

MTW Consultants Ltd.

Consulting Civil and
Structural Engineers



Unit 4, MTW House
Broomfield Business Park
Malahide, Co. Dublin
Tel: 846 3505
Fax: 846 3515
info@mtw.ie

Response
to
Additional Information Request
Relating to
Drainage Issues
For
Development
At
Rathinree Esker Lane Lucan K78 X2C4
Reg Ref SD22A/0320

Client	Eoin and Nora Hickey			
Project Title	Rathinree Esker Lane Lucan K78 X2C4.			
Project Number	3898			
Document Number	155353			
Rev	Issue Date	By	Approved By	Status
-	06/12/2022	GF	BW	Issued to Architect

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Introduction

MTW Consultants Ltd, Consulting Civil and Structural Engineers, MTW House, Broomfield Business Park, Malahide, Co. Dublin have been retained by the Applicants as Consulting Engineers for this proposed development.

1. Response to queries

Reference numbers refer to the Additional Information request from South Dublin County Council.

4. (a) The Applicant is requested to submit a report showing site specific soil percolation test results and design calculations for the proposed soakaway in accordance with BRE Digest 365 – Soakaway Design. Subject to percolation test results, all additional Surface Water is to be directed to proposed soakaway. Where feasible connect an overflow surface pipe and/or swale from proposed soakaway to existing surface water sewer east of site.

Percolations tests have been undertaken by Stingray Environment and are attached in Annex A.

Soakaway has been designed using percolation results and can store a 100 year event. Calculations are attached in annex B.

An overflow to the surface water mains to the east is shown on drawing number 3898-AI-601 & 3898-AI-605

(b) The applicant is requested to submit a revised drawing showing plan and cross-sectional views, dimensions, and location of proposed soakaway. Any proposed soakaway shall be located fully within the curtilage of the property and shall be:

- i) At least 5m from any building, public sewer, road boundary or structure.*
- ii) Generally, not within 3m of the boundary of the adjoining property.*
- iii) Not in such a position that the ground below foundations is likely to be adversely affected.*
- iv) 10m from any sewage treatment percolation area and from any watercourse / floodplain.*
- v) Soakaways must include an overflow connection to the surface water drainage network*

Soakaway position, details and sections are shown on following drawings. Note as the development is an Ancillary Dwelling Unit (ADU) the boundaries are as per the original dwelling, refer to George Boyle Designs submission for more information.

3898-AI-601

3898-AI-604

3898-AI-605

3898-AI-606



Glen Faherty

BSc (Eng), Dip Eng, CEng MIEI

Chartered Engineer

For and on behalf of MTW Consultants Ltd

Annex A Infiltration Test

Infiltration Test BRE Digest 365



STINGRAY ENVIRONMENTAL
ENGINEERING
Protect Our Water

Reference Number: SEE-S469

Project: Eoin & Nora Hickey, Rathinree, Esker Lane,
Lucan, Co. Dublin, K78X2C4, X304513, Y235052

December 2022

STINGRAY ENVIRONMENTAL ENGINEERING LTD

Authored by: Waldemar Debowski

M:00353857215590

T:0035316949174

Email: info@stingrayenvironmental.ie

Company Registration No:639965

www.stingrayenvironmental.ie

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STINGRAY ENVIRONMENTAL ENGINEERING LTD.
2 FORGEHILL CLOSE, STAMULLEN, CO. MEATH, K32 VK76, IRELAND
TEL: +353 (0)1 852 2200
WWW.STINGRAYENVIRONMENTALENGINEERING.COM

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- Personal data will be adequate, relevant, and limited to what is necessary in relation to the purposes for which they are processed.
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- Personal data will be kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the personal data is processed.
- Personal data will be processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction, or damage, using appropriate technical or organisational measures.

We would like to continue to correspond with you by email and text. If you wish to continue, you need take no further action. Otherwise simply forward the email, letter or text message and confirm if you no longer wish to receive correspondence via email or SMS.

