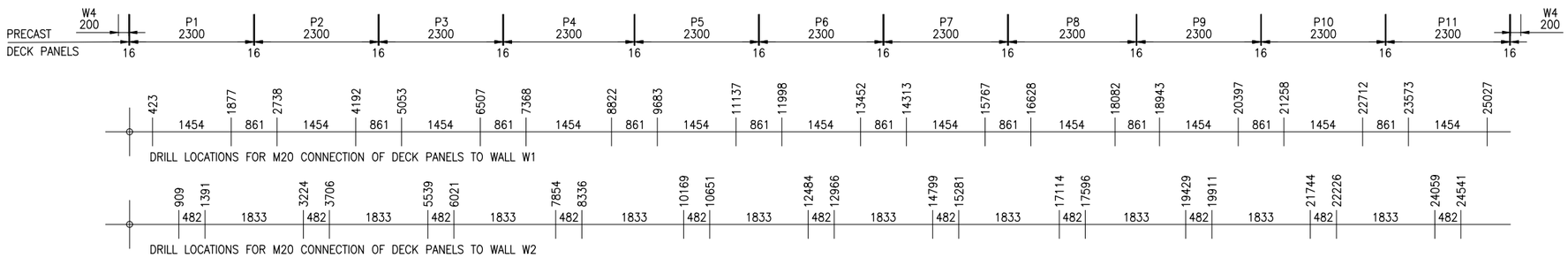
W1 – EXTERNAL WALL, 210 THICK

W2 – INTERMEDIATE WALL, 210 THICK

W3 – WING WALLS 210 THICK
VERTICAL EXTENT TO BE DETERMINED ON SITE MAX. 2m RETAINED HEIGHT

W4 – UPSTAND WALL
VERTICAL EXTENT TO BE DETERMINED ON SITE MAX. 0.4m HEIGHT





CULVERT SITE PLAN

SCALE 1:50

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FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF	
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF	
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF	
NO.	DATE	DESCRIPTION	DESIGN	APPROVED	

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:100 / 1:50 — 0 1 2 3 — A3 / A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL

DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT SITE PLAN

DRAWING NO: 160-012-S110 | SIZE: A1 | REVISION: 3

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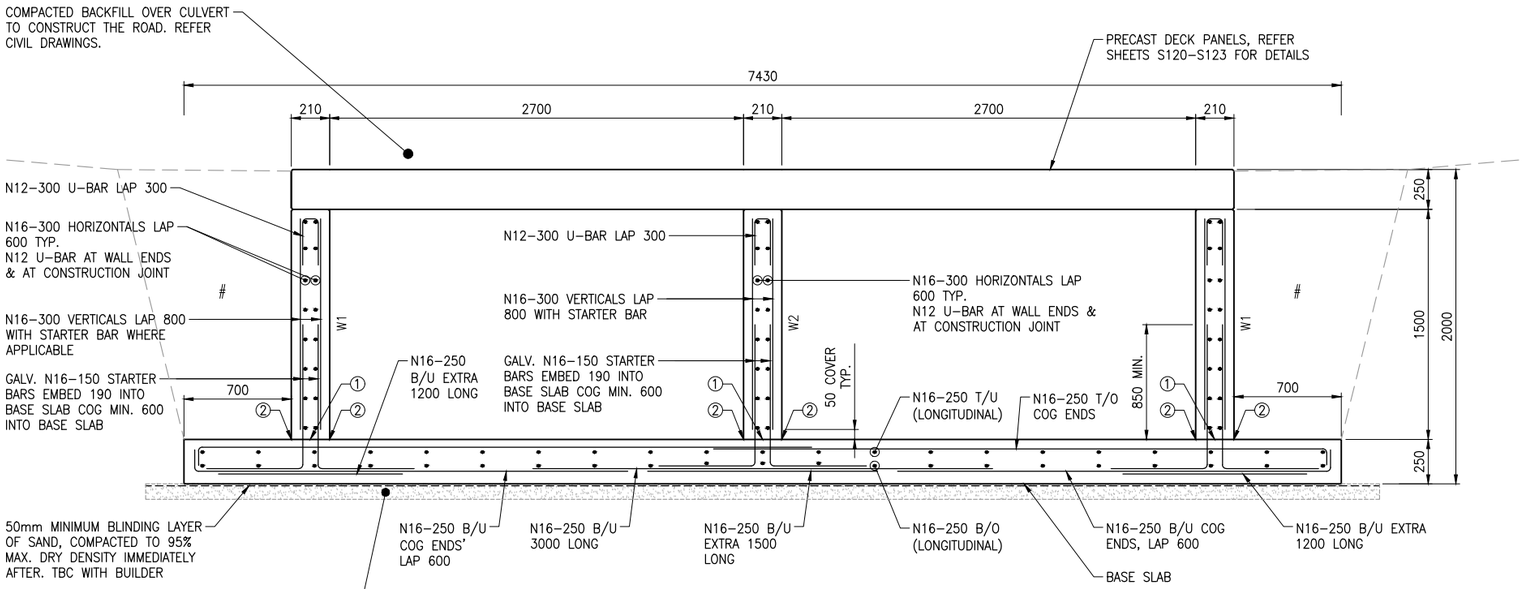

A S110 TYPICAL CULVERT SECTION
SCALE 1:20

NOTES:

REINFORCEMENT COVER
50mm TOP, BTM & SIDES TYP. U.N.O.
BASE SLAB 80 BTM (CAST AGAINST GROUND)

CONCRETE
S50
MIN. CEMENTITIOUS CONTENTS 450 kg/m³
MAX. WATER/CEMENT RATIO 0.4
CURE FOR MIN. 14 DAYS
MIN. STRENGTH AT TIME OF STRIPPING 32 MPa

WATER PROOFING – RECOMMENDATONS
PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURERS SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m^3 OF CONCRETE = 3.6–4.5 kg/m^3.
ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' E.G. ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.

BASE SLAB
TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREENING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' CAN BE USED. THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATION.

MEMBER SCHEDULE

W1 – EXTERNAL WALL, 210 THICK
W2 – INTERMEDIATE WALL, 210 THICK
PRECAST DECK PANELS, 250 THICK
BASE SLAB, 250 THICK

LEGEND

\# ZONE I BACKFILL:
LOCAL CUT SOIL MATERIAL COMPACTED TO 98% SRDD.
ZONE II BACKFILL:
REFER SHEET 'SECTION THROUGH WING WALL'

WATER PROOFING RECOMMENDATION

① THOROUGHLY CLEAN JOINT SURFACE & APPLY 2 COATS OF "XUPEX CONCENTRATE" SLURRY TO JOINT SURFACE AT A RATE OF 1.0 kg/sqm.

② APPLY ONE SLURRY COAT OF "XUPEX CONCENTRATE" AT A RATE OF 0.8 kg/sqm. THEN FILL SLOT TO SURFACE WITH "XUPEX CONCENTRATE" IN DRY–PAC FORM. PROVIDE 10x10 CHAMFER AT THIS LOCATION.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE: 1:40 / 1:20 — 0 0.2 0.4 0.6 0.8 1 1.2 — A3 / A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN: CS	APPROVED: RQ		
DESIGN: RQ	APPROVED: RQ		
STRUCTURAL SIGNOFF APPROVAL: R.Q.			
DATE: 20/03/2025	RPEQ: 15306		

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: TYPICAL CULVERT SECTION A

DRAWING NO: 160-012-S111 | SIZE: A1 | REVISION: 3

25/08/2025 10:03:43 AM
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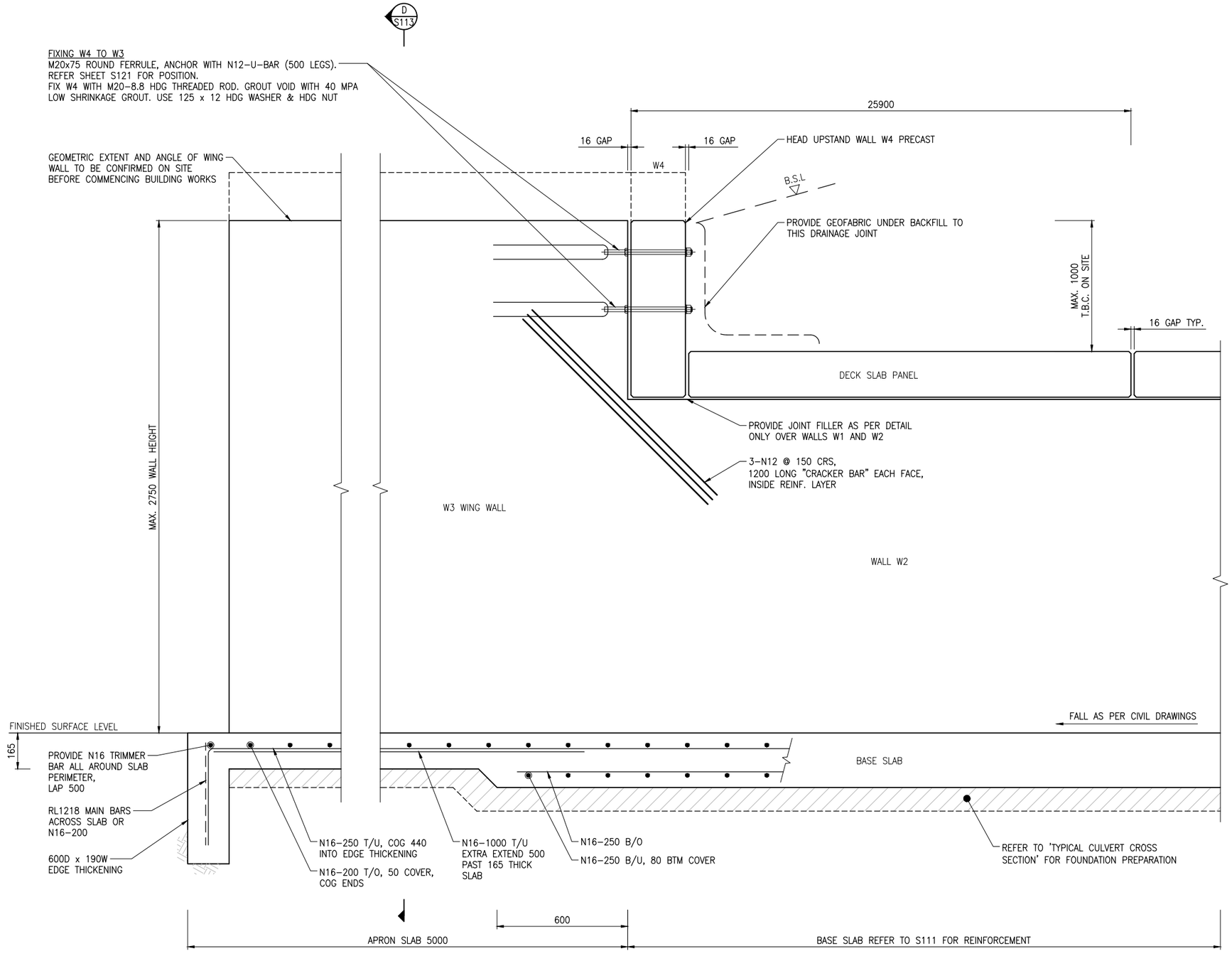

C S110 TYPICAL SECTION THROUGH APRON SLAB

SCALE 1:10

NOTES:

REINFORCEMENT COVER
50mm TOP, BTM & SIDES TYP. U.N.O.
BASE SLAB 80 BTM (CAST AGAINST GROUND)

CONCRETE
S50
MIN. CEMENTITIOUS CONTENTS 450 kg/m³
MAX. WATER/CEMENT RATIO 0.4
CURE FOR MIN. 14 DAYS
MIN. STRENGTH AT TIME OF STRIPPING 32 MPa

WATER PROOFING – RECOMMENDATONS
PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURERS SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.

