



Project Title	Extension at Slade, Saggart, Co Dublin
Document Title	Engineering Planning Report
Client	Dave Thompson
File No.	T23_DRPL_002
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Date	16 May 2022
Revision	

INTRODUCTION:

This report outlines the proposals for the provision of surface water drainage services for the proposed extension to the dwelling at Slade, Saggart, Co Dublin.

The report should be read in conjunction with all other drawings and documents as part of this submission.

LOCATION:

The applicant site is located on the L2005 road at Slade, Saggart, Co Dublin with Eircode D24 CA36.



Fig. 1: Map location of Applicant site at Slade, Saggart

PROJECT SCALE:

The development will consist of an extension to the east of the dwelling with some internal remodelling works as indicated on architectural drawings.

Site works will include the provision of additional soakaways to cater for the additional roofed area.

STORM WATER DRAINAGE:

South Dublin City Council (SDCC) guidelines for the design of surface water require the incorporation of Sustainable Drainage Systems as per the Greater Dublin Strategic Drainage Study. This is good practice and we propose to use as many sustainable urban drainage systems (SUDS) as possible and recharge any precipitation to ground through permeable surface finishes or soakaway.

The systems we propose at different stages are as follows:

1. Rainwater from roof of extension to be discharged to soakaway trench sized for a 60minute, 1 in 30 year return storm + 20% for climate change. Rainfall data has been used from Met Eireann records.
2. Water butts to be provided at rainwater downpipes fitted with overflow pipes discharging to proposed soakaway.
3. Proposed hard standings to receive fully permeable surfaces to allow direct percolation of rainfall to ground.

The soakaway has been sized following a site percolation test and calculated as per attached design to BRE365, indicated in Fig. 2.

Ciltron Limited Newtownmoyaghy, Killocock, Co. Kildare www.perculationtests.ie Tel: 067 6636757		BRE Digest 365 Test	
		Revision:	1.00
		Job No:	Soakpit 1
		Page:	G/01
Section:	David Thompson, Slade, Saggart, Co. Dublin TH3	Prepared By:	DR
		Date:	18/01/2022

ALTERNATIVE SOAKAWAY SIZES			
trench soakaways			
width of trench (mm):	450	600	900
required trench length (m):	19.39	15.73	11.40
ring soakaways			
diameter of ring (mm):	1500	2100	2400
required pit diameter (m):	2.00	2.03	2.00

* Based on effective depth and number of pits as in Soakaway Data table

SUMMARY OF CALCULATIONS	
critical design rainfall duration T_{crit}	= 360 min
required storage volume V_{req}	= 4.28 m ³
provided storage volume V_{prov}	= 4.66 m ³
utilisation factor	= 0.92 .OK
required time to discharge 50% T_{50}	= 6.32 hours
utilisation factor	= 0.26 .OK

GENERAL DATA	
site location:	[redacted] Ireland
soakaway type:	instilled pit or trench
Impermeable area drained to soakaway A [m ²]	= 128
60 min rainfall depth of 5 year return period R (mm)	= 16
M5-60 to M5-2d rainfall ratio γ	= 0.28
allowance for climate change:	20%

SOAKAWAY DATA	
soakaway width W [m]	= 3.50
soakaway length L [m]	= 3.50
total depth from ground level D_g [m]	= 1.00
depth to drain invert level D_d [m]	= 0.60
soakaway effective depth D_{eff} [m]	= 0.40
free volume in in-fill aggregate [%]	= 95

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	30%
available on-site infiltration test results:	<input checked="" type="radio"/> Yes <input type="radio"/> No
use soakage trial pit table below	
internal surface area of trial pit A_{poc} [m ²]	= 1.04
storage volume between 75-25% V_s [m ³]	= 0.07
time for water to fall from 75-25% T_s [min]	= 71.00
soil infiltration rate T [m/s]	= 1.58E-05

