Queensland Government

SARA reference: 2111-25741 SRA
Council reference: D/143-2021
Applicant reference: 1266

6 December 2021

Chief Executive Officer
Rockhampton Regional Council
PO Box 1860
Rockhampton QLD 4700
enquiries@rrc.qld.gov.au

Dear Sir/Madam

SARA response—57 Elphinstone Street, Berserker

(Referral agency response given under section 56 of the *Planning Act 2016*)

The development application described below was confirmed as properly referred by the State Assessment and Referral Agency (SARA) on 5 November 2021.

Response

Outcome:	Referral agency response – with conditions.
Date of response:	6 December 2021
Conditions:	The conditions in **Attachment 1** must be attached to any development approval.
Advice:	Advice to the applicant is in **Attachment 2**.
Reasons:	The reasons for the referral agency response are in **Attachment 3**.

Development details

Description:	Development permit	Material change of use for Multiple Dwelling (Six Dwellings)
SARA role:	Referral Agency.	
SARA trigger:	Schedule 10, Part 9, Division 4, Subdivision 2, Table 4, Item 1 (Planning Regulation 2017) Development application for a material change of use within 100m of a state transport corridor intersection	
SARA reference:	2111-25741 SRA	

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

Assessment Manager:	Rockhampton Regional Council
Street address:	57 Elphinstone Street, Berserker
Real property description:	4RP601093
Applicant name:	PurProjex c/- Bauhinia Architects Pty Ltd
Applicant contact details:	PO Box 558 Rockhampton QLD 4700 design@bauhinia-architects.com

Representations

An applicant may make representations to a concurrence agency, at any time before the application is decided, about changing a matter in the referral agency response (s.30 Development Assessment Rules) Copies of the relevant provisions are in **Attachment 4**.

A copy of this response has been sent to the applicant for their information.

For further information please contact Jacklyn Neyenhuis, Planning Officer, on 4924 2907 or via email RockhamptonSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Graeme Kenna
Manager (Planning)

cc PurProjex c/- Bauhinia Architects Pty Ltd, design@bauhinia-architects.com

enc Attachment 1 - Referral agency conditions
Attachment 2 - Advice to the applicant
Attachment 3 - Reasons for referral agency response
Attachment 4 - Representations provisions
Attachment 5 - Approved plans and specifications

Attachment 1—Referral agency conditions

(Under section 56(1)(b)(i) of the *Planning Act 2016* the following conditions must be attached to any development approval relating to this application) (Copies of the plans and specifications referenced below are found at Attachment 5)

No.	Conditions	Condition timing
Material change of use		
Schedule 10, Part 9, Division 4, Subdivision 2, Table 4, Item 1 (Planning Regulation 2017)—The chief executive administering the *Planning Act 2016* nominates the Director-General of 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(s):		
1.	The development must be carried out generally in accordance with sections 3, 4 and 6 of the STORMWATER MANAGEMENT PLAN prepared by McMurtrie Consulting Engineers dated 20.10.2021, reference 032-21-22 and revision B	At all times

Attachment 2—Advice to the applicant

General advice	
1.	Terms and phrases used in this document are defined in the *Planning Act 2016* its regulation or the State Development Assessment Provisions (SDAP) [v2.6]. If a word remains undefined it has its ordinary meaning.

Attachment 3—Reasons for referral agency response

(Given under section 56(7) of the *Planning Act 2016*)

The reasons for SARA's decision are:

- The proposed development is a material change of use for a multiple dwelling being a six-unit complex.
- Appropriate maintenance of stormwater management will minimise impacts and worsening to the state-controlled road as part of the application.
- The proposed development is considered to be minor and generally in accordance with the requirements of the State Development Assessment Provisions of State code 1.

Material used in the assessment of the application:

- The development application material and submitted plans
- *Planning Act 2016*
- Planning Regulation 2017
- The *State Development Assessment Provisions* (version [2.6]), as published by SARA
- The Development Assessment Rules
- SARA DA Mapping system

Attachment 4—Change representation provisions

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Attachment 5—Approved plans and specifications

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Development Assessment Rules—Representations about a referral agency response

The following provisions are those set out in sections 28 and 30 of the Development Assessment Rules[1] regarding **representations about a referral agency response**

Part 6: Changes to the application and referral agency responses

28 Concurrence agency changes its response or gives a late response

28.1. Despite part 2, a concurrence agency may, after its referral agency assessment period and any further period agreed ends, change its referral agency response or give a late referral agency response before the application is decided, subject to section 28.2 and 28.3.

28.2. A concurrence agency may change its referral agency response at any time before the application is decided if—

(a) the change is in response to a change which the assessment manager is satisfied is a change under section 26.1; or

(b) the Minister has given the concurrence agency a direction under section 99 of the Act; or

(c) the applicant has given written agreement to the change to the referral agency response.[2]

28.3. A concurrence agency may give a late referral agency response before the application is decided, if the applicant has given written agreement to the late referral agency response.