MEMBER SCHEDULE:

W3 – WING WALLS 210 THICK
VERTICAL EXTENT TO BE DETERMINED ON SITE
MAX. 2m–RETAINED HEIGHT

W4 – UPSTAND WALL
VERTICAL EXTENT TO BE DETERMINED ON SITE
MAX. 0.4m HEIGHT

APRON SLAB

TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREENING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' CAN BE USED. THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATION.

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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A3 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
R.Q.
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT DETAILS
SHEET 1 OF 2
DRAWING NO: 160-012-S112
SIZE: A1
REVISION: 3

25/08/2025 10:03:40 AM
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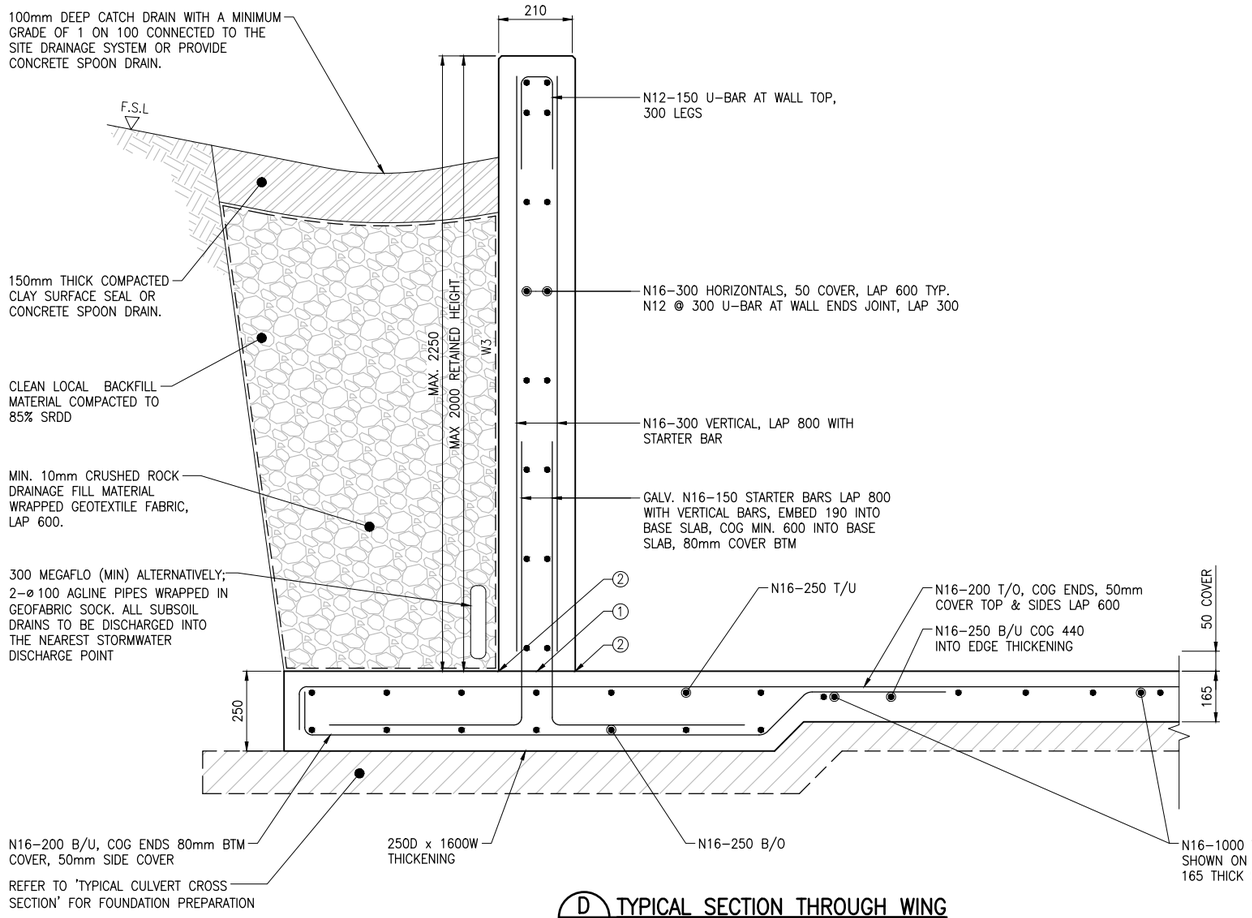


D S112 **TYPICAL SECTION THROUGH WING WALL (W3) AND APRON SLAB**

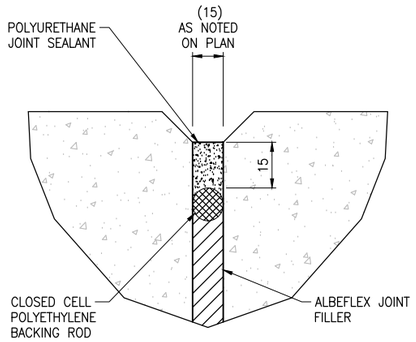
SCALE 1:10

LEGEND

WATER PROOFING RECOMMENDATION

① THOROUGHLY CLEAN JOINT SURFACE & APPLY 2 COATS OF "XUPEX CONCENTRATE" SLURRY TO JOINT SURFACE AT A RATE OF 1.0 kg/sqm.

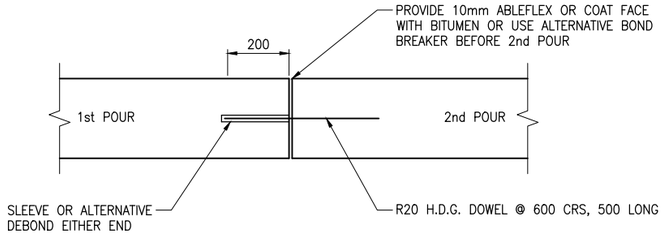
② APPLY ONE SLURRY COAT OF "XUPEX CONCENTRATE" AT A RATE OF 0.8 kg/sqm. THEN FILL SLOT TO SURFACE WITH "XUPEX CONCENTRATE" IN DRY–PAC FORM. PROVIDE 10x10 CHAMFER AT THIS LOCATION.



NOTE:
PROVIDE TEMPORARY SHIN PLATES IN GAP DURING PLACEMENT OF DECK PANELS

TYPICAL DECK PANEL JOINT DETAIL

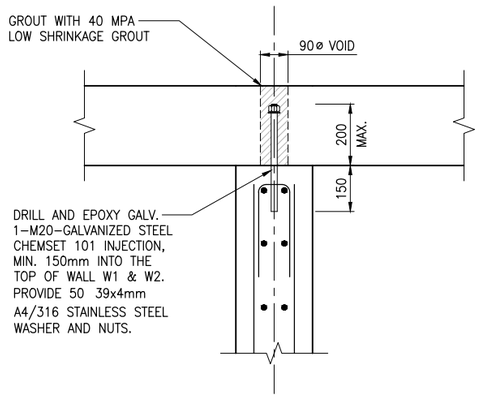
SCALE 1:1



TYPICAL CONSTRUCTION JOINT IN BASE SLAB AND WALLS

SCALE 1:10

NOTE: WALL JOINTS CAN BE CONSTRUCTED WITHOUT DOWELS



TYPICAL CONNECTION DECK PANELS TO TOP OF WALL (W1 & W2)

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE

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1:1 A1

ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL

DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT DETAILS
SHEET 2 OF 2

DRAWING NO: 160-012-S113 | SIZE: A1 | REVISION: 3

25/08/2025 10:03:42 AM
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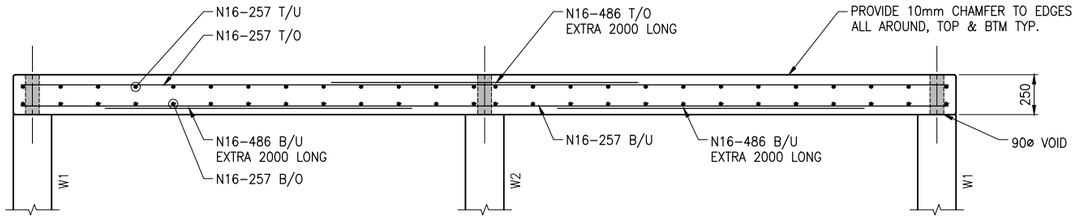
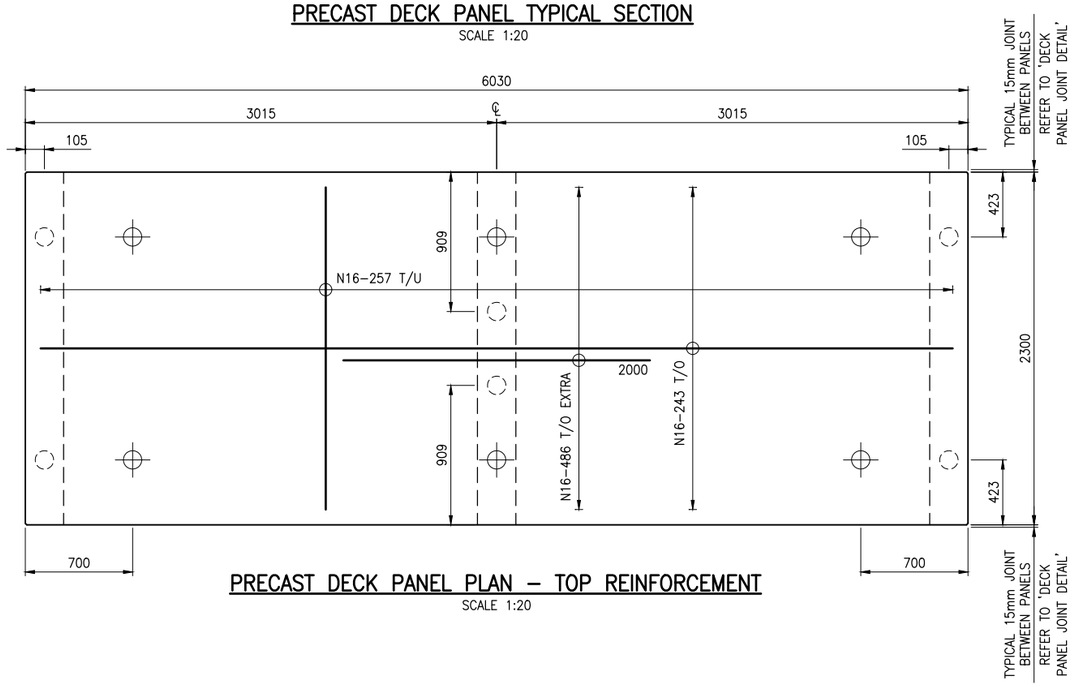