SOAKAGE TRIAL PIT DATA	
soakage trial pit width W_t [m]	= 0.70
soakage trial pit length L_t [m]	= 1.00
total depth from ground level D_{gt} [m]	= 1.00
depth to pipe invert level D_{dt} [m]	= 0.60
soakage trial pit effective depth $D_{eff,t}$ [m]	= 0.20
free volume in in-fill aggregate [%]	= 100

NOTE: faces of excavation assumed to be vertical

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION											
rainfall duration [min]	rainfall factor Z1	M5-D rainfalls [mm]	M30-D			Ignore			outflow from soakaway [m ³]	required storage [m ³]	
			Z2	rainfalls [mm]	inflow [m ³]	Z2	rainfalls [mm]	inflow [m ³]			
5	0.33	5.21	1.44	9.02	1.15				0.03	1.12	
10	0.48	7.57	1.47	13.31	1.70				0.06	1.64	
15	0.58	9.14	1.48	16.24	2.53				0.09	1.99	
30	0.76	11.96	1.49	21.41	2.74				0.18	2.56	
60	1.00	15.70	1.49	28.08	3.59				0.37	3.23	
120	1.27	19.88	1.47	35.15	4.50				0.74	3.76	
240	1.63	25.53	1.46	44.67	5.72				1.47	4.24	
360	1.86	29.20	1.45	50.67	6.49				2.21	4.28	
600	2.22	34.79	1.43	59.66	7.64				3.68	3.95	
1440	3.05	47.85	1.38	79.36	10.16				8.84	1.32	

* Z2 is a growth factor from 1/6 rainfalls

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	123																	
	depth to water [m]	= 0.80	0.90																	
Soakage Trial 2	time [min]	= 0	130																	
	depth to water [m]	= 0.80	0.90																	
Soakage Trial 3	time [min]	= 0	142																	
	depth to water [m]	= 0.80	0.90																	

Spreadsheet provided by: www.YourApraxData.co.uk

calculations are based on BRE Guide (see Digest 365)

Fig. 2: Infiltration trench calculation to BRE365 for extension roof

The surface water drainage layout is indicated on our drawing T23-P-002 in Appendix A

FOUL WATER DRAINAGE:

There is no increase in the population of the property as a result of the development. The existing treatment plant is being retained. Some of the existing foul drain runs will need to be relaid and diverted around the extension, which will not affect the operation of the treatment system.

The foul water drainage layout is indicated on our drawing T23-P-002 in **Appendix A**.

FLOOD RISK ASSESSMENT:

The risk of flooding is considered under five headings as follows:

1. Coastal flooding
2. Fluvial flooding
3. Pluvial flooding
4. Ground water flooding

Coastal Flooding

The applicant site is located outside the area affected by coastal flooding, being 12km from the flooding affected zone of the River Liffey and 150m above sea level.

