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Planning Assessments & Land Surveys

Tel: 087 6636 757 Email: percolationtests@gmail.com Web: www.percolationtests.ie

BRE Digest 365 Report.

Prepared on behalf of:

John Gorman

At:

126b Sarsfield Park,
Lucan,
Co. Dublin.

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Scope of Report.

The findings of this report are the result of an on-site infiltration test. Interpretations and conclusions included in the report are based on knowledge of the ground conditions following detailed investigations, as well as the regional soils, subsoils and bedrock geology, and the experience of the author. David Ryan has prepared this report in line with the best current practice and with all reasonable skill, care and diligence in consideration of the limits imposed by the survey techniques used and resources devoted to it by agreement with the client.

David Ryan accepts no responsibility for any matters arising if any recommendations contained in this document are not carried out, or are partially carried out, without further advice being obtained from David Ryan.

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BRE digest 365 test

		Revision	
Job No:	**Soakpit1**	Page:	**C/01**
Section:	**126b Sarsfield Park, Lucan, Co. Dublin**	Prepared By:	**DR**
		Date:	**02/10/2023**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	6.23	4.98	3.57
	ring soakaways		
diameter of ring *[mm]* :	1050	1350	1500
required pit diameter *[m]* :	2.14	2.15	2.15

** 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}' =	2.42	m^3
provided storage volume 'V_{prov}' =	2.66	m^3
utilisation factor =	**0.91**	***.OK***
required time to discharge 50% 't_{50}' =	6.83	*hours*
utilisation factor =	**0.28**	***.OK***

GENERAL DATA

site location: [redacted] **Ireland**
soakaway type: **geocellular units** (?)

impermeable area drained to soakaway 'A' *[m^2]* = **70**
60 min rainfall depth of 5 year return period 'R' *[mm]* = **16** (?)
M5-60 to M5-2d rainfall ratio 'r' = **0.28**
allowance for climate change: **20%**

SOAKAWAY DATA

soakaway width 'W' [m] = **1.00**
soakaway length 'L' [m] = **3.50**

total depth from ground level 'D_b' *[m]* = **1.20**
depth to drain invert level 'D_d' *[m]* = **0.40**
soakaway effective depth 'D_{eff}' *[m]* = 0.80
free volume in infill aggregate *[%]* = **95** (?)

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base: **30%** (?)
available on-site infiltration test results: (●) Yes ( ) No (?)
use soakage trial pit table below
internal surface area of trial pit 'a_{p50}' [m^2] = 1.88
storage volume between 75-25% 'V_p' [m^3] = 0.24
time for water to fall from 75-25% 't_p' [min] = 183.00
soil infiltration rate 'f' [m/s] = 1.16E-05

SOAKAGE TRIAL PIT DATA (?)

soakage trial pit width 'W_t' *[m]* = **0.60**
soakage trial pit length 'L_t' *[m]* = **1.00**
total depth from ground level 'D_{tb}' *[m]* = **1.20**
depth to pipe invert level 'D_{tp}' *[m]* = **0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* = 0.80
free volume in infill aggregate *[%]* = **100** (?)
NOTE: faces of excavation assumed to be vertical

Infiltration rate: Good – No mottling above 1.2m below ground level

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION (?)

rainfall duration *[min]*	rainfall factor Z1	M5-D rainfalls *[mm]*	M30-D Z2	M30-D rainfalls *[mm]*	M30-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.33	5.33	1.44	9.24	0.65							0.02	0.63
10	0.48	7.73	1.47	13.62	0.95							0.03	0.92
15	0.58	9.33	1.48	16.61	1.16							0.05	1.11
30	0.76	12.21	1.49	21.86	1.53							0.10	1.43
60	1.00	16.00	1.49	28.60	2.00							0.19	1.81
120	1.26	20.21	1.47	35.72	2.50							0.39	2.11
240	1.62	25.87	1.46	45.23	3.17							0.78	2.39
360	1.85	29.55	1.44	51.23	3.59							1.17	**2.42**
600	2.20	35.20	1.43	60.31	4.22							1.95	2.28
1440	3.01	48.21	1.38	79.87	5.59							4.67	0.92

