EMD Architects

107 Ludford Road, Ballinteer, Dublin 16, Ireland **T** +353 1 298 7948 **F** + 353 1 296 0811 **W** www.emdarchitects.com

8th November 2022

South Dublin County Council
Planning Department
County Hall
Tallaght
Dublin 24

Re: Single storey extension to front and side of existing Green Keepers Building at Edmondstown Golf Club, Rathfarnham, Dublin 16

Planning Reg Ref No. SD21A/0235

Dear Sirs,

In accordance with Condition No.3 and No.4 of Grant of Permission as issued by South Dublin County Council in relation to the above, please find attached 3no. copies of engineers cover letter, proposed drainage layout drawing no. 21158-500 and BRE Digest 365 Report.

If you have any queries or comments in relation to the above, do not hesitate to contact the undersigned.

Yours sincerely

Dermot Mac Dermott
EMD Architects

ALAN CLARKE & ASSOCIATES
YORK STREET, CASTLEBLAYNEY, CO MONAGHAN
t: +353 (0) 42 9740071 f: +353 (0) 42 9754726 e: info@alanclarke.ie

ALAN CLARKE
& ASSOCIATES
consulting civil & structural engineers
PROJECT MANAGERS

Planning Department
South Dublin Co Co
County Hall Tallaght
Dublin 24

12th October 2022

21158/AC/LT02

Re: Planning Reference SD21A/0235 Proposed Extension and Alterations to Green Keepers Building at Green Keepers Facility, Edmondstown Golf Club, Rathfarnham, Dublin 16

To whom it may concern,

Your clarification of additional information (AI) request dated 31st January 2022 in relation to the above referenced planning application refers. I wish to set out the following in relation to the engineering elements of this AI request. Drawing 21158-500 (Rev P2) and the BRE Digest 365 report are enclosed with this response indicating the various proposals. This letter, the accompanying drawing and report should be read in conjunction with information provided by EMD Architects and others which addresses the remaining items raised in the clarification of AI request. The following are the engineering/drainage elements which are addressed in this response (enumeration as per the AI request);

Item 3; The soil percolation tests have been carried out and a report incorporating the test results and design calculations are enclosed with this response.

Item 3.(i)(ii)(iii)(iv); The proposed soakaway details including the plan and cross sectional views, dimensions and location are included in the BRE Digest 365 report. The proposed soakaway has been positioned based on the separation distances outlined in part *2(2)*of the AI request dated 19th October 2021.

***Item 3.(v)*;** The proposed soakaway is the outfall for the surface water run-off for the proposed building extension and has been designed to store and infiltrate the surface water run-off. The site is not serviced with a storm drainage network, and it will therefore not be possible to provide an overflow connection from the soakaway to the storm drainage network.

Item 4; There will be no requirement for an Irish Water connection to the foul sewer. The site is serviced by an existing foul sewer as indicated on the drawing 21158-500 Rev P2. There will be no new Irish Water connection required for the water services.

We trust that you find the above in order, however if you have any queries, please do not hesitate to contact us.

Yours sincerely,

Edwin Lennon

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Alan Clarke & Associates

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Yours sincerely,

Edwin Lennon

Edwin Lennon
Alan Clarke & Associates

PercolationTests.ie
Planning Assessments & Land Surveys

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

BRE Digest 365 Report.

Prepared on behalf of:

Edmondstown Golf Club

At:

Rathfarnham,
Co. Dublin.

PercolationTests.ie
Planning Assessments & Land Surveys

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

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.

Cillron Limited - PercolationTests.ie	BRE Digest 365 Test			
Newtownmoyaghy, Kilcock, Co. Kildare.			Revision	1.00
www.percolationtests.ie		Job No:	Soakpit 1	Page: C/01
Tel: 087 6636757				
Section: Edmondstown Golf Club		Prepared By:	DR	Date: 19/11/2021

ALTERNATIVE SOAKAWAY SIZES			
	trench soakaways		
width of trench *[mm]*:	450	600	900
required trench length *[m]*:	25.66	20.72	14.98
	ring soakaways		
diameter of ring *[mm]*:	1500	2100	2400
required pit diameter *[m]*:	2.77	2.78	2.77

** 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}' =	12.63	m^3
provided storage volume 'V_{prov}' =	14.96	m^3
utilisation factor =	**0.84**	***.OK***
required time to discharge 50% 't_{50}' =	8.78	*hours*
utilisation factor =	**0.37**	***.OK***

GENERAL DATA	
site location: [redacted] Ireland	
soakaway type: infilled pit or trench	
impermeable area drained to soakaway 'A' $[m^2]$ =	350
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] =	2.50
soakaway length 'L' [m] =	7.00
total depth from ground level 'D_b' *[m]* =	1.20
depth to drain invert level 'D_d' *[m]* =	0.30
soakaway effective depth 'D_{eff}' *[m]* =	0.90
free volume in infill aggregate *[%]* =	95

SOIL INFILTRATION DATA	
allowance for infiltration through soakaway base:	50%
available on-site infiltration test results: (●) Yes ( ) No	
use soakage trial pit table below	
internal surface area of trial pit 'a_{p50}' $[m^2]$ =	2.13
storage volume between 75-25% 'V_p' $[m^3]$ =	0.27
time for water to fall from 75-25% 't_p' [min] =	154.50
soil infiltration rate 'f' [m/s] =	1.37E-05

SOAKAGE TRIAL PIT DATA	
soakage trial pit width 'W_t' *[m]* =	0.90
soakage trial pit length 'L_t' *[m]* =	1.20
total depth from ground level 'D_{tb}' *[m]* =	1.20
depth to pipe invert level 'D_{tp}' *[m]* =	0.70
soakage trial pit effective depth 'D_{teff}' *[m]* =	0.50
free volume in infill aggregate *[%]* =	100
NOTE: faces of excavation assumed to be vertical	

Additional trial hole showed no seasonal high water table above 1.8m bgl.

