

MR J. O'KANE

Proposed Workshop / Store and Office,  
Located at 79b Finvoy Road,  
Ballymoney. Planning Reference  
LA01/2018/1402/F

P954 DRAINAGE ASSESSMENT

6 SEPTEMBER 2021

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# 1 INTRODUCTION

## 1.1 Report Brief

O'Sullivan Macfarlane Environmental Consulting (OSM) were instructed in August 2021 by Mr J. O'Kane to undertake a Drainage Assessment on lands at 79b Finvoy Road, Ballymoney.

The development proposal is for the retrospective approval of an exiting workshop / store and office for industrial use pertaining to the research, development and testing of overland slurry distributors. The current active planning application number for the site is LA01/2018/1402/F.

This report assesses the proposed development in accordance with Revised Planning Policy Statement 15 (PPS15) and considers the flood risk within the site in terms of surface water and drainage, relating directly to FLD3.

## 1.2 Scope of Works

The following scope of works has been undertaken as part of this assessment:

- Review of site development proposals / planning application;
- Site walkover / inspection by an Environmental Engineer;
- Review of Rivers Agency strategic flood maps, in order to identify any potential areas of flooding, and determine aspects of PPS15 to consider;
- Calculation of storm flows using Modified Rational Method under pre and post development scenarios, which will be used to aid drainage design of the site;
- Limitation of flows with mitigation measures and attenuation volumes if required;
- Submission of Schedule 6 to Rivers Agency local office if NIW public sewer is unavailable (if required);
- Assess the site in relation to the applicability of Sustainable Urban Drainage (SuDS), including attenuation, with recommendations for suitable mitigation measures;
- Preparation of Drainage Assessment (DA), based upon proposed land uses and in accordance with Planning Policy Statement 15 (PPS15).

## 2 SITE DESCRIPTION AND PROPOSALS

### 2.1 Site Description

The assessment site is located on lands at 79b Finvoy Road, Ballymoney, approximately 3.5km south of Ballymoney town and 9.5km north of Rasharkin. The Irish Grid Reference for the centre of the site is 295502 (Easting), 422273 (Northing). The entire site has a surface area of circa 0.75ha, and consists of permeable surfacing (grassland) and various types of hardstanding. The assessment site is located in a predominately agricultural setting.

Topographically, the site is positioned on relatively flat lands (~70mOD), with the surrounding lands featuring a slope from east to west. The site is bounded by agricultural lands in all directions, with a small drainage ditch along the sites southern boundary. A Site Location Map is presented below as Figure 1, and a Site Boundary Map as Figure 2.