28.4. If a concurrence agency proposes to change its referral agency response under section 28.2(a), the concurrence agency must—

(a) give notice of its intention to change its referral agency response to the assessment manager and a copy to the applicant within 5 days of receiving notice of the change under section 25.1; and

(b) the concurrence agency has 10 days from the day of giving notice under paragraph (a), or a further period agreed between the applicant and the concurrence agency, to give an amended referral agency response to the assessment manager and a copy to the applicant.

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1 Pursuant to Section 68 of the *Planning Act 2016*

2 In the instance an applicant has made representations to the concurrence agency under section 30, and the concurrence agency agrees to make the change included in the representations, section 28.2(c) is taken to have been satisfied.

Part 7: Miscellaneous

30 Representations about a referral agency response

30.1. An applicant may make representations to a concurrence agency at any time before the application is decided, about changing a matter in the referral agency response.[3]

[3] An applicant may elect, under section 32, to stop the assessment manager's decision period in which to take this action. If a concurrence agency wishes to amend their response in relation to representations made under this section, they must do so in accordance with section 28.

mcmurtrie
CONSULTING ENGINEERS
REGIONAL LEADERS | NATIONAL EXPERTISE

DATE 20.10.2021

OUR REF. 032-21-22

REPORT TYPE

STORMWATER MANAGEMENT PLAN

PROJECT

57 Elphinstone Street Townhouses
Lot 4 RP601093, Berserker Queensland

CLIENT

Pure Projex

Amended in red by SARA on
6 December 2021

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DOCUMENT CONTROL

Rev.	Description	Signature	RPEQ No.	Date
A	Draft			12/10/2021
B	Final		05141	20/10/2021

The information contained within this report is provided in good faith in the belief that no information, opinions or recommendations made are misleading. All comments and opinions given in this report are based on information supplied by the client, their agent and third parties.

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3. HYDROLOGY ASSESSMENT

3.1. LAWFUL POINT OF DISCHARGE

The existing site surface grades towards Elphinstone Street at the southern end of the site. The existing road and kerb in Elphinstone Street is the Lawful Point of Discharge (LPOD) for the site. The flows from the site then enter the below ground stormwater system via the existing inlet in the kerb of Elphinstone Street directly outside the development site.

Post development discharge will be assessed to ensure that there will be no adverse impacts on downstream properties and infrastructure. A desktop study and a site visit of the surrounding properties suggests that runoff is not directed on the development site. 176, 180 and 184 Musgrave Street discharge to Musgrave Street via kerb outlets and runoff from 59 Elphinstone Street reaches the kerb in Elphinstone Street via overland flow paths within the site of number 59. Based on this the no external catchments are considered relevant to this development.

3.2. HYDROLOGIC MODELLING

Hydrologic calculations have been undertaken using XPSTORM 2020.1 for pre and post development scenarios. The modelling within XPSTROM environment has been undertaken to estimate the peak discharge for storms up to 1% AEP. Hydrologic modelling has been undertaken using the Laurenson Runoff Routing Method. Laurenson's Method is an industry leading hydrologic routing method that can be used for catchments ranging between 10m^2 up to 20,000km^2. The information required to apply Laurenson's Method include:

- Rainfall Intensity Data (obtained from the Bureau of Meteorology 2016 IFD utility)
- Rainfall Temporal Patterns (obtained from the ARR'16 Data Hub)
- Catchment Area (ha)
- Catchment Slope
- Initial and Continuing Infiltration Data
- Catchment Roughness (Manning's 'n')

Given the relatively limited scope of this hydraulic impact assessment a lumped catchment approach, as defined by ARR'16 and shown in Figure 2 below, was applied to the hydrologic review of the site. The lumped approach is suitable for this site given the relative consistency in land use and the ultimate purpose of the model.

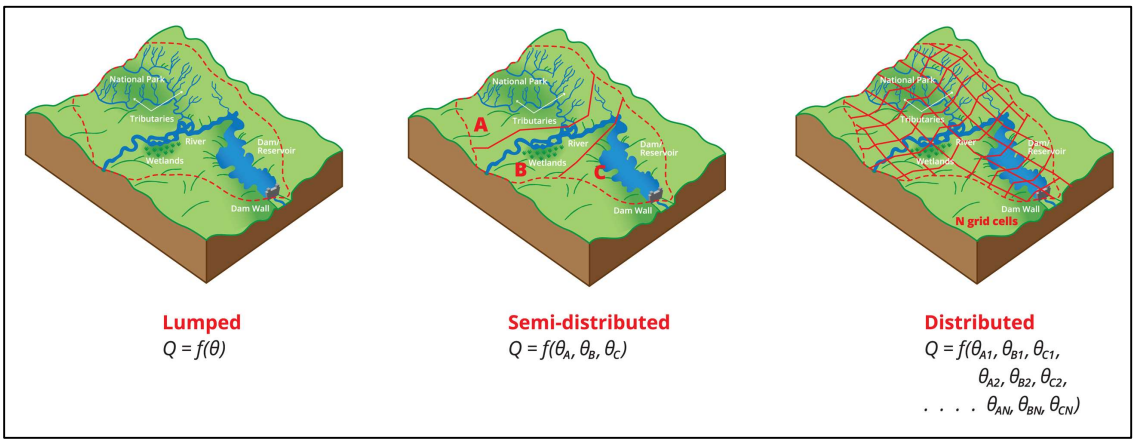

Figure 2: Catchment Analysis Options

Refer Appendix A for Site Layout.