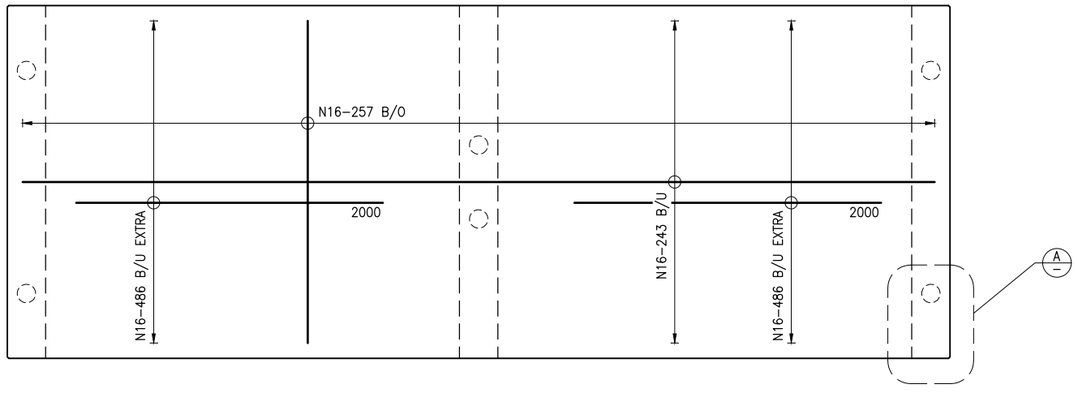
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

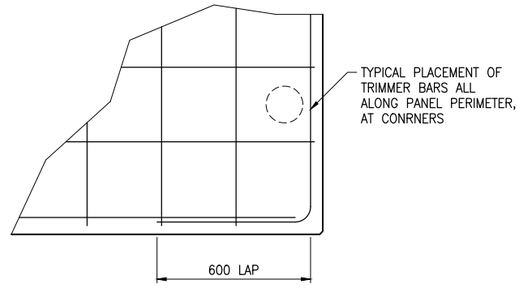
SCALE 1:20

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 9
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



DETAIL A

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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1:10 A1
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1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT PRECAST DECK PANELS P1-P6 & P9-P11
DRAWING NO: 160-012-S120
SIZE: A1
REVISION: 3

25/08/2025 10:03:45 AM
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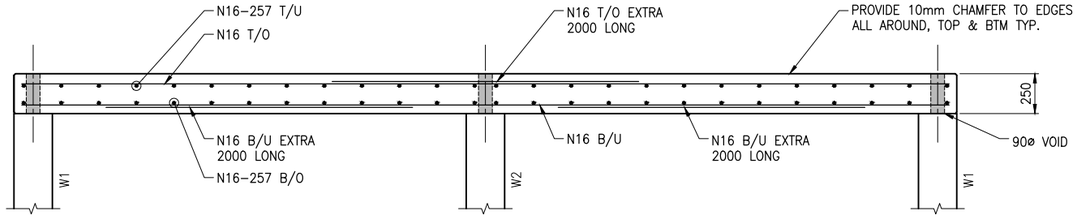
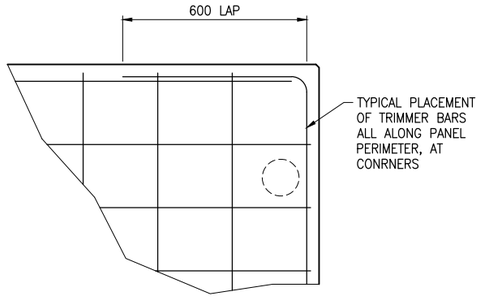




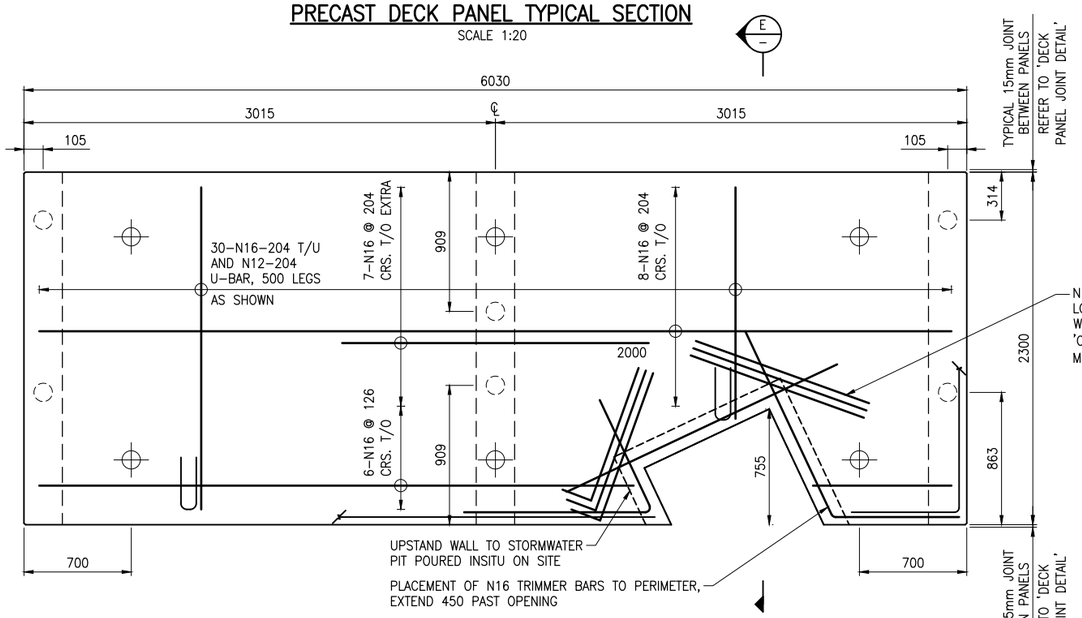
DETAIL B
SCALE 1:10

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 1
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

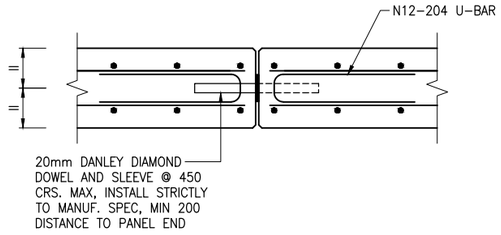
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20

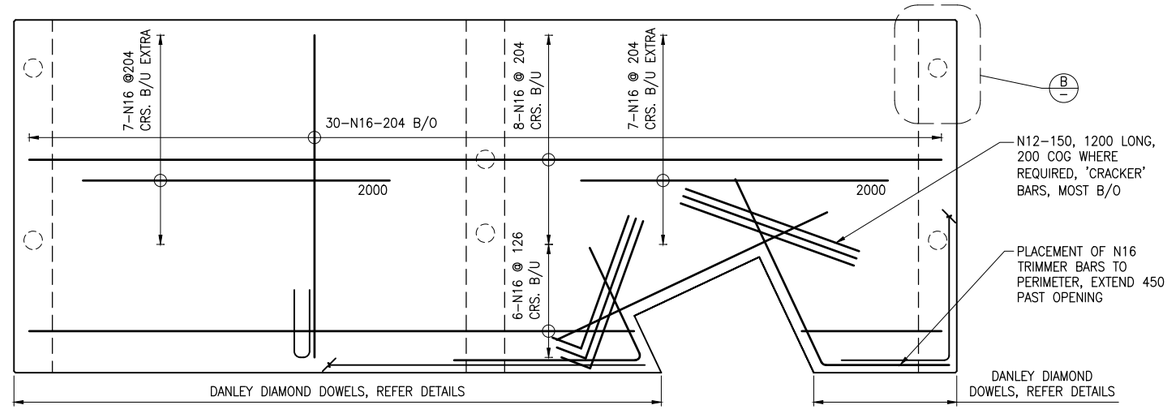


P7 TO P8 CONNECTION DETAIL

SCALE 1:10

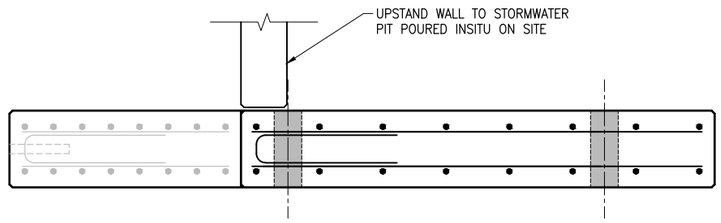
LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20



E SECTION
SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/08/25	COUNCIL APPROVAL	RQ	MF
1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

SCALE
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1:20 A1
ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PRECAST DECK PANEL P7

