

Enquiries: Jacques Janse van Rensburg  
Direct Phone: 07 5433 2259  
Our Ref: DA/2021/4669  
Your Ref: 18-0096  
Date: 24 August 2023

Foreverlen Pty Ltd  
c/- Peak Urban  
PO Box 1344  
BUDDINA QLD 4575

Dear Applicant

**Re: DEVELOPMENT APPROVAL**  
***Planning Act 2016***  
**Development Application No.: DA/2021/4669**  
**Property Location: 409-423 Caboolture River Road LILYWOOD**  
**Property Description: Lot 1 RP 866105**  
**Lot 12 RP 866105**

Please be advised that on 23 August 2023 the above development application was approved by Council's Delegate as the Assessment Manager in accordance with section 64 of the *Planning Act 2016* subject to conditions.

The following type of approval has been issued:

- Reconfiguring a Lot - Development Permit for Subdivision (2 lots into 181 residential lots, open space, drainage, 3 balance lots, and new road - Stage 1A & 1B, 2-4)

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

In addition to this approval you may also be required to obtain a water approval from Unity Water.

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 have any further queries in relation to this decision, please contact Jacques Janse van Rensburg as referenced above.

Yours faithfully



Jacques Janse van Rensburg  
**Senior Planner**  
Development Services

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

**ATTACHMENT 1**

**Decision Notice**

## Decision Notice

### *Planning Act 2016, section 63*

#### APPLICATION DETAILS

<b>Application No:</b>	<b>DA/2021/4669</b>
<b>Applicant:</b>	<b>Foreverlen Pty Ltd</b>
<b>Street Address:</b>	<b>409-423 Caboolture River Road LILYWOOD</b>
<b>Real Property Description:</b>	<b>Lot 1 RP 866105 Lot 12 RP 866105</b>
<b>Planning Scheme:</b>	<b>Moreton Bay Regional Council Planning Scheme</b>

#### APPROVAL DETAILS

**Date of Decision: 23 August 2023**

The development application was approved by Council's Delegate as the Assessment Manager in accordance with section 64 of the *Planning Act 2016* subject to conditions (refer Attachment 2).

APPROVAL TYPE	Development Permit	Preliminary Approval
Reconfiguring a Lot for Subdivision (2 into 188 lots plus open space and drainage reserve)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### OTHER NECESSARY PERMITS

Listed below are other permit/s that are necessary to allow the development to be carried out:

- Operational Works – Development Permit.

#### CURRENCY PERIOD OF APPROVAL

In accordance with section 85 of the *Planning Act 2016*, the currency period for each aspect of the development approval is as outlined below:

- Reconfiguring a Lot – 4 years from the date 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*.

Schedules 2 of Infrastructure Agreement Caboolture West - Neighbourhood Development Precinct 1 (Foreverlen Pty Ltd) and Infrastructure Agreement Caboolture West - Neighbourhood Development Precinct 1 (Combined NDP1 Developers) provides an alternative

arrangement whereby if the specified infrastructure is delivered, Infrastructure Charges do not apply to this development approval.

### 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.

Approved Plans and Documents			
Plan / Document Name	Reference Number	Prepared By	Dated
Reconfiguration of Lot	ND1577 ROL-01 Rev. 11	URBIS	17/02/2023 Annotated by Council 23/08/2023
Plan of Development	ND1577 POD-01 Rev. 14	URBIS	17/02/2023 Annotated by Council 23/08/2023
Road Network Hierarchy	ND1577 RH-01 Rev. 14	URBIS	17/02/2023
Connectivity Plan	ND1577 CP-02 Rev. 14	URBIS	17/02/2023
Stormwater Management Plan - Caboolture West NDP1 - Foreverlen Stages 1 to 4	16-002108-SWMP-01C	Calibre	22 November 2022

### Plans to be Amended

Plan / Document Name	Reference Number	Prepared By	Dated
Landscape Concept Plan	V9	Aecom	01 August 2023
Assessment and Control of Road Traffic Noise Intrusion	21-1305.R04.Rev1	Acoustics RB Pty Ltd	December 2022

### 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)*

Schedule 10 of the Regulation

- Not applicable

#### **Local Categorising Instrument (*Moreton Bay Regional Council Planning Scheme*)**

- Caboolture West local plan code - Urban living precinct (Overall Outcomes only)
- Reconfiguring a Lot Code
  - Urban living precinct
  - Green network precinct
- Flood hazard overlay code

#### **Local Categorising Instrument (Variation Approval)**

Not applicable.

#### **Local Categorising Instrument (Temporary Local Planning Instrument)**

Not applicable.

#### **REASONS FOR DECISION**

Subject to development conditions being imposed (refer Attachment 2), the development can comply with the applicable Assessment Benchmarks against which the application was required to be assessed. For further details, refer to the Reasons for the Decision section of the Assessment Report which is available on Council's website (via *DA Tracker*) <https://www.moretonbay.qld.gov.au/Services/Building-Development/DA-Tracker> using the application number referenced in this Notice.

#### **REFERRAL AGENCY CONDITIONS**

There are no Referral Agencies applicable to this development approval.

#### **APPEAL RIGHTS**

Attachment 5 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.

#### **OTHER DETAILS**

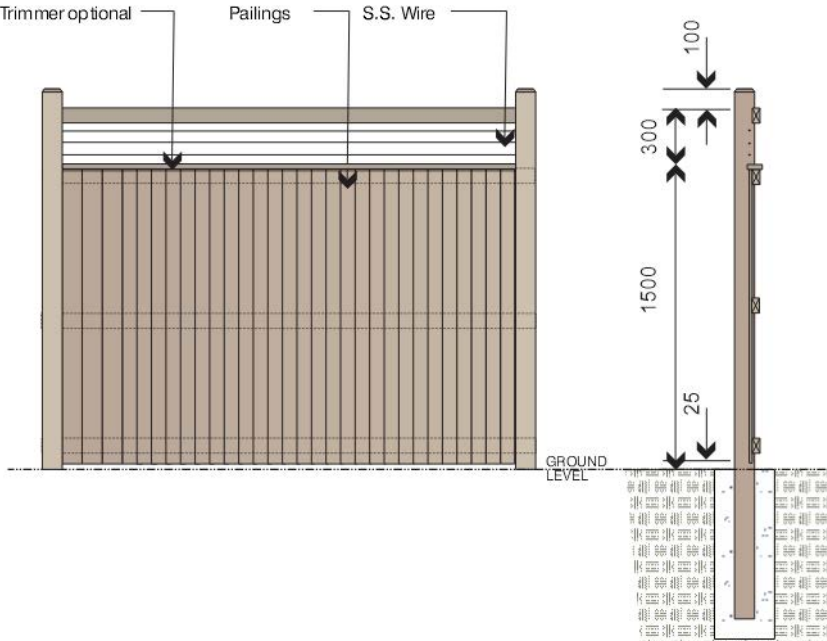
If you wish to obtain more information about Council's decision, please refer to the Assessment Report for the application on Council's (via *DA Tracker*) <https://www.moretonbay.qld.gov.au/Services/Building-Development/DA-Tracker> using the application number referenced in this Notice.

**ATTACHMENT 2**

**Assessment Manager Conditions of Approval**


CONDITION	TIMING
<b>RECONFIGURING A LOT - ALL STAGES</b>	
<b>DEVELOPMENT PLANNING</b>	
<b>1. Approved Plans and/or Documents</b>	
Undertake development in accordance with the approved plans and/or documents. These plans and/or documents will form part of the approval, unless otherwise amended by conditions of this approval.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) and to be maintained at all times.
<b>2. Amended Plan Required</b>	
<p>A Submit an amended Landscape Concept Plan incorporating the following:</p> <ul style="list-style-type: none"> <li>- Landscape vegetation directly adjacent the acoustic fence, fronting Caboolture River Road, to Lots 41-50.</li> <li>- Details of the <i>feature posts/pillars on private property</i>, including their overall height.</li> <li>- Amend the western boundary fencing to Lot 53, 54, 68-75 and 80-81 to be semi-transparent.</li> <li>- Amend the design and fencing along in Internal District Collector Road is consistent with the adjoining development directly to the west.</li> </ul>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<p>B Submit an amended Noise Impact Report that incorporates the following:</p> <ul style="list-style-type: none"> <li>- a 1.8m high acoustic barrier along proposed Lots 51 and 52;</li> <li>- a 1.8m high acoustic barrier along the western side of the pedestrian connection to the Internal District Collector Road. To remove any doubt, this includes the acoustic fence where it extends further north of proposed Lot 50's western boundary.</li> </ul>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<p>C Obtain approval from Council for the amended Landscape Concept Plan and Noise Impact Report in accordance with (A) and (B) above.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<p>D Implement the requirements and recommendations of the approved plan(s). The approved amended plan(s) will form part of the approval.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>3. Fencing of Public Areas</b>	
<p>A Unless an alternate design is required under the recommendations of the approved noise impact assessment, provide semi-transparent fencing in following locations:</p> <ol style="list-style-type: none"> <li>1. along the northern boundary of Lots 1-9, 75 and 140;</li> <li>2. along the southern boundary of Lot 51, 68, 108, 130 and 141;</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.



CONDITION	TIMING
<p>3. along the eastern boundary of Lot 55; 4. along the western boundary of Lots 1, 53, 54, 68-75 and 80-81.</p> <p><i>Fencing is to have a maximum height of 1.8 meters and a minimum 85% transparency for any part of the fence above 1.5m in height, unless otherwise approved in writing by Council. An example is shown in the image below.</i></p> 	
<p>B Unless an alternate design is required under the recommendations of the approved noise impact assessment provide fencing in accordance with the approved Landscape Concept Plan - Fencing Plan.</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.</p>
<p><b>4. Acoustic Attenuation Measures</b></p>	
<p>A Construct the 1.8m high acoustic barrier arrangement on Lots 41-52. Provide the acoustic attenuation measures as specified in the Assessment and Control of Road Traffic Noise Intrusion report prepared by Acoustics RB Pty Ltd.</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development.</p>
<p>B Provide certification from a suitably qualified person that the 1.8m high acoustic barrier arrangement on Lots 41-52 has been constructed in accordance with the specifications of the Assessment and Control of Road Traffic Noise Intrusion report prepared by Acoustics RB Pty Ltd.</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development.</p>

CONDITION		TIMING
<b>5.</b>	<b>Entry Statement</b>	
	Establishment of any “Entry Statement” as a marketing strategy for the development must accord with the following, unless otherwise approved by Council: <ol style="list-style-type: none"> <li>1. Located within a privately owned allotment or on the boundary of a privately owned allotment;</li> <li>2. Limited to one (1) entry statement per development;</li> <li>3. Constructed of durable, weather resistant materials;</li> <li>4. Positively contributes to the character of the surrounding area; and</li> <li>5. Does not contain the logo of any developer or other entity.</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan).
<b>6.</b>	<b>Landscaping for Reconfiguring a Lot</b>	
A	Carry out landscaping and associated earthworks, site preparation and other necessary works in accordance with approved plans, details and technical specifications of any proposed planting or landscape work (both soft and hard works) where such works will be on land under the control of Council, whether as a park, reserve or road reserve. Landscaping is to accord with Planning scheme policy - Integrated design Appendix D - Landscaping.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
B	Before commencing the works obtain Operational Works approval for the plans, details and technical specifications of any planting or landscape work from Council.	Prior to work commencing on site.
<b>7.</b>	<b>Street Trees</b>	
	Provide street trees within the development in accordance with Planning scheme policy - Integrated design Appendix D - Landscaping and the approved Landscape Concept Plan.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>8.</b>	<b>Water and/or Sewerage</b>	
	Submit to Council a Certificate of Completion or Provisional Certificate of Completion (for each stage where there are stages) for the development from the Northern SEQ Distributor–Retailer Authority (Unitywater) confirming: <ol style="list-style-type: none"> <li>1. a reticulated water supply network connection is available to the land; and</li> <li>2. a sewerage network connection is available to the land; and</li> <li>3. all the requirements of Unitywater have been satisfied.</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>9.</b>	<b>New Telecommunications Infrastructure</b>	
A	Provide Fibre-Ready telecommunications infrastructure (pit and pipe) throughout the development in accordance with the Communication Alliance specifications contained within Industry Guideline G645:2011 Fibre Ready Pit and Pipe Specifications for Real Estate Development Projects or in accordance with the NBN Co. specifications contained within New Developments:	Prior to the development being accepted off maintenance.

CONDITION		TIMING
	Deployment of the NBN Co Conduit and Pit Network – Guidelines for Developers NBN-TE-CTO-194 and Creating Pit and Pipe Designs for New Developments (Job Aid for Developers) NBN-TE-CTO-586, as amended and current at the date of installation.	
B	Provide certification from a RPEQ electrical engineer that the works specified in (a) above have been installed and evidence that a telecommunications carrier licensed under the Telecommunications Act 1997 has agreed to take ownership of the infrastructure.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>10. Existing Service Connections</b>		
	Submit certification from a suitably qualified person that: <ol style="list-style-type: none"> <li>1. All of the existing service connections (electricity, telecommunications, water) to an existing building or a private property pole is wholly contained in the lot it serves; and</li> <li>2. Any electricity connections and infrastructure made redundant by the development is removed with the land reinstated.</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>11. Electricity</b>		
A	Provide evidence (e.g. Certificate for Electricity Supply to Subdividers with Agreement Number or Certificate of Supply) demonstrating that an electricity supply network has or will be constructed within all new roads and along the frontage of each proposed lot.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
B	Provide an underground electricity supply connection to each proposed lot.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
C	Submit certification from a licensed surveyor, Registered Professional Engineer of Queensland (RPEQ) or registered building surveyor that any electricity connections and infrastructure made redundant by the development is removed with the land reinstated.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
D	Ensure any padmount transformer located immediately adjacent to proposed public use land / open space is painted with a mural or has a film applied on all sides that integrates the infrastructure into the location of being adjacent to the open space. Concepts for the mural are to be approved by Council and align with the use of the adjoining land as open space or alternatively the	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each

CONDITION		TIMING
	<p>environmental values of the area e.g. koalas or a previous use of the land. An example is shown in the image below;</p> 	<p>respective stage of the development.</p>
<b>12. Smart Technology</b>		
A	<p>Ensure in the designing and construction of the new 22m wide north-south road in proposed Stages 2, provision is made for the installation of conduits (with draw wires) for electricity and telecommunications along the length of the new road for future smart poles (to accommodate potentially smart lighting, 5G, electric car charging and the like) in accordance with Council's requirements.</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.</p>
B	<p>Provide and deliver in the landscaping design of the proposed Local Park in proposed Stage 2, unless agreed to otherwise in writing by the Council;</p> <p>(i) the installation of conduits (with draw wires) for electricity and telecommunications extending from the new Living Residential road (in proposed Stage 2) to the playground required to be delivered in proposed Lot 1001 by other conditions of this approval and proposed Lot 1001 for future smart poles;</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for Stage 1A of the development.</p>
<b>13. Certify Lots are in Accordance with Approved Plan</b>		
	<p>Provide certification from a Licensed Surveyor that the lots created accord with the approved plan.</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.</p>
<b>14. Street Names</b>		
A	<p>Submit requests for the names of new street/s in accordance with Council's Policy 11-2150-038 Allocation of Road Names and Street Address Numbers or as amended;</p>	<p>Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.</p>
B	<p>Obtain approval from Council for the names of new streets in accordance with (A) above;</p>	<p>Prior to submitting to the Council any request for approval of a plan of</p>

CONDITION		TIMING
		subdivision (i.e. survey plan) for each respective stage of the development.
C	Erect approved street name boards on all new roads in accordance (A) and (B); and	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
D	Mark all street names on the survey plans.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>15. Payment of Rates</b>		
	Pay all outstanding rates and charges applicable to the subject land.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>16. Dedicated Road Access</b>		
	Provide dedicated constructed road access to the development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
<b>17. Develop in Stages</b>		
	Develop the site generally in accordance with the stages identified on the approved plans in consecutive order. Development must comply with each condition of the development approval as it relates to each stage, unless otherwise stated in the condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan).
<b>18. Remove /Demolition of Existing Buildings</b>		
	Remove / demolish all existing buildings located on the site.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan).

CONDITION		TIMING
<b>19.</b>	<b>Plan of Development</b>	
	Development must comply with the approved Plan of Development unless otherwise approved in writing by Council.	To be maintained at all times.
<b>20.</b>	<b>Advice to Purchasers Regarding Plan of Development</b>	
A	Acknowledge in writing that potential purchasers will be advised of the approved Plan of Development and the requirement to comply with the approved Plan of Development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
B	Provide potential purchasers with written notice of the approved Plan of Development and the requirement to comply with the approved Plan of Development.	Prior to entering into a contract of sale for the relevant lot.
<b>21.</b>	<b>Fauna Management Plan</b>	
A	Submit a Fauna Management Plan to reduce potential impacts on native fauna. The plan must be prepared by a suitably qualified person and contain at least the following information: <ol style="list-style-type: none"> <li>1. Procedures for dealing with fauna observed immediately prior to vegetation clearing;</li> <li>2. Procedures for dealing with fauna during vegetation clearing;</li> <li>3. Procedures for the treatment / removal of injured fauna from the site.</li> </ol>	Prior to works commencing on site.
B	Obtain approval from Council for the Fauna Management Plan in accordance with (A) above.	Prior to works commencing on site.
C	Carry out works in accordance with the approved Fauna Management Plan.	During site works and to be maintained.
<b>22.</b>	<b>No Net Loss of Fauna Habitat</b>	
	Development does not result in the net loss of fauna habitat. Where development does result in the loss of a Habitat Tree, development will provide replacement fauna nesting boxes at the following rate: <ol style="list-style-type: none"> <li>1. One (1) nest box for every hollow removed; or</li> <li>2. Where hollows have not yet formed in trees greater than 80cm in diameter at 1.3m height, three (3) nest boxes are required for every habitat tree removed.</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan).
B	Where development does result in the loss of a Habitat Tree, submit and obtain approval from Council for a nest box management plan with details of the proposed construction, installation methods and GPS location for each nest box for Council's records. The plan must be prepared in accordance with Council's Planning scheme policy - Environmental areas and corridors and by a suitably qualified person and include details of proposed maintenance and protocols for replacing fallen or broken nest boxes. Include any additional information that may be relevant such as:	Prior to any vegetation clearing.

CONDITION	TIMING
<ol style="list-style-type: none"> <li>1. Exact number of habitat trees and number of hollows to be impacted,</li> <li>2. Assessment of replacement hollows required as per 'No Net Loss of Fauna Habitat' condition requirements,</li> <li>3. Assessment of target species,</li> <li>4. Requirements for the target species,</li> <li>5. Nest box types - design and sizes,</li> <li>6. Installation technique,</li> <li>7. Proposed location of installed nest box including GPS location and owner's consent,</li> <li>8. Installation timeframes which provide for installation prior to the commencement of clearing wherever possible, otherwise within seven (7) days of clearing; and</li> <li>9. Monitoring and maintenance regime details, including protocols for replacing fallen or broken nest boxes.</li> </ol> <p><i>Note: Nest boxes must be maintained for a minimum of 12 months post installation.</i></p>	
<p>C If nest box installation is proposed within a Council park, provide written confirmation from Council's Coordinator Parks and Recreation Planning that Council agrees to the installation of the nest boxes within Council park.</p> <p><i>Note: The agreement may require the payment of a maintenance bond refundable after the satisfactory completion of the 12 months maintenance period.</i></p>	Prior to any vegetation clearing.
<p>D Provide a copy of written permission to enter Council Land from Council's Operations Technical Services team.</p>	Prior to any vegetation clearing.
<p><b>23. Vegetation Management Plan</b></p>	
<p>Submit a Vegetation Management Plan prepared by a suitably qualified person and in accordance with the Environmental areas and corridors - Planning scheme policy. The plan must include scaled plans and supporting documentation that provides for the following:</p> <ol style="list-style-type: none"> <li>1. Identification of trees to be removed during site works;</li> <li>2. Control measures, maintenance procedures and monitoring programs; and</li> <li>3. Weed control during construction; and</li> <li>4. Weed control in landscape areas.</li> </ol>	Prior to works commencing on site.
<p>B Obtain approval from Council for the Vegetation Management Plan in accordance with (A) above.</p>	Prior to works commencing on site.
<p>C Carry out works in accordance with the approved Vegetation Management Plan.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan).

CONDITION		TIMING
<b>24.</b>	<b>Extent of Vegetation Clearing</b>	
	Undertake vegetation clearing only in accordance with the approved Vegetation Management Plan. No additional clearing is permitted without prior consent from Council.	At all times
<b>25.</b>	<b>Disposal of Cleared Vegetation</b>	
	Chip, shred or tub grind cleared native vegetation and spread as mulch or dispose of at an authorised waste facility.  Any hollows observed in cleared vegetation must be salvaged and installed as nest boxes in trees within the property.	At all times.
<b>26.</b>	<b>Stockpiles of Construction and Landscaping Materials</b>	
	Locate any stockpiles of construction and landscaping materials and other site debris clear of drainage lines and clear of any position from which it could be washed onto any footpath, nature strip, roadway or into any drain, wetland or watercourse.	During site works.
<b>27.</b>	<b>Temporary Exclusion Fencing</b>	
	Delineate areas where vegetation is proposed to be retained with exclusion fencing to prevent accidental damage. Delineation and fencing is to be undertaken in accordance with Australian Standard 4970-2009 Protection of Trees on Development Sites.	While site works are occurring
<b>28.</b>	<b>Management of Wildlife</b>	
A	Carry out approved vegetation clearing under the supervision of a Fauna Spotter Catcher holding a valid Rehabilitation Permit from the relevant State Government Agency.	During vegetation clearing
B	Vegetation and rubble piles are not left to serve as a refuge for displaced or roaming wildlife through the implementation of the following measures: 1 immediately (within 12 hours) remove or destroy such materials; or old (>12 hours) piles of felled vegetation are treated as potential wildlife habitat and inspected by a fauna spotter catcher prior to removal or destruction.	As indicated
C	The type of equipment used is matched to the specific clearing task to minimise the risk of death or injury to fauna. Bulldozers are not to be used on any tree that may contain fauna or potential fauna habitat.	During vegetation clearing
D	Preserve valuable habitat features such as large fallen logs, log piles, rock piles or outcrops wherever practicable through the translocation and re-establishment in coordination with the wildlife spotter.	As indicated
<b>29.</b>	<b>Fauna Sensitive Lighting</b>	
	Outdoor lighting adjacent to Wildlife Corridor is to be in accordance with AS4282-1997 - (Control of the Obtrusive	Prior to commencement of use



CONDITION		TIMING
	Effects of Outdoor Lighting) and orientated away from the higher value habitats to avoid light spill after dusk or in the early mornings.  Lighting design and orientation is to utilise lights with low 'blue light' emissions, e.g. amber LED Luminaire and light curtain/blinker	and to be maintained at all times.
<b>30. Infrastructure Agreement</b>		
A	In accordance with Section 65(2)(c) of the <i>Planning Act 2016</i> , carry out development in accordance with, and comply with the obligations in, the executed <i>Infrastructure Agreement Caboolture West - Neighbourhood Development Precinct 1 (Combined NDP1 Developers) between Moreton Bay Regional Council between Moreton Bay Regional Council, ICP Caboolture Pty Ltd ACN 667 670 199 and Retmac Pty Ltd ACN 011 075 559 as Trustee Under Instrument 718 772 536, AVID Developments Pty Ltd, Baycrown Pty Ltd, Foreverlen Pty Ltd and Orchard (Craig Rd) Developments Pty Ltd.</i>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.
B	In accordance with Section 65(2)(c) of the <i>Planning Act 2016</i> , carry out development in accordance with, and comply with the obligations in, the executed <i>Infrastructure Agreement Caboolture West - Neighbourhood Development Precinct 1 (Foreverlen Pty Ltd) between Moreton Bay Regional Council and Foreverlen Pty Ltd.</i>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each respective stage of the development.

CONDITION		TIMING
<b>RECONFIGURING A LOT - All Stages</b>		
<b>DEVELOPMENT ENGINEERING</b>		
<b>31. Replace Existing Council Infrastructure</b>		
	Replace existing Council infrastructure (including but not limited to street trees and footpaths) that is damaged as part of works carried out in association with the development to Council's standards.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development.
<b>32. Alterations and Relocation of Existing Services</b>		
	Ensure any alteration or relocation in connection with or arising from the development to any service, installation, plant, equipment or other item belonging to or under the control of an entity engaged in the provision of public utility services is to be carried out with the development and at no cost to Council unless agreed to in writing by the Council.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development.

<b>33. Stormwater</b>		
	Carry out the development to ensure that adjoining properties, reserves and roads are protected from ponding or nuisance from stormwater as a result of any works undertaken.	To be maintained at all times.
<b>34. Pathways</b>		
	Construct, at no cost to Council, reinforced concrete pathways in accordance with the approved plans.  This condition has been imposed under section 145 of the <i>Planning Act 2016</i> .	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development.
<b>35. Certify complies Flood Plain Management Policy</b>		
A	Provide certification from a licensed Surveyor that all lots are flood free.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development .
B	For each stage with filling within the MBRC Medium or High Flood Hazard Overlay areas, submit calculations demonstrating that there has been no nett loss of flood storage through the detailed design and construction of the stage based on the flood model used in the 'Stormwater Management Plan - Caboolture West NDP1'.  The flood storage calculations are to be certified by a suitably qualified Registered Professional Engineer Queensland.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each respective stage of the development .
<b>RECONFIGURING A LOT - STAGE 1A</b>		
<b>DEVELOPMENT ENGINEERING</b>		
<b>36. Stormwater Management</b>		
A	Submit and have approved by Council, a development application for operational works for stormwater infrastructure to service the development.  Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.	Prior to commencement of works associated with this condition.
B	Construct stormwater infrastructure to service the development at no cost to Council and in accordance with the approved plans and documents of development.  This condition has been imposed under section 145 of the <i>Planning Act 2016</i> .	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	Provide registered easements in favour of Council over any drainage paths and drainage infrastructure within all new lot/s in	Prior to submitting to the Council any

	<p>accordance with the approved plans and documents of development.</p> <p>The easement documents must acknowledge the maintenance, repair and replacement responsibilities of the owner of this development site.</p> <p>Note: All easements are to be shown on plans submitted as part of operational works applications.</p>	request for approval of a plan of subdivision (i.e. a survey plan).
<b>37. New Council Roads</b>		
A	<p>Submit and have approved by Council, a development application for operational works for the following:</p> <p>All new roads and associated works. The following classifications are to be applied:</p> <ul style="list-style-type: none"> <li>• Modified Living Residential (16.5m wide) - from Lot 19 to 28, and 33 to 40.</li> <li>• Modified Living Residential Esplanade (15.0m wide) - from Lot 18 to 53.</li> </ul> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct, at no cost to Council and in accordance with the approved plans and documents of development the following:</p> <ol style="list-style-type: none"> <li>1. All new roads and associated works</li> </ol> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>46. Site Access Prohibited</b>		
	<p>Ensure vehicular access directly to and from the East West Road to Lots 50 to 53, Caboolture River Road to Lots 41 to 50, and the roundabout to Lots 53 to 54 is prohibited for traffic management and safety reasons.</p> <p>Note: A property condition will be attached to the affected lots to advise land owners of this restriction.</p>	To be maintained at all times.
<b>47. Shared Access Driveways - Lots 48 - 50</b>		
	<p>Design and construct a residential shared access driveway for Lots 48 - 50, in accordance with the approved plans and documents of development.</p> <p>The following are the minimum requirements:</p> <ol style="list-style-type: none"> <li>1. Design loading of <math>2.5 \times 10^3</math> Equivalent Standard Axles (ESA) for each lot entitled to use the driveway;</li> <li>2. Minimum sealed width must be 3.0m;</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

	<ol style="list-style-type: none"> <li>3. The construction must be reinforced concrete slabs or interlocking concrete pavers, unless approved otherwise;</li> <li>4. Appropriate longitudinal drainage, cross drainage and scour/erosion protection works must be provided;</li> <li>5. General maximum longitudinal grade must be 16%, unless approved otherwise;</li> <li>6. Install conduits for underground electricity supply and telecommunications including draw wires within and for the entire length of the access handle;</li> <li>7. Design and construct a driveway crossover from the constructed road to the site in accordance with MBRC Standard Drawing RS-049 &amp; RS-050.</li> </ol>	
<b>48. Temporary Turnarounds</b>		
A	<p>Submit and have approved by Council a development application for operational works for a sealed temporary turnaround at the end of new roads.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The turnaround is to be of a configuration that enables Council's standard waste collection vehicle to undertake a three point turn or better.</li> </ol>	Prior to commencement of works associated with this condition.
B	<p>Construct a sealed turnaround at the end of new roads, at no cost to Council and in accordance with approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>49. Earth Retaining Structures</b>		
A	<p>Design all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and MBRC Planning scheme current the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The minimum design life (the period assumed in design for which a structure or structural element is required to perform its intended purpose without replacement or major structural repairs) for the earth retaining structure that is specified in Table 3.1 of Australian Standard AS4678;</li> <li>2. Earth retaining structures within the land and around areas of cut on or near the boundaries of the site must be designed to allow for live and dead loads associated with the land/premise's current occupancy use;</li> <li>3. Where the adjoining land use rights or zoning allows for industrial uses a minimum live load of 25kPA must be allowed in the design of the retaining structure for these adjoining premises.</li> </ol>	Prior to commencement of works associated with this condition.

	4. Provide temporary safety fencing to all earth retaining structures over 1.0m in height.	
B	<p>Submit and have approved by Council, a development application for operational works for all earth retaining structures.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and they are to clearly show the location and overall configuration (fully dimensioned), design parameters and loads, materials and finishes of all earth retaining structures for the development.</p>	Prior to commencement of works associated with this condition.
C	Construct all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>50.</b>	<b>Existing Dams</b>	
A	<p>Drain, desilt, remove embankments of existing dams and fill the dam to reinstate the ground levels generally as they existed prior to the dam being constructed and in accordance with the plans and documents of development.</p> <p>The dam area is to be made free draining and stabilized to prevent erosion. Any filling required to ensure the area is free draining is to be carried out in accordance with Level 1 supervision as detailed in AS3798.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
B	Provide certification from a suitable geotechnical testing authority that filling has been conducted in accordance with AS3798.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>51.</b>	<b>Existing Driveway Crossover</b>	
	Remove completely all redundant driveway crossovers fronting the development site on Caboolture River Road. Reinstatement all disturbed areas (including kerb and channel) to Council's standards current at the time of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>52.</b>	<b>Minimum Flood Planning Level</b>	
A	<p>Submit and have approved by Council, a development application for operational works for earthworks associated with pad / allotment fill to the Council adopted Flood Planning Level (FPL) in accordance with the approved <b>stormwater management plan</b>.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme</p>	Prior to commencement of works associated with this condition.

	<p>current at the time of the operational works application.</p> <p>The FPL used for development can be obtained from the relevant section of the Flood Check Development Report available via Council's website: <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>.</p>	
B	Construct the pad / allotment levels, at no cost to Council and in accordance with the approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	Submit to Council As-Constructed drawings prepared by a Registered Surveyor, certifying that the development has been constructed in accordance this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>53. Refuse Collection - Bin Pads</b>		
	<p>Provide concrete bin pads with a minimum dimension of 1m<sup>2</sup> per bin along on the new internal road to service Lots 47, 48, 49, 50, and 51 in accordance with the approved plans and documents of development. The final location is to be clear of parking bays, driveways and street trees; and accessible to a left loading 12.5 metre long HRV.</p> <p>Note: A property note will be included on Council's electronic property system alerting future owners that bin pads have been provided for their use.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>RECONFIGURING A LOT - STAGE 1B</b>		
<b>DEVELOPMENT ENGINEERING</b>		
<b>54. Stormwater Management</b>		
A	<p>Submit and have approved by Council, a development application for operational works for stormwater infrastructure to service the development.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct stormwater infrastructure to service the development at no cost to Council and in accordance with the approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	<p>Provide registered easements in favour of Council over any drainage paths and drainage infrastructure within all new lot/s in accordance with the approved plans and documents of development.</p> <p>The easement documents must acknowledge the maintenance, repair and replacement responsibilities of the owner of this</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

	development site.  Note: All easements are to be shown on plans submitted as part of operational works applications.	
<b>55. New Council Roads</b>		
A	Submit and have approved by Council, a development application for operational works for the following:  All new roads and associated works. The following classifications are to be applied:  1. Modified Living Residential (16.5m wide) - between Lots 1 to 9. 2. Modified Living Residential Esplanade (15.0m wide) - between Lots 18 to 19.  Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.	Prior to commencement of works associated with this condition.
B	Construct, at no cost to Council and in accordance with the approved plans and documents of development the following:  1. All new roads and associated works  This condition has been imposed under section 145 of the <i>Planning Act 2016</i> .	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>56. Temporary Turnarounds</b>		
A	Submit and have approved by Council a development application for operational works for a sealed temporary turnaround at the end of new roads.  Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and the following:  1. The turnaround is to be of a configuration that enables Council's standard waste collection vehicle to undertake a three point turn or better.	Prior to commencement of works associated with this condition.
B	Construct a sealed turnaround at the end of new road, at no cost to Council and in accordance with approved plans and documents of development.  This condition has been imposed under section 145 of the <i>Planning Act 2016</i> .	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>57. Earth Retaining Structures</b>		
A	Design all earth retaining structures within private land in accordance with Australian Standards, Building Code	Prior to commencement of

	<p>requirements and MBRC Planning scheme current the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The minimum design life (the period assumed in design for which a structure or structural element is required to perform its intended purpose without replacement or major structural repairs) for the earth retaining structure that is specified in Table 3.1 of Australian Standard AS4678;</li> <li>2. Earth retaining structures within the land and around areas of cut on or near the boundaries of the site must be designed to allow for live and dead loads associated with the land/premise's current occupancy use;</li> <li>3. Provide temporary safety fencing to all earth retaining structures over 1.0m in height.</li> </ol>	works associated with this condition.
B	<p>Submit and have approved by Council, a development application for operational works for all earth retaining structures.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and they are to clearly show the location and overall configuration (fully dimensioned), design parameters and loads, materials and finishes of all earth retaining structures for the development.</p>	Prior to commencement of works associated with this condition.
C	<p>Construct all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and approved plans and documents of development.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>58. Existing Dams</b>		
A	<p>Drain, desilt, remove embankments of existing dams and fill the dam to reinstate the ground levels generally as they existed prior to the dam being constructed and in accordance with the plans and documents of development.</p> <p>The dam area is to be made free draining and stabilized to prevent erosion. Any filling required to ensure the area is free draining is to be carried out in accordance with Level 1 supervision as detailed in AS3798.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
B	<p>Provide certification from a suitable geotechnical testing authority that filling has been conducted in accordance with AS3798.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>59. Minimum Flood Planning Level</b>		
A	<p>Submit and have approved by Council, a development application for operational works for earthworks associated with pad / allotment fill to the Council adopted Flood Planning Level</p>	Prior to commencement of



	<p>(FPL) in accordance with the approved stormwater management plan.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p> <p>The FPL used for development can be obtained from the relevant section of the Flood Check Development Report available via Council's website: <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>.</p>	works associated with this condition.
B	Construct the pad / allotment levels, at no cost to Council and in accordance with the approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	Submit to Council As-Constructed drawings prepared by a Registered Surveyor, certifying that the development has been constructed in accordance this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>RECONFIGURING A LOT - STAGE 2</b>		
<b>DEVELOPMENT ENGINEERING</b>		
<b>60.</b>	<b>Stormwater Management</b>	
A	<p>Submit and have approved by Council, a development application for operational works for stormwater infrastructure to service the development.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct stormwater infrastructure to service the development at no cost to Council and in accordance with the approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	<p>Provide registered easements in favour of Council over any drainage paths and drainage infrastructure within all new lot/s in accordance with the approved plans and documents of development.</p> <p>The easement documents must acknowledge the maintenance, repair and replacement responsibilities of the owner of this development site.</p> <p>Note: All easements are to be shown on plans submitted as part of operational works applications.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

<b>61.</b>	<b>New Council Roads</b>	
A	<p>Submit and have approved by Council, a development application for operational works for the following:</p> <p>All new roads and associated works. The following classifications are to be applied:</p> <ul style="list-style-type: none"> <li>• Modified Contemporary Residential (22.0m wide) - between Lots 107 to 117.</li> <li>• Modified Living Residential (16.5m wide) - between Lots 90 to 102, and 90 to 117.</li> </ul> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct, at no cost to Council and in accordance with the approved plans and documents of development the following:</p> <ol style="list-style-type: none"> <li>1. All new roads and associated works.</li> </ol> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>62.</b>	<b>Site Access Prohibited</b>	
	<p>Ensure vehicular access directly to and from the East West Road to Lots 103 to 107 is prohibited for traffic management and safety reasons.</p> <p>Note: A property condition will be attached to the affected lots to advise land owners of this restriction.</p>	To be maintained at all times.
<b>63.</b>	<b>Shared Access Driveways - Lots 105 - 107</b>	
	<p>Design and construct a residential shared access driveway for Lots 105 - 107, in accordance with the approved plans and documents of development.</p> <p>The following are the minimum requirements:</p> <ol style="list-style-type: none"> <li>1. Design loading of <math>2.5 \times 10^3</math> Equivalent Standard Axles (ESA) for each lot entitled to use the driveway;</li> <li>2. Minimum sealed width must be 3.0m;</li> <li>3. The construction must be reinforced concrete slabs or interlocking concrete pavers, unless approved otherwise;</li> <li>4. Appropriate longitudinal drainage, cross drainage and scour/erosion protection works must be provided;</li> <li>5. General maximum longitudinal grade must be 16%, unless approved otherwise;</li> <li>6. Install conduits for underground electricity supply and telecommunications including draw wires within and for the entire length of the access handle;</li> <li>7. Design and construct a driveway crossover from the constructed road to the site in accordance with MBRC Standard Drawing RS-049 &amp; RS-050.</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>64.</b>	<b>Temporary Turnarounds</b>	

A	<p>Submit and have approved by Council a development application for operational works for a sealed turnaround at the end of new roads.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The turnaround is to be of a configuration that enables Council's standard waste collection vehicle to undertake a three point turn or better.</li> </ol>	Prior to commencement of works associated with this condition.
B	<p>Construct a sealed turnaround at the end of new roads, at no cost to Council and in accordance with approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>65. Earth Retaining Structures</b>		
A	<p>Design all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and MBRC Planning scheme current the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The minimum design life (the period assumed in design for which a structure or structural element is required to perform its intended purpose without replacement or major structural repairs) for the earth retaining structure that is specified in Table 3.1 of Australian Standard AS4678;</li> <li>2. Earth retaining structures within the land and around areas of cut on or near the boundaries of the site must be designed to allow for live and dead loads associated with the land/premise's current occupancy use;</li> <li>3. Where the adjoining land use rights or zoning allows for industrial uses a minimum live load of 25kPA must be allowed in the design of the retaining structure for these adjoining premises.</li> <li>4. Provide temporary safety fencing to all earth retaining structures over 1.0m in height.</li> </ol>	Prior to commencement of works associated with this condition.
B	<p>Submit and have approved by Council, a development application for operational works for all earth retaining structures.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and they are to clearly show the location and overall configuration (fully dimensioned), design parameters and loads, materials and finishes of all earth retaining structures for the development.</p>	Prior to commencement of works associated with this condition.

C	Construct all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>66. Existing Dams</b>		
A	Drain, desilt, remove embankments of existing dams and fill the dam to reinstate the ground levels generally as they existed prior to the dam being constructed and in accordance with the plans and documents of development.  The dam area is to be made free draining and stabilized to prevent erosion. Any filling required to ensure the area is free draining is to be carried out in accordance with Level 1 supervision as detailed in AS3798.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
B	Provide certification from a suitable geotechnical testing authority that filling has been conducted in accordance with AS3798.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>67. Minimum Flood Planning Level</b>		
A	Submit and have approved by Council, a development application for operational works for earthworks associated with pad / allotment fill to the Council adopted Flood Planning Level (FPL).  Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.  The FPL used for development can be obtained from the relevant section of the Flood Check Development Report available via Council's website: <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a> .	Prior to commencement of works associated with this condition.
B	Construct the pad / allotment levels, at no cost to Council and in accordance with the approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	Submit to Council As-Constructed drawings prepared by a Registered Surveyor, certifying that the development has been constructed in accordance this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>68. Refuse Collection - Bin Pads</b>		
	Provide concrete bin pads with a minimum dimension of 1m2 per bin along the new internal roads to service Lots 105 and 107 in accordance with the approved plans and documents of development. The final location is to be clear of parking bays,	Prior to submitting to the Council any request for approval of

	<p>driveways and street trees; and accessible to a left loading 12.5 metre long HRV.</p> <p>Note: A property note will be included on Council's electronic property system alerting future owners that bin pads have been provided for their use.</p>	a plan of subdivision (i.e. a survey plan).
<b>RECONFIGURING A LOT - STAGE 3</b>		
<b>DEVELOPMENT ENGINEERING</b>		
<b>69.</b>	<b>Stormwater Management</b>	
A	<p>Submit and have approved by Council, a development application for operational works for stormwater infrastructure to service the development.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct stormwater infrastructure to service the development at no cost to Council and in accordance with the approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	<p>Provide registered easements in favour of Council over any drainage paths and drainage infrastructure within all new lot/s in accordance with the approved plans and documents of development.</p> <p>The easement documents must acknowledge the maintenance, repair and replacement responsibilities of the owner of this development site.</p> <p>Note: All easements are to be shown on plans submitted as part of operational works applications.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>70.</b>	<b>New Council Roads</b>	
A	<p>Submit and have approved by Council, a development application for operational works for the following:</p> <p>All new roads and associated works. The following classifications are to be applied:</p> <ul style="list-style-type: none"> <li>• Modified Living Residential (16.5m wide) - between Lots 83 to 168, and Lots 88 to 55.</li> <li>• Modified Living Residential Esplanade (15.0m wide) - between 58 to 86.</li> </ul> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme</p>	Prior to commencement of works associated with this condition.

	current at the time of the operational works application.	
B	<p>Construct, at no cost to Council and in accordance with the approved plans and documents of development the following:</p> <ol style="list-style-type: none"> <li>All new roads and associated works</li> </ol> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>71.</b>	<b>Shared Access Driveways - 56 - 57 and 79 - 80</b>	
	<p>Design and construct a residential shared access driveway for Lots 56 - 57 and 79 - 80, in accordance with the approved plans and documents of development.</p> <p>The following are the minimum requirements:</p> <ol style="list-style-type: none"> <li>Design loading of <math>2.5 \times 10^3</math> Equivalent Standard Axles (ESA) for each lot entitled to use the driveway;</li> <li>Minimum sealed width must be 3.0m;</li> <li>The construction must be reinforced concrete slabs or interlocking concrete pavers, unless approved otherwise;</li> <li>Appropriate longitudinal drainage, cross drainage and scour/erosion protection works must be provided;</li> <li>General maximum longitudinal grade must be 16%, unless approved otherwise;</li> <li>Install conduits for underground electricity supply and telecommunications including draw wires within and for the entire length of the access handle;</li> <li>Design and construct a driveway crossover from the constructed road to the site in accordance with MBRC Standard Drawing RS-049 &amp; RS-050.</li> </ol>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>72.</b>	<b>Site Access Prohibited</b>	
	<p>Ensure vehicular access directly to and from the East Wes Road to Lots 55 to 57, and from the new 22.0m wide road to Lots 57, 68 to 75, and 80 to 81 is prohibited for traffic management and safety reasons.</p> <p>Note: A property condition will be attached to the affected lots to advise land owners of this restriction.</p>	To be maintained at all times.
<b>73.</b>	<b>Turnarounds</b>	
A	<p>Submit and have approved by Council a development application for operational works for a sealed turnaround at the end of new roads.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and the following:</p>	Prior to commencement of works associated with this condition.

	1. The turnaround is to be of a configuration that enables Council's standard waste collection vehicle to undertake a three point turn or better.	
B	Construct a sealed turnaround at the end of new roads, at no cost to Council and in accordance with approved plans and documents of development.  This condition has been imposed under section 145 of the <i>Planning Act 2016</i> .	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>74. Earth Retaining Structures</b>		
A	Design all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and MBRC Planning scheme current the time of the operational works application and the following:  1. The minimum design life (the period assumed in design for which a structure or structural element is required to perform its intended purpose without replacement or major structural repairs) for the earth retaining structure that is specified in Table 3.1 of Australian Standard AS4678; 2. Earth retaining structures within the land and around areas of cut on or near the boundaries of the site must be designed to allow for live and dead loads associated with the land/premise's current occupancy use; 3. Provide temporary safety fencing to all earth retaining structures over 1.0m in height.	Prior to commencement of works associated with this condition.
B	Submit and have approved by Council, a development application for operational works for all earth retaining structures.  Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and they are to clearly show the location and overall configuration (fully dimensioned), design parameters and loads, materials and finishes of all earth retaining structures for the development.	Prior to commencement of works associated with this condition.
C	Construct all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>75. Existing Dams</b>		
A	Drain, desilt, remove embankments of existing dams and fill the dam to reinstate the ground levels generally as they existed prior to the dam being constructed and in accordance with the plans and documents of development.  The dam area is to be made free draining and stabilized to prevent erosion. Any filling required to ensure the area is free	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

	draining is to be carried out in accordance with Level 1 supervision as detailed in AS3798.	
B	Provide certification from a suitable geotechnical testing authority that filling has been conducted in accordance with AS3798.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>76.</b>	<b>Minimum Flood Planning Level</b>	
A	<p>Submit and have approved by Council, a development application for operational works for earthworks associated with pad / allotment fill to the Council adopted Flood Planning Level (FPL) in accordance with the approved <b>stormwater management plan</b>.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p> <p>The FPL used for development can be obtained from the relevant section of the Flood Check Development Report available via Council's website: <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>.</p>	Prior to commencement of works associated with this condition.
B	Construct the pad / allotment levels, at no cost to Council and in accordance with the approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	Submit to Council As-Constructed drawings prepared by a Registered Surveyor, certifying that the development has been constructed in accordance this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>77.</b>	<b>Refuse Collection - Bin Pads</b>	
	<p>Provide concrete bin pads with a minimum dimension of 1m2 per bin along new internal road to service Lots 56, 57, 79 &amp; 80 in accordance with the approved plans and documents of development. The final location is to be clear of parking bays, driveways and street trees; and accessible to a left loading 12.5 metre long HRV.</p> <p>Note: A property note will be included on Council's electronic property system alerting future owners that bin pads have been provided for their use.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

<b>CONDITION</b>	<b>TIMING</b>
<b>RECONFIGURING A LOT - STAGE 4</b>	
<b>DEVELOPMENT ENGINEERING</b>	



	<b>78. Stormwater Management</b>	
A	<p>Submit and have approved by Council, a development application for operational works for stormwater infrastructure to service the development.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct stormwater infrastructure to service the development at no cost to Council and in accordance with the approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	<p>Provide registered easements in favour of Council over any drainage paths and drainage infrastructure within all new lot/s in accordance with the approved plans and documents of development.</p> <p>The easement documents must acknowledge the maintenance, repair and replacement responsibilities of the owner of this development site.</p> <p>Note: All easements are to be shown on plans submitted as part of operational works applications.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
	<b>79. New Council Roads</b>	
A	<p>Submit and have approved by Council, a development application for operational works for the following:</p> <p>All new roads and associated works. The following classifications are to be applied:</p> <ol style="list-style-type: none"> <li>1. Modified Living Residential (16.5m wide) - between Lots 143 to 163, 144 to 152, and 173 to 179.</li> <li>2. Modified Living Residential Esplanade (15.0m wide) - between Lots 169 to 180.</li> </ol> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p>	Prior to commencement of works associated with this condition.
B	<p>Construct, at no cost to Council and in accordance with the approved plans and documents of development the following:</p> <ol style="list-style-type: none"> <li>1. All new roads and associated works.</li> </ol> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

	<b>80. Turnarounds</b>	
A	<p>Submit and have approved by Council a development application for operational works for a sealed turnaround at the end of new roads.</p> <p>Design drawings are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The turnaround is to be of a configuration that enables Council's standard waste collection vehicle to undertake a three point turn or better.</li> </ol>	Prior to commencement of works associated with this condition.
B	<p>Construct a sealed turnaround at the end of new roads, at no cost to Council and in accordance with approved plans and documents of development.</p> <p>This condition has been imposed under section 145 of the <i>Planning Act 2016</i>.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
	<b>81. Earth Retaining Structures</b>	
A	<p>Design all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and MBRC Planning scheme current the time of the operational works application and the following:</p> <ol style="list-style-type: none"> <li>1. The minimum design life (the period assumed in design for which a structure or structural element is required to perform its intended purpose without replacement or major structural repairs) for the earth retaining structure that is specified in Table 3.1 of Australian Standard AS4678;</li> <li>2. Earth retaining structures within the land and around areas of cut on or near the boundaries of the site must be designed to allow for live and dead loads associated with the land/premise's current occupancy use;</li> <li>3. Provide temporary safety fencing to all earth retaining structures over 1.0m in height.</li> </ol>	Prior to commencement of works associated with this condition.
B	<p>Submit and have approved by Council, a development application for operational works for all earth retaining structures.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application and they are to clearly show the location and overall configuration (fully dimensioned), design parameters and loads, materials and finishes of all earth retaining structures for the development.</p>	Prior to commencement of works associated with this condition.
C	<p>Construct all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and approved plans and documents of development.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

<b>82.</b>	<b>Existing Dams</b>	
A	<p>Drain, desilt, remove embankments of existing dams and fill the dam to reinstate the ground levels generally as they existed prior to the dam being constructed and in accordance with the plans and documents of development.</p> <p>The dam area is to be made free draining and stabilized to prevent erosion. Any filling required to ensure the area is free draining is to be carried out in accordance with Level 1 supervision as detailed in AS3798.</p>	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
B	Provide certification from a suitable geotechnical testing authority that filling has been conducted in accordance with AS3798.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
<b>83.</b>	<b>Minimum Flood Planning Level</b>	
A	<p>Submit and have approved by Council, a development application for operational works for earthworks associated with pad / allotment fill to the Council adopted Flood Planning Level (FPL) in accordance with the approved <b>stormwater management plan</b>.</p> <p>Design drawing are to be prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ) and in accordance with the approved plans and documents of development and the MBRC Planning Scheme current at the time of the operational works application.</p> <p>The FPL used for development can be obtained from the relevant section of the Flood Check Development Report available via Council's website: <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>.</p>	Prior to commencement of works associated with this condition.
B	Construct the pad / allotment levels, at no cost to Council and in accordance with the approved plans and documents of development.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
C	Submit to Council As-Constructed drawings prepared by a Registered Surveyor, certifying that the development has been constructed in accordance this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

## ADVICES

<b>1.</b>	<b>Aboriginal Cultural Heritage Act 2003</b>
	<p>The <i>Aboriginal Cultural Heritage Act 2003</i> commenced in Queensland on April 16, 2004. The Act provides blanket protection of Aboriginal cultural heritage sites and places, including significant areas and objects, as well as archaeological remains. The Act also recognises that Aboriginal cultural heritage parties are key stakeholders in the assessment and management of Aboriginal cultural heritage.</p> <p>Under the Act, if a proposed activity involves disturbance of the ground surface, cultural</p>

<b>ADVICES</b>	
	<p>heritage Duty of Care must be considered. This involves consideration of whether an activity is <i>likely</i> to harm Aboriginal cultural heritage. This may require involvement from the relevant Aboriginal cultural heritage party.</p> <p>Cultural heritage Duty of Care compliance ultimately lies with the person or entity conducting the activity, and penalty provisions apply for failing to fulfil this Duty of Care.</p> <p>Council strongly advises that before undertaking the land use activity, you refer to the <a href="#">cultural heritage duty of care - Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)</a> for further information regarding the responsibilities of the developer.</p>
<b>2.</b>	<b>Adopted Charges</b>
	<p>Payment of an Adopted Infrastructure Charge in accordance with Council's Charges Resolution (No. 10) commencing 5 October 2022 or as amended apply to this development approval.</p> <p>From 1 July 2014, Moreton Bay Regional Council no longer issues an Infrastructure Charges Notice on behalf of Unitywater for water supply and sewerage networks and therefore a separate Infrastructure Charges Notice may be issued directly to the applicant by Unitywater in respect to this development approval. Payment of Infrastructure Charges is to be in accordance with the Infrastructure Charges Notice issued with this development approval and any Infrastructure Charges Notice issued by Unitywater.</p> <p>From 1 July 2014, all Infrastructure Charges for infrastructure networks controlled by Unitywater (eg. water and/or sewerage) regardless of when the Infrastructure Charges Notice was issued are to be paid directly to Unitywater while Infrastructure Charges for networks controlled by Moreton Bay Regional Council will continue to be paid directly to Moreton Bay Regional Council.</p>
<b>3.</b>	<b>Biosecurity Act 2014 - Fire Ant Control</b>
	<p>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.</p> <p>More information is available on <a href="https://www.fireants.org.au/treat/business-and-industry/movement-controls">https://www.fireants.org.au/treat/business-and-industry/movement-controls</a></p>

