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Ground Investigations Ireland

Gaelcholáiste An Phiarsaigh

DBFL

Ground Investigation Report

October 2020

GROUND INVESTIGATIONS IRELAND
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APPENDICES

1.0 Preamble

On the instructions of DBFL Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between August and September 2020 at the site of the proposed School extension at Gaelcholaiste An Phiarsaigh, Rathfarnham, Dublin.

2.0 Overview

2.1. Background

It is proposed to construct an extension to the existing school with associated services, access roads and car parking at the proposed site. The site is currently occupied by exiting school buildings and is situated to the south Rathfarnham. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

2.2. Purpose and Scope

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 5 No. Foundation Inspection Pits to determine existing foundation details
- Carry out 3 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 6 No. Window Sample Boreholes to recover soil samples
- Carry out 8 No. Dynamic Probes to determine soil strength/density characteristics
- Carry out 6 No. TRL DCP tests to determine CBR Values
- Carry out 1 No. Cable Percussion boreholes to a depth of 4.3m BGL
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

3.0 Subsurface Exploration

3.1. General

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.
The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

3.2. Foundation Pits

The foundation pits were excavated using a 3T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The foundation inspection pits were excavated at the locations shown in the exploratory hole location plan in Appendix 1. The exposed foundations were logged and sketched prior to backfilling and reinstatement. The logs and sketches are provided in Appendix 2 of this Report.

3.3. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in the exploratory hole location plan in Appendix 1. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level was recorded over time as required by BRE Digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arising's upon completion. The soakaway test results are provided in Appendix 3 of this Report.

3.4. Window Sampling

The window sampling was carried out at the locations shown in the location plan in Appendix 1 using a Tecopsa SPT Tec 10 percussion drilling rig. The window sampling consists of a 1m long steel tube with a cutting edge and an internal plastic liner which is mechanically driven into the ground utilising a 50kg weight falling a height of 500mm. Upon completion of the 1m sample, the tube is withdrawn and the plastic liner removed and sealed for logging and sub sampling by a Geotechnical Engineer/Engineering Geologist. The tube is replaced in the borehole and a subsequent 1m sample can be recovered. Occasionally outer casing or a reduced diameter tube is utilised to enable the window sample to progress in difficult drilling conditions. Geotechnical or environmental soil samples can be recovered from each of the liners following logging. The window sample records are provided in Appendix 4 of this Report.

3.5. Dynamic Probing

The dynamic probe tests (DPH) were carried out at the locations shown in the location plan in Appendix 1 in accordance with B.S. 1377: Part 9 1990. The test consists of mechanically driving a cone with a 50kg weight in 100mm intervals and monitoring the number of blows required. An equivalent Standard Penetration Test (SPT) 'N' value may be calculated by dividing the total number of blows over a 300mm drive length by 1.5. The dynamic probe logs are provided in Appendix 5 of this Report.

3.6. Cable Percussion Boreholes

The Cable Percussion Boreholes were drilled using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing.

The standard method of boring in soil for site investigation is known as the Cable Percussion method. It consists of using a Shell in non cohesive soils and a clay cutter in cohesive soils, both operated on a wire cable. Very hard soils, boulders and other hard obstructions are broken up by chiselling and the fragments removed with the Shell. Where ground conditions made it necessary, the borehole was lined with 200mm diameter steel casing. While the use of the Cable Percussion method of boring gives the maximum data on soil conditions, some mixing of laminated soil is inevitable. For this reason, thin lenses of granular material may not be noticed. Disturbed samples were taken from the boring tools at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata. Standard Penetration Tests were carried out in the boreholes. The results of these tests, together with the depths at which the tests were taken are shown on the accompanying borehole records. The test consists of a thick wall sampler tube, 50mm external diameter, being driven into the soil by a monkey weighing 63.5kg and with a free drop of 760mm. For gravels and glacial till the driving shoe was replaced by a solid 60º cone. The Standard Penetration Test number referred to as the 'N' value is the number of blows required to drive the tube 300mm, after an initial penetration of 150mm. The number gives a guide to the consistency of the soil and can also be used to estimate the relative strength/density at the depth of the test and also to estimate the bearing capacity and compressibility of the soil. The cable percussion borehole logs are provided in Appendix 6 of this Report.

3.7. Surveying

Where possible the exploratory hole locations have been recorded using a KQ GEO Technologies KQ-M8 System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. In some areas GPS surveying was not possible due to the proximity to surrounding buildings therefore the locations were measured from existing site features. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

3.8. Groundwater/Gas Monitoring Installations

Groundwater and or Gas Monitoring Installation were installed upon the completion of the boreholes to enable sampling and the determination of the equilibrium groundwater level. The typical groundwater monitoring installation consists of a 50mm HDPE slotted pipe with a pea gravel response zone and bentonite seal installed to the Engineers specification. Where required the standpipe is sealed with a gas tap and finished with a durable steel cover fixed in place with a concrete surround. The installation details are provided on the exploratory hole logs in the appendices of this Report.

3.9. TRL Dynamic Cone Penetrometer

The TRL DCP tests were carried out at locations specified by the Consulting Engineer to determine a CBR design value for the design of external pavements. The testing was carried out below the Topsoil or existing pavement at the depths detailed on the test report. The test consists of dropping a 10kg weight on an anvil

to drive a small diameter cone and recording the blows for a given penetration. The results of the DCP testing is included in Appendix 7 of this Report.

3.10. Laboratory Testing

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design.
Environmental & Chemical testing as required by the specification, including the Rilta Suite pH and sulphate testing was carried out by Element Materials Technology Laboratory in the UK. The Rilta suite testing includes both Solid Waste and Leachate Waste Acceptance Criteria.
Geotechnical testing consisting of moisture content, Atterberg limits and Particle Size Distribution (PSD) were carried out in NMTL's Geotechnical Laboratory in Carlow.
The results of the laboratory testing are included in Appendix 8 of this Report.

4.0 Ground Conditions

4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were variable across the site and are generally comprised;

- Topsoil/Surfacing
- Made Ground
- Cohesive Deposits
- Granular Deposits

TOPSOIL: Topsoil was encountered in IT01 to IT03 and WS03, WS05 and WS07 was present to a maximum depth of 0.3m BGL. Made ground was encountered from the surface in the other window samples and the majority of the foundation pits. Concrete surfacing was present in TP04.

MADE GROUND: Made Ground deposits were encountered beneath the Topsoil/Surfacing or from the surface and were present to depths of between 0.6m and >3.0m BGL. It should be noted that base of the made ground was not encountered in WS03 at a depth of 3m BGL. These deposits were described generally as *brown sandy slightly gravelly CLAY with occasional cobbles and boulders and contained occasional fragments of concrete, red brick and glass.*

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Made Ground and were described typically as *brown or black slightly sandy slightly gravelly CLAY with occasional cobbles and*

boulders. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was firm to stiff or stiff below depths of 1.3m to 1.8m BGL in the majority of the exploratory holes. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANULAR DEPOSITS: The granular deposits in WS06 and were described as G*rey brown clayey gravelly fine to coarse SAND.* Based on the SPT N values the deposits are typically medium dense.

4.2. Insitu Strength Testing

The correlated DPH blow counts indicate that the made ground deposits are weak and the cohesive overburden deposits are generally firm to stiff of stiff however in WS04 soft to firm deposits were encountered to a depth of 1.70m BGL

4.3. Groundwater

No groundwater was noted during the investigation however we would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, rainfall, nearby construction and other factors. For this reason, standpipes were installed in WS06A to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendix 9 of this Report.

4.4. Laboratory Testing

4.4.1. Geotechnical Laboratory Testing

The geotechnical testing carried out on soil samples recovered generally confirm the descriptions on the logs with the primary constituent of the cohesive deposits found to be a CLAY of low to intermediate plasticity. The Particle Size Distribution tests confirm that generally the cohesive deposits are well-graded with percentages of sands and gravels ranging between 21.1% and 49.5% generally with fines contents of 29.4 to 35.1%.

4.4.1. Chemical Laboratory Testing

The pH and sulphate testing carried out indicate that pH results are near neutral and that the water soluble sulphate results is low when compared to the guideline values from BRE Special Digest 1:2005. The samples tested classify the soil as a Design Sulphate Level DS-1.

4.4.1. Environmental Laboratory Testing

A number of samples were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for classification of materials as *hazardous* or *non-hazardous*. The suite also allows for the assessment of the sampled material in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

As part of the suite a leachate is generated from the solid sample which is analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS).

While the laboratory report provides a comparison with the waste acceptance criteria limits it does not provide a waste classification of the material sampled nor does it comment on any potentially hazardous properties of the materials tested. The possibility for contamination, not revealed by the testing undertaken should be borne in mind particularly where Made Ground deposits are present or the previous site use or location indicate a risk of environmental variation. The waste classification report is included under the cover of a sperate report by Ground Investigations Ireland.

5.0 Recommendations & Conclusions

5.1. General

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

5.2. Foundations

An allowable bearing capacity of 125 kN/m^2 is recommended for conventional strip or pad foundations on the firm to stiff or stiff cohesive deposits at a depth of between 1.8 and 2.0m BGL.

In some areas made ground is deeper, such as at the location of WS03. If structures are proposed at this location the depth to suitable founding strata should be proven and lean mix trench fill to the depth of the founding strata is recommended to achieve the recommended allowable bearing capacity.

The possibility for variation in the depth of the made ground in the vicinity of these foundations should be considered and foundation inspections should be carried out. Any soft spots encountered at the proposed foundation depths should be excavated and replaced with lean mix concrete.

In any part of the site, should part of the foundation be on rock we would recommend that all the foundations of the unit in question be lowered to the competent rock stratum to avoid differential settlement.

A ground bearing floor slab is recommended to be based on the firm to stiff cohesive deposits with an appropriate depth of compacted hardcore specified by the consulting engineer and in accordance with the limits and guidelines in SR21:2014 +A1:2016 and/or NRA SRW CL808 Type E granular stone fill. Where the depth of Made Ground/Soft deposits exceeds 0.9m then suspended floor slabs should be considered.

The pH and sulphate testing completed on samples recovered from the exploratory holes indicates the pH results are near neutral and the sulphate results are low, when compared to the guideline values from BRE Special Digest 1:2005. No special precautions are required for concrete foundations to prevent sulphate attack. The samples tested were below the limits of DS1 in the BRE Special Digest 1:2005.

5.3. External Pavements

The proposed pavements are recommended to be designed in accordance with the CBR test results included in the Appendixes of this Report. The low CBR test results indicate that a capping layer or a

sufficient depth of crushed stone fill may be required. It should be noted that variable depths of made ground were encountered across the site so inspections should be undertaken.
Plate bearing tests are recommended at the time of construction to verify the design assumptions for the proposed pavement make up and to verify adequate compaction has been achieved.
The use of a geogrid and separation membrane may improve the performance of the proposed pavement and enable a more economical pavement design to be achieved, a specialist supplier is recommended to advise of the required strength, depth and type of geotextile for the proposed design.

5.4. Excavations

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry.
Excavations in the Made Ground or soft Cohesive Deposits will require to be appropriately battered or the sides supported due to the low strength of these deposits.
Any excavations which penetrate the granular deposits will require to be appropriately battered or the sides supported and may require dewatering.
The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations.

5.5. Soakaway Design

Infiltration rates of f=4.09 x 10^{-6} m/s was calculated for the soakaway location IT01, however it should be noted that made ground was encountered for the full depth of the pit and results could vary at different locations. At the locations of IT02 and IT03 the water level dropped too slowly to allow calculation of ‘f’ the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

APPENDIX 1 - Site Location Plan

Client:

Project Code:
9901-08-20

Project Title:
Gaelcolaiste an Phiarsaigh

Drawing Title:
Investigation Locations

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0 5 10 15 20 25 m

Drawn By:	Date:
M Sutton	30/10/2019

Indicative Site Boundary
Borehole
CBR
Dynamic Probe
Infiltration Pit
Trial Pit

Client:

Project Code:
9901-08-20

Project Title:
Gaelcolaiste an Phiarsaigh

Drawing Title:
Investigation Locations

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www.gii.ie 01-6015175/5176

0 4 8 12 16 20 m

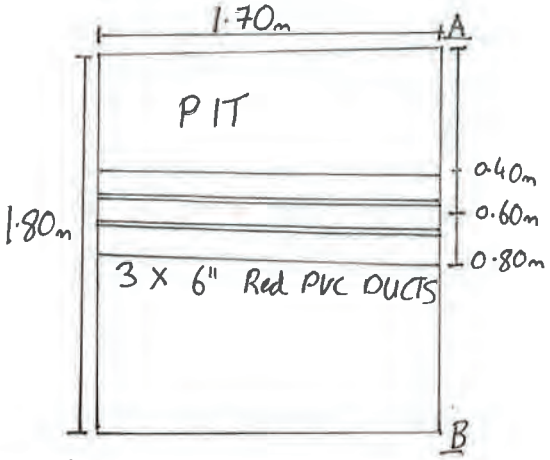
Drawn By:	Date:
M Sutton	30/10/2019

APPENDIX 2 – Foundation Pit Records

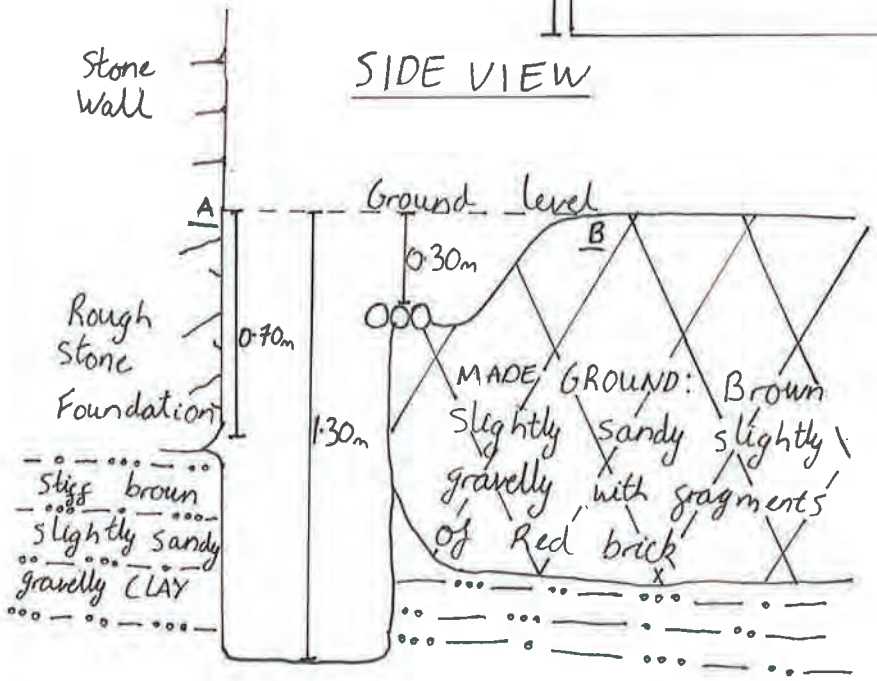
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Foundation Sketch

