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MAIN REPORT
Noise Issues, 61 Mahoney Drive, Austins Ferry

Dear Nikki

We conducted noise measurements at the neighbouring site at 63 Mahoney Dr during April 2026. The locations of these measurements were close to the common boundary, such that they represent noise levels for both lots within error of measurement. The layout of Units in both lots is very similar as well.
This is the main report, supported by data presented in accompanying Appendix sent earlier.

INTRODUCTION

Using the measured noise levels, the building elements were determined in accordance with AS/NZS 2107:2014 'Acoustics – Recommended design sound levels and reverberation times for building interiors' and AS 3671 – 1989 'Acoustics – Road traffic noise intrusion – Building siting and construction'.

The standard AS/NZS 2107:2016 recommends in Table 1, for houses near major roads, the following satisfactory and maximum design noise levels in rooms:

Table 1: AS/NZS 2107:2016 design noise levels in rooms

Design noise level	Leq (dBA)	
	Satisfactory	Maximum
Sleeping areas	35	40
Living areas	35	45
Work areas	35	45

Australian Standard AS 3671-1989, 'Acoustics – Road traffic noise intrusion – Building siting and construction', gives procedures for determining required construction categories. In par. 3.3, footnote 5 says, "A cost penalty will be incurred when buildings fall within Categories 2, 3 or 4. Due recognition should be given to what is acoustically desirable while recognizing practical financial limits".

Noise annoyance depends on the following factors:

- the ambient noise level
- the new noise level
- whether the noise has tonal components
- whether the noise has impulsive components
- the low frequency content
- the time of the day or night the noise occurs
- how often it occurs and its degree of predictability
- whether the noise is regretfully caused, mindlessly created or inflicted as an act of aggression

Traffic noise measurements are conducted on a typical week day, that is, Tuesday, Wednesday or Thursday, under suitable weather conditions, that is, no rain and light or no wind.

The Brooker Highway 2019 Annual Average Daily Traffic (AADT) was 28,734 vehicles/day with 11.4% heavy vehicles. The annual compound growth in traffic is about 2.7%. At this rate, the traffic noise is likely to increase by 1.5 dB in 15 years time, that is, by 2040.

Community complaints about traffic noise start to increase when L_{10}(18 h) = 63 dB(A). When L_{10}(18 h) = 63 dB(A) then 10% of the community is highly annoyed.

L_{10} is the noise level exceeded for 10% of the sampling time. For example, for Location U2 (page A12 Table column 2), L_{10} = 69.5 dB(A). This means that for 3 minutes out of the 30 minute sample, the noise level was 69.5 dB(A) or higher. L_{10} gives the approximate average of the higher noise levels encountered. It is used as a metric in traffic noise studies.

L_{10}(18h) means that such sampling is conducted for 18 hours between 6 am and midnight and the result averaged over 18 hours.

Leq is the A weighted equivalent noise level. A fluctuating noise having Leq = 66.4 dB(A) has the same acoustic energy as a steady noise of 66.4 dB(A). Leq is usually 2 to 3 dB(A) less than L_{10} for typical traffic noise exposure.

RESULTS

The main measurement results are presented in Appendix A. We conducted noise measurements at the site on 21/4/2026. Weather conditions were good for traffic noise measurements, that is; little or no wind and no rain, meaning that the road surface was dry.

From page A12, we calculate for location U2, the 3 hour free field mean L_{10}(3 h) = 69.2 dB(A) and Leq(3h) = 66.2 dB(A). From this we deduce the 18 hour (0600 h to 2400 h) L_{10} as L_{10}(18 h) = 69.2 – 1 = 68.2 dB(A) and similarly, Leq(18 h) = 65.2 dB(A). The difference between the two is 68.2 – 65.2 = 3.0 dB(A) and this is a typical difference reported in traffic noise studies literature.

The measurements were carried out in the free acoustic field, that is, there were no reflecting surfaces nearby. To the above we add +2.5 dB(A) normally added for the façade effect, that is; sound reflection off the façade of a dwelling, back into the measuring microphone. Hence L_{10}(18 h) = 68.2 + 2.5 = 70.7 dB(A) and Leq(18 h) = 65.2 + 2.5 = 67.7 dB(A).