DRAWING NO: 160-012-S121 | SIZE: A1 | REVISION: 2

25/08/2025 10:03:42 AM
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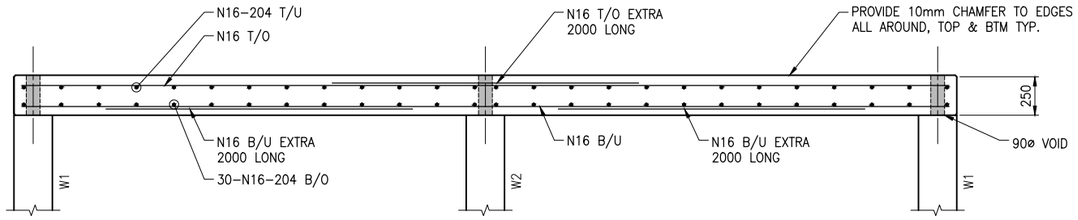
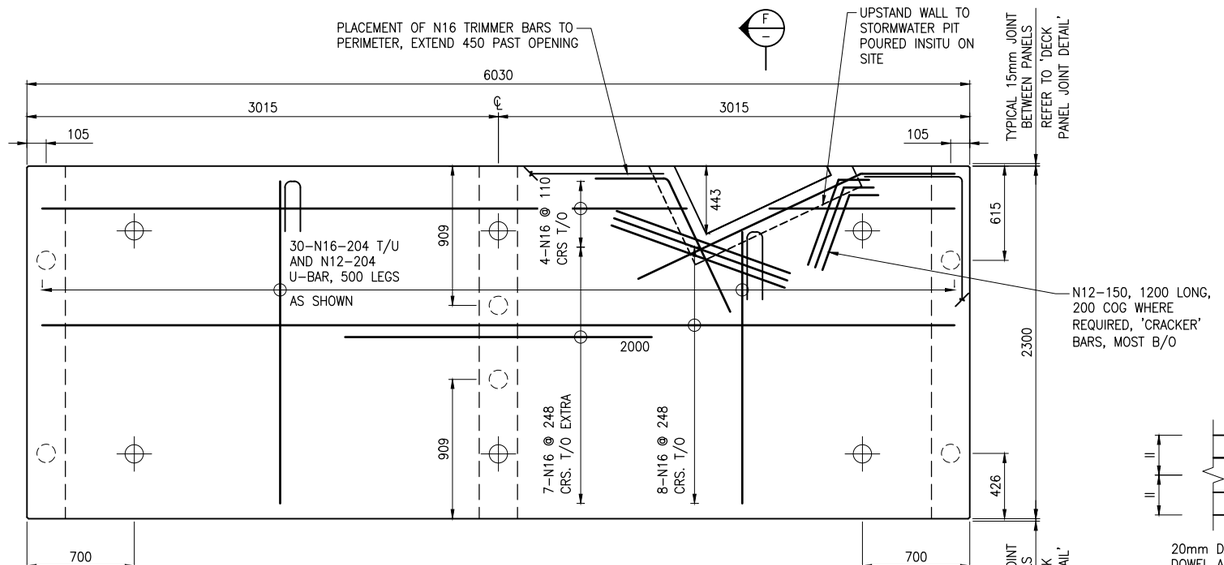


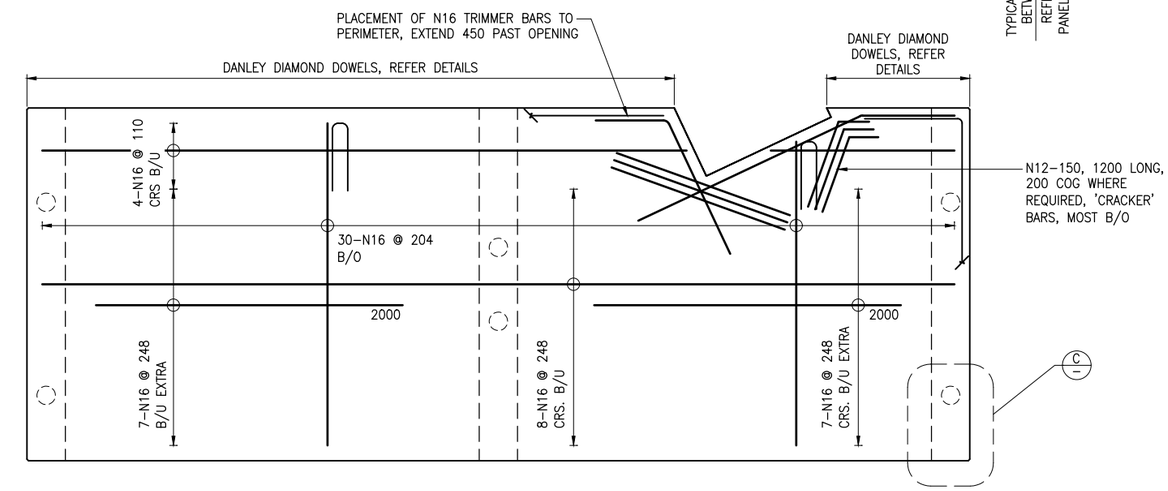
PRECAST DECK PANEL TYPICAL SECTION

SCALE 1:20



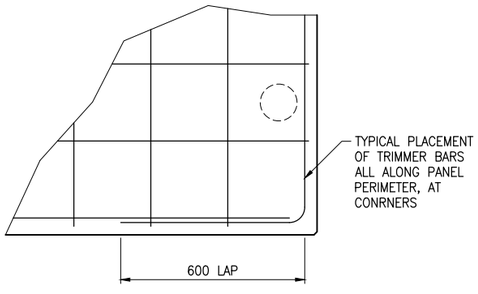
PRECAST DECK PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



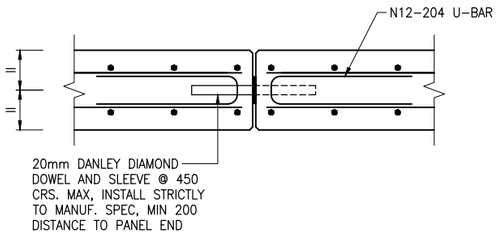
PRECAST DECK PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20



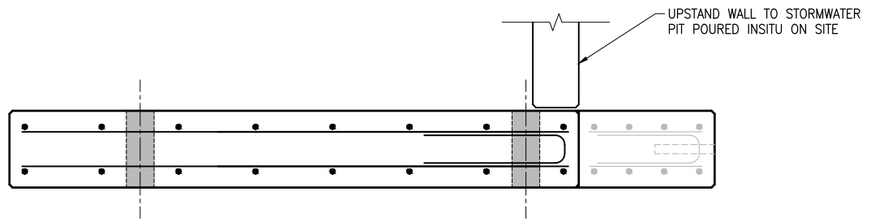
DETAIL C

SCALE 1:10



P7 TO P8 CONNECTION DETAIL

SCALE 1:10



F SECTION

SCALE 1:20

PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 250mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 1
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: 8.7t
13. PANEL VOLUME: 3.47m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE OF ALL CONCRETE FLATWORK, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

- PROVIDE 90 DIA. VOID IN DECK SLAB PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED.
- LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
2	21/08/25	COUNCIL APPROVAL	RQ	MF
1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

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DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING

DRAWING REF: CULVERT PRECAST DECK PANEL P8

DRAWING NO: 160-012-S122 | SIZE: A1 | REVISION: 2

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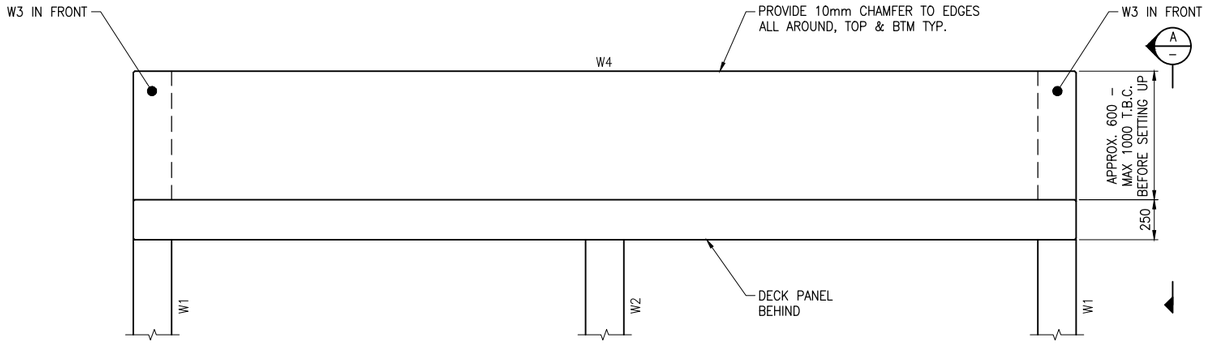

PRECAST HEAD WALL PANEL TYPICAL ELEVATION

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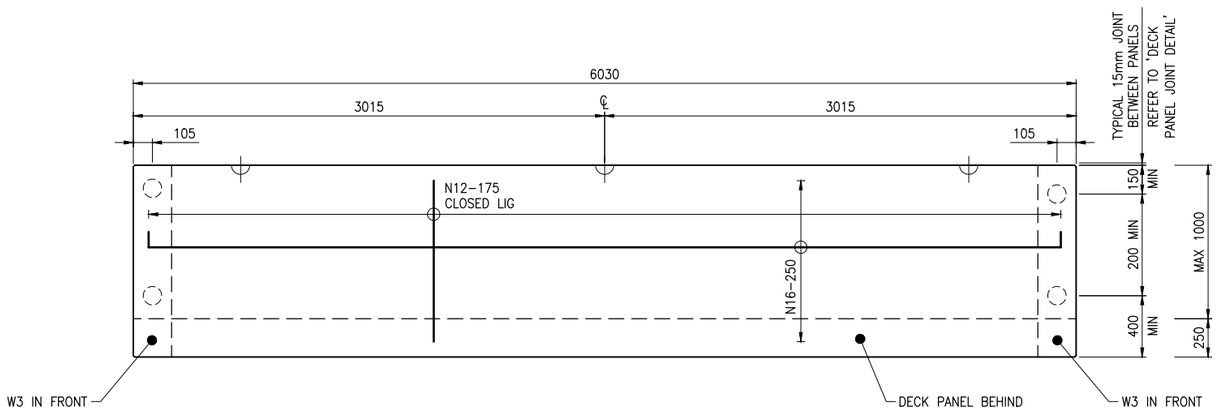
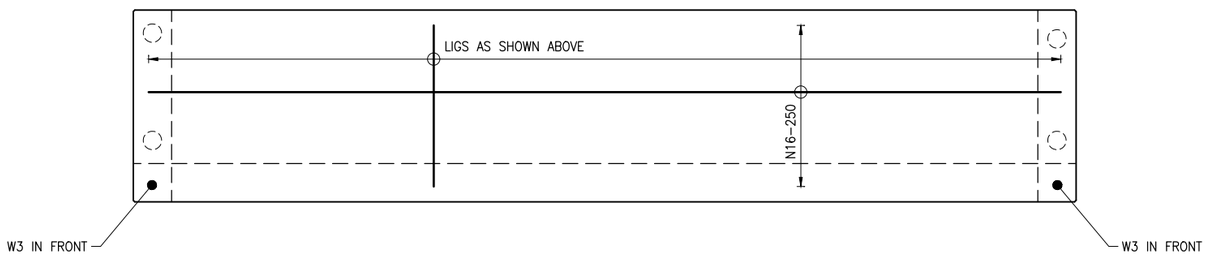


