CITY OF MORETON BAY

Enquiries: Xavier Dubreuil
Direct 07 5433 2739
Our Ref: DA/2023/3606
Your Ref: 22-000082_EWKS
Date: 16 October 2023

Foreverlen Pty Ltd
PO Box 5233
BRISBANE QLD 4001

Dear Applicant,

Re: DEVELOPMENT APPROVAL
Planning Act 2016

Development Application No.:	**DA/2023/3606**
Property Location:	**409-423 Caboolture River Road LILYWOOD** **403 Caboolture River Road UPPER CABOOLTURE**
Property Description:	**Lot 1 RP 866105** **Lot 12 RP 866105** **Lot 1000 SP 337426**
Development Type:	**Request to Change (Minor) - Operational Works - Development Permit for Earthworks (Lilywood Landings, Stage 1-5 & 23)**

Please be advised that on 13 October 2023 the above development application was approved by Council's Delegate as the Assessment Manager in accordance with section 63 of the *Planning Act 2016* subject to conditions.

The following type of approval has been issued:

- **Development Permit - Operational Works Earthworks**

The development allowed by this approval must be carried out in accordance with the attached Decision package.

Attached is an extract from the *Planning Act 2016* which details your appeal rights and the appeal rights of any submitters, if applicable, regarding this decision.

Should you require any further information about this matter, please contact Xavier Dubreuil as referenced above.

Yours faithfully

X. Dubreuil

Xavier Dubreuil
Senior Engineer
Development Services

Enclosures: Attachment 1 - Decision Notice
Attachment 2 - Assessment Manager Conditions
Attachment 3 - Approved Plans / Documents
Attachment 4 - Appeal Rights
Attachment 5 - Infrastructure Charges

ATTACHMENT 1

Decision Notice

Decision Notice

Planning Act 2016, section 63

APPLICATION DETAILS

Application No:	**DA/2023/3606**
Applicant:	**Foreverlen Pty Ltd**
Street Address:	**409-423 Caboolture River Road LILYWOOD** **403 Caboolture River Road UPPER CABOOLTURE**
Real Property Description:	**Lot 1 RP 866105** **Lot 12 RP 866105** **Lot 1000 SP 337426**
Planning Scheme:	**Moreton Bay Regional Council Planning Scheme**

APPROVAL DETAILS

Date of Decision: **13 October 2023**

The development application was approved by Council's Delegate as the Assessment Manager subject to conditions (refer Attachment 2).

Application Type	Development Permit	Preliminary Approval
Operational Works for Earthworks	☑	☐

OTHER NECESSARY PERMITS

Not applicable.

In addition to this approval, you may also be required to obtain a water approval from the Northern SEQ Distributor Retailer, trading as Unitywater. To engage a Registered Certifier to lodge your connection application, go to Unitywater's website www.unitywater.com/certifier

CURRENCY PERIOD OF APPROVAL

The currency period stated in section 85 of the *Planning Act 2016* applies to this approval as outlined below:

- Operational Works - 2 years from the date of this approval starts to have effect.

INFRASTRUCTURE

Unless otherwise specified, all assessment manager conditions of this development approval relating to the provision of infrastructure are non-trunk infrastructure conditions under Chapter 4, section 145 of the *Planning Act 2016*.

ASSESSMENT MANAGER CONDITIONS

The Conditions relevant to this development approval are listed in Attachment 2 of the Decision package.

APPROVED PLANS / DOCUMENTS

The approved plans and/or documents as listed below for this development approval are included in Attachment 3 of the Decision package.

The approved plans/documents for this development approval are listed below.

Approved Plans and Documents			
Plan / Document Name	**Reference Number**	**Prepared By**	**Dated**
Stormwater Management Plan - Caboolture West NDP1 - Foreverlen Stages 1 to 4	16-002108-SWMP-01C	Calibre Professional Services Pty Ltd	22/11/2022
Title Sheet & Locality Plan	22-000082 EWKS Dwg. 1000 Rev. B	Calibre Professional Services Pty Ltd	25/05/2023
Overall Bulk Earthworks Layout Plan	**22-000082 EWKS Dwg. 1200 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 1 of 13	**22-000082 EWKS Dwg. 1210 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 2 of 13	**22-000082 EWKS Dwg. 1211 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 3 of 13	**22-000082 EWKS Dwg. 1212 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 4 of 13	**22-000082 EWKS Dwg. 1213 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 5 of 13	**22-000082 EWKS Dwg. 1214 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 6 of 13	**22-000082 EWKS Dwg. 1215 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 7 of 13	**22-000082 EWKS Dwg. 1216 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 8 of 13	**22-000082 EWKS Dwg. 1217 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 9 of 13	**22-000082 EWKS Dwg. 1218 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 10 of 13	**22-000082 EWKS Dwg. 1219 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023

Approved Plans and Documents			
Bulk Earthworks Layout Plan Sheet 11 of 13	**22-000082 EWKS Dwg. 1220 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 12 of 13	**22-000082 EWKS Dwg. 1221 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Layout Plan Sheet 13 of 13	**22-000082 EWKS Dwg. 1222 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Site Sections Plan Sheet 1 of 6	**22-000082 EWKS Dwg. 1250 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Site Sections Plan Sheet 2 of 6	**22-000082 EWKS Dwg. 1251 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Site Sections Plan Sheet 3 of 6	**22-000082 EWKS Dwg. 1252 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Site Sections Plan Sheet 4 of 6	**22-000082 EWKS Dwg. 1253 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Site Sections Plan Sheet 5 of 6	**22-000082 EWKS Dwg. 1254 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Site Sections Plan Sheet 6 of 6	**22-000082 EWKS Dwg. 1255 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023
Bulk Earthworks Typical Details Plan	**22-000082 EWKS Dwg. 1260 Rev. B**	Calibre Professional Services Pty Ltd	25/05/2023

Note: Approved plans as indicated in **BOLD** above are annotated in **red** on the stamped plans by Council dated 16/10/2023.

ASSESSMENT BENCHMARKS

The Assessment Benchmarks that applied to the development from the following Categorising Instruments include;

Categorising Instrument (*Planning Regulation 2017*)

State Planning Policy

- *State Planning Policy 2017*, Part E.

Regional Plan

- *South East Queensland Regional Plan 2017 (ShapingSEQ).*

Local Categorising Instrument (Moreton Bay Regional Planning Scheme)

- Moreton Bay Regional Council Planning Scheme - Site Earthworks Code

Local Categorising Instrument (Variation Approval)

Not applicable.

Local Categorising Instrument (Temporary Local Planning Instrument)

Not applicable.

OTHER RELEVANT ASSESSMENT MATTERS

Not applicable.

REASONS FOR THE DECISION

Not Applicable.

REASONS FOR APPROVAL DESPITE NON-COMPLIANCE WITH ASSESSMENT BENCHMARKS

Not applicable.

REFERRAL AGENCY CONDITIONS

There were no Referral Agencies applicable to this development application.

SUBMISSIONS

Not applicable.

APPEAL RIGHTS

Attachment 4 of the Decision package is an extract from the *Planning Act 2016* which details your appeal rights, and the appeal rights of any submitters, if applicable, regarding this decision.

ATTACHMENT 2

Assessment Manager Conditions of Approval

CONDITION		**TIMING**
OPERATIONAL WORKS		
DEVELOPMENT ENGINEERING		
1	**Management Plans**	
	Undertake all works in accordance with the approved Stormwater Management Plan - Caboolture West NDP1 Foreverlen Stages 1 to 4.	At all times.
2	**Non-Conforming Designs**	
	Only non-conforming designs listed in this approval have been accepted. All other discrepancies with Council standards shall be redesigned and / or reconstructed as necessary to conform with Council standards at no cost to Council.	At all times during construction and prior to finalisation of works.
3	**Errors and Omissions**	
	Where errors or omissions occur in the design or works do not conform to or meet Council standards then these works shall be rectified to comply with Council standards at no cost to Council. Where drawings contain insufficient detail or do not contain details of works that are either necessary or associated with the development then these works shall be designed and constructed to Council standards. Only the approved plans shall be used for construction. Note: Council reserves the right to amend the approved drawings or request further information should this become necessary.	At all times during construction and prior to finalisation of works.
4	**Works – Applicant's Expense**	
	All works, services, facilities and/or public utility alterations required by or as a consequence of this approval or stated condition/s, whether carried out by the Council or otherwise, shall be at the developer's expense unless otherwise specified or agreed in writing. Replace existing Council infrastructure (including but not limited to street trees and footpaths) to Council's standards.	At all times during construction and prior to finalisation of works.
5	**Notification of Finalisation of Works**	
	Notify Council in writing that the development works on site have been finalised.	At the time of completion of construction.
6	**Works Through Land not owned by the Developer**	
	Where any works are proposed to be undertaken on or extend into any property not owned by the developer then the other property owner's written consent must be lodged with Council. The written consent from the land owner must	Prior to any works commencing within those properties.

CONDITION		TIMING
	identify the correct drawing title and number (including revision number) for the works within or through their land.	
7	**Notification to Affected Premises**	
A	Provide Council with a copy of an information kit for 'Notification to Affected Premises' which includes the following: • A layout plan of the proposed development showing adjoining lot boundaries, new and existing roads, park and open space, drainage reserves and community purposes lots as applicable; • Details of any external works with any changes to existing works highlighted for easy identification; • Scheduled start and completion dates; • Contact names and phone numbers for the Developer, Supervising Engineer, Consulting Engineer, the Contractor, Wildlife Spotter and who to contact in an emergency; and • The site working hours authorised for the site works.	Prior to distribution of information kit to residents.
B	Provide all occupiers of premises adjoining the site, directly opposite the frontage of the site, adjacent to and directly opposite external works and residents/occupiers likely to be directly affected by the works with a copy of the 'Notification to Affected Premises' information kit. Provide Council's delegated officer with a list of premises which the information kit has been delivered to.	Not less than 14 days prior to commencing any construction works.
8	**Information Sign – Development Works**	
	An information sign containing the following details and after hours contact details must be provided at each entrance to the development site: • Developer • Supervising Consultant/ Engineers / Project Manager • Principal Contractor The sign must be at least 0.9m (W) by 0.6m (H). The sign must be erected and maintained for the duration of the development works.	For the duration of the development works from commencement to finalisation of works.
9	**Prestart Meeting**	
	Arrange a prestart meeting with Council officers from Development Services section on 3205 0555 or Email - council@moretonbay.qld.gov.au - Attention - Development Services - Engineering Waraba Construction Team - Referencing DA/2023/2169. The following people will be required to attend the prestart meeting: • Developer's Supervising Engineer • Contractor's Engineer / Project Manager • Contractor's Site Supervisor	Not less than 7 days prior to commencing any construction works.

CONDITION		TIMING
	• Fauna Manager (where required).	
10	**Testing Frequency – General**	
A	All testing of the works shall be carried to comply with the minimum testing frequencies given in MBRC Planning Scheme Policy - Operational Works inspection, maintenance and bonding procedures. Note: Council's delegated officer may vary the frequency of testing to suit site conditions but must provide written advice to the supervising engineer prior to commencement of the relevant works.	At all times during construction.
B	Provide a plan identifying locations where testing has occurred.	Prior to finalisation of works.
11	**Construction Hours Restrictions**	
	Ensure hours of construction are limited to 0630 to 1830 Monday to Saturday and not at all on Sundays and public holidays. Note: Council's engineer may approve (in writing) work outside the above hours where it can be demonstrated to the satisfaction of Council that the work will not cause unreasonable interference with the amenity of adjoining premise and any person.	At all times.
12	**Construction Nuisance and Annoyance**	
	Ensure construction works do not cause unreasonable interference with the amenity of adjoining premise and any person by reason of noise, vibration, electrical interference, smell, fumes, vapour, steam, soot, ash, dust, silt, wastewater, waste products, grit, oil or otherwise.	At all times.
13	**Construction Site Management**	
	Ensure the construction site is kept in a clean and tidy state.	At all times.
14	**Temporary Sedimentation, Erosion and Runoff Control**	
A	Implement an Erosion and Sediment Control Plan which is prepared by an experienced Certified Professional in Erosion and Sediment Control (CPESC) in accordance with International Erosion Control Association Australasia (IECA) Best Practice and Sediment Control document and MBRC Planning Scheme current at the time of development.	Prior to commencement of works and to be maintained current at all times during construction and until finalisation of works.
B	The temporary erosion and sediment control measures shall be maintained and be functional until the end of the Maintenance Period for the works or earlier if Council's delegated officer considers they are no longer required. Note: Council's delegated officer may order additional measures to control silt on site at no cost to Council.	At all times during construction.

CONDITION		TIMING
15	**Haul Routes**	
	Submit and have approved by Council's delegated officer all haul routes for the transport of imported or spoil material and gravel pavement material along Council roads below sub-arterial standard. Note: Refer to MBRC Planning Scheme Values and Constraints Mapping - Road Hierarchy for details on sub-arterial and arterial roads.	Prior to a prestart meeting being held.
16	**Spillage onto Existing Roads**	
	Clean those parts of the access route to the site that are affected by any material dropped, deposited or spilled on the roads as a result of construction processes associated with the site. Note: • All materials must be swept up and removed from the roads and not directed into Council's stormwater drainage system. • All care must be taken to prevent sediments being deposited on roads.	At all times during construction.
17	**Dust Control – Nuisance and Annoyance**	
	Implement suitable dust control measures. If airborne particles are observed leaving the site, any work is to cease immediately and satisfactory dust suppression is to be implemented. Note: Dust suppression measures must be in place at all times including weekends and public holidays.	Prior to finalisation of works.
18	**Earthworks Batters**	
	Where approved drawings do not include specifications for scour and erosion protection apply the following treatments to batter slopes: • Slopes of 1:6 or flatter – topsoil and seed • Slopes between 1:6 and 1:4 – topsoil and turf • Slopes of 1:4 or greater – provide treatment recommendation from a qualified geotechnical engineer (R.P.E.Q.) for Council approval prior to undertaking batter works • Or as directed by Council. Note: Batters within Open and Civic Spaces are to be treated in accordance with MBRC Planning Scheme Policy Integrated Design - Open and Civil Space Design.	At all times during construction.
19	**Site works – Stormwater Runoff Quality**	
	Carry out earthworks in accordance with the State Planning Policy - Water Quality and IECA Best Practice Erosion and	At all time during construction and until

CONDITION		TIMING
	Sediment Control document. Note: • Soil disturbances of greater than 1.0 hectares will require a site specific Erosion & Sediment Control Plan. • Earthworks are to be undertaken to ensure that soil disturbances are staged into manageable areas of not greater than 3.5 hectares.	the site is suitably stabilised.
20	**Unsuitable Fill Materials**	
	Ensure that all fill material used on the development site is free of unsuitable materials, identified in AS3798 and the following: • actual acid sulfate soils and potential acid sulfate soils; • organic or putrescible matter; • material imported from land which is, or has been, listed on the "Environmental Management Register" under the *Environmental Protection Act 1994*; and • building demolition material.	At all times.
21	**Compaction Requirements**	
	All fill material which is intended to be load bearing, or the finished surface level of which is required to remain approximately constant, is selected, placed and compacted to the standard prescribed in Australian Standard AS3798 Guidelines on Earthworks for Commercial and Residential developments.	At all times during construction.
22	**Stormwater Runoff Control – Batters and Retaining Walls**	
	Provide cut-off drains at the top of the batter with turf or rock lined batter drains for all batters and/or retaining walls generally higher than 600mm in height and with a catchment greater than 1000m2. Note: Where these are not detailed on the approved drawings then these works shall be in accordance with Council's current standards.	Prior to finalisation of works.
23	**Stormwater Runoff Control – Open Drains**	
	Provide lining with appropriate scour protection to all open drains and bunds in accordance with Council's Planning Scheme, Planning Scheme Policies and standard drawings current at the time of development. Note: Dumped rock is generally not considered as an appropriate solution.	Prior to finalisation of works.
24	**Stormwater Overland Flow – Site Earthworks**	
	Earthworks must be undertaken on the site so as not to cause nuisance and annoyance to any person or premises. The development must:	At all times during construction.

CONDITION		TIMING
	• Allow stormwater overland flow which entered the land prior to the commencement of the earthworks to continue to enter the land; and • Ensure stormwater overland flow from the development site is not discharged or diverted onto land (other than a road) adjacent to the site in a manner which: i. concentrates the rate of flow at any point along the property boundary; or ii. increases the peak flow rates of stormwater discharged at any point along the property boundary; beyond that which existed prior to commencement of these earthworks.	
25	**Stabilisation of Disturbed Areas**	
	Ensure that a grass strike rate of at least 80% cover has been attained on all disturbed areas or other approved means of stabilisation of grassed areas have been provided. Note: For residential and rural residential subdivisions, the road reserve between kerb and property line shall be turfed as a condition of completion.	Prior to finalisation of works and maintained at all times.

ADVICES	
1	**Extent of Checking by Council**
	This approval shall not be taken to mean that the drawings have been checked in detail and Council accepts no responsibility whatsoever for the survey information, the design, or for the accuracy of any information or detail contained in the approved drawings and specifications.
2	**Aboriginal Cultural Heritage Act**
	The *Aboriginal Cultural Heritage Act 2003* commenced in Queensland on April 16, 2004. Under the Act, indigenous parties are key in assessing cultural heritage significance. The *Aboriginal Cultural Heritage Act 2003* establishes a Duty of Care for indigenous cultural heritage. This applies on all land and water, including freehold land. The Cultural Heritage Duty of Care lies with the person or entity conducting the activity. Penalty provisions apply for failing to fulfil the Cultural Heritage Duty of Care. Those proposing an activity that involves additional surface disturbance beyond that which has already occurred on the proposed site need to be mindful of the Duty of Care requirement. Details of how to fulfil the Duty of Care are outlined in the Duty of Care Guidelines gazetted with the Act. Council strongly advises that you contact the relevant state agency to obtain a copy of the Duty of Care Guidelines and further information on the responsibilities of developer under the terms of the *Aboriginal Cultural Heritage Act 2003*.

ADVICES	
3	**Environmental Protection Act**
	It remains the duty of care of the site owner not to cause Environmental Harm as defined under the *Environmental Protection Act 1994*.
4	**Bulk Earthworks**
	This bulk earthworks approval does not imply that Council will support any other development over the site. Furthermore it shall not have any bearing on any future approvals. The earthworks have been assessed as a stand-alone application and it is at the Developer's risk should any future Development Applications require revised levels or layout. No other works are to commence until Council Operational Works approval is issued and a pre-start meeting has been held between the appropriate personnel and Council.
5	**Fill in Proposed Parks**
	Filling is not permitted in proposed parks without prior written approval of Council's Delegated Officer.
6	**Acceptance Based on Applicant's Certification**
	Council's acceptance of the above submission is based solely on the applicant's certification that the proposal conforms totally to Council's Planning Scheme, Planning Scheme Policies and standard drawings.
7	**Biosecurity Act 2014 - Fire Ant Control**
	Significant portions of the Moreton Bay are within Fire Ant Biosecurity Zone 2 and must remain vigilant for the presence of fire ants. Under the Biosecurity Act 2014, individuals and businesses are responsible for ensuring that they follow the movement controls for specific organic materials to help prevent the spread of fire ants within South East Queensland's fire ant biosecurity zones. Movement of a fire ant carrier from within the fire ant biosecurity zone may need a biosecurity instrument permit. More information is available on https://www.fireants.org.au/treat/business-and-industry/movement-controls

ATTACHMENT 3

Approved Plans / Documents

LILYWOOD LANDINGS

BULK EARTHWORKS STAGES 1 - 5 - OPERATIONAL WORKS FOR FOREVERLEN PTY LTD

LOCALITY PLAN
N.T.S

DRAWINGS INDEX

CONSTRUCTION NOTE

THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH:
- SEDIMENT AND EROSION HAZARD ASSESSMENT (BY CONTRACTOR)
- GEOTECHNICAL REPORT
- VEGETATION MANAGEMENT PLAN (VMP) (PREPARED BY SAUNDERS HAVILL GROUP)
- ENVIRONMENTAL MANAGEMENT PLAN (EMP) (PREPARED BY SAUNDERS HAVILL GROUP)
- CRR INTERSECTION & IDC SET - 22-000082_CRR
- STAGE 1A & 1B SET - 22-000082_1A-1B
- STAGE 2 SET - 22-000082_2
- STAGE 3 SET - 22-000082_3
- STAGE 4 SET - 22-000082_4
- BAF TRUNK WATER INFRASTRUCTURE SET - 22-000082_TWI
- DOBSON LANE TRUNK GRAVITY SEWER SET - 20-000027
- SIGNALS PLANS (BY CV SERVICES)
- LANDSCAPE PLANS (BY AECOM)
- ELECTRICAL/COMMS PLANS (BY CV SERVICES)

CONSTRUCTION HOLD POINT

PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL VERIFY LEVELS OF ALL EXISTING CROSSINGS AND CONNECTION POINTS.

MORETON BAY REGIONAL COUNCIL

AREA OF SITE: 8.108 ha

LOT INFORMATION

LOT 12 ON RP866105, LOT 35 ON SP115959,
& LOT 1 ON RP866105

SURVEYOR

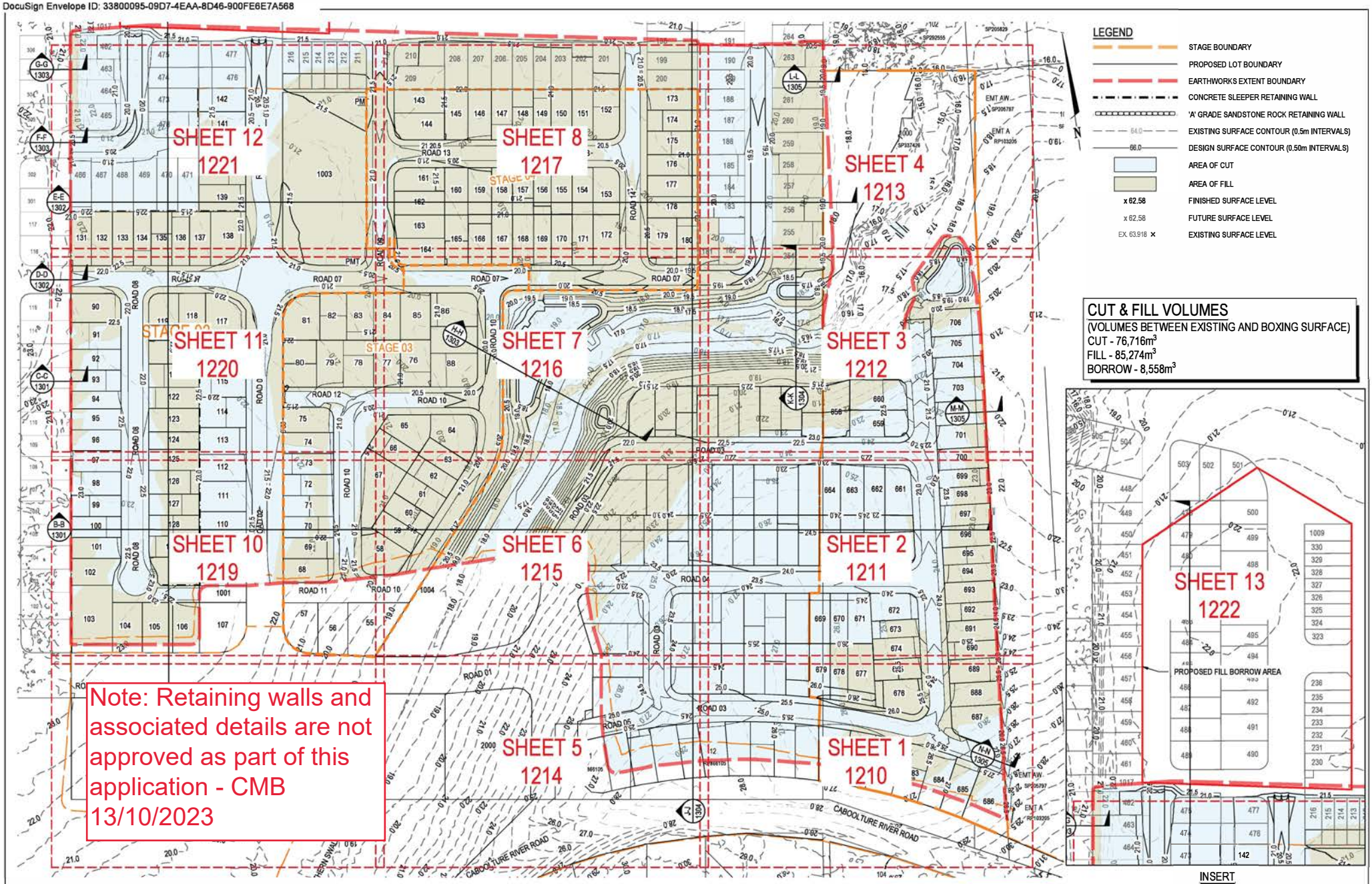
VERIS
DATUM LEVEL
P.M. 72109
RL 30.422 AHD

LILYWOOD LANDINGS

BULK EARTHWORKS STAGES 1 TO 5 DA REF NO. -

Project No.:	Stage:	Milestone:	Revision Date.:	Drawing No.:	Revision:
22-000082	EWKS	OPERATIONAL WORKS	25.05.23	1000	B

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



LEGEND

- STAGE BOUNDARY
- PROPOSED LOT BOUNDARY
- EARTHWORKS EXTENT BOUNDARY
- CONCRETE SLEEPER RETAINING WALL
- 'A' GRADE SANDSTONE ROCK RETAINING WALL
- 64.0 EXISTING SURFACE CONTOUR (0.5m INTERVALS)
- 66.0 DESIGN SURFACE CONTOUR (0.50m INTERVALS)
- AREA OF CUT
- AREA OF FILL
- x 62.58 FINISHED SURFACE LEVEL
- x 62.58 FUTURE SURFACE LEVEL
- EX. 63.918 × EXISTING SURFACE LEVEL

CUT & FILL VOLUMES

(VOLUMES BETWEEN EXISTING AND BOXING SURFACE)

CUT - 76,716m^3
FILL - 85,274m^3
BORROW - 8,558m^3

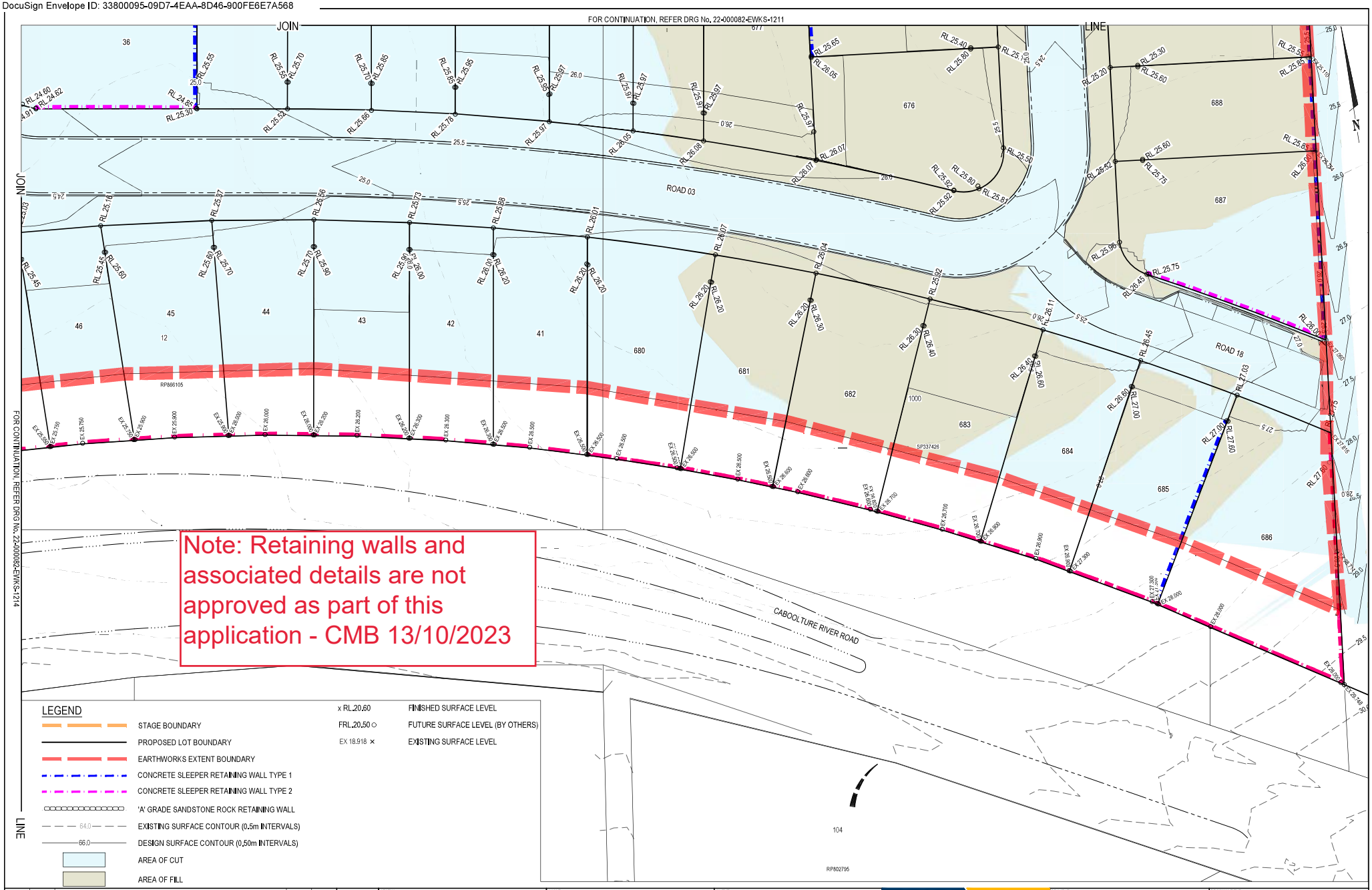
Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:1000 10 0 10 20 30 40 50m A1; 1:2000 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© calibre calibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION, USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: OVERALL BULK EARTHWORKS LAYOUT PLAN
PROJECT No. 22-000082_EWKS
DRAWING No. 1200
REVISION B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023

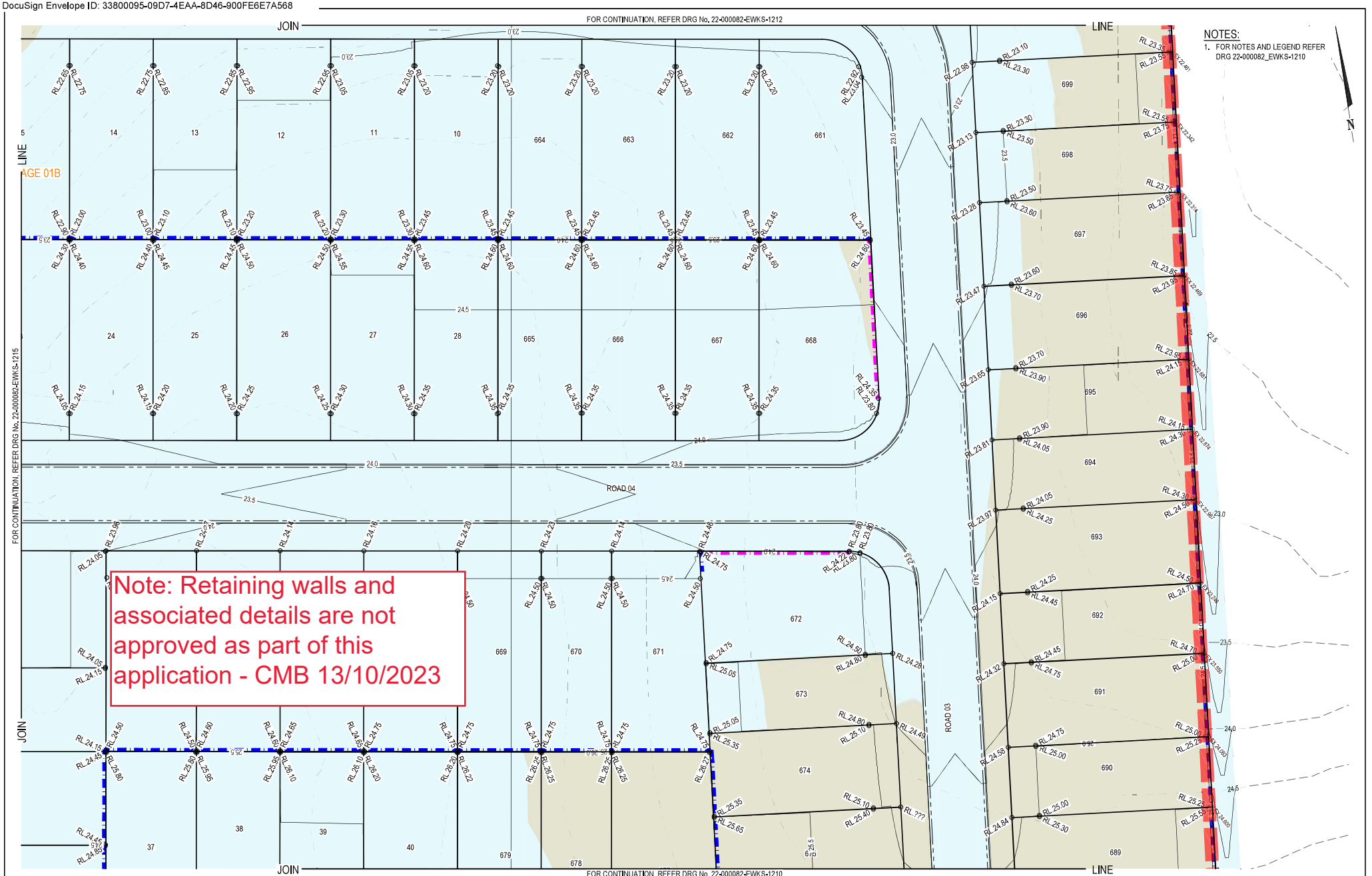


REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: aa
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500 5 0 5 10m A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© calibre group.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 1 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1210
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023

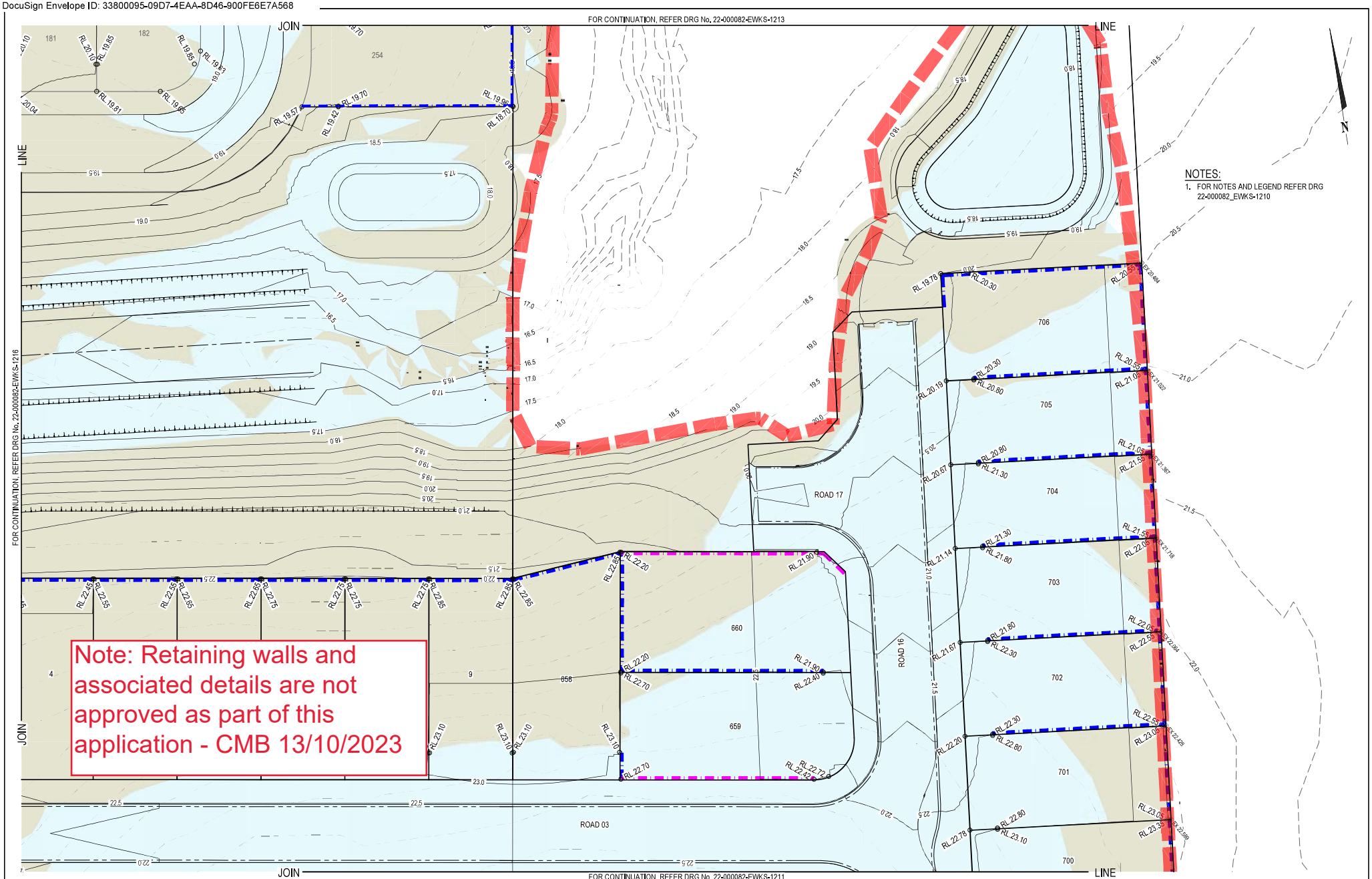


REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500 (5 0 5 10m) A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© callibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 2 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1211
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: aa

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE: 1:250 1:500 5 0 5 10m A1 A3

CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP

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calibregroup.com

PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5

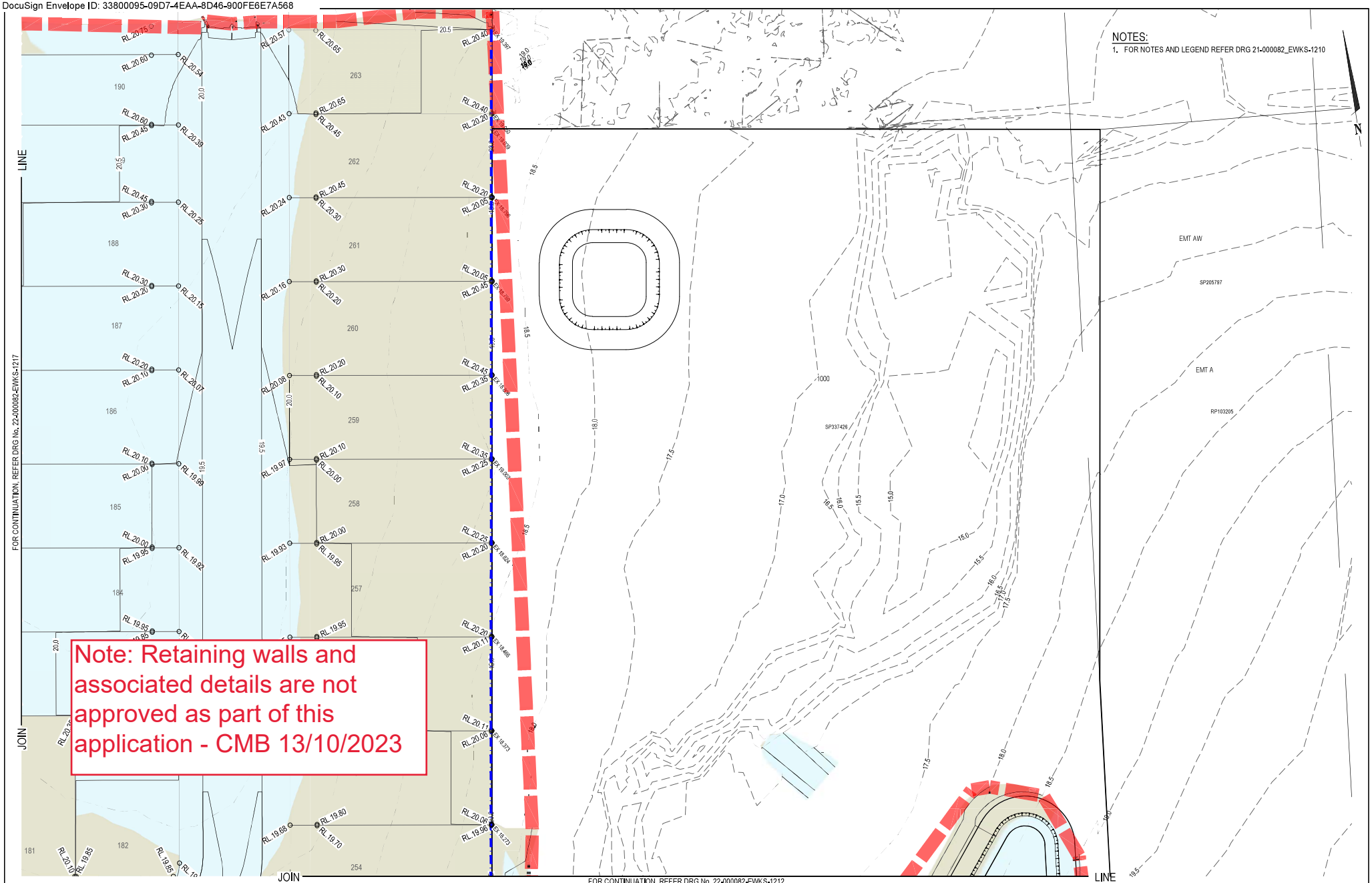
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 3 OF 13

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1212	B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

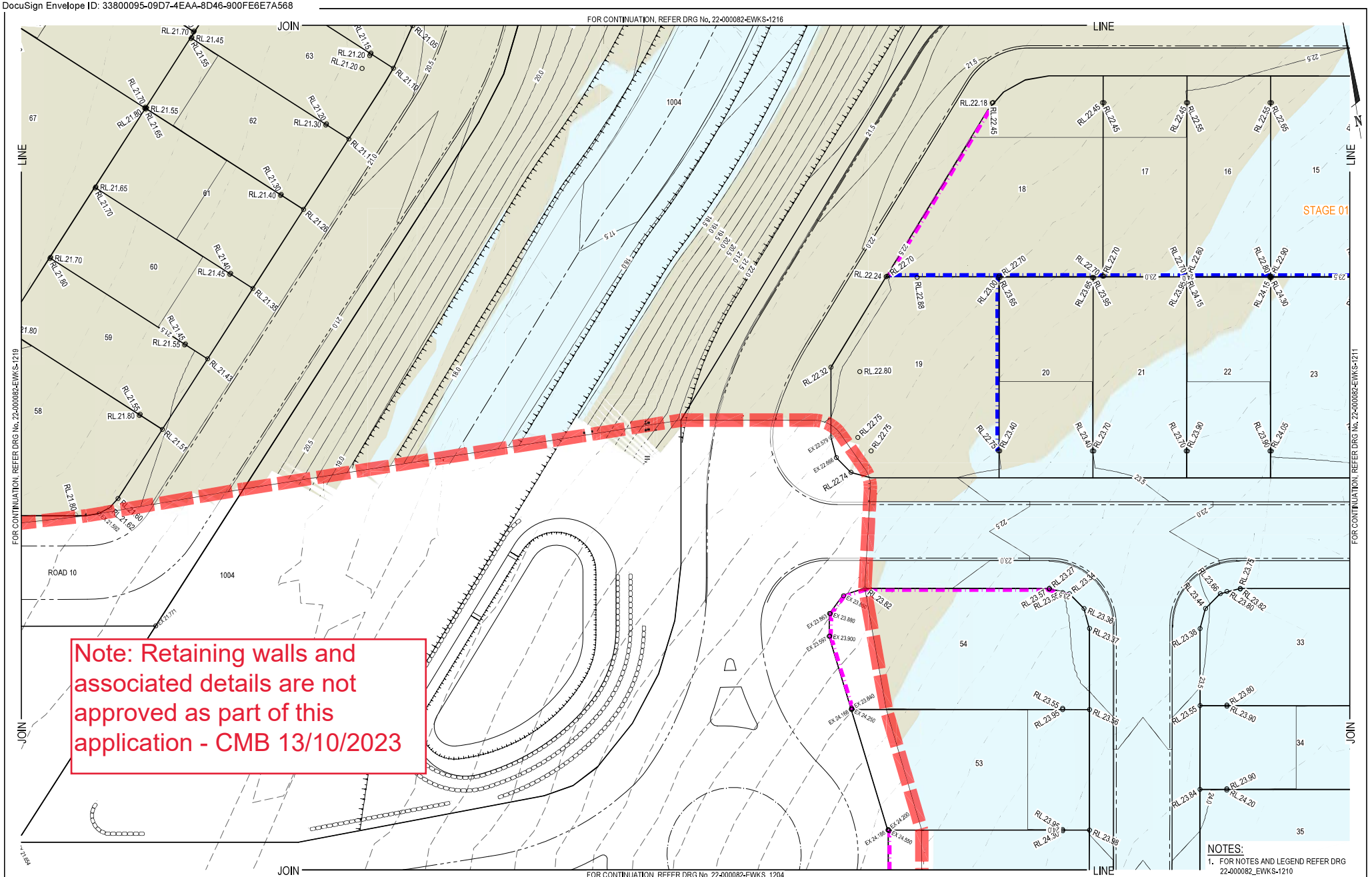
DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 5 0 5 10m A1; 1:500 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
calibre
calibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 4 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1213
REVISION: B

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500 5 0 5 10m A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© calibre group.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 5 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1214
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: aa

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE: 1:250 1:500 (5 0 5 10m) A1 A3

CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP

calibre
calibregroup.com

PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5

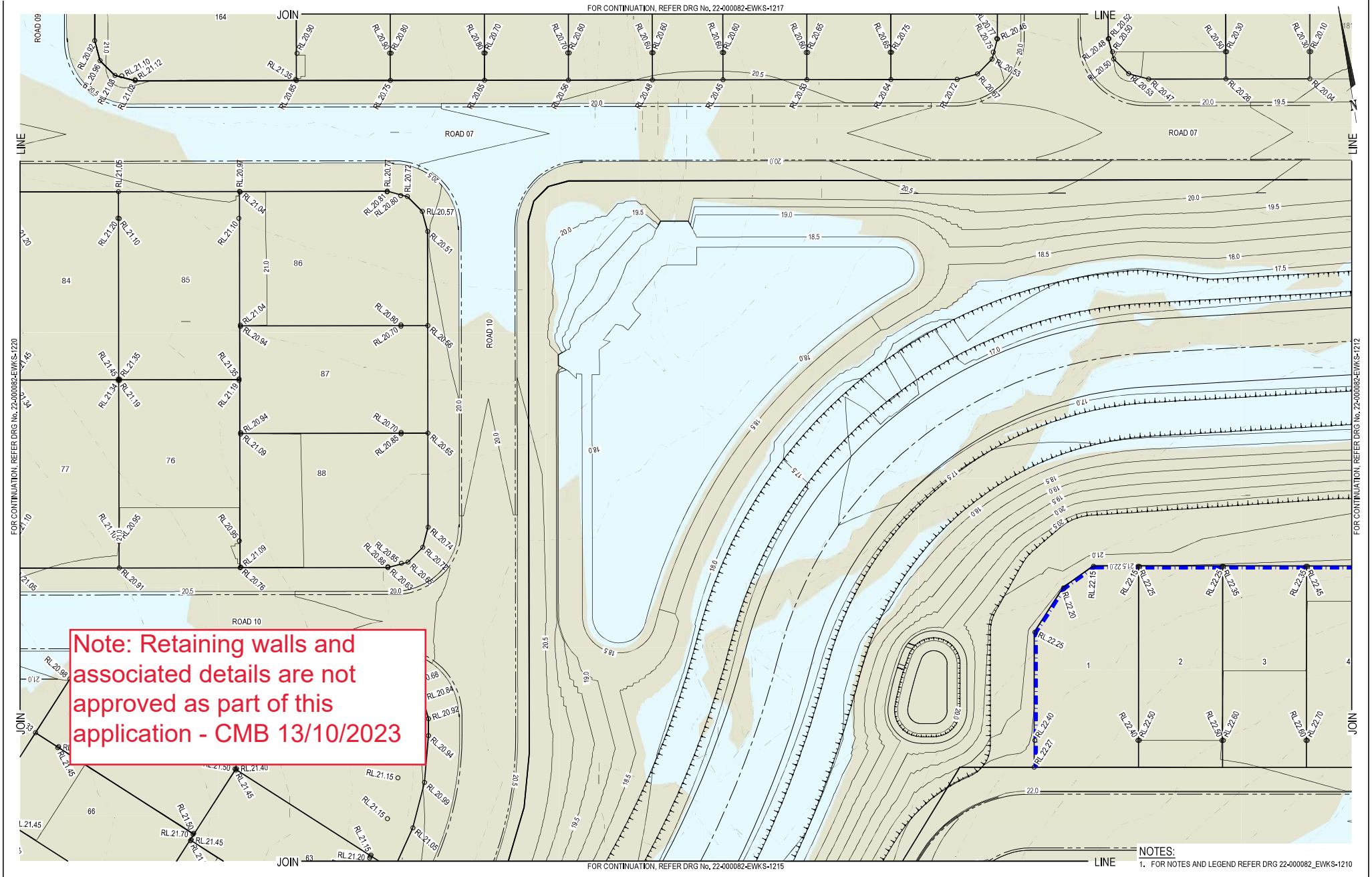
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.

DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 6 OF 13

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1215	B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



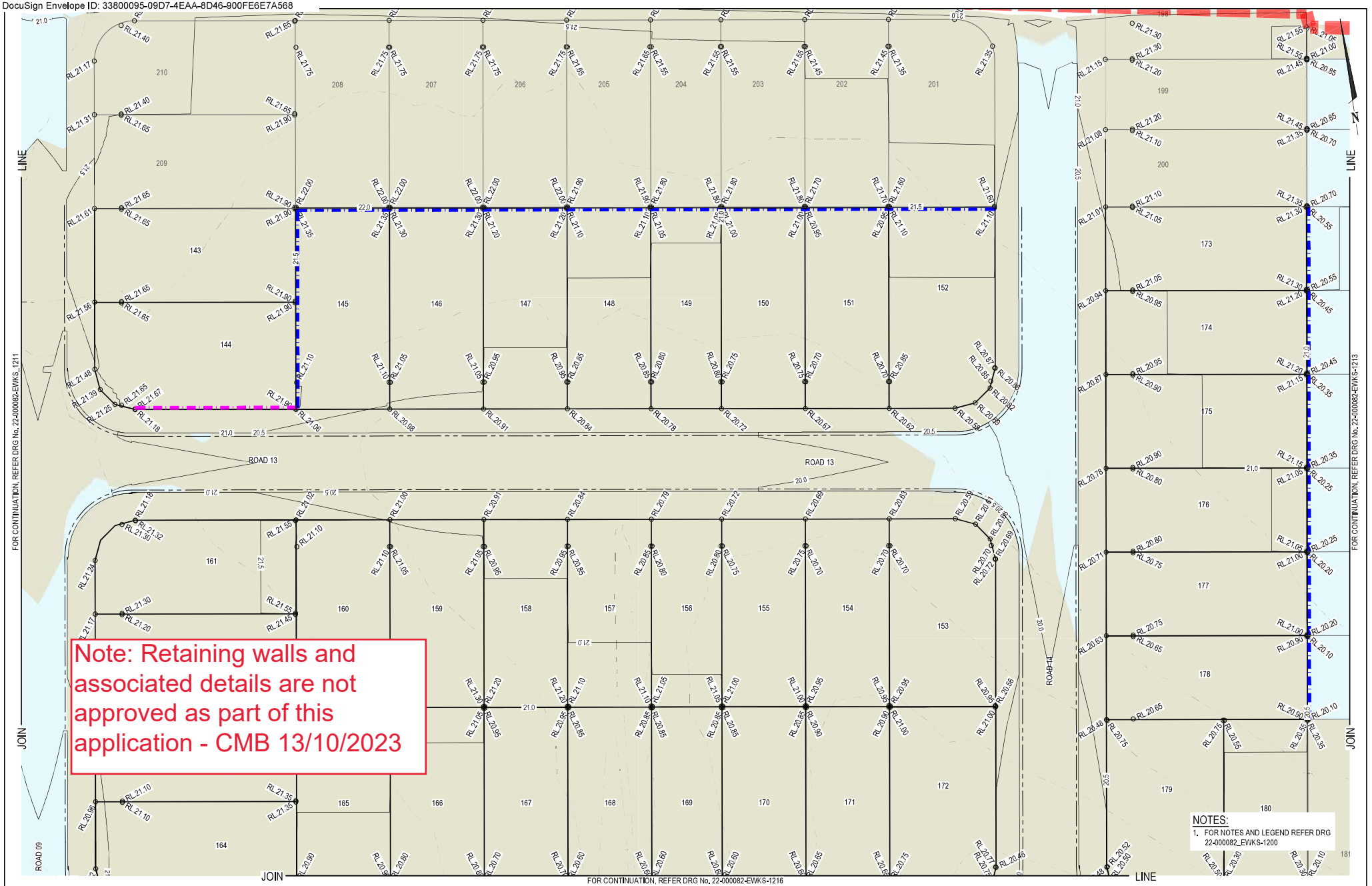
NOTES:
1. FOR NOTES AND LEGEND REFER DRG 22-000082_EWKS-1210

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: aa
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500 5 0 5 10m A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© callibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 7 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1216
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023

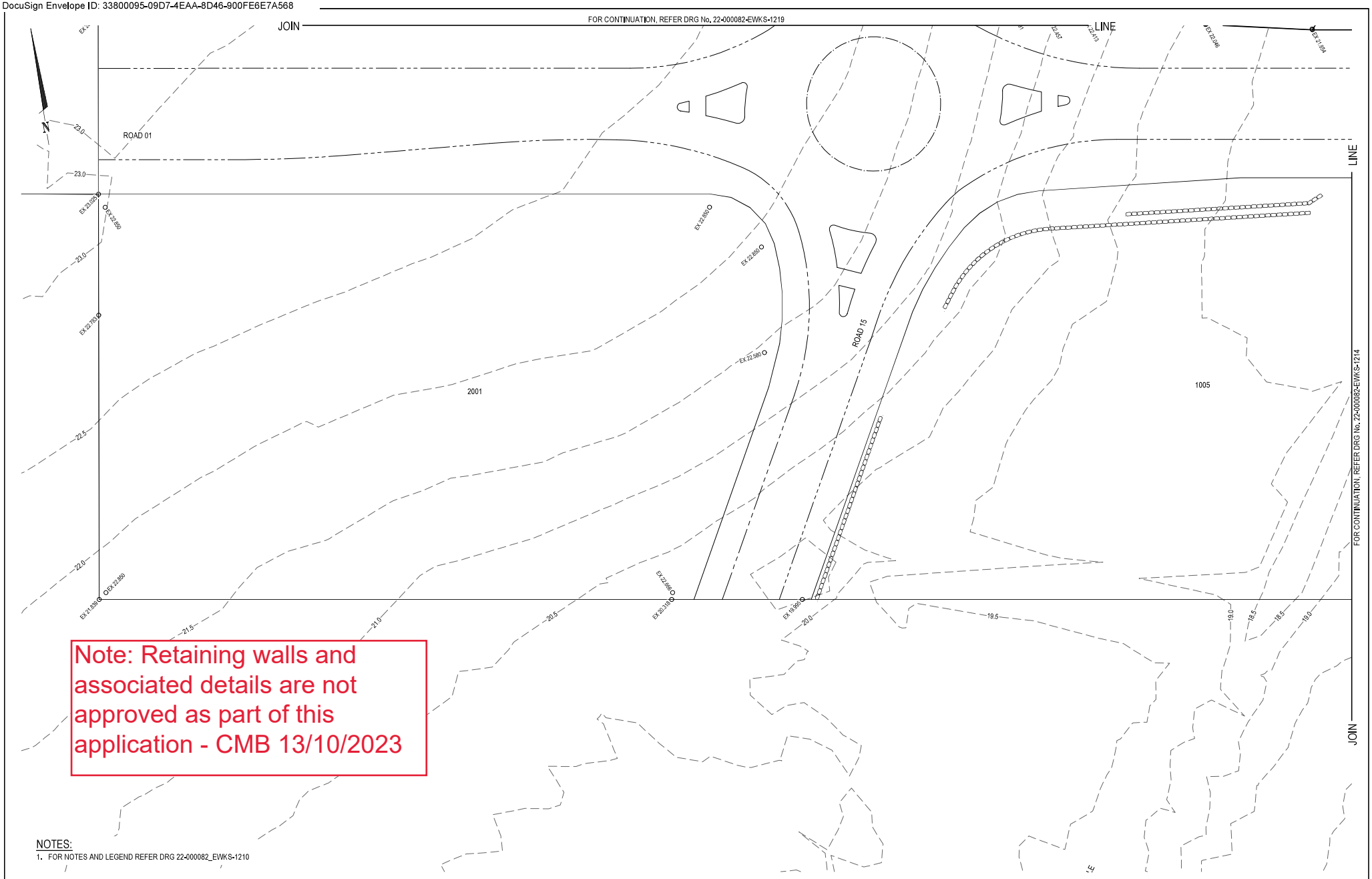


REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
callibre
callibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 8 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1217
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE: 1:250 / 1:500 — 5 0 5 10m — A1 / A3

CLIENT: FOREVERLEN PTY LTD — LENNIUM GROUP

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PROJECT: LANDINGS — BULK EARTHWORKS STAGE 1 TO 5

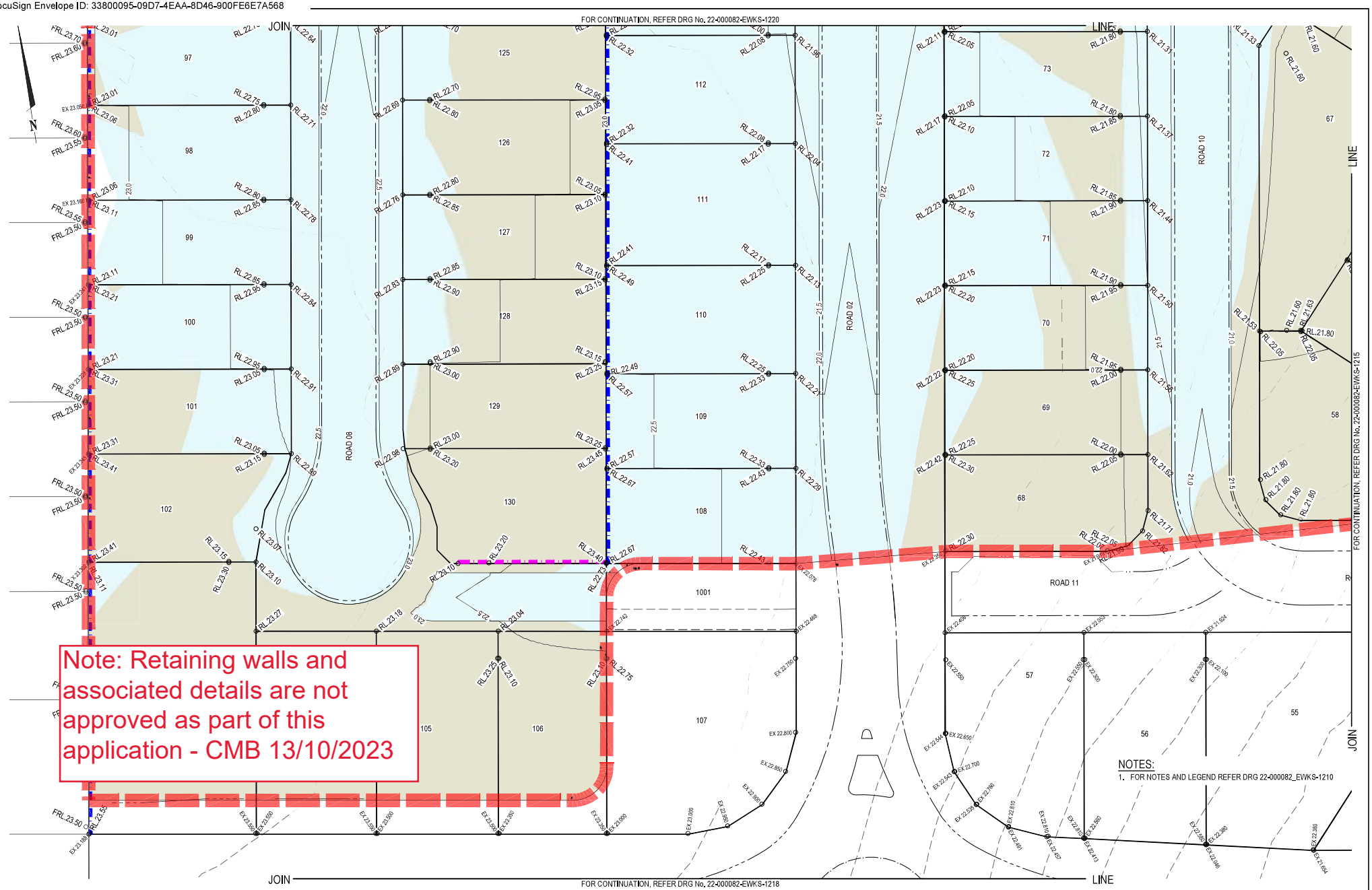
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.

DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 9 OF 13

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1218	B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023

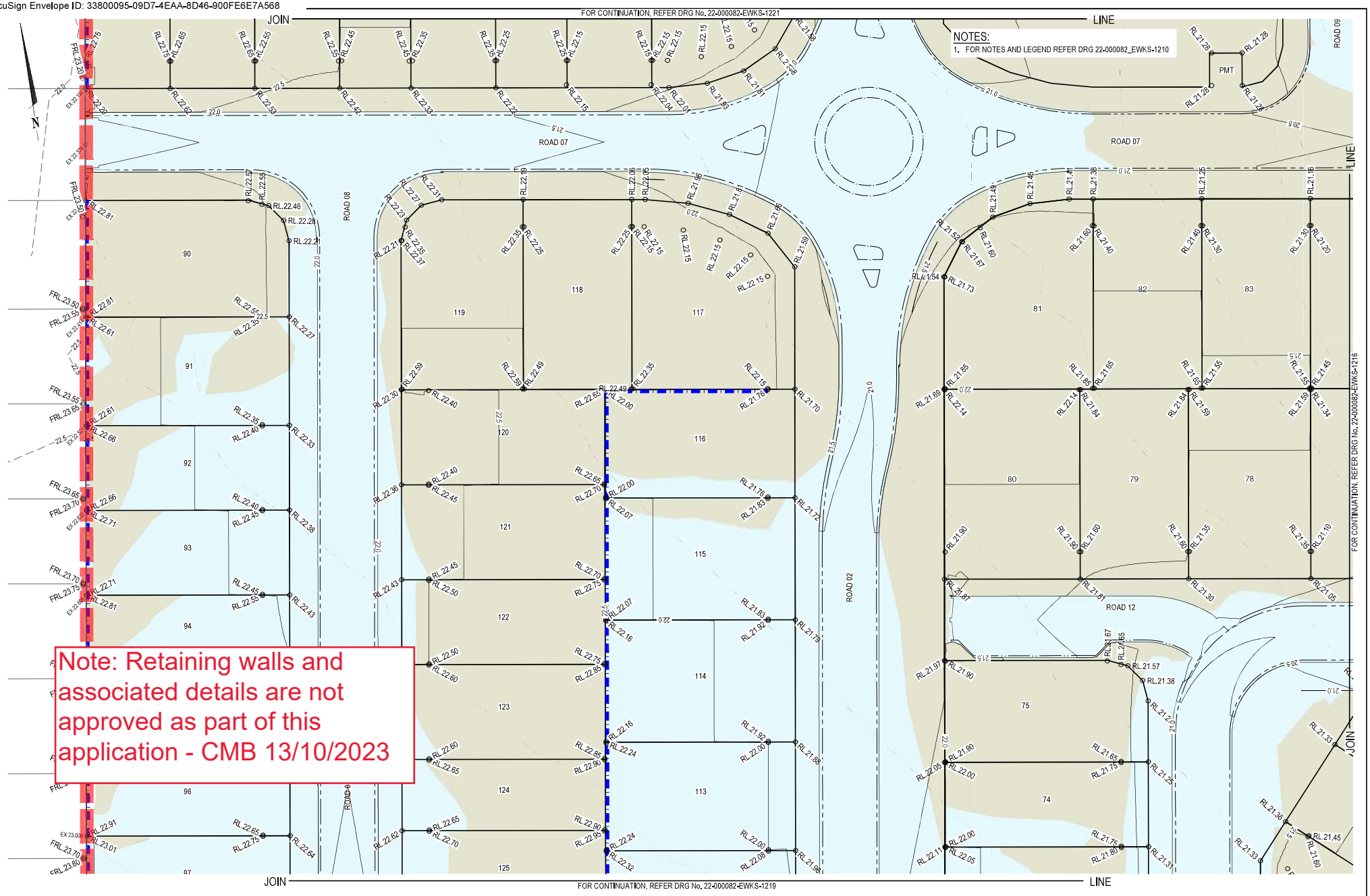


REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500 5 0 5 10m A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© callibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 10 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1219
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE: 1:250 / 1:500 — 5 0 5 10m — A1 / A3

CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP

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PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5

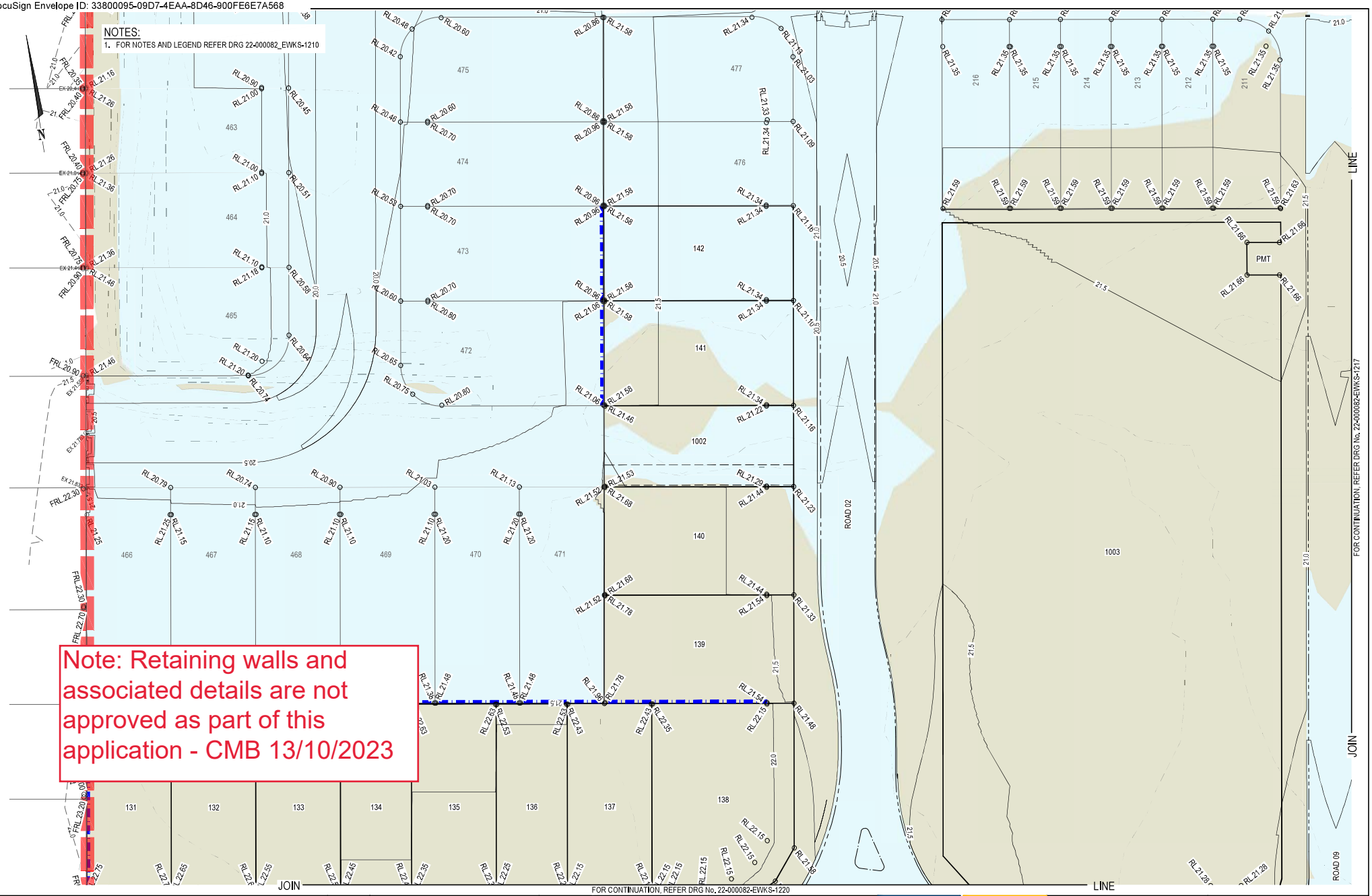
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.

DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 11 OF 13

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1220	B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



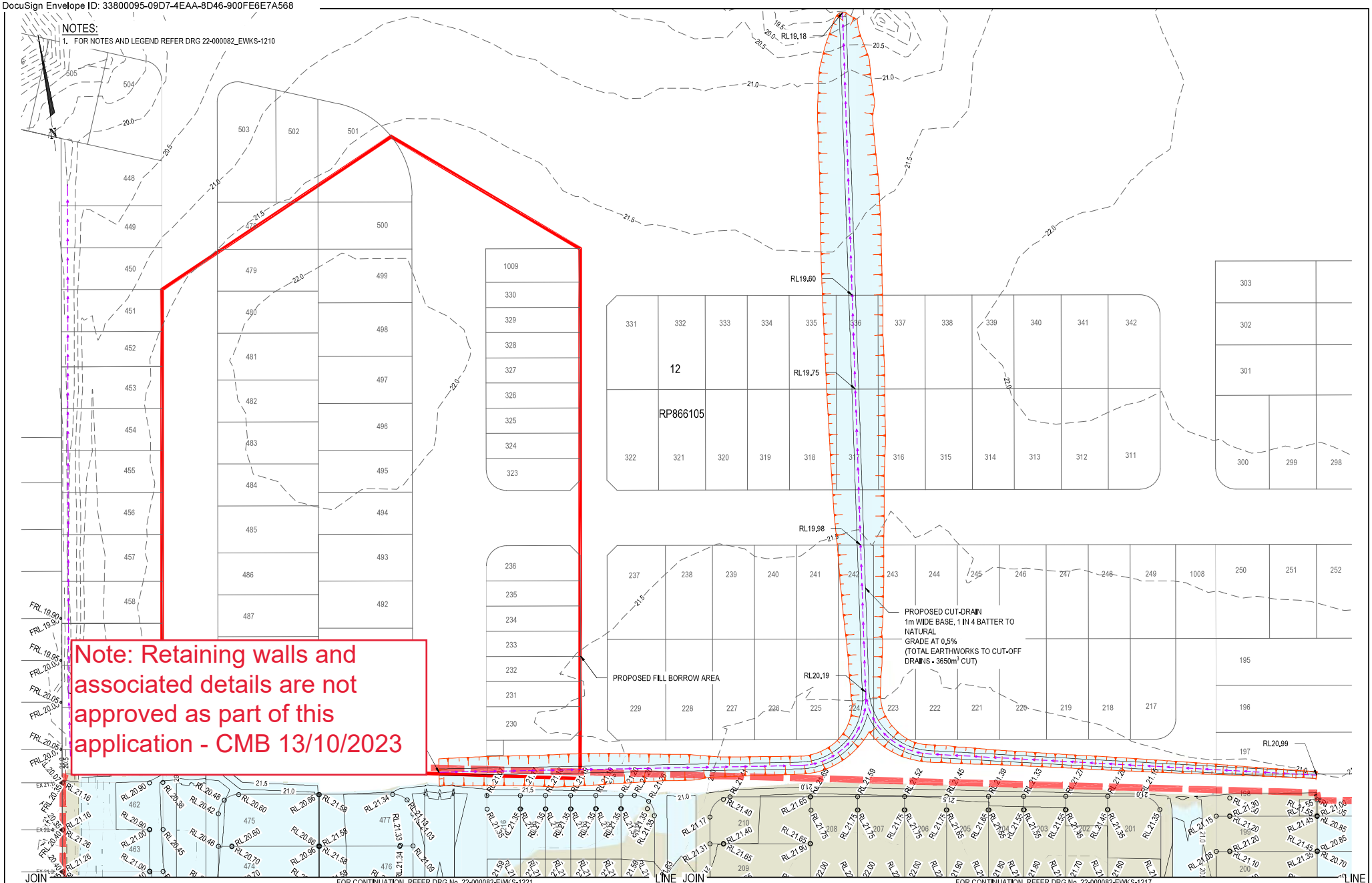
Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 5 0 5 10m A1; 1:500 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
callibre
callibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 12 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1221
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023

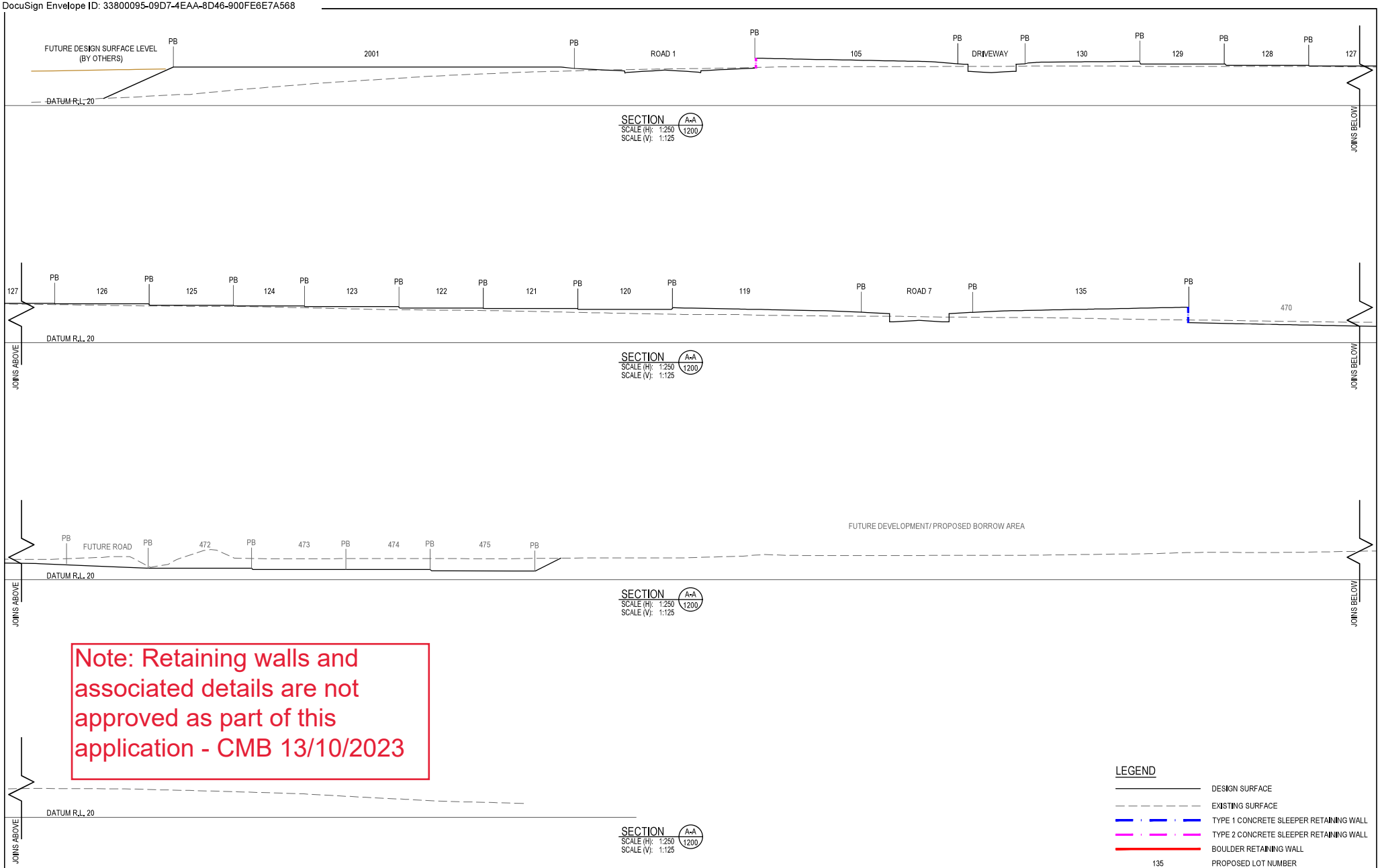


REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: aa
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:500 10 5 0 10 20m A1; 1:1000 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© calibre group.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS LAYOUT PLAN SHEET 13 OF 13
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1222
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

LEGEND

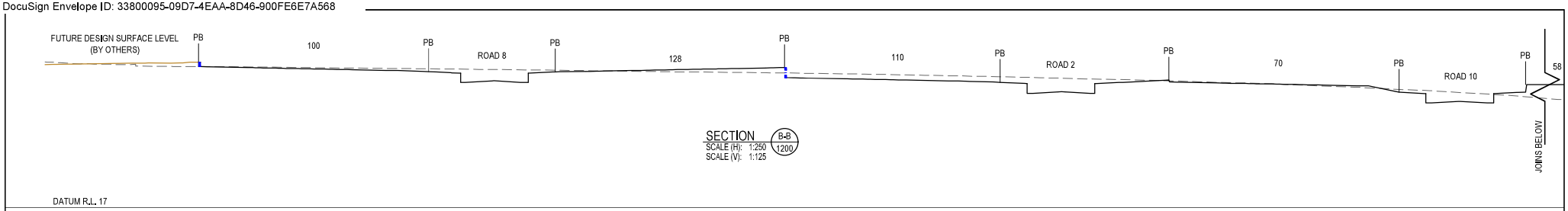
- DESIGN SURFACE
- EXISTING SURFACE
- TYPE 1 CONCRETE SLEEPER RETAINING WALL
- TYPE 2 CONCRETE SLEEPER RETAINING WALL
- BOULDER RETAINING WALL
- 135 PROPOSED LOT NUMBER
- 470 FUTURE LOT NUMBER

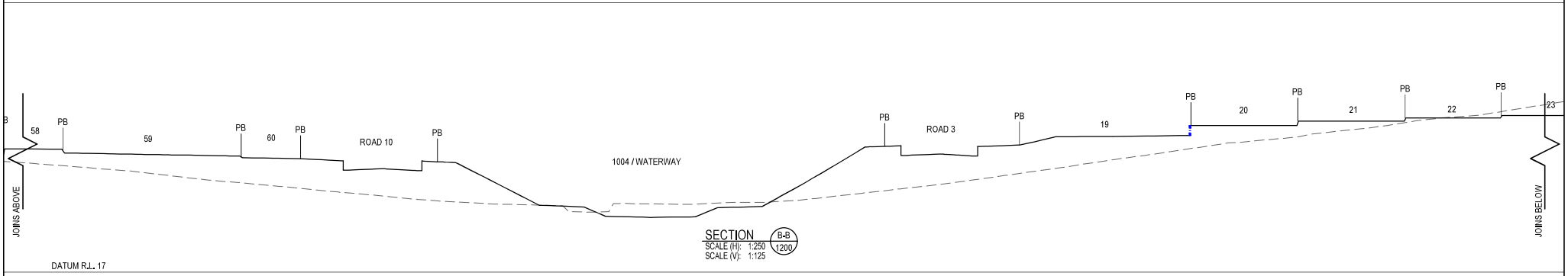
REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

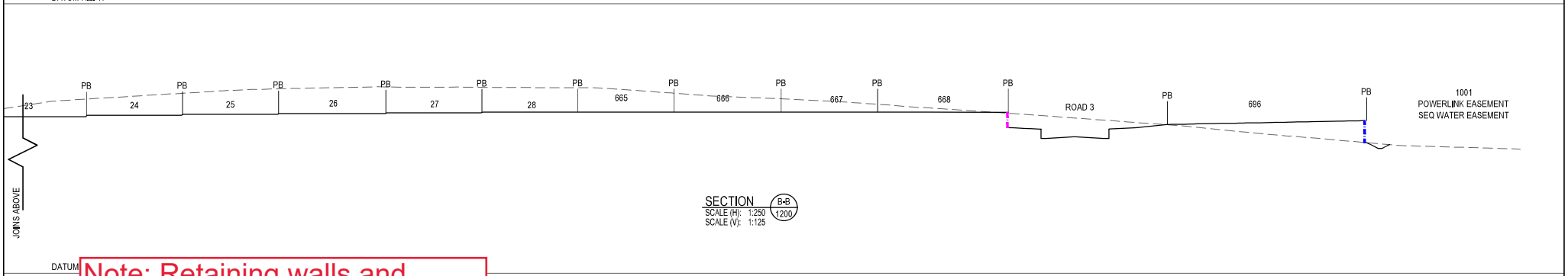
DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:250 1:500 HORIZONTAL; 1:125 1:250 VERTICAL; A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© calibre calibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS SITE SECTIONS PLAN SHEET 1 OF 6
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1250
REVISION: B

Moreton Bay Regional Council

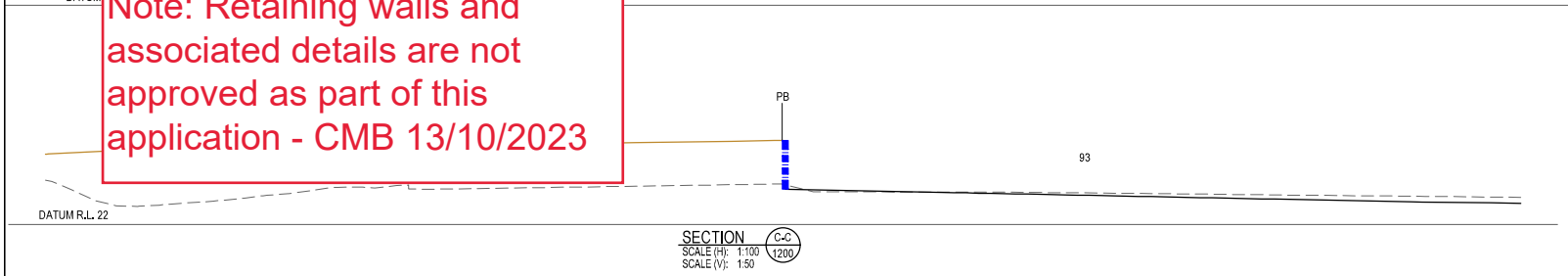
Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023







Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023



LEGEND

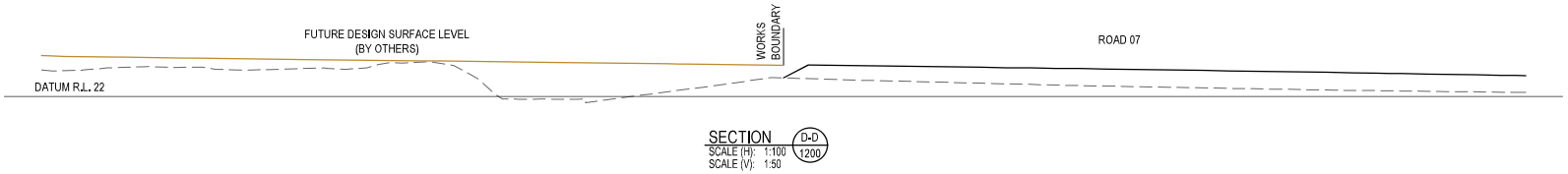
- DESIGN SURFACE
- EXISTING SURFACE
- TYPE 1 CONCRETE SLEEPER RETAINING WALL
- TYPE 2 CONCRETE SLEEPER RETAINING WALL
- BOULDER RETAINING WALL
- 135 PROPOSED LOT NUMBER
- 470 FUTURE LOT NUMBER

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

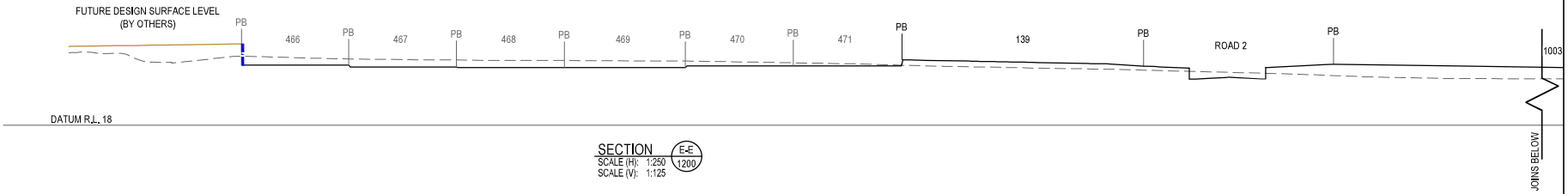
DRAWN CHECK: IB
DESIGN CHECK: aa
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE 1:250 1:500 HORIZONTAL 5 0 5 10m A1 A3
1:125 1:250 VERTICAL 2.5 0 2.5 5m A1 A3
1:100 1:200 HORIZONTAL 2 1 0 2 4m A1 A3
1:50 1:100 VERTICAL 1 0.5 0 1 2m A1 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
© calibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY, DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS SITE SECTIONS PLAN SHEET 2 OF 6
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1251
REVISION: B

Moreton Bay Regional Council

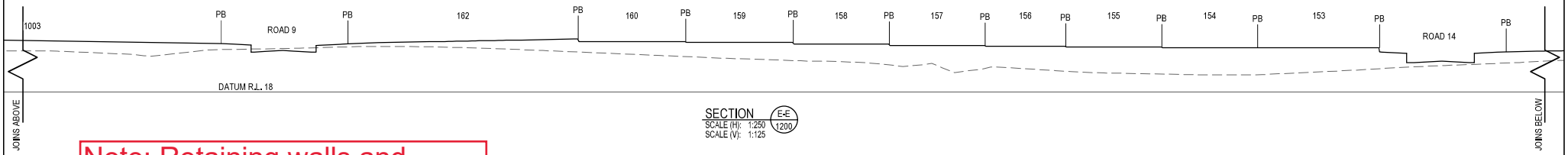
Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



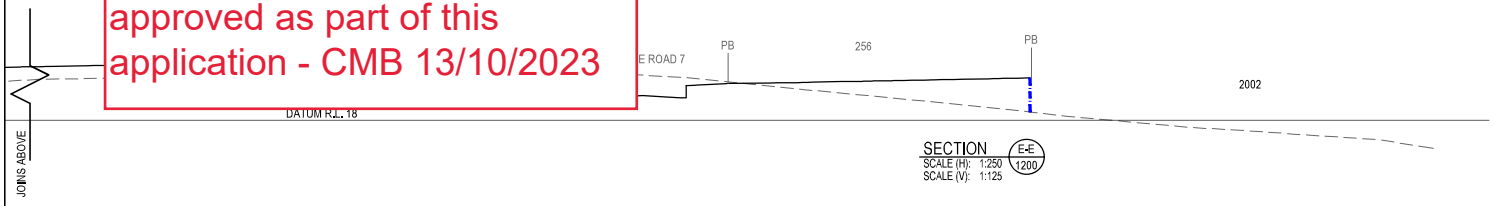
SECTION D-D 1200
SCALE (H): 1:100
SCALE (V): 1:50



SECTION E-E 1200
SCALE (H): 1:250
SCALE (V): 1:125



SECTION E-E 1200
SCALE (H): 1:250
SCALE (V): 1:125



SECTION E-E 1200
SCALE (H): 1:250
SCALE (V): 1:125

Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- TYPE 1 CONCRETE SLEEPER RETAINING WALL
- TYPE 2 CONCRETE SLEEPER RETAINING WALL
- BOULDER RETAINING WALL
- 135 PROPOSED LOT NUMBER
- 470 FUTURE LOT NUMBER

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE 1:250 / 1:500 HORIZONTAL A1 A3
SCALE 1:125 / 1:250 VERTICAL A1 A3
SCALE 1:100 / 1:200 HORIZONTAL A1 A3
SCALE 1:50 / 1:100 VERTICAL A1 A3

CLIENT: FOREVERLEN PTY LTD

LENNIUM GROUP

calibre
calibregroup.com

PROJECT: LANDINGS
BULK EARTHWORKS
STAGE 1 TO 5

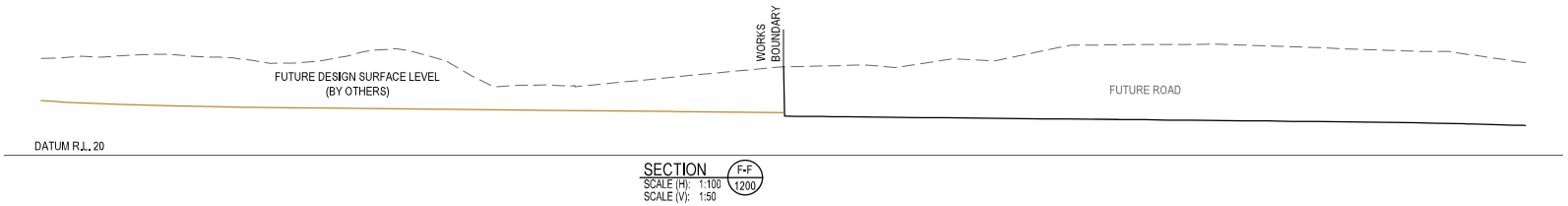
DISCLAIMER
ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.

DRAWING TITLE
BULK EARTHWORKS
SITE SECTIONS PLAN
SHEET 3 OF 6

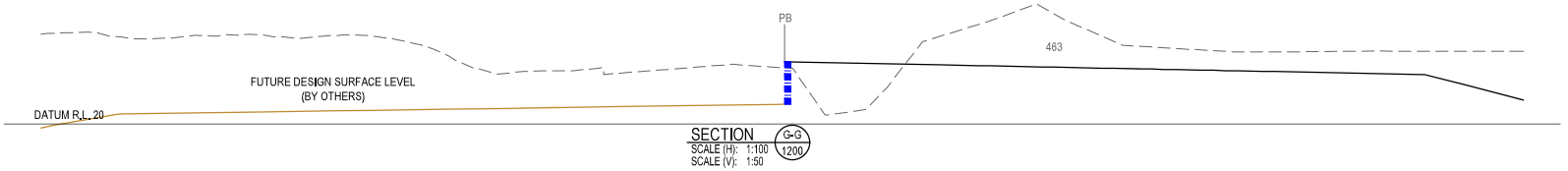
PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1252	B

Moreton Bay Regional Council

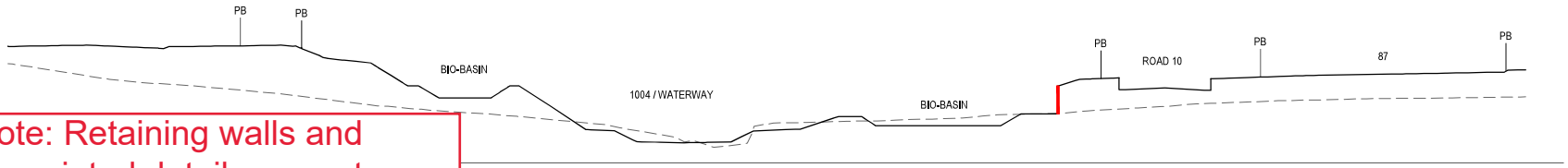
Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023



SECTION F-F 1200
SCALE (H): 1:100
SCALE (V): 1:50



SECTION G-G 1200
SCALE (H): 1:100
SCALE (V): 1:50



SECTION H-H 1200
SCALE (H): 1:250
SCALE (V): 1:125

Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- TYPE 1 CONCRETE SLEEPER RETAINING WALL
- TYPE 2 CONCRETE SLEEPER RETAINING WALL
- BOULDER RETAINING WALL
- 135 PROPOSED LOT NUMBER
- 470 FUTURE LOT NUMBER

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE 1:250 / 1:500 HORIZONTAL 5 0 5 10m A1 A3
SCALE 1:125 / 1:250 VERTICAL 2.5 0 2.5 5m A1 A3
SCALE 1:100 / 1:200 HORIZONTAL 2 1 0 2 4m A1 A3
SCALE 1:50 / 1:100 VERTICAL 1 0.5 0 1 2m A1 A3

CLIENT: FOREVERLEN PTY LTD

LENNIUM GROUP

PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5

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DRAWING TITLE: BULK EARTHWORKS SITE SECTIONS PLAN SHEET 4 OF 6

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1253	B

Moreton Bay Regional Council

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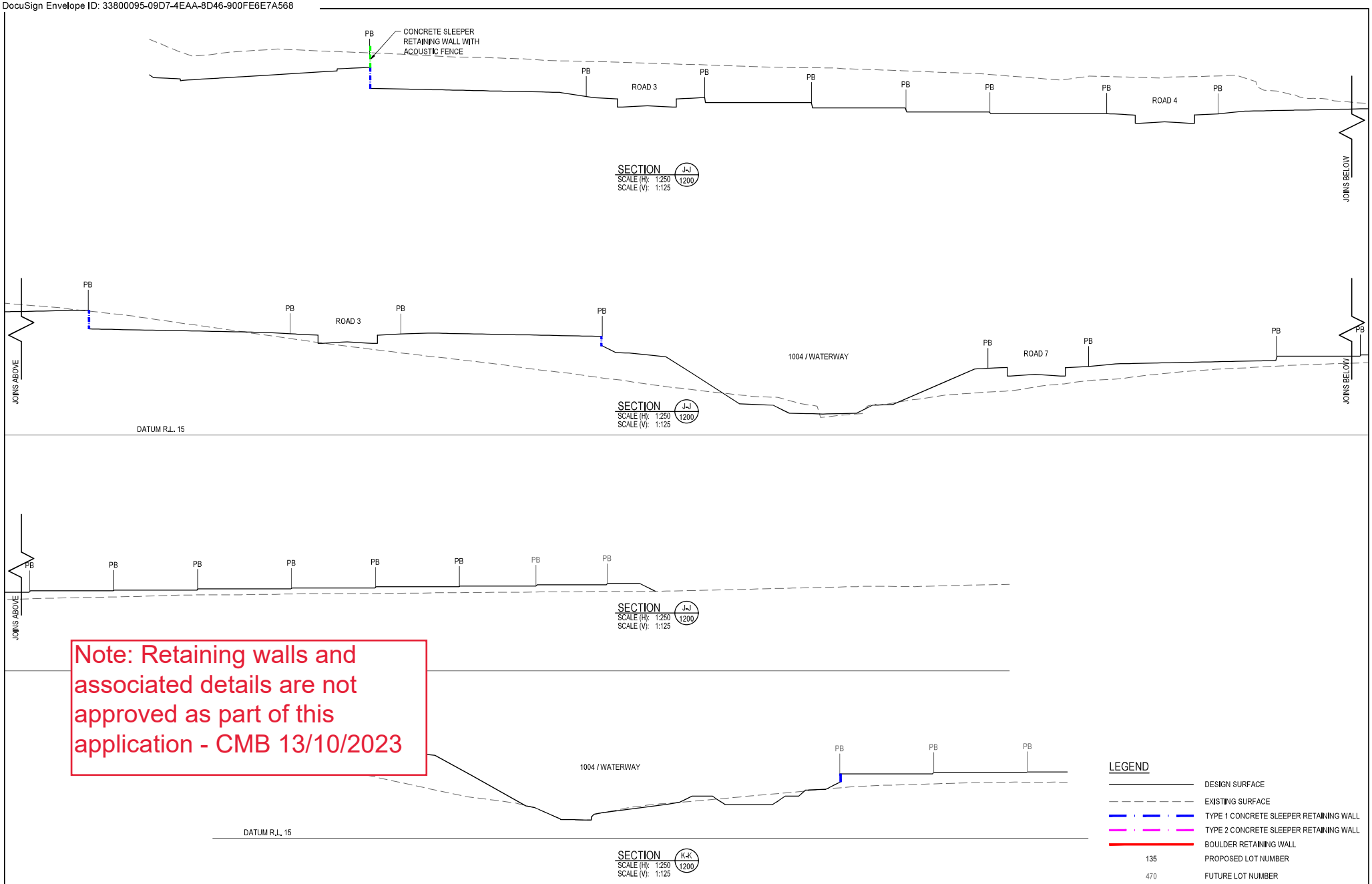

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE
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HORIZONTAL 5 0 5 10m A1 A3
VERTICAL 2.5 0 2.5 5m A1 A3

CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP

PROJECT: LANDINGS
BULK EARTHWORKS
STAGE 1 TO 5

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DRAWING TITLE: BULK EARTHWORKS SITE SECTIONS PLAN SHEET 5 OF 6

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1254	B

Moreton Bay Regional Council

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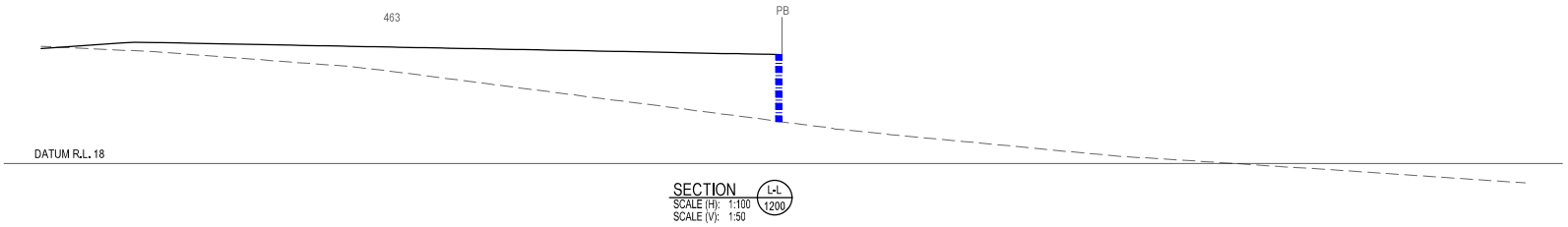

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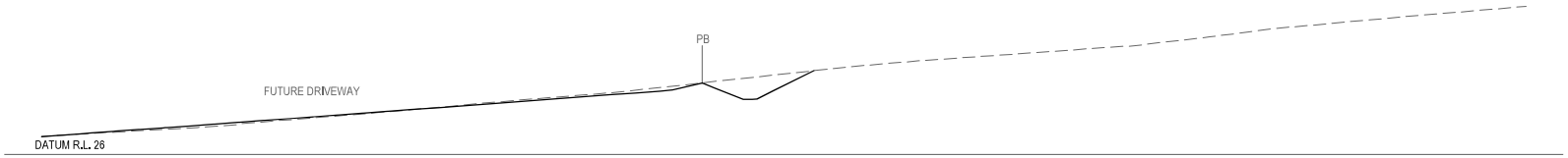
SCALE (V): 1:50



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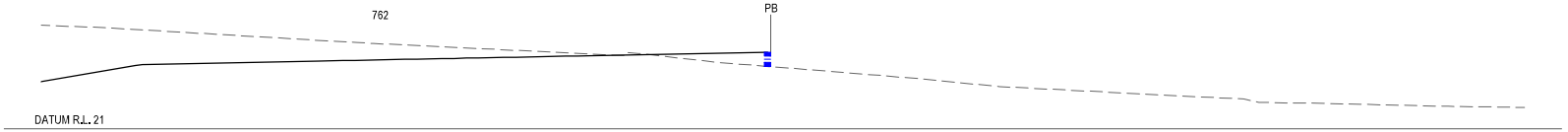

SECTION M-M (1200)
SCALE (H): 1:100
SCALE (V): 1:50

Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

LEGEND

- DESIGN SURFACE
- EXISTING SURFACE
- TYPE 1 CONCRETE SLEEPER RETAINING WALL
- TYPE 2 CONCRETE SLEEPER RETAINING WALL
- BOULDER RETAINING WALL
- 135 PROPOSED LOT NUMBER
- 470 FUTURE LOT NUMBER

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA

STATUS: FOR APPROVAL

APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD

SCALE
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1:200 HORIZONTAL A3
1:50 2.5 0 1 2m A1
1:100 VERTICAL A3

CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP

PROJECT: LANDINGS
BULK EARTHWORKS
STAGE 1 TO 5

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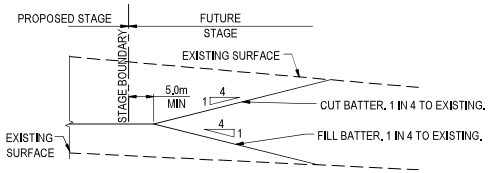
DRAWING TITLE: BULK EARTHWORKS SITE SECTIONS PLAN SHEET 6 OF 6

PROJECT No.	DRAWING No.	REVISION
22-000082_EWKS	1255	B



TYPICAL EARTHWORKS SECTION AT STAGE BOUNDARY
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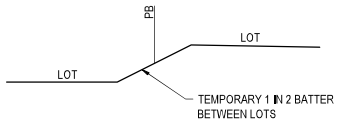

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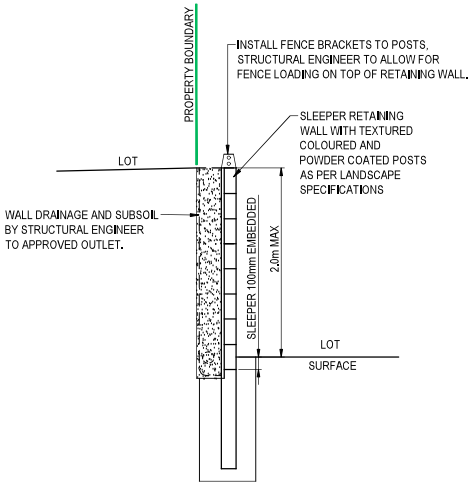
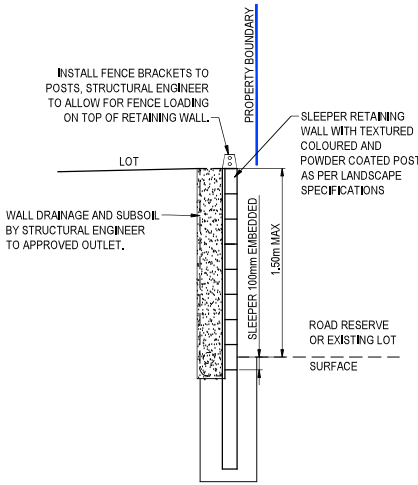
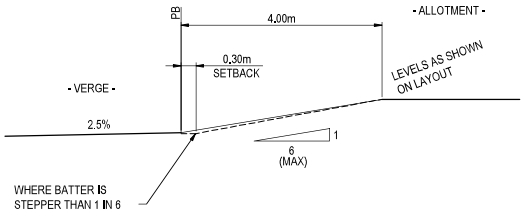


TYPICAL SINGLE TIER CONCRETE SLEEPER RETAINING WALL AT BDY TYPE 1 (INCLUDING B2B WALLS)
N.T.S



TYPICAL SINGLE TIER CONCRETE SLEEPER RETAINING WALL AT BDY TYPE 2
N.T.S

NOTE
DETAIL TO APPLY TO ALL RETAINING WALL TERMINATIONS ADJACENT TO BATTERS INCLUDING AT VERGES.