PLAN VIEW



SIDE VIEW



Project:	Gaelcholaiste Phiarsaigh	**TP01**	
Engineer:	DBFL		
Contractor	Ground Investigations Ireland Ltd	Date	28/08/2020

GROUND INVESTIGATIONS IRELAND
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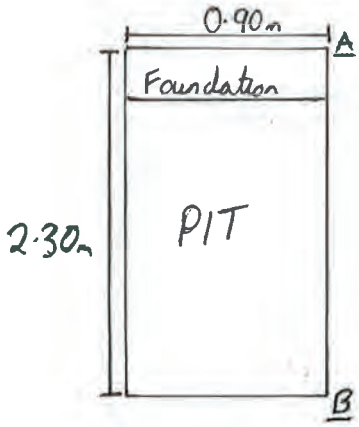
Foundation Sketch

Plan VIEW



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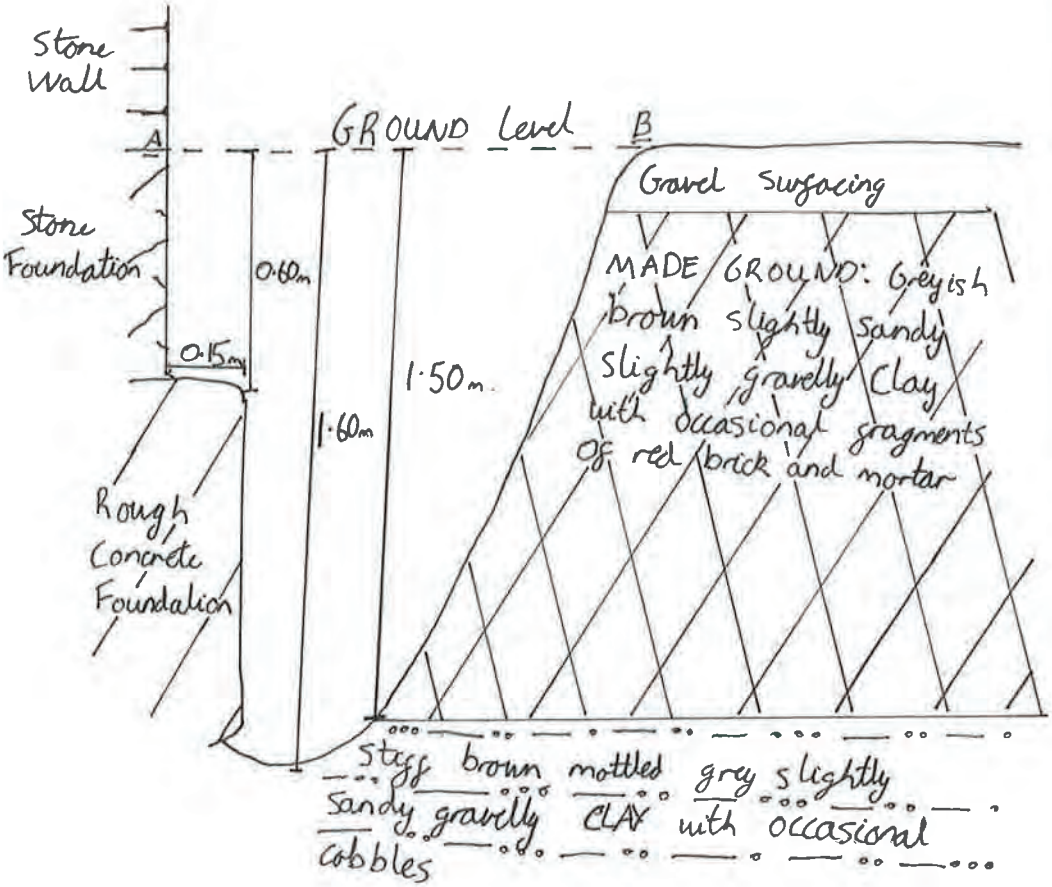
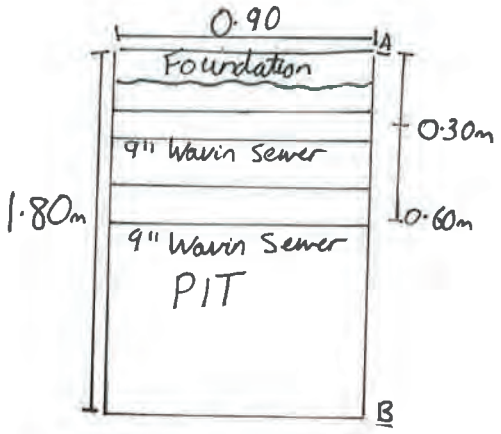


Project:	Gaelcholaiste Phiarsaigh	**TP02**	
Engineer:	DBFL		
Contractor	Ground Investigations Ireland Ltd	Date	28/08/2020

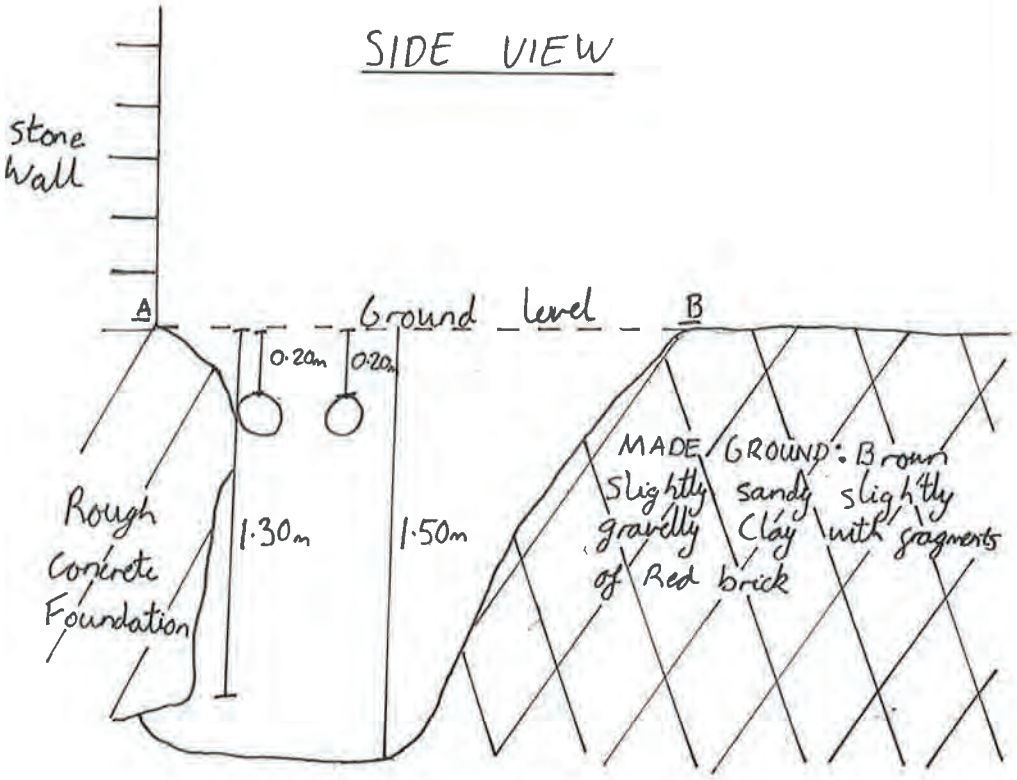
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Foundation Sketch

PLAN VIEW



SIDE VIEW

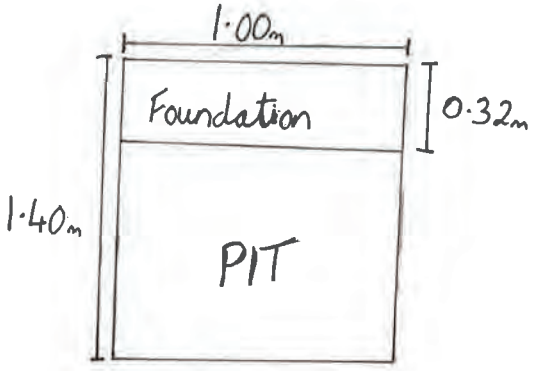


Project:	Gaelcholaiste Phiarsaigh	**TP03**	
Engineer:	DBFL		
Contractor	Ground Investigations Ireland Ltd	Date	28/08/2020

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

Foundation Sketch

PLAN VIEW



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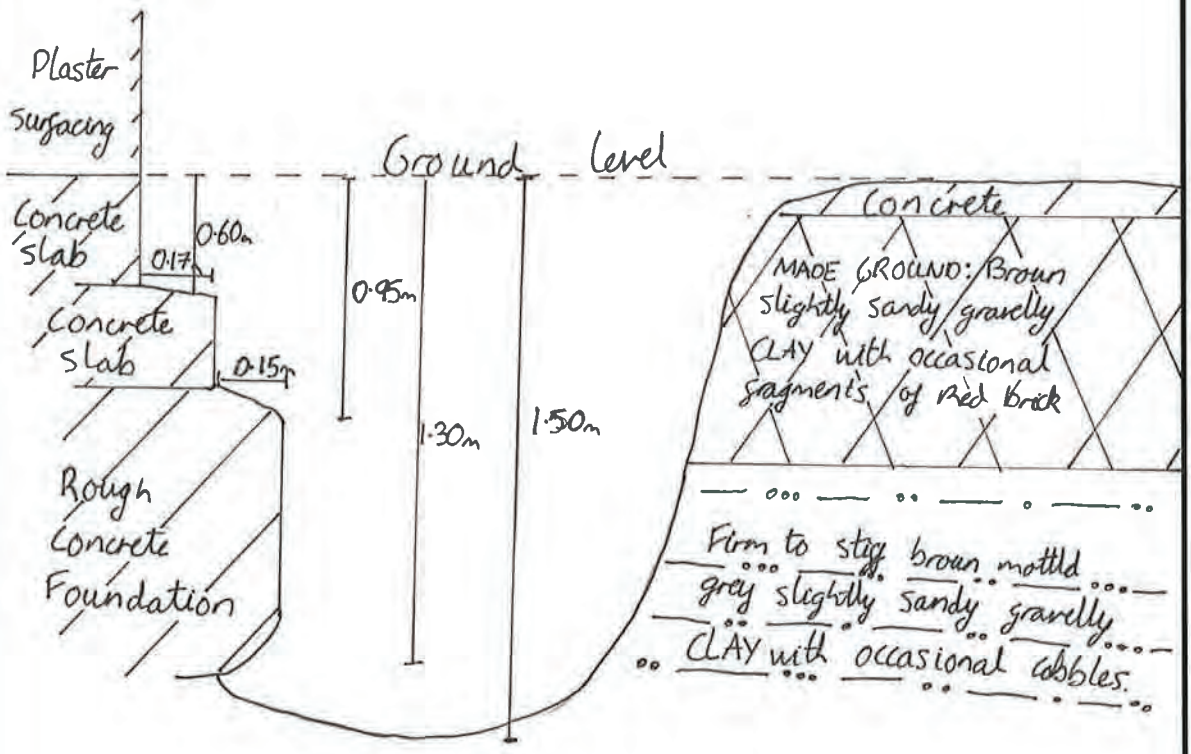

Project:	Gaelcholaiste Phiarsaigh	**TP04**	
Engineer:	DBFL		
Contractor	Ground Investigations Ireland Ltd	Date	28/08/2020

GROUND INVESTIGATIONS IRELAND
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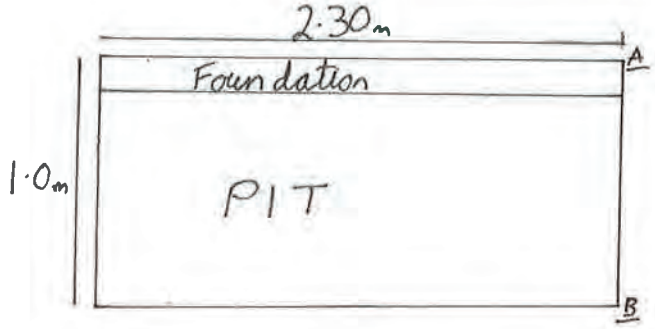
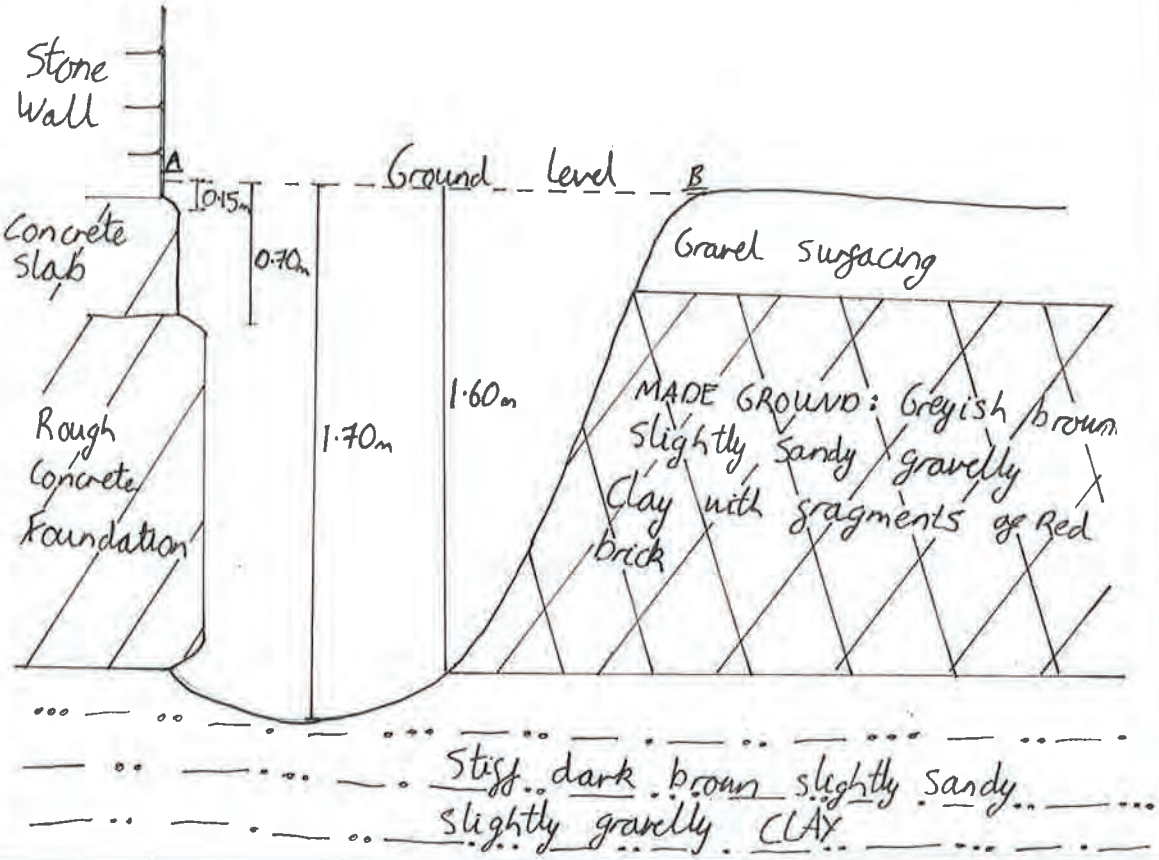
Foundation Sketch