PRECAST HEAD WALL PANEL PLAN – TOP REINFORCEMENT

SCALE 1:20



PRECAST HEAD WALL PANEL PLAN – BOTTOM REINFORCEMENT

SCALE 1:20

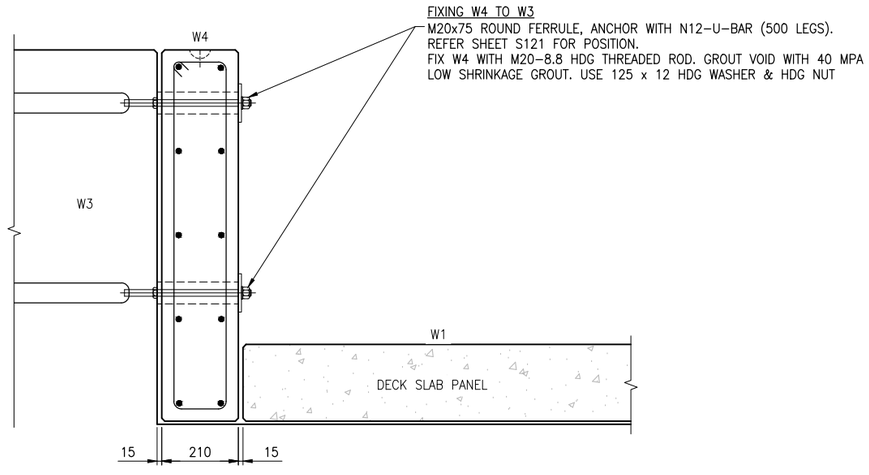
PRECAST PANEL NOTES:

1. ALL DETAILS TO BE IN ACCORDANCE WITH AS3850 AND AS5100.
2. THE PANELS HAVE BEEN DESIGNED FOR FINAL 'IN SERVICE' CONDITIONS ONLY. 'REID CONSTRUCTION SYSTEMS' SHALL PROVIDE THE LIFTER DESIGN & CERTIFICATION AND ANY ADDITIONAL REINFORCEMENT REQUIRED TO RESIST LOADS IMPOSED DURING, TRANSPORT AND LIFTING.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LIFTING ARRANGEMENT & CRANAGE.
4. INSTALL LIFTERS IN ACCORDANCE WITH MANUF. INSTRUCTIONS.
5. LIFTER LOCATIONS & SPECIFICATION TO BE CONFIRMED BY 'REID CONSTRUCTION SYSTEMS' BEFORE ANY PRECAST WORKS COMMENCE
6. ALL PANEL JOINTS SHALL BE 15mm AND SEALED AS PER DETAIL
7. ALL DIMENSIONS TO BE CHECKED ON SITE AGAINST BUILT DIMENSIONS OF CULVERT WALL BEFORE ANY PRECAST WORKS COMMENCE
8. DO NOT SCALE OFF DRAWING
9. TYPICAL PANEL DETAILS UNO
   CONCRETE GRADE = S50
   MIN. CEMENTITOUS CONTENTS 450 kg/m³
   MAX. WATER/CEMENT RATIO 0.4
   CURE FOR MIN. 14 DAYS
   MIN. STRENGTH AT TIME OF STRIPPING 32 MPa
   THICKNESS: 210mm
   REINFORCEMENT: AS SHOWN
   TRIMMER: 1–N16 EACH FACE (LAP 600) ALL ALONG OUTER PERIMETER
   COVER: 50mm
   FINISHES TO PANELS: SMOOTH OFF–FORM FINISH
   PROVIDE 10x10 CHAMFERS TO ANY EDGES
10. NUMBERS OF PANELS : 2
11. WATER PROOFING – RECOMMENDATION:
    PROVIDE PENETRON ADMIX SB TO THE CONCRETE MIX STRICTLY IN ACC. WITH THE MANUFACTURER'S SPECIFICATIONS WHICH IS AT A DOSE OF 0.8–1% OF TOTAL CEMENTITIOUS CONTENTS PER m³ OF CONCRETE = 3.6–4.5 kg/m³.
    ADD ADMIX TO THE CONCRETE MIX AT THE TIME OF BATCHING.
    ALTERNATIVE USE 'XYPEX ADMIX C–SERIES' LIKE ADMIX C–2000/2000 NF. BUILDING CONTRACTOR TO CONFIRM PRODUCT CHOICE WITH MANUFACTURER BEFORE COMMENCING WORKS.
12. PANEL WEIGHT: MAX 4t
13. PANEL VOLUME: 1.58m³
14. TO REDUCE RAPID EVAPORATION OF WATER FROM THE SURFACE AFTER THE CONCRETE POUR, APPLY 'SUPERCURE HR' IMMEDIATELY AFTER INITIAL SCREEDING. ALTERNATIVE 'ECOVAP' OR 'MASTERCURE 111CF' THE PRODUCT MUST BE MIXED AND APPLIED STRICTLY TO MANUFACTURER'S SPECIFICATIONS.

LEGEND

PROVIDE 90 DIA. VOIDS IN PANELS. ADJUST REINFORCEMENT AT VOID TO ENSURE MIN. 50mm COVER IS MAINTAINED. MATCH ROUND FERRULES IN W3 TO VOID POSITION

LIFTING INSERT, INDICATIVE LOCATIONS SHOWN ONLY



SECTION A–A THROUGH HEAD UPSTAND WALL W4

SCALE 1:10

PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS					
3	21/08/25	COUNCIL APPROVAL	RQ	MF
2	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
1	31/03/25	FOR COUNCIL APPROVAL	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

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ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE

DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 30/06/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: CULVERT PRECAST HEAD WALL W4
DRAWING NO: 160-012-S123
SIZE: A1
REVISION: 3

25/08/2025 10:03:45 AM
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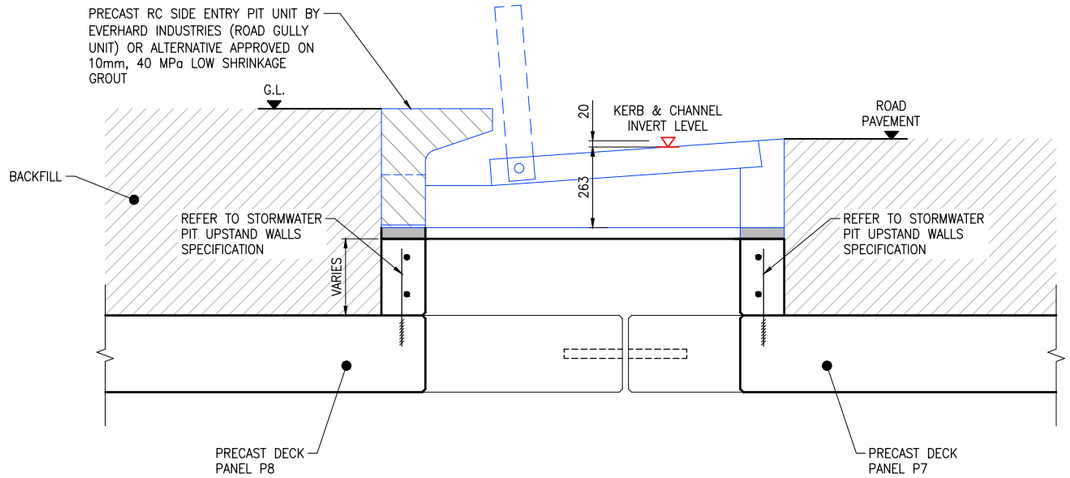
STORMWATER PIT UPSTAND WALLS SPECIFICATIONS

1. POUR INSITU ON SITE
2. 160mm THICK
3. N12–200 GALV. STARTER BARS DRILL EXPOXY 110mm INTO TOP OF DECKS SLAB WITH CHEMSET RE0502
4. N12–150 HORIZONTAL, COG 300 AT CORNERS OR USE CORNER 'L' BARS WITH LEGS LAPPING MIN. 400 WITH HORIZONTAL BARS
5. S40 CONCRETE STRENGTH, SLUMP 80 +/–15, MAX 20mm AGGREGATE SIZE, CURE CONTINOUS FOR 7 DAYS, MIN 25 MPa CONCRETE STRENGTH AT STRIPPING USE BLENDED CEMENTS COMPRISING OF 25–30% FLY ASH (FLY ASH TO COMPLY WITH AS 3582.1) TIME
6. MIN. 60mm COVER
7. PROVIDE 5x5 CHAMFER TO EXTERNAL EDGES
8. BACKFILL UPSTAND WALL NOT EARLIER THAN 28 DAYS AFTER CONCRETE POUR



G S110 SECTION STORMWATER PIT
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PRINT IN COLOUR

FOR COUNCIL APPROVAL

REVISIONS				
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1	30/06/25	DECK PANEL OPENINGS ADDED	RQ	MF
NO.	DATE	DESCRIPTION	DESIGN	APPROVED

ERSCON CONSULTING ENGINEERS

CLIENT: CONMAT CONSTRUCTION MATERIALS

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DRAWN	CS	APPROVED	RQ
DESIGN	RQ	APPROVED	RQ

STRUCTURAL SIGNOFF APPROVAL
DATE: 20/03/2025 RPEQ: 15306

PROJECT REF: COUNTRY ROAD ESTATE
COUNTRY ROAD CULVERT CROSSING
DRAWING REF: STORMWATER PIT
DRAWING NO: 160-012-S130
SIZE: A1
REVISION: 2

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ERSCON
CONSULTING ENGINEERS

Country Road Estate

Country Road Culvert Crossing Stormwater Management Plan

August 2025

www.erscon.com.au

Prepared by:

ERSCON PTY. LTD.
T/as ERSCON Consulting Engineers
PO Box 7890
CAIRNS QLD 4870

Telephone: (07) 4242 8479

DOCUMENT ISSUE RECORD

Revision Code	Date Revised	Revision Details	Author	Checked	Approved
1	22/08/25	Stormwater Management Plan	MG	MF	JM

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APPENDIX A – FNQROC IFD Chart

APPENDIX B – Catchment Plan

APPENDIX C – Hydrological Analysis

APPENDIX D – Hydraulic Analysis

1 SUMMARY

1.1 DEVELOPMENT APPLICATION DETAILS

Proposed development:	Construction of 2 / 2700 x 1500 culverts at the end of Stage 3 Country Road Estate and future works. Works include site clearing, bulk earthworks, roadworks, services and drainage.
Type of approval sought:	**Operational Works**
Site address:	Country Road Mareeba, QLD 4880
Real property description:	Lot 200 on SP342245
Site area:	3,500 m²
Assessment manager:	Mareeba Shire Council
Owner details:	Conmat Pty Ltd
Applicant details:	Conmat Pty Ltd C/-ERSCON PTY. LTD. PO BOX 7890 CAIRNS QLD 4870

1.2 PLANNING INSTRUMENT DETAILS

Planning scheme:	Mareeba Shire Council Planning Scheme 2016
Zone:	Rural Residential A – ZM016a
Local plan:	Nil
Level of assessment:	Code Assessment
Applicable codes:	Bushfire Overlay Code Flood Hazard Overlay

1.3 REFERRAL AGENCIES

Referral agency and role
Nil

2 SITE DETAILS

2.1 SITE DESCRIPTION

The site is located adjacent existing rural residential subdivision land to the North-east of the Mareeba township.

