Moreton Bay Regional Council

Enquiries: Blayne Magner
Direct Phone: 07 5433 2781
Our Ref: DA/2021/1519
Your Ref:
Date: 7 January 2022

Narangba View Pty Ltd
C/- DTS Qld Pty Ltd
PO Box 3128
WEST END QLD 4101

Dear Applicant,

Re: CHANGE APPLICATION FOR A MINOR CHANGE TO A DEVELOPMENT APPROVAL
Under section 79 of the Planning Act 2016

Development Application No.:	**DA/2021/1519**
Property Location:	**265 Callaghan Road, Narangba** **305 Burpengary Road, Narangba** **52 Venus Street, Narangba** **295 Burpengary Road, Narangba**
Property Description:	**Lot 1 RP 907550** **Lot 1 RP 185250** **Lot 99 RP 907550** **Lot 9996 SP 295608**
Development Type:	**Request to Change (Minor) - Reconfiguring a Lot - Development Permit for Subdivision (2 lots into 51 lots plus Balance Lot) in 2 stages**

I refer to the Change Application in respect to the abovementioned development approval and advise that on 23 December 2021 Council's Delegate as the Assessment Manager decided to approve these changes in accordance with the *Planning Act 2016*.

A Changed Development Approval for the following has now been issued;

- Development Permit for Reconfiguration of a Lot (2 into 74 lots plus open space)

This Changed Decision Notice replaces the Notice previously issued and dated 16 January 2020.

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

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

Should you have any further queries in relation to this decision, please contact Blayne Magner as referenced above.

Yours faithfully

Blayne Magner
Principal Planner
Development Services

Enclosures: Attachment 1 - Decision Notice
Attachment 2 - Assessment Manager Conditions
Attachment 3 - Approved Plans/ Documents
Attachment 4 - Amended Infrastructure Charges Notice (if applicable)
Attachment 5 - Appeal Rights
Attachment 6 - Referral Agency Response

Cc: Department of State Development, Infrastructure, Local Government and Planning
SARA – North Regional Office SEQNorthSARA@dsdmip.qld.gov.au

ATTACHMENT 1

Decision Notice

Decision Notice

Planning Act 2016, section 83

NATURE OF CHANGES

The nature of the agreed changes include;

- The list of Conditions is amended;
- The Table of Approved Plans and Documents is amended; and
- The Table of Plans and Documents to be Amended is included

All other aspects of the previous Notice remain unchanged.

APPLICATION DETAILS

Date of Change Application:	**19 April 2021**
Application No:	**DA/2021/1519**
Applicant:	**Narangba View Pty Ltd**
Street Address:	**265 Callaghan Road, Narangba** **305 Burpengary Road, Narangba** **52 Venus Street, Narangba** **295 Burpengary Road, Narangba**
Real Property Description:	**Lot 1 RP 907550** **Lot 1 RP 185250** **Lot 99 RP 907550** **Lot 9996 SP 295608**
Planning Scheme:	**Moreton Bay Regional Council Planning Scheme**

APPROVAL DETAILS

Date of previous Notice: **16 January 2021**

Date of Decision of Changed Development Approval: 23 December 2021

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

APPLICATION TYPE	Development Permit	Preliminary Approval
Reconfiguring a Lot for Subdivision (2 in 74 Lots plus open space)	☑	☐

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

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

- Reconfiguring a Lot – 4 years from the date this approval starts to have effect.

DEEMED APPROVAL

Not applicable.

VARIATION APPROVAL

Not applicable.

INFRASTRUCTURE

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

ASSESSMENT MANAGER CONDITIONS

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

APPROVED PLANS / DOCUMENTS

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

Approved Plans and Documents			
Plan / Document Name	**Reference Number**	**Prepared By**	**Dated**
Subdivision Proposal Plan	A2 1096 Rev J	DTS urban planning, surveying & development	15/11/21
Proposed Plan of Development	A3 6214 Rev E	DTS urban planning, surveying & development	15/11/21
Proposed Footpath Plan	A3 6307 Rev B	DTS urban planning, surveying & development	18/11/21
Stormwater Technical Note	14883	RMA Engineers	17/05/2021

Plans and Documents to be Amended			
Plan / Document Name	**Reference Number**	**Prepared By**	**Dated**
Noise Impact Assessment	ATP180412-R-NIA-01_RoL	ATP Consulting Engineers	May 2018
Stormwater Management Plan	17-0112FSMP01-V2	Peak Urban	Sept 2021

ASSESSMENT BENCHMARKS

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

Categorising Instrument (*Planning Regulation 2017*)

State Planning Policy
- *State Planning Policy 2017*, Part E

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

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

- 9.4.1.3.2 -Reconfiguring a lot code, Emerging community zone code, Transition precinct

Local Categorising Instrument (Variation Approval)

Not applicable.

Local Categorising Instrument (Temporary Local Planning Instrument)

Not applicable.

OTHER RELEVANT ASSESSMENT MATTERS

Not Applicable.

REASONS FOR THE DECISION

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.>

REASONS FOR APPROVAL DESPITE NON-COMPLIANCE WITH ASSESSMENT BENCHMARKS

Not Applicable.

REFERRAL AGENCY CONDITIONS

The following Referral Agencies are relevant to the application:

Referral Trigger	Name and Address of Agency	Status
Schedule 10, Part 9, Division 4, Subdivision 2, Table 1 (Areas within 25m of a State Transport Corridor)	Name: Department of State Development, Infrastructure, Local Government and Planning SARA – North Regional Office SEQNorthSARA@dsdmip.qld.gov.au	Concurrence Agency

Refer to the Referral Agency Response(s) in Attachment 6 of the Decision package for details of any conditions imposed by a Referral Agency.

SUBMISSIONS

Not applicable.

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 *(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
RECONFIGURING A LOT - ALL STAGES		
DEVELOPMENT PLANNING		
1	**Approved Plans and/or Documents**	
	Undertake development generally 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) for each stage and to be maintained at all times.
2	**Amended Document Required**	
A	Submit an amended Noise Impact Assessment incorporating the following: • Refer to the approved Plan of Subdivision; and • A revised 10 year horizon for traffic volumes for Callaghan Road with consideration given to the applied annual traffic growth rate.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 1.
B	Obtain approval from Council for the amended Noise Impact Assessment in accordance with (A) above.	
C	Implement the requirements and recommendations of the Noise Impact Assessment. The approved amended Noise Impact Assessment will form part of the approval.	At all times.
D	Notify the Council in writing that potential purchasers will be advised of the following: 1. The requirement to comply with the recommendations of the approved Acoustic Attenuation Report through future design siting, design and construction. 2. A property note will be included on Council's electronic property system advising of the requirement to comply with this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage.
E	Provide potential purchasers with written notice of the following: 1. The requirement to comply with the recommendations of the approved Acoustic Attenuation Report through future design siting, design and construction. 2. A property note will be included on Council's electronic property system advising of the requirement to comply with this condition.	Prior to entering into a contract of sale for the relevant lot.
3	**Amended Plan - Stormwater Management**	
	Submit and have approved by Council, an amended Stormwater Management Plan (SMP) prepared and certified by a suitably qualified Registered Professional Engineer Queensland (RPEQ). The SMP is to demonstrate that stormwater can be managed on/from the subject land in accordance with the MBRC Planning Scheme. The following specific amendments are to be included:	Prior to lodging an application for operational works.

	• Revise and update the SMP to reflect the latest staging; • Detail what infrastructure is to be delivered in which stage; • Detail temporary measures required (if any) as a result of the revised construction strategy.	
4	**Infrastructure Agreement**	
	Comply with the "265 Callaghan Road and 305 Burpengary Road, Narangba Infrastructure Agreement 2021" executed on 21 December 2021 between Moreton Bay Regional Council and Orchard (Narangba) Developments Pty Ltd, or as amended.	At all times.
5	**Develop in Stages**	
	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) for each stage.
6	**Entry Statement**	
	Establishment of any "Entry Statement" as a marketing strategy for the development must accord with the following, unless otherwise approved by Council: (i) Located within a privately-owned allotment or on the boundary of a privately owned allotment; (ii) Limited to one (1) entry statement per development; (iii) Constructed of durable, weather resistant materials; (iv) Positively contributes to the character of the surrounding area; and (v) Does not contain the logo of any developer or any other entity.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for stage 1.
7	**Landscaping for Reconfiguring a Lot**	
A	Carry out landscaping and associated earthworks, site preparation and other necessary works in accordance with the approved landscaping plans, details and technical specifications of any proposed planting or landscape work (both soft and hard works) prepared in accordance with (c) below 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 stage.
B	Unless an alternative design is approved in writing by Council or required under the recommendation of the approved Noise Impact Assessment, provide a capped and stained timber screen fence that is 1.8 metres in height along the full development frontage of Callaghan Road and Burpengary Road (excluding the park) and the southern	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage.

	boundary of lots 241-243, with associated landscaping to soften the visual appearance of the fence. An alternative fence design may be approved by Council as part of the submission for Operational Works - Landscaping approval.	
C	Before commencing the operational work for the development obtain approval for the landscaping plans, details and technical specifications of any proposed planting or landscape work (both soft and hard works) from Council.	Prior to operational work for the development commencing on site.
8	**Driveway Crossover**	
	Construct paired driveway crossovers servicing all Type A lots in accordance with the approved plans and documents of development, MBRC Standard Drawing RS-49 and Planning Scheme Policy - Residential Design.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan), for each stage.
9	**Street Trees**	
	Provide street trees within the development in accordance with Planning scheme policy - Integrated design Appendix D - Landscaping. Specifically, the: 1. pot size is set out in section 4.2; and 2. number and species to be provided is set out in section 5.2.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage.
10	**Water and/or Sewerage**	
	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: (i) a reticulated water supply network connection is available to the land; and (ii) a sewerage network connection is available to the land; and (iii) all the requirements of Unitywater have been satisfied.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage.
11	**New Telecommunications Infrastructure**	
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: 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.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage.

B	Provide certification from a Registered Professional Engineer Queensland (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.	
12	**Electricity**	
A	Provide evidence (e.g. Certificate for Electricity Supply to Subdividers with Agreement Number or Certificate of Supply) demonstrating that an underground 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 stage.
B	Provide an underground electricity supply connection to each proposed lot.	
C	Ensure any PAD Mount transformer located immediately adjacent to proposed public use land / open space is painted with a mural on all sides that integrates the infrastructure into the location of being adjacent to the open space. Concepts for the mural are to align with the use of the adjoining land as open space or alternatively the environmental values of the area e.g. koalas or a previous use of the land. An example is shown in the image below; 	
D	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.	
13	**Certify Lots are in Accordance with Approved Plan**	
	Provide certification from a Licensed Surveyor that the lots to be created on the plan of subdivision are in accordance with the approved plan.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage.
14	**Street Names**	
A	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;	Prior to submitting to the Council any request for approval of a plan of

B	Obtain approval from Council for the names of new streets in accordance with (A) above;	subdivision (i.e. survey plan) for each stage.
C	Erect approved street name boards on all new roads in accordance (A) and (B); and	
D	Mark all street names on the survey plans.	
15	**Payment of Rates**	
	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 stage.
16	**Dedicated Road Access**	
	Provide dedicated constructed road access to the development. This condition has been imposed under section 145 of the Planning Act 2016.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for each stage and to be maintained at all times.
17	**Remove /Demolition of Existing Buildings**	
	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) for each stage.
18	**Plan of Development**	
	Development must comply with the approved Plan of Development unless otherwise approved in writing by Council.	To be maintained at all times.
19	**Advice to Purchasers Regarding Plan of Development**	
A	Notify the Council 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 stage.
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.
20	**Fauna Management Plan**	
	(a) Submit a Fauna Management Plan to reduce potential impacts on native fauna in accordance with the Environmental areas and corridors - Planning scheme policy. The plan must be prepared by a suitably qualified person and contain at least the following information:	(a) Prior to works commencing on site.

	(i) Procedures for dealing with fauna observed immediately prior to vegetation clearing; (ii) Procedures for dealing with fauna during vegetation clearing; (iii) Procedures for the treatment / removal of injured fauna from the site. (b) Obtain approval from Council for the Fauna Management Plan in accordance with (a) above. (c) Carry out works in accordance with the approved Fauna Management Plan.	(b) During site works and to be maintained. (c) Prior to and during site works.
21	**Vegetation Management Plan**	
	(a) 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: i. Identification of trees to be removed during site works; ii. Retention of habitat trees and healthy trees in the open space area (Lot 901) of the development iii. Control measures, maintenance procedures; and monitoring programs; and iv. Weed control during construction; and v. Weed control in landscape areas; and vi. The rehabilitation of Lot 99 RP907550 in accordance with the requirements of the infrastructure agreement. (b) Obtain approval from Council for the Vegetation Management Plan in accordance with (a) above. (c) Carry out works in accordance with the approved Vegetation Management Plan.	(a) Prior to works commencing on site. (b) Prior to works commencing on site. (c) Prior to lodging a request for Compliance Assessment of subdivision plans
22	**No Net Loss of Fauna Habitat**	
A	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: 1. One (1) nest box for every hollow removed; or	Prior to any vegetation clearing.

	2. Where hollows have not yet formed in trees greater than 80cm in diameter at 1.3m in height, three (3) nest boxes are required for every habitat tree removed.	
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: - Exact number of habitat trees and number of hollows to be impacted, - Assessment of replacement hollows required as per 'No Net Loss of Fauna Habitat' condition requirements, - Assessment of target species, - Requirements for the target species, - Nest box types - design and sizes, - Installation technique, - Proposed location of installed nest box including GPS location and owner's consent, - Installation timeframes which provide for installation prior to the commencement of clearing wherever possible, otherwise within seven (7) days of clearing; and - Monitoring and maintenance regime details, including protocols for replacing fallen or broken nest boxes. Nest boxes must be maintained for a minimum of 12 months post installation.	Prior to any vegetation clearing.
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. *Note: The agreement may require the payment of a maintenance bond refundable after the satisfactory completion of the 12 months* maintenance *period*	Prior to any vegetation clearing.
D	Provide a copy of written permission to enter Council Land from Council's Operations Technical Services team.	Prior to any vegetation clearing.

23	**Disposal of Cleared Vegetation**	
	Chip, shred or tub grind cleared native vegetation and spread as mulch outside of any areas identified to be maintained as low fuel loads in the approved Bushfire Management Plan or dispose of at an authorised waste facility.	At all times during work being carried out on site
24	**Stockpiles of Construction and Landscaping Materials**	
	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.	At all times during work being carried out on site.
DEVELOPMENT ENGINEERING		
25	**Replace Existing Council Infrastructure**	
	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 stage.
26	**Alterations and Relocation of Existing Services**	
	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 stage.
27	**Stormwater**	
	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.
28	**Stormwater Management**	
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.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).

	This condition has been imposed under section 145 of the *Planning Act 2016*.	
C	Submit certification from a suitably qualified Registered Professional Engineer Queensland (RPEQ) that the works have been built in accordance with the approved Stormwater Management Plan.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
D	Provide registered easements for private drainage & Access Driveway infrastructures in accordance with the approved plans and documents of development. The easement documents must acknowledge the maintenance, repair and replacement responsibilities of the owner of this development site.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan).
29	**Stormwater Drainage - Lawful Discharge**	
	Ensure that stormwater from the development of the site is to be lawfully discharged from the site without causing nuisance and annoyance to any person.	To be maintained at all times.
30	**Pathways**	
	Construct all footpaths as shown on the approved Pedestrian Pathway Plan in accordance with Council standards and at the widths shown on the approved plan. This condition has been imposed under section 145 of the *Planning Act 2016.*	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each stage.
31	**Erosion and Sediment Control**	
	Implement an Erosion and Sediment Control Plan prepared by an experienced Certified Professional in Erosion and Sediment Control (CPESC) in accordance with the International Erosion Control Association Australasia (IECA) Best Practice and Sediment Control document.	Prior to commencement of works and to be maintained current at all times during construction.
32	**Earth Retaining Structures**	
A	Design all earth retaining structures within private land in accordance with Australian Standards, Building Code requirements and the MBRC Planning scheme current at the time of the operational works application referred to in (B) below 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	Prior to commencement of works associated with this condition.

	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. 4. Any retaining wall located along the Callaghan Road frontage a limited to a maximum height of 1.5m.	
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 the approved plans and documents of the development. (see note below)	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each stage.
D	Provide written certification from a suitably qualified Registered Professional Engineer Queensland (RPEQ) that the design, construction and materials comply with this condition.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for each stage.
33	**Construction Management Plan**	
A	Submit and have approved by Council, a Construction Management Plan (CMP) prepared by the Principal Contractor. The CMP is to outline, in sufficient detail, the processes that will be employed to minimise impacts on the surrounding community during construction. These processes are to cover the following: 1. Material delivery and storage locations 2. Waste locations and collection details 3. Construction office accommodation 4. Contractor / tradesman vehicle parking arrangements 5. Works that may make audible noise outside of 6:30am to 6:30pm any business day or Saturday. The CMP may include a site layout drawing identifying these areas.	Not less than two (2) weeks prior to commencement of works. To be maintained construction of the development at all times.

	The CMP needs to reflect any staging requirements. Notes: 1. Council will generally only approve early starts for large concrete pours during summer (e.g. monolithic concrete pours for basements and suspended floor slabs) 2. Dewatering directly into Council's stormwater system (pipes or overland flow) without appropriate water quality treatment/improvement is not acceptable 3. Traffic control measures may need to be put in place for the duration of the construction works to control contractor / tradesman vehicle parking arrangements, this should be documented within the CMP 4. Materials unloading and loading must occur on-site unless prior written approval is given by Council. 5. All construction office accommodation and associated temporary buildings is to be contained within the site or on a nearby site.	
B	Implement the approved CMP and keep a copy of the approved CMP on site at all times during construction.	At all times during construction of the development.
34	**Concurrence Agency**	
A	Comply with the conditions of the Department of State Development, Infrastructure, Local Government and Planning response dated 19 August 2021 (reference: 2107-23774 SPD) or as amended.	At all times.
B	Provide certification to Council prepared by a suitably qualified person or the agency demonstrating the requirements of the Department of State Development , Infrastructure, Local Government and Planning have been met.	At all times.
RECONFIGURING A LOT - STAGE 1		
CONDITION		**TIMING**
DEVELOPMENT PLANNING		
35	**Fencing of Boundaries**	
	Provide uniform semi-transparent fencing to the following property boundaries to enable passive surveillance of public areas: • The eastern property boundary of Lot 157.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 1 and to be maintained at all times.

	Fencing is to have a maximum height of 1.8 metres and a minimum 50% transparency for any part of the fence above 1.2m in height. An example is shown in the image below. 	
36	**New Council Roads**	
A	Submit and have approved by Council, a development application for operational works for the following: 1. Roads 1, 2, 3 & 4 including associated works as modified Living Residential roads including the following. (a) Minimum 16.5m wide road reserve. (b) Minimum 8.0m wide vehicle zone. (c) Minimum 1.5m pathway widths. (d) A minimum verge width of 4.0m. (e) The path and reticulated sewerage within a minimum 4.5m wide verge. (f) The reticulated water service within the eastern verge of Road 3 is to be located on an alignment in accordance with Council's standard drawing RS-100. 2. New Road (Driveway) including the following: (a) Minimum 10.0m wide reserve (b) Minimum 5.0m wide vehicle zone 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 internal roads and associated works. This condition has been imposed under section 145 of the *Planning Act 2016*.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 1.

37	**Existing Dams**	
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. This condition has been imposed under section 145 of the *Planning Act 2016*.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 1.
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) for stage 1.
38	**Existing Driveway Crossover**	
	Remove completely all redundant driveway crossovers fronting the development site on Callaghan Road.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 1.
39	**Site Access Prohibited**	
	Vehicular access directly from Callaghan Road to Lots 148 to 157 and 101 is prohibited for traffic management and safety reasons. Note: A property condition will be attached to the affected lots to advise land owners of this restriction.	To be maintained at all times.
40	**Access and Service Easement**	
	Provide a drainage easement over Lot 104 in favor of Council 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) for stage 1.
RECONFIGURING A LOT - STAGE 2		
CONDITION		**TIMING**
DEVELOPMENT PLANNING		
41	**Related Approvals**	
	Demonstrate all conditions and requirements of Development Permit for DA/36366/2018/V3RM have been fulfilled and the lots created.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. survey plan) for stage 2.
42	**Fencing of Park Boundaries**	

	Unless an alternative design is required under the recommendations of the approved noise impact assessment, provide semi-transparent fencing in the following locations: • The northern property boundary of Lot 245. Fencing is to have a maximum height of 1.8 metres and a minimum 50% transparency for any part of the fence above 1.2m in height. An example is shown in the image below. 	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 2 and to be maintained at all times.
43	**New Council Roads**	
A	Submit and have approved by Council, a development application for operational works for the following: 1. The New Road including associated works as a modified Living Residential roads including the following. (a) Minimum 15m wide road reserve; (b) Minimum 8.0m wide vehicle zone; (c) Minimum 1.5m wide pathway widths; and (d) A minimum verge width of 5.0m on eastern side. 2. Frontage works along Callaghan Road shall be in accordance with the associated Infrastructure Agreement. 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 internal roads and associated works. This condition has been imposed under section 145 of the *Planning Act 2016*.	Prior to submitting to the Council any request for approval of a plan of subdivision (i.e. a survey plan) for stage 2.
44	**Site Access Prohibited**	

	(a) Vehicular access directly from Burpengary Road to lots 243 to 245 is prohibited for traffic management and safety reasons. (b) Vehicular access directly from Kallatina Street to lots 241 -243 is prohibited for traffic management and safety reasons Note: A property condition will be attached to the affected lots to advise land owners of this restriction.	To be maintained at all times.

ADVICES	
1	**Aboriginal Cultural Heritage Act 2003**
	The *Aboriginal Cultural Heritage Act 2003* commenced in Queensland on April 16, 2004. Under the Act, indigenous parties are key in assessing cultural heritage significance. The *Aboriginal Cultural Heritage Act 2003* establishes a Duty of Care for indigenous cultural heritage. This applies on all land and water, including freehold land. The Cultural Heritage Duty of Care lies with the person or entity conducting the activity. Penalty provisions apply for failing to fulfil the Cultural Heritage Duty of Care. Those proposing an activity that involves additional surface disturbance beyond that which has already occurred on the proposed site need to be mindful of the Duty of Care requirement. Details of how to fulfill the Duty of Care are outlined in the Duty of Care Guidelines gazetted with the Act. Council strongly advises that you contact the relevant state agency to obtain a copy of the Duty of Care Guidelines and further information on the responsibilities of developer under the terms of the *Aboriginal Cultural Heritage Act 2003.*
PROPERTY NOTES	
1	**DS01 Siting Requirements**
	The following property note will be attached to Council's database for all Lots: *"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.* *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 www.moretonbay.qld.gov.au."*
2	**DS07 Additional Development Requirements**
	The following property note will be attached to Council's database for All Lots: *"Additional development requirements apply to this lot. Any development on this lot must be in accordance with the approved plan and associated conditions.* *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 www.moretonbay.qld.gov.au."

3	**Acoustic Advice**
	The following property note will be attached to Council's database for All Lots: *"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.* *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 www.moretonbay.qld.gov.au."*
4	**DS05 Site Access Prohibited**
	The following property note will be attached to Council's database for Lots 101 and 148-157: *"Vehicular access to these lots directly from Callaghan Road is prohibited for traffic management and safety reasons.* *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 www.moretonbay.qld.gov.au."*
5	**DS05 Site Access Prohibited**
	The following property note will be attached to Council's database for Lots 243-245: *"Vehicular access to these lots directly from Burpengary Road is prohibited for traffic management and safety reasons.* *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 www.moretonbay.qld.gov.au."*
6	**DS05 Site Access Prohibited**
	The following property note will be attached to Council's database for Lots 241-243: *"Vehicular access to these lots directly from Kallantina Street is prohibited for traffic management and safety reasons.* *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 www.moretonbay.qld.gov.au."*

ATTACHMENT 3

Approved Plans / Documents

Statistics

Total Area of Subdivision	1.000 Ha
Length of New Internal Road	533 m
Length of External Road Widening	233 m
Contour Interval	0.25 m

Residential Lot Yield Statistics

Lot Type	Frontage (m)	Depth (m)	Lots	
Lot Type A	7.5	25-35	10	14%
Lot Type B	>7.5-10	25-35	17	23%
Lot Type C	>10-12.5	25-35	29	39%
Lot Type D	>12.5-18	25-35	17	23%
Lot Type E	>18-32	25-35	1	1%
Lot Type F	32+	25-35	0	0%
Total Residential Allotments			74	100%

dts urban planning, surveying & development

Brisbane Mackay

Moreton Bay Regional Council

Issue	Revision	Int	Date
D	Lot 68, staging boundaries	AV	24/03/21
E	Staging	AV	30/03/21
F	Staging	AV	01/04/21
G	Trunk road areas/dimensions, adjoining park hatch	AV	20/07/21
H	Staging, lot numbers	AV	20/10/21
I	Lots246-249	AV	25/10/21

Property Description
Lot 1 on RP907550
Lot 1 on RP185250

Subdivision Proposal Plan

265 Callaghan Road & 305 Burpengary Road, Narangba

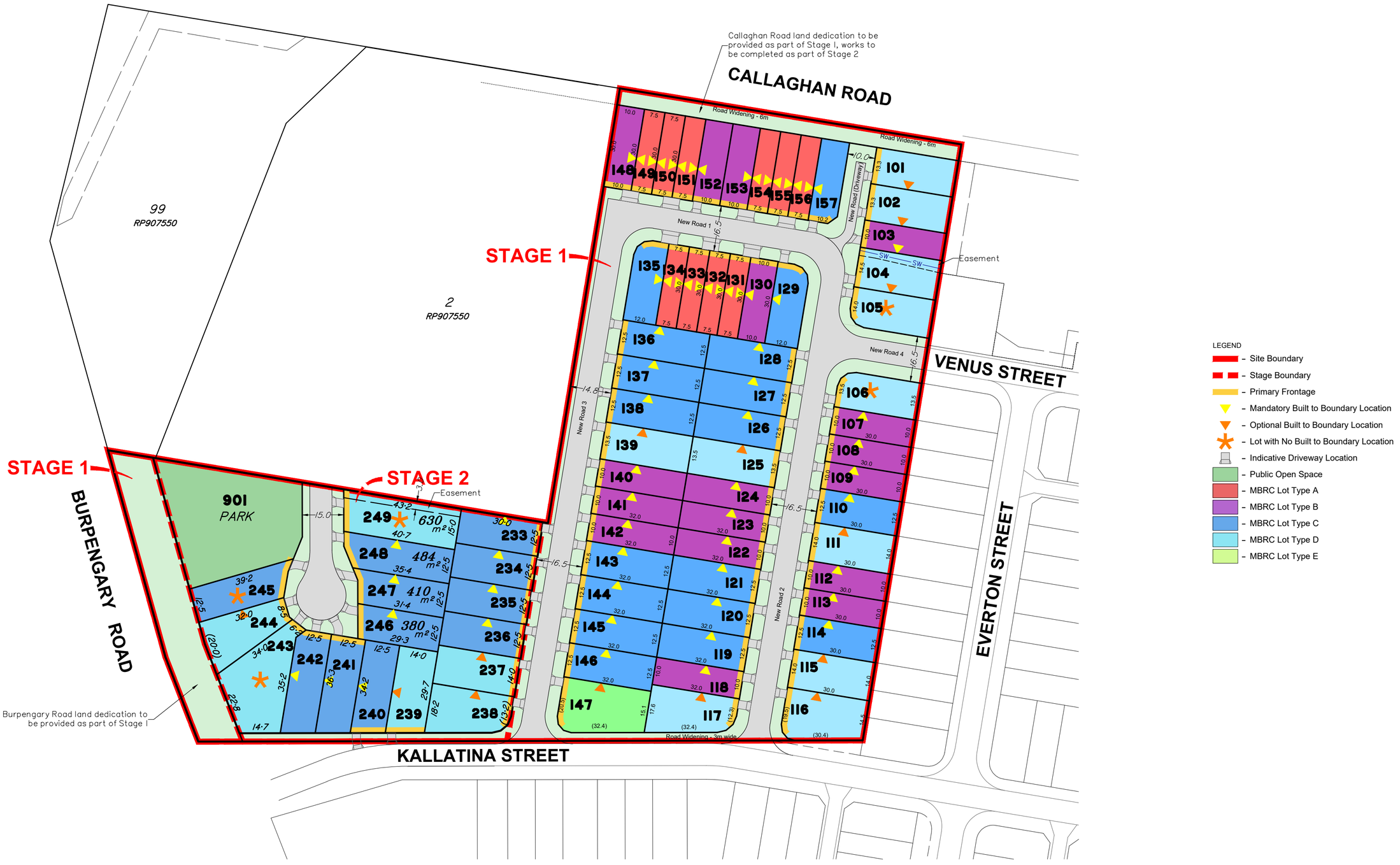
Local Authority: Moreton Bay Regional Council
Client: Orchard Property Group

Approved Subject to Conditions of Decision Notice DA/2021/1519

SCALE 1:1000 @ A2

This plan has been prepared by DTS as a proposal plan and should not be used for any other purpose. The information contained on this plan is approximate only, has not been verified and may be subject to change. The intellectual property on this plan remains the property of DTS. The contours shown on this plan have been derived from survey by others.