PLAN VIEW



SIDE VIEW



Project:	Gaelcholaiste Phiarsaigh	**TP06**	
Engineer:	DBFL		
Contractor	Ground Investigations Ireland Ltd	Date	28/08/2020

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP01

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP01

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP02

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP02

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP02 Redig

TP02 redig

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP03

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP03

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP04

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP06

Gaelcholaiste Phiarsaigh – Foundation Pit Photographs

TP06

APPENDIX 3 – Soakaway Records

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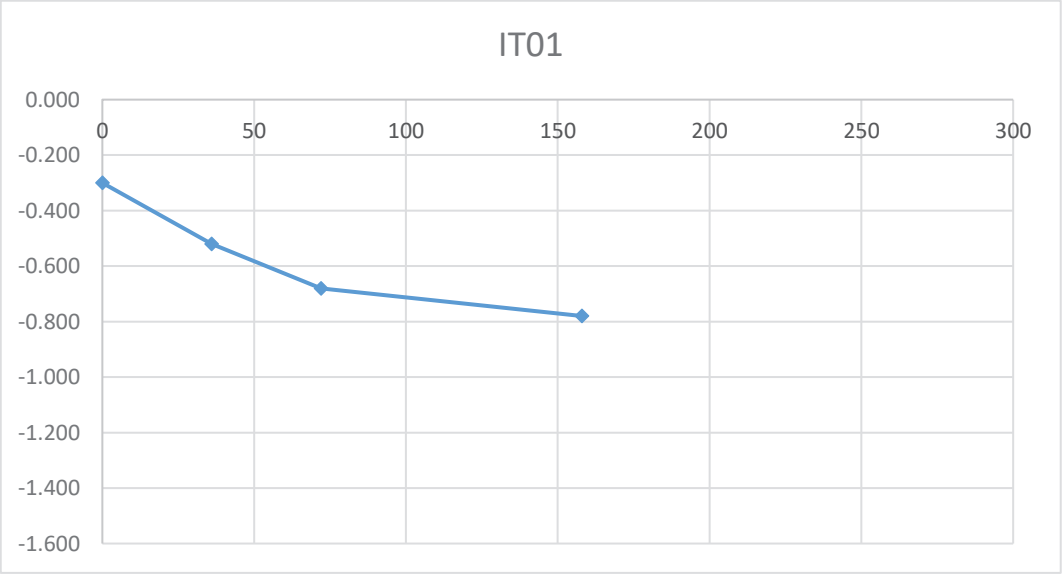
IT01

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 1.40m x 0.40m 1.60m (L x W x D)

Date	Time	Water level (m bgl)
29/08/2020	0	-0.300
29/08/2020	36	-0.520
29/08/2020	72	-0.680
29/08/2020	158	-0.780

Start depth	Depth of Pit		Diff	75% full	25%full
0.43	**1.600**		**1.170**	**0.7225**	**1.3075**
Length of pit (m)	Width of pit (m)			75-25Ht (m)	Vp75-25 (m3)
1.400	0.400			0.585	0.33
Tp75-25 (from graph) (s)		**30000**		50% Eff Depth	ap50 (m2)
				0.585	2.666
f =	**4.096E-06**	**m/s**			



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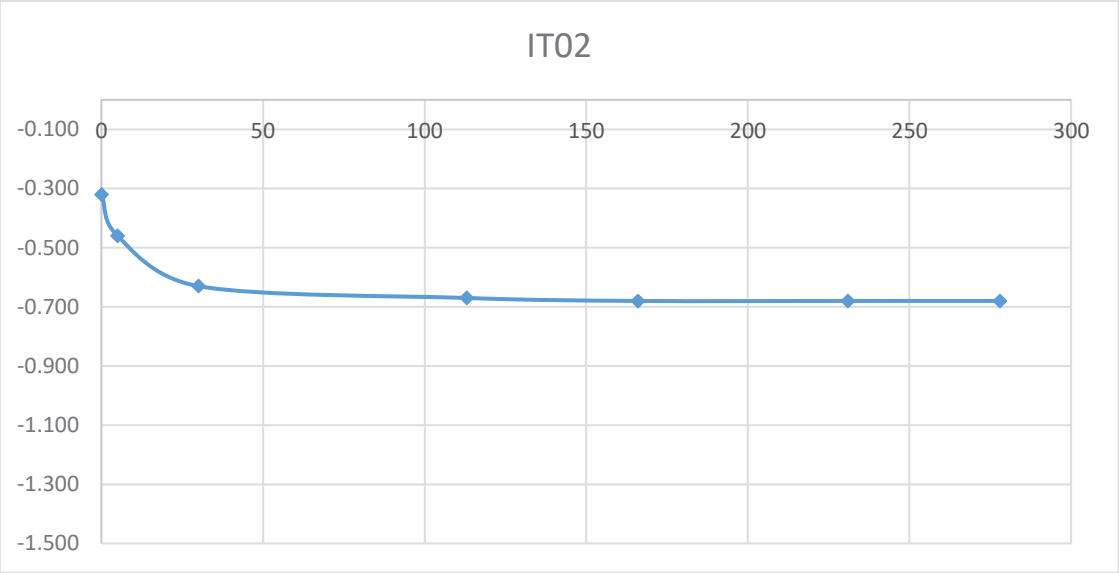
IT02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 1.5m x 0.40m 1.5m (L x W x D)

Date	Time	Water level (m bgl)
29/08/2020	0	-0.320
29/08/2020	5	-0.460
29/08/2020	30	-0.630
29/08/2020	113	-0.670
29/08/2020	166	-0.680
29/08/2020	231	-0.680
29/08/2020	278	-0.680

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.32	1.500	1.180	0.615	1.205



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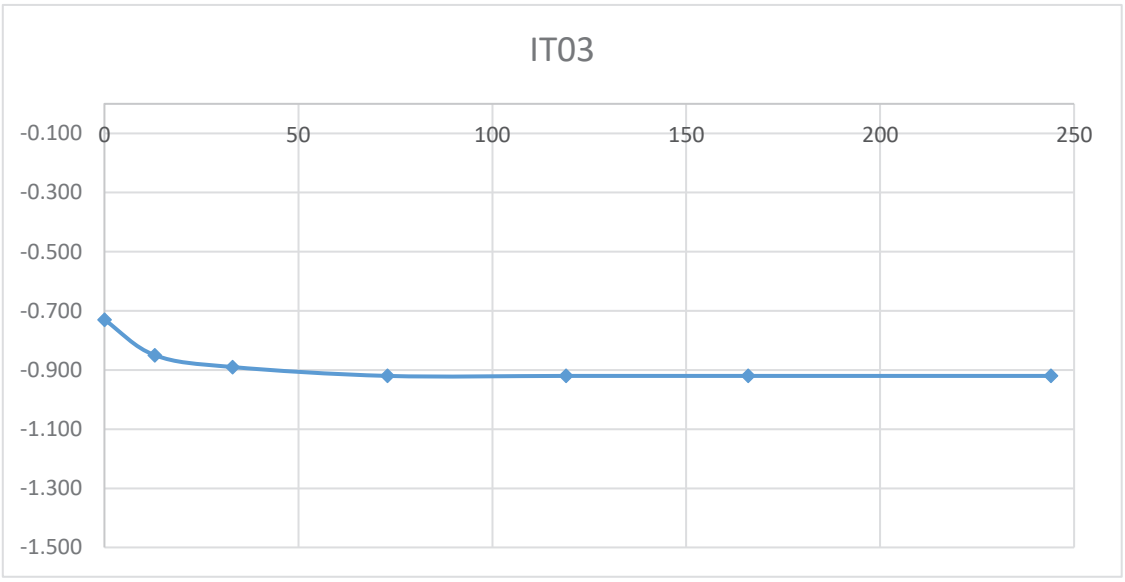
IT03

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 1.5m x 0.40m 1.5m (L x W x D)

Date	Time	Water level (m bgl)
29/08/2020	0	-0.730
29/08/2020	13	-0.850
29/08/2020	33	-0.890
29/08/2020	73	-0.920
29/08/2020	119	-0.920
29/08/2020	166	-0.920
29/08/2020	244	-0.920

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.73	1.500	0.770	0.9225	1.3075



Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Trial Pit Number** IT01
Machine : 3t Digger **Method :** Trial Pit	**Dimensions** 1.40x0.40x1.60	**Ground Level (mOD)** 52.80	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714544.6 E 728279.6 N	**Dates** 29/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown/grey slightly sandy slightly gravelly TOPSOIL with rootlets. Gravel is subangular to subrounded fine to coarse.		
				52.50	0.30			
0.50	B				(1.30)	MADE GROUND: Brown slightly sandy slightly gravelly Silt with occasional cobbles red brick and glass fragments. Gravel is subangular to subrounded fine to coarse.		
1.50	B			51.20	1.60	Complete at 1.60m		

Plan

Remarks

Trial Pit stable.
No Groundwater encountered during excavation.
Infiltration Test undertaken in pit.
Trial pit backfilled upon completion.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By	Figure No.
1:25	C.Byrne	9901-08-20.IT01

Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Trial Pit Number** IT02
Machine : 3t Digger **Method :** Trial Pit	**Dimensions** 1.50x0.40x1.50	**Ground Level (mOD)** 52.40	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714660.1 E 728256.6 N	**Dates** 29/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Dark brown/grey slightly sandy slightly gravelly TOPSOIL with rootlets. Gravel is subangular to subrounded fine to coarse.		
				52.15	0.25			
0.50	B				(0.65)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional cobbles and red brick fragments. Gravel is subangular to subrounded fine to coarse.		
				51.50	0.90			
					(0.60)	Soft to firm brownish grey slightly sandy gravelly CLAY with some cobbles and occasional boulders. Gravel is subangular to subrounded fine to coarse.		
1.50	B			50.90	1.50	Complete at 1.50m		

Plan

Remarks

Trial Pit stable.
No Groundwater encountered during excavation.
Infiltration Test undertaken in pit.
Trial pit backfilled upon completion.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By	Figure No.
1:25	C.Byrne	9901-08-20.IT02

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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Trial Pit Number** IT03
Machine : 3t Digger **Method :** Trial Pit	**Dimensions** 2.50x0.40x1.50	**Ground Level (mOD)** 52.00	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714666.5 E 728317.5 N	**Dates** 29/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Grey slightly sandy slightly gravelly TOPSOIL with rootlets. Gravel is subangular to subrounded fine to coarse.		
				51.70	0.30			
0.50	B				(0.90)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional cobbles red brick and concrete fragments. Gravel is subangular to subrounded fine to coarse.		
				50.80	1.20			
					(0.30)	Soft to firm brownish grey slightly sandy gravelly CLAY with some subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
1.50	B			50.50	1.50	Complete at 1.50m		

Plan

Remarks

Trial Pit stable.
No Groundwater encountered during excavation.
Infiltration Test undertaken in pit.
Trial pit backfilled upon completion.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By	Figure No.
1:25	C.Byrne	9901-08-20.IT03

Gaelcholaiste An Phiarsaigh – Soakaway Pit Photographs

IT01

TP01

Gaelcholaiste An Phiarsaigh – Soakaway Pit Photographs

IT01

Gaelcholaiste An Phiarsaigh – Soakaway Pit Photographs

IT02

IT02

Gaelcholaiste An Phiarsaigh – Soakaway Pit Photographs

IT02

Gaelcholaiste An Phiarsaigh – Soakaway Pit Photographs

IT03

IT03

Gaelcholaiste An Phiarsaigh – Soakaway Pit Photographs

IT03

APPENDIX 4 – Window Sample

Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Number** WS03
Machine : GEOTECH 10 **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m 68mm to 3.0m	**Ground Level (mOD)** 53.10	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714607.6 E 728262.6 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	B			53.00	(0.10) 0.10	Dark brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
						MADE GROUND: Brown slightly sandy slightly gravelly SILT with red brick and concrete fragments. Gravel is subangular to subrounded fine to coarse.		
					(1.00)			
1.00-2.00	B			52.00	1.10	MADE GROUND: Brown slightly sandy slightly gravelly silty CLAY with red brick and concrete fragments. Gravel is subangular to subrounded fine to coarse.		
					(1.10)			
2.00-3.00	B			50.90	2.20	MADE GROUND: Dark brown slightly sandy slightly gravelly Clay wit red brick and concrete fragments. Gravel is subangular to subrounded fine to coarse.		
					(0.80)			
				50.10	3.00	Complete at 3.00m		

Remarks
55% Recovery from 0.00m to 1.00m BGL.
70% Recovery from 1.00m to 2.00m BGL.
95% Recovery from 2.00m to 3.00m BGL.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