Figure 1: Site Location Map, 79b Finvoy Road, Ballymoney

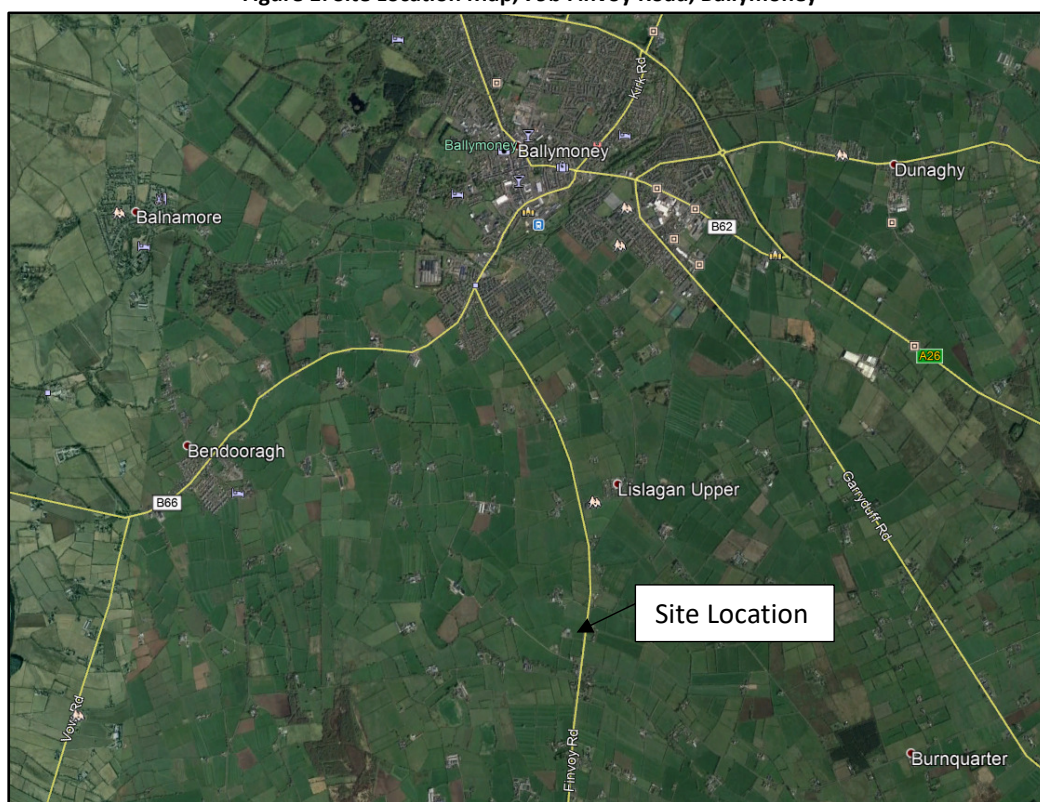
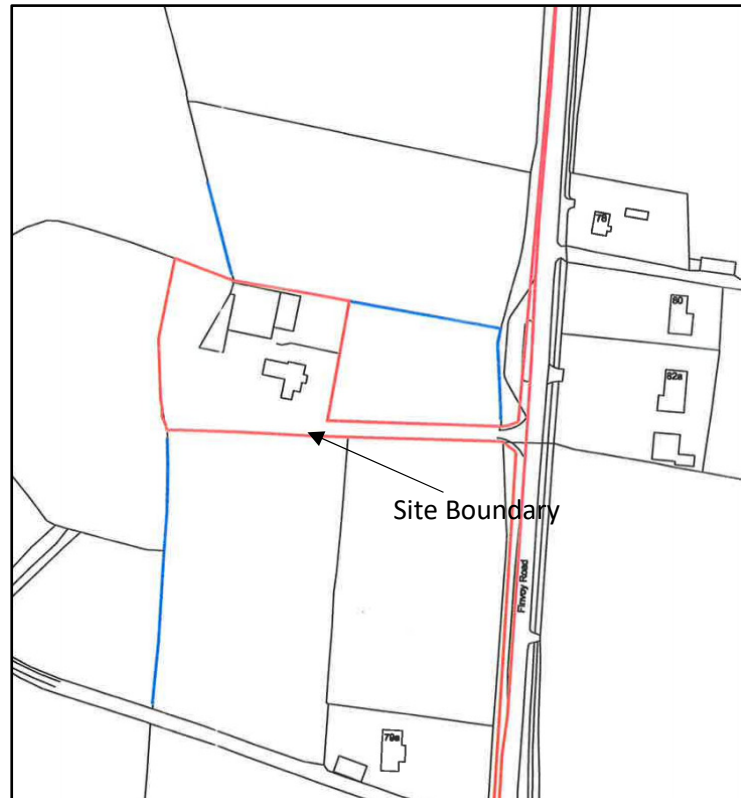


Figure 2: Site Boundary Map, 79b Finvoy Road, Ballymoney



## 2.2 Site Development Plans

Site development proposals are detailed in the planning portal P1 Form as *Retrospective Application for Existing Workshop/Store and Office for industrial use pertaining to the research, development and testing of overland slurry distributors, RHI Boiler and Flue*. A Site Development Plan is presented as Appendix A.