Ideally we should design the building elements for the end of life of the building, that is, for the noise climate and the traffic noise likely to illuminate the building in say 40 years time. However, predictions beyond 15 to 20 years are unreliable. There may be more electric vehicles, there may be quieter road surfaces, the mix of cars and trucks may alter and so on.

Our calculations take into account the increase of traffic for the next 15 years, currently at about 2.75% per annum compound. This results in a likely increase in traffic noise of 1.5 dB(A) in 15 years.

That is, the noise level increases by:

$$10 \log(1.0275)^{15} = 1.5 \text{ dB.}$$

Hence we calculate the $L_{eq(18\ h\ +\ 15years)}$ = 67.7 + 1.5 = 69.2 dB(A) and $L_{10\ (18\ h)}$ = 70.7 + 1.5 = 72.2 dB(A). This is nearly 10 dB above the $L_{10(18\ h)}$ = 63 dB(A) standard above the noise level that some community complaints can be expected.

INTERPRETATION and RECOMMENDATION

The Traffic Noise Reduction (TNR) = $L_{eq(18\ h)} - L_{eq\ (room)}$

For sleeping areas, TNR = 69.2 – 40 = 29.2 dB(A).

According to AS3671, the required construction category is 3. Category 3, means that "Special Construction, chosen in accordance with Clause 3.4. Windows, doors and other openings must be closed. TNR between 25 and 35 dB(A) is expected".

The results are given below for the rooms of Unit 1 and Unit 2 at 61 Mahoney Drive, as shown on your TB-21 drawings. The results were based on the maximum design noise levels shown in the Table 1 (on page 1 of this report) and hence the values shown below are minimum values but bear in mind AS 3671-1989 footnote 5 quoted on page 1.

The subdivision is unevenly illuminated by traffic flow noise, because of the distance and topography. Measurements were conducted at Location U2 and U1 (see page A11) where the results are different by about 3 dB(A). There is also a variation in height amounting to 2.1 dB(A) for Leq at 1.4 m and 4.5 m. This was used to estimate the noise level at the first floor of the building compared to ground floor. There is less ground absorption of noise at the higher level. Rabbits sit up to hear better.

Unit 1 is further away from the Brooker Highway but being higher, has a wider view of the highway and is also close to Mahoney Drive traffic.
Once the units are completed, Unit 2 provides some noise shielding to the unit above. However, the unit above will also reflect Brooker highway traffic sound to the unit below. The angle of view to Brooker Highway is reduced by about 65 degrees and this reduces traffic noise by

$$10 \log(180-65)/180 = 1.95 \text{ or say } 2 \text{ dB(A)}$$

You may however consider the room design noise levels somewhere between satisfactory and maximum levels, in which case, increase the STC/Rw ratings below by say 5 STC (non sleeping and sleeping areas).

Bedrooms should be acoustic havens. You may wish to consider higher rated building elements for the bedrooms, that is, 5 or more points above the minimum values in the Table 2 below.

Table 2: Minimum STC/Rw for various rooms

Unit	Room	Summary table for house zones, STC/Rw		
		Ceiling/roof system	Wall system	Windows
Unit 1	bedroom 1	39	39	30
	bedroom 2	39	39	36
	master bedroom	36	36	33
	lounge, kitchen	31	28	28
Unit 2	bedroom 1	43	44	39
	bedroom 2	43	44	38
	lounge, kitchen	38	37	34

For example, ceiling/roof systems having a STC/Rw range of 39 to 41 dB can be had with a pitched roof of 0.5 mm corrugated iron over 10 mm plasterboard with insulation of 50 mm thick, 12 kg/m^3 glass fibre blanket between the joists.

For example, wall systems having a STC/Rw range of 36 to 38 dB can be had by conventional timber framed walls, clad externally with 9 mm thick timber and internally with 10 mm plaster board with cavity filled with mineral wool as per BCA requirements. Brick veneer walls will perform better than the above.

"Double-skin (cavity) clay brick wall, 270 mm thick in which the wall space is ventilated by connection with subfloor vents; upper part of internal wall sheeting is exposed to, and penetrated by upper wall vents leading to, the eaves space," gives an Rw or STC range of 42 to 44 dB. (See AS 3671-1989 Table B2, page 12).

