

21/712D TE

30th September 2021

Brian Dunne

c/o McCrae Consulting Engineers

Rear 6B Arbourfield Terrace,

Dundrum Business Park,

Dublin 14,

D14 F5C6

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

Tel: 049 9522236

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Web: www.traynoreenvironmental.com

Re: Permeable paving as per BRE 365 for Brian Dunne, Lynbrook, Whitechurch Rd, Rathfarnham, Dublin 16.

We have designed as per BRE Digest 365 based on the total permeable area and Met Eireann's Extreme Rainfall Return

Site Information Supplied as part of the layout provided By McCrae Consulting Engineers

Total permeable area to be drained = 485 m²

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

Storm dur.	Rainfall	20% Allowance for Climate Change
<i>mins.</i>	<i>mm.</i>	<i>mm.</i>
5	13.0	15.6
10	18.1	21.72
15	21.3	25.56
30	27.1	32.52
60	34.6	41.52

Void Ratio

The void ratio for was set at 30% (0.3) to accommodate the use of granular fill material i.e. rounded gravel.

We have designed the permeable paving as per BRE Digest 365 based on the total permeable area and Met Eireann's Extreme Rainfall Return

Calculations For Permeable Paving

Average Soil Infiltration From Soakaways for houses A & B	$\frac{2.40^{-5}m/s + 1.62^{-5}m/sec}{2}$ $= 2.01^{-5}m/s$
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Site Information Supplied as part of the layout provided By McCrae Consulting Engineers
Total permeable area = 485 m²

Permeable Paving Design

CLIENT: Brian Dunne, Lynbrook, Whitechurch Rd, Rathfriland, Dublin 16	
ATCE JOB NO.:	Traynor/Erw
JOB DESCRIPTION: Proposed Development at Lynbrook, Whitechurch Rd, Rathfriland, Dublin 16	
Paving Design: Overall	

Input Data					
Impermeable Area to be drained	AI	485	m ²	Soil permeability	2.01E-05 m/s
Permeable area to be drained	Ap	485	m ²	Factor of Safety	3
Ratio of 60min-2day M5-r	r	0.4		Stone Void Ratio	0.300

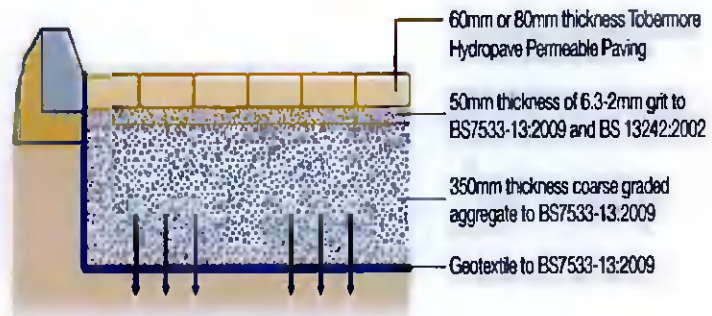
	M10-5min	M10-10min	M10-15min	M10-30min	M10-60min
Design Rainfall-R (mm)	15.6	21.7	23.8	32.5	41.9
Storage depth (mm)	52	72	85	108	137

Figure 1: Site Layout Lynbrook, Whitechurch Rd, Rathfarnham, Dublin 16 showing Location of Tested Area



Figure 2: Cross Section

The Infiltration system allows the water to flow slowly through the crushed stone beneath the paving before being slowly released back into the ground through a geotextile.



NB:

Please note for the purpose of the design, that the fill material used must have no less free volume than 30%.

NB:

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

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

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APPENDIX A – SITE PHOTOGRAPHS


Photographs From the Soakaway Test A




Photographs From the Soakaway Test B



**SOAKAWAY TESTING TO BRE DIGEST 365
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APPENDIX B – TRIAL PIT LOG**

Trial Pit Number TP A	Traynor Environmental Ltd Unit 6, Belturbet Business Park Creeny Belturbet Co. Cavan			Sheet 1 of 3		
Project <i>Proposed Development Site at Lynbrook, Whitechurch Rd, Rathfarnham, Dublin 16</i>				Client <i>Brian Dunne</i>		
Method 3 ton digger		Ground Level		Start Date 24.08.21		
Description	Legend	Reduced Level	Depth	Installation Backfill	Sample Test	Notes
<i>Silt/Clay, Crumb Nature, Low Density Brown Colour</i>			<i>0.00m - 0.30m</i>			
<i>Clay intermixed with stone Blocky Nature, Medium Density Grey Colour</i>			<i>0.30- 0.80m</i>			
<i>Gravel intermixed with stone Crumb Nature, Medium Density Grey Colour</i>			<i>0.80m- 1.10m</i>			
<i>Winter Water Table</i>			<i>1.10m- 1.40m</i>			
<i>Groundwater Table</i>			<i>1.40m- 2.10m</i>			
Trial Pit Completed at 2.1m BGL.						
Remarks: <i>Bedrock None Encountered Winter Water Table: 1.10mBGL Groundwater Table:1.40m BGL Average soakage characteristics of the subsoil.</i>		Pit Dimensions Depth: 3.10m Length: 3.0m Width: 1.60m Orientation of Long Side: 000 Degrees		Photo 		