Table 1: Site description

Site characteristic	Description
Existing land use	The existing land consists of nearby rural residential allotments and generally sparse vegetation. A seasonally flowing creek runs under the proposed works.
Existing structures	There is no significant existing infrastructure on the site.
Frontage and access	Extensions to Country Road will provide frontage and access to all allotments.
Topography and views	Levels vary across the site from approximately RL400m AHD at the invert to RL 404m AHD at the end of the road.
Existing vegetation	There is sparse existing vegetation present.
Existing waterways	Site stormwater discharges to a seasonally flowing creek.



Figure 1: Aerial View of Site Identification
Source: DA Mapping System



Figure 2: Satellite View of Site Identification
Source: QLD Globe

2.2 SURROUNDING LAND USES

Table 2: Surrounding land uses

	Surrounding land uses
North	Existing vegetated area
South	Future development/cleared land
East	Existing vegetated area
West	Existing development/drainage

3 STORMWATER MANAGEMENT PLAN

3.1 DESIGN METHOD

The stormwater design has been carried out using the Rational Method, in accordance with the Queensland Urban Drainage Manual (QUDM). Rainfall values from FNQROC Development Manual D4 (05/23) have been utilised. The majority of the hydrological and hydraulic computations undertaken during the development of the stormwater drainage system have been performed utilising the stormwater design module of Version 14 of 12d Model.

In accordance with the QUDM recommendations, the major system design has been calculated based on a 50-year recurrence interval, using overland flow. Minor flows in rural residential streets and overland flow have been designed to a 5-year recurrence interval for rural areas in accordance with QUDM and FNQROC.

Runoff has been calculated using Rainfall intensities that have been obtained from FNQROC Development Manual - D4 **Stormwater Drainage** - Chart 18 and checked against the Australian Government's - Bureau of Meteorology - Design Rainfall Data System (2016) for the area.

Overland road flow will be controlled by breaks in the kerb and channel and diverted to concrete table drains, which will lie at the bottom of the embankment batters and directed to the creek. Water to flow at -4% crossfall from road and then at -3% cross over the verge overtopping into waterway.

Gully pit capacities have been estimated using FNQROC Section D4 Appendix B "Kerb Inlet Capacity Charts". Roadway flow widths have been calculated using Manning's equation for both major and minor flows.

As a rural residential subdivision, pits have been spaced at intervals to ensure road flows do not exceed the reserve, typical of the adjacent development.

3.2 CATCHMENT AREAS

The catchment area contributing to the culverts is directed from the overland flow of the lots within Stage 3 and 4 and also the upstream catchment surrounding the waterway. (Refer **Appendix B** – Figure 1 – Catchment Plan).

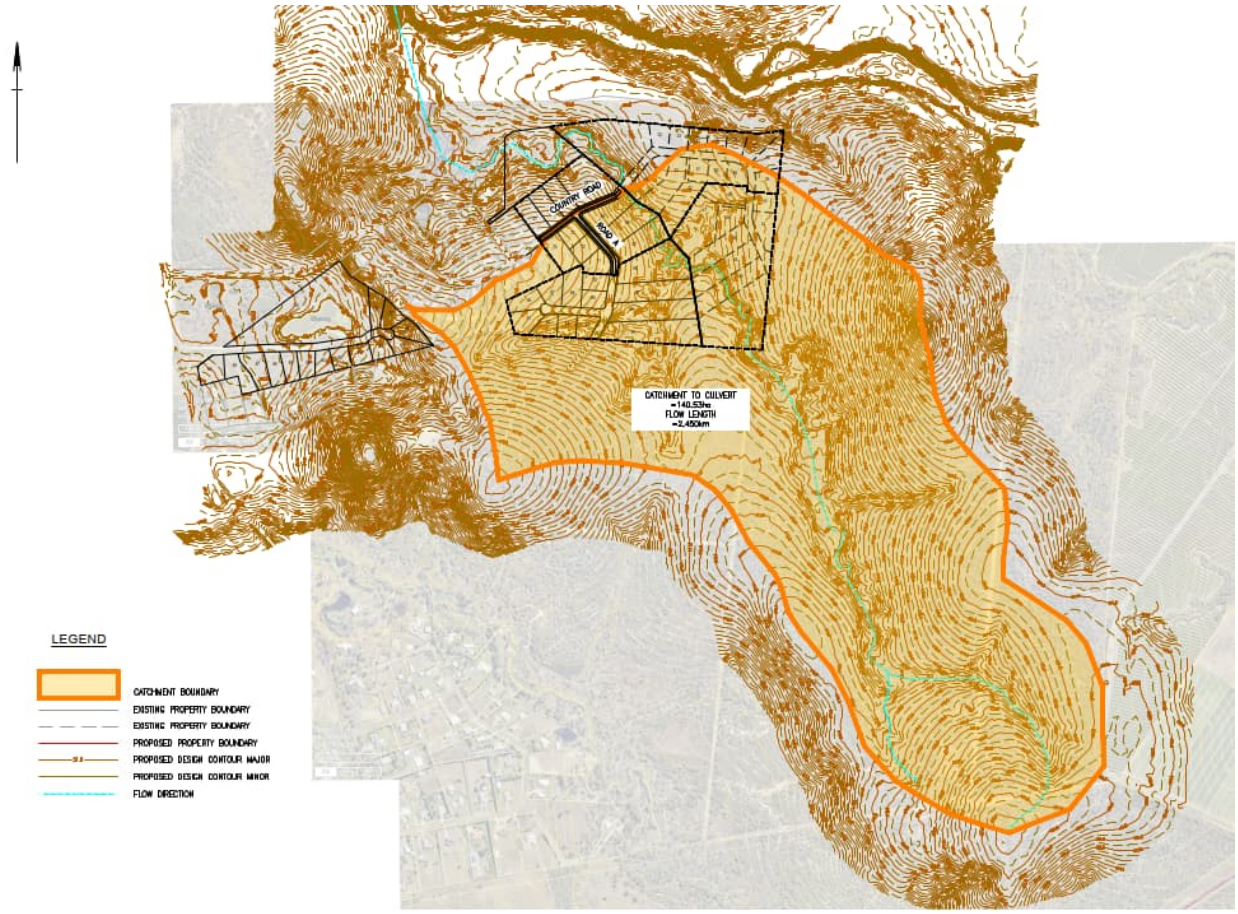


Figure 1 - Catchment Area for Country Road Stage 3-5 Culvert

3.3 MINOR DRAINAGE

3.3.1 Hydrological Design Philosophy

The minor drainage system consists of a combination of overland flow through the culvert system and roads, and the kerb inlet pit has a capacity of Q5 plus 300mm freeboard.

The major drainage system involves overland flow on both the street surfaces and through the culvert. The major drainage system has a capacity of Q50 plus 300mm freeboard, as required by QUDM and confirmed with MSC.

3.4 MAJOR DRAINAGE

3.4.1 Overland Flow

In accordance with the requirements of QUDM, the major drainage system, which incorporates overland flow along the street network, has been designed for a recurrence interval of 50 years. Similarly to the minor drainage, major overland bypass flow will be directed to tip out over the batters to the lawful point of discharge.

Depth by velocity calculations for half the road flow have been undertaken and all pits produce satisfactory results regarding pedestrian safety ($dv < 0.6m^2/s$).

3.5 HYDROLOGICAL ANALYSIS

12d Model requires various data to be input by the operator for it to perform hydrological computations as detailed below.

Coefficients of Runoff have been determined in accordance with Section 5.04 of QUDM assuming an Urban Residential Development Category. Rainfall intensities have been obtained from the Australian Government's - Bureau of Meteorology - Design Rainfall Data System (2016) for the area.

Times of Concentration have been determined in accordance with Section 4.6.11 of QUDM, specifically the Recommended Standard Inlet Times detailed in Table 4.6.2. Larger catchment Tc has been calculated on an average slope calculation using the Bransby- Williams' equation in accordance with QUDM.

The Hydrological Analysis for a Q5 and Q50 event have been undertaken including pit flow, catchment, bypass and flow widths for the pit layout are shown in the calculation tables contained in **Appendix C**. Stormwater longitudinal sections are referred to in **Appendix A**.

Results of the Hydraulic Analysis showing proposed culvert sizes and invert levels have been determined through the utilisation of 12d Model. Calculations and tables are contained in **Appendix D**.

Stream velocities and volumes were calculated for the catchment for AEP values of 63%, 39%, 18%, 10%, 5%, 2%, 1% and 0.5%. Accumulated values were then determined when flow paths converged as they descended through the catchment.

The Catchment flow volumes were determined as **10.12m³/s** and a velocity of **2.60m/s** for the 18**% AEP / Q5 event**. (Refer Appendix D - Hydrological Analysis).

The Catchment flow volumes were determined as **18.32m³/s** and a velocity of **3.29m/s** for the 2**% AEP / Q50**. (Refer Appendix D - Hydrological Analysis).

3.6 STORMWATER OUTLETS

Stormwater outlets have been designed to be in council owned land (drainage easements). Outlets have been designed to have outlet scour protection and energy dissipation through rock outlet pads. The flow from the upstream creek will be conveyed under Country Road using culverts. The outflow from Country Road will be directed towards the north-west overtopping into the creek.

Upstream flows have been calculated for the existing channels and crossroad drainage culverts to minimise the risk of disturbance to property.