** Z2 is growth factor from M5 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**	**40**	**82**	**128**	**183**														
	depth to water *[m]* =	**0.60**	**0.70**	**0.80**	**0.90**	**1.00**														
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

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		Date:	**02/10/2023**

ALTERNATIVE SOAKAWAY SIZES

	trench soakaways		
width of trench *[mm]* :	**450**	**600**	**900**
required trench length *[m]* :	10.58	8.48	6.16
	ring soakaways		
diameter of ring *[mm]* :	1050	1350	1500
required pit diameter *[m]* :	2.29	2.29	2.29

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

SUMMARY OF CALCULATIONS

critical design rainfall duration 't_{crit}' =	600	*min*
required storage volume 'V_{req}' =	4.52	m^3
provided storage volume 'V_{prov}' =	4.56	m^3
utilisation factor =	**0.99**	***.OK***
required time to discharge 50% 't_{50}' =	8.79	*hours*
utilisation factor =	**0.37**	***.OK***

GENERAL DATA

site location: [redacted] **Ireland**
soakaway type: **geocellular units** (?)

impermeable area drained to soakaway 'A' *[m^2]* = **118**
60 min rainfall depth of 5 year return period 'R' *[mm]* = **16** (?)
M5-60 to M5-2d rainfall ratio 'r' = **0.28**
allowance for climate change: **20%**

SOAKAWAY DATA

soakaway width 'W' [m] = **1.50**
soakaway length 'L' [m] = **4.00**

total depth from ground level 'D_b' *[m]* = **1.20**
depth to drain invert level 'D_d' *[m]* = **0.40**
soakaway effective depth 'D_{eff}' *[m]* = 0.80
free volume in infill aggregate *[%]* = **95** (?)

SOIL INFILTRATION DATA

allowance for infiltration through soakaway base: **30%** (?)
available on-site infiltration test results: (●) Yes ( ) No (?)
use soakage trial pit table below
internal surface area of trial pit 'a_{p50}' [m^2] = 1.88
storage volume between 75-25% 'V_p' [m^3] = 0.24
time for water to fall from 75-25% 't_p' [min] = 183.00
soil infiltration rate 'f' [m/s] = 1.16E-05

SOAKAGE TRIAL PIT DATA (?)

soakage trial pit width 'W_t' *[m]* = **0.60**
soakage trial pit length 'L_t' *[m]* = **1.00**
total depth from ground level 'D_{tb}' *[m]* = **1.20**
depth to pipe invert level 'D_{tp}' *[m]* = **0.40**
soakage trial pit effective depth 'D_{teff}' *[m]* = 0.80
free volume in infill aggregate *[%]* = **100** (?)
NOTE: faces of excavation assumed to be vertical

Infiltration rate: Good – No mottling above 1.2m below ground level

REQUIRED STORAGE CAPACITY PER RAINFALL DURATION (?)

rainfall duration *[min]*	rainfall factor Z1	M5-D rainfalls *[mm]*	M30-D Z2	M30-D rainfalls *[mm]*	M30-D inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	ignore Z2	ignore rainfalls *[mm]*	ignore inflow *[m^3]*	outflow from soakaway *[m^3]*	required storage *[m^3]*
5	0.33	5.33	1.44	9.24	1.09							0.02	1.07
10	0.48	7.73	1.47	13.62	1.61							0.04	1.56
15	0.58	9.33	1.48	16.61	1.96							0.06	1.90
30	0.76	12.21	1.49	21.86	2.58							0.13	2.45
60	1.00	16.00	1.49	28.60	3.37							0.26	3.11
120	1.26	20.21	1.47	35.72	4.22							0.52	3.70
240	1.62	25.87	1.46	45.23	5.34							1.04	4.30
360	1.85	29.55	1.44	51.23	6.04							1.56	4.49
600	2.20	35.20	1.43	60.31	7.12							2.60	**4.52**
1440	3.01	48.21	1.38	79.87	9.42							6.23	3.20

** Z2 is growth factor from M5 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**	**40**	**82**	**128**	**183**														
	depth to water *[m]* =	**0.60**	**0.70**	**0.80**	**0.90**	**1.00**														
Soakage Trial 2	time *[min]* =																			
	depth to water *[m]* =																			
Soakage Trial 3	time *[min]* =																			
	depth to water *[m]* =																			