Project: BNE190340
File: B190340P1.dwg
Date: 15/11/2021
23/12/2021
Drawing: A2 1096
Revision: J
Sheet: 1 of 1



Issue	Revision	Int	Date
A	Original issue	AV	31/03/21
B	Staging	AV	01/04/21
C	Staging & Lot numbers	AV	20/10/21
D	Lots 246-249	AV	25/10/21
E	Easement lot 249	AV	15/11/21

Property Description
Lot 1 on RP907550
Lot 1 on RP185250

Proposed Plan of Development

265 Callaghan Road & 305 Burpengary Road, Narangba

Local Authority: Moreton Bay Regional Council
Client: Orchard Property Group

SCALE 1:1000
10 0 10 20 30 40 50

Project BNE190340
File B190340Sk5.dwg
Date 15/11/2021
Drawing A3 6214
Revision E
Sheet 1 of 1

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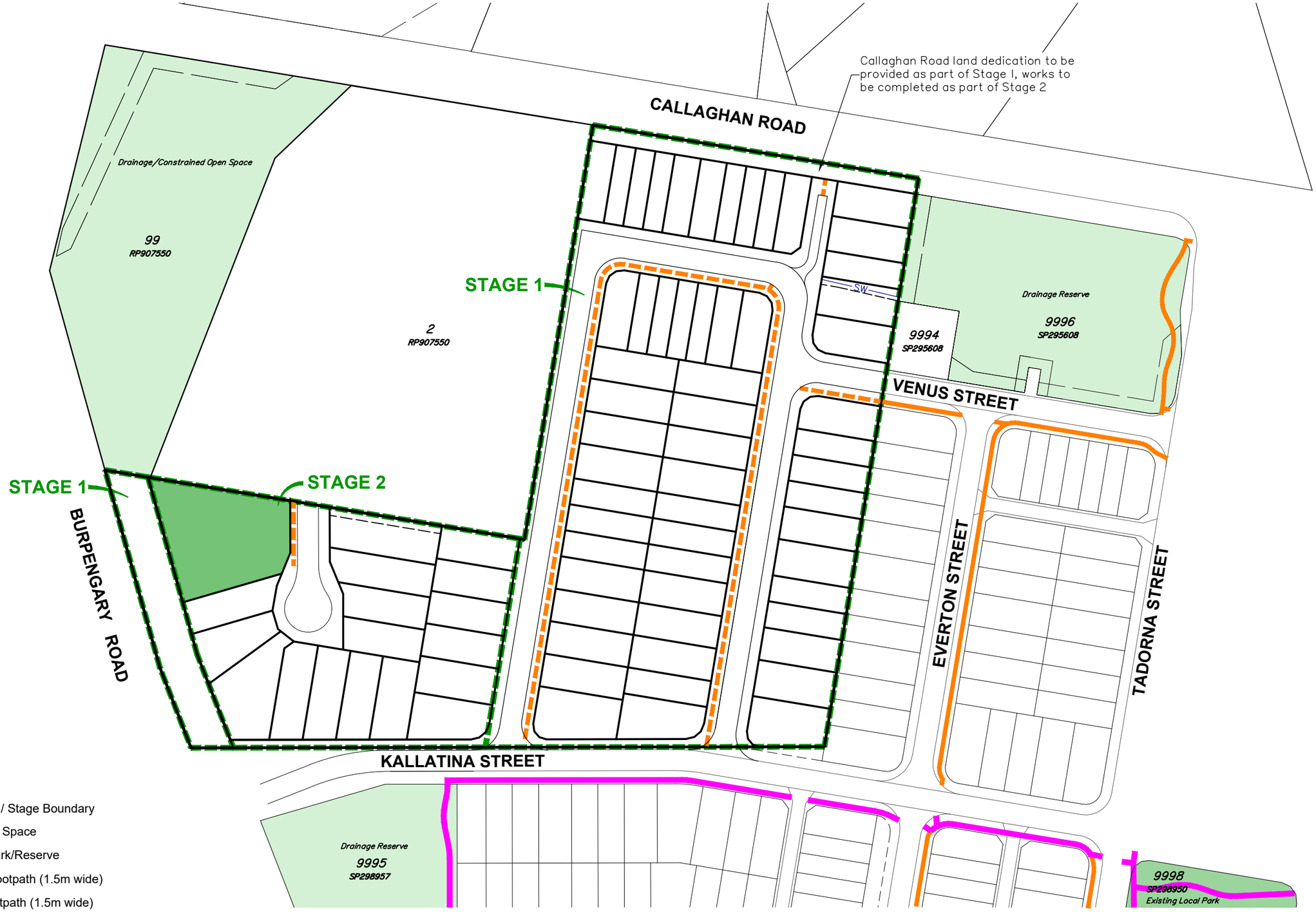

LEGEND

- Subject Site / Stage Boundary
- Public Open Space
- Adjoining Park/Reserve
- Proposed Footpath (1.5m wide)
- Existing Footpath (1.5m wide)
- Existing Footpath (2m wide)

dts urban planning, surveying & development

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Moreton Bay Regional Council

Issue	Revision	Int	Date
A	Original issue	AV	26/07/21
B	Match proposal Rev J	AV	18/11/21

Proposed Footpath Plan

265 Callaghan Road & 305 Burpengary Road, Narangba

Description	Lot 1 on RP907220 & Lot 1 on RP185250
Local Authority	Moreton Bay Regional Council
Client	Narangba Vista Pty Ltd

SCALE 1:1500

20 0 20 40 60 80 100

Project	BNE190340	Drawing	A3 6307
File	B190340Sk6.dwg	Revision	B
Date	18/11/2021	Sheet	1 of 1

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9 Bowen St
Toowoomba Qld 4350
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17/05/21

Narangba View Pty Ltd

PO Box 340

Underwood QLD 4119

Attention: Mr Stuart Somerville

Dear Mr Somerville,

STORMWATER TECHNICAL NOTE

Project Name: Subdivision– 265 Callaghan Road | Narangba
Site: Lot 1 RP907550 and Lot 1 RP185250
Project No: 14883

1.0 Introduction

A residential subdivision is proposed at 265 Callaghan Road, Narangba.

RMA Engineers have been engaged to assess an alternative stormwater quality and quality solution in lieu of providing on-site stormwater management devices.

A locality plan of the development site is shown in **Figure 1**, based on Subdivision Proposal Plan by DTS dated 1 April 2021.

Figure 1: Locality Plan

The investigations have been completed generally in accordance with Council's current planning scheme, and have been based on LiDAR contour data, survey data and the proposed development layout current at the time of investigation.

Concept modelling was completed to determine a portion of the development site can distribute minor stormwater flows by gravity to the existing Amity detention/bio-retention basin to the east of the development site.

Stormwater quality assessment was then completed using MUSIC software to determine the existing Council bio-retention basin within the Amity development was able to be increased in filter media area to achieve a consolidated pollutant reduction target for the development site and Amity's associated catchment.

Stormwater quantity assessment was completed using DRAINS software to determine the proposed development may discharge stormwater directly to Council's downstream drainage network without augmentation other than that passively achieved from the minor flows within Council's existing drainage basin in Amity.

2.0 Catchment Philosophy

A coordinated layout and stormwater management scheme is proposed between the subject site and Orchard Development to the west. A preliminary catchment scheme has been determined to allow Stage 2, Stage 4 and the western half of Stage 3 of the subject site will contribute stormwater flows to the Orchard Development's stormwater management system.

Stage 1 and the western half of Stage 3 will contribute minor flows to the existing basin within the Amity development, with major flows less the minor flows to discharge directly to Callaghan Road's drainage network without augmentation.

Concept drawings C-SK0001, C-SK0002 and C-CK0003 included in **Appendix A** demonstrate the alternative stormwater quality solution for the proposed subdivision at 265 Callaghan Road, Narangba.

The stormwater longitudinal section on drawing C-SK0002 demonstrates that minor stormwater flows from the eastern portion of the development can be conveyed to the existing Amity basin by gravity flow, discharging through an additional inlet into the existing sediment basin.

With reference to **Figure 2**, the western portion of the development (catchments E1, E2 and E3) will contribute to, and be managed for quantity quality by the basin in the adjoining subdivision at 275 Callaghan Road, Narangba.

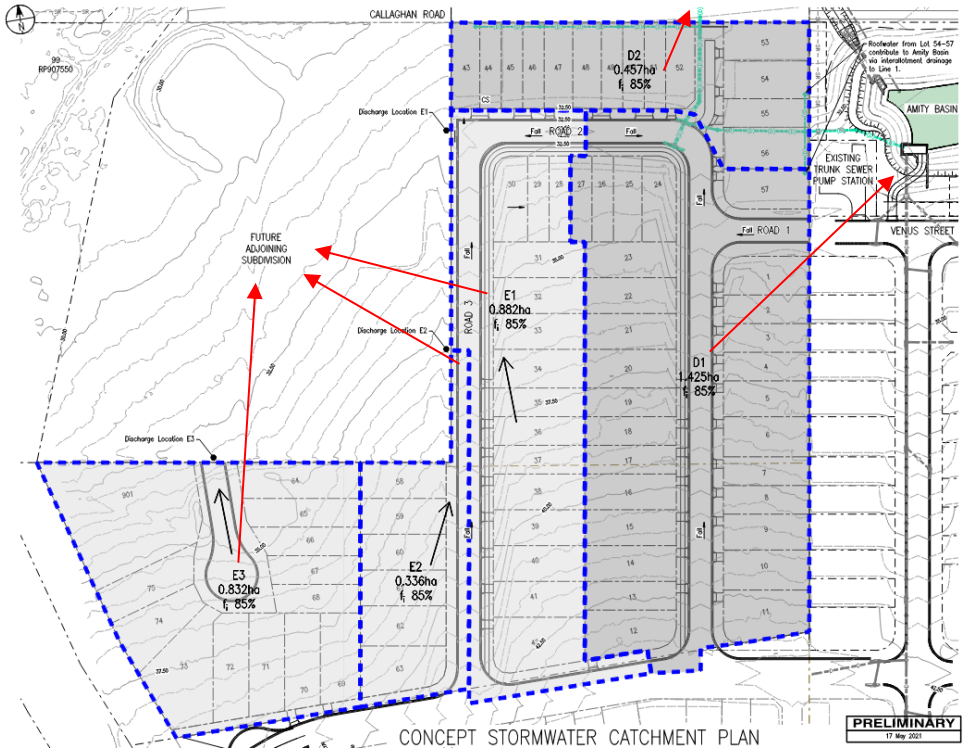


Figure 1: Development Site Catchment Plan

Stormwater pipes downstream of structure G5/1 are sized to convey up to and including the 1-year ARI (1 EY) storm event through an appropriately designed orifice plate. Larger storm events will bypass the basin and be conveyed to Callaghan Road.

Management of stormwater to Callaghan Road is subject to future detailed design.

3.0 Stormwater Quality

The following table summarises the minimum water quality objectives identified for the site in accordance with the State Planning Policy (SPP).

Table 1: Water quality objectives

Indicator	Reduction in average annual pollutant load discharging from the site
Total Suspended Solids (TSS)	80%
Total Phosphorous (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (GP)	90%

The existing bio-retention basin treatment train has been analysed using MUSIC software (Version 6) and catchment and basin parameters procured from PDOnline information.

The *MUSIC Modelling Guidelines (Version 1.0-2010) – Water by Design* (the Water by Design Guideline) has been used to obtain the various source and treatment node parameters for the proposed treatment train.

The eastern portion of the proposed development site (catchment D1 and D2) has been added to the treatment train for the existing Council bioretention basin. The schematic is shown in **Figure 3** below.

The existing bio-retention filter media area in the existing Council bio-basin is 730m^2. MUSIC modelling showed that with the addition of the stormwater flows from the development site, the required water quality objectives cannot be achieved with the existing filter media area.

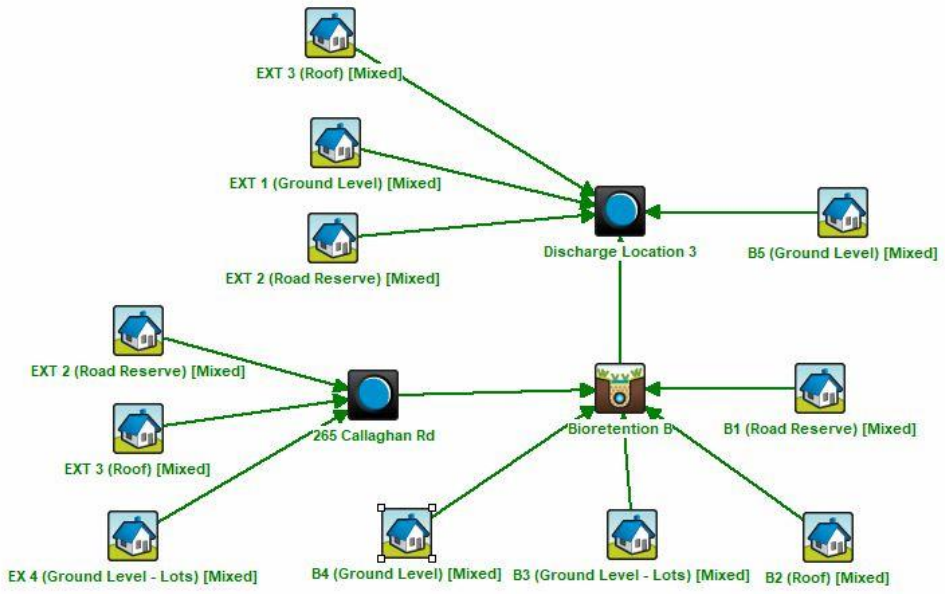


Figure 3: Treatment train

The bio-retention characteristics were altered until the required water quality objectives were achieved. The following table summarises the bioretention basin characteristics (existing and proposed).

Table 2: Existing bio-retention basin in Amity Development characteristics

Parameter	Existing Basin	
	Existing (pre-development of 265 Callaghan Rd)	**Proposed** (including 265 Callaghan Road development)
Extended Detention Depth	0.30m	0.30m
Filter Area	730m^2	780m^2
Filter Depth	0.40m	0.40m
Saturated Hydraulic Conductivity	200mm/hr	
Maximum TN content of filter media	400mg/kg	
Maximum orthophosphate content of filter media	30mg/kg (As recommended by Healthy Waterways) http://healthywaterways.org/initiatives/waterbydesign/stormwater	
Submerged Zone	0.30m	0.30m
Underdrain System	An underdrain system of slotted drainage pipes (100mm dia and 150mm dia for lengths >25m) at 2.5m centres in accordance with WSUD Technical Design Guidelines for South East Queensland 2006	

The following table summarises the effectiveness of the treatment train with the filter area increased from 730m^2 to 780m^2.

Table 3: Treatment train effectiveness

	Sources	**Residual Load**	**% Reduction Achieved**	**Required % Reductions**
Total Suspended Solids (kg/yr)	19700	3800	80.7	80
Total Phosphorous (kg/yr)	38.6	15	61.2	60
Total Nitrogen (kg/yr)	211	110	48	45
Gross Pollutants (kg/yr)	2290	75.2	96.7	90

Results illustrate that the required water quality objectives can be achieved with a filter media area of 780m^2.

Drawing C-SK0001 in **Appendix A** demonstrates how this additional filter media area can be achieved in Council's existing basin within the Amity Development.

Additional Minor Flows to Existing Basin

Post developed 3-month stormwater runoff shall be directed from the subject site to the existing stormwater basin in Lot 9996 on SP295608 in accordance with the stormwater quality management strategy described in Section 2.0 above. Stormwater flows from rain events greater than Q1 (1 year ARI) shall be discharged directly to the Callaghan Road drainage network and ultimately to Little Burpengary Creek via an appropriately designed orifice system.

We have undertaken preliminary civil modelling to confirm Q1 stormwater flows can connect to the existing basin's headwall/forebay under gravity conditions to accepted design standards. Evidence of this modelling is shown in RMA Drawings in **Appendix A**.

Further to the assessment for additional filter media within the existing basin on Lot 996 SP295608, hydrological modelling was undertaken using DRAINS to assess the behaviour of the Council's existing basin within the Amity Development with the additional 1 year flows from the proposed development site.

Stormwater flows from the eastern portion of the development (catchments D1 and D2) for a 1 year ARI (1 EY) storm event were modelled to contribute to the Council's existing basin within the Amity Development. A DRAINS schematic is shown in **Figure 4** below.

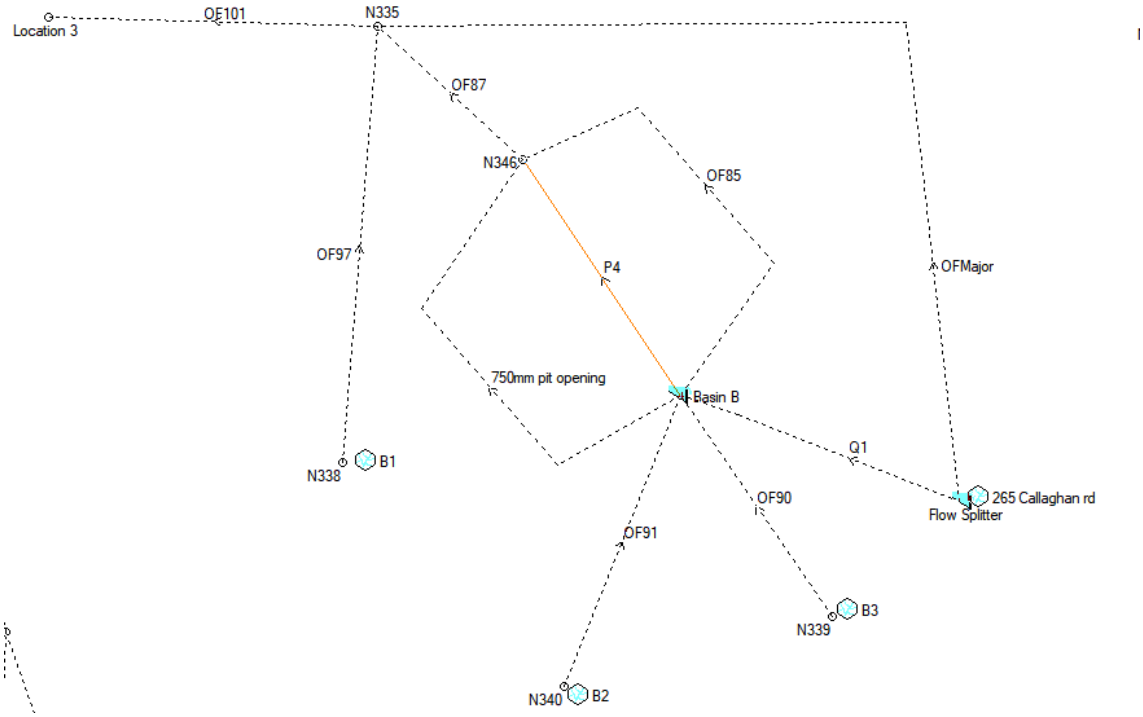


Figure 4: DRAINS schematic

Table 4 provides an overview of pre-development (pre-development of Amity Development), existing (pre-development of 265 Callaghan Road) and post-development (post-development of 265 Callaghan Road) median peak flow rates at the existing discharge location and basin water levels.

Table 4: Median peak flow rates overview at Discharge Location 3

Discharge Location	Storm Event	Pre-dev (of Amity)	Existing (pre-development of 265 Callaghan Rd)		Post-development (post-development of 265 Callaghan Rd)	
		Discharge (m3/s)	Discharge (m3/s)	Basin Water Level (RL)	Discharge (m3/s)	Basin Water Level (RL)
3	1EY	1.04	0.927	31.79	1.03	31.43
	0.5EY	1.42	1.19	31.96	1.33	31.69
	10% AEP	2.01	2.03	32.28	2.02	32.18
	5% AEP	2.88	2.26	32.47	2.58	32.38
	2% AEP	3.53	3.01	32.65	3.06	32.62
	1% AEP	4.11	3.84	32.73	4.0	32.71

Table 5 compares post-development flow characteristics at Discharge Location 3 with original pre-development and existing flow characteristics.

Table 5: Median peak flow rates comparison at Discharge Location 3

Discharge Location	Storm Event	Difference	
		Pre-development to Post-development Peak Median Discharge (m^3/s)	Existing to Post-development Basin Water Level (RL)
3	1EY	-0.01	-0.36
	0.5EY	-0.09	-0.27
	10% AEP	0.01	-0.1
	5% AEP	-0.3	-0.09
	2% AEP	-0.47	-0.03
	1% AEP	-0.11	-0.02

Results show that the post-development median peak flow rates discharging to Discharge Location 3 are less than pre-development median peak flow rates for all storm events except for the 10% AEP storm.

The 10% AEP storm event is showing an increase of 0.01m^3/s in a total flow of 2.0m^3/s. This increase is imperceptible and of no significance.

Results also show that the existing stormwater basin water levels are not significantly affected by additional flow from the development site.

The analysis indicates post-development flows from the existing stormwater basin will not result in actionable nuisance with quantifiable loss to downstream infrastructure or properties. Therefore, the existing stormwater basin function is not compromised by additional flows from the development site.

It should be noted that this analysis was undertaken to determine the existing stormwater basin function.

4.0 Development Site Stormwater Quantity

4.1 No detention

We have assessed the subject sites stormwater quantity management strategy with consideration of the greater stormwater catchment and downstream drainage network capacities associated to Little Burpengary Creek.

This assessment identified that stormwater quantity detention following development is not considered appropriate due to the site's location within a wider catchment.

We provide an extract below from Council Planning Scheme Policy Integrated Design – Appendix C Clause 1.11 that supports this assessment;

"The design and location of basins will influence if they have a negative or a positive impact to stormwater flows and great care must be taken in their design and integration with the surrounding catchments. Poorly located and designed basins may cause flows from different tributaries to peak at the same time, increasing peak flow rates for downstream locations. Assessing the performance of a basin may include modelling to a key/sensitive downstream location or junction."

Upstream of the development site, there is a 76.3 hectare stormwater catchment contributing to Little Burpengary Creek. The greater stormwater catchment is illustrated in **Figure 5**.

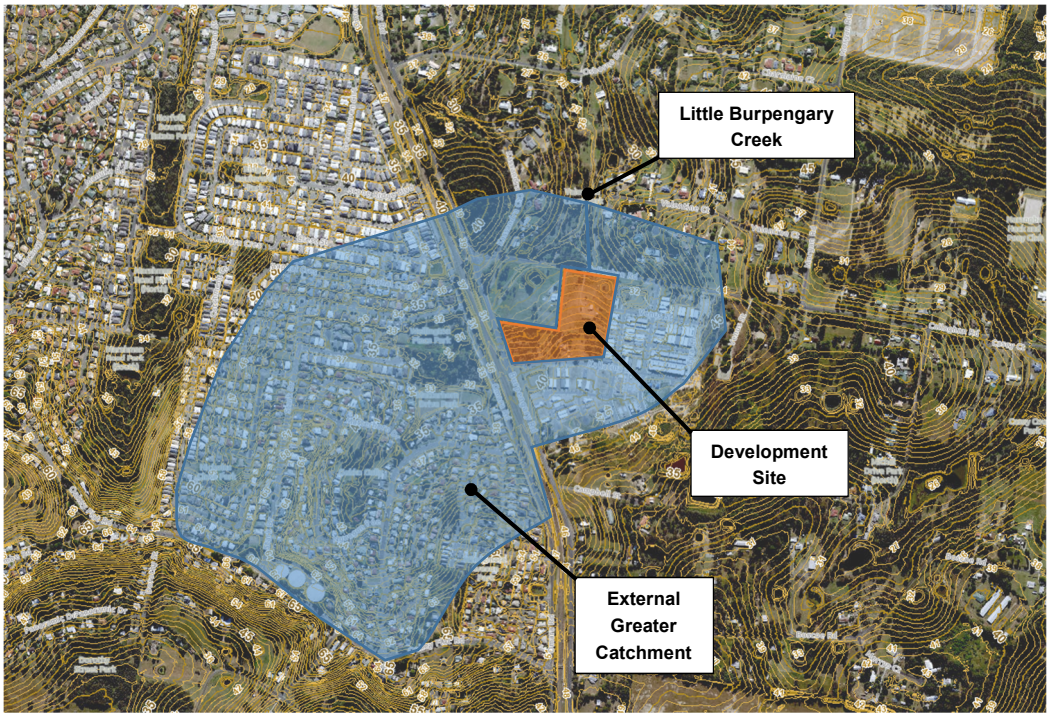


Figure 5: Little Burpengary Creek Greater Stormwater Catchment

The flows to Little Burpengary Creek were analysed using DRAINS software. The greater stormwater catchments and the pre- and post-development catchment were included as additional DRAINS nodes. The general schematic of the DRAINS model is shown in **Figure 6** below.

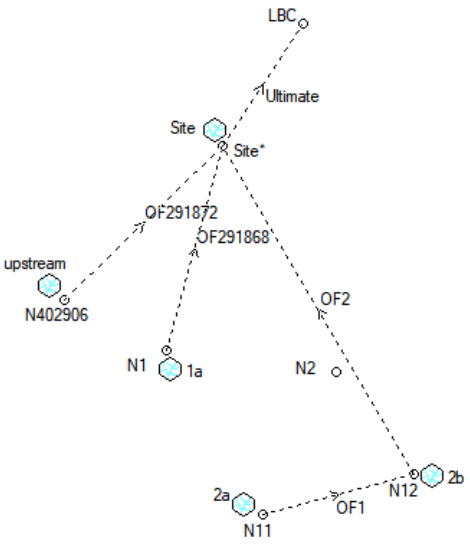


Figure 6: DRAINS Model Schematic

Table 6 provides a comparison of pre- and post-development median peak flow rates at Little Burpengary Creek.

Table 6: Comparison of pre- and post-development median peak flow rates

Discharge Location	Storm Event	Pre-development Peak Median Discharge (m^3/s)	Post-development Peak Median Discharge (m^3/s)	Difference (m^3/s)
Little Burpengary Creek	1EY	8.82	8.85	0.03
	0.5EY	12.1	12.1	0.0
	10% AEP	20.5	20.6	0.1
	5% AEP	24.9	25.0	0.1
	2% AEP	30.6	30.7	0.1
	1% AEP	35.0	35.0	0.0

Results show that the post-development median peak flow rates discharging to Little Burpengary Creek are equal to existing median peak flows rates for 1EY and 1% AEP.

