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Doc Ref:  
 P011-ENG-R01

Rev No. 00

Date: 14<sup>th</sup> Sept '22

**Project:** Flat Roof Extension to Existing Property and Associated Site Works

**Client:** Tom & Hilary Norton

**Architect:** **JOE FALLON** DESIGN  
 ARCHITECTURE  
 Joe Fallon Architecture  
 1A Ryland Street,  
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**Proposed Extension / Alterations @ No.17 St Enda's Drive,  
 Rathfarnham,  
 Dublin 14**

## Storm Water Drainage Design Report



### Review History

Revision	Date	Prepared by	Description	Checked by	Approved by
00	14 <sup>th</sup> Sept 2022	CHA	For Information		CHA
				Total no of pages [incl Att]	
				11	

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## 1. INTRODUCTION

The proposed development by Tom & Hilary Norton, (South Dublin Co. Co. Planning Reference SD22B/0152) is for the construction of a flat roof extension and other alterations to an existing dwelling at No.17 St Enda's Drive, Rathfarnham, Dublin14.

This document has been prepared as a Storm Water Drainage Design Report (P011 – ENG – R01) to include full details and a design for a required soakaway including the results of a soil percolation test. It will also set out to provide proposals for SuDS (Sustainable Drainage Systems) within the constraints of the development.

P011-ENG-R01 has been prepared to satisfy Pts. 2, 3 & 4 of the South Dublin Co. Co. Planning Department correspondence reference SD22B/0152 dated 8<sup>th</sup> June 2022.

## 2. SOAKAWAY DESIGN DETAILS

### 2.1 EXISTING SURFACE WATER

The current surface water infiltrates into the existing soil located to the rear of the property.

### 2.2 SURFACE WATER POLICY

Storm drainage is to be designed in accordance with the Building Regulations Part H and specifically in accordance with the principles and methods set out in the Department of Environment "Recommendations for Site Development Works for Housing Areas", BS8301:1985, IS En752 (2008), IS EN12056: Part 2 (2000) and the recommendations of the "Greater Dublin Strategic Drainage Study" (GDSDS) policies and guidelines, the requirements of Dublin City Council, SuDS Manuals C609 & C697 and the Irish Water Code of Practice.

### 2.3 DEISGN INPUT AND PARAMETERS

The new development will create an additional 85m<sup>2</sup> hard surface, i.e., 35m<sup>2</sup> of hard landscape plus 50m<sup>2</sup> of new flat roof. In order to alleviate the surface water

run-off from the new hard surface area, it is proposed to divert the runoff to a soakaway located to the rear of the property.

As stated, the contribution area to the soakaway is approximately 85m<sup>2</sup> with 100% im-permeability. The soakaway size is to be chosen based on the characteristics of the site and the BRE soak test.

The design of the surface water runoff soakaway is such that it will cater for a storm event of a 100-year critical event without causing any significant unplanned flooding. The design allows for climate change in the storage capacity.

The following criteria have been applied:

- Pipe Friction (Ks) 1.5mm;
- Minimum Velocity 0.75mls (self-cleansing velocity);
- Maximum Velocity 3.0mls;
- Frequency Factor 0.5 for domestic use.