A 6 mm horizontal sliding window has an STC rating of 24 to 26 STC points. In practice, the field values are about 5 STC points lower than the laboratory values. The Dowell double glazed windows have an STC rating of 35 and Rw rating of 35 (-1; - 4) as per NATA ATF Report, 1426 of 8/10/2003. The -4 in the bracket means that the window is rated at Rw = 35 – 4 = Rw 31 points for traffic noise and noise with low frequency components.

For Unit 2 bedrooms, the openable window may be "5 mm + 6 mm at 44 mm rollover aluminium sash". See table B3, page 14, of AS 3671-1989, Australian Standard 'Acoustics – Road traffic noise intrusion-Building siting and construction'.

The spectral content of the traffic noise (see page A14 and A15) shows some low frequency noise but not an excessive amount. There is however some mid frequency noise due to the high speed tyre/road interaction.. The table on page A14 shows a difference between the dB(C) and dB(A) of 70.8-66.4 = 4.4 dB. When this difference is about 15 dB then the low frequency noise can be annoying. This could be the case early morning around 06:00 h when semi trailers and heavy vehicles leave and approach the Hobart warehouses, Brighton hub etc.

For rooms with sliding windows and sliding glass doors you may consider two sliding windows and two glass doors separated by a wide (width of wall) air space, for low frequency mitigation.

CONCLUSION

To conclude, Unit 1 and more especially Unit 2 [$L_{10(18\ h)}$ = 68.2 dB(A)] are exposed to high traffic noise and require noise mitigation that is not usually provided by lightweight building elements.

Yours sincerely,

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Stormwater Report

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Engineers+Project Managers

GLENORCHY CITY COUNCIL
PLANNING SERVICES

APPLICATION No. : PLN-26-044

DATE RECEIVED: 16 July 2026

Unit Development

16/07/2026

PROJECT INFORMATION

DOCUMENT TITLE	Stormwater Report - 26 E 11 - 2 Rev A
PROJECT LOCATION	61 Mahoney Drive, Austins Ferry TAS 7011
CLIENT ORGANISATION	Taylor and Beeson Building
CLIENT REFERENCE	Unit Development
CLIENT CONTACT/S	Nikki Jennings
VERTO REFERENCE	26 E 11 - 2
VERTO CONTACT/S	Lachlan Gadomski

Verto will notify you immediately if at any stage during the works we believe that the fee will be higher than this estimate. In this event Verto will cease works until written approval to proceed is provided by you.

DOCUMENT CONTROL

REVISION	DATE	REVISION DETAILS	PREPARED	VERIFIED	APPROVED
A	16/07/2026	Development Approval	LG	DE	MG

1. INTRODUCTION

Verto have been engaged to provide a stormwater report for the proposed development at 61 Mahoney Drive, Austins Ferry.

This report aims to demonstrate that the proposed stormwater design for the development at 61 Mahoney Drive, Austins Ferry complies with the stormwater quantity and quality requirements of Glenorchy City Council (GCC) Stormwater Management Policy.

2. SITE OVERVIEW

The existing site is currently undeveloped but is serviced by existing lot connections located in the south-west corner of the property.

Two (2) units are proposed to be constructed on the subject site, as well as new concrete driveway and associated parking areas as per Figure 1 below. The increase in impervious area within the site is expected to increase the quantity of site stormwater runoff.

