

Additional Information

Soakaway design, percolation tests/Site Map & CFRAM Map

Re.

Proposed retention planning application at:
123 Whitehall Road, Dublin 12
Plan Reg. Ref. SD22B/0335

September 2022

21/296 TE

27th September 2022

Kevin & Robyn O' Shea
 123 Whitehall Road,
 Dublin 12

Belturbet Business Park,
 Creeny,
 Belturbet,
 Co. Cavan.

Tel: 049 9522236
 Fax: 049 9522808
 Web: www.traynorenvironmental.com

Re: Soakaway design as per BRE 365 for 90m² impermeable area for Kevin & Robyn O'Shea, Whitehall Road, Dublin 12

Dear Kevin & Robyn O'Shea,

We have designed per BRE Digest 365 based on the total impermeable area as supplied and Met Eireann's Extreme Rainfall Return Periods for 123 Whitehall Road, Dublin 12.

Site Information Supplied as part of the layout (extension only)
Total Impermeable area feeding Soakaway from retention structures on site = 90m²

Rainfall Information as Per Met Eireann (30 Year Rainfall Returns)

Storm dur.	Area	Rainfall	Rainfall Plus 20% Climate Change
mins.	m²	mm.	mm.
5	90	11.6	13.91
10	90	16.2	19.44
30	90	23.8	28.56
60	90	29.8	35.76

Void Ratio
 The void ratio for the trench fill was set at 95% (0.95) to accommodate the use of Cellular Storage. The safety factor was taken as 1.

Soil infiltration rate
 Tests carried out at 0.70m below ground level.
 Calculated as per BRE365 = $3.0352 * 10^{-6}$ m/sec

The total impermeable area is c. 90m² and the runoff co-efficient is set at 1.0 as per BRE365.

Inflow From	
Total Impermeable Area: 90sq m @ runoff coefficient 1.0	= 3.218cu m
Total Inflow 90sq m	= 3.218cu m

Outflow from Soakaway in model storm	
Internal Surface area to 50% effective depth of Cellular Storage	2.40 sq m
Soil Infiltration Rate	0.0000030352m/s
Storm duration in seconds	= 3600s
Total Outflow (3.60 x 0.0000030352 x 3600)	0.039 cu. m

Storage Required in Cellular Storage (Inflow – Outflow)	= 3.218 m ³
Capacity of Pit Required	= 3.346m ³
Actual capacity of calculated soakaway:	=4.80m ³

The Cellular Storage will have the following dimensions
4.00m long, 0.60m deep x 2.0m wide (4.80m³)

Traynor Environmental Ltd – BRE Digest 365 Calculations

Infiltration Rate	
Test Hole Dimension	
Length (l)	0.80m
Width (m)	0.70m
Depth (m)	0.70m
Drop Time (mins)	1025

Soil Infiltration Rate, $f = V_{p75-25} / a_{p50} \times t_{p75-25}$

Where

V_{p75-25} = the effective storage volume of water in the trial pit between 75% and 25% effective depth;

a_{p50} = the internal surface area of the trial pit up to 50% effective depth and including the base area;

t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth

$$V_{p75-25} = 0.80 \times 0.70 \times (0.525 - 0.175) = 0.196m^3$$

$$na_{p50} = (0.80 \times 0.35 \times 2) + (0.70 \times 0.35 \times 2) = 1.05m^2$$

$$f = \frac{0.196}{1.05}$$

$$1.05 \times 1025 \times 60 = 3.0352 \text{ } ^4m/s$$

Inflow and Outflow	
Impermeable Area	90m ²
Rainfall (Depth)	35.76
Cellular Storage (Length)	4.00
Cellular Storage (Width)	2.00
Cellular Storage (depth)	0.60
Storm Duration (mm)	60

Inflow to Soakaway Area I:

$I = A \times R$

= impermeable surface area x M60-D min rainfall

M60 – 60min Storm Duration, M60-D = 35.76mm = 0.03576m

Inflow = 90m² x 0.03576 = 3.2184m²

$A_{50} = (4.00 \times 0.30 \times 2) + (2.00 \times 0.30 \times 2) = 3.60m^2$

Outflow From Soakaway O:

$O = a_{50} \times f \times D$ = Internal surface area of soakaway pit to 50% storage depth (excluding base area) x soil percolation rate x storm duration.