3.2.1 CATCHMENT HYDOLOGY PARAMETERS

Table 2 and 3 summarise the input data for the development site in pre-development and post-development conditions. Table 4 summarises the input data for the external catchment.

Parameter		Existing site		
		Grass	Gravel driveway	Roof
Area (ha)		0.0683	0.0182	0.0106
Impervious (%)		0.0	50	100
Slope (%)		0.7	0.7	41
Laurenson 'n' (storage non-linearity exponent)		-0.285	-0.285	-0.285
Infiltration	Initial Loss (mm/hr)	0.0	0.0	0.0
	Continuing Loss (mm/hr)	2.5	2.5	0.0
Manning's Roughness (n)		0.030	0.020	0.022

Table 2: Pre-Development Model Parameters (XP Storm)

Parameter		Developed site		
		Garden	Concrete Pavement	Roof
Area (ha)		0.0188	0.0409	0.0374
Impervious (%)		0.0	100	100
Slope (%)		0.7	0.7	41
Laurenson 'n' (storage non-linearity exponent)		-0.285	-0.285	-0.285
Infiltration	Initial Loss (mm/hr)	0.0	0.0	0.0
	Continuing Loss (mm/hr)	2.5	0.0	0.0
Manning's Roughness (n)		0.060	0.013	0.022

Table 3: Post-Development Model Parameters (XP Storm)

Applying no initial losses within the model is consistent with the requirements of both ARR'87 and ARR'16. ARR'16 states that there is no evidence that infiltration losses change with respect to the recurrence interval being modelled and that continuing losses can be applied equally to frequent and rare events.

3.2.2 HYDOLOGY RESULTS

Applying the ARR'16 ensemble temporal patterns to the catchments allowed the identification of the critical duration for the mean minor (10% AEP) and major storm (1% AEP) events. The below figures are screen shots of Box and Whisker plot taken from XPSTORM software. These plots show the comparison of storm ensembles for different durations for minor and major storm events.

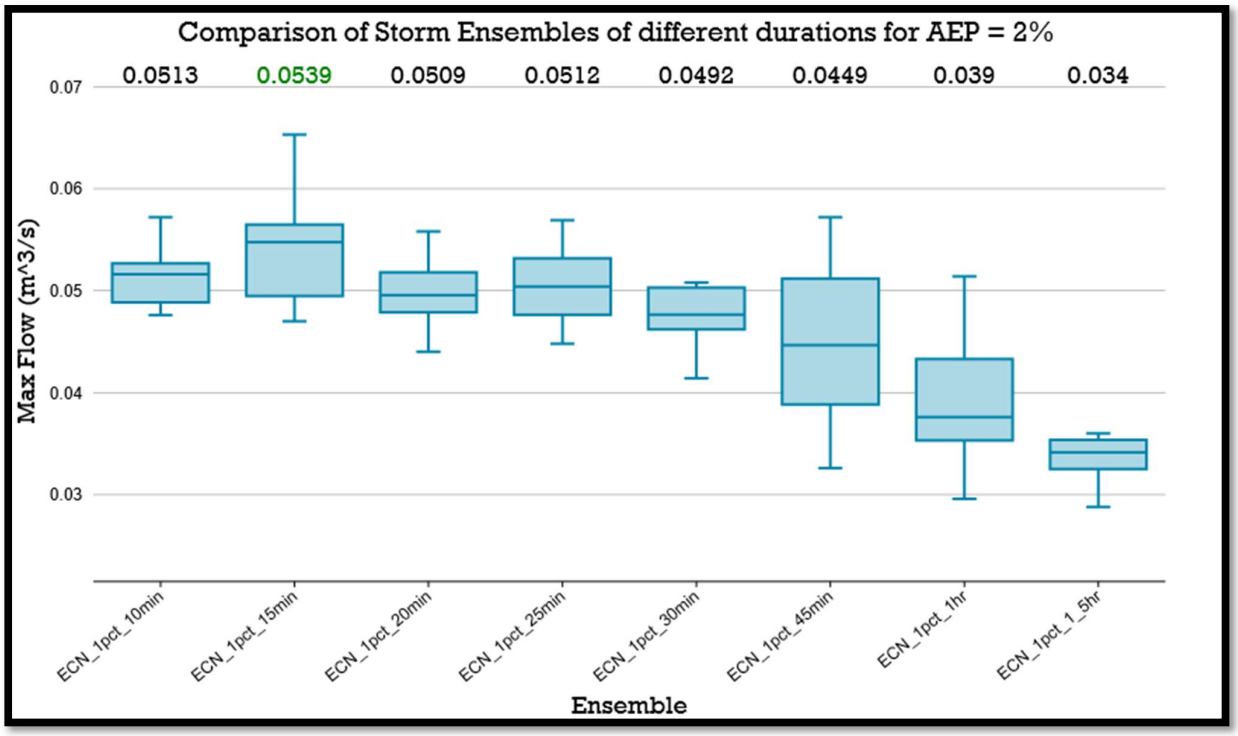

Figure 3: Comparison of Storm Ensembles of different durations for pre-development 1% AEP (XPSTROM Model)