TYPICAL PAD SETBACK
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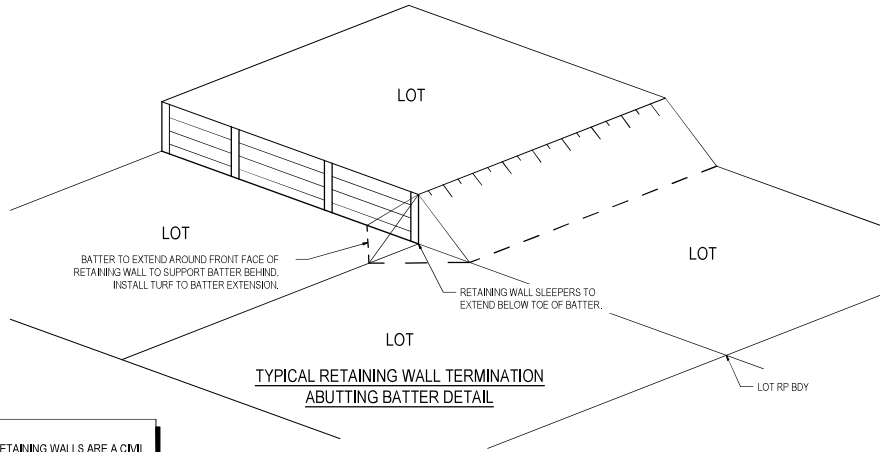

TYPICAL RETAINING WALL TERMINATION ABUTTING BATTER DETAIL

Note: Retaining walls and associated details are not approved as part of this application - CMB 13/10/2023

NO
STRUCTURAL DESIGN AND CONSTRUCT ALL RETAINING WALLS AND ASSOCIATED SPOON DRAINS. CONTRACTOR TO PROVIDE RPEQ DESIGN, FORM 15 TO SUPERINTENDENT PRIOR TO CONSTRUCTION AND FORM 16 PRIOR TO PRACTICAL COMPLETION. CONTRACTOR TO CONSIDER NEARBY EXISTING AND PROPOSED SERVICES WITHIN RPEQ DESIGN OF WALLS, AND TO OBTAIN BUILD OVER ASSET APPROVALS WITH THE RELEVANT AUTHORITIES AS REQUIRED BY THE AUTHORITIES' SPECIFICATIONS. PRIOR TO CONSTRUCTION. CONTRACTOR TO PROVIDE BUILD OVER ASSET APPROVALS TO THE SUPERINTENDENT, PRIOR TO CONSTRUCTION

NOTES:
1. RETAINING WALLS TO BE CONSTRUCTED TO MANUFACTURERS SPECIFICATIONS.
2. PROVIDE APPROVED SAFETY FENCE TO ALL WALLS HIGHER THAN 1.0m.
3. ALL RETAINING WALL FOOTINGS ARE TO BE LOCATED A MINIMUM 1.0M HORIZONTALLY CLEAR OF THE STORMWATER DRAINAGE, ROOFWATER AND SEWER, AND TO BE TAKEN BELOW THE ZONE OF INFLUENCE OF THE SERVICES.
4. INSPECTION AND CERTIFICATION OF RETAINING WALL TO BE DONE AT FOOTING STAGE BY STRUCTURAL RPEQ AND INSTALLATION OF DRAINAGE STAGE.

NOTES:
1. CONCRETE SLEEPER RETAINING WALLS ARE A CIVIL CONTRACTOR DESIGN AND CONSTRUCT ITEM
2. THE CIVIL CONTRACTOR SHALL ENGAGE A STRUCTURAL RPEQ TO DESIGN THE RETAINING WALLS
3. PRIOR TO CONSTRUCTION THE CIVIL CONTRACTOR SHALL PROVIDE THE STRUCTURAL RPEQ DESIGN AND FORM 15.
4. PRIOR TO PRACTICAL COMPLETION BEING APPROVED THE CIVIL CONTRACTOR SHALL PROVIDE A FORM 16 FOR THE CONSTRUCTED RETAINING WALLS CERTIFIED BY THE STRUCTURAL RPEQ, AND COPIES OF ALL STRUCTURAL RPEQ INSPECTION REPORTS.

MINIMUM DESIGN REQUIREMENTS
- SURCHARGE LOADING TO SUIT RESIDENTIAL HOUSES LOADING TO BE DETERMINED BY STRUCTURAL ENGINEER
- POST AND FOOTING DESIGN TO ALLOW FOR 1.8m HIGH FENCE BY OTHERS
- MAX 1V:4H SLOPE BEHIND WALL
-ALL RETAINING WALL FOOTINGS TO BE LOCATED A MINIMUM 1.0m HORIZONTALLY CLEAR OF THE ROOFWATER AND SEWER AND BE TAKEN BELOW THE ZONE OF INFLUENCE

REVISION	DATE	ISSUE DETAILS	DRAWN	DESIGN
A	03.03.23	ISSUED FOR APPROVAL	IB	AA
B	25.05.23	MINOR AMENDMENTS	IB	AA

DRAWN CHECK: IB
DESIGN CHECK: AA
STATUS: FOR APPROVAL
APPROVED: RYAN ASHWORTH RPEQ 19674
FOR & ON BEHALF OF CALIBRE PROFESSIONAL SERVICES PTY LTD
SCALE: 1:1000 10 0 10 20 30 40 50m A1; 1:2000 A3
CLIENT: FOREVERLEN PTY LTD
LENNIUM GROUP
calibre
calibregroup.com
PROJECT: LANDINGS
BULK EARTHWORKS STAGE 1 TO 5
DISCLAIMER: ALL DIMENSIONS TO BE CHECKED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION. USE WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
DRAWING TITLE: BULK EARTHWORKS TYPICAL DETAILS PLAN
PROJECT No.: 22-000082_EWKS
DRAWING No.: 1260
REVISION: B

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/3606 13/10/2023

REPORT

Stormwater Management Plan – Caboolture West NDP1 – Foreverlen Stages 1 to 4

PREPARED FOR FOREVERLEN PTY LTD

Calibre Professional Services Pty Ltd
ABN 55 070 683 037

16-002108-SWMP-01C | 22 November 2022

QUALITY ASSURANCE STATEMENT

TASK	NAME	SIGNATURE
Project Manager	Ryan Ashworth	
Prepared by	Nathan Eremenco	Nathan Eremenco
Reviewed by	Matthew Starr	
Approved for Issue by	Daniel Yates	

DOCUMENT CONTROL

ISSUE	DATE	ISSUE DETAILS	AUTHOR	CHECKED	APPROVED
A	06/06/2022	RAL1 DA Application	DY	MS	MS
B	08/09/2022	IDC blockage assessment added	NE	DY	MS
C	22/11/2022	Revised Lot Layout	NE	MS	DY

16-002108-SWMP-01C.Docx

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Executive Summary

Calibre Professional Services has been commissioned by Foreverlen Pty Ltd to prepare a Stormwater Management Plan in support of their development application for Reconfiguring a Lot to develop Stages 1 to 4 of the Foreverlen development within Phase 1 of the Neighbourhood Development Plan 1 precinct of Caboolture West.

This report investigates and addresses the management of flooding, stormwater quantity, stormwater quality and the conveyance of runoff from Stage 1 to 4 of the Foreverlen development. As such, this report provides strategies set out in accordance with the relevant Local and State Government regulations and the overarching Masterplan *Stormwater Management Plan – Caboolture West NDP1* prepared by Calibre (Calibre Report No. 16-001367-SWMP-01C dated November 2021) for Phase 1 of the NDP1 area that was endorsed by Moreton Bay Regional Council in December 2021.

The aim of this report is to demonstrate that through the implementation of appropriate management strategies (developed in consultation with Moreton Bay Regional Council) Stages 1 to 4 of the Foreverlen development can occur without resulting in adverse or actionable impacts to adjacent or downstream properties and is consistent with the endorsed Stormwater Management Plan.

Flood Management

Flood management investigations and analysis have been undertaken by Calibre to determine what impact the development will have on the magnitude and timing of peak flows to the Caboolture River and to the South East Watercourse.

Hydrological and hydraulic analysis has confirmed that the timing of post development peak flows from parts of the study area that discharge runoff directly to the Caboolture River will not coincide with the peak flow (and therefore not increase the peak flow) from the larger upstream river catchment. As a result, no change to peak flow or maximum flood conditions along the Caboolture River system is expected to result from changing the land use and hydrology for the catchments containing Stages 1 to 4 of the Foreverlen development that discharge directly to the river. On this basis peak flow mitigation (i.e. detention) is not required for these catchments.

Hydrological investigations undertaken for the catchments discharging runoff to the South East Watercourse have identified little to no increases in peak flow occurring at the South East Discharge Location. Stage 1 to 4 earthworks associated with channel works and the formation of the on-line detention basin storage area are proposed within Foreverlen owned land only, and do not extend past the Foreverlen development boundary. This interim detention basin configuration provides sufficient upstream flow attenuation, which allows stormwater runoff from the Foreverlen Stage 1 to 4 development areas to discharge to the South East Watercourse downstream of the on-line detention basin. No additional peak flow mitigation is required for Stages 1 to 4.

The results of the flood investigation and analysis for Stages 1 to 4 of the Foreverlen development support an update to the MBRC Flood Hazard Overlay mapping within the South East Watercourse. The driving design criteria for the proposed earthworks within existing mapping of High or Medium Flood Hazard Overlay is trunk infrastructure for stormwater or roads and as such contemplated within MBRC's *Planning Scheme Policy for Flood hazard, Coastal hazard and Overland flow*. The resultant minor encroachments of lots are as a result of the land form changes to deliver the trunk infrastructure and an engineered stormwater channel within the south-east stormwater course.

The modelling and analysis undertaken has confirmed these changes do not result in any adverse local drainage impacts, flooding and coastal impacts on other premises, public land, watercourses, roads or infrastructure or impacts on natural riverine and coastal processes or flood warning times for the Caboolture River or the South East Watercourse.

Stormwater Quality Management

In accordance with the MBRC Planning Scheme Policy and the State Planning Policy (SPP, 2017) it is a requirement that new development treat runoff prior to it entering receiving waterways.

A stormwater quality management strategy (consistent with that proposed within the overarching masterplan report*)* will implement Stormwater Quality Improvement Devices (SQIDs) to capture gross pollutants, sediment, suspended solids and nutrients, utilising vegetated natural processes (i.e. bioretention systems) to treat runoff from residential areas.

The proposed Foreverlen Stage 1 to 4 development will see the provision of these SQIDs located, sized, and configured to capture and reduce the export of pollutants in runoff to meet the relevant Pollutant Load Reduction (SPP,2017) and Non-Worsening based Water Quality Objectives (WQOs).

Analysis was undertaken to the sizing of bioretention devices and results of the analysis indicate that proposed bioretention devices are appropriate in meeting the WQOs.

Contents

Tables

Figures

Appendices

1 Introduction

Calibre Professional Services has been commissioned by the Foreverlen PTY LTD to prepare a Stormwater Management Plan (SWMP) in support of a Reconfiguring a Lot application for Stages 1 to 4 of the Foreverlen site within Phase 1 of the Neighbourhood Development Plan 1 (NDP1) precinct of Caboolture West.

For clarity, reference to the subject of this report, being Stages 1 to 4 of the Foreverlen site within Phase 1 of NDP1, will henceforth be referred to in this report as 'the proposed development'.

This report identifies the stormwater and flood management strategies required to service the proposed development as identified within the *Stormwater Management Plan – Caboolture West NDP1* (Calibre Report No. 16-1367-SWMP-01C dated November 2021, herein referred to as the *NDP1* SWMP) and provides results that demonstrate the strategies will be appropriate. This report also demonstrates the proposed development will not cause any adverse or actionable impacts to adjacent or downstream properties.

The proposed development extent and layout is indicated in **Figure 2.2**.

1.1 Objectives & Scope

The objectives of this report are to:

- Document the locations where runoff discharges from the site area under existing and developed (Stages 1 to 4) conditions;
- Demonstrate that the increase in runoff generated by the proposed Stage 1 to 4 development will not cause an adverse impact adjacent to or downstream of the site;
- Demonstrate the development of the study area complies with the Moreton Bay Regional Council (MBRC) standards with respect to stormwater quantity and quality management;
- Identify the relevant water quality objectives for development within the study area and potential stormwater quality improvements devices to employ to achieve these objectives;

The scope undertaken involved the following:

- Flood Investigation – Hydrological and hydraulic modelling to determine the potential changes to runoff, peak flow and flood levels associated with the development. For this investigation the hydrological and hydraulic models associated with the *NDP1 SWMP* have been adopted.
- Stormwater Quality Investigation – an investigation identifying the relevant water quality objectives and appropriate stormwater quality treatment methods to employ for development within the study area. Preliminary locations and sizes for bioretention systems have been identified.

1.2 Methodology

The analysis undertaken has utilised the hydrological and hydraulic modelling previously undertaken for the *NDP1 SWMP*. This report, prepared in collaboration with Calibre, the Land Owners Group (LOG), Moreton Bay Regional Council (MBRC) and other stakeholders, has been approved 'in principle' by MBRC. This project, involving experienced floodplain management consultants, resulted in the creation of comprehensive computer-based models and flood mapping of the Caboolture River and SEWC in the area of NDP1, taking into account the proposed master planned development.

The hydrological (WBNM) and hydraulic (TUFLOW) models used to analyse stormwater and flood management strategies for NDP1 were originally sourced from MBRC (the *Caboolture River Flood Modelling Database* 002c, 2014). It is noted that these models underwent a comprehensive verification process during the initial model development (by SKM), as well as further model verification as documented within the *NDP1 SWMP*.

Furthermore, Section 4.4 of the *NDP1 SWMP* report details a comparison of TUFLOW model results (between the received MBRC model and the model updated by Calibre) to identify changes resulting from updates to the existing scenario hydrological model configuration and use of a later version of TUFLOW only.

Due to the rigorous verification previously undertaken no further model verification was undertaken as part of this investigation.

2 Site Location & Characteristics

2.1 Location

NDP1 is located approximately 5km west of Morayfield, in the suburb of Upper Caboolture. NDP1 is bound by the Caboolture River to the north and west, Caboolture River Road to the south and existing Riverparks residential precinct to the east. The Foreverlen Stage 1 to 4 development site is located at the southeast corner of NDP1 (within the Foreverlen owned land). **Figure 2.1** below shows the extent of NDP1 and properties under the control of the LOG within Phase 1, as well as the Stage 1 to 4 development site extent.

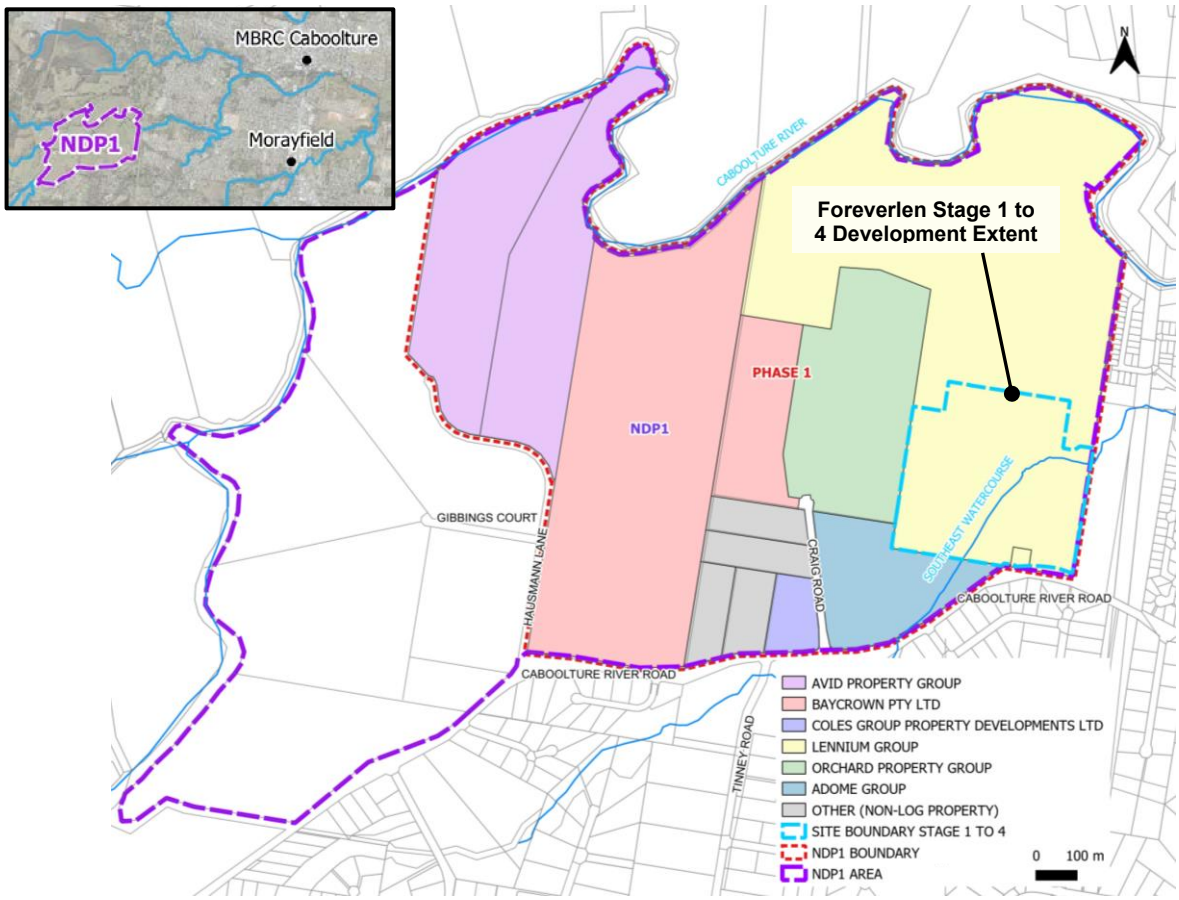


Figure 2.1: Site, NDP1 & Phase 1 Study Area Location

As indicated in the figure above, the proposed development extent is in the southeast portion of Phase 1 of NDP1. This report addresses flooding and stormwater management for Foreverlen Stage 1 to 4 only.

The properties under control of the Land Owners Group within the Phase 1 study area are indicated in colour on **Figure 2.1**. Other properties (not part of the LOG) are also identified (in grey). It is noted that the property ownership presented above is current at the time this report was prepared.

2.2 Topography

Topography over the proposed development site, as shown in **Figure 2.2** below, is characterised by the following features:

- Majority of the development area falls to a natural gully (South East Watercourse), stemming from the southern property boundary, traversing generally through the centre of the site and exits at the eastern property boundary The natural gully has longitudinal grade of approximately 0.5%;
- Small portions at the southeast and northeast corners of the proposed development area generally fall east to ultimately enter the South East Watercourse downstream of the site.
- Terrain across the site generally grades at less than 2%, with the highest part of the study area located in the southeast corner.

2.3 Discharge locations

Runoff from the proposed development site effectively discharges via two watercourses. The majority of the runoff discharges via the South East Watercourse to the eastern Lawful Point of Discharge (LPD1). LPD1 is the same location referred to as the South East Discharge Location referenced in the *NDP1 SWMP*. A small portion (less than 3% of the proposed development) discharges to the Caboolture River via a northern tributary designated as Lawful Point of Discharge 2 (LPD2). Refer to **Figure 2.2** for discharge locations with respect to the proposed development.

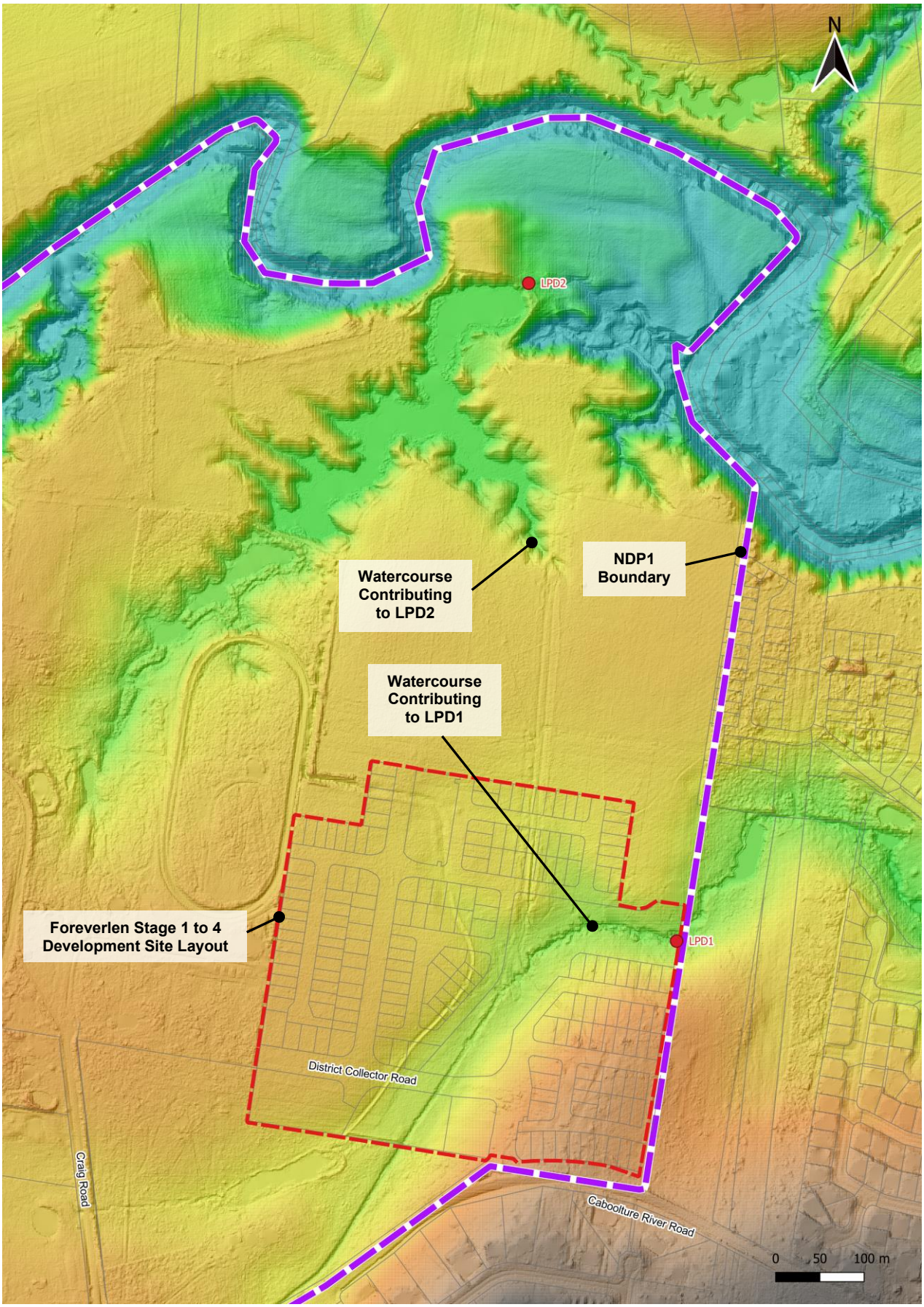


Figure 2.2: Foreverlen Stage 1 to 4 Existing Topography & Discharge Locations

3 Flood Impact Assessment

Flood management investigations and analysis have been undertaken by Calibre to determine the impact the proposed development will have on peak flows and flood conditions to the adjacent Caboolture River and South East Watercourse. As discussed in **Section 1.2** the investigations and analysis undertaken has been based on modifications to the hydrological and hydraulic modelling previously undertaken for the *NDP1 SWMP*.

3.1 Hydrological Investigations

Hydrological analysis and modelling have been undertaken by reconfiguring the WBNM model input parameters used for the regional Caboolture River NDP1 analysis (as described in the *NDP1 SWMP*) to represent the proposed development for Foreverlen Stages 1 to 4. The following sections describe the methodology and model reconfiguration adopted for the hydrological analysis.

3.1.1 Model Configuration and Verification

Previous WBNM configuration and input parameters for the regional Caboolture River NDP1 analysis were adopted for this investigation. The results of this site-based analysis were verified against the results of the previous verification undertaken as part of the NDP1 investigation as documented within Section 4.2.1 of the *NDP1 SWMP*.

For the hydrological analysis component of this flood investigation the WBNM was used to determine peak flow hydrographs for all standard storm events between the 63% AEP to the 0.1% AEP, and for storm durations including the 30, 45, 60, 90, 120, 180, 270, 300, 360, 720 and 1440 minutes.

3.1.2 Land Use Assumptions

Fraction impervious values have been determined based on the lot density for each catchment and the assumed land use as per **Table 3.1**. The resultant fraction impervious values corresponding to existing and developed scenarios are presented on the catchment plans, SK3001 and SK3002 in **Appendix A**.

Table 3.1 Land Use Fraction Impervious

Land Use	Percentage Impervious (%)
Road	70
Open Space (incl. SQIDs)	0
Park	20
Commercial	90
Rural Residential	20
Allotment Ground	30
Allotment Roof	100

Values for catchment routing lag and infiltration loss for pervious and impervious areas have been kept consistent with the *NDP1 SWMP* modelling as per **Table 3.2,** which adopts parameters prescribed in *MBRC's Planning Scheme documents Integrated Design – Stormwater Management Appendix C*.

Table 3.2 Catchment Lag and Infiltration Losses

WBNM Model Parameter	Minor Storm Events (63.2% to 5% AEP)	Major Storm Events (2% to 0.1% AEP)
Impervious Area Lag	0.1	0.1
Lag Parameter C value	1.6	1.6
Impervious Area – Initial Loss (mm)	0	0
Pervious Area – Initial Loss (mm)	15	0
Pervious Area – Continuing Loss Rate (mm/hr)	2.5	2.5

3.1.3 Catchment Configurations

3.1.3.1 South East Watercourse – LPD1

Hydrological analysis has been undertaken for the catchments that discharge runoff to the South East Watercourse. The analysis has been undertaken to determine how the development will change the magnitude and timing of the watercourse peak flows to hydraulically assess the changes in flood levels though and adjacent to the proposed development.

Catchment delineation and fraction impervious values were updated in line with the proposed Foreverlen Stage 1 to 4 development layout and preliminary earthworks design. The stormwater management strategy proposed for the South East Watercourse remains consistent with the *NDP1 SWMP*, with the exception of the following items associated with the assumed staging and timing of works within NDP1 relative to Stage 1 to 4 of the Foreverlen development:

- The strategy remains consistent with the *NDP1 SWMP* in that runoff generated from the rural land owned by Orchard Group adjacent to the Foreverlen land in Sub-Catchment 34_03661B1B shall be captured and conveyed via the proposed Internal District Collector Road (IDC). However, this analysis assumes Orchard land remains in its pre-development condition and will be picked up by a temporary diversion drain along the western boundary prior to discharging to the South East Watercourse at the downstream side of the IDC embankment. Refer to **Figure 3.3** for further details.
- It was assumed that the future Caboolture River Road upgrade and realignment works will not take place for this initial stage of the Phase 1 NDP1 development. Only initial works will be constructed to allow suitable entry to and exit from the development.
- The culvert crossing and road embankment formation of the IDC to remain consistent with the *NDP1 SWMP*, but the weir structure designed for the Ultimate Phase 1 NDP1 conditions will not be constructed for this stage of the development. The IDC culvert crossing configuration is as follows, with reference to the Trunk Drainage Infrastructure ID referred to in the *NDP1 SWMP* report:
  - *SEWC_DET_01* (Primary Detention Outlet) – 3 x 1650mm diameter Reinforced Concrete Pipes (RCP).
  - *SEWC_DET_02* (Secondary Detention Outlet) – 3 x 1500mm RCP.
  - District Collector Road Embankment – The crest of the District Collect Road will form a weir for infrequent events where flow within the South East Watercourse exceeds the 1% AEP event. A minimum crest level of 21.25m AHD has been adopted.
- Earthworks associated with channel works and the formation of the on-line detention basin storage area are proposed within Foreverlen owned land only (designated Trunk Drainage Infrastructure ID *SEWC_RES_01* as per the *NDP1 SWMP*). These works do not extend past the Foreverlen development boundary into land owned by Adome (designated Trunk Drainage Infrastructure ID *SEWC_RES_02* as per the *NDP1 SWMP*) for this stage of the development. This interim detention basin configuration will remain until works associated with the upstream (Adome land) development commence. Detention storage upstream of the Foreverlen development boundary is defined by the pre-development topography along the South East Watercourse within the upstream property (Adome land)[i]. A comparison of the Foreverlen Stage 1 to 4 and Ultimate Phase 1 NDP1 stage-storage relationships is indicated in **Figure 3.1** below.

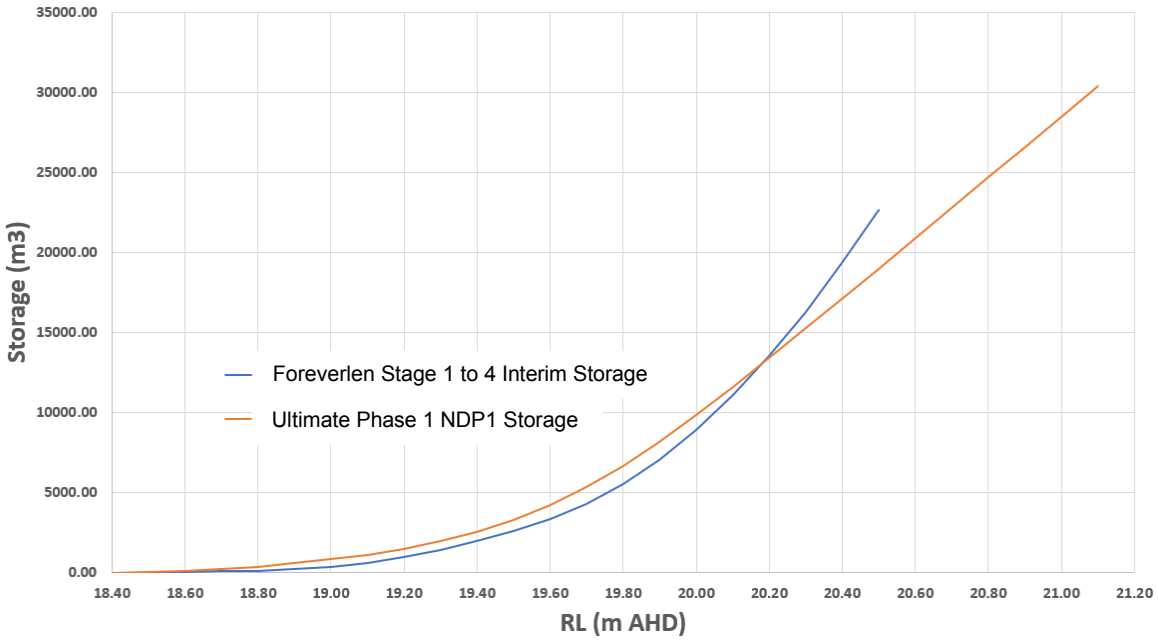


Figure 3.1: On-line Detention Basin Stage-Storage Comparison – Foreverlen Stage 1 to 5 vs Ultimate

[i] Subsequent increases in flood levels propagating upstream from the IDC onto Adome land have been consented to by way of agreement between both Adome and Foreverlen land owners. The flood envelope is significantly reduced once the Ultimate Phase detention basin configuration is constructed on Adome land.

While less detention storage is available in the interim scenario (i.e. prior to the ultimate configuration being completed) the results presented in **Section 3.2** demonstrate that the available interim storage is sufficient.

The adopted existing catchment configuration is shown on **Figure 3.2** below.

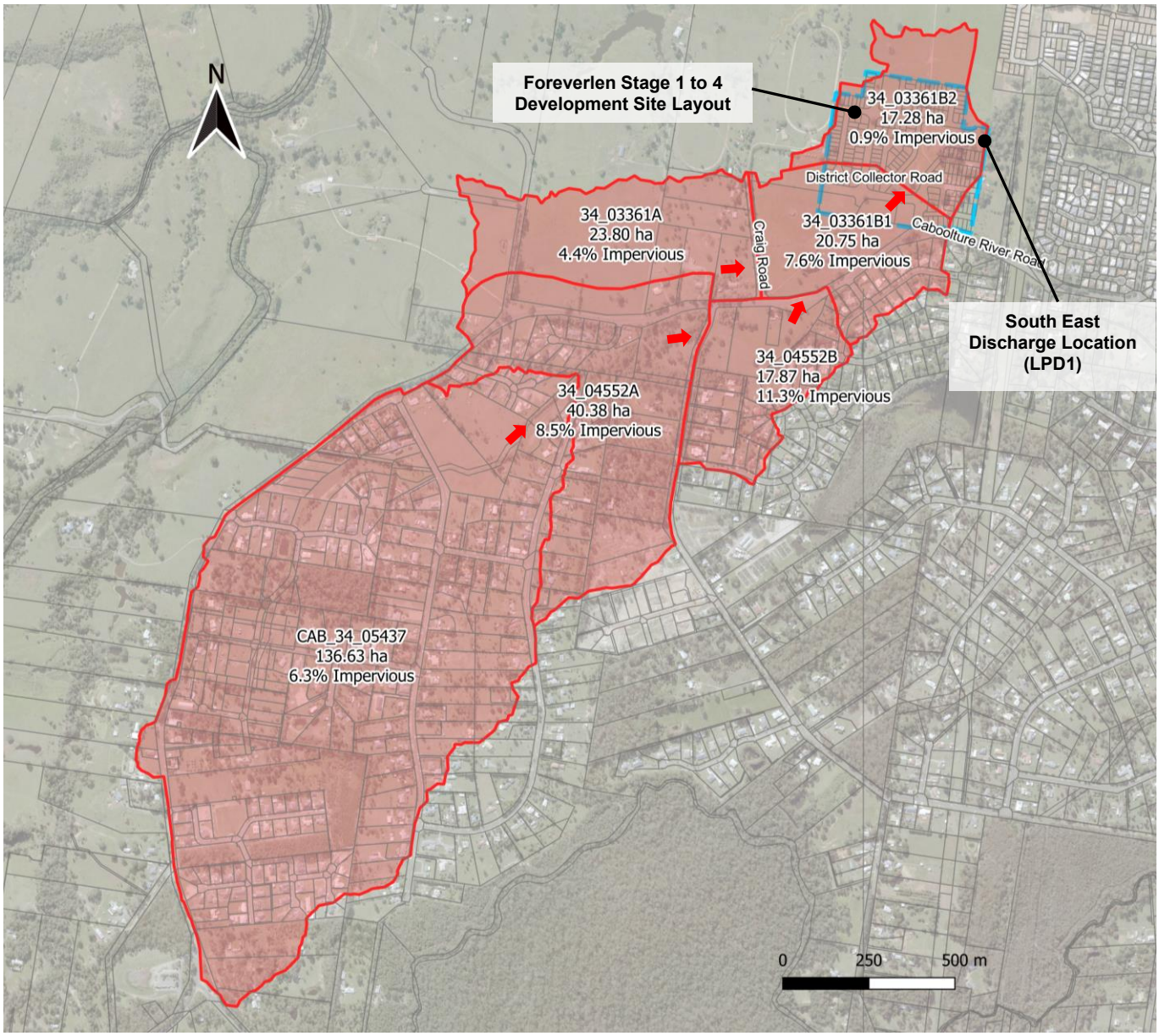


Figure 3.2: Existing South East Watercourse Analysis WBNM Catchment

The adopted developed catchment delineation and properties are shown on **Figure 3.3** below.

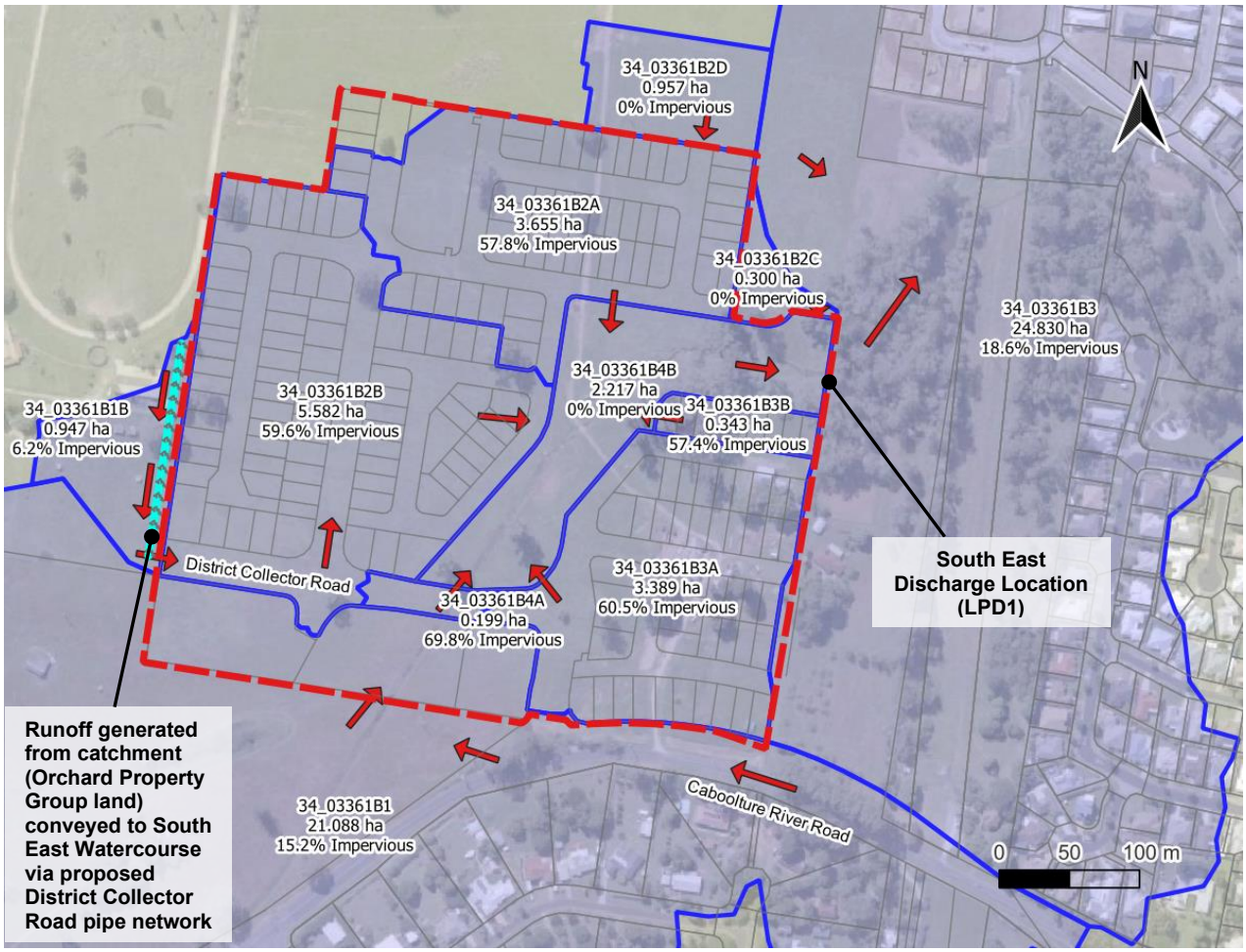


Figure 3.3: Developed South East Watercourse Sub-Catchment Configuration

Hydrological investigations undertaken for the catchment of the South East Watercourse have identified the timing of peak flows from the development is largely offset to the larger peak from the upstream contributing catchment, with no increases in peak flow occurring at the South East Discharge Location (LPD1) for the range of storm events analysed.

3.1.3.2 Caboolture River tributary – LPD2

The portions of the Foreverlen Stage 1 to 4 development directly contributing runoff to the Caboolture River was allowed for in the WBNM update. Sub-catchment areas were re-delineated based on the grading plans and development layouts for the proposed development. The existing and developed sub-catchments discharging to LDP2 are indicated on **Figure 3.4** and **Figure 3.5** respectively.