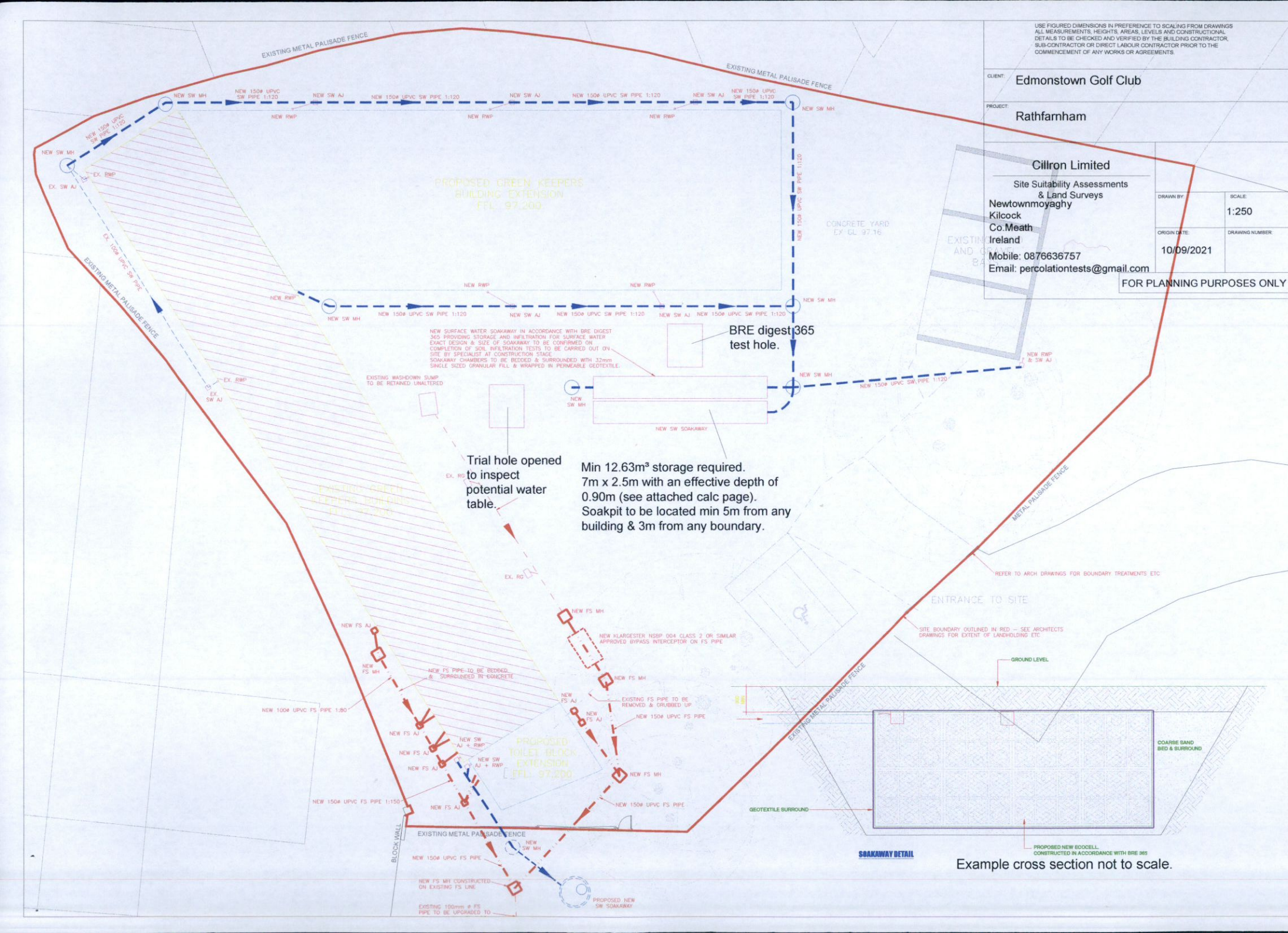
REQUIRED STORAGE CAPACITY PER RAINFALL DURATION

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	5.21	1.44	9.02	3.16							0.07	3.09
10	0.48	7.57	1.47	13.31	4.66							0.14	4.52
15	0.58	9.14	1.48	16.24	5.69							0.21	5.47
30	0.76	11.96	1.49	21.41	7.49							0.43	7.07
60	1.00	15.70	1.49	28.08	9.83							0.85	8.98
120	1.27	19.88	1.47	35.15	12.30							1.70	10.60
240	1.63	25.53	1.46	44.67	15.64							3.41	12.23
360	1.86	29.20	1.45	50.67	17.73							5.11	**12.63**
600	2.22	34.79	1.43	59.66	20.88							8.52	12.36
1440	3.05	47.85	1.38	79.36	27.77							20.44	7.34

** Z2 is a 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	60	125																
	depth to water *[m]* =	0.80	0.90	1.00																
Soakage Trial 2	time *[min]* =	0	75	155																
	depth to water *[m]* =	0.80	0.90	1.00																
Soakage Trial 3	time *[min]* =	0	82	175																
	depth to water *[m]* =	0.80	0.90	1.00																