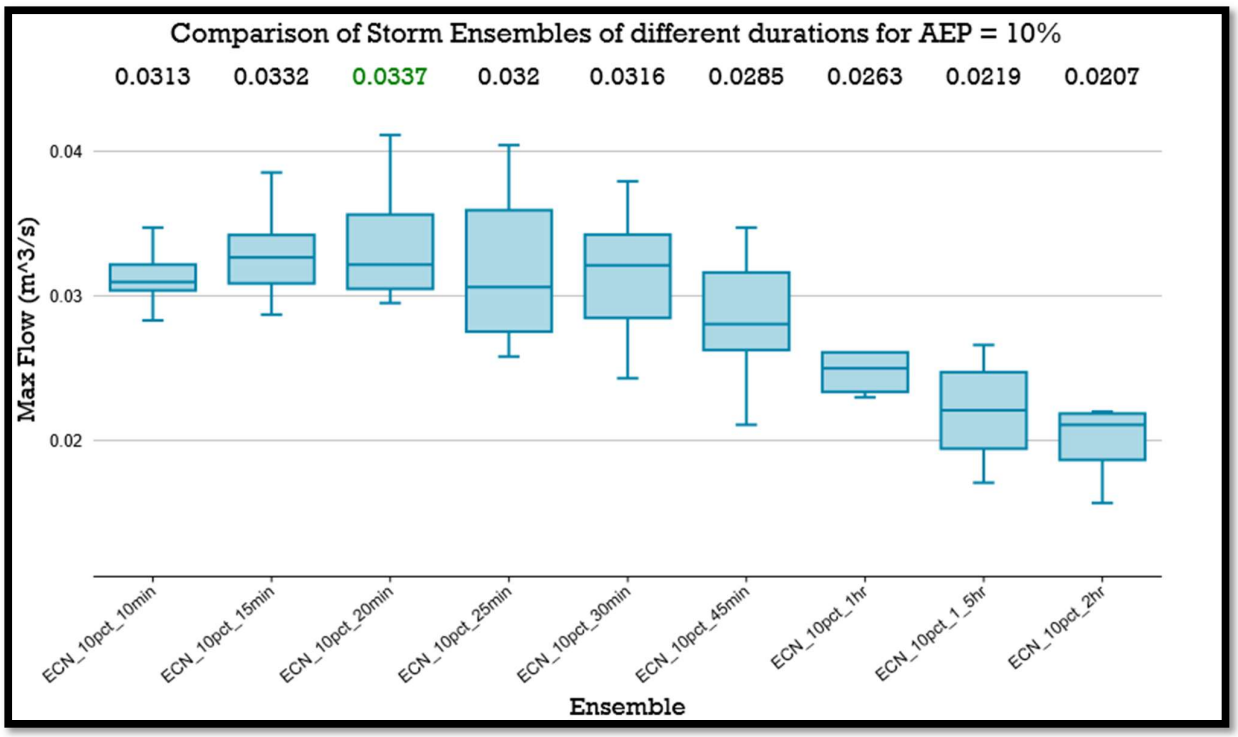

Figure 4: Comparison of Storm Ensembles of different durations for pre-development 10% AEP (XPSTORM Model)