CLIENT: John Gorman

PROJECT: 126b Sarsfield Park, Lucan, Co. Dublin

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Site Suitability Assessments & Land Surveys
Newtownmoyaghy
Kilcock
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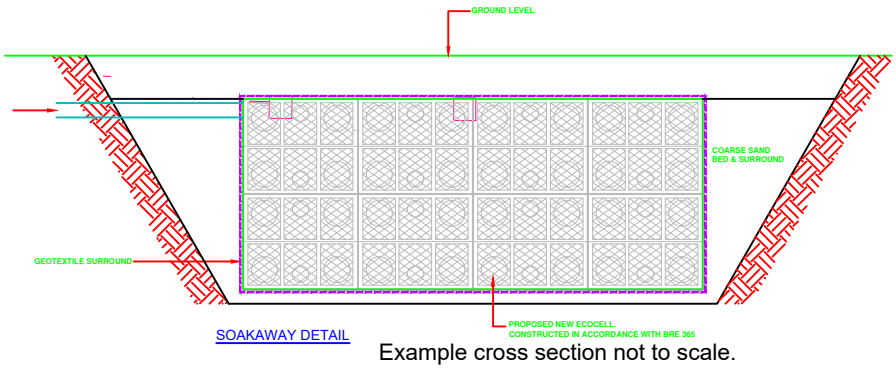
Mobile: 0876636757
Email: percolationtests@gmail.com

DRAWN BY:
SCALE: 1:250
ORIGIN DATE: 02/10/2023
DRAWING NUMBER:

FOR PLANNING PURPOSES ONLY



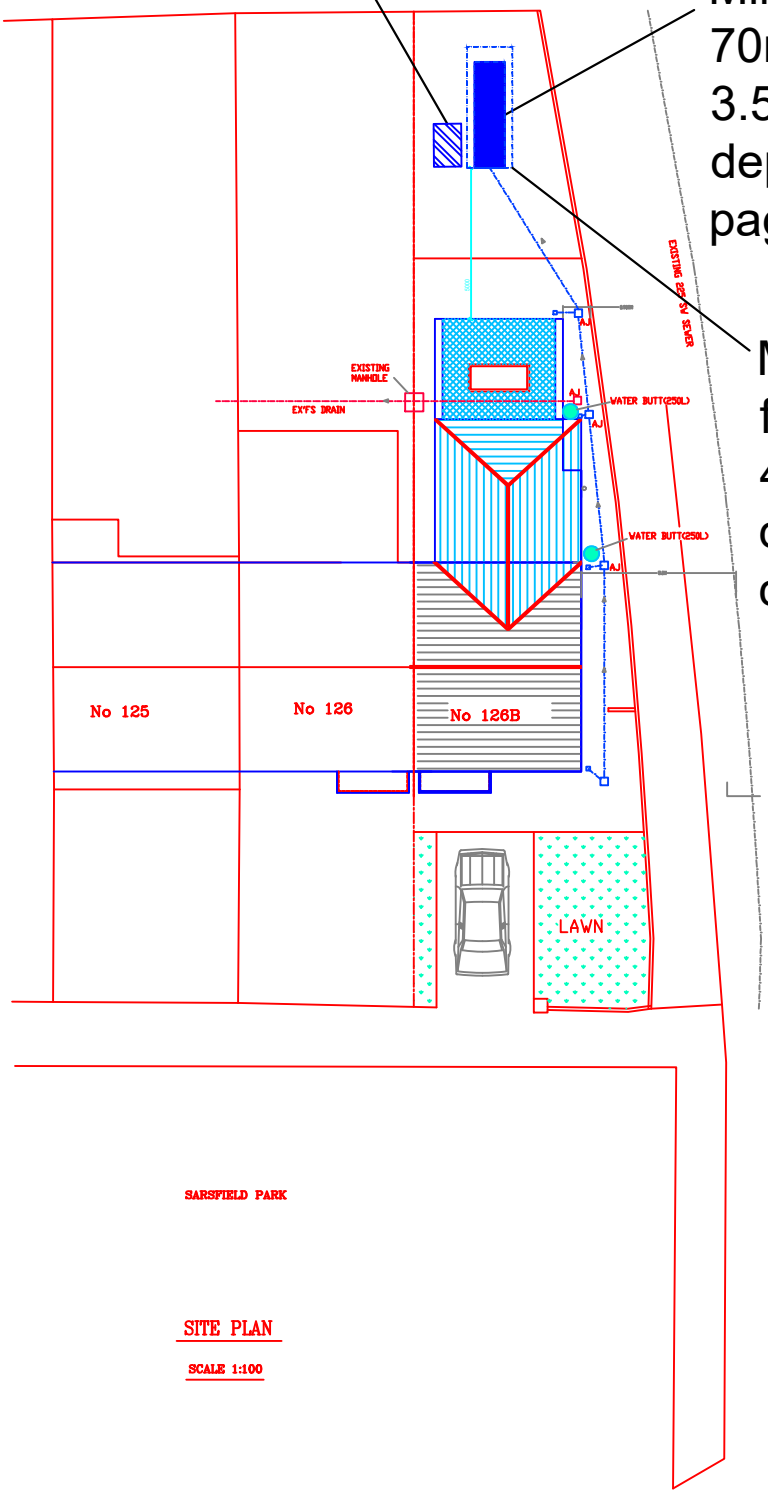
SOAKAWAY DETAIL

Example cross section not to scale.

BRE digest infiltration test hole

Min 2.42m³ storage required for 70m² hardstanding.
3.5m x 1.0m with an effective depth of 0.80m (see attached calc page).

Min 4.52m³ storage required for 118m² hardstanding.
4.0m x 1.5m with an effective depth of 0.80m (see attached calc page).