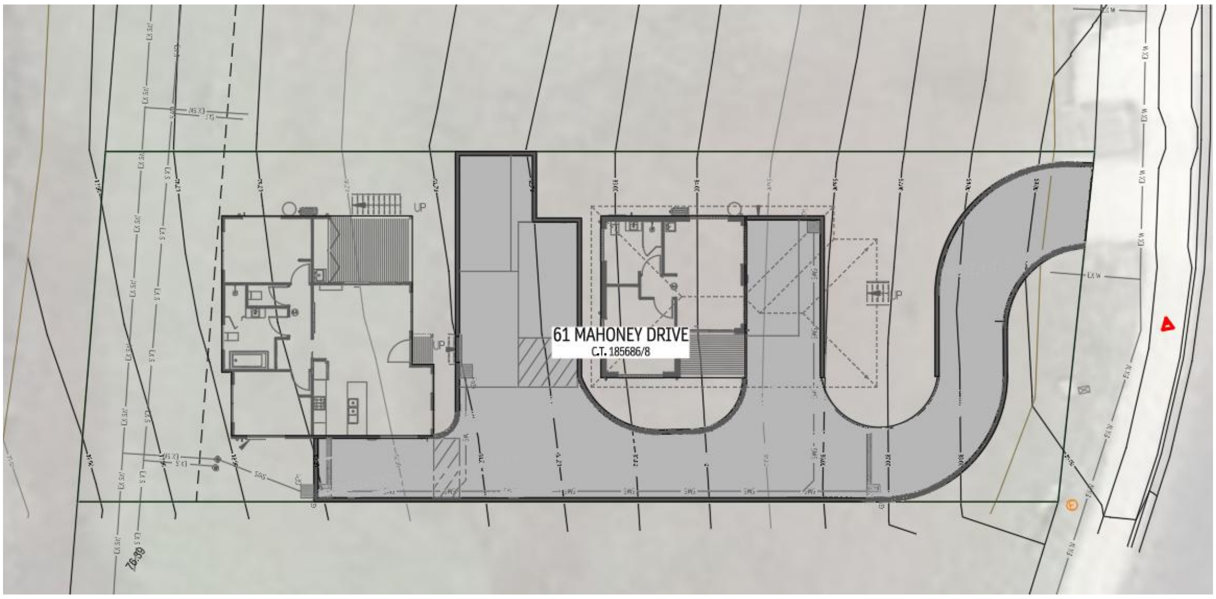

FIGURE 1: PROPOSED SITE PLAN

3. QUANTITY REQUIREMENTS

3.1 INITIAL LOSS / CONTINUING LOSS (IL-CL) METHOD

The Initial Loss / Continuing Loss (IL-CL) loss method was applied within the software DRAINS to determine the increase in runoff between the pre-development and post-development conditions. The DRAINS model was then used to determine the volume and configuration of on-site detention required to reduce the site runoff below the pre-development conditions.

Rainfall data for the DRAINS model was sourced from the ARR Data Hub website (https://data.arr-software.org/) and includes the following:

- Storm losses – Initial and continual
- Pre-burst rainfall depths
- Temporal patterns

3.2 SITE CATCHMENTS

A single homogenous site catchment was simulated for the pre-development condition area for the pre-development condition based on the boundary area determined from Taylor & Beeson Site Plan dated April 2026.

For the Post-development condition, catchment areas were also determined from the architectural site plan prepared by Tayor and Beeson. Catchments were based on the individual roof areas of the two (2) proposed Units and the driveway pavement.

The proportion of effective impervious area (EIA), remaining impervious area (RIA) and pervious area (PA) defined for the DRAINS model catchments are shown in Table 1 below. For the pre-development condition, an EIA of 55% was assumed in accordance with Condition 6(g(i)) of GCC's Stormwater Management Policy. Similarly the post-development EIAs were also assumed in accordance with Condition 6(g(iii)) of GCC's Stormwater Management Policy.

Times of concentration for all catchments were determined within DRAINS using the kinematic wave equation.

TABLE 1: SITE CATCHMENTS BREAKDOWN

CATCHMENT	AREA (Ha)	EIA (%)	RIA (%)	PA (%)
Pre-development	0.0751	55	0	45
Post-development				
Driveway	0.0197	100	0	0
Unit 1 (roof)	0.0110	100	0	0
Unit 2 (roof)	0.0111	100	0	0

3.3 STORM LOSSES

The initial and continuing losses for the pre-development condition were sourced from the ARR Data Hub website and the impervious area losses were set as per advice in ARR 2019 Book 5 Chapter 3 Section 3.5.3.1.2.

Table 2 captures the storm losses assumed in the DRAINS model for both the pre-development and post-development conditions.

TABLE 2: ASSUMED STORM LOSSES (ARR)

Storm Losses	Value
Impervious Area Initial Losses (mm)	1
Post-Impervious Area Continuing Losses (mm/hr)	0
Pervious Area Initial Losses (mm)	27.0
Pervious Area Continuing Losses (mm/hr)	3.8

3.4 MODEL RESULTS

The results from the DRAINS Analysis model (Appendix A) showed that the post-development site runoff for 61 Mahoney Drive, Austins Ferry is **not increased** when compared to pre-existing runoff quantities for the 5% AEP storm event as shown in Table 3.

The total post development EIA (sum of EIAs of the post development catchments) is equal to 56% of the total catchment area for the site. This value is approx. equal to the pre-development EIA of 55% which was assumed in accordance with GCC's Stormwater in New Development Policy). The post-development runoff is therefore approx. equal to the assumed pre-existing quantities and the results from the DRAINS Analysis model indicate that an engineered **stormwater detention solution is not required**.