Trial Pit Number TP B	Traynor Environmental Ltd Unit 6, Belturbet Business Park Creeny Belturbet Co. Cavan			Sheet 2 of 3			
Project <i>Proposed Development Site at Lynbrook, Whitechurch Rd, Rathfarnham, Dublin 16</i>			Client <i>Brian Dunne</i>				
Method 3 ton digger	Ground Level			Start Date 24.08.21			
Description	Legend	Reduced Level	Depth	Installation Backfill	Sample Test		Notes
<i>Silt/Clay, Crumb Nature, Low Density Brown Colour</i>			0.00m - 0.30m				
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SOAKAWAY TESTING TO BRE DIGEST 365

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APPENDIX B – MET EIREANN RAINFALL RETURN PERIODS

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 314707, Northing: 225697,

DURATION	Interval		Years													
	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.7,	4.0,	4.7,	5.8,	6.6,	7.2,	9.1,	11.4,	13.0,	15.2,	17.2,	18.7,	21.2,	23.1,	24.7,	N/A
10 mins	3.8,	5.6,	6.6,	8.1,	9.2,	10.0,	12.7,	15.9,	18.1,	21.2,	23.9,	26.1,	29.5,	32.2,	34.4,	N/A
15 mins	4.5,	6.6,	7.8,	9.5,	10.8,	11.8,	15.0,	18.7,	21.3,	24.9,	28.2,	30.7,	34.7,	37.9,	40.5,	N/A
30 mins	5.9,	8.6,	10.1,	12.4,	13.9,	15.2,	19.2,	24.0,	27.1,	31.6,	35.7,	38.9,	43.8,	47.7,	51.0,	N/A
1 hours	7.8,	11.2,	13.1,	16.0,	18.0,	19.6,	24.7,	30.6,	34.6,	40.2,	45.2,	49.2,	55.3,	60.1,	64.1,	N/A
2 hours	10.2,	14.7,	17.1,	20.8,	23.3,	25.3,	31.7,	39.1,	44.1,	51.1,	57.4,	62.2,	69.8,	75.7,	80.7,	N/A
3 hours	12.0,	17.2,	20.0,	24.2,	27.1,	29.3,	36.7,	45.2,	50.8,	58.8,	65.9,	71.4,	80.0,	86.7,	92.3,	N/A
4 hours	13.5,	19.2,	22.3,	27.0,	30.1,	32.6,	40.8,	50.0,	56.2,	64.9,	72.7,	78.8,	88.1,	95.4,	101.5,	N/A
6 hours	15.8,	22.4,	26.0,	31.4,	35.0,	37.9,	47.2,	57.8,	64.8,	74.7,	83.5,	90.4,	101.0,	109.3,	116.1,	N/A
9 hours	18.6,	26.2,	30.3,	36.5,	40.7,	44.0,	54.6,	66.7,	74.7,	86.0,	96.0,	103.8,	115.8,	125.1,	132.8,	N/A
12 hours	20.8,	29.3,	33.9,	40.7,	45.3,	48.9,	60.6,	73.9,	82.7,	95.0,	105.9,	114.4,	127.5,	137.7,	146.1,	N/A
18 hours	24.5,	34.3,	39.5,	47.4,	52.7,	56.8,	70.2,	85.3,	95.3,	109.3,	121.7,	131.4,	146.2,	157.7,	167.2,	N/A
24 hours	27.4,	38.3,	44.1,	52.8,	58.6,	63.1,	77.9,	94.5,	105.4,	120.8,	134.4,	144.9,	161.0,	173.6,	183.9,	220.2
2 days	34.6,	47.1,	53.6,	63.3,	69.7,	74.7,	90.7,	108.5,	120.1,	136.1,	150.2,	161.1,	177.6,	190.4,	200.9,	237.3
3 days	40.4,	54.1,	61.3,	71.8,	78.8,	84.1,	101.2,	120.0,	132.1,	148.9,	163.6,	174.8,	191.9,	205.0,	215.7,	252.8
4 days	45.4,	60.3,	68.0,	79.2,	86.6,	92.3,	110.3,	130.0,	142.6,	160.1,	175.3,	186.9,	204.5,	217.9,	228.9,	266.7
6 days	54.4,	71.2,	79.7,	92.1,	100.3,	106.5,	126.1,	147.3,	160.9,	179.5,	195.7,	207.9,	226.4,	240.5,	252.0,	291.4
8 days	62.3,	80.7,	90.0,	103.4,	112.2,	118.9,	139.9,	162.5,	176.9,	196.5,	213.4,	226.2,	245.6,	260.3,	272.2,	313.0
10 days	69.6,	89.4,	99.4,	113.8,	123.1,	130.2,	152.4,	176.2,	191.3,	211.8,	229.4,	242.8,	262.9,	278.1,	290.5,	332.5
12 days	76.5,	97.6,	108.2,	123.3,	133.2,	140.6,	163.9,	188.8,	204.6,	225.9,	244.2,	258.1,	278.8,	294.5,	307.3,	350.5
16 days	89.2,	112.6,	124.3,	141.0,	151.7,	159.8,	185.1,	211.9,	228.8,	251.6,	271.1,	285.8,	307.8,	324.4,	337.8,	383.1
20 days	101.0,	126.6,	139.2,	157.1,	168.7,	177.4,	204.4,	233.0,	250.9,	275.0,	295.5,	311.0,	334.0,	351.3,	365.4,	412.6
25 days	114.9,	142.8,	156.5,	176.0,	188.4,	197.8,	226.8,	257.2,	276.2,	301.8,	323.5,	339.8,	364.1,	382.3,	397.0,	446.4