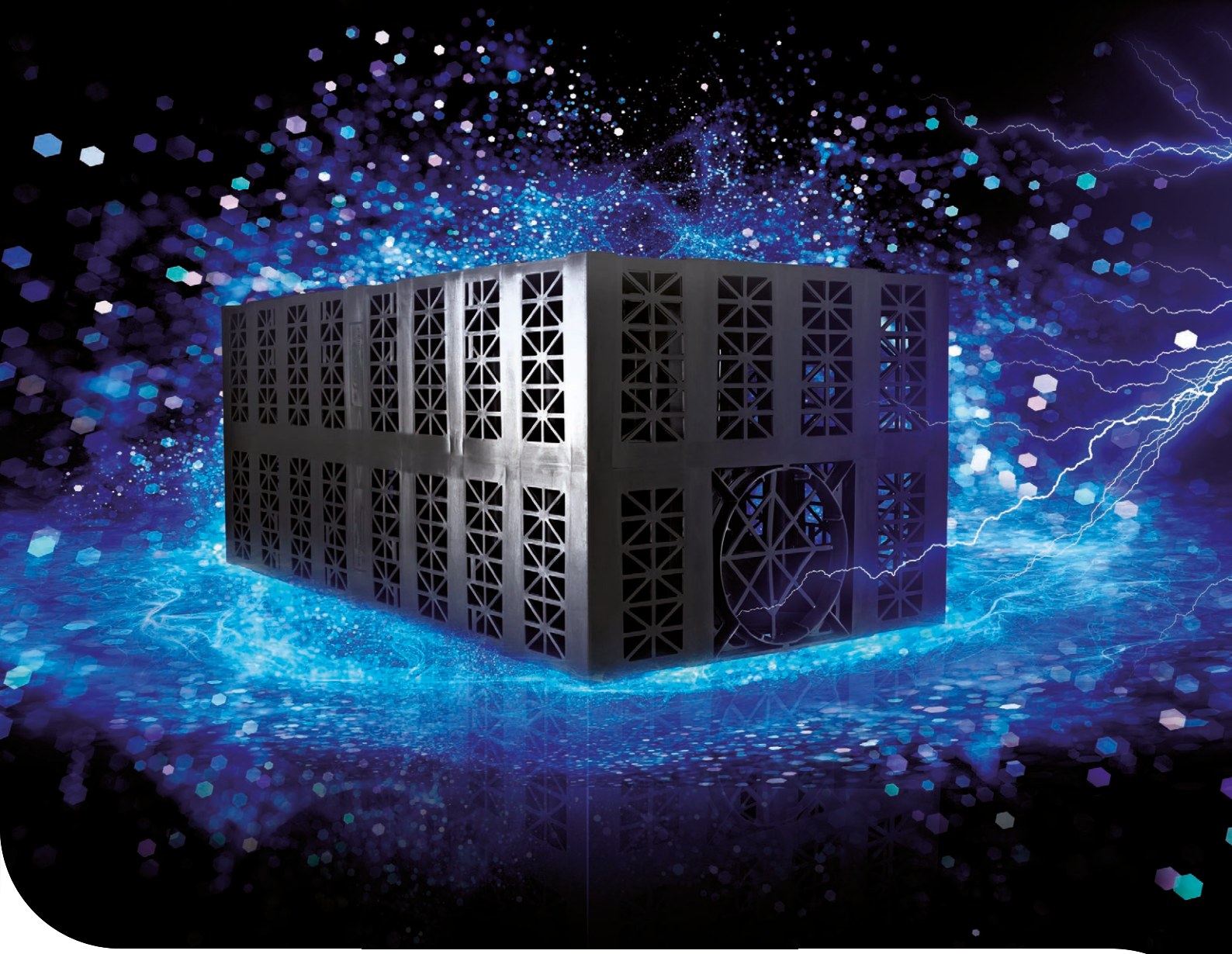
SITE PLAN

SCALE 1:100

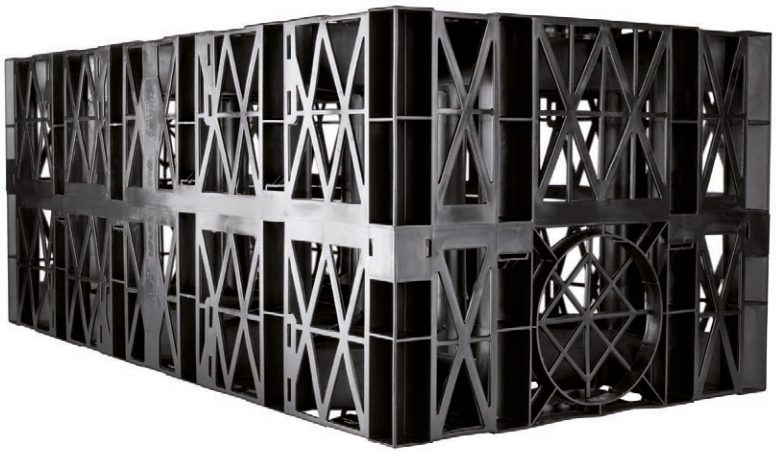
AquaCell

Re-engineered to rain supreme for years to come

The new AquaCell range engineered from reformulated, recycled material.

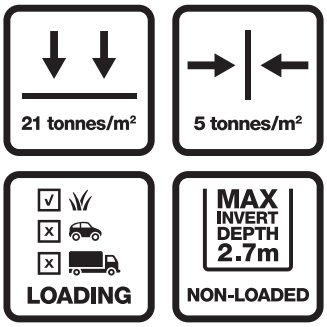


wavin



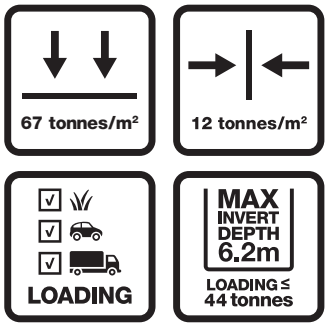
AquaCell
ECO

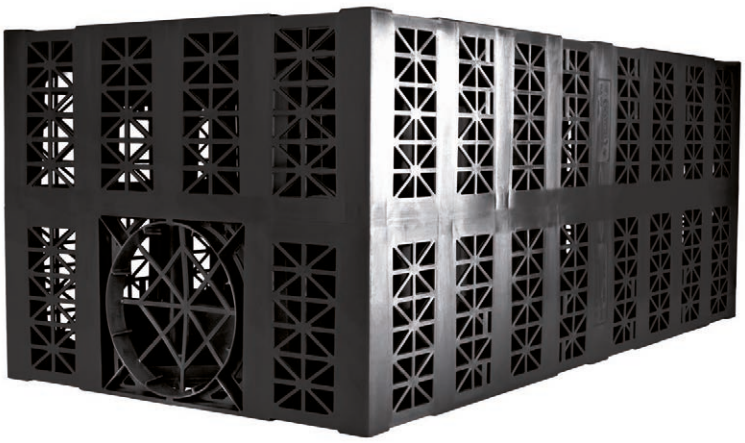
ECO is manufactured from specially reformulated, recycled material and has been designed for shallow, non-trafficked, landscaped applications.