## 2.4 DESIGN CALCULATIONS AND PERCOLATION TEST RESULTS (TEST DATE 2<sup>ND</sup> SEPTEMBER 2022)

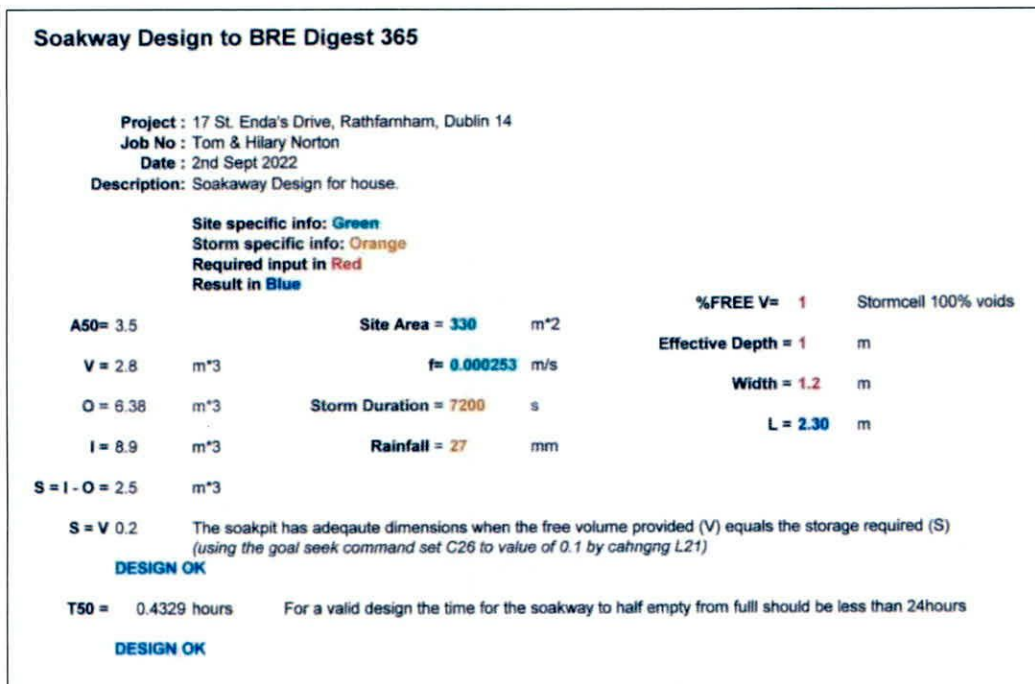


Figure 1

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION													
rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M10-D			M50-D			M100-D			outflow from soakaway [m <sup>3</sup> ]	required storage [m <sup>3</sup> ]
			Z2	rainfalls [mm]	inflow [m <sup>3</sup> ]	Z2	rainfalls [mm]	inflow [m <sup>3</sup> ]	Z2	rainfalls [mm]	inflow [m <sup>3</sup> ]		
5	0.39	5.85	1.20	9.09	2.73	1.58	11.98	3.59	1.81	13.77	4.13	#DIV/0!	#DIV/0!
10	0.54	8.10	1.21	12.73	3.82	1.62	17.01	5.10	1.86	19.83	5.89	#DIV/0!	#DIV/0!
15	0.65	9.75	1.22	15.44	4.63	1.65	20.86	6.26	1.90	24.13	7.24	#DIV/0!	#DIV/0!
30	0.82	12.30	1.23	19.65	5.90	1.67	26.75	8.03	1.95	31.13	9.34	#DIV/0!	#DIV/0!
60	1.00	15.00	1.24	24.18	7.25	1.70	33.15	9.94	1.99	38.81	11.64	#DIV/0!	#DIV/0!
120	1.19	17.85	1.24	28.77	8.63	1.72	39.85	11.95	2.01	46.71	14.01	#DIV/0!	#DIV/0!
240	1.38	20.70	1.24	33.37	10.01	1.73	46.52	13.95	2.03	54.55	16.37	#DIV/0!	#DIV/0!
360	1.51	22.65	1.24	36.51	10.95	1.72	50.78	15.24	2.02	59.46	17.84	#DIV/0!	#DIV/0!
600	1.68	25.20	1.24	40.60	12.18	1.72	56.32	16.90	2.01	65.80	19.74	#DIV/0!	#DIV/0!
1440	2.03	30.45	1.22	48.24	14.47	1.70	67.19	20.16	1.97	77.84	23.35	#DIV/0!	#DIV/0!

\* Z2 is growth factor from M5 rainfalls

Invalid measurements. Click the grey question mark below to see what measurements are required. Also refer to BRE 365 for details.

SOAKAGE TRIAL PIT INFILTRATION TEST RESULTS																				
water level measurement N°:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Soakage Trial 1	time [min] =	0	11	25	44	80	102	180	190											
	depth to water [m] =	0.50	0.60	0.82	0.64	0.70	0.71	0.75	0.90											
Soakage Trial 2	time [min] =																			
	depth to water [m] =																			
Soakage Trial 3	time [min] =																			
	depth to water [m] =																			

Figure 2

## 2.5 FINDINGS

It is proposed to install a soakaway pit with the following dimensions, 2.3m long \* 1.2m wide \* 1m depth. It is also proposed to use a geo cell system for attenuation prior to the water infiltrating the ground and re-charging the water table. A system such as Aquacell from Wavin as per figure 3 below or a similar system to be approved by the engineer prior to installation.