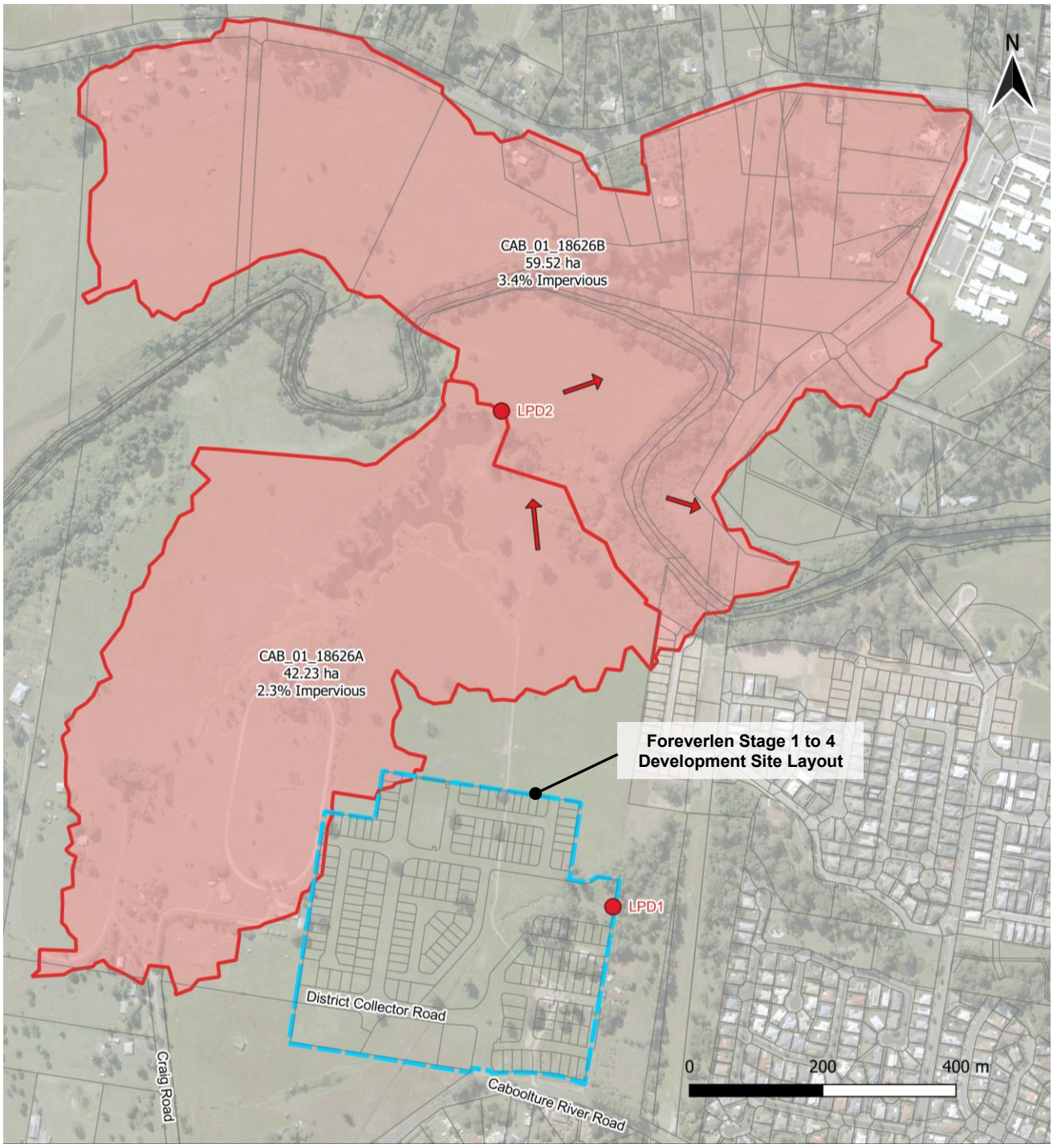


Figure 3.4: Existing Caboolture River Analysis WBNM Catchment

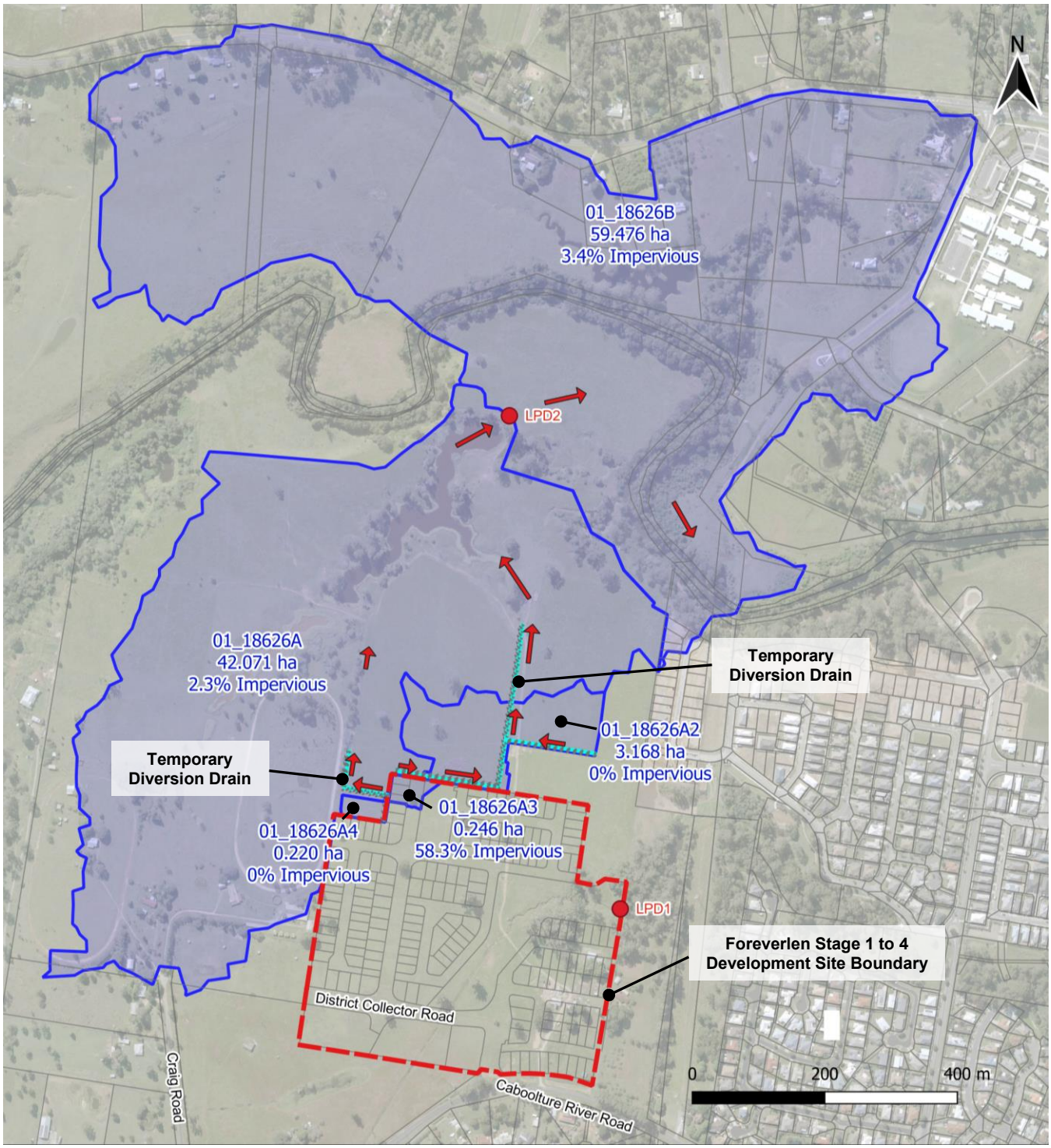


Figure 3.5: Developed Caboolture River Analysis WBNM Catchment

3.1.3.3 Temporary Catchment Diversions

The proposed stormwater management strategy for the Foreverlen Stage 1 to 4 development will involve management of externally contributing runoff via temporary diversion drains. The locations of these temporary drains are presented on Calibre Sketch Plans SK3002 and SK3003 in **Appendix A**.

Runoff generated from the partially developed Catchment 01_18626A2 contributing to the northern boundary of the Stage 1 to 4 development shall be conveyed north via a temporary diversion drain sized for the 10% AEP storm event, to the natural tributary (located in Catchment 01_18626A) which feeds into the Caboolture River via LPD2. A check of the temporary drain design against a 1% AEP storm event has also been undertaken to confirm it has the capacity to convey runoff from a larger storm event. Checks were also made to ensure velocity-depth products within the channel were less than 0.6m^2/s for all storm events analysed. Refer to **Table 3-3** below for details. Refer to **Appendix B** for detailed Manning's 'n' open drain calculations.

Table 3-3 Catchment 01_18626A2 Temporary Diversion Drain Design Details

Design Parameters		
Base Width (m)	2	
Side Slopes	1 in 4	
Longitudinal Slope (%)	0.5	
Total Depth (m)	0.7	
Total Width (m)	7.6	
Manning's 'n' Roughness	0.030	
Design Storm AEP	**10%**	**1%**
Critical Duration (mins)	60	60
Peak Flowrate (m^3/s)[1]	1.43	2.46
Max. Depth (m)	0.40	0.52
Max. Velocity (m/s)	0.99	1.15

Runoff generated from a portion of the existing Catchment 34_03361B1B (located in Orchard Land) contributing to the western boundary of Stage 1 to 4 development shall be directed south via a temporary diversion drain (sized for the 10% AEP storm event) along the western edge of the staged Foreverlen development for subsequent conveyance to the South East Watercourse. The contributing runoff is to be conveyed from the western end of the partially constructed District Collector Road via the underlying pipe drainage system and discharged to the South East Watercourse. A check of the temporary drain design against a 1% AEP storm event has also been undertaken to confirm it has the conveyance capacity in the event of a larger storm event. Checks were also made to ensure velocity-depth products within the channel were less than $0.6m^2/s$ for all storm events analysed. Refer to **Table 3-4** below for details. Refer to **Appendix B** for detailed Manning's 'n' open drain calculations.

Table 3-4 Catchment 34_03361B1B Temporary Diversion Drain Design Details

Design Parameters		
Base Width (m)	0.5	
Side Slopes	1 in 4	
Longitudinal Slope (%)	0.5	
Total Depth (m)	0.6	
Total Width (m)	5.3	
Manning's 'n' Roughness	0.030	
Design Storm AEP	**10%**	**1%**
Critical Duration (mins)	60	25
Peak Flowrate (m^3/s)[1]	0.322	0.578
Max. Depth (m)	0.28	0.52
Max. Velocity (m/s)	0.70	1.15

These proposed temporary diversion drains will ultimately be replaced with formal means of flow conveyance (i.e. underground pit and pipe drainage systems associated with future stages of the development) until such time the future stages of the Foreverlen development to the north and the Orchard development to the west are constructed. The alignments of these drains will be further developed during detailed design and provisions for a temporary drainage easement will be made. The temporary drains will be owned and maintained by Foreverlen (not MBRC) until they are decommissioned and replaced with permanent drainage infrastructure.

3.2 Hydraulic Investigations

Hydraulic analysis and modelling have been undertaken by reconfiguring the TUFLOW model input parameters used for the regional Caboolture River NDP1 analysis (as described in the *NDP1 SWMP*) to represent the proposed development for Foreverlen Stages 1 to 4.

The hydraulic investigations, using TUFLOW, have been undertaken to demonstrate the following:

- Flood results are consistent with those presented in the *NDP1 SWMP;*
- The proposed development will not propagate adverse flood impacts outside of the NDP1 boundary; and
- The proposed development will not adversely change maximum flood conditions on adjacent and downstream properties along the Caboolture River or South East Watercourse.

The following sections describe the methodology and model reconfiguration adopted for the hydraulic analysis, which incorporates peak discharge hydrographs extracted from the WBNM modelling described in **Section 3.1**.

3.2.1 Topographical Data and Projection

The Digital Elevation Model's (DEM) used in this analysis consists of a 1.0km^2 LIDAR tiles covering the extent of the model, and a bulk earthworks Triangulated Irregular Network (TIN) over the extent of the Foreverlen site for the proposed development of Stages 1 to 4. The model was projected to the GDA 94/ MGA Zone 56 coordinate system.

For areas where a bulk earthworks TIN has not yet been developed, TUFLOW '2d_ztin' and '2d_zsh' shape files were used to set Z-point elevations to account for planned development works.

3.2.2 2D Model Area

The 2D model area adopted for the *NDP1 SWMP* modelling was retained for this analysis. Section 4.4 of the *NDP1 SWMP* report details a comparison of TUFLOW model results (between the received MBRC model and the model updated by Calibre) to identify changes resulting from updates including truncation of the 2D model area and use of a later version of TUFLOW, including the Quad Tree Mesh functionality.

Due to the rigorous verification previously undertaken for the *NDP1 SWMP* modelling no further model verification was undertaken as part of this investigation.

3.2.3 Modelled Storm Events

Before the model was configured to account for the proposed development, the existing scenario model previously utilised for the Caboolture River hydrological investigation was first updated with the catchment SA Polygons and inflow hydrographs adopted for the South East Watercourse hydrological analysis (as discussed in **Section 3.1**). The modelled storm events are listed in **Table 3.5**. These storms represent the critical durations for the 5%, 1% and 0.1% AEP events for the existing and developed scenarios as determined in the hydrologic analysis. The flood model results adopt a maximum flood envelope for the critical durations listed.

Table 3.5 Modelled Storm Events

Duration (min)	5% AEP	1% AEP	0.1% AEP
30	✔	✔	-
60	✔	✔	-
90	✔	✔	-
120	✔	✔	-
180	-	-	✔
270	-	-	-
300	-	-	✔
360	-	✔	✔
720	-	-	✔
1440	✔	-	-

3.2.4 Roughness

Various Manning's n roughness values have been utilised to represent the 2D topographical areas within the 2D model extent.

Table 3.6 Manning's n values

Material Description	Manning's n
Dense vegetation	0.09 to 0.18 varying with vegetation height
Reeds	0.08
Medium dense vegetation	0.075 to 0.15 varying with vegetation height
Crops	0.04
Low Grass/Grazing	0.025 to 0.06 varying with vegetation heigh
Roads/Footpaths	0.015
Buildings	1
Waterbodies	0.03
Urban block	0.3

These values are consistent with hydraulic roughness used in the *NDP1 SWMP* TUFLOW model.

A hydraulic roughness of 0.013 was adopted for all culvert structures modelled, which is a value consistent with a reinforced concrete conduit.

3.2.5 TUFLOW Model Results

Peak water level, velocity and flood hazard results were extracted for each storm duration and combined to create 'peak of peaks' rasters for the extent of the TUFLOW model. Results from the existing and developed scenario, along with difference plans indicating changes in flood conditions between the two scenarios for the 5%, 1% and 0.1% AEP events are provided in **Appendix D**.

Caboolture River

The results indicate there is effectively no change in flood conditions up to the 1% AEP event within the Caboolture River adjacent to the study area and downstream. The 1% AEP flood difference results presented in **Figure 3.6** and **Figure 3.7** below show no change in flood level or velocity along the Caboolture River.

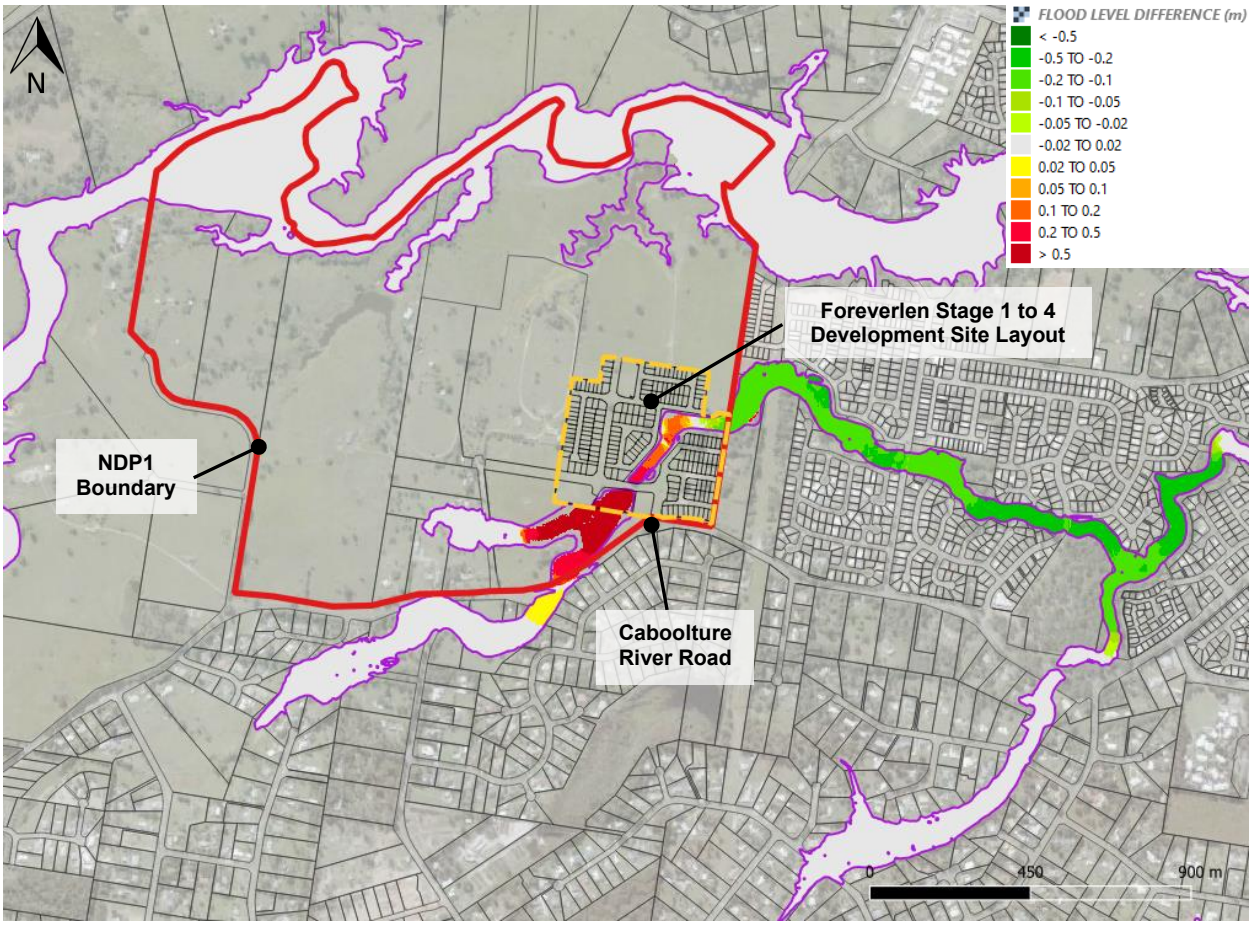


Figure 3.6: Flood Level Difference Results – 1% AEP

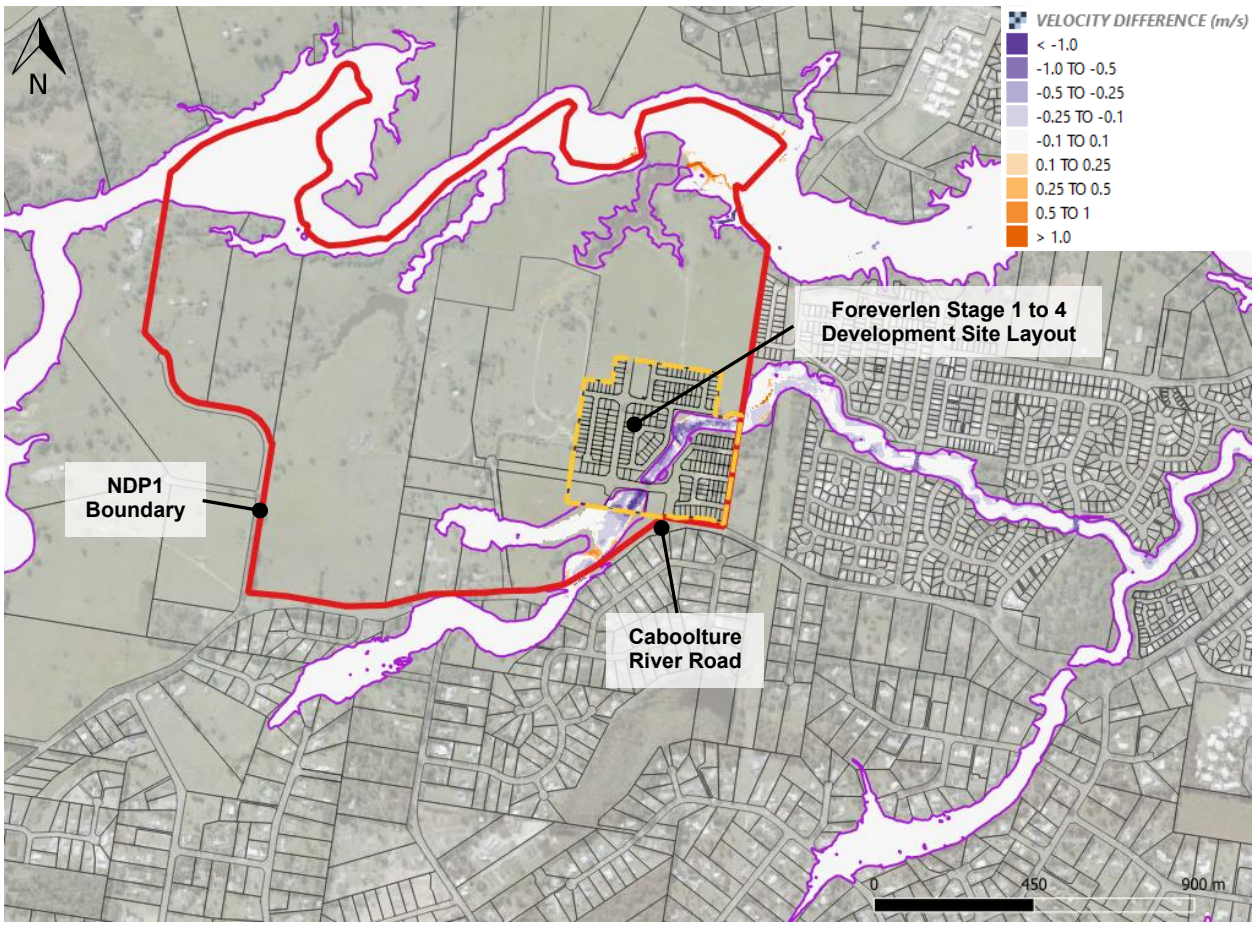


Figure 3.7: Flood Velocity Difference Results – 1% AEP

For the 0.1% AEP event flood level increases up to 30mm do occur along the Caboolture River, however the increases that do occur (below 50mm) are generally located outside of the existing urban residential areas and are considered acceptable under the MBRC *Planning Scheme Policy for Flood hazard, Coastal hazard and Overland flow*. Refer to flood plans contained in **Appendix D.**

These results confirm that the change in hydrology resulting from the proposed development that discharges runoff directly to the Caboolture River effectively will not change maximum flood levels or velocities along the river system. This is due to runoff entering the river from the proposed development before the peak from the larger upstream catchment arrives. This is illustrated in **Figure 3.8** below which shows the TUFLOW modelled flow results for the 1% AEP event, critical duration storm adjacent to the downstream end of the study area.

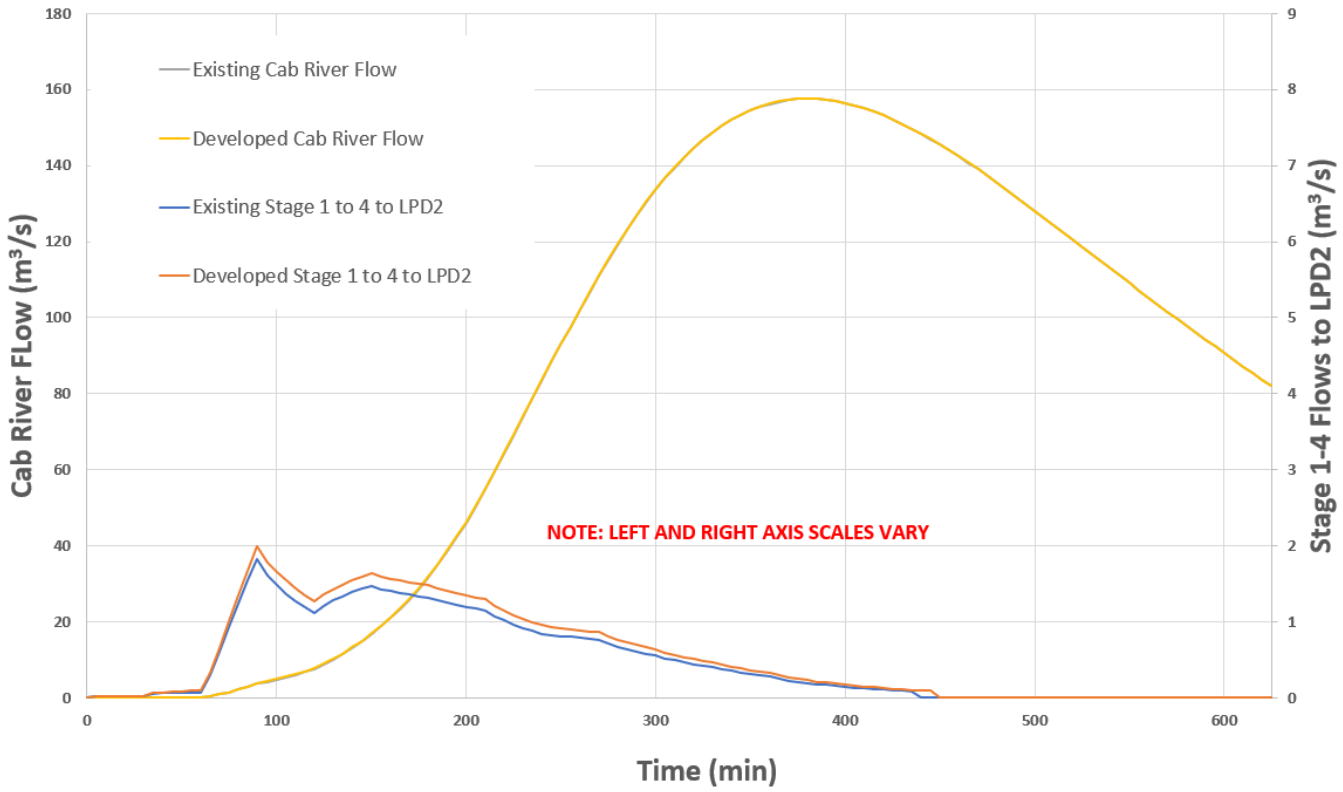


Figure 3.8: TUFLOW Hydrograph Comparison - 1% AEP, Critical Duration Storm

The flow from the Caboolture River (plotted on the left axis) compared to the significantly lower existing and developed scenario discharges (on the right axis) clearly illustrates that the maximum runoff from the study area enters the receiving system well before the main peak in the Caboolture River. Similar flow behaviour was observed for other design events and durations analysed.

The *NDP1 SWMP* report investigations determined that the timing of peak flow discharging directly to the Caboolture River from the fully developed NDP1 scenario does not coincide with, or increase, the peak flow from the larger upstream river catchment. Similarly, this is the case for the interim configuration presented in this report whereby only the proposed Stages 1 to 4 of Foreverlen are developed, and only a fraction of the fully developed catchment area (0.25ha area within Stage 2) discharges to the Caboolture River via one of the northern tributaries at LPD2. Based on these results, peak flow mitigation (detention) at or prior to discharging to LPD2 is considered unnecessary and is consistent with the *NDP1 SWMP* report.

South East Watercourse

For the South East Watercourse, the results indicate the following:

- There will be reductions in flood level along the South East Watercourse downstream of the study area for all modelled storm events up to and including the 0.1% AEP.
- As indicated in **Figure 3.6** flood levels increase within the NDP1 boundary area as a result of the proposed on-line detention basin and works within the watercourse. The effect of the detention structure is also evident in the velocity difference results presented in **Figure 3.7** which generally indicate a reduction in velocity along the South East Watercourse upstream of the District Collector Road embankment. Outside the study area velocities generally remain unchanged.

- For the 0.1% AEP event flood level reductions occur downstream of the study area, however increases are noted within the South East Watercourse upstream of Caboolture River Road. **Figure 3.9** below indicates that flood level increases between 200mm to 500mm occur across the Caboolture River Road reserve and along the boundary of adjacent rural properties to the south. Increases in flood level for this event do extend further upstream but no further than Tinney Road to the south west. Irrespective of this, the change in flood level and extent for the 0.1% AEP does not encroach on or adversely impact any existing dwellings and are considered acceptable under the MBRC *Planning Scheme Policy for Flood hazard, Coastal hazard and Overland flow*. Differences in velocity are generally consistent with those for the 1% AEP event.

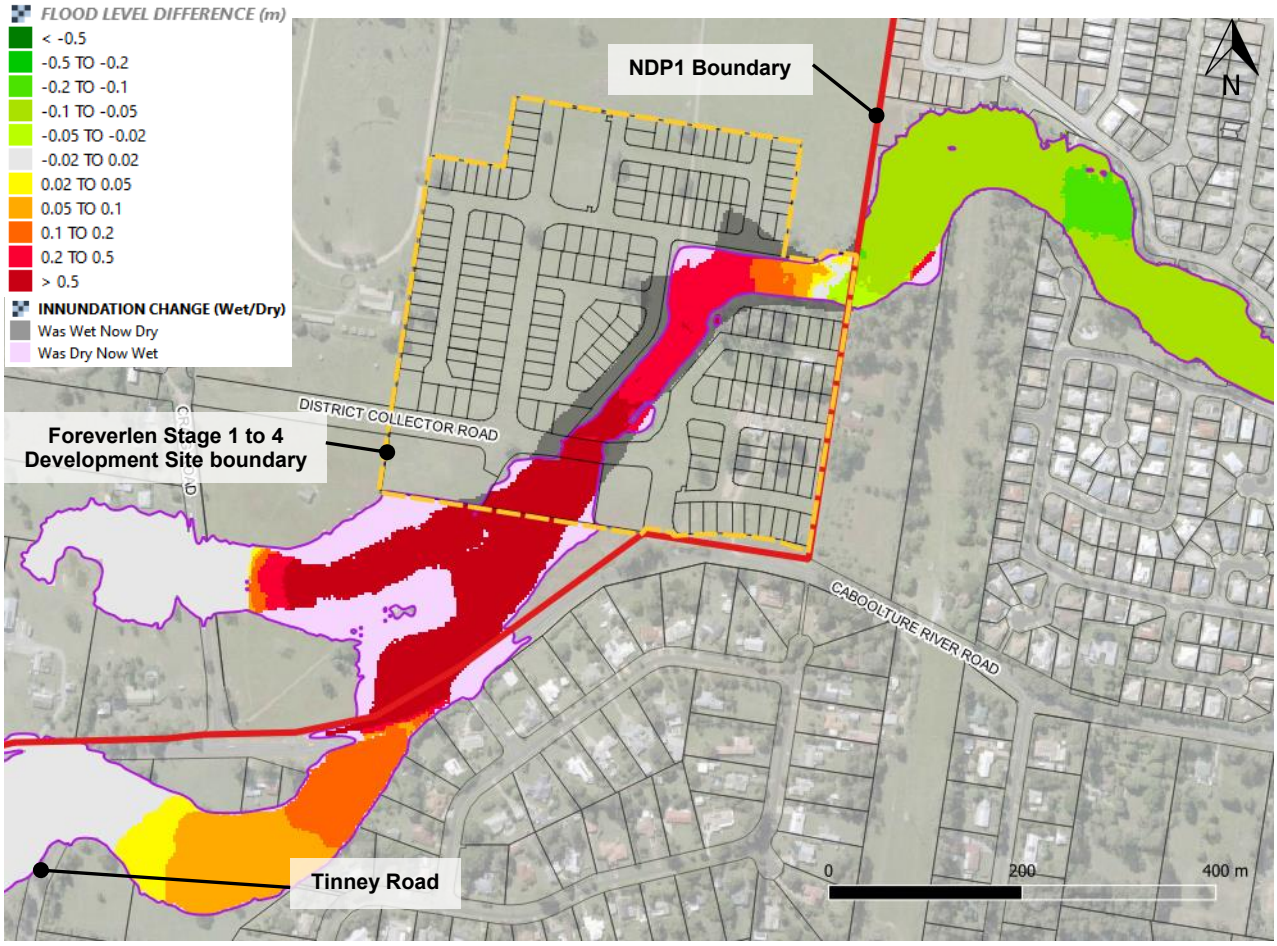


Figure 3.9: Flood Level Difference Results – 0.1% AEP

Table 3-7 below summarises the flooding conditions over each road.

Table 3-7 Over Road Flood Conditions

Road	QUDM safety standard for vehicles	District Collector Road (IDC)	Caboolture River Road[a]	
Scenario		**Developed[b]**	**Existing**	**Developed**
5% AEP Depth (m)	0.20[c]	No overtopping	0.30	0.33 *(+0.03)*
5% AEP D.V (m^2/s)	0.30[c]	NA	0.64	0.81 *(+0.17)*
1% AEP Depth (m)	0.20 [d]	No overtopping	0.46	0.48 *(+0.02)*
1% AEP D.V (m^2/s)	0.30 [d]	NA	1.40	1.49 *(+0.09)*
0.1% AEP Depth (m)	-	0.48	0.75	0.96 *(+0.21)*
0.1% AEP D.V (m^2/s)	0.60 [e]	0.49	1.84	2.04 *(+0.20)*

a. Upgrades to Caboolture River Road are proposed as part of future works in accordance with the overall NDP1 Masterplan, however, there is no change to the Caboolture River Road sag levels proposed as part of the Stage 1-4 Foreverlen development.
b. Results presented for Developed conditions only, as there is no IDC in the existing scenario.
c. Refer QUDM (2016 Ed.) Table 7.4.3 Flow limits for 'transverse' flow during MINOR STORM
d. Refer QUDM (2016 Ed.) Table 7.4.5 Flow limits for 'transverse' flow during MAJOR STORM
e. Refer QUDM (2016 Ed.) Table 7.3.6 Flow depth and width limitations for the major storm. Note that a D.V. less that of equal to 0.6m^2/s may still be trafficable for most heavy emergency services vehicles.

As part of this Revision C report the flood analysis included an additional 3.458 ha of Rural Residential land area diverted into the SEWC basin upstream of the IDC, due to CRR entry/exit works into the estate. As such, there is a resultant 20-30mm afflux for the 5% and 1% AEP events at the CRR crossing compared with the results presented in Revision B of this report presented in **Table 3-7** above. This impact is temporary, until such time that the CRR is upgraded to its ultimate configuration (refer to the NDP1 SWMP report, Rev D).

Results indicate flooding across the Caboolture River Road occurs for the 5%, 1% and 0.1% AEP for both existing and developed model scenarios. At the CRR crossing the developed scenario results are generally consistent with existing conditions, with minor impacts to road flooding conditions for the three AEP events. Minor increases in peak flow depth across the Caboolture River Road (CRR) of +0.03m and +0.02m are observed for the 5% and 1% AEP events, respectively. 0.1% AEP flood conditions are the most affected AEP at the CRR with a 0.21 m increase in overtopping depth and a 0.20 m^2/s increase in transverse flow depth-velocity product.

The impacts at the CRR are not considered to be adverse because the existing transverse flow conditions across the CRR sag are already not trafficable by QUDM safety standards for events greater or equal to the 5% AEP event. Hence, the impacts ranging across the 5%, 1% and 0.1% AEP events are deemed to be inconsequential.

The results above indicate that the IDC will be trafficable for the 1% AEP. While 0.1% AEP transverse flow depth-velocity product results are within the acceptable range for heavy emergency services vehicles, but otherwise not trafficable for regular road users and pedestrians according to QUDM. These results demonstrate that the IDC achieves the required design flood immunity during the interim phase of the Foreverlen development of Stages 1 to 4, while the flood immunity of the Caboolture River Road remains poor. It is noted that the upgrades proposed as part of the broader NDP1 development will result in the CRR sag being trafficable in a 0.1% AEP event according to the *NDP1 SWMP*.

3.2.6 Blockage Scenario Assessment

This section discusses a 50% bottom-up culvert blockage scenario for the District Collector Road (IDC) which has been assessed and modelled for the Defined Flood Event (DFE) (1% AEP). This scenario was based on two blockage assessment criteria adopted as referenced below and provided in **Appendix E**.

1. *AR&R Book 6, Chapter 6*, resulted in no blockage assessment required.
2. *MBRC Regional Floodplain Database: Floodplain Parameterisation (SKM, 2012)* resulted in adopting 100% blockage

Taking into consideration the configuration of the IDC culverts proposed, the conditions during the DFE across CRR prior to proposed upgrades, and feedback received during consultation with MBRC representatives, a 50% blockage sensitivity scenario was considered appropriate for this investigation.

Below is a summary of the modelled impacts due to the 50% blockage scenarios compared with no blockage as detailed previously in this report. The flowing has been assessed:

- Impacts to lots.
- Impacts to IDC overtopping depths and velocity.

- Impacts to upstream CRR overtopping depths and velocity.

Figure 3.10 below presents the model results of the blockage scenario assessment, which are then discussed further in the following sub-sections.

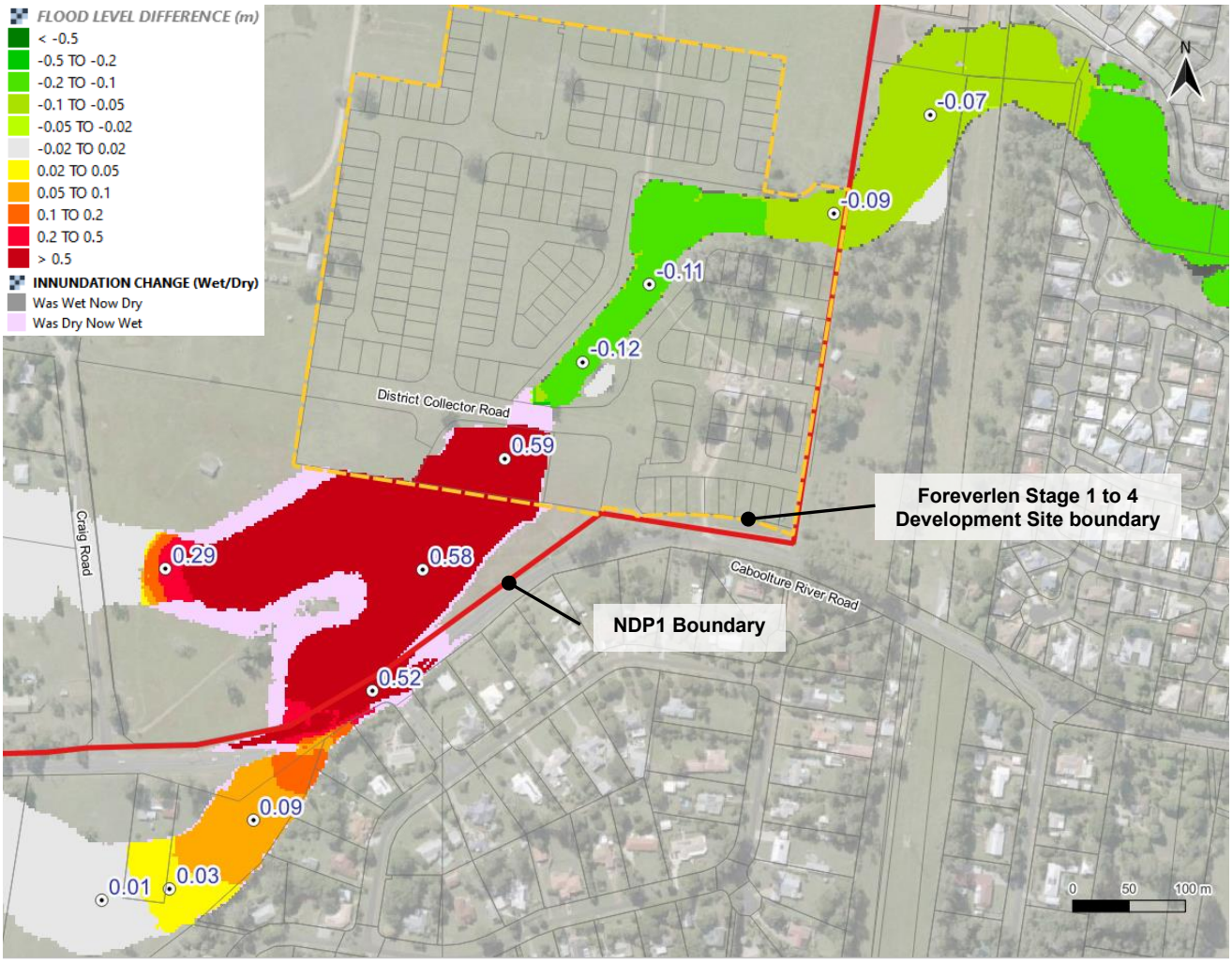


Figure 3.10: 1% AEP Maximum Flood Level Difference for 50% Blockage Scenario

Impacts to Lots

The blockage sensitivity scenario model demonstrates no adverse flood impact to proposed lots within the development. However, there is a flood level increase upstream of the Foreverlen development boundary into land owned by Adome. The Afflux map presented in **Figure 3.10** shows that the flood depth within the Adome land increases by approximately 0.59 m for the 50% blockage scenario, compared with developed conditions without culvert blockage.

Impacts to IDC Overtopping Depths and Velocity

From the model results the 'Was Wet, Now Dry' area along the IDC road sag presented on **Figure 3.11** below indicates the IDC will overtop at the sag for a 50% blockage scenario.

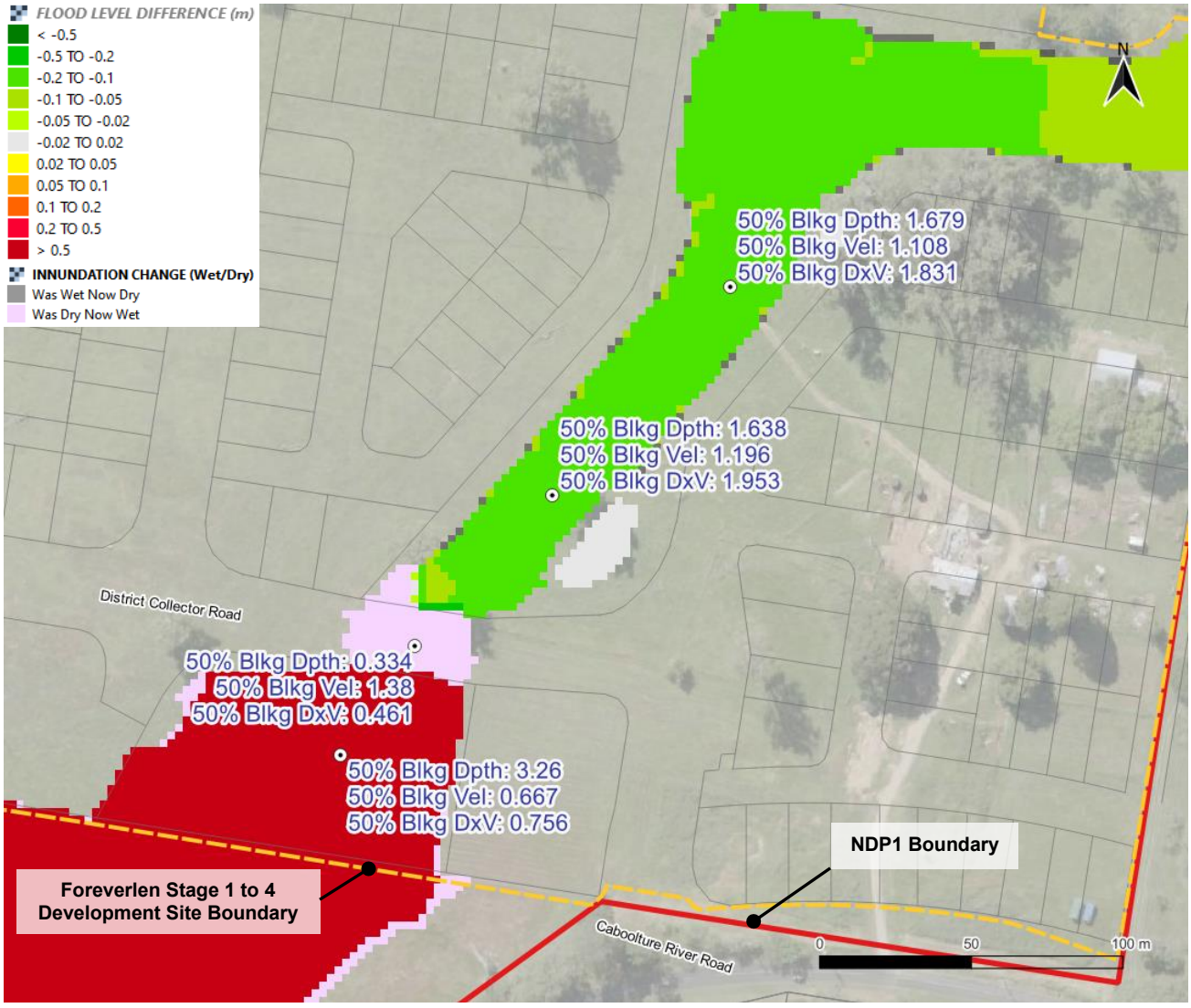


Figure 3.11: 1% AEP 'Was Dry, Now Wet' (pink) at the IDC for 50% Blockage Scenario

Figure 3.11 indicates that 0.33 m of overtopping will occur during a 1% AEP storm event with 50% blockage of the IDC culverts, with a depth-velocity product of 0.46 m^2/s. While this maximum depth of flow is not considered trafficable for vehicles and pedestrians, the depth-velocity product is within trafficable limits for some heavy emergency services vehicles. These flood conditions pose risks that can be managed by appropriate signage and flood depth markers along the road to alert road users and pedestrians of the flood risk.

Impacts to Upstream Caboolture River Road Overtopping Depths and Velocity

The model results indicate there will be a significant increase in flood depth along the CRR in the event of a 50% blockage scenario at the downstream ICD road culverts. The 1% AEP Maximum Flood Level Difference plan presented in **Figure 3.10** indicates that the flood depth along the CRR is increased by 0.52 m for the 50% blockage scenario. **Figure 3.12** below present this flood level difference in real terms, showing the resultant increase in inundation extents in pink (or 'Was Dry, Now Wet') across the CRR for the 50% blockage scenario.

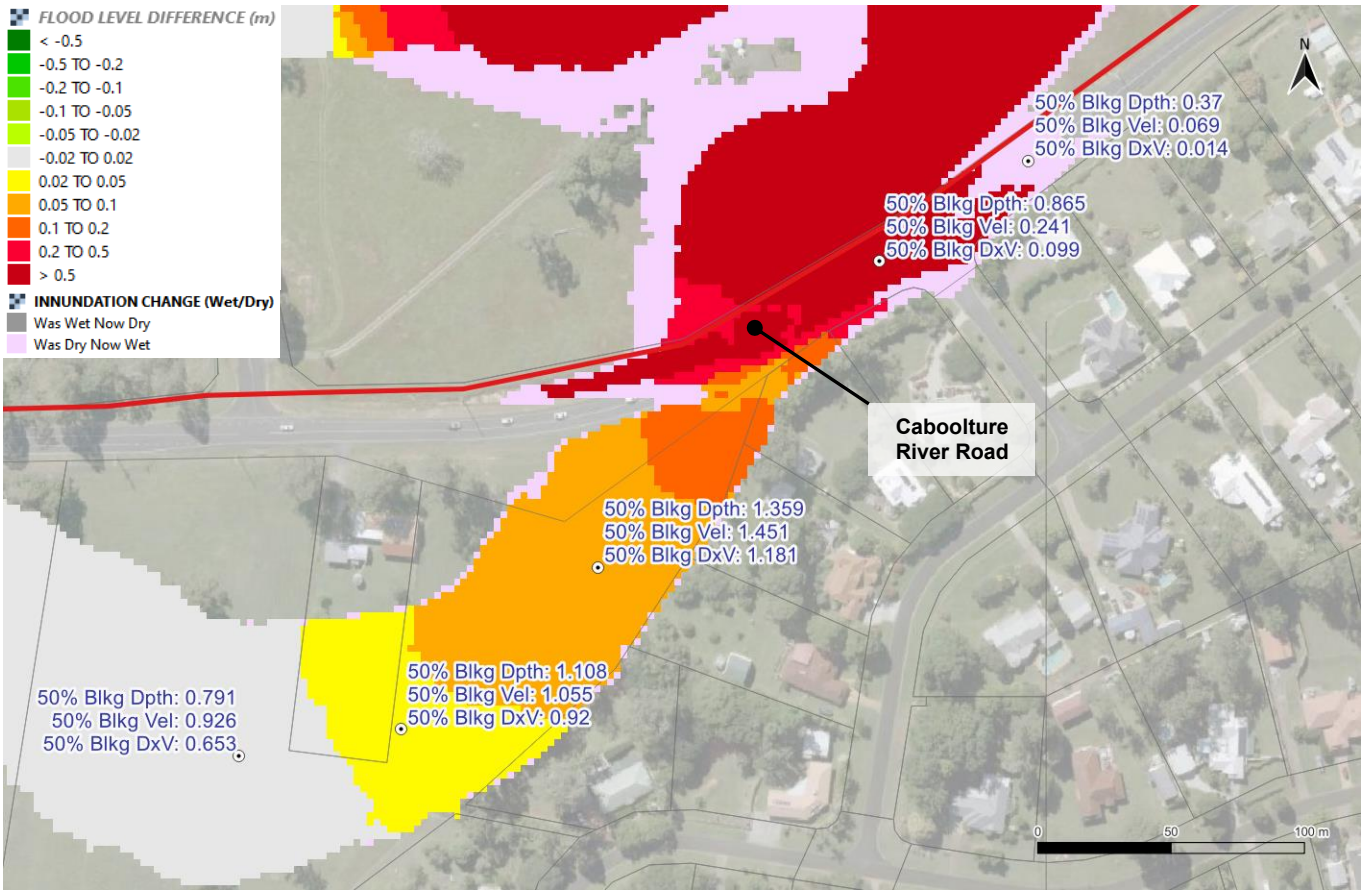


Figure 3.12: 1% AEP 'Was Dry, Now Wet' (pink) at the CRR for 50% Blockage Scenario

Results presented in **Figure 3.12** indicate that 0.87 m of overtopping occurs at the CRR during a 1% AEP storm event with 50% blockage of the downstream IDC culverts, with a depth-velocity product of 0.10 m^2/s. While this maximum depth of flow at the sag remains not trafficable, the flood conditions within the increased inundation extents (in pink) show maximum flood depths and depth-velocity products of approximately 0.37 m and 0.01 m^2/s, respectively. Furthermore, residents adjacent to these areas do not have (or rely on) property access points along the CRR and would still have trafficable roads along the southern property boundary for emergency egress.

As established in **Section 3.2.5** the existing flooding conditions across CRR are already not trafficable by QUDM safety standards for events greater or equal to the 5% AEP event. Hence, the trafficability of the CRR is effectively unchanged for the 1% AEP, 50% blockage scenario assessed.

3.3 Flood Hazard and Overland Flow Overlay Mapping

MBRC's Flood Hazard Overlay mapping presented in **Figure 3.13** below identifies the parts of the proposed development where Balance (grey), Medium (blue) and High (pink) Flood Hazard are mapped for existing site conditions.