APPENDIX A

FNQROC IFD Chart

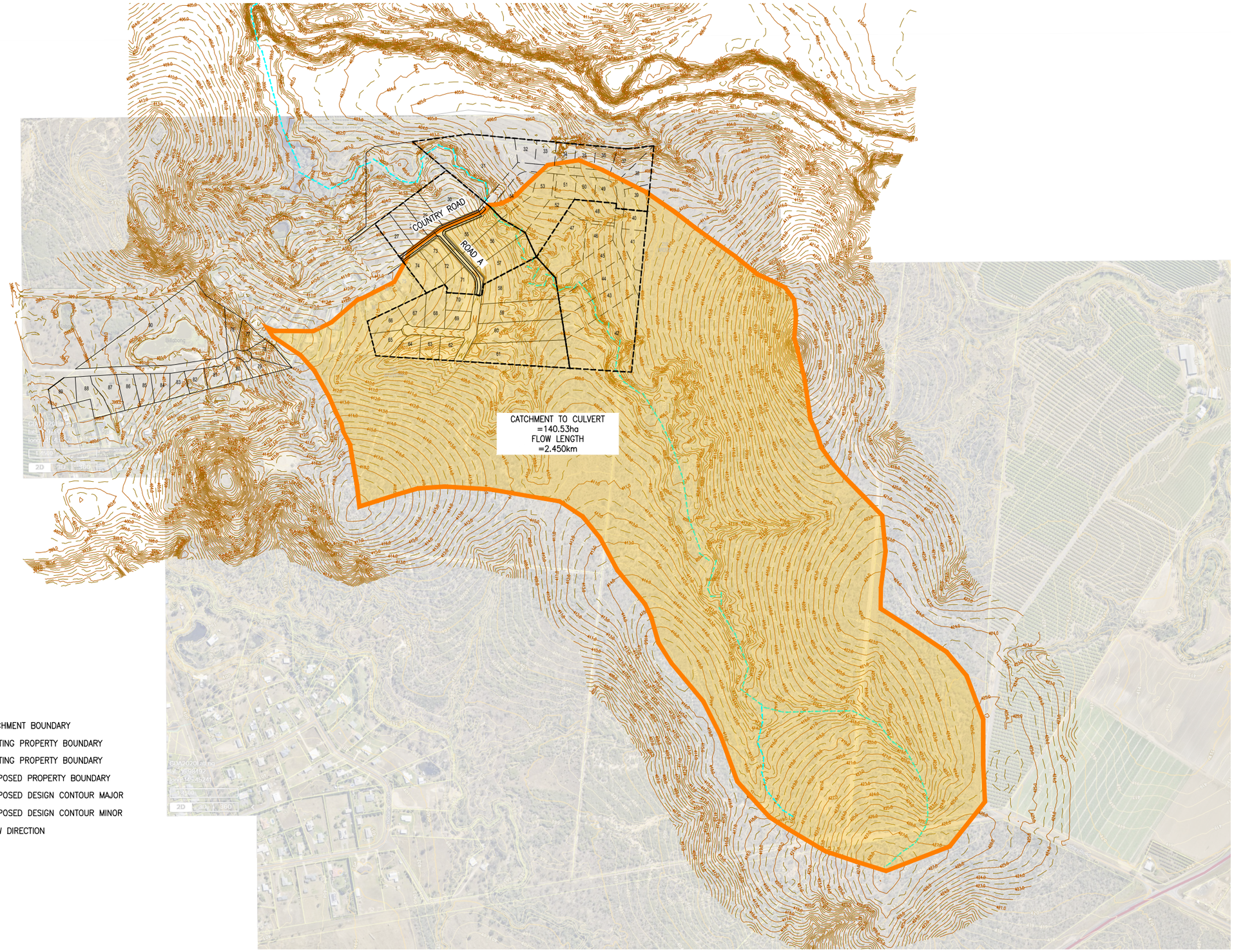
Chart 18 Mareeba

Annual Exceedance Probability (AEP)

Duration	Duration (mins)	63.20%	50%	20%	10%	5%	2%	1%
1 min	1	135	152	204	237	267	305	333
2 min	2	117	132	175	202	227	258	281
3 min	3	110	124	164	190	214	244	265
4 min	4	105	118	157	182	205	234	255
5 min	5	100	113	151	175	198	225	246
10 min	10	84.3	95.3	128	149	168	192	209
15 min	15	73.5	83	111	130	146	167	182
20 min	20	65.4	73.9	99	115	130	149	162
25 min	25	59.1	66.7	89.4	104	117	134	146
30 min	30	54.1	61	81.6	94.7	107	122	133
45 min	45	43.4	48.9	65.2	75.6	85.3	97.4	106
1 hour	60	36.6	41.2	54.8	63.5	71.6	81.7	89.1
1.5 hour	90	28.2	31.7	42.1	48.8	55.1	62.9	68.6
2 hour	120	23.1	26	34.7	40.2	45.4	51.9	56.7
3 hour	180	17.3	19.5	26.1	30.4	34.4	39.5	43.2
4.5 hour	270	12.9	14.5	19.6	22.9	26.1	30.1	33.1
6 hour	360	10.4	11.8	16	18.8	21.5	25	27.6
9 hour	540	7.75	8.82	12.1	14.4	16.6	19.5	21.7
12 hour	720	6.31	7.2	10	12	13.9	16.5	18.5
18 hour	1080	4.75	5.45	7.73	9.34	11	13.2	14.9
24 hour	1440	3.91	4.5	6.47	7.88	9.34	11.4	13
30 hour	1800	3.37	3.89	5.64	6.92	8.26	10.1	11.6
36 hour	2160	2.99	3.46	5.05	6.23	7.48	9.22	10.7
48 hour	2880	2.48	2.88	4.24	5.27	6.37	7.94	9.26
72 hour	4320	1.9	2.21	3.28	4.11	5.01	6.31	7.42
96 hour	5760	1.56	1.81	2.7	3.39	4.14	5.23	6.17
120 hour	7200	1.32	1.54	2.29	2.87	3.5	4.42	5.22
144 hour	8640	1.15	1.33	1.98	2.47	3.01	3.79	4.46
168 hour	10080	1.01	1.17	1.73	2.15	2.61	3.27	3.84

APPENDIX B

Catchment Area



LEGEND

- CATCHMENT BOUNDARY
- EXISTING PROPERTY BOUNDARY
- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- 51.0 PROPOSED DESIGN CONTOUR MAJOR
- PROPOSED DESIGN CONTOUR MINOR
- FLOW DIRECTION

PRINT IN COLOUR

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REVISIONS				
NO.	DATE	DESCRIPTION	DESIGN	APPROVED
1	16/01/25	INITIAL ISSUE		

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CLIENT

SCALE

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DRAWN APPROVED	DESIGN APPROVED
CIVIL SIGNOFF APPROVAL	
DATE:	RPEQ:

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DRAWING REF: CULVERT CROSSING CATCHMENT PLAN

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APPENDIX C

Hydrological Analysis

JOB NO: 160-005
JOB: Country Road Estate - between Stage 3 and 5
12d Long Section - In-Situ Culvert Design -
TITLE : Country Road Estate -
DATE: 20/01/2025

ERSCON CONSULTING ENGINEERS

Time of concentration Calculation
(Using Bransby-Williams' Equation)

Proportionality Factor P= 58 (for Ha)

Length of Flow Path L= 2.450 km
Top of Catchment (RL) RL = 428.35 m
Area of Catchment A = 140.53 Ha

Catchment Profile 399 [to utilise graph area better]

Chainage	RL	RL	Area under Graph (m²)
0	399.495	0.495	-----
30	399.732	0.732	18
40	400.3	1.3	10
642	402.8	3.8	1535
1588	411.35	12.35	7639
2021	417.35	18.35	6647
2239	421.85	22.85	4491
2370	427.1	28.1	3337
2433	428.097	29.097	1802
2453	428.35	29.35	584

Average Slope Calculation	
Outlet Chainage	0
Catchment length	2450
Outlet RL	0
Top RL (Av Slope)	20.8

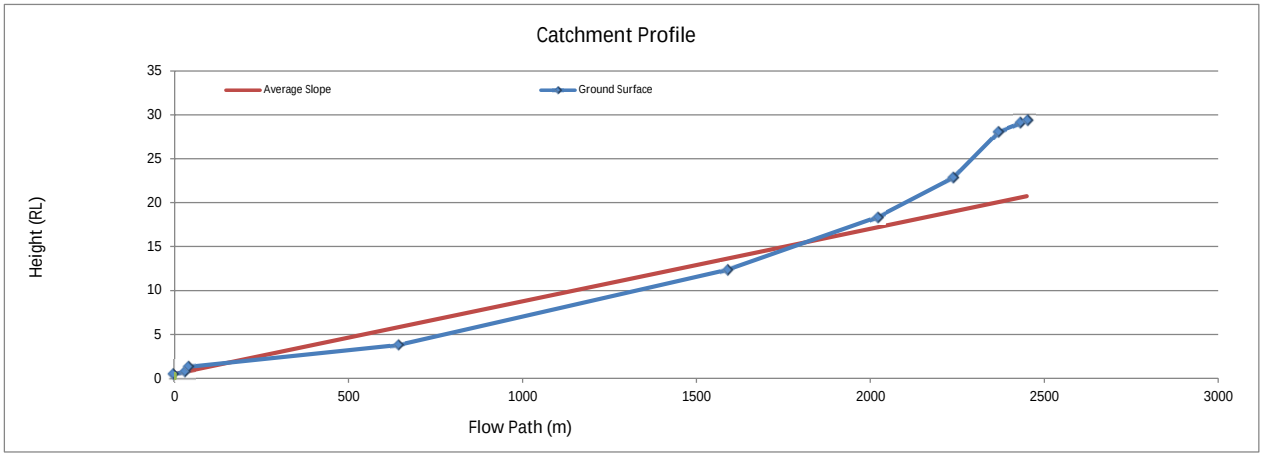
$$Tc = \frac{P \times L}{(A \wedge 0.1) \times (S \wedge 0.2)}$$

Tc = 90.0 min

Adopted Tc 90.0 min

Total area under graph **26063** m^2
Area below outlet level 1214 m^2
Area above outlet 24849 m^2

Height for average slope 20.26 m
Average Slope S = 0.8 %

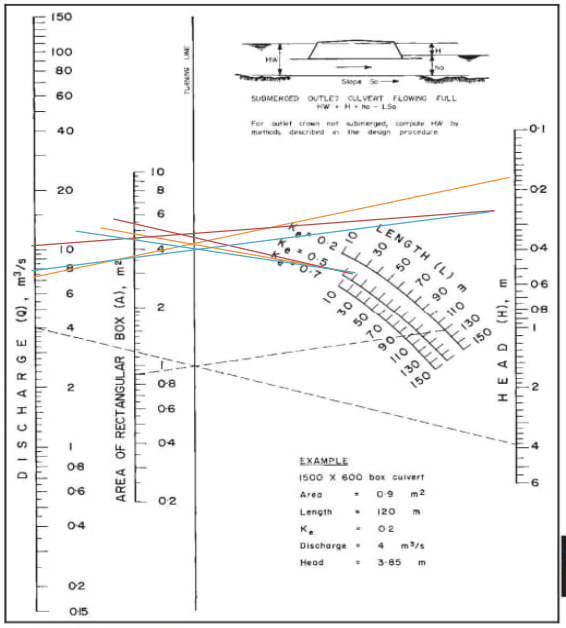


Flow Calculation for Upstream Catchment

Catchment 1

Fraction Impervious = f_i = 0.2 Table Below (QUDM Table 4.5.1)
1 hour @ 10 year ARI = $^{1}I_{10}$ = 63.5 mm/hr (IFD CHARTS)
C_{10} = 0.65 (QUDM Table 4.5.3)