Outflow = 3.60 x 0.0000030352 x 3600 = 0.039m³

Volume Required	
Void (Ratio)	0.95

Soakaway Storage Volume S

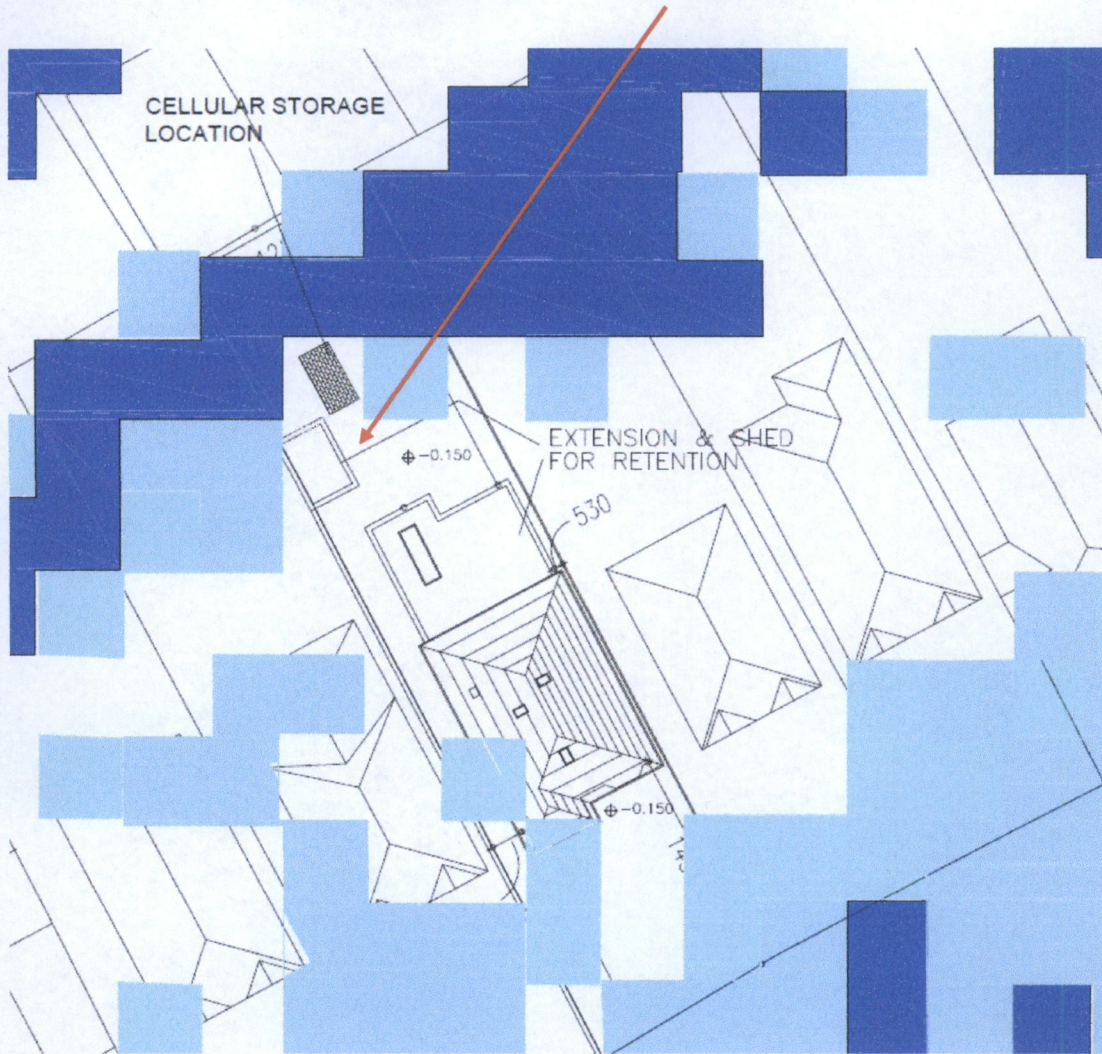
= effective storage volume of soakaway with 95% free volume

Storage = 3.218m² – 0.039 = 3.179 m³

Volume = $\frac{3.179}{0.95} = 3.346m^3$

0.95

Figure 1: Site Layout 123 Whitehall Road, Dublin 12 showing Location of Tested Area



NB:

During the design process, a Silt Trap **must** be incorporated into any drains discharging into the soakaway system.

NB:

Any paved surface runoff or runoff from a car-parking area **must** pass through an oil interceptor/hydrocarbon retention geotextile before discharge to the soakaway if applicable.

NB:

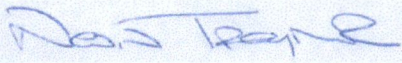
All elements of the soakaway **must** be maintained by suitably qualified professionals *i.e. Silt traps must be regularly cleaned.*

NB:

Please note that all relevant aspects of BRE365 **must** be taken into account in the design and installation of this soakaway system e.g. minimum separation distance of 5m from building foundations and from soil polishing filter for domestic wastewater.

Should you have any queries on this, do not hesitate to contact me.

Yours sincerely



Nevin Traynor

BSc. Env, H.Dip I.T, Cert SHWW, EPA/FAS Cert.

For **Traynor Environmental Ltd**

Encl – Appendices A - D

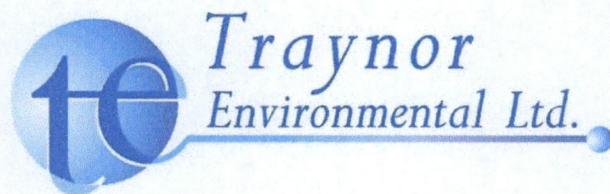
SOAKAWAY TESTING TO BRE DIGEST 365

SITE AT THE 123 WHITEHALL ROAD, DUBLIN 12

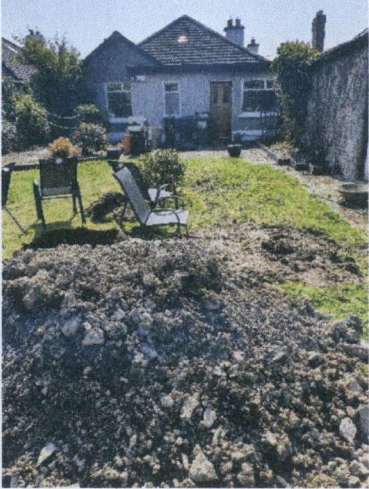



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APPENDIX A – SITE PHOTOGRAPHS