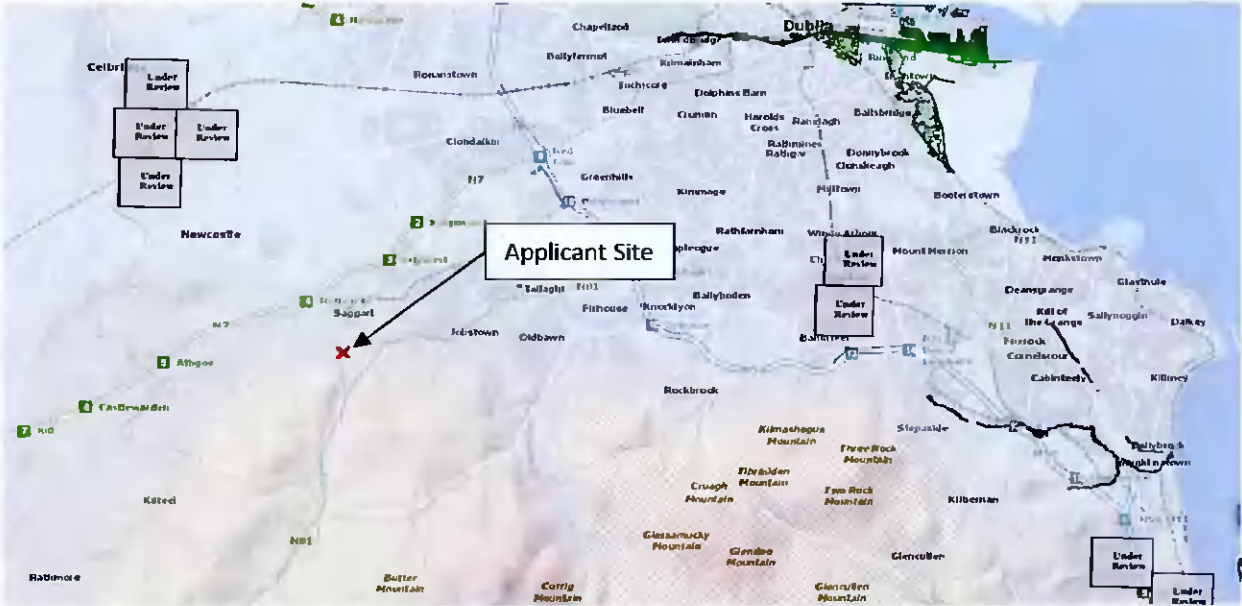


Fig. 3 CFRAM map for coastal flooding – General Risk indicating 0.1% – 10% AEP exposure

Fluvial Flooding / Justification Test

Under the South Dublin County Council (SDCC) Development Plan, it is directed to carry out a justification test for sites in flood zones A & B, as per the Strategic Flood Risk Assessment (SFRA). The applicant site does not fall within a zone requiring a Justification Test.

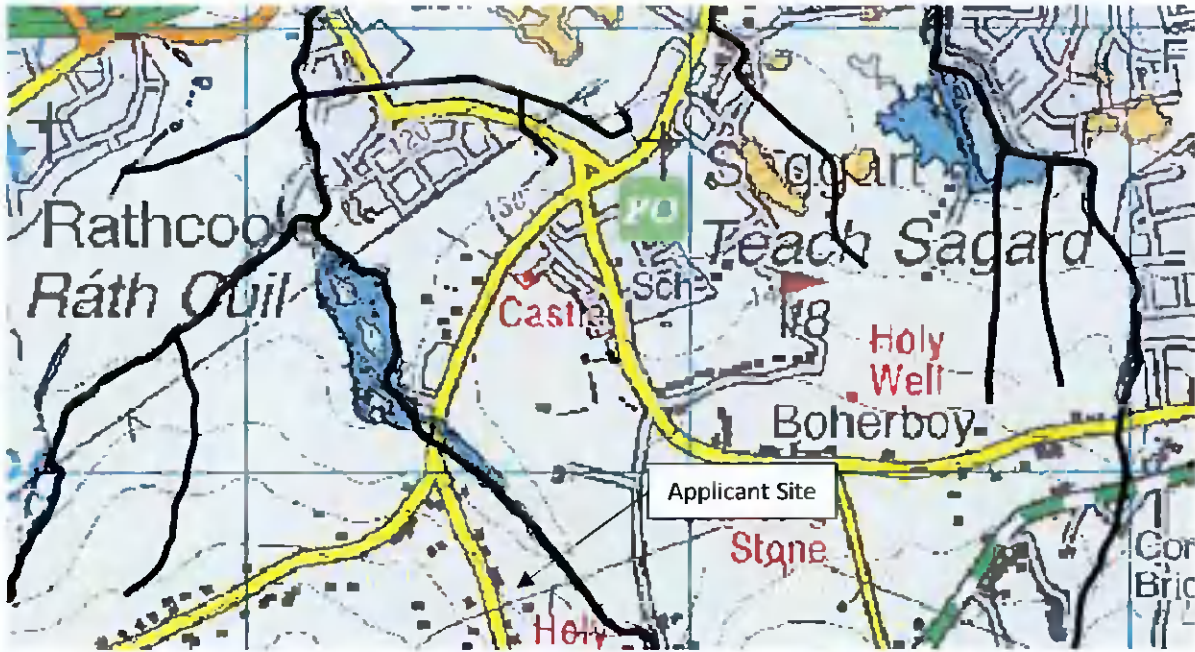


Figure 6.10 Fluvial & indicative pluvial flood zones in Rathcoole & Saggart

Fig. 4 – extract from SDCC strategic flood risk assessment indicating flood extents in Slade, Saggart