AEP		63%	39%	18%	10%	5%	2%	1%		
Design ARI		**1**	**2**	**5**	**10**	**20**	**50**	**100**		
Frequency Factor	F_Y	0.8	0.85	0.95	1	1.05	1.15	1.2		(QUDM Table 4.5.2)
Coefficient of Discharge	C_Y	0.52	0.5525	0.6175	0.65	0.6825	0.7475	0.78		(QUDM Equation 4.3)
Time of Concentration	T_C	90	90	90	90	90	90	90	min	
Rainfall Intensity	$^{90min}I_{10}$	28.0	31.5	42.0	48.7	54.9	62.8	68.5	mm/hr	(IFD CHARTS)
Area	A	140.53	140.53	140.53	140.53	140.53	140.53	141	Ha	
Path A Flow		**5.68**	**6.79**	**10.12**	**12.36**	**14.63**	**18.32**	**20.86**	**m^3/s**	
Velocity		**2.061**	**2.213**	**2.596**	**2.812**	**3.009**	**3.292**	**3.467**	**m/s**	Taken from ERSCON Super Drain Table
Height		**0.510**	**0.568**	**0.722**	**0.814**	**0.900**	**1.031**	**1.114**	**m**	



Note: Q is Discharge per culvert cell

9A-5 Outlet Control - Head for concrete box culverts flowing full (n=0.012)

Hw=H+ho-LSo

where	Hw = 2.8	2.8
	ho = 1.8	1.8
	L = 30m	30
	So = 0.8%	0.008

H= Hw - (ho+Lso)

H **0.76 m**

K = V2/1296a

Where	K=	Length of VC
	a=	0.05 g (vertical accelration)
	V=	40 km/h

K= **24.7 m**

Q10

Given	Q10 discharge	12.36	m³/s
	Head (H)	0.2	m
	Length	30	m

Where Ke : 0.5 Entry Loss co-efficent (assume 0.5 if unknown) (see 10.8 QUDM)

	No. of Cells	2	No	
	Q10/ Cell	6.18	m³/s/cell	
Cell 1	Area of RCBC =	4.10	m²	(from 9A-5 on graph)
Where	Height =	1.50	m	(Given - road height above invert less min. pavement and roof slab)
	Width =	2.73	m²	

Therefore use **2 No** **2700 x 1500**

Q50

Given	Q100 discharge	18.32	m³/s
	Head (H)	0.3	m
	Length	30	m

Where Ke : 0.5 Entry Loss co-efficent (assume 0.5 if unknown) (see 10.8 QUDM)

	No. of Cells	2	No	
	Q50/ Cell	9.2	m³/s/cell	
Cell 1	Area of RCBC =	4.90	m²	(from 9A-5 on graph)
Where	Height =	1.80	m	(Given - road height above invert less min. pavement and roof slab)
	Width =	2.72	m	

Therefore use **2 No** **2700 x 1800**

Q100

Given	Q100 discharge	20.86	m³/s
	Head (H)	0.3	m
	Length	30	m

Where Ke : 0.5 Entry Loss co-efficent (assume 0.5 if unknown) (see 10.8 QUDM)

	No. of Cells	3	No	
	Q100/ Cell	7.0	m³/s/cell	
Cell 1	Area of RCBC =	3.80	m²	(from 9A-5 on graph)
Where	Height =	1.80	m	(Given - road height above invert less min. pavement and roof slab)
	Width =	2.11	m	

Therefore use **3 No** **2100 x 1800**

APPENDIX D

Hydraulic Analysis

Q5 STORMWATER CALCULATIONS

		tc	I	C	A	(CxA)	Q	Qa			Wf	dg	Vg	dg.Vg			Qg	Qb		tc	I	(CxA)	Qrat	Qrc	Qb(net)	Qo	L	S		V	Vt		S/Do	Qg/Qo	Du/Do	V2/2g	Ku	hu	Kw	hw	Sf	hf	dn	Vn						
STRUCTURE NO.	DRAIN SECTION	SUB-CATCHMENT TIME OF CONCENTRATION	RAINFALL INTENSITY	COEFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	TOTAL CONTRIBUTING EQUIVALENT AREA	SUB-CATCHMENT DISCHARGE	FLOW IN K & C (INCLUDING BYPASS)	ROAD GRADE AT INLET	ROAD XFALL AT INLET	FLOW WIDTH	FLOW DEPTH AT INVERT	GUTTER FLOOD VELOCITY	VELOCITY-DEPTH	STRUCTURE TYPE	INLET CAPACITY CURVE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE NO.	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	TOTAL CONTRIBUTING EQUIVALENT AREA	TOTAL PEAK FLOW	HALF ROAD CAPACITY	NET BYPASS FLOW	FLOW IN PIPE	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS	FULL-PIPE FLOW VELOCITY	PIPE TRAVEL TIME VELOCITY	1/2D Ku / Kw CHART IDENTIFIERS	SUBMERGENCE RATIO	FLOW RATIO	DIAMETER RATIO	VELOCITY HEAD	U/S PRESSURE HEAD CHANGE COEFFICIENT	CHANGE IN U/S PRESSURE HEAD	W.S.E. COEFFICIENT	CHANGE IN W.S.E.	PIPE FRICTION SLOPE	PIPE FRICTION TOTAL HEAD LOSS	DEPTH	VELOCITY	PIPE U/S INVERT LEVEL	PIPE D/S INVERT LEVEL	PIPE U/S H.G.L.	PIPE D/S H.G.L.	W.S.E.	SURFACE OR K & C INVERT LEVEL	FREEBOARD	STRUCTURE NO.
		min	mm/hr		ha	ha	m3/s	m3/s	%	%	m	m	m/s	m2/s			m3/s	m3/s		min	mm/hr	ha	m3/s	m3/s	m3/s	m3/s	m	%	mm	m/s	m/s						m			m	%	m	m	m/s	m	m	m	m	m	m	m	
2/11															HW OUT																																			400.613	401.085		2/11
1/11	1/11 to 2/11	15	115	0.677	140.000	94.799	30.230	30.230							HW IN		30.23			15	115	94.799	30.230			30.230	25.550	0.59	(2x)2700x1500	3.73	3.62	Inlet Control	1.16			0.273	2.44	0.664		0.664		0.108	0.891	6.28	399.500	399.350	400.571	400.613	401.235	401.235		1/11
2-12	2-12 to 1-12	5	156	0.677	0.205	0.139	0.060	0.060							AL4D		0.06			5	156	0.139	0.060			0.060	22.180	1.13	900	0.12	3.4	G2	1.01	1		0.001	9.7	0.007		0.007	1.26	0.232	0.109	1.37	400.400	400.150	400.539	400.259	400.546	401.641	1.10	2-12
1-12															HW OUT																																	400.259	400.800		1-12

Q50 STORMWATER CALCULATIONS

		tc	I	C	A	(CxA)	Q	Qa			Wf	dg	Vg	dg.Vg			Qg	Qb		tc	I	(CxA)	Qrat	Qrc	Qb(net)	Qo	L	S		V	Vt		S/Do	Qg/Qo	Du/Do	V2/2g	Ku	hu	Kw	hw	Sf	hf	dn	Vn								
STRUCTURE NO.	DRAIN SECTION	SUB-CATCHMENT TIME OF CONCENTRATION	RAINFALL INTENSITY	COEFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	TOTAL CONTRIBUTING EQUIVALENT AREA	SUB-CATCHMENT DISCHARGE	FLOW IN K & C (INCLUDING BYPASS)	ROAD GRADE AT INLET	ROAD XFALL AT INLET	FLOW WIDTH	FLOW DEPTH AT INVERT	GUTTER FLOOD VELOCITY	VELOCITY-DEPTH	STRUCTURE TYPE	INLET CAPACITY CURVE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE NO.	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	TOTAL CONTRIBUTING EQUIVALENT AREA	TOTAL PEAK FLOW	HALF ROAD CAPACITY	NET BYPASS FLOW	FLOW IN PIPE	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS	FULL-PIPE FLOW VELOCITY	PIPE TRAVEL TIME VELOCITY	12D Ku / Kw CHART IDENTIFIERS	SUBMERGENCE RATIO	FLOW RATIO	DIAMETER RATIO	VELOCITY HEAD	U/S PRESSURE HEAD CHANGE COEFFICIENT	CHANGE IN U/S PRESSURE HEAD	W.S.E. COEFFICIENT	CHANGE IN W.S.E.	PIPE FRICTION SLOPE	PIPE FRICTION TOTAL HEAD LOSS	DEPTH	VELOCITY	PIPE U/S INVERT LEVEL	PIPE D/S INVERT LEVEL	PIPE U/S H.G.L.	PIPE D/S H.G.L.	W.S.E.	SURFACE OR K & C INVERT LEVEL	FREEBOARD	STRUCTURE NO.
		min	mm/hr		ha	ha	m3/s	m3/s	%	%	m	m	m/s	m2/s			m3/s	m3/s		min	mm/hr	ha	m3/s	m3/s	m3/s	m3/s	m	%	mm	m/s	m/s					m		m		m	%	m	m	m/s	m	m	m	m	m	m	m	
2/11															HW OUT																																		400.850	401.085		2/11
1/11	1/11 to 2/11	15	167	1.000	140.000	140.000	64.944	64.944							HW IN		64.944			15	167	140.000	64.944			64.944	25.55	0.59	(2x)2700x1500	8.02	3.62	Outlet Control	1.16			0.23	1.82	0.418		0.418		0.035	0.839	14.3	399.500	399.350	400.817	400.850	401.235	401.235		1/11
2-12	2-12 to 1-12	5	225	1.000	0.205	0.205	0.128	0.128							AL4D		0.128			5	225	0.205	0.128			0.128	22.18	1.13	900	0.26	3.4	G2	1.04	1		0.003	9.7	0.034		0.034	1.34	0.218	0.158	1.72	400.400	400.150	400.604	400.308	400.638	401.641	1.003	2-12
1-12															HW OUT																																		400.308	400.800		1-12