In order to determine the extent of new hardstanding included within this application, a review of historical satellite imagery was undertaken using Google Earth, and is now presented below:-

**Figure 3: Site Historical Satellite Imagery, April 2011**

The image above depicts the existing residential house with construction works appearing to be undertaken within the lands to the rear of the dwelling.

**Figure 4: Site Historical Satellite Imagery, April 2012**

As shown in the image above, a significant shed has been constructed within the site with concrete hardstanding to the south. A storage area, likely to be constructed from gravel, is present to the south-east of the site, with the main yard area consisting of concrete.

Figure 5: Site Historical Satellite Imagery, July 2017



As shown above, the main shed within the development area has been extended to the west of the site, in an area which would have already consisted of gravelled hardstanding.



Figure 6: Site Historical Satellite Imagery, April 2021



Figure 6 above clearly shows an extension of the main site area to the north-west, consisting of a new section of gravelled surfacing. This area would be considered to consist of entirely new impermeable surfacing.

### 2.3 Assessment Area

In to identify all new hardstanding associated with the proposed planning application, a review of historical planning applications was undertaken. Planning Application D/2010/0040/F was approved in November 2010, and is expected to be the relevant planning mission for works undertaken in Figure 4. Therefore, the area of new hardstanding associated with the currently application is defined as the area shown in Figure 7 below.

Figure 7: Area of New Hardstanding



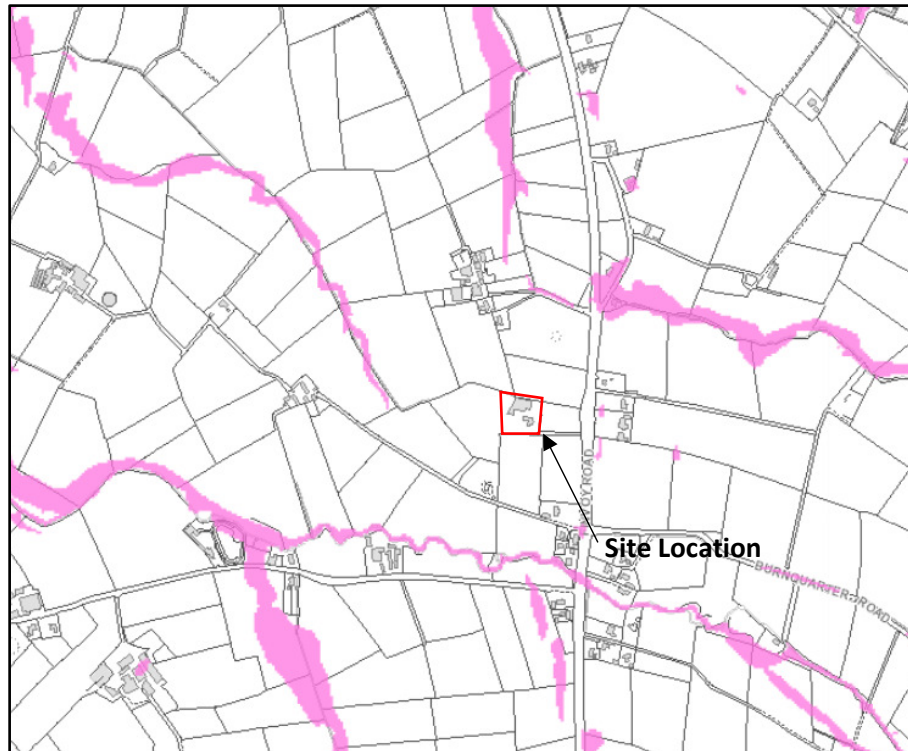
The area identified above consists of approximately 794m<sup>2</sup> gravelled hardstanding which is considered to be impermeable. The remaining areas of the site will not be altered with respect to surface water runoff or drainage, and will therefore not be included within this assessment.