Stingray Environmental Engineering Ltd. Registered Office: 2 Forgehill Close, Stamullen, Co. Meath, K32 VK76, Registered in Ireland. Company Reg. No.639965, A private company limited by shares having a share capital. Directors: Waldemar Debowski

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STINGRAY ENVIRONMENTAL
ENGINEERING
P.L.L.C. & P.L.C.

Introduction

This report is based on the findings of a soil infiltration tests examination as per BRE Digest 365, carried out by Stingray Environmental Engineering Ltd. on the 24th, 25th, 26th of November 2022.

As required by South Dublin County Council, this report provides calculations of soil infiltration rate in line with test requirements of BRE365.

1. Site Specific Information

Information supplied by client /architect

- ✚ Project Name: **Residential Development**
- ✚ Site Address: **Esker Lane, Lucan, Co. Dublin, K78X2C4, X304513, Y235052**
- ✚ Consulting engineers: **MTW Consultants Ltd., Unit 4, MTW House, Broomfield Business Park, Malahide, Co. Dublin**

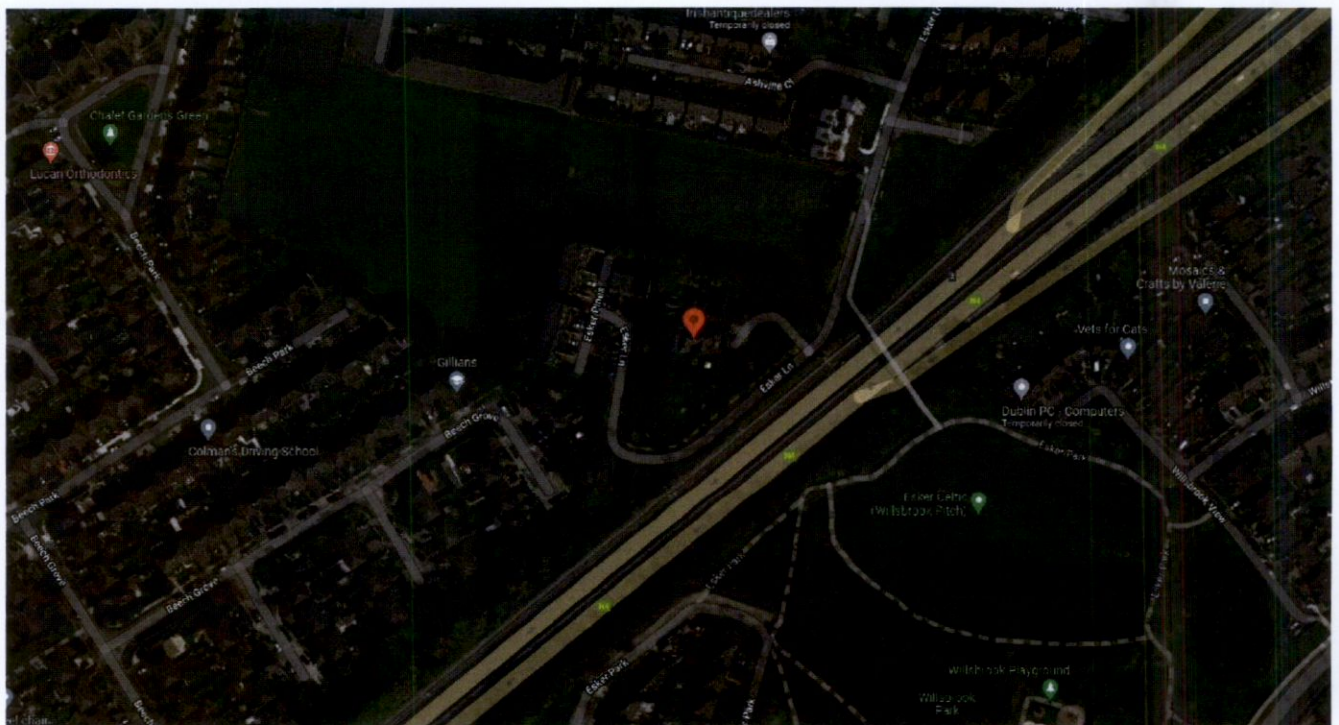


Fig 1. Site Location: Rathinree, Esker Lane

2. Infiltration Test BRE Digest 365

- ✦ Dimensions of the infiltration test pit : L 1200mm x W 300mm x D 1300mm
- ✦ An effective storage depth adopted:700mm