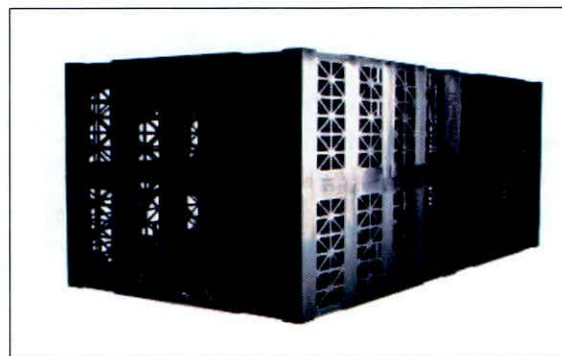


Figure 3

The soakaway is to be located in the rear garden, 9.25m from the rear of the proposed flat roof extension and 3.5m from the adjacent property boundary.

Details of the proposed drainage layout and soakaway construction can be seen on drawings P011 – DRG – 01 & 02 in Appendix 1.

### 3. SUSTAINABLE DRAINAGE SYSTEMS PROPOSALS (SUDS)

Although it is considered the soakaway details as outlined in section 2 above satisfy the request for additional information as per SDCC correspondence dated 8<sup>th</sup> June '22, other forms of SuDS that are being proposed and/or considered for the development are as follows:

- **Water Butts**

It is proposed to install water butts to collect water from the rainwater downpipes on the building. The water gathered will be used for gardening and maintenance purposes. The overflow from the butts will connect to the pipework flowing towards the proposed soakaway.



Figure 4 (Example of Butt)

- **Permeable Paving**

A feature of the proposed development is for a new patio area to be laid to the rear of the new flat roof extension. The patio is to be paved with slabs or cobble setts (yet to be decided). It is intended that the foundation for the paving will be constructed as follows, 50mm thick layer of 2 – 4mm grit on top of a layer of

200mm – 300mm layer of open graded stone such as 20mm – 40mm. The joints in the paving surface will be un-pointed and surface water will be allowed to permeate through the joints and the grit layer into the open graded sub-base. The sub-base will act as a soakaway itself and attenuate the water before it infiltrates the soil underneath.

A possible permeable pavement solution example can be seen in figure 5 below. The details in the image are “Kilsaran Clima Pave”. Other equivalent types of paving can also be considered.

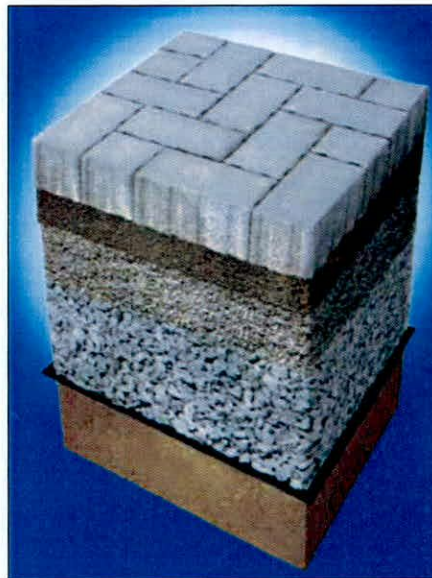


Figure 5

#### 4. SUMMARY

- Soakaway with dimensions and details outlined above is designed to cater for a new hard surface area approximately 85m<sup>2</sup>.
- Secondary SuDS proposals as follows:
  - Rainwater Butts at downpipe locations with overflows to the soakaway;
  - Permeable paving to be considered depending on development constraints. In any event, the soakaway has been designed to cater for the hard landscaped paved area being 100% impermeable.