<b>PROPERTY NOTES</b>	
<b>1.</b>	<b>DS01 Siting Requirements</b>
	<p>The following property note will be attached to Council's database for Lot 2-17, 20-31, 33-36, 38-49, 51-56, 59-63, 67-76, 79-83, 86-101, 104-106, 109-118, 120-129, 132-138, 140, 142, 143, 146-159, 161-163, 166-177 and 180: <a href="#">These lot references need to be checked.</a></p> <p><i>"A plan has been approved by Council for this lot identifying how and/or where development on this lot is to occur. Any development on this lot must be in accordance with the approved plan and associated conditions.</i></p>

<b>PROPERTY NOTES</b>	
	<i>Further details can be found in the development permit creating the lot or the development approval for the use, and the associated Council report (Delegated or Council Meeting) or approval letter. This information is available through the PD Online facility on Council's website <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>."</i>
<b>2.</b>	<b>DS05 Site Access - Prohibited Location</b>
	<p>The following property note will be attached to Council's database for Lots 50-57 and 103-107:</p> <p><i>"Vehicular access to this lot directly from the new "East West Road" is prohibited for traffic management and safety reasons.</i></p> <p><i>Further details can be found in the development permit creating the lot or the development approval for the use, and the associated Council report (Delegated or Council Meeting) or approval letter. This information is available through the PD Online facility on Council's website <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>."</i></p>
<b>3.</b>	<b>DS05 Site Access - Prohibited Location</b>
	<p>The following property note will be attached to Council's database for Lot 41-50:</p> <p><i>"Vehicular access to this lot directly from Caboolture River Road is prohibited for traffic management and safety reasons."</i></p> <p><i>Further details can be found in the development permit creating the lot or the development approval for the use, and the associated Council report (Delegated or Council Meeting) or approval letter. This information is available through the PD Online facility on Council's website <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>."</i></p>
<b>4.</b>	<b>DS07 Additional Development Requirements - Bin Pads</b>
	<p>The following property note will be attached to Council's database for Lots 47 to 50, 55 to 56, 79 to 80 and 105 to 107:</p> <p><i>"Additional development requirements apply to this lot. Any development on this lot must be in accordance with the approved plan and associated conditions.</i></p> <p><i>Further details can be found in the development permit creating the lot or the development approval for the use, and the associated Council report (Delegated or Council Meeting) or approval letter. This information is available through the PD Online facility on Council's website <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>."</i></p>
<b>5.</b>	<b>DS08 Acoustic Advice</b>
	<p>The following property note will be attached to Council's database for Lots 29-54:</p> <p><i>"It is required that any residential development on this lot be designed and constructed in accordance with the relevant acoustic design and construction standards, or the specific requirements approved in any acoustic report.</i></p> <p><i>Further details can be found in the development permit creating the lot or the development approval for the use, and the associated Council report (Delegated or Council Meeting) or approval letter. This information is available through the PD Online facility on Council's website <a href="http://www.moretonbay.qld.gov.au">www.moretonbay.qld.gov.au</a>."</i></p>

**ATTACHMENT 3**

**Approved Plans / Documents**

**LEGEND**

- SITE BOUNDARY
- - - APPLICATION BOUNDARY
- - - STAGE BOUNDARY
- LOCAL PARK RECREATION
- GREEN NETWORK
- Removed Reference to Commercial Lots  
Annotated by Council 23/08/2023

**YIELD SUMMARY**

<b>21m DEEP LOTS</b>		
<span style="color: pink;">■</span> 16.0m - PREMIUM COURTYARD		2
<b>28m DEEP LOTS</b>		
<span style="color: orange;">■</span> 10.5m - VILLA		3
<span style="color: yellow;">■</span> 12.5m - PREMIUM VILLA		11
<span style="color: lightorange;">■</span> 14.0m - COURTYARD		7
<span style="color: yelloworange;">■</span> 16.0m - PREMIUM COURTYARD		15
<span style="color: lightyellow;">■</span> 18.0m - PREMIUM TRADITIONAL		13
<b>30m DEEP LOTS</b>		
<span style="color: cyan;">■</span> 16.0m - CAR PARK		1
<span style="color: lightcyan;">■</span> 18.0m - SALES OFFICE / CAR PARK		2
<span style="color: bluegrey;">■</span> 10.5m - VILLA		5
<span style="color: bluegrey;">■</span> 12.5m - PREMIUM VILLA		60
<span style="color: bluegrey;">■</span> 14.0m - COURTYARD		25
<span style="color: lightblue;">■</span> 16.0m - PREMIUM COURTYARD		5
<span style="color: lightblue;">■</span> 18.0m - PREMIUM TRADITIONAL		5
<b>32m DEEP LOTS</b>		
<span style="color: brown;">■</span> 10.5m - VILLA		2
<span style="color: brown;">■</span> 12.5m - PREMIUM VILLA		12
<span style="color: brown;">■</span> 14.0m - COURTYARD		6
<span style="color: brown;">■</span> 16.0m - PREMIUM COURTYARD		2
<span style="color: brown;">■</span> 18.0m - PREMIUM TRADITIONAL		3
<b>TOTAL</b>		<b>179</b>

**PARKING**

Total Visitor Parking Spaces	158
Total Lots	179





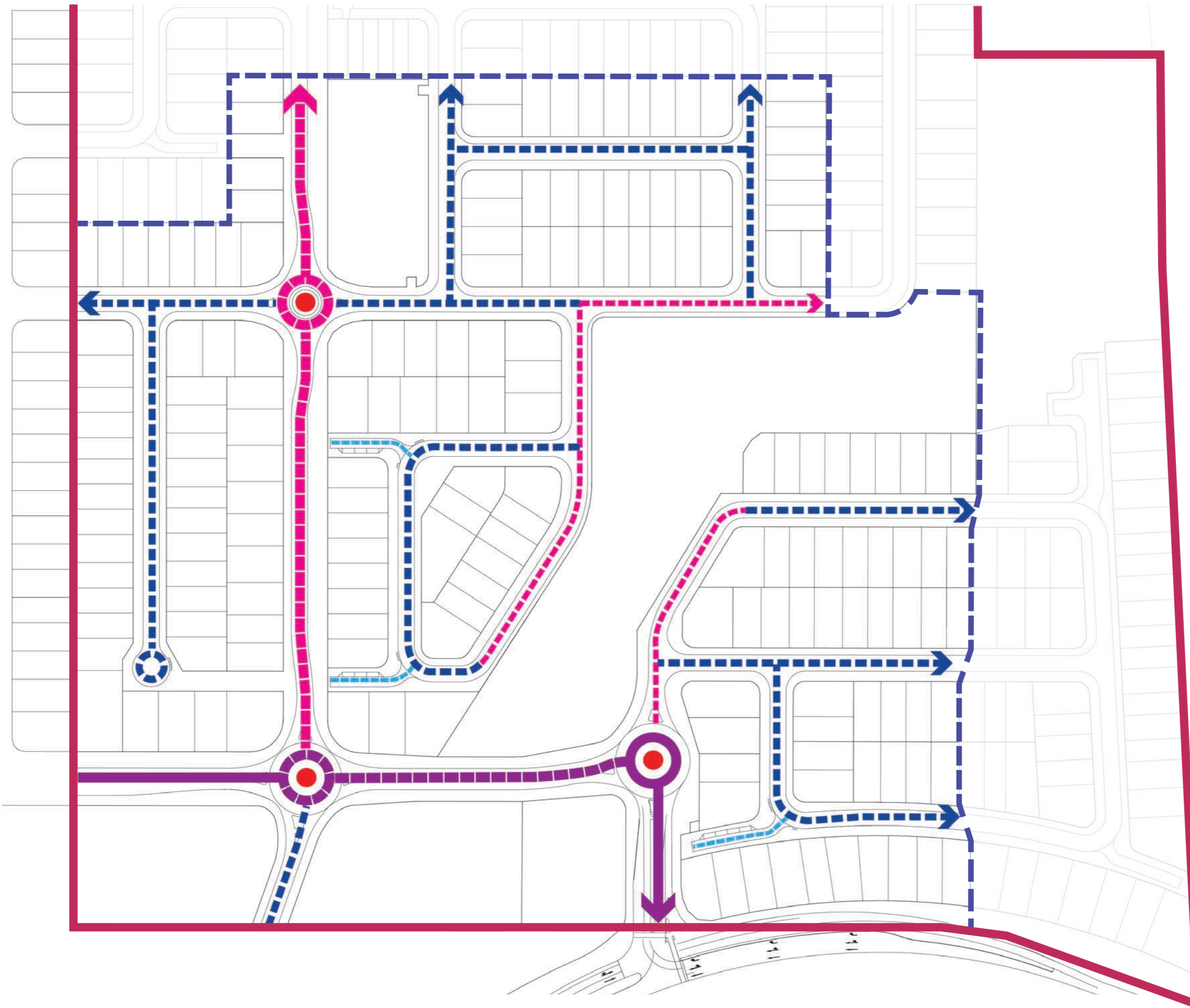
**LEGEND**

- SITE BOUNDARY
- APPLICATION BOUNDARY
- LOCAL PARK RECREATION
- GREEN NETWORK Removed Reference to Commercial Lots Annotated by Council 23/08/2023
- DUPLEX LOTS
- INDICATIVE CAR PARK LOCATION  
(Parking Bay Dimensions - 5.4m x 2.1m)
- RECOMMENDED BUILD TO BOUNDARY WALL
- OPTIONAL BUILD TO BOUNDARY WALL
- INDICATIVE LOCATION OF DRIVEWAYS

**YIELD SUMMARY**

<b>21m DEEP LOTS</b>		
<span style="background-color: #FFC0CB; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 16.0m - PREMIUM COURTYARD		2
<b>28m DEEP LOTS</b>		
<span style="background-color: #FFDAB9; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 10.5m - VILLA		3
<span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 12.5m - PREMIUM VILLA		11
<span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 14.0m - COURTYARD		7
<span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 16.0m - PREMIUM COURTYARD		15
<span style="background-color: #FFD700; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 18.0m - PREMIUM TRADITIONAL		13
<b>30m DEEP LOTS</b>		
<span style="background-color: #ADD8E6; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 16.0m - CAR PARK		1
<span style="background-color: #ADD8E6; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 18.0m - SALES OFFICE / CAR PARK		2
<span style="background-color: #4682B4; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 10.5m - VILLA		5
<span style="background-color: #4682B4; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 12.5m - PREMIUM VILLA		60
<span style="background-color: #4682B4; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 14.0m - COURTYARD		25
<span style="background-color: #ADD8E6; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 16.0m - PREMIUM COURTYARD		5
<span style="background-color: #ADD8E6; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 18.0m - PREMIUM TRADITIONAL		5
<b>32m DEEP LOTS</b>		
<span style="background-color: #8B4513; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 10.5m - VILLA		2
<span style="background-color: #8B4513; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 12.5m - PREMIUM VILLA		12
<span style="background-color: #8B4513; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 14.0m - COURTYARD		6
<span style="background-color: #8B4513; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 16.0m - PREMIUM COURTYARD		2
<span style="background-color: #8B4513; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> 18.0m - PREMIUM TRADITIONAL		3
<b>TOTAL</b>		<b>179</b>
<b>PARKING</b>		
Total Visitor Parking Spaces	158	
Total Lots	179	





LEGEND	
	Site Boundary
	Application Boundary
	26.8m Wide Road
	22m Wide Road
	22m Wide Road
	16.5m Wide Road
	15.0m Wide Road
	12m Wide Road
	Roundabout Intersection



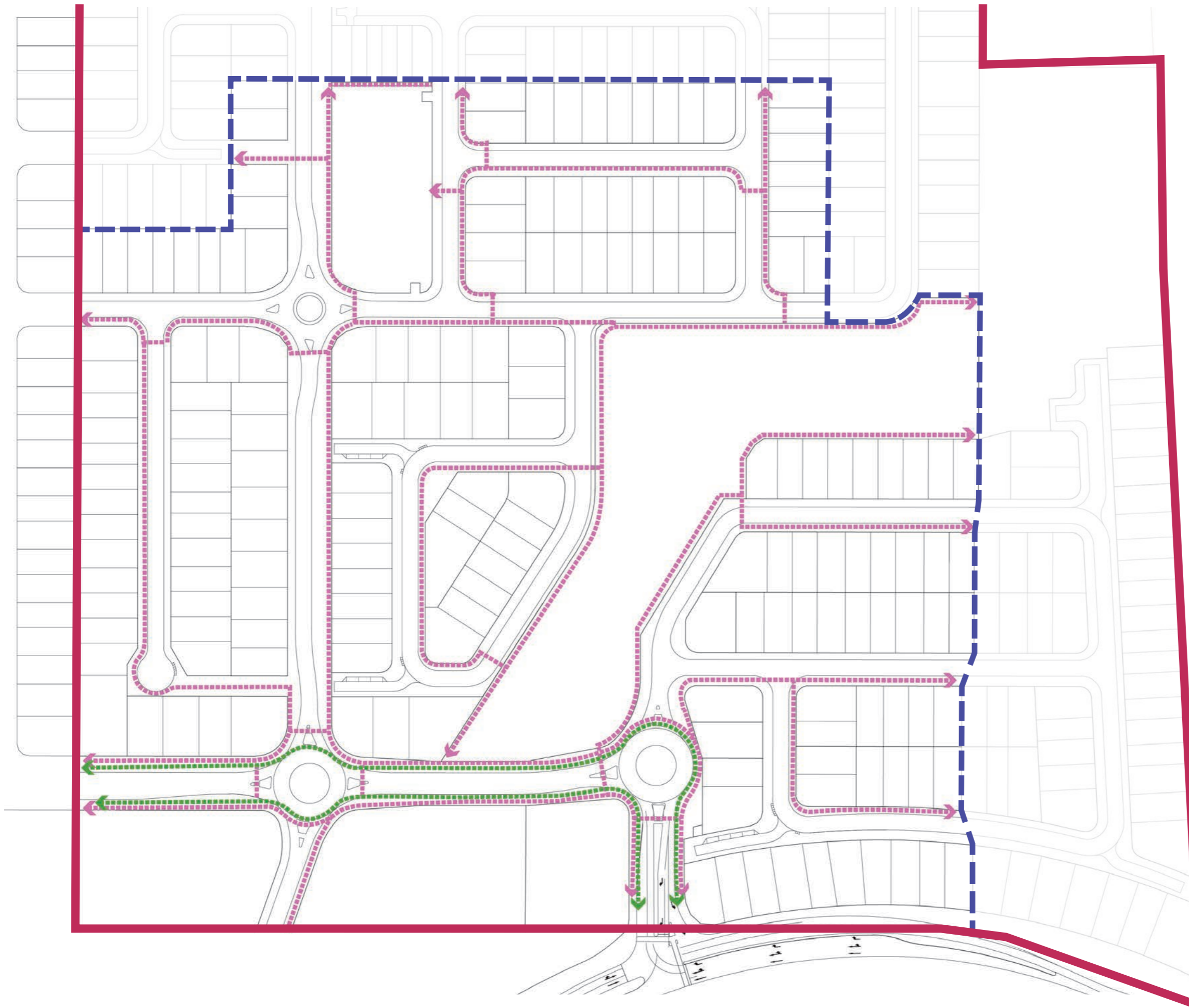
**CABOOLTURE WEST**  
ROAD NETWORK HIERARCHY





Approved Subject to Conditions of Decision Notice DA/2021/4669

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DATE: 17.02.2023  
 JOB NO: ND1577  
 DWG NO: RH-01  
 REV: 14  
 23/08/2023



LEGEND	
	Site Boundary
	Application Boundary
	2.0m Wide Cycle Lane
	2.0m Wide Shared Path

**NOTES:**  
 1. Pathway location and all crossings are subject to change through design development.

# REPORT

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



PREPARED FOR FOREVERLEN PTY LTD

**QUALITY ASSURANCE STATEMENT**

TASK	NAME	SIGNATURE
Project Manager	Ryan Ashworth	
Prepared by	Nathan Eremenco	<i>Nathan Eremenco</i>
Reviewed by	Matthew Starr	<i>Matthew Starr</i>
Approved for Issue by	Daniel Yates	<i>D. Yates</i>

**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.

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- Appendix A Concept Drawings
- Appendix B Temporary Diversion Drain Calculations
- Appendix C MUSIC Modelling Details
- Appendix D Flood Plans
- Appendix E IDC Culvert Blockage Assessment



# 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.

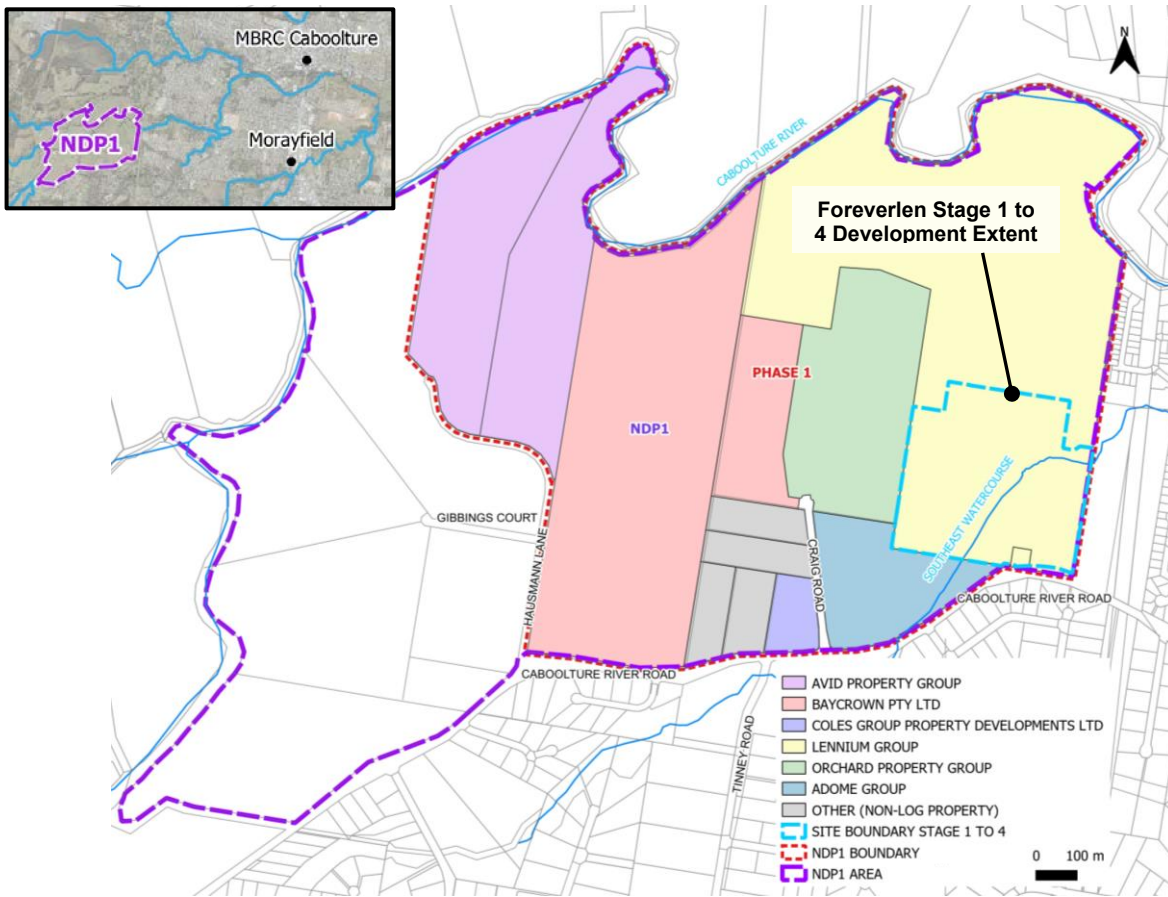


Figure 2.1: Site, NDP1 & Phase 1 Study Area Location

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.

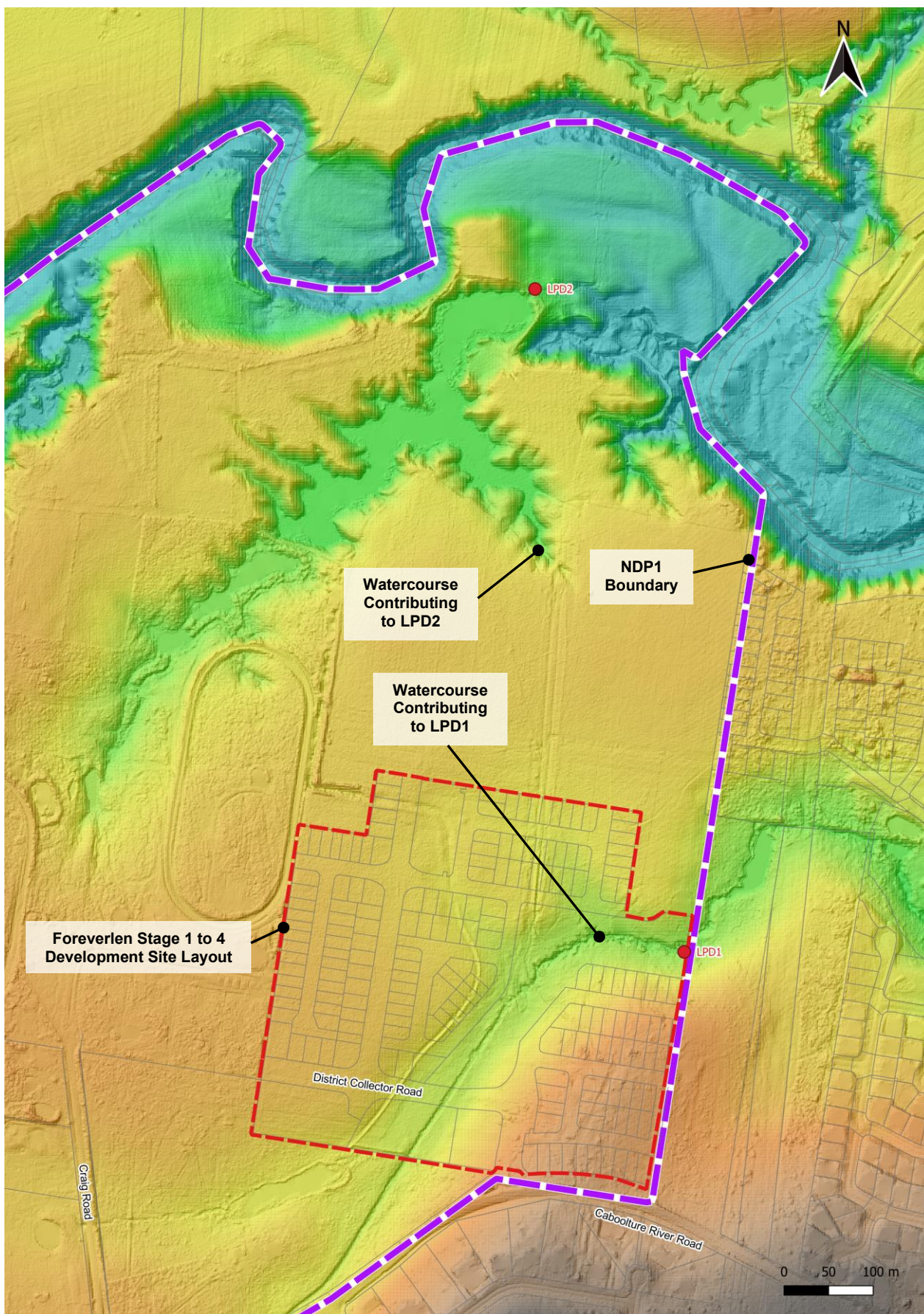


Figure 2.2: Foreverlen Stage 1 to 4 Existing Topography & Discharge Locations

### 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)<sup>i</sup>. A comparison of the Foreverlen Stage 1 to 4 and Ultimate Phase 1 NDP1 stage-storage relationships is indicated in **Figure 3.1** below.

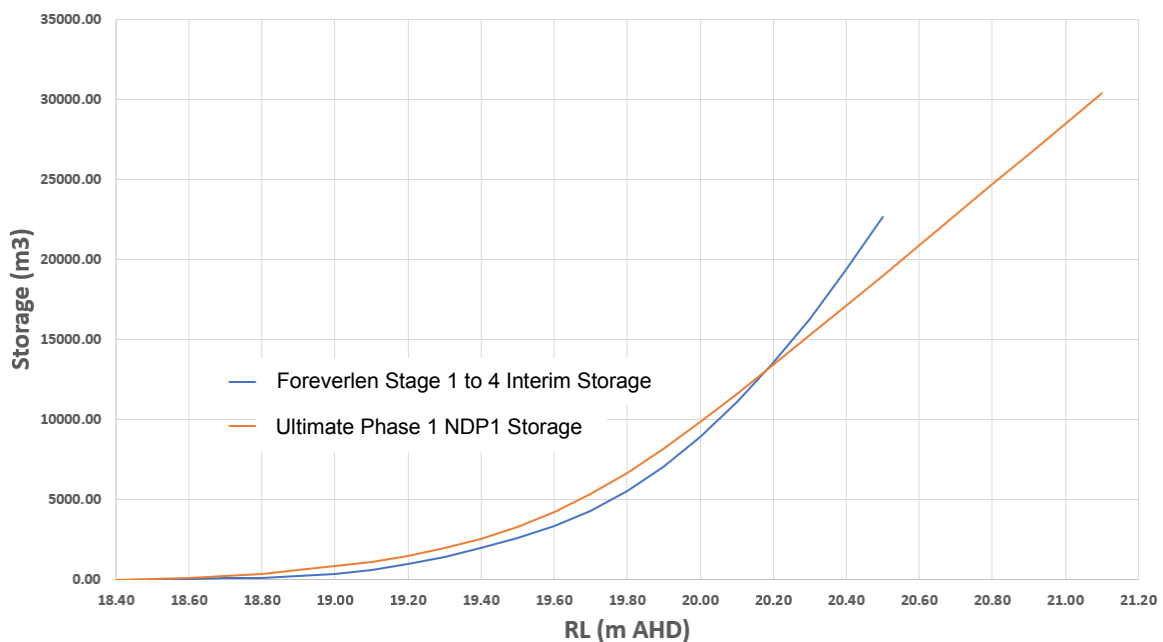


Figure 3.1: On-line Detention Basin Stage-Storage Comparison – Foreverlen Stage 1 to 5 vs Ultimate

<sup>i</sup> 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.

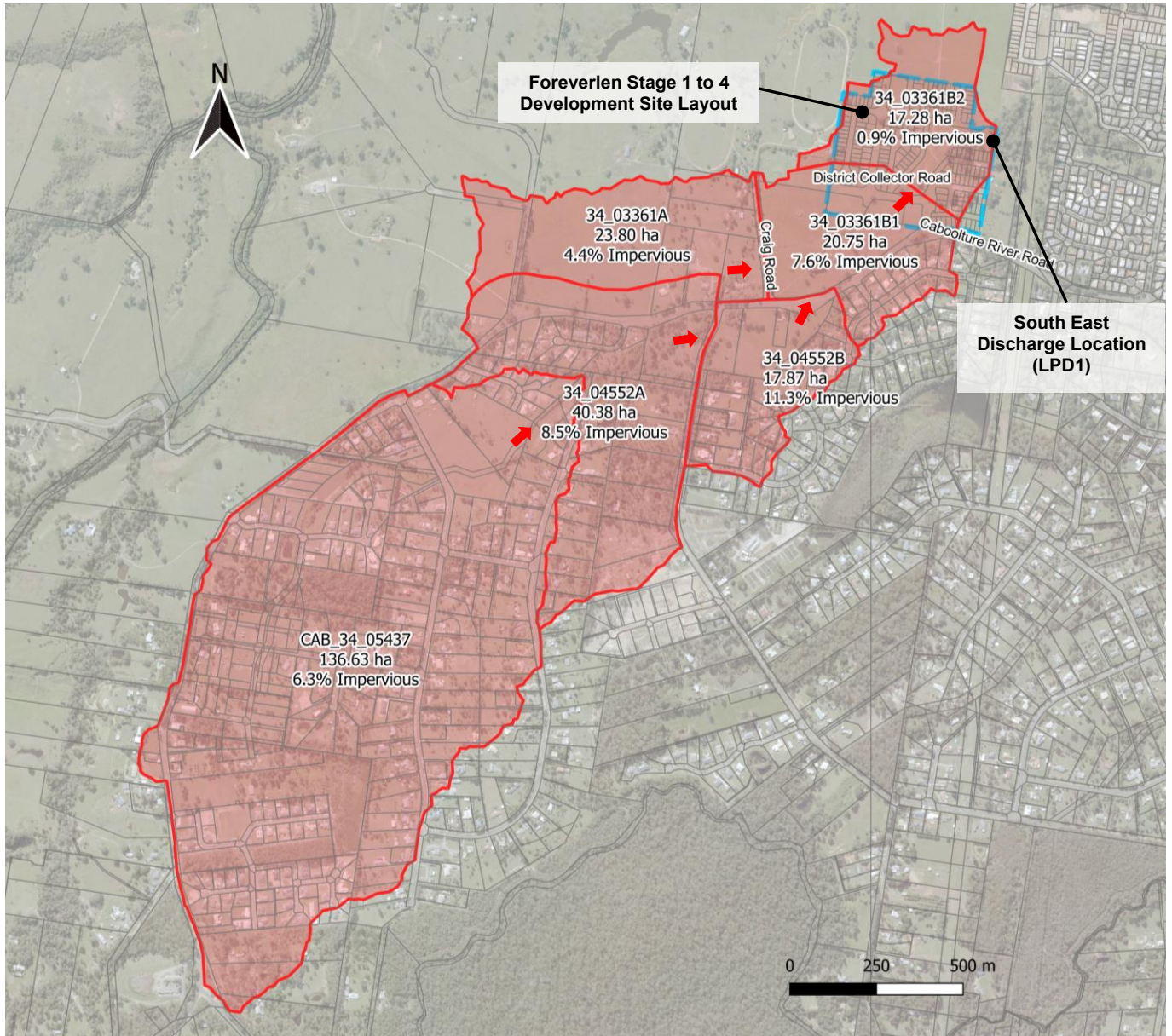


Figure 3.2: Existing South East Watercourse Analysis WBNM Catchment

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

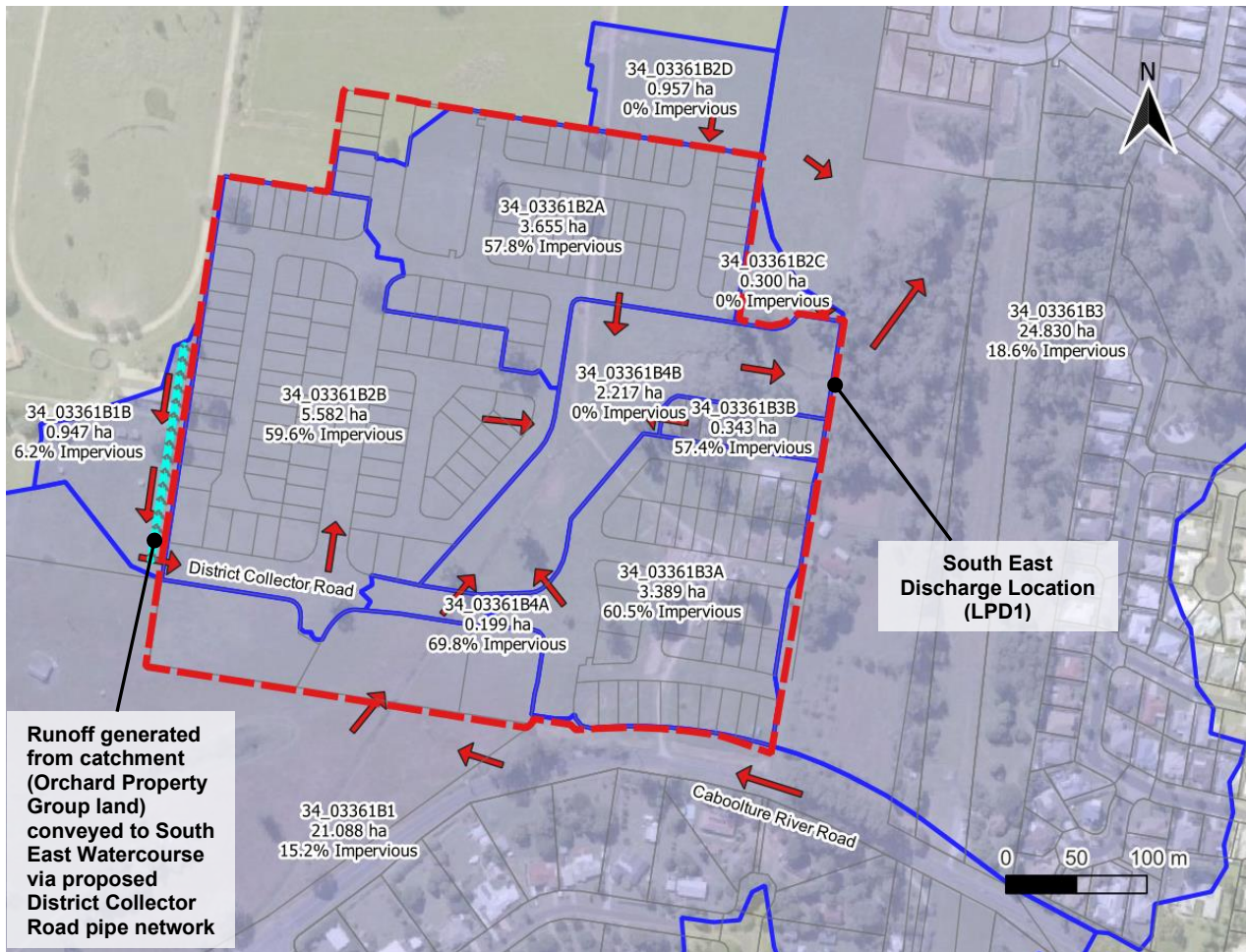


Figure 3.3: Developed South East Watercourse Sub-Catchment Configuration

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.

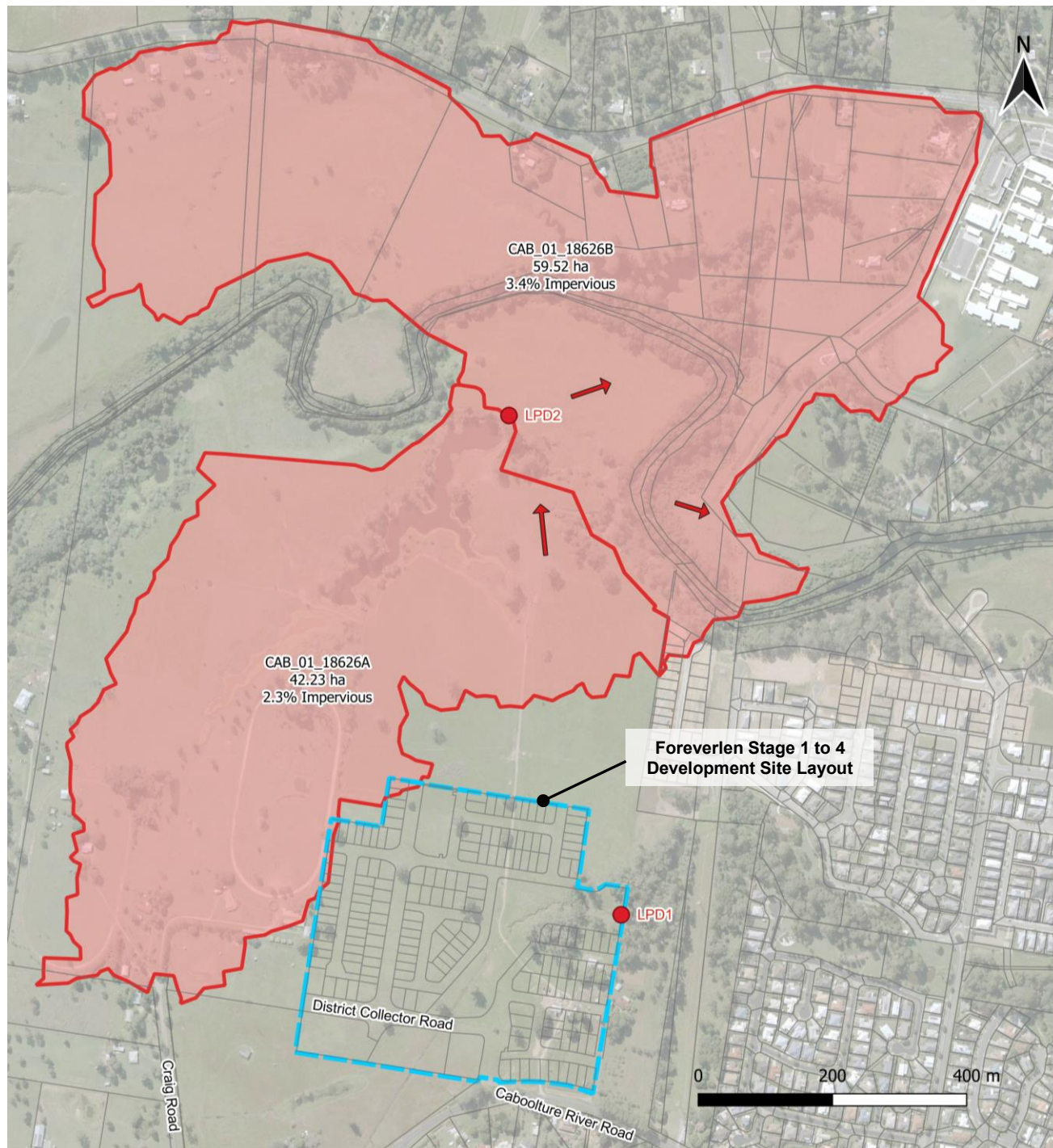


Figure 3.4: Existing Caboolture River Analysis WBNM Catchment



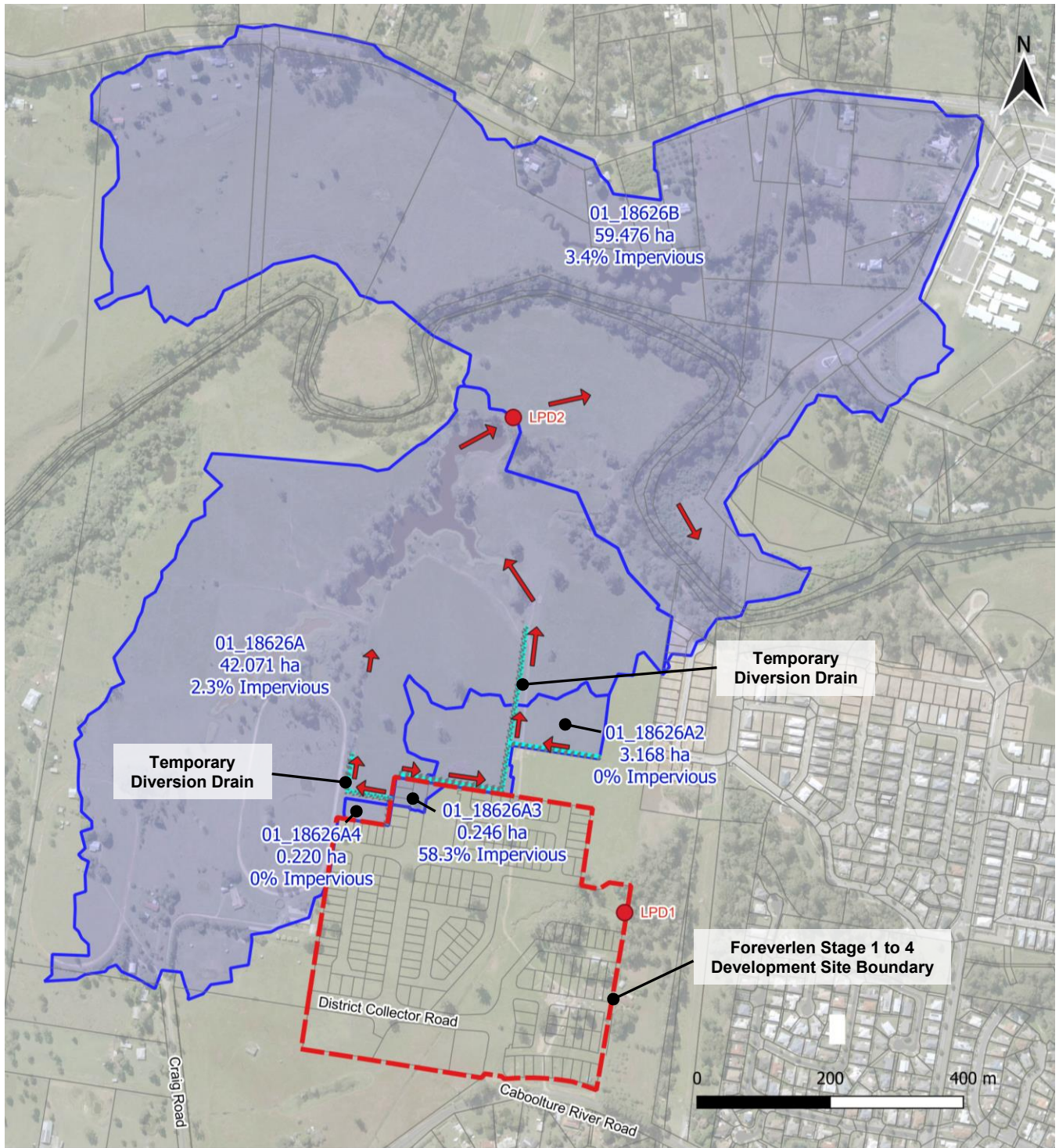


Figure 3.5: Developed Caboolture River Analysis WBNM Catchment

### 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<sup>2</sup>/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 <sup>3</sup> /s) <sup>1</sup>	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<sup>2</sup>/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 <sup>3</sup> /s) <sup>1</sup>	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<sup>2</sup> 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 height
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.

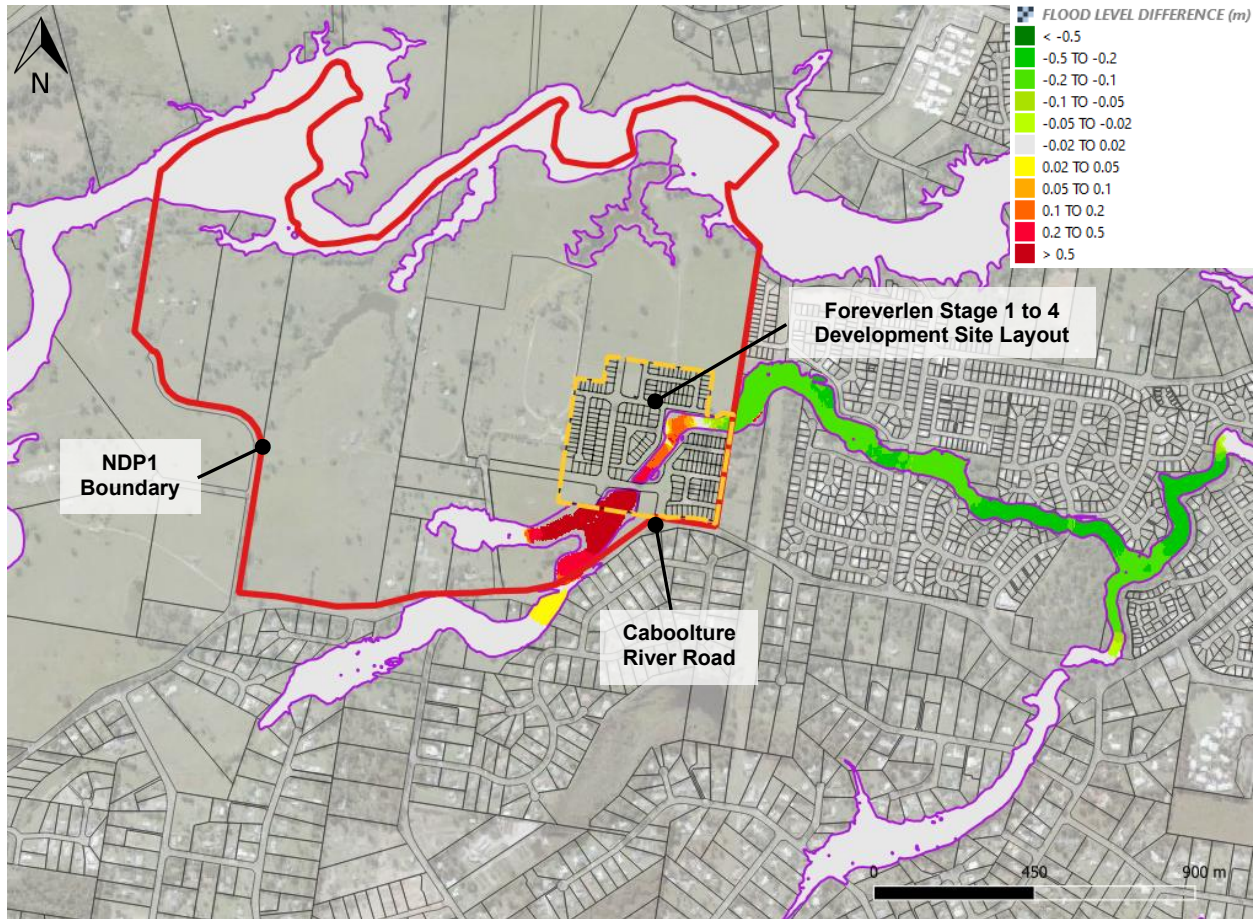


Figure 3.6: Flood Level Difference Results – 1% AEP

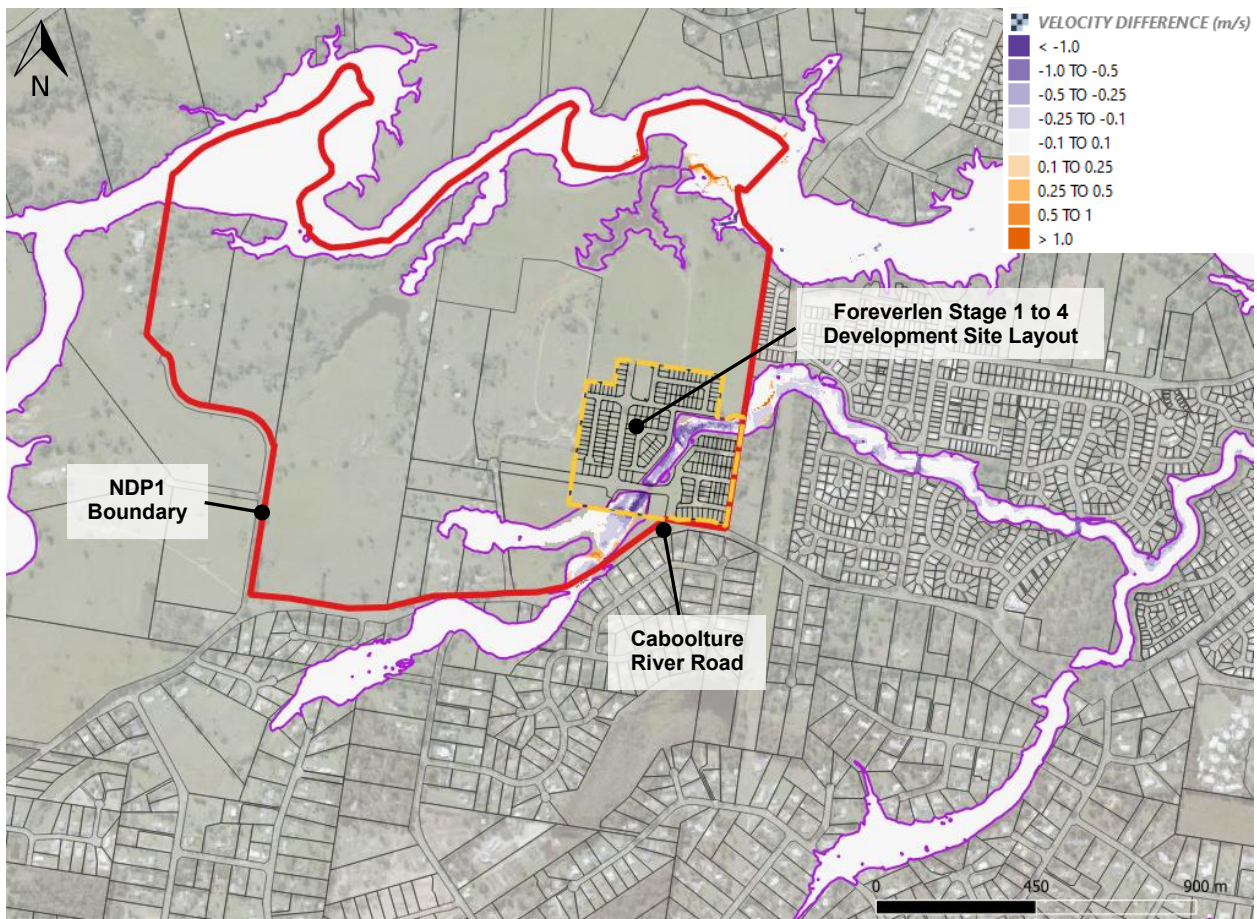


Figure 3.7: Flood Velocity Difference Results – 1% AEP

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.

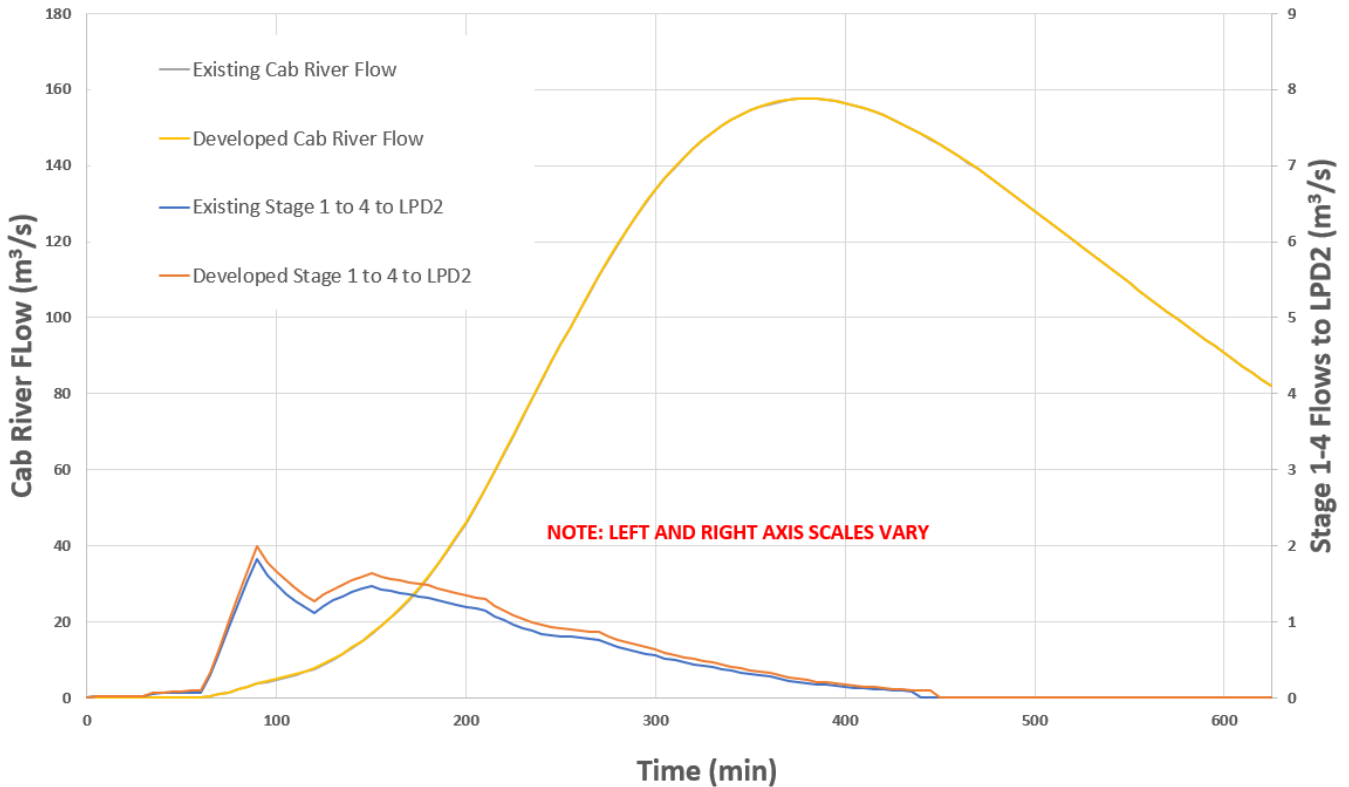


Figure 3.8: TUFLOW Hydrograph Comparison - 1% AEP, Critical Duration Storm

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.