The 10%, 5% and 2% AEP storm events are showing an increase of 0.1m^3/s in a total flow of 20.6m^3/s, 25.0m^3/s and 30.7m^3/s, respectively. These increases are imperceptible in relation to the total flow.

The analysis indicates post-development flows will not result in actionable nuisance with quantifiable loss to downstream neighbouring properties.

The analysis illustrates that stormwater quantity detention is not appropriate for the development site to achieve 'no actionable nuisance' in accordance with QUDM 2016 requirements.

We acknowledge that any proposal for discharging development flows without detention would need to consider an upgraded drainage system from the subject site to Little Burpengary Creek, subject to operational works approvals.

This assessment has not considered minor augmentation achieved for the minor storm from the existing basin within the Amity Development or from possible augmentations of the revised Stage 2, 3 and 4 development flows (catchments E1, E2 and E3) to contribute to the Orchard Development to the west. This assessment is therefore considered conservative.

4.2 Major flows

We have completed preliminary site grading of the layout to understand road and allotment drainage. Generally, in accordance with the approved DA civil schematic scheme, post-developed flows shall be directed to a localised road sag adjacent the proposed driveway providing access to proposed Lots 53-55.

A major storm event (100 year) underground pipe network is proposed to collect and discharge stormwater runoff through the proposed driveway road reserve to Callaghan Road drainage

network and ultimately to Little Burpengary Creek. The details of the Callaghan Road drainage network are subject to final form of Callaghan Road improvements. An overland swale is proposed along the proposed driveway reserve to manage emergency flows from the road sag in the rare case of major storm pit or pipe blockage. Refer **Figure 6** for general sketch details**.**

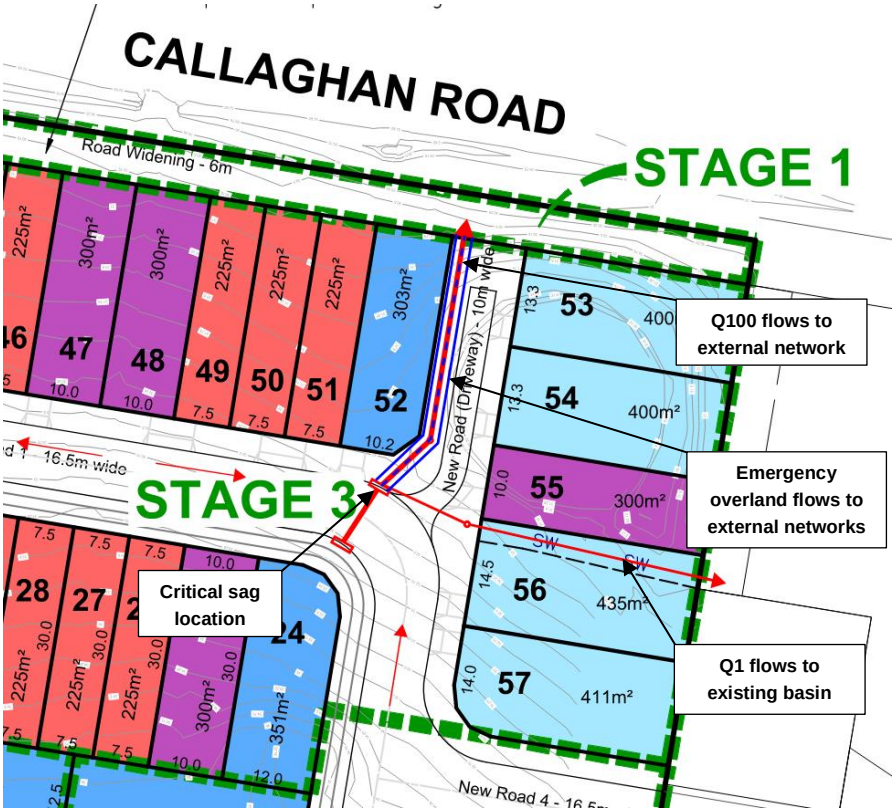


Figure 6: Minor/Major stormwater runoff concept

5.0 Summary

An alternate stormwater quantity and quality solution have been investigated for the development site at 265 Callaghan Road (Lot 1 RP907550 and Lot 1 RP185250).

The preliminary outcomes of the investigations in this letter have demonstrated the following:

- Minor storm runoff from the eastern portion of the development site can flow by gravity to the existing Council detention/bio-retention basin within the Amity Development
- Required water quality objectives can be achieved by increasing the filter media area within the existing Council basin from 730m^2 to 780m^2. Drawing C-SK0001 in **Appendix A** demonstrates how the additional filter media area can be achieved in the existing Council basin within the Amity Development.
- An investigation of Council's existing stormwater detention/bio-retention basin on Lot 9996 SP295608 has determined there is additional area within this basin to extent the existing filter media by 50m^2.
- The detention function of the existing Council basin is not compromised by the additional flows from the development site. The development will not result in an actionable nuisance to Callaghan Road, downstream properties or stormwater infrastructure.
- Stormwater quality and quantity for runoff from the western portion of the development site is

to be managed on the adjoining site to the west.

- Stormwater quantity runoff following development of the subject site does not require detention prior to discharge to Little Burpengary Creek

We consider the proposed stormwater management strategy in association with the Layout is a preferred and efficient outcome for Council, utilising existing infrastructure capacity and minimising life cycle and maintenance costs for Council.

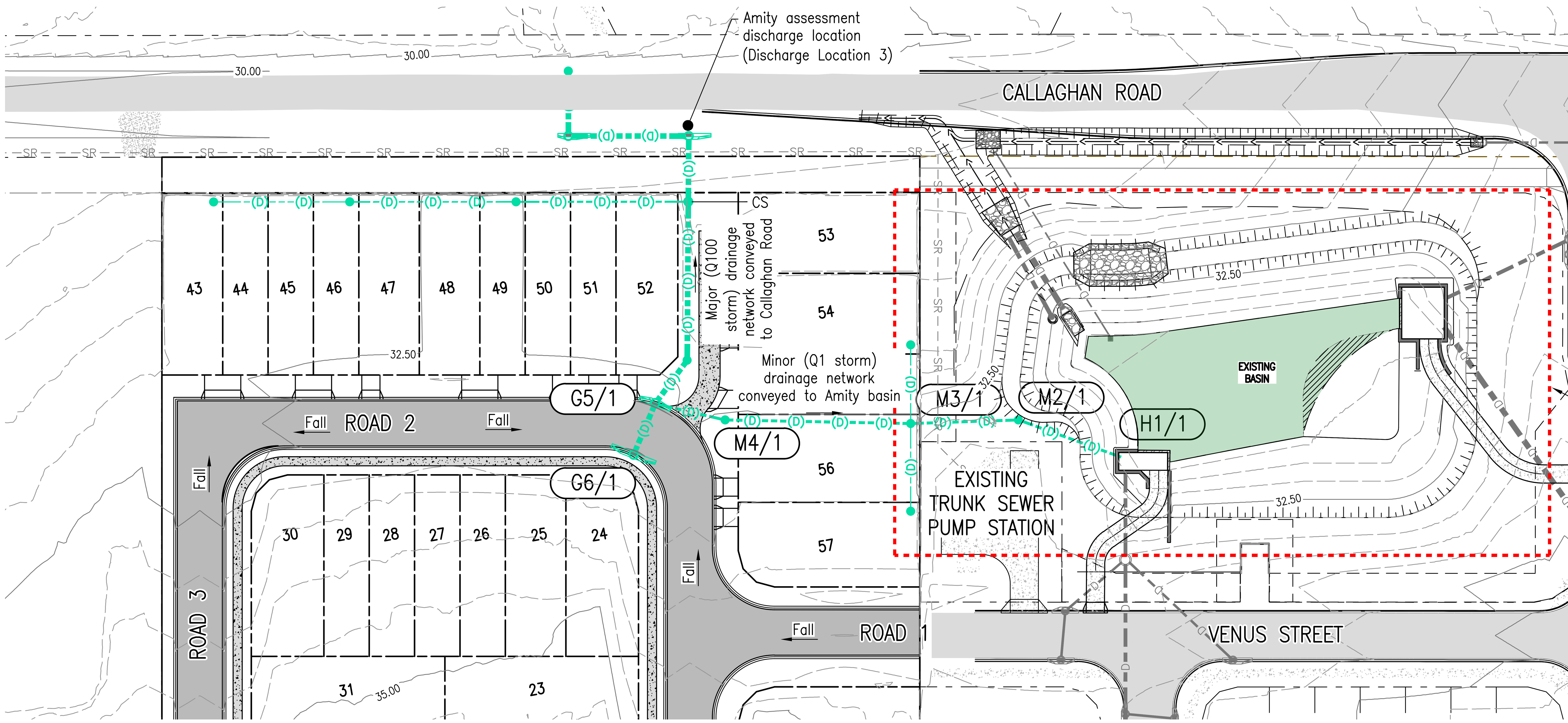
Any further questions, please do not hesitate to contact myself.

David Waldock

Associate | Principal Civil Engineer

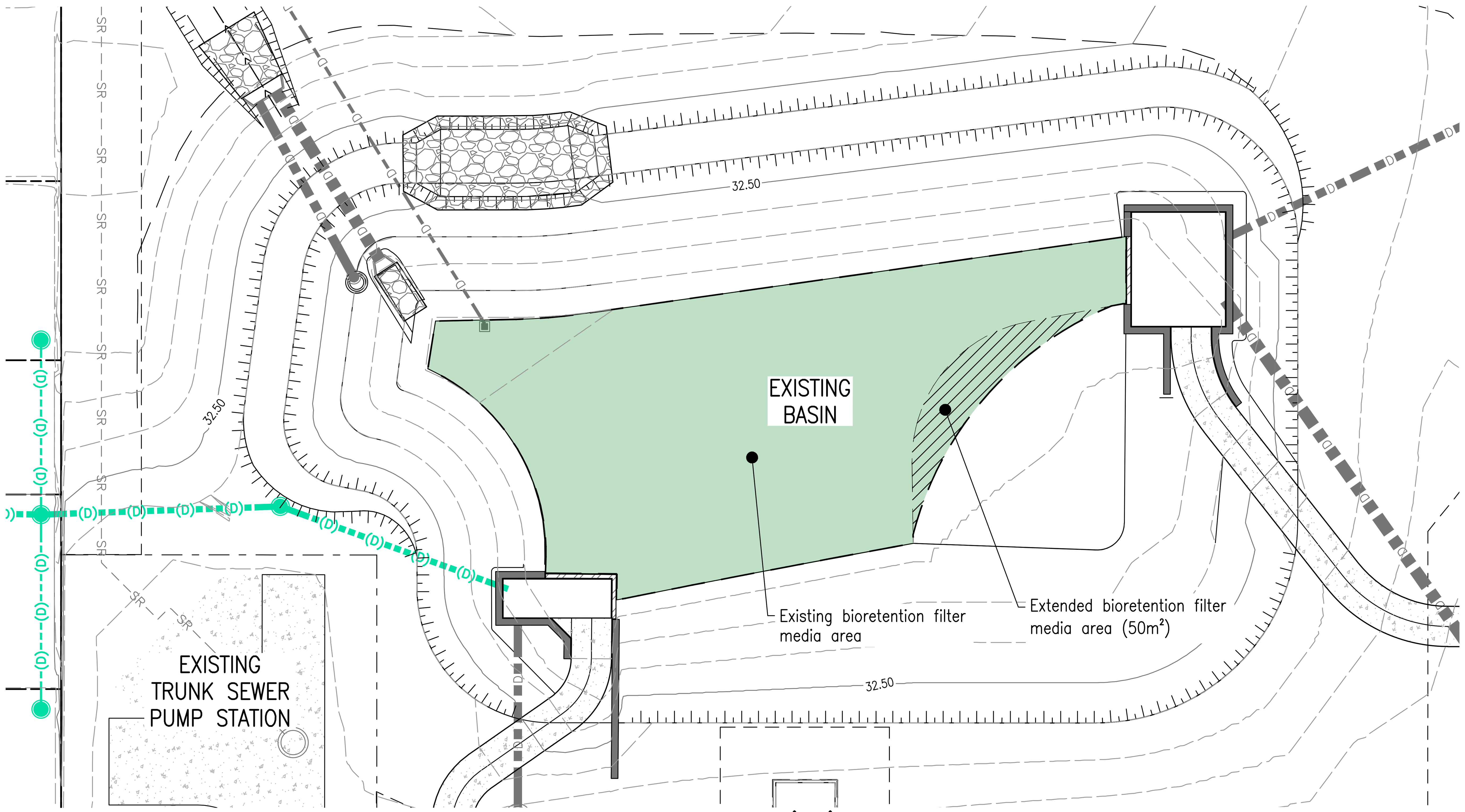
RMA ENGINEERS PTY LTD

APPENDIX A RMA Drawings



CONCEPT LAYOUT PLAN

Scale 1:500 (A1)



INSET 'A'

Scale 1:250 (A1)

LEGEND:

- Existing Property Boundary
- Existing Easement Boundary
- Proposed Property Boundary
- Existing Road Pavement
- Existing Concrete Pavement
- Proposed Road Pavement
- Proposed Concrete Pavement
- --(D)---(D)-- Proposed Stormwater
- ---D--- Existing Stormwater
- Filter Media (Area: 780m²)
- Design Minor Contours
- 609.00 Design Major Contours

PLAN NOTES:

P.1. This is a sketch plan only and is conceptual only.
P.2. Intervals between contours – 0.5m
P.3. This sketch plan represents design intent and concepts only.
P.4. This plan shall not be used for tendering, financing, ordering of materials, construction or any other unintended purpose.
P.5. Information shown on these plans has been compiled from varying sources and may not be accurate and will need verifying. This includes existing infrastructure, property boundaries and natural surface data.
P.6. This plan shall not be relied upon for detailed design.

REFERENCE NOTES:

R.1. Amity Stage 1 as constructed drawings.

PRELIMINARY
13 May 2021

SCALE BARS
0 2 4 6 8 10m — 1:250(A1) 1:500(A3)
0 5 10 15 20m — 1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
B	FOR APPROVAL	13/05/21	ARB	ARB	DAW	DAW
A	FOR APPROVAL	24/04/20	ARB	ARB	DAW	DAW

NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. COPYRIGHT OF THIS DRAWING IS VESTED WITH RMA ENGINEERS PTY. LTD.

RMA Engineers
www.rmaeng.com.au

CLIENT
NARANGBA VIEW PTY LTD
PO BOX 340
UNDERWOOD QLD 4119

PROJECT
SUBDIVISION
265 CALLAGHAN ROAD
NARANGBA QLD 4504

TITLE
CONCEPT LAYOUT PLAN

R.P.E.Q.
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HEIGHT DATUM	GRID	SIZE
AHD	MGA-56	A1

COUNCIL RAL/MCU NO. DA/35817/2018
COUNCIL OW NO.

PROJECT NO.	DRAWING NO.	ISSUE
14883	C-SK0003	B

LEGEND:

Design Surface

Natural Surface

PLAN NOTES:

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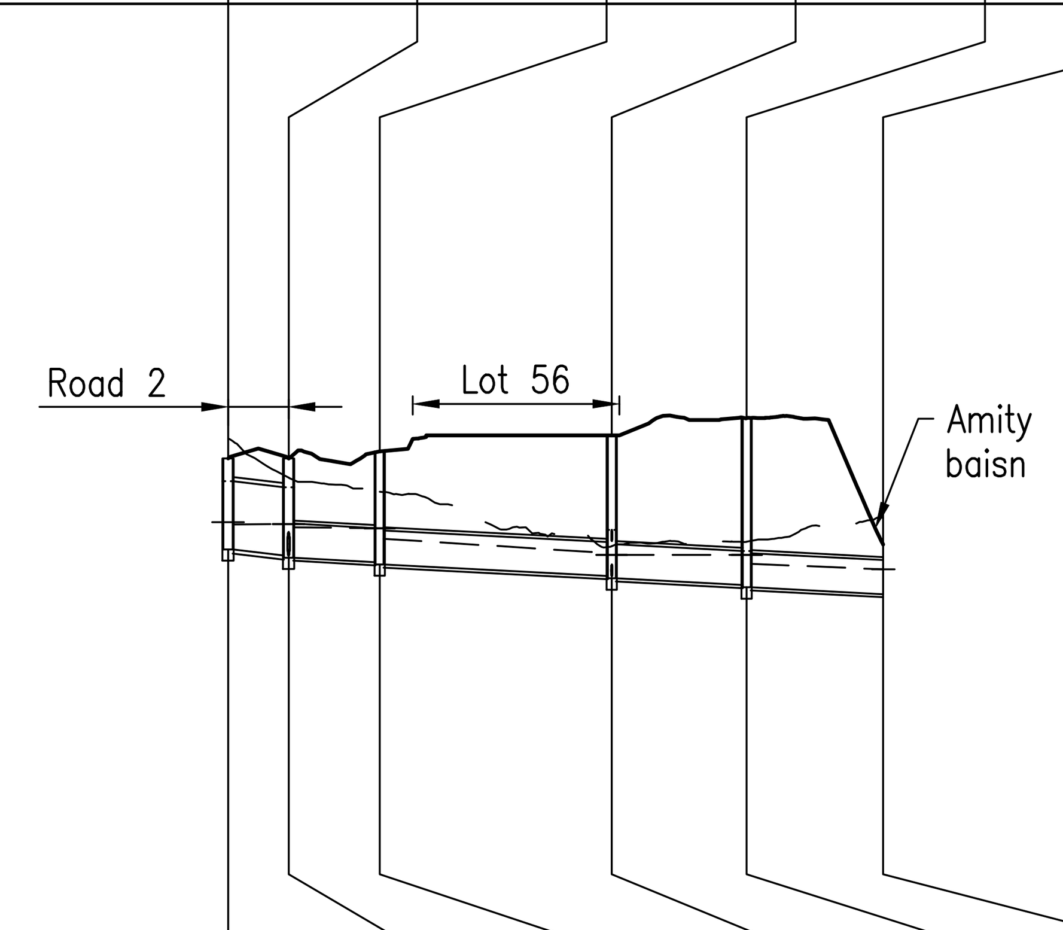
- P.5. This plan shall not be relied upon for detailed design.

REFERENCE NOTES:

- R.1. Amity Stage 1 as constructed drawings.

STRUCTURE NAME	G6/1	G5/1	M4/1	M3/1	M2/1	H1/1
STANDARD STRUCTURE/ INLET CAPACITY CHART	TYPE A GULLY (SAG); LIP IN LINE 4.8m Lintel; LAYBACK K&C ø1200mm MANHOLE	TYPE A GULLY (SAG); LIP IN LINE 2.4m Lintel; LAYBACK K&C ø1200mm MANHOLE	SWD ACCESS CHAMBER; TYPE D LID REFER IPWEAQ STD DRG DS-010 ø1050mm MANHOLE	SWD ACCESS CHAMBER; TYPE D LID REFER IPWEAQ STD DRG DS-010 ø1050mm MANHOLE	SWD ACCESS CHAMBER; TYPE D LID REFER IPWEAQ STD DRG DS-010 ø1050mm MANHOLE	PRECAST HEADWALL 525mm OUTLET 10



	G6/1–G5/1	G5/1–M4/1	M4/1–M3/1	M3/1–M2/1	M2/1–H1/1
Pipe Size (mm)	900	450	450	450	450
Pipe Class	2	2	2	2	2
Pipe Grade (%)	1.01%	0.50%	0.50%	0.50%	0.50%
Pipe Slope (1 in X)	1:99.3	1:200.0	1:200.0	1:200.0	1:200.0
Full Pipe Velocity (m/s)	0.51	3.13	1.17	1.87	1.38
Part Full Velocity (m/s)	2.16	3.13	1.44	1.87	1.42
PIPE FLOW (m^3/s)	0.326	0.495	0.186	0.218	0.216
PIPE CAPACITY AT GRADE (m^3/s)	1.825	0.212	0.202	0.165	0.216

DATUM RL 21.0

	G6/1	G5/1	M4/1	M3/1	M2/1	H1/1
Q2 H.G.L. IN PIPE / Q2 W.S.E. IN STRUCTURE	31.623	31.625 / 31.583	31.573 / 31.433	31.243 / 31.219	31.219 / 31.103	31.027 / 31.027
DEPTH TO INVERT	1.200	1.280 / 1.310	1.464 / 1.494	1.861 / 1.891	2.207 / 2.237	0.653 / 0.653
INVERT LEVEL OF PIPE/DRAIN	31.293	31.213 / 31.183	31.123 / 31.093	30.939 / 30.909	30.820 / 30.790	30.700 / 30.700
SURVEYED SURFACE LEVEL	32.757	32.238	32.055	31.336	31.394	31.706
DESIGN SURFACE LEVEL	32.493	32.493	32.586	32.800	33.027	31.353
SETOUT COORDINATES	E 495893.701 N 6992687.000	E 495897.879 N 6992693.823	E 495909.179 N 6992689.677	E 495939.328 N 6992684.074	E 495957.004 N 6992681.762	E 495972.720 N 6992672.930

Where relevant, Easting & Northing setout coordinates shall be cross referenced with property boundary setout dimensions.

CONCEPT STORMWATER LONGITUDINAL SECTION

Scale 1:1000 (H); 1:100 (V) (A1)

SCALE BARS

0 1 2 3 4m — 1:100(A1) 1:200(A3)

0 10 20 30 40m — 1:1000(A1) 1:2000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
B	FOR APPROVAL	13/05/21	ARB	ARB	DAW	DAW
A	FOR APPROVAL	24/04/20	ARB	ARB	DAW	DAW

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UNDERWOOD QLD 4119

PROJECT
SUBDIVISION
265 CALLAGHAN ROAD
NARANGBA QLD 4504

TITLE
CONCEPT STORMWATER LONGITUDINAL SECTION

R.P.E.Q.
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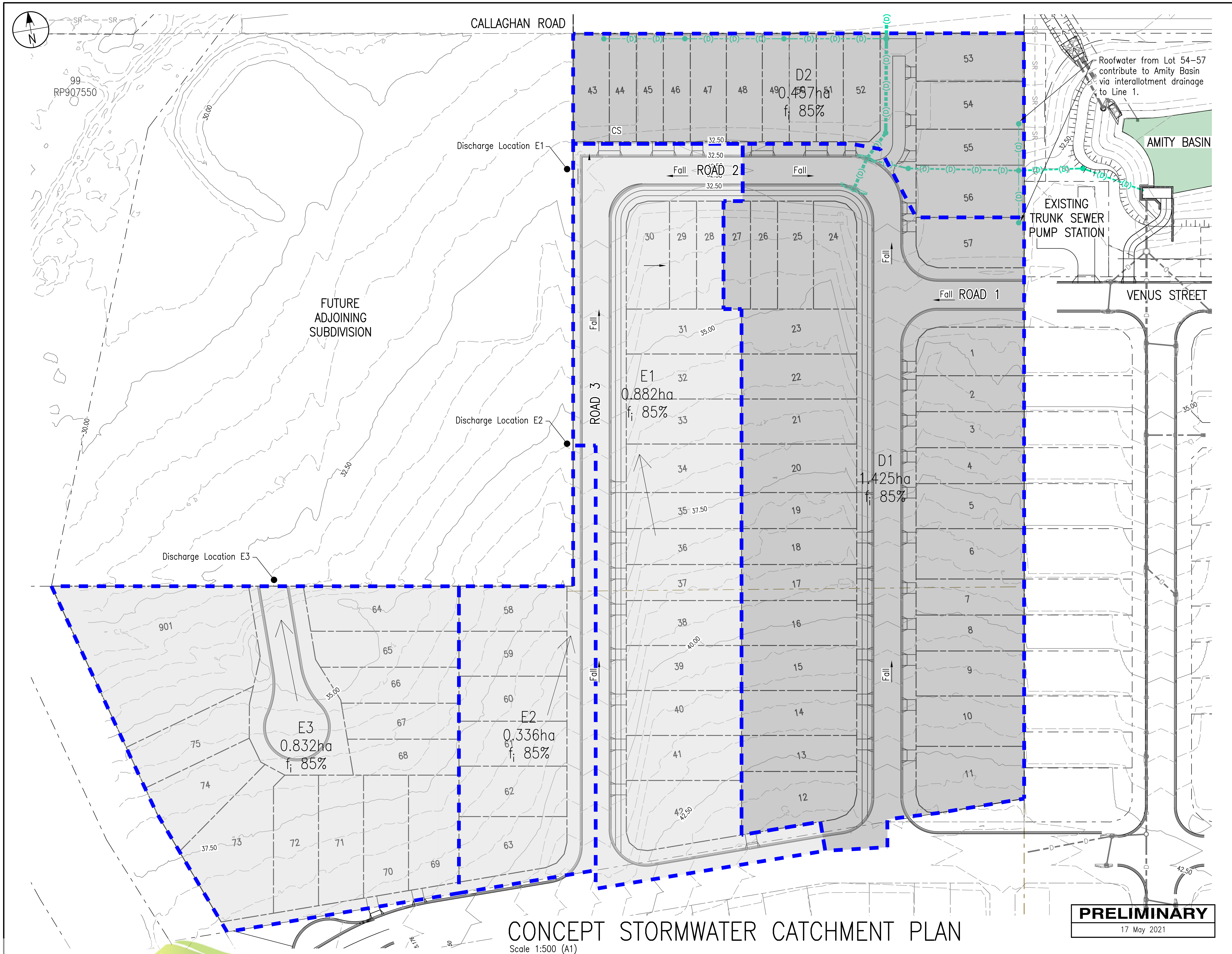
HEIGHT DATUM	GRID	SIZE
AHD	MGA-56	A1

COUNCIL RAL/MCU NO. DA/35817/2018

COUNCIL OW NO.

PROJECT NO.	DRAWING NO.	ISSUE
14883	C-SK0004	B



CONCEPT STORMWATER CATCHMENT PLAN

Scale 1:500 (A1)

PRELIMINARY

17 May 2021

LEGEND:

- Existing Property Boundary
- Existing Easement Boundary
- Proposed Property Boundary
- Stormwater Catchment Boundary
- G1/1 0.00ha — Stormwater Catchment and Area
- Proposed Stormwater
- Existing Stormwater
- Design Minor Contours
- 609.00 — Design Major Contours

PLAN NOTES:

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- P.2. Intervals between contours – 0.5m
- P.3. This sketch plan represents design intent and concepts only.
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- P.6. This plan shall not be relied upon for detailed design.

REFERENCE NOTES:

- R.1. Amity Stage 1 as constructed drawings.

SCALE BARS

0 5 10 15 20m

1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
A	FOR APPROVAL	13/05/21	ARB	ARB	DAW	DAW

NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. COPYRIGHT OF THIS DRAWING IS VESTED WITH RMA ENGINEERS PTY. LTD.

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HEIGHT DATUM	GRID	SIZE
AHD	MGA-56	A1

COUNCIL RAL/MCU NO.
DA/35817/2018

COUNCIL OW NO.