## 2.4 Hydrology

The site is located within the catchment of the River Bann, with the sub-catchment of the Claghney Burn located approximately 270m south of the site. Closer to the site, a small drainage ditch flows in an approximately south-east to north-west direction. This small drainage ditch is the recipient of all surface water generated onsite.

Rivers Agency's online Hazard Maps has indicated the site is not affected by surface water flooding during a Q<sub>100</sub> rainfall event (including climate change). In the general area of the site, surface water flooding accumulates primarily in and around the banks of the existing watercourses, as shown in Figure 8 below.

Figure 8: Surface Water Flood Map, 79b Finvoy Road, Ballymoney



### 3 SITE RUNOFF

#### 3.1 Current Runoff

The application area has been developed for some time, with the majority of the application site completed historically under a previous planning application. Therefore, only new hardstanding has been assessed within this application, as shown in Figure 7. This area currently consists of compacted gravel and would be considered to consist of entirely impermeable surfacing. The Modified Rational Method has been used to calculate run-off from this portion of the site (total area of new hardstanding equals approximately 794m<sup>2</sup>.), with analysis presented as Table 1 below.

**Table 1. Modified Rational Method Calculations**

Input Data: -	<b>Modified Rational Method (Wallingford Procedure)</b>				
Site Location:	Finvoy Road				
Site Area (ha):	0.0794	Roof, Roads, Paths etc			
Flow (l/s):	2.78*Ap*i*Cr*Cv				
Cr	1.3				
Cv	1				
Notes:-	Larger margins of error for 1, 2, 5 and 10 minute maximum rainfall values and for 100 year return Periods				
M560:	17	M52d:	56.67	M560/m52d:	0.3

<b>Impermeable Surface Run-off</b>					0.08 ha
Duration (Sec)	Return Period (Years)	Maximum Rainfall (mm)	Rainfall Intensity (mm/hr)	Flow (l/s)	
3600	1	10.3	10.3	2.96	
3600	30	24.2	24.16	6.93	
3600	100	32.8	32.8	9.41	

<b>Total Site Run-off</b>					0.08 ha
Duration (Sec)	Return Period (Years)	Maximum Rainfall (mm)	Rainfall Intensity (mm/hr)	Flow (l/s)	
3600	1	10.3	10.3	2.96	
3600	30	24.2	24.16	6.93	
3600	100	32.8	32.8	9.41	

<b>Greenfield Run-off</b>					0.00
Duration (Sec)	Return Period (Years)	Maximum Rainfall (mm)	Rainfall Intensity (mm/hr)	Flow (l/s)	
3600	1			0.00	
3600	30			0.00	
3600	100			0.00	

Based on the above information, the predicted existing site run-off during a  $Q_{100}$  rainfall event is 9.41l/s (118.5l/s/ha).

Given that this is a retrospective application, attenuation will be required within the site to reduce run-off from this new section of hardstanding to meet the greenfield run-off standard.

### 3.2 Discharge Options

Given the topography of the area, and its close proximity to a watercourse to the south, it is proposed to connect all new site surface water drainage infrastructure directly to the adjacent watercourse. The location of the proposed discharge point is presented in Figure 9 (See Section 3.5).

A Schedule 6 application has been submitted to DFI Rivers for a discharge rate of 0.8l/s. On receipt of the discharge consent, a copy will be forwarded to DFI Rivers (Planning Advisory Unit) as an addendum to this Drainage Assessment.

### 3.3 Attenuation Calculations

Calculations for the proposed development indicate that the site discharge from all new hardstanding will be 9.41l/s during a  $Q_{100}$  storm event. It is proposed that the site is limited to a surface water discharge of 0.8l/s, based on the greenfield run-off rate of 10l/s/ha.

In order to achieve this discharge rate during a  $Q_{100}$  storm event, attenuation will be required to ensure the proposed discharge rate (0.8l/s) is not exceeded, and surface water flooding does not occur.