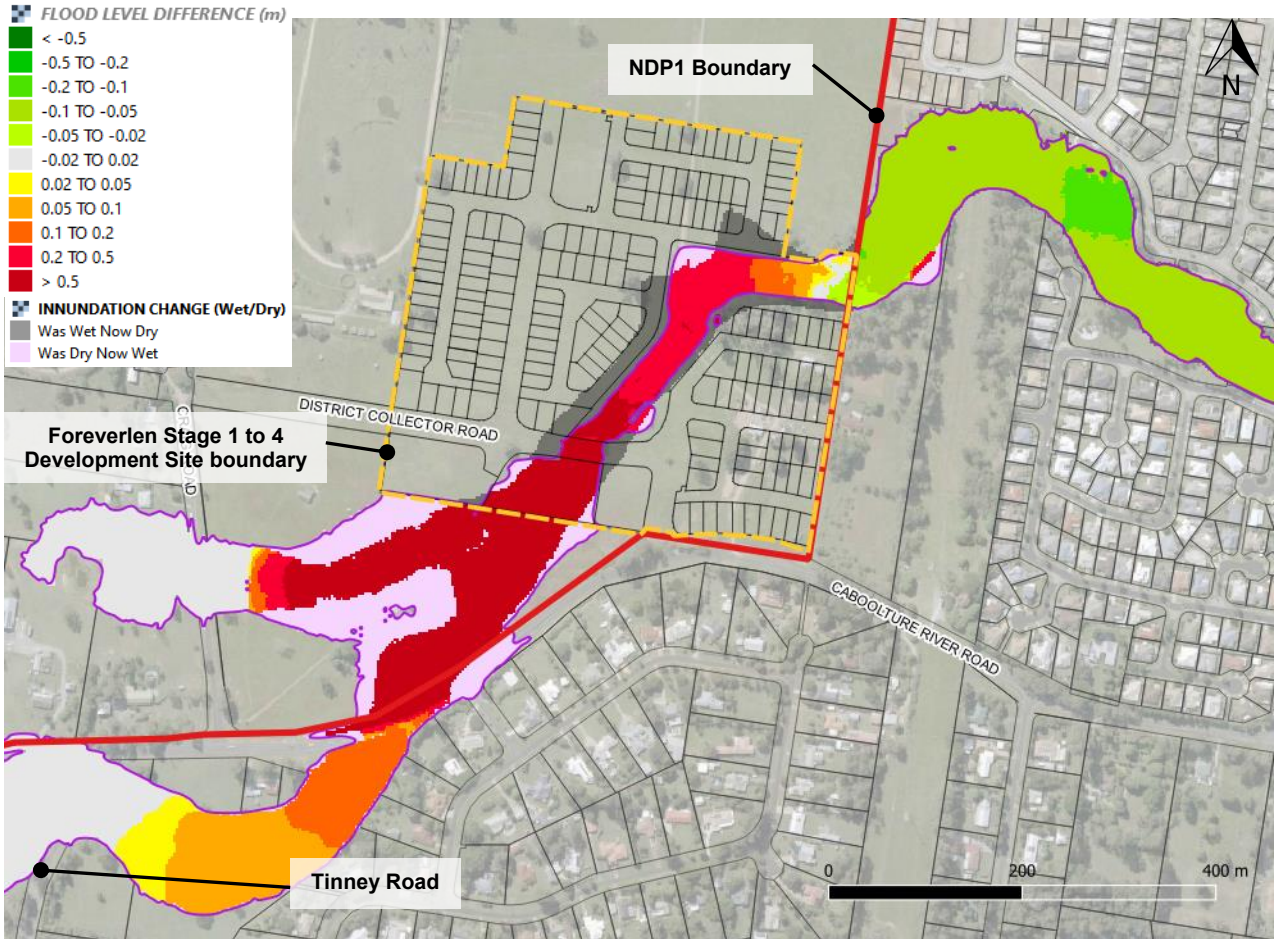


Figure 3.9: Flood Level Difference Results – 0.1% AEP

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 <sup>a</sup>	
			Existing	Developed
<b>Scenario</b>		<b>Developed<sup>b</sup></b>	<b>Existing</b>	<b>Developed</b>
5% AEP Depth (m)	0.20 <sup>c</sup>	No overtopping	0.30	0.33 (+0.03)
5% AEP D.V (m <sup>2</sup> /s)	0.30 <sup>c</sup>	NA	0.64	0.81 (+0.17)
1% AEP Depth (m)	0.20 <sup>d</sup>	No overtopping	0.46	0.48 (+0.02)
1% AEP D.V (m <sup>2</sup> /s)	0.30 <sup>d</sup>	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 <sup>2</sup> /s)	0.60 <sup>e</sup>	0.49	1.84	2.04 (+0.20)

- 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.
- Results presented for Developed conditions only, as there is no IDC in the existing scenario.
- Refer QUDM (2016 Ed.) Table 7.4.3 Flow limits for 'transverse' flow during MINOR STORM
- Refer QUDM (2016 Ed.) Table 7.4.5 Flow limits for 'transverse' flow during MAJOR STORM
- Refer QUDM (2016 Ed.) Table 7.3.6 Flow depth and width limitations for the major storm. Note that a D.V. less than that of equal to 0.6m<sup>2</sup>/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<sup>2</sup>/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**.

- AR&R Book 6, Chapter 6*, resulted in no blockage assessment required.
- 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.

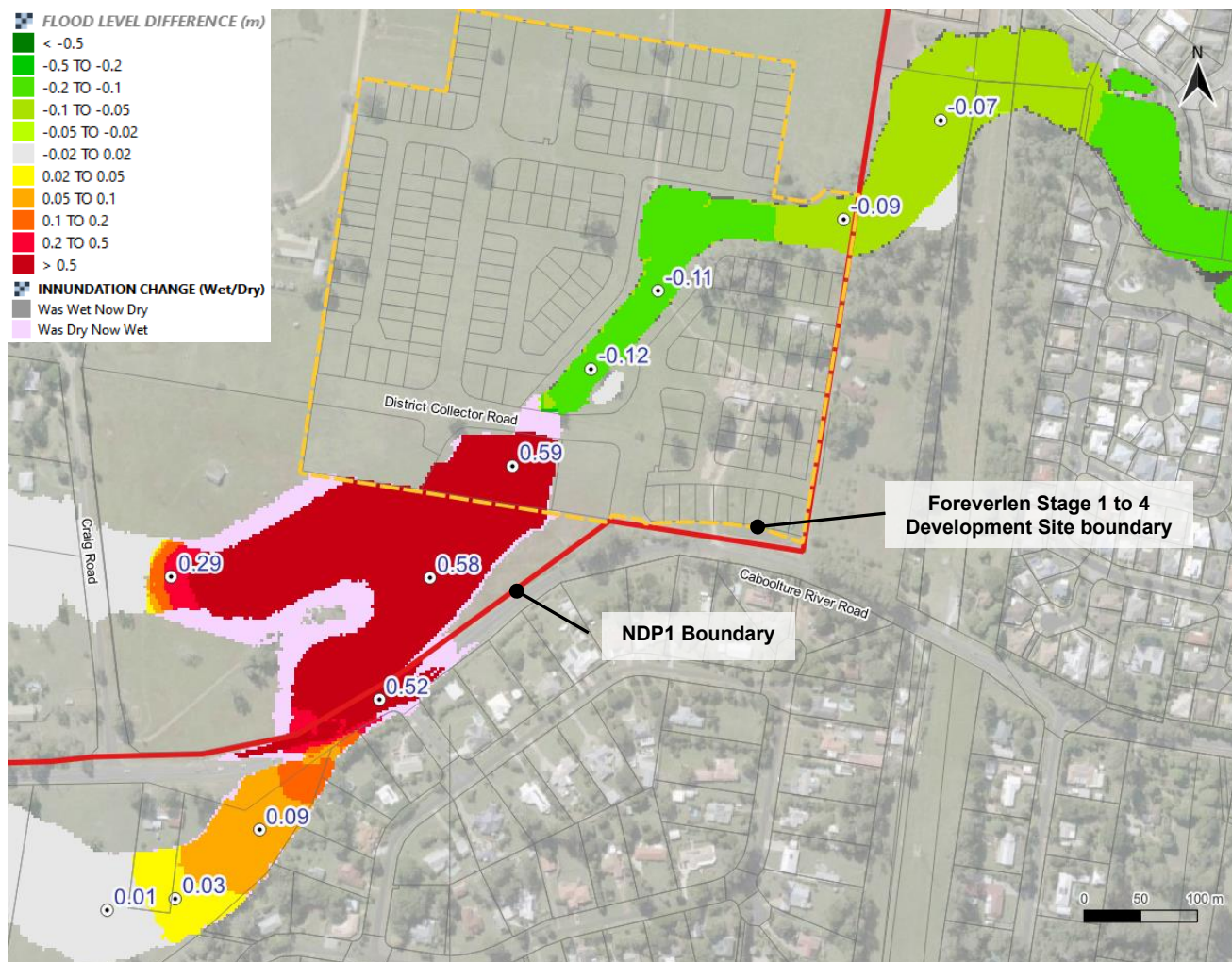


Figure 3.10: 1% AEP Maximum Flood Level Difference for 50% Blockage Scenario

### 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.

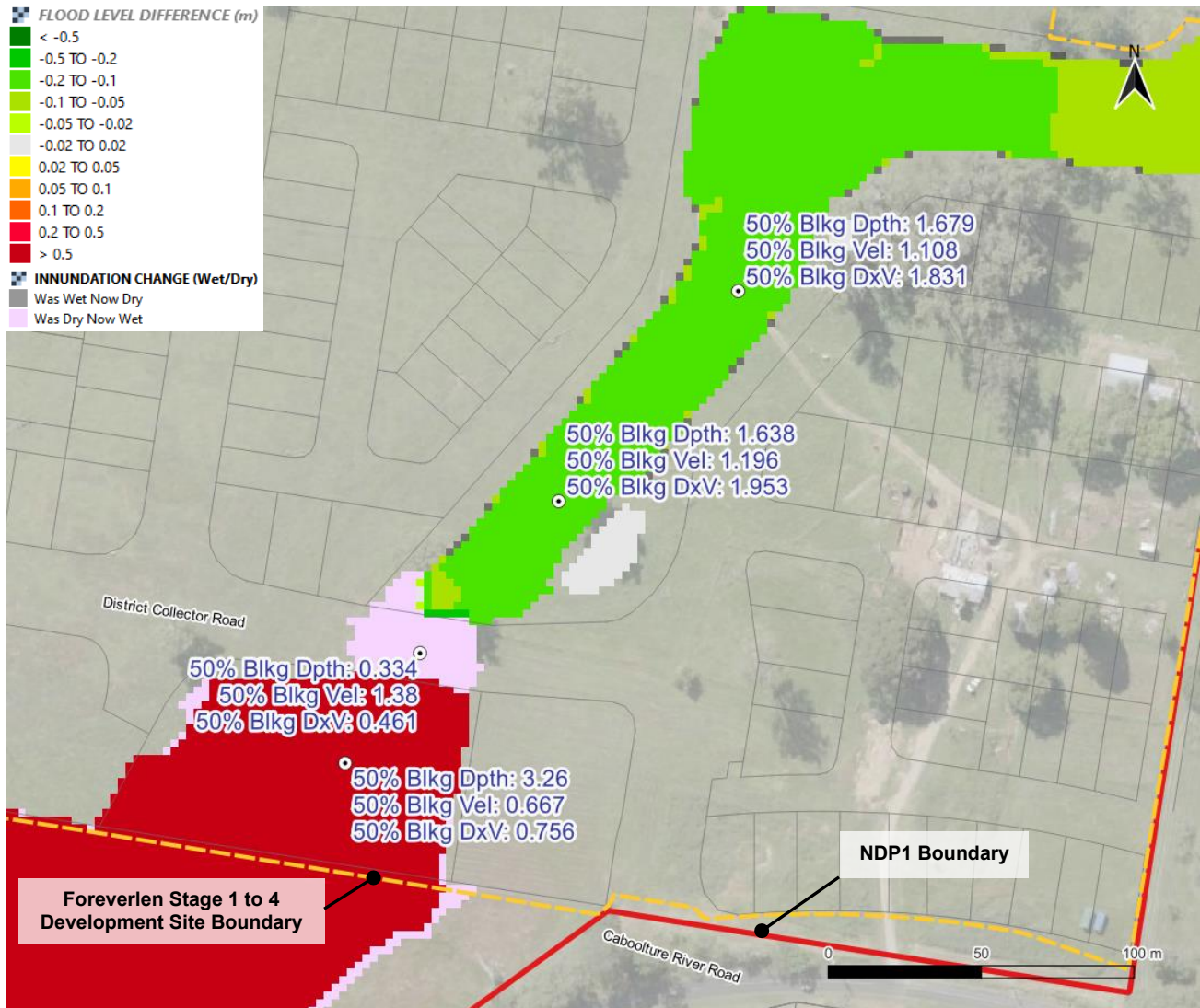


Figure 3.11: 1% AEP 'Was Dry, Now Wet' (pink) at the IDC for 50% Blockage Scenario

**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<sup>2</sup>/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 IDC 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.

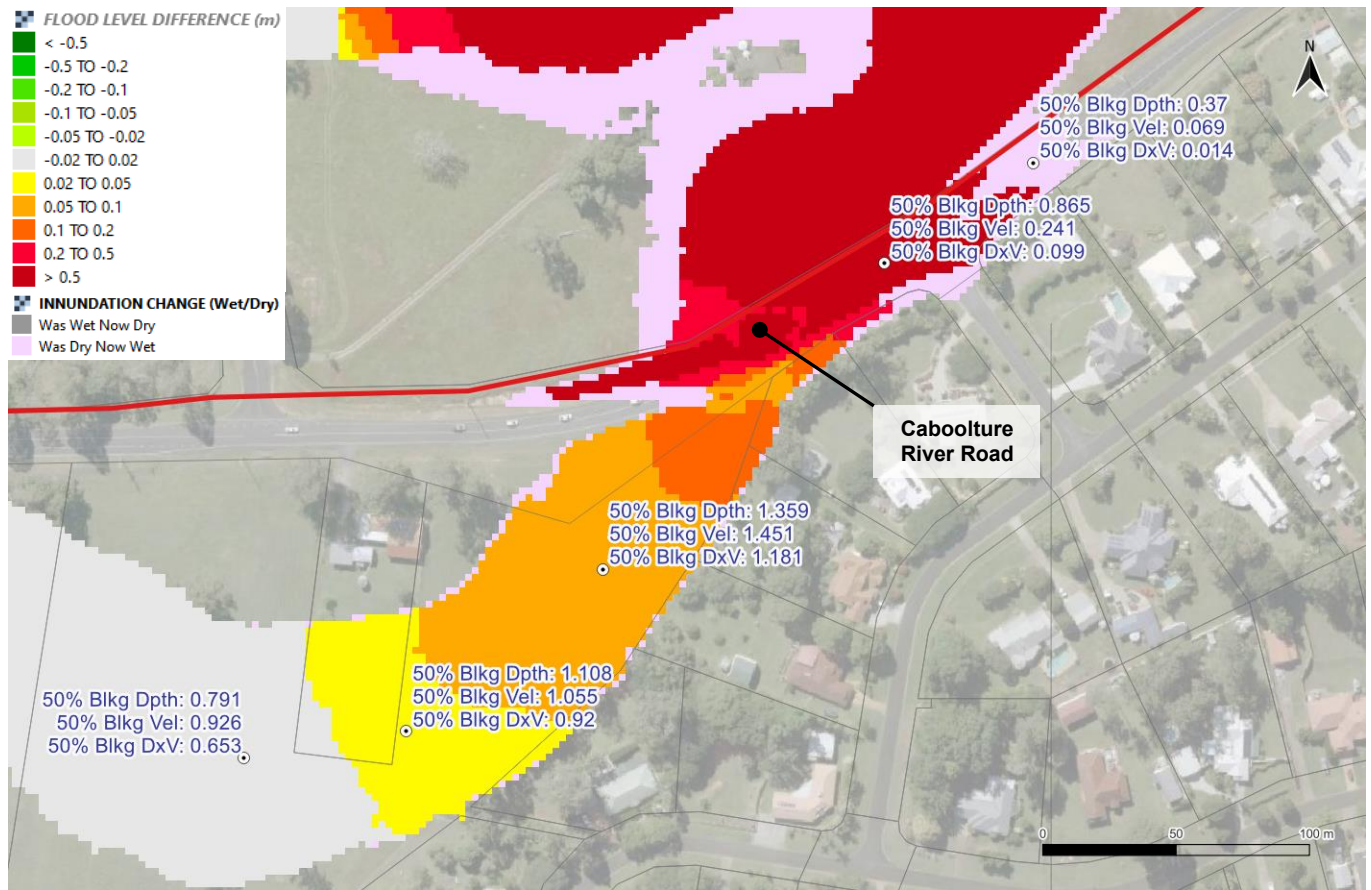


Figure 3.12: 1% AEP 'Was Dry, Now Wet' (pink) at the CRR for 50% Blockage Scenario

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<sup>2</sup>/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<sup>2</sup>/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.

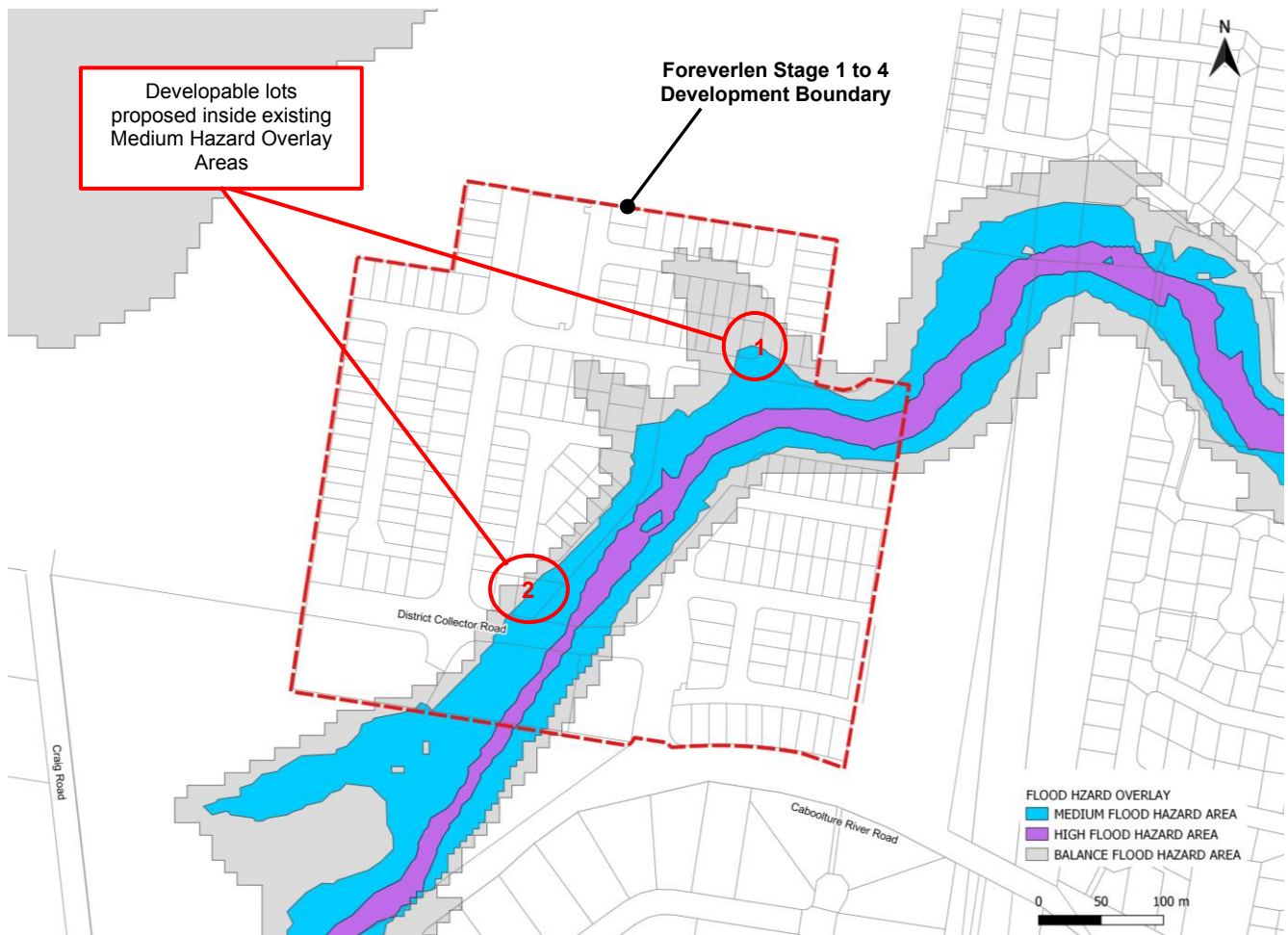


Figure 3.13: Flood Hazard Overlay Mapping (Source: MBRC)

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.

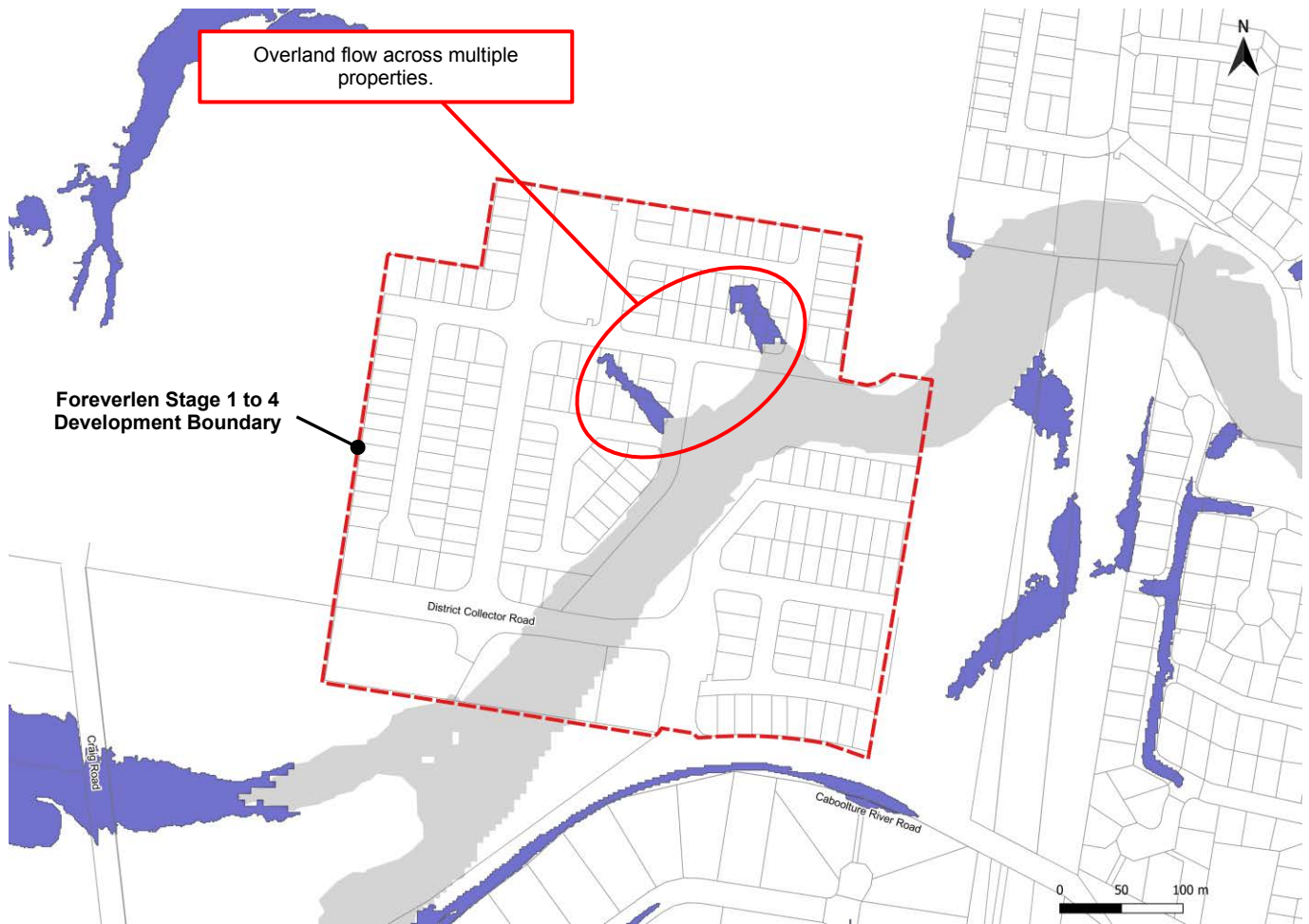


Figure 3.14: Overland Flow Overlay Mapping (Source: MBRC)

**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.

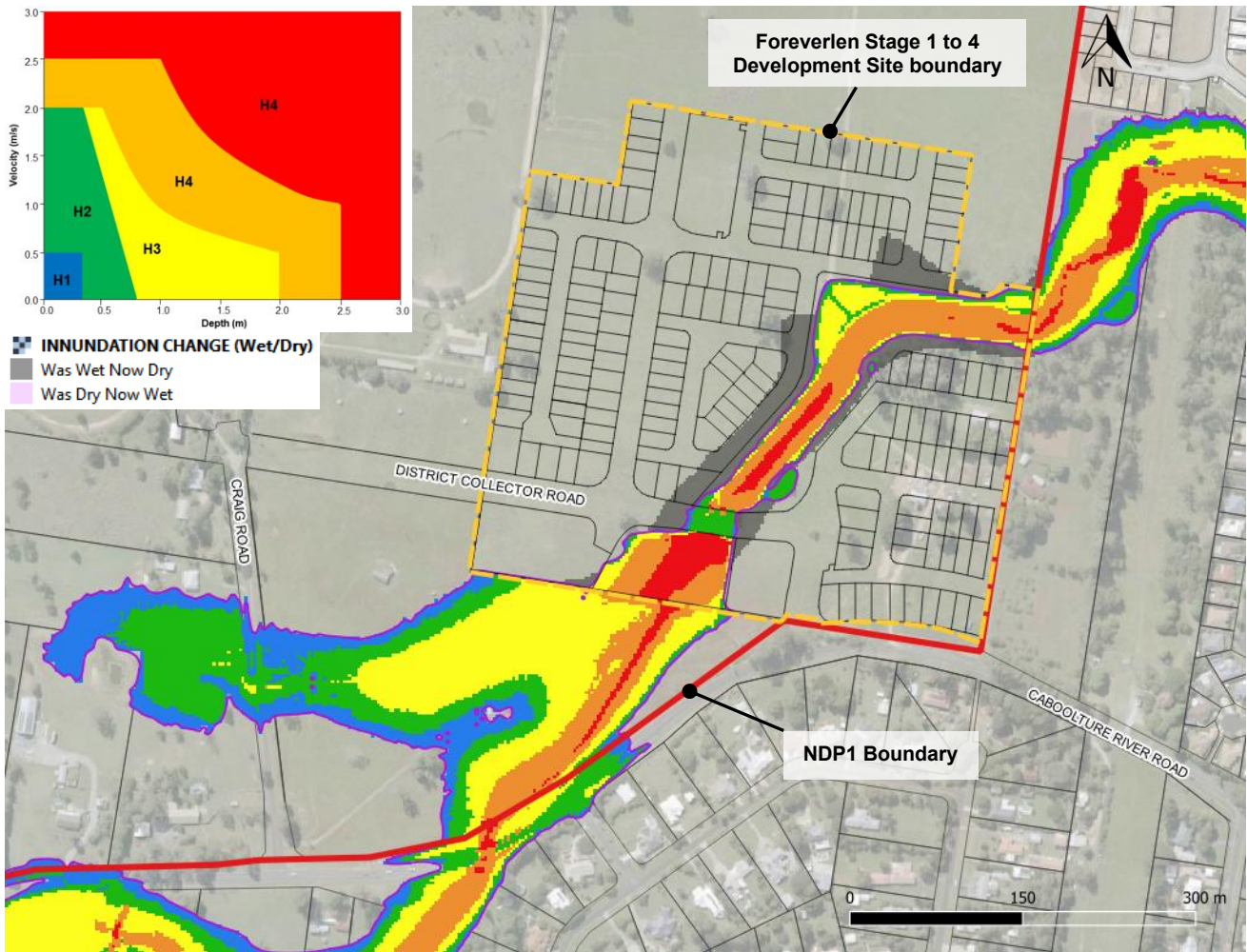


Figure 3.15: 0.1% AEP Developed Scenario Flood Hazard Modelling

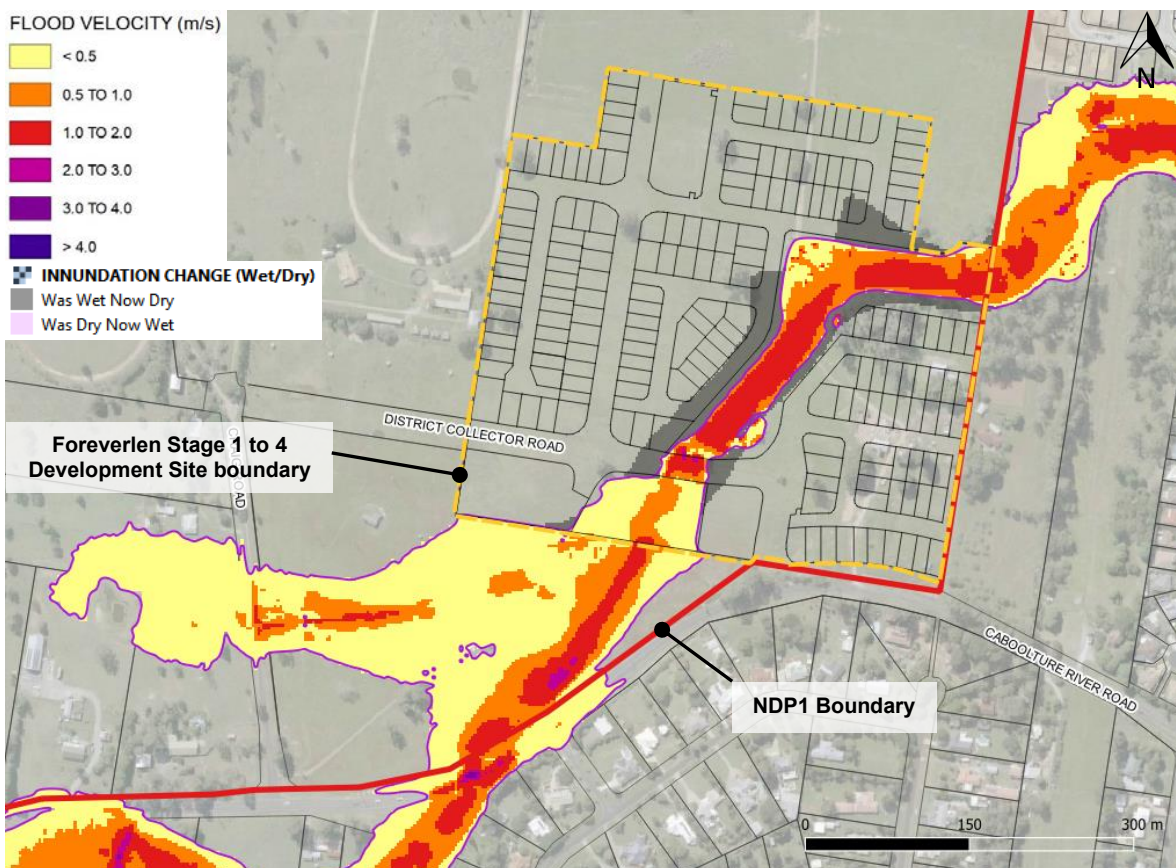


Figure 3.16: 0.1% AEP Developed Scenario Flood Velocity Modelling

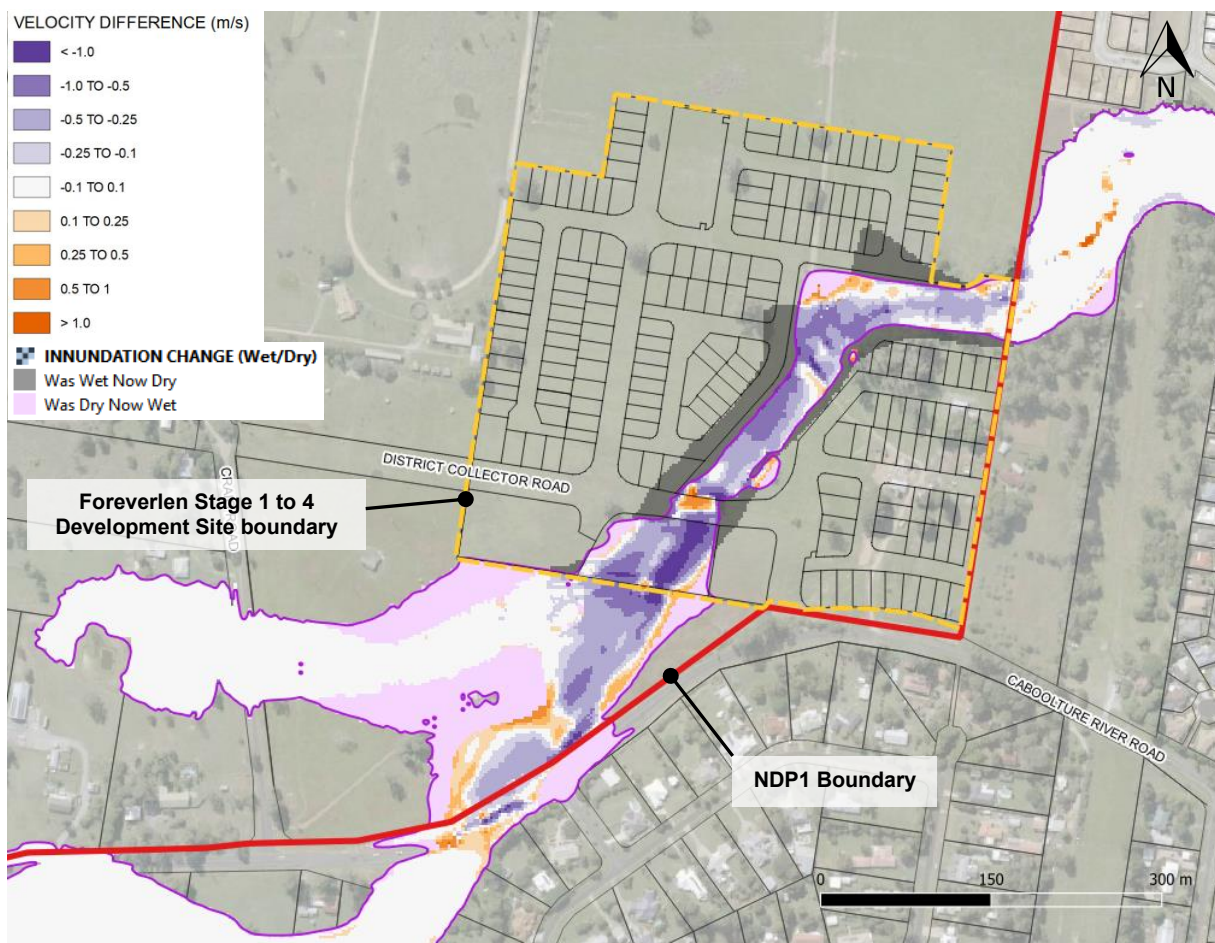


Figure 3.17: 0.1% AEP Developed Scenario Flood Velocity Difference

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

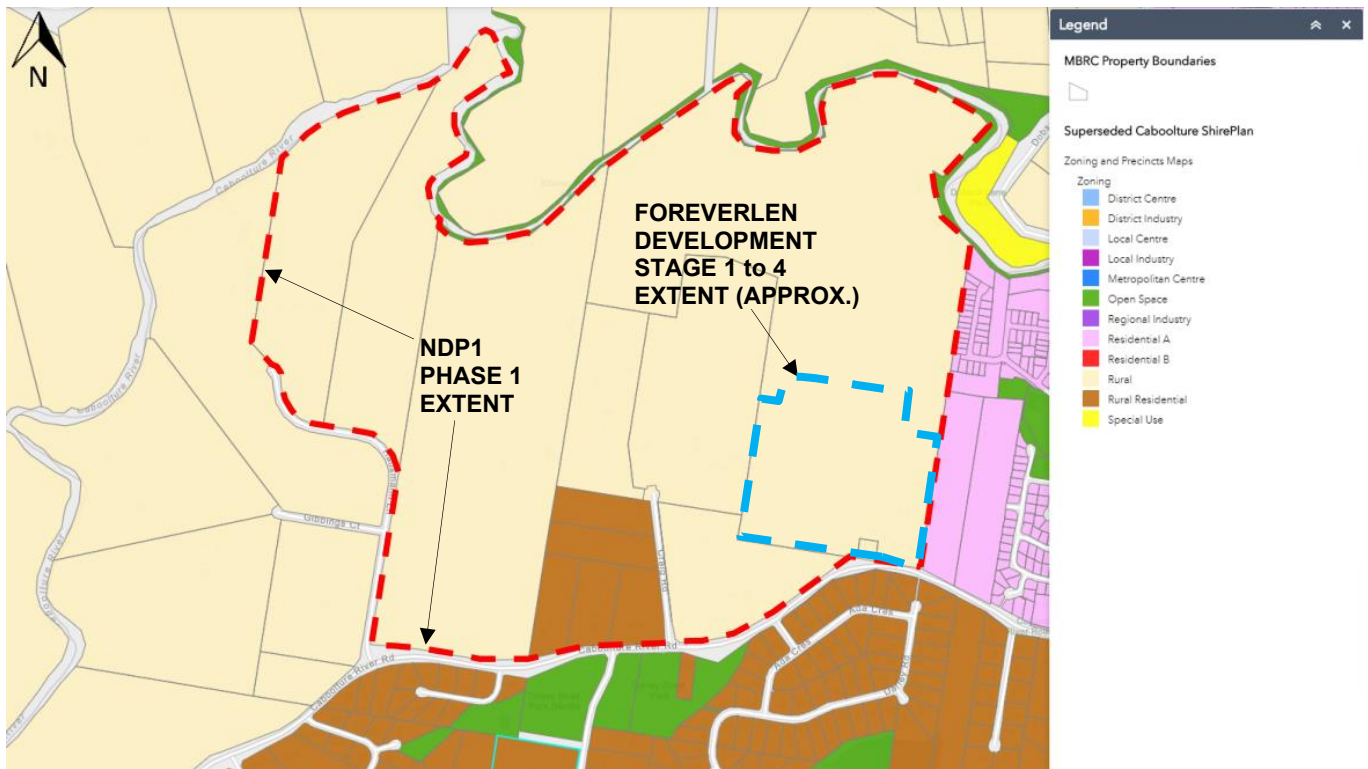


Figure 4.1: Existing Land Use Layout & Stage 1 to 4 Development Extent

## 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.

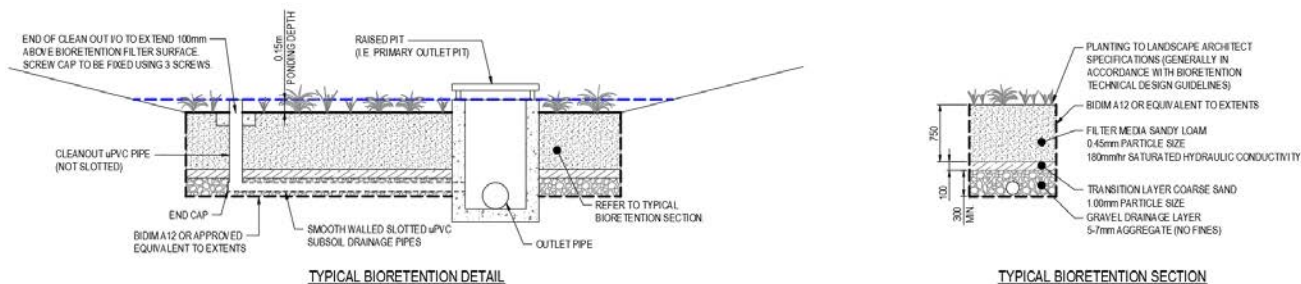


Figure 4.2: Typical Bioretention System Configuration

### 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 NDP1 development, 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
<b>Fraction Impervious Percentage (%)</b>	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<sup>2</sup> 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 <sup>2</sup> )	641	670	423	79	40*
Filter Area (m <sup>2</sup> )	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	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

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?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

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

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

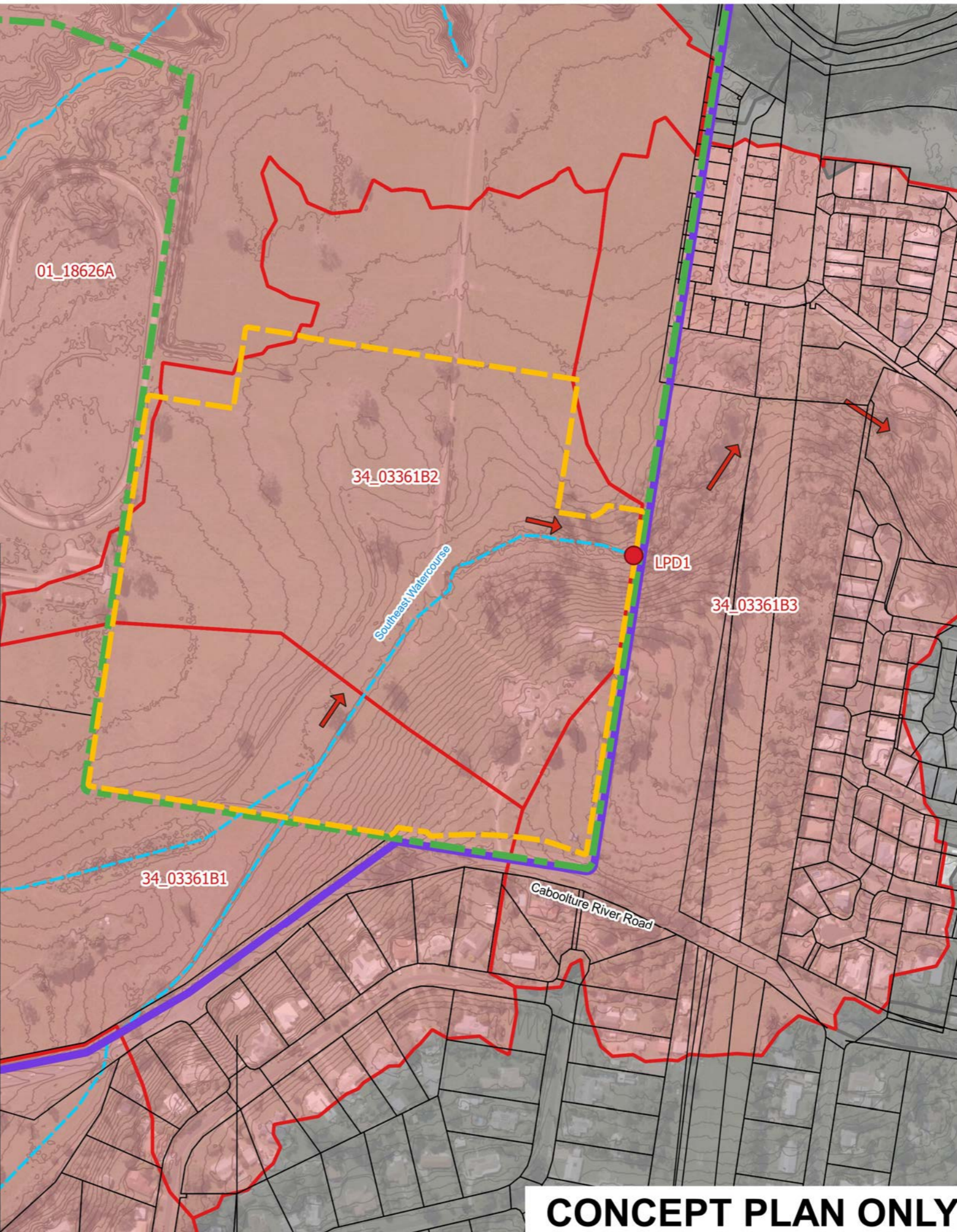
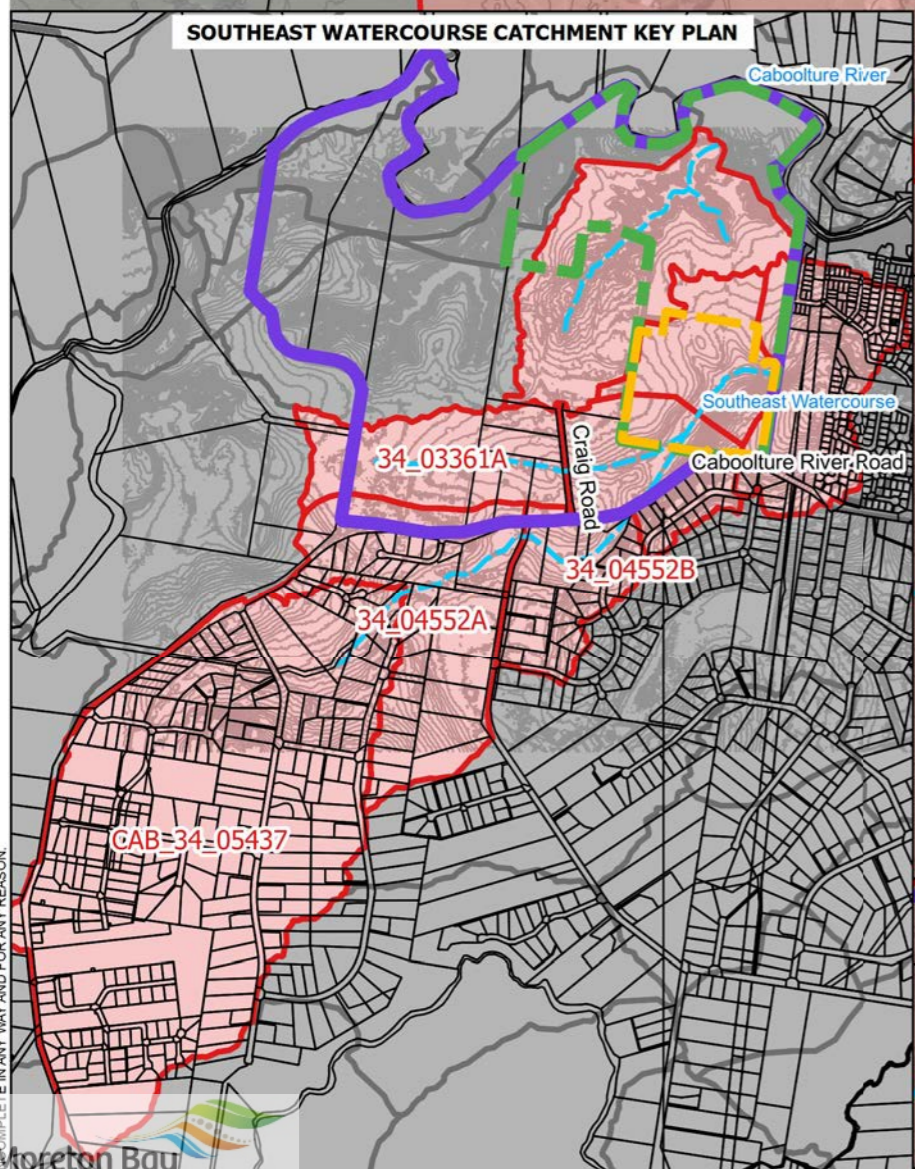
# Appendix A Concept Drawings

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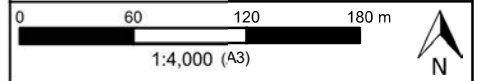
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34_03361B2	17.28	0.9
34_03361B3	28.95	12.0
01_18626A	42.23	2.3
34_03361A	23.80	4.4
34_04552B	17.87	11.3
34_04552A	40.38	8.5
CAB_34_05437	136.63	6.3
<b>TOTAL</b>	<b>327.89</b>	<b>6.5</b>



- 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:**

- THIS DRAWING IS TO BE INTERPRETED IN CONJUNCTION WITH CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.
- CATCHMENT BOUNDARIES ADOPTED AS PER THE NDP1 MASTERPLAN REPORT. CATCHMENT PARAMETERISATION ADOPTED AS PER THE WBNM HYDROLOGICAL MODEL.



**PROJECT:**  
 CABOOLTURE WEST SWMP - FOREVERLEN STAGES 1-4

**CLIENT:**  
 FOREVERLEN PTY LTD

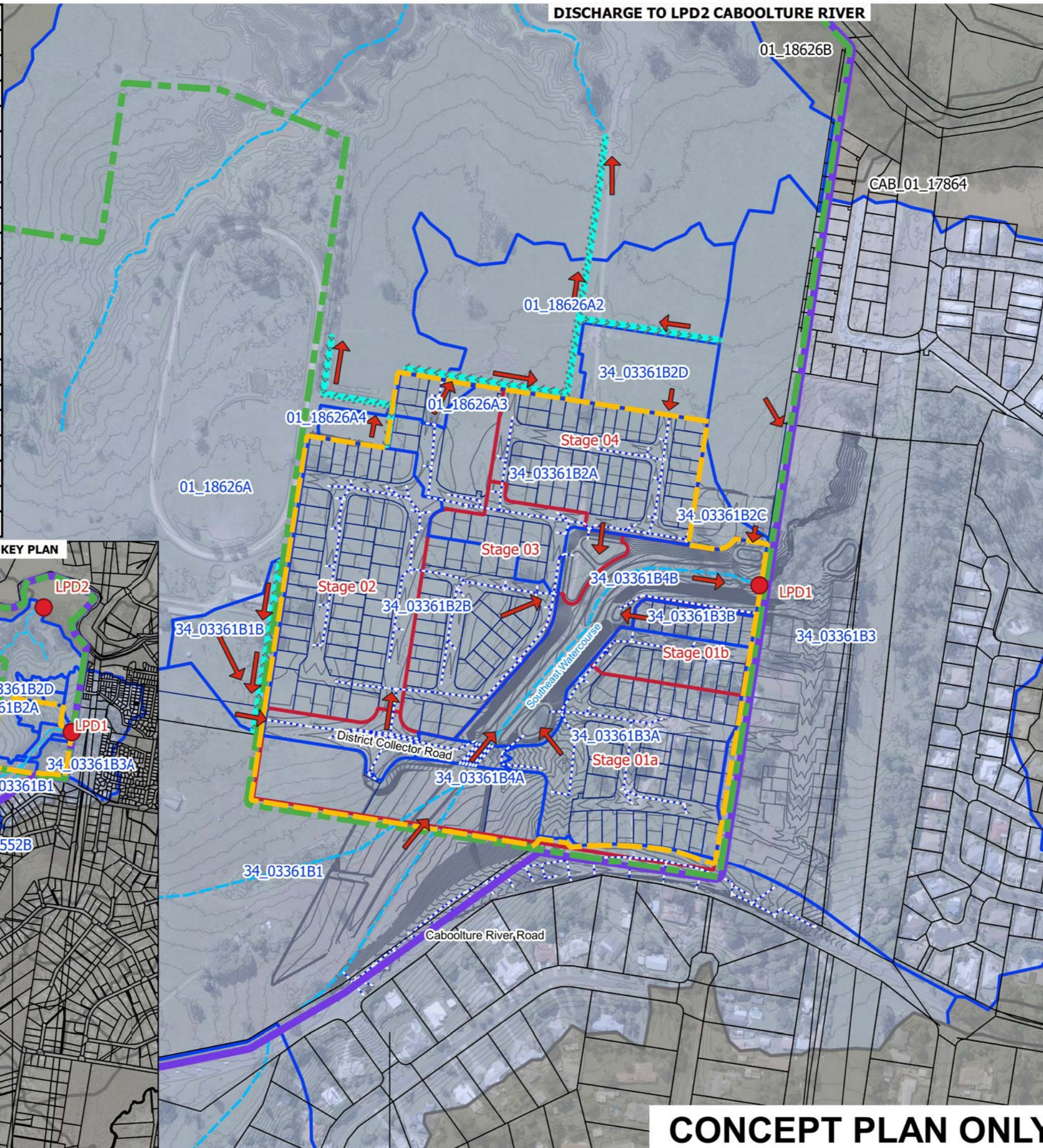
**DRAWING TITLE:**  
 STORMWATER QUANTITY CATCHMENT PLAN EXISTING SCENARIO

**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				

CONCEPT PLAN ONLY

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



**LEGEND**

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

**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:**

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

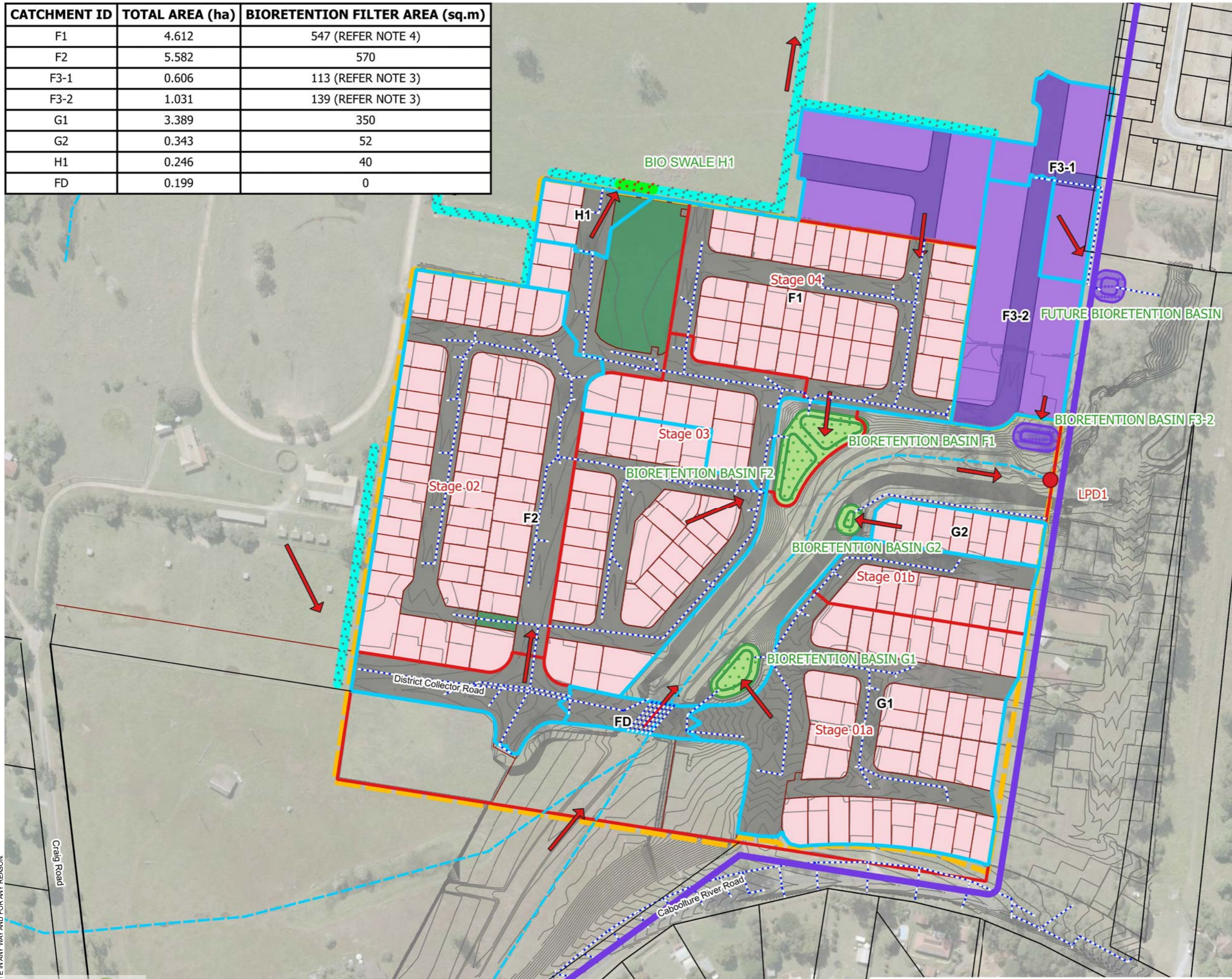
0 60 120 180 m  
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PROJECT:	
CABOOLTURE WEST SWMP - FOREVERLEN STAGES 1-4	
CLIENT:	
FOREVERLEN PTY LTD	
DRAWING TITLE:	
STORMWATER QUANTITY CATCHMENT PLAN DEVELOPED SCENARIO	
DRAWING NO:	ISSUE:
16-002108-SK3002	B
ISS BY CHK DATE DETAILS	
A JC DY 06.06.22 RAL DA	
B NE DY 18.11.22 RAL DA	
C	
D	
E	23/08/2023

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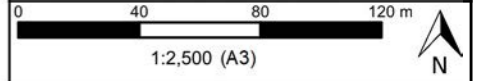
CATCHMENT ID	TOTAL AREA (ha)	BIORETENTION FILTER AREA (sq.m)
F1	4.612	547 (REFER NOTE 4)
F2	5.582	570
F3-1	0.606	113 (REFER NOTE 3)
F3-2	1.031	139 (REFER NOTE 3)
G1	3.389	350
G2	0.343	52
H1	0.246	40
FD	0.199	0



- LEGEND**
- SITE BOUNDARY (STAGES 1-4)
  - NDP1 BOUNDARY
  - MUSIC CATCHMENTS
  - STAGE 1-4 BOUNDARY
  - DEVELOPMENT LAYOUT (STAGES 1-4)
  - FUTURE STAGES
  - ROOF & GROUND (Refer Note 2)
  - PARK
  - ROAD
  - 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.