PROJECT NO.	DRAWING NO.	ISSUE
14883	C-SK0005	A

Last saved: Ashleigh Braden
N:\Sydney\Projects\14883 Sub\...\265 Callaghan Rd\3 Drafting\Acad\C-SK0004.dwg

ATTACHMENT 4

Amended Infrastructure Charges Notice

The Infrastructure Charges Notice applicable to the development is as follows:

Infrastructure Charges Notice

Original Notice (s119 Planning Act 2016)

ABN 92 967 232 136

Moreton Bay Regional Council
Caboolture Office, 2 Hasking Street, Caboolture Qld 4510
PO Box 159, CABOOLTURE QLD 4510

Approval No:	DA/2021/1519	**Applicant:**	Narangba View PTY LTD
Approval Description:	Reconfiguring a Lot - Development Permit for Subdivision (2 into 74 lots plus park in 2 stages)	**Stage:**	1-2
Based On:	2020/21 financial year	**Applicant Address:**	PO Box 340 UNDERWOOD QLD 4119
Version of Charges Resolution:	Ver 8 - 14 August 2018	**Owner:**	Moreton Bay Regional Council Tte Moreton Bay Regional Council Narangba View Pty Ltd
Proportional Split (MBRC/UW):	20/21 financial year Adopted 60/40	**Owner Address:**	52 Venus Street NARANGBA QLD 4504 295 Burpengary Road NARANGBA QLD 4504 305 Burpengary Road NARANGBA QLD 4504 265 Callaghan Road NARANGBA QLD 4504
		Date Charges Payable:	Reconfiguring a Lot component of the development approval - in accordance with section 122(1)(a) of the Planning Act 2016. Material Change of Use component of the development approval - in accordance with section 122(1)(c) of the Planning Act 2016. There has been no alternative agreement about payment or provision of infrastructure instead of payment.
Total Levied Charges:	**$0.00**	**The Total Levied Charge is calculated as the Total Charge less any Offset available as identified below in an Infrastructure Agreement or a condition of the development approval. Where the Offset exceeds the Total Charge and a refund is available, the Total Levied Charge is zero and any refund is addressed in the Refund section of this Infrastructure Charges Notice.**	

Property Details

Property Address	Real Property Description
52 Venus Street NARANGBA QLD 4504	Lot 1 RP 185250
295 Burpengary Road NARANGBA QLD 4504	Lot 1 RP 907550
305 Burpengary Road NARANGBA QLD 4504	Lot 99 RP 907550
265 Callaghan Road NARANGBA QLD 4504	Lot 9996 SP 295608

Charge Details

Description	Existing Demand (Credit)	Proposed Demand	Unit of Demand	Demand Factor	Charge Rate per Unit of Demand	Total Charge
RESIDENTIAL						
Residential Use - 3 or more bedroom dwelling						
Stage 1 - 57 Lots	2	57	Dwelling	1	$18,406.59	$1,049,175.63
Stage 2 - 17 Lots	0	17	Dwelling	1	$18,406.59	$312,912.03
SUB TOTAL						**$1,325,274.48**
TOTAL GST						**$0.00**
GRAND TOTAL						**$1,325,274.48**

Infrastructure Charges Notice

Original Notice (s119 Planning Act 2016)

ABN 92 967 232 136

Moreton Bay Regional Council
Caboolture Office, 2 Hasking Street, Caboolture Qld 4510
PO Box 159, CABOOLTURE QLD 4510

Infrastructure Agreement Offset Details

IA Number (Council Ref)	DA/2021/1519
Description	265 Callaghan Road and 305 Burpengary Road, Narangba Infrastructure Agreement 2021
Agreement Date	21 December 2021

Infrastructure ID Number	Infrastructure Item Description	Delivery Status1	Original Agreed Value of Item2	Previous Value of Item Used3	New Value of Item Used4	Value of Item left Available5
Schedule 2	Items 1.2-1.3, 2.1.1-2.1.5 and 2.2.1	Future	$1,325,274.48 plus indexation	$0.00	$1,325,274.48 plus indexation	$0.00

Development Condition Offset Details

Condition and DA Number	Infrastructure Item Description	Delivery Status1	Original Agreed Value of Item2	Previous Value of Item Used3	New Value of Item Used4	Value of Item left Available5

Offset and Refund Details

In accordance with s121(1)(f) of the *Planning Act 2016*, any offset or refund applicable is listed below and will be refunded in accordance with the terms listed in an infrastructure agreement, or if there is no infrastructure agreement, in accordance with the Council's Infrastructure Charges Resolution Implementation Policy in effect at the date when the refund is payable and the Infrastructure Item has been Delivered6 to Council.

Infrastructure Item	Condition Number	Value of the Infrastructure Item Used as Offset in this ICN	Value of Offset available for Refund or transfer to other development7

Notes

1. Where an Infrastructure Item has not been delivered, the value of the Infrastructure Item as an offset has been deducted from the charge on an expectation that the Infrastructure Item will be delivered concurrently with, or before, payment of the Levied Charge is due as payable to Council. AVAILABLE means the item has been delivered at the date of issue of this Infrastructure Charges Notice whereas FUTURE means the item has not yet been delivered at the date of issue of this Infrastructure Charges Notice.
2. Represents the amount of the Original Agreed Value of the Infrastructure Item.
3. Represents the amount of the Original Agreed Value of the Infrastructure Item used in another Infrastructure Charges Notice (e.g. an earlier stage of the development).
4. Represents the amount of the Original Agreed Value of the Infrastructure Item used in this Infrastructure Charges Notice to determine the Total Levied Charge.
5. Represents the amount of the Original Agreed Value of the Infrastructure Item remaining after the issuing of this Infrastructure Charges Notice.
In respect to the Notes above, where provided for in an Infrastructure Agreement or the Council's Infrastructure Charges Resolution, the value of the infrastructure has been indexed to the date of issue of this Infrastructure Charges Notice.

6. Delivered is taken to be:
(a) for land, the date when the land is transferred to Council in fee simple or dedicated as a reserve (e.g. road reserve), and/or
(b) for works, the date when the works are accepted by Council in writing and in full as being 'On Maintenance', unless agreed to otherwise by Council in writing.
7. Where an Infrastructure Item has not been Delivered, the value of any refund is not available until the Infrastructure Item has been delivered to Council and has been confirmed by the Council as exceeding any Offset available and is in accordance with the Council's Infrastructure Charges Resolution Implementation Policy.

DECISION NOTICE

Council resolved to approve the development application as stated at the beginning of this notice over premises located at the property/s mentioned in this notice and gave a decision notice to the Applicant.

The Council having regard to the relevant sections of its current Charges Resolution is of the view that an adopted charge applies to providing trunk infrastructure for the development.

Accordingly, the Council has resolved to give this infrastructure charges notice to you in accordance with section 119 of the *Planning Act 2016*. The infrastructure charges notice contains the mandatory information in accordance with section 121 of the *Planning Act 2016*.

SUBMISSIONS REGARDING THIS NOTICE The recipient of an Infrastructure Charges Notice may make a submission about the charges notice within the relevant appeal period (20 days from receipt of the charges notice) in accordance with Chapter 4 Part 2 Subdivision 5 of the *Planning Act 2016*.

APPEALS ABOUT AN INFRASTRUCTURE CHARGES NOTICE The recipient of an Infrastructure Charges Notice may appeal to the court about the decision to give the notice in accordance with Chapter 6 Part 1 of the *Planning Act 2016*.

TO WHOM THE CHARGE MUST BE PAID

Payment of the Charge must be made payable to MORETON BAY REGIONAL COUNCIL via Customer Service or Development Services, PO Box 159, Caboolture Qld 4510

The Infrastructure Charge has been calculated in accordance with the charges stated in Council's Infrastructure Charges Resolution. This notice will be escalated to time of payment to the extent permitted under legislation in force at that time.

Infrastructure Charges Notice

Original Notice (s119 Planning Act 2016)

ABN 92 967 232 136

Moreton Bay Regional Council
Caboolture Office, 2 Hasking Street, Caboolture Qld 4510
PO Box 159, CABOOLTURE QLD 4510

PAYMENT DUE BY:

In accordance with sections 121(1)(d) and 122 of the *Planning Act 2016* - extract as follows:
A levied charge is payable:
(a) if the charge applies for reconfiguring a lot - when the local government that levied the charge approves a plan for the reconfiguration that, under the Land Title Act, is required to be given to the local government for approval;
or
(b) if the charge applies for building work - when the final inspection certificate for the building work, or the certificate of classification for the building, is given under the Building Act;
or
(c) if the charge applies for material change of use - when the change happens;
or
(d) if the charge is for other development - on the day stated in the infrastructure charges notice under which the charge is levied.

Notice is hereby given that the abovementioned infrastructure charges levied by Moreton Bay Regional Council in compliance with the *Planning Act 2016*, Chapter 6 on land described for the period described, and such charges are DUE AND PAYABLE BY THE TIME STIPULATED IN THIS NOTICE. These charges plus any arrears and interest thereon may be recovered by legal process without further notice if unpaid after the time stipulated in this notice.

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.

OVERSEAS PAYEES

Please forward your infrastructure charges payment by way of a bank draft for the required amount in Australian dollars.

GOODS AND SERVICES TAX

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

INFRASTRUCTURE CHARGE IS SUBJECT TO PRICE VARIATION

In accordance with section 121(e) of the *Planning Act 2016*, the Levied Charge in this notice will be escalated to time of payment to the extent permitted under legislation and the Council's Infrastructure Charges Resolution in force at that time.

Where indexation is applicable, an online spreadsheet calculator is available to assist with making the calculation https://www.moretonbay.qld.gov.au/Services/Building-Development/infrastructure-Charges

Council takes no responsibility for the accuracy of the calculator.

PLEASE CONTACT DEVELOPMENT SERVICES BEFORE MAKING PAYMENT.

INFRASTRUCTURE CHARGE ENQUIRIES

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

Infrastructure Charges Notice

Original Notice (s119 Planning Act 2016)

ABN 92 967 232 136

Moreton Bay Regional Council
Caboolture Office, 2 Hasking Street, Caboolture Qld 4510
PO Box 159, CABOOLTURE QLD 4510

METHODS OF PAYMENT

PAYMENT BY MAIL	PAYMENT AT COUNCIL OFFICES	PAYMENT MADE BY CREDIT CARD
Confirm the current Infrastructure Charge applicable and obtain an updated payment notice from Council's Development Services. Mail this updated payment notice immediately with your payment to: MORETON BAY REGIONAL COUNCIL, PO Box 159, Caboolture Qld 4510 **NOTE: Cheques must be made payable to MORETON BAY REGIONAL COUNCIL**	Confirm the current Infrastructure Charge applicable and obtain an updated payment notice from Council's Website. Present this updated payment notice with your payment to Moreton Bay Regional Council at the Customer Service Counters. **NOTE: Cheques must be made payable to MORETON BAY REGIONAL COUNCIL**	Credit Cards accepted: Mastercard or Visa

ATTACHMENT 5

Appeal Rights

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

(1) Schedule 1 states—

(a) matters that may be appealed to—

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

(ii) only a tribunal; or

(iii) only the P&E Court; and

(b) the person—

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

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

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

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

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

(3) The ***appeal period*** is—

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

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

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

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

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

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

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

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

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

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

Note—

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

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

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

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

(a) the adopted charge itself; or

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

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

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

230 Notice of appeal

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

(a) is in the approved form; and

(b) succinctly states the grounds of the appeal.

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

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

(a) the respondent for the appeal; and

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

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

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

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

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

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

(4) The ***service period*** is—

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

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

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

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

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

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

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

231 Non-appealable decisions and matters

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

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

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

(4) In this section—

decision includes—

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

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

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

(d) a purported decision; and

(e) a deemed refusal.

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

(a) is final and conclusive; and

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

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

232 Rules of the P&E Court

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

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

ATTACHMENT 6

Referral Agency Response(s)

The Referral Agency responses are as follows:

Queensland Government

Changed referral agency response
Our reference: 2107-23774 SPD

Referral agency response—with conditions
(Given under section 56 of the *Planning Act 2016*)

Date of original response: 8 May 2018
Original reference: 1803-4577 SRA

The development application described below was properly referred to the State Assessment and Referral Agency (SARA) on 27 March 2018.

Applicant details

Applicant name:	Narangba View Pty Ltd c/- Jensen Bowers
Applicant contact details:	Mr Andrew McLean PO Box 799 Spring Hill QLD 4004 andrewmclean@jensenbowers.com.au

Location details

Street address:	305 Burpengary Road and 265 Callaghan Road, Narangba
Real property description:	Lot 1 on RP185250 and Lot 1 on RP907550
Local government area	Moreton Bay Regional Council

Application details

Development permit	Reconfiguring a lot for subdivision

Referral triggers
The development application was referred to SARA under the following provisions of the Planning Regulation 2017:

- Schedule 10, Part 9, Division 4, Subdivision 2, Table 1, Item 1—State transport corridors and future state transport corridors

Conditions
Under section 56(1)(b)(i) of the *Planning Act 2016* (the Act), the conditions set out in Attachment 1 must be attached to any development approval.

Reasons for decision to impose conditions
SARA must set out the reasons for the decision to impose conditions. These reasons are set out in Attachment 2.

South East Queensland (North) regional office
Mike Ahern Building, Level 3, 12 First Avenue, Maroochydore
PO Box 1129, Maroochydore QLD 4558

enc Attachment 1—Changed conditions to be imposed
Attachment 2—Changed reasons for decision to impose conditions
Attachment 3—Approved plans and specifications

Attachment 1—Changed conditions to be imposed

No.	Conditions of development approval	Condition timing
Reconfiguring a lot		
Schedule 10, Part 9, Division 4, Subdivision 2, Table 1, Item 1—State transport corridors and future state transport corridors—The chief executive administering the *Planning Act 2016* nominates the Director-General of the Department of Transport and Main Roads to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following condition:		
1.	The development must be carried out generally in accordance with the following: - ~~Sections 4 & 5 of the Site Based Stormwater Management Plan, prepared by Morgan Consulting Engineers Pty Ltd, dated 13 arch 2018, reference 18006 – SBSMP/2, revision 2; and~~ - ~~Concept Roadworks and Drainage Plan – Sheet 1, prepared by Morgan Consulting Engineers, dated March 2018, drawing number 18006/SK10, revision C; and~~ - ~~Concept Roadworks and Drainage Plan – Sheet 2, prepared by Morgan Consulting Engineers, dated March 2018, drawing number 18006/SK11, revision B; and~~ - ~~Concept Roadworks and Drainage Plan – Sheet 3, prepared by Morgan Consulting Engineers, dated March 2018, drawing number 18006/SK12, revision B; and~~ - ~~Concept Stormwater Management Details, prepared by Morgan Consulting Engineers, dated March 2018, drawing number 18006/SK14, revision A; and~~ - ~~Section 7.2 of the Detailed Detention and Overland Flow Study Report, prepared by MRG Water Consulting Pty Ltd, dated 12 March 2018, reference 2307_V@_12032018, version 2.~~ - **Concept Layout Plan prepared by RMA Engineers, drawing C-SK0003 (Project No. 14883) Issue B dated 13/05/21** - **Concept Stormwater Longitudinal Section prepared by RMA Engineers, drawing C-SK0004 (Project No. 14883) Issue B dated 13/05/21** - **Concept Stormwater Catchment Plan prepared by RMA Engineers, drawing C-SK0005 (Project No. 14883) Issue A dated 13/05/21** - **Section 2. Stormwater Quantity of the Flooding and Stormwater Management Plan, prepared by Peak Urban, reference 17-0112FSMP01-V1 and version 1, dated 09/06/21** - **Section 2.0 Catchment Philosophy and Section 4.0 Development Site Stormwater Quantity of the Stormwater Technical Note, prepared by RMA Engineers, Project No. 14883, dated 17 May 2021.**	At all times

Attachment 2—Changed reasons for decision to impose conditions

The reasons for SARA's decision are:

- The development application is for a development permit for reconfiguring a lot (2 lots into 75 lots and parkland).
- The development site is within 25 metres of a railway corridor.
- The development application has been assessed against State code 2: Development in a railway environment of the *State Development Assessment Provisions* (SDAP), version 2.2.
- A condition has been imposed to ensure the development does not have an adverse impact on the state-controlled railway from stormwater impacts.

Material used in the assessment of the application:

- The change application material and submitted plans
- *Planning Act 2016*
- Planning Regulation 2017
- The SDAP version 2.2, as published by the Department of State Development, Infrastructure, Local Government and Planning
- The Development Assessment Rules
- SARA DA Mapping system
- *Human Rights Act 2019.*

Attachment 3—Approved plans and specifications

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Queensland Government

Our reference: 2107-23774 SPD
Your reference: BNE190340

19 August 2021

Narangba View Pty Ltd
C/- DTS Group QLD Pty Ltd
PO Box 3128
WEST END QLD 4101
planning@dtsqld.com.au

Attention: Tim Smith

Dear Mr Smith

Decision notice—change application
(Given under section 83 of the *Planning Act 2016*)

Your change application under section 78 of the *Planning Act 2016* for the development approval dated 22 January 2021 was made to the State Assessment and Referral Agency on 21 July 2021.

Decision for change application

Date of decision:	19 August 2021
Decision details:	Make the change and amend existing condition.

The changes agreed to are:

1. Amend Condition 1 to require that the development is undertaken generally in accordance with the amended plans and relevant sections of the Flooding and Stormwater Management Plan and Stormwater Technical Note.

South East Queensland (North) regional office
Mike Ahern Building, Level 3, 12 First Avenue, Maroochydore
PO Box 1129, Maroochydore QLD 4558

For further information please contact Celeste Bownds, Senior Planning Officer, on (07) 5352 9707 or via email SEQNorthSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Garth Nolan
Manager (Planning)

cc Moreton Bay Regional Council, mbrc@moretonbay.qld.gov.au

enc Attachment 1—Changed referral agency response
Planning Act appeal provisions

Queensland Government

State Assessment and Referral Agency (SARA)
Statement of reasons for application 2107-23774 SPD
(Given under section 83 of the *Planning Act 2016*)

Departmental role: Responsible entity

Applicant details

Applicant name:	Narangba View Pty Ltd c/- DTS Group QLD Pty Ltd
Applicant contact details:	Mr Tim Smith PO Box 3128 West End QLD 4101 planning@dtsqld.com.au

Location details

Street address:	305 Burpengary Road, 265 Callaghan Road Narangba
Real property description:	Lot 1 on RP185250 and Lot 1 on RP907550
Local government area:	Moreton Bay Regional Council

Development details

Nature of development	Approval type	Category of assessment
Reconfiguring a lot	Development permit	Code assessment
Description of proposal: Minor change from 2 lots into 50 lots plus balance lot in 2 stages, to 2 lots into 75 lots and parkland		

Assessment matters

Aspect of development requiring code assessment	Applicable codes
Schedule 10, Part 9, Division 4, Subdivision 2, Table 1, Item 1—State transport corridors and future state transport corridors	State code 2: Development in a railway environment of the *State Development Assessment Provisions* (SDAP), version 2.2.

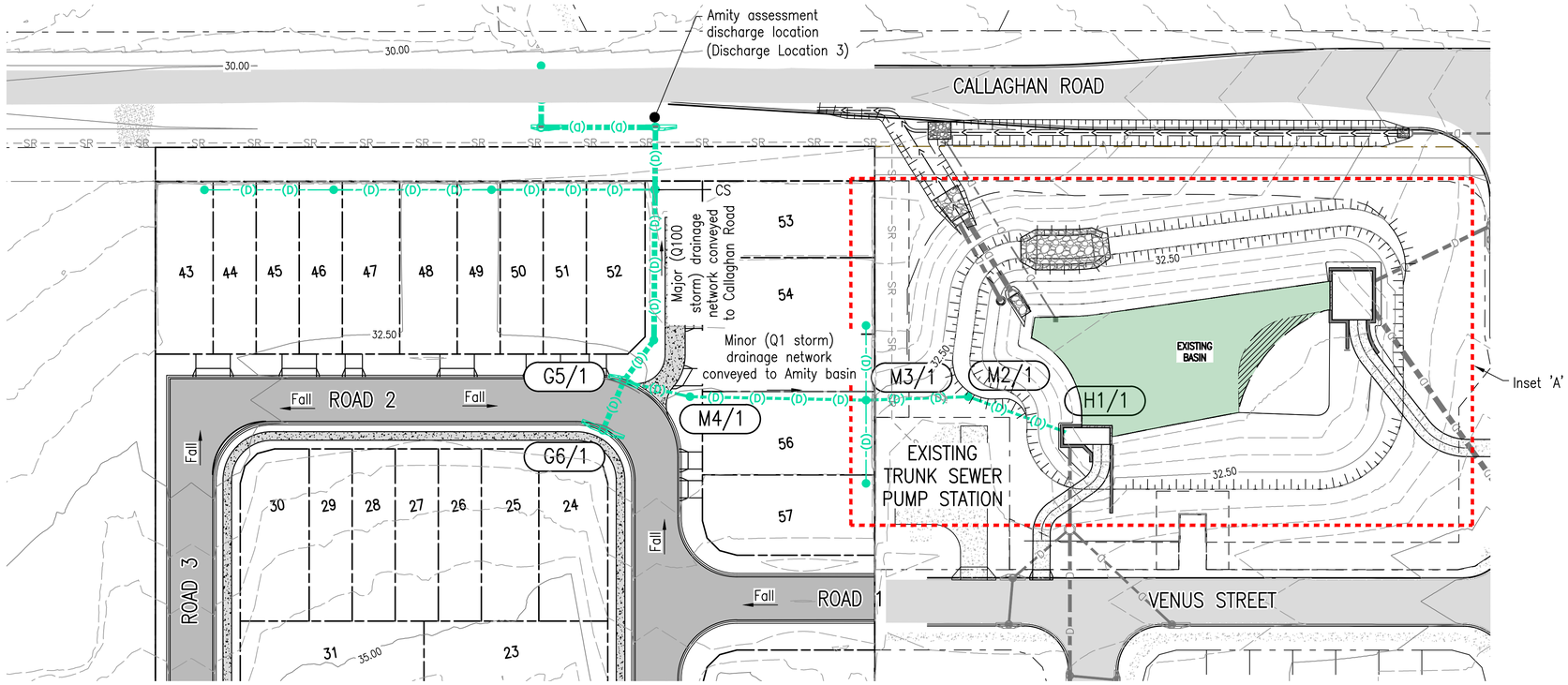
The reasons for SARA's decision are:

- The development application is for a development permit for reconfiguring a lot (2 lots into 75 lots and parkland).
- The development site is within 25 metres of a railway corridor.
- The development application has been assessed against State code 2: Development in a railway environment of the *State Development Assessment Provisions* (SDAP), version 2.2.
- A condition has been imposed to ensure the development does not have an adverse impact on the state-controlled railway from stormwater impacts.

South East Queensland (North) regional office
Mike Ahern Building, Level 3, 12 First Avenue, Maroochydore
PO Box 1129, Maroochydore QLD 4558

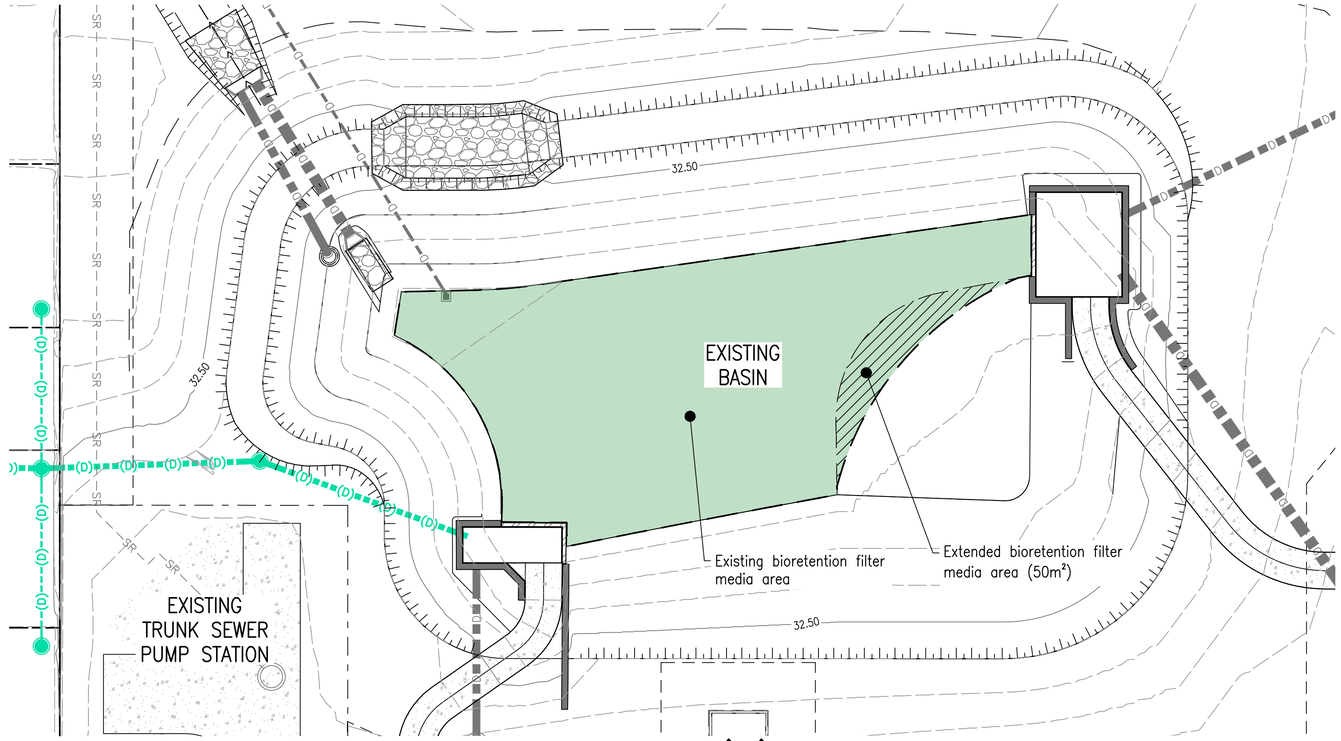
Material used in the assessment of the application:

- The change application material and submitted plans
- *Planning Act 2016*
- Planning Regulation 2017
- The SDAP version 2.2, as published by the Department of State Development, Infrastructure, Local Government and Planning
- The Development Assessment Rules
- SARA DA Mapping system
- *Human Rights Act 2019.*



CONCEPT LAYOUT PLAN

Scale 1:500 (A1)



INSET 'A'

Scale 1:250 (A1)

LEGEND:

- Existing Property Boundary
- Existing Easement Boundary
- Proposed Property Boundary
- Existing Road Pavement
- Existing Concrete Pavement
- Proposed Road Pavement
- Proposed Concrete Pavement
- Proposed Stormwater
- Existing Stormwater
- Filter Media (Area: 780m²)
- Design Minor Contours
- 609.00 Design Major Contours

PLAN NOTES:

P.1. This is a sketch plan only and is conceptual only.
P.2. Intervals between contours – 0.5m
P.3. This sketch plan represents design intent and concepts only.
P.4. This plan shall not be used for tendering, financing, ordering of materials, construction or any other unintended purpose.
P.5. Information shown on these plans has been compiled from varying sources and may not be accurate and will need verifying. This includes existing infrastructure, property boundaries and natural surface data.
P.6. This plan shall not be relied upon for detailed design.

REFERENCE NOTES:

R.1. Amity Stage 1 as constructed drawings.

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE
Queensland Government
SARA ref: 2107-23774 SPD
Date: 19 August 2021

PRELIMINARY
13 May 2021

SCALE BARS
0 2 4 6 8 10m — 1:250(A1) 1:500(A3)
0 5 10 15 20m — 1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
B	FOR APPROVAL	13/05/21	ARB	ARB	DAW	DAW
A	FOR APPROVAL	24/04/20	ARB	ARB	DAW	DAW

NOTE: FIGURED DIMENSIONS TO TAKE PRECEDENCE OVER SCALED MEASUREMENTS. VERIFY ALL ON SITE DIMENSIONS & LEVELS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

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SUBDIVISION
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NARANGBA QLD 4504

TITLE
CONCEPT LAYOUT PLAN

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AHD	MGA-56	A1

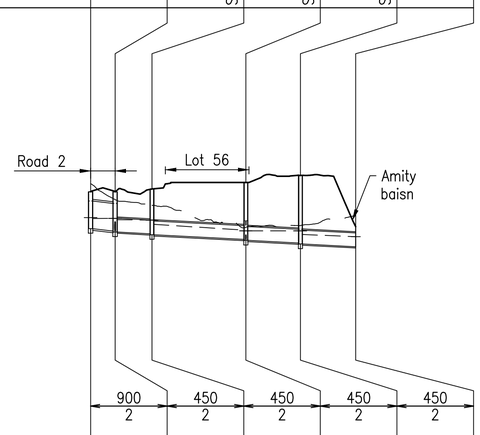
COUNCIL RAL/MCU NO.
DA/35817/2018
COUNCIL OW NO.