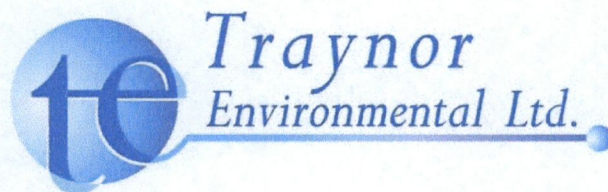
Photographs From the Soakaway Test No. 1

Surface View Of Soakaway Test Hole No 1	Surface View Of Trial Pits and Soakaway Test Hole No 1 Prior To Test
	
Soakaway Filling	Soakaway Under Test
	

SOAKAWAY TESTING TO BRE DIGEST 365
SITE AT THE 123 WHITEHALL ROAD, DUBLIN 12

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APPENDIX B – TRIAL PIT LOG

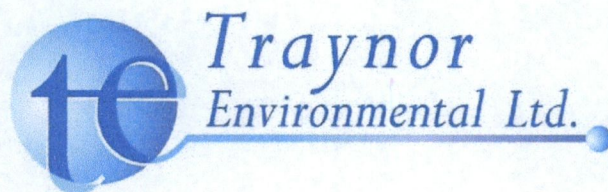


Trial Pit Number TP 1	Traynor Environmental Ltd Unit 6, Belturbet Business Park Creeny Belturbet Co. Cavan				Sheet 1 of 1			
Project <i>Proposed Development Site at 123 Whitehall Road, Dublin 12</i>				Client <i>Kevin & Robyn O'Shea</i>				
Method 1.5-ton digger		Ground Level		Start Date <i>22nd April 2021</i>				
Description	Legend	Reduced Level	Depth	Water Strike (m)	Installation Backfill	Sample Test		Notes
<i>Silt/Clay, Crumb Nature, Medium Density Brown Colour</i>			0.00m- 0.40m					
<i>Clay intermixed with stone. Medium Density Brown Colour</i>			0.40m- 1.00m					
<i>Winter Water Table</i>			1.00m- 1.20m					
<i>Groundwater Table</i>			1.20m 1.50m					
Trial Pit Completed at 1.50m BGL.								
Remarks: <i>Winter Groundwater: 1.00m BGL Groundwater: 1.20m BGL Bedrock: None Encountered</i>			Pit Dimensions Length: 2.20m Width : 1.80m Orientation of Long Side: 000 Degrees			Job Number 21/296TE Logged By NT		