Figure No. 9901-08-20.WS03

Ground Investigations Ireland Ltd
www.gii.ie

Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Number** WS04
Machine : GEOTECH 10 **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m	**Ground Level (mOD)** 52.30	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714677.3 E 728314.8 N	**Dates** 27/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND:Reddish brown slightly sandy slightly gravelly Clay with red brick fragments. Gravel is subangular to subrounded fine to coarse.		
0.30-0.55	B			52.00	0.30			
					(0.25)	MADE GROUND: Grey slightly sandy clayey angular to subrounded fine to coarse Gravel with occasional angular cobbles and red brick fragments.		
0.55-1.00	B			51.75	0.55			
					(0.45)	MADE GROUND: Light brown slightly sandy slightly gravelly Clay. Gravel is subangular to subrounded fine to coarse.		
				51.30	1.00			
					(0.20)	MADE GROUND: Grey sandy clayey angular to subrounded fine to coarse Gravel.		
1.20-2.00	B			51.10	1.20			
					(0.50)	Soft to firm brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
				50.60	1.70			
					(0.30)	Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
				50.30	2.00			
						Complete at 2.00m		

Remarks
80% Recovery from 0.00m to 1.00m BGL.
80% Recovery from 1.00m to 2.00m BGL.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

Figure No. 9901-08-20.WS04

Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Number** WS05
Machine : GEOTECH 10 **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m	**Ground Level (mOD)** 52.30	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714689.8 E 728306.8 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Dark brown slightly sandy peaty TOPSOIL with rootlets.		
				52.00	0.30	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles and fragments of red brick. Gravel is subangular to subrounded fine to coarse.		
1.00-1.40	B				(1.00)			
1.40-2.00	B			51.00	1.30	Stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
					(0.70)			
				50.30	2.00	Complete at 2.00m		

Remarks
30% Recovery from 0.00m to 1.00m BGL.
100% Recovery from 1.00m to 2.00m BGL.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

Figure No. 9901-08-20.WS05

Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Number** WS06
Machine : GEOTECH 10 **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 1.60m	**Ground Level (mOD)** 52.40	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714701.5 E 728290.9 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.35)	MADE GROUND: Dark grey sandy angular to subrounded fine to coarse Gravel.		
0.35-0.65	B			52.05	0.35			
					(0.30)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
				51.75	0.65			
					(0.65)	Medium dense dark brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse.		
				51.10	1.30			
					(0.30)	Stiff greyish brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
				50.80	1.60	Complete at 1.60m		

Remarks
85% Recovery from 0.00m to 1.00m BGL.
90% Recovery from 1.00m to 1.60m BGL.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

Figure No. 9901-08-20.WS06

Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Number** WS06A
Machine : GEOTECH 10 **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m 68mm to 2.45m	**Ground Level (mOD)** 52.40	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714700.8 E 728291 N	**Dates** 15/10/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					(0.30)	MADE GROUND: Black slightly sandy clayey angular fine to coarse Gravel.			
				52.10	0.30	Poor recovery, Recovery of MADE GROUND: brown mottled black slightly sandy slightly gravelly Clay.			
					(0.70)				
				51.40	1.00	Brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.			
					(0.20)				
				51.20	1.20	No Recovery.			
					(1.25)				
				49.95	2.45	Complete at 2.45m			

Remarks
40% Recovery from 0.00m to 1.00m BGL.
20% Recovery from 1.00m to 2.00m BGL.
0% Recovery from 1.00m to 2.00m BGL.
Slotted pipe installed with pea gravel surround from 2.45m to 1.0m BGL, plain pipe and bentonite seal from 1.0m BGL to GL finished with a flush cover.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

Figure No. 9901-08-20.WS06A

Ground Investigations Ireland Ltd
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Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Number** WS07
Machine : GEOTECH 10 **Method :** Drive-in Windowless Sampler	**Dimensions** 88mm to 2.00m 68mm to 2.50m	**Ground Level (mOD)** 52.40	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714699.1 E 728304.3 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				52.30	(0.10) 0.10	Brown slightly sandy slightly gravelly TOPSOIL with rootlets.		
0.10-0.60	B				(0.50)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular to subrounded cobbles and fragments of red brick and concrete. Gravel is subangular to subrounded fine to coarse.		
0.60-2.50	B			51.80	0.60	Stiff brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
					(1.90)			
				49.90	2.50	Complete at 2.50m		

Remarks
80% Recovery from 0.00m to 1.00m BGL.
90% Recovery from 1.00m to 2.00m BGL.
80% Recovery from 2.00m to 2.50m BGL.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

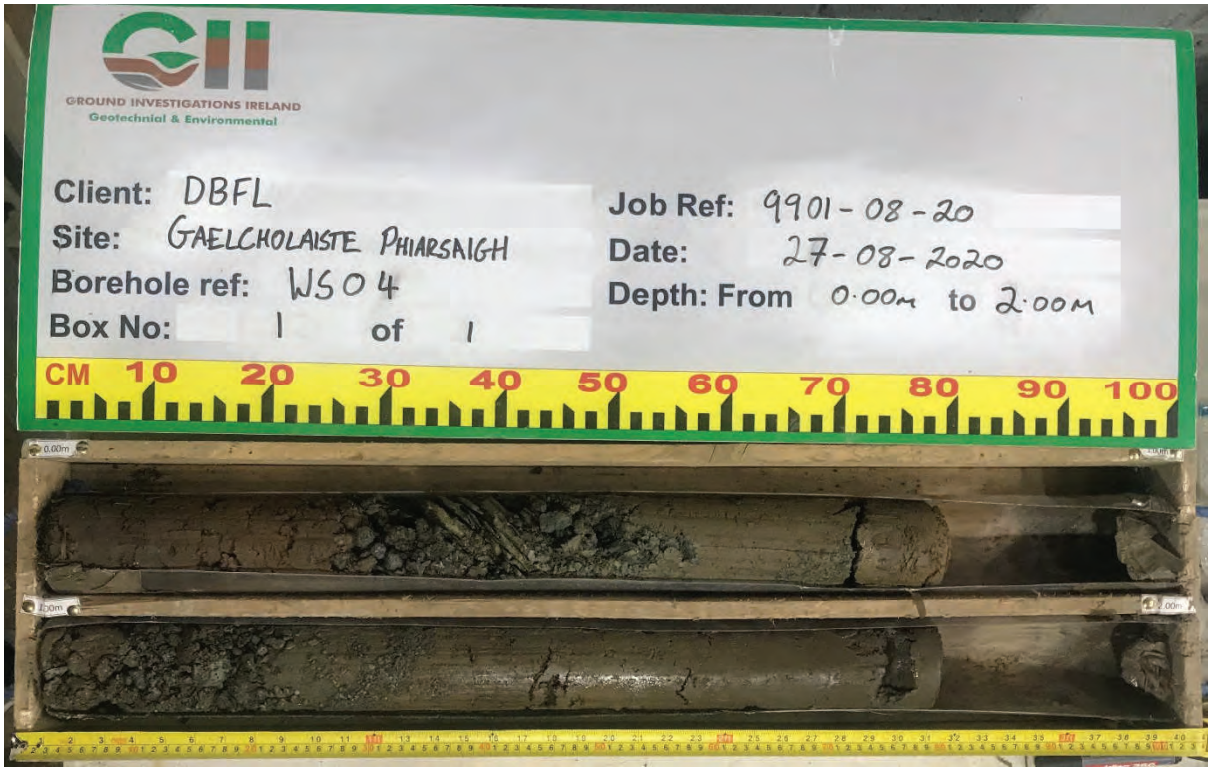
Scale (approx)	Logged By
1:25	C. Byrne

Figure No. 9901-08-20.WS07

Window Sample Photographs- Gaelcholaiste Phiarsaigh
DBFL – 9901-08-20

WS03

WS04



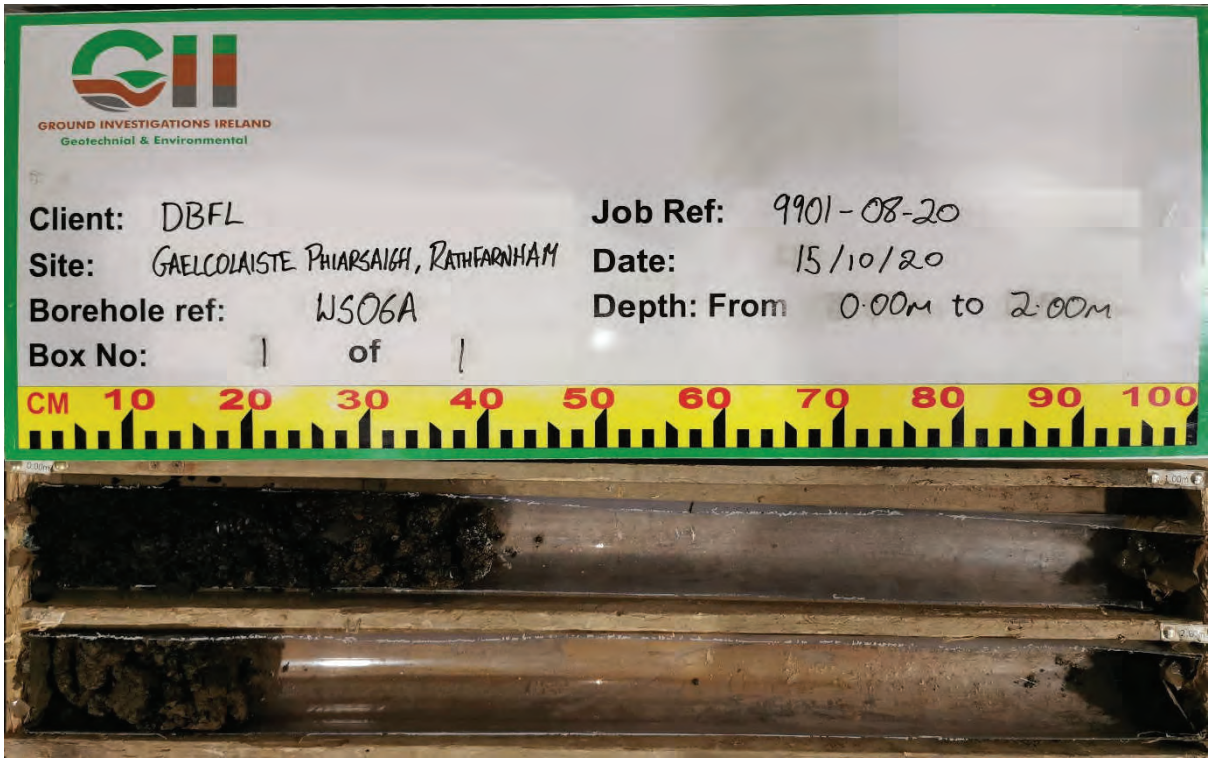
Window Sample Photographs- Gaelcholaiste Phiarsaigh
DBFL – 9901-08-20

WS05

WS06

Window Sample Photographs- Gaelcholaiste Phiarsaigh
DBFL – 9901-08-20

WS06A



WS07

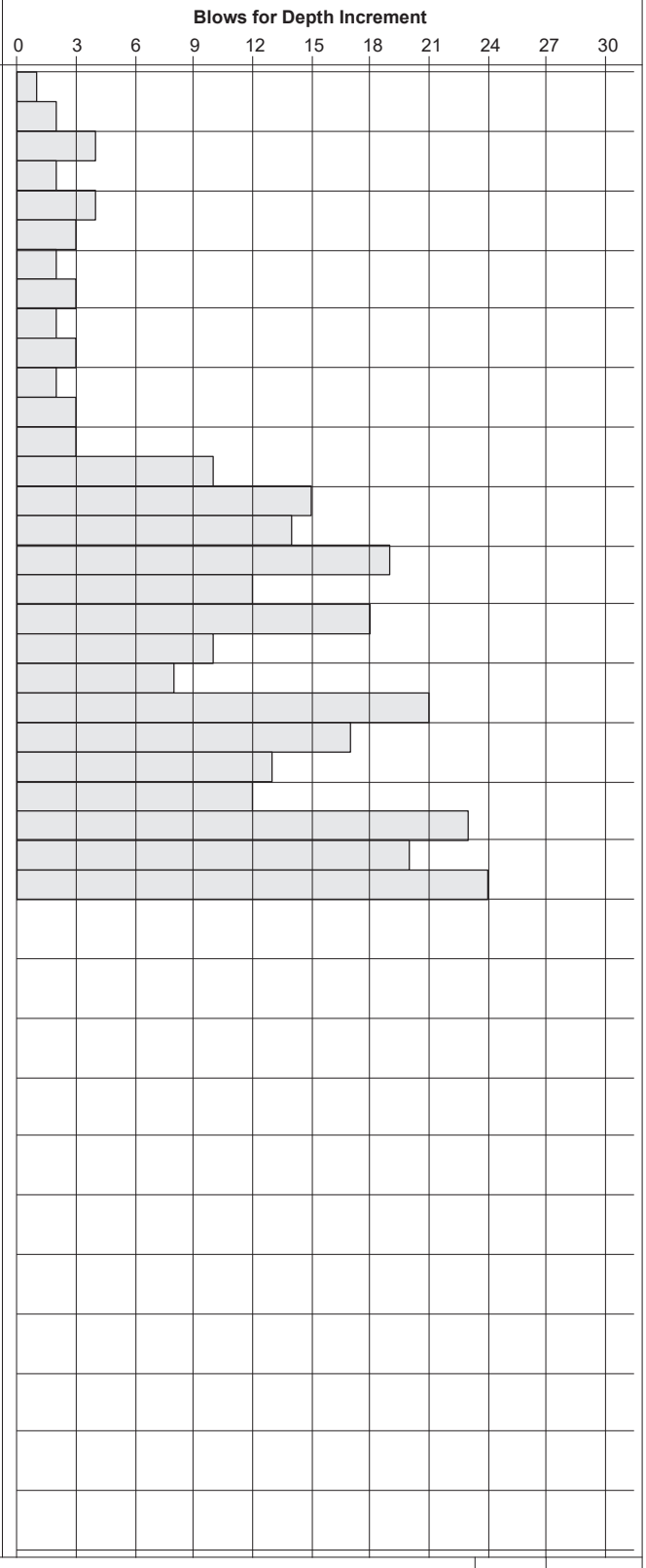
APPENDIX 5 – Dynamic Probes

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP01

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.00		9901-08-20
	Location (Observed measurements) 714544.6 E 728294.8 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records
0.00-0.10	1	
0.10-0.20	2	
0.20-0.30	4	
0.30-0.40	2	
0.40-0.50	4	
0.50-0.60	3	
0.60-0.70	2	
0.70-0.80	3	
0.80-0.90	2	
0.90-1.00	3	
1.00-1.10	2	
1.10-1.20	3	
1.20-1.30	3	
1.30-1.40	10	
1.40-1.50	15	
1.50-1.60	14	
1.60-1.70	19	
1.70-1.80	12	
1.80-1.90	18	
1.90-2.00	10	
2.00-2.10	8	
2.10-2.20	21	
2.20-2.30	17	
2.30-2.40	13	
2.40-2.50	12	
2.50-2.60	23	
2.60-2.70	20	
2.70-2.80	24	