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',

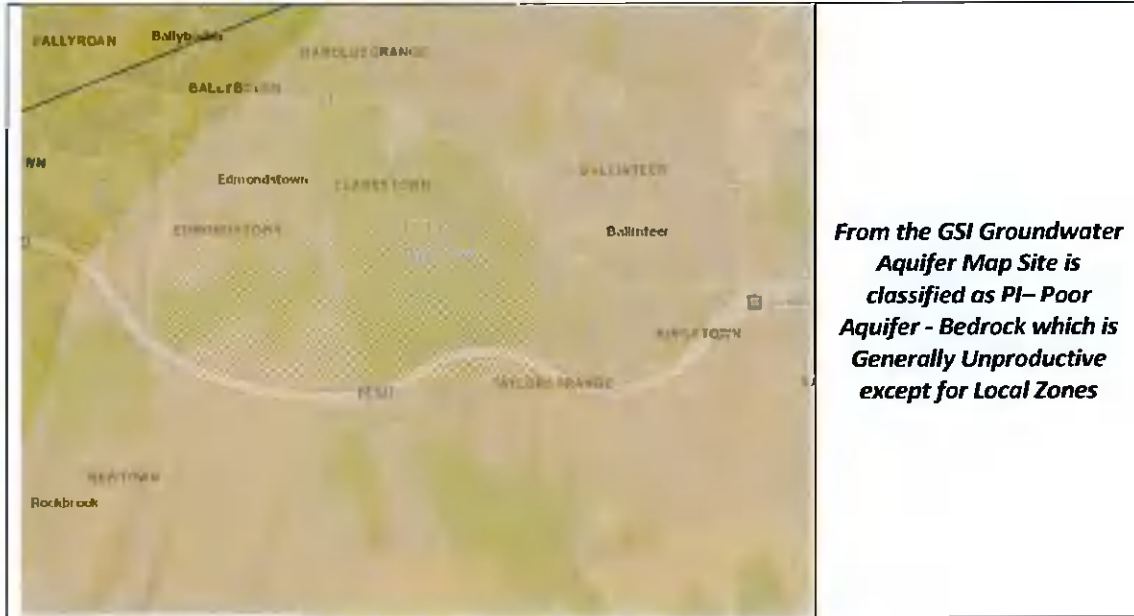
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