Pluvial Flooding

Pluvial flooding arises from high intensity rainfall increasing surface water flows overland. Review of historical records on the Office of Public Works (OPW) online database www.floodmaps.ie indicates some flooding in the vicinity of the applicant property – primarily associated with fluvial flooding, addressed above.

We have carried out a flood history review referring to the OPW flood maps. The OPW flood database has indicated flooding incidents within a 2.5km radius. None of the events have any effect on the applicant property.

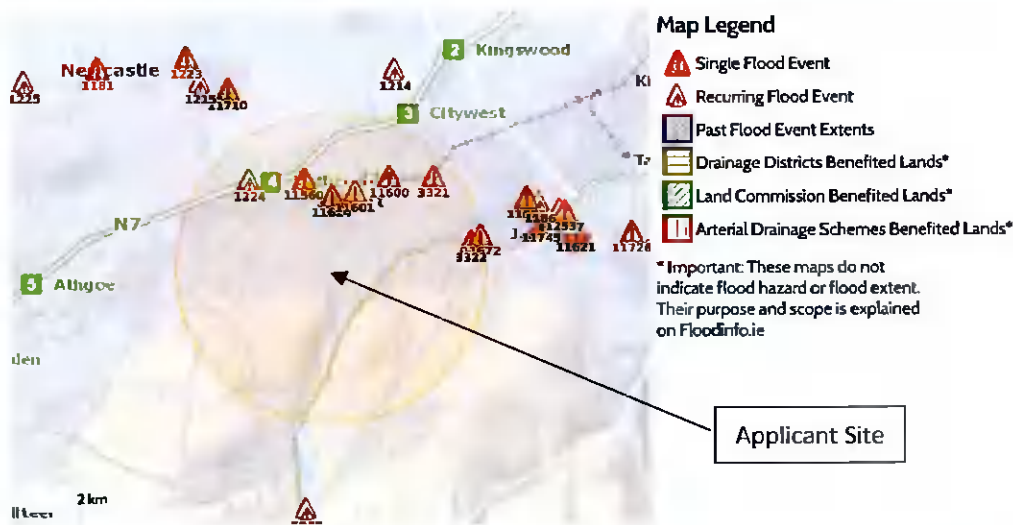
Past Flood Event Local Area Summary Report



Report Produced: 4/8/2021 8:21

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



8 Results

Name (Flood_ID)	Start Date	Event Location
1. Rathcoole Bridge recurring (ID-1224) Additional Information: Reports (2) Press Archive (4)	n/a	Approximate Point
2. Jobstown N81 Nov 2000 (ID-3322) Additional Information: Reports (1) Press Archive (2)	05/11/2000	Approximate Point
3. Fortunestown Lane Nov 2000 (ID-3321) Additional Information: Reports (1) Press Archive (0)	06/11/2000	Approximate Point
4. Flooding at Avoca Road, Saggart on 24th Oct 2011 (ID-11560) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Exact Point
5. Flooding at Fortunestown Lane, Citywest, Co. Dublin on 24th Oct 2011 (ID-11600) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Approximate Point
6. Flooding at Garter Lane, Saggart, Co. Dublin on 24th Oct 2011 (ID-11601) Additional Information: Reports (1) Press Archive (0)	24/10/2011	Approximate Point

Fig. 5 CFRAM map for historic flood events

Ground water flooding

Site specific data could not be sourced for ground water flooding at Slade, Saggart. We have extracted data in relation to the groundwater resources & vulnerability.