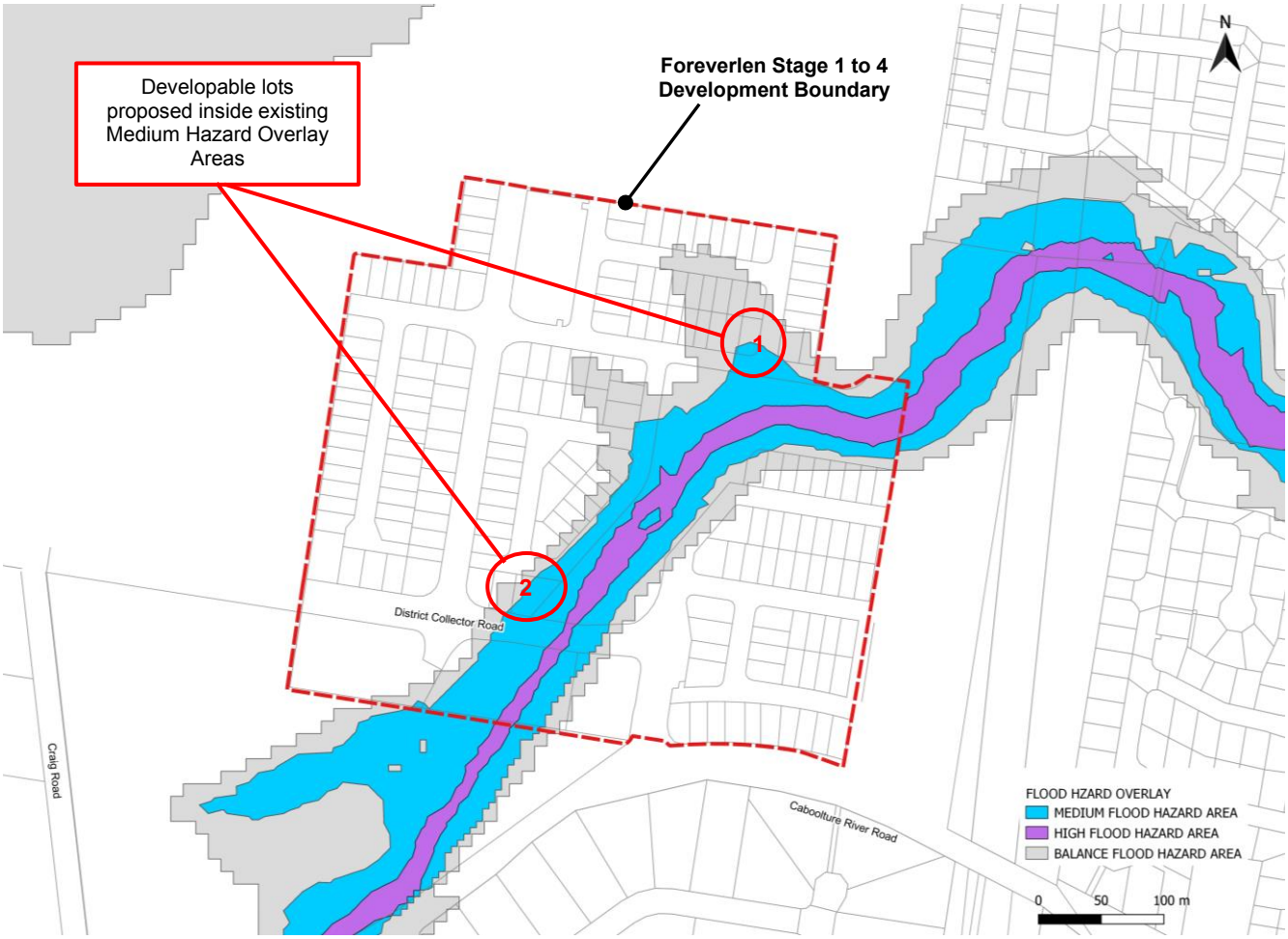


Figure 3.13: Flood Hazard Overlay Mapping (Source: MBRC)

The site area is also constrained by local overland flow flooding (in blue) identified in **Figure 3.14** below.

The Flood Hazard Overlay Code for Assessable Development (*MBRC Planning Scheme, Version 4, Table 8.2.2.2*) outlines requirements around the flood hazard mapping in relation to Reconfiguring a Lot. It also details what planning and operational works constraints apply to the mapped flood hazard. Specifically, development in the sense of creating developable lots in the High Flood Hazard area within the Urban Living land use is not supported and is not proposed for the Foreverlen development.

Performance Outcome (PO) 18 of the Flood Hazard Overlay Code outlines that proposed development within the Medium Flood Hazard area must manage and mitigate the tolerable risk of flood hazard by ensuring that all proposed lots are located outside the High or Medium risk area, and that Reconfiguring a Lot is only for the purposes of a park or permanent plantation.

PO20 of the Flood Hazard Overlay Code outlines that proposed development must ensure that infrastructure (excluding a road and stormwater drainage infrastructure) is located outside of the High or Medium Flood Hazard area unless it is to function during and after all flood hazard events up to and including the Defined Flood Event.

Generally, the management of overland flows is to be addressed through the provision of an underground drainage network, together with the formation of engineered channels and earthworks to convey stormwater flows through the site to the South East Watercourse. The works incorporate a road crossing, a naturally designed and vegetated low flow channel (in place of an eroded gully) and stormwater quality treatment devices. Where earthworks are required within High or Medium Flood Hazard areas, these works are required to service the development and to provide appropriate flood immunity for roads and allotments.

There are two instances presented on **Figure 3.13** where, despite flood risks being managed and mitigated through the development, the above PO18 criteria is not met by the proposal of lots within the Medium Flood Hazard area. This is discussed below in more detail.

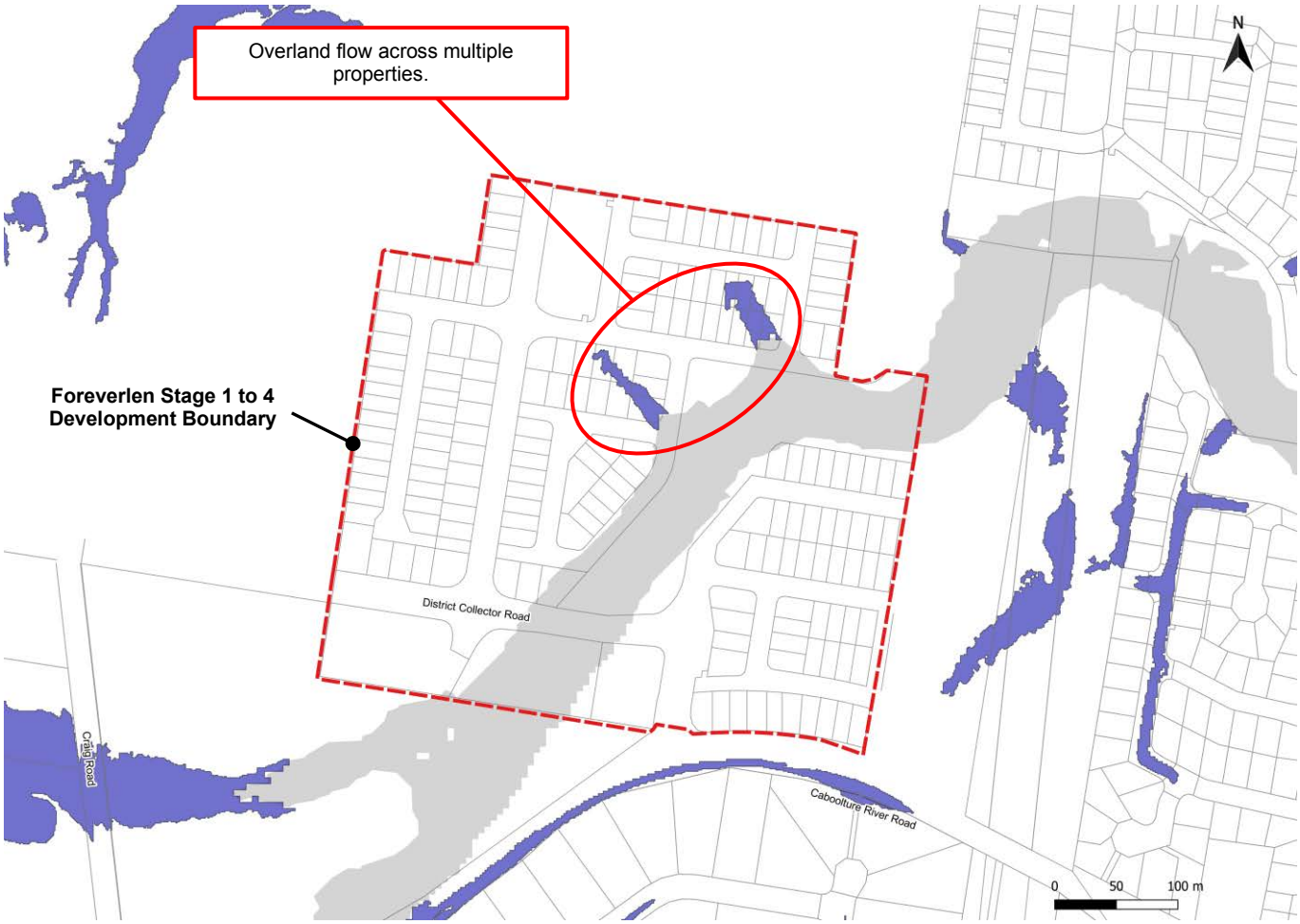


Figure 3.14: Overland Flow Overlay Mapping (Source: MBRC)

Location 1: the encroachment of this lot is justified due to the creation of mapped linear active transport along an esplanade road which requires a 1% AEP flood level immunity for safety and efficiency. Additionally, the Building Acceleration Fund (BAF) trunk sewer connection to Dobson Lane is identified as needing to be constructed along road reserve to service the broader NDP1 area. Unitywater require their asset to be constructed on a standard alignment with unimpeded access along the entire length of this sewer to maintain the asset over the design life of the asset. The unimpeded access is required to be 1% AEP immune.

Similarly, one stormwater quality device is required to be formed in this location to treat runoff from the proposed development and will require earthworks and shaping to enable it to be established. The establishment of stormwater infrastructure, active transport infrastructure and trunk sewer within the High or Medium Flood Hazard mapping is consistent with PO20 and supported under the MBRC *Planning Scheme Policy for Flood hazard, Coastal hazard and Overland flow*. The natural continuation of development footprint with esplanade road (not lots) is also consistent with PO20. Furthermore, the conclusions of this SWMP and the *NDP1 SWMP* both demonstrate the requirements of PO21 can be achieved.

Location 2: the encroachment of this lot is justified due to the IDC (trunk road infrastructure) crossing the South East Watercourse and hence changing the hydraulic regime of this watercourse. Similarly, the earthworks associated with the construction of the IDC and the formation of the water course crossing (culvert crossing) has resulted in much of the immediate area being filled. The development of the IDC road within the High or Medium Flood Hazard mapping is consistent with PO20 and supported under the MBRC *Planning Scheme Policy for Flood hazard, Coastal hazard and Overland flow*. The natural continuation of development footprint with esplanade road (not lots) is also consistent with PO20. Furthermore, the conclusions of this SWMP and the *NDP1 SWMP* both demonstrate the requirements of PO21 can be achieved.

As demonstrated in each case above, the driving design criteria for the earthworks within High or Medium Flood Hazard is trunk infrastructure for stormwater or roads and as such contemplated within MBRC's *Planning Scheme Policy for Flood hazard, Coastal hazard and Overland flow*. The resultant minor encroachments of lots are because of the land form changes to deliver the trunk infrastructure and an engineered stormwater channel within the south-east stormwater course. These changes do not result in any adverse local drainage impacts, flooding and coastal impacts on other premises, public land, watercourses, roads or infrastructure, or impacts on natural riverine and coastal processes or flood warning times. This is outlined in conclusions of this SWMP and the *NDP1 SWMP*.

Furthermore, Calibre have identified the following benefits to MBRC resulting from the proposed works within the Flood Hazard area to formalise the South East Watercourse channel and detention basin into a hydraulically efficient channel design which incorporates a naturally designed and vegetated low flow channel;

- The potential for propagating further scour and erosion of an already eroded gully is significantly reduced, thus reducing the maintenance burden on MBRC for waterway stability management and embankment works.
- The extent of 0.1% AEP flood velocity greater than 1.5 m/s, and flood hazard greater than Category H3, has been reduced by approximately 50% and 15% respectively, as presented on the flood plans provided in **Appendix D** and reproduced in **Figure 3.15** and **Figure 3.16** below for reference. These reductions will subsequently reduce the likelihood and consequence (i.e. risk) of severe flood damage to areas that would otherwise be public land, watercourses, roads or infrastructure owned and maintained by MBRC.
- The Building Acceleration Fund (BAF) trunk sewer connection to Dobson Lane is identified as needing to be constructed along this active transport alignment to service the broader NDP1. The proposed trunk sewer alignment has been optimised. If the alignment of the road was to follow the current Medium Flood Hazard mapping boundary, the sewer alignment would require longer pipe lengths and additional junction pits, resulting in a greater cost and maintenance burden.
- The three abovementioned areas within the Medium Flood Hazard area (where lots are proposed) are suitable for the creation of allotments. The land-use for these areas would otherwise be designated as Park or Green Network as permitted by the Code, which would require a greater maintenance burden to both MBRC and Unitywater.
- The stormwater solution proposed as part of this development has been considered from a whole of life cost perspective with the co-location of assets and implementation of end of line water quality proposed. This solution is the most efficient, easily maintainable, and least burden on Council.

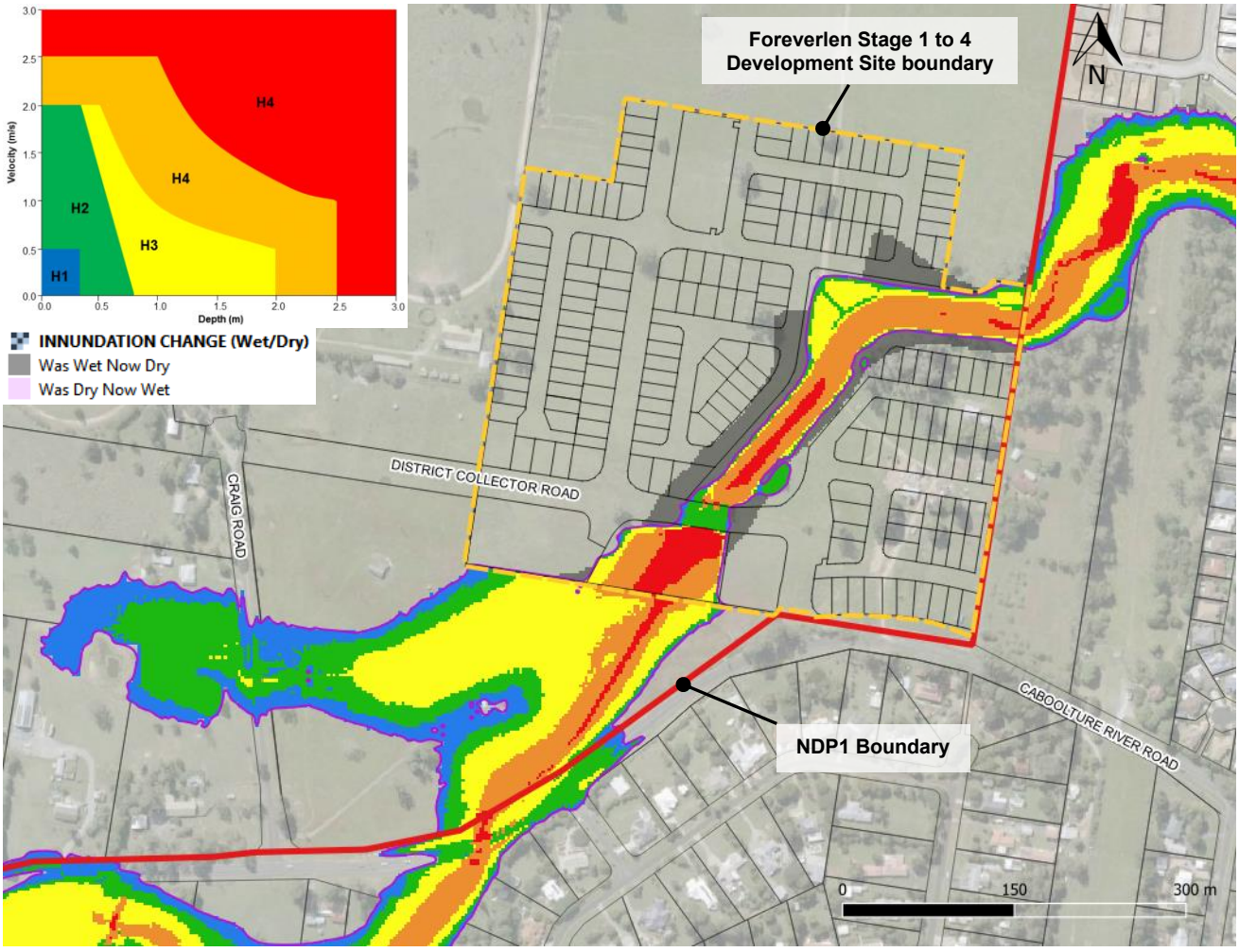


Figure 3.15: 0.1% AEP Developed Scenario Flood Hazard Modelling

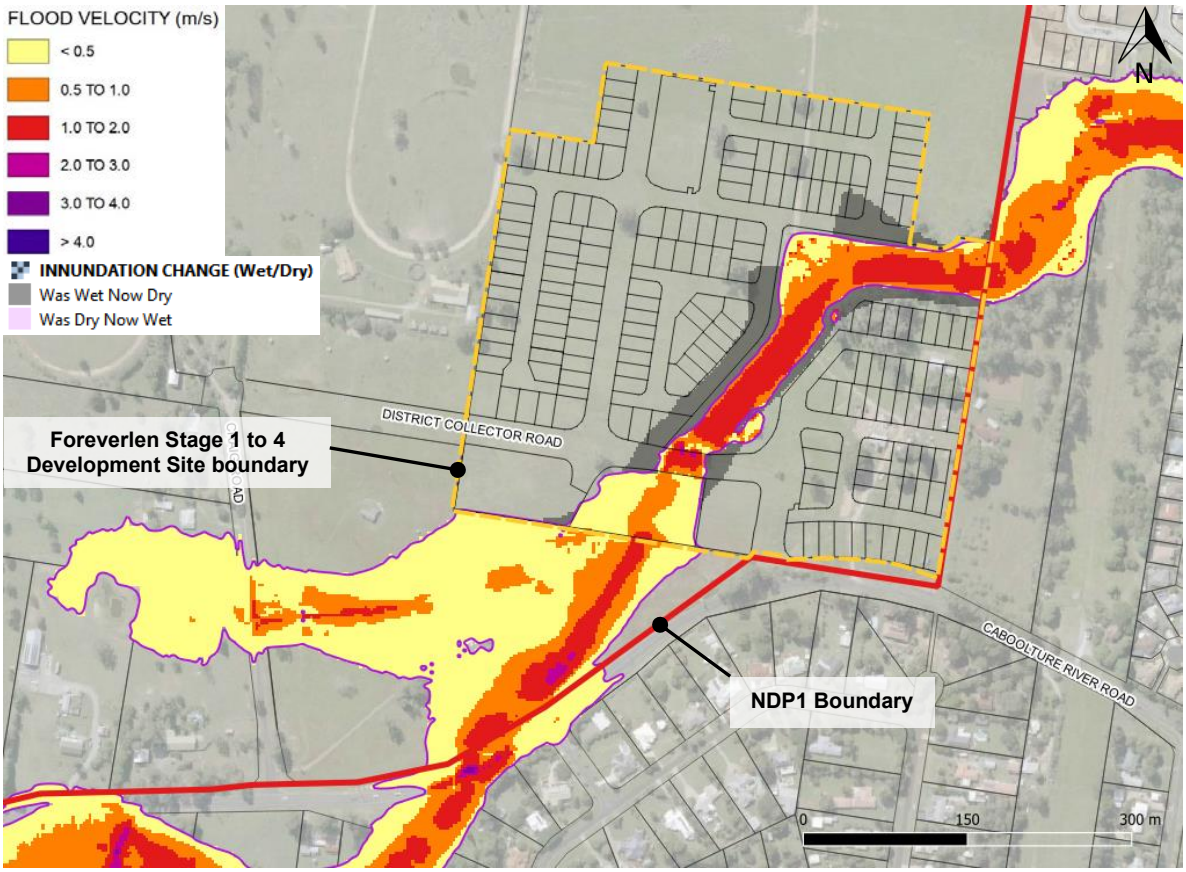


Figure 3.16: 0.1% AEP Developed Scenario Flood Velocity Modelling

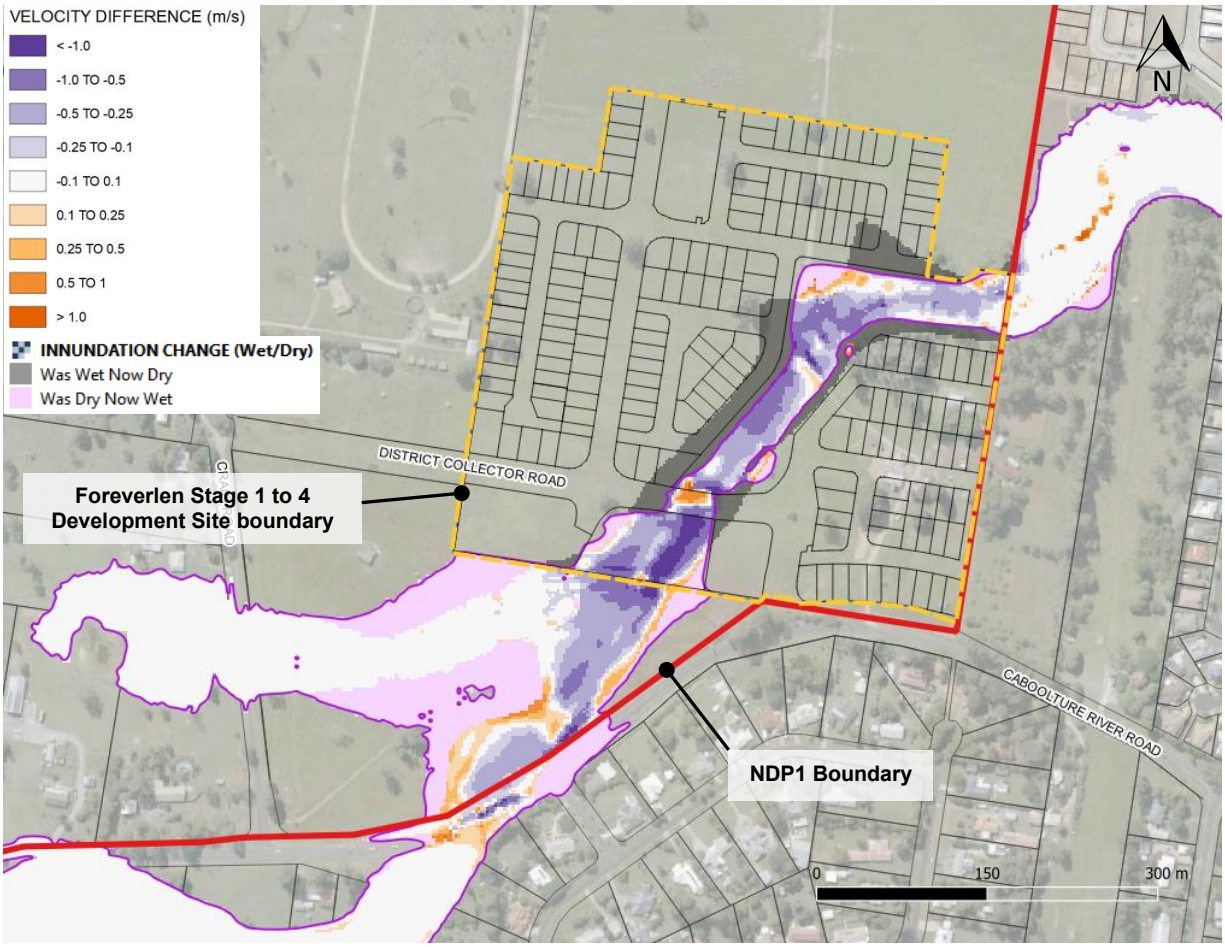


Figure 3.17: 0.1% AEP Developed Scenario Flood Velocity Difference

3.4 Summary of Flood Impacts

In summary, the results of the analysis undertaken confirms the flood management strategies proposed are effective in mitigating adverse or actionable changes in flood conditions adjacent to or downstream of the proposed development, both within the Caboolture River and the South East Watercourse.

The flood results are consistent with those presented in the *NDP1 SWMP*, and the proposed development will not propagate adverse flood impacts outside of the NDP1 boundary. After investigating the 50% blockage sensitivity scenario at the IDC crossing, it is recommended that appropriate signage and flood depth markers be installed along the IDC road prior to the road sag at the culvert crossing in both directions of traffic to alert road users and pedestrians of the flood risk discussed in **Section 3.2.6**.

Further analysis is to be undertaken as part of future investigation to refine the configuration of elements that are part of the South East Watercourse strategy and set development levels to incorporate appropriate freeboard. These investigations are to be undertaken as part of future development application works.

4 Stormwater Quality Management

The Stormwater Quality Management Strategy of this report will investigate Stages 1 to 4 of the proposed Foreverlen development within Phase 1 of NDP1 Caboolture West. If runoff from the catchments located within the previously indicated development stages are left unmitigated, it has the potential to increase stormwater pollutants that are exported from the site. This investigation analyses the impact of the development on stormwater quality generated from the study area and devises a stormwater quality treatment strategy to intercept and capture pollutants to meet the MBRC non-worsening requirements and WQO's required under the *SPP (2017)*.

4.1 Pollutants of Concern & Water Quality Objectives

Typical key pollutants expected to be generated during the operational (post-construction) phase of a development are listed as follows, with those presented in capitals being the key pollutants to be targeted for treatment:

- SEDIMENT
- Oxygen demanding substances (possibly present)
- NUTRIENTS (N & P)
- Pathogens / Faecal coliforms
- Hydrocarbons
- HEAVY METALS (associated with fine sediments)
- Surfactants
- Organochlorines & organophosphates
- Thermal pollution
- pH altering substances

Moreton Bay Regional Council Post Construction Phase water quality objectives (Table 10.2.1, *MBRC Planning Scheme*) identifies the development is required to achieve the greater pollutant removal of:

- State Planning Policy (2017) WQO reduction targets with respect to unmitigated development conditions; or
- Non-worsening (no increase in pollutant loads) of TSS, TP, TN and Gross Pollutants with respect to the existing land uses.

4.1.1 State Planning Policy

The load reduction WQOs presented in **Table 4-1** have been adopted from the Moreton Bay Regional Council *Planning Scheme* (2017) and are the required WQOs for urban developments within South East Queensland under Appendix 2 of the *State Planning Policy* (SPP 2017).

Table 4-1: Load Reduction Water Quality Objectives for South East Queensland

Pollutant	Total Suspended Solids (kg/yr)	Total Phosphorus (kg/yr)	Total Nitrogen (kg/yr)	Gross Pollutants (kg/yr)
Load Reduction Target	80%	60%	45%	90%

4.1.2 Non-Worsening Requirements

The proposed development is located within an Emerging Community zone, which governs the discharge criteria for the site. In the Emerging Community zone development is to achieve the greater removal of;

- The load reduction WQOs presented in **Table 4-1** above; and
- No worsening (no increase in pollutant loads (in kilograms per year) of existing land uses of Total Suspended Solids, Total Phosphorus, Total Nitrogen and Gross Pollutants).

The existing land use adopted for this portion of the NDP1 study area was a rural (agricultural) land use. The extent of these uses was adopted from the Superseded Caboolture Shire Planning Scheme, extract indicated in **Figure 4.1** below, and verified with current aerial imagery. Existing fraction impervious values were measured from aerial imagery.

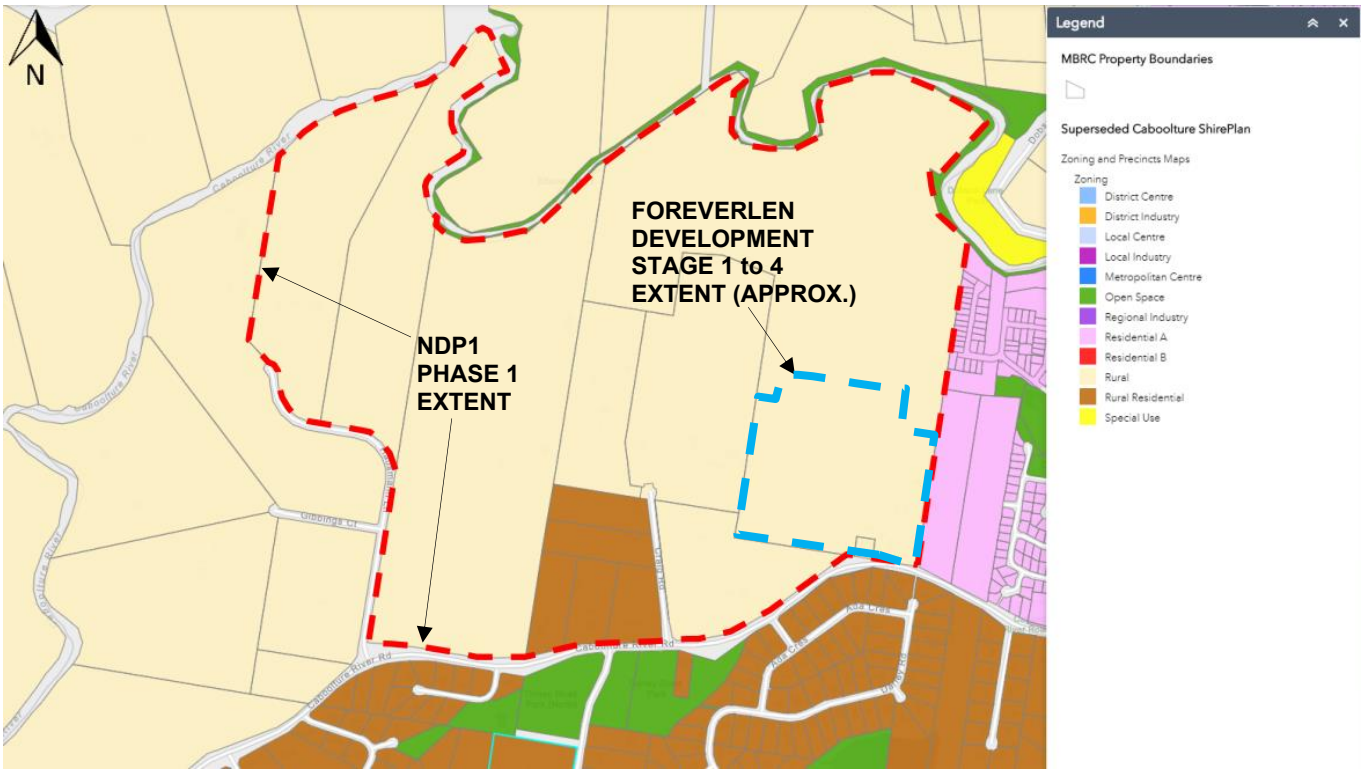


Figure 4.1: Existing Land Use Layout & Stage 1 to 4 Development Extent

4.2 Stormwater Quality Management Strategy

The Foreverlen Stage 1 to 4 development discharges runoff both to the Caboolture River and to the South East Watercourse which also ultimately contributes to the Caboolture River. As the development has the potential to increase pollutant loads in stormwater runoff entering downstream waterways, suitable Stormwater Quality Improvement Devices (SQIDs) such as bioretention devices are proposed to treat the generated site runoff.

Five (5) end-of-line bioretention devices are proposed to treat runoff generated from Catchments F1, F2, G1, G2 and H1 within the proposed Stages 1 to 4 of the Foreverlen development. Details of the proposed catchments and bioretention devices are presented on the *Stormwater Quality Management and Catchment Plan* (Calibre Drawing **16-002108-SK3003**) in **Appendix A** and described below.

- Bioretention Basins F1 & F2 – these bioretention basins are located along the northern edge of the South East Watercourse within the Foreverlen Stage 1 to 4 development extent. Runoff from Catchments F1 and F2 is treated by the respective bioretention basins, inclusive of runoff from future development Stage 5 in Catchment F1. For the purposes of adequately sizing Basin F1 to meet WQOs for the ultimate configuration of the treatment train, Catchment F1 has been assumed to be fully developed (i.e. inclusive of future Stage 5 development runoff) as indicated on Calibre Drawing **16-002108-SK3003** in **Appendix A**.
- Bioretention Basins G1 & G2 - Each bioretention basin is located along the southern edge of the South East Watercourse. Runoff from Catchments G1 and G2 is treated by their respective basins.
- Temporary Bioretention Swale H1 – A small portion at the north west corner of the Foreverlen Stage 1 to 4 development is proposed to be treated by a temporary end-of-line bioretention swale incorporated into the temporary catchment diversion drain discussed in **Section 3.1.3**. The Temporary Bioretention Swale H1 will be in place until the future stages of the Foreverlen development to the north of Stage 2 are developed. The alignment of this bioretention swale will be further developed during detailed design and provisions for a temporary drainage easement will be made. The temporary swale will be owned and maintained by Foreverlen (not MBRC) until they are decommissioned and replaced with permanent drainage infrastructure.

It is noted that, except for the proposed temporary works, the above-mentioned stormwater quality management strategy is generally consistent with the *NDP1 SWMP* report.

Bioretention systems utilise a sandy loam soil-based media to filter runoff. Sediment and suspended solids are trapped within the vegetation as well as on the surface of the filter media. Micro-organisms and vegetation remove dissolved nutrients (nitrogen and phosphorus) through biological uptake processes. Subsoil drainage provided below the filter media allows for the treated runoff to discharge from the bioretention systems. A typical bioretention system is shown in **Figure 4.2** below.

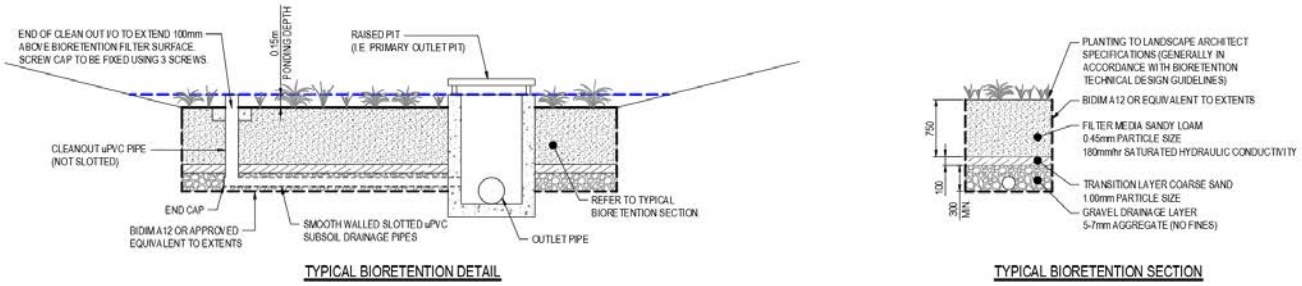


Figure 4.2: Typical Bioretention System Configuration

4.3 MUSIC Modelling Methodology

Stormwater quality modelling has been undertaken using MUSIC Version 6.3.0, developed by the Cooperative Research Centre for Catchment Hydrology (CRCCH). MUSIC enables the user to conceptualise the transfer of pollutants through a stormwater drainage system and provides an aid in quantifying the effectiveness of the proposed stormwater quality treatment train. MUSIC only provides quantitative modelling for Total Suspended Solids (TSS), Total Phosphorous (TP), Total Nitrogen (TN) and Gross Pollutants (GP).

Moreton Bay Regional Council Post Construction Phase water quality objectives (Table 10.2.1 of the MBRC Planning Scheme document *SC10 Stormwater Management Design Objectives*) identifies the development is required to achieve the greater pollutant removal of:

- Load reduction Water Quality Objectives (WQO's) as per the *State Planning Policy* (SPP, 2017); or
- Non-worsening (no increase in pollutant loads) of TSS, TP, TN and gross pollutants with respect to the existing land uses.

To devise a suitable stormwater quality treatment strategy to meet these objectives, both an existing and developed MUSIC model were created. The model files are indicated below.

- Existing Model: 16-002108-20220602_EX_Foreverlen_Stage 1-4.sqz
- Developed Model: 16-002108-20220602_DEV_Foreverlen_Stage 1-4.sqz

The MUSIC models were setup generally in accordance with Healthy Land and Water *MUSIC Modelling Guidelines* (2018). The subsequent sections discuss the model configurations adopted for the analysis, with the MUSIC model layout and modelling details presented in **Appendix C**.

4.3.1 Meteorological Data

Six-minute pluviographic data was sourced from the Bureau of Meteorology (BOM) for Dayboro Post Office (Station No. 40063) as this was the nearest rainfall station to the site with a range of rainfall data. In accordance with *Table A1.1* from the *MUSIC Modelling Guidelines* (2018) the 10-year period from 1st January 1980 to 31st December 1989 was adopted for the rainfall duration. The six-minute time step mean annual rainfall for this period is 1,256mm.

4.3.2 Source Nodes

Source nodes are sub-catchments that are defined for MUSIC modelling purposes. For the existing scenario, the lumped catchment approach has been used in accordance with the *MUSIC Modelling Guidelines* (2018) which lumps the catchment into one node type. A single sub-catchment was created and assigned as 'Rural Residential' for the applied rainfall-runoff parameters and as an 'agricultural' source node for the pollutant export parameters. Rainfall-runoff and Pollutant export parameters for the existing scenario area were taken from Table 3.7 and Table 3.9, respectively, of the *MUSIC Modelling Guidelines* (2018). The MUSIC catchment source node details for the existing scenario are indicated in **Table 4-2** below.

Table 4-2: MUSIC Source Node Areas – Existing Scenario

Sub-Catchment	Node Type	Total Area (Ha)	Fraction Impervious Percentage (%)
F, G & H Existing	Agricultural	14.371	2

To ensure consistency with Calibre's previous stormwater quality modelling undertaken for the ultimate Phase 1 NDP1development, source nodes were adopted (where applicable) in accordance with the *Stormwater Management Plan – Caboolture West NDP1 (Report No. **16-001367-SWMP-01C*** dated 19/11/2021). Source node areas were amended in accordance with the revised layout and earthworks strategy associated with Foreverlen Stages 1 to 4.

Source node sub-catchment areas for the developed scenario were determined using the split catchment approach in accordance with the *MUSIC Modelling Guidelines* (2018). The source node areas were amended in accordance with the revised layout (Calibre Drawing **16-002108-SK3003** in **Appendix A**) and earthworks strategy associated with the Foreverlen Stages 1 to 4. **Table 4-3** below shows the source node details input into the MUSIC Model.

Table 4-3: MUSIC Source Node Areas – Developed Scenario - Stages 1 to 4 of NDP1-Phase 1

Sub-Catchments	Total Area (Ha)	Road (Res)	Roof (Res)	Ground (Res)	Park/Open Space
F1	4.612	1.538	1.005	1.587	0.482
F2	5.582	2.168	1.125	2.260	0.028
G1	3.389	1.398	0.675	1.316	-
G2	0.343	0.000	0.135	0.208	-
H1	0.246	0.098	0.045	0.071	0.032
FD-Road	0.199	0.199	-	-	0.000

For Foreverlen Stages 1 to 4 of the Phase 1 NDP1 Caboolture West development, the fraction impervious values for the source nodes were adopted in accordance with Table 3.5 of the *MUSIC Modelling Guidelines* (2018). Fraction Impervious percentages applied for the different land type areas are presented in **Table 4-4** below.

Table 4-4: Fraction Impervious Percentage

Source Node	Road	Roof	Ground	Park
Fraction Impervious Percentage (%)	*70*	*100*	*30*	*20*

The pollutant export parameters were configured in accordance with Table 3.9 of the *MUSIC Modelling Guidelines* (2018). A roof area of 150m^2 was applied to all residential lots in line with Table 3.4 of the *MUSIC Modelling Guidelines* (2018). The road reserve areas were measured using the updated lot layout from Calibre drawing **16-002108-SK3003** in **Appendix A**. Refer to **Appendix C** for detailed MUSIC modelling details.

Stochastic generation estimation and serial autocorrelation set to zero has also been adopted.

4.3.3 Drainage Links

No routing was adopted for drainage links within MUSIC model. This assumes flows and associated pollutants from all parts of the catchment arrive at the treatment nodes at the same time. This is conservative as it means that MUSIC may overestimate the overflow volumes.

4.3.4 Treatment Nodes

As the development has the potential to increase pollutant loads in stormwater runoff entering downstream waterways, a treatment train of suitable SQIDs are proposed to mitigate this increase. The stormwater quality treatment strategy outlined in **Section 4.2** identified bioretention devices as the adopted SQIDs.

Bioretention treatment nodes were used to model the proposed bioretention systems. Default K and C* values were adopted for these treatment nodes. These treatment nodes were set up generally in accordance with the *MUSIC Modelling Guidelines* (2018) and Healthy Waterways *Bioretention Technical Design Guidelines* (2014). Refer to **Table 4-5** below for the bioretention treatment node parameters modelled.

Table 4-5: Bioretention Device Input Node Details

Parameter	F1 Bio basin	F2 Bio basin	G1 Bio basin	G2 Bio basin	H1 Temporary Bio-swale
Surface Area (m^2)	641	670	423	79	40*
Filter Area (m^2)	547	570	350	52	40
Extended Detention Depth (m)	0.3	0.3	0.3	0.3	0.0
Filter Depth (m)	0.6	0.6	0.6	0.6	0.6
Filter Media Type	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
Saturated Hydraulic Conductivity of Filter Media (mm/hr)	200	200	200	200	200
TN Content of Filter Media (mg/kg)	400	400	400	400	400
Orthophosphate Content of Filter Media (mg/kg)	30	30	30	30	30
Overflow Weir (m)	48.5	56.0	35.0	5.0	4.0

* - Bioretention Swale 2m wide x 20m long.

4.4 MUSIC Modelling Results

The MUSIC modelling results indicate the proposed stormwater quality treatment strategy achieves a greater pollutant removal than that specified in the SPP objectives and non-worsening objectives. The developed model results were analysed against the required WQOs and against the existing model results to determine if there was an increase in pollutant loads.

4.4.1 SPP Load Reduction Results

Table 4-6 below presents the MUSIC model pollutant load reduction results achieved by the proposed stormwater quality treatment strategy for the Foreverlen Stage 1 to 4 development.

Table 4-6: Developed MUSIC Modelling Results

Pollutant	TSS	TP	TN	Gross Pollutants
Source Load (kg/yr)	27,500	50.5	245	2,760.0
Residual Load (kg/yr)	4,790	12.2	117	43.9
Pollutant Reduction Percentage	82.6%	75.9%	52.4%	98.4%
WQO's Required	80%	60%	45%	90%
WQO Achieved	**Yes**	**Yes**	**Yes**	**Yes**

The results indicate that the proposed stormwater quality management strategy is effective in reducing the export of pollutants from the development to achieve the load reduction WQO's.

4.4.2 Non-Worsening Results

Table 4-7 below presents the MUSIC model pollutant load export results for both the existing and developed scenarios.

Table 4-7: Non-Worsening Pollutant Load Results

Pollutant	TSS	TP	TN	Gross Pollutants
Existing Pollutant Export (kg/yr)	24,000	24.5	146	93.3
Developed Pollutant Export (kg/yr)	4,790	12.2	117	43.9
Meets Non-worsening Requirement?	**Yes**	**Yes**	**Yes**	**Yes**

The results indicate that pollutant loads exported from the development will be lower than existing conditions for TSS, TP, TN and Gross Pollutants. On this basis the proposed stormwater quality management strategy is appropriate.

5 Conclusion

Calibre Professional Services has prepared this Stormwater Management Plan in support of their development application for Reconfiguring a Lot to develop Stages 1 to 4 of the Foreverlen development within Phase 1 of the Neighbourhood Development Plan 1 of Caboolture West.

This report has identified stormwater and flood management strategies required to service the proposed development, and documents results of analysis undertaken that demonstrate that the strategies are consistent with the *NDP1 SWMP* and will be appropriate.

To summarise:

- Peak flow mitigation (i.e. detention) is not required prior to discharge to the Caboolture River of runoff generated from Stages 1 to 4 of the Foreverlen development as no change to peak flow or maximum flood conditions along the Caboolture River system is expected to occur for all standard storm events up to and including the 1% AEP.
- The interim detention basin configuration associated with the Foreverlen Stage 1 to 4 works provides sufficient upstream flow attenuation, which allows stormwater runoff from the Foreverlen Stage 1 to 4 development areas to discharge to the South East Watercourse downstream of the on-line detention basin.
- Hydrological and hydraulic analysis confirms the flood management strategies proposed are effective in mitigating adverse or actionable changes in flood conditions adjacent to or downstream of the proposed development, both within the Caboolture River and the South East Watercourse.
- The results of the flood investigation and analysis for Stages 1 to 4 of the Foreverlen development support an update to the MBRC Flood Hazard Overlay mapping within the South East Watercourse.
- MUSIC modelling has been undertaken for the proposed stormwater quality management strategy which involves end-of-line bioretention basins and one temporary bioretention swale to reduce the export of pollutants in runoff from the proposed development.
- MUSIC modelling results indicate standard State Planning Policy load reduction and Non-Worsening water quality objectives will be achieved by the proposed SQIDs.

The above outcomes demonstrate that adequate solutions for managing stormwater and flooding associated with the development will be provided, and that the proposed drainage strategy works.

6 Recommendations

It is recommended that the strategies proposed in this Stormwater Management Plan are approved as part of the RAL Development Application. In addition, the following is also recommended as part of future detailed design:

- Appropriate signage and flood depth markers along the IDC road prior to the road sag at the culvert crossing in both directions of traffic is recommended to alert road users and pedestrians of the flood risk discussed in **Section 3.2.6**.
- The flood investigation is to be updated to account for detailed designs and / or as-constructed information for preceding development and / or works upstream and downstream.
- The flood investigation is to be updated to include comparisons of site flood levels to design floor and other development levels to confirm flood immunity requirements are achieved.
- MUSIC modelling is to be updated to account for potential changes to the stormwater quality management strategy arising from detailed design.

7 References

- Caboolture Shire Council (2014), *Caboolture Shire Plan*.
- Calibre Professional Services (2021), Stormwater Management Plan – Caboolture West NDP1;
- Department of Energy and Water Supply (2017), *Queensland Urban Drainage Manual*;
- Department of State Development, Infrastructure and Planning (2017), *State Planning Policy 2017*;
- Healthy Land & Water (2018), *MUSIC Modelling Guidelines*;
- Moreton Bay Regional Council (2014), Caboolture River Regional Flood Modelling Database (002c);
- Moreton Bay Regional Council (2015), *Integrated Design Planning Scheme Policy – Appendix C Stormwater Management*;
- Moreton Bay Regional Council (2015), *Planning Scheme Policy – Flood Hazard, Coastal Hazard and Overland Flow*;
- SKM (2012); *MBRC Regional Floodplain Database: Floodplain Parameterisation Report*;

8 Disclaimer

This report has been prepared on behalf of and for the exclusive use of Foreverlen Pty Ltd and is subject to and issued in accordance with the agreement between Calibre Professional Services Pty Ltd.

Our investigation and analysis have been specifically catered for the particular requirements of Foreverlen Pty Ltd and may not be applicable beyond this scope. For this reason, any other third parties are not authorised to utilise this report without further input and advice from Calibre Professional Services Pty Ltd.

Calibre Professional Services Pty Ltd accepts no liability or responsibility whatsoever for the report in respect of any use of or reliance upon this report by any third party.