**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				

**CONCEPT PLAN ONLY**



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

## Appendix B Temporary Diversion Drain Calculations

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# MANNING'S OVERLAND FLOW CALCULATION

File name: 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 CATCHME01\_18626A2

POINT	Developed Surface			10% AEP			Top of Batter		
	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									
TOTAL				wA	wP	n x wA	wA	wP	n x wA
				0.459	2.824	0.014	0.005	0.576	0.000
S (m/m)				R	n	Q	R	n	Q
0.005				0.162	0.030	0.322	0.009	0.030	0.000

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

Design Flow (m3/s)

0.322

WSL (mAHD)

0.28

0.0

Flow Calculated by Manning's Equation (m3/s)

0.322

0.00

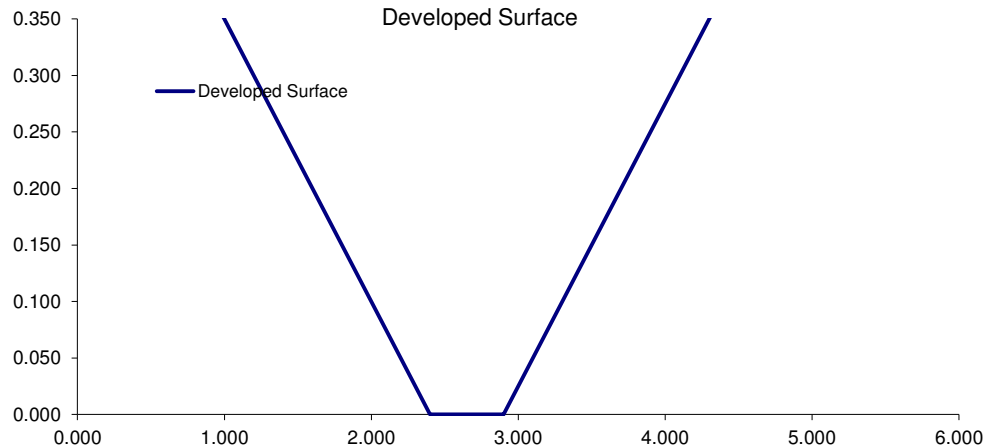
Vel (m/s)

0.70

0.10

V.D Product (m2/s)

0.1977477



# 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

POINT	Developed Surface			1% AEP			Top of Batter		
	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									
TOTAL				wA	wP	n x wA	wA	wP	n x wA
				0.710	3.497	0.021	0.005	0.576	0.000
S (m/m)				R	n	Q	R	n	Q
0.005				0.203	0.030	0.578	0.009	0.030	0.000

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

Design Flow (m3/s)

0.578

WSL (mAHD)

0.36

Flow Calculated by Manning's Equation (m3/s)

0.578

Vel (m/s)

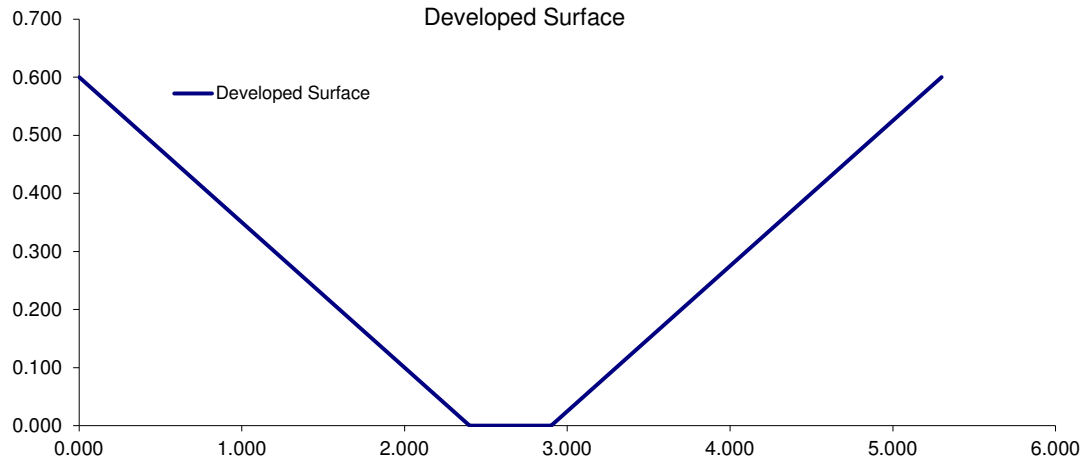
0.81

V.D Product (m2/s)

0.2959767

0.00

0.10



# MANNING'S OVERLAND FLOW CALCULATION

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 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 CATCHME01\_18626A2

POINT	Developed Surface			1% AEP			Top of Batter		
	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									
TOTAL				wA	wP	n x wA	wA	wP	n x wA
				2.142	6.316	0.064	0.011	2.043	0.000
S (m/m)				R	n	Q	R	n	Q
0.005				0.339	0.030	2.456	0.005	0.030	0.001

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

Design Flow (m3/s)

2.456

WSL (mAHD)

0.52

0.0

Flow Calculated by Manning's Equation (m3/s)

2.456

0.00

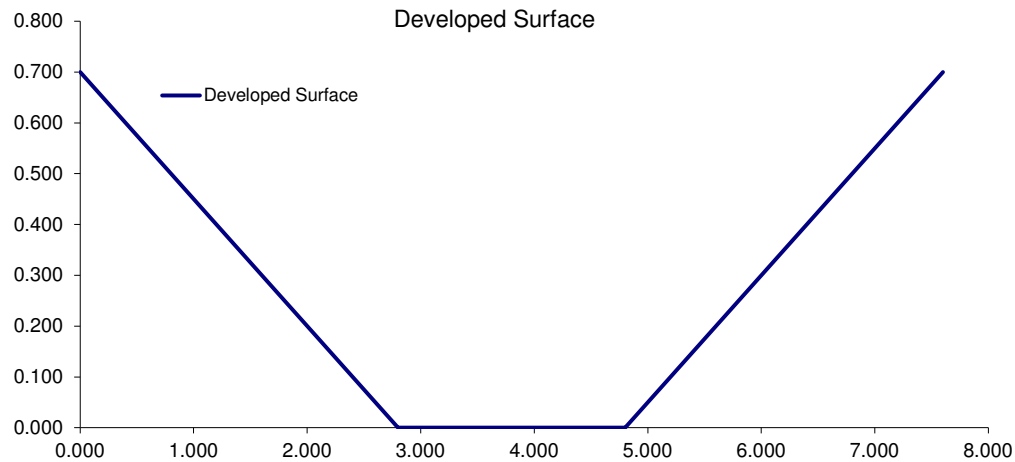
Vel (m/s)

1.15

0.07

V.D Product (m2/s)

0.5999398



# 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 I  
 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

POINT	Developed Surface			10% AEP			Top of Batter		
	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									
TOTAL				wA	wP	n x wA	wA	wP	n x wA
				1.444	5.305	0.043	0.011	2.043	0.000
S (m/m)				R	n	Q	R	n	Q
0.005				0.272	0.030	1.430	0.005	0.030	0.001

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

Design Flow (m3/s)

1.430

WSL (mAHD)

0.40

0.0

Flow Calculated by Manning's Equation (m3/s)

1.430

0.00

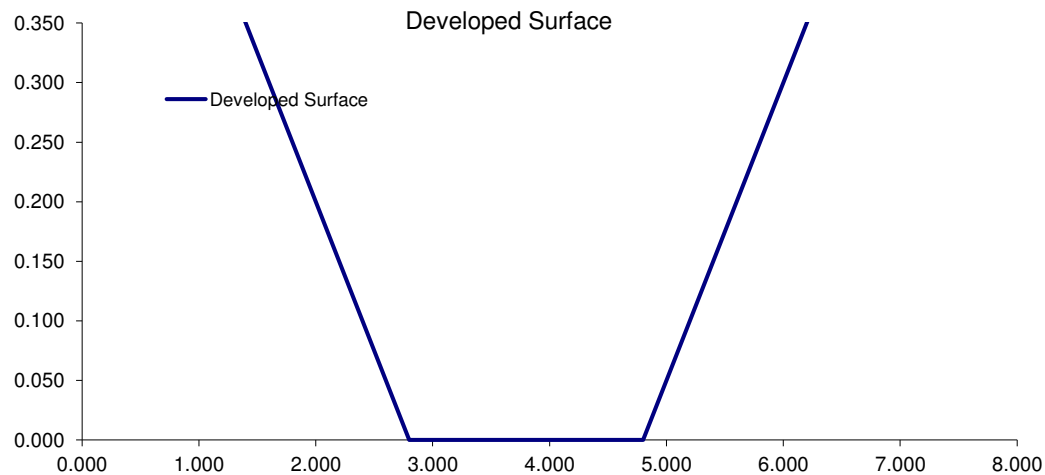
Vel (m/s)

0.99

0.07

V.D Product (m2/s)

0.3967814





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
<b>TOTAL</b>	<b>14.371</b>	<b>5.401</b>	<b>2.985</b>	<b>5.443</b>	<b>0.542</b>

Note: Roof area of each lot is based on 150m<sup>2</sup>.

## 2. MUSIC TREATMENT NODES DETAILS

### a. End-of-line Bioretention Basin

MUSIC Catchment	Filter Area (m <sup>2</sup> )	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
<b>TOTAL</b>	<b>1,519</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

### b. Bioretention Swale

MUSIC Catchment	Total Length (m)	Effective Length (m)	Filter Area (m <sup>2</sup> )	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
<b>TOTAL</b>	<b>20</b>	<b>20</b>	<b>40</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

### 3. MUSIC MODEL LAYOUT

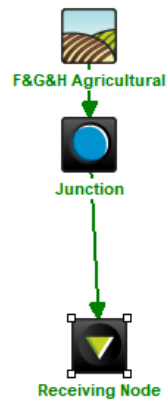
#### a. Existing Model

**File:**

16-002108-20220602\_EX\_Lennium\_Stage 1-4.sqz

**Location:**

\\bneas01\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

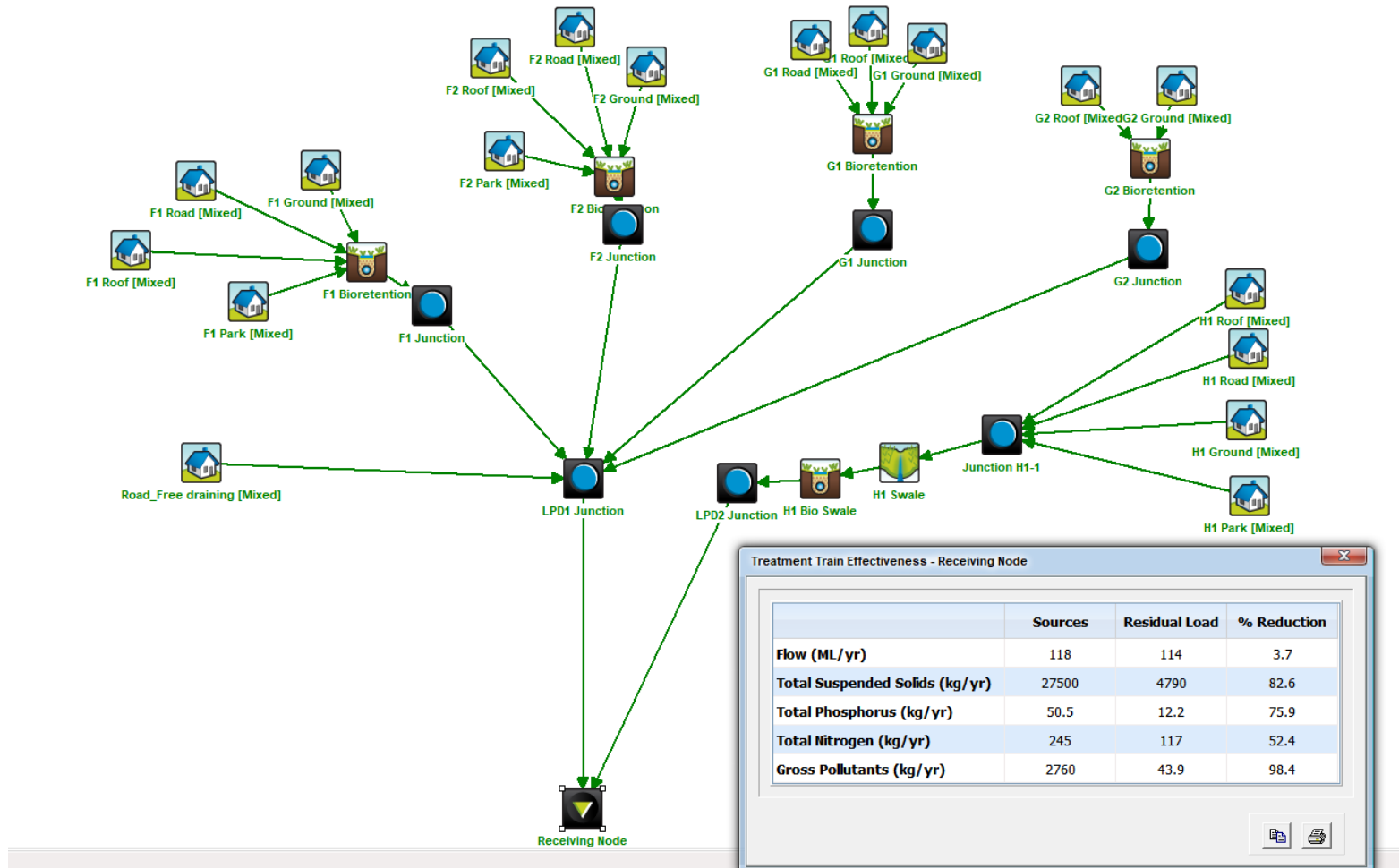
**b. Developed Model**

**File:**

16-002108-20221110\_DEV Lennium\_Stage 1-4.sqz

**Location:**

\\bneas01\Projects\16\002108 - NDP1 Lennium Land\6\_Model\SF\SWMP\_Stg1-4\_Oct2022\MUSIC\



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

# Appendix D Flood Plans

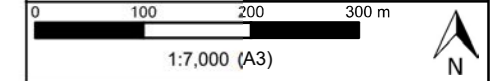
FOREVERLEN PTY LTD

**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).



**PROJECT:**  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

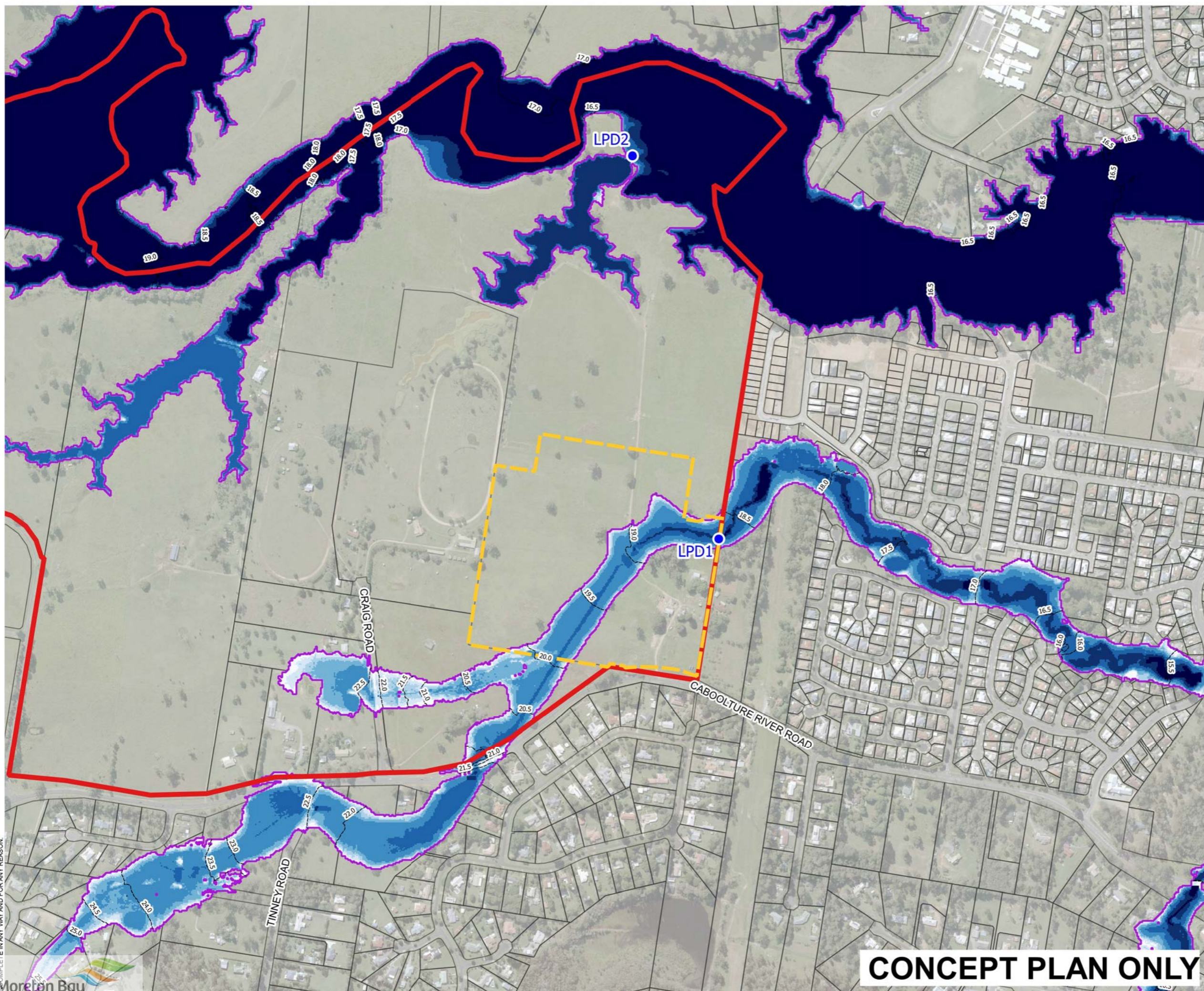
**CLIENT:**  
**FOREVERLEN PTY LTD**

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

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

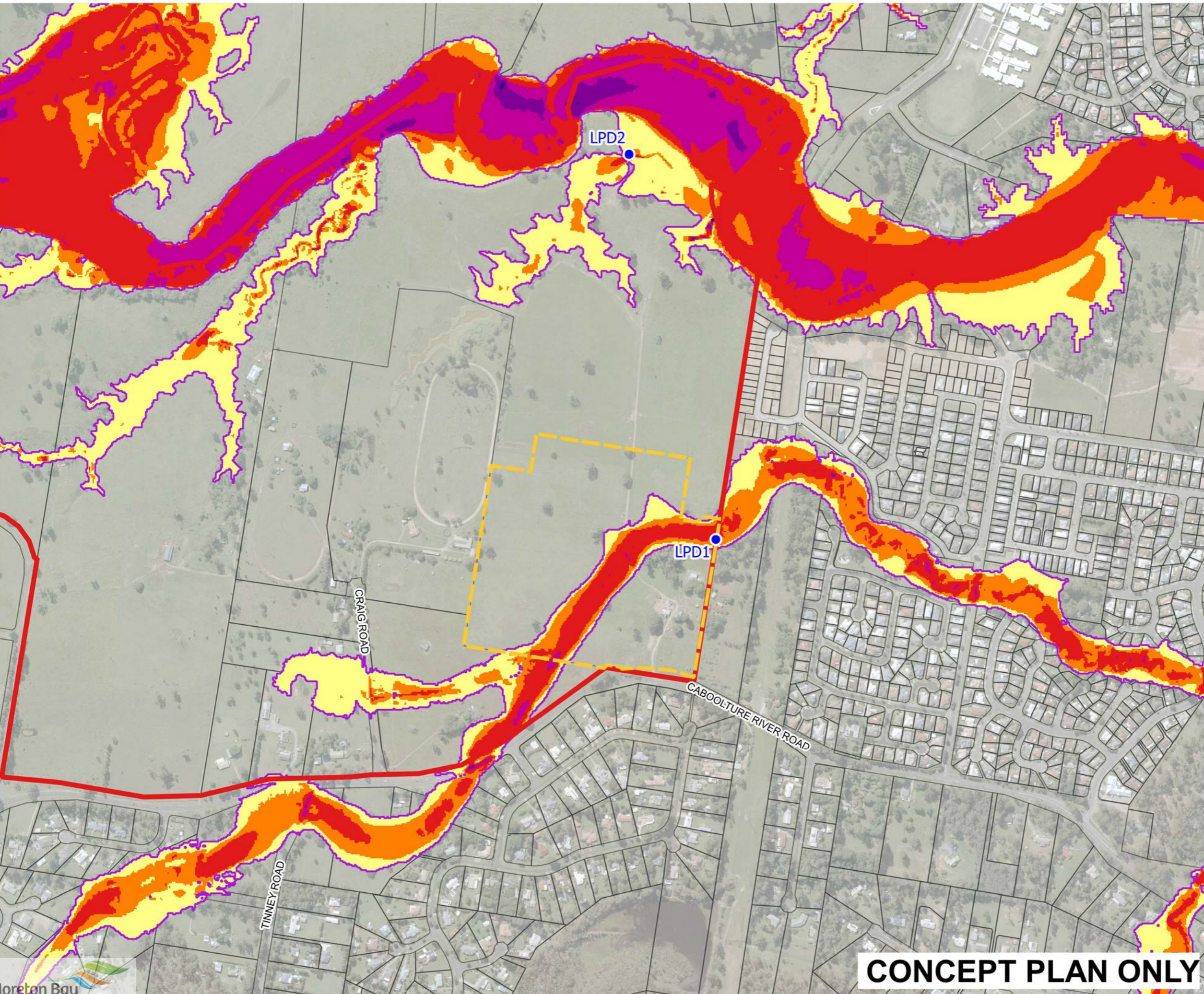
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A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

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**LEGEND**

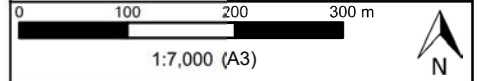
- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

**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).



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**

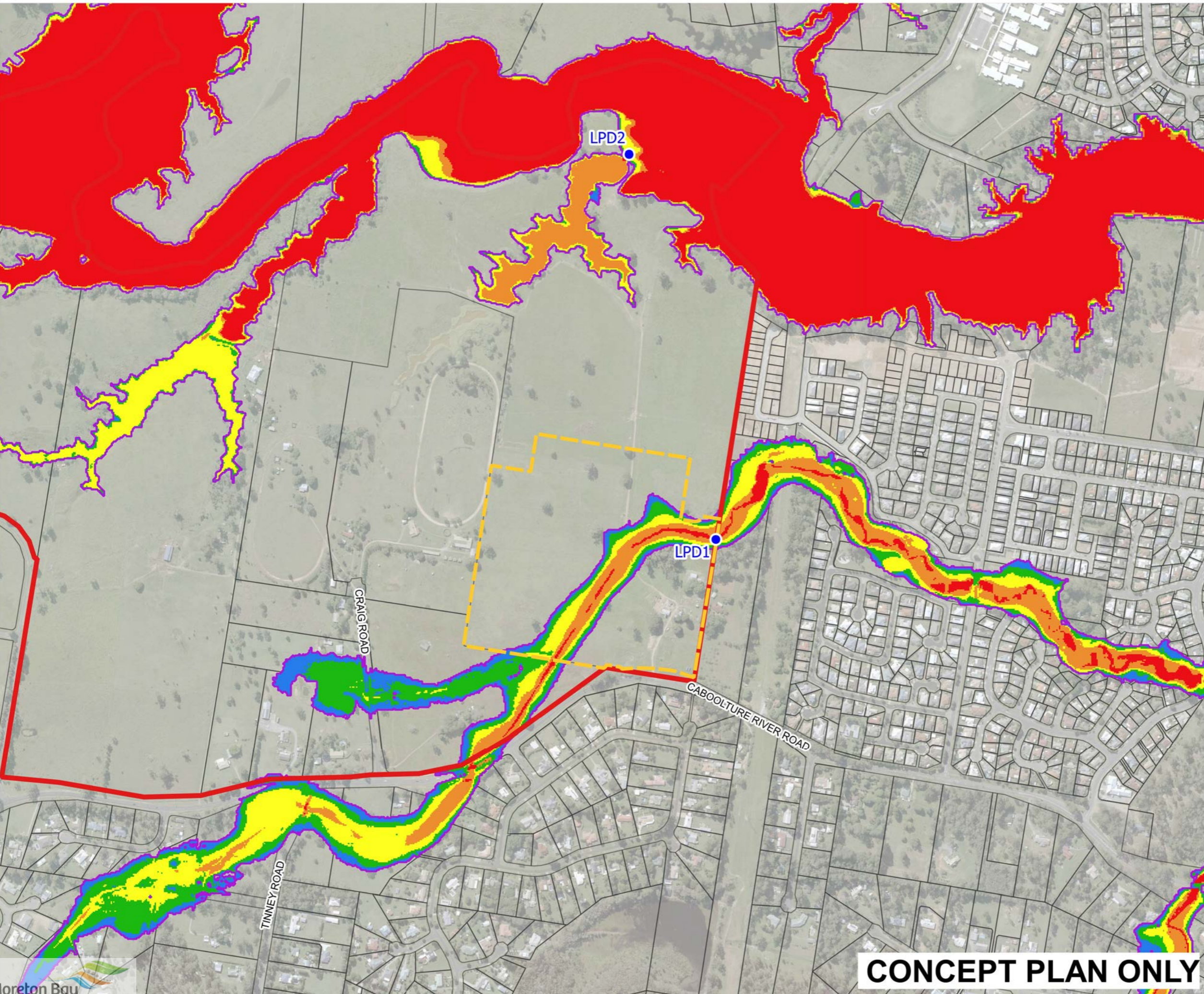
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B	NE	DY	18.11.22	FOR APPROVAL
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D				
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23/08/2023

**CONCEPT PLAN ONLY**



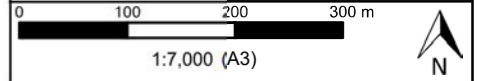
WHILE EVERY CARE IS TAKEN TO ENSURE THE ACCURACY OF DATA SOURCED THROUGH THIRD PARTIES, CALIBRE PROFESSIONAL SERVICES PTY LTD MAKES NO REPRESENTATIONS OR WARRANTIES ABOUT ITS ACCURACY, RELIABILITY, COMPLETENESS OR SUITABILITY FOR ANY PARTICULAR PURPOSE AND DISCLAIMS ALL RESPONSIBILITY AND ALL LIABILITY (INCLUDING WITHOUT LIMITATION LIABILITY IN NEGLIGENCE) FOR ALL EXPENSES, LOSSES, DAMAGES (INCLUDING INDIRECT OR CONSEQUENTIAL DAMAGE) AND COSTS WHICH MIGHT BE INCURRED AS A RESULT OF THE DATA BEING INACCURATE OR INCOMPLETE IN ANY WAY AND FOR ANY REASON.



- 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).



**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

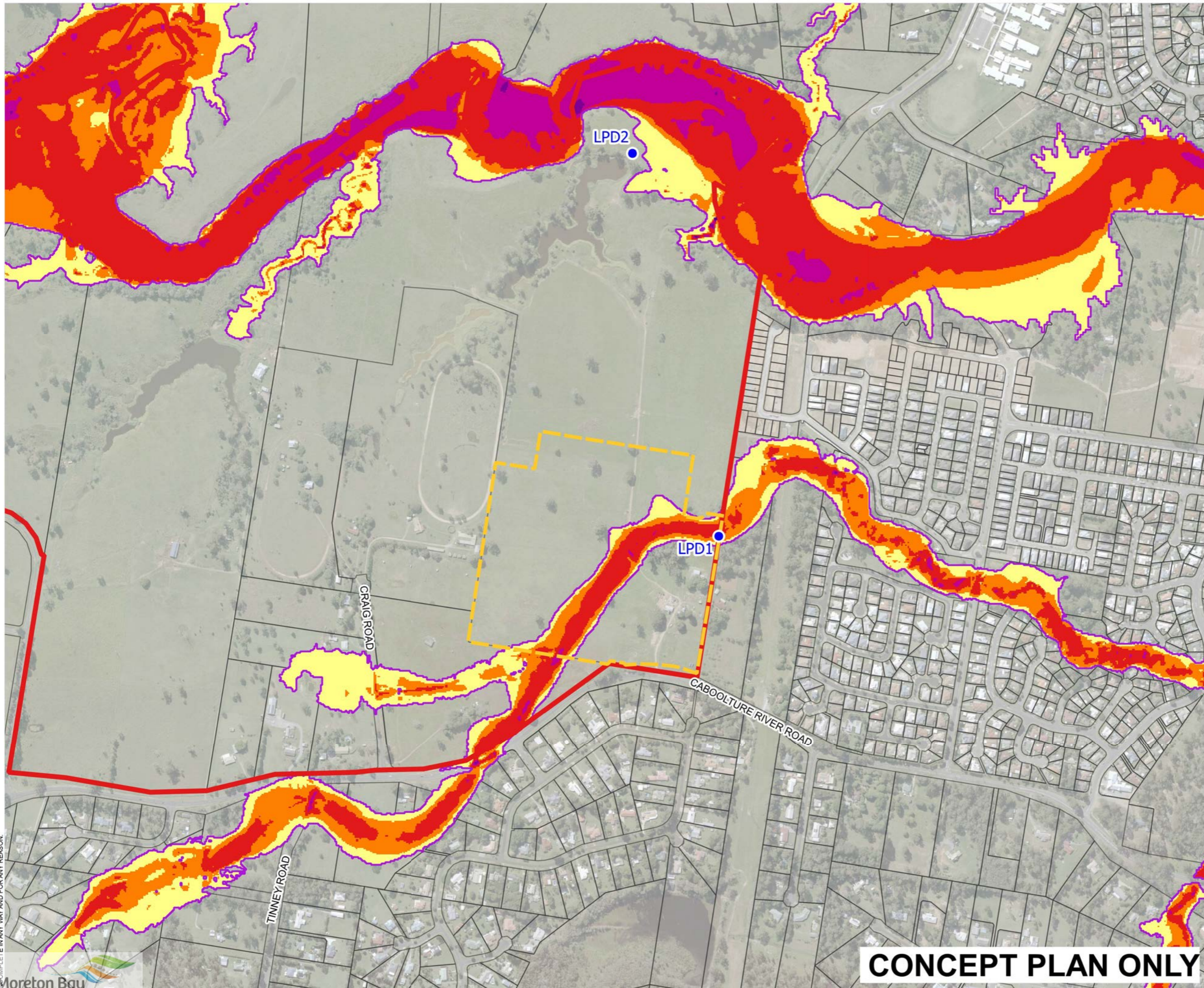
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B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

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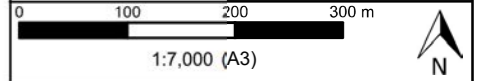
**LEGEND**

- 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).



**PROJECT:**  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

**CLIENT:**  
**FOREVERLEN PTY LTD**

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

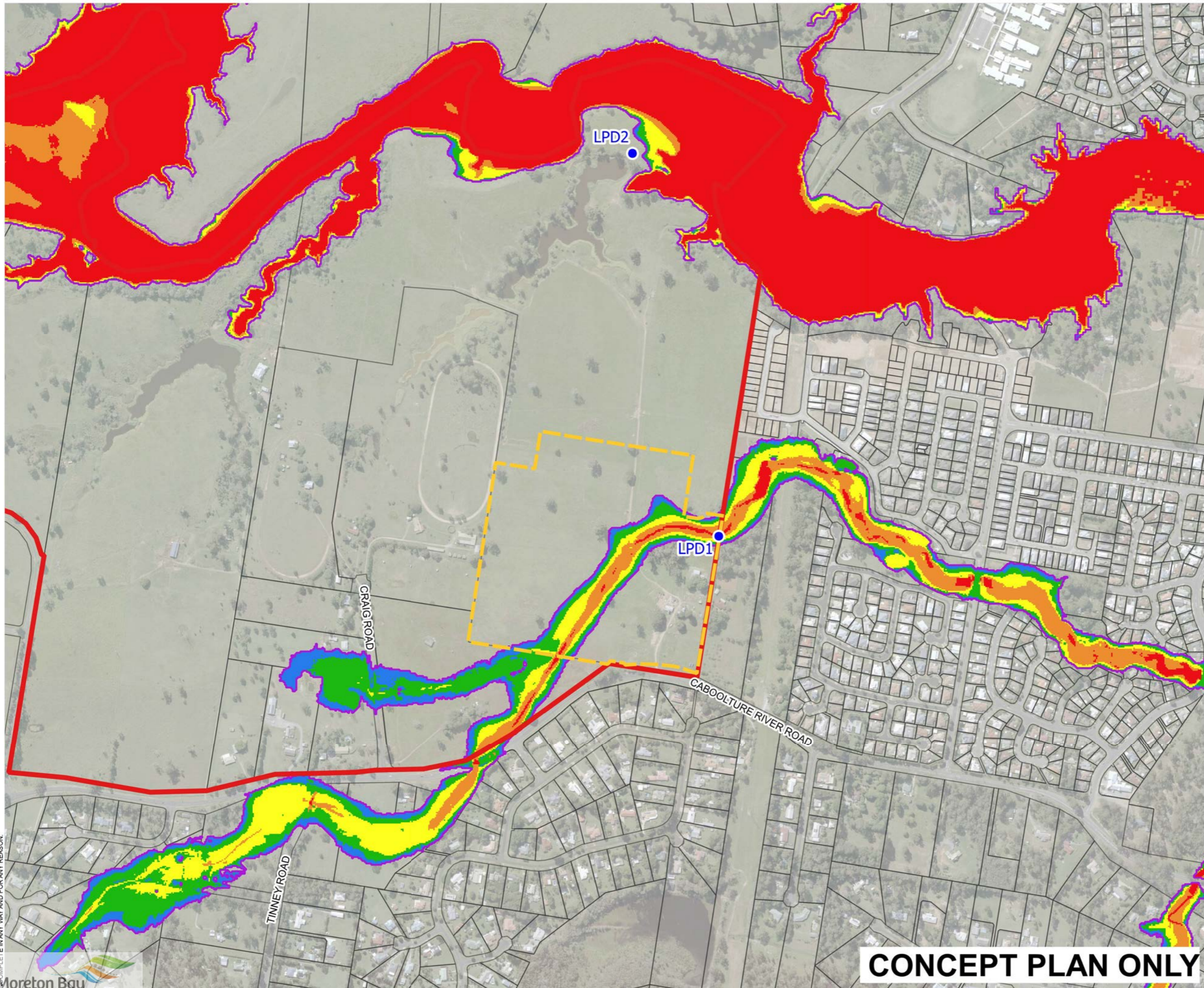
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D				
E				

**CONCEPT PLAN ONLY**



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**LEGEND**

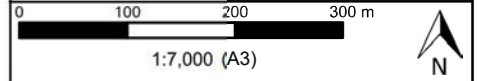
- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

**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).



PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

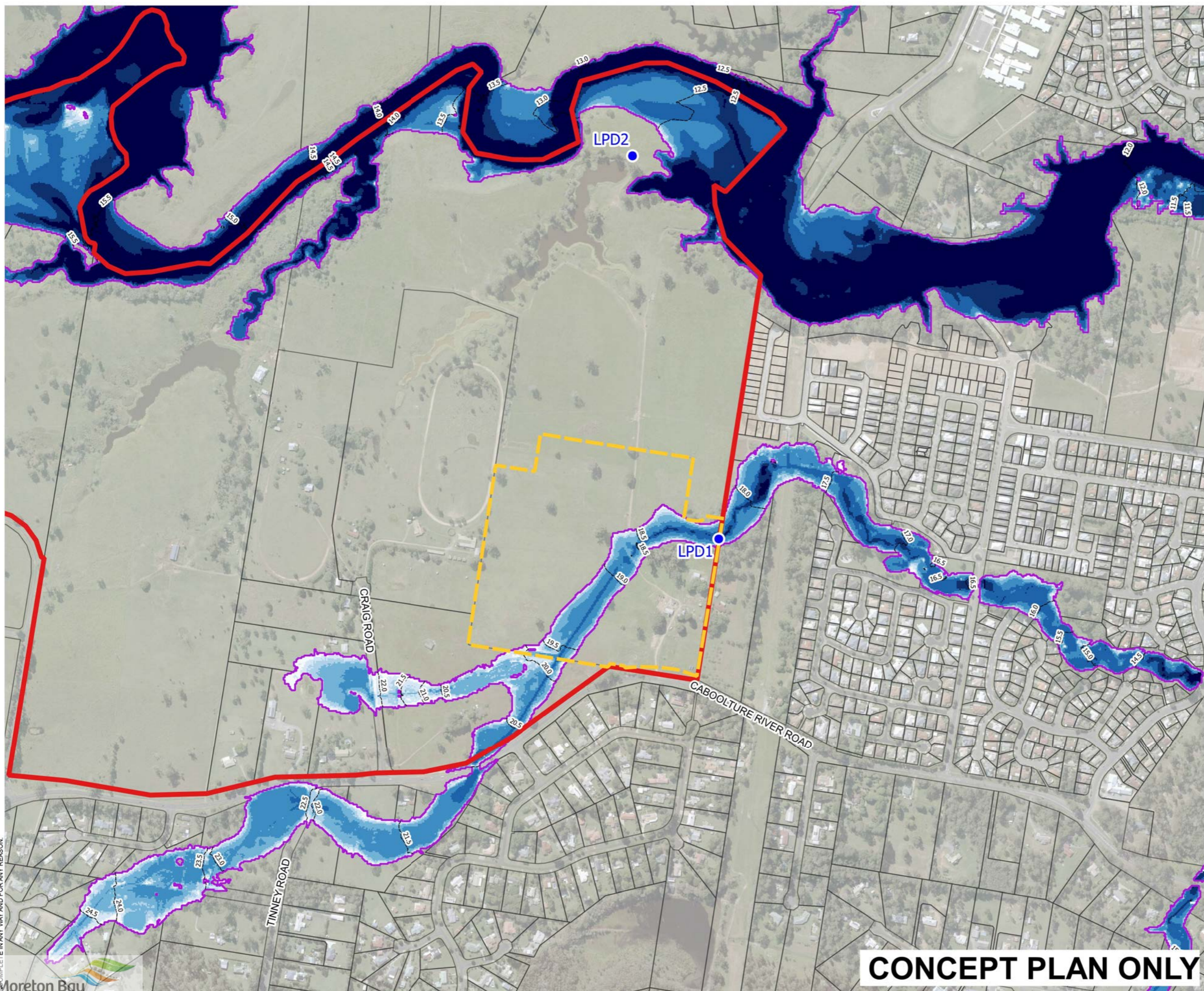
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1% AEP STORM EVENT  
MAXIMUM FLOOD HAZARD**

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				
E				

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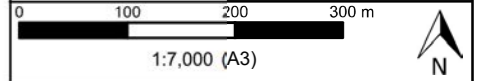


**LEGEND**

- 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).



**PROJECT:**  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

**CLIENT:**  
**FOREVERLEN PTY LTD**

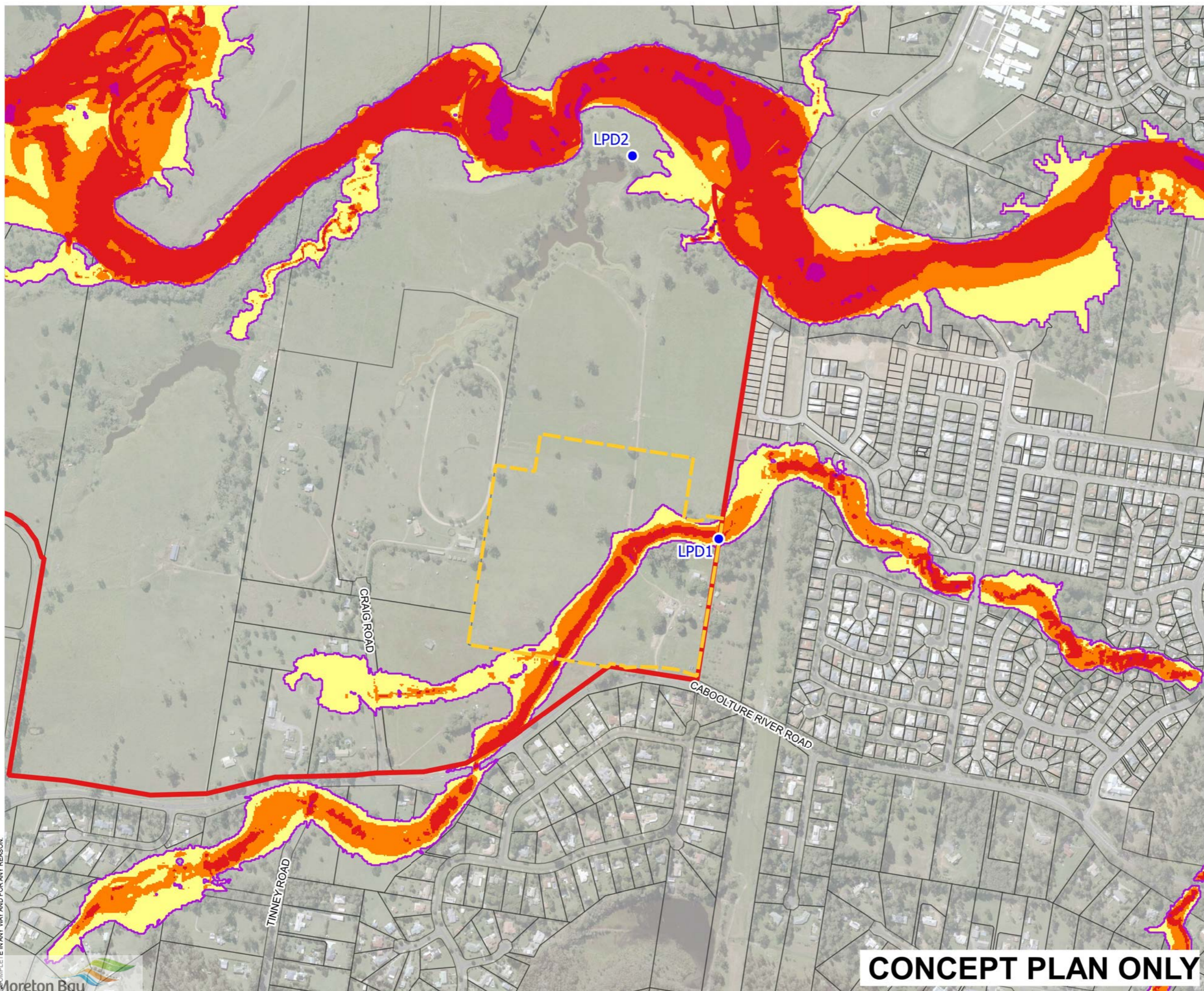
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 5% AEP STORM EVENT  
 MAXIMUM FLOOD DEPTH**

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

ISS	BY	CHK	DATE	DETAILS
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B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

CONCEPT PLAN ONLY

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**LEGEND**

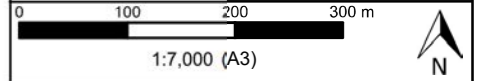
- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

**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).



**PROJECT:**  
 CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

**CLIENT:**  
 FOREVERLEN PTY LTD

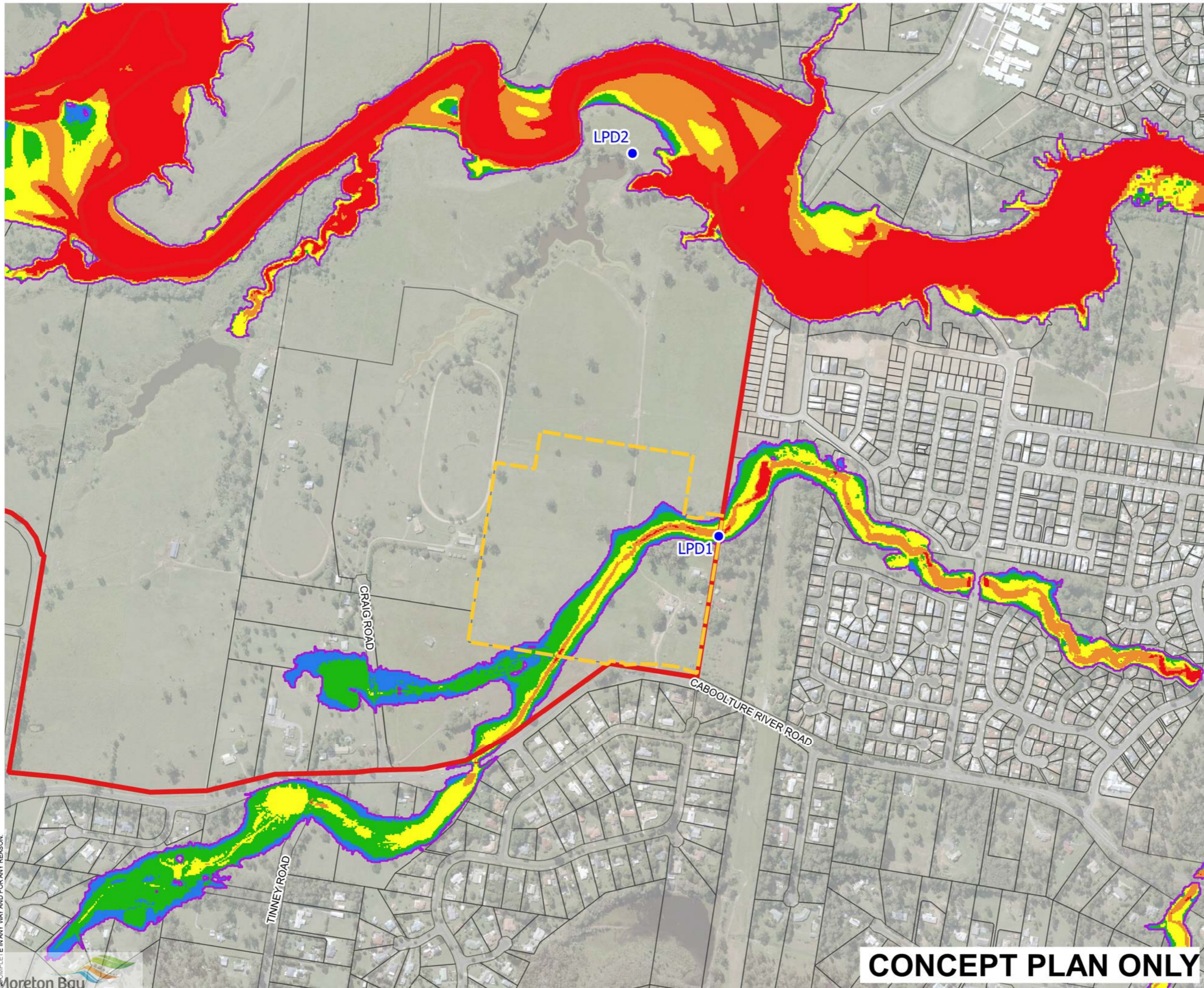
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 5% AEP STORM EVENT  
 MAXIMUM FLOOD VELOCITY

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

ISS	BY	CHK	DATE	DETAILS
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B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

**CONCEPT PLAN ONLY**

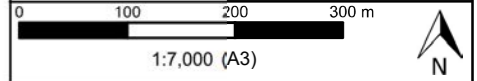
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- LEGEND**
- SITE BOUNDARY (STAGES 1-4)
  - NDP1 BOUNDARY
  - CADASTRE
  - LAWFUL POINT OF DISCHARGE
  - FLOOD EXTENT
- FLOOD HAZARD**
- H1
  - H2
  - H3
  - H4
  - H5

**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).



PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

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

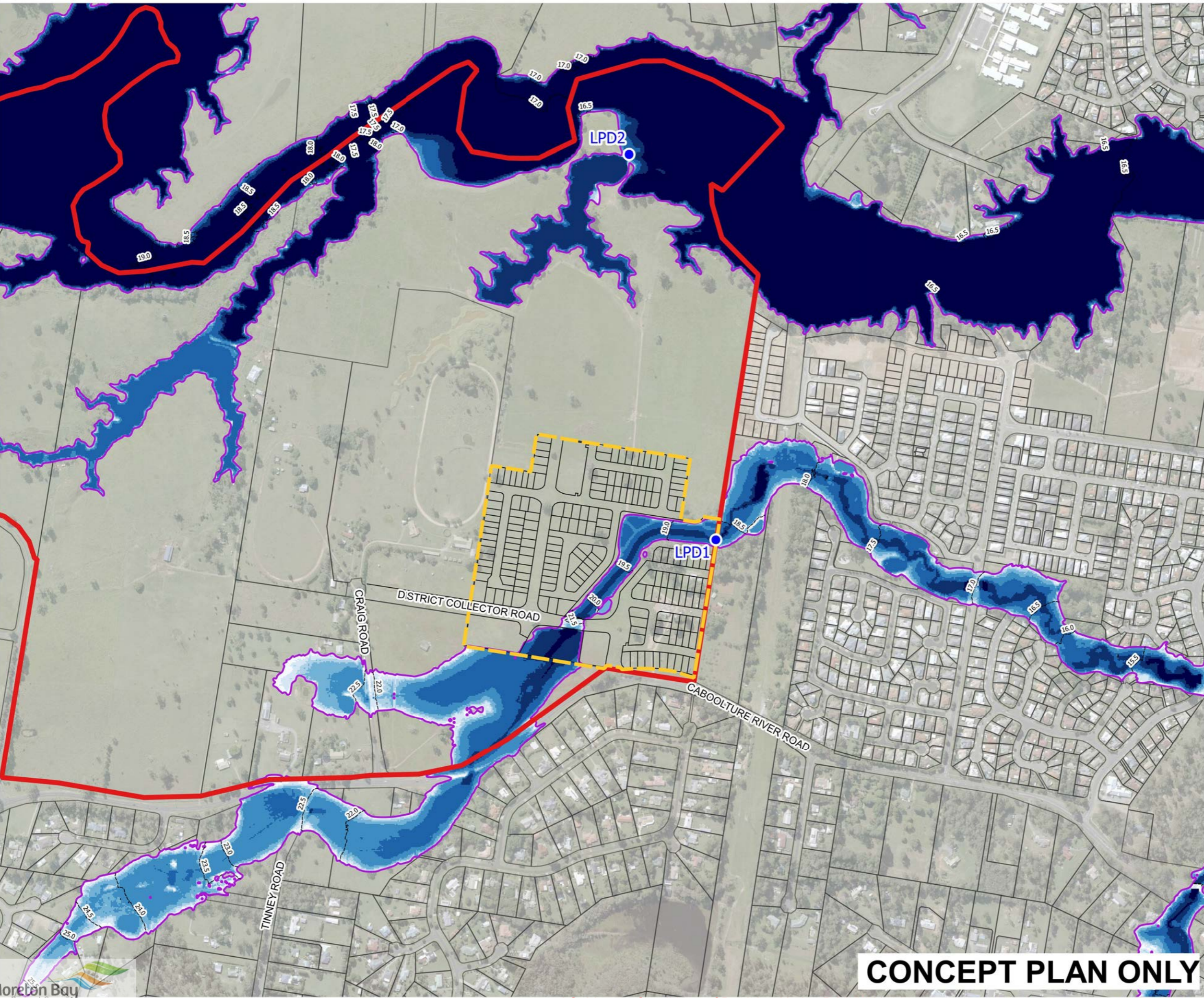
DRAWING NO: **16-002108-E-020-D**      ISSUE: **B**

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

**CONCEPT PLAN ONLY**



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**LEGEND**

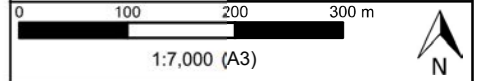
- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD HEIGHT CONTOURS (mAHD)
- FLOOD EXTENT

**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.
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).



**PROJECT:**  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

**CLIENT:**  
**FOREVERLEN PTY LTD**

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

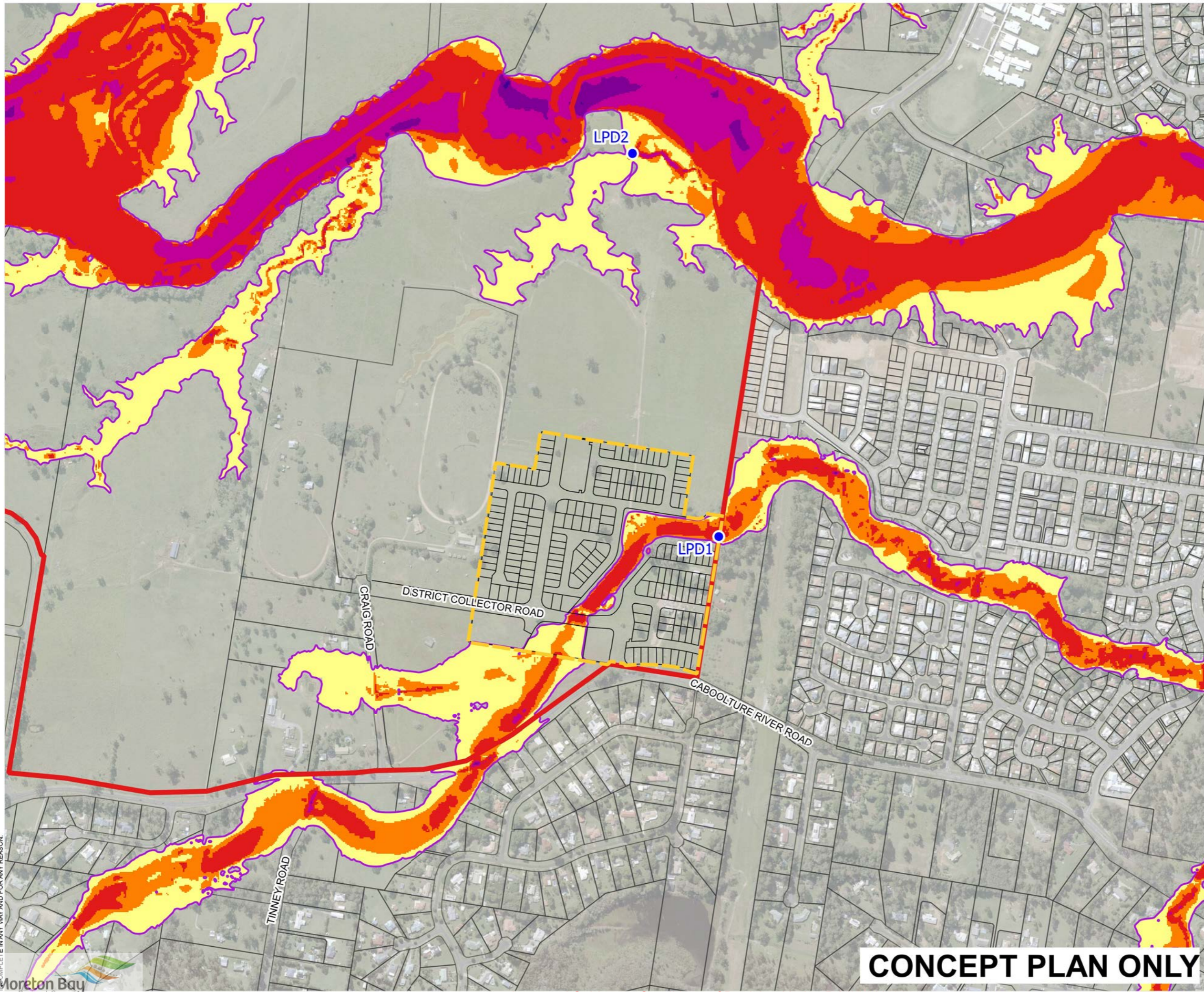
**DRAWING NO:** 16-002108-D-1000-A **ISSUE:** B

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

**CONCEPT PLAN ONLY**



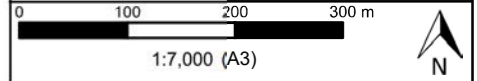
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**LEGEND**

- 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).