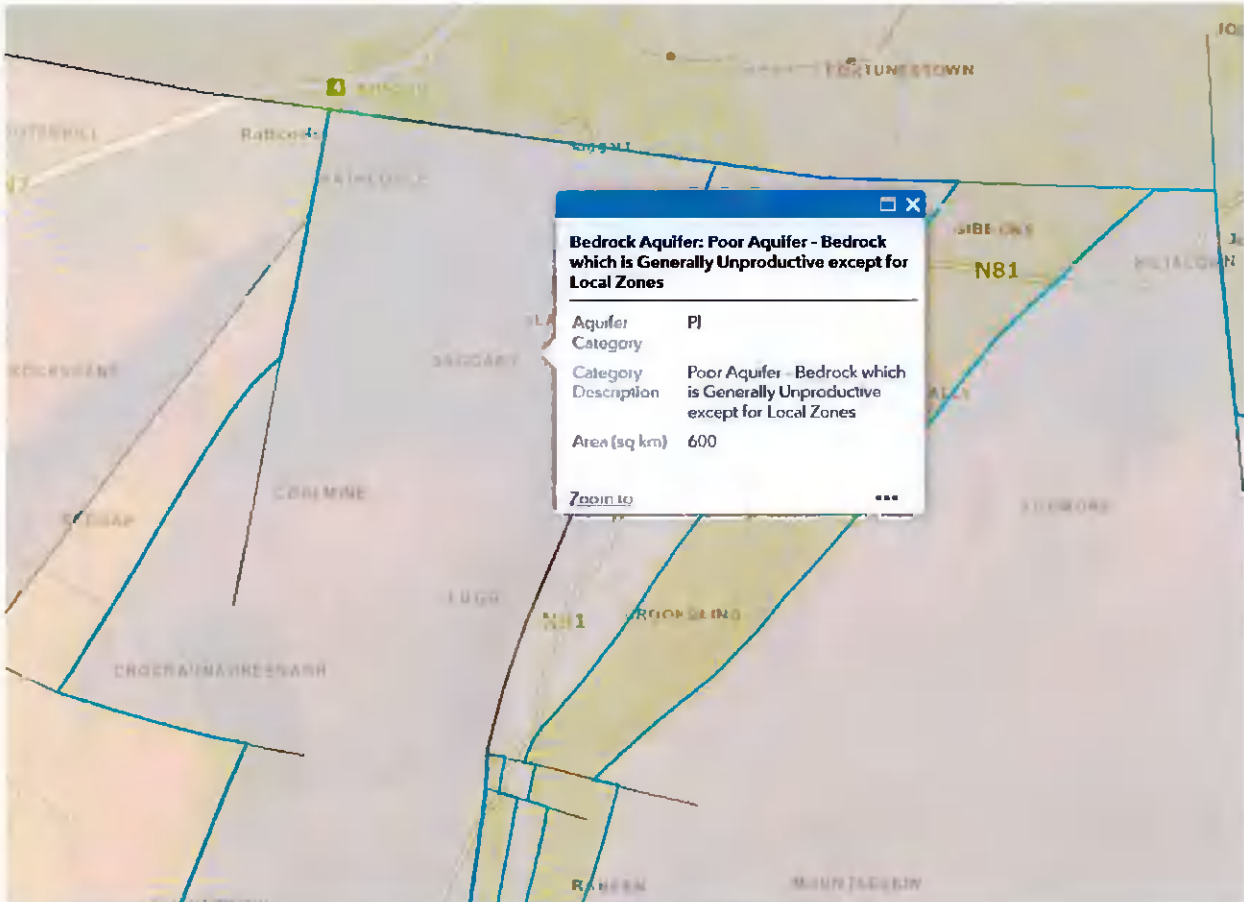


Fig. 6 GSI mapping information for “Groundwater Resources (Aquifers)”

An aquifer is an underground body of water bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts.

The applicant site is located on an a Poor Aquifer which is generally unproductive.