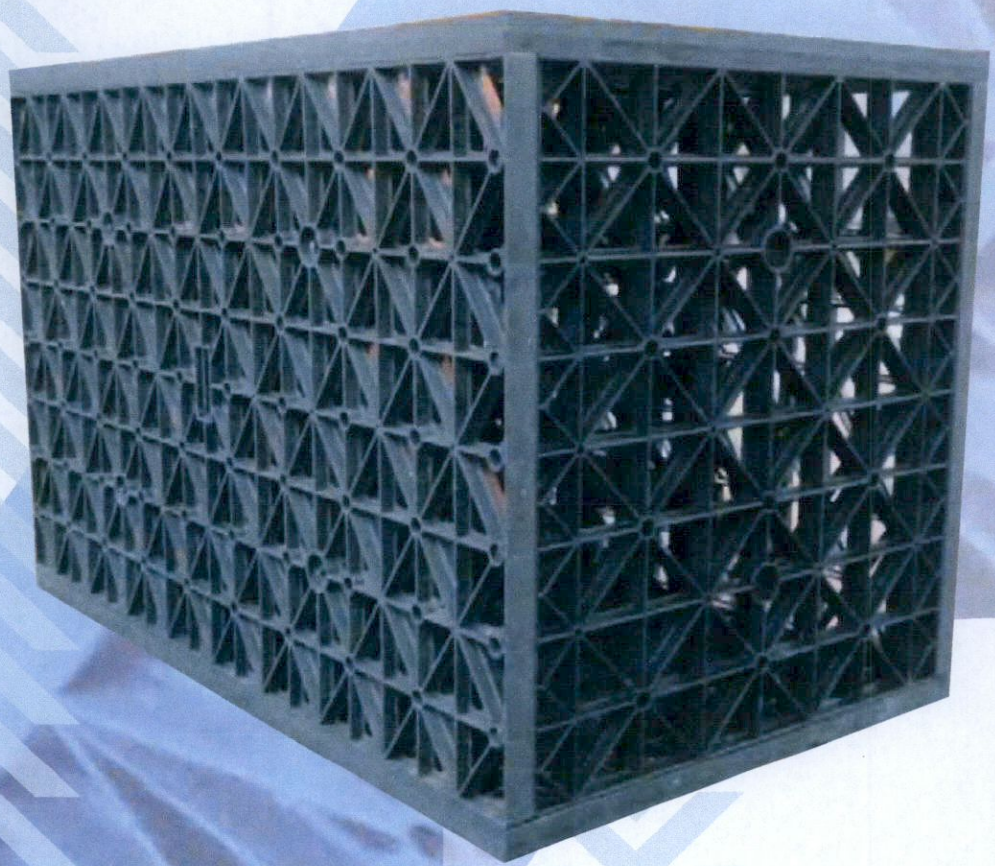

USE FIGURED DIMENSIONS IN PREFERENCE TO SCALING FROM DRAWINGS
ALL MEASUREMENTS, HEIGHTS, AREAS, LEVELS AND CONSTRUCTIONAL DETAILS TO BE CHECKED AND VERIFIED BY THE BUILDING CONTRACTOR, SUB-CONTRACTOR OR DIRECT LABOUR CONTRACTOR PRIOR TO THE COMMENCEMENT OF ANY WORKS OR AGREEMENTS.
CLIENT: Edmonstown Golf Club
PROJECT: Rathfarnham
Cillron Limited
Site Suitability Assessments & Land Surveys
Newtownmoyaghy
Kilcock
Co.Meath
Ireland
Mobile: 0876636757
Email: percolationtests@gmail.com
DRAWN BY:
SCALE: 1:250
ORIGIN DATE: 10/09/2021
DRAWING NUMBER:
FOR PLANNING PURPOSES ONLY
EXISTING METAL PALISADE FENCE
PROPOSED GREEN KEEPERS BUILDING EXTENSION FFL 97.200
CONCRETE YARD EX GL 97.16
NEW SW MH
NEW 150ø UPVC SW PIPE 1:120
NEW SW AJ
NEW RWP
EX. SW AJ
EX. RWP
NEW 150ø UPVC SW PIPE 1:120
NEW SURFACE WATER SOAKAWAY IN ACCORDANCE WITH BRE DIGEST 365 PROVIDING STORAGE AND INFILTRATION FOR SURFACE WATER. EXACT DESIGN & SIZE OF SOAKAWAY TO BE CONFIRMED ON COMPLETION OF SOIL INFILTRATION TESTS TO BE CARRIED OUT ON SITE BY SPECIALIST AT CONSTRUCTION STAGE. SOAKAWAY CHAMBERS TO BE BEDDED & SURROUNDED WITH 32mm SINGLE SIZED GRANULAR FILL & WRAPPED IN PERMEABLE GEOTEXTILE.
BRE digest 365 test hole.
EXISTING WASHDOWN SUMP TO BE RETAINED UNALTERED
NEW SW SOAKAWAY
Trial hole opened to inspect potential water table.
Min 12.63m³ storage required.
7m x 2.5m with an effective depth of 0.90m (see attached calc page).
Soakpit to be located min 5m from any building & 3m from any boundary.
EX. RG
NEW FS MH
NEW FS AJ
NEW KLARGESTER NSBP 004 CLASS 2 OR SIMILAR APPROVED BYPASS INTERCEPTOR ON FS PIPE
NEW FS PIPE TO BE BEDDED & SURROUNDED IN CONCRETE
EXISTING FS PIPE TO BE REMOVED & GRUBBED UP
NEW 150ø UPVC FS PIPE
NEW 100ø UPVC FS PIPE 1:80
NEW SW AJ + RWP
PROPOSED TOILET BLOCK EXTENSION FFL 97.200
NEW 150ø UPVC FS PIPE 1:150
BLOCK WALL
NEW SW MH
NEW FS MH CONSTRUCTED ON EXISTING FS LINE
EXISTING 100mm ø FS PIPE TO BE UPGRADED TO
PROPOSED NEW SW SOAKAWAY
METAL PALISADE FENCE
REFER TO ARCH DRAWINGS FOR BOUNDARY TREATMENTS ETC
ENTRANCE TO SITE
SITE BOUNDARY OUTLINED IN RED – SEE ARCHITECTS DRAWINGS FOR EXTENT OF LANDHOLDING ETC
GROUND LEVEL
COARSE SAND BED & SURROUND
GEOTEXTILE SURROUND
PROPOSED NEW ECOCELL CONSTRUCTED IN ACCORDANCE WITH BRE 365
SOAKAWAY DETAIL
Example cross section not to scale.

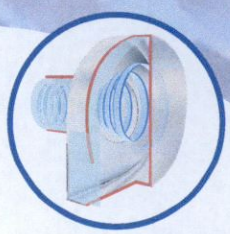
Modular Geo-Void Systems

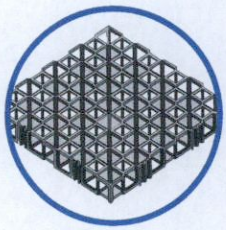
Total Water Management

ESS EcoCell

Ecological Tank Systems







ENVIRONMENTAL SUSTAINABLE SOLUTIONS LTD

Environmental Sustainable Solutions

Welcome to Environmental Sustainable Solutions; specialist suppliers and designers of geocomposites and water re-use systems. Environmental Sustainable Solutions can help you achieve innovative results for all your requirements:-

- Stormwater Management
- Gas Barrier Protection
- Stormwater Attenuation
- Contaminated Land Development
- Stormwater Drainage
- Ground Stabilisation
- Rainwater Recycling Management
- Structural Waterproofing
- Gas Venting Systems
- Damp-proofing projects

Over the last 12 years Environmental Sustainable Solutions, and associated companies, have designed and installed thousands of water recycling, drainage and attenuation tank systems for schools, car parks, retail parks, offices and sports arenas throughout Ireland, UK, Europe and the Middle East.

Our wide range of environmental protection products, surface water drainage modules and modular water storage tank systems provides maximum design flexibility for engineers and architects working on even the most demanding of storm water storage and recycling projects.

Stormwater Management And Design

Stormwater is the phrase used to describe the excess rainwater that flows from rooftops, roads, car parks and other buildings. This water can contain many pollutants picked up from roofs and highways. In extreme weather conditions sudden heavy downpours of rain can cause major environmental disasters. Using our Rainmanager products; stormwater can not only safely be removed, but it can be stored and recycled for commercial and domestic use.

How it works - ESS Attenuation Tank

Stormwater enters the attenuation tank via the inlet manhole, which incorporates a silt collection sump and a galvanised leaf collection basket. Water passes through the tank and exits through the outlet manhole, which contains an AquaBrake flow control device.
This flow control device regulates the release rate of water from the tank, and in so doing, enables the tank to fill. As a result of water entering the tank at a greater rate than it can exit, the void space then fills with water. While the tank fills, air is vented from the tank.
The Inlet/Outlet pipe will act as a flushing channel. This perforated pipe is wrapped completely in High Flow Filtering Geotextile, which prevents silt entering the block area. As the tank continues to empty at a pre-determined rate, air re-enters the tank via the same air vent system. **The roof of the completed tank must be lower than the lowest gully trap on site.**

Benefits

- 100% sealed tank
- Full installation service provided
- 12 years experience as market leader
- Quick installation – reduce site access delays
- Increased land usage – tanks are sub surface
- Economical – generally more cost efficient than any other equivalent sealed tank
- Cost effective – reduced costs for excavation and disposal of material
- Modular – easy to create any shape
- Strong – designed to support shear loading
- Lightweight – no cranes required
- Determinate volume – one cubic metre of matrix tank modules contain 950 litres of water, whereas stone fill will only provide 300 litres of storage per cubic metre.

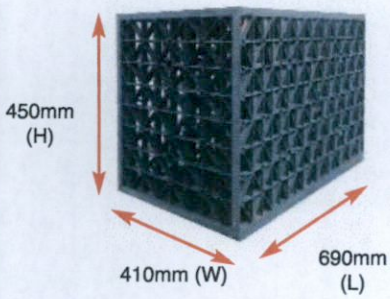
Soakaway

The soakaway is normally best built as a long narrow structure.
The inlet pipe comes in at roof level and faces downwards so that the water can percolate into the tank.
The blocks are wrapped in Geotextile, to protect them and also to keep clay from filling up the void.
An air vent pipe is installed on the highest point with a cowl on top or vented back to an inlet manhole.
There is no outlet from a soakaway, therefore no flow control unit is required.