**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

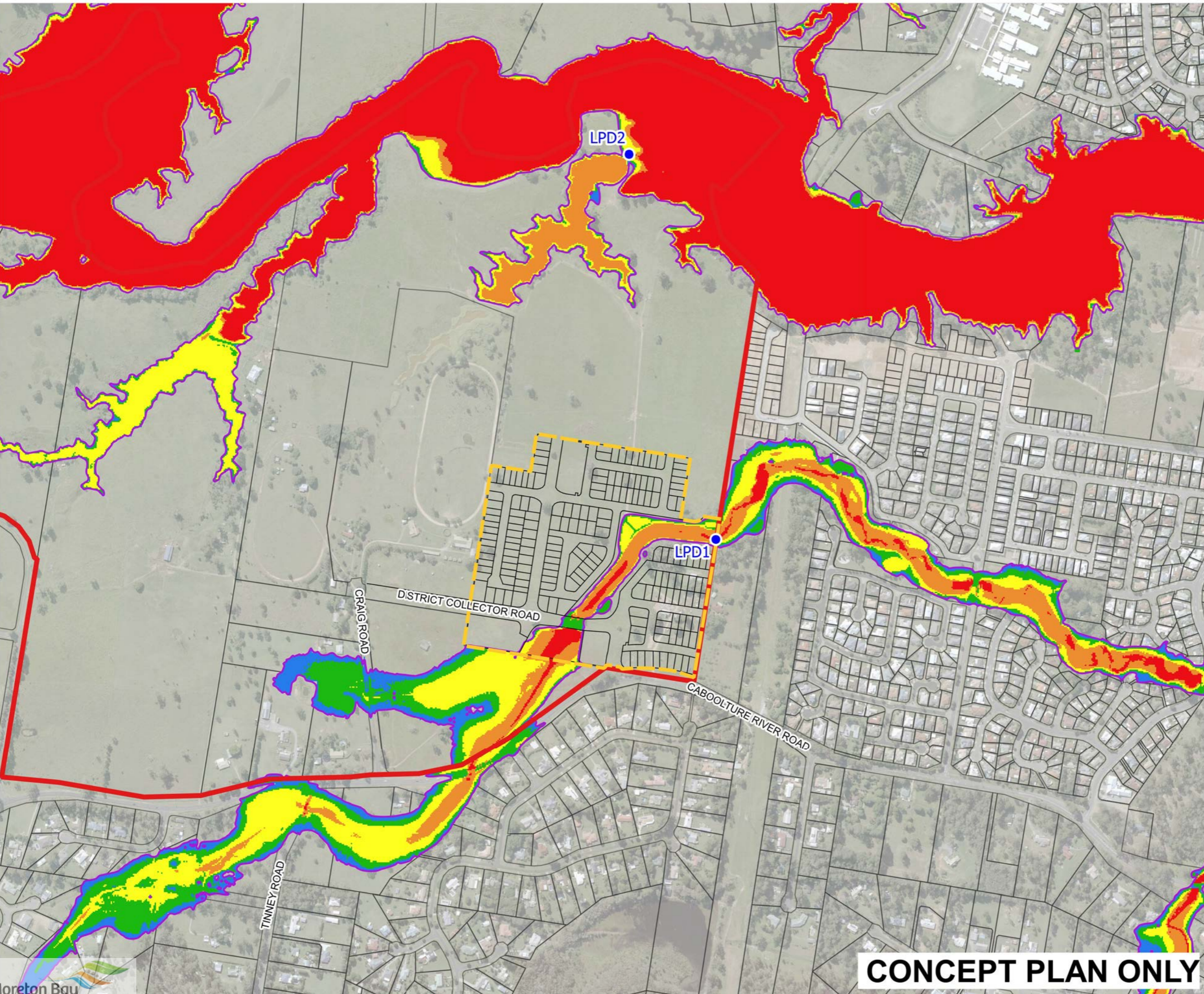
ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

**CONCEPT PLAN ONLY**





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**LEGEND**

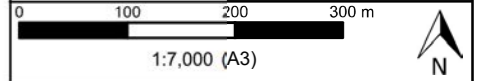
- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

**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).



PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

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

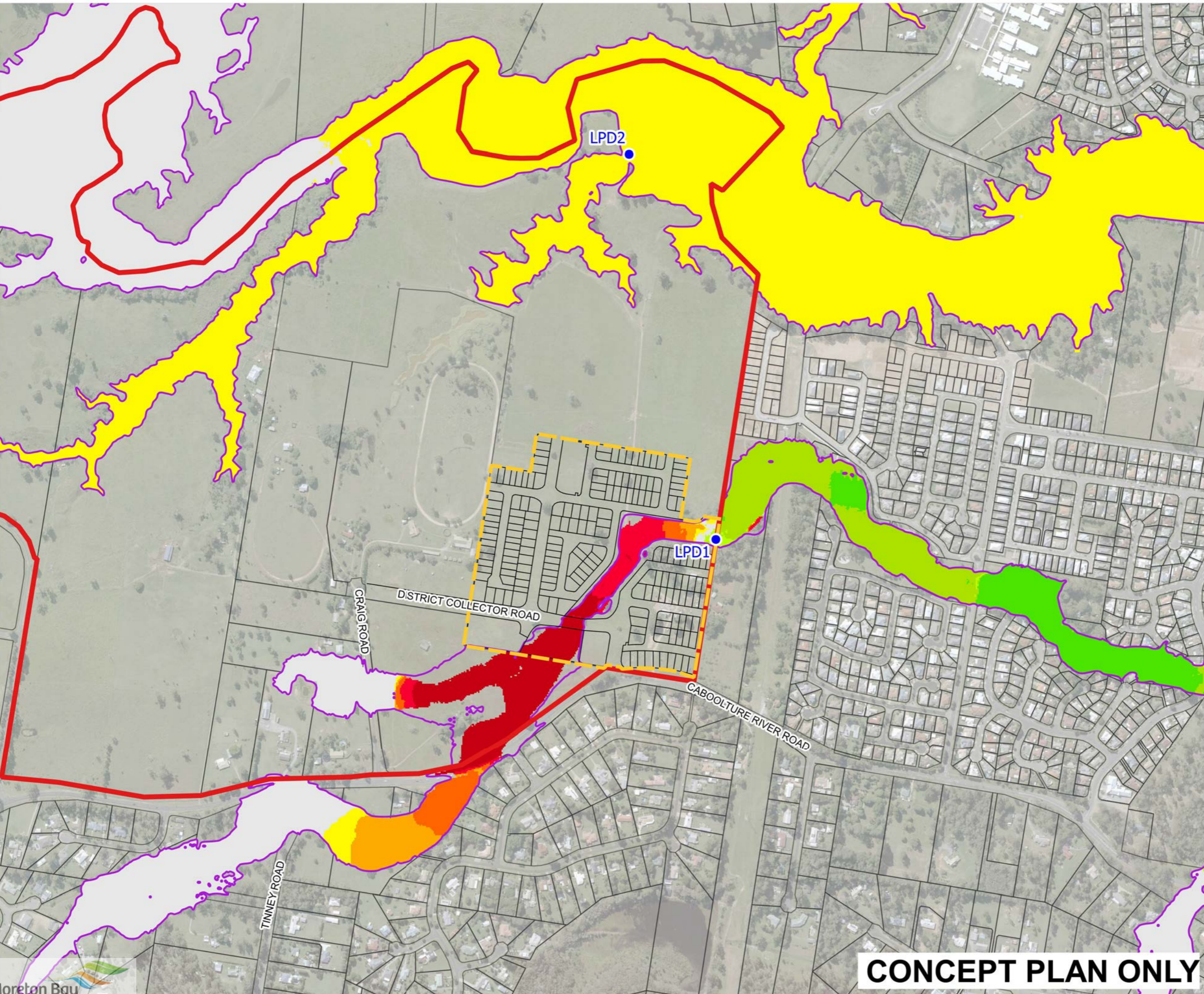
DRAWING NO: **16-002108-D-1000-D**      ISSUE: **B**

ISS	BY	CHK	DATE	DETAILS
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B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

**CONCEPT PLAN ONLY**



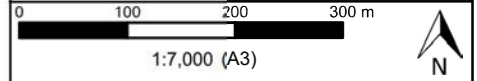
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**LEGEND**

- 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:**
- REFER TO CALIBRE REPORT No. 16-002108-SWMP-01C DATED NOVEMBER 2022.
  - RESULTS PRESENTED ARE THE MAXIMUM OF STANDARD DURATIONS FOR THE AEP EVENT PRESENTED.
  - ALL LEVELS PRESENTED ARE IN METRES FROM AUSTRALIAN HEIGHT DATUM (mAHD).



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**

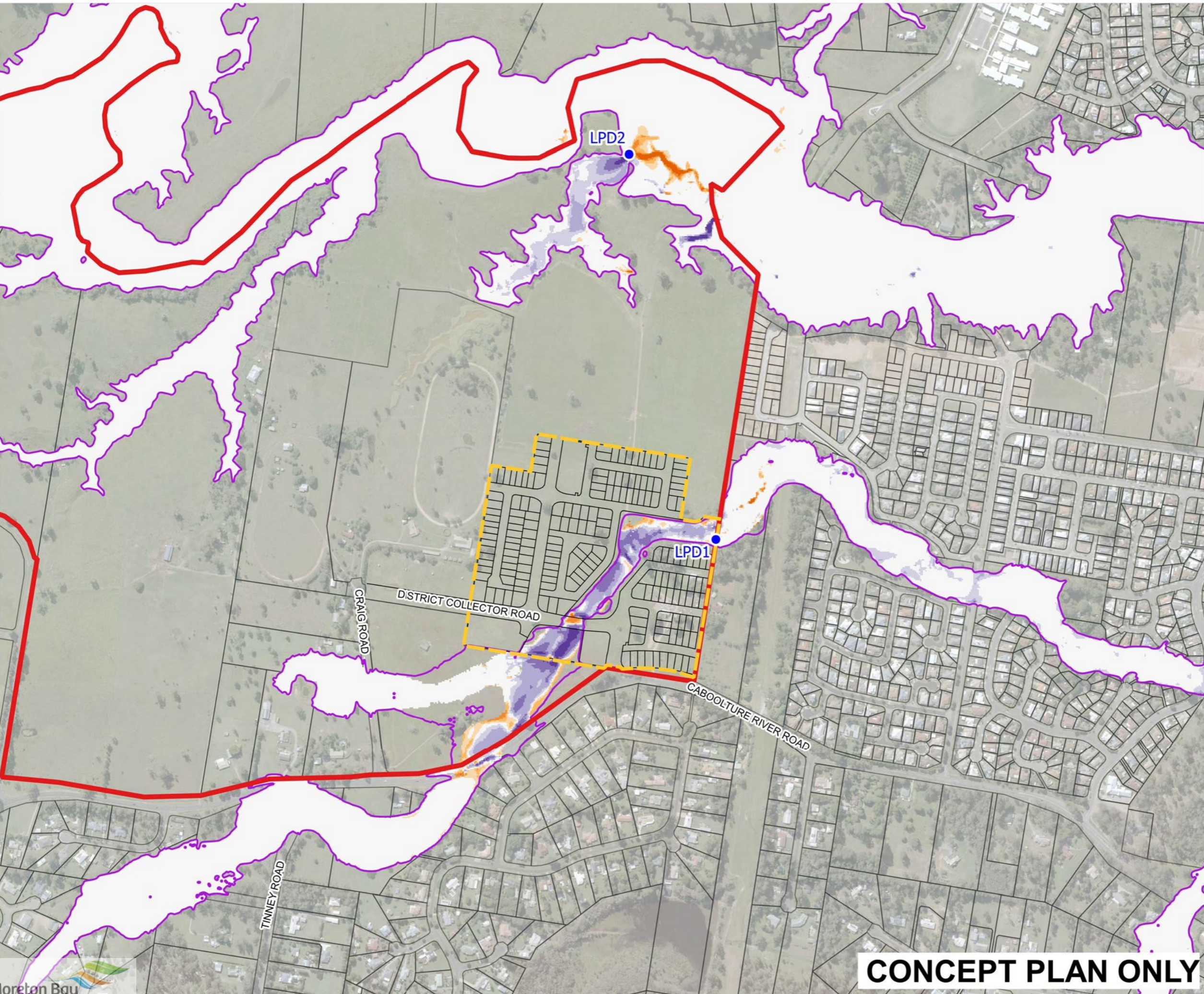
DRAWING NO: **16-002108-D-1000-E**      ISSUE: **B**

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

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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)**

- <math>< -1.0</math>
- 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

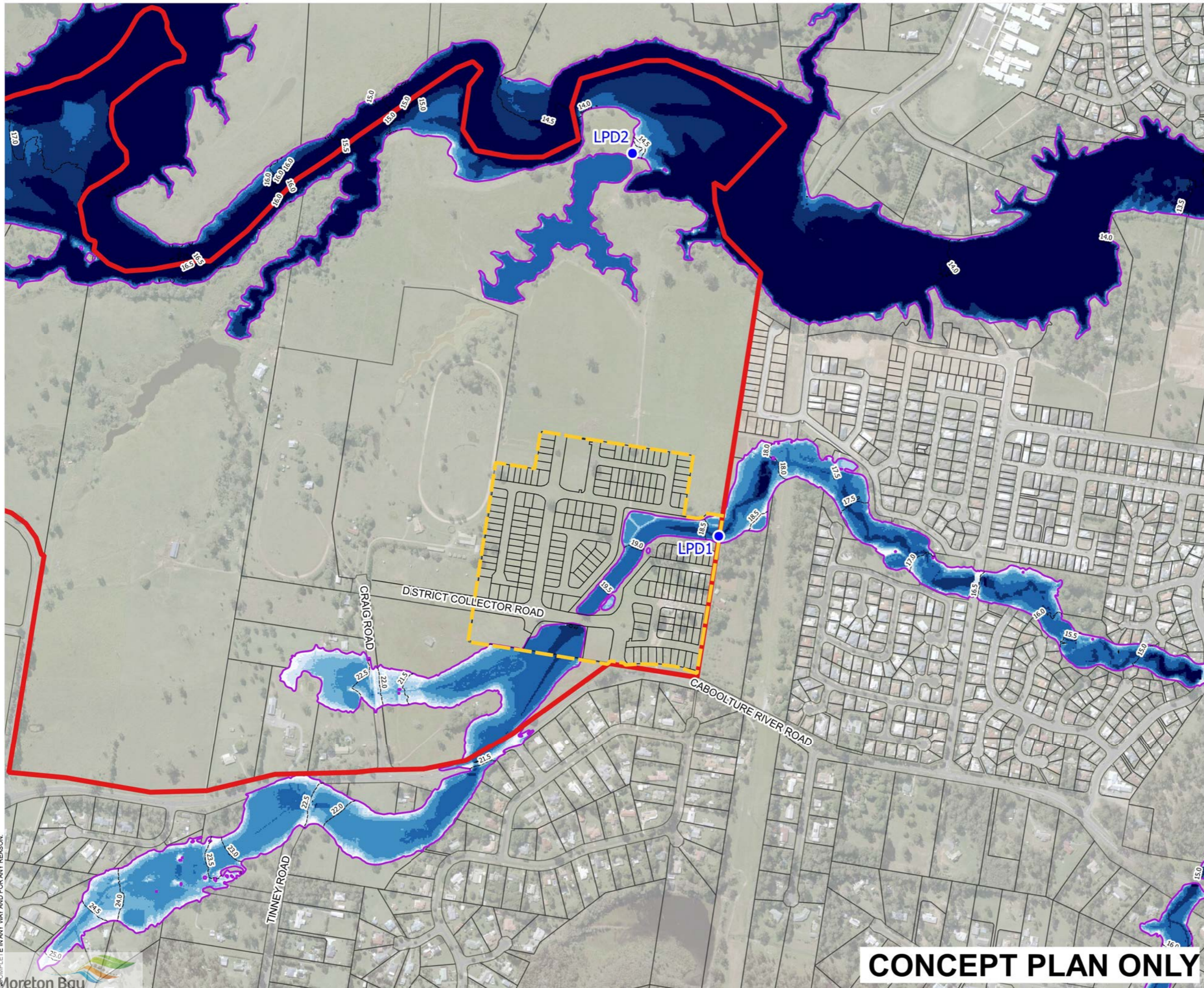
**DRAWING NO:** 16-002108-D-1000-F **ISSUE:** B

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

**CONCEPT PLAN ONLY**



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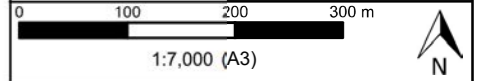
**LEGEND**

- 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.
  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).



PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

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

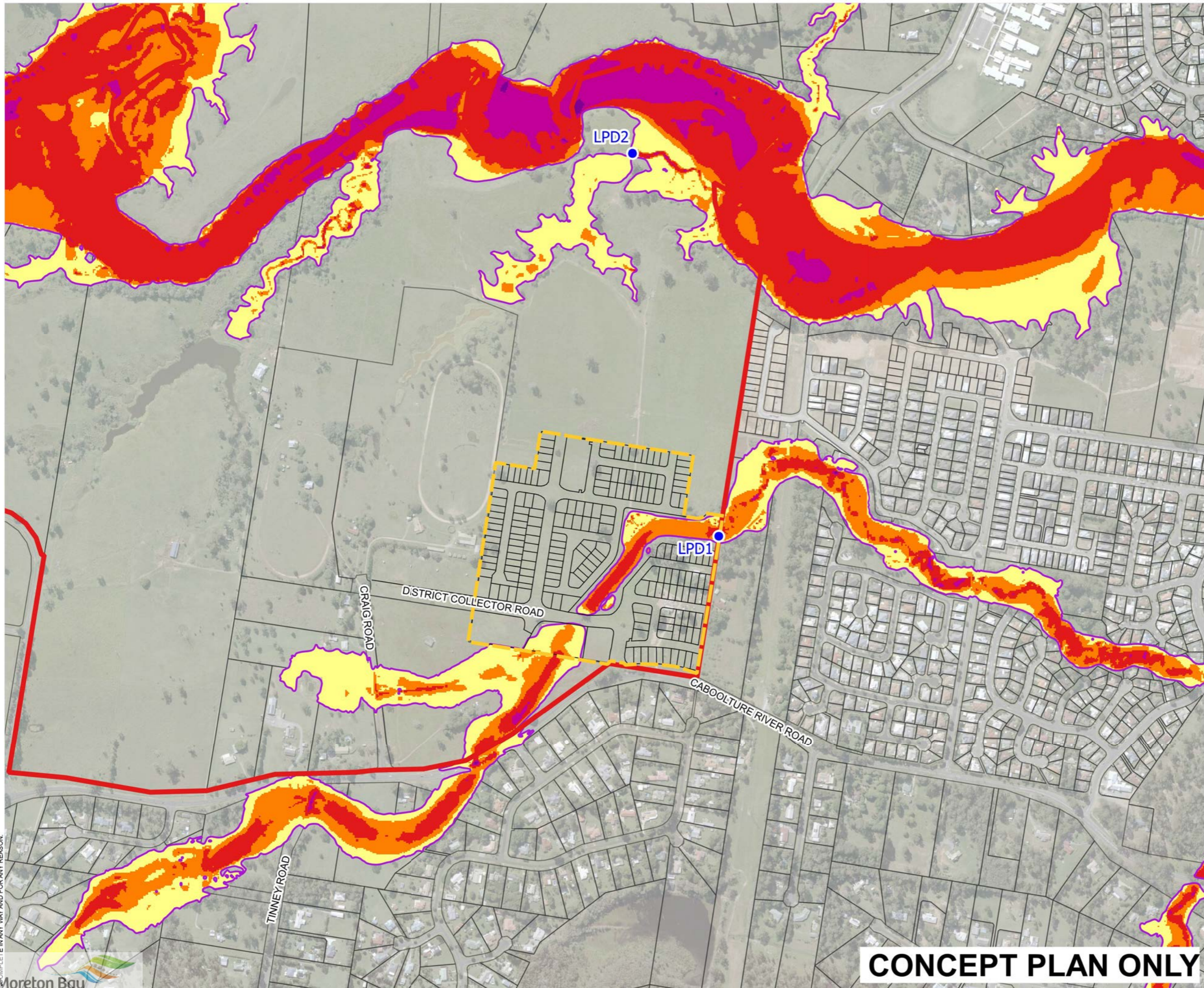
DRAWING NO: **16-002108-D-100-A**      ISSUE: **B**

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

**CONCEPT PLAN ONLY**



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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)**

- <math>< 0.5</math>
- 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

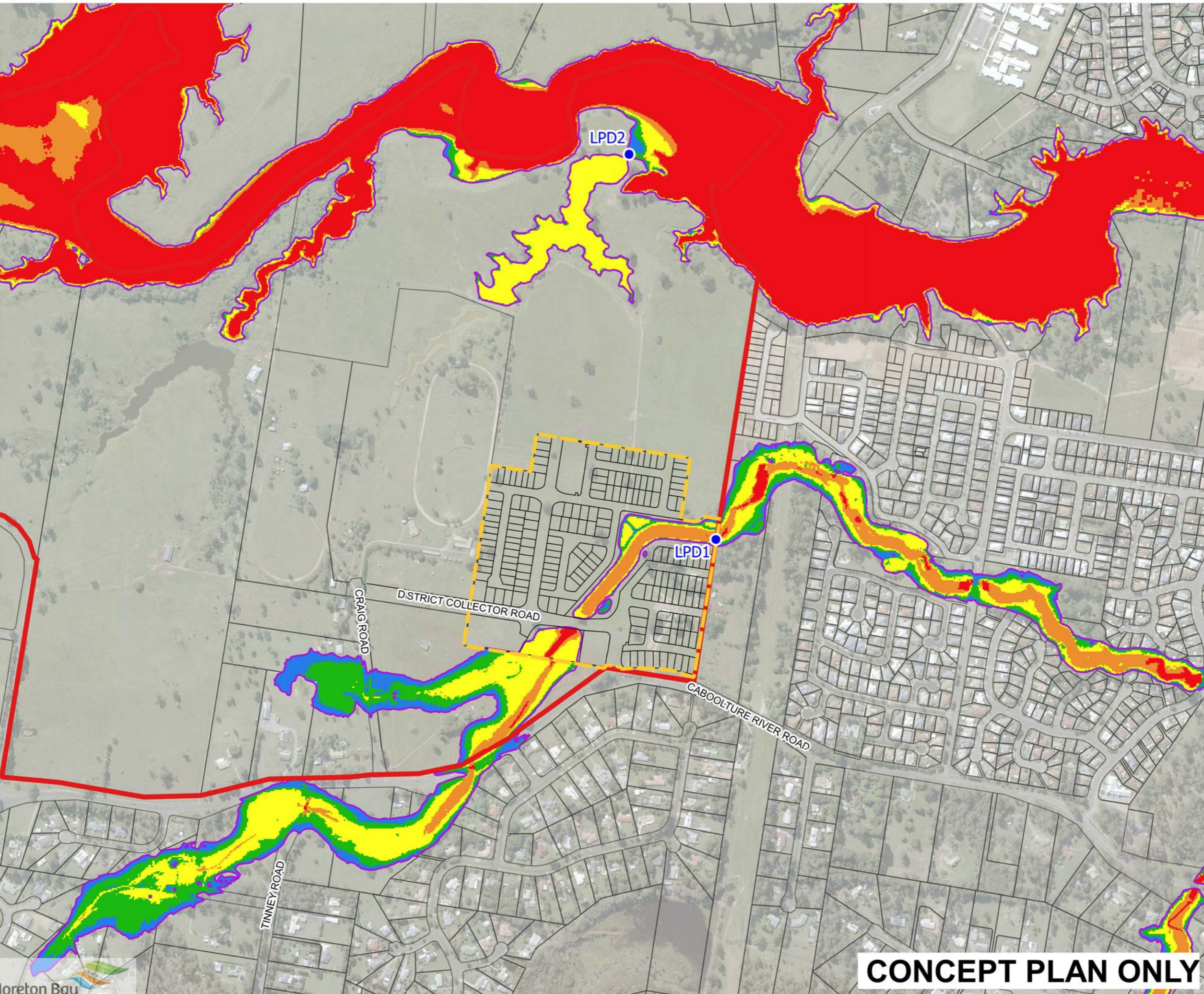
<b>PROJECT:</b> CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4	
<b>CLIENT:</b> FOREVERLEN PTY LTD	
<b>DRAWING TITLE:</b> DEVELOPED SCENARIO 1% AEP STORM EVENT MAXIMUM FLOOD VELOCITY	
<b>DRAWING NO:</b> 16-002108-D-100-B	<b>ISSUE:</b> B

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

**CONCEPT PLAN ONLY**

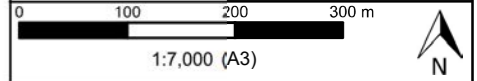


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- LEGEND**
- SITE BOUNDARY (STAGES 1-4)
  - NDP1 BOUNDARY
  - PROPOSED DEVELOPMENT LAYOUT
  - CADASTRE
  - LAWFUL POINT OF DISCHARGE
  - FLOOD EXTENT
- FLOOD HAZARD**
- H1
  - H2
  - H3
  - H4
  - H5

- 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).



PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

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

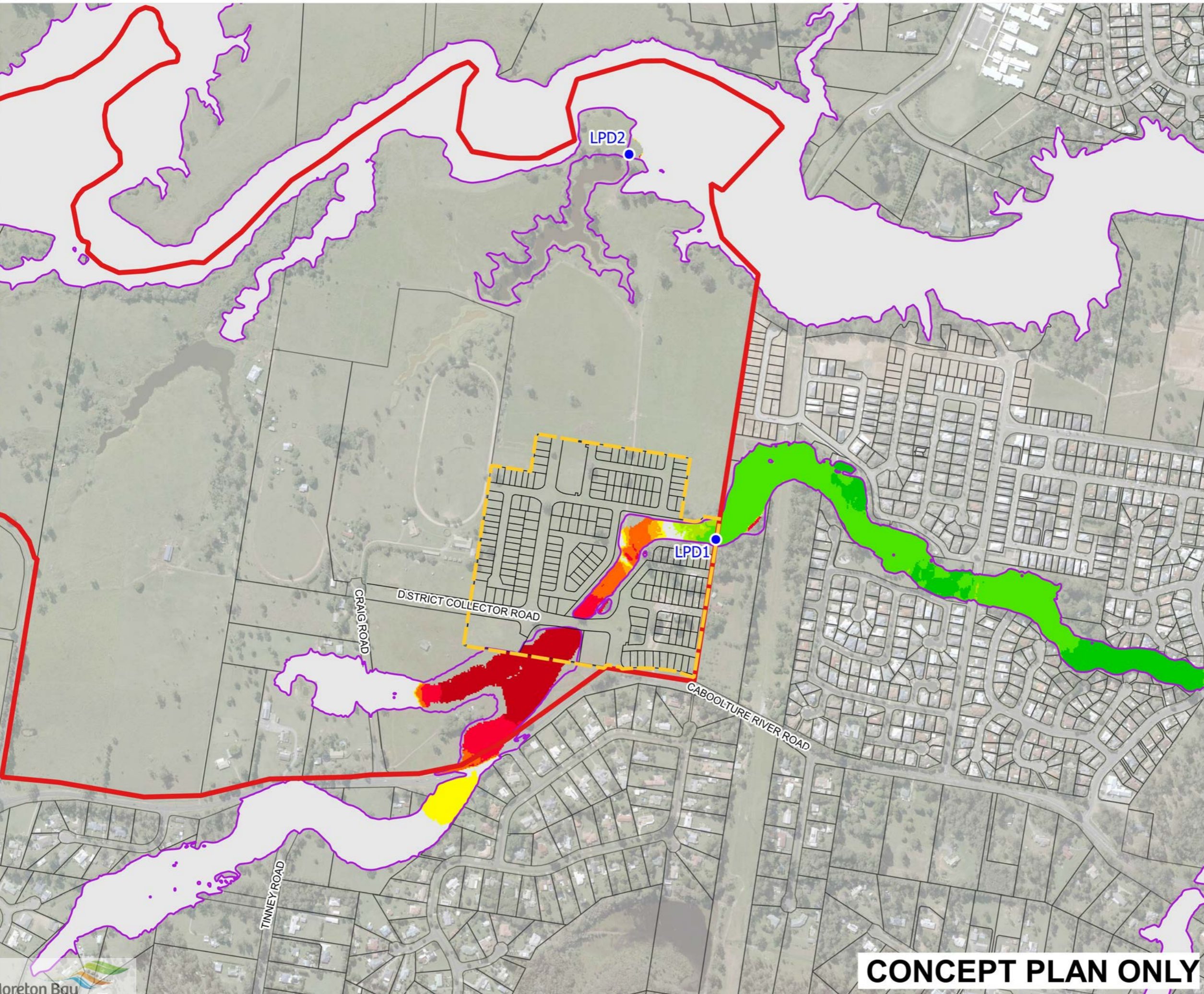
DRAWING NO: **16-002108-D-100-D**      ISSUE: **B**

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

**CONCEPT PLAN ONLY**



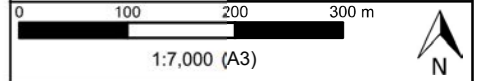
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- LEGEND**
- SITE BOUNDARY (STAGES 1-4)
  - NDP1 BOUNDARY
  - PROPOSED DEVELOPMENT LAYOUT
  - CADASTRE
  - LAWFUL POINT OF DISCHARGE
  - FLOOD EXTENT
- WSL DIFFERENCE (m)**
- < -0.5
  - 0.5 TO -0.2
  - 0.2 TO -0.1
  - 0.1 TO -0.05
  - 0.05 TO -0.02
  - 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).



**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
C				
D				
E				

**CONCEPT PLAN ONLY**



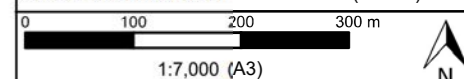
**LEGEND**

- 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).



**PROJECT:**  
 CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

**CLIENT:**  
 FOREVERLEN PTY LTD

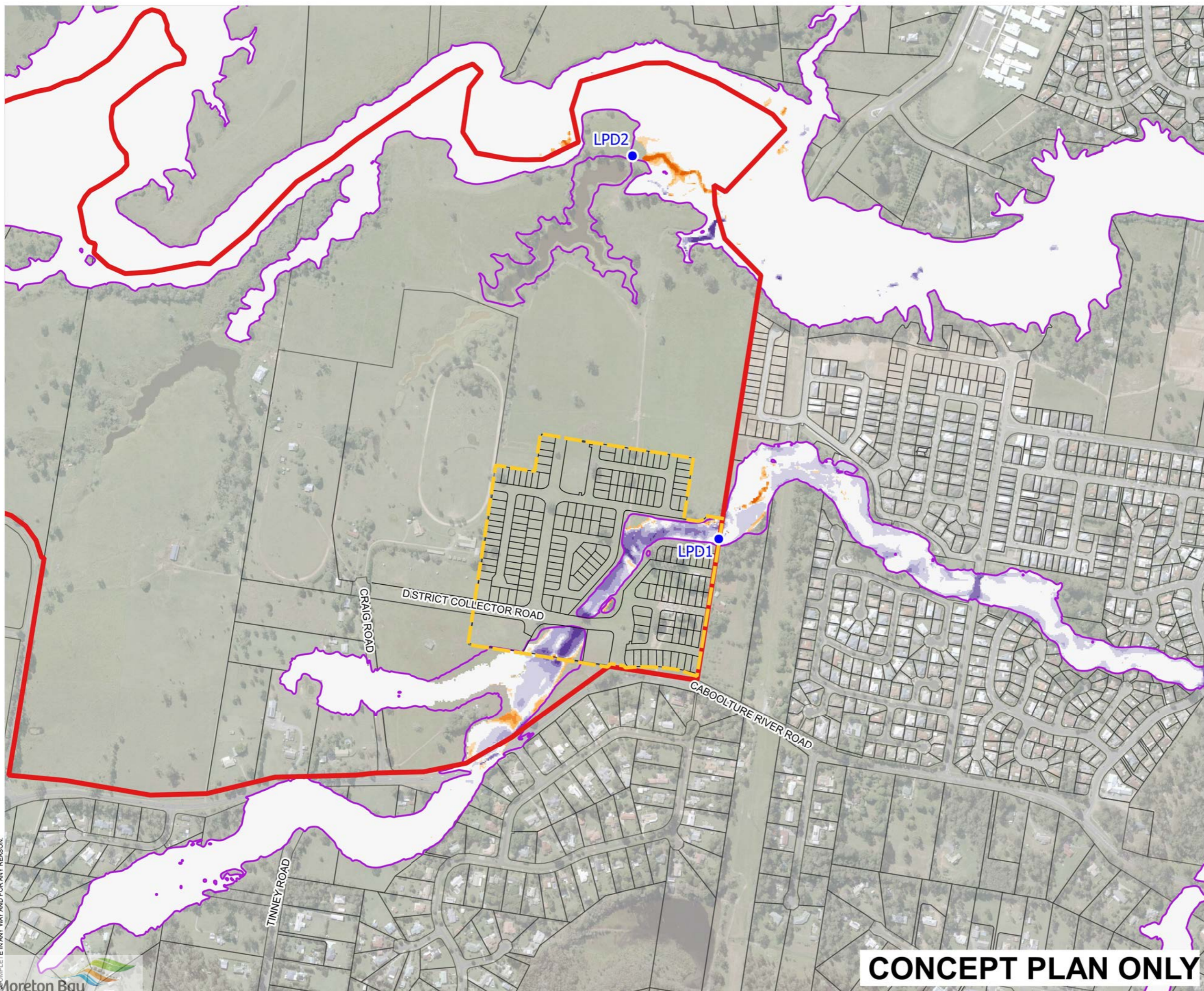
**DRAWING TITLE:**  
 DEVELOPED SCENARIO  
 1% AEP STORM EVENT  
 MAXIMUM FLOOD VELOCITY  
 DIFFERENCE

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

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

23/08/2023

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**CONCEPT PLAN ONLY**



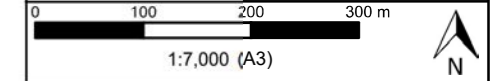
**LEGEND**

- 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).



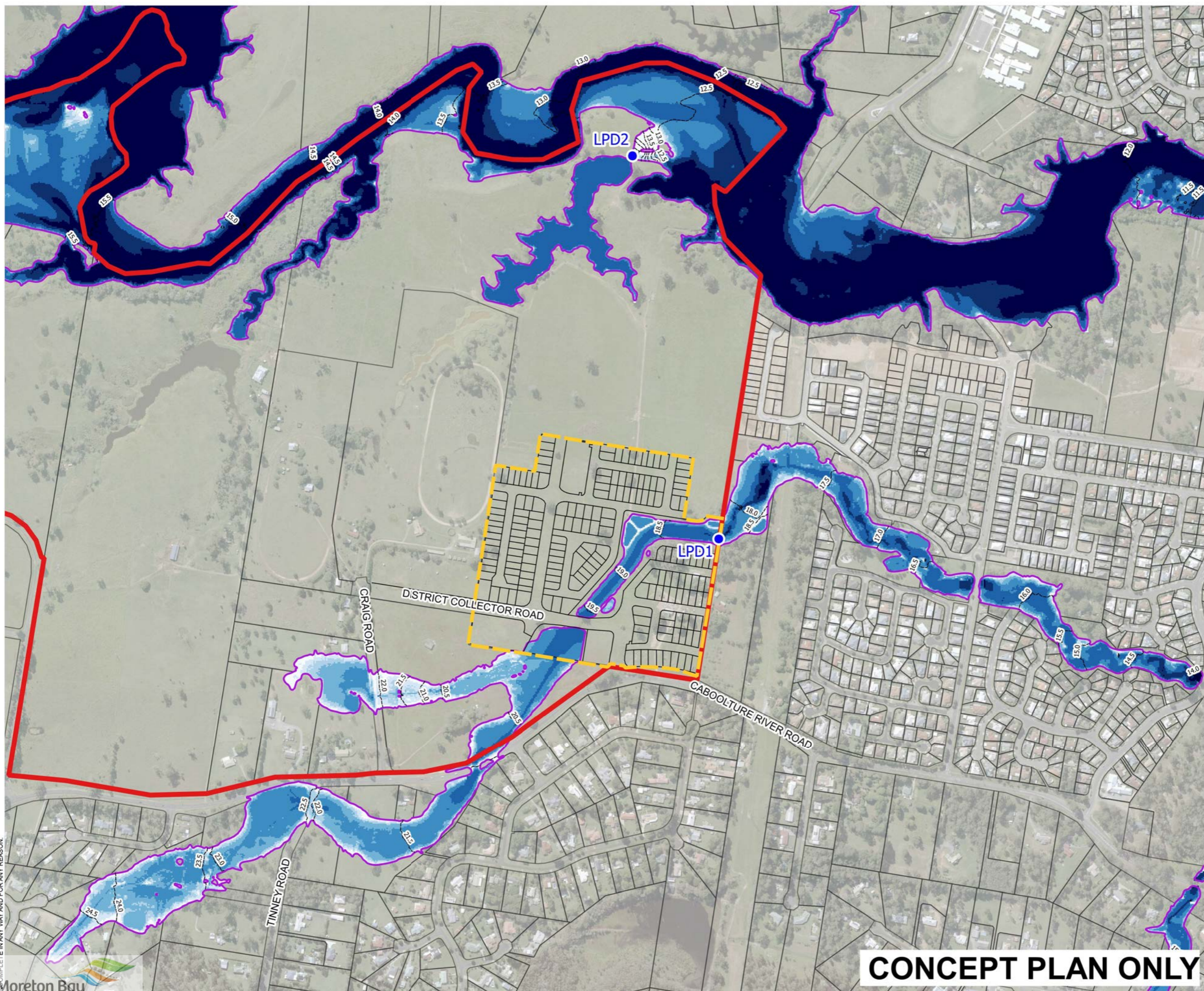
PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

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

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

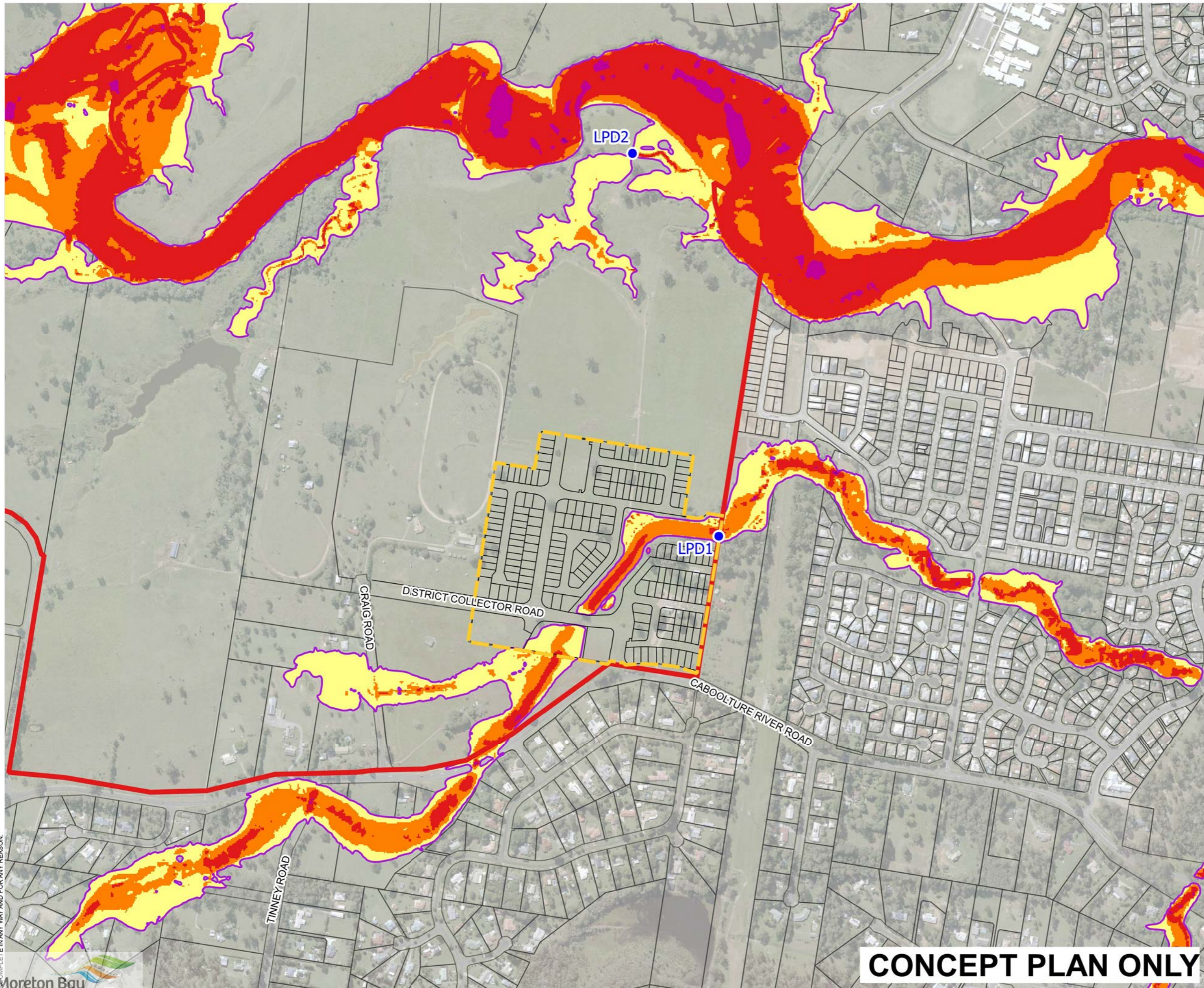
ISS	BY	CHK	DATE	DETAILS
A	MC	DY	06.06.22	INITIAL ISSUE
B	NE	DY	18.11.22	FOR APPROVAL
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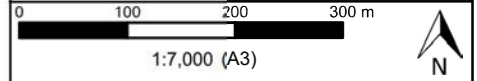
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**LEGEND**

- 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).



PROJECT:  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

CLIENT:  
**FOREVERLEN PTY LTD**

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

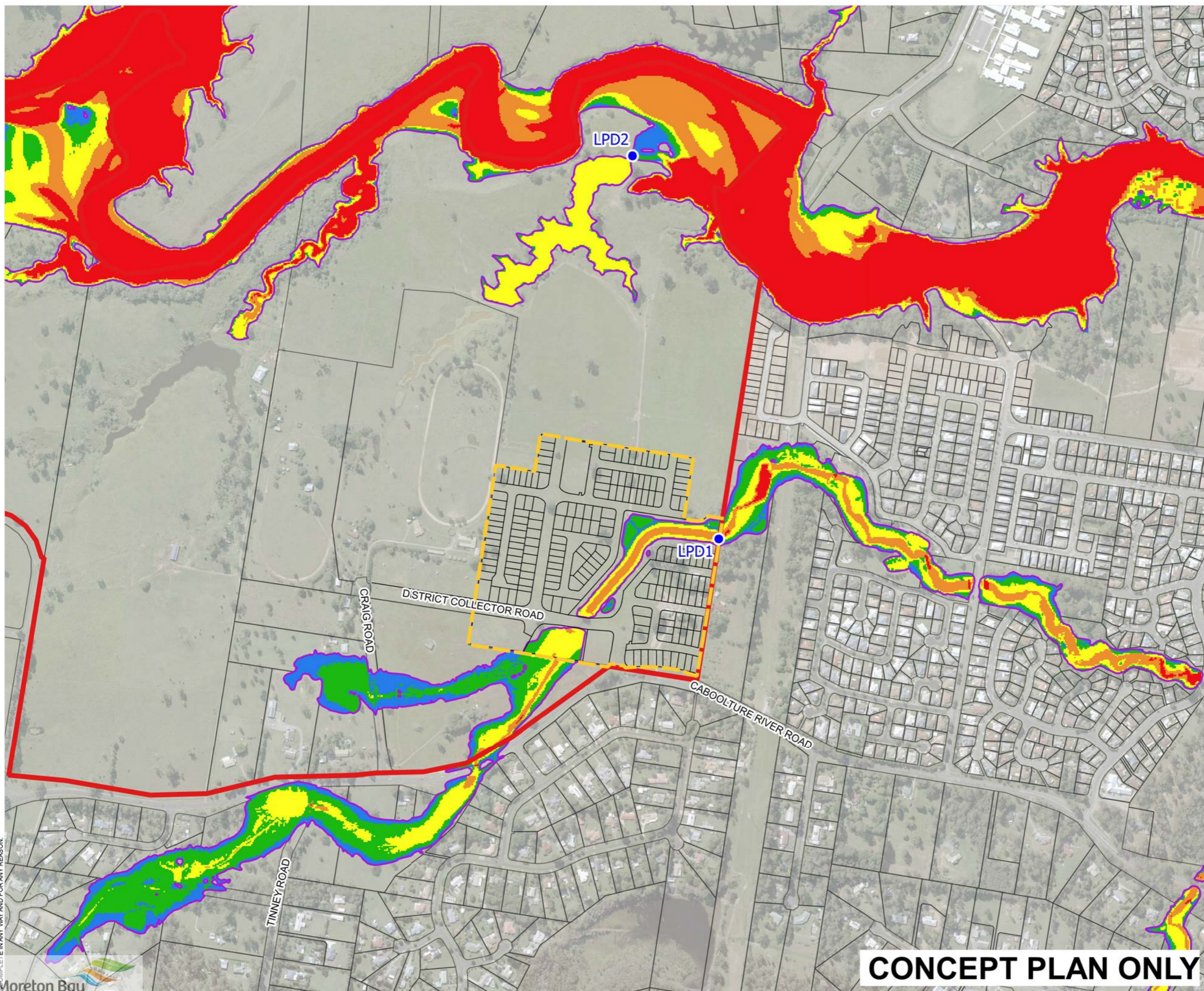
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ISS	BY	CHK	DATE	DETAILS
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B	NE	DY	18.11.22	FOR APPROVAL
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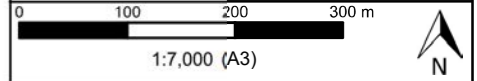


**LEGEND**

- 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).