Remarks
Completed at 2.80m BGL.
Coordinates based on site measurmens and taken from GIS / Level estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

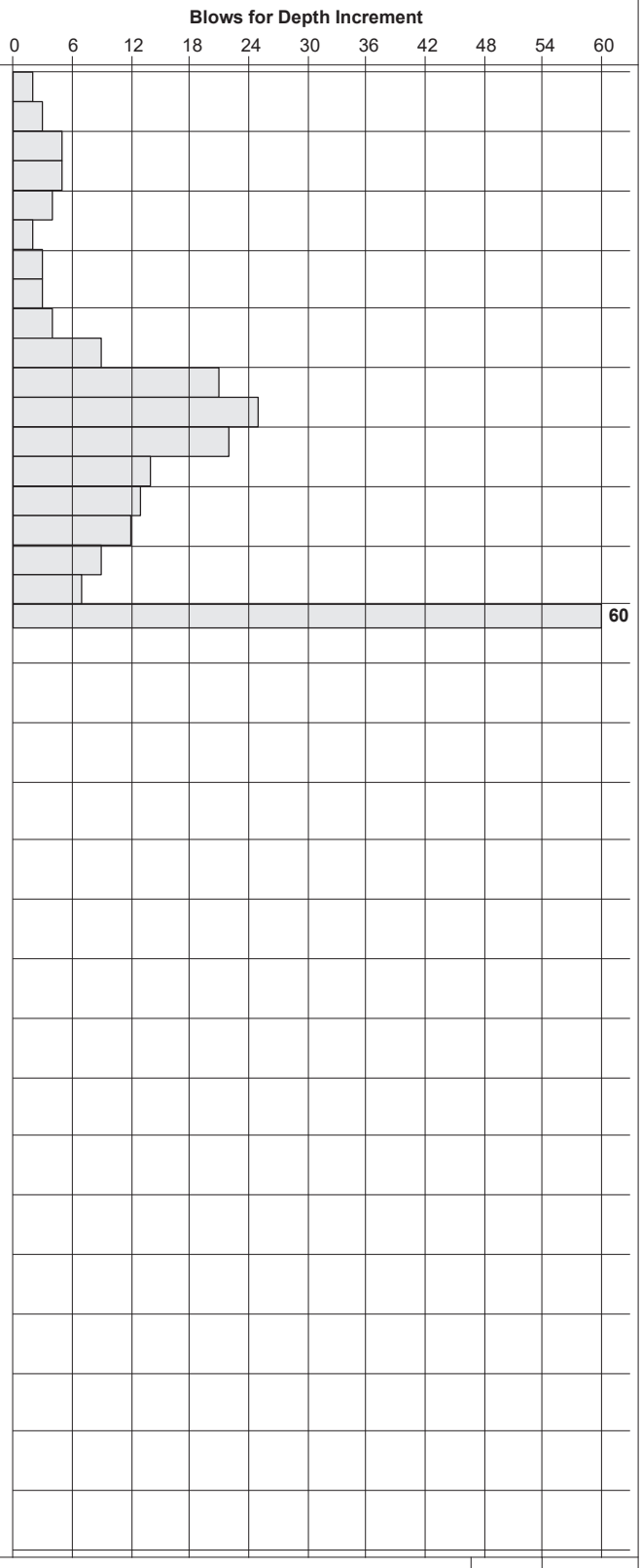
Figure No.
9901-08-20.DP01

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP02

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.90		9901-08-20
	Location (Observed measurements) 714579.5 E 728269 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		52.90	0.00
0.10-0.20	3			
0.20-0.30	5			
0.30-0.40	5			
0.40-0.50	4			
0.50-0.60	2		52.40	0.50
0.60-0.70	3			
0.70-0.80	3			
0.80-0.90	4			
0.90-1.00	9			
1.00-1.10	21		51.90	1.00
1.10-1.20	25			
1.20-1.30	22			
1.30-1.40	14			
1.40-1.50	13			
1.50-1.60	12		51.40	1.50
1.60-1.70	9			
1.70-1.80	7			
1.80-1.88	60			
			50.90	2.00
			50.40	2.50
			49.90	3.00
			49.40	3.50
			48.90	4.00
			48.40	4.50
			47.90	5.00



Remarks
Refusal at 1.88m BGL.
60 Hammer Blows for 80mm penetration.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

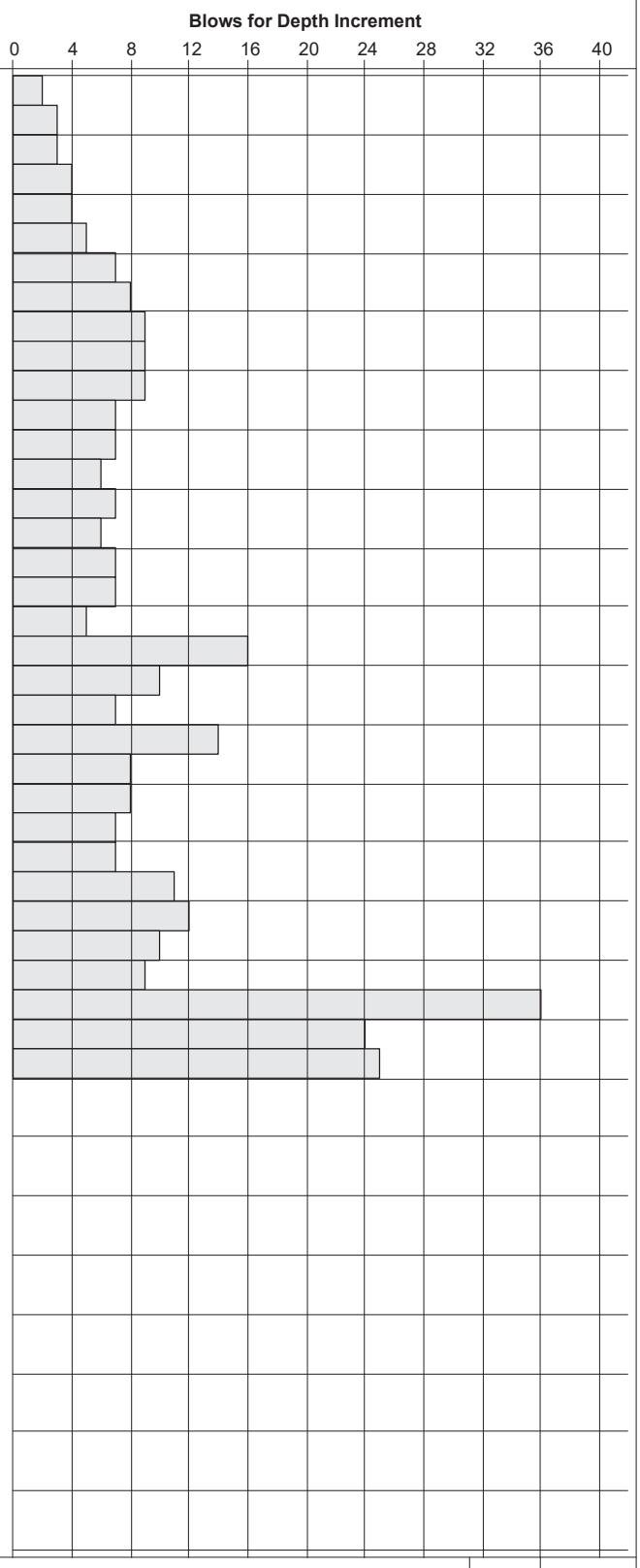
Figure No.
9901-08-20.DP02

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP03

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		53.10		9901-08-20
	Location (Observed measurements) 714607.6 E 728262.6 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		53.10	0.00
0.10-0.20	3			
0.20-0.30	3			
0.30-0.40	4			
0.40-0.50	4			
0.50-0.60	5		52.60	0.50
0.60-0.70	7			
0.70-0.80	8			
0.80-0.90	9			
0.90-1.00	9			
1.00-1.10	9		52.10	1.00
1.10-1.20	7			
1.20-1.30	7			
1.30-1.40	6			
1.40-1.50	7			
1.50-1.60	6		51.60	1.50
1.60-1.70	7			
1.70-1.80	7			
1.80-1.90	5			
1.90-2.00	16			
2.00-2.10	10		51.10	2.00
2.10-2.20	7			
2.20-2.30	14			
2.30-2.40	8			
2.40-2.50	8			
2.50-2.60	7		50.60	2.50
2.60-2.70	7			
2.70-2.80	11			
2.80-2.90	12			
2.90-3.00	10			
3.00-3.10	9		50.10	3.00
3.10-3.20	36			
3.20-3.30	24			
3.30-3.40	25			
			49.60	3.50
			49.10	4.00
			48.60	4.50
			48.10	5.00



Remarks
Complete at 3.40m BGL.
Dynamic probe completed adjacent to WS03.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

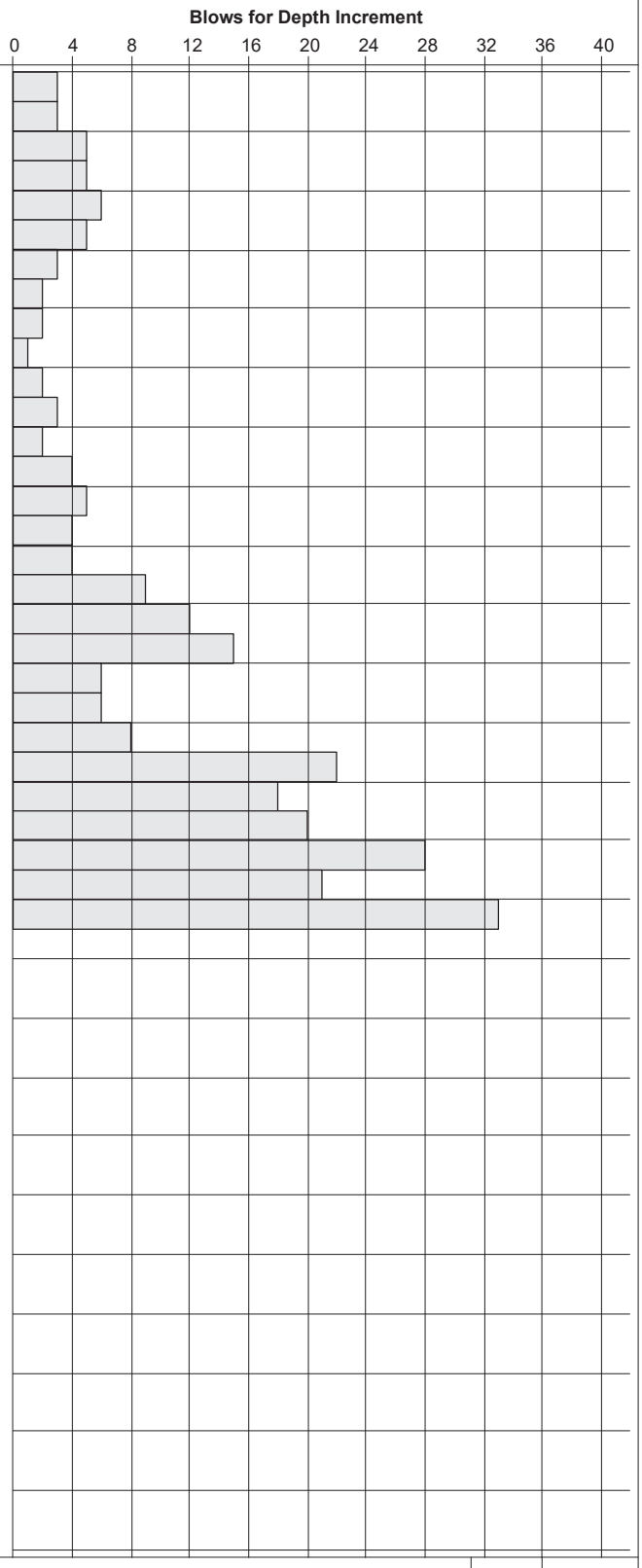
Figure No.
9901-08-20.DP03

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP04

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.30		9901-08-20
	Location (Observed measurements) 714677.3 E 728314.8 N	**Dates** 27/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	3		52.30	0.00
0.10-0.20	3			
0.20-0.30	5			
0.30-0.40	5			
0.40-0.50	6			
0.50-0.60	5		51.80	0.50
0.60-0.70	3			
0.70-0.80	2			
0.80-0.90	2			
0.90-1.00	1			
1.00-1.10	2		51.30	1.00
1.10-1.20	3			
1.20-1.30	2			
1.30-1.40	4			
1.40-1.50	5			
1.50-1.60	4		50.80	1.50
1.60-1.70	4			
1.70-1.80	9			
1.80-1.90	12			
1.90-2.00	15			
2.00-2.10	6		50.30	2.00
2.10-2.20	6			
2.20-2.30	8			
2.30-2.40	22			
2.40-2.50	18			
2.50-2.60	20		49.80	2.50
2.60-2.70	28			
2.70-2.80	21			
2.80-2.90	33			
			49.30	3.00
			48.80	3.50
			48.30	4.00
			47.80	4.50
			47.30	5.00



Remarks
Complete at 2.90m BGL.
Dynamic probe completed adjacent to WS04.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