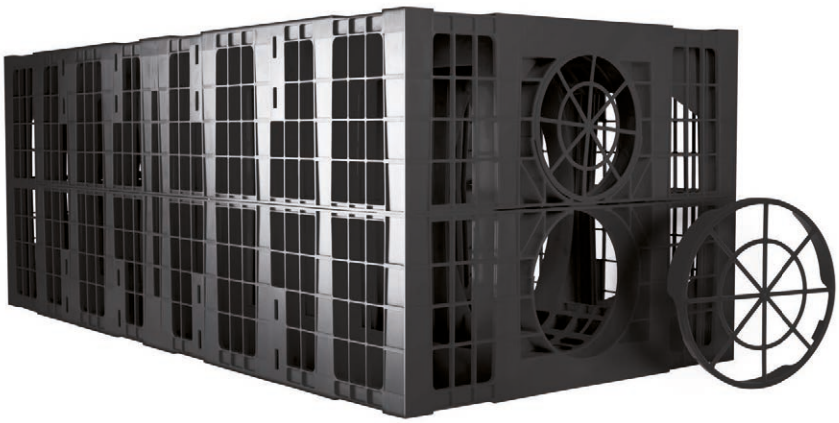


AquaCell
CORE-R

CORE-R has been designed for use in deep applications, subject to both regular and heavy traffic loadings, such as cars and HGV's.