**PROJECT:**  
 CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4

**CLIENT:**  
 FOREVERLEN PTY LTD

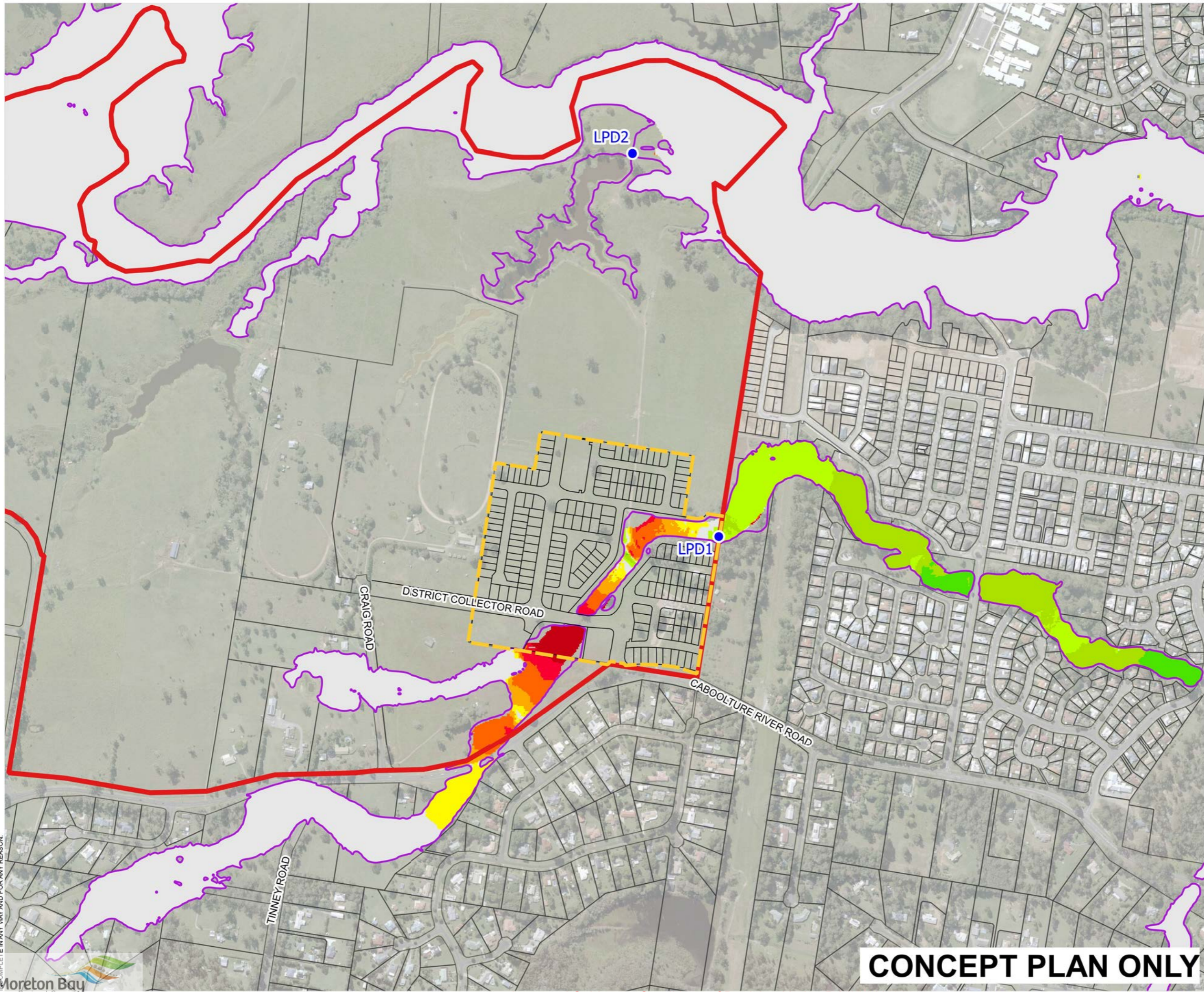
**DRAWING TITLE:**  
 DEVELOPED SCENARIO  
 5% AEP STORM EVENT  
 MAXIMUM FLOOD HAZARD

**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
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**LEGEND**

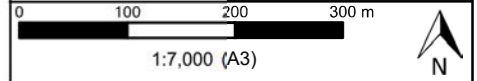
- SITE BOUNDARY (STAGES 1-4)
- NDP1 BOUNDARY
- PROPOSED DEVELOPMENT LAYOUT
- CADASTRE
- LAWFUL POINT OF DISCHARGE
- FLOOD EXTENT

**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).



**PROJECT:**  
**CABOOLTURE WEST SBSMP - FOREVERLEN STAGES 1-4**

**CLIENT:**  
**FOREVERLEN PTY LTD**

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

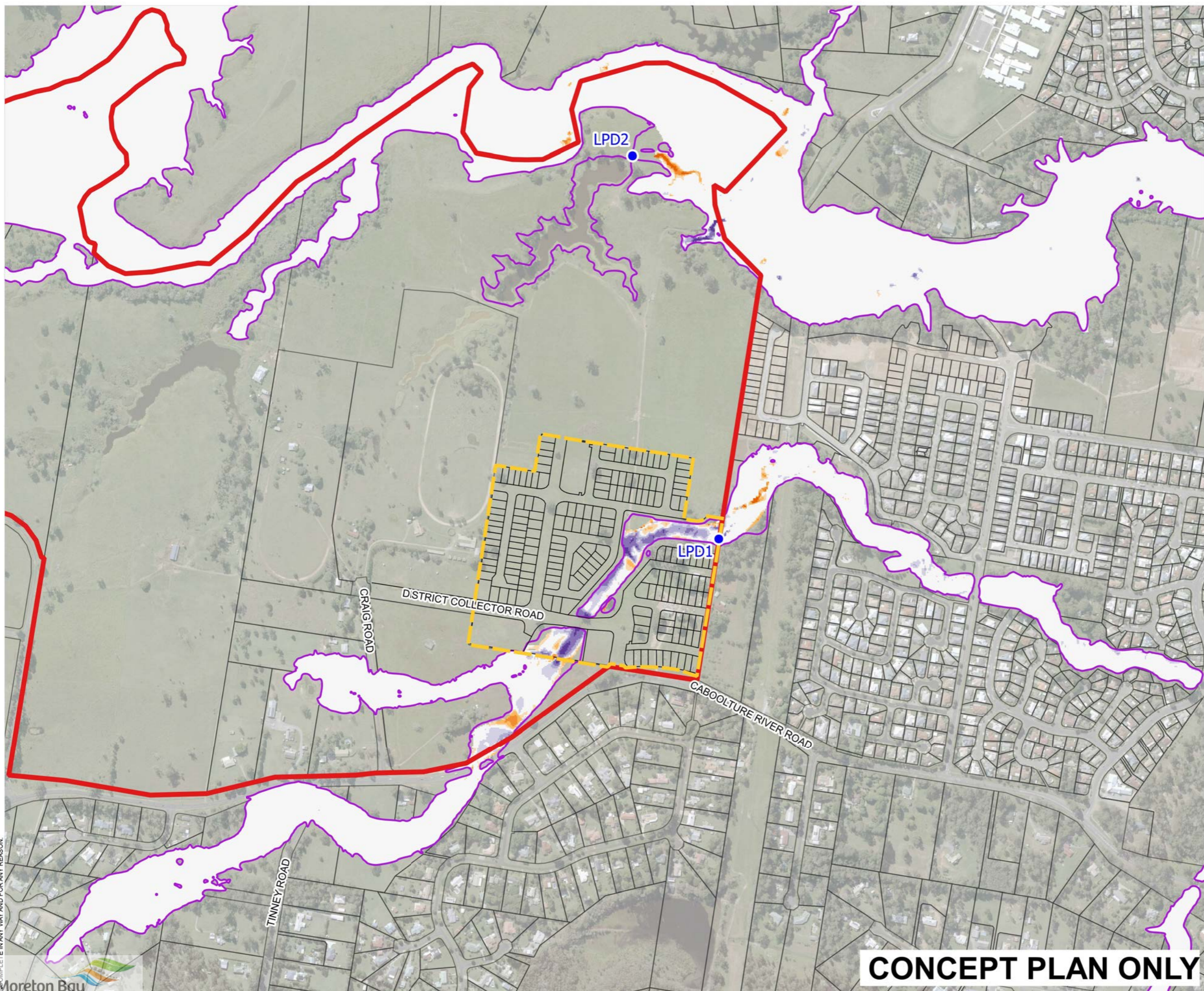
**DRAWING NO:** 16-002108-D-020-E **ISSUE:** B

ISS	BY	CHK	DATE	DETAILS
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B	NE	DY	18.11.22	FOR APPROVAL
C				
D				
E				

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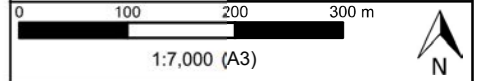
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**LEGEND**

- 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.
  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).



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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C				
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E				

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

## Appendix E IDC Culvert Blockage Assessment

FOREVERLEN PTY LTD

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<sub>10</sub> 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	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Streams with boulder/cobble beds and steep bed slopes and steep banks showing signs of substantial past bed/bank movements.</li> <li>• Arid areas, where loose vegetation and exposed loose soils occur and vegetation is sparse.</li> <li>• 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.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• State forest areas with clear understory, grazing land with stands of trees.</li> <li>• Source areas generally falling between the High and Low categories.</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Well maintained rural lands and paddocks with minimal outbuildings or stored materials in the source area.</li> <li>• Streams with moderate to flat slopes and stable bed and banks.</li> <li>• Arid areas where vegetation is deep rooted and soils are resistant to scour.</li> <li>• Urban areas that are well maintained with limited debris present in the source area.</li> </ul>

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	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Receiving streams that frequently overtop their banks.</li> <li>• Main debris source areas close to streams.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>• Source areas generally falling between the High and Low mobility categories.</li> </ul>
Low	<ul style="list-style-type: none"> <li>• Low rainfall intensities and large, flat source areas.</li> <li>• Receiving streams infrequently overtops their banks.</li> <li>• Main debris source areas well away from streams.</li> </ul>

Table 6.6.3. Debris Transportability - Ability of a Stream to Transport Debris Down to the Structure<sup>a</sup>

Transportability	Typical Transporting Stream Characteristics (1% AEP Event)
High	<ul style="list-style-type: none"> <li>Steep bed slopes (&gt; 3%) and/or high stream velocity (<math>V &gt; 2.5</math> m/s)</li> <li>Deep stream relative to vertical debris dimension (<math>D &gt; 0.5L_{10}</math>)</li> <li>Wide stream relative to horizontal debris dimension. (<math>W &gt; L_{10}</math>)</li> <li>Stream relatively straight and free of major constrictions or snag points.</li> <li>High temporal variability in maximum stream flows.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Stream generally falling between High and Low categories.</li> </ul>
Low	<ul style="list-style-type: none"> <li>Flat bed slopes (&lt; 1%) and/or low stream velocity (<math>V &lt; 1</math> m/s).</li> <li>Shallow depth relative to vertical debris dimension (<math>D &lt; 0.5L_{10}</math>).</li> <li>Narrow stream relative to horizontal debris dimension (<math>W &lt; L_{10}</math>).</li> <li>Stream meanders with frequent constrictions/snag points.</li> <li>Low temporal variability in maximum stream flows.</li> </ul>

<sup>a</sup>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%
$L_{10} \leq W \leq 3 * L_{10}$	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.



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



### 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	
	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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Level 3, 545 Queen Street  
Brisbane QLD 4000  
07 3895 3444

[calibregroup.com](http://calibregroup.com)

*Lilywood*  
**Amended Plan Required**

# LANDINGS

Landscape  
Master Plan  
Report  
Stages 1 to 4



Amended Plan Required

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## Streetscape

/ Entry Experience - Design Inspiration, Plan, Sections, Elevation, Entry Wall Montage 20-24

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# Introduction

Caboolture West is a master planned residential community located on the Caboolture River, within the Moreton Bay Region. It is approximately 10 minutes' drive west of Morayfield and 25 minutes from Moreton Bay.

The site is bounded by the Caboolture River to the north, the existing residential community of Upper Caboolture to the east, Caboolture River Road to the south and a future residential development to the west.

## Report Background

The following report outlines the master plan for the proposed stages of 1 to 4 Streetscape and Landscape Design Structure. This report is to be read in association with the accompanying civil and planning reports.

The report outlines the design intent and direction for the detailed design and documentation of all landscape and streetscape elements within the development, and should be used as a guide in developing detailed works.

*The overall theme of the development should draw upon the sites unique location within the Moreton Bay Region. A riverside community between the city and sand, Caboolture West.*

## Landscape Character

The landscape character intent for Caboolture West is to achieve a well-designed residential community that is cohesive, legible and site responsive landscape reflective of the sites history, climate and existing character.

A timeless and contemporary quality is to be achieved through the use of quality materials and attention to detail. The design intent is to take inspiration from the rustic and rural nature of the sites historic and balance it with refined contemporary design utilising quality materials and finishes to establish a unique design language for Caboolture West.

## Landscape Vision

To provide a consistent landscape character and amenity throughout the entirety of Caboolture West bringing together a seamless transition of landscape treatments and experiences between stages 1 to 4.

## Landscape Principles

- / Celebrate the natural hinterland vegetation and its character
- / Celebrate the sites heritage and draw inspiration from it
- / Provide a high quality landscape with attention to detail and use of quality materials
- / Utilise a predominantly native planting palette
- / Consideration of maintenance
- / Be sustainability, legibility and functionality
- / Encourage active transport through shaded legible connections

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# Site Context Plan

Situated on the Caboolture River in a valley surrounded by distant hills. The site is at the southern entry to the future Caboolture West development area and minutes from Morayfield and Caboolture transport links and the Bruce Highway.



Amended Plan Required



Not to Scale



# Landscaping Masterplan

Amended Plan Required



# Landscape Masterplan

1:2500 @ A3



- Legend**
- - - Site boundary
  - - - Stage boundary
  - Prevailing winds
  - Landscape vegetation
  - Turf
  - GN Green Network (MBRC)
  - WSUD elements
  - Pathway arrangement. Refer to Civil
  - Road and forecourt arrangement. Refer to Civil
  - Feature Fig Tree
  - Feature Hoop Pine Trees
  - Street Trees
  - Shade / Revegetation Trees
  - Entrance wall



Amended Plan Required

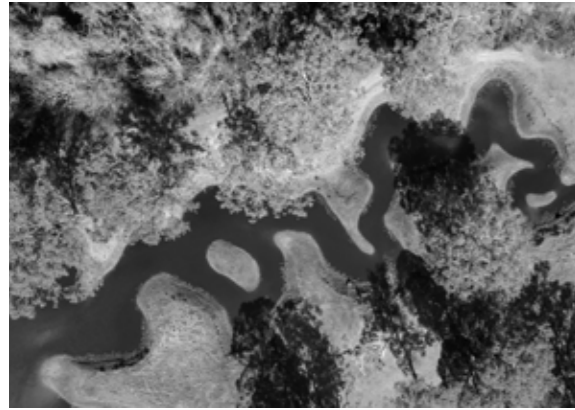
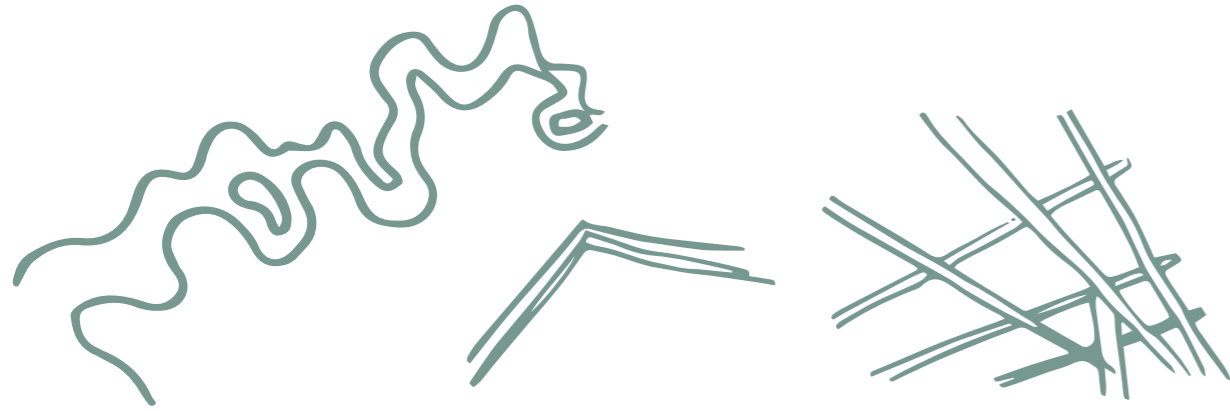


# Open space

Amended Plan Required

# Local Park

## Design Inspiration



Caboolture River - Softscape / Curves / Land Form / Mounds / Tree Structure / Garden Beds



Historical Architecture - Hardscape / Shelters / Concrete Features / Structure / Pathway Alignments / Geometric Shapes

## Form & Function



Coloured features which are inspired by the surrounding natural environment, will entice the residents to explore, whilst creating visual cues for wayfinding and connectivity.

## Colour



Amended Plan Required



Artist Impression

# Local Park - Plan

1:500 @ A3



- Legend**
- Stage boundary
  - ← Prevailing winds
  - Landscape Areas / Vegetation
  - Turf
  - Pathways / Concrete
  - Feature Fig Tree with mulch ring
  - Feature Hoop Pine Trees
  - Street Trees
  - Shade Trees
  - 1 Shelter / Picnic Area
  - 2 Seating Nook
  - 3 Play Area
  - 4 Kickabout
  - 5 Drinking Fountain
  - 6 Waste / Recycle Bin
  - 7 Pedestrian Pathways 2m wide
  - 8 Maintenance Access
  - 9 Park Name Signage



# Local Park - Section

1:250 @ A3



Typical Section AA

# Southern Green Network Waterway - Plan

1:1500 @ A3



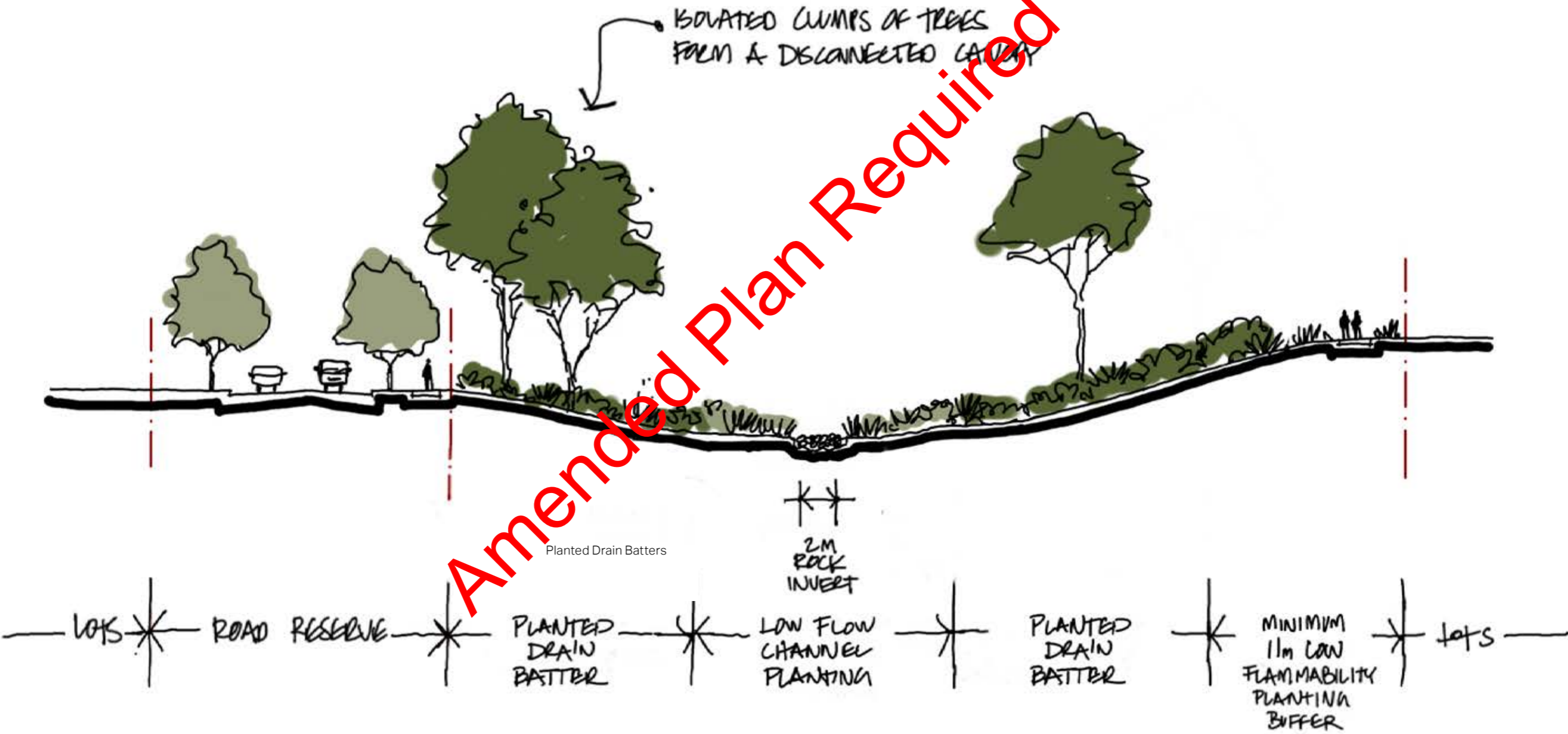
### Legend

- Stage boundary
- Prevailing winds
- Sewer Trunk. Refer Civil
- Revegetation / Drain Trees
- Rock Invert Channel
- Low Flow Channel Planting
- Planted Drain Batters
- Bioretention Basin
- Concrete Footpath. Refer to Civil.



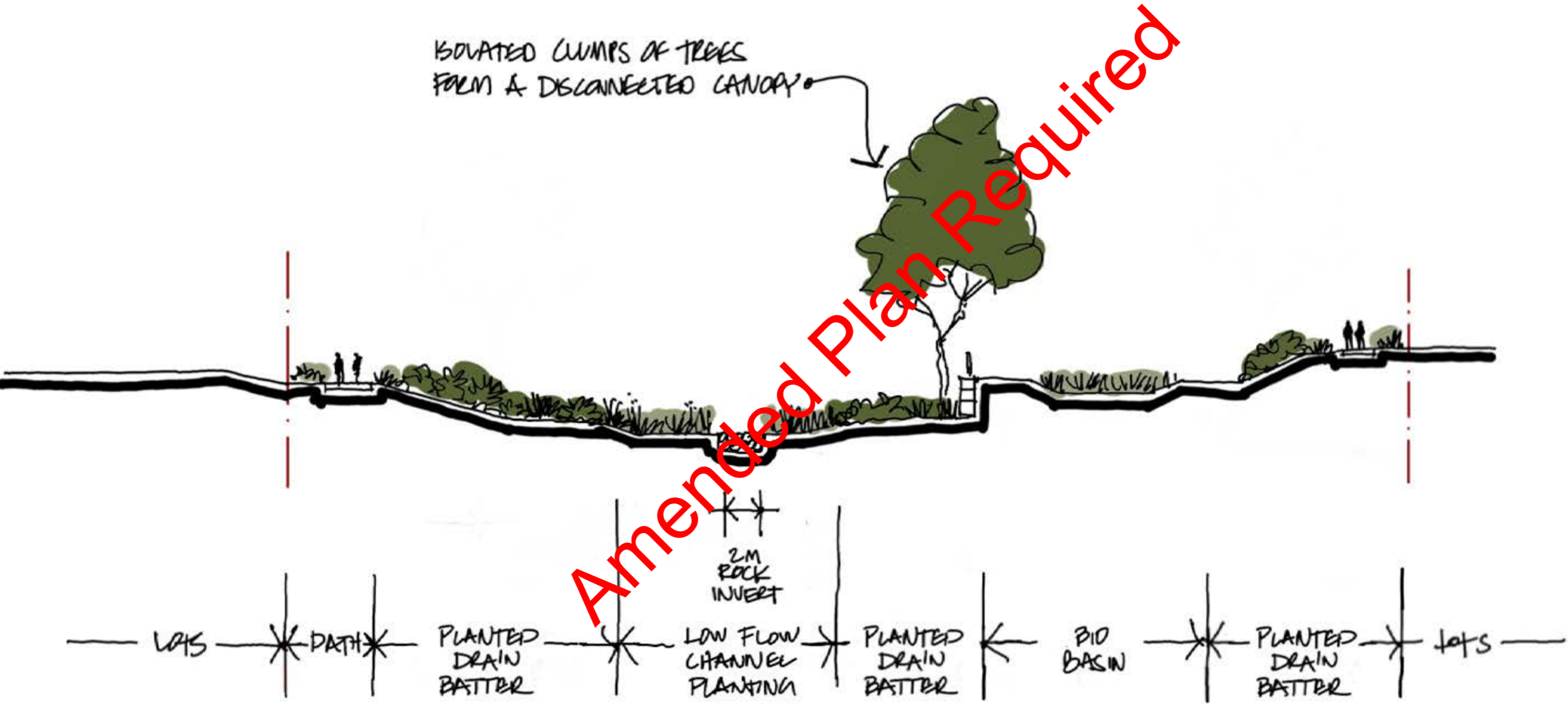
# Southern Green Network Waterway - Sections

1:200 @ A3



Typical Section AA

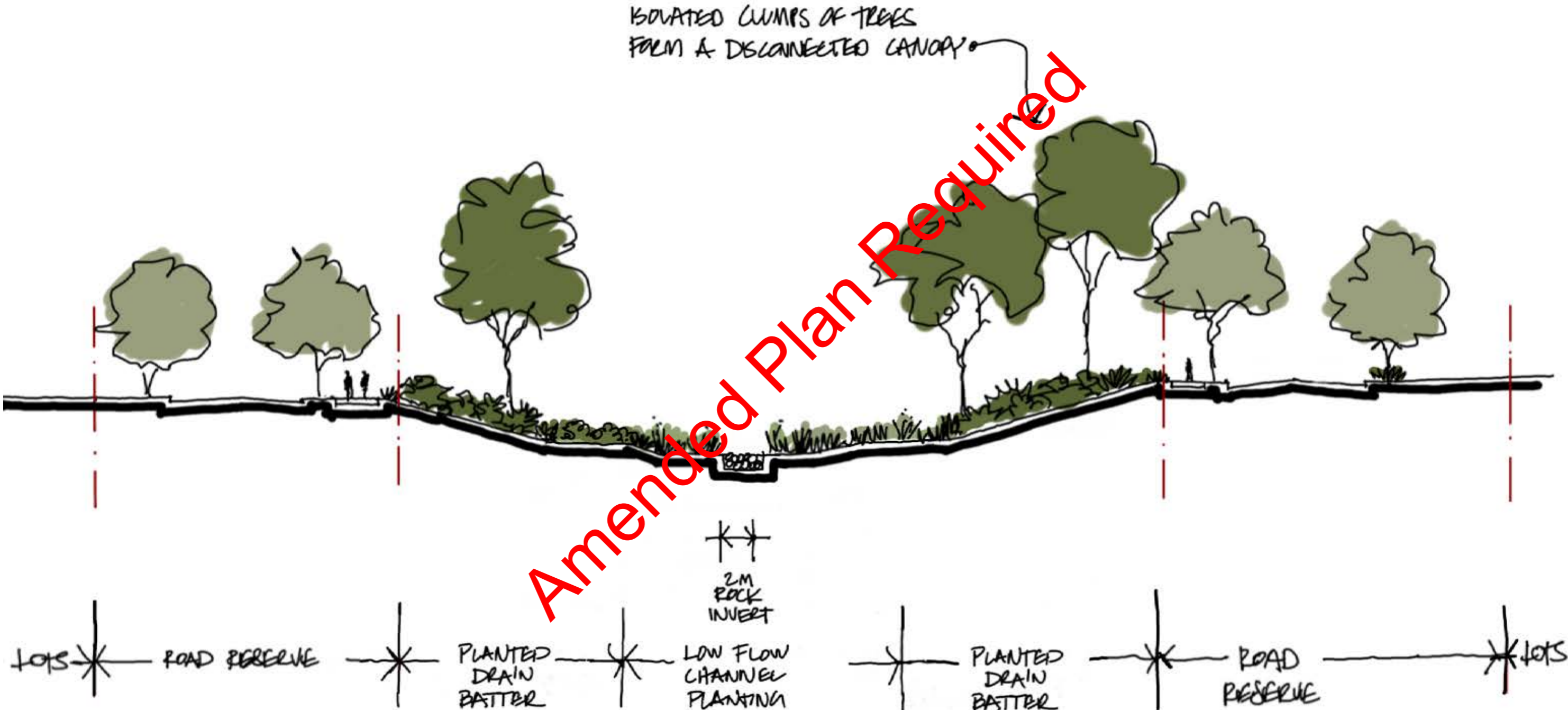




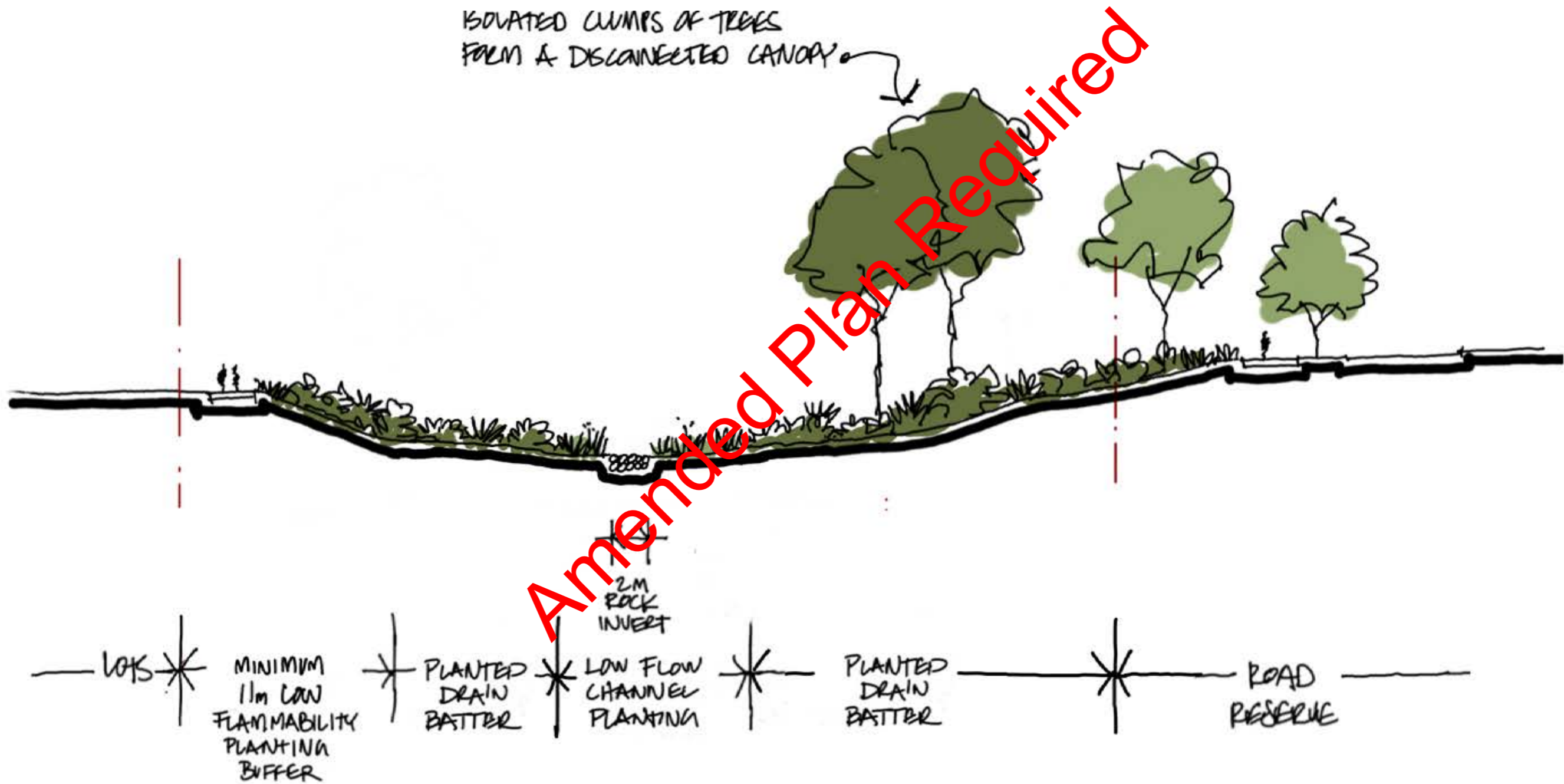
Typical Section BB

# Southern Green Network Waterway - Sections

1:200 @ A3



Typical Section CC



Typical Section DD



Amended Plan Required



# Streetscape

Amended Plan Required

# Entry Experience

## Design Inspiration



# Entry Experience Plan

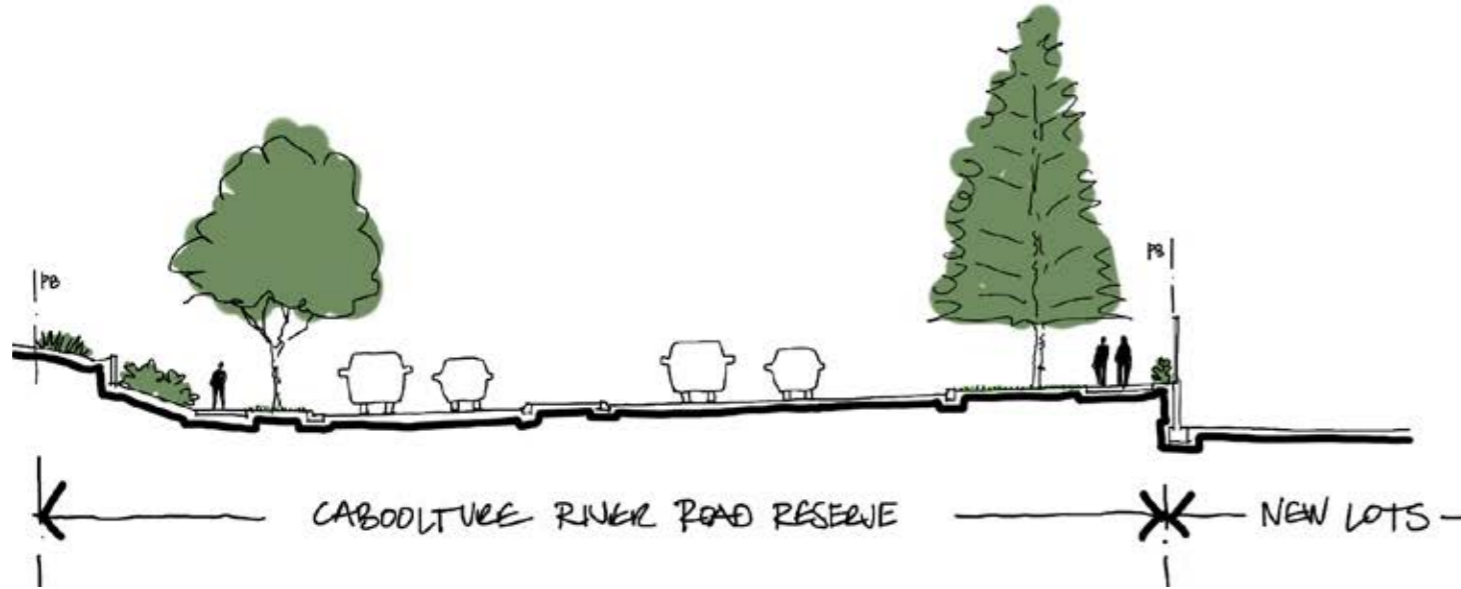
1:1500 @ A3



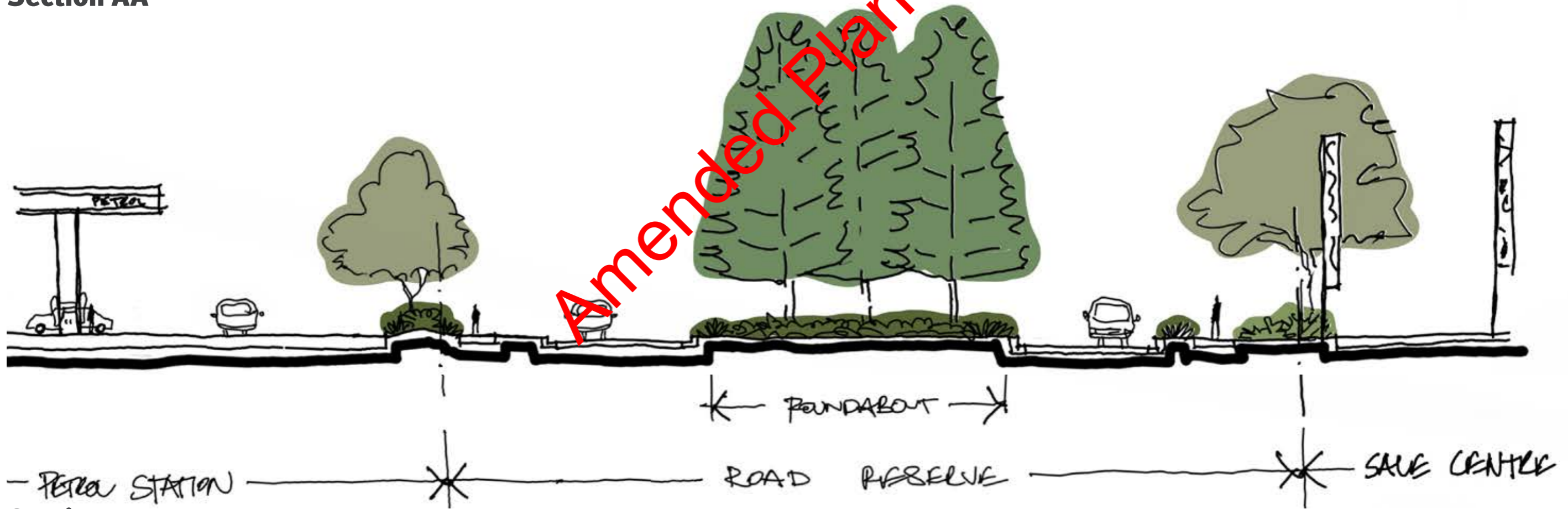
- Legend**
- - - - Site boundary
  - - - - Stage boundary
  - Prevailing winds
  - Entry Wall
  - Feature posts/pillars on private property
  - Landscape Areas / Vegetation
  - Turf
  - Pathways / Concrete
  - Feature Hoop Pine Trees
  - Street Trees
  - Revegetation / Drain Trees
  - 1 Arrival Feature Planting
  - 2 Shrubs and Understorey to Sales Center to not Obstruct Views
  - 3 Shrubs and Understorey to Roundabout. Feature Trees with clear trunks, to accommodate sightlines.
  - 4 Naturalised Drain
  - 5 The Triple Avenue - Major North/South Road

# Arrival Sequence

1:250 @A3



Section AA

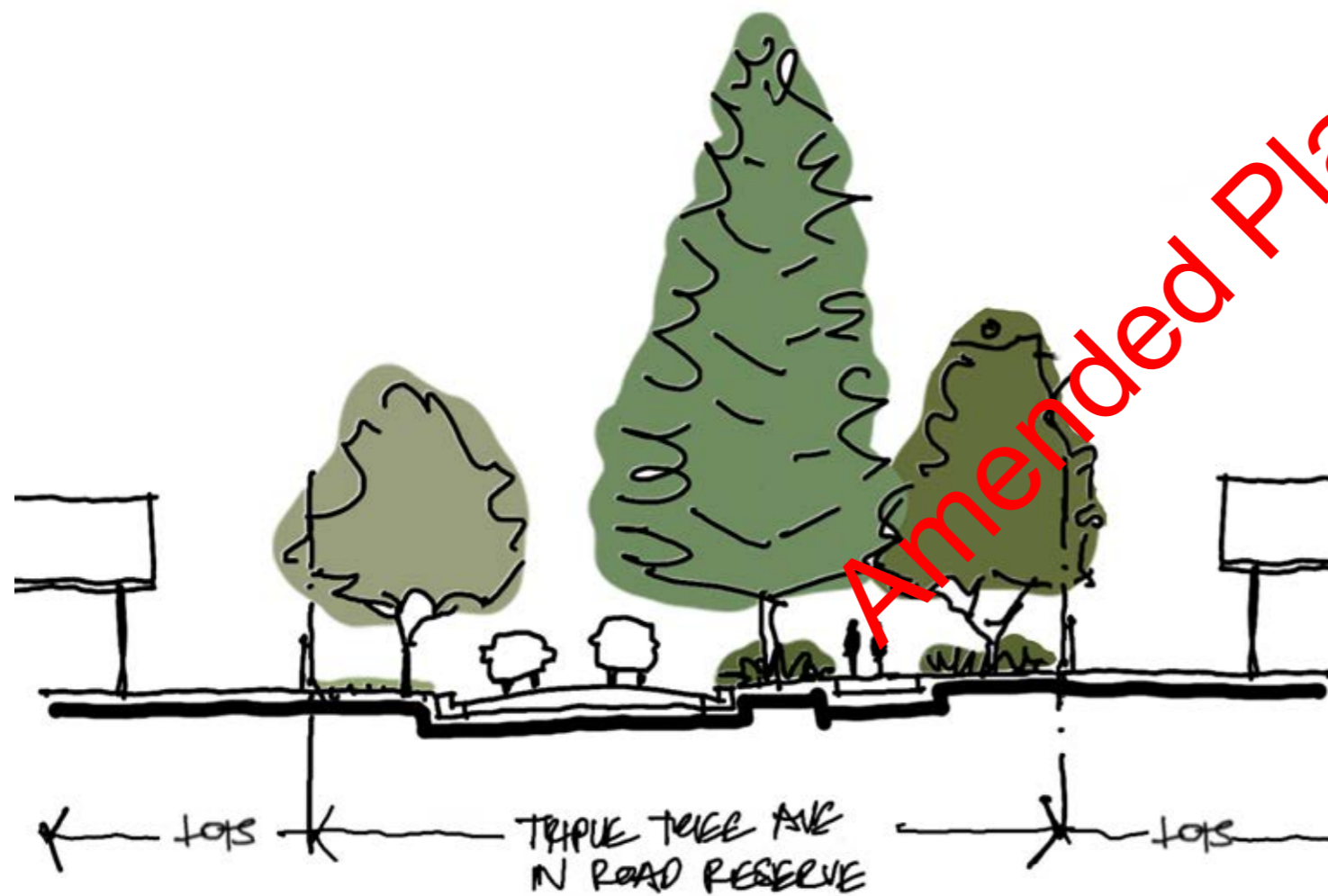


Section BB

Amended Plan Required



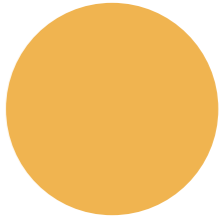
Amended Plan Required



Section CC



# Entry Wall Montage



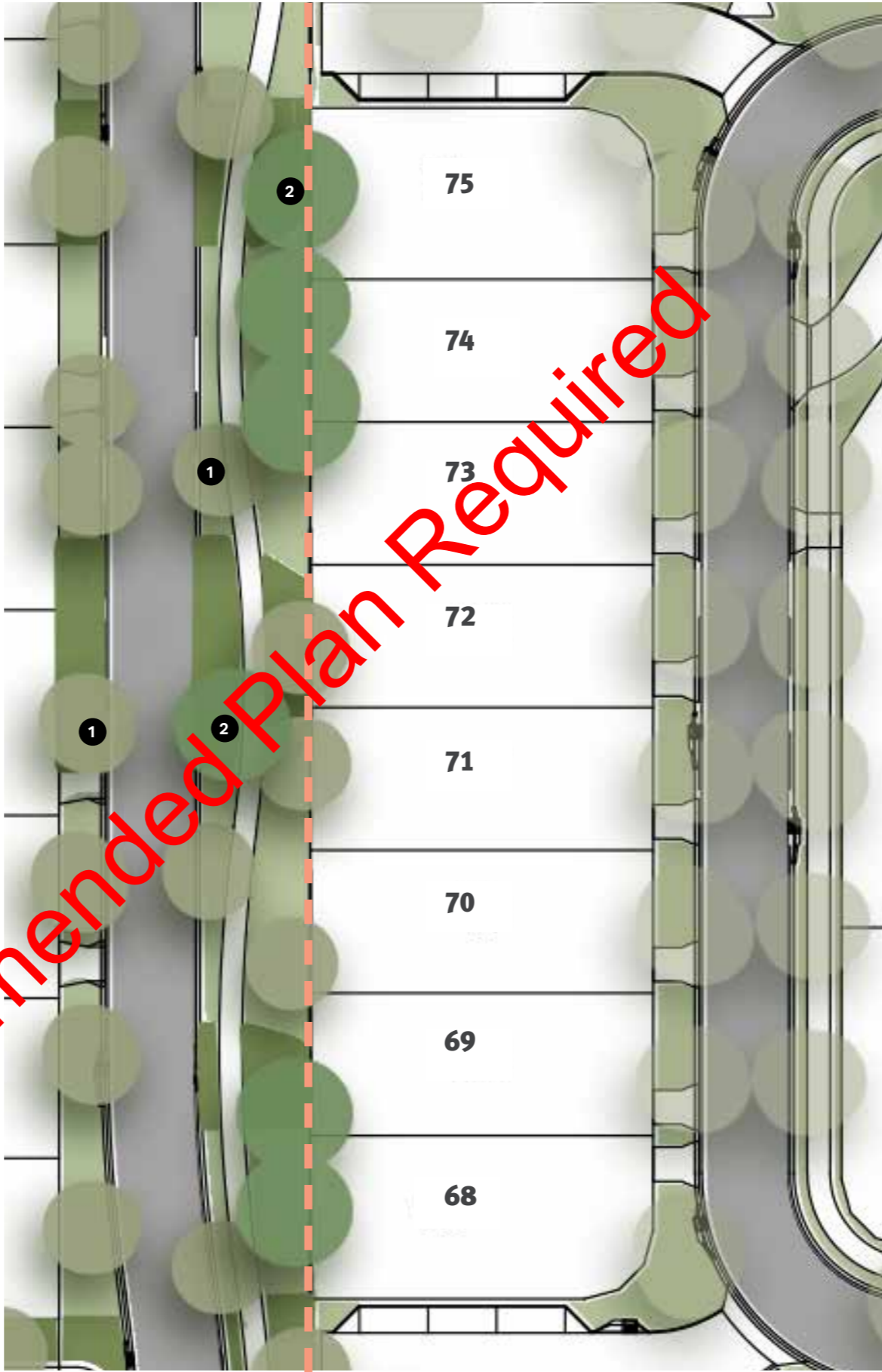
A true sense of arrival

Amended Plan Required



# The Triple Avenue - Major North / South Road

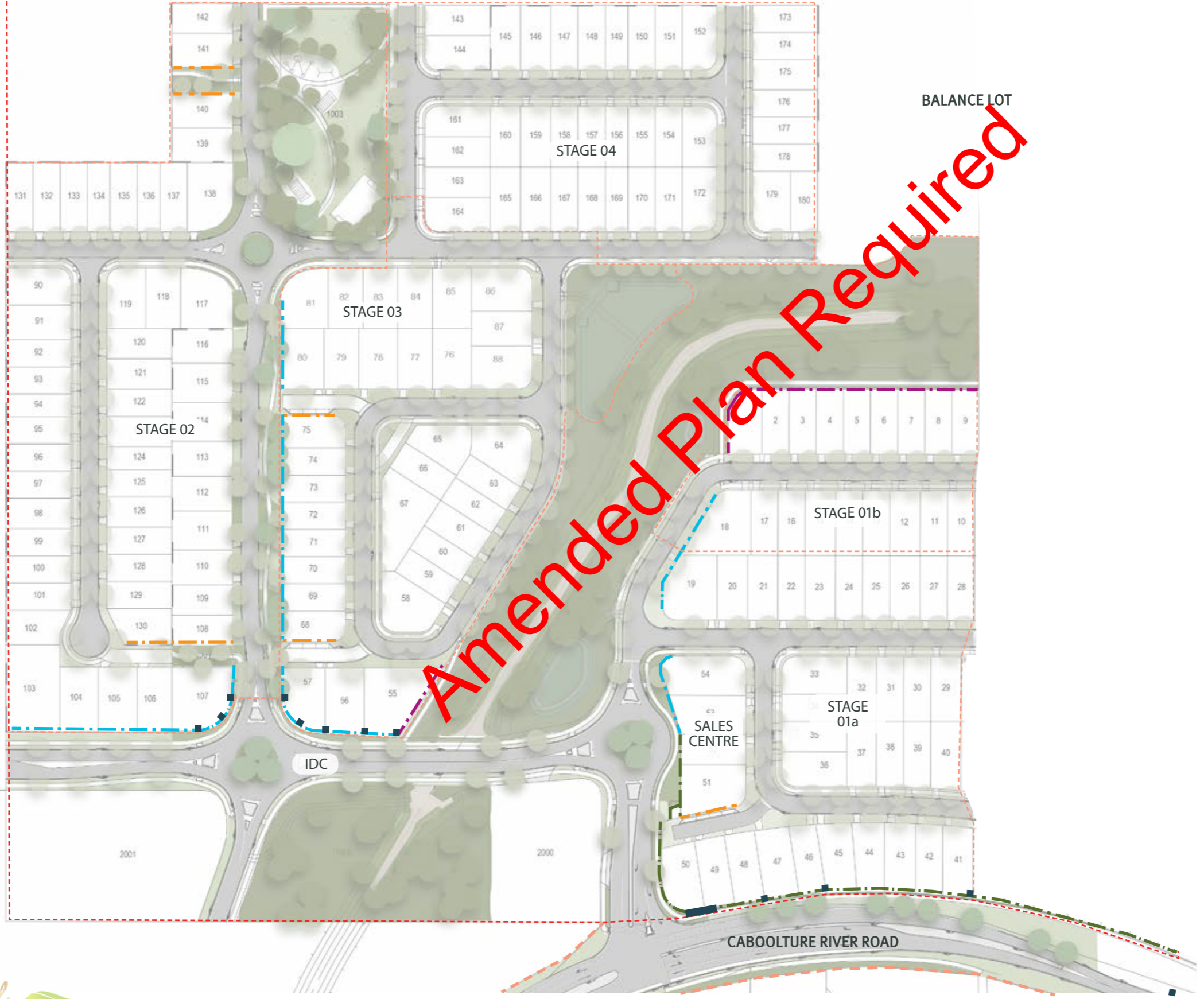
1:500 @ A3



- Legend**
- Stage boundary
  - Prevailing winds
  - Civil design contours. Refer to civil package for civil earthworks.
  - Existing contours
  - Planted Verge
  - Turf
  - 2m Pedestrian Pathway
  - Feature Hoop Pine Trees
  - Street Trees
  - Trees in Mulch
  - Trees in Planting

# Fencing Plan - Stage 1 to 4

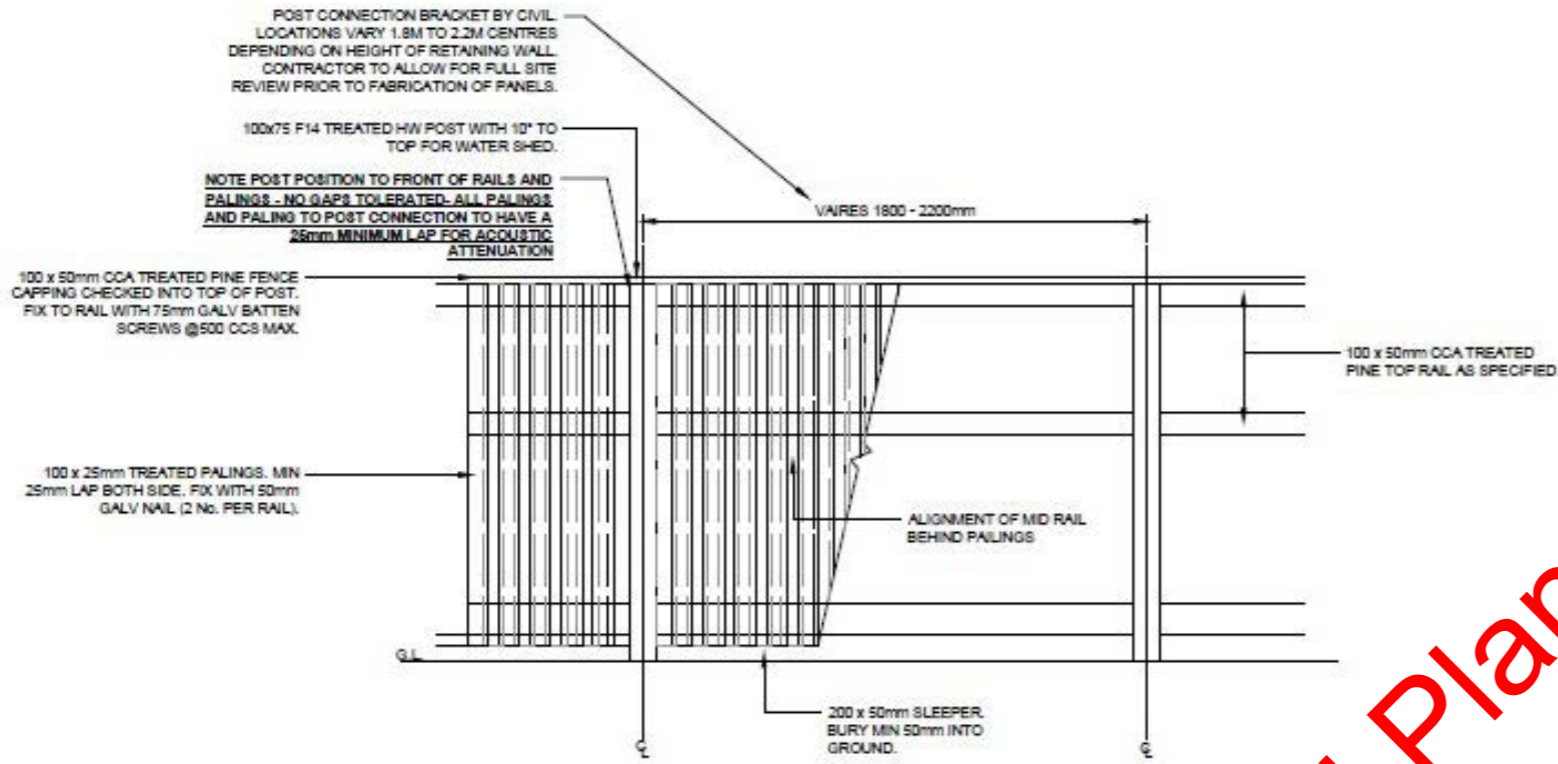
1:2000 @ A3



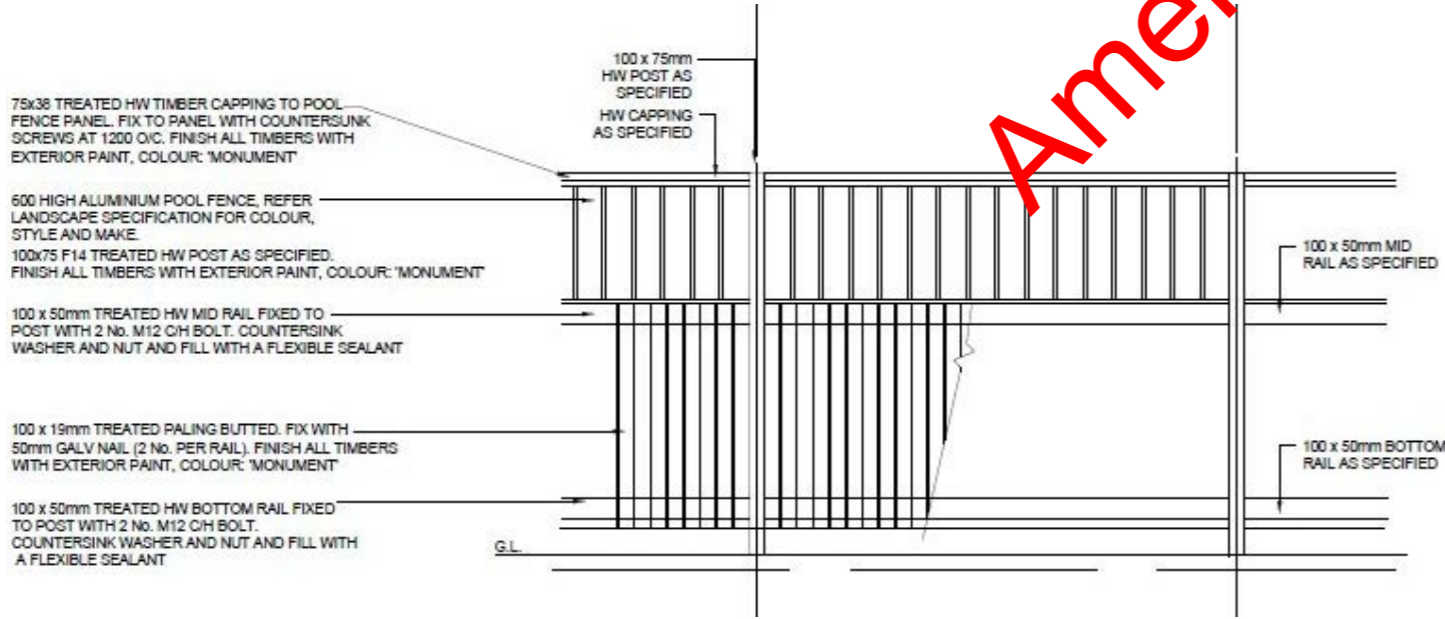
- Legend**
- - - - Site boundary
  - - - - Stage boundary
  - Entry Wall
  - Feature posts/pillars on private property
  - - - - Acoustic timber paling fence painted charcoal.
  - - - - Timber paling fence painted charcoal.
  - - - - Open Space Semi-transparent fence
  - - - - Side boundary Semi-transparent fence

# Fence Types

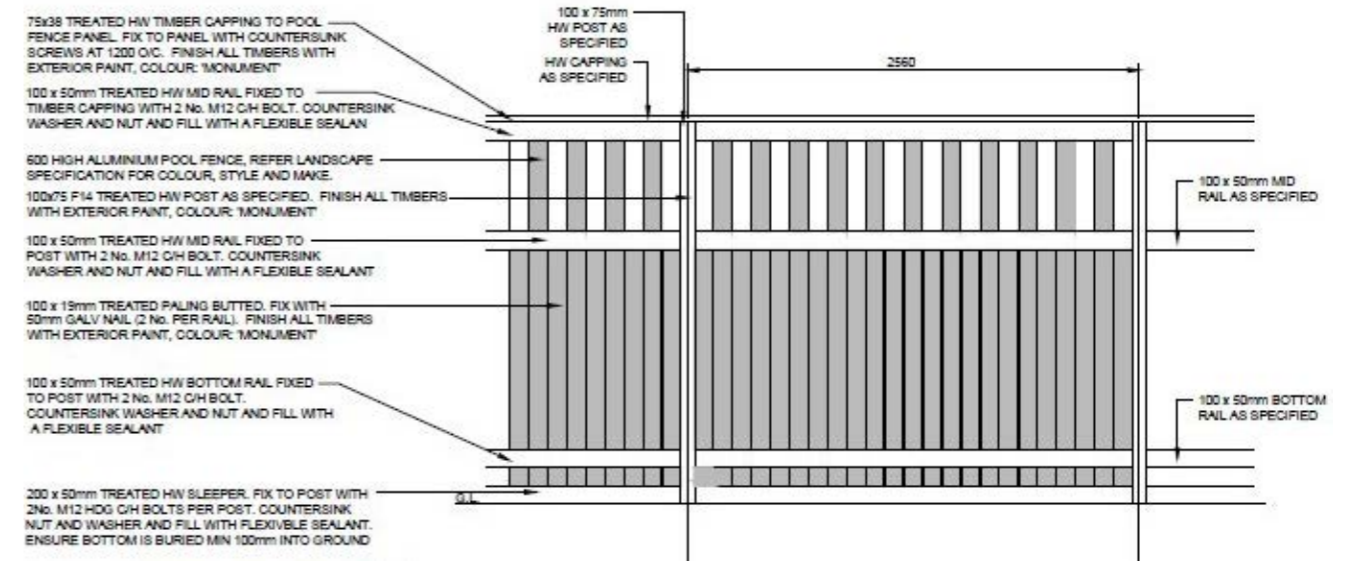
Variety of proposed fence types to be used in the project including timber paling, acoustic barrier paling and semi transparent fences. Fences to comply with relevant Australian standards for safety and quality assurance.