PROJECT NO.	DRAWING NO.	ISSUE
14883	C-SK0003	B

Last saved: Ashleigh Braden

N:\Synergy\Projects\14883 Subdivision – 265 Callaghan Rd\3 Drafting\Acad\C-SK0004.dwg

STRUCTURE NAME	G6/1	G5/1		M4/1		M3/1		M2/1		H1/1	
STANDARD STRUCTURE/ INLET CAPACITY CHART	TYPE A GULLY (SAG); LIP IN LINE 4.8m Lintel; LAYBACK K&C ø1200mm MANHOLE		TYPE A GULLY (SAG); LIP IN LINE 2.4m Lintel; LAYBACK K&C ø1200mm MANHOLE		SWD ACCESS CHAMBER; TYPE D LID REFER IPWEAQ STD DRG DS-010 ø1050mm MANHOLE		SWD ACCESS CHAMBER; TYPE D LID REFER IPWEAQ STD DRG DS-010 ø1050mm MANHOLE		SWD ACCESS CHAMBER; TYPE D LID REFER IPWEAQ STD DRG DS-010 ø1050mm MANHOLE		PRECAST HEADWALL 525mm OUTLET 10
Pipe Size (mm)		900		450		450		450		450	
Pipe Class		2		2		2		2		2	
Pipe Grade (%)		1.01%		0.50%		0.50%		0.50%		0.50%	
Pipe Slope (1 in X)		1:99.3		1:200.0		1:200.0		1:200.0		1:200.0	
Full Pipe Velocity (m/s)		0.51		3.13		1.17		1.87		1.38	
Part Full Velocity (m/s)		2.16		3.13		1.44		1.87		1.42	
DATUM RL		21.0									
Q2 H.G.L. IN PIPE Q2 W.S.E. IN STRUCTURE		31.623	31.625	31.583	31.573	31.433	31.243	31.219	31.219	31.103	31.027 31.027
PIPE FLOW (m^3/s)		0.326		0.495		0.186		0.218		0.216	
PIPE CAPACITY AT GRADE (m^3/s)		1.825		0.212		0.202		0.165		0.216	
DEPTH TO INVERT		1.200	1.280	1.310	1.464	1.494	1.861	1.891	2.207	2.237	0.653 0.653
INVERT LEVEL OF PIPE/DRAIN		31.293	31.213	31.183	31.123	31.093	30.939	30.909	30.820	30.790	30.700 30.700
SURVEYED SURFACE LEVEL	32.757		32.238		32.055		31.336		31.394		31.706
DESIGN SURFACE LEVEL	32.493		32.493		32.586		32.800		33.027		31.353
SETOUT COORDINATES Where relevant, Easting & Northing setout coordinates shall be cross referenced with property boundary setout dimensions.	E 495893.701 N 6992687.000		E 495897.879 N 6992693.823		E 495909.179 N 6992689.677		E 495939.328 N 6992684.074		E 495957.004 N 6992681.762		E 495972.720 N 6992672.930



CONCEPT STORMWATER LONGITUDINAL SECTION

Scale 1:1000 (H); 1:100 (V) (A1)

LEGEND:

Design Surface

Natural Surface

PLAN NOTES:

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REFERENCE NOTES:

R.1. Amity Stage 1 as constructed drawings.

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

Queensland Government

SARA ref: 2107-23774 SPD

Date: 19 August 2021

SCALE BARS

0 1 2 3 4m — 1:100(A1) 1:200(A3)

0 10 20 30 40m — 1:1000(A1) 1:2000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
B	FOR APPROVAL	13/05/21	ARB	ARB	DAW	DAW
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TITLE
CONCEPT STORMWATER LONGITUDINAL SECTION

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AHD	MGA-56	A1

COUNCIL RAL/MCU NO. DA/35817/2018

COUNCIL OW NO.

PROJECT NO.	DRAWING NO.	ISSUE
14883	C-SK0004	B

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CALLAGHAN ROAD

99
RP907550

FUTURE
ADJOINING
SUBDIVISION

Discharge Location E1

Discharge Location E2

Discharge Location E3

D2
0.457ha
f_i 85%

E1
0.882ha
f_i 85%

D1
1.425ha
f_i 85%

E2
0.336ha
f_i 85%

E3
0.832ha
f_i 85%

ROAD 1

ROAD 2

ROAD 3

Fall

CS

Roofwater from Lot 54–57 contribute to Amity Basin via interallotment drainage to Line 1.

AMITY BASIN

EXISTING
TRUNK SEWER
PUMP STATION

VENUS STREET

CONCEPT STORMWATER CATCHMENT PLAN

Scale 1:500 (A1)

PRELIMINARY
17 May 2021

LEGEND:

- Existing Property Boundary
- Existing Easement Boundary
- Proposed Property Boundary
- Stormwater Catchment Boundary
- G1/1 0.00ha — Stormwater Catchment and Area
- Proposed Stormwater
- Existing Stormwater
- Design Minor Contours
- 609.00 — Design Major Contours

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REFERENCE NOTES:

R.1. Amity Stage 1 as constructed drawings.

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

SARA ref: 2107-23774 SPD

Date: 19 August 2021

Queensland Government

SCALE BARS
0 5 10 15 20m
1:500(A1) 1:1000(A3)

ISSUE	DESCRIPTION	DATE	DWN	DES	CHK	APP
A	FOR APPROVAL	13/05/21	ARB	ARB	DAW	DAW

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TITLE
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COUNCIL OW NO.

PROJECT NO.	DRAWING NO.	ISSUE
14883	C-SK0005	A

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Flooding and Stormwater Management Plan

265-275 Callaghan Road and 305 Burpengary Road, Narangba

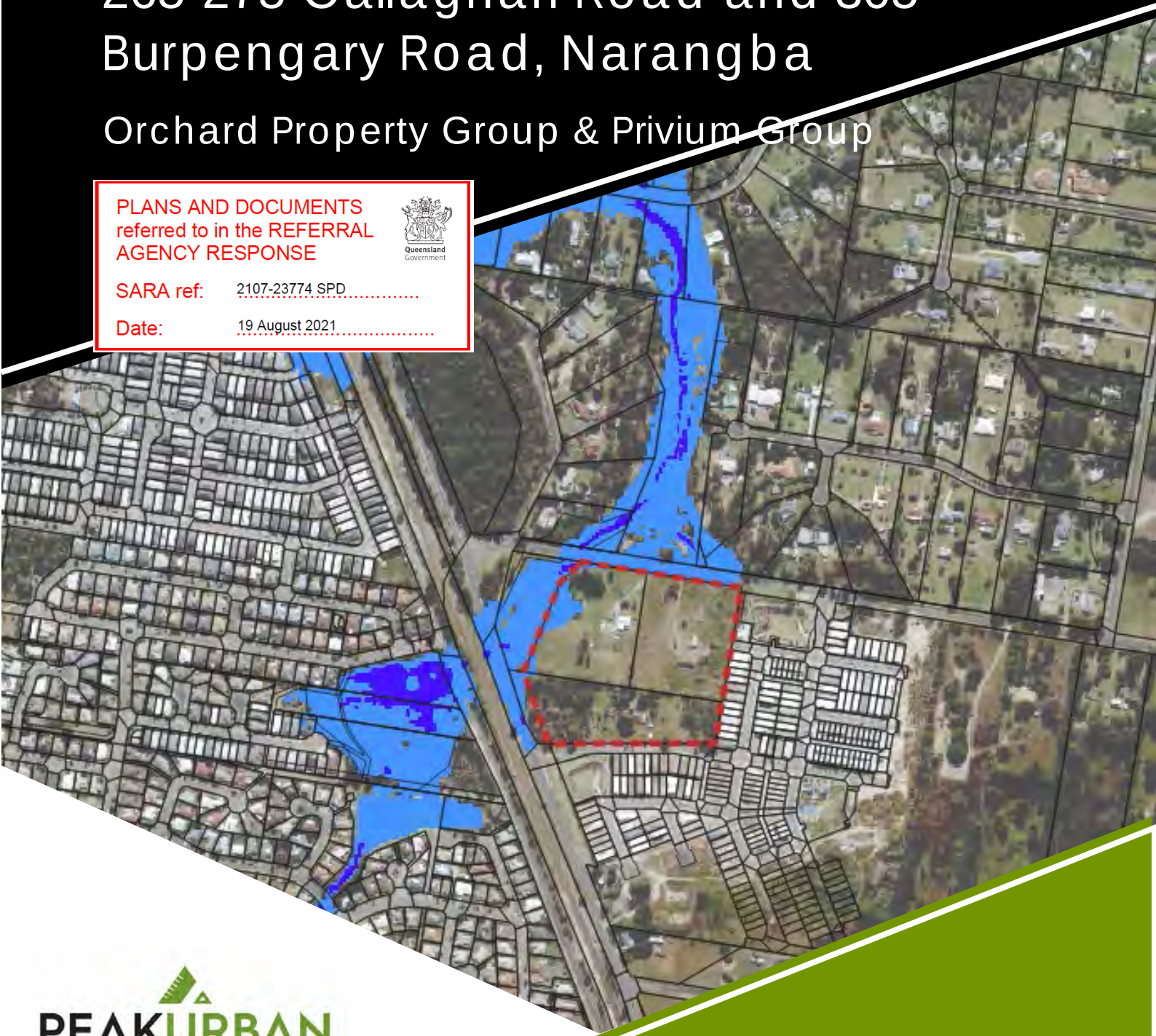
Orchard Property Group & Privium Group

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

Queensland Government

SARA ref: 2107-23774 SPD

Date: 19 August 2021



PEAKURBAN
Achieve more.

17-0112FSMP01-V1
June 2021

COMMERCIAL IN CONFIDENCE

PEAKURBAN Pty Ltd
ABN 44 615 403 506

Brisbane
Level 4, 196 Wharf Street
Spring Hill Qld 4000

Sunshine Coast
Level 2, 1 Innovation Parkway
Birtinya Qld 4575

Melbourne
Level 1, 1-5 Nantilla Road
Notting Hill Vic 3168

E enquiries@peakurban.com.au
W peakurban.com.au

DOCUMENT CONTROL
17-0112FSMP01-V1

Version	Date	Details	Prepared	Checked	Approved	Signed	RPEQ
1	09/06/21	For issue	RB	KM	AN		09298

PLANS AND DOCUMENTS
referred to in the REFERRAL
AGENCY RESPONSE

Queensland Government

SARA ref: 2107-23774 SPD

Date: 19 August 2021

EXECUTIVE SUMMARY

PEAKURBAN Pty Ltd have been engaged by Orchard (Narangba) Developments Pty Ltd & Privium Group to provide a Flooding and Stormwater Management Plan in support of development applications over adjoining sites to Moreton Bay Regional Council (MBRC). The applications are over land located at 265-275 Callaghan Road and 305 Burpengary Road, Narangba, on land currently described as Lots 2RP907550, 1RP907550 and 1RP185250.

The application over Lot 2RP907550 will be a Reconfiguration of Lot development application to create 32 residential lots, roads, parks and green space. This will be referred to as 'the Orchard development site'.

This document is also intended to support a minor change application relating to Lots 1RP907550 and 1RP185250 (to be referred to as 'the Privium development site'). The development application submitted over this lots included a Stormwater Management Plan and subsequent technical advice prepared by RMA Engineers in May 2020. This plan relates only to the areas of the development which will drain west. The catchments draining north to Callaghan Road will remain unchanged from the approved SWMP.

A further advice note from MBRC following a meeting dated (24/03/2021), shows agreement in principle with a no detention strategy for Stages 1-3 of the Privium development based on a stormwater management technical memorandum developed by RMA engineers (07/05/2020).

Discussion with Council regarding the development of both sites indicated that Council wished to achieve an outcome of consolidation of park on the south western corner of the site. As such this plan aims to facilitate Council's preferred outcome.

The subject site (including both developments) covers an approximate area of 5.98ha, is mostly undeveloped and consistent with a rural residential land use. Lots 1RP907550 and 2RP907550 have been mostly cleared while Lot 1RP185250 maintains some low-density wooded vegetation. The site is bound by Callaghan Road to the north, Kallatina Street to the south, Burpengary Road to the west and a low-density residential development 'Amity' to the east. Little Burpengary Creek, a tributary to Burpengary Creek, is located to the immediate northwest of the site and flows through council owned land on at 295 Callaghan Road, described as Lot 99RP907550. This block has been zoned as "Recreation and Open Space".

A 'Flood Check Property Report' was obtained from MBRC's database for the site. It was found that the site is affected by the 5%, 1% and 0.1% AEP regional flood extent and overland flow mapping, triggering a flood impact assessment.

The Plan of Subdivision shows the development extent encroaches on the Medium Flood Hazard Risk Area where filling is likely required to address flood immunity for the development and for the location of stormwater treatment infrastructure. The minor modifications within the medium flood hazard proposed assist in the control of peak flows through the site and support a strategy of no detention basins (reducing the long term maintenance burden to Council).

The MBRC Burpengary Creek (2014) Regional Flood Data hydrologic (WBNM) and hydraulic (TUFLOW) model was used as the basis for the flood impact assessment. Catchment parameters were adjusted within the hydrologic model and the terrain was modified within the hydraulic model to represent the proposed development.

The assessment found that non worsening is achieved from the proposed development. The proposed development layout (including within the MBRC Medium Hazard Flood overlay) will not result in any off-site impacts relating to flooding or flood risk.

Stormwater runoff from the site will pass through a bioretention basin prior to discharge to the receiving environment. The water quality modelling results found annual load reductions of Total Suspended Solids (TSS), Total Phosphorus, Total Nitrogen (TN) and Gross Pollutants (GP) between the Mitigated and Unmitigated Scenarios are achieved through the proposed bioretention basins within the report. The modelling shows the proposed stormwater quality improvement devices are expected to result in less pollutant loading than the existing case land use. This satisfies Schedule 10 of the Moreton Bay Regional Council planning scheme.

The legal point of discharge requirements will be met via discharging to Little Burpengary Creek with no increased nuisance to third party property.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1. INTRODUCTION

PEAKURBAN Pty Ltd have been engaged by Orchard (Narangba) Developments Pty Ltd & Privium Group to provide a Flooding and Stormwater Management Plan in support of development applications over adjoining sites to Moreton Bay Regional Council (MBRC). The applications are over land located at 265-275 Callaghan Road and 305 Burpengary Road, Narangba, on land currently described as Lots 2RP907550, 1RP907550 and 1RP185250.

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This document is also intended to support a minor change application relating to Lots 1RP907550 and 1RP185250 (to be referred to as 'the Privium development site'). The development application submitted over this lots included a Stormwater Management Plan and subsequent technical advice prepared by RMA Engineers in May 2020. This plan relates only to the areas of the development which will drain west. The catchments draining north to Callaghan Road will remain unchanged from the approved SWMP.

The proposed outcome of this document is to identify stormwater management options that could be implemented within the development to achieve the requirements and targets of Moreton Bay Regional Council (MBRC) Planning Scheme *"Works Code"* as well as the relevant provisions of State Planning Policy (SPP 2017). The intent of the codes associated with these documents will be achieved through the appropriate integration of stormwater management options within the proposed residential land-use. The objectives of this Stormwater Management Plan are to:

- Detail the proposed stormwater quality management strategy and how the load reduction objectives specified by the State Planning Policy (SPP, DSDIP 2017) and Schedule 10 of the MBRC Planning Scheme are achieved during the operational phase of the development;
- Consider suitable Stormwater Quality Improvement Devices (SQID's) based on Water Sensitive Urban Design (WSUD) principles;
- Outline the maintenance requirements for the proposed stormwater quality improvement devices;
- Ensure the development achieves non-worsening principles of stormwater flows downstream of the site; and
- Demonstrate how the lawful point of discharge requirements for the site will be achieved.

The intent of the ROLs are demonstrated by the inclusion of a Concept Plan of Subdivision showing the layout of the proposed development. The Concept Plan of Subdivision and can be found in Appendix A.

1.1. Background

A development application has been lodged over the Privium development site (Lots 1RP907550 and 1RP185250) and a Stormwater Management Plan was prepared by RMA in May 2020. This plan and subsequent additional information proposed that Stage 1 and part of Stage 3 of the development be discharged north across Callaghan Road, utilising the adjacent existing 'Amity' bioretention basin for stormwater treatment. Discharge of

stormwater was proposed without mitigation via a detention basin. The balance of the development would be discharged west towards the Orchard development site and Lot 99RP907550.

A further advice note from MBRC following a meeting dated (24/03/2021), shows agreement in principle with a no detention strategy for Stages 1-3 of the Privium development based on a stormwater management technical memorandum developed by RMA Engineers (17/05/2020). This technical memorandum can be summarised as follows:

- no detention is required prior to discharge to Little Burpengary Creek from Stage 1-3 of the development;
- stormwater quality targets for Stage 1-3 are to be met through augmentation of the existing bioretention/detention basin in Lot 9996SP295608. This requires an additional 50m2 of filter media surface area;
- additional minor storm flows of up to the 63.9% AEP from the development to the bioretention/detention basin does not compromise its performance.

Discussion with MBRC for both development sites indicated that Council wished to see a consolidated park located adjacent to Burpengary Road. To facilitate this a stormwater strategy is presented for the west draining catchments of the Privium site and the Orchard development.

The purpose of this FSMP is to address stormwater quality and quantity for the west draining stages of Priviums proposed development as well as Orchard's development.

MBRC have provided agreement in principle to Privium that stormwater quantity and quality can be carried out within existing Lot 99RP907550 subject to detailed design. This is also conditional to rehabilitating Lot 99RP907550 with native species, including trees and scrubs.

1.2. Site Location

The location of the proposed development site is shown in Figure 1-1, covering and approximate area of 5.98ha. The site is mostly undeveloped and consistent with a rural residential land use. Lots 1RP907550 and 2RP907550 have been mostly cleared while Lot 1RP185250 maintains some low-density wooded vegetation. The site is bound by Callaghan Road to the north, Kallatina Street to the south, Burpengary Road to the west and a low-density residential development 'Amity' to the east. Little Burpengary Creek, a tributary to Burpengary Creek, is located to the immediate northwest of the site and flows through council owned land on at 295 Callaghan Road, described as Lot 99RP907550. This block has been zoned as "Recreation and Open Space".

Figure 1-1: Site Location (*Source: ESRI Imagery 2020*)

1.3. Site Characteristics and Drainage

The majority of runoff from the site reports to Little Burpengary Creek to the northwest. A slight ridge traversing the eastern half of the site directs a portion of runoff to a mapped overland flow path in the northeast as shown in Figure 1-2. Elevation ranges across the site vary from 43 mAHD to 29 mAHD. There are two existing farm dams located on the site, one to the northeast and one to the northwest which is mapped to be within the defined flood extent.

A 'Flood Check Property Report' was obtained from MBRC's database for the site (Appendix B). It was found that the site is affected by the 5%, 1% and 0.1% AEP regional flood extent and overland flow mapping as shown in Figure 1-2. This also shows the proposed development extent compared to the flood hazard overlay. This shows the development extent has been proposed within the medium flood hazard area triggering a flood impact assessment.

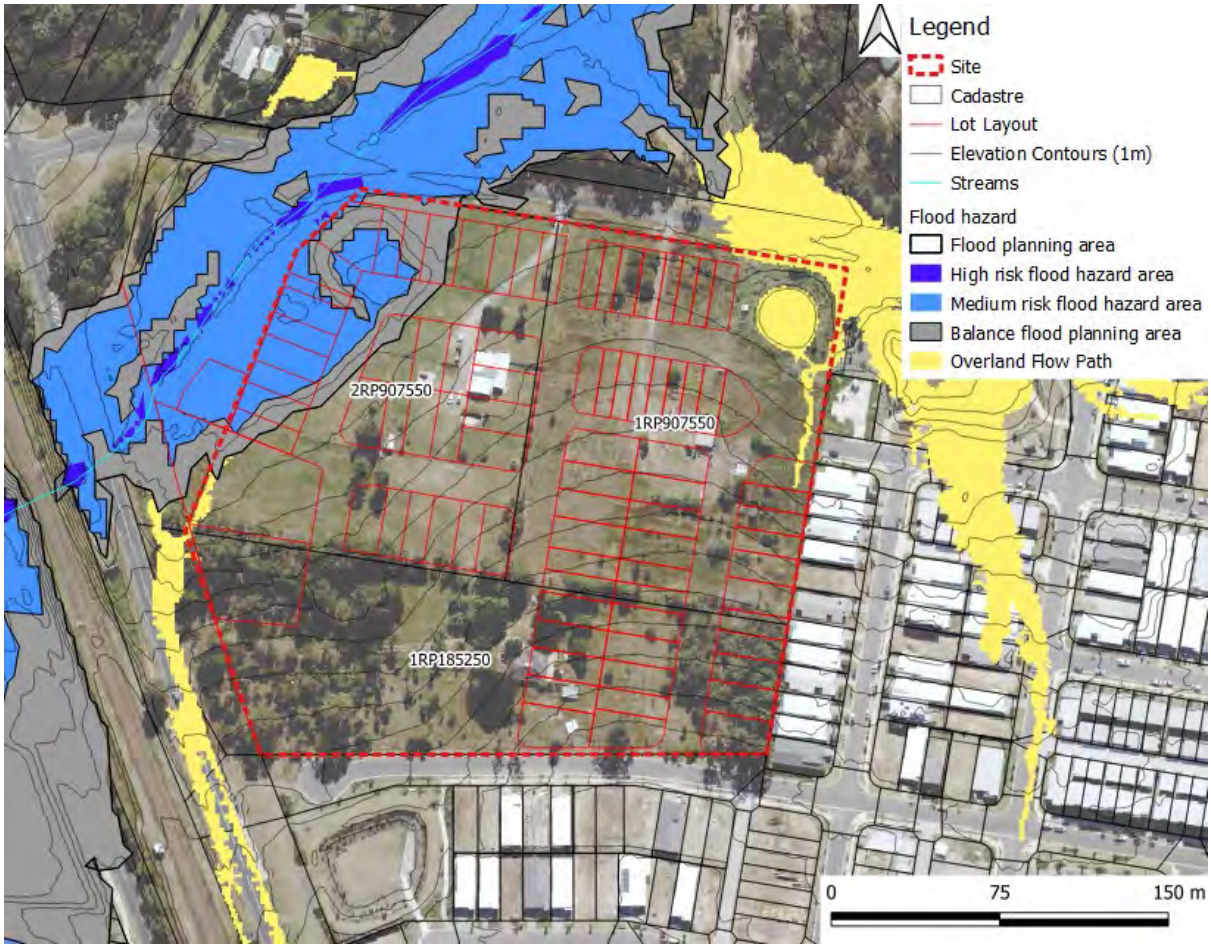

Figure 1-2: Proposed development Layout, Overland Flow Paths and Flood Hazard Risk Overlay Mapping

2. STORMWATER QUANTITY

The objective of this component of the study is to investigate the potential impact that the proposed development will have on peak flows discharging downstream of the site and any associated impacts of the proposed layout.

2.1. Hydrologic Model

The Burpengary Creek Regional Flood Dataset (BUR; 2013) sub-catchment delineation and WBNM hydrologic model were used as the basis for the assessment. The models were sourced from MBRC. A hydrologic assessment was completed for the waterways that affect the site, including the 63.2%, 39%, 20%, 10%, 5%, 2% and 1% AEP events for the 30min to 360min storm durations.

2.1.1. Catchments

The existing BUR sub-catchment parameters have been adjusted to represent changes within the catchment upstream of the site from the 'Amity' development. The changes were made to best represent: 2019 LiDAR contours, approved operational works drawings and the approved Stormwater Management Plan (SMP), in order of precedence, dated 25th May 2016 by RMA Engineers. This scenario is referred to as the 'Base Case' herein.

To reflect the changes, sub-catchments LBC_01_11299 and LBC_01_10735 has been split into five (5) sub-catchments, namely 01_11299a, 01_10735a, 01_10735b, LBC_01_11299 and LBC_01_10735. Sub-catchments 01_11299a and 01_10735a each contain a basin. Basin parameters have been determined from operational works documentation and the approved SMP. Refer to Appendix B for a summary of the basin parameters included within the model.

The existing BUR sub-catchment delineation is shown in Figure 2-1 with the Base Case sub-catchment delineation shown in Figure 2-2. Table 2-1 summarises the changes to sub-catchment parameters resulting from the 'Amity' development and previously approved ROL for stages 1-3 of Privium's development. This shows sub-catchments 01_11299a, 01_10735a and 01_10735b have higher percentage imperviousness consistent with developed catchments. Fraction imperviousness selections have been based of values found within literature.

Additional adjustments to the Base Case sub-catchments imperviousness were made to reflect the impacts of the proposed development. This scenario is referred to as the 'Developed Case' herein. The changes to the sub-catchment parameters are summarised in Table 2-1.