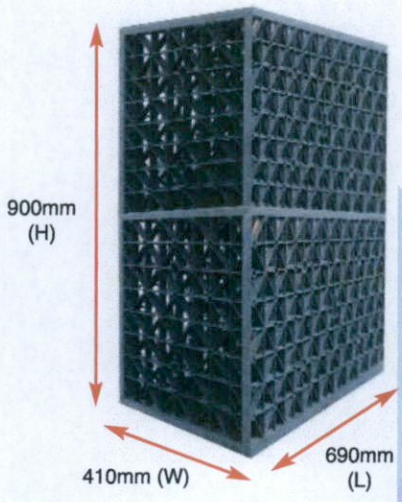
Protecting the Environment

Stormwater Storage Tank

SUITABLE FOR USE UNDER:
- **Roadways**
- **Car parks**
- **Green areas**



Single
8 Modules/m³
Flowrate - 2300 l/min



Double
4 Modules/m³
Flowrate - 4600 l/min

Triple
2.6 Modules/m³
Flowrate - 6900 l/min

Notes:
Blocks must be positioned in the correct orientation.
See opposite above

SPECIFICATION (SINGLE)

Weight (maximum)		9.17kg
Crush Strength (up to)		400kN/m²
Lateral Strength		80kN/m²
Minimum Cover	(green areas)	500mm
	(trafficked areas)	650mm
Maximum Cover		3m
Material		Polypropylene
Void Ratio (Internal)		>95%

Design Requirements:

Tank storage capacity (m³)
Depth restrictions
Location (Road, Car Park, Green Area)
Design constraints on site

A set of loading calculations specific to the site requirement will be done by ESS and submitted on all tanks

DESIGN CRITERIA

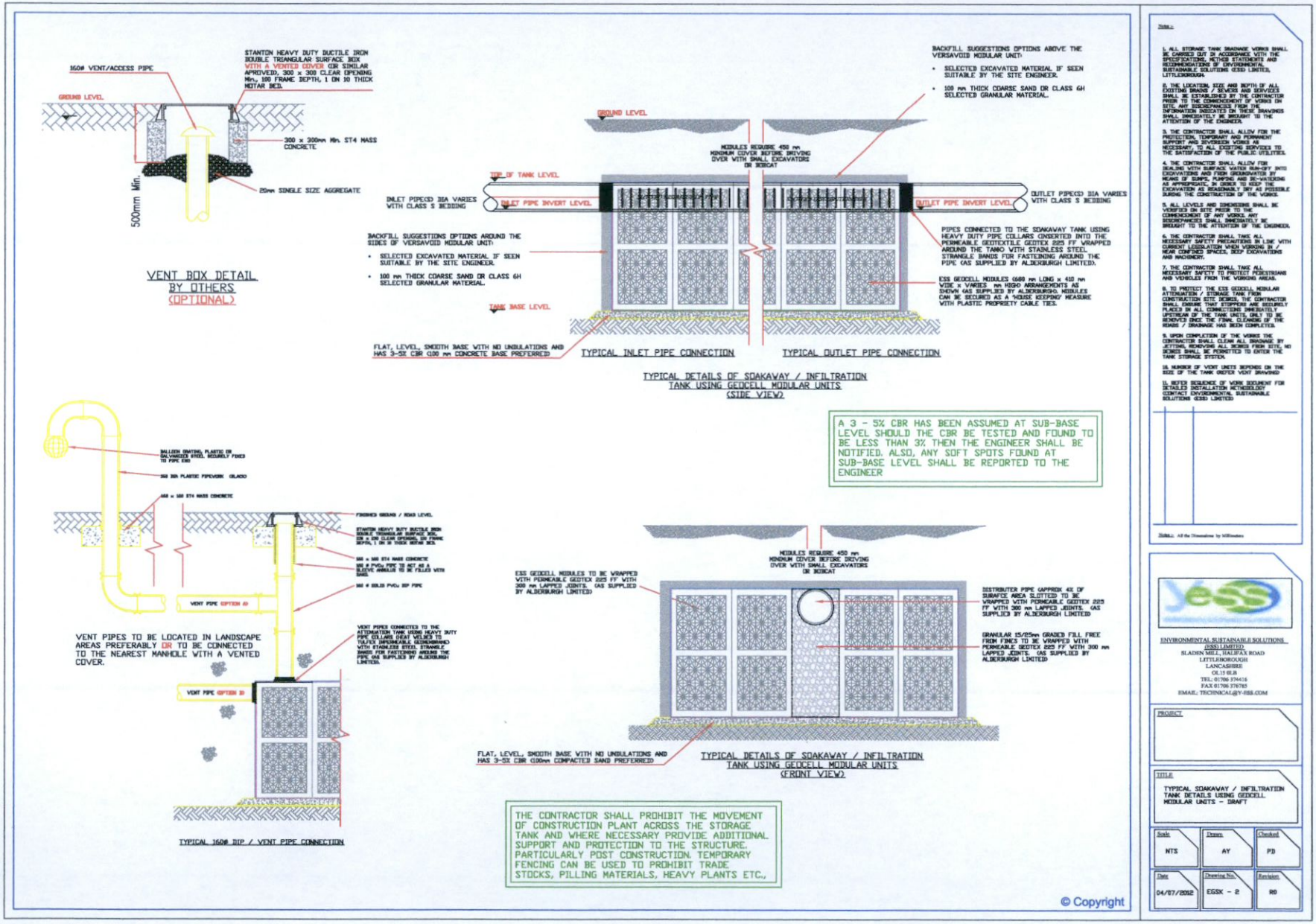
The attenuation tank is constructed using matrix module blocks. These blocks can take passing loads of up to 40 tonnes/m². The void ratio of each block is 95%. The blocks are made from polypropylene.

The tank is sealed with a layer of Tuflex membrane, which is fully welded together to form a 100% seal. All pipe penetrations are fully sealed to the membrane. The Tuflex membrane is protected by a layer of heavy duty protection geotextile, to prevent damage from construction or backfilling. A number of air extraction vents/flushing points are placed in the roof of the tank.

Note:
It is vital that the underground tanks are fully sealed, otherwise ground water and silt particles may enter the void space and use up capacity. Preferably, the base of the tank should be 500mm above the ground water level. Otherwise ground water relief measures should be implemented.

Infiltration System

Typical arrangement using ESS Ecological Tank System for water quality



Notes:-

1. ALL STORAGE TANK DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATIONS, METHOD STATEMENTS AND RECOMMENDATIONS OF ENVIRONMENTAL SUSTAINABLE SOLUTIONS (ESS) LIMITED, LITTLEBOROUGH.
2. THE LOCATION, SIZE AND DEPTH OF ALL EXISTING DRAINS / SEWERS AND SERVICES SHALL BE ESTABLISHED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS ON SITE. ANY DISCREPANCIES FROM THE INFORMATION INDICATED ON THESE DRAWINGS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT AND DIVERSION WORKS AS NECESSARY, TO ALL EXISTING SERVICES TO THE SATISFACTION OF THE PUBLIC UTILITIES.
4. THE CONTRACTOR SHALL ALLOW FOR DEALING WITH SURFACE WATER RUN-OFF INTO EXCAVATIONS AND FROM GROUNDWATER BY MEANS OF SUMPS, PUMPING AND DE-WATERING AS APPROPRIATE, IN ORDER TO KEEP THE EXCAVATION AS REASONABLY DRY AS POSSIBLE DURING THE CONSTRUCTION OF THE WORKS.
5. ALL LEVELS AND DIMENSIONS SHALL BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORKS. ANY DISCREPANCIES SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
6. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS IN LINE WITH CURRENT LEGISLATION WHEN WORKING IN / NEAR CONFINED SPACES, DEEP EXCAVATIONS AND MACHINERY.
7. THE CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY TO PROTECT PEDESTRIANS AND VEHICLES FROM THE WORKING AREAS.
8. TO PROTECT THE ESS GEOCELL MODULAR ATTENUATION / STORAGE TANK FROM CONSTRUCTION SITE DEBRIS, THE CONTRACTOR SHALL ENSURE THAT STOPPERS ARE SECURELY PLACED IN ALL CONNECTIONS IMMEDIATELY UPSTREAM OF THE TANK UNITS, ONLY TO BE REMOVED ONCE THE FINAL CLEANING OF THE DRAIN / DRAINAGE HAS BEEN COMPLETED.
9. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING, REMOVING ALL DEBRIS FROM SITE, NO DEBRIS SHALL BE PERMITTED TO ENTER THE TANK STORAGE SYSTEM.
10. NUMBER OF VENT UNITS DEPENDS ON THE SIZE OF THE TANK (REFER VENT DRAWING)
11. REFER SEQUENCE OF WORK DOCUMENT FOR DETAILED INSTALLATION METHODOLOGY (CONTACT ENVIRONMENTAL SUSTAINABLE SOLUTIONS (ESS) LIMITED)