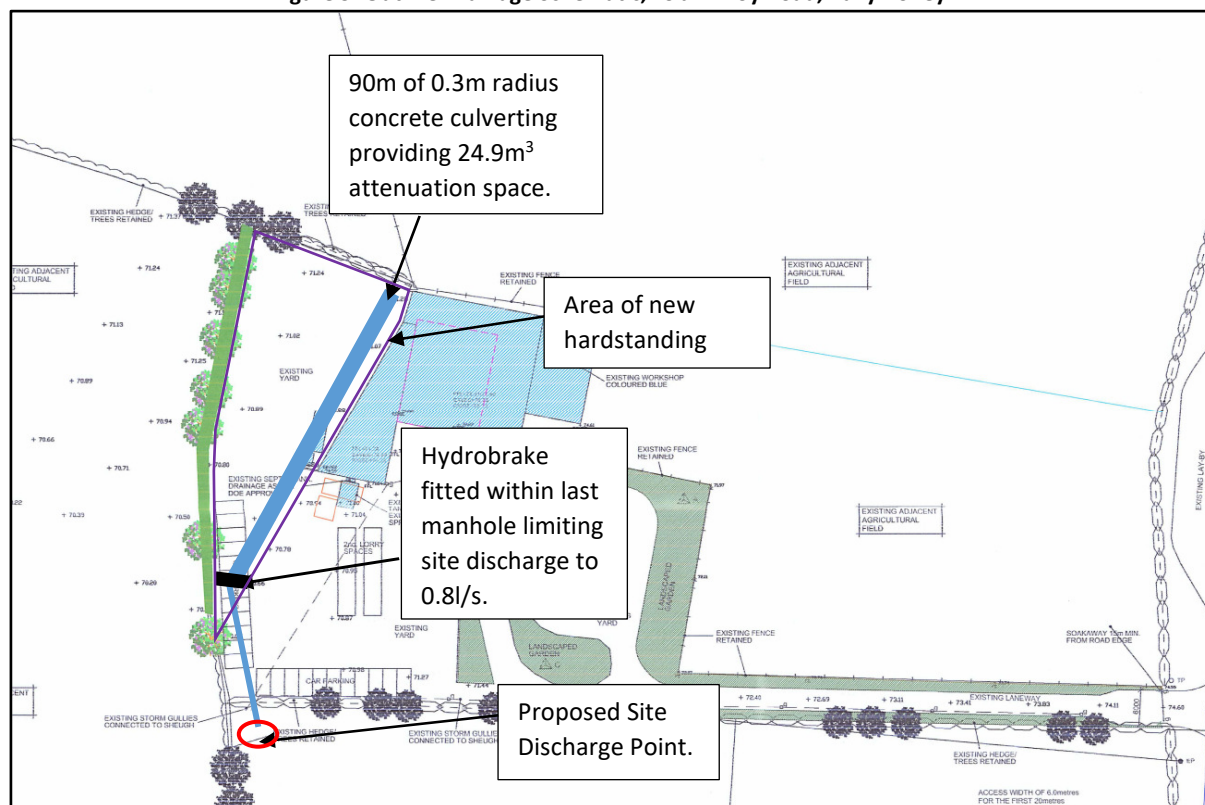
In order to achieve the proposed runoff rate (0.8l/s) during a  $Q_{100}$  rainfall event for the application area, a number of SuDS techniques will be employed, including oversized piping and manhole junctions, and hydrobrakes throughout the drainage network.

To assess the level of attenuation required all new hardstanding, analysis was undertaken using Stormwater Management™ (Version 7.9) software (Appendix B). Analysis found that on the basis of a discharge rate of 0.8l/s, the proposed new hardstanding would require an attenuation capacity of 24.9m<sup>3</sup>, in order to prevent out of pipe flooding, during a Q<sub>100</sub> storm event.

### 3.4 Site Drainage Proposals

Within the area of the site to be developed, drainage infrastructure will be installed adjacent to the existing shed, linking surface water run-off from areas of hardstanding within the site to the proposed site discharge point. A watercourse running parallel to the south of the assessment site is the proposed final discharge point for surface water run-off. Based on the topography of the land, surface water run-off will be gravity fed towards the final discharge point.