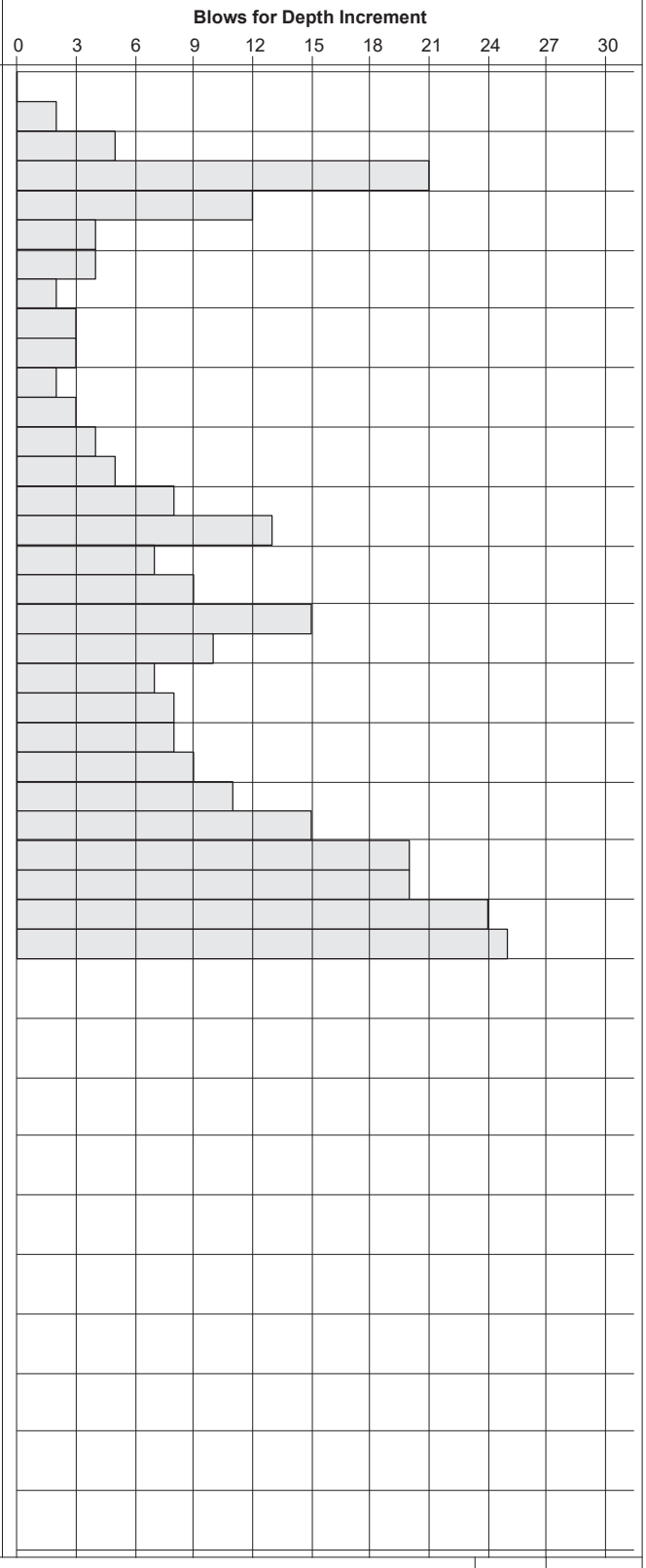
Figure No.
9901-08-20.DP04

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP05

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.30		9901-08-20
	Location (Observed measurements) 714689.8 E 728306.8 N	**Dates** 27/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	0		52.30	0.00
0.10-0.20	2			
0.20-0.30	5			
0.30-0.40	21			
0.40-0.50	12			
0.50-0.60	4		51.80	0.50
0.60-0.70	4			
0.70-0.80	2			
0.80-0.90	3			
0.90-1.00	3			
1.00-1.10	2		51.30	1.00
1.10-1.20	3			
1.20-1.30	4			
1.30-1.40	5			
1.40-1.50	8			
1.50-1.60	13		50.80	1.50
1.60-1.70	7			
1.70-1.80	9			
1.80-1.90	15			
1.90-2.00	10			
2.00-2.10	7		50.30	2.00
2.10-2.20	8			
2.20-2.30	8			
2.30-2.40	9			
2.40-2.50	11			
2.50-2.60	15		49.80	2.50
2.60-2.70	20			
2.70-2.80	20			
2.80-2.90	24			
2.90-3.00	25		49.30	3.00
			48.80	3.50
			48.30	4.00
			47.80	4.50
			47.30	5.00



Remarks
Complete at 3.00m BGL.
Dynamic probe completed adjacent to WS05.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

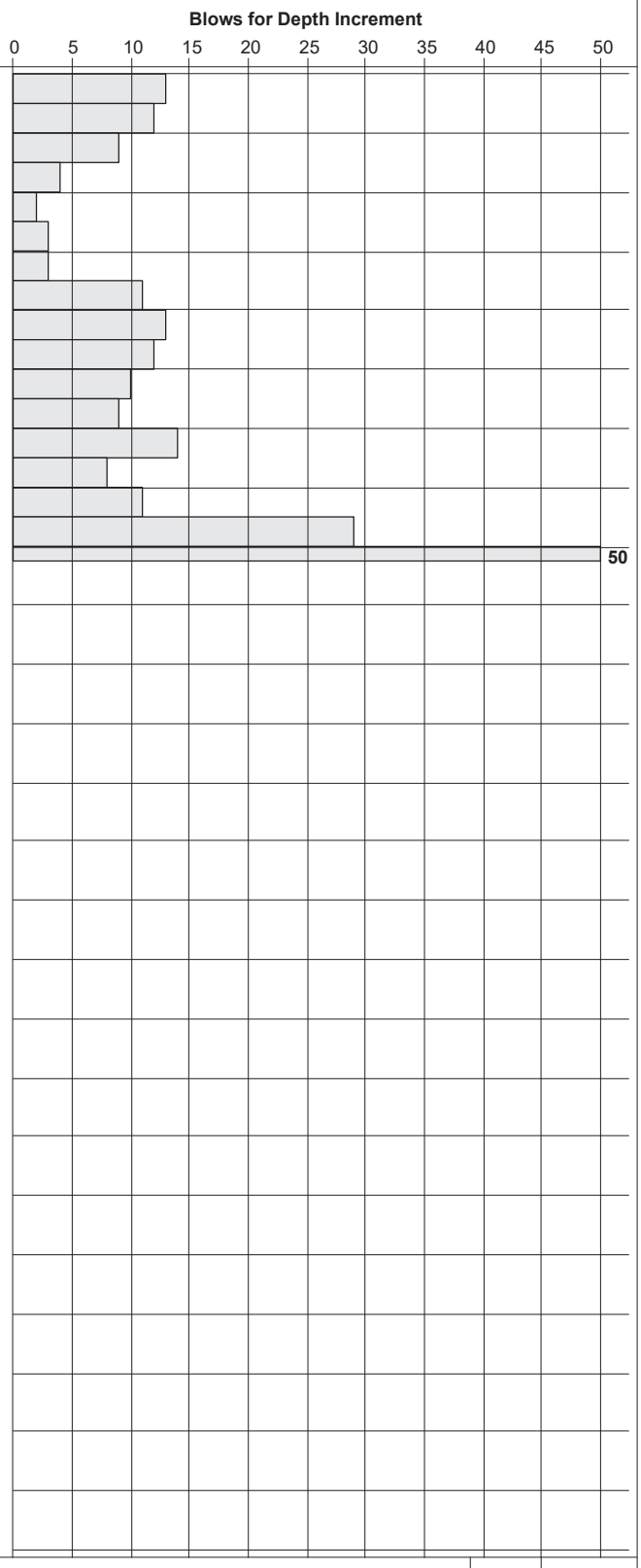
Figure No.
9901-08-20.DP05

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP06

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.40		9901-08-20
	Location (Observed measurements) 714701.5 E 728290.9 N	**Dates** 28/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	13		52.40	0.00
0.10-0.20	12			
0.20-0.30	9			
0.30-0.40	4			
0.40-0.50	2			
0.50-0.60	3		51.90	0.50
0.60-0.70	3			
0.70-0.80	11			
0.80-0.90	13			
0.90-1.00	12			
1.00-1.10	10		51.40	1.00
1.10-1.20	9			
1.20-1.30	14			
1.30-1.40	8			
1.40-1.50	11			
1.50-1.60	29		50.90	1.50
1.60-1.65	50			
			50.40	2.00
			49.90	2.50
			49.40	3.00
			48.90	3.50
			48.40	4.00
			47.90	4.50
			47.40	5.00



Remarks
Refusal at 1.65m BGL.
50 hammer blows for 50mm penetration.
Dynamic probe completed adjacent to WS06.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

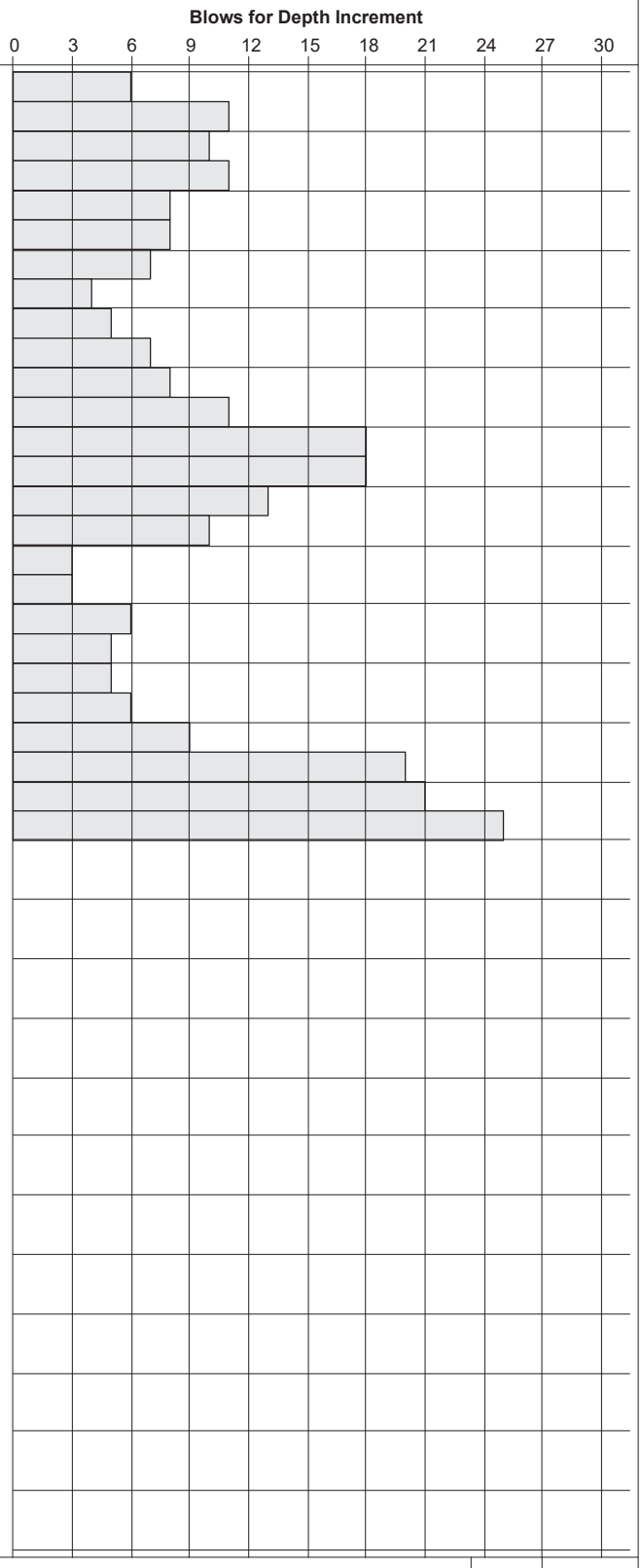
Figure No.
9901-08-20.DP06

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP06A

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.40		9901-08-20
	Location (Observed measurements) 714700.8 E 728291 N	**Dates** 14/10/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	6		52.40	0.00
0.10-0.20	11			
0.20-0.30	10			
0.30-0.40	11			
0.40-0.50	8			
0.50-0.60	8		51.90	0.50
0.60-0.70	7			
0.70-0.80	4			
0.80-0.90	5			
0.90-1.00	7			
1.00-1.10	8		51.40	1.00
1.10-1.20	11			
1.20-1.30	18			
1.30-1.40	18			
1.40-1.50	13			
1.50-1.60	10		50.90	1.50
1.60-1.70	3			
1.70-1.80	3			
1.80-1.90	6			
1.90-2.00	5			
2.00-2.10	5		50.40	2.00
2.10-2.20	6			
2.20-2.30	9			
2.30-2.40	20			
2.40-2.50	21			
2.50-2.60	25		49.90	2.50
			49.40	3.00
			48.90	3.50
			48.40	4.00
			47.90	4.50
			47.40	5.00



Remarks
Refusal at 2.65m BGL.
50 hammer blows for 50mm penetration.
Dynamic probe completed adjacent to WS06A.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