Notes:- All the Dimensions in Millimeters

ENVIRONMENTAL SUSTAINABLE SOLUTIONS (ESS) LIMITED
SLADEN MILL, HALIFAX ROAD
LITTLEBOROUGH
LANCASHIRE
OL15 0LB
TEL: 01706 374416
FAX 01706 378785
EMAIL: TECHNICAL@Y-ESS.COM

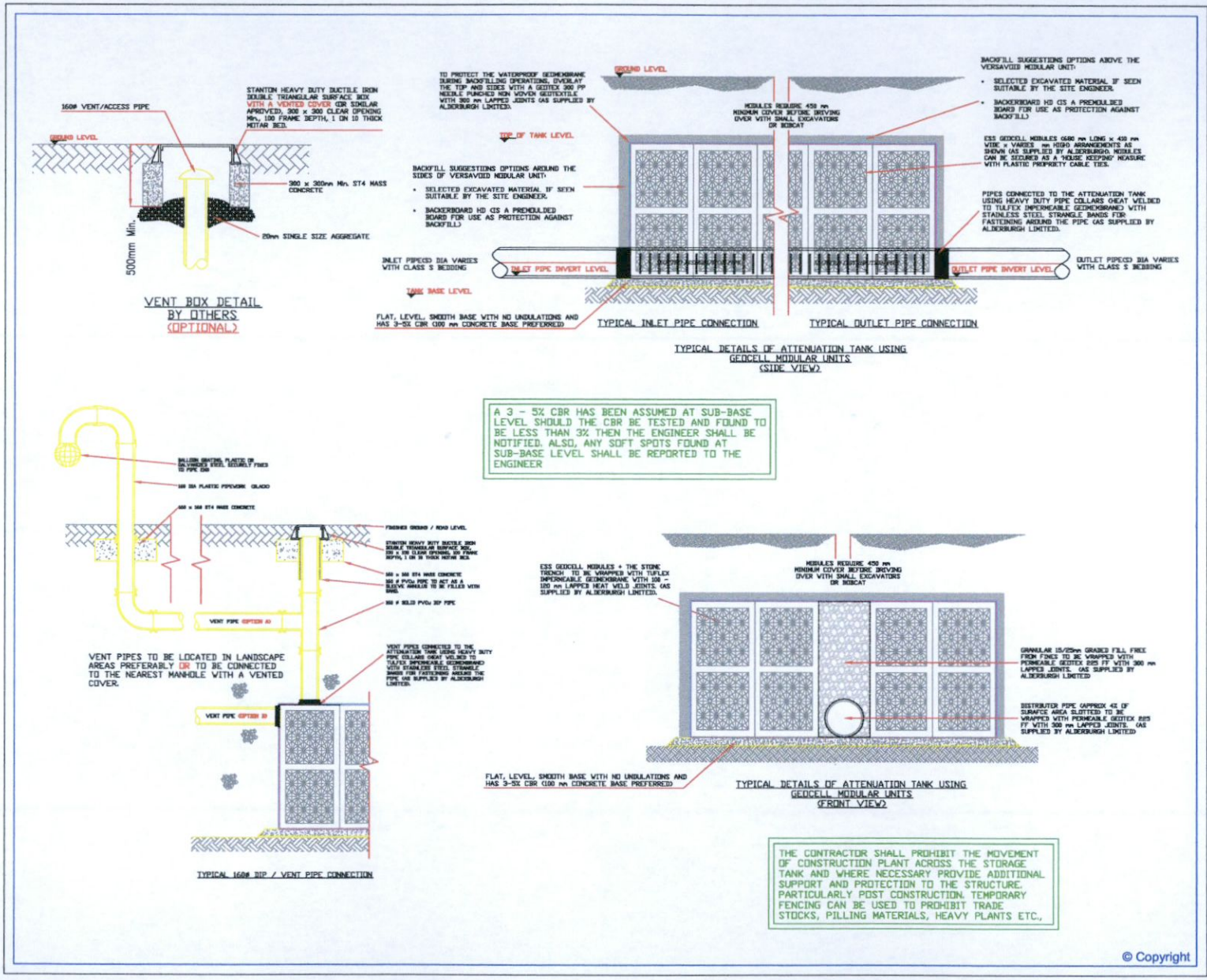
PROJECT

TITLE: TYPICAL SOAKAWAY / INFILTRATION TANK DETAILS USING GEOCELL MODULAR UNITS - DRAFT

Scale	Drawn	Checked
NTS	AY	PD
Date	Drawing No.	Revision
04/07/2012	ESSX - 2	R0

Retention System

Typical on site collection and recycling arrangement using ESS Ecological Tank System



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9. UPON COMPLETION OF THE WORKS THE CONTRACTOR SHALL CLEAN ALL DRAINAGE BY JETTING, REMOVING ALL DEBRIS FROM SITE, NO DEBRIS SHALL BE PERMITTED TO ENTER THE TANK STORAGE SYSTEM.
10. NUMBER OF VENT UNITS DEPENDS ON THE SIZE OF THE TANK (REFER VENT SPACING)
11. REFER SEQUENCE OF WORK DOCUMENT FOR DETAILED INSTALLATION METHODOLOGY (CONTACT ENVIRONMENTAL SUSTAINABLE SOLUTIONS (ESS) LIMITED)

Notes:- All the Dimensions in Millimetres

ENVIRONMENTAL SUSTAINABLE SOLUTIONS (ESS) LIMITED
SLADEN MILL, HALIFAX ROAD
LITTLEBOROUGH
LANCASHIRE
OL15 0LB
TEL: 01706 374416
FAX: 01706 378705
EMAIL: TECHNICAL@Y-ESS.COM

PROJECT

TITLE: TYPICAL ATTENUATION / STORAGE TANK DETAILS USING GEOCELL MODULAR UNITS - DRAFT

Scale	Drawn	Checked
NTS	AY	PB

Date	Drawing No.	Revision
04/07/2012	EGST - 2	R0

Infiltration Swales & Underground Channels

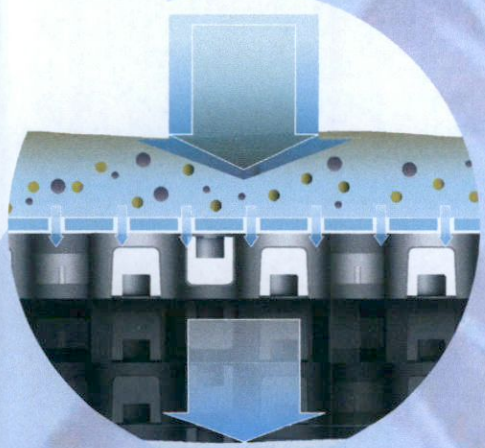
Please refer to separate data sheets for the following products