SOAKAWAY TESTING TO BRE DIGEST 365
SITE AT THE 123 WHITEHALL ROAD, DUBLIN 12

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APPENDIX B – MET EIREANN RAINFALL RETURN PERIODS



Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 312353, Northing: 230105,

DURATION	Interval		Years													
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.5,	3.6,	4.3,	5.2,	5.9,	6.4,	8.2,	10.2,	11.6,	13.5,	15.3,	16.7,	18.8,	20.5,	21.9,	N/A ,
10 mins	3.5,	5.1,	5.9,	7.3,	8.2,	9.0,	11.4,	14.2,	16.2,	18.9,	21.3,	23.2,	26.2,	28.6,	30.6,	N/A ,
15 mins	4.1,	6.0,	7.0,	8.6,	9.7,	10.6,	13.4,	16.8,	19.0,	22.2,	25.1,	27.4,	30.9,	33.6,	36.0,	N/A ,
30 mins	5.4,	7.8,	9.1,	11.1,	12.4,	13.5,	17.0,	21.1,	23.8,	27.7,	31.1,	33.8,	38.0,	41.3,	44.0,	N/A ,
1 hours	7.1,	10.1,	11.8,	14.3,	15.9,	17.3,	21.6,	26.5,	29.8,	34.4,	38.6,	41.8,	46.8,	50.7,	53.9,	N/A ,
2 hours	9.4,	13.2,	15.3,	18.3,	20.4,	22.1,	27.4,	33.4,	37.3,	42.9,	47.8,	51.7,	57.6,	62.2,	66.0,	N/A ,
3 hours	11.1,	15.4,	17.8,	21.3,	23.6,	25.5,	31.4,	38.1,	42.6,	48.8,	54.3,	58.5,	65.1,	70.1,	74.3,	N/A ,
4 hours	12.4,	17.2,	19.8,	23.6,	26.2,	28.2,	34.7,	41.9,	46.7,	53.4,	59.3,	63.9,	70.9,	76.4,	80.8,	N/A ,
6 hours	14.6,	20.1,	23.0,	27.4,	30.3,	32.5,	39.8,	48.0,	53.3,	60.7,	67.3,	72.3,	80.1,	86.1,	91.0,	N/A ,
9 hours	17.2,	23.5,	26.8,	31.8,	35.0,	37.6,	45.8,	54.9,	60.8,	69.0,	76.3,	81.9,	90.5,	97.0,	102.5,	N/A ,
12 hours	19.3,	26.2,	29.9,	35.3,	38.8,	41.6,	50.5,	60.3,	66.7,	75.6,	83.4,	89.4,	98.6,	105.7,	111.5,	N/A ,
18 hours	22.7,	30.7,	34.8,	40.9,	44.9,	48.0,	58.0,	69.0,	76.1,	86.0,	94.6,	101.3,	111.4,	119.1,	125.5,	N/A ,
24 hours	25.5,	34.2,	38.8,	45.4,	49.8,	53.2,	64.0,	75.9,	83.6,	94.2,	103.5,	110.6,	121.4,	129.7,	136.5,	159.9,
2 days	31.7,	41.6,	46.7,	54.1,	58.9,	62.6,	74.3,	87.0,	95.2,	106.4,	116.1,	123.4,	134.6,	143.1,	150.1,	173.8,
3 days	36.6,	47.5,	53.1,	61.0,	66.2,	70.2,	82.7,	96.2,	104.8,	116.5,	126.6,	134.3,	145.8,	154.6,	161.8,	186.1,
4 days	41.0,	52.7,	58.6,	67.1,	72.6,	76.8,	90.0,	104.2,	113.1,	125.3,	135.8,	143.8,	155.7,	164.7,	172.1,	197.1,
6 days	48.6,	61.8,	68.3,	77.7,	83.8,	88.4,	102.7,	118.0,	127.6,	140.6,	151.8,	160.3,	172.9,	182.4,	190.2,	216.3,
8 days	55.4,	69.7,	76.8,	87.0,	93.5,	98.4,	113.8,	130.0,	140.2,	154.0,	165.8,	174.6,	187.9,	197.8,	205.9,	233.1,
10 days	61.5,	76.9,	84.6,	95.4,	102.3,	107.5,	123.8,	140.9,	151.6,	166.0,	178.4,	187.6,	201.4,	211.7,	220.1,	248.3,
12 days	67.3,	83.7,	91.8,	103.2,	110.5,	116.0,	133.0,	150.9,	162.1,	177.2,	190.0,	199.5,	213.8,	224.5,	233.2,	262.3,
16 days	78.0,	96.1,	105.0,	117.5,	125.5,	131.5,	150.0,	169.3,	181.3,	197.4,	211.1,	221.3,	236.4,	247.8,	257.0,	287.7,
20 days	87.8,	107.6,	117.2,	130.6,	139.2,	145.6,	165.4,	186.0,	198.7,	215.8,	230.2,	241.0,	256.9,	268.9,	278.5,	310.6,
25 days	99.5,	120.9,	131.3,	145.9,	155.1,	162.0,	183.2,	205.2,	218.8,	236.9,	252.2,	263.5,	280.4,	293.0,	303.1,	336.8,

NOTES:

N/A Data not available

These values are derived from a Depth Duration Frequency (DDF) Model

For details refer to:

'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',

Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

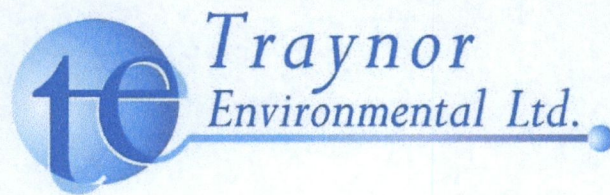
SOAKAWAY TESTING TO BRE DIGEST 365

SITE AT THE 123 WHITEHALL ROAD, DUBLIN 12

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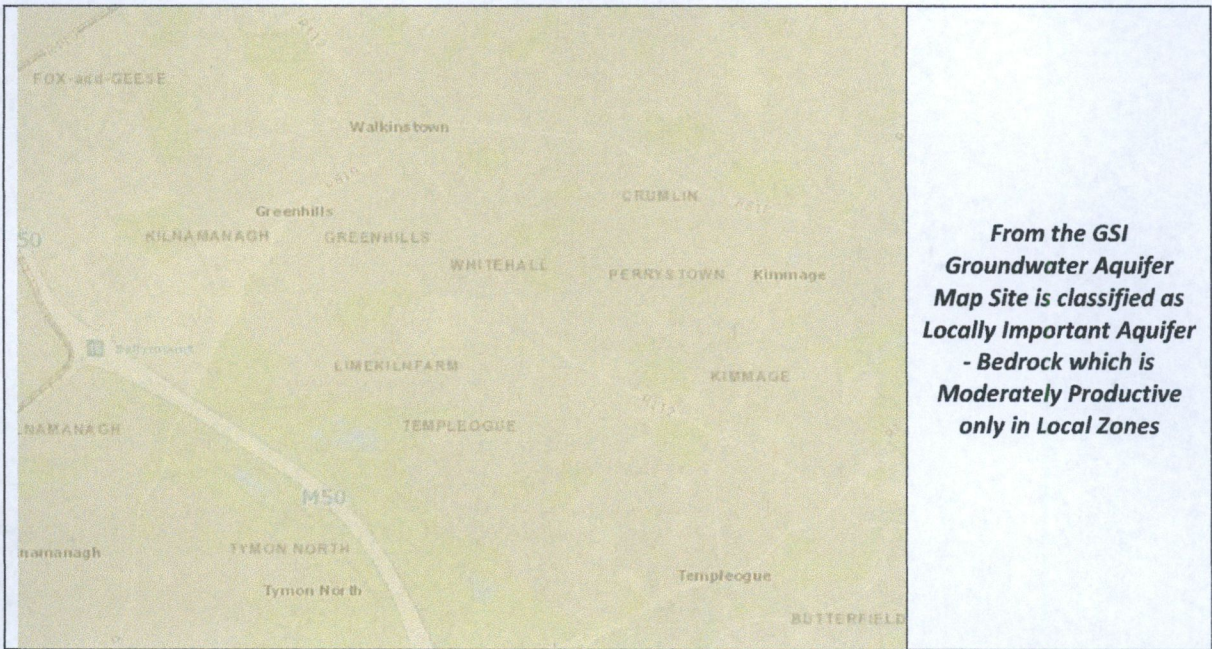
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APPENDIX C – MAPS USED AS PART OF THE DESK STUDY