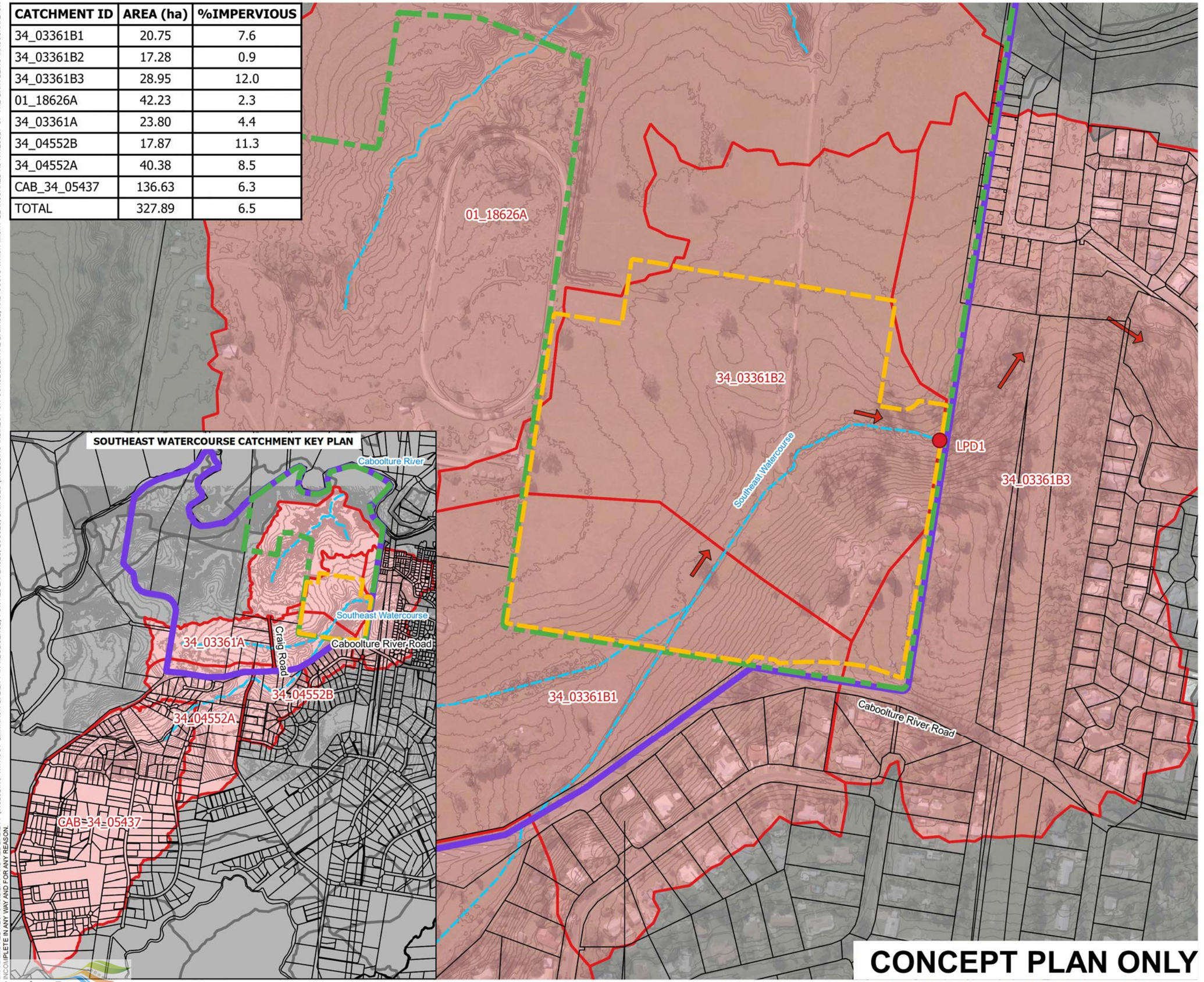
The investigation and analysis have relied on information provided by others. We accept no responsibility for accuracy of material supplied by others. The accuracy of the investigation, analysis and report is dependent upon the accuracy of this information.

STORMWATER MANAGEMENT PLAN – CABOOLTURE WEST NDP1 – FOREVERLEN STAGES 1 TO 4

Appendix A Concept Drawings

FOREVERLEN PTY LTD

CATCHMENT ID	AREA (ha)	%IMPERVIOUS
34_03361B1	20.75	7.6
34_03361B2	17.28	0.9
34_03361B3	28.95	12.0
01_18626A	42.23	2.3
34_03361A	23.80	4.4
34_04552B	17.87	11.3
34_04552A	40.38	8.5
CAB_34_05437	136.63	6.3
TOTAL	327.89	6.5



CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- FOREVERLEN PROPERTY BOUNDARY

EXISTING CATCHMENTS

- SUB-CATCHMENT (SITE)
- SUB-CATCHMENT (OTHER)
- FLOW DIRECTION ARROW
- EXISTING CHANNEL INVERT
- LAWFUL POINT OF DISCHARGE
- CADASTRE
- EXISTING CONTOURS (0.5m)

NOTES:
1. THIS DRAWING IS TO BE INTERPRETED IN CONJUNCTION WITH CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. CATCHMENT BOUNDARIES ADOPTED AS PER THE NDP1 MASTERPLAN REPORT. CATCHMENT PARAMETERISATION ADOPTED AS PER THE WBNM HYDROLOGICAL MODEL.

0 60 120 180 m
1:4,000 (A3)

PROJECT:
CABOOLTURE WEST SWMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
STORMWATER QUANTITY CATCHMENT PLAN EXISTING SCENARIO

DRAWING NO: **16-002108-SK3001**

ISSUE: **B**

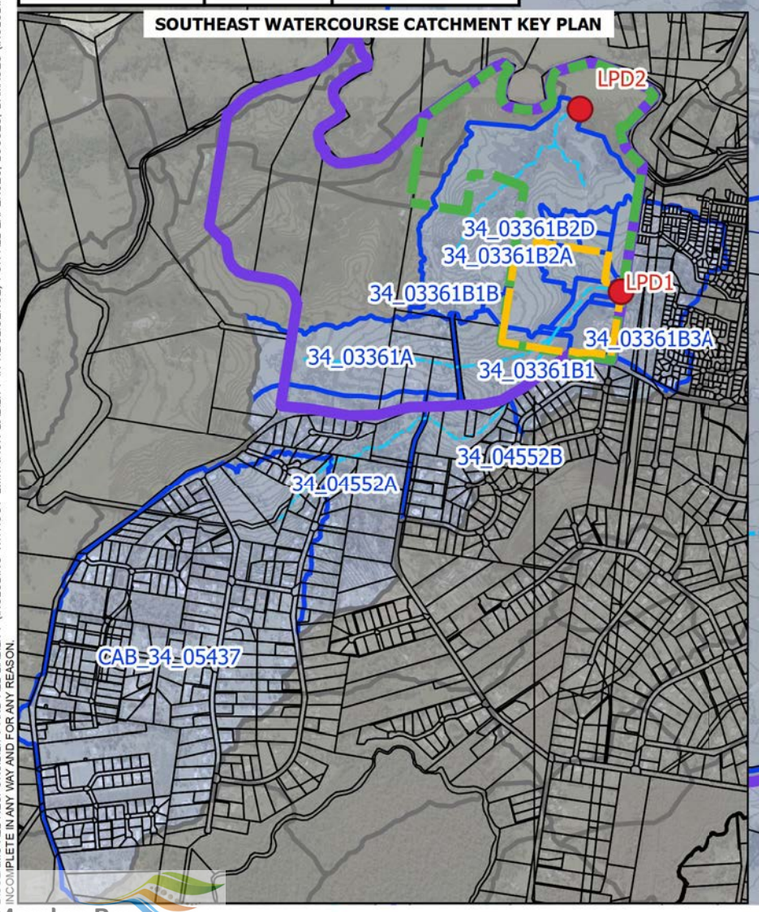
ISS	BY	CHK	DATE	DETAILS
A	JC	DY	06.06.22	RAL DA
B	NE	DY	18.11.22	RAL DA
C				
D				
E				

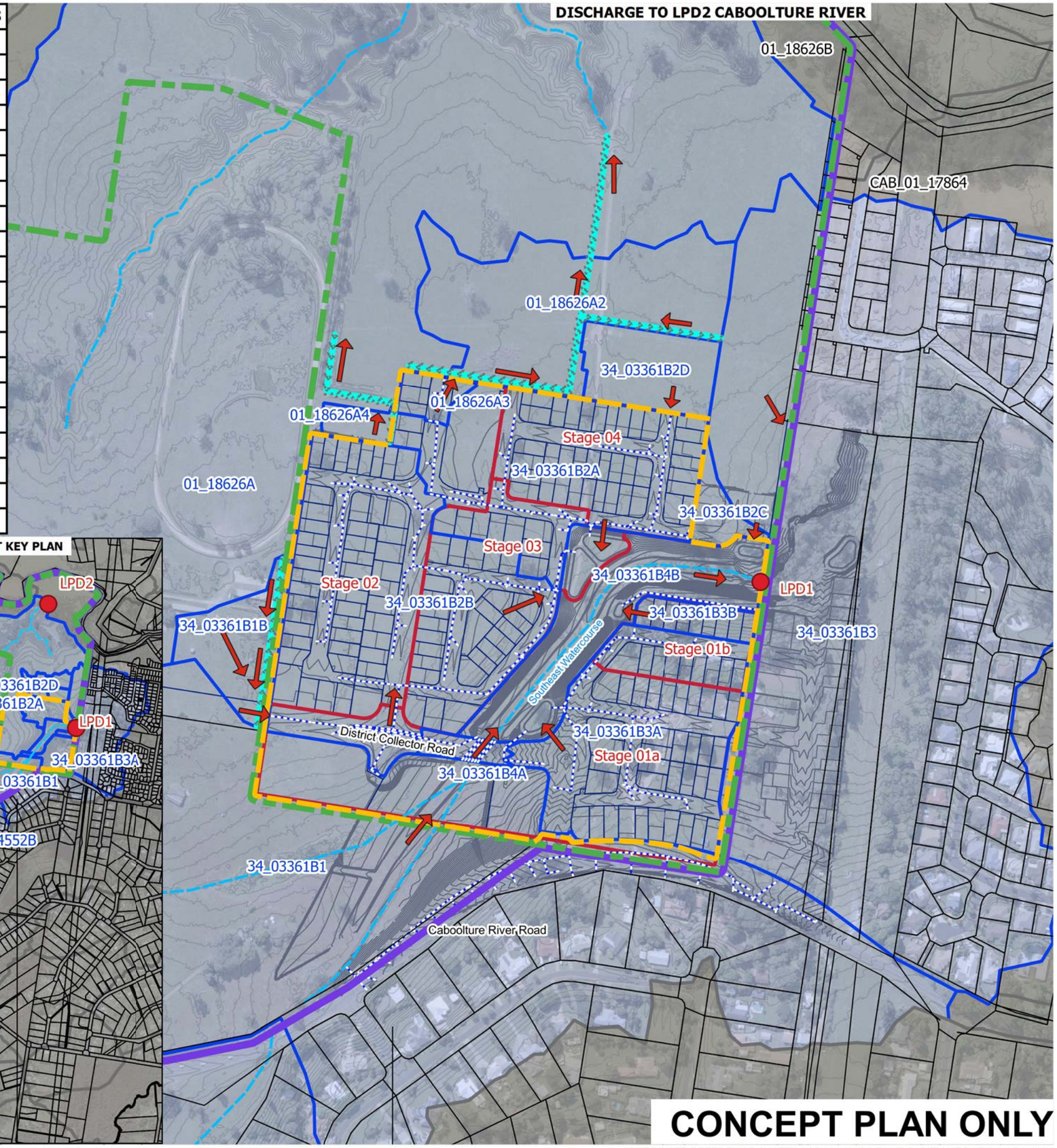
Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023

CATCHMENT ID	AREA (ha)	%IMPERVIOUS
01_18626A	42.071	2.3
34_03361B1	21.088	15.2
34_03361B1B	0.947	6.2
34_03361B3	24.830	18.6
34_03361B2B	5.582	59.6
34_03361B4A	0.199	69.8
34_03361B3A	3.389	60.5
34_03361B3B	0.343	57.4
34_03361B4B	2.217	0.0
01_18626A2	3.168	0.0
01_18626A3	0.246	58.3
34_03361B2C	0.300	0.0
01_18626A4	0.220	0.0
34_03361B2A	3.655	57.8
34_03361B2D	0.957	0.0
34_03361A	23.836	4.4
34_04552A	40.336	8.4
34_04552B	17.811	11.7
CAB_34_05437	136.630	6.3
TOTAL	327.825	9.7





CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- FOREVERLEN PROPERTY BOUNDARY
- DEVELOPMENT LAYOUT (STAGES1-4)

DEVELOPED CATCHMENTS

- SUB-CATCHMENT (SITE)
- SUB-CATCHMENT (OTHER)
- PROPOSED STORMWATER NETWORK
- TEMPORARY DIVERSION DRAIN
- FLOW DIRECTION ARROW
- DEVELOPED CHANNEL INVERT
- LAWFUL POINT OF DISCHARGE
- CADASTRE
- DEVELOPED CONTOURS (0.25m)
- EXISTING CONTOURS (0.5m)

NOTES:
1. THIS DRAWING IS TO BE INTERPRETED IN CONJUNCTION WITH CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. CATCHMENT BOUNDARIES WERE ADOPTED AS PER THE NDP1 MASTERPLAN REPORT AND REFINED TO ACCOUNT FOR RECENT PRELIMINARY EARTHWORKS DESIGN. CATCHMENT PARAMETERISATION WAS ADOPTED AS PER THE WBNM HYDROLOGICAL MODEL.

0 60 120 180 m
1:4,000 (A3)
N

PROJECT:
CABOOLTURE WEST SWMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
STORMWATER QUANTITY CATCHMENT PLAN DEVELOPED SCENARIO

DRAWING NO: **16-002108-SK3002**
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	JC	DY	06.06.22	RAL DA
B	NE	DY	18.11.22	RAL DA
C				
D				
E				

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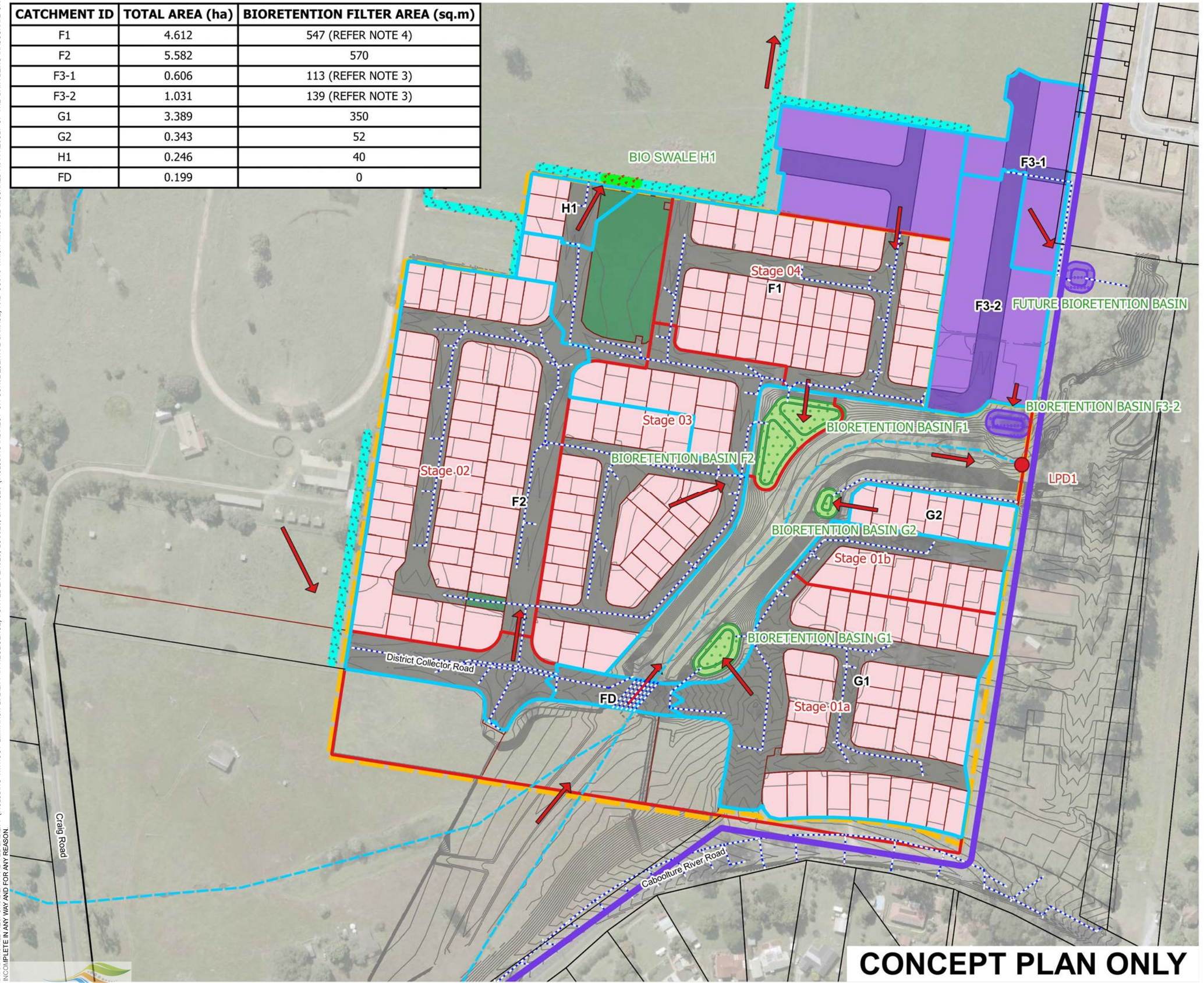
11/07/2023

CATCHMENT ID	TOTAL AREA (ha)	BIORETENTION FILTER AREA (sq.m)
F1	4.612	547 (REFER NOTE 4)
F2	5.582	570
F3-1	0.606	113 (REFER NOTE 3)
F3-2	1.031	139 (REFER NOTE 3)
G1	3.389	350
G2	0.343	52
H1	0.246	40
FD	0.199	0



CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- MUSIC CATCHMENTS
- STAGE 1-4 BOUNDARY
- DEVELOPMENT LAYOUT (STAGES1-4)
- FUTURE STAGES

MUSIC LAND USE

- ROOF & GROUND (Refer Note 2)
- PARK
- ROAD

MUSIC TREATMENT

- BIORETENTION BASIN
- PROPOSED STORMWATER NETWORK
- BIORETENTION SWALE
- TEMPORARY DIVERSION DRAIN
- FLOW DIRECTION ARROW
- DEVELOPED CHANNEL INVERT
- LAWFUL POINT OF DISCHARGE
- CADASTRE
- DEVELOPED CONTOURS (0.25m)

NOTES:
1. THIS DRAWING IS TO BE INTERPRETED IN CONJUNCTION WITH CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.
2.CATCHMENT PARAMETERISATION AS ADOPTED IN MUSIC. ASSUMED ROOF AREA 150sq.m/lot WITH BALANCE LOT AREA MODELLED AS GROUND.
3. BIO BASINS F3-1 & F3-2 HAVE BEEN EXCLUDED FROM MUSIC MODELLING AS THEY ARE NOT PROPOSED FOR STAGES 1-4.
4. FUTURE STAGE WORKS WITHIN CATCHMENT F1 HAVE BEEN INCLUDED IN MUSIC MODELLING FOR BASIN SIZING TO MEET WQOs.

0 40 80 120 m
1:2,500 (A3)
N

PROJECT:
CABOOLTURE WEST SWMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
STORMWATER QUALITY MANAGEMENT AND CATCHMENT PLAN

DRAWING NO: **16-002108-SK3003**
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	JC	DY	06.06.22	RAL DA
B	NE	DY	18.11.22	RAL DA
C				
D				
E				

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023

STORMWATER MANAGEMENT PLAN – CABOOLTURE WEST NDP1 – FOREVERLEN STAGES 1 TO 4

Appendix B Temporary Diversion Drain Calculations

FOREVERLEN PTY LTD

MANNING'S OVERLAND FLOW CALCULATION

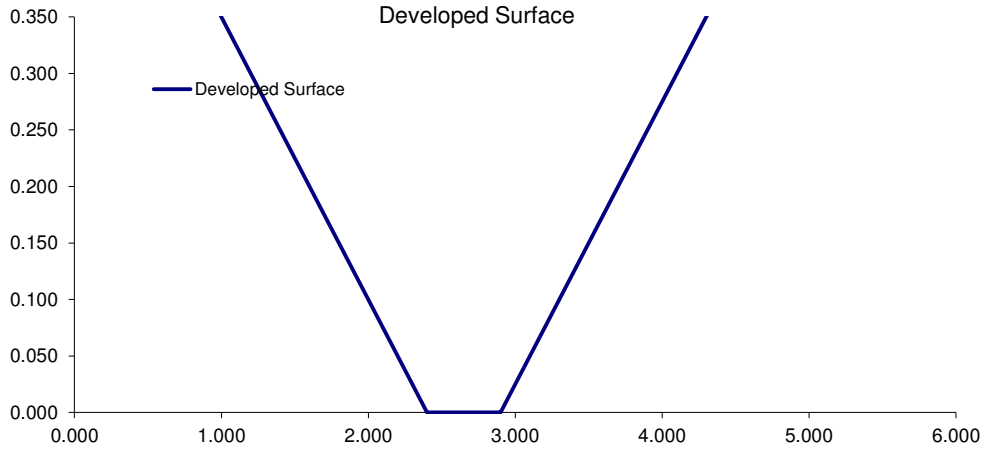
Filename: H:\16\002108 - NDP1 Lennium Land\6_Model\SF\SBSWMP_Stg1-5_Jan2022\WBNM\2022_Analysis\[DEVELOPED_CATCH_34_03361B1B_OPEN_DRAIN_DESIGN.xls]10% AEP Open Drain
Date: 11/02/2022
By: Blake Peacock
Manning's calculation as per Equation 4.2.3 of Australian Rainfall and Runoff (1987)

SECTION A

DEVELOPED CATCHME 01_18626A2

	Developed Surface			10% AEP			Top of Batter		
POINT	CH	Z	n	wA	wP	n x wA	wA	wP	n x wA
1	0.000	0.600	0.030						
2	2.400	0.000	0.030	0.16	1.16	0.00	0.00	0.04	0.00
3	2.900	0.000	0.030	0.14	0.50	0.00	0.00	0.50	0.00
4	5.300	0.600	0.030	0.16	1.16	0.00	0.00	0.04	0.00
5									
161									
				wA	wP	n x wA	wA	wP	n x wA
			TOTAL	0.459	2.824	0.014	0.005	0.576	0.000
	S (m/m)								
	0.005			R	n	Q	R	n	Q
				0.162	0.030	0.322	0.009	0.030	0.000
			Design Flow (m3/s)		0.322				
			WSL (mAHD)		0.28			0.0	
			Flow Calculated by Manning's Equation (m3/s)		**0.322**			**0.00**	
			Vel (m/s)		0.70			0.10	
			V.D Product (m2/s)		0.1977477				

Base (m)	0.5
Depth (m)	0.6
Side Slopes (1 in X)	4
Total Width	5.300



MANNING'S OVERLAND FLOW CALCULATION

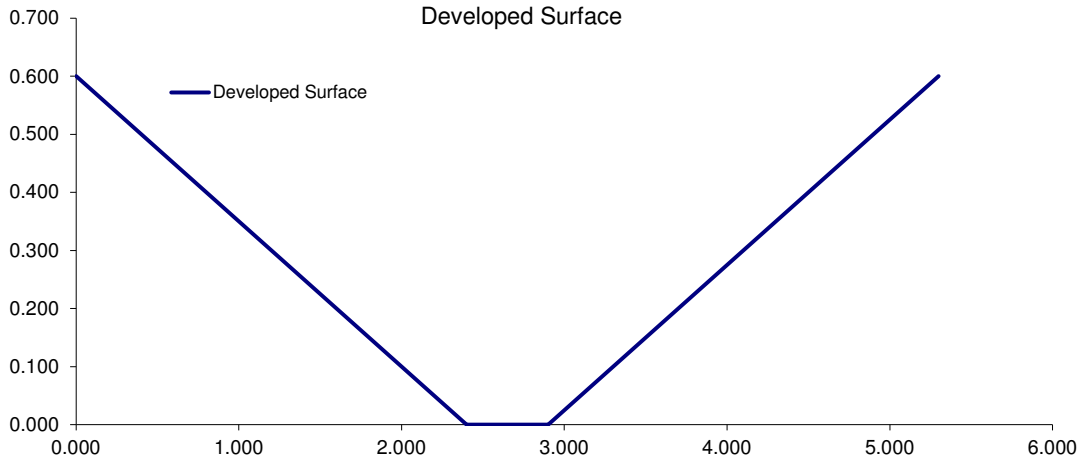
Filename: H:\16\002108 - NDP1 Lennium Land\6_Model\SF\SBSWMP_Stg1-5_Jan2022\WBNM\2022_Analysis\[DEVELOPED_CATCH_34_03361B1B_OPEN_DRAIN_DESIGN.xls]1% AEP Open Drain
Date: 11/02/2022
By: Blake Peacock
Manning's calculation as per Equation 4.2.3 of Australian Rainfall and Runoff (1987)

SECTION A

DEVELOPED CATCHMENT 34_03361B1B

	Developed Surface			1% AEP			Top of Batter		
POINT	CH	Z	n	wA	wP	n x wA	wA	wP	n x wA
1	0.000	0.600	0.030						
2	2.400	0.000	0.030	0.26	1.50	0.01	0.00	0.04	0.00
3	2.900	0.000	0.030	0.18	0.50	0.01	0.00	0.50	0.00
4	5.300	0.600	0.030	0.26	1.50	0.01	0.00	0.04	0.00
5									
161									
				wA	wP	n x wA	wA	wP	n x wA
			TOTAL	0.710	3.497	0.021	0.005	0.576	0.000
	S (m/m)								
	0.005			R	n	Q	R	n	Q
				0.203	0.030	0.578	0.009	0.030	0.000
			Design Flow (m3/s)		0.578				
			WSL (mAHD)		0.36			0.0	
			Flow Calculated by Manning's Equation (m3/s)		**0.578**			**0.00**	
			Vel (m/s)		0.81			0.10	
			V.D Product (m2/s)		0.2959767				

Base (m)	0.5
Depth (m)	0.6
Side Slopes (1 in X)	4
Total Width	5.300



MANNING'S OVERLAND FLOW CALCULATION

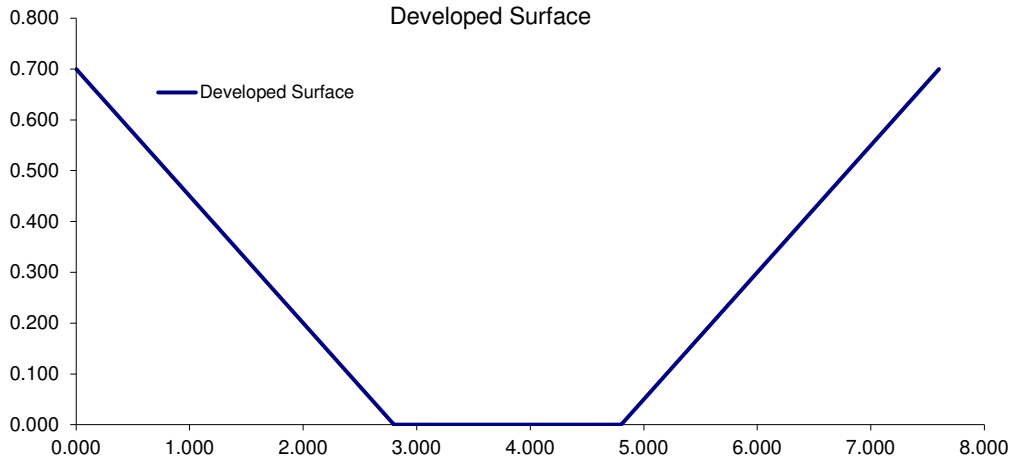
Filename: H:\16\002108 - NDP1 Lennium Land\6_Model\SF\SBSWMP_Stg1-5_Jan2022\WBNM\2022_Analysis\[DEVELOPED_CATCH_01_18626A2_OPEN_DRAIN_DESIGN.xls]1% AEP Open D
Date: 11/02/2022
By: Blake Peacock
Manning's calculation as per Equation 4.2.3 of Australian Rainfall and Runoff (1987)

SECTION A

DEVELOPED CATCHME 01_18626A2

	Developed Surface			1% AEP			Top of Batter		
POINT	CH	Z	n	wA	wP	n x wA	wA	wP	n x wA
1	0.000	0.700	0.030						
2	2.800	0.000	0.030	0.55	2.16	0.02	0.00	0.02	0.00
3	4.800	0.000	0.030	1.05	2.00	0.03	0.01	2.00	0.00
4	7.600	0.700	0.030	0.55	2.16	0.02	0.00	0.02	0.00
5									
161									
				wA	wP	n x wA	wA	wP	n x wA
			TOTAL	2.142	6.316	0.064	0.011	2.043	0.000
	S (m/m)								
	0.005			R	n	Q	R	n	Q
				0.339	0.030	2.456	0.005	0.030	0.001
			Design Flow (m3/s)		2.456				
			WSL (mAHD)		0.52			0.0	
			Flow Calculated by Manning's Equation (m3/s)		**2.456**			**0.00**	
			Vel (m/s)		1.15			0.07	
			V.D Product (m2/s)		0.5999398				

Base (m)	2
Depth (m)	0.7
Side Slopes (1 in X)	4
Total Width	7.600



MANNING'S OVERLAND FLOW CALCULATION

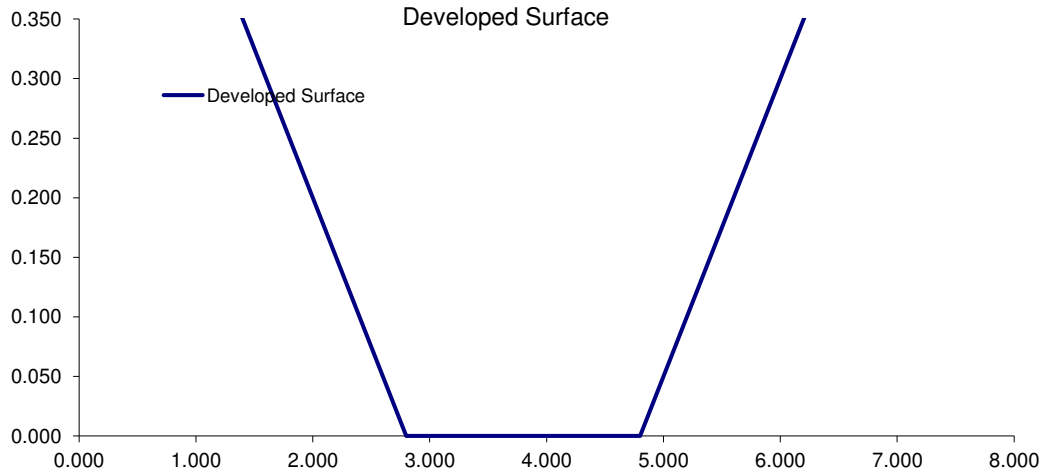
Filename: H:\16\002108 - NDP1 Lennium Land\6_Model\SF\SBSWMP_Stg1-5_Jan2022\WBNM\2022_Analysis\[DEVELOPED_CATCH_01_18626A2_OPEN_DRAIN_DESIGN.xls]10% AEP Open
Date: 11/02/2022
By: Blake Peacock
Manning's calculation as per Equation 4.2.3 of Australian Rainfall and Runoff (1987)

SECTION A

DEVELOPED CATCHME 01_18626A2

	Developed Surface			10% AEP			Top of Batter		
POINT	CH	Z	n	wA	wP	n x wA	wA	wP	n x wA
1	0.000	0.700	0.030						
2	2.800	0.000	0.030	0.32	1.65	0.01	0.00	0.02	0.00
3	4.800	0.000	0.030	0.80	2.00	0.02	0.01	2.00	0.00
4	7.600	0.700	0.030	0.32	1.65	0.01	0.00	0.02	0.00
5									
161									
				wA	wP	n x wA	wA	wP	n x wA
			TOTAL	1.444	5.305	0.043	0.011	2.043	0.000
	S (m/m)								
	0.005			R	n	Q	R	n	Q
				0.272	0.030	1.430	0.005	0.030	0.001
			Design Flow (m3/s)		1.430				
			WSL (mAHD)		0.40			0.0	
			Flow Calculated by Manning's Equation (m3/s)		**1.430**			**0.00**	
			Vel (m/s)		0.99			0.07	
			V.D Product (m2/s)		0.3967814				

Base (m)	2
Depth (m)	0.7
Side Slopes (1 in X)	4
Total Width	7.600



STORMWATER MANAGEMENT PLAN – CABOOLTURE WEST NDP1 – FOREVERLEN STAGES 1 TO 4

Appendix C MUSIC Modelling Details

FOREVERLEN PTY LTD

1. MUSIC NODES DETAILS

MUSIC Catchment	Total Area (ha)	Road (ha)	Roof (ha)	Ground (ha)	Park (ha)
F1	4.612	1.538	1.005	1.587	0.482
F2	5.582	2.168	1.125	2.260	0.028
G1	3.389	1.398	0.675	1.316	0.000
G2	0.343	0.000	0.135	0.208	0.000
H1	0.246	0.098	0.045	0.071	0.032
FD	0.199	0.199	N/A	N/A	N/A
TOTAL	**14.371**	**5.401**	**2.985**	**5.443**	**0.542**

Note: Roof area of each lot is based on 150m^2.

2. MUSIC TREATMENT NODES DETAILS

a. End-of-line Bioretention Basin

MUSIC Catchment	Filter Area (m^2)	Filter Depth (mm)	Saturated Hydraulic Conductivity (mm/hr)	TN Content of Filter Media (mg/kg)	Orthophosphate Content of Filter Media (mg/kg)
F1	547	600	200	400	30
F2	570	600	200	400	30
G1	350	600	200	400	30
G2	52	600	200	400	30
TOTAL	**1,519**	**N/A**	**N/A**	**N/A**	**N/A**

b. Bioretention Swale

MUSIC Catchment	Total Length (m)	Effective Length (m)	Filter Area (m^2)	Filter Depth (mm)	Bed Slope (%)	Base Width (m)	Top Width (m)	Vegetation Height (m)
H1	20	20	40	600	0.5	2.0	5.2	0.25
TOTAL	**20**	**20**	**40**	**NA**	**NA**	**NA**	**NA**	**NA**

3. MUSIC MODEL LAYOUT

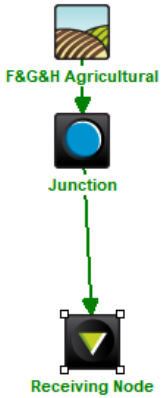
a. Existing Model

File:

16-002108-20220602_EX_Lennium_Stage 1-4.sqz

Location:

\\bnenas01\Projects\16\002108 - NDP1 Lennium Land\6_Model\SF\SWMP_Stg1-4_Oct2022\MUSIC\



Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	62.3	62.3	0
Total Suspended Solids (kg/yr)	24000	24000	0
Total Phosphorus (kg/yr)	24.5	24.5	0
Total Nitrogen (kg/yr)	146	146	0
Gross Pollutants (kg/yr)	93.3	93.3	0

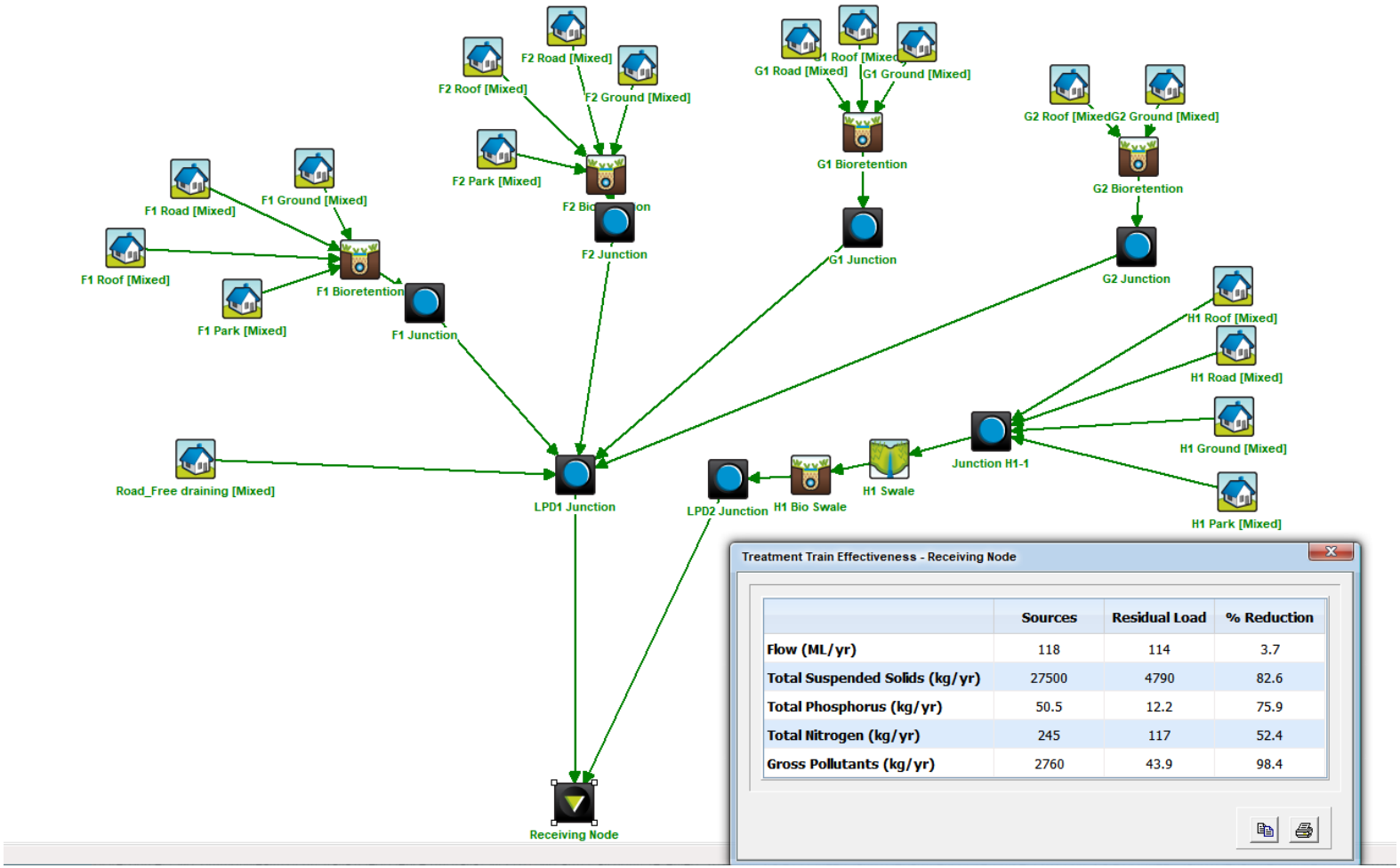
b. Developed Model

File:

16-002108-20221110_DEV_Lennium_Stage 1-4.sqz

Location:

\\bnenas01\Projects\16\002108 - NDP1 Lennium Land\6_Model\SF\SWMP_Stg1-4_Oct2022\MUSIC\

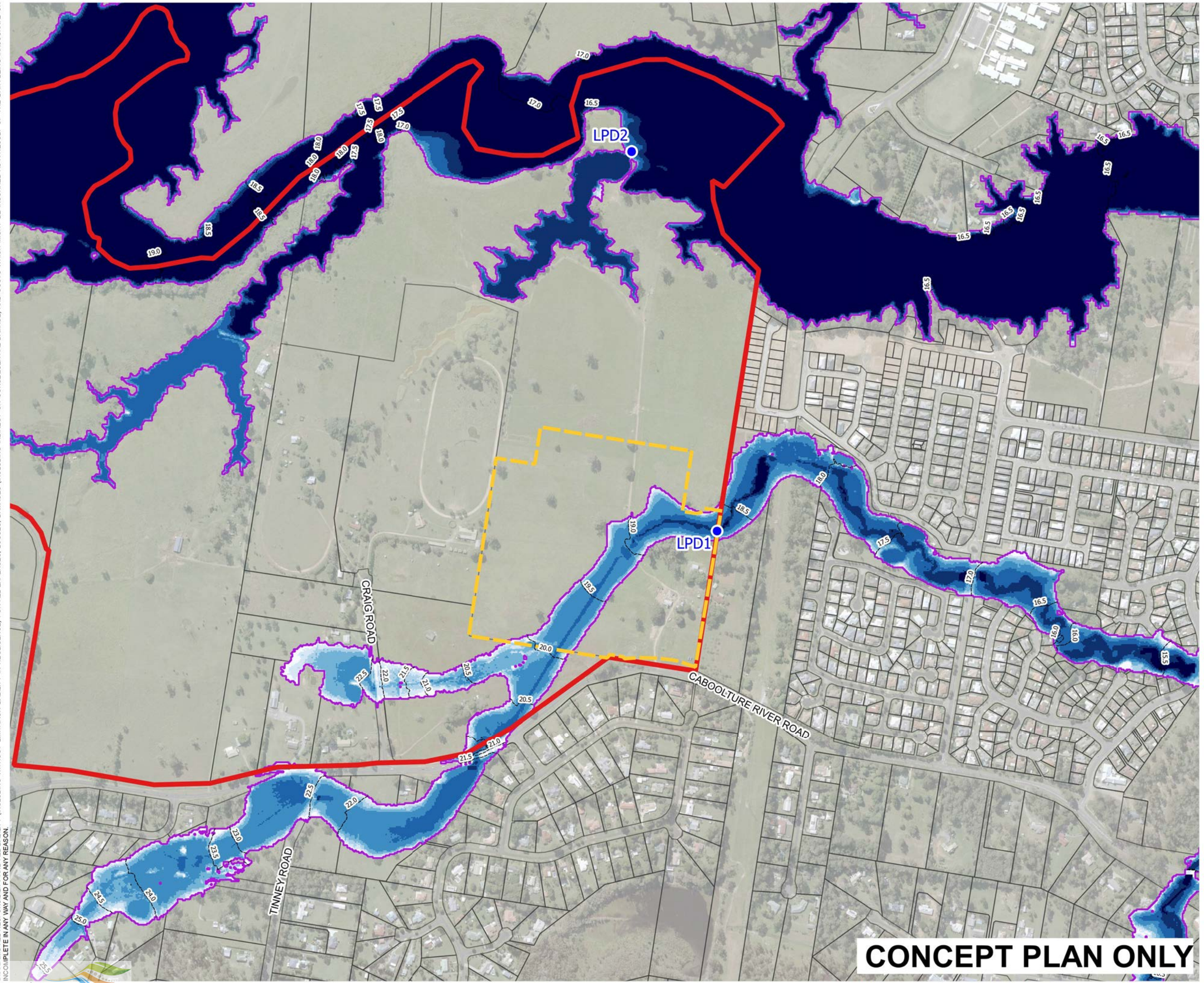


	Sources	Residual Load	% Reduction
Flow (ML/yr)	118	114	3.7
Total Suspended Solids (kg/yr)	27500	4790	82.6
Total Phosphorus (kg/yr)	50.5	12.2	75.9
Total Nitrogen (kg/yr)	245	117	52.4
Gross Pollutants (kg/yr)	2760	43.9	98.4

STORMWATER MANAGEMENT PLAN – CABOOLTURE WEST NDP1 – FOREVERLEN STAGES 1 TO 4

Appendix D Flood Plans

FOREVERLEN PTY LTD



calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

FLOOD DEPTH (m)

- < 0.1
- 0.1 TO 0.2
- 0.2 TO 0.3
- 0.3 TO 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- > 3.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
0.1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **16-002108-E-1000-A**

ISSUE: **B**

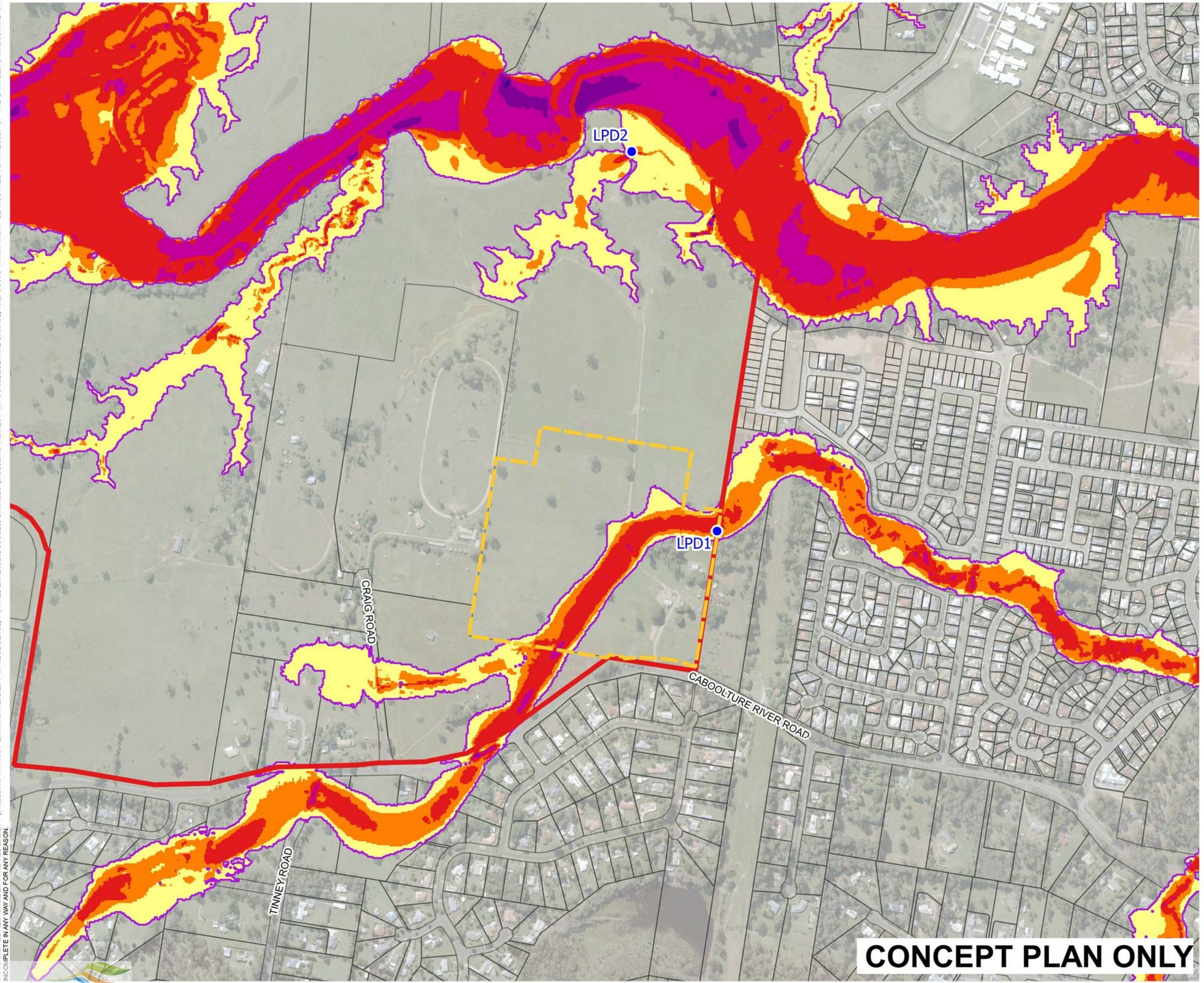
ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD VELOCITY (m/s)

- < 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- 3.0 TO 4.0
- > 4.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
0.1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **16-002108-E-1000-B**

ISSUE: **B**

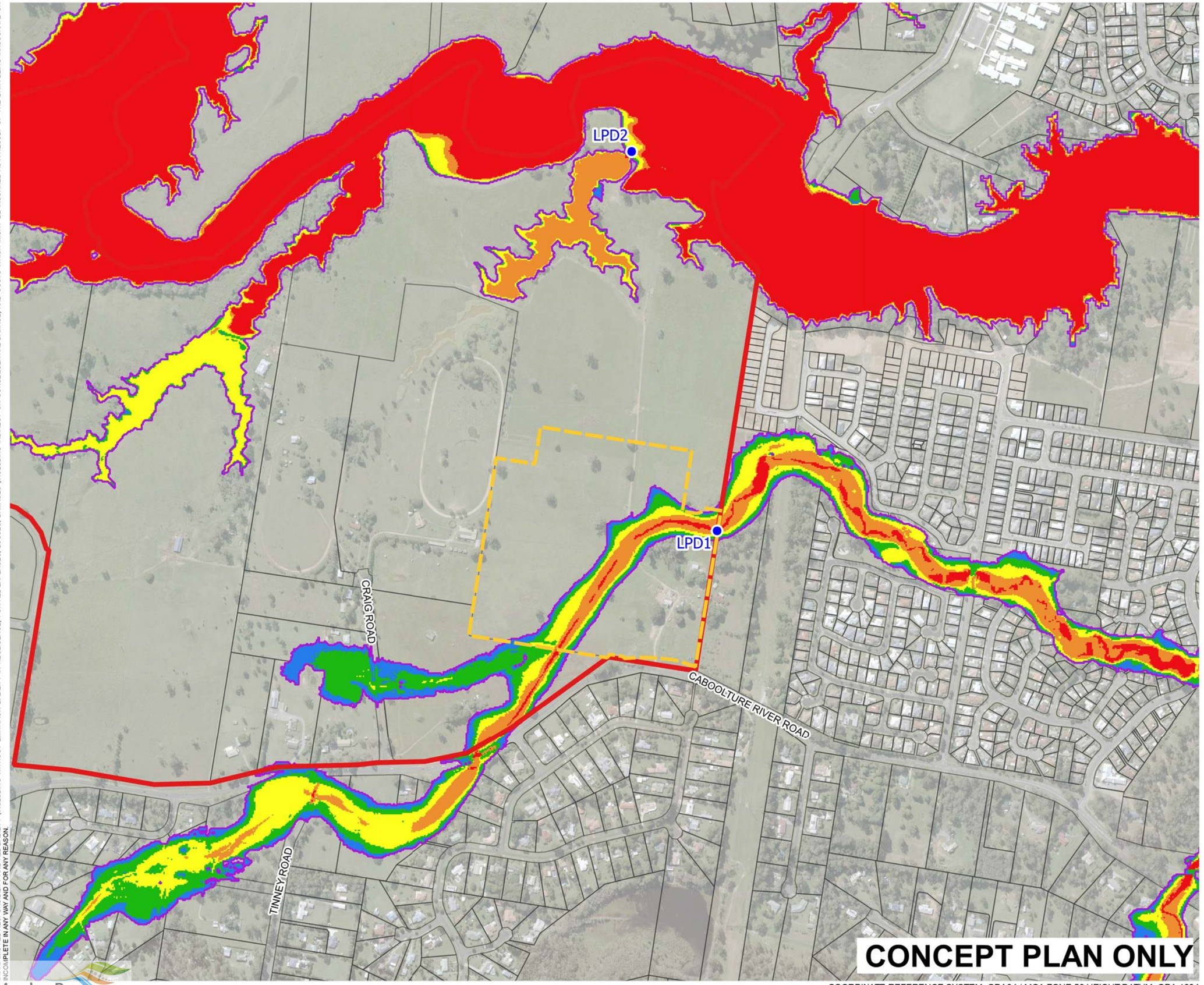
ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD HAZARD