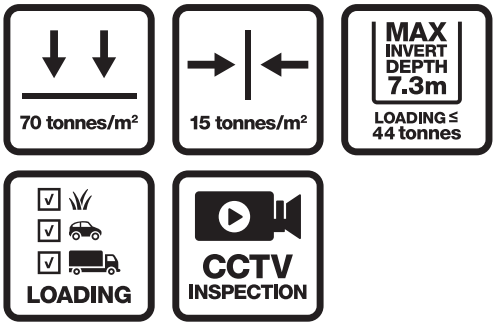


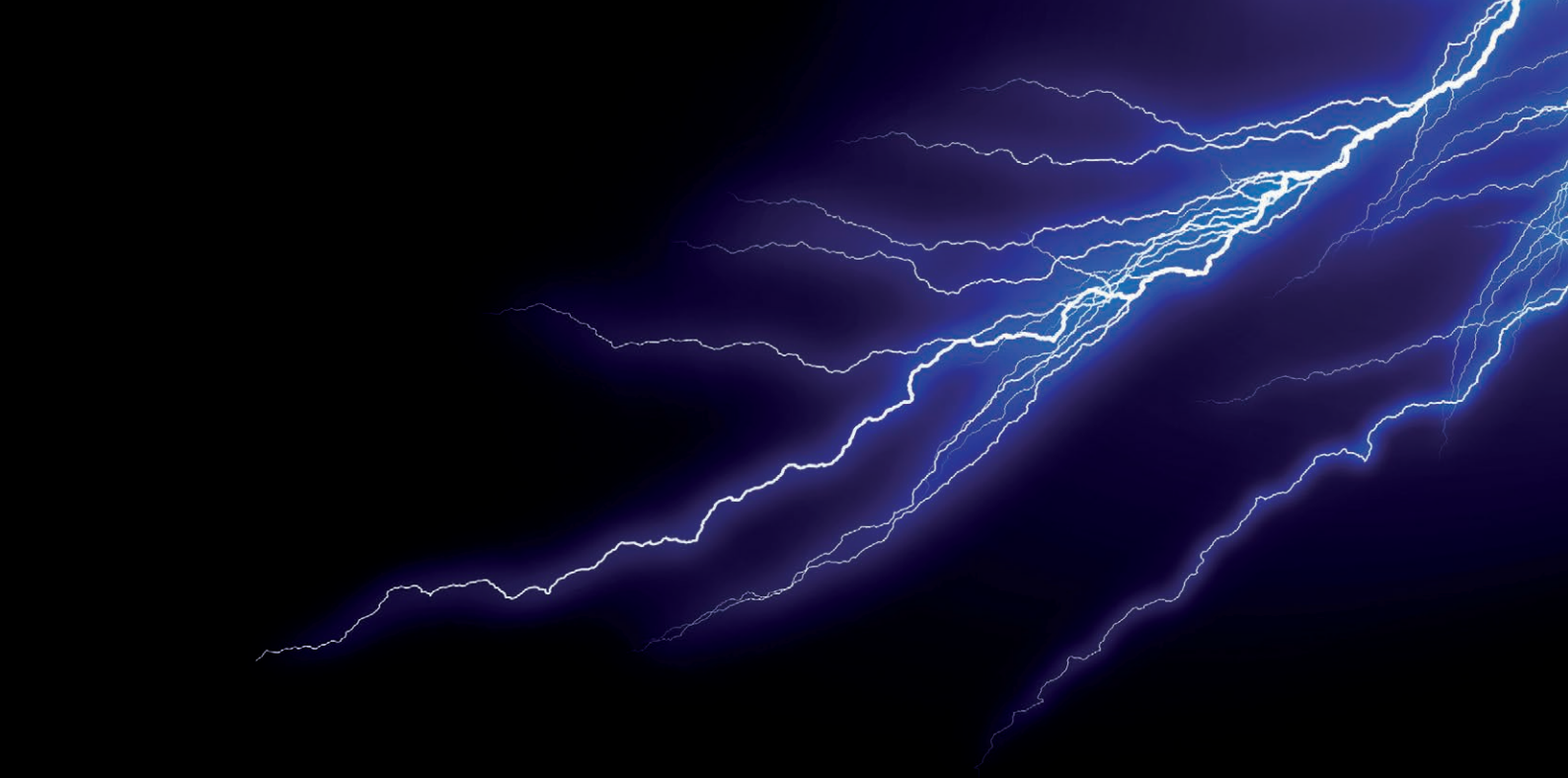




AquaCell
PLUS-R

PLUS-R has been designed primarily for use in applications where inspection is required, and is suitable for use in all applications from landscaped areas to heavily trafficked areas.