Table 2-1: BUR Sub-catchment Modifications

Scenario	Existing BUR Model		Base Case		Developed Case	
Sub-catchment	Area (ha)	% Imp	Area (ha)	% Imp	Area (ha)	% Imp
LBC_01_11299	8.718	6.6	6.075	6.6	6.075	53.0
LBC_01_10735	42.673	6.6	31.370	6.6	31.370	6.6
01_11299a	-	-	3.262	70.0	3.262	70.0
01_10735a	-	-	8.684	70.0	8.684	70.0
01_10735b			2.000	75	2.000	75

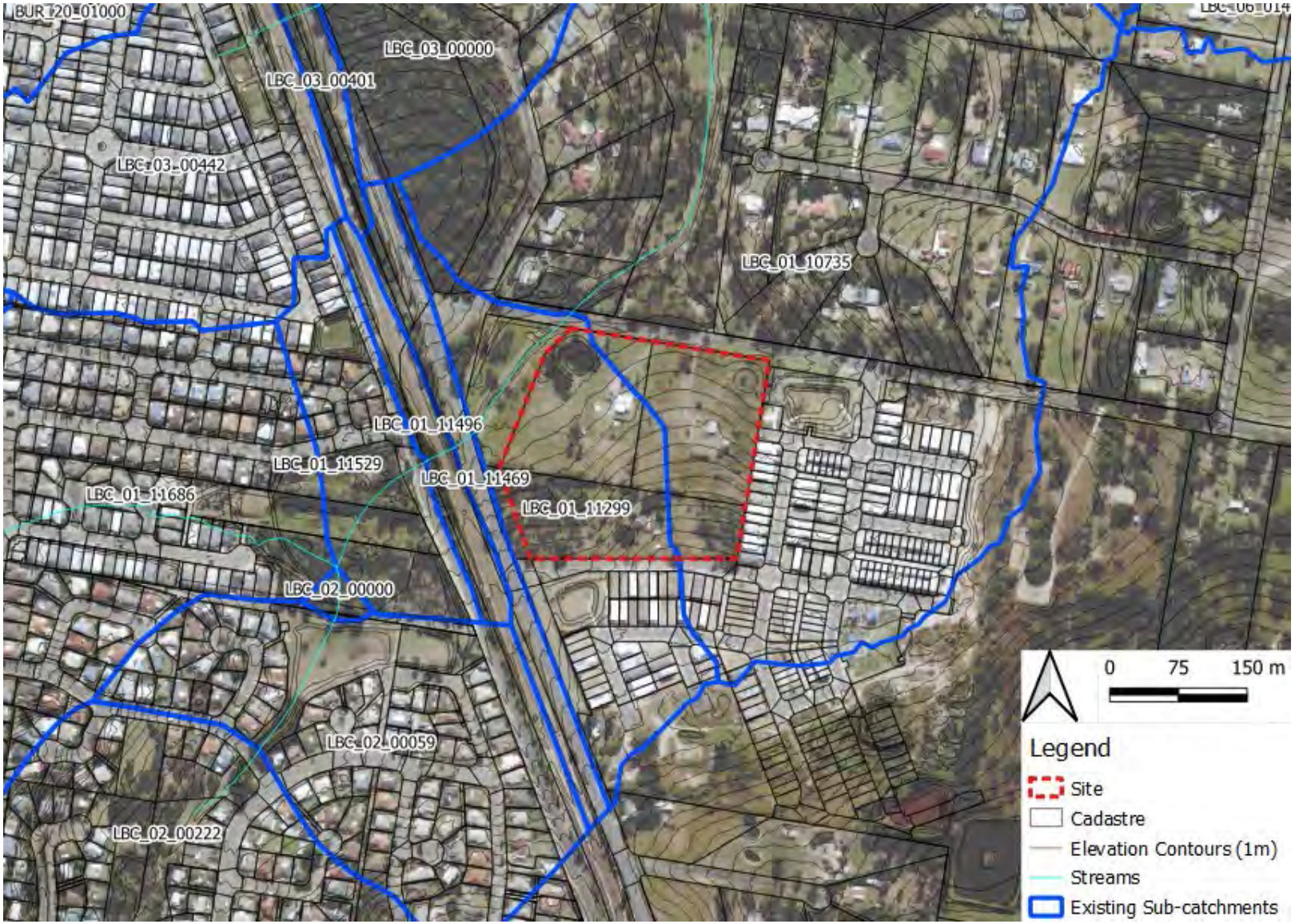

Figure 2-1: Existing BUR Sub-catchment Delineation

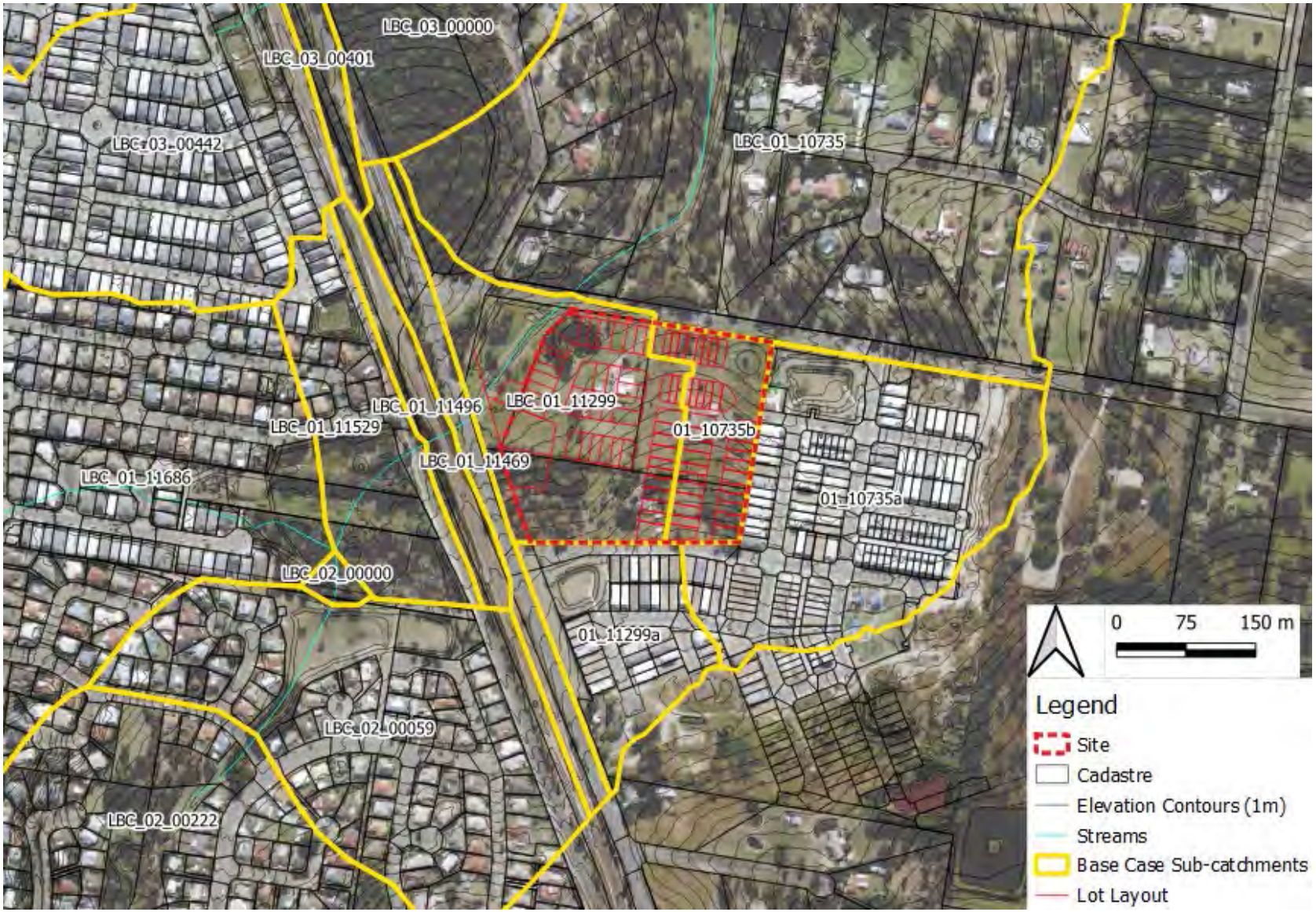

Figure 2-2: Base and Developed Case Sub-catchment Delineation

2.1.2. Intensity Frequency Duration (IFD)

The IFD's applied to each catchment are as per the IFD values for BUR01 to BUR03 developed as part of the BUR WBNM model. The IFD values applied within WBNM is detailed in Table 2-2.

Table 2-2: Applied IFD Values

Gauge	2yr 1hr	2yr 12hr	2yr 72hr	50yr 1hr	50yr 12hr	50yr 72hr	F2	F50	Skew
BUR03	48.67	9.43	2.94	91.83	19.49	7.06	4.40	17.34	0.13
BUR02	48.36	9.56	2.95	91.06	19.48	6.76	4.39	17.32	0.15
BUR01	47.83	9.70	2.94	89.52	19.15	6.52	4.39	17.30	0.17

2.1.3. Catchment Losses

Catchment losses for each event have been applied as per the Regional Floodplain Database Design Rainfall – Burpengary Pilot Project Report Worley Parsons, 2012) and are summarised in Table 2-3.

Table 2-3: Catchment Losses

Event	Initial Loss (mm)	Continuing Loss (mm/hr)
<= 5% AEP	15	2.5
>5% AEP	0	2.5

2.1.4. Hydrologic Modelling Results

The hydrologic modelling has been undertaken for the 63.2% to 1% AEP scenario for the Existing, Base Case and Developed Case scenarios. The results of the hydrologic modelling is shown in Table 2-4 to Table 2-9 for three critical reporting locations. These are the outlet of the development (LBC_01_11299), which assesses the local flooding impact of the development, downstream of the confluence with the 'Amity' development (LBC_01_10735) and several catchments further downstream (LBC_01_07590) to assess the regional flooding impacts.

The modelling found that the updated sub-catchment parameters for the Base Case resulted in an increase in peak flow across all design events at all locations. This has been mostly attributed to the increased in imperviousness within the catchment from the approved developments. It is noted that the basin and catchments have been represented with the best available data within the limitations of the modelling software. Outlet configurations could not be exactly recreated within WBNM as per the operational works drawings. Given the assessment is regarding impacts resulting from the development only, this is considered an acceptable basis for the modelling.

Table 2-4: Peak Flow Comparison at LBC_01_11299 (Existing vs. Base Case)

Scenario	Existing Peak Flow (m^3/s)	Base Case Peak Flow (m^3/s)	Difference (%)
63.2% AEP	5.099	5.344	4.8%
39% AEP	7.379	7.773	5.3%
20% AEP	10.613	11.146	5.0%
10% AEP	12.659	13.247	4.6%
5% AEP	15.448	16.104	4.2%
2% AEP	21.220	22.057	3.9%
1% AEP	24.200	25.137	3.9%

Table 2-5: Peak Flow Comparison at LBC_01_10735 (Existing vs. Base Case)

Scenario	Existing Peak Flow (m^3/s)	Base Case Peak Flow (m^3/s)	Difference (%)
63.2% AEP	5.864	6.509	11.0%
39% AEP	8.488	9.466	11.5%
20% AEP	12.209	13.555	11.0%
10% AEP	14.588	16.100	10.4%
5% AEP	17.788	19.606	10.2%
2% AEP	24.046	26.422	9.9%
1% AEP	27.468	30.166	9.8%

Table 2-6: Peak Flow Comparison at LBC_01_07590 (Existing vs. Base Case)

Scenario	Existing Peak Flow (m^3/s)	Base Case Peak Flow (m^3/s)	Difference (%)
63.2% AEP	10.187	10.525	3.3%
39% AEP	14.961	15.409	3.0%
20% AEP	21.856	22.455	2.7%
10% AEP	26.084	26.752	2.6%
5% AEP	31.800	32.595	2.5%
2% AEP	43.943	44.966	2.3%
1% AEP	50.652	51.786	2.2%

Table 2-7 shows a minor decrease in peak flow is predicted to occur at the site outlet while Table 2-8 shows a minor increase in peak flows are predicted for events up to the 5% AEP and begin decreasing for rarer events at the first confluence. Table 2-9 shows a minor increase in peak flow is expected within the Little Burpengary Creek further downstream. The impacts are due to a change in timing to the peak, where flows from the development are able to escape earlier than the peak from the upstream catchments, however coincide with peaks further downstream.

A definitive assessment of the adverse impacts of the minor increases and changes to timing in Little Burpengary Creek are better informed using a hydraulic model. The proposed development has been prescriptively included in the TUFLOW hydraulic model for which a spatial assessment of the flood impacts has been undertaken for a range of design event magnitudes. This is discussed in detail in the following section.

Table 2-7: Peak Flow Comparison at LBC_01_11299 (Base Case vs. Developed)

Scenario	Base Case Peak Flow (m^3/s)	Developed Peak Flow (m^3/s)	Difference (%)
63.2% AEP	5.344	5.307	-0.7%
39% AEP	7.773	7.698	-1.0%
20% AEP	11.146	11.058	-0.8%
10% AEP	13.247	13.153	-0.7%
5% AEP	16.104	15.969	-0.8%
2% AEP	22.057	21.857	-0.9%
1% AEP	25.137	24.913	-0.9%

Table 2-8: Peak Flow Comparison at LBC_01_10735 (Base Case vs. Developed)

Scenario	Base Case Peak Flow (m^3/s)	Developed Peak Flow (m^3/s)	Difference (%)
63.2% AEP	6.509	6.560	0.8%
39% AEP	9.466	9.506	0.4%
20% AEP	13.555	13.577	0.2%
10% AEP	16.100	16.114	0.1%
5% AEP	19.606	19.610	0.0%
2% AEP	26.422	26.386	-0.1%
1% AEP	30.166	30.132	-0.1%

Table 2-9: Peak Flow Comparison at LBC_01_07590 (Base Case vs. Developed)

Scenario	Base Case Peak Flow (m^3/s)	Developed Peak Flow (m^3/s)	Difference (m^3/s)
63.2% AEP	10.525	10.613	0.8%
39% AEP	15.409	15.506	0.6%
20% AEP	22.455	22.556	0.4%
10% AEP	26.752	26.847	0.4%
5% AEP	32.595	32.701	0.3%
2% AEP	44.966	45.087	0.3%
1% AEP	51.786	51.920	0.3%

2.2. Hydraulic Model

Hydraulic modelling has been carried out using TUFLOW software developed by BMT WBM in Brisbane. TUFLOW is a computational engine that provides one-dimensional (1D) and two-dimensional (2D) solutions for free-surface flow equations to simulate flood and tidal wave propagation.

The BUR Flood Study (MBRC, 2014) TUFLOW model was cut-down and used as the basis for the Base Case and Developed Case scenarios. The extent of the model cut-down is shown in Figure 2-3. Modelling assumptions and outcomes are described in the following sections.

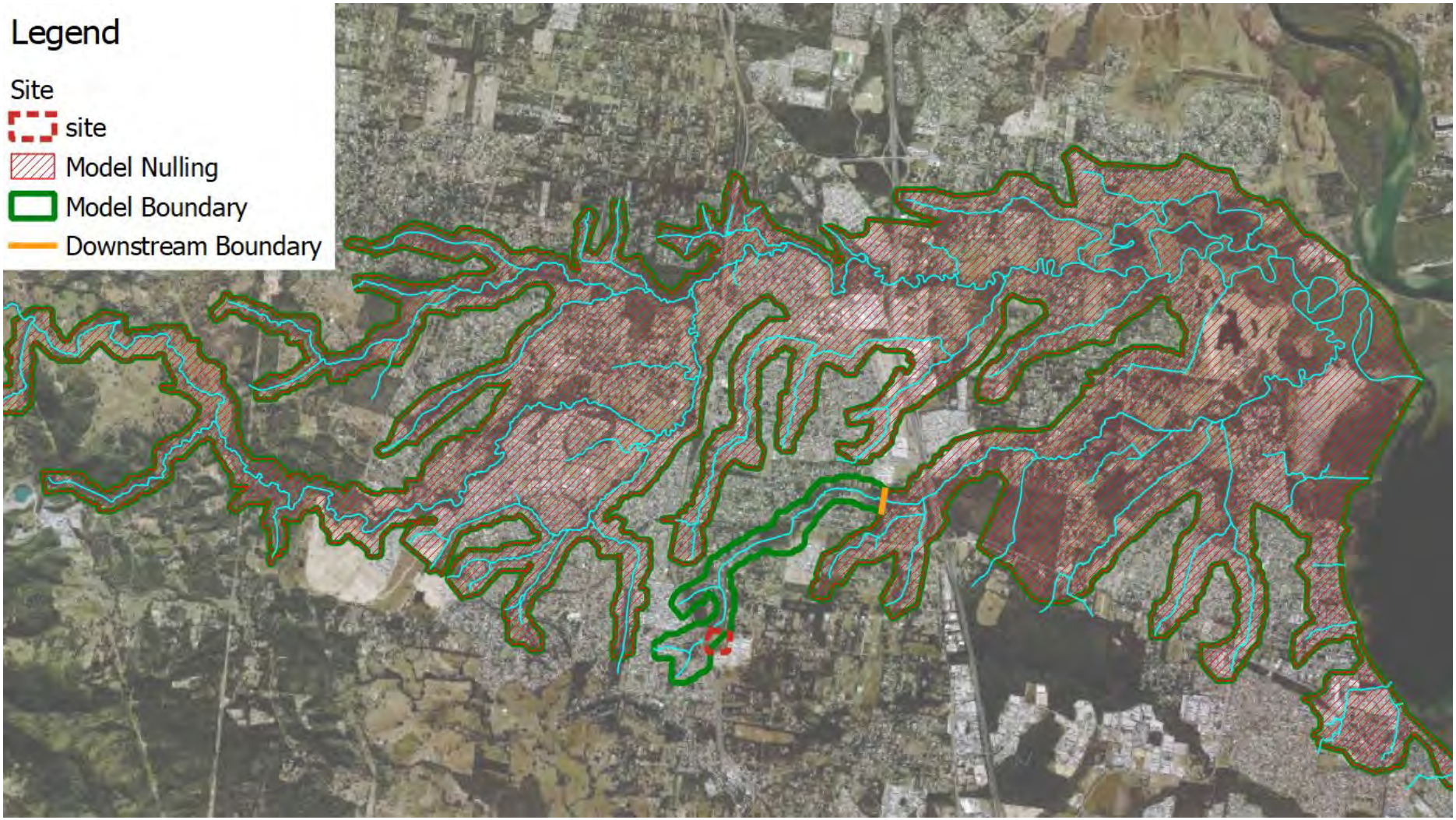

Figure 2-3: Model Cutdown Extent

2.2.1. Topography

TUFLOW model topography is based upon a digital elevation model created from aerial LiDAR. The Base Case model topography was updated with site survey (provided by Orchard Group dated 16/02/2021), and the concept Callaghan Road upgrade design (developed by RMA) digital elevation models. The base case model topography is shown in Figure 2-4.

In the developed scenario, the concept design digital elevation model of the proposed development as produced by PEAKURBAN has been stamped over the base case terrain model. Refer to Figure 2-5 for the developed case topography. This design proposes cut and reshaping of the drainage reserve to the west of the development as part of the mitigation strategy. Additional, storage has been included in the drainage reserve by use of terrain manipulations (2d_zsh), as well as some minor verge smoothing.

A 5m hydraulic grid size has been used for the analysis.

Roughness values have been applied as per the BUR flood model for the existing and Base Case scenario models. In the Developed Case scenario, the manning's roughness of the drainage reserve, has been adjusted to reflect medium-density vegetation within the waterway. This was achieved by adjusting the depth varying manning's as shown in Table 2-10.

Table 2-10: Comparison of Depth Varying Manning's Roughness for Drainage Reserve

Low Grass Grazing		Medium-dense Vegetated Waterway	
Depth (m)	**Manning's Roughness (n)**	**Depth (m)**	**Manning's Roughness (n)**
0.0	0.25	0.0	0.25
0.2	0.06	0.6	0.08
0.4	0.045	1.0	0.06
0.8	0.035	2.0	0.045
2.0	0.025	99	0.025
99	0.025		

2.2.2. Inflow

Inflows have been incorporated into the model setup using inflow polygons (2d_sa) to read in the inflow hydrographs from the hydrology models. All inflows were applied directly from the WBNM model based on full hydrograph inclusion and run as unsteady state.

Changes to the inflow locations as a result of the hydrologic modelling updates have been limited to the sub-catchments, 01_11299a, 01_10735a, 01_10735b. These have been included in the model at their relevant downstream boundary locations as local (loc) inflow files.

2.2.3. Tailwater

The tailwater condition for the model has been applied as a HQ boundary (manning's equation) based on a slope of 1%. The cut-down downstream model boundary is located approximately 2.5km downstream of the site and is considered to be a sufficient distance away as to minimise hydraulic effects and model boundary issues within the area of interest.

2.2.4. Structures

Structures have been provided by MBRC in the BUR RFD flood model. The Callaghan Road upgrade concept design includes widening of verges, which fills in the existing culvert inlet. These culverts have been extended, as consistent with the design, in both the Base and Developed Cases to account for the design. The culvert extension included in the model has been summarised in Table 2-11.

Table 2-11: Callaghan Road Culvert Extension Summary

Culvert ID	Size / Type	No. of Cells	USIL (m AHD)	DSIL (m AHD)
01_11299a_ex	525mm RCP	3	28.175	28.125
01_11299b_ex	450 RCP	1	28.175	28.125

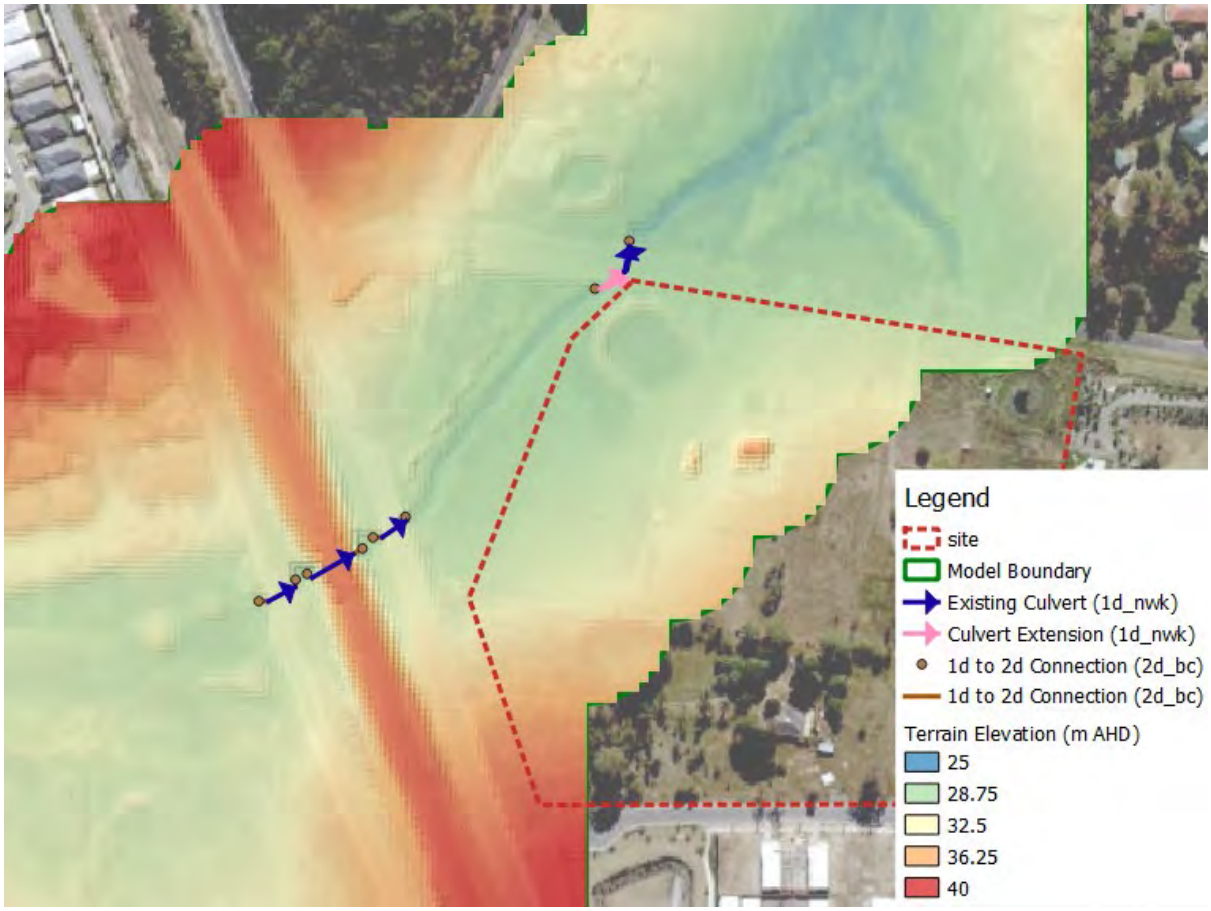

Figure 2-4: Base Case Topography

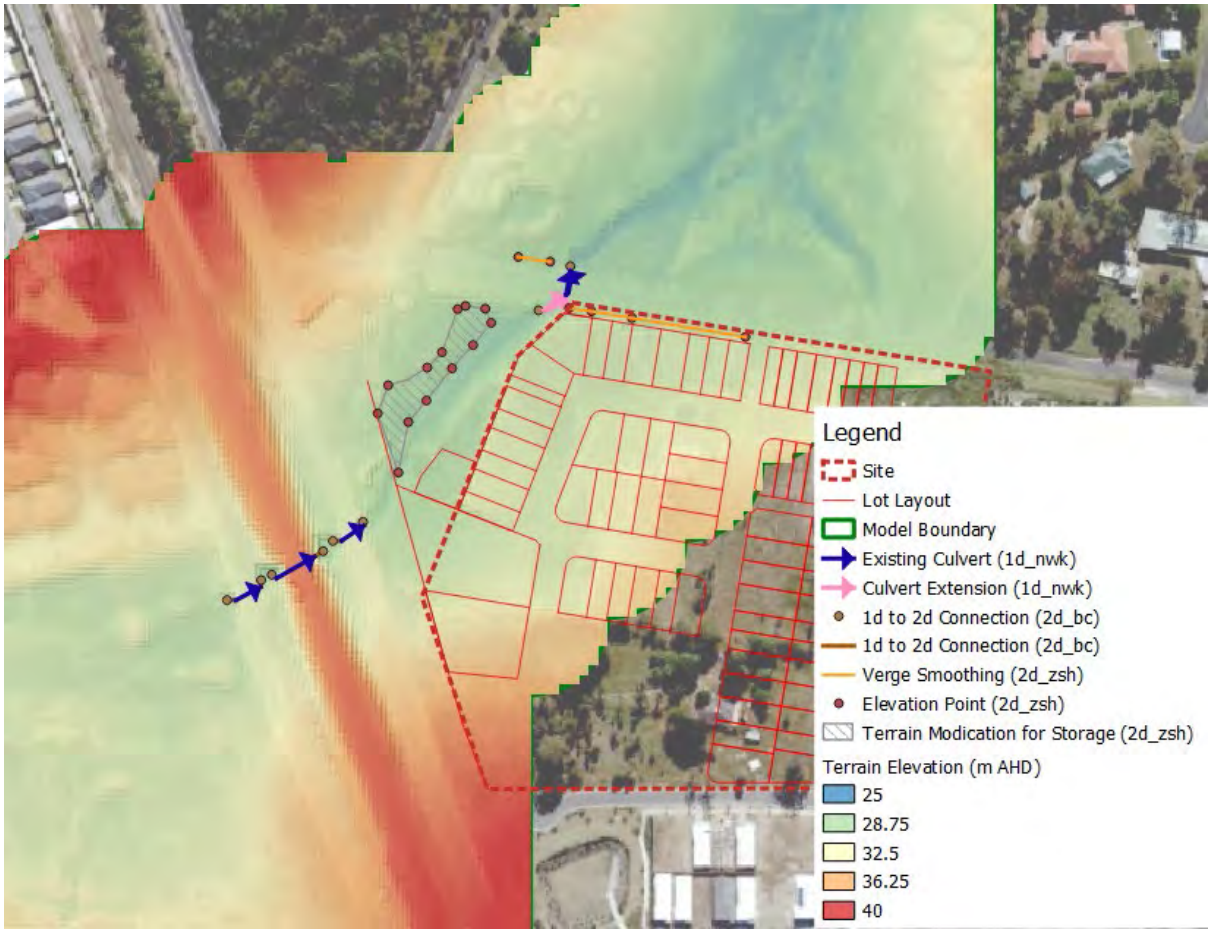

Figure 2-5: Developed Case Topography

2.2.5. Model Validation

The cut-down model has been run with both the Classic (2013-12-AD) and HPC (2020-10-AA) solvers and compared against the supplied BUR flood model peak flows for the 1% AEP 90-minute (determined to be the critical duration) storm event at three (3) different reporting locations. Table 2-12 shows the comparison of peak flows between the 2013-12-AD and BUR model.

Table 2-13 compares the peak flows of the 2020-10-AA to the BUR model and Table 2-14 compares the 2013-12-AD and 2020-10-AA peak flows.

The results show that the differences between the supplied CAB Flood Model, cut-down 2013-12-AD and 2020-10-AA are all typically within 2%, except for the HPC 2020-10-AA at reporting location BUR_LBC_005. This location found differences of approximately 7%. This is due to the difference in solving methods between the solvers for shallow flow over broad weirs. Although there is a minor difference at this location it is considered a reasonable peak flow validation has been achieved and the cut-down 2020-10-AA model is considered acceptable as the basis for conducting the hydraulic assessment.