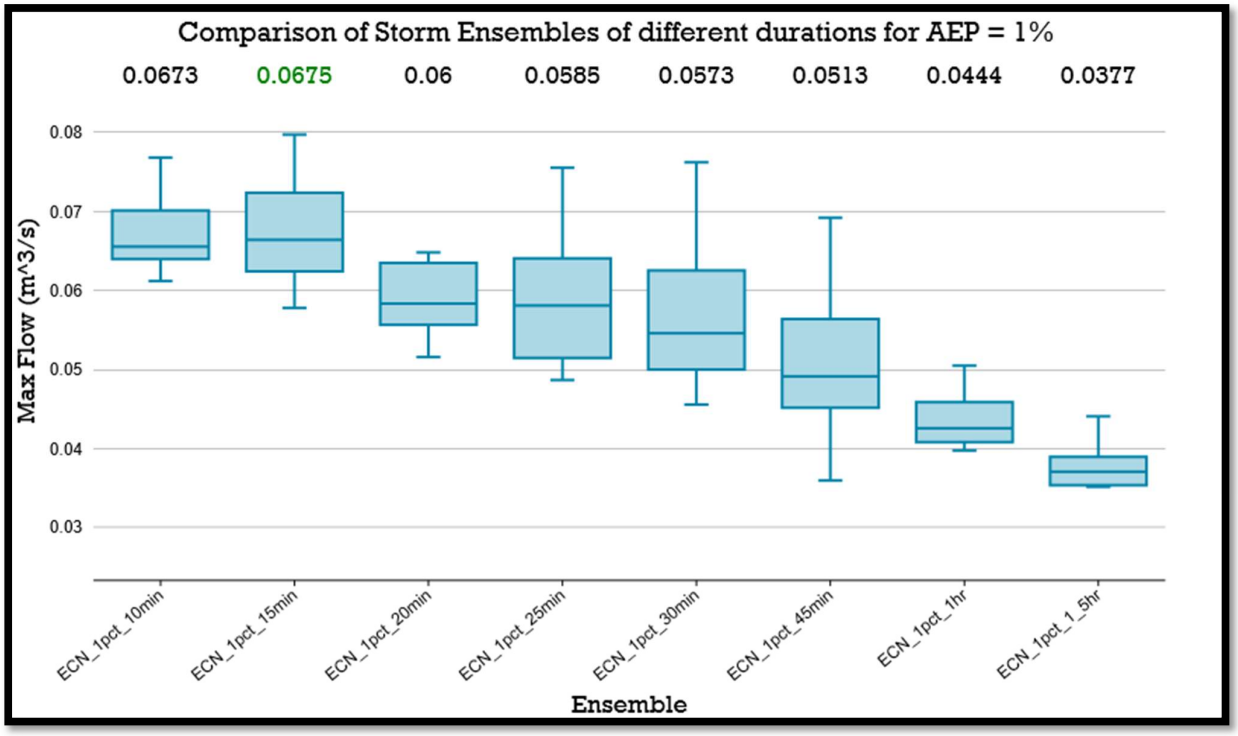

Figure 5: Comparison of Storm Ensembles of different durations for post-development 1% AEP (XPSTORM Model)

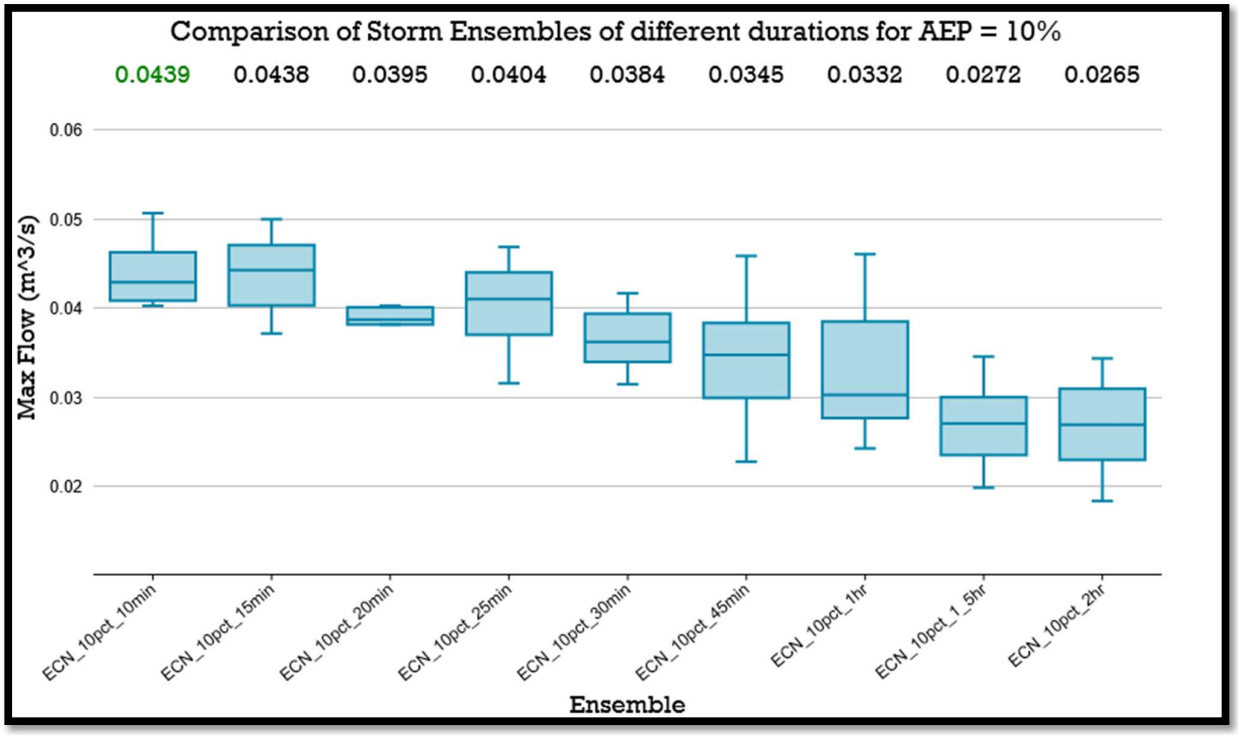

Figure 6: Comparison of Storm Ensembles of different durations for post-development 10% AEP (XPSTORM Model)

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The results of each of the ensembles are summarised in Table 4. The same storm events are applied to the hydraulic analysis.