Figure 9: Outline Drainage Schematic, 79b Finvoy Road, Ballymoney



As shown in the site outline drainage schematic, a length of 90m, 0.3m diameter, concrete culverting along the site access road would provide an attenuation void of 24.9m<sup>3</sup>, above what is required for all new hardstanding within the site.

Prior to the final discharge from the site to the watercourse, it is proposed a hydrobrake is fitted within the final manhole to ensure site discharge is limited to 0.8l/s.

## 4 CONCLUSION

Site development proposals relate to a retrospective application for an existing workshop/store and office for industrial use pertaining to the research, development and testing of overland slurry distributors, RHI Boiler and Flue. As part of this development, an extension the existing yard area is the only physical change, with respect to surface water run-off, from the previously approved development.

No alteration of the previously approved physical development will occur with respect to drainage / run-off.

The proposed maximum surface water discharge rate from new hardstanding within the site will be limited to 0.8l/s using a combination of oversized piping and manhole junctions (total volume =24.9m<sup>3</sup>) and a hydrobrake. Given that this area has already been developed, this will have to be installed retrospectively.

A schematic of the proposed oversized drainage network is presented as Figure 9 above. It is recommended that prior to any development, a final detailed drainage design is undertaken at the site to ensure these proposals are correctly carried out onsite, and are in line with the relevant NI Water standards (Sewers for Adoption).

As the site development continues, the approved drainage design will be installed in accordance to local Building Control Regulations, and comply with River Agency standards. Drainage infrastructure will drop in elevation as it progresses towards the final discharge point to the south of the site to ensure no build-up of surface water occurs on the site.

On approval of the Schedule 6 application, a copy of the consent will be forwarded to the local planning service as an addendum to the report.

Given the above information, it is considered that this development will not increase surface water flood risk at, or downstream of the site, and therefore meets the requirements of Revised Planning Policy Statement 15 'Planning and Flood Risk' Policy FLD3.

**Appendix A    Site Development Plan**



74.1

78

79a

**KEY TO PLAN SYMBOLS**

	Indicates mature tree planting as per notes		Indicates new hedging as per notes
	Indicates existing trees to be retained		Indicates existing hedging to be removed
	Indicates existing hedging to be retained		Indicates landscaped garden

**Proposed tree planting**

Key	Species	Form	Size	Type	Qty
Ag	Ailanthus glutinosa	Standard	10-12	Br	8
Bp	Betula pendula	Standard	10-12	Rballed	9
Cm	Crataegus monogyna	Standard	10-12	Br	7
Fs	Fraxinus excelsior	Standard	10-12	Br	8
Cr	Quercus robur	Standard	10-12	Rballed	7

**Proposed hedge planting**

Species	Size	Type	pot	Qty
Crataegus Monogyna	60-80	Br	N/A	960
Fagus Sylvatica	60-80	Br	N/A	200
Ilex Aquifolium	40-60	Br	N/A	220

**MAINTENANCE:**  
 MAINTAIN ALL AREAS IN A WEED-FREE CONDITION FOR A MINIMUM OF 3 years AFTER PLANTING BY SPRAYING WITH A TRANSLUCENT HERBICIDE IN APRIL, JUNE AND AUGUST TO ERADICATE PERENNIAL WEEDS.

MONTHLY MAINTENANCE TO BE CARRIED OUT TO CLEAR AWAY ANY DEBRIS AND CARRY OUT WIND FIRMING, SPOT WEEDING AND MINOR PRUNING OF ANY PLANTS WHICH MAY REQUIRE IT.

ANY PLANTS WHICH HAVE FAILED TO ESTABLISH IN THE FIRST GROWING SEASON WILL BE REPLACED.