1800 High Acoustic and non-acoustic timber paling fence painted charcoal (Height varies for Acoustic fence)



1800 High Open Space Semi-transparent fence



1800 High Side boundary Semi-transparent fence



**Amended Plan Required**



# Character

**Amended Plan Required**

# Character Imagery

Considered landscape embellishments will create a balance between formal and informal open space that is underpinned by large shade trees, fine timber detailing, stone features and vibrant activation spaces.



Amended Plan Required



# Planting Palette

An understanding of the land history creates an opportunity for contemporary design with an embedded cultural response. The planting palette features historical signature trees, complemented by Australian native shade trees and understorey planting representative of the local area.

## Signature Tree



*Araucaria cunninghamii*

## Trees



*Acmena hemilampra*



*Tristaniopsis laurina 'luscious'*

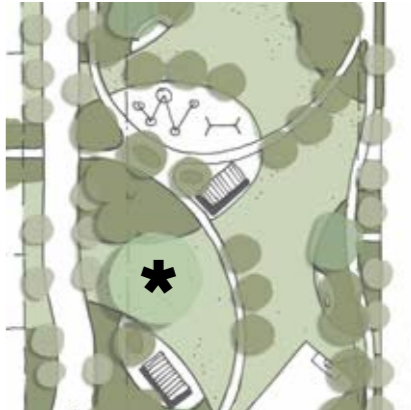


*Waterhousea floribunda 'sweeper'*

## Feature Tree \*



*Ficus macrophylla*



## Shrubs



*Syzygium australe*



*Hymenocallis littoralis*



*Lomandra 'The Tuff'*



*Philodendron xanadu*

## Understorey



*Callistemon 'Little John'*



*Callistemon 'Firebrand'*



*Trachelospermum Jasminoides Tricolour*



*Myoporum ellipticum*



Amended Plan Required

**Sunshine Coast Studio**

Level 1, 29 The Esplanade  
Maroochydore  
QLD 4558

**Brisbane Studio**

Level 8, 540 Wickham Street  
Fortitude Valley  
QLD 4006



Acoustics RB Pty Ltd

**Report No. 21-1305.R04.Rev1**

**Reconfiguring a Lot Application  
Lennium Stages 01a, 01b, 02, 03 and 04  
Caboolture West NDP1**

**Assessment and Control of Road Traffic  
Noise Intrusion**

**Amended Plans/Documents Required**

**December 2022**

**DOCUMENT CONTROL PAGE****Reconfiguring a Lot Application****Lennium Stages 01a, 01b, 02, 03 and 04, Caboolture West NDP1****Assessment and Control of Road Traffic Noise Intrusion****Report No. 21-1305.R04.Rev1****Report Prepared by**

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**Status:** Revision 1  
**Date of Issue:** 16 December 2022

**History of Revisions**

Date	Revision No	Changes / Page Reference
13 June 2022	Draft	NA
14 June 2022	Final	
16 December 2022	Rev1	Update to road traffic noise assessment accounting for revised lot layout and earthworks design over subject site, plus proposed reconfiguration of 403 Caboolture River Rd, Upper Caboolture.

**Record of Distribution**

Document Type	Revision No.	Destination
electronic	Rev1	Lennium Property Group
electronic	Rev1	PeakUrban

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## SUMMARY

Foreverlen Pty Ltd (part of Lennium Property Group) has lodged a Reconfiguring a Lot Application with Moreton Bay Regional Council for approval over land in Upper Caboolture comprising Lot 1 on RP866105 and part of Lot 12 on RP866105. The land adjoins Caboolture River Road.

The application (MBRC Development Application No DA/2021/4699) seeks approval for re-development of the site to generate 179 residential allotments together with one area of local open space, two Green Network parcels with detention basins/drainage corridor, two lots for commercial development and one balance lot, with the development being undertaken over four stages, ie Stages 01a, 01b, 02, 03 and 04.

At the southern extent of the land, Stage 01a adjoins Caboolture River Road which is an arterial road under Council's road hierarchy. Because of the proximity of the site to Caboolture River Road, Council will require that the Applicant undertake an assessment of the impact of road traffic noise intrusion onto the site and determine the appropriate measures to achieve adequate control of any excessive road traffic noise intrusion. Accordingly, Acoustics RB Pty Ltd has been engaged by Foreverlen Pty Ltd to conduct an assessment of the impact of the road traffic noise intrusion onto the site and to provide recommendations for the control of any excessive levels of road traffic noise intrusion.

This report addresses the expected impact of road traffic noise intrusion against the relevant acceptance criteria set by SC 6.16 *Planning Scheme Policy – Noise*. The report makes recommendations for appropriate noise control measures to achieve compliance with the relevant noise level limits and provides guidance for the acoustical design of future residences to be constructed on specific lots.

From the results of the assessment, the following conclusions can be drawn:-

- The acoustical design provisions of Section 8.1 of SC 6.16 *Planning Scheme Policy – Noise* apply to all residences to be constructed on lots located within 100m of the arterial section of Caboolture River Road. In this instance, this requirement will apply to 25 lots. These are Lots 29-53.
- In addition, Section 8.1 of SC 6.16 requires that road traffic noise intrusion into the designated private open space of each dwelling located within the 100m setback zone comply with DTMR's 60dBA free field noise level limit for private open spaces.
- In the absence of an acoustic barrier, the 60dBA free field noise level limit set by DTMR for private open spaces would not be met on Lots 41-50.
- To adequately control road traffic noise intrusion in all private open space areas on all lots, it will be sufficient to erect a 1.8m high acoustic barrier along the southern boundaries of Lots 41-50 together with a 28.15m long 1.8m high return constructed along the four truncation chords of boundary at the south-western corner of Lot 50 (ie 26.15m total) and for a further distance of 2.0m along the western boundary of Lot 50. The arrangement of this barrier is shown in Figure 10 of this report.

To adequately control road traffic noise intrusion into the proposed residential allotments, it is recommended that the barrier arrangement shown in Figure 10 be constructed.

Note:

The height of return along the western boundary of Lot 50 has been set to match the relevant part of the acoustic barrier required to be constructed to address the impact of noise intrusion from proposed service station development on Lot 2000. A revised noise report for MBRC Development Application No DA/2022/1840 supporting this statement will be submitted in the future.

SC 6.16 *Planning Scheme Policy – Noise* does not provide specifications for the design and/or construction of acoustic fences. Notwithstanding, guidance on the appropriate design specifications and construction requirements can be drawn from (i) Council's [Standard Drawing No SF-1520](#) for typical construction details of post and paling acoustic barriers and (ii) Council's [Standard Drawing No SF-1521](#) for typical construction details of post and board acoustic barriers.

To ensure that adequate control of road traffic noise intrusion into the habitable spaces of any dwellings located on Lots 29-53 is achieved, the particular dwellings should be designed and constructed in accordance with AS3671-1989 *Acoustics – Road traffic noise intrusion - Building siting and construction* to achieve compliance with the internal sound levels of AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

Accordingly, it is recommended that a condition of approval be imposed requiring that potential purchasers of Lots 29-53 be advised that due consideration needs to be given to the design and construction of any residences on these lots.

Suggested wording of an appropriate condition as commonly adopted by Council is presented below.

Condition XX Noise Management

- a) The applicant is required to advise prospective buyers of Lots 29-53 that the dwelling to be constructed on the particular lot is to be designed and constructed in accordance with the accordance with AS3671-1989 *Acoustics – Road traffic noise intrusion - Building siting and construction* to achieve compliance with the internal sound levels of AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.
- b) At the completion of construction of any dwellings on Lots 29-53, certification shall be undertaken by a qualified Building Certifier. The purpose of this certification is to confirm that, having regard to the Construction Category bands applying to each level of each relevant lot as shown in Table 2 of the approved road traffic noise impact assessment report, the dwelling constructed on the particular lot has been designed and constructed in accordance with AS3671-1989 to achieve compliance with the internal sound levels of AS/NZS 2107:2016.

Amended Plans/Documents Required

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## 1.0 Introduction

Foreverlen Pty Ltd (part of Lennium Property Group) has lodged a Reconfiguring a Lot Application with Moreton Bay Regional Council for approval over land in Upper Caboolture comprising Lot 1 on RP866105 and part of Lot 12 on RP866105. The land adjoins Caboolture River Road.

The application (MBRC Development Application No DA/2021/4699) seeks approval for re-development of the site to generate 179 residential allotments together with one area of local open space, two Green Network parcels with detention basins/drainage corridor, two lots for commercial development and one balance lot, with the development being undertaken over four stages, ie Stages 01a, 01b, 02, 03 and 04.

At the southern extent of the land, Stage 01a adjoins Caboolture River Road which is an arterial road under Council's road hierarchy. Because of the proximity of the site to Caboolture River Road, Council will require that the Applicant undertake an assessment of the impact of road traffic noise intrusion onto the site and determine the appropriate measures to achieve adequate control of any excessive road traffic noise intrusion.

Accordingly, Acoustics RB Pty Ltd has been engaged by Foreverlen Pty Ltd to conduct an assessment of the impact of the road traffic noise intrusion onto the site and to provide recommendations for the control of any excessive levels of road traffic noise intrusion.

This report addresses the expected impact of road traffic noise intrusion against the relevant acceptance criteria set by SC 6.16 *Planning Scheme Policy – Noise*.

The report makes recommendations for appropriate noise control measures to achieve compliance with the relevant noise level limits and provides guidance for the acoustical design of future residences to be constructed on specific lots.

## 2.0 Existing Situation and Proposed Development

The location of the subject site is shown in Figure 1. The real property description of the site is Lot 1 on RP866105 and part of Lot 12 on RP866105.

The local authority is Moreton Bay Regional Council.

The site is currently occupied by a dwelling and outbuildings.

The Concept Plan for the entirety of the development over Lots 1 and 12 is shown in Figure 2A. Proposed development over the land subject to the current RAL application, ie Stages 01a, 01b, 02, 03 and 04, is presented in Figure 2B. As noted above, it is proposed to re-develop the site to generate 179 residential allotments together with one area of local open space, two Green Network parcels with detention basins/drainage corridor, two lots for commercial development and one balance lot.

## 3.0 Relevant Roads

As noted above, the site adjoins Caboolture River Road which is an arterial road.

It is also noted that a new E-W Road serving NDP1 is shown on MBRC Figure 7.2.3.9 *Neighbourhood Development Plan No.1 (NDP 1)*. The alignment of new E-W Road shown in Figure 3 attached. (Refer heavy dashed line shown running from Tinny Road to the north-west extent of NDP1.)



By reference to SC 6.16 *Planning Scheme Policy – Noise*, it will be necessary to assess the impact of Road traffic noise intrusion onto all lots located within 100m of the arterial road section of the E-W Road. (Refer also section 4.1 following.)

As is evident in this figure, and by reference to Figure 2A, it can be seen that the Foreverlen (Lennium) land is located more than 100m from the E-W Road. Accordingly, there will be no requirement to consider the impact of noise intrusion onto the subject site due to road traffic on the E-W Road.

Rather, the only road of significance is Caboolture River Road.

#### **4.0 SC 6.16 Planning Scheme Policy – Noise**

##### **4.1 Overview**

The requirements for assessing road traffic noise intrusion for Reconfiguring a Lot applications are presented at Section 8.1 of Council's SC 6.16 *Planning Scheme Policy – Noise*.

Section 8.1 of SC 6.16 is reproduced below.

#### **8. Assessment of road traffic and railway noise**

The following outlines the process for establishing acceptable acoustic amenity at sites impacted by noise from roads and railways.

##### **8.1 Reconfiguring a lot**

A transport noise impact assessment report is to be provided where development involves reconfiguring a lot in the General Residential, Emerging Community, Rural Residential zones and Township Residential Precinct where:

1. proposed lots are located within:
  - a. 50 metres of a current or future designated sub arterial; or
  - b. 100 metres of a current or future designated arterial road; or
  - c. 150 metres of a highway or railway; or
  - d. extractive resource transport buffer
2. where otherwise requested by Council.

Note - Does not apply if the proposed development site is within a designated transport noise corridor and the Department of Transport and Main Roads is a referral agency.

The assessment is to be in accordance with MP 4.4 of the QDC. The assessment is to identify the noise category applicable to each lot in the proposed development for both lower and upper levels. Noise categories are defined in Schedule 3 of MP4.4.

In addition the assessment is to address the requirement for residential development to have private open space that meets the Environmental Emission Criteria identified in Department of Transport and Main Roads *Policy for Development on land affected by Environmental Emissions from Transport and Transport Infrastructure Version 2 or as amended*.

Note – Noise Categories are derived from the identified noise levels at 1 metre from the facade of the proposed or existing building. For the purposes of this policy the facade is to be determined at the deemed to be building setback or proposed building envelope or the lot boundary.

### 8.1.1 Property notes

A property note will be applied to all new lots identified as Noise Category 1 or higher. The development approval will advise of the intended property note generally in accordance with the following example.

*The following notation will be recorded on Council's property system for proposed Lots xxxxxxxx*

*This lot is impacted by road traffic noise. A Traffic Noise Impact Report by xxxx, xxxxxx, has been prepared in relation to this lot. The report identifies this lot as being at Noise Level Category X. Mandatory Part 4.4 of the Queensland Development Code identifies the required noise reduction building treatments applicable to each Noise Category.*

*Further assessment by a suitably qualified acoustic expert should be sought in order to determine the appropriate building design and treatment required to effectively mitigate noise impacts for the provision of acceptable acoustic amenity in private open spaces and habitable rooms.*

Note – where lots are impacted by noise sources other than transport alternative property notes will be applied as deemed appropriate.

The key provisions of s.8.1 as they apply to the subject development are summarised below:-

- The provisions of SC 6.16 apply to lots located within 100m of a designated arterial road, ie Caboolture River Road.
- A Transport Noise Impact Assessment report is to be prepared which identifies the QDC MP 4.4 noise categories applicable to the development.
- The level of road traffic noise intrusion into the designated private open space areas is to comply with the limits set under DTMR *Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure* (EEP).
- Property notes are to be applied to all new lots identified as Noise Category 1 or higher.

Each of the requirements with respect to the QDC MP 4.4 noise categories, compliance with the noise levels set by DTMR for acceptable levels of road traffic noise intrusion into private open space areas and the application of property notes is discussed in further detail in the following sub-sections.

## 4.2 Examination of Applicability of QDC MP 4.4 Buildings in a Transport Noise Corridor

Section 8 of SC 6.16 outlines the process for establishing acceptable acoustical amenity at sites impacted by noise from roads and railways.

As stated at s.8.1 *Reconfiguring a Lot* of SC 6.16 of the extract above:-

“The [transport noise impact] assessment is to be in accordance with MP 4.4 of the QDC. The assessment is to identify the noise category applicable to each lot in the proposed development for both lower and upper levels. Noise categories are defined in Schedule 3 of MP 4.4.”

The purpose of QDC MP 4.4 is to ensure control of transport noise intrusion into particular residential buildings, specifically “relevant residential buildings”, where a relevant residential building must be located within a Transport Noise Corridor (TNC) as defined at Chapter 8B of *Building Act 1975* and, more particularly, in these circumstances, at s.246X and s.246Y of the Act.

It is noted that the site is not located within a gazetted TNC. As a result, the provisions of QDC MP 4.4 are not triggered. Consequently, it is not appropriate to apply QDC MP 4.4 as a basis for building design. Further discussion re this matter is presented in Attachment A.

Notwithstanding, and as discussed with Council, it is noted that at Section 5 of QDC MP 4.4, AS3671-1989 *Acoustics – Road traffic noise intrusion - Building siting and construction* and AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors* are both cited as referenced documents for QDC MP 4.4. In fact, the minimum  $R_w$  ratings set at Schedule 1 of the Code have been derived directly by application of the calculation methods of AS3671-1989 to achieve compliance with the recommended internal sound levels of AS/NZS 2107:2016.

Furthermore, when undertaking a site-specific acoustical design review of any relevant residential building located within a TNC, QDC MP 4.4 permits such assessments to be conducted using the more refined and more accurate noise level calculation methods of AS3671-1989 to achieve compliance with the recommended internal sound levels of AS/NZS 2107:2016.

Finally, prior to the introduction of QDC MP 4.4 on 1 September 2010, all assessments to determine the degree of upgrade required to be implemented into any noise-affected residence located on land adjoining a State-controlled road were conducted using the methods of AS3671-1989 to achieve compliance with the recommended internal sound levels of AS/NZS 2107:2016<sup>1</sup>.

Consequently, it can be readily and reasonably concluded that the appropriate means of achieving adequate control of road traffic noise intrusion is to apply the more robust methodology of the calculation methods of AS3671-1989 to the design of noise affected residences, with the goal being to achieve compliance with the recommended internal sound levels of AS/NZS 2107:2016. This method has been adopted successfully for many other recently approved developments within the bounds of MBRC as well as in other local authority jurisdictions where gazettal of TNC's is yet to occur, notably Ipswich City Council.

Finally, it should be noted that, notwithstanding the fact that it is quite reasonable to conclude that QDC MP 4.4 cannot be applied to the current circumstances, the net result of adoption of the more robust methodology of calculation discussed above will be to achieve a more rigorous and more efficient acoustical outcome for the design of the noise-affected dwellings than would have resulted from an application of less refined procedures of QDC MP 4.4.

### 4.3 Applicability of Construction Categories of AS3671-1989

A discussion of AS3671-1989 together with the appropriate method of applying the calculation procedures of the Standard is presented below. Further information is presented in Attachment B following.

AS3671-1989 sets Construction Categories by reference to  $L_{Aeq,T}$  noise levels, notably  $L_{Aeq,1hr\ night}$ <sup>2</sup> and  $L_{Aeq,1hr\ day}$ <sup>3</sup>. Noise level prediction programs determine road traffic noise levels in terms of the  $L_{A10(18hour)}$ <sup>4</sup> noise level parameter. The offsets between  $L_{A10(18hour)}$  and the day and night  $L_{Aeq,T}$  values are site-specific and depend upon the hourly distribution of traffic.

Note: Construction Categories applying under AS3671-1989 are not the same as Noise Categories applying under QDC MP 4.4.

<sup>1</sup> At that time, ie prior to 1 September 2010, the version of the standard current at that time was AS/NZS 2107:2000.

<sup>2</sup>  $L_{Aeq,1hr\ night}$  is defined as the maximum rolling average  $L_{Aeq,1hr}$  value from 10:00pm to 6:00am, where the integrating time for  $L_{Aeq,T}$  (ie equal energy) values used to determine the  $L_{Aeq,1hr}$  value is typically 10minutes or 15 minutes.

<sup>3</sup>  $L_{Aeq,1hr\ day}$  is defined as the maximum rolling average  $L_{Aeq,1hr}$  value from 6:00am to 10:00pm, where the integrating time for  $L_{Aeq,T}$  (ie equal energy) values used to determine the  $L_{Aeq,1hr}$  value is typically 10minutes or 15 minutes.

<sup>4</sup>  $L_{10(18hour)}$  is defined by DTMR in their *Road Traffic Noise Management: Code of Practice* and by UK DoE in their *Calculation of Road Traffic*, as the arithmetic mean of each of the eighteen hourly  $L_{10,1hr}$  levels between 6:00am and 12:00 midnight on an average weekday where  $L_{10,1hr}$  is the noise level measured in dBA that is exceeded for 10% of the specific one hour period. It is noted that this terminology is not in strict accordance with the recommendations of Standards Australia because it does not identify the A-weighting requirement. Recognising this departure, DTMR has adopted the term  $L_{A10(18hour)}$  in their *Code of Practice*.  $L_{A10(18hour)}$  has been used throughout this report as a result.

To establish offsets which can be used satisfactorily in most commonly encountered situations, it is appropriate to refer to standard offset values derived from an extensive study of a large number of comparable sites in SE Queensland located adjacent to major roads<sup>5</sup>. When this is done, the relevant construction categories can be determined in terms of the predicted  $L_{A10(18\text{hour})}$  value directly. The derivation of the bounds of the construction categories is presented in Attachment B.

From the results presented in Attachment B, it can be seen that Construction Category 1 means that the relevant floor level of the dwelling (ie ground floor level or first floor level) is subjected to noise levels that do not exceed 48dBA  $L_{A10(18\text{hour})}$  facade-corrected. For any dwellings subject to Construction Category 1, there will be no requirement to apply any specific acoustical upgrades to the design of the relevant floor level of the dwelling.

Construction Category 2 means that the relevant floor level of the dwelling (ie ground floor level or first floor level) is subjected to noise levels in the range 48dBA to 63dBA  $L_{A10(18\text{hour})}$  facade-corrected. By reference to AS3671-1989 *Acoustics - Road Traffic Noise Intrusion - Building Siting and Construction*, "standard construction (ie brick veneer), except for the lightweight elements such as fibre cement or metal cladding or all-glass facades" is deemed to be adequate to control noise intrusion for dwellings within the Construction Category 2 band, provided all windows and external doors to the dwelling are closed.

Construction Category 3 means that the relevant floor level of the dwelling (ie ground floor level or first floor level) is subjected to noise levels in the range 63dBA<sup>6</sup> to 73dBA  $L_{A10(18\text{hour})}$  facade-corrected.

Similarly, Construction Category 4 means that the relevant floor level of the dwelling (ie ground floor level or first floor level) is subjected to noise levels exceeding 73dBA  $L_{A10(18\text{hour})}$  facade-corrected.

For both Construction Categories 3 and 4, the design of the dwelling will need to be reviewed acoustically to ensure that the level of road traffic noise intrusion is adequately controlled.

#### Notes:

For purposes of initial guidance only, standard brick veneer or blockwork wall construction would normally be satisfactory in most instances to deal with external noise levels up to 63dBA  $L_{A10(18\text{hour})}$  facade-corrected, ie for Construction Category 2 dwellings. For Construction Category 3 and 4 dwellings, however, it will be necessary to (i) upgrade the acoustical performance of windows and external sliding glass doors beyond standard  $R_w$  23 performance and (ii) close windows and external doors. Further guidance is provided in AS3671-1989 *Acoustics - Road Traffic Noise Intrusion - Building Siting and Construction*.

It is stressed that **Construction** Categories applying under AS3671-1989 are not the same as **Noise** Categories applying under QDC MP 4.4. While the goal of each set of designations is the same, ie to control road traffic noise intrusion, they act in different ways to each other. There is no direct correspondence or consistent correlation between each set of designations. It is regrettable that the term "category" has been adopted by the relevant regulatory bodies for both sets of designations.

<sup>5</sup> Brown, AR & Brown, HD A *Re-Examination of the Relationship Between the  $L_{A10(18\text{hour})}$  Noise Level Parameter and Other Road Traffic Noise Level Parameters*, proc. Joint Conference of Australian and New Zealand Acoustical Societies, Brisbane, 2016.

<sup>6</sup> DTMR and several local authorities in SE Queensland apply this limit of 63dBA  $L_{A10(18\text{hour})}$  facade-corrected as the basis of setting limits for acceptable levels of road traffic noise intrusion onto residential allotments situated adjacent to major roads.

#### 4.4 DTMR Limits for Road Traffic Noise Intrusion into Private Open Space Areas

SC 6.16 requires that the limits for acceptable levels of road traffic noise intrusion into Private Open Space areas be set by reference to the DTMR's *Policy for Development on Land Affected by Environmental Emissions from Transport and Transport Infrastructure* (EEP). The criteria from the EEP have been adopted in *State Code 1: Development in a State-Controlled Road Environment of State Development Assessment Provisions* (SDAP).

Under EEP, a pair of limits has been established, with one limit of the pair applying depending on the prevailing  $L_{A90(18\text{hour})}$  noise level. These limits are as follows:-

- (a) 57dBA  $L_{A10(18\text{hour})}$  free field (ie 60dBA  $L_{A10(18\text{hour})}$  facade-corrected) if the measured  $L_{A90(18\text{hour})}$  is currently  $\leq 45\text{dBA } L_{A90(18\text{hour})}$ <sup>7</sup>
- (b) 60dBA  $L_{A10(18\text{hour})}$  free field (ie 63dBA  $L_{A10(18\text{hour})}$  facade-corrected) if the measured  $L_{A90(18\text{hour})}$  is currently  $> 45\text{dBA } L_{A90(18\text{hour})}$ .

### 5.0 Current Road Traffic Noise Levels and Derived Noise Level Limits

#### 5.1 General

The prediction of road traffic noise intrusion onto any site can be conducted by using the CRTN '88<sup>8</sup> algorithms. These algorithms have been validated for Australian conditions. Even so, it has been well established that the algorithms generally over-predict the level of road traffic noise intrusion onto adjoining land.

The extent of the over-prediction tends to be site-specific. The degree of over-prediction is generally greater at sites with complex topography and significant distances of separation from the road as well as at sites located adjacent to signalised intersections.

In situations where the road has been formed and is operating with significant volumes of traffic, it is appropriate to conduct noise level measurements under the existing road traffic conditions. The results of these measurements can be used (i) to validate/calibrate the noise prediction model for the site or the development and, (ii) where appropriate, to establish the appropriate parameter offset values so that the equivalent facade-corrected external  $L_{A10(18\text{hour})}$  noise limits can be set.

In fact, in situations where the arterial/sub arterial road exists, Council requires that noise logging be undertaken at a representative location on the site to determine the current level of noise intrusion onto that location.

#### 5.2 Current Road Traffic Noise Levels and Derivation of External Limits for Private Open Spaces

Monitoring of the level of noise generated by road traffic on Caboolture River Road was conducted continuously at a representative location close to the southern boundary of the site from 1:15pm Tuesday 7 June 2020 to 10:30am Tuesday 14 June 2022.

The measurement location is shown as "M" in Figure 4. This location was 13m from the edge of the road pavement. The measurement height was 2.2m (approx) above local ground level, ie 0.7m (approx) above existing road level.

<sup>7</sup>  $L_{A90(18\text{hour})}$  is defined as the arithmetic mean of each of the eighteen hourly  $L_{A90,1\text{hr}}$  levels between 6:00am and 10:00pm on an average weekday.

<sup>8</sup> "Calculation of Road Traffic", UK DoE, HMSO, 1988. This is the method endorsed by Queensland Department of Transport and Main Roads and various local authorities.

The measurements were carried out in accordance with AS2702-1984 *Acoustics - Methods for the Measurement of Road Traffic Noise*. Weather conditions were fine. Other than on Saturday 11 June, winds were generally calm to light (of variable direction).

Test instrumentation consisted of a Norsonic type Nor-139 Type 1 portable statistical noise logger.

The results of the monitoring for a typical day (ie Thursday 9 June 2022) are presented graphically in Figure 5.

The resultant free field  $L_{10(18\text{hour})}$  and  $L_{A90(18\text{hour})}$  values were measured to be as follows:-

- $L_{10(18\text{hour})} = 63.0\text{dBA}$ ; and
- $L_{A90(18\text{hour})} = 42.4\text{dBA}$ .

### 5.3 Future Road Traffic Noise Levels and Derivation of External Limits for Private Open Spaces

From the results above, it can be seen that the measured  $L_{A90(18\text{hour})}$  values at Location M was 42.4dBA. This value is below the limit of 45dBA  $L_{A90(18\text{hour})}$  set by DTMR under EEP.

Based on traffic data provided by the Project Traffic Engineers, Lambert & Ranbein, it is noted that the prevailing AADT traffic volume on Caboolture River Road during the measurement period was approximately 3590 vpd. As is detailed further at Section 6.1 below, 3590 vpd is <15% of the forecast future traffic volume of 25000 vpd at Year 2032. As the volume of traffic increases over time, the  $L_{A90(18\text{hour})}$  noise level will increase correspondingly.

Indeed, it is fully expected that, by the time the future residents take up occupancy of dwellings on the 279 lots within Stages 01a, 01b, 02, 03 and 04, as well as the 400 lots (approx.) within other portions of the NDP1-1 area of Caboolture West, the volume of traffic on Caboolture River Road adjacent to the subject site will be in the range 2000-10000 vpd. It is noted that at 2021, the road traffic volume on the section of Caboolture River Road 500m further to the east, ie between Dobson Lane and Parkridge Avenue was 7025 vpd. On this basis, by the time the dwellings within the subject site are expected to be first occupied, the volume of traffic on the section of Caboolture River Road will be comparable to the current volume of traffic on the section of Caboolture River Road approximately 500m to the east.

In simple terms, it would be reasonable to expect the  $L_{A90(18\text{hour})}$  noise level will increase logarithmically with the increase in traffic volumes. More specifically, a doubling of the traffic volume would be expected to result in a 3dBA increase in the  $L_{A90(18\text{hour})}$  noise level. On this basis, by the time the future residents take up occupancy of dwellings within the subject site, the  $L_{A90(18\text{hour})}$  noise level will have increased to 46.4dBA – 46.8dBA.

Notwithstanding, to more accurately gauge the likely effect of the change in  $L_{A90(18\text{hour})}$  noise levels with change in traffic volumes, a series of attended and unattended noise level measurements was conducted at Location 1 shown on Figure 4. This location was also 13m from the edge of the road pavement. From the results of these noise level measurements and subsequent calculations, it was determined that the resultant free field  $L_{A90(18\text{hour})}$  noise level at Location 1 was 48.9dBA at 2021.

That is, on both bases, ie by simple calculation and by direct measurement elsewhere, the increase in traffic volumes will result in an increase in the  $L_{A90(18\text{hour})}$  noise levels to >45dBA, ie to a point above the limit of 45dBA  $L_{A90(18\text{hour})}$  set by DTMR under EEP. By reference to Section 4.4 above, the corresponding target external noise level limit for private open spaces areas will be 60dBA  $L_{10(18\text{hour})}$  free field, ie 63dBA  $L_{10(18\text{hour})}$  facade-corrected.

## 6.0 Road Traffic Noise Model

### 6.1 Preparation of Road Traffic Noise Model

The prediction of road traffic noise intrusion onto the site has been conducted using the CRTN '88 algorithms as applied by the SoundPLAN<sup>9</sup> computer program.

The lot layout has been determined from the electronic files provided by the Project Urban Designer, Urbis.

The finished ground levels across the site have been determined from the earthworks design provided by the Project Civil Engineers, Calibre.

The existing topographical contours surrounding the site have been extracted from the MBRC Open Data Portal *DataHub* website.

At the subject site, the traffic volume, vehicle mix and road speed information for Caboolture River Road under 10 year planning horizon conditions (ie Year 2032) have been set by reference to data provided by the Project Traffic Engineers, Lambert & Rehbein.

The relevant information for Caboolture River Road adjacent to the subject site is presented below.

- Traffic Volume - Eastbound (AADT): 12500vpd
- Traffic Volume - Westbound (AADT): 12500vpd
- Percentage Heavy Vehicles: 4%
- Traffic Speed: 60km/h
- Road Surface: Dense Graded Asphalt

The noise level prediction calculations also took account of the various site-specific variables and parameter settings which influence the level of road traffic noise emission onto the site. These included:-

- Site topography
- Distance from road
- Road gradients and road surfaces
- Vertical alignment of road
- Angle of view to road
- Receptor height<sup>10</sup>

At the logger location M, the free field  $L_{10(18\text{hour})}$  noise level due to road traffic on Caboolture River Road at 2022 agreed to within 0.5dBA of the measured noise level of 63.0dBA. This level of fit is well within the  $\pm 2\text{dBA}$  tolerance normally deemed satisfactory, notably by DMTR under their *Transport Noise Management Code of Practice Volume 1 – Road Traffic Noise* November 2013.

<sup>9</sup> SoundPLAN is an integrated software package for noise and air pollution evaluation developed in Germany by Braunstein + Berndt GmbH. It has been configured to predict the extent of (i) road traffic noise intrusion by application of the CRTN '88 algorithms and (ii) industrial noise emission using the CONCAWE algorithms. It is in use in more than 48 countries and has had widespread application throughout Australia. It is endorsed by DTMR, MBRC, BCC, RCC, LCC, GCCC, SCRC, DES and most other State environmental authorities.

<sup>10</sup> Noise levels at ground floor level facades are determined at a receptor height of 1.6m above ground level. For first floor level facades, the receptor height is 4.2m.

## 6.2 Road Traffic Noise Prediction Scenarios

Under s.8.1 of SC 6.16, it is necessary to consider the impact of road traffic noise intrusion onto residential lots located within 100m of an arterial road. As can be determined from Figure 2 and, more definitively, by reference to Figures 7-9 following, there will be 25 new lots either wholly or partially located within the 100m setback zone from Caboolture River Road. These are Lots 29-53<sup>11</sup>.

Four road traffic noise scenarios have been modelled.

The details of each are presented below.

**Scenario 1:** Receiver height set at 1.3m agl (ie occupant ear level in private open space), Caboolture River Road at 2032 traffic volume, no barriers constructed. Refer Figure 6 for noise level contours. Note: Noise level contours are presented only over those lots lying within the 100m setback zone.

**Scenario 2:** Receiver height set at 1.3m agl (ie occupant ear level in private open space), Caboolture River Road at 2032 traffic volume, 1.8m high acoustic barrier constructed along the southern boundaries of Lots 41-50 together with 1.8m high returns along (i) the south-western and western boundaries of Lot 50 and (ii) part of the north-western boundary of Lot 50 for a distance of 2m in a north-north-easterly direction.

Refer Figure 7 for degree of compliance achieved across the site with the 60dBA  $L_{A10(18\text{hour})}$  free field noise level limit. The alignment of the barrier arrangement is shown in Figure 10.

Notes:

1. Subsequent development that is currently proposed to be undertaken on land adjoining to the east requires that a 1.8m high acoustic barrier be constructed along the southern boundary of Lots 680-686 (MBRC Development Application No DA/2022/4535 refers). This barrier arrangement has been included in the assessment for the subject site.
2. The height and alignment of the ultimate barrier to be constructed along the western boundary of Lot 50 will set by the requirement to control noise intrusion from road traffic on Caboolture River Road as well as the requirement to adequately control noise intrusion from the proposed service station development over Lot 2000 to the west. Ref. MBRC Development Application No DA/2022/1840A. A revised noise report for the development over Lot 2000 detailing the height and alignment of the ultimate barrier will be submitted in the future No DA/2022/1840. In the interim, the height of the return along the four truncation chords of the boundary at the south-western corner of Lot 50 along part of the western boundaries of Lot 50 that is required to adequately control road traffic noise intrusion on Lot 50 has been set to match the relevant part of the acoustic barrier required to be constructed to address the impact of noise intrusion from proposed service station development on Lot 2000 as well.

**Scenario 3:** Receiver height set at 1.6m agl (ie ground floor level facades), Caboolture River Road at 2032 traffic volume, acoustic barrier arrangement as shown in Figure 10. Refer Figure 8 for the ground floor level AS3671-1989 Construction Categories.

**Scenario 4:** Receiver height set at 4.2m agl (ie first floor level facades), Caboolture River Road at 2032 traffic volume, acoustic barrier arrangement as shown in Figure 10. Refer Figure 9 for the first floor level AS3671-1989 Construction Categories.

<sup>11</sup> It is noted that the incursion of 100m setback line intrudes to a very minor degree onto Lot 33. Having regard to standard building setbacks from side boundary, it is still possible that a residence constructed on this lot may lie just within the 100m setback line.



## 7.0 Discussion

From the results presented in Figure 6, it can be seen that with no acoustic barriers in place, the 60dBA  $L_{A10(18\text{hour})}$  free field noise level target adopted by DTMR (and, hence, by Council) for private open spaces areas would not be met on Lots 41-50.

As shown in Figure 7, to adequately control road traffic noise intrusion into the private open space areas across Lots 29-53, it will be sufficient to construct a 1.8m high acoustic barrier along the southern boundaries of Lots 41-50 together with a 28.15m long 1.8m high return constructed along the four truncation chords of boundary at the south-western corner of Lot 50 (ie 26.15m total) and for a further distance of 2.0m along the western boundary of Lot 50.

The alignment of this acoustic barrier arrangement is shown in Figure 10.

With this barrier arrangement in place, the AS3671-1989 Construction Categories applying to the ground floor and first floor facades of the residential allotments located within 100m of Caboolture River Road (ie Lots 29-53) will be as shown in Figures 8 and 9, respectively.

By reference to Figure 8 (ground floor facades, with acoustic barrier shown in Figure 10 constructed), it can be seen that a Construction Category 2 designation would apply to each of Lots 29-53.

By reference to Figure 9 (first floor facades, with acoustic barrier shown in Figure 10 constructed), it can be seen that, on each of Lots 41-50, at least half of the area of the lot that lies within the standard building setbacks will be in the Construction Category 3 band. By contrast, it is evident that a Construction Category 2 designation would apply to each of each of Lots 29-40 and 51-53.

A summary of the Construction Categories applying to Lots 29-53 is presented below in Table 2 below.

Lot	AS3671 Construction Category by Level		Lot	AS3671 Construction Category by Level		Lot	AS3671 Construction Category by Level	
	Ground Floor	First Floor		Ground Floor	First Floor		Ground Floor	First Floor
29	2	2	38	2	2	47	2	3
30	2	2	39	2	2	48	2	3
31	2	2	40	2	2	49	2	3
32	2	2	41	2	3	50	2	3
33	2	2	42	2	3	51	2	2
34	2	2	43	2	3	52	2	2
35	2	2	44	2	3	53	2	2
36	2	2	45	2	3			
37	2	2	46	2	3			

**Table 2 – AS3671-1989 Construction Categories Applying to Lots 29-53**

(AS3671-1989 Construction Categories are not the same as QDC MP 4.4 Noise Categories)

The alignment of the acoustic fence is shown in Figure 10. To adequately address the Council's normal landscaping requirements, it would be appropriate to consider the planting of low height vegetation in the verge. Details can be prepared by the Project Landscape Architect, as necessary.

## 8.0 Conclusions

From the results of the assessment presented above, the following conclusions can be drawn:-

- The acoustical design provisions of Section 8.1 of SC 6.16 *Planning Scheme Policy – Noise* apply to all residences to be constructed on lots located within 100m of the arterial section of Caboolture River Road. In this instance, this requirement will apply to 25 lots. These are Lots 29-53.
- In addition, Section 8.1 of SC 6.16 requires that road traffic noise intrusion into the designated private open space of each dwelling located within the 100m setback zone comply with DTMR's 60dBA free field noise level limit for private open spaces.
- In the absence of an acoustic barrier, the 60dBA free field noise level limit set by DTMR for private open spaces would not be met on Lots 41-50.
- To adequately control road traffic noise intrusion in all private open space areas on all lots, it will be sufficient to erect a 1.8m high acoustic barrier along the southern boundaries of Lots 41-50 together with a 28.15m long 1.8m high return constructed along the four truncation chords of boundary at the south-western corner of Lot 50 (ie 26.15m total) and for a further distance of 2.0m along the western boundary of Lot 50. The arrangement of this barrier is shown in Figure 10 of this report.

## 9.0 Recommendations

To adequately control road traffic noise intrusion into the proposed residential allotments, it is recommended that the barrier arrangement shown in Figure 10 be constructed. This barrier arrangement comprises a 1.8m high acoustic barrier constructed along the southern boundaries of Lots 41-50 together with a 28.15m long 1.8m high return constructed along the four truncation chords of boundary at the south-western corner of Lot 50 (ie 26.15m total) and for a further distance of 2.0m along the western boundary of Lot 50

Note:

The height of return along the western boundary of Lot 50 has been set to match the relevant part of the acoustic barrier required to be constructed to address the impact of noise intrusion from proposed service station development on Lot 2000. A revised noise report for MBRC Development Application No DA/2022/1840 supporting this statement will be submitted in the future.

SC 6.16 *Planning Scheme Policy – Noise* does not provide specifications for the design and/or construction of acoustic fences. Notwithstanding, guidance on the appropriate design specifications and construction requirements can be drawn from (i) Council's [Standard Drawing No SF-1520](#) for typical construction details of post and paling acoustic barriers and (ii) Council's [Standard Drawing No SF-1521](#) for typical construction details of post and board acoustic barriers.

To ensure that adequate control of road traffic noise intrusion into the habitable spaces of any dwellings located on Lots 29-53 is achieved, the particular dwellings should be designed and constructed in accordance with AS3671-1989 *Acoustics – Road traffic noise intrusion - Building siting and construction* to achieve compliance with the internal sound levels of AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

Accordingly, it is recommended that a condition of approval be imposed requiring that potential purchasers of Lots 29-53 be advised that due consideration needs to be given to the design and construction of any residences on these lots.

Suggested wording of an appropriate condition as commonly adopted by Council is presented below.

Condition XX Noise Management

- a) The applicant is required to advise prospective buyers of Lots 29-53 that the dwelling to be constructed on the particular lot is to be designed and constructed in accordance with the accordance with AS3671-1989 *Acoustics – Road traffic noise intrusion - Building siting and construction* to achieve compliance with the internal sound levels of AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.
- b) At the completion of construction of any dwellings on Lots 29-53, certification shall be undertaken by a qualified Building Certifier. The purpose of this certification is to confirm that, having regard to the Construction Category bands applying to each level of each relevant lot as shown in Table 2 of the approved road traffic noise impact assessment report, the dwelling constructed on the particular lot has been designed and constructed in accordance with AS3671-1989 to achieve compliance with the internal sound levels of AS/NZS 2107:2016.

We trust that this information is adequate for your purposes at this stage, but should you require any further information, please do not hesitate to contact us.

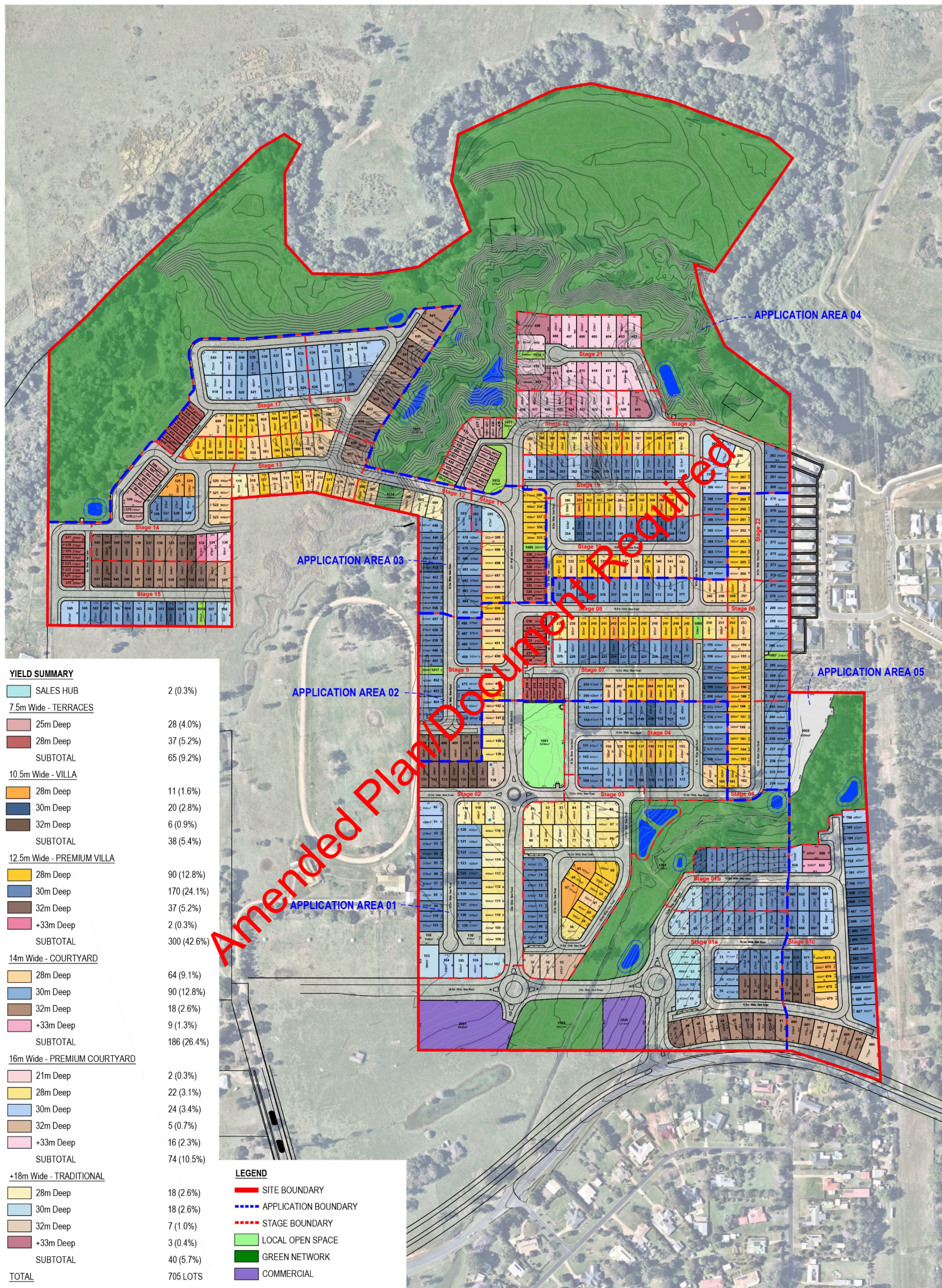
Report prepared by:



Russell Brown,  
Director, Acoustics RB Pty Ltd  
RPEQ 2799

Amended Plan/Document Required





**CABOOLTURE WEST**  
CONCEPT PLAN

Scale 1:4,000 @ A3  
0 10 50 100 200m

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This plan is conceptual and is for discussion purposes only. Subject to further detail study, Council approval, engineering input, and survey. Cadastral boundaries, areas and dimensions are approximate only. Figured dimensions shall take preference to scaled dimensions. No reliance should be placed on this plan for any financial dealings of the land.