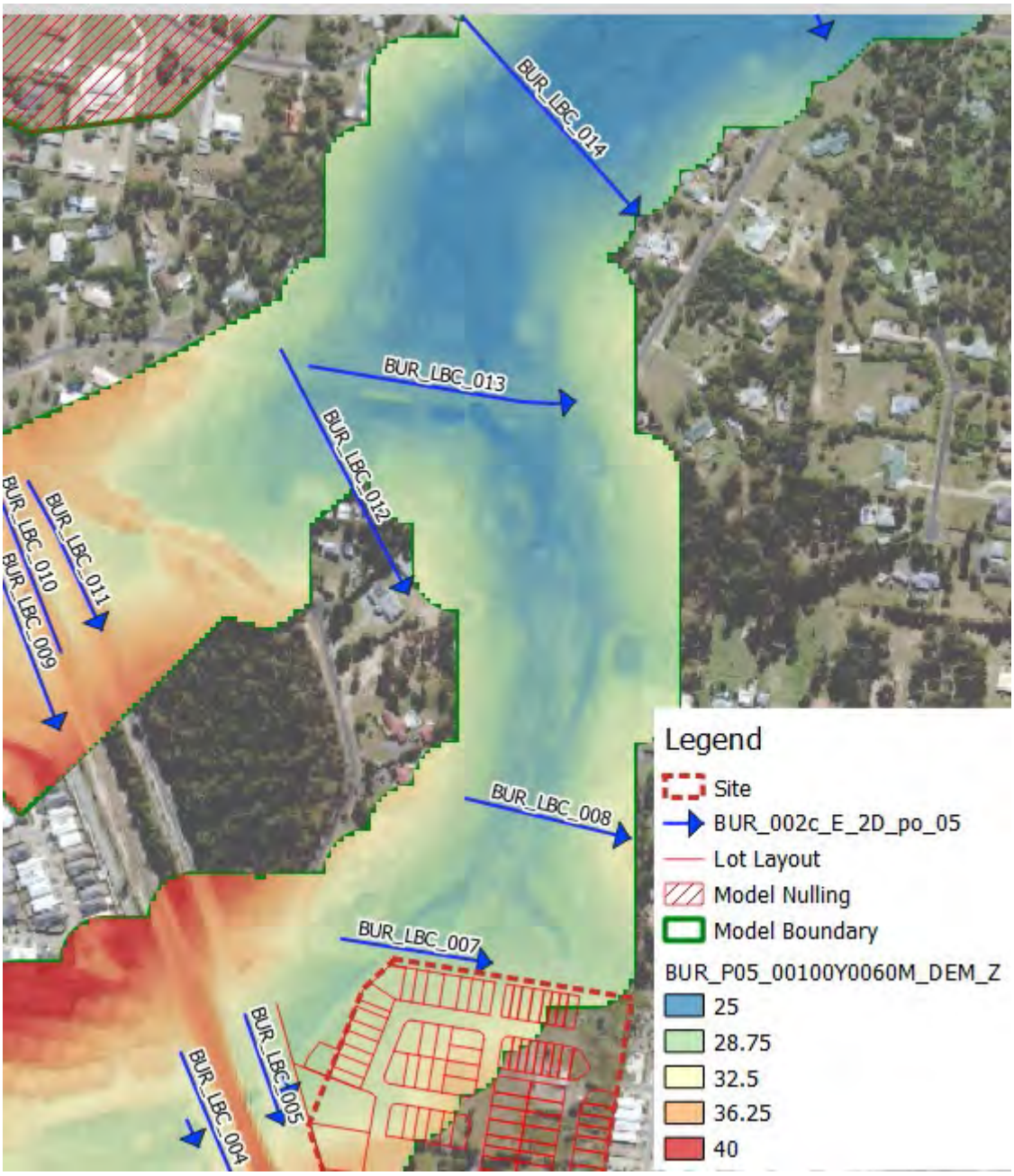

Figure 2-6: Flow Comparison Reporting Locations

Table 2-12: Base Case Classic (2013) vs Supplied BUR Flood Model Flow Comparison (1% AEP 360 Minute)

Location	BUR Flood Model (m^3/s)	2013-12-AD (m^3/s)	Difference (m^3/s)	Difference (%)
BUR_LBC_005	1.497	1.500	0.003	0.2
BUR_LBC_007	11.033	11.032	-0.001	0.0
BUR_LBC_008	15.027	15.027	-0.001	0.0
BUR_LBC_014	25.366	25.362	-0.004	0.0

Table 2-13: Base Case (2020) vs Supplied CAB Flood Model Flow Comparison (1% AEP 360 Minute)

Location	BUR Flood Model (m^3/s)	2020-10-AA (m^3/s)	Difference (m^3/s)	Difference (%)
BUR_LBC_005	1.50	1.62	0.12	7.35%
BUR_LBC_007	11.03	10.84	-0.19	-1.76%
BUR_LBC_008	15.03	14.71	-0.32	-2.19%
BUR_LBC_014	25.37	25.32	-0.05	-0.18%

Table 2-14: Base Case HPC (2018) vs Base Case Classic (2013) l Flow Comparison (1% AEP 360 Minute)

Location	2013-12-AD (m^3/s)	2020-10-AA (m^3/s)	Difference (m^3/s)	Difference (%)
BUR_LBC_005	1.50	1.62	0.12	7.16%
BUR_LBC_007	11.03	10.84	-0.19	-1.76%
BUR_LBC_008	15.03	14.71	-0.32	-2.18%
BUR_LBC_014	25.36	25.32	-0.04	-0.16%

2.3. Results

The Base Case and Developed Case cutdown HPC 2020-10-AA TUFLOW hydraulic models have been assessed for a range of flood events from the 63.2 % to 0.1% AEP. The assessment has considered a range of design storm durations to ensure that the critical storm is defined.

The results of the hydraulic assessment are presented as a series of flood maps to illustrate the flooding characteristics of the Base Case and Developed scenario across a range of flood properties including water surface level, depth, hazard and velocity. The maximum flood depth and afflux levels have been combined and mapped for all event durations assessed.

The flood maps are presented in Appendix D to Appendix G.

2.3.1. Flood Levels, Afflux and Depth

Flood depth mapping is provided in Appendix D as figure number 1D to 12D. Flood level and afflux mapping is provided in Appendix E as figure numbers 13E to 30E.

The afflux mapping shows some minor afflux impacts (shown as pink cells) and increased flood extent (shown as magenta cells) downstream of the property, most notably in the 5% AEP event. It has been determined that impacts do not considerably increase flood hazard risk and are considered an acceptable outcome.

Larger increases in afflux have been found within drainage reserve. This is the result of compensatory cut and roughening of the model domain increasing water surface levels and extent in the developed scenario.

2.3.2. Flood Velocity

Flood velocity mapping is provided in Appendix F as figure numbers 31F to 47F.

The modelling found velocities within the proposed bioretention basin in the drainage reserve do not exceed 0.5m/s in any events up to the 1% AEP. From this, no scour is expected to occur within the bioretention basin during flooding events, reducing the maintenance burden on the ultimate asset owner.

The change in velocity mapping shows no fundamental changes in flood velocities are expected from the development in any flood event, satisfying non-worsening principles.

2.3.3. Flood Hazard and Risk

Flood Hazard mapping has been provided in Appendix G as figure numbers 48G to 62G.

The Flood hazard maps show that there are no fundamental changes to flood hazard as a result of the proposed development.

The Flood Hazard Risk mapping has also been produced based on the requirements of the MBRC Flood Hazard Overlay Code. The modelling found that while the proposed development will alter the extent of Medium Flood Hazard risk within the development there will be no significant changes to the Medium or High Flood Hazard risk extents outside of the development.

2.3.4. Peak Discharge

Table 2-15 compares the peak flow at the site outlet for the Base Case and Developed peak flows. The comparisons show a minor decrease in peak flow is predicted of 0.11% for the 63.2% AEP. All other events saw an increase in peak flows at the downstream boundary. The variations in peak discharge are a result of the altered stage storage behaviour and roughness within the drainage reserve upstream of Callaghan Road.

Table 2-15: Developed vs Base Case Peak Flow Comparison at Downstream Boundary (CAB_WAR_041)

	Critical Duration (min)	Base Case Peak Flow (m3/s)	Developed Peak Flow (m3/s)	Difference (m3/s)	Difference (%)
63.20%	90	5.299	5.2931	-0.006	-0.11%
39%	90	7.1901	7.3339	0.144	2.00%
10%	90	11.0664	11.9254	0.859	7.76%
5%	90	13.4441	14.4872	1.043	7.76%
1%	90	18.3079	18.6677	0.360	1.97%
0.1%	60	25.3775	25.5186	0.141	0.56%

The discharge behaviour for the Base Case and Developed scenario for the 1% AEP and 63.2% AEP events are shown in Figure 2-7. This shows greater discharge from the site occurs marginally earlier in the developed scenario from the reduced reaction time of the increased imperviousness. The resulting Developed Case hydrographs do not fundamentally change in behaviour from the Base Case.

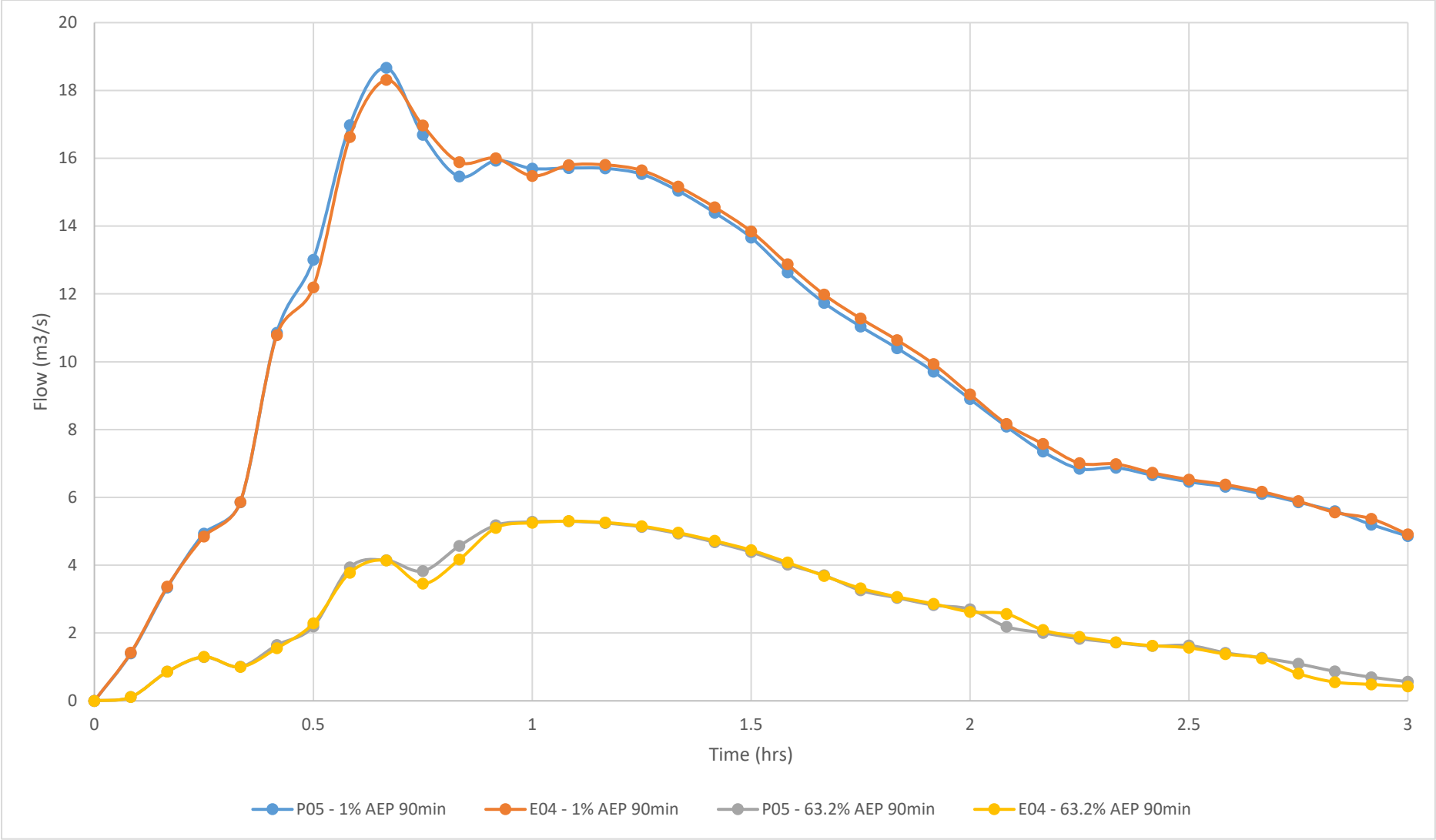

Figure 2-7: Hydrograph at Site Outlet

2.4. Waterway Stability

The results of the hydraulic modelling found a minor decrease in the 63.2% AEP peak flows is predicted at the site outlet which discharges to into Little Burpengary Creek. This satisfies the requirements of Table 10.2.1 of the MBRC Planning scheme Schedule 10 for waterway stability management.

2.5. Lawful Point of Discharge

As outlined by the *Queensland Urban Drainage Manual* (4th Edition – Institute of Public Works Engineering Australasia, Queensland Division) a test can be undertaken to determine whether a lawful point of discharge exists:

The criteria for determining the lawful point of discharge are:

(i) Will the proposed development alter the site's stormwater discharge characteristics in a manner that may substantially damage a third-party property (see Section 3.6)?

- If not, then no further steps are required to obtain tenure for a lawful point of discharge (assuming any previous circumstances and changes were lawful).

It is proposed that discharge of runoff from the proposed development site will be maintained to Little Burpengary Creek to the west. It has been demonstrated that runoff discharging the site into Little Burpengary Creek are not altered in character. It was found that peak flows are predicted to slightly increase, however does not result in any adverse impacts able to substantially damage third party property. As a result, it is considered the discharge locations satisfy the requirements of achieving lawful points of discharge.

3. STORMWATER QUALITY

3.1. Design Objectives

This report identifies the stormwater quality management objectives for the operational phase (post-construction phase) of the proposed development. Construction based stormwater quality management objectives will need to be addressed as part of operational works documentation.

Schedule 10 of the MBRC Planning Scheme (2020) defines the post-construction phase Water Quality Objectives for emerging communities to be the greater pollutant removal of:

1. The load-based Water Quality Objectives (WQO's) stipulated in the State Planning Policy (DILGP, 2017) for the South East Queensland region, as shown in Table 3-1, or
2. No worsening (no increase in pollutant loads of the existing land use).

Table 3-1: Site Stormwater Quality Objectives (Operational Phase)

Minimum reductions in mean annual loads from unmitigated development (%)			
Total Suspended Solids (TSS)	**Total Phosphorous (TP)**	**Total Nitrogen (TN)**	**Gross pollutants >5 mm**
80	60	45	90

3.2. Stormwater Quality Treatment

3.2.1. Strategy

The objective of this report is to assess the stormwater quality measures required based on the development layout to support the development application. Runoff from the development (Catchment A & B) will be collected in a stormwater drainage system and discharged into one bioretention basins located within the drainage reserve to the west prior to being discharged to Little Burpengary Creek. The proposed bioretention basin location is shown on Figure 3-1.

This plan sizes the required SQID's to treat runoff from the proposed development of this site only.

3.2.2. MUSIC Parameters

An assessment of stormwater runoff quality from the existing conditions and proposed developed conditions has been undertaken using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) – Version 6.3, released in 2018.

Climate data for the catchment was sourced from the MUSIC model database. The rainfall and evaporation data template for this site has been based on data from Dayboro (40063) from 1/1/1980-31/12/1989 with six (6) minute rainfall duration.

Table 3-2, Table 3-3 and Table 3-4 outline the adopted source node parameters from "MUSIC Modelling Guidelines" (Water By Design, 2010) that were used in the MUSIC model.

Table 3-2: Existing Conditions (Rural lumped node) - Pollutant Export Parameters

Land Use	Parameter	Total Suspended Solids (Log_{10} mg/L)		Total Phosphorous (Log_{10} mg/L)		Total Nitrogen (Log_{10} mg/L)	
		Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow
Rural	Mean	2.26	0.53	-0.56	-1.54	0.32	-0.52
	Std Deviation	0.51	0.24	0.28	0.38	0.30	0.39

Table 3-3: Urban land use (Split Source Nodes) - Pollutant Export Parameters

Land Use	Parameter	Total Suspended Solids (Log_{10} mg/L)		Total Phosphorous (Log_{10} mg/L)		Total Nitrogen (Log_{10} mg/L)	
		Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow
Ground	Mean	2.18	1.0	-0.47	-0.97	0.26	0.20
	Std Deviation	0.39	0.34	0.31	0.31	0.23	0.20
Road	Mean	2.43	1.0	-0.30	-0.97	0.26	0.20
	Std Deviation	0.39	0.34	0.31	0.31	0.23	0.20
Roof	Mean	1.30	N/A	-0.89	N/A	0.26	N/A
	Std Deviation	0.39	N/A	0.31	N/A	0.23	N/A

Table 3-4: MUSIC Runoff Generation Parameters

Parameter	Existing - Rural	Proposed -Urban
Rainfall Threshold (mm)	1	1
Soil Capacity (mm)	98	500
Initial Storage (%)	10	10
Field Capacity	80	200
Infiltration Capacity Coefficient a	87	211
Infiltration Capacity Coefficient b	3.3	5
Initial Depth (mm)	50	50
Daily Recharge (%)	100	28
Daily Drainage (%)	22	27
Daily Deep Seepage Rate (%)	0	0

3.2.3. Catchment Areas

The development site has been split into split source nodes (road, roof and ground) representing the total developed area reporting to the bioretention basin or bypassing treatment. Table 3-5 details the catchment areas, source and imperviousness represented within the MUSIC model. The stormwater quality catchments are provided in Figure 3-1.

The balance area of site is to be treated by augmenting the existing bioretention basin to the east in the amity development, as per previous discussions with council.

Table 3-5: Water Quality Catchment Areas

Catchment	Total Area (ha)	Road (ha/% imp)	Roof (ha/% imp)	Ground (ha/% imp)
Development	3.589	1.018 / 80	1.62 / 100	0.951 / 20
Park	0.352	-	-	0.352 / 10
Total	**3.941**	1.018	1.62	1.303

Figure 3-1: WSUD Catchment Locality Plan

3.2.4. MUSIC Model Layout

As the management of urban stormwater needs to take a holistic approach, specific management measures need to be implemented in series to form a treatment train. The correct utilisation of various devices within the treatment train is imperative to target the desired pollutants, from the gross solids to the fine colloidal partials. Figure 3-2 shows the MUSIC model layout for the development.

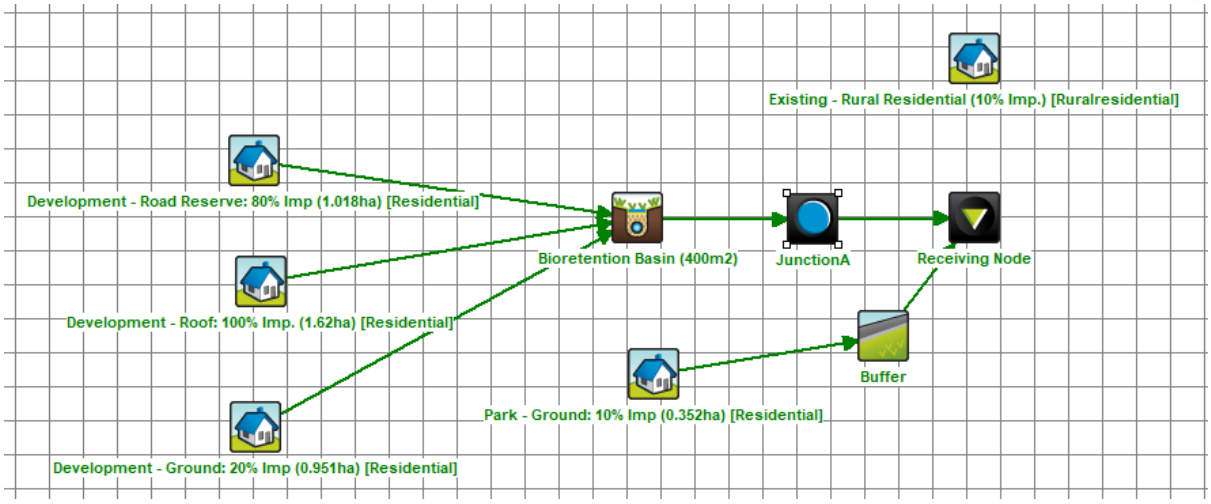

Figure 3-2: MUSIC Model Layout

3.3. Treatment Measures

Runoff from the development is proposed to be treated through one bioretention basin.

3.3.1. Bioretention Systems

Bioretention systems use ponding above a treatment surface to maximise the volume of runoff flowing through the filtration media. They typically convey flows above the design event through overflow pits or a weir. The treatment system operates by firstly filtering surface flows through surface vegetation and then percolating runoff through prescribed filtration media. This media provides treatment through fine filtration, extended detention and biological uptake of nutrients.

As these systems take approximately 12-24hrs to drain, the maximum depth of pondage allowed to occur over the filter area has been limited to 300mm, with a minimum filter media depth of 500mm. Table 3-6 summarises the preliminary design parameters for bioretention systems modelled in MUSIC as proposed for the development. As noted above this may be split into several devices on detailed design. It is to be noted that the Orthophosphate content of the filter media has been reduced to 30mg/kg in line with recent advice from Healthy Waterways.

(http://healthywaterways.org/initiatives/waterbydesign/stormwater).

Table 3-6: Typical Bioretention Design Parameters

Parameter	Bioretention Basin
Extended Detention Depth (m)	0.30
Unlined Filter Media Perimeter (m)	0.01
Saturated Hydraulic Conductivity (mm/hr)	200
Filter Depth (m)	0.5
TN Content of Filter Media (mg/kg)	400
Orthophosphate Content of Filter Media (mg/kg)	30
Exfiltration Rate (mm/hr)	0.0
Storage Surface Area (m2)	400
Filter Media Area	400
Sediment Forebay Required?	Y

3.3.2. Sediment Forebays

To ensure that the deposition of coarse sediment on the filter media surface does not affect the bioretention system function, bioretention systems should be designed with pre-treatment to limit the amount of coarse sediment reaching the filter media. A sediment forebay will be required to pre-treat runoff for each proposed bioretention basin where their contributing catchment is greater than 2 ha. The basin's contributing catchment is greater than 2ha, requiring a sediment forebay.

3.4. Results

MUSIC modelling of the proposed treatment train for the developable area of the subdivision was performed to ensure the WQO's were achieved. Table 3-7 and Table 3-8 presents the load-based outputs that are represented by this application. The results show the mitigated scenario achieves both compliant load reductions and produced less pollutant loads than the existing case. This satisfies the requirements set out by schedule 10 of the MBRC Planning Scheme.

Table 3-7: MUSIC Results – Load Based Pollutant Outputs

Pollutant	Unmitigated (kg/yr)	Mitigated (kg/yr)	Reduction Achieved	Target Reduction	Compliance
TSS	5380	921	82.9%	80%	✓
TP	11.4	2.89	74.6%	60%	✓
TN	69.2	32.8	52.6%	45%	✓
GP	758	0	100%	90%	✓

Table 3-8: MUSIC Results – Load Based Pollutant Outputs (Existing Vs Mitigation)

Pollutant	Existing (kg/yr)	Mitigated (kg/yr)	Difference
TSS	7520	921	-6599
TP	6.79	2.89	-3.90
TN	52.9	32.8	-20.1
GP	238	0	-238

4. CONSTRUCTION PHASE MANAGEMENT

4.1. Erosion and Sediment Control

The management of the site during the construction phase is an important step in ensuring water quality standards are achieved. Implementation of best practice Erosion and Sediment Control techniques is imperative to managing the quality of runoff affected by construction works.

The following points provide general guidance on the management of stormwater during the construction phase. Detailed Erosion and Sediment Control Management Plans should be developed in conjunction with the Operational Works design prior to construction works commencing in accordance with the International Erosion Control Association (IECA) - "*Best Practice Erosion and Sediment Control (BPESC) document"* and overseen by a Certified Professional in Erosion and Sediment Control (CPESC) or Registered Professional Engineer Queensland (RPEQ).

1. Establish a single stabilised entry/exit point for the site works;
2. Construct a shake-down grid at the entrance to facilitate the removal of sediment from trucks leaving the site. The access road extending from the end of existing road or kerb to the grid should comprise a 150-200mm deep pad of 40mm crushed rock;
3. Install sediment fences along the lower boundaries of the site;
4. Construct one or more strategically placed sediment basins in the proposed drainage reserve and construct contour drains / bunds to direct disturbed runoff to the sediment basins;
5. Install bins and/or wind-proof litter areas on-site to minimise the dispersion of gross pollutants;
6. Maintain on site sufficient materials necessary for the emergency repair of all erosion control devices. This includes silt fences, clean crushed rock for reapplication to the entrance road and for replacement of rock within temporary drainage channels, and flocculants for settling sediment basins;
7. Following each day's construction works, ensure that any material on road surfaces is swept from the road, and not permitted to be washed down the gutters and piped drainage systems;
8. Quality of pooled water within sediment basins are to be monitored prior to dewatering, sufficient time should be given to allow sediment to settle (possible with the assistance of a suitable flocculent if necessary) &/or filtering during pumping operations; and
9. Final establishment of bioretention basin should not occur until full stabilisation of upstream catchment has occurred; preferably these should be temporarily turfed during the maintenance period while dwelling construction is occurring.

It shall be the responsibility of the developer, through their principal contractor, to ensure that temporary sediment and erosion controls are installed and maintained correctly.

5. ESTABLISHMENT AND OPERATIONAL PHASE MANAGEMENT

5.1. Establishment

Experience shows that the critical periods in the life of WSUD vegetated stormwater systems are the construction and establishment phases. The timing and approach to these systems must be carefully considered to ensure successful establishment and long-term performance. Bioretention systems are now common stormwater treatment devices for new urban developments in Queensland. Successful construction and allowing adequate time for the systems to establish is critical to their long-term performance and function. Construction of the system is also linked to having suitable bioretention designs in place to ensure, civil contractors have appropriate plans to construct to. Applying due care in the design and construction phase will ensure the function of the system whilst also keeping on-going maintenance to a minimum. It is highly recommended that the constructed activities be completed in accordance with *the Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands (Apr 2010).* This will require a sacrificial turf layer to be installed to protect the filter media from the building phase.

5.2. Operational

It is not proposed for water quality monitoring of the bioretention system to be undertaken during the operational phase of its life. The *"Maintaining Vegetated Asset"* guideline highlights that water quality monitoring is not recommended to determine the performance of every vegetated stormwater asset, as it is a specialized field that is complex and costly. In line with this guideline the on-going monitoring of water quality from this device is not considered necessary considering the small size of the development.

The bioretention system will be maintained by the property owner, who as the asset custodian, will be responsible for the on-going maintenance of the water quality device. Maintenance for the bioretention basin may involve the following:

1. Scheduled inspections;
2. Removal of noxious plants or weeds;
3. Maintaining the desired vegetation;
4. Repairing erosion;
5. Unblocking inlets and outlets;
6. Removing litter and debris;
7. Managing algal or moss growth; and
8. Maintaining the permeability of the filtration.

Operations and maintenance should be conducted in accordance with the *Maintaining Vegetated Stormwater Assets* (Feb 2012) guideline.

6. CONCLUSION

PEAKURBAN have completed a FSMP for Orchard Property Group & Privium Group in support of a development application at 265-275 Callaghan Road and 305 Burpengary Road, Narangba. The FSMP details the flood impact assessment, water quality and quantity impacts and management strategies proposed to comply with relevant provisions of the MBRC Planning Scheme.

The results of the hydraulic modelling show acceptable outcomes have been achieved for the modelled scenarios. The assessment found that non worsening is achieved from the proposed development.

The legal point of discharge requirements will be met via discharging to Little Burpengary Creek to the west with no increased nuisance or adverse impacts to neighbouring properties.