## 5. APPENDIX 1 (DRAWINGS P011 – DRG -01 & 02)

Project : Proposed Extension to Existing Dwelling House  
Doc. Title : Storm Water Drainage Design Report  
Doc Ref : P011 - ENG - R01

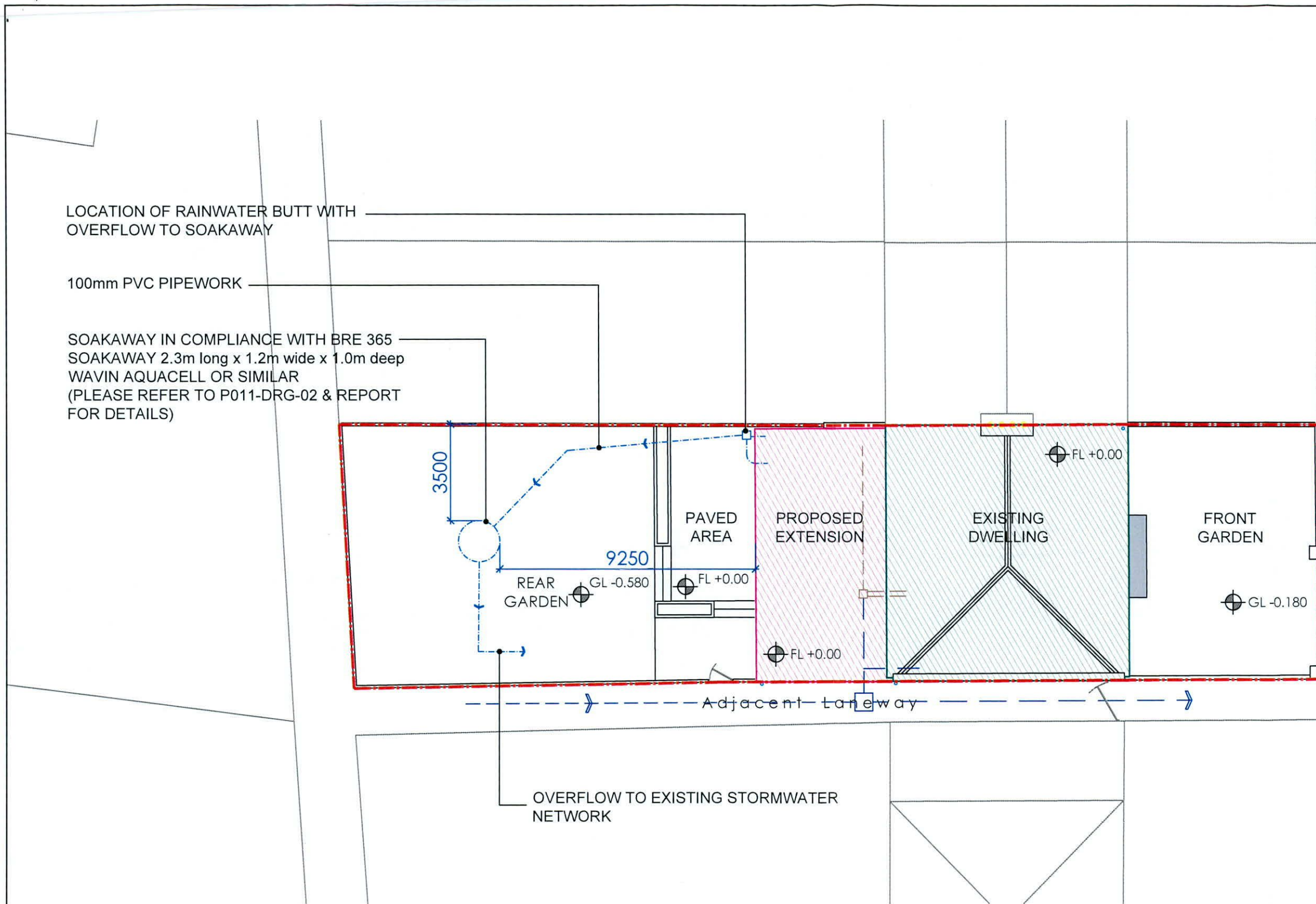
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6. APPENDIX 2 (PHOTOS OF PERCOLATION TEST – 2<sup>ND</sup> SEPTEMBER 2022)