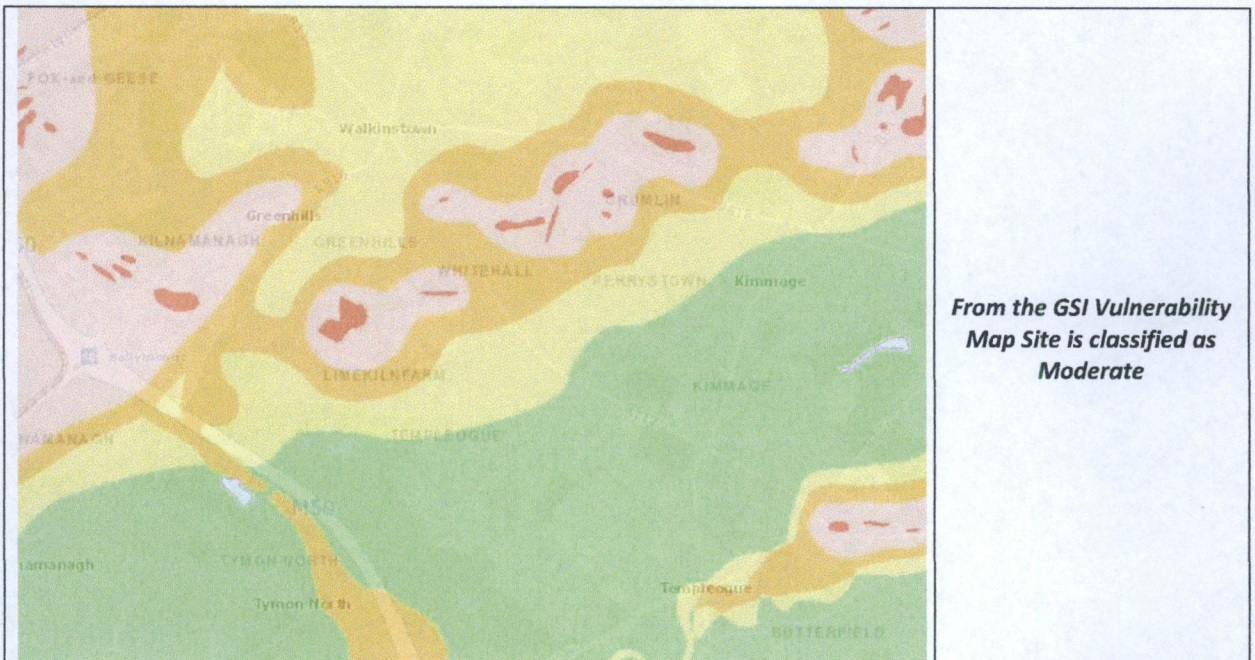


Maps Used As Part of the EPA Site Suitability Assessment

Groundwater/Aquifer Map



Vulnerability Map



Bedrock Map



From the GSI Bedrock Map Site is classified as DUIL – Dinantian Upper Impure Limestones

Teagasc Subsoil Map



From the GSI Teagasc Subsoil Map Site is classified as Urban

**SOAKAWAY TESTING TO BRE DIGEST 365
SITE AT THE 123 WHITEHALL ROAD, DUBLIN 12**

**COMPLETED BY
TRAYNOR ENVIRONMENTAL LTD**

APPENDIX D – INSURANCE

Griffiths & Armour Europe DAC

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The Sweepstakes
Ballsbridge
Dublin 4

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+353 (0)1 634 9001
info@griffithsandarmour.com
griffithsandarmour.com

Griffiths
&
Armour

PROFESSIONAL INDEMNITY INSURANCE

We confirm the following details relating to our client's Professional Indemnity Insurance:

Insured: Traynor Environmental Ltd

Address: Belturbet Business Park
Creeny
Belturbet
Co. Cavan
H14AY94


Lead Insurer(s): Axis Specialty Europe SE

Period of Insurance: 12 July 2020 to 11 July 2021

Policy Number: 19/1/03965

Limit of Indemnity: A sum not less than €1,500,000 any one claim and unlimited in the period of insurance

Signed: _____


Graeme Tinney
Chief Executive Officer
Griffiths & Armour Europe DAC

Date: 09 July 2020

The policy is subject to the insuring agreements, exceptions, exclusions, limitations, conditions and declarations contained therein. The above is accurate at the date of signature. No obligation is imposed herein on the signatory to advise of any alteration.