Modular VersaVoid System

Benefits

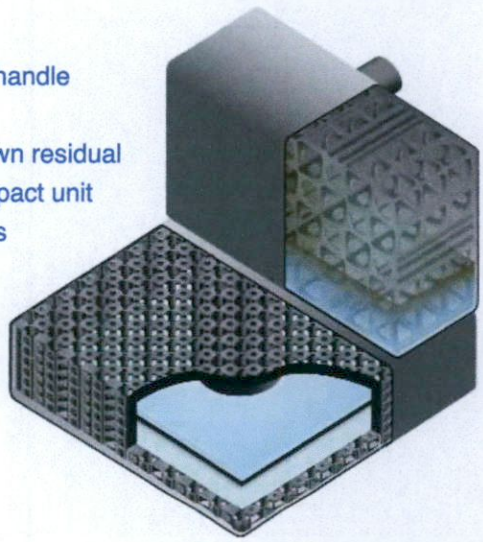
- **Quick**
  Reduce site access delays
- **Lightweight**
  No cranes required
- **Strong**
  Designed for maximum anticipated loads
- **Maintenance Free Tank**
  All debris and sediment is pre-filtered
- **Determinate Volume**
  One cubic metre of Tank modules contain 950 litres of water
- **Cost Effective**
  Reduces excavation and disposal by up to 5 x compared with conventional soak wells
- **High Infiltration**
  98% void surface area
- **Totally Modular**
  For greatest flexibility designed to cope. Units start at 300mm deep for shallow inverts to 3050mm+ deep in 250mm increments.
- **Designed by Engineers for Engineers** – to specify with confidence.
- **Designing out Problems**
  with such systems (access, maintenance, loading etc.)
- **Designing in Answers**
  to design requirements.
- **Total 3D Access**
  For total maintenance with total confidence.
- **Structurally Designed**
  with built in safety factor to carry all loads with complete confidence.
  16 clear vertical access chambers per m2.
- **Total Void Creation**
  With the greatest strength from any modular systems.

Oil Filtration

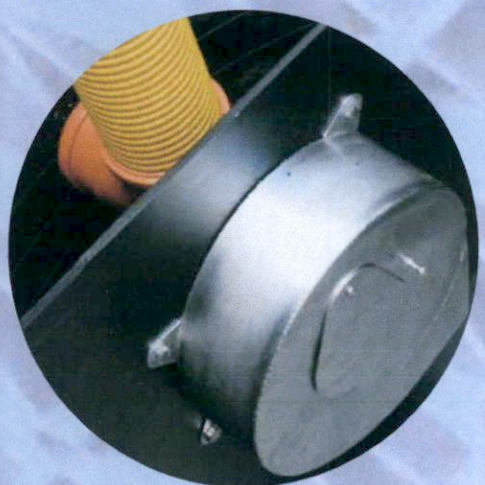


Benefits

- Source control designed to handle catastrophic spillages
- Capture, filter and break down residual hydrocarbons - all in one compact unit
- Self-maintaining ecosystems decompose hydrocarbon compounds and clean filters
- Load bearing, modular components provide up to 200t/m² loading capacity

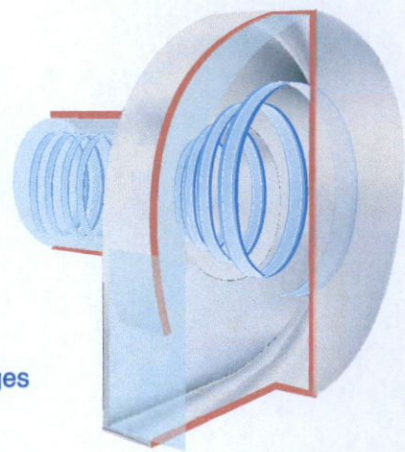


Aquabrake



Benefits

- **Cost Savings**
  Can reduce upstream storage requirements by up to 30%.
- **Durability**
  Corrosion resistant stainless steel.
- **No energy requirements**
  Self-activating solution with no moving parts.
- **Clog Resistant**
  AquaBrake design prevents blockages likely to occur in traditional orifices.
- **Flexible Design**
  Several options for attachment available.



The ESS CombiSwale

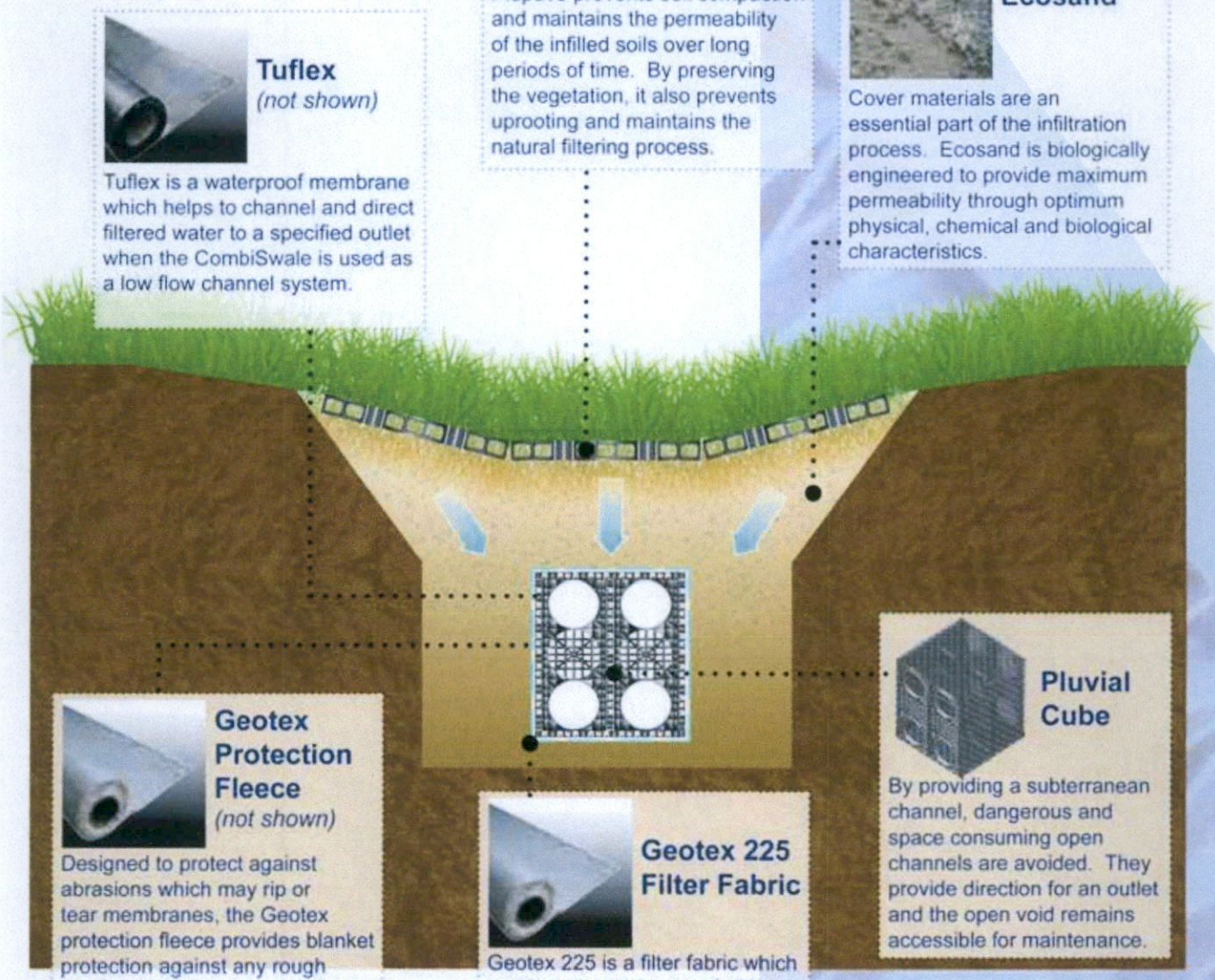
Please refer to separate data sheets for the following products