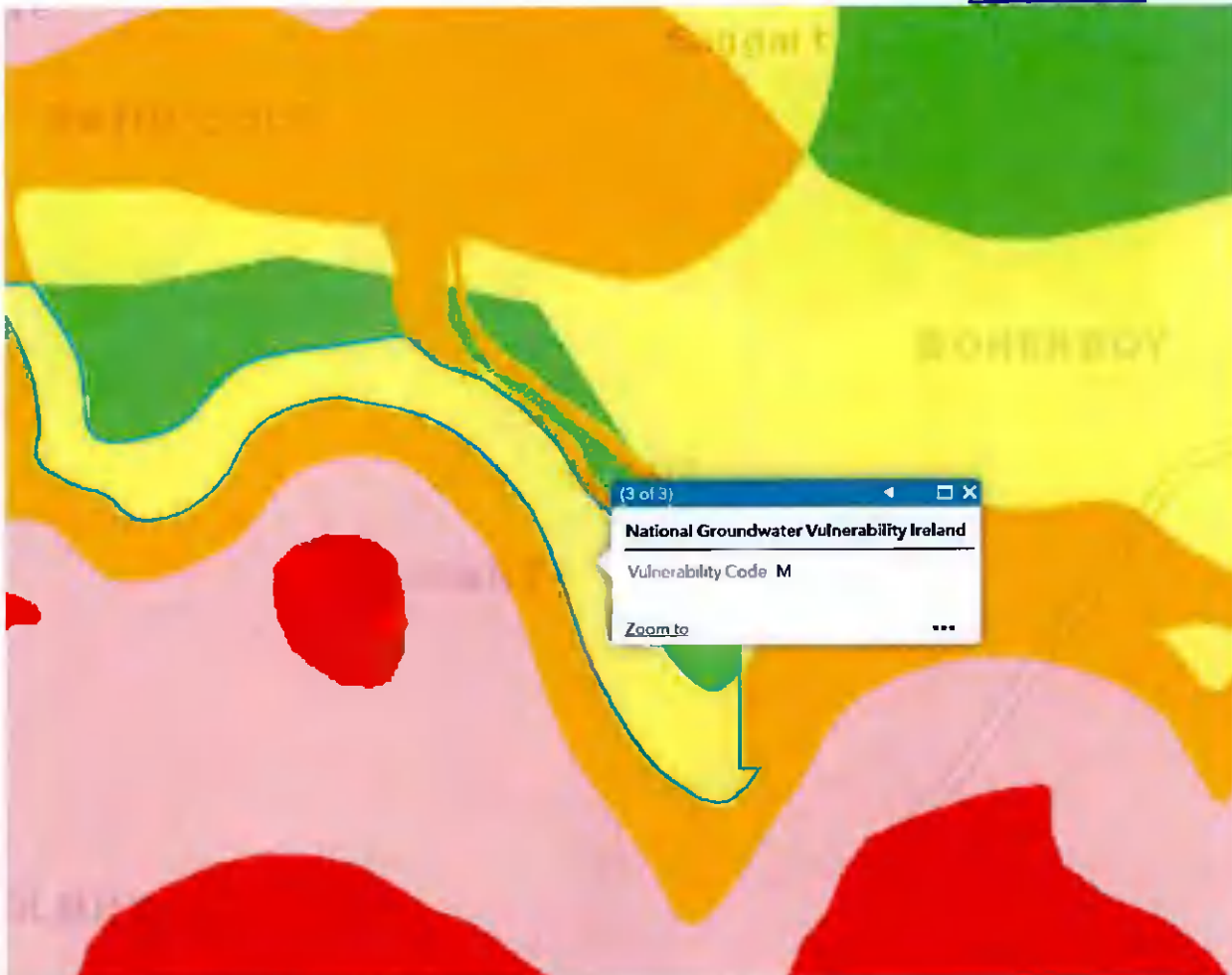


Fig. 7 GSI mapping information for “Groundwater Vulnerability”

Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes.

Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of karst features.

All land area is assigned one of the following groundwater vulnerability categories: Rock near surface or karst (X) Extreme (E) High (H) Moderate (M) Low (L).

The applicant site is located in an area with a Vulnerability Code M – moderate risk.

Appendix A

Surface water and Foul water drainage plan