Soil Infiltration rate calculated as per BRE365 soakaway test:

INFILTRATION TEST PIT:

$$\text{✦ } f = V_{75-25} / (a_{50} * t_{75-25}) = 5.3478E-07 = \mathbf{0.000000535m/sec}$$

where:

$$\text{✦ } V_{75-25} = 1200\text{mm} * 300\text{mm} * 350\text{mm} = 0.126\text{m}^3$$

$$\text{✦ } A_{50 \text{ base}} = (2 * 1200\text{mm} * 350\text{mm}) + (2 * 300\text{mm} * 350\text{mm}) + (1 * 1200\text{mm} * 300\text{mm}) = 1.41\text{m}^2$$

$$\text{✦ } \text{Fill 1 } t_{75-25} = 2785\text{min} = 167100\text{sec}$$

	Date	T ₇₅ =ED-175mm	T ₂₅ =ED-525mm	T ₇₅₋₂₅ [min]
Fill1	24/11/2022	12:20		
	26/11/2022		10:45	2785

Only 1 fill completed, due to relatively slow infiltration rates



Fig 2. BRE365 Test Location



Fig 3. Site View East



Fig 4. Site View North



Fig 5. Site View West



Fig 6. Test Pit Location



Fig 7. Infiltration test pit 24-11-2022



Fig 8. Infiltration test 24-11-2022



Fig 9. Infiltration test 24-11-2022



Fig 10. Infiltration test pit 25-11-2022

3. Trial Pit

The main findings of the trial pit examination were as follows:

- Groundwater was not encountered on-site at a depth of 1200mm below ground level.
- Bedrock was not- encountered on-site at a depth of 1200mm below ground level
- Vulnerability in the area Classified as H-High which could indicate rock at $\leq 2\text{m}$ BCL
- **Zone A Topsoil/SILT/CLAY; depth 500mm; crumb/soft**
- **Zone B CLAY with gravels and cobbles increasing with depth; depth 700mm; massive/firm**