Water Sensitive Urban Channels

Surface and Sub-Surface Water Treatment

By combining surface and sub-surface channeling and treatment solutions, ESS has created the ideal in bioswale water management.

The CombiSwale system includes the addition of permeable sub-surface waterways that further restore water quality and recharge the natural environment. The sub-surface ESS channel system provides a unique way of working with nature to solve the enormous problems currently associated with open concrete channels and swales.



Plupave

Plupave prevents soil compaction and maintains the permeability of the infilled soils over long periods of time. By preserving the vegetation, it also prevents uprooting and maintains the natural filtering process.

Ecosand

Cover materials are an essential part of the infiltration process. Ecosand is biologically engineered to provide maximum permeability through optimum physical, chemical and biological characteristics.

Tuflex
(not shown)

Tuflex is a waterproof membrane which helps to channel and direct filtered water to a specified outlet when the CombiSwale is used as a low flow channel system.

Pluvial Cube

By providing a subterranean channel, dangerous and space consuming open channels are avoided. They provide direction for an outlet and the open void remains accessible for maintenance.

Geotex Protection Fleece
(not shown)

Designed to protect against abrasions which may rip or tear membranes, the Geotex protection fleece provides blanket protection against any rough materials within the backfill that may cause the membrane to tear. Only needed when Tuflex is used.

Geotex 225 Filter Fabric

Geotex 225 is a filter fabric which combats the problems of silting and clogging, by allowing water to pass into the sub-surface system, but preventing the movement of subsoils.

All products are manufactured to the highest quality, being subject to rigid quality control. However, the company cannot control conditions of application and use of its products, thus any warranty, written or implied, is given in good faith for materials only. ESS Ltd will not accept any responsibility for damage or injury arising from storage handling, misapplication or misuse of its products. All transactions are subject to our standard condition of sale, copies of which are available on request.

To find out more about these systems and products please contact us

Environmental Sustainable Solutions Ltd

Sladen Mill, Halifax Road, Littleborough,
Lancashire. OL15 0LB.
tel: +44 (0)1706 374416
fax: +44 (0)1706 376785
email: technical@y-ess.com

Acorn Business Centre, Blackrock, Cork
tel: 00353 (0)21 4614260
email: info@y-ess.com

http: www.y-ess.com

An Alderburgh Group Company

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 319075, Northing: 232626,

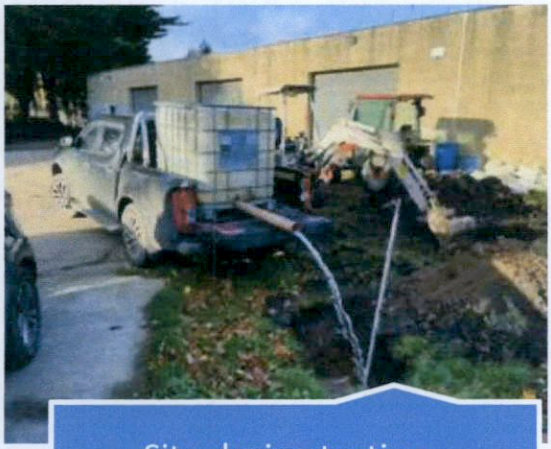
	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.6,	3.7,	4.2,	5.1,	5.7,	6.2,	7.8,	9.6,	10.7,	12.4,	13.9,	15.1,	16.8,	18.2,	19.4,	N/A ,
10 mins	3.6,	5.1,	5.9,	7.2,	8.0,	8.7,	10.8,	13.3,	15.0,	17.3,	19.4,	21.0,	23.5,	25.4,	27.0,	N/A ,
15 mins	4.2,	6.0,	7.0,	8.4,	9.4,	10.2,	12.7,	15.7,	17.6,	20.3,	22.8,	24.7,	27.6,	29.9,	31.8,	N/A ,
30 mins	5.6,	7.8,	9.0,	10.8,	12.1,	13.0,	16.2,	19.7,	22.0,	25.3,	28.2,	30.5,	34.0,	36.7,	38.9,	N/A ,
1 hours	7.3,	10.2,	11.7,	14.0,	15.5,	16.7,	20.5,	24.8,	27.6,	31.5,	35.0,	37.7,	41.8,	45.0,	47.7,	N/A ,
2 hours	9.7,	13.3,	15.2,	18.0,	19.9,	21.3,	26.0,	31.2,	34.5,	39.3,	43.4,	46.6,	51.5,	55.3,	58.4,	N/A ,
3 hours	11.4,	15.5,	17.7,	20.8,	23.0,	24.6,	29.8,	35.6,	39.4,	44.6,	49.3,	52.8,	58.2,	62.3,	65.7,	N/A ,
4 hours	12.8,	17.3,	19.7,	23.2,	25.5,	27.2,	32.9,	39.2,	43.3,	48.9,	53.9,	57.6,	63.4,	67.9,	71.5,	N/A ,
6 hours	15.1,	20.2,	22.9,	26.8,	29.4,	31.4,	37.8,	44.8,	49.3,	55.6,	61.1,	65.3,	71.6,	76.5,	80.5,	N/A ,
9 hours	17.8,	23.7,	26.7,	31.1,	34.0,	36.3,	43.4,	51.2,	56.3,	63.2,	69.3,	73.9,	80.9,	86.2,	90.6,	N/A ,
12 hours	20.0,	26.4,	29.7,	34.6,	37.7,	40.2,	47.9,	56.4,	61.8,	69.3,	75.7,	80.7,	88.2,	93.9,	98.6,	N/A ,
18 hours	23.5,	30.8,	34.6,	40.1,	43.6,	46.4,	55.0,	64.5,	70.5,	78.7,	85.9,	91.3,	99.6,	105.9,	111.0,	N/A ,
24 hours	26.4,	34.4,	38.5,	44.5,	48.4,	51.4,	60.7,	70.9,	77.4,	86.2,	93.9,	99.8,	108.6,	115.3,	120.7,	139.4,
2 days	32.1,	41.1,	45.6,	52.1,	56.3,	59.5,	69.5,	80.2,	87.0,	96.2,	104.2,	110.1,	119.1,	125.9,	131.5,	150.2,
3 days	36.7,	46.4,	51.3,	58.3,	62.8,	66.2,	76.7,	88.0,	95.1,	104.7,	112.9,	119.1,	128.3,	135.3,	141.0,	160.2,
4 days	40.7,	51.1,	56.3,	63.7,	68.4,	72.0,	83.1,	94.8,	102.2,	112.1,	120.6,	127.0,	136.5,	143.7,	149.5,	169.1,
6 days	47.8,	59.3,	65.0,	73.0,	78.2,	82.1,	94.1,	106.7,	114.5,	125.1,	134.1,	140.8,	150.8,	158.4,	164.5,	184.9,
8 days	54.0,	66.5,	72.6,	81.2,	86.8,	90.9,	103.7,	117.0,	125.3,	136.4,	145.8,	152.9,	163.4,	171.2,	177.5,	198.7,
10 days	59.6,	73.0,	79.5,	88.7,	94.5,	98.9,	112.4,	126.4,	135.0,	146.7,	156.5,	163.8,	174.7,	182.8,	189.4,	211.2,
12 days	64.9,	79.1,	86.0,	95.6,	101.7,	106.3,	120.4,	135.0,	144.0,	156.1,	166.3,	173.9,	185.1,	193.5,	200.3,	222.8,
16 days	74.7,	90.2,	97.8,	108.3,	114.9,	119.9,	135.1,	150.8,	160.4,	173.3,	184.2,	192.2,	204.1,	213.0,	220.1,	243.8,
20 days	83.7,	100.5,	108.6,	119.9,	127.0,	132.3,	148.5,	165.1,	175.3,	188.9,	200.3,	208.8,	221.3,	230.6,	238.1,	262.9,
25 days	94.2,	112.4,	121.2,	133.3,	140.9,	146.6,	163.9,	181.6,	192.5,	206.9,	218.9,	227.9,	241.1,	250.8,	258.7,	284.6,