Annual Exceedance Probability (AEP %)	Critical Storm Event	
	Pre-development	Post development
10% (Minor Event)	10pct_20min_5	10pct_10min_3
		10pct_15min_2
		10pct_20min_5
		10pct_25min_3
		10pct_30min_2
		10pct_45min_2
1% (Major Event)	1pct_15min_2	1pct_10min_3
		1pct_15min_2
		1pct_20min_9
		1pct_25min_1
		1pct_30min_9

Table 4: Critical Storm Events

4. HYDRAULIC ASSESSMENT

4.1. BACKGROUND

The hydraulic assessment for the site has been carried out using XPSTORM 2020.1. The aim of the hydraulic modelling is to demonstrate that the post-development minor and major storm peak discharge at the LPOD is equal or less than the peak pre-development discharge. This will be achieved by utilising the concrete road area within the development as above ground storage.

4.1. DETENTION

To ensure no worsening to downstream catchments and infrastructure the proposed development will require a minimum of approximately 5.1m^3 of detention volume before engaging a 5.5m wide weir, defined as the driveway apron on Elphinstone Street. The maximum depth of water at any point on the site has been limited to 55mm in the 1% AEP event. The drainage network within the site will consist of multiple gully inlets located in sag points designed to capture and locally detain storm flows. Details of the concept drainage can be found on the drawings in Appendix A.

The flows from the site will discharge via a low flow outlet consisting of twin 90mm diameter uPVC pipes connecting into the existing stormwater chamber in Elphinstone Street in front of the driveway.

Refer below Table 5 for peak discharge rates at legal point of discharge, the critical duration for the for each recurrence interval for each site condition is highlighted in yellow. The objective of the detention system is to ensure the peak mitigated post development discharge for each AEP is less than that of the Pre-development in accordance with Australian Rainfall and Runoff 2019 Table 9.4.1.

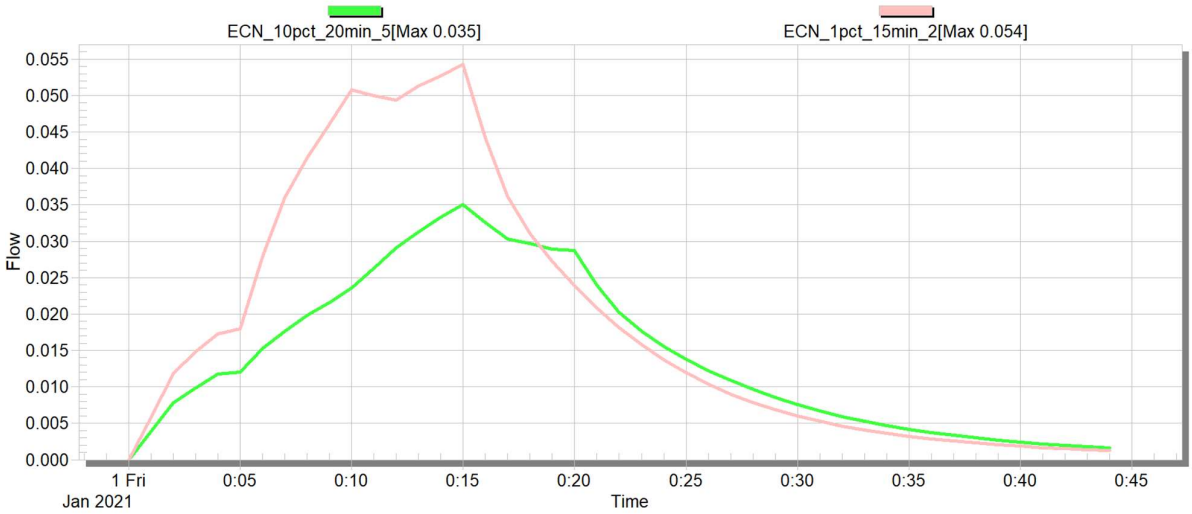

Figure 7: Discharge to LPOD for pre-development 10% and 1% AEP critical storms (XPSTORM Model)