Fig 11. Trial Pit- Depth 1.2m BCL



Fig 12. Trial Pit-Excavated Soil

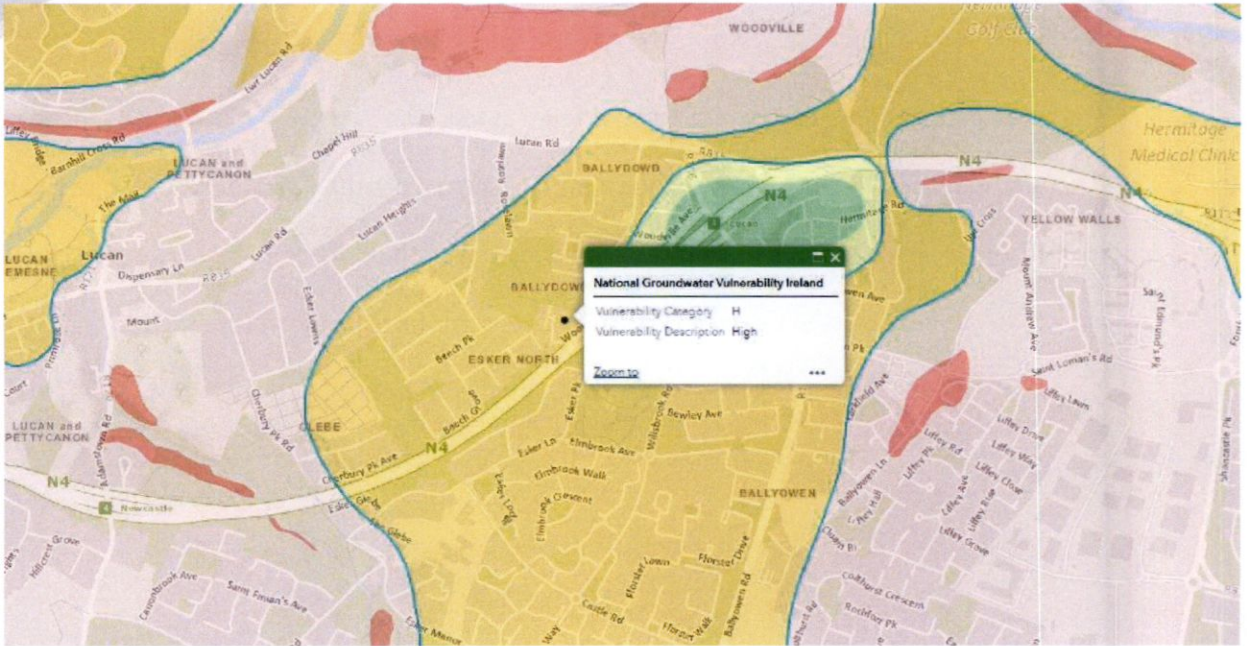


Fig 32. Trial Pit-Excavated Soil



Signed: *Waldemar Debnwski* Date: 1 December 2022

Qualifications: B.Eng. P.Grad.Dips. FETAC Cert MIEI MIAH



STINGRAY ENVIRONMENTAL
ENGINEERING
100, 101 & 102

Annex B Surface Water Calculations



Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.400
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)
PS1	0.011
PS2	
PS3	
PS4	
PS5	
PS6	
PS7	

Links

Name	US Node	DS Node	US IL (m)	DS IL (m)	Slope (1:X)	Dia (mm)
PS1-PS2	PS1	PS2	46.856	46.750	59.2	100
PS2-PS7	PS2	PS7	46.750	46.675	98.0	100
PS7-PS3	PS7	PS3	46.675	46.381	14.3	100
PS5-PS6	PS5	PS6	46.549	46.469	100.5	100
PS6-PS3	PS6	PS3	46.469	46.381	99.3	100
PS3-PS4	PS3	PS4	46.381	46.280	90.9	100

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
PS1-PS2	1.003	7.9	1.3	0.900	0.900	0.011	0.0	28	0.744
PS2-PS7	0.776	6.1	1.3	0.900	0.932	0.011	0.0	31	0.611
PS7-PS3	2.054	16.1	1.3	0.932	1.141	0.011	0.0	19	1.226
PS5-PS6	0.767	6.0	0.0	0.900	0.950	0.000	0.0	0	0.000
PS6-PS3	0.771	6.1	0.0	0.950	1.141	0.000	0.0	0	0.000
PS3-PS4	0.807	6.3	1.3	1.141	1.231	0.011	0.0	30	0.626

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Detailed
FSR Region	Scotland and Ireland	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	60
Ratio-R	0.300	Additional Storage (m³/ha)	1.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440
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Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	20	0	0

Node PS4 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00193	Invert Level (m)	45.280	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.00193	Time to half empty (mins)	5087	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	3.000	Number Required	1
Porosity	0.30	Pit Length (m)	2.000		