Directors: G Tinney, C Evans (UK), D J Whalley (UK), T Cosgrove (Non-Executive)
Registered in Ireland No. 632268
Registered Office: Q House, 108 Furze Road, Sandyford, Dublin 18, Ireland
Griffiths & Armour Europe Designated Activity Company is regulated by the Central Bank of Ireland

Disclosure

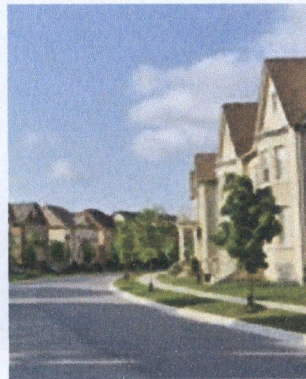
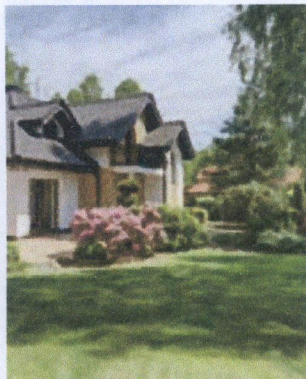
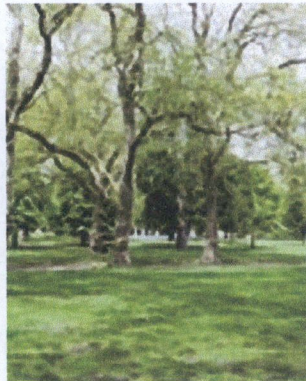
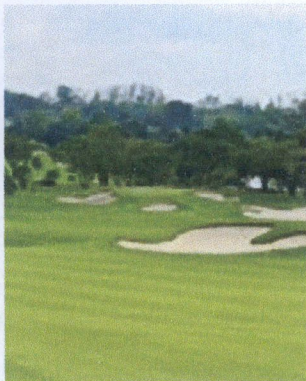
Overview AquaCell Systems

The AquaCell range of geocellular systems are a fully tried and tested, BBA approved, modular technique for managing excessive rainfall.

Applications

The AquaCell range can be used as either a temporary storage tank or as a soakaway, and is suitable for applications including:

- ⓪ Landscaped areas
- ⓪ Parks
- ⓪ Domestic gardens
- ⓪ Residential developments
- ⓪ Car parks & roads
- ⓪ Industrial/commercial areas



The AquaCell Range

There are four types of AquaCell unit. Each can be used as a standalone system or different unit types can be mixed and matched together in layers to value engineer the most cost effective solution.

All AquaCell units have identical dimensions (1m x 0.5m x 0.4m), but they are manufactured to perform differently. The type of unit, or combination of units required will depend on factors such as the load application, overall installation depth and site conditions.

Features & benefits

The following are applicable to all AquaCell units:

- ⓪ Fully BBA Approved – Eco/Prime/Core/Plus are all approved under certificate No. 03/4018
- ⓪ Modular, lightweight and versatile
- ⓪ Easy to handle and quick to install
- ⓪ Proven clip and peg connection system
- ⓪ 95% void (each unit holds 190 litres of water)
- ⓪ Can be brick-bonded for extra stability
- ⓪ Units can be mixed and matched together for optimum performance
- ⓪ Safer than open or above ground storage structures
- ⓪ Full range of ancillaries
- ⓪ Can be used as part of a SuDS scheme to help reduce flood risk