PROJECT NO: ND1577  
DATE: 24.10.2022  
DRAWING NO: CD01  
REV: 18

Figure 2A – Concept Plan (Stages 01a, 01b, 02, 03 and 04 Shown Outlined in Blue)



Figure 2B – Reconfiguration of Lot – Application 1 (Stages 01a, 01b, 02, 03 and 04 Shown Outlined in Navy)





Figure 4 – Site Location, Nearby Existing Residences and Location of Noise Logger “M”



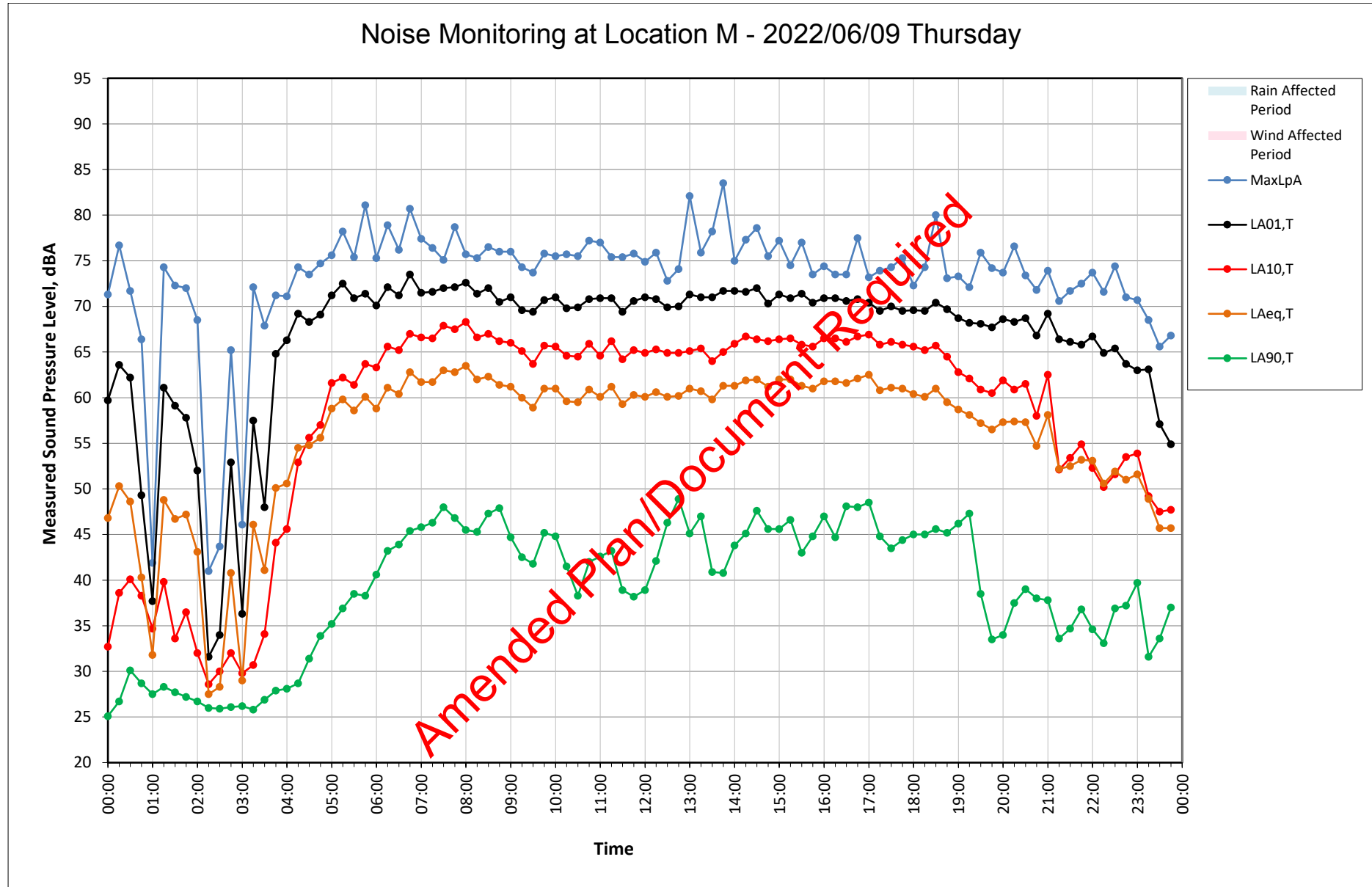
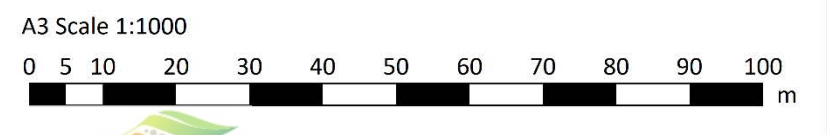
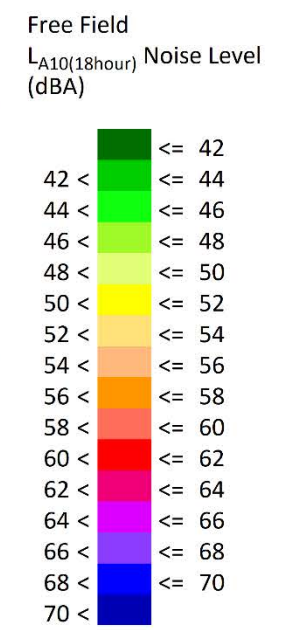
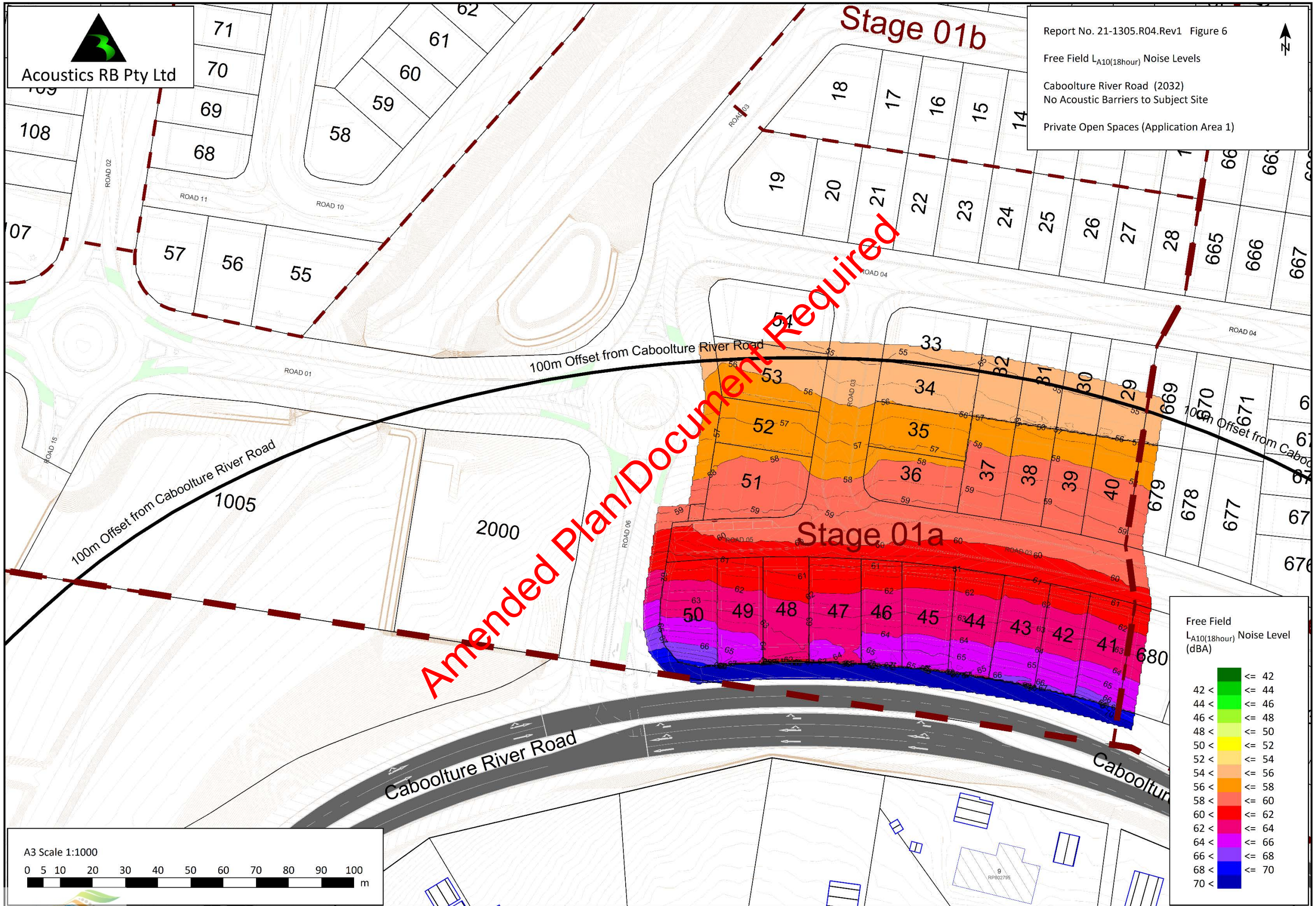


Figure 5 – Results of Noise Level Monitoring at “M” – 9 June 2022

**Figures 6-9 (Noise Contour Plots) and Figure 10 (Barrier Alignment)**

**Amended Plan/Documents Required**





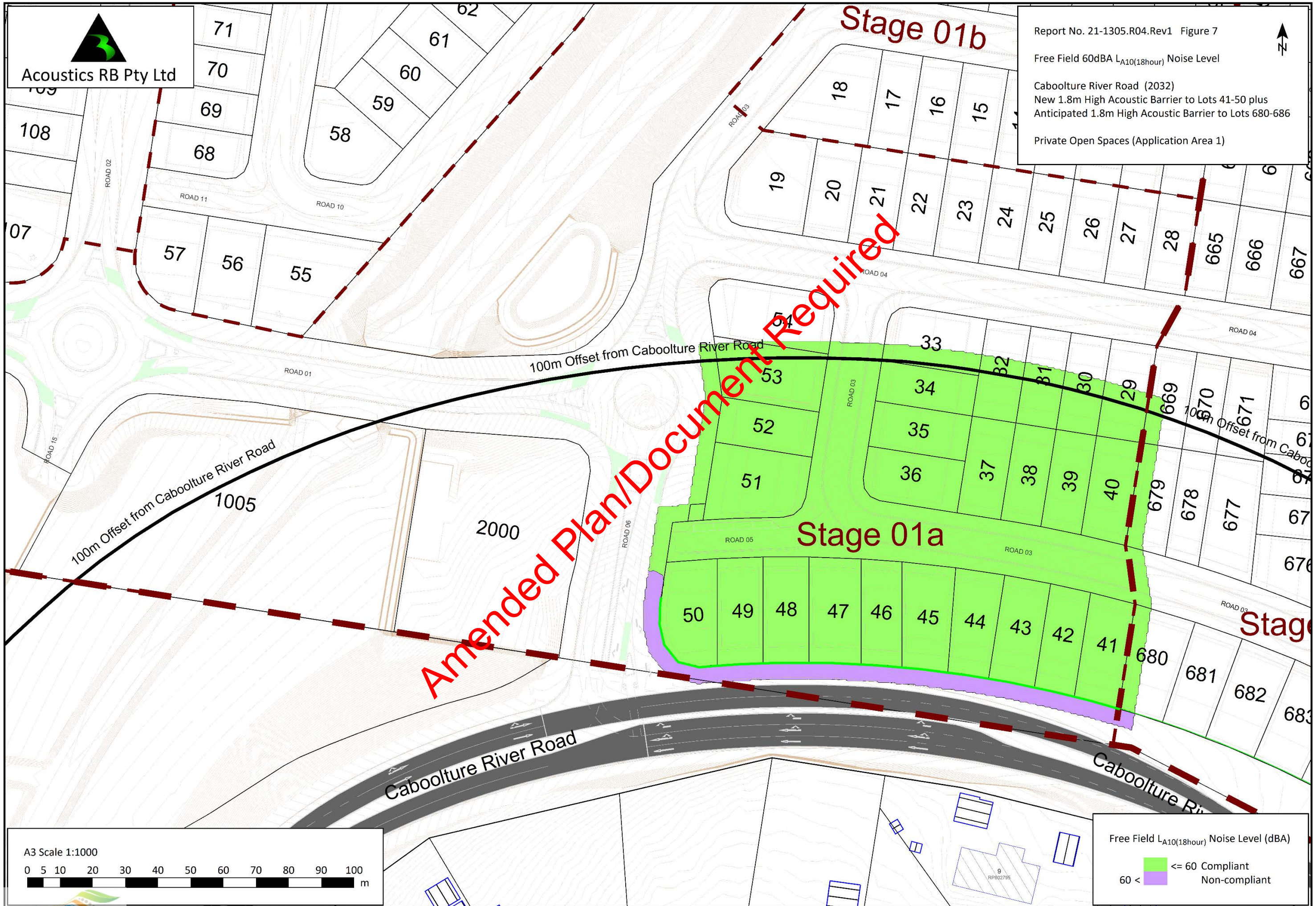
Acoustics RB Pty Ltd

Report No. 21-1305.R04.Rev1 Figure 7

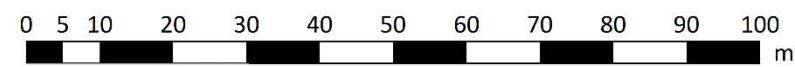
Free Field 60dBA  $L_{A10(18\text{hour})}$  Noise Level

Caboolture River Road (2032)  
New 1.8m High Acoustic Barrier to Lots 41-50 plus  
Anticipated 1.8m High Acoustic Barrier to Lots 680-686

Private Open Spaces (Application Area 1)



A3 Scale 1:1000



Free Field  $L_{A10(18\text{hour})}$  Noise Level (dBA)

- $\leq 60$  Compliant
- $60 <$  Non-compliant

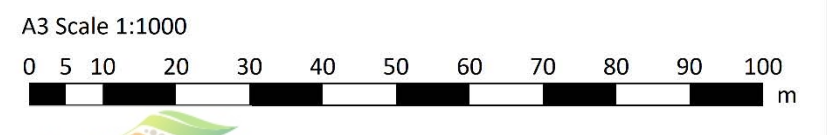
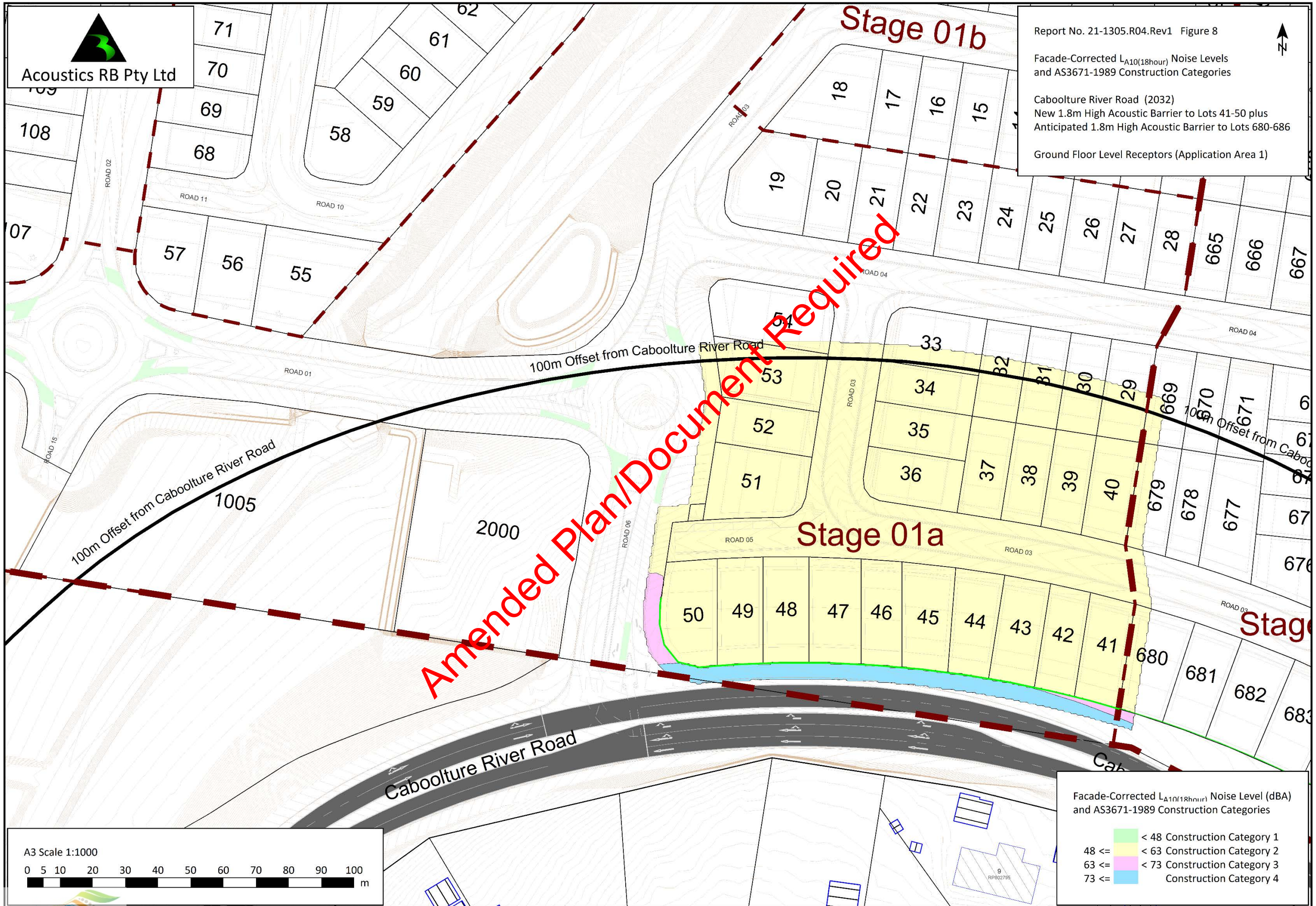


Report No. 21-1305.R04.Rev1 Figure 8

Facade-Corrected  $L_{A10(18hr)}$  Noise Levels and AS3671-1989 Construction Categories

Caboolture River Road (2032)  
New 1.8m High Acoustic Barrier to Lots 41-50 plus  
Anticipated 1.8m High Acoustic Barrier to Lots 680-686

Ground Floor Level Receptors (Application Area 1)



Facade-Corrected  $L_{A10(18hr)}$  Noise Level (dBA) and AS3671-1989 Construction Categories

< 48	Construction Category 1
48 <=	< 63 Construction Category 2
63 <=	< 73 Construction Category 3
73 <=	Construction Category 4



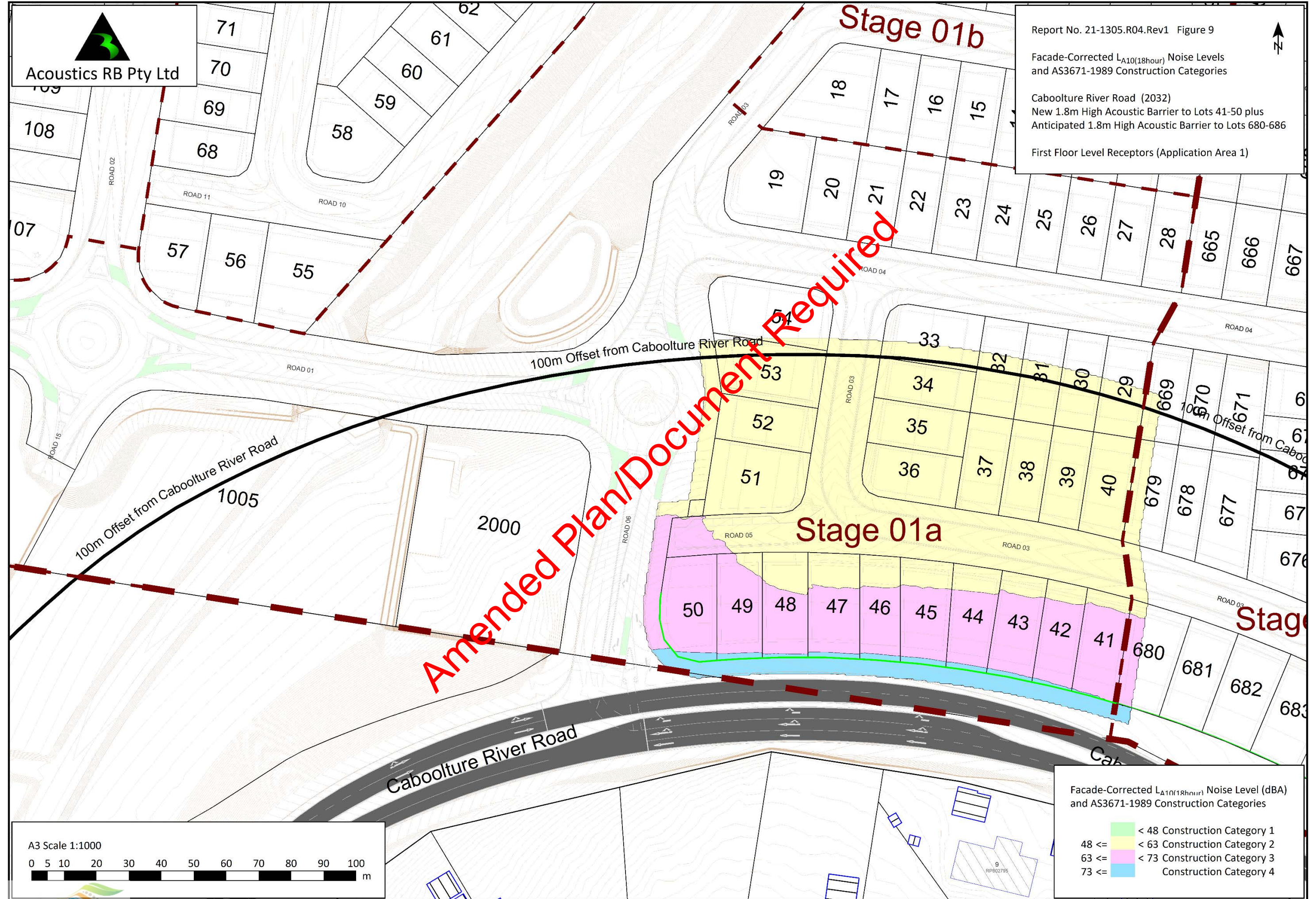
Acoustics RB Pty Ltd

Report No. 21-1305.R04.Rev1 Figure 9

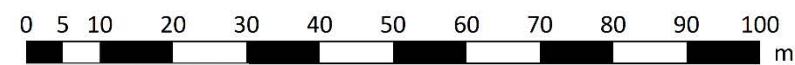
Facade-Corrected  $L_{A10(18hr)}$  Noise Levels and AS3671-1989 Construction Categories

Caboolture River Road (2032)  
New 1.8m High Acoustic Barrier to Lots 41-50 plus  
Anticipated 1.8m High Acoustic Barrier to Lots 680-686

First Floor Level Receptors (Application Area 1)



A3 Scale 1:1000



Facade-Corrected  $L_{A10(18hr)}$  Noise Level (dBA) and AS3671-1989 Construction Categories

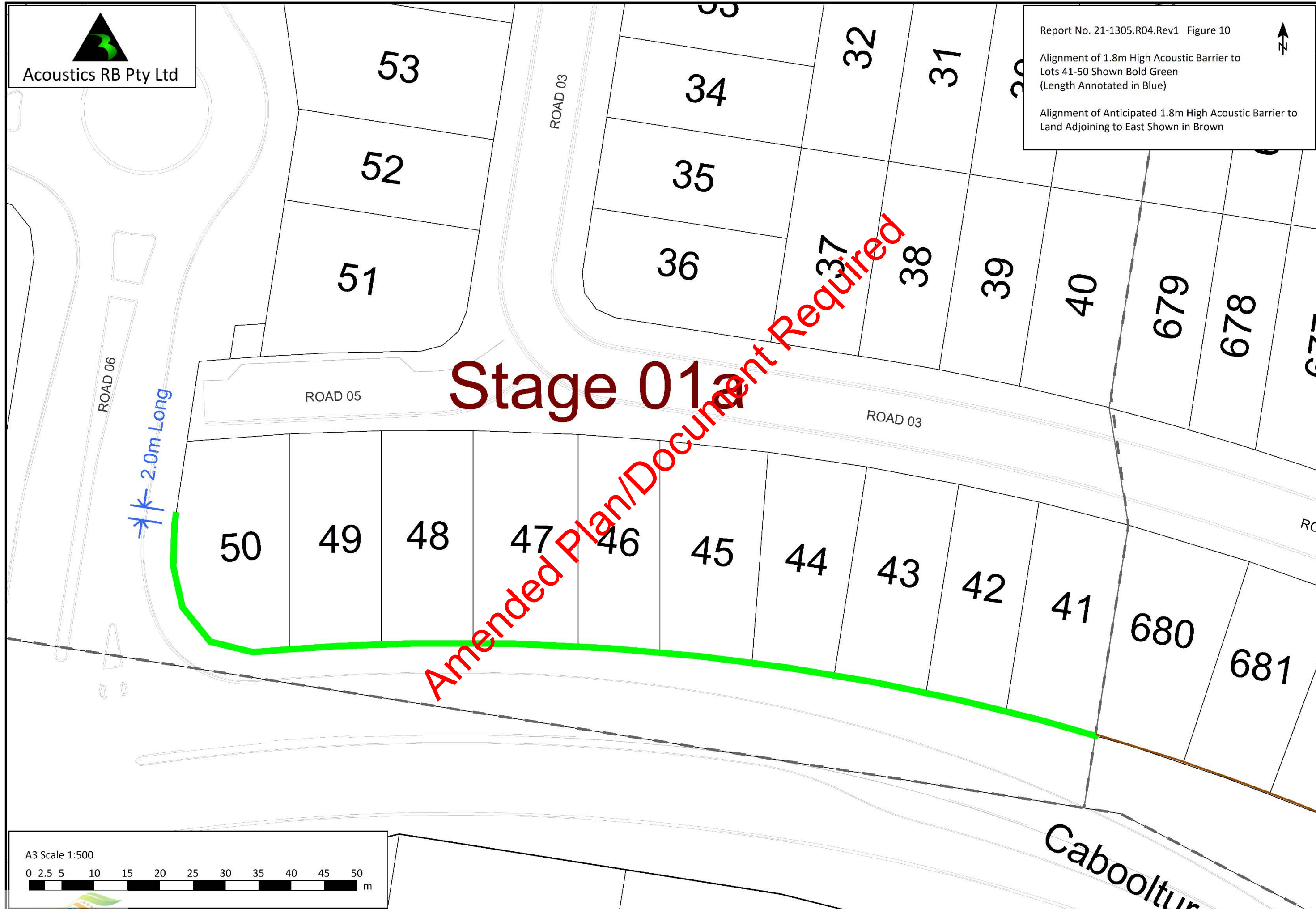
- < 48 Construction Category 1
- 48 <= < 63 Construction Category 2
- 63 <= < 73 Construction Category 3
- 73 <= Construction Category 4



Report No. 21-1305.R04.Rev1 Figure 10

Alignment of 1.8m High Acoustic Barrier to Lots 41-50 Shown Bold Green (Length Annotated in Blue)

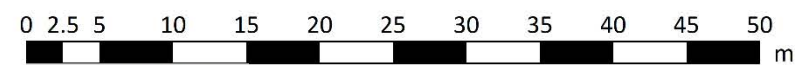
Alignment of Anticipated 1.8m High Acoustic Barrier to Land Adjoining to East Shown in Brown



**Stage 01**

**Amended Plan/Document Required**

A3 Scale 1:500



## Attachment A

### Constraint on Adoption of QDC MP 4.4

Section 8 *Assessment of Road Traffic and Railway Noise* of SC 6.16 *Planning Scheme Policy – Noise* outlines the process of establishing acceptable acoustical amenity at sites impacted by noise from roads and railways. At Section 8.1 *Reconfiguring a Lot* of SC 6.16, it is stated:-

“The [transport noise impact] assessment is to be in accordance with MP4 .4 of the QDC. The assessment is to identify the noise category applicable to each lot in the proposed development for both lower and upper levels. Noise categories are defined in Schedule 3 of MP4.4.”

With respect to s.8.1, it is relevant to have regard to *Queensland Development Code MP4.4 Buildings in a Transport Noise Corridor* (QDC MP4.4) and Chapter 8B (especially s.246X) of *Building Act 1975*.

The relevant extracts from QDC MP4.4 follow below.

#### 1 Purpose

To ensure *habitable rooms* of particular residential buildings located in *transport noise corridors* are designed and constructed to reduce the extent to which *transport noise* intrudes into those rooms.

#### 3 Application

This QDC part applies to building work for a *relevant residential building* if the work is the subject of a building development application made on or after 17 August 2015.

#### 6 What is a relevant residential building

A building is a *relevant residential building* if:

- (a) a building development application for the construction of the building is made after 31 August 2010; and
- (b) the building:
  - (i) is a class 1, 2, 3 or 4 building; and
  - (ii) is located in a *transport noise corridor*; and
  - (iii) is not a *relocated building*; and
- (c) the building development approval for the construction of the building was not given under the building assessment provisions in force immediately before 1 September 2010, under section 37 of the *Building Act 1975*.

At Section 8 *Definitions* of QDC MP4.4, “transport noise corridor is defined as follows:-

***Transport noise corridor*** means land designated under Chapter 8B of the *Building Act 1975* as a *transport noise corridor*.

*Note: This is identified in State and Local Government records as described in a gazettal notice following designation of the transport noise corridor.*



As noted above, the purpose of QDC MP4.4 is to ensure control of transport noise intrusion into particular residential buildings, specifically “relevant residential buildings”, where as noted in the definition above, a relevant residential building must be located within a Transport Noise Corridor (TNC) as defined at Chapter 8B of *Building Act 1975* and, more particularly, at s.246X and s.246Y of the Act.

The subject site is not located in a TNC. Therefore, the provisions of QDC MP4.4 are not triggered.

Whether it is possible to extend the application of QDC MP 4.4 beyond its purpose is a town planning/legal question.

In the absence of an answer to that question and to avoid any inadvertent conflict by attempting to invoke QDC MP 4.4 where it cannot be properly applied, the appropriate means of controlling of road traffic noise intrusion is to apply the more robust methodology of the calculation methods of AS3671-1989 *Acoustics – Road traffic noise intrusion - Building siting and construction* to the design of noise affected residences, with the goal being to achieve compliance with the recommended internal sound levels of AS/NZS 2107:2016 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

Amended Plan/Document Required

## Attachment B

### Derivation of Upper and Lower Bounds of Construction Categories

The upper and lower bounds of the Construction Categories can be derived in the following manner.

Internal noise level limits set by AS/NZS 2107:2016:-

- \* Bedrooms and sleeping areas: 35dBA ( $L_{Aeq,1hr \text{ night}}$ )
- \* Living and work areas: 40dBA ( $L_{Aeq,1hr \text{ day}}$ )

Reduction external to internal, glazing open  
(includes conversion from free field to facade-corrected): 10dBA

External noise limits (facade-corrected):-

- \* Night: 45dBA ( $L_{Aeq,1hr \text{ night}}$ )
- \* Day: 50dBA ( $L_{Aeq,1hr \text{ day}}$ )

Offsets: +3.3dBA (night)  
-0.6dBA (day)

Resultant Facade-Corrected External  $L_{A10(18hour)}$  Limit:

- \* Based on internal limits during night: 48.3dBA (48dBA rounded)
- \* Based on internal limits during day: 49.4dBA (49dBA rounded)

On the basis of these results, the noise level external to the most exposed facade of any residence should not exceed a facade-corrected noise level of **48dBA** ( $L_{A10(18hour)}$ ) if the internal noise level limits of AS/NZS 2107:2000 are to be met when windows and external doors are **open**. This is the upper bound Construction Category 1 and the lower bound of Construction Category 2.

Internal noise level limits set by AS/NZS 2107:2016:-

- \* Bedrooms and sleeping areas: 35dBA ( $L_{Aeq,1hr \text{ night}}$ )
- \* Living and work areas: 40dBA ( $L_{Aeq,1hr \text{ day}}$ )

Reduction external to internal, glazing open  
(includes conversion from free field to facade-corrected): 25dBA

External noise limits (facade-corrected):-

- \* Night: 60dBA ( $L_{Aeq,1hr \text{ night}}$ )
- \* Day: 65dBA ( $L_{Aeq,1hr \text{ day}}$ )

Offsets: +3.3dBA (night)  
-0.6dBA (day)

Resultant Facade-Corrected External  $L_{A10(18hour)}$  Limit:

- \* Based on internal limits during night: 63.3dBA (63dBA rounded)
- \* Based on internal limits during day: 64.4dBA (64dBA rounded)

On the basis of these results, the noise level external to the most exposed facade of any residence should not exceed a facade-corrected noise level of **63dBA** ( $L_{A10(18hour)}$ ) if the internal noise level limits of AS/NZS 2107:2016 are to be met when standard construction windows and external doors are **closed**. This is the upper bound Construction Category 2 and the lower bound of Construction Category 3.

**ATTACHMENT 4**

**Infrastructure Charges Notice**

# Infrastructure Charges Notice (s125 Planning Act 2016)

Moreton Bay Regional Council  
PO Box 159, CABOOLTURE QLD 4510  
ABN 92 967 232 136



**Applicant:** Foreverlen Pty Ltd  
**Applicant Address:** C/- Peakurban Pty Ltd PO Box 1344 BUDDINA QLD 4575  
**Date of Notice:** 24 August 2023  
*(s121(3)(a) Planning Act 2016)*  
**Notice Reference Number:** DA/2021/4669

## APPROVAL DETAILS:

**Approval No.:** DA/2021/4669  
**Type of Approval:** Development Permit for Reconfiguring a Lot  
**Approval Description:** Reconfiguring a Lot - Development Permit for Subdivision (2 lots into 181 residential lots, open space, drainage, 3 balance lots, and new road - Stage 1A & 1B, 2-4)

## PREMISES TO WHICH THE CHARGES APPLY: *(s121(1)(c) Planning Act 2016)*

**Property Address:** 409-423 Caboolture River Road LILYWOOD QLD 4513  
**Real Property Description:** Lot 1 RP 866105  
Lot 12 RP 866105

## LEVIED CHARGE:

**Version of Charges Resolution:** Ver 10 - 5 October 2022

**Current Amount of the Levied Charge** **\$0.00**  
*(s121(1)(a) Planning Act 2016)*

Notes:

- 1) See "CHARGE DETAILS" below for details of how the charge has been worked out.
- 2) This infrastructure charge does not include the levied charges payable for water supply and sewerage networks to be levied by the Northern SEQ Distributor-Retailer Authority (trading as Unitywater).

## DATE CHARGES ARE PAYABLE: *(s121(1)(d) Planning Act 2016)*

The levied charges are payable in accordance with the timing stated in section 122 of the *Planning Act 2016*, namely:

For reconfiguring a lot - when the Council approves the plan of reconfiguration.

**Before paying the total levied charges you must request an Infrastructure Charges Fee Statement showing the total levied charge payable at the time of payment. Refer to the 'Important Information' section below for details.**

## CHARGE DETAILS: *(s121(1)(b) Planning Act 2016)*

PROPOSED DEVELOPMENT						
Description	Base Charge Rate	Quantity	Base Charge	Council Proportion	Indexation	Total
Residential Use 3 or more bedroom dwelling - proposed	Dwelling	184.00	\$18,648.00	60%	Nil	\$3,431,232.00
CREDITS						
Description	Base Charge Rate	Quantity	Base Charge	Council Proportion	Indexation	Total Credit
Residential Use 3 or more bedroom dwelling - existing	Dwelling	2.00	\$18,648.00	60%	Nil	-\$37296.00
OFFSET						
Refer below for details						<b>Total Offset</b> \$3,393,936.00
LEVIED CHARGE						\$0.00
					Levied Charge	\$0.00

# Infrastructure Charges Notice (s125 Planning Act 2016)

Moreton Bay Regional Council  
PO Box 159, CABOOLTURE QLD 4510  
ABN 92 967 232 136



## OFFSET / REFUND DETAILS: (s121(1)(f) Planning Act 2016)

In accordance with s121(1)(f) of the *Planning Act 2016*, this table identifies whether an offset or refund applies and, if so, information about the offset or refund, including when any refund will be given

Does an offset or refund apply? No

Timing of Refund: Not applicable

## INFRASTRUCTURE AGREEMENT ESTABLISHMENT COST DETAILS:

IA Number (Council Ref): DA/2023/2452  
Description: Infrastructure Agreement Caboolture West - Neighbourhood Development Precinct 1 (Foreverlen Pty Ltd)  
Agreement Commencement Date: 22 August 2023

Infrastructure ID Number	Infrastructure Item Description	Delivery Status	Original Agreed Value of Item <sup>1</sup>	Previous Value of Item Used <sup>2</sup>	New Value of Item Used <sup>3</sup>	Value of Item left Available <sup>4</sup>
Not identified	Item 1.1 & 1.2 in accordance with executed IA for District and Regional Sports Parks	Future, not yet available	\$763,526.78 (plus indexation in accordance with IA)	\$0.00	\$763,526.78 (plus indexation in accordance with IA)	\$0.00

DA Offset Number	DA Number and Condition Number	Infrastructure Item	Establishment Cost
DA/2023/3344	DA Number: DA/2021/4669 Condition Number: 25	District & Regional Sports Parks	\$763,526.78 (plus indexation in accordance with IA)

## NOTES:

1. Represents the amount of the original value of the infrastructure item agreed in the infrastructure agreement.
2. Represents the amount (if any) of the original agreed value applied as an offset, or refunded, previously (eg an earlier stage of the development).
3. Represents the amount of the original agreed value applied as an offset, or to be refunded, under this Infrastructure Charges Notice.
4. Represents the amount of the original agreed value that remains available after the issuing of this Infrastructure Charges Notice.

## IMPORTANT INFORMATION:

### PAYMENT

This notice is due and payable by the due time shown. Cheques, money orders or postal notes should be made payable to MORETON BAY REGIONAL COUNCIL and crossed "Not Negotiable". Change cannot be given on cheque payments. Property owners will be liable for any dishonour fees.

### LEVIED CHARGE IS SUBJECT TO AUTOMATIC INCREASES (s121(1)(e) Planning Act 2016)

In accordance with section 121(1)(e) of the *Planning Act 2016*, the Levied Charge in this notice will be automatically increased from the date of this notice until the date of payment, following the methodology in Council's charges resolution. Under that methodology, an automatic increase will be the lesser of:

- (a) the difference between the levied charge and the maximum adopted charge that Council could have levied for the development when the charge is paid; or
- (b) the increase worked out using the PPI, adjusted according to the 3-yearly PPI average, for the period starting on the day the charge was levied, and ending on the day the charge is paid.

Where indexation is applicable, an [online spreadsheet calculator](#) is available to assist with making the calculation.

Council takes no responsibility for the accuracy of the calculator.

# Infrastructure Charges Notice (s125 Planning Act 2016)

Moreton Bay Regional Council  
PO Box 159, CABOOLTURE QLD 4510  
ABN 92 967 232 136



## REQUEST FOR AN UPDATED CALCULATION AND INFRASTRUCTURE CHARGES FEE STATEMENT

For confirmation of the current charges applicable for this development and to obtain an Infrastructure Charges Fee Statement, you may submit a [request](#) to Council. To avoid having to make repeat requests, it is recommended that your request is not made until you are ready to make payment of the infrastructure charges.

## GOODS AND SERVICES TAX

GST is not applicable to the Infrastructure Charges contained in this Notice.

## APPEAL RIGHTS (s121(3)(b) Planning Act 2016)

You have a right to appeal against the decision to give this notice. Attached is an extract from schedule 1 of the *Planning Act 2016* detailing your appeal rights

## REPRESENTATIONS ABOUT THIS NOTICE

During your appeal period (see s229(3)(d) *Planning Act 2016*), you may make representations about this notice under section 125 of the *Planning Act 2016*. Section 126 of the *Planning Act 2016* allows you to suspend your appeal period if you need more time to make such representations

## INFRASTRUCTURE CHARGE ENQUIRIES

Enquiries regarding this infrastructure charge notice should be directed to MORETON BAY REGIONAL COUNCIL, Development Services, during office hours, Monday to Friday on phone (07) 3205 0555.

## Schedule 1 Appeals

section 229

### 1 Appeal rights and parties to appeals

- (1) Table 1 states the matters that may be appealed to—
  - (a) the P&E court; or
  - (b) a tribunal.
- (2) However, table 1 applies to a tribunal only if the matter involves—
  - (a) the refusal, or deemed refusal of a development application, for—
    - (i) a material change of use for a classified building; or
    - (ii) operational work associated with building work, a retaining wall, or a tennis court; or
  - (b) a provision of a development approval for—
    - (i) a material change of use for a classified building; or
    - (ii) operational work associated with building work, a retaining wall, or a tennis court; or
  - (c) if a development permit was applied for—the decision to give a preliminary approval for—
    - (i) a material change of use for a classified building; or
    - (ii) operational work associated with building work, a retaining wall, or a tennis court; or
  - (d) a development condition if—
    - (i) the development approval is only for a material change of use that involves the use of a building classified under the Building Code as a class 2 building; and

- (ii) the building is, or is proposed to be, not more than 3 storeys; and
    - (iii) the proposed development is for not more than 60 sole-occupancy units; or
  - (e) a decision for, or a deemed refusal of, an extension application for a development approval that is only for a material change of use of a classified building; or
  - (f) a decision for, or a deemed refusal of, a change application for a development approval that is only for a material change of use of a classified building; or
  - (g) a matter under this Act, to the extent the matter relates to the Building Act, other than a matter under that Act that may or must be decided by the Queensland Building and Construction Commission; or
  - (h) a decision to give an enforcement notice—
    - (i) in relation to a matter under paragraphs (a) to (g); or
    - (ii) under the *Plumbing and Drainage Act 2018*; or
  - (i) an infrastructure charges notice; or
  - (j) the refusal, or deemed refusal, of a conversion application; or
  - (l) a matter prescribed by regulation.
- (3) Also, table 1 does not apply to a tribunal if the matter involves—
- (a) for a matter in subsection (2)(a) to (d)—
    - (i) a development approval for which the development application required impact assessment; and
    - (ii) a development approval in relation to which the assessment manager received a properly made submission for the development application; or
  - (b) a provision of a development approval about the identification or inclusion, under a variation approval, of a matter for the development.



# Attachment - extract of appeal rights

Planning Act 2016

Schedule 1

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- (4) Table 2 states the matters that may be appealed only to the P&E Court.
- (5) Table 3 states the matters that may be appealed only to the tribunal.
- (6) In each table—
  - (a) column 1 states the appellant in the appeal; and
  - (b) column 2 states the respondent in the appeal; and
  - (c) column 3 states the co-respondent (if any) in the appeal; and
  - (d) column 4 states the co-respondents by election (if any) in the appeal.
- (7) If the chief executive receives a notice of appeal under section 230(3)(f), the chief executive may elect to be a co-respondent in the appeal.
- (8) In this section—

*storey* see the Building Code, part A1.1.

<b>Table 1</b> <b>Appeals to the P&amp;E Court and, for certain matters, to a tribunal</b>
---

<b>1. Development applications</b>
------------------------------------

For a development application other than an excluded application, an appeal may be made against—
--

- |  |
|--|
| <ol style="list-style-type: none"><li>(a) the refusal of all or part of the development application; or</li><li>(b) the deemed refusal of the development application; or</li><li>(c) a provision of the development approval; or</li><li>(d) if a development permit was applied for—the decision to give a preliminary approval.</li></ol> |
|--|

<b>Table 1 Appeals to the P&amp;E Court and, for certain matters, to a tribunal</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The applicant	The assessment manager	If the appeal is about a concurrence agency's referral response—the concurrence agency	<ol style="list-style-type: none"> <li>1 A concurrence agency that is not a co-respondent</li> <li>2 If a chosen assessment manager is the respondent—the prescribed assessment manager</li> <li>3 Any eligible advice agency for the application</li> <li>4 Any eligible submitter for the application</li> </ol>
<p><b>2. Change applications</b></p> <p>For a change application other than an excluded application, an appeal may be made against—</p> <p>(a) the responsible entity's decision on the change application; or</p> <p>(b) a deemed refusal of the change application.</p>			

# Attachment - extract of appeal rights

Planning Act 2016

Schedule 1

<b>Table 1 Appeals to the P&amp;E Court and, for certain matters, to a tribunal</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
<p>1 The applicant</p> <p>2 If the responsible entity is the assessment manager—an affected entity that gave a pre-request notice or response notice</p>	<p>The responsible entity</p>	<p>If an affected entity starts the appeal—the applicant</p>	<p>1 A concurrence agency for the development application</p> <p>2 If a chosen assessment manager is the respondent—the prescribed assessment manager</p> <p>3 A private certifier for the development application</p> <p>4 Any eligible advice agency for the change application</p> <p>5 Any eligible submitter for the change application</p>
<p><b>3. Extension applications</b></p> <p>For an extension application other than an extension application called in by the Minister, an appeal may be made against—</p> <p>(a) the assessment manager’s decision on the extension application; or</p> <p>(b) a deemed refusal of the extension application.</p>			

<b>Table 1</b> <b>Appeals to the P&amp;E Court and, for certain matters, to a tribunal</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
1 The applicant 2 For a matter other than a deemed refusal of an extension application—a concurrence agency, other than the chief executive, for the application	The assessment manager	If a concurrence agency starts the appeal—the applicant	If a chosen assessment manager is the respondent—the prescribed assessment manager
<p><b>4. Infrastructure charges notices</b></p> <p>An appeal may be made against an infrastructure charges notice on 1 or more of the following grounds—</p> <p>(a) the notice involved an error relating to—</p> <p style="padding-left: 20px;">(i) the application of the relevant adopted charge; or</p> <p><i>Examples of errors in applying an adopted charge—</i></p> <ul style="list-style-type: none"> <li>• the incorrect application of gross floor area for a non-residential development</li> <li>• applying an incorrect ‘use category’, under a regulation, to the development</li> </ul> <p style="padding-left: 20px;">(ii) the working out of extra demand, for section 120; or</p> <p style="padding-left: 20px;">(iii) an offset or refund; or</p> <p>(b) there was no decision about an offset or refund; or</p> <p>(c) if the infrastructure charges notice states a refund will be given—the timing for giving the refund; or</p> <p>(d) for an appeal to the P&amp;E Court—the amount of the charge is so unreasonable that no reasonable relevant local government could have imposed the amount.</p>			

# Attachment - extract of appeal rights

Planning Act 2016

Schedule 1

<b>Table 1 Appeals to the P&amp;E Court and, for certain matters, to a tribunal</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The person given the infrastructure charges notice	The local government that gave the infrastructure charges notice	—	—
<p><b>5. Conversion applications</b>            An appeal may be made against—            (a) the refusal of a conversion application; or            (b) a deemed refusal of a conversion application.</p>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The applicant	The local government to which the conversion application was made	—	—
<p><b>6. Enforcement notices</b>            An appeal may be made against the decision to give an enforcement notice.</p>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The person given the enforcement notice	The enforcement authority	—	If the enforcement authority is not the local government for the premises in relation to which the offence is alleged to have happened—the local government

<b>Table 1</b> <b>Appeals to the P&amp;E Court and, for certain matters, to a tribunal</b>			
7. Enforcement notices under the <i>Plumbing and Drainage Act 2018</i> An appeal may be made against the decision to give an enforcement notice.			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The person given the enforcement notice	The local government that gave the enforcement notice	—	—

<b>Table 2</b> <b>Appeals to the P&amp;E Court only</b>			
1. Appeals from tribunal An appeal may be made against a decision of a tribunal, other than a decision under section 252, on the ground of— (a) an error or mistake in law on the part of the tribunal; or (b) jurisdictional error.			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A party to the proceedings for the decision	The other party to the proceedings for the decision	—	—
2. Eligible submitter appeals For a development application or change application other than an excluded application, an appeal may be made against the decision to approve the application, to the extent the decision relates to— (a) any part of the development application or change application that required impact assessment; or (b) a variation request.			

# Attachment - extract of appeal rights

Planning Act 2016

Schedule 1

<b>Table 2 Appeals to the P&amp;E Court only</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
<p>1 For a development application—an eligible submitter for the development application</p> <p>2 For a change application—an eligible submitter for the change application</p>	<p>1 For a development application—the assessment manager</p> <p>2 For a change application—the responsible entity</p>	<p>1 The applicant</p> <p>2 If the appeal is about a concurrence agency’s referral response—the concurrence agency</p>	<p>Another eligible submitter for the application</p>
<p><b>3. Eligible submitter and eligible advice agency appeals</b></p> <p>For a development application or change application other than an excluded application, an appeal may be made against a provision of the development approval, or a failure to include a provision in the development approval, to the extent the matter relates to—</p> <p>(a) any part of the development application or change application that required impact assessment; or</p> <p>(b) a variation request.</p>			

<b>Table 2 Appeals to the P&amp;E Court only</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
<p>1 For a development application—an eligible submitter for the development application</p> <p>2 For a change application—an eligible submitter for the change application</p> <p>3 An eligible advice agency for the development application or change application</p>	<p>1 For a development application—the assessment manager</p> <p>2 For a change application—the responsible entity</p>	<p>1 The applicant</p> <p>2 If the appeal is about a concurrence agency’s referral response—the concurrence agency</p>	<p>Another eligible submitter for the application</p>
<p><b>4. Compensation claims</b></p> <p>An appeal may be made against—</p> <p>(a) a decision under section 32 about a compensation claim; or</p> <p>(b) a decision under section 265 about a claim for compensation; or</p> <p>(c) a deemed refusal of a claim under paragraph (a) or (b).</p>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person dissatisfied with the decision	The local government to which the claim was made	—	—



# Attachment - extract of appeal rights

Planning Act 2016

Schedule 1

<b>Table 2 Appeals to the P&amp;E Court only</b>			
<b>5. Registered premises</b>			
An appeal may be made against a decision of the Minister under chapter 7, part 4.			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
<p>1 A person given a decision notice about the decision</p> <p>2 If the decision is to register premises or renew the registration of premises—an owner or occupier of premises in the affected area for the registered premises who is dissatisfied with the decision</p>	The Minister	—	If an owner or occupier starts the appeal—the owner of the registered premises
<b>6. Local laws</b>			
An appeal may be made against a decision of a local government, or conditions applied, under a local law about—			
(a) the use of premises, other than a use that is the natural and ordinary consequence of prohibited development; or			
(b) the erection of a building or other structure.			

<b>Table 2 Appeals to the P&amp;E Court only</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who— (a) applied for the decision; and (b) is dissatisfied with the decision or conditions.	The local government	—	—

<b>Table 3 Appeals to a tribunal only</b>			
<b>1. Building advisory agency appeals</b>			
An appeal may be made against giving a development approval for building work to the extent the building work required code assessment against the building assessment provisions.			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A building advisory agency for the development application related to the approval	The assessment manager	The applicant	1 A concurrence agency for the development application related to the approval  2 A private certifier for the development application related to the approval

# Attachment - extract of appeal rights

Planning Act 2016

Schedule 1

<b>Table 3 Appeals to a tribunal only</b>			
<p><b>2. Inspection of building work</b> An appeal may be made against a decision of a building certifier or referral agency about the inspection of building work that is the subject of a building development approval under the Building Act.</p>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The applicant for the development approval	The person who made the decision	—	—
<p><b>3. Certain decisions under the Building Act and the <i>Plumbing and Drainage Act 2018</i></b> An appeal may be made against—</p> <p>(a) a decision under the Building Act, other than a decision made by the Queensland Building and Construction Commission, if an information notice about the decision was given or required to be given under that Act; or</p> <p>(b) a decision under the <i>Plumbing and Drainage Act 2018</i>, other than a decision made by the Queensland Building and Construction Commission, if an information notice about the decision was given or required to be given under that Act.</p>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who received, or was entitled to receive, an information notice about the decision	The entity that made the decision	—	—
<p><b>4. Failure to decide an application or other matter under the Building Act</b> An appeal may be made against a failure to make a decision under the Building Act within the period required under that Act, other than a failure by the Queensland Building and Construction Commission to make a decision, if an information notice about the decision was required to be given under that Act.</p>			

<b>Table 3 Appeals to a tribunal only</b>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who was entitled to receive notice of the decision	The entity that failed to make the decision	—	—
<p><b>5. Failure to decide an application or other matter under the <i>Plumbing and Drainage Act 2018</i></b></p> <p>An appeal may be made against a failure to make a decision under the <i>Plumbing and Drainage Act 2018</i> within the period required under that Act, other than a failure by the Queensland Building and Construction Commission to make a decision, if an information notice about the decision was required to be given under that Act.</p>			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who was entitled to receive an information notice about the decision	The entity that failed to make the decision	—	—

## **ATTACHMENT 5**

### **Appeal Rights**

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## 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.

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- (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.