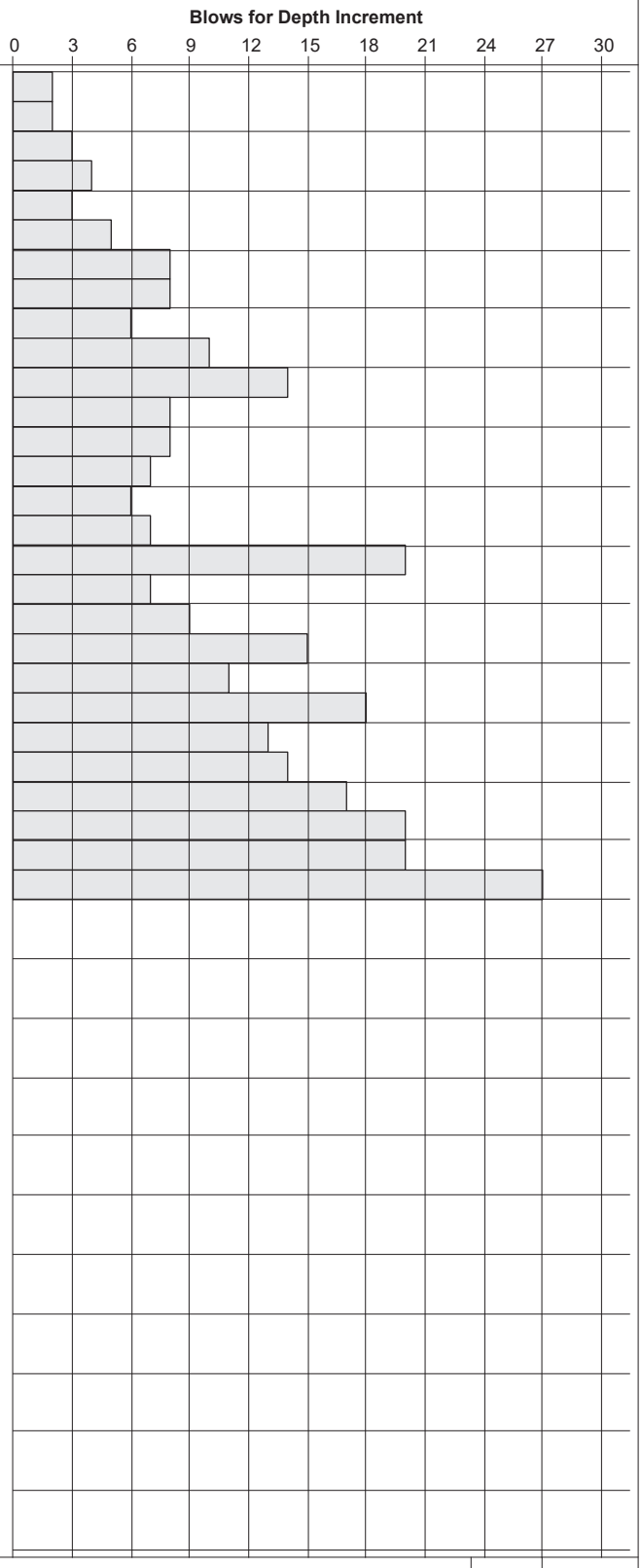
Figure No.
9901-08-20.DP06A

Ground Investigations Ireland Ltd
www.gii.ie

Site	Probe Number
Gaelcholaiste an Phiarsaigh, Rathfarnham	DP07

Method	Cone Dimensions	Ground Level (mOD)	Client	Job Number
Dynamic Probe Heavy DPH Fall Height 500mm Hammer Weight 50kg		52.40		9901-08-20
	Location (Observed measurements) 714699.1 E 728304.3 N	**Dates** 27/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Blows for Depth Increment	Field Records	Level (mOD)	Depth (m)
0.00-0.10	2		52.40	0.00
0.10-0.20	2			
0.20-0.30	3			
0.30-0.40	4			
0.40-0.50	3			
0.50-0.60	5		51.90	0.50
0.60-0.70	8			
0.70-0.80	8			
0.80-0.90	6			
0.90-1.00	10			
1.00-1.10	14		51.40	1.00
1.10-1.20	8			
1.20-1.30	8			
1.30-1.40	7			
1.40-1.50	6			
1.50-1.60	7		50.90	1.50
1.60-1.70	20			
1.70-1.80	7			
1.80-1.90	9			
1.90-2.00	15			
2.00-2.10	11		50.40	2.00
2.10-2.20	18			
2.20-2.30	13			
2.30-2.40	14			
2.40-2.50	17			
2.50-2.60	20		49.90	2.50
2.60-2.70	20			
2.70-2.80	27			
			49.40	3.00
			48.90	3.50
			48.40	4.00
			47.90	4.50
			47.40	5.00



Remarks
Complete at 2.80m BGL.
Dynamic probe completed adjacent to WS07.
Coordinates based on site measurmens and taken from GIS / Levels estimated from topo survey

Scale (approx)	Logged By
1:25	C. Byrne

Figure No.
9901-08-20.DP07

APPENDIX 6 – Cable Percussion

Ground Investigations Ireland Ltd
www.gii.ie

Site Gaelcholaiste an Phiarsaigh, Rathfarnham			**Borehole Number** BH02
Machine : Dando 200 **Method :** Cable Percussion	**Casing Diameter** 200mm to 4.30m	**Ground Level (mOD)** 52.40	**Client**	**Job Number** 9901-08-20
	Location (Observed measurements) 714696.4 E 728292.6 N	**Dates** 29/08/2020	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(1.80)	MADE GROUND: Dark grey slightly sandy gravelly Clay with occasional angular to subrounded cobbles and red brick fragments. Gravel is angular to subrounded fine to coarse.		
1.00-1.45 1.00	SPT(C) N=18 B			2,4/3,3,3,9	50.60	1.80			
2.00	B					(1.20)	Firm to stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
3.00-3.36 3.00	SPT(C) 50/210 B			14,10/15,13,22	49.40	3.00			
						(1.30)	Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
4.00-4.20 4.00	SPT(C) 50/50 B			29,42/50	48.10	4.30			
							Refusal at 4.30m		

Remarks
No Groundwater encountered during drilling.
Refusal at 4.30m BGL.
Borehole backfilled upon completion.
Coordinates based on site measurmens and taken from GIS / Level estimated from topo survey
Chiselling from 2.10m to 2.60m for 0.75 hours. Chiselling from 4.30m to 4.30m for 1 hour.

Scale (approx)	Logged By
1:50	C. Byrne

Figure No. 9901-08-20.BH02

APPENDIX 7 – TRL Probe Records

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

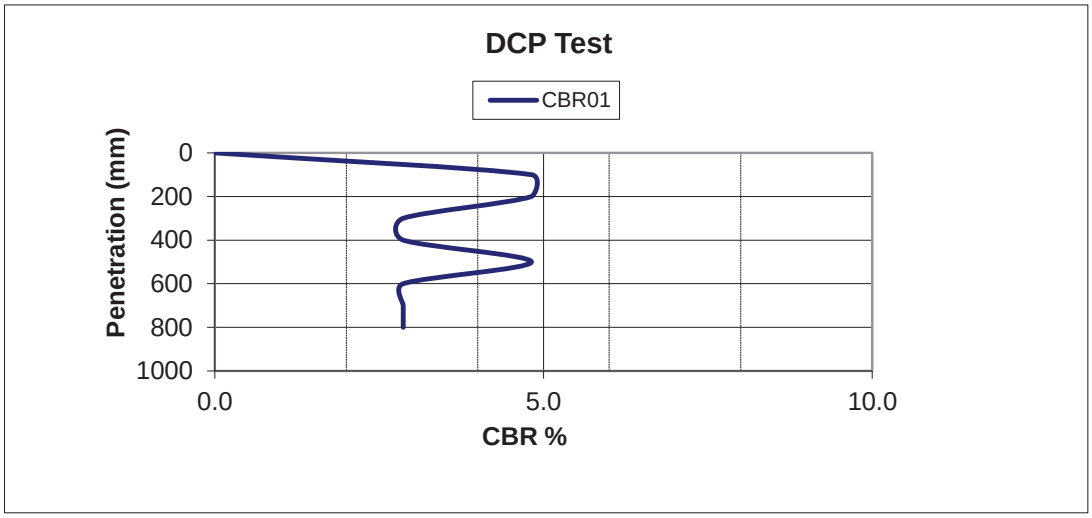
Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Job Name	Gaelcolaiste Phiarsaigh	**Test Type**	Dynamic Cone Penetration Test
Job No.	9901-08-20	**Test Reference**	CBR01
Client	DBFL	**By**	C. Byrne
		Date	29/08/2020
Initial Depth	Ground level		

Depth (mm bgl)	No. of Blows per 100mm	Penetration per Blow (mm)	CBR (%)
0	-	-	0.0
100	3	33.3	4.8
200	3	33.3	4.8
300	2	50.0	2.9
400	2	50.0	2.9
500	3	33.3	4.8
600	2	50.0	2.9
700	2	50.0	2.9
800	2	50.0	2.9
900	2	50.0	2.9
1000	2	50.0	2.9
1100	-		
1200	-		
1300	-		
1400	-		
1500	-		

Reference **Kleyn and Van Heerden (60° Cone)**
Formula Log10 (CBR) = 2.632 - 1.28 Log10 (mm/blow)



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

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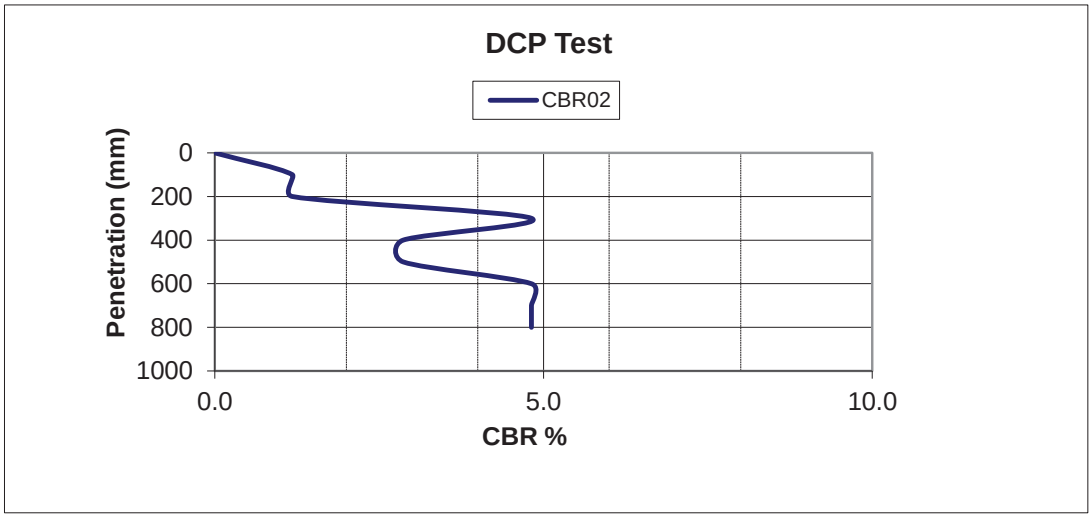
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Job Name	Gaelcolaiste Phiarsaigh	**Test Type**	Dynamic Cone Penetration Test
Job No.	9901-08-20	**Test Reference**	CBR02
Client	DBFL	**By**	C. Byrne
		Date	29/08/2020
Initial Depth	Ground level		

Depth (mm bgl)	No. of Blows per 100mm	Penetration per Blow (mm)	CBR (%)
0	-	-	0.0
100	0	100.0	1.2
200	0	100.0	1.2
300	3	33.3	4.8
400	2	50.0	2.9
500	2	50.0	2.9
600	3	33.3	4.8
700	3	33.3	4.8
800	3	33.3	4.8
900	3	33.3	4.8
1000	2	50.0	2.9
1100	-		
1200	-		
1300	-		
1400	-		
1500	-		

Reference **Kleyn and Van Heerden (60° Cone)**
Formula Log10 (CBR) = 2.632 - 1.28 Log10 (mm/blow)



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

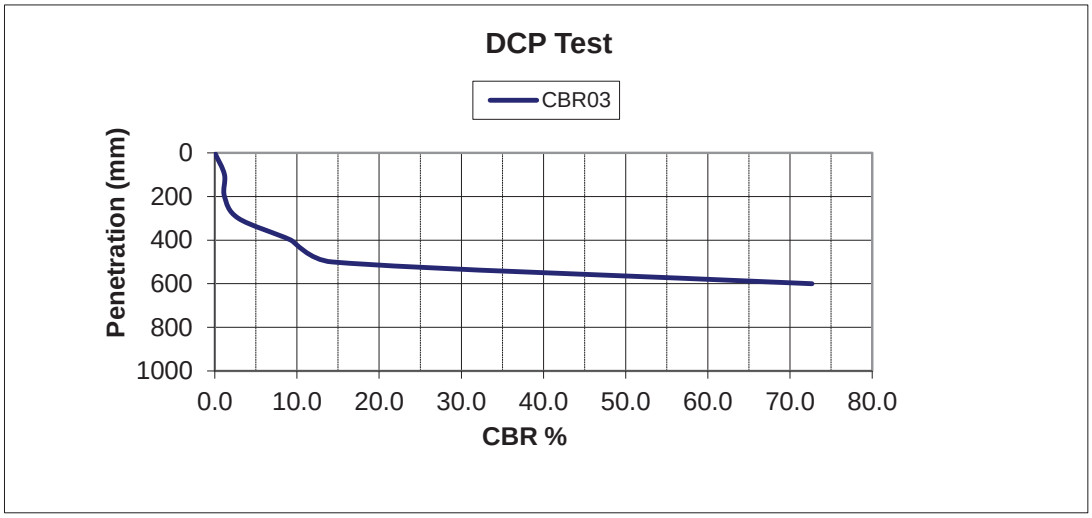
Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Job Name	Gaelcolaiste Phiarsaigh	**Test Type**	Dynamic Cone Penetration Test
Job No.	9901-08-20	**Test Reference**	CBR03
Client	DBFL	**By**	C. Byrne
		Date	29/08/2020
Initial Depth	Ground level		

Depth (mm bgl)	No. of Blows per 100mm	Penetration per Blow (mm)	CBR (%)
0	-	-	0.0
100	0	100.0	1.2
200	1	100.0	1.2
300	2	50.0	2.9
400	5	20.0	9.3
500	7	14.3	14.2
600	25	4.0	72.7
700			
800			
900			
1000			
1100	-		
1200	-		
1300	-		
1400	-		
1500	-		

Reference **Kleyn and Van Heerden (60° Cone)**
Formula Log10 (CBR) = 2.632 - 1.28 Log10 (mm/blow)