Refer to Appendix B for box and whisker plots of pre & post development outflows.

TABLE 3: PEAK SITE RUNOFF SUMMARY

Condition	Site Runoff (L/s)	Critical Duration
Pre-development	26	5-min
Post-development	25	5-min

4. QUALITY REQUIREMENTS

Condition 5(a(ii)) of GCC's Stormwater Management Policy states that developments creating a total new impervious area less than 500m^2 are exempt from the Stormwater Quality Management Requirements set out in 5(b) to 5(e).

The total impervious area for the proposed development is equal to 418m^2 as shown in Table 1, the site is therefore exempt from quality management requirements.

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5. CONCLUSION

This report has demonstrated that the proposed stormwater design for the development at 63 Mahoney Drive, Austins Ferry complies with the stormwater quantity and quality requirements of Glenorchy City Council (GCC) Stormwater Management Policy.

Note:

- No assessment has been undertaken of Council's stormwater infrastructure and its capacity.
- This report assumes the Council stormwater main has capacity for the pre-development peak discharge.
- It is the responsibility of Council to assess their infrastructure and determine the impact (if any) of altered inflows into their stormwater network.

Please contact me at lgadomski@vertotas.com.au if you require any additional information.

Yours faithfully,

Lachlan Gadomski BEng Civil (Hons), Dip. Project Management
Civil Engineer

APPENDIX A - DRAINS MODEL

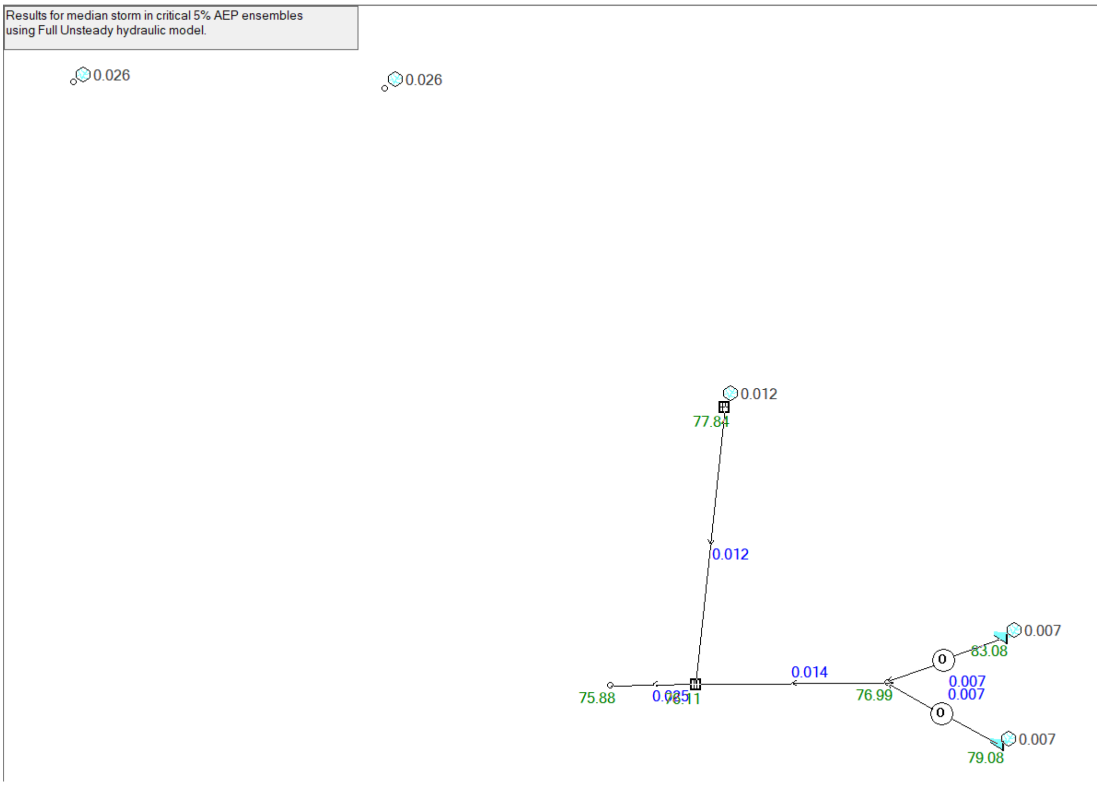

FIGURE 2: DRAINS MODEL - 5% AEP EVENT

APPENDIX B – BOX AND WHISKER PLOTS

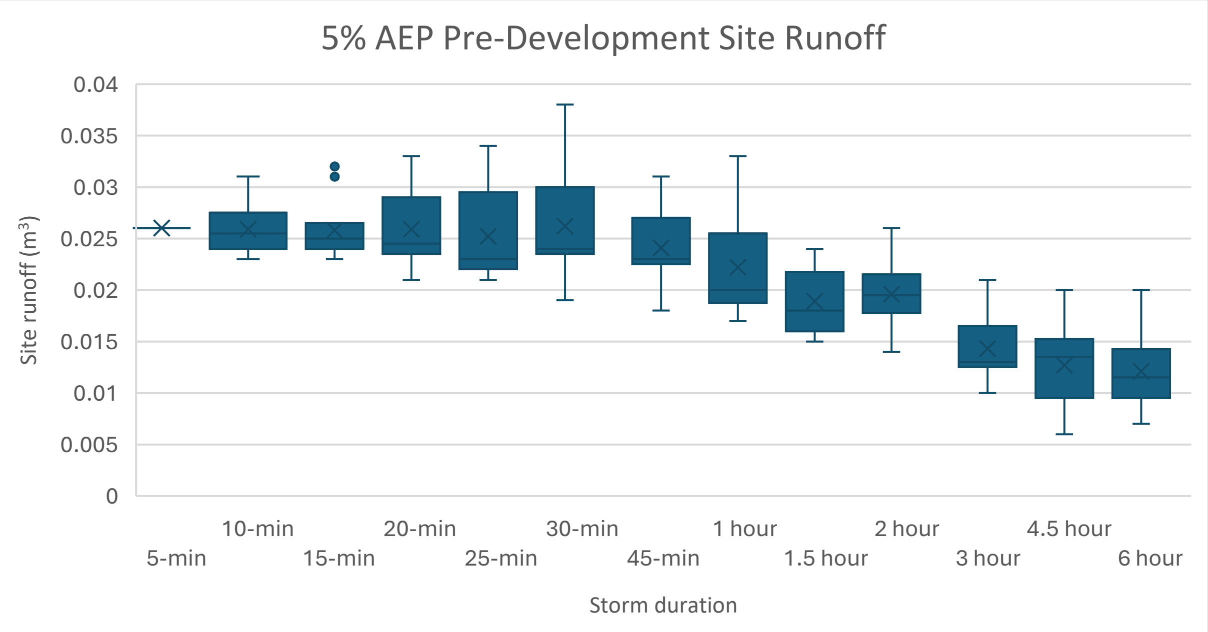

FIGURE 3: PRE-DEVELOPMENT 5% AEP RUNOFF

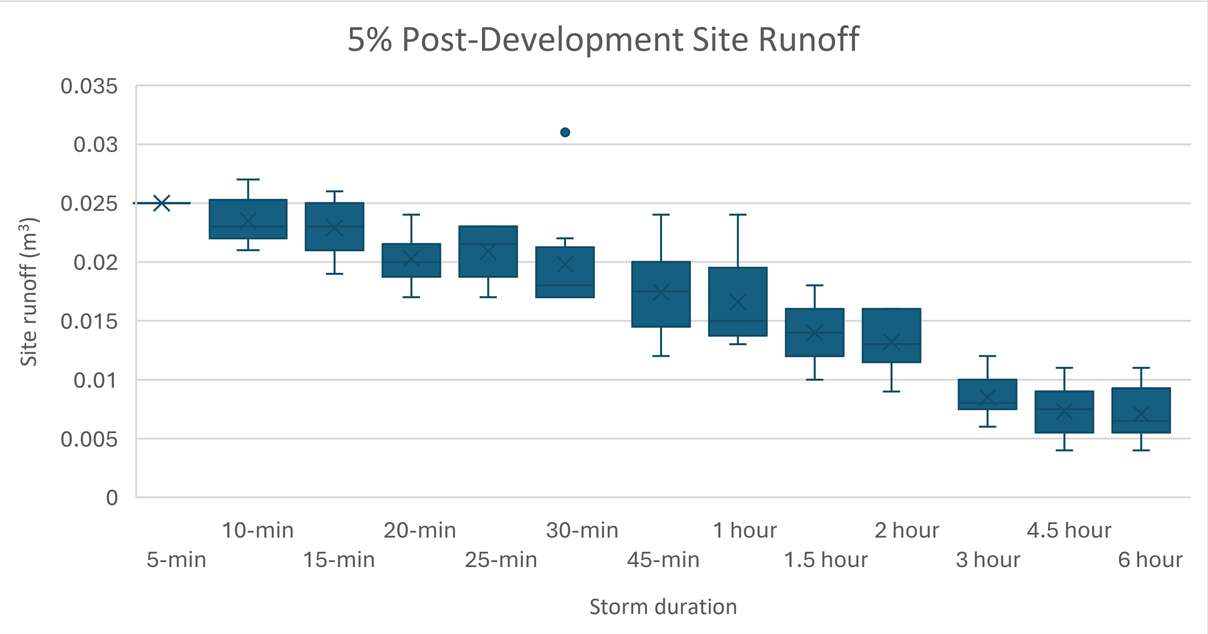

FIGURE 4: POST-DEVELOPMENT 5% AEP RUNOFF UNMITIGATED

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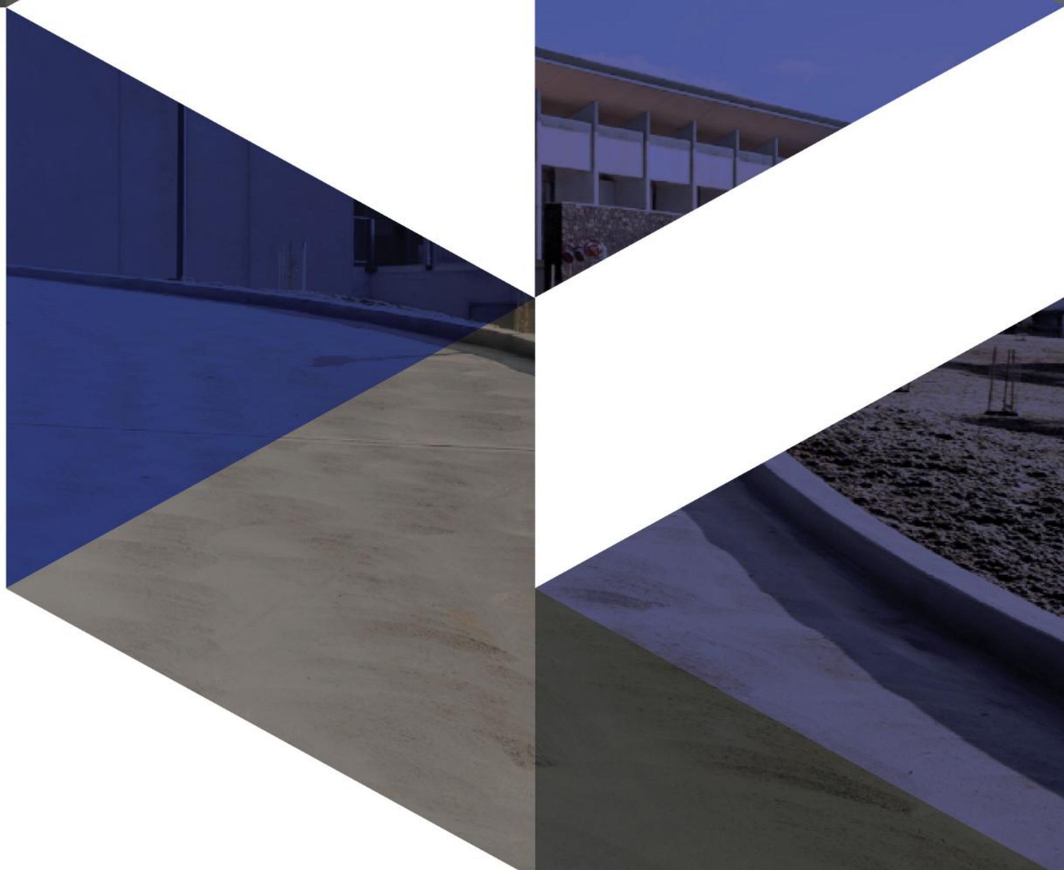

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