Results for 1 year Critical Storm Duration. Lowest mass balance: 35.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
15 minute winter	PS1	10	46.884	0.028	1.3	0.0038	0.0000	OK
15 minute winter	PS2	11	46.784	0.034	1.3	0.0043	0.0000	OK
1440 minute winter	PS3	990	46.524	0.143	0.1	0.0180	0.0000	SURCHARGED
1440 minute winter	PS4	960	46.524	0.244	0.1	1.8317	0.0000	OK
15 minute summer	PS5	1	46.549	0.000	0.0	0.0000	0.0000	OK
1440 minute winter	PS6	990	46.524	0.055	0.0	0.0070	0.0000	OK
15 minute winter	PS7	11	46.694	0.019	1.3	0.0024	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)
15 minute winter	PS1	PS1-PS2	PS2	1.3	0.639	0.165	0.0129
15 minute winter	PS2	PS2-PS7	PS7	1.3	0.779	0.213	0.0125
1440 minute winter	PS3	PS3-PS4	PS4	0.1	0.298	0.016	0.0719
1440 minute winter	PS4	Infiltration		0.0			
15 minute summer	PS5	PS5-PS6	PS6	0.0	0.000	0.000	0.0000
1440 minute winter	PS6	PS6-PS3	PS3	0.0	-0.007	-0.007	0.0536
15 minute winter	PS7	PS7-PS3	PS3	1.3	0.929	0.081	0.0066



Results for 30 year Critical Storm Duration. Lowest mass balance: 35.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
720 minute winter	PS1	675	47.028	0.172	0.3	0.0236	0.0000	SURCHARGED
720 minute winter	PS2	675	47.028	0.278	0.3	0.0350	0.0000	SURCHARGED
720 minute winter	PS3	675	47.028	0.647	0.3	0.0815	0.0000	SURCHARGED
720 minute winter	PS4	675	47.028	0.748	0.2	1.8952	0.0000	OK
720 minute winter	PS5	675	47.028	0.479	0.1	0.0604	0.0000	SURCHARGED
720 minute winter	PS6	675	47.028	0.559	0.2	0.0705	0.0000	SURCHARGED
720 minute winter	PS7	675	47.028	0.353	0.3	0.0445	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)
720 minute winter	PS1	PS1-PS2	PS2	0.3	0.441	0.038	0.0491
720 minute winter	PS2	PS2-PS7	PS7	0.3	0.508	0.049	0.0575
720 minute winter	PS3	PS3-PS4	PS4	0.2	0.365	0.032	0.0719
720 minute winter	PS4	Infiltration		0.0			
720 minute winter	PS5	PS5-PS6	PS6	-0.1	-0.027	-0.016	0.0629
720 minute winter	PS6	PS6-PS3	PS3	-0.2	-0.025	-0.029	0.0684
720 minute winter	PS7	PS7-PS3	PS3	0.3	0.486	0.019	0.0329



Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 35.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m ³)	Flood (m ³)	Status
960 minute winter	PS1	930	47.508	0.652	0.4	0.0893	0.0000	SURCHARGED
960 minute winter	PS2	930	47.508	0.758	0.4	0.0955	0.0000	FLOOD RISK
960 minute winter	PS3	930	47.508	1.127	0.3	0.1420	0.0000	FLOOD RISK
960 minute winter	PS4	930	47.508	1.228	0.2	1.9557	0.0000	OK
960 minute winter	PS5	930	47.508	0.959	0.1	0.1208	0.0000	FLOOD RISK
960 minute winter	PS6	930	47.508	1.039	0.2	0.1309	0.0000	FLOOD RISK
960 minute winter	PS7	930	47.508	0.833	0.3	0.1049	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m ³)
960 minute winter	PS1	PS1-PS2	PS2	0.4	0.441	0.051	0.0491
960 minute winter	PS2	PS2-PS7	PS7	0.3	0.508	0.053	0.0575
960 minute winter	PS3	PS3-PS4	PS4	0.2	0.365	0.032	0.0719
960 minute winter	PS4	Infiltration		0.0			
960 minute winter	PS5	PS5-PS6	PS6	-0.1	-0.014	-0.015	0.0629
960 minute winter	PS6	PS6-PS3	PS3	-0.2	-0.020	-0.026	0.0684
960 minute winter	PS7	PS7-PS3	PS3	0.3	0.490	0.019	0.0329