- H1
- H2
- H3
- H4
- H5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
0.1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **16-002108-E-1000-D**

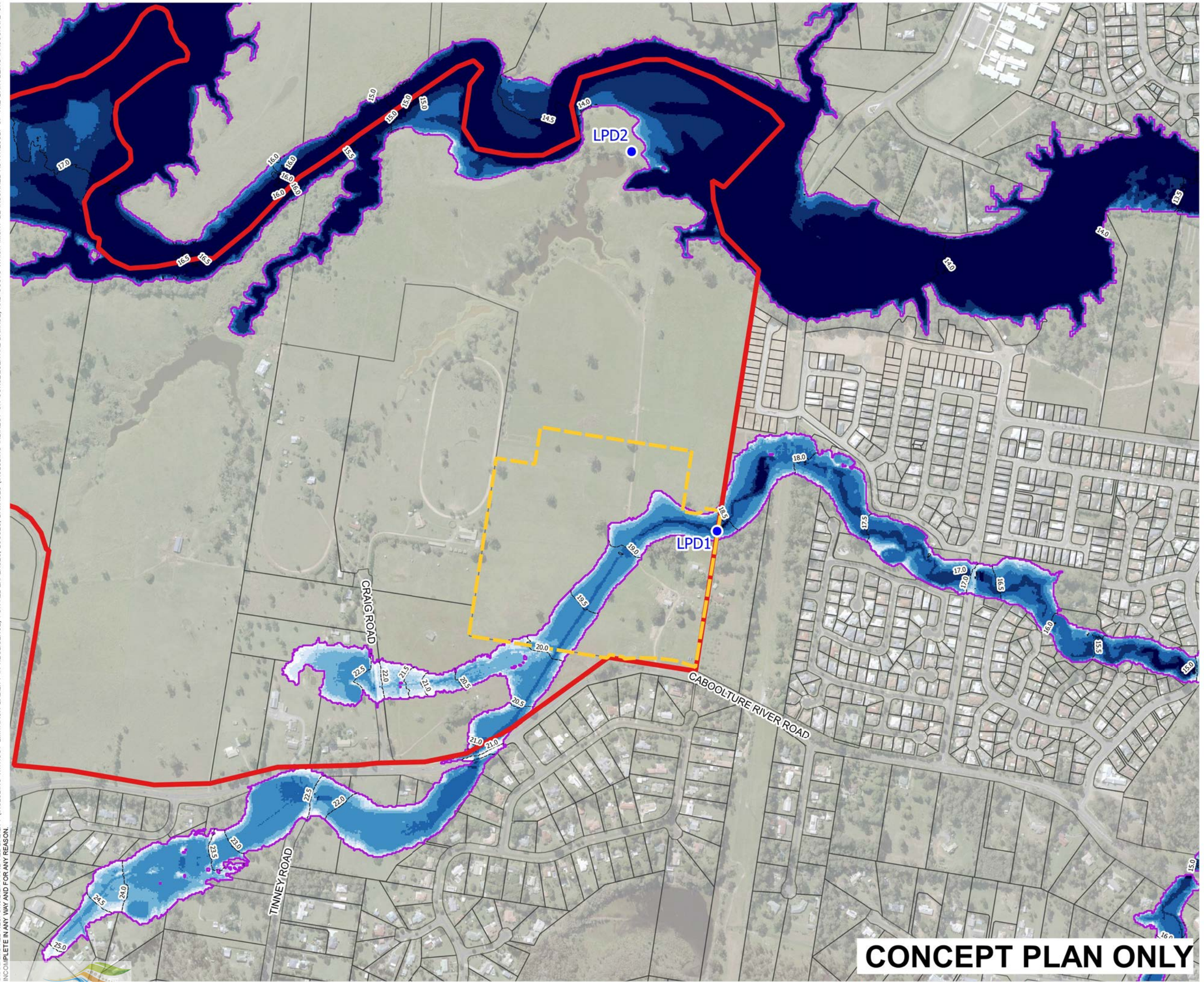
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

FLOOD DEPTH (m)

- < 0.1
- 0.1 TO 0.2
- 0.2 TO 0.3
- 0.3 TO 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- > 3.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **16-002108-E-100-A**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

Moreton Bay Regional Council

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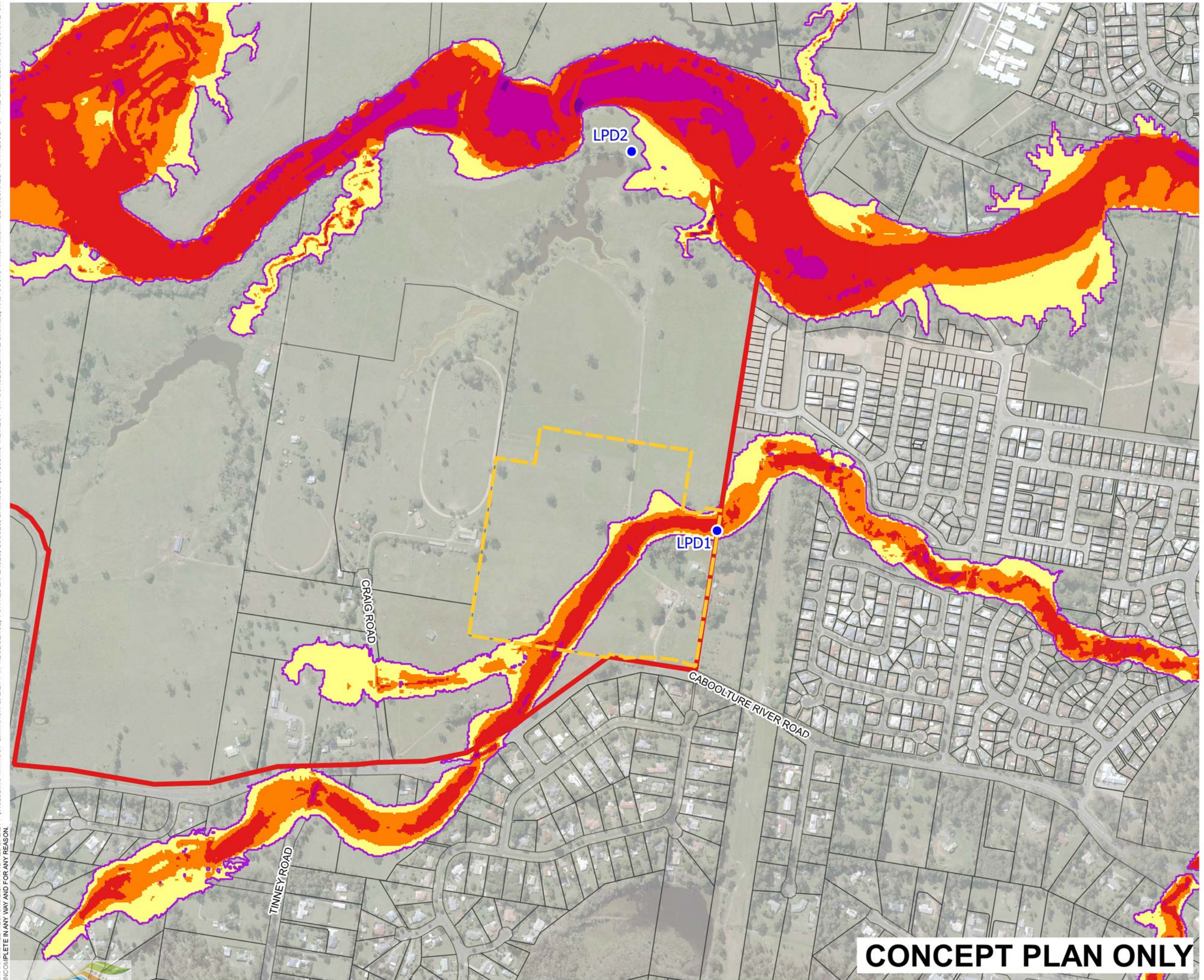
11/07/2023



CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD VELOCITY (m/s)

- < 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- 3.0 TO 4.0
- > 4.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **16-002108-E-100-B**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
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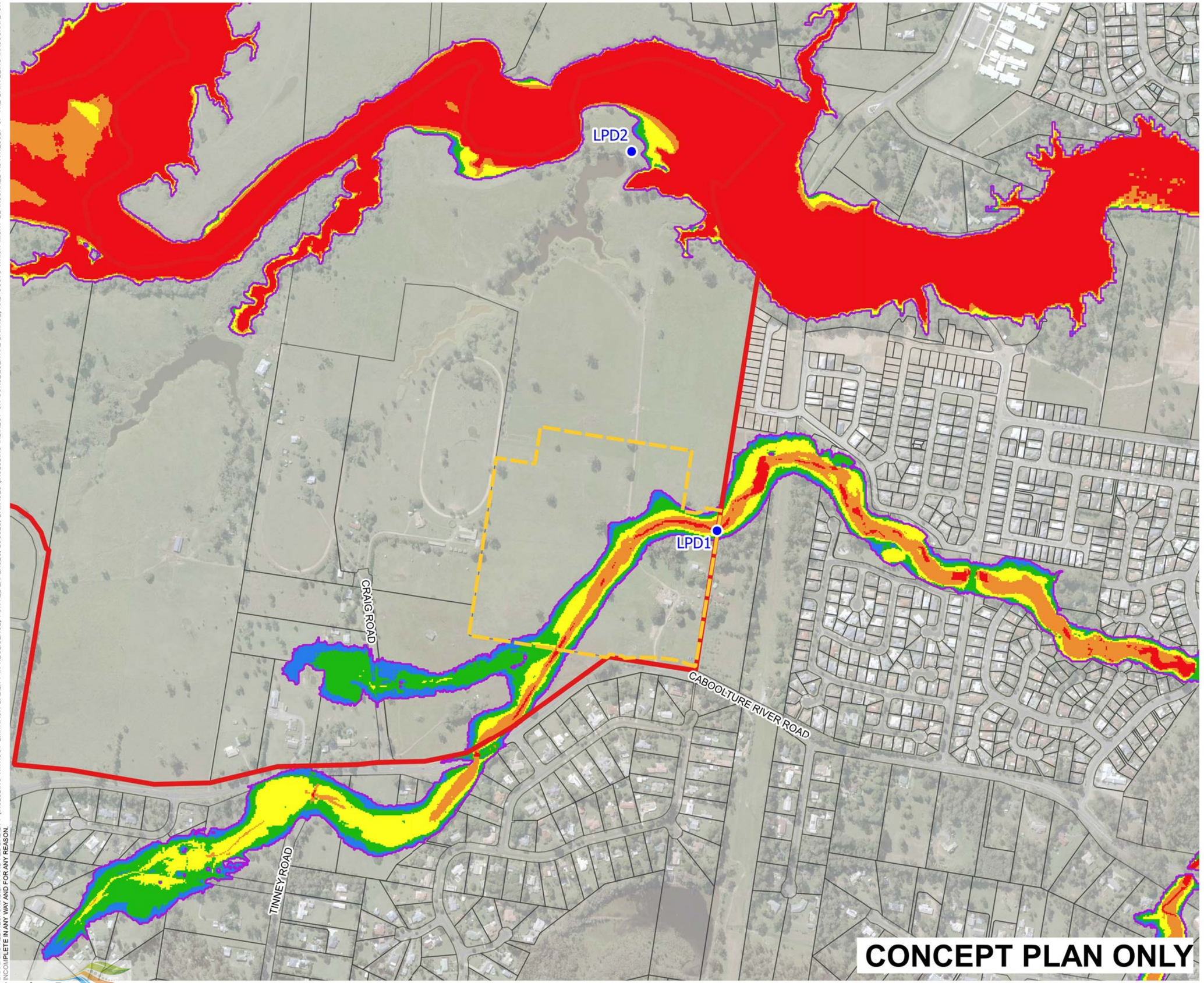
Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD HAZARD

- H1
- H2
- H3
- H4
- H5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **16-002108-E-100-D**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
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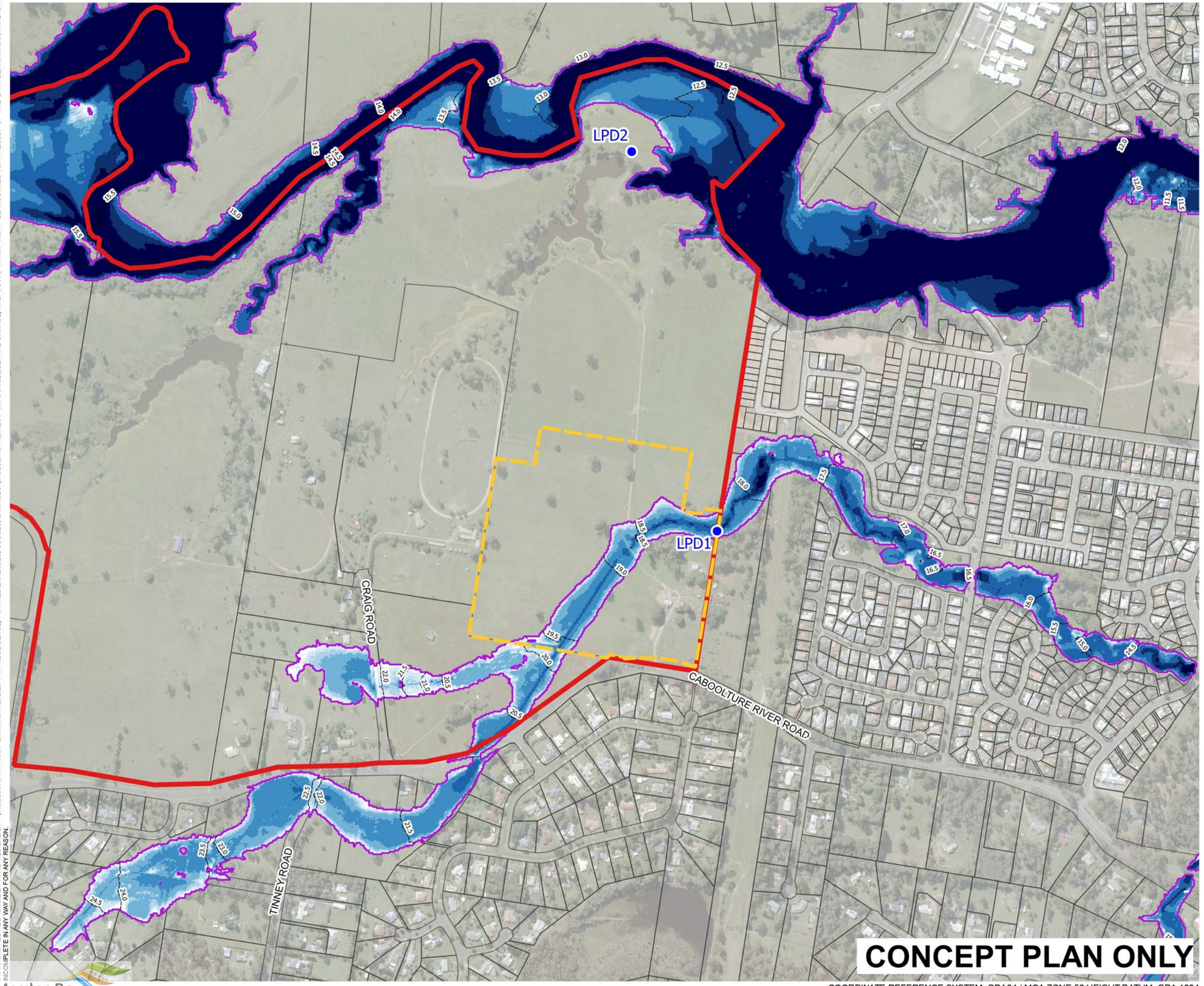
11/07/2023



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COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

FLOOD DEPTH (m)

- < 0.1
- 0.1 TO 0.2
- 0.2 TO 0.3
- 0.3 TO 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- > 3.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD DEPTH

DRAWING NO: **16-002108-E-020-A**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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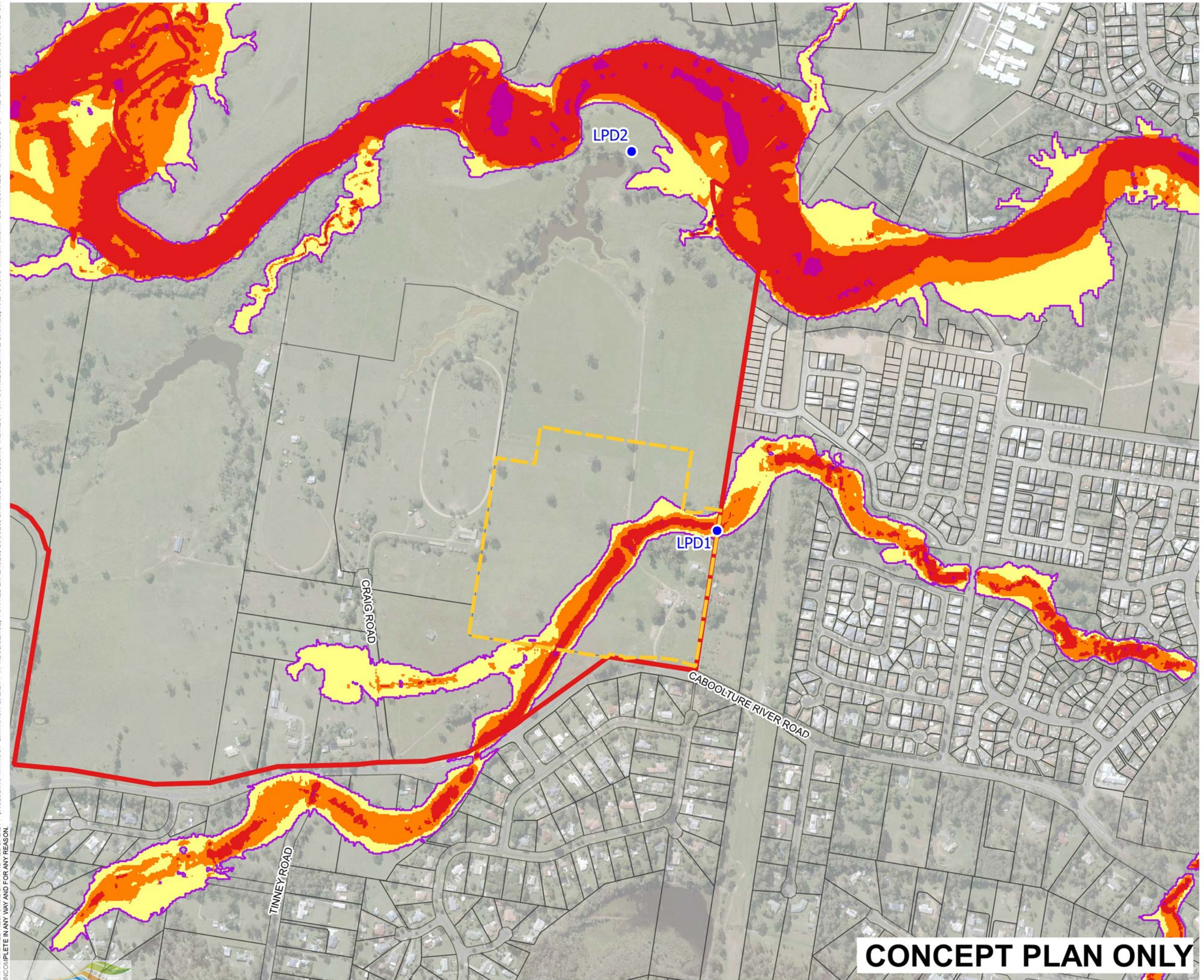

CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD VELOCITY (m/s)

- < 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- 3.0 TO 4.0
- > 4.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **16-002108-E-020-B**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
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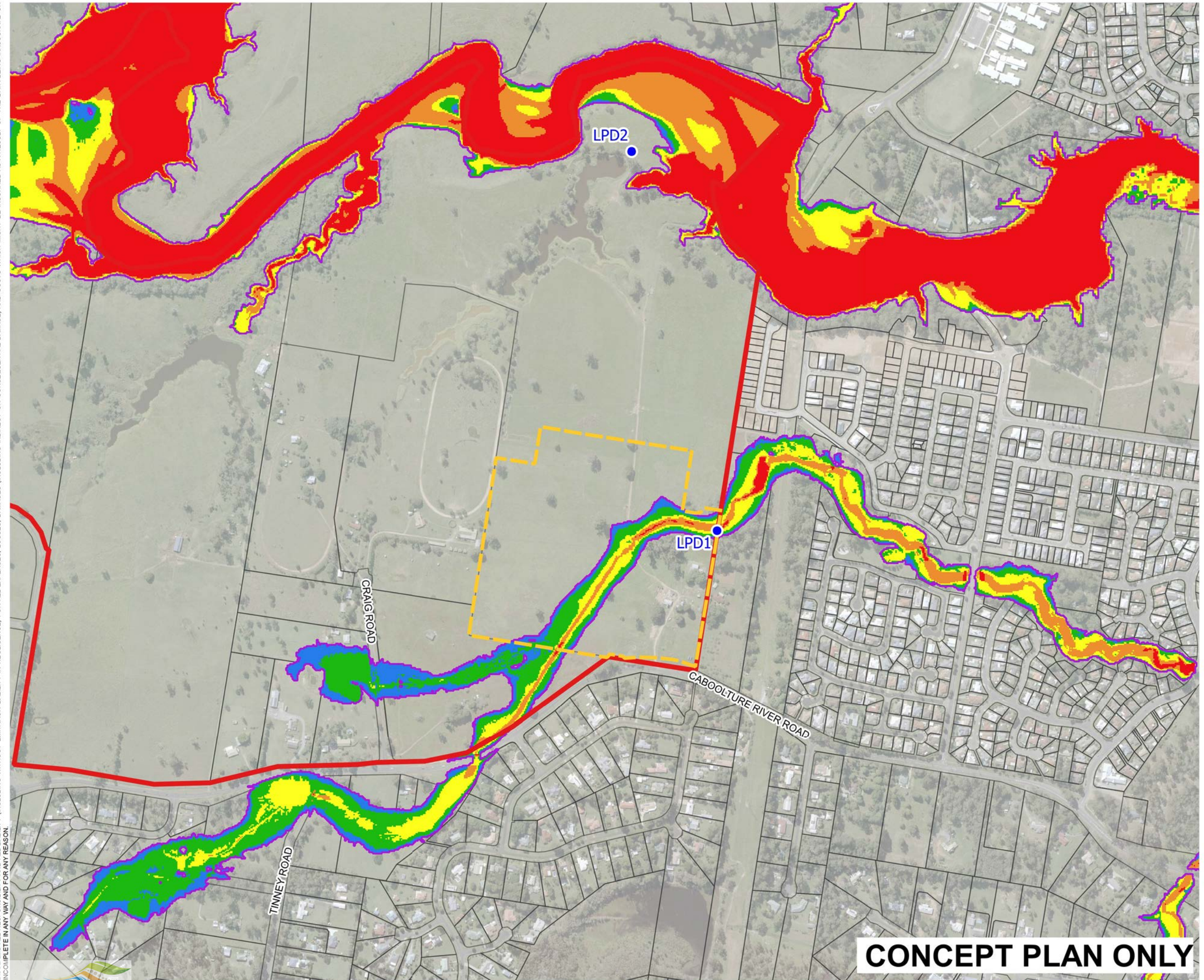
11/07/2023



CONCEPT PLAN ONLY

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD HAZARD

- H1
- H2
- H3
- H4
- H5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
EXISTING SCENARIO
5% AEP STORM EVENT
MAXIMUM FLOOD HAZARD

DRAWING NO: **16-002108-E-020-D**

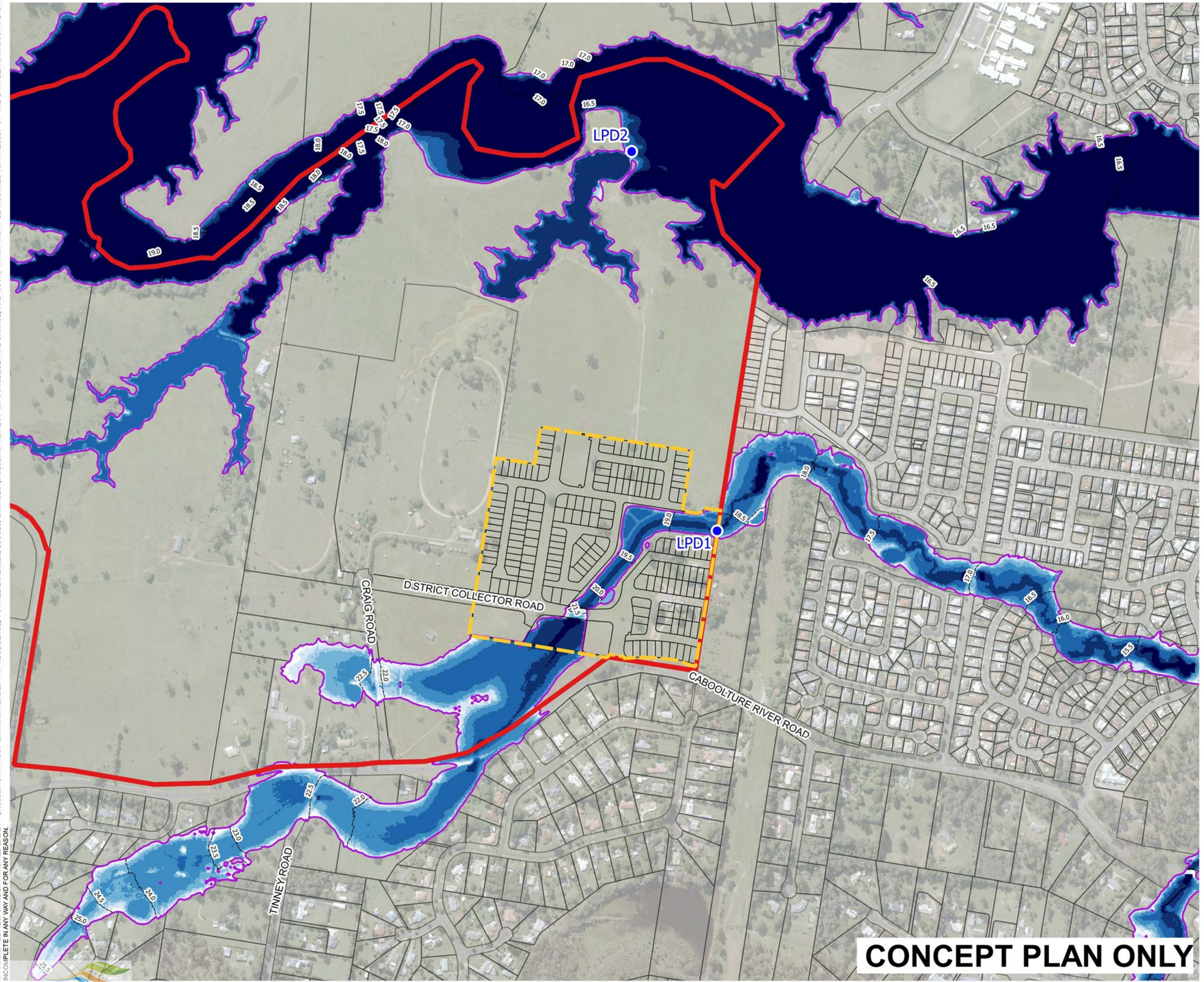
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

FLOOD DEPTH (m)

- < 0.1
- 0.1 TO 0.2
- 0.2 TO 0.3
- 0.3 TO 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- > 3.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 0.1% AEP STORM EVENT MAXIMUM FLOOD DEPTH

DRAWING NO: **16-002108-D-1000-A**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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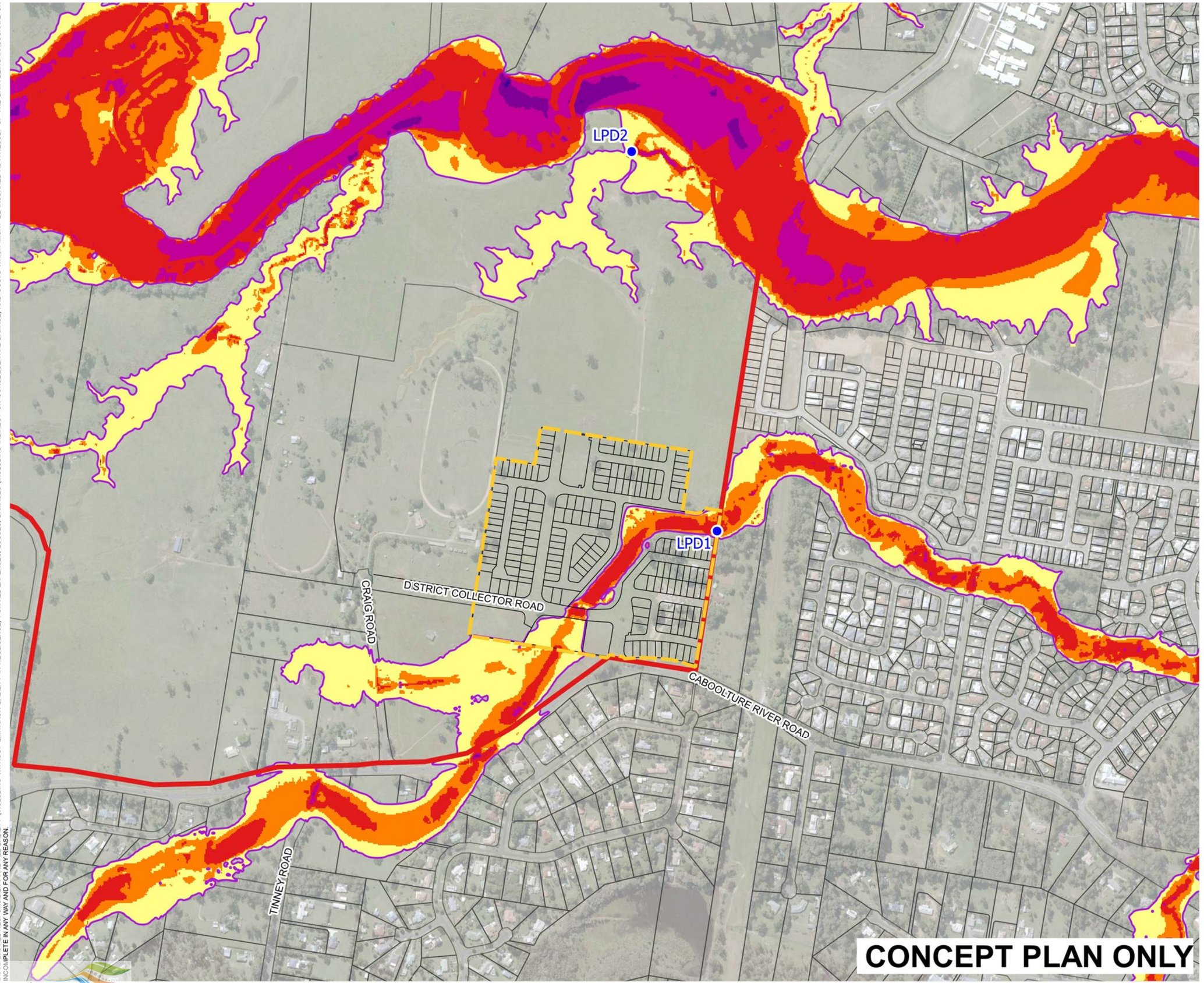

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD VELOCITY (m/s)

- < 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- 3.0 TO 4.0
- > 4.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 0.1% AEP STORM EVENT MAXIMUM FLOOD VELOCITY

DRAWING NO: **16-002108-D-1000-B**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
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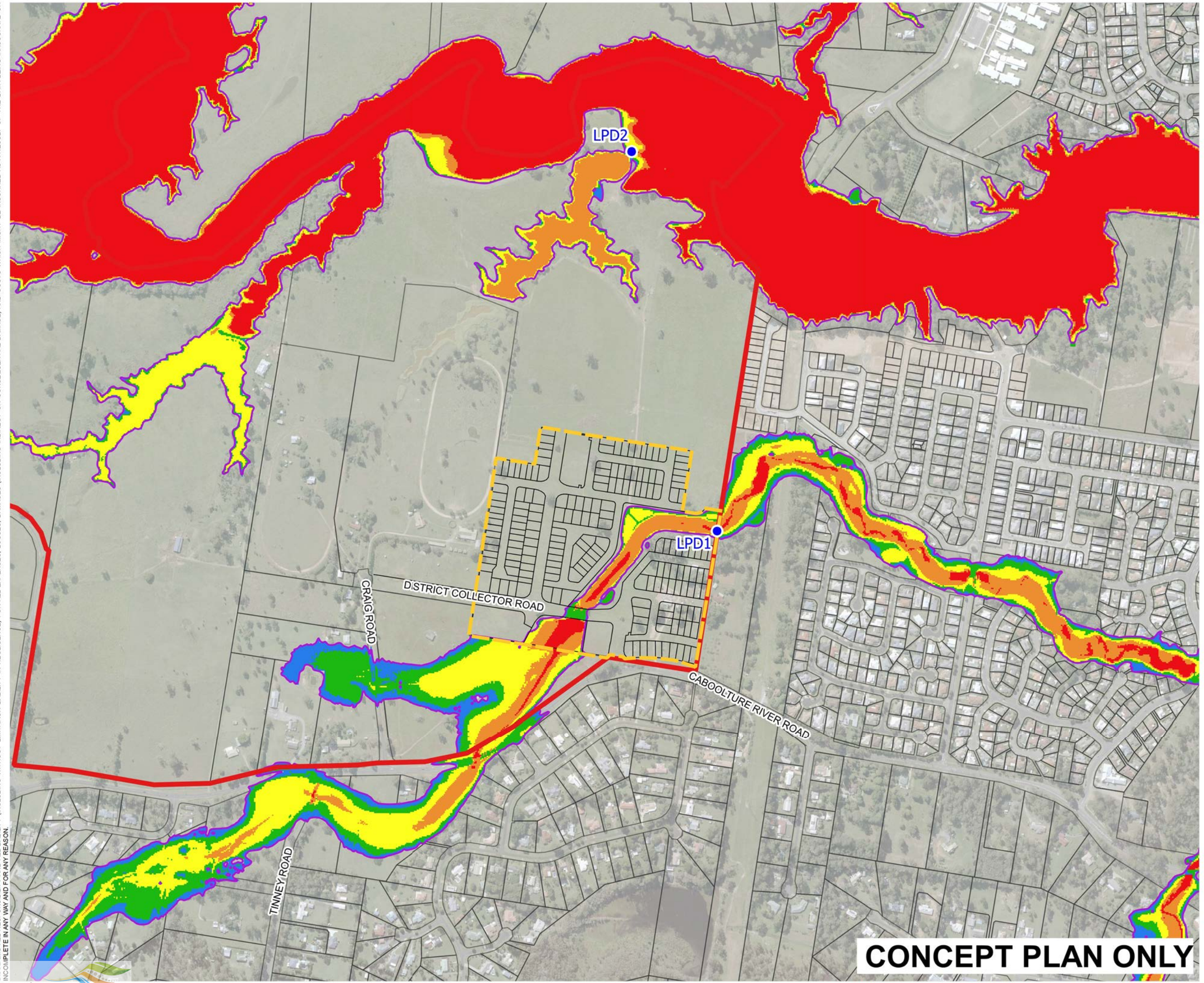
Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD HAZARD

- H1
- H2
- H3
- H4
- H5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 0.1% AEP STORM EVENT MAXIMUM FLOOD HAZARD

DRAWING NO: **16-002108-D-1000-D**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
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Moreton Bay Regional Council

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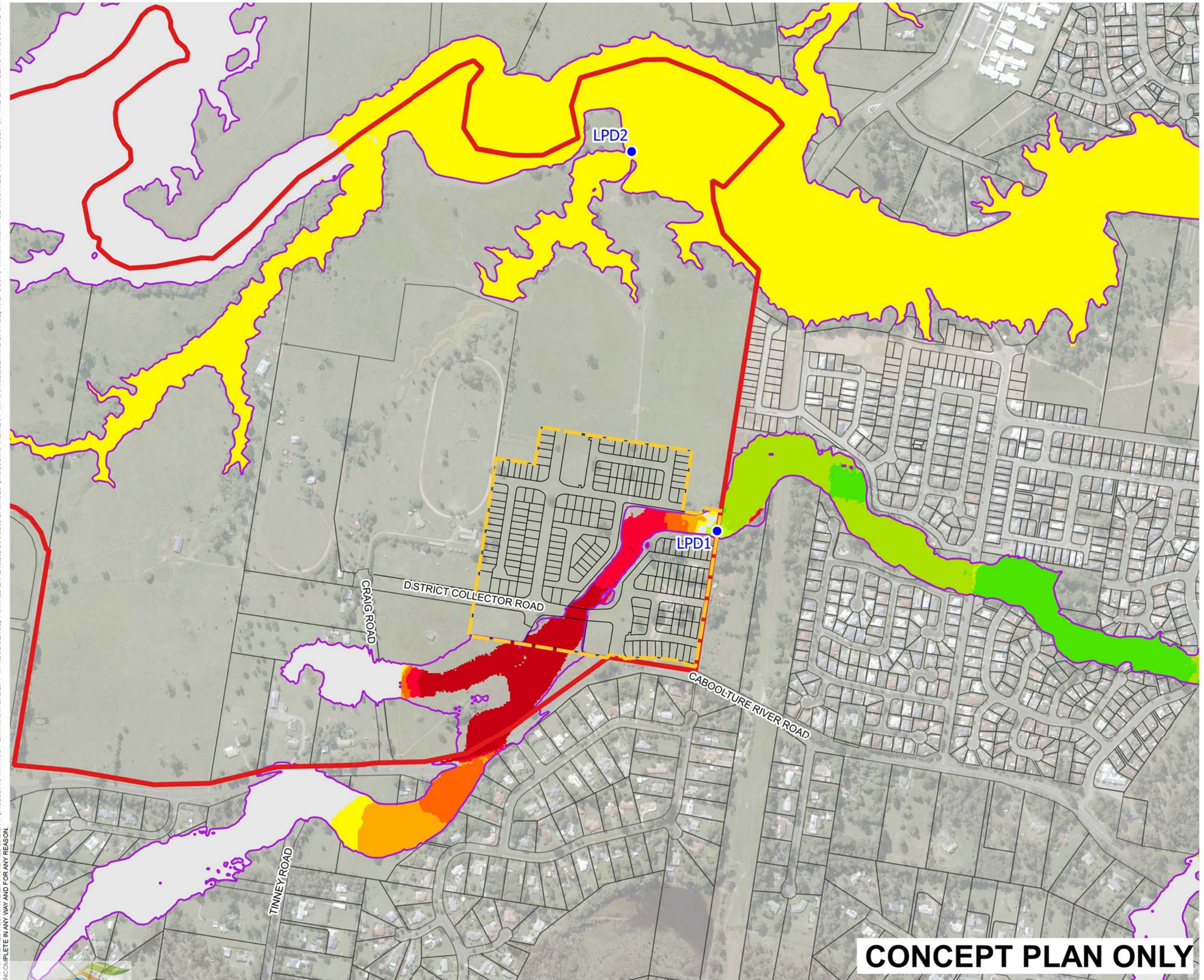
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

WSL DIFFERENCE (m)

- < -0.5
- -0.5 TO -0.2
- -0.2 TO -0.1
- -0.1 TO -0.05
- -0.05 TO -0.02
- -0.02 TO 0.02
- 0.02 TO 0.05
- 0.05 TO 0.1
- 0.1 TO 0.2
- 0.2 TO 0.5
- > 0.5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m
1:7,000 (A3)
N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 0.1% AEP STORM EVENT MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **16-002108-D-1000-E**
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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Moreton Bay Regional Council

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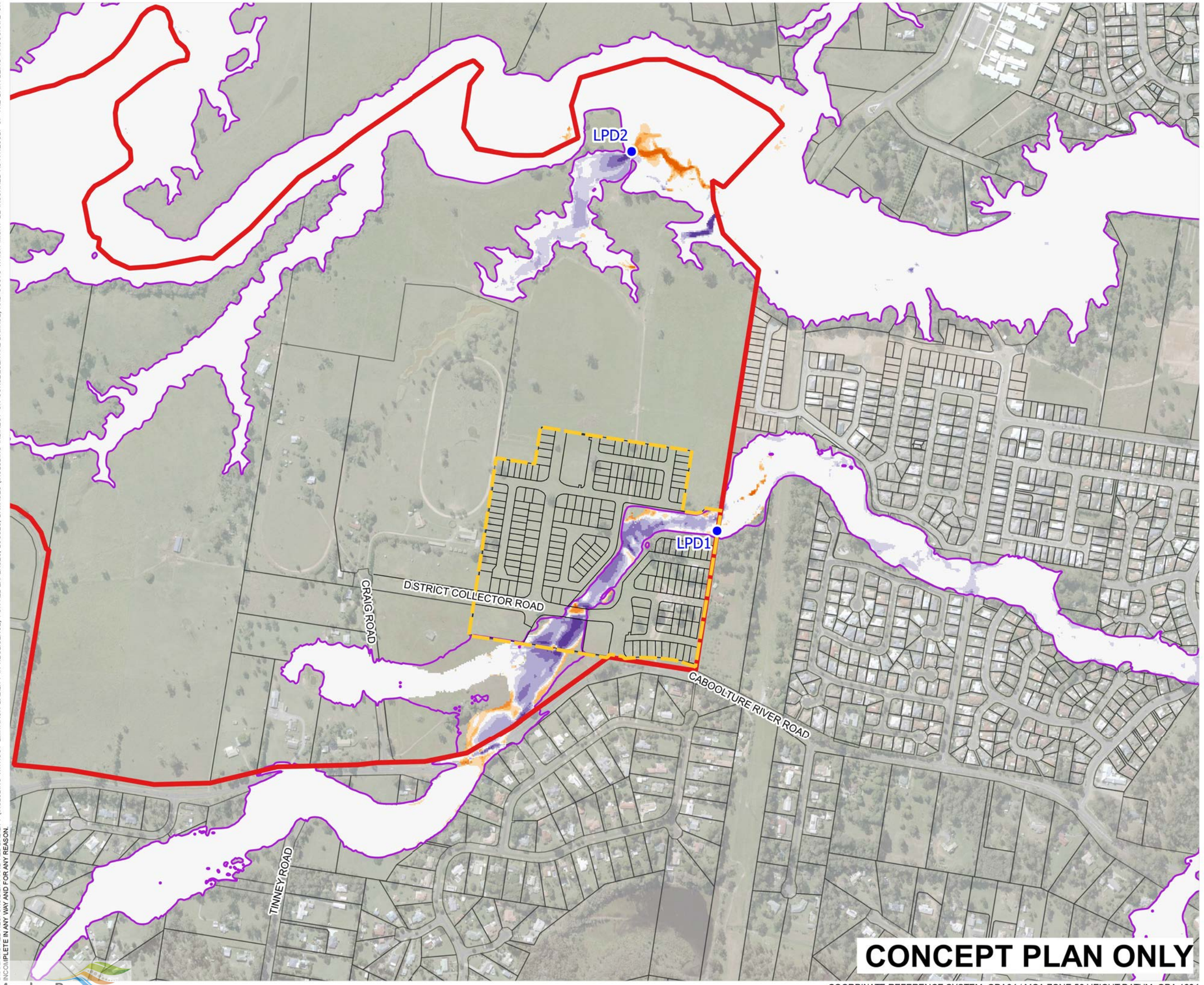

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

VELOCITY DIFFERENCE (m/s)

- < -1.0
- -1.0 TO -0.5
- -0.5 TO -0.25
- -0.25 TO -0.1
- -0.1 TO 0.1
- 0.1 TO 0.25
- 0.25 TO 0.5
- 0.5 TO 1
- > 1.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 0.1% AEP STORM EVENT MAXIMUM FLOOD VELOCITY DIFFERENCE

DRAWING NO: **16-002108-D-1000-F**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
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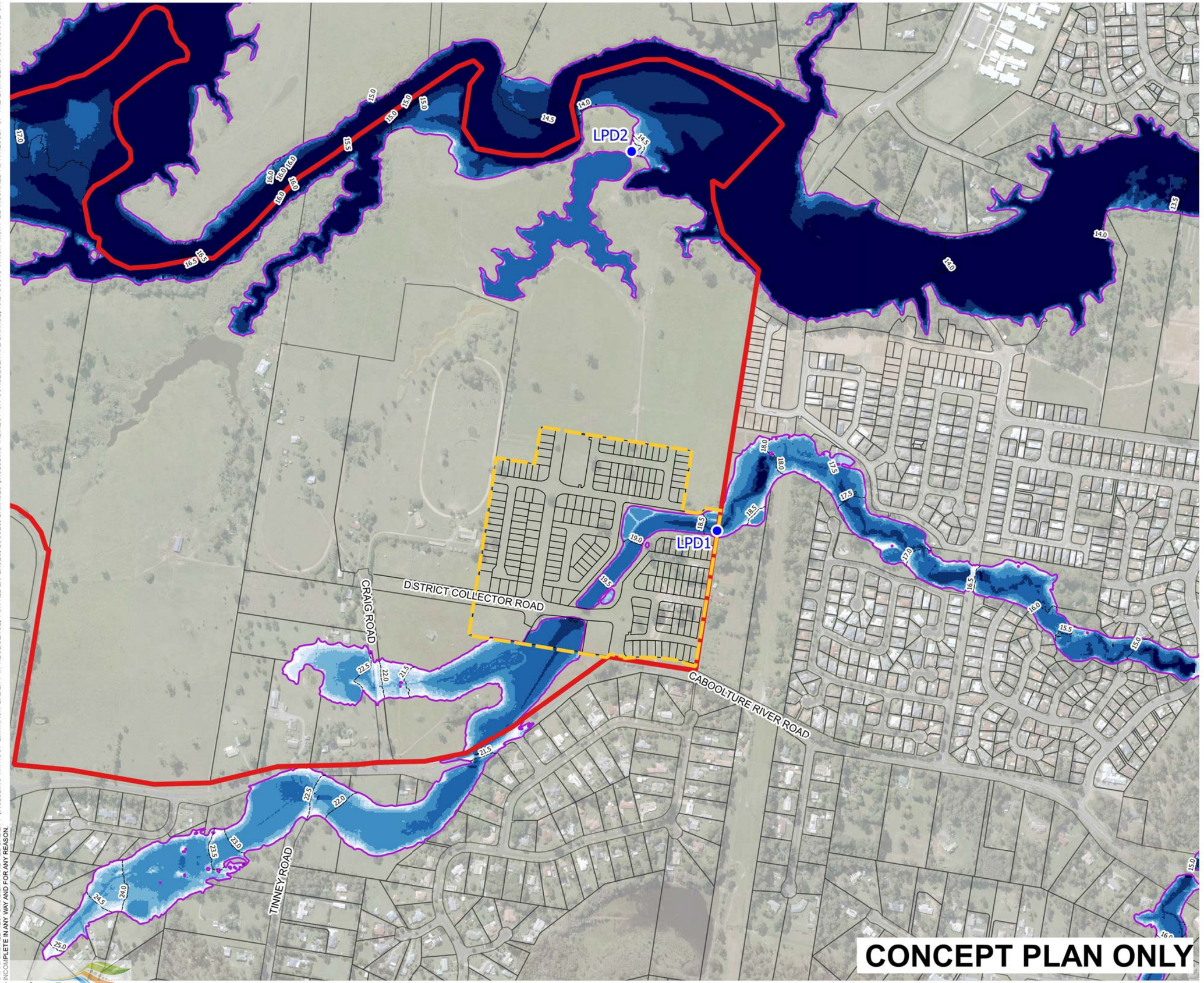
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

FLOOD DEPTH (m)

- < 0.1
- 0.1 TO 0.2
- 0.2 TO 0.3
- 0.3 TO 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- > 3.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 1% AEP STORM EVENT MAXIMUM FLOOD DEPTH