LOCATION OF RAINWATER BUTT WITH OVERFLOW TO SOAKAWAY

100mm PVC PIPEWORK

SOAKAWAY IN COMPLIANCE WITH BRE 365  
 SOAKAWAY 2.3m long x 1.2m wide x 1.0m deep  
 WAVIN AQUACELL OR SIMILAR  
 (PLEASE REFER TO P011-DRG-02 & REPORT FOR DETAILS)

3500

9250

REAR GARDEN GL -0.580

PAVED AREA

PROPOSED EXTENSION

EXISTING DWELLING

FRONT GARDEN

Adjacent laneway

OVERFLOW TO EXISTING STORMWATER NETWORK

**Notes:**

LEGEND	
FOUL LINE (existing)	---
SURFACE LINE (proposed)	-.-.-
FOUL LINE (proposed)	---
SITE BOUNDARY OUTLINE	-.-.-
EXISTING DWELLING OUTLINE	---
PROPOSED EXTENSION OUTLINE	---

**Drawing Title:**

Storm Water Drainage Layout Plan

00	Planning	13/09/2022
Rev.	Description	Date

**Project:**

Single Storey Flat Roof Extension & Associated Site Works.

**Client:**

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 17 St. Enda's Drive,  
 Rathfarnham,  
 Dublin 14,  
 D14 T2X9

**Other Consultants:**

**JOE FALLON** DESIGN  
 ARCHITECTURE

1A Ryland St, Bunclody, Enniscorthy, Co. Wexford



**Proposed Storm Water Drainage Layout Plan**

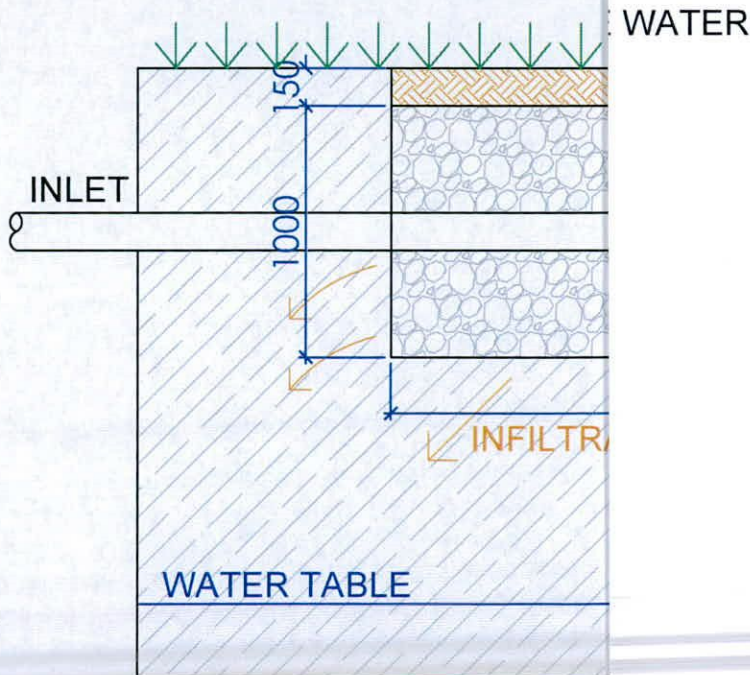
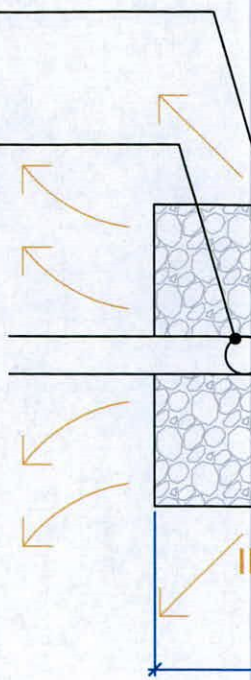
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Scale:	1:150 @ A3
Drg. By	D. Murphy
Checked By	C. Hannon
Drawing No.	P011-DRG-02



PERFORATED  
DISTRIBUTION  
PIPE  
CAP TO TOP OF  
INSPECTION PIPE



Notes:

Drawing Title:

Soakaway Details

Rev.	Description	Date
00	Planning	13/09/2022

Project:

Single Storey Flat Roof  
Extension & Associated  
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TUDYAJ YAWAJAD



SOAKAWAY CROSS SECTION