ALL GRASS AREAS TO BE CUT AT 10 DAY INTERVALS AS APPROPRIATE TO THE GROWING SEASON

**TREE PLANTING:**  
 DIG HOLE LARGE ENOUGH TO ACCOMMODATE ROOT SYSTEM COMFORTABLY. APPROX. 800mm deep x 800mm wide. ALLOW 150mm OF BACKFILL AROUND OUTSIDE OF ROOT SYSTEM

TREES TO BE STAKED WITH 1no. 75mm ROUND STAKE SECURED WITH 1no. RUBBER STRAP TREE TIES AS PER MANUFACTURERS SPECIFICATION TO APPROX. 600mm ABOVE GROUND LEVEL

BACKFILL ALL PITS WITH TOP SOIL MIXED WITH 150g OF FERTILISER AND ORGANIC COMPOST

Drawing Number 02

LA01/2018/1402

Planning Office RECEIVED  
 - 9 NOV 2018  
 File No. ....  
 Causeway Coast and Glens Borough Council

Client: Mr. J. Okane		 <small>44 BALLYMONEY ROAD, BALLYMONEY, DUBLIN 11. TEL: 01761 8870. Email: sales@simpsonandsons.ie. Web: www.simpsonandsons.ie</small>	
Project: Retro-spective Planning Application at 79a Finvoy Road, Ballymoney	Scale: 1:500	Plot Date: June 18	Job No: -
Drawing Title: PROPOSED Site Plan	DWG. NO.: PSP-01	ISSUE NO.: D	

ACCESS WIDTH OF 6.0metres FOR THE FIRST 20metres  
 GRADIENT OF ACCESS NOT TO EXCEED 1 in 25 FOR THE FIRST 20 metres  
 WATER CHANNEL ACROSS THE ACCESS BEHIND THE LINE OF THE EXISTING HEDGE  
 EXISTING ROADSIDE GULLY RE-LOCATED FROM WITHIN THE ACCESS

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING HEDGE/TREES RETAINED

EXISTING HEDGE/TREES RETAINED

EXISTING FENCE RETAINED

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING WORKSHOP COLOURED BLUE

EXISTING FENCE RETAINED

EXISTING DWELLING

EXISTING YARD

EXISTING FENCE RETAINED

EXISTING YARD

EXISTING FENCE RETAINED

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING ADJACENT AGRICULTURAL FIELD

EXISTING LANEWAY

EXISTING LANEWAY

EXISTING LANEWAY

EXISTING LANEWAY

EXISTING LANEWAY

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EXISTING LANEWAY

EXISTING LANEWAY



**Appendix B StormWater™ Management Calculations**

Client:  
 Project:  
 Location: No Data  
 Catchment:

## Catchment Details:

Buildings	0 m <sup>2</sup>	x 95 %
Dense surfacing	800 m <sup>2</sup>	x 90 %
Effective Area	720 m <sup>2</sup>	

## Storage Details:

Length	50 m
Width	1 m
Depth	1 m
Porosity	100 %
Area Increase	0 %

## Rainfall Details - FSR Method:

Return Period	100 years
Climate Change Factor	0 %
r value	0.31
M5-60	17 mm

## Summer Storm Profile

Duration	Intensity		Required storage(m <sup>3</sup> )
	mm	mm/h	
5 min	10.3	123.9	7.197
10 min	15.7	94.4	10.843
15 min	19.4	77.5	13.234
30 min	26.2	52.5	17.455
45 min	30.3	40.4	19.650
60 min	33.3	33.3	21.117
2 hours	41.3	20.6	23.973
6 hours	56.3	9.4	24.125
24 hours	81.6	3.4	18.543

## Outflow Details:

Infiltration rate	0 m/hr
Attenuation Control	Fixed Outflow
Control Diameter	-
Discharge rate	0.8 l/s

## Result:

Outcome	Pass
Critical Storm Duration	3.37 hrs
Hmax	0.497 m
Required Volume	24.854 m <sup>3</sup>
Time to half empty	4.3 hrs