DRAWING NO: **16-002108-D-100-A**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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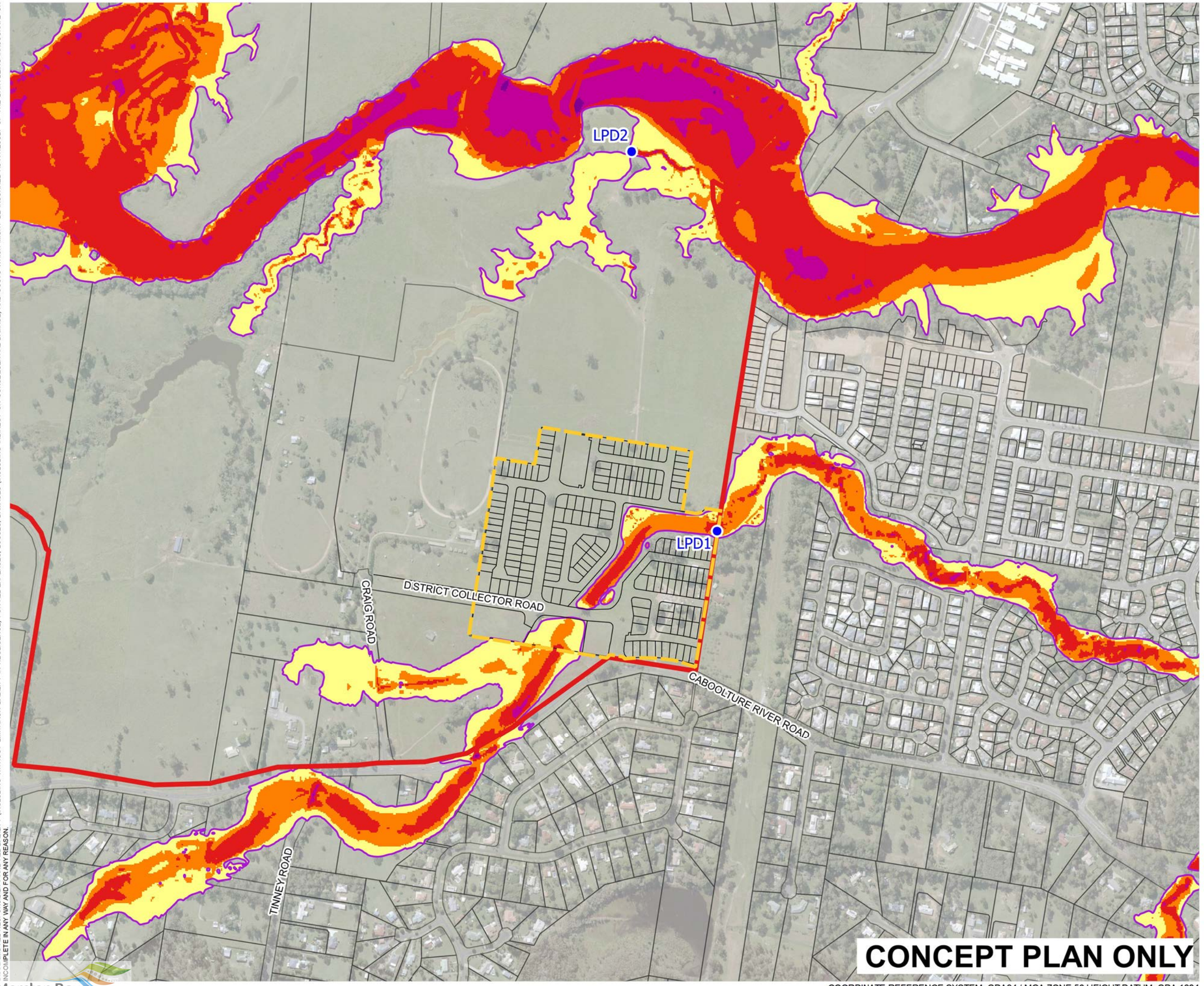

COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD VELOCITY (m/s)

- < 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- 3.0 TO 4.0
- > 4.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO
1% AEP STORM EVENT
MAXIMUM FLOOD VELOCITY

DRAWING NO: **16-002108-D-100-B**

ISSUE: **B**

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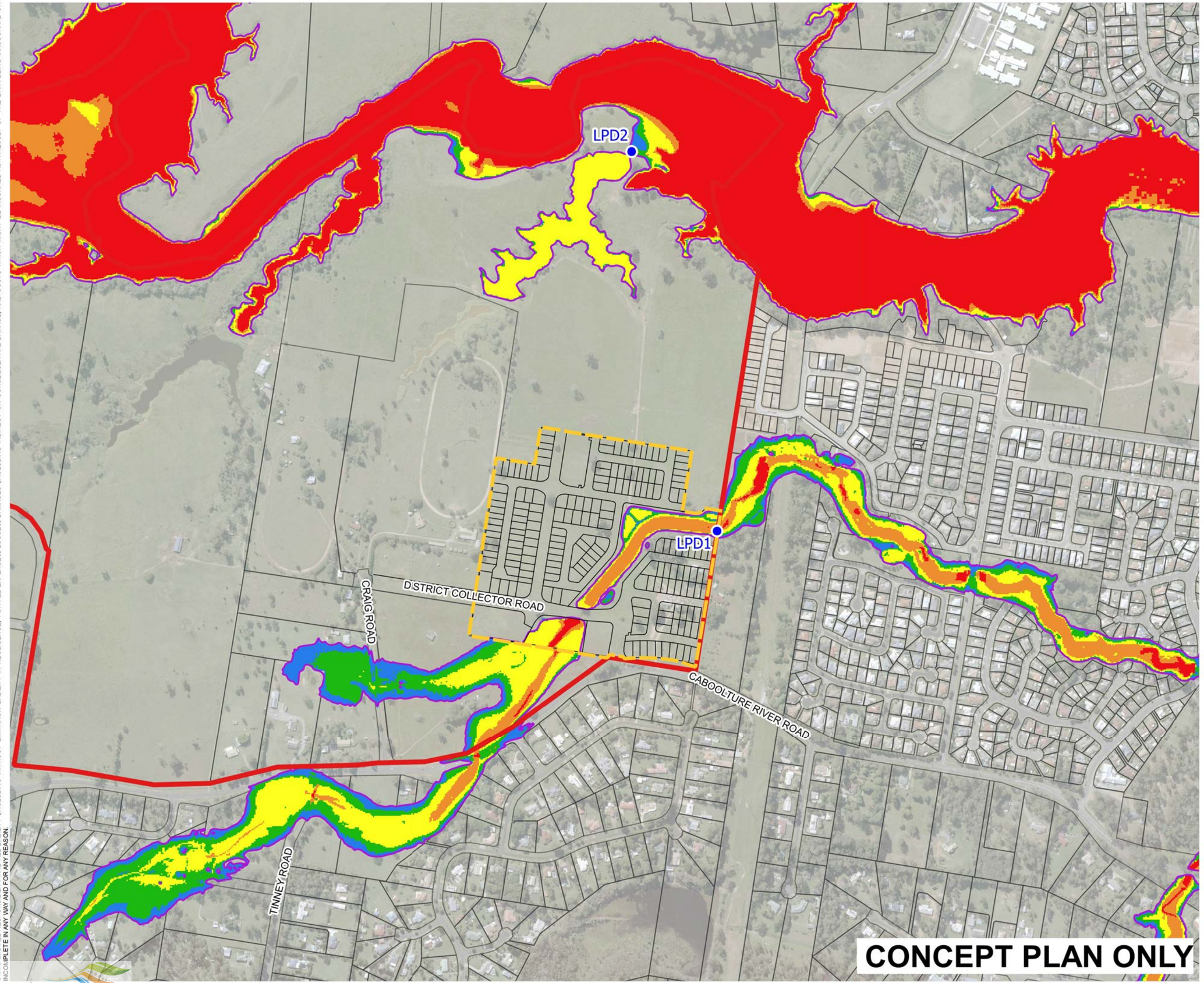
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD HAZARD

- H1
- H2
- H3
- H4
- H5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 1% AEP STORM EVENT MAXIMUM FLOOD HAZARD

DRAWING NO: **16-002108-D-100-D**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
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Moreton Bay Regional Council

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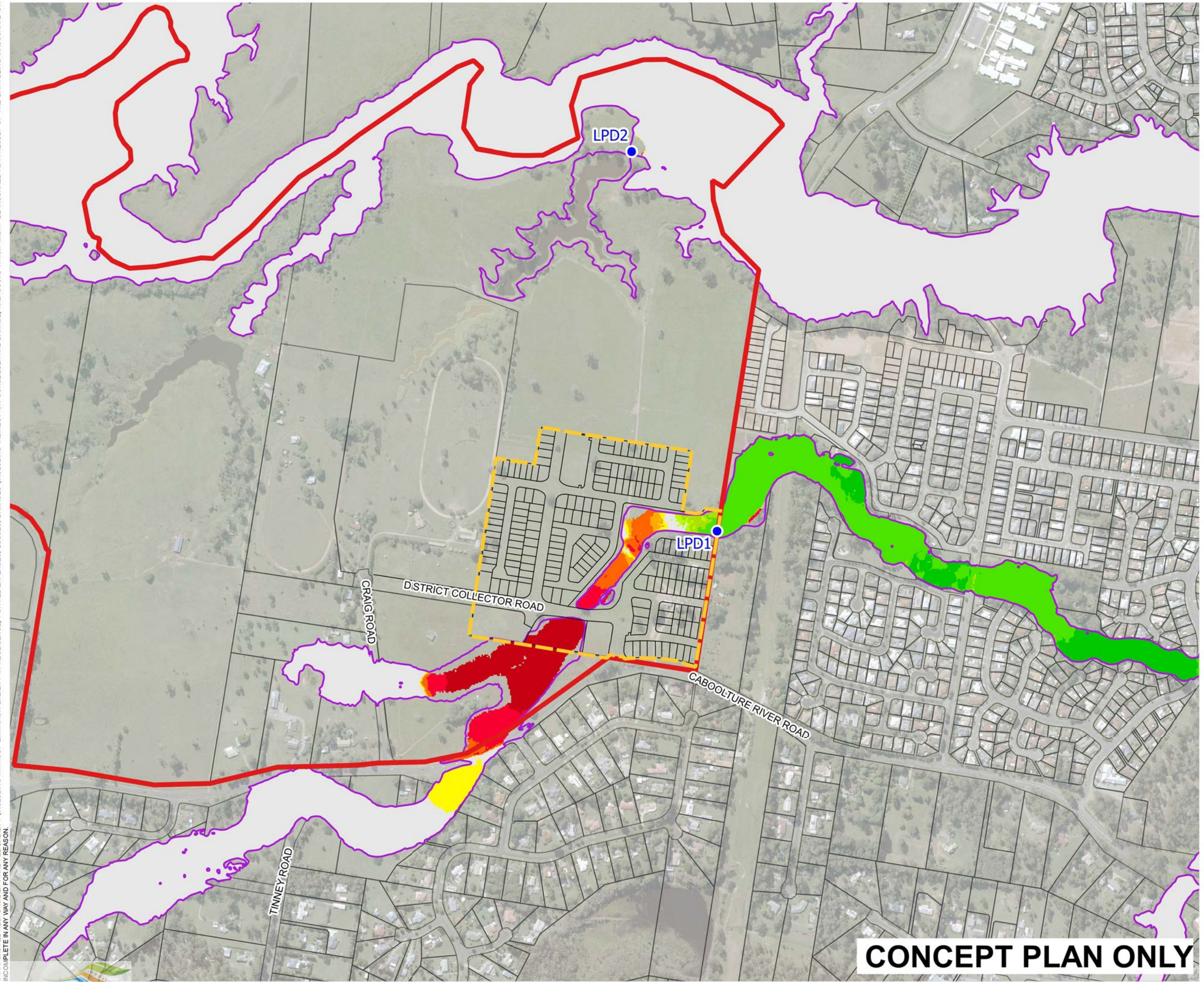

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COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

WSL DIFFERENCE (m)

- < -0.5
- -0.5 TO -0.2
- -0.2 TO -0.1
- -0.1 TO -0.05
- -0.05 TO -0.02
- -0.02 TO 0.02
- 0.02 TO 0.05
- 0.05 TO 0.1
- 0.1 TO 0.2
- 0.2 TO 0.5
- > 0.5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m
1:7,000 (A3)
N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 1% AEP STORM EVENT MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **16-002108-D-100-E**
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
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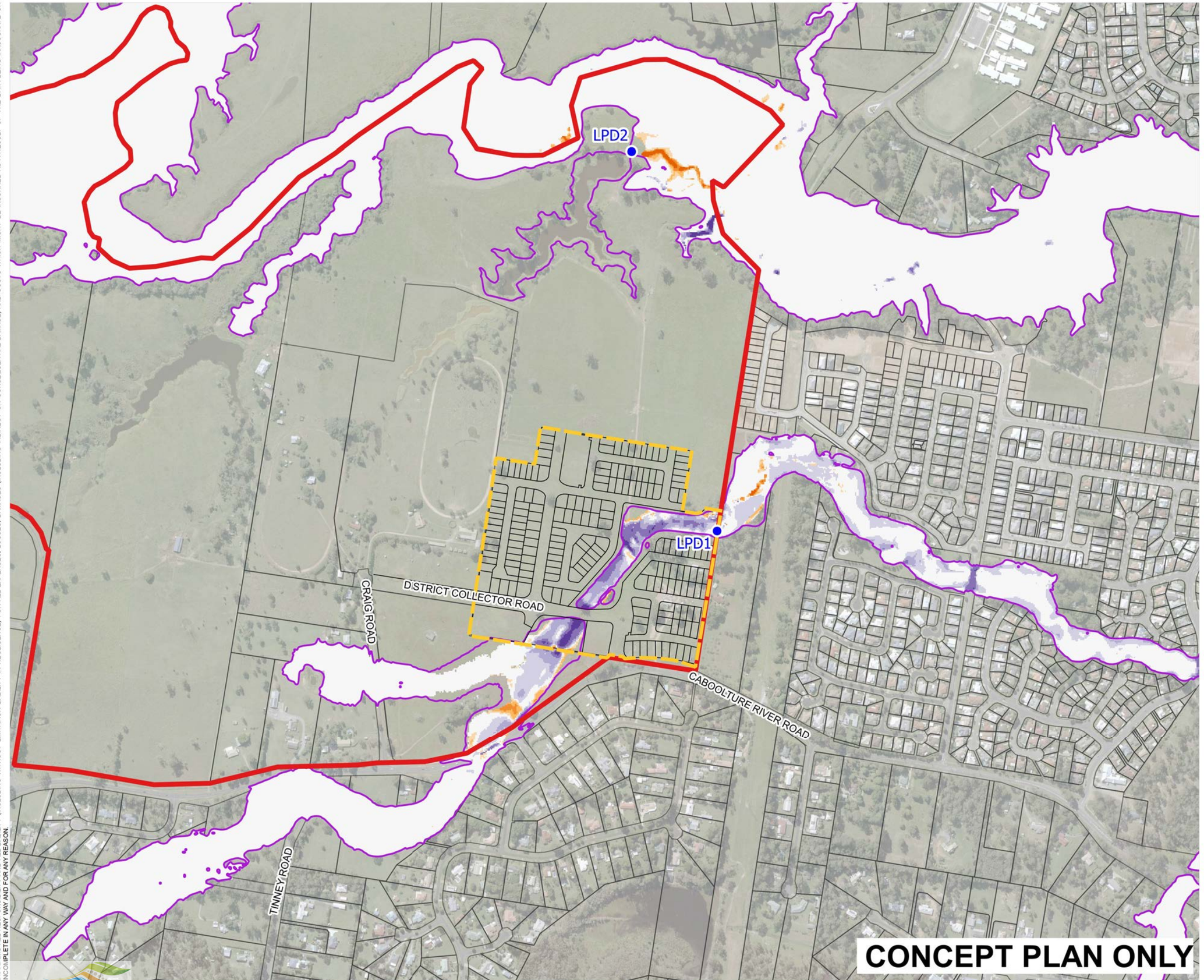
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

VELOCITY DIFFERENCE (m/s)

- < -1.0
- -1.0 TO -0.5
- -0.5 TO -0.25
- -0.25 TO -0.1
- -0.1 TO 0.1
- 0.1 TO 0.25
- 0.25 TO 0.5
- 0.5 TO 1
- > 1.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

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3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m
1:7,000 (A3)
N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 1% AEP STORM EVENT MAXIMUM FLOOD VELOCITY DIFFERENCE

DRAWING NO: **16-002108-D-100-F**
ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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Moreton Bay Regional Council

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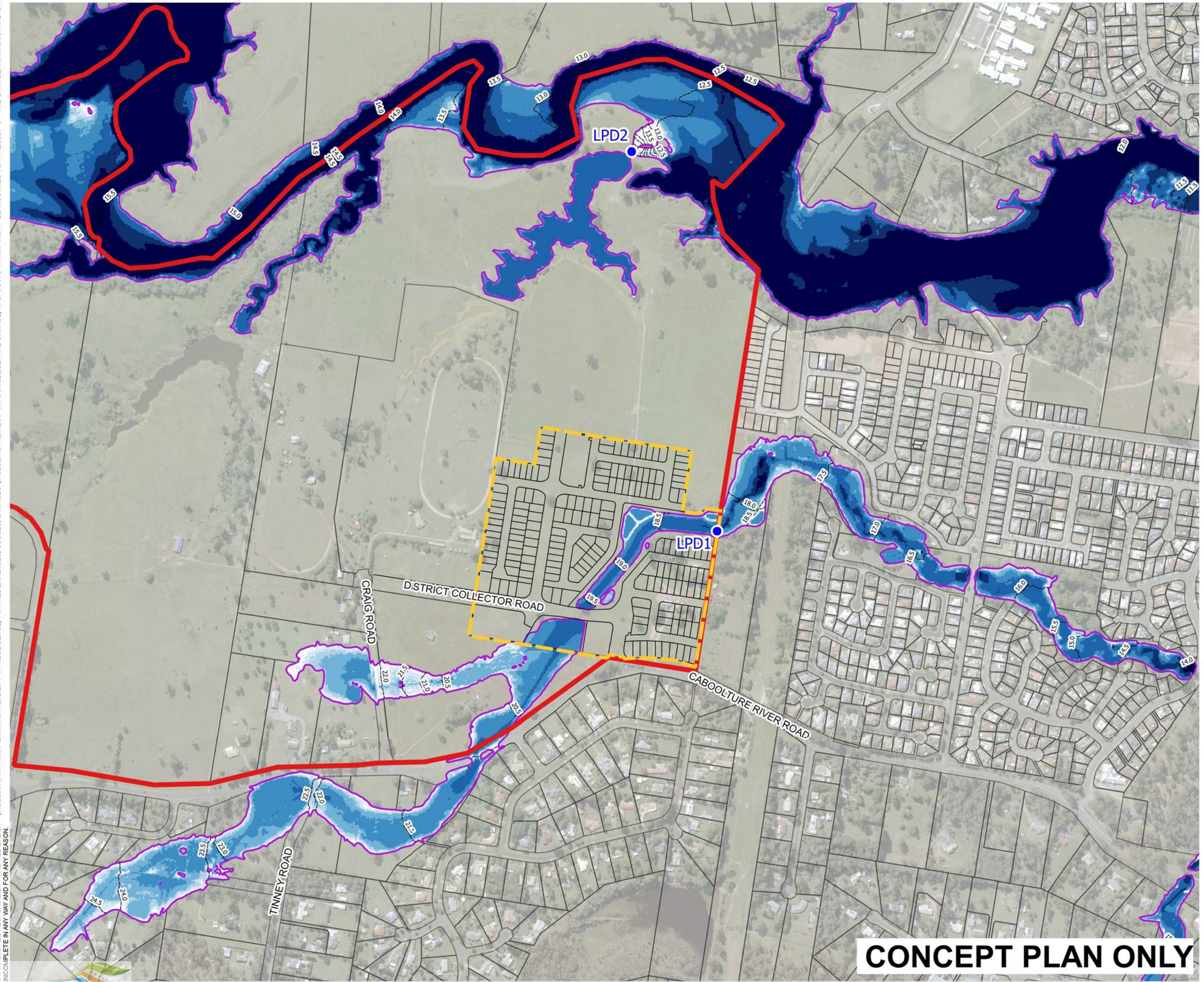

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COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

FLOOD DEPTH (m)

- < 0.1
- 0.1 TO 0.2
- 0.2 TO 0.3
- 0.3 TO 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- > 3.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

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3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 5% AEP STORM EVENT MAXIMUM FLOOD DEPTH

DRAWING NO: **16-002108-D-020-A**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
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Moreton Bay Regional Council

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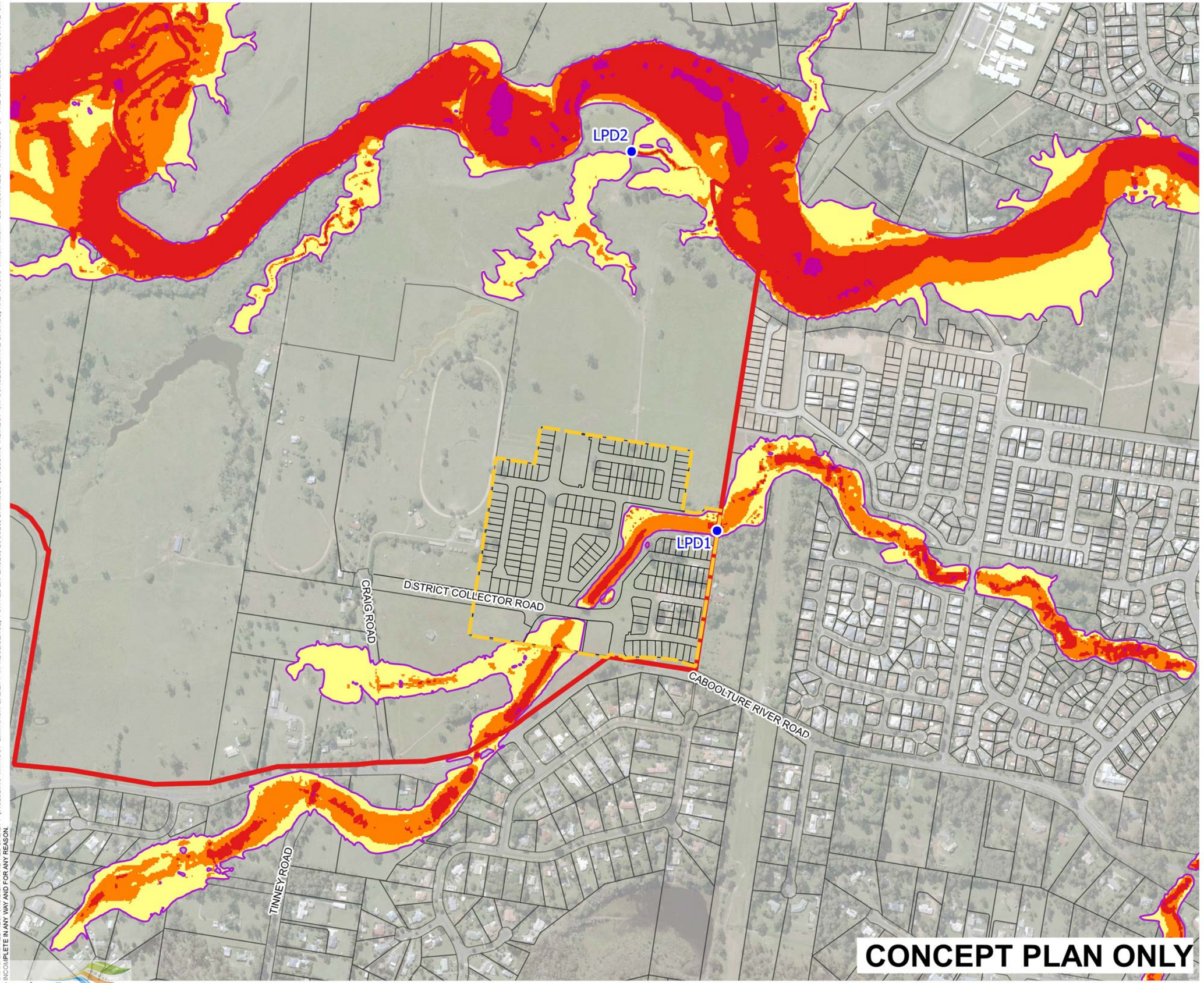
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD VELOCITY (m/s)

- < 0.5
- 0.5 TO 1.0
- 1.0 TO 2.0
- 2.0 TO 3.0
- 3.0 TO 4.0
- > 4.0

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

2. RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.

3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 5% AEP STORM EVENT MAXIMUM FLOOD VELOCITY

DRAWING NO: **16-002108-D-020-B**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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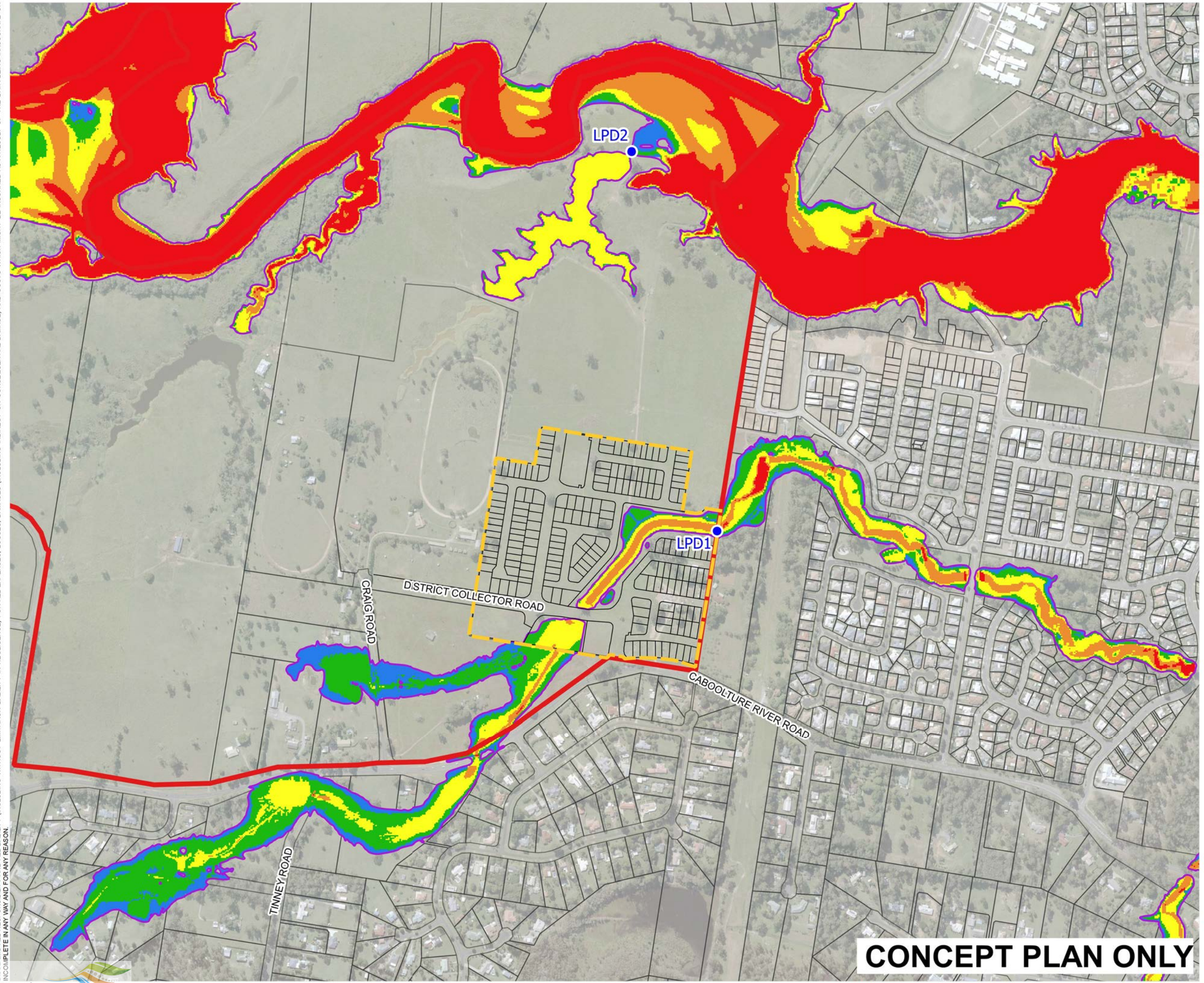
Moreton Bay Regional Council

Approved Subject to Conditions of Decision Notice DA/2023/2169

11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

FLOOD HAZARD

- H1
- H2
- H3
- H4
- H5

NOTES:
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3. ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).

0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 5% AEP STORM EVENT MAXIMUM FLOOD HAZARD

DRAWING NO: **16-002108-D-020-D**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
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Moreton Bay Regional Council

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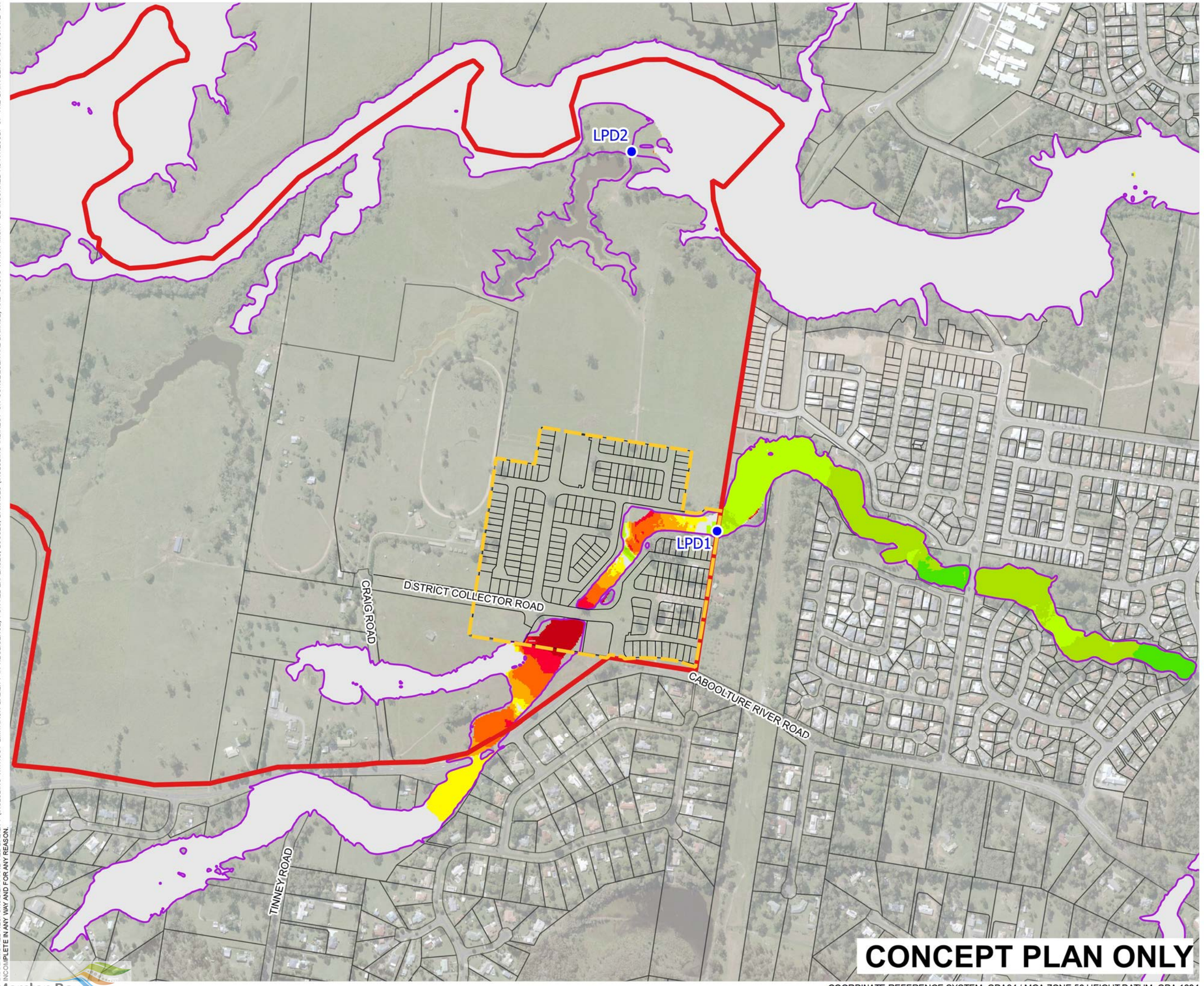
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

calibre

LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

WSL DIFFERENCE (m)

- < -0.5
- -0.5 TO -0.2
- -0.2 TO -0.1
- -0.1 TO -0.05
- -0.05 TO -0.02
- -0.02 TO 0.02
- 0.02 TO 0.05
- 0.05 TO 0.1
- 0.1 TO 0.2
- 0.2 TO 0.5
- > 0.5

NOTES:
1. REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.

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0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 5% AEP STORM EVENT MAXIMUM FLOOD LEVEL DIFFERENCE

DRAWING NO: **16-002108-D-020-E**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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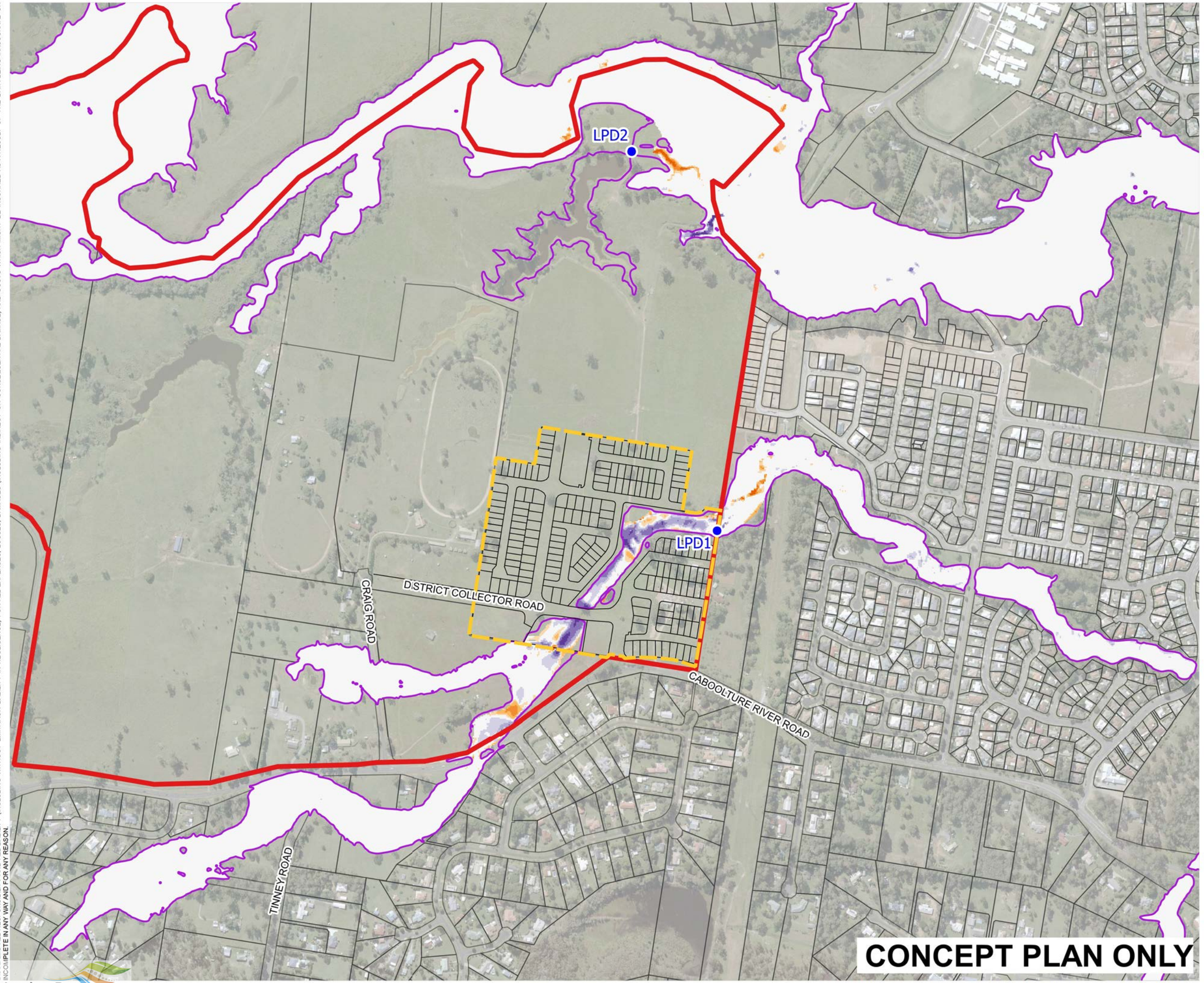
11/07/2023



COORDINATE REFERENCE SYSTEM: GDA94 / MGA ZONE 56 HEIGHT DATUM: GDA 1994

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LEGEND

- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

VELOCITY DIFFERENCE (m/s)

- < -1.0
- -1.0 TO -0.5
- -0.5 TO -0.25
- -0.25 TO -0.1
- -0.1 TO 0.1
- 0.1 TO 0.25
- 0.25 TO 0.5
- 0.5 TO 1
- > 1.0

NOTES:
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0 100 200 300 m

1:7,000 (A3)

N

PROJECT:
CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

CLIENT:
FOREVERLEN PTY LTD

DRAWING TITLE:
DEVELOPED SCENARIO 5% AEP STORM EVENT MAXIMUM FLOOD VELOCITY DIFFERENCE

DRAWING NO: **16-002108-D-020-F**

ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
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11/07/2023

STORMWATER MANAGEMENT PLAN – CABOOLTURE WEST NDP1 – FOREVERLEN STAGES 1 TO 4

Appendix E IDC Culvert Blockage Assessment

FOREVERLEN PTY LTD

Blockage Assessment – ARR, 2019

Crossing Details for District Collector Road (IDC);

- SEWC_DET_01 (Primary Detention Outlet) – 3 x 1650mm diameter RCP
- SEWC_DET_02 (Secondary Detention Outlet) – 3 x 1500mm RCP (modelled as interim configuration, i.e. without US flow control weir that is proposed for the Ultimate configuration)

Factors influencing blockage

- 1% AEP max velocity in upstream channel between 1 to 2 m/s
- 1% AEP max flow depth in upstream channel between 0.5m to 1.0m
- Numerous upstream culvert crossings (e..g at Caboolture River Road, Craig Road, Tinney Road) reducing risk of large debris availability and transportability to IDC culvert
- L_{10} value estimated to be 1.5m based on low debris motility & reduced debris transportability (due to size of upstream culverts <1.5D)

Table 6.6.1. Debris Availability - in Source Area of a Particular Type/Size of Debris

Classification	Typical Source Area Characteristics (1% AEP Event)
High	• Natural forested areas with thick vegetation and extensive canopy cover, difficult to walk through with considerable fallen limbs, leaves and high levels of floor litter. • Streams with boulder/cobble beds and steep bed slopes and steep banks showing signs of substantial past bed/bank movements. • Arid areas, where loose vegetation and exposed loose soils occur and vegetation is sparse. • Urban areas that are not well maintained and/or where old paling fences, sheds, cars and/or stored loose material etc., are present on the floodplain close to the water course.
Medium	• State forest areas with clear understory, grazing land with stands of trees. • Source areas generally falling between the High and Low categories.
Low	• Well maintained rural lands and paddocks with minimal outbuildings or stored materials in the source area. • Streams with moderate to flat slopes and stable bed and banks. • Arid areas where vegetation is deep rooted and soils are resistant to scour. • Urban areas that are well maintained with limited debris present in the source area.

Table 6.6.2. Debris Mobility - Ability of a Particular Type/Size of Debris to be Moved into Streams

Classification	Typical Source Area Characteristics (1% AEP Event)
High	• Steep source areas with fast response times and high annual rainfall and/or storm intensities and/or source areas subject to high rainfall intensities with sparse vegetation cover. • Receiving streams that frequently overtop their banks. • Main debris source areas close to streams.
Medium	• Source areas generally falling between the High and Low mobility categories.
Low	• Low rainfall intensities and large, flat source areas. • Receiving streams infrequently overtops their banks. • Main debris source areas well away from streams.

Table 6.6.3. Debris Transportability - Ability of a Stream to Transport Debris Down to the Structure[a]

Transportability	Typical Transporting Stream Characteristics (1% AEP Event)
High	• Steep bed slopes (> 3%) and/or high stream velocity (V > 2.5 m/s) • Deep stream relative to vertical debris dimension (D > 0.5L_{10}) • Wide stream relative to horizontal debris dimension.(W > L_{10}) • Stream relatively straight and free of major constrictions or snag points. • High temporal variability in maximum stream flows.
Medium	• Stream generally falling between High and Low categories.
Low	• Flat bed slopes (< 1%) and/or low stream velocity (V < 1m/s). • Shallow depth relative to vertical debris dimension (D < 0.5L_{10}). • Narrow stream relative to horizontal debris dimension (W < L_{10}). • Stream meanders with frequent constrictions/snag points. • Low temporal variability in maximum stream flows.

[a]Where V = velocity, D is depth, W is width and L_{10} is average length of the longest 10% of the debris that could arrive at the site

Table 6.6.4. 1% AEP Debris Potential

Classification	Combinations of the Above (any order)
High	HHH or HHM
Medium	MMM or HML or HMM or HLL
Low	LLL or MML or MLL

Table 6.6.5. AEP Adjusted Debris Potential

Event AEP	(1% AEP) Debris Potential at Structure		
	High	Medium	Low
AEP > 5%	Medium	Low	Low
AEP 5% - AEP 0.5%	High	Medium	Low
AEP < 0.5%	High	High	Medium

Table 6.6.6. Most Likely Inlet Blockage Levels - B_{DES}%

Control Dimension Inlet Clear Width (W) (m)	AEP Adjusted Debris Potential At Structure		
	High	Medium	Low
W < L_{10}	100%	50%	25%
L_{10} ≤ W ≤ 3*L_{10}	20%	10%	0%
W > 3*L_{10}	10%	0%	0%

Based on the above assessment a 0% debris blockage has been adopted for all modelled events.

Blockage Assessment – *MBRC Regional Floodplain Database: Floodplain Parameterisation* (SKM, 2012)

Crossing Details for District Collector Road (IDC);

- SEWC_DET_01 (Primary Detention Outlet) – 3 x 1650mm diameter RCP
- SEWC_DET_02 (Secondary Detention Outlet) – 3 x 1500mm RCP (modelled as interim configuration, i.e. without US flow control weir that is proposed for the Ultimate configuration)

Extracts from SKM, 2012

MBRC Regional Floodplain Database:
Floodplain Parameterisation

SKM

8.3. Culvert Blockage – Urban Debris

Culvert blockage in the urban areas is possible due to urban debris mobilisation, for example car, garbage bins and shipping containers. This sort of blockage is reasonably random and is therefore difficult to apply a standard factor to the structures for urban debris blockage in the hydraulic model.

In the absence of more refined information, it is therefore recommended that the 'moderate' debris potential blockage criteria developed for natural debris described in **Table 8-3** be also applied to culverts within urban areas.

- **Table 8-3 Culvert Blockage Factors – Natural Debris**

Upstream Catchment Conditions	Culvert Blockage Conditions	
Debris Potential	Full Blockage	Partial Blockage
High	If <6.0 m diagonal	If > 6.0 m diagonal, then apply 25 %
Moderate	If <2.4 m diagonal	If > 2.4 m diagonal, then apply 15 %
Low	If <1.2 m diagonal	If > 1.2 m diagonal, then apply 10 %

Based on the above assessment a full (100%) debris blockage is recommended.

Contact Us

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Brisbane QLD 4000
07 3895 3444

calibregroup.com

ATTACHMENT 4

Appeal Rights

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

(1) Schedule 1 states—

(a) matters that may be appealed to—

(i) either a tribunal or the P&E Court; or

(ii) only a tribunal; or

(iii) only the P&E Court; and

(b) the person—

(i) who may appeal a matter (the ***appellant***); and

(ii) who is a respondent in an appeal of the matter; and

(iii) who is a co-respondent in an appeal of the matter; and

(iv) who may elect to be a co-respondent in an appeal of the matter.

(2) An appellant may start an appeal within the appeal period.

(3) The ***appeal period*** is—

(a) for an appeal by a building advisory agency—10 business days after a decision notice for the decision is given to the agency; or

(b) for an appeal against a deemed refusal—at any time after the deemed refusal happens; or

(c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises—20 business days after a notice is published under section 269(3)(a) or (4); or

(d) for an appeal against an infrastructure charges notice—20 business days after the infrastructure charges notice is given to the person; or

(e) for an appeal about a deemed approval of a development application for which a decision notice has not been given—30 business days after the applicant gives the deemed approval notice to the assessment manager; or

(f) for an appeal relating to the *Plumbing and Drainage Act 2018*—

(i) for an appeal against an enforcement notice given because of a belief mentioned in the *Plumbing and Drainage Act 2018*, section 143(2)(a)(i), (b) or (c)—5 business days after the day the notice is given; or

(ii) for an appeal against a decision of a local government or an inspector to give an action notice under the *Plumbing and Drainage Act 2018*—5 business days after the notice is given; or

(iii) for an appeal against a failure to make a decision about an application or other matter under the *Plumbing and Drainage Act 2018*—at anytime after the period within which the application or matter was required to be decided ends; or

(iv) otherwise—20 business days after the day the notice is given; or

(g) for any other appeal—20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note—

See the P&E Court Act for the court's power to extend the appeal period.

(4) Each respondent and co-respondent for an appeal may be heard in the appeal.

(5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.

(6) To remove any doubt, it is declared that an appeal against an infrastructure charges notice must not be about—

(a) the adopted charge itself; or

(b) for a decision about an offset or refund—

(i) the establishment cost of trunk infrastructure identified in a LGIP; or

(ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

(1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that—

(a) is in the approved form; and

(b) succinctly states the grounds of the appeal.

(2) The notice of appeal must be accompanied by the required fee.

(3) The appellant or, for an appeal to a tribunal, the registrar, must, within the service period, give a copy of the notice of appeal to—

(a) the respondent for the appeal; and

(b) each co-respondent for the appeal; and

(c) for an appeal about a development application under schedule 1, section 1, table 1, item 1—each principal submitter for the application whose submission has not been withdrawn; and

(d) for an appeal about a change application under schedule 1, section 1, table 1, item 2—each principal submitter for the application whose submission has not been withdrawn; and

(e) each person who may elect to be a co-respondent for the appeal other than an eligible submitter for a development application or change application the subject of the appeal; and

(f) for an appeal to the P&E Court—the chief executive; and

(g) for an appeal to a tribunal under another Act—any other person who the registrar considers appropriate.

(4) The ***service period*** is—

(a) if a submitter or advice agency started the appeal in the P&E Court—2 business days after the appeal is started; or

(b) otherwise—10 business days after the appeal is started.

(5) A notice of appeal given to a person who may elect to be a co-respondent must state the effect of subsection (6).

(6) A person elects to be a co-respondent to an appeal by filing a notice of election in the approved form—

(a) if a copy of the notice of appeal is given to the person—within 10 business days after the copy is given to the person; or

(b) otherwise—within 15 business days after the notice of appeal is lodged with the registrar of the tribunal or the P&E Court.

(7) Despite any other Act or rules of court to the contrary, a copy of a notice of appeal may be given to the chief executive by emailing the copy to the chief executive at the email address stated on the department's website for this purpose.

231 Non-appealable decisions and matters

(1) Subject to this chapter, section 316(2), schedule 1 and the P&E Court Act, unless the Supreme Court decides a decision or other matter under this Act is affected by jurisdictional error, the decision or matter is non-appealable.

(2) The *Judicial Review Act 1991*, part 5 applies to the decision or matter to the extent it is affected by jurisdictional error.

(3) A person who, but for subsection (1) could have made an application under the *Judicial Review Act 1991* in relation to the decision or matter, may apply under part 4 of that Act for a statement of reasons in relation to the decision or matter.

(4) In this section—

decision includes—

(a) conduct engaged in for the purpose of making a decision; and

(b) other conduct that relates to the making of a decision; and

(c) the making of a decision or the failure to make a decision; and

(d) a purported decision; and

(e) a deemed refusal.

non-appealable, for a decision or matter, means the decision or matter—

(a) is final and conclusive; and

(b) may not be challenged, appealed against, reviewed, quashed, set aside or called into question in any other way under the *Judicial Review Act 1991* or otherwise, whether by the Supreme Court, another court, any tribunal or another entity; and

(c) is not subject to any declaratory, injunctive or other order of the Supreme Court, another court, any tribunal or another entity on any ground.

232 Rules of the P&E Court

(1) A person who is appealing to the P&E Court must comply with the rules of the court that apply to the appeal.

(2) However, the P&E Court may hear and decide an appeal even if the person has not complied with rules of the P&E Court.

ATTACHMENT 5

Infrastructure Charges Notice

In accordance with the Infrastructure Charges Resolution (No. 10) dated 5 October 2022 or as amended, there is no Infrastructure Charges applicable to the development.