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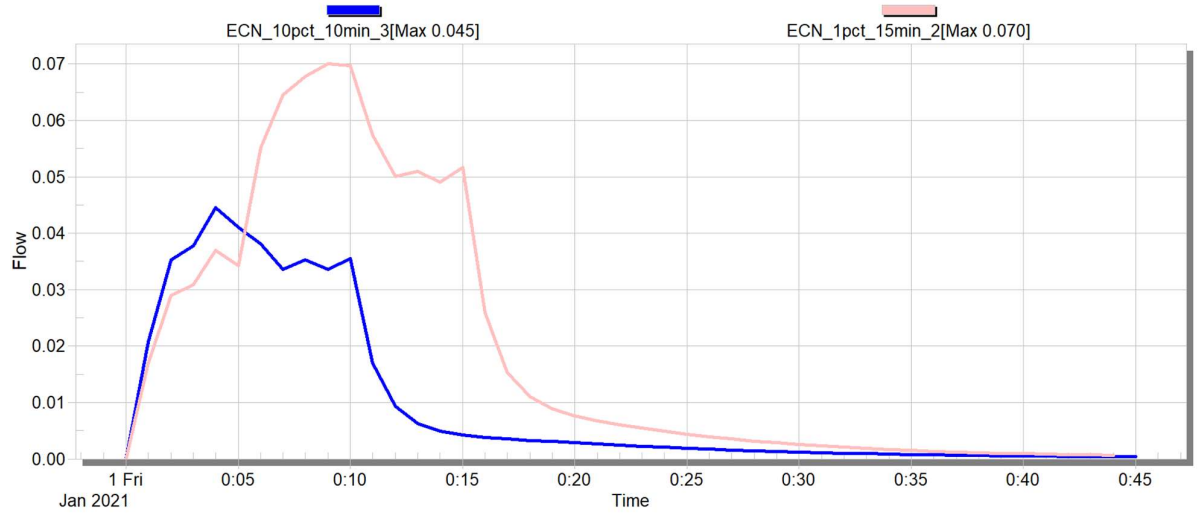

Figure 8: Discharge to LPOD for post-development (unmitigated) 10% and 1% AEP critical storms (XPSTORM Model)

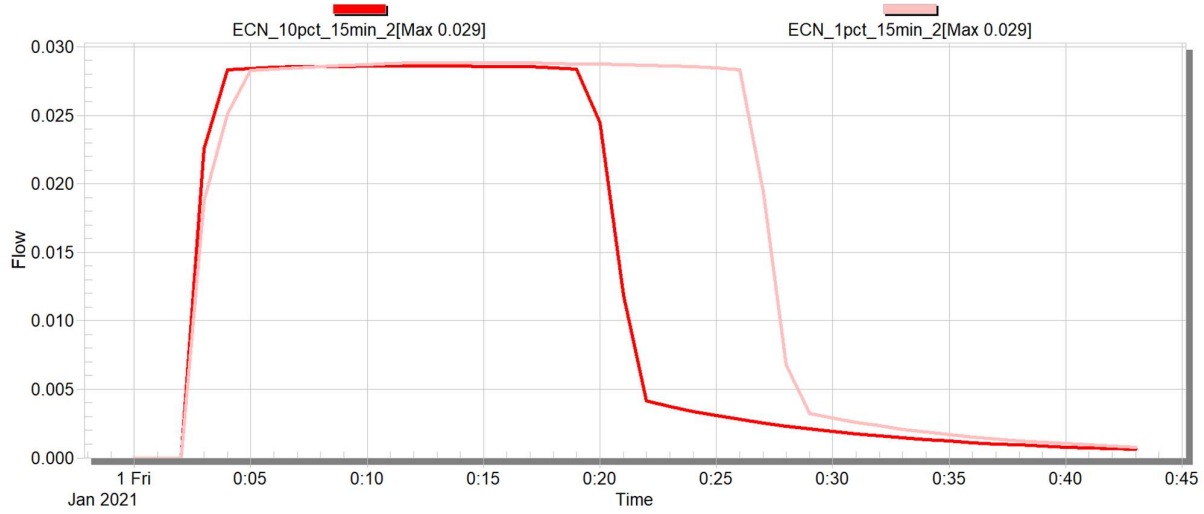

Figure 9: Peak flow through 2x90 uPVC pipes (mitigated) for post-development 10% and 1% AEP critical storms (XPSTORM Model)

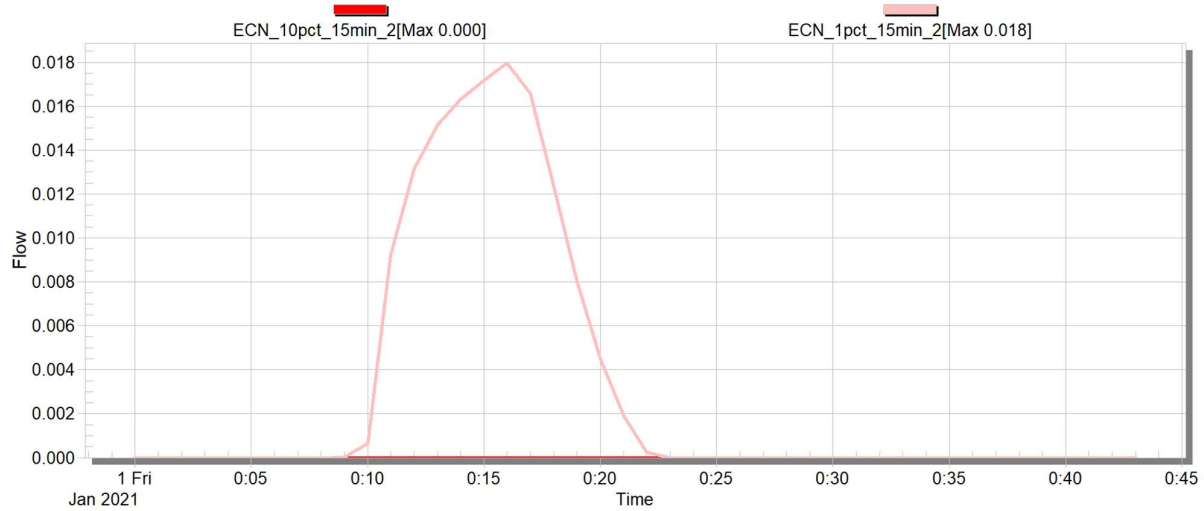

Figure 10: Flow over weir (mitigated) for post-development 10% and 1% AEP critical storms (XPSTORM Model)