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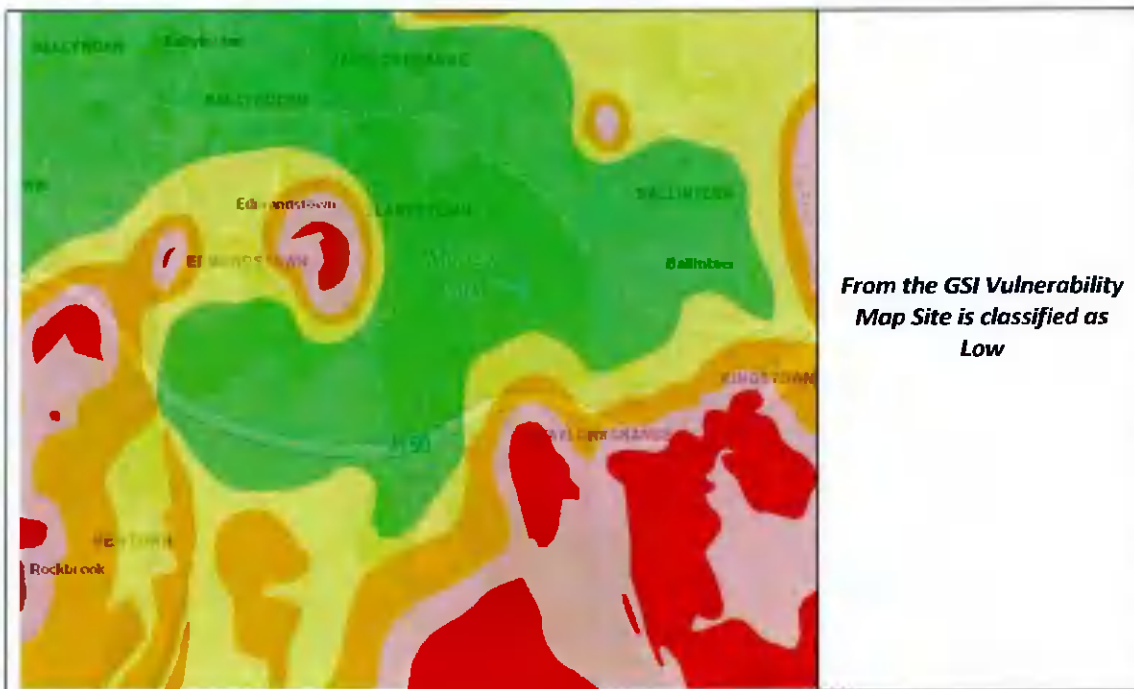
APPENDIX C – MAPS USED AS PART OF THE DESK STUDY

Maps Used

Groundwater/Aquifer Map



Vulnerability Map

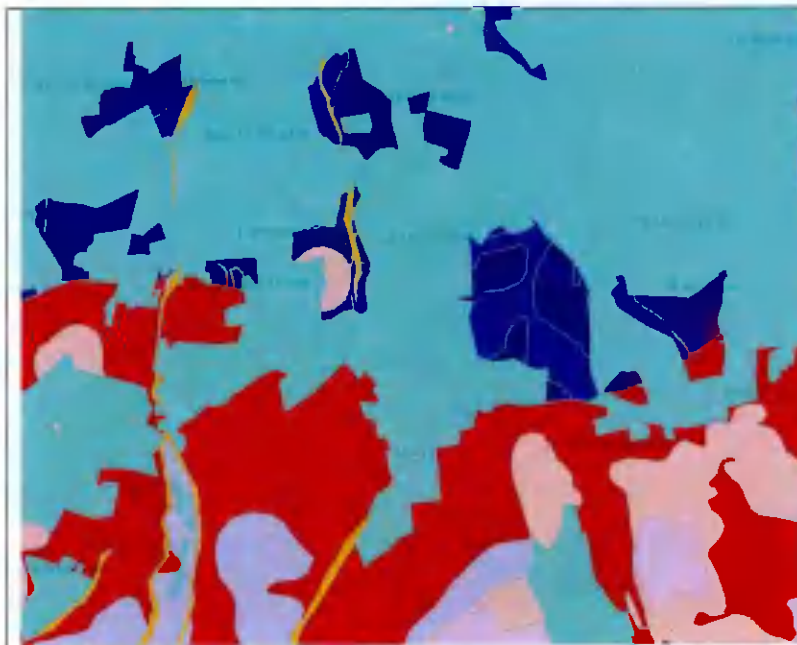


Bedrock Map



From the GSI Bedrock Map the Site is classified as GII-Granites & other Igneous Intrusive rocks

Teagasc Subsoil Map



From the GSI Teagasc Subsoil Map Site is classified as Fine loamy drift with siliceous stones

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APPENDIX D – INSURANCE

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**Griffiths &
Armour**

PROFESSIONAL INDEMNITY INSURANCE

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

Insured: Traynor Environmental Ltd

Address: Bellurbet Business Park
Greeng
Bellurbet
Co. Cavan
H14AY94

Lead Insurer(s): Ais Specialty Europe SE

Period of Insurance: 12 July 2021 to 11 July 2022

Policy Number: Z011/04786

Limit of Indemnity: €1,500,000 any one claim and unlimited in the period of insurance

Signature



Graeme Timney
Chief Executive Officer
Griffiths & Armour Europe DAC

Date: 22 June 2021

The policy is subject to the insuring agreements, exclusions, 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 Timney, C Brana (UK), D J Whalley (UK), T Cochrane (Non-Executive)
Registered in Ireland No. 603285
Registered Office: Q House, 108 Parnock Road, Sandyford, Dublin 18, Ireland
Griffiths & Armour Europe Designated Activity Company is regulated by the Central Bank of Ireland

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