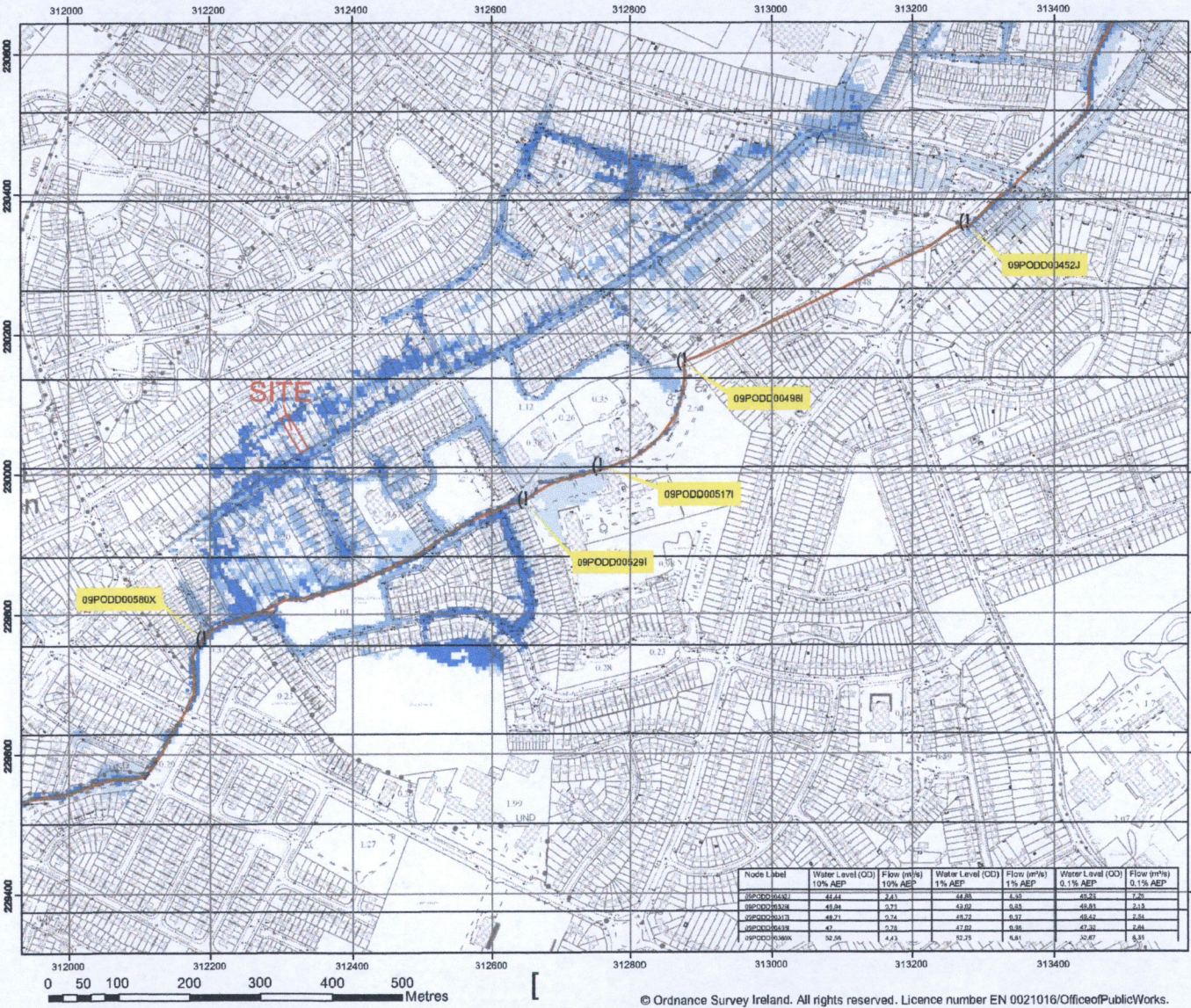
Environmental Benefits

In addition, the AquaCell range can also offer the following environmental benefits:

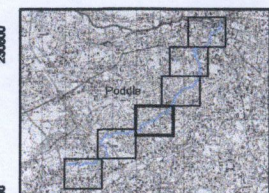
- ⓪ Significantly reduced flooding risk
- ⓪ Controlled, reduced-volume release of stormwater into existing sewer systems or watercourses
- ⓪ Recharging of local groundwater (if infiltration/soakaway application)
- ⓪ Aerobic purification to improve water run-off quality
- ⓪ Sustainable, cost effective management of the water environment



NOTES



Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
09PODD00452J	44.44	2.43	44.85	6.33	45.41	7.75
09PODD00498I	49.24	5.71	49.69	9.55	49.83	2.13
09PODD00517I	49.71	5.34	49.72	5.57	49.82	1.24
09PODD00529I	47	5.33	47.02	9.38	47.32	2.81
09PODD00580X	52.55	4.43	52.75	6.81	52.87	6.51

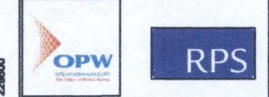


IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER
TO THE DISCLAIMER, GUIDANCE NOTES
AND CONDITIONS OF USE THAT
ACCOMPANY THIS MAP.

- Legend**
- 10% Fluvial AEP Event
 - 1% Fluvial AEP Event
 - 0.1% Fluvial AEP Event
 - Modelled River Centreline
 - AFA Extents
 - ↑ Node Point
 - Node ID Node Label

FINAL

REV.	DATE	DESCRIPTION	APPROVED



The Office of Public Works
Jonathan Swift Street
Tinn
Co Naith

Elmwood House T +44(0) 28 90 887 14
74 Baucher Road +44(0) 28 90 985 93
Belfast W www.rps.com
BT12 6RZ E info@rps.com

Map:
Poddle River Fluvial Flood Extents

Map Type: EXTENT
Source: FLUVIAL
Map Area: HPIV
Scenario: CURRENT

Drawn By: F.M.C. Date: 11 August 2016
Checked By: A.S. Date: 11 August 2016
Approved By: S.P. Date: 11 August 2016

Drawing No.:
E09POD_EXFCDF_03

Map Series: Page 3 of 8
Drawing Scale:

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CLIENT
KEVIN & ROBYN O'SHEA

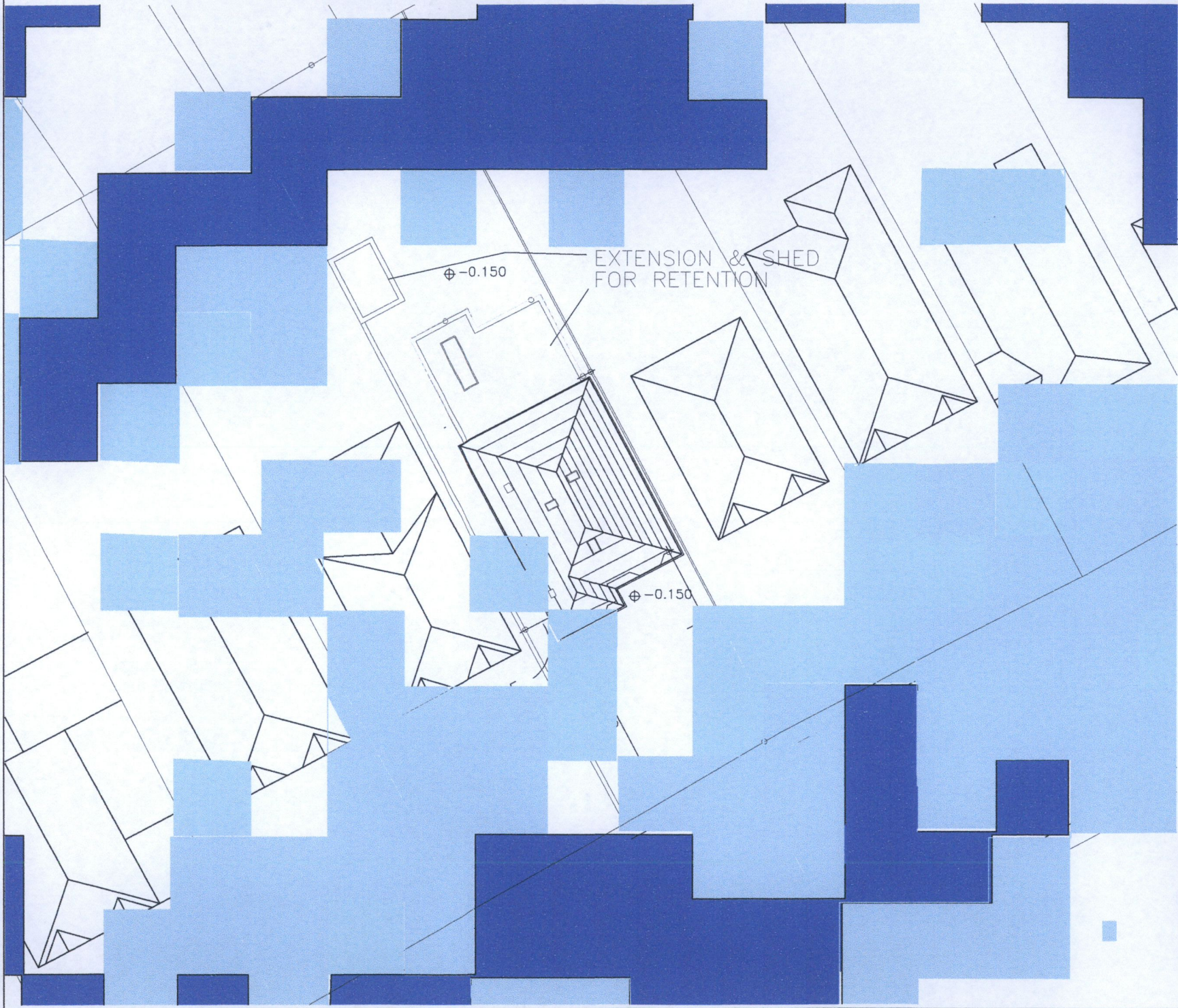
PROJECT TITLE
**123 WHITEHALL ROAD
DUBLIN 12**

DRAWING TITLE
OPW'S CFRAM MAP

SCALE	DRAWN	CHECKED	APPROVED
N/A	KILLIAN BANNON	N. TRAYNOR	N. TRAYNOR
	DATE	DATE	DATE
	MAY 2020	MAY 2020	MAY 2020

DRAWING No. **21.296.100** REV.

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NOTES

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event

EXTENSION & SHED FOR RETENTION

⊕ -0.150

⊕ -0.150

REV.	DATE	DESCRIPTION	APPROVED

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CLIENT
KEVIN & ROBYN O'SHEA

PROJECT TITLE
**123 WHITEHALL ROAD
DUBLIN 12**

DRAWING TITLE
LAYOUT SHOWING FLOOD AREA

SCALE	DRAWN	CHECKED	APPROVED
1/250	KILLIAN BANNON	N. TRAYNOR	N. TRAYNOR
	DATE SEP 2022	DATE SEP 2022	DATE SEP 2022

DRAWING No. **21.296.200** REV.

CELLULAR STORAGE
LOCATION

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event



REV.	DATE	DESCRIPTION	APPROVED

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CLIENT
KEVIN & ROBYN O'SHEA

PROJECT TITLE
**123 WHITEHALL ROAD
DUBLIN 12**

DRAWING TITLE
LAYOUT SHOWING FLOOD AREA & SOAKAWAY

SCALE	DRAWN KILLIAN BANNON	CHECKED N. TRAYNOR	APPROVED N. TRAYNOR
1/250	DATE SEP 2022	DATE SEP 2022	DATE SEP 2022

DRAWING No. **21.296.300**