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

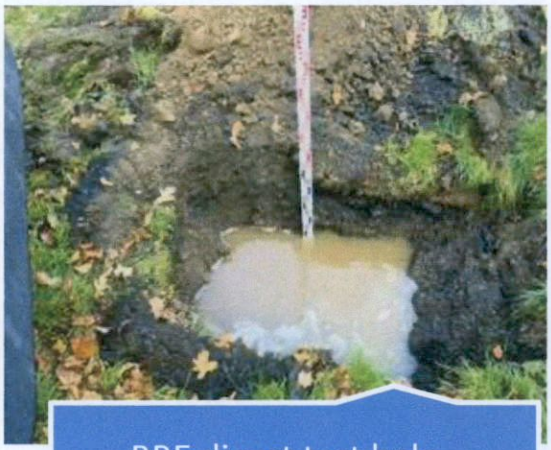
PercolationTests.ie

Planning Assessments & Land Surveys

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



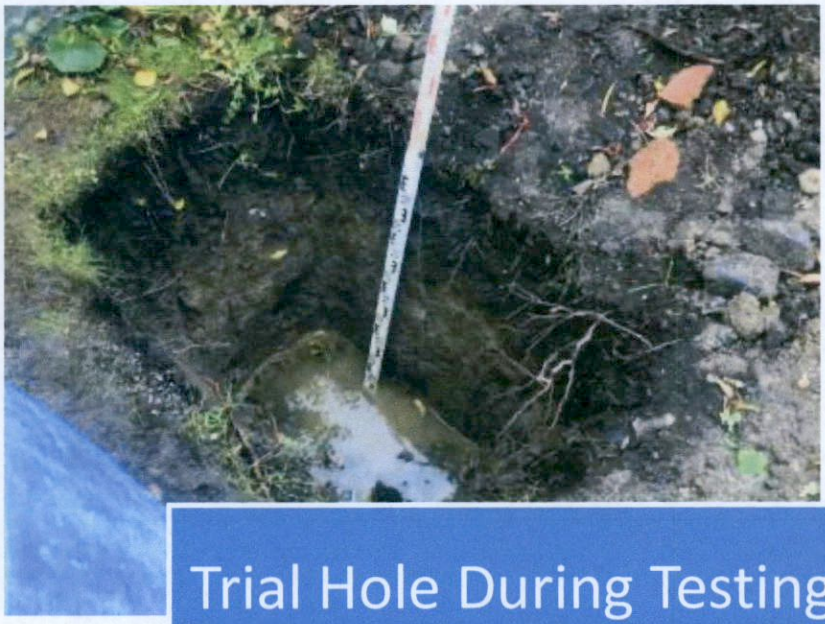
Site during testing - 19/11/2021



BRE digest test hole - 19/11/2021

Trial hole. Land fill observed and no water table above 1.8m bgl. 19/11/2021

Trial Hole During Testing.



Trial Hole During Testing.

SOUND INSURANCE

You're safe with *Sound*.

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

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

sound.ie

David Ryan
Newtownmoyaghy
Kilcock
Co Meath

Date: 06/04/2021
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:	**PID00024862**
Provider:	**Optio Europe Ltd**
Insurer:	**Accredited Insurance (Europe) Ltd**
Period of Insurance:	**04/03/2021 to 03/03/2022**
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,

Gary Kinsella
Commercial Broker
P: (01) 524 1415
E: Gary@sound.ie

ALAN CLARKE & ASSOCIATES
YORK STREET, CASTLEBLAYNEY, CO MONAGHAN
t: +353 (0) 42 9740071 f: +353 (0) 42 9754726 e: info@alanclarke.ie

ALAN CLARKE & ASSOCIATES
consulting civil & structural engineers
PROJECT MANAGERS

Planning Department
South Dublin Co Co
County Hall Tallaght
Dublin 24

12th October 2022

21158/AC/LT02

Re: Planning Reference SD21A/0235 Proposed Extension and Alterations to Green Keepers Building at Green Keepers Facility, Edmondstown Golf Club, Rathfarnham, Dublin 16

To whom it may concern,

Your clarification of additional information (AI) request dated 31st January 2022 in relation to the above referenced planning application refers. I wish to set out the following in relation to the engineering elements of this AI request. Drawing 21158-500 (Rev P2) and the BRE Digest 365 report are enclosed with this response indicating the various proposals. This letter, the accompanying drawing and report should be read in conjunction with information provided by EMD Architects and others which addresses the remaining items raised in the clarification of AI request. The following are the engineering/drainage elements which are addressed in this response (enumeration as per the AI request);

Item 3; The soil percolation tests have been carried out and a report incorporating the test results and design calculations are enclosed with this response.

Item 3.(i)(ii)(iii)(iv); The proposed soakaway details including the plan and cross sectional views, dimensions and location are included in the BRE Digest 365 report. The proposed soakaway has been positioned based on the separation distances outlined in part *2(2)*of the AI request dated 19th October 2021.

Item 3.(v); The proposed soakaway is the outfall for the surface water run-off for the proposed building extension and has been designed to store and infiltrate the surface water run-off. The site is not serviced with a storm drainage network, and it will therefore not be possible to provide an overflow connection from the soakaway to the storm drainage network.

Item 4; There will be no requirement for an Irish Water connection to the foul sewer. The site is serviced by an existing foul sewer as indicated on the drawing 21158-500 Rev P2. There will be no new Irish Water connection required for the water services.

We trust that you find the above in order, however if you have any queries, please do not hesitate to contact us.

Yours sincerely,

Edwin Lennon
Alan Clarke & Associates

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t: +353 (0) 42 9740071 f: +353 (0) 42 9754726 e: info@alanclarke.ie

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