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H 0.4m

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WAV013 - January 2020

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 298196, Northing: 235869,

	Interval		Years											
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.3,	3.3,	3.9,	4.8,	5.4,	5.9,	7.5,	9.4,	10.6,	12.4,	14.0,	15.2,	17.2,	18.7,	20.0,	N/A ,
10 mins	3.2,	4.6,	5.5,	6.7,	7.6,	8.2,	10.5,	13.0,	14.8,	17.3,	19.5,	21.2,	24.0,	26.1,	27.9,	N/A ,
15 mins	3.7,	5.5,	6.4,	7.9,	8.9,	9.7,	12.3,	15.3,	17.4,	20.3,	22.9,	25.0,	28.2,	30.7,	32.8,	N/A ,
30 mins	4.9,	7.1,	8.3,	10.1,	11.4,	12.4,	15.6,	19.3,	21.8,	25.3,	28.4,	30.9,	34.7,	37.7,	40.2,	N/A ,
1 hours	6.5,	9.3,	10.8,	13.1,	14.6,	15.8,	19.8,	24.3,	27.3,	31.5,	35.3,	38.2,	42.8,	46.3,	49.2,	N/A ,
2 hours	8.6,	12.1,	14.0,	16.8,	18.7,	20.2,	25.0,	30.5,	34.1,	39.2,	43.7,	47.2,	52.6,	56.8,	60.3,	N/A ,
3 hours	10.2,	14.2,	16.3,	19.5,	21.7,	23.3,	28.8,	34.9,	38.9,	44.6,	49.6,	53.5,	59.4,	64.1,	67.9,	N/A ,
4 hours	11.4,	15.8,	18.2,	21.7,	24.0,	25.8,	31.7,	38.4,	42.7,	48.8,	54.2,	58.4,	64.8,	69.7,	73.8,	N/A ,
6 hours	13.4,	18.5,	21.1,	25.1,	27.8,	29.8,	36.5,	43.9,	48.8,	55.5,	61.5,	66.1,	73.2,	78.6,	83.1,	N/A ,
9 hours	15.8,	21.6,	24.6,	29.1,	32.1,	34.4,	41.9,	50.2,	55.6,	63.1,	69.8,	74.9,	82.6,	88.6,	93.6,	N/A ,
12 hours	17.7,	24.1,	27.4,	32.3,	35.6,	38.1,	46.2,	55.2,	61.1,	69.2,	76.3,	81.7,	90.1,	96.5,	101.8,	N/A ,
18 hours	20.9,	28.1,	31.9,	37.5,	41.2,	44.0,	53.1,	63.1,	69.6,	78.6,	86.5,	92.6,	101.7,	108.8,	114.6,	N/A ,
24 hours	23.4,	31.4,	35.6,	41.6,	45.6,	48.7,	58.6,	69.4,	76.5,	86.1,	94.6,	101.1,	110.9,	118.5,	124.6,	146.0,
2 days	29.5,	38.5,	43.1,	49.7,	54.0,	57.3,	67.8,	79.1,	86.3,	96.2,	104.7,	111.2,	121.0,	128.4,	134.5,	155.3,
3 days	34.5,	44.3,	49.2,	56.3,	60.9,	64.4,	75.4,	87.2,	94.7,	104.8,	113.6,	120.2,	130.1,	137.6,	143.8,	164.6,
4 days	38.9,	49.4,	54.6,	62.1,	67.0,	70.7,	82.1,	94.4,	102.1,	112.5,	121.5,	128.2,	138.3,	146.0,	152.2,	173.1,
6 days	46.7,	58.4,	64.2,	72.4,	77.6,	81.6,	93.9,	107.0,	115.1,	126.1,	135.4,	142.4,	152.9,	160.8,	167.2,	188.6,
8 days	53.7,	66.4,	72.6,	81.4,	87.1,	91.3,	104.4,	118.0,	126.6,	138.0,	147.7,	155.0,	165.8,	173.9,	180.4,	202.3,
10 days	60.2,	73.8,	80.4,	89.7,	95.7,	100.1,	113.8,	128.1,	137.0,	148.8,	158.9,	166.4,	177.5,	185.8,	192.5,	214.9,
12 days	66.3,	80.7,	87.7,	97.5,	103.7,	108.4,	122.7,	137.5,	146.7,	158.9,	169.2,	176.9,	188.3,	196.8,	203.7,	226.5,
16 days	77.7,	93.6,	101.2,	111.9,	118.6,	123.6,	138.9,	154.7,	164.5,	177.4,	188.2,	196.3,	208.2,	217.0,	224.2,	247.8,
20 days	88.5,	105.6,	113.8,	125.2,	132.3,	137.7,	153.9,	170.5,	180.7,	194.2,	205.5,	213.9,	226.3,	235.5,	242.8,	267.1,
25 days	101.1,	119.7,	128.5,	140.7,	148.4,	154.0,	171.3,	188.8,	199.6,	213.7,	225.5,	234.3,	247.1,	256.7,	264.3,	289.4,

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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Planning Assessments & Land Surveys

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126b Sarsfield Park - 26/09/2023

BRE digest 365 test in progress

SOUND INSURANCE

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Sound Insurance
Unit 7 Burnell Court
Northern Cross
Malahide Road
Dublin 17

E: emailus@sound.ie
T: +353 1 524 2800

sound.ie

Cillron Limited
Newtownmoyaghy
Kilcock
Co Meath

Date: 09/03/2023
Reference: RYDA01001

INSURANCE CERTIFICATE

To Whom It May Concern

We confirm we act as Insurance Brokers to the above and set out below a summary of cover we have arranged:

Business Description: *Soil Engineer (Percolation Testing)*

PROFESSIONAL INDEMNITY

Policy No.	PID00027964
Insurer:	Robertson Low Insurances
Period of Insurance:	04/03/2023 – 03/03/2024
Limit of Indemnity:	€1,000,000

Subject always to Insurers policy wording, warranties, conditions, restrictions & exclusions a copy of which is available on request.

We trust this is in order but if you have any queries, please do not hesitate to contact us.

Yours sincerely,

Matthew Collins
Client Service Advisor
P: (01) 524 2614
E: Matthew@sound.ie