This plan demonstrates that the water quality treatment measures proposed for the development site achieve the performance criteria set by the MBRC Planning Scheme (2020) and SPP (July 2017). Annual Load Reductions of Total Suspended Solids (TSS), Total Phosphorus, Total Nitrogen (TN) and Gross Pollutants (GP) between the Mitigated and Unmitigated Scenarios have been achieved. Pollutant loading for the proposed mitigated scenario is also less than the existing case, meeting the requirements of Schedule 10 of the MBRC Planning Scheme.

This plan demonstrates that effective treatment of stormwater at the proposed development can be achieved through the integration of Water Sensitive Urban Design (WSUD) principles. Through the incorporation of bioretention basins, the plan successfully demonstrates:

- Compliance with the requirements of the MBRC Planning Scheme and SPPs Load Based Objectives;
- The end of line bioretention basins are appropriately sized for the proposed development and can be incorporated into the development; and
- Ecological sustainability in terms of the development's impact upon receiving waters and the viability of the proposed site development.

We therefore request Council approval of the engineering components for the proposed development with reasonable and relevant conditions. Detailed design may result in changes to the proposed strategy; however, the design objectives will be maintained.

7. REFERENCES

- Australian Rainfall and Runoff (Institute of Engineers Australia, 2019).
- Construction and Establishment Guidelines: Swales, Bioretention Systems and Wetlands (Water by Design 2012).
- http://www.bom.gov.au/water/designRainfalls/revised-ifd (Bureau of Meteorology, Online Rainfall IFD Data System).
- Maintaining Vegetated Stormwater Assets (Water by Design, 2012).
- Moreton Bay Regional Council (MBRC) Planning Scheme: Version 4, 2020.
- MUSIC Modelling Guidelines Version 1.0 (Water by Design, 2010).
- State Planning Policy (Department of Infrastructure, Local Government and Planning, 2017).
- Queensland Urban Drainage Manual – 4th Edition (Institute of Public Works Engineering Australasia, Queensland Division, 2017).
- Works Code (Moreton Bay Regional Council, 2016).

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17/05/21

Narangba View Pty Ltd
PO Box 340
Underwood QLD 4119

Attention: Mr Stuart Somerville

Dear Mr Somerville,

STORMWATER TECHNICAL NOTE

Project Name: Subdivision– 265 Callaghan Road | Narangba
Site: Lot 1 RP907550 and Lot 1 RP185250
Project No: 14883

1.0 Introduction

A residential subdivision is proposed at 265 Callaghan Road, Narangba.

RMA Engineers have been engaged to assess an alternative stormwater quality and quality solution in lieu of providing on-site stormwater management devices.

A locality plan of the development site is shown in **Figure 1**, based on Subdivision Proposal Plan by DTS dated 1 April 2021.

Figure 1: Locality Plan

The investigations have been completed generally in accordance with Council's current planning scheme, and have been based on LiDAR contour data, survey data and the proposed development layout current at the time of investigation.

Concept modelling was completed to determine a portion of the development site can distribute minor stormwater flows by gravity to the existing Amity detention/bio-retention basin to the east of the development site.

Stormwater quality assessment was then completed using MUSIC software to determine the existing Council bio-retention basin within the Amity development was able to be increased in filter media area to achieve a consolidated pollutant reduction target for the development site and Amity's associated catchment.

Stormwater quantity assessment was completed us
proposed development may discharge stormwater di
network without augmentation other than that passiv
Council's existing drainage basin in Amity.

2.0 Catchment Philosophy

A coordinated layout and stormwater management scheme is proposed between the subject site and Orchard Development to the west. A preliminary catchment scheme has been determined to allow Stage 2, Stage 4 and the western half of Stage 3 of the subject site will contribute stormwater flows to the Orchard Development's stormwater management system.

Stage 1 and the western half of Stage 3 will contribute minor flows to the existing basin within the Amity development, with major flows less the minor flows to discharge directly to Callaghan Road's drainage network without augmentation.

Concept drawings C-SK0001, C-SK0002 and C-CK0003 included in **Appendix A** demonstrate the alternative stormwater quality solution for the proposed subdivision at 265 Callaghan Road, Narangba.

The stormwater longitudinal section on drawing C-SK0002 demonstrates that minor stormwater flows from the eastern portion of the development can be conveyed to the existing Amity basin by gravity flow, discharging through an additional inlet into the existing sediment basin.

With reference to **Figure 2**, the western portion of the development (catchments E1, E2 and E3) will contribute to, and be managed for quantity quality by the basin in the adjoining subdivision at 275 Callaghan Road, Narangba.

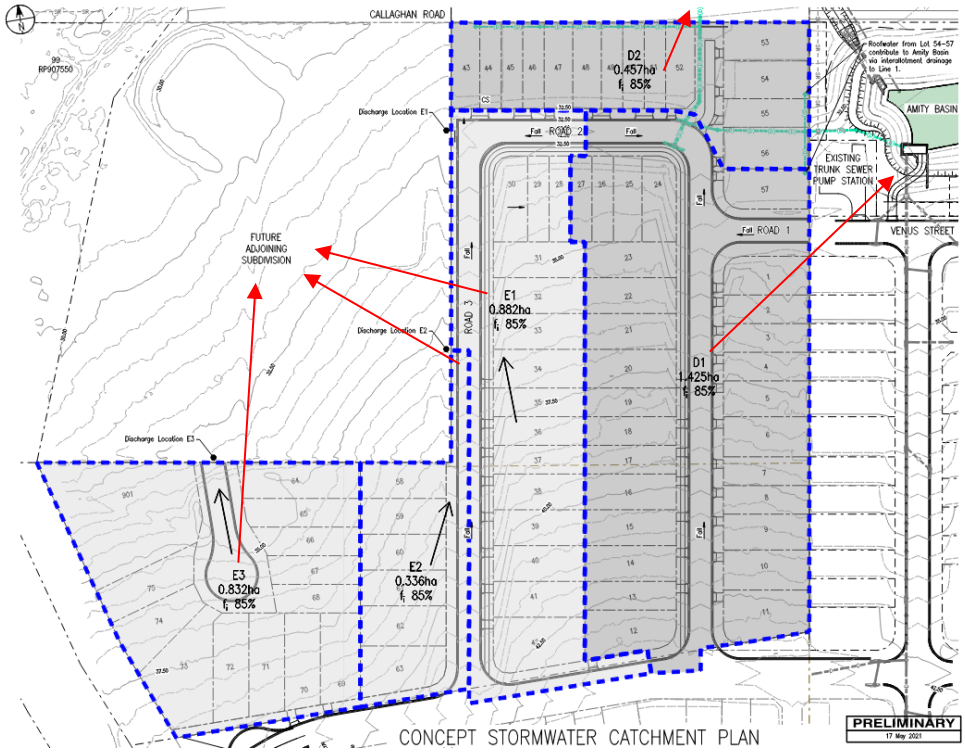

Figure 1: Development Site Catchment Plan

Stormwater pipes downstream of structure G5/1 are sized to convey up to and including the 1-year ARI (1 EY) storm event through an appropriately designed orifice plate. Larger storm events will bypass the basin and be conveyed to Callaghan Road.

Management of stormwater to Callaghan Road is subject to future detailed design.

3.0 Stormwater Quality

The following table summarises the minimum water quality objectives identified for the site in accordance with the State Planning Policy (SPP).

Table 1: Water quality objectives

Indicator	Reduction in average annual pollutant load discharging from the site
Total Suspended Solids (TSS)	80%
Total Phosphorous (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants (GP)	90%

The existing bio-retention basin treatment train has been analysed using MUSIC software (Version 6) and catchment and basin parameters procured from PDOnline information.

The *MUSIC Modelling Guidelines (Version 1.0-2010) – Water by Design* (the Water by Design Guideline) has been used to obtain the various source and treatment node parameters for the proposed treatment train.

The eastern portion of the proposed development site (catchment D1 and D2) has been added to the treatment train for the existing Council bioretention basin. The schematic is shown in **Figure 3** below.

The existing bio-retention filter media area in the existing Council bio-basin is 730m^2. MUSIC modelling showed that with the addition of the stormwater flows from the development site, the required water quality objectives cannot be achieved with the existing filter media area.

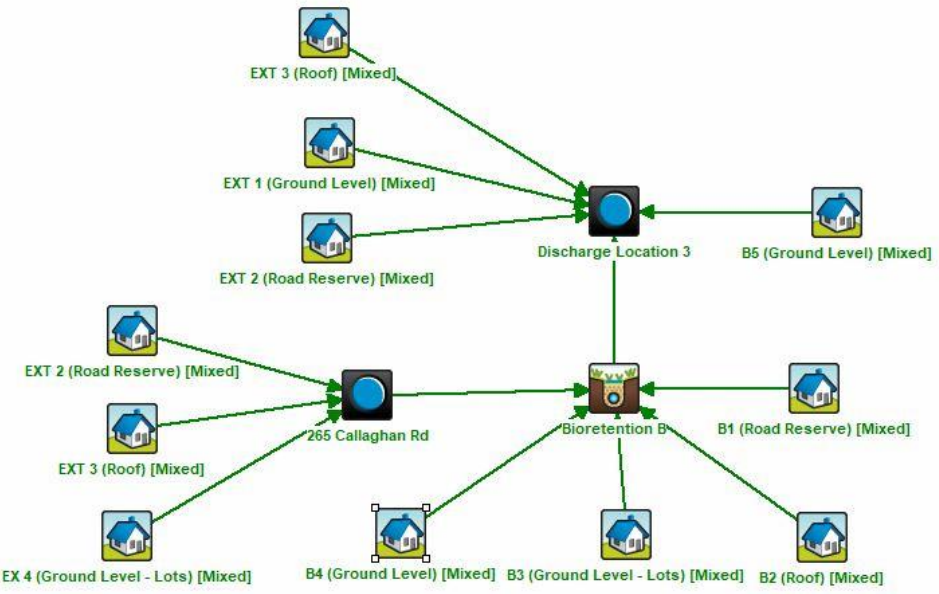

Figure 3: Treatment train

The bio-retention characteristics were altered until the required water quality objectives were achieved. The following table summarises the bioretention basin characteristics (existing and proposed).

Table 2: Existing bio-retention basin in Amity Development characteristics

Parameter	Existing Basin	
	Existing (pre-development of 265 Callaghan Rd)	**Proposed** (including 265 Callaghan Road development)
Extended Detention Depth	0.30m	0.30m
Filter Area	730m^2	780m^2
Filter Depth	0.40m	0.40m
Saturated Hydraulic Conductivity	200mm/hr	
Maximum TN content of filter media	400mg/kg	
Maximum orthophosphate content of filter media	30mg/kg (As recommended by Healthy Waterways) http://healthywaterways.org/initiatives/waterbydesign/stormwater	
Submerged Zone	0.30m	0.30m
Underdrain System	An underdrain system of slotted drainage pipes (100mm dia and 150mm dia for lengths >25m) at 2.5m centres in accordance with WSUD Technical Design Guidelines for South East Queensland 2006	

The following table summarises the effectiveness of the treatment train with the filter area increased from 730m^2 to 780m^2.

Table 3: Treatment train effectiveness

	Sources	**Residual Load**	**% Reduction Achieved**	**Required % Reductions**
Total Suspended Solids (kg/yr)	19700	3800	80.7	80
Total Phosphorous (kg/yr)	38.6	15	61.2	60
Total Nitrogen (kg/yr)	211	110	48	45
Gross Pollutants (kg/yr)	2290	75.2	96.7	90

Results illustrate that the required water quality objectives can be achieved with a filter media area of 780m^2.

Drawing C-SK0001 in **Appendix A** demonstrates how this additional filter media area can be achieved in Council's existing basin within the Amity Development.

Additional Minor Flows to Existing Basin

Post developed 3-month stormwater runoff shall be directed from the subject site to the existing stormwater basin in Lot 9996 on SP295608 in accordance with the stormwater quality management strategy described in Section 2.0 above. Stormwater flows from rain events greater than Q1 (1 year ARI) shall be discharged directly to the Callaghan Road drainage network and ultimately to Little Burpengary Creek via an appropriately designed orifice system.

We have undertaken preliminary civil modelling to confirm Q1 stormwater flows can connect to the existing basin's headwall/forebay under gravity conditions to accepted design standards. Evidence of this modelling is shown in RMA Drawings in **Appendix A**.

Further to the assessment for additional filter media within the existing basin on Lot 996 SP295608, hydrological modelling was undertaken using DRAINS to assess the behaviour of the Council's existing basin within the Amity Development with the additional 1 year flows from the proposed development site.

Stormwater flows from the eastern portion of the development (catchments D1 and D2) for a 1 year ARI (1 EY) storm event were modelled to contribute to the Council's existing basin within the Amity Development. A DRAINS schematic is shown in **Figure 4** below.

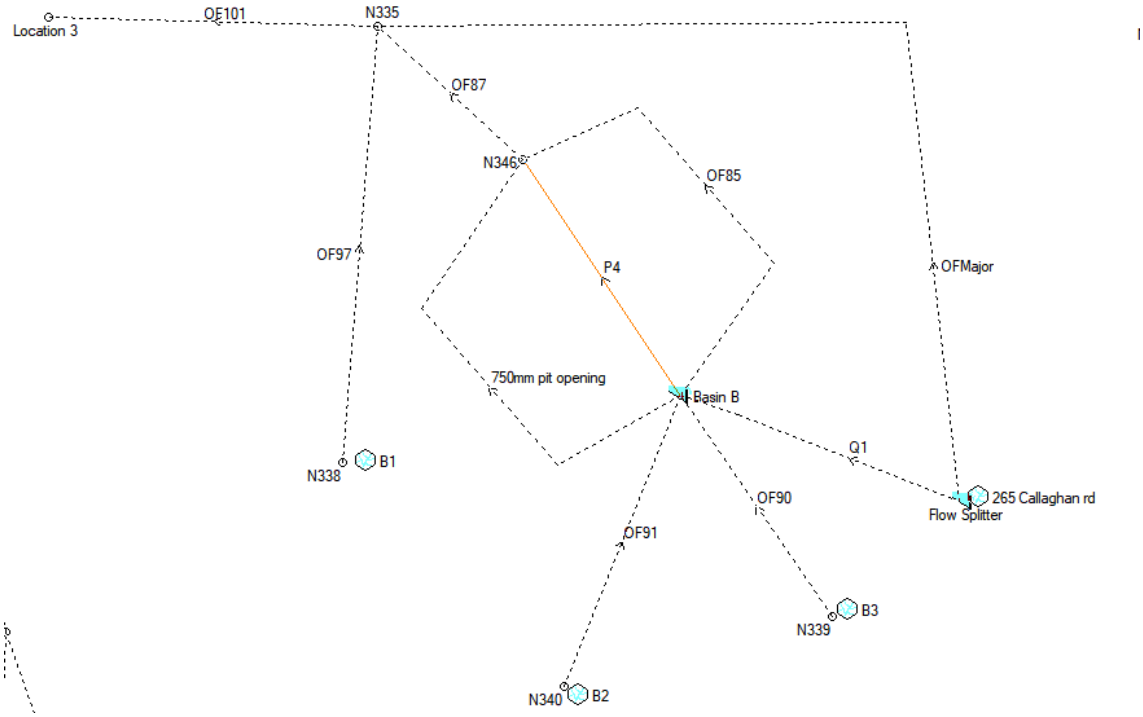

Figure 4: DRAINS schematic

Table 4 provides an overview of pre-development (pre-development of Amity Development), existing (pre-development of 265 Callaghan Road) and post-development (post-development of 265 Callaghan Road) median peak flow rates at the existing discharge location and basin water levels.

Table 4: Median peak flow rates overview at Discharge Location 3

Discharge Location	Storm Event	Pre-dev (of Amity)	Existing (pre-development of 265 Callaghan Rd)		Post-development (post-development of 265 Callaghan Rd)	
		Discharge (m3/s)	Discharge (m3/s)	Basin Water Level (RL)	Discharge (m3/s)	Basin Water Level (RL)
3	1EY	1.04	0.927	31.79	1.03	31.43
	0.5EY	1.42	1.19	31.96	1.33	31.69
	10% AEP	2.01	2.03	32.28	2.02	32.18
	5% AEP	2.88	2.26	32.47	2.58	32.38
	2% AEP	3.53	3.01	32.65	3.06	32.62
	1% AEP	4.11	3.84	32.73	4.0	32.71

Table 5 compares post-development flow characteristics at Discharge Location 3 with original pre-development and existing flow characteristics.

Table 5: Median peak flow rates comparison at Discharge Location 3

Discharge Location	Storm Event	Difference	
		Pre-development to Post-development Peak Median Discharge (m^3/s)	Existing to Post-development Basin Water Level (RL)
3	1EY	-0.01	-0.36
	0.5EY	-0.09	-0.27
	10% AEP	0.01	-0.1
	5% AEP	-0.3	-0.09
	2% AEP	-0.47	-0.03
	1% AEP	-0.11	-0.02

Results show that the post-development median peak flow rates discharging to Discharge Location 3 are less than pre-development median peak flow rates for all storm events except for the 10% AEP storm.

The 10% AEP storm event is showing an increase of 0.01m^3/s in a total flow of 2.0m^3/s. This increase is imperceptible and of no significance.

Results also show that the existing stormwater basin water levels are not significantly affected by additional flow from the development site.

The analysis indicates post-development flows from the existing stormwater basin will not result in actionable nuisance with quantifiable loss to d
Therefore, the existing stormwater basin function is not
development site.

It should be noted that this analysis was undertaken tc
function.

4.0 Development Site Stormwater Quantity

4.1 No detention

We have assessed the subject sites stormwater quantity management strategy with consideration of the greater stormwater catchment and downstream drainage network capacities associated to Little Burpengary Creek.

This assessment identified that stormwater quantity detention following development is not considered appropriate due to the site's location within a wider catchment.

We provide an extract below from Council Planning Scheme Policy Integrated Design – Appendix C Clause 1.11 that supports this assessment;

"The design and location of basins will influence if they have a negative or a positive impact to stormwater flows and great care must be taken in their design and integration with the surrounding catchments. Poorly located and designed basins may cause flows from different tributaries to peak at the same time, increasing peak flow rates for downstream locations. Assessing the performance of a basin may include modelling to a key/sensitive downstream location or junction."

Upstream of the development site, there is a 76.3 hectare stormwater catchment contributing to Little Burpengary Creek. The greater stormwater catchment is illustrated in **Figure 5**.

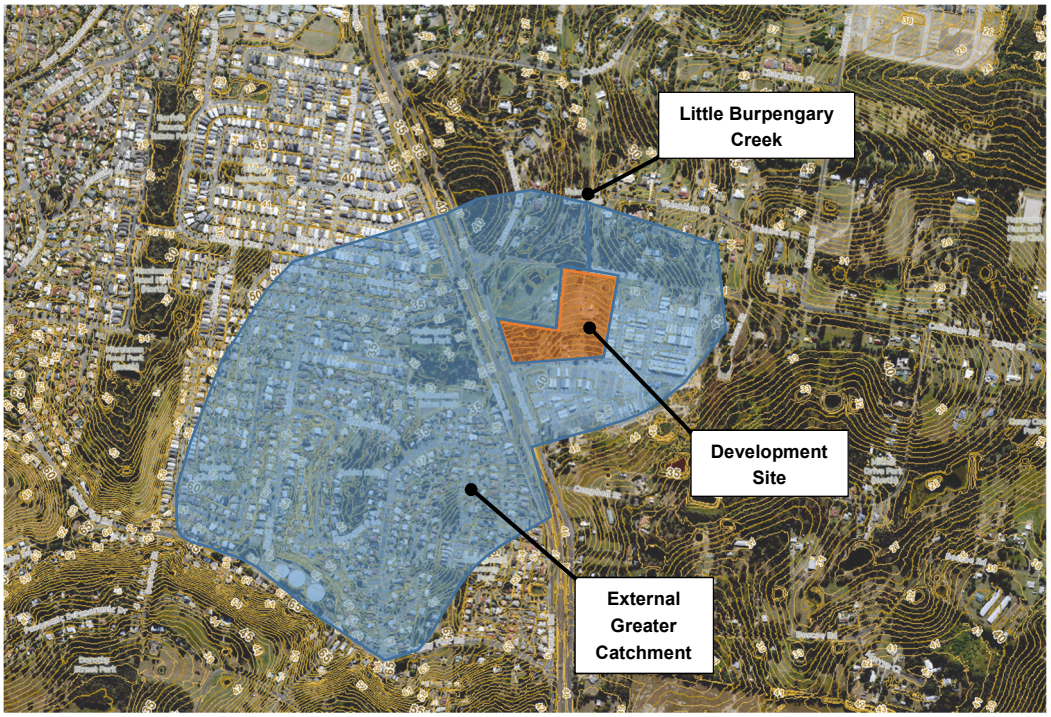

Figure 5: Little Burpengary Creek Greater Stormwater Catchment

The flows to Little Burpengary Creek were analysed using DRAINS software. The greater stormwater catchments and the pre- and post-development catchment were included as additional DRAINS nodes. The general schematic of the DRAINS model is shown in **Figure 6** below.

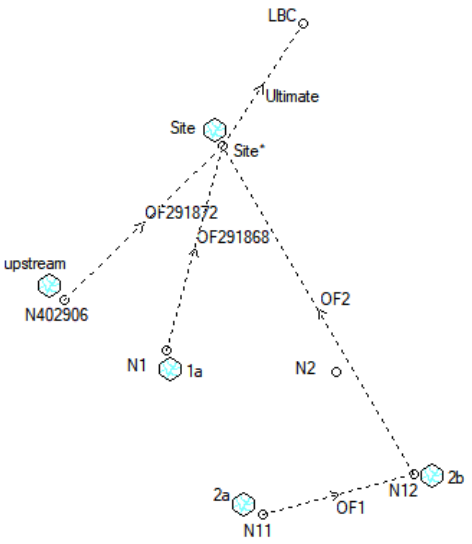

Figure 6: DRAINS Model Schematic

Table 6 provides a comparison of pre- and post-development median peak flow rates at Little Burpengary Creek.

Table 6: Comparison of pre- and post-development median peak flow rates

Discharge Location	Storm Event	Pre-development Peak Median Discharge (m^3/s)	Post-development Peak Median Discharge (m^3/s)	Difference (m^3/s)
Little Burpengary Creek	1EY	8.82	8.85	0.03
	0.5EY	12.1	12.1	0.0
	10% AEP	20.5	20.6	0.1
	5% AEP	24.9	25.0	0.1
	2% AEP	30.6	30.7	0.1
	1% AEP	35.0	35.0	0.0

Results show that the post-development median peak flow rates discharging to Little Burpengary Creek are equal to existing median peak flows rates for 1EY and 1% AEP.

The 10%, 5% and 2% AEP storm events are showing an increase of 0.1m^3/s in a total flow of 20.6m^3/s, 25.0m^3/s and 30.7m^3/s, respectively. These increases are imperceptible in relation to the total flow.

The analysis indicates post-development flows will not result in actionable nuisance with quantifiable loss to downstream neighbouring properties.

The analysis illustrates that stormwater quantity detention is not appropriate for the development site to achieve 'no actionable nuisance' in accordance with QUDM 2016 requirements.

We acknowledge that any proposal for discharging development flows without detention would need to consider an upgraded drainage system from the subject site to Little Burpengary Creek, subject to operational works approvals.

This assessment has not considered minor augmentation achieved for the minor storm from the existing basin within the Amity Development or from possible augmentations of the revised Stage 2, 3 and 4 development flows (catchments E1, E2 and E3) to contribute to the Orchard Development to the west. This assessment is therefore considered conservative.

4.2 Major flows

We have completed preliminary site grading of the layout to understand road and allotment drainage. Generally, in accordance with the approved DA civil schematic scheme, post-developed flows shall be directed to a localised road sag adjacent the proposed driveway providing access to proposed Lots 53-55.

A major storm event (100 year) underground pipe network is proposed to collect and discharge stormwater runoff through the proposed driveway road reserve to Callaghan Road drainage

network and ultimately to Little Burpengary Creek. The details of the Callaghan Road drainage network are subject to final form of Callaghan Road improvements. An overland swale is proposed along the proposed driveway reserve to manage emergency flows from the road sag in the rare case of major storm pit or pipe blockage. Refer **Figure 6** for general sketch details**.**

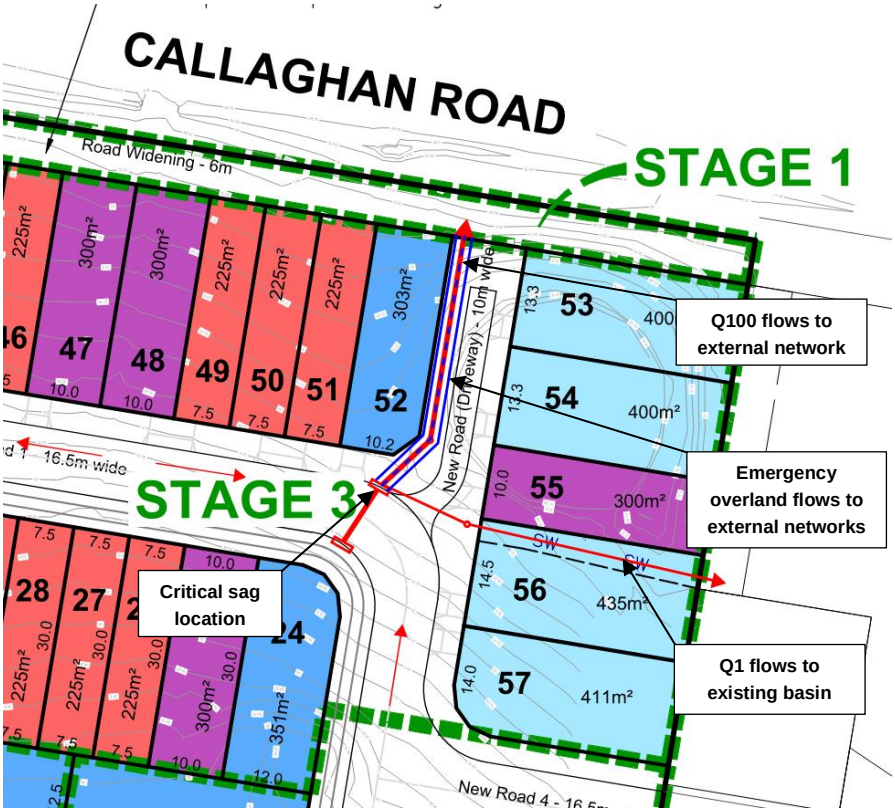

Figure 6: Minor/Major stormwater runoff concept

5.0 Summary

An alternate stormwater quantity and quality solution have been investigated for the development site at 265 Callaghan Road (Lot 1 RP907550 and Lot 1 RP185250).

The preliminary outcomes of the investigations in this letter have demonstrated the following:

- Minor storm runoff from the eastern portion of the development site can flow by gravity to the existing Council detention/bio-retention basin within the Amity Development
- Required water quality objectives can be achieved by increasing the filter media area within the existing Council basin from 730m^2 to 780m^2. Drawing C-SK0001 in **Appendix A** demonstrates how the additional filter media area can be achieved in the existing Council basin within the Amity Development.
- An investigation of Council's existing stormwater detention/bio-retention basin on Lot 9996 SP295608 has determined there is additional area within this basin to extent the existing filter media by 50m^2.
- The detention function of the existing Council basin is not compromised by the additional flows from the development site. The development will not result in an actionable nuisance to Callaghan Road, downstream properties or stormwater infrastructure.
- Stormwater quality and quantity for runoff from the western portion of the development site is

to be managed on the adjoining site to the west.

- Stormwater quantity runoff following development of the subject site does not require detention prior to discharge to Little Burpengary Creek

We consider the proposed stormwater management strategy in association with the Layout is a preferred and efficient outcome for Council, utilising existing infrastructure capacity and minimising life cycle and maintenance costs for Council.

Any further questions, please do not hesitate to contact myself.

David Waldock

Associate | Principal Civil Engineer

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