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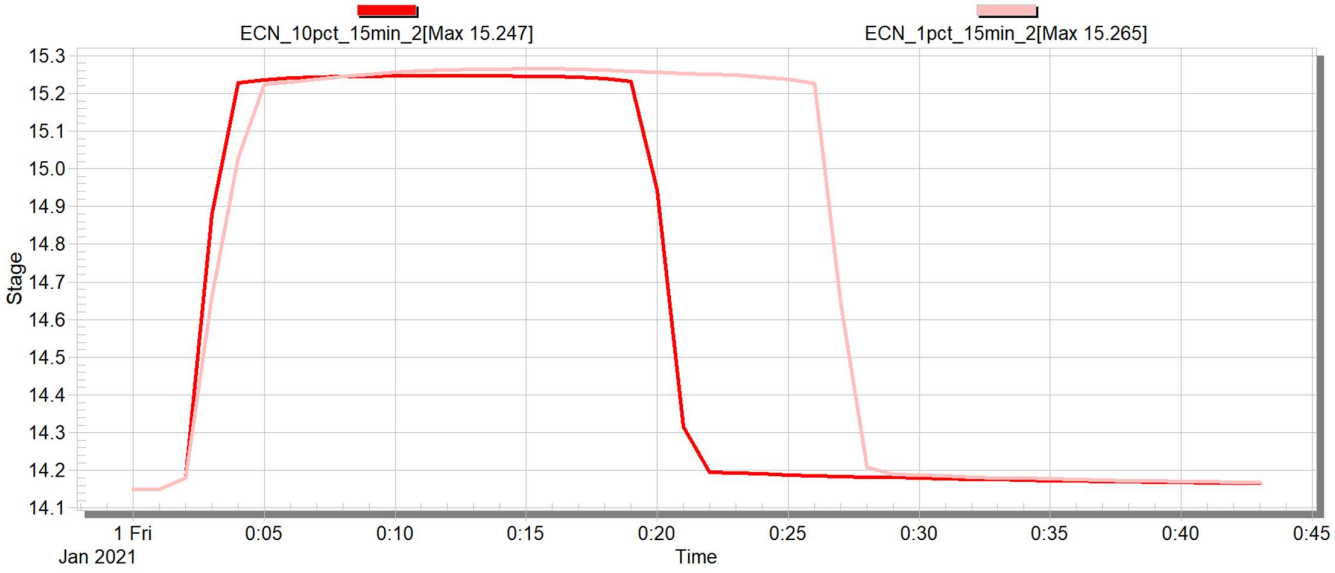

Figure 11: Flow level at weir (mitigated) for post-development 10% and 1% AEP critical storms (XPSTORM Model)

Storm Event (AEP %)	Duration	Pre-Development Mean Discharge (m^3/s)	Post-Development Mean Discharge – Unmitigated (m^3/s)	Post-Development Discharge - Mitigated (m^3/s)		
				2x90mm pipes	5.5m Weir	Total
10% (Minor Event)	10 mins	0.0313	0.0439	0.029	0	0.029
	15 mins	0.0332	0.0438	0.029	0	0.029
	20 mins	0.0337	0.0395	0.029	0	0.029
	25 mins	0.0320	0.0404	0.029	0	0.028
	30 mins	0.0316	0.0384	0.029	0	0.029
	45 mins	0.0285	0.0345	0.029	0	0.028
1% (Major Event)	10 mins	0.0513	0.0673	0.029	0.014	0.043
	15 mins	0.0539	0.0675	0.029	0.018	0.047
	20 mins	0.0509	0.0600	0.029	0.015	0.044
	25 mins	0.0512	0.0585	0.029	0.012	0.041
	30 mins	0.0492	0.0573	0.029	0.015	0.044

Table 5: Peak Discharge Rate at LPOD

6. CONCLUSION

The following conclusions are drawn based on the above study of the site:

- Post-development runoff routed through an internal drainage network, with crests and sags to allow ponding for additional storage of at least 5.1m^3.
- Outflow from the stormwater network will be discharged into Elphinstone Street stormwater pit, the legal point of discharge, via 2x90mm diameter uPVC pipes and a 5.5m driveway serving as a weir.
- There will be no stormwater quality strategy adopted for the operational phase of the development in accordance with the requirements of the State Planning Policy (July 2017).