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

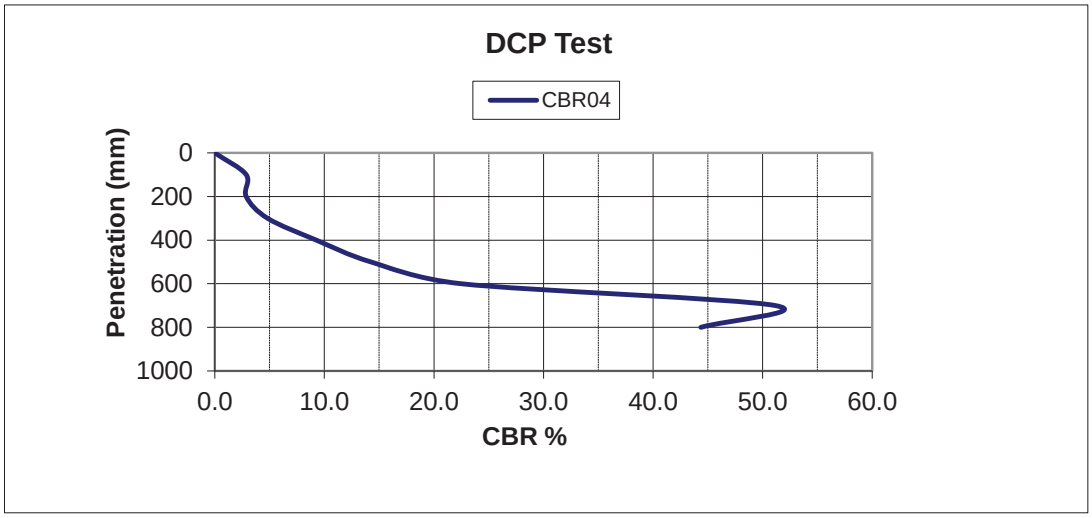
Catherinestown House,
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Job Name	Gaelcolaiste Phiarsaigh	**Test Type**	Dynamic Cone Penetration Test
Job No.	9901-08-20	**Test Reference**	CBR04
Client	DBFL	**By**	C. Byrne
		Date	29/08/2020
Initial Depth	Ground level		

Depth (mm bgl)	No. of Blows per 100mm	Penetration per Blow (mm)	CBR (%)
0	-	-	0.0
100	2	50.0	2.9
200	2	50.0	2.9
300	3	33.3	4.8
400	5	20.0	9.3
500	7	14.3	14.2
600	10	10.0	22.5
700	19	5.3	51.1
800	17	5.9	44.4
900	16	6.3	41.0
1000	11	9.1	25.4
1100	-		
1200	-		
1300	-		
1400	-		
1500	-		

Reference **Kleyn and Van Heerden (60° Cone)**
Formula Log10 (CBR) = 2.632 - 1.28 Log10 (mm/blow)



GROUND INVESTIGATIONS IRELAND
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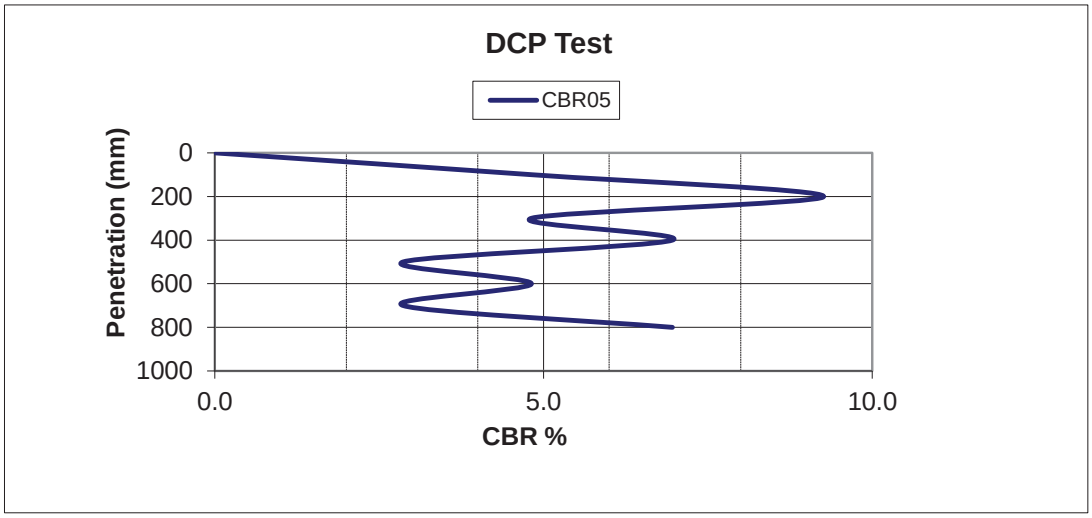
Hazelhatch Road,
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Job Name	Gaelcolaiste Phiarsaigh	**Test Type**	Dynamic Cone Penetration Test
Job No.	9901-08-20	**Test Reference**	CBR05
Client	DBFL	**By**	C. Byrne
		Date	29/08/2020
Initial Depth	Ground level		

Depth (mm bgl)	No. of Blows per 100mm	Penetration per Blow (mm)	CBR (%)
0	-	-	0.0
100	3	33.3	4.8
200	5	20.0	9.3
300	3	33.3	4.8
400	4	25.0	7.0
500	2	50.0	2.9
600	3	33.3	4.8
700	2	50.0	2.9
800	4	25.0	7.0
900	3	33.3	4.8
1000	2	50.0	2.9
1100	-		
1200	-		
1300	-		
1400	-		
1500	-		

Reference **Kleyn and Van Heerden (60° Cone)**
Formula Log10 (CBR) = 2.632 - 1.28 Log10 (mm/blow)



GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

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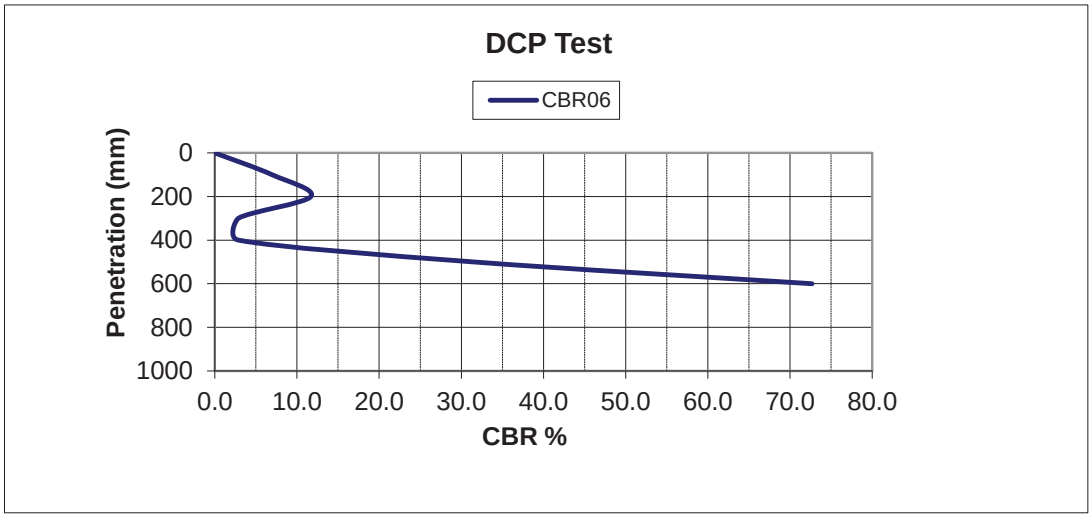
Newcastle,
Co. Dublin.
D22 YD52

Tel: 01 601 5175 / 5176
Email: info@gii.ie
Web: www.gii.ie

Job Name	Gaelcolaiste Phiarsaigh	**Test Type**	Dynamic Cone Penetration Test
Job No.	9901-08-20	**Test Reference**	CBR06
Client	DBFL	**By**	C. Byrne
		Date	29/08/2020
Initial Depth	Ground level		

Depth (mm bgl)	No. of Blows per 100mm	Penetration per Blow (mm)	CBR (%)
0	-	-	0.0
100	4	25.0	7.0
200	6	16.7	11.7
300	2	50.0	2.9
400	2	50.0	2.9
500	13	7.7	31.5
600	25	4.0	72.7
700			
800			
900			
1000			
1100	-		
1200	-		
1300	-		
1400	-		
1500	-		

Reference **Kleyn and Van Heerden (60° Cone)**
Formula Log10 (CBR) = 2.632 - 1.28 Log10 (mm/blow)



Gaelcholaiste An Phiarsaigh – CBR Pit Photographs

CBR01

CBR01

Gaelcholaiste An Phiarsaigh – CBR Pit Photographs

CBR2

CBR2

Gaelcholaiste An Phiarsaigh – CBR Pit Photographs

CBR3

CBR3

Gaelcholaiste An Phiarsaigh – CBR Pit Photographs

CBR4

CBR4

Gaelcholaiste An Phiarsaigh – CBR Pit Photographs

CBR5

CBR5

APPENDIX 8 – Laboratory Testing

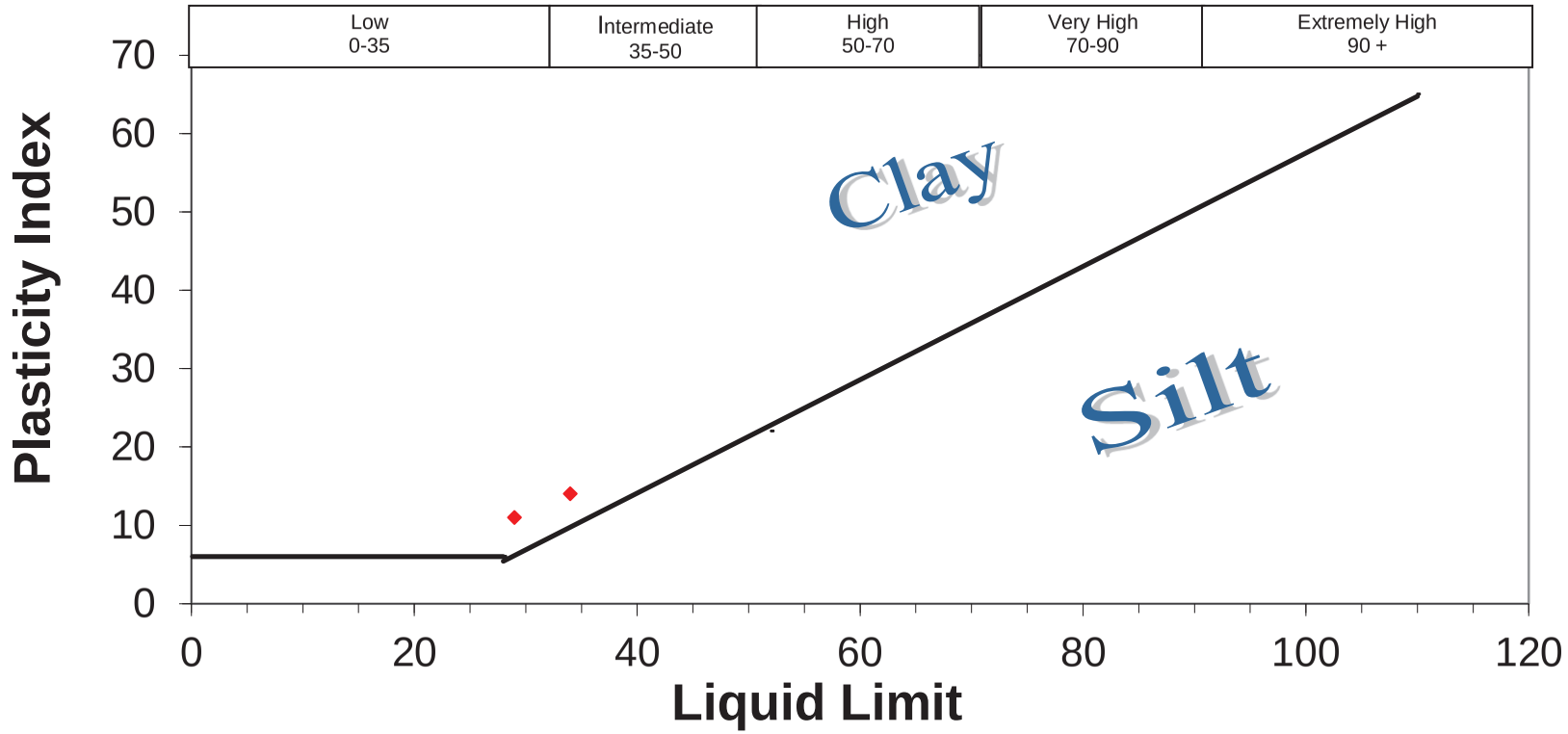
National Materials Testing Laboratory Ltd.

SUMMARY OF TEST RESULTS

				Particle			Index Properties		Bulk	Cell	Undrained Triaxial Tests		Lab	
BH/TP	Depth	sample	Moisture	Density	<425um	LL	PL	PI	Density	Presssure	Compressive	Strain at	Vane	Remarks
No	m	No.	%	Mg/m3	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	
BH02	3.00	B	12.4		40.6	34	20	14						
WS05	1.40-2.0	B	11.9		48.6	29	18	11						
NMTL		Notes :									Job ref No.	NMTL 3299	GII Project ID:	9855-08-20
		1. All BS tests carried out using preferred (definitive) method unless otherwise stated.									Location	Geal Cholaiste an Phiarsaigh		

NMTL LTD
Unit 18c, Tullow Industrial Estate
Tullow
County Carlow
Tel: 00353 59 9180822
Mob: 00353 872575508
billa@nmtl.ie

Contract:	**Geal Cholaiste an Phiarsaigh**
Client:	**Ground Investigations Ireland Ltd**
Engineer:	**Conor Finnerty**
GII Project ID	**9855-08-20**
Date:	**28/09/2020**
Tested By:	**Sb/Tzr/Ms** **Checked:** **Bc**
Job ref No.	**NMTL 3299**



NMTL Ltd

Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	90.5
37.500	85.3
28.000	74.6
20.000	70.4
14.000	66.2
10.000	62.3
6.300	57.9
5.000	55.8
3.350	53.9
2.000	50.5
1.180	46.7
0.600	42.6
0.425	40.6
0.300	38.6
0.212	36.5
0.150	34.5
0.063	29.4

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
0.0		29.4			21.1			49.5		0.0	0.0

Sample Description	Dark brown slightly sandy gravelly silty CLAY					Project No.	NMTL 3299
						BH/TP No.	BH02
Project	Geal Cholaiste an Phiarsaigh			GII Project ID-9855-08-20		Sample No.	B
Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	23/09/2020	Depth	3.0m

NM TL Ltd

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Determination of Particle Size Distribution

BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	89.0
28.000	83.3
20.000	79.5
14.000	76.5
10.000	73.8
6.300	68.7
5.000	65.7
3.350	62.9
2.000	59.1
1.180	55.3
0.600	50.8
0.425	48.6
0.300	46.2
0.212	43.7
0.150	41.2
0.063	35.1

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
0.0		35.1			24.1			40.9		0.0	0.0

Sample Description	Dark brown slightly sandy gravelly silty CLAY					Project No.	NMTL 3299
						BH/TP No.	WS05
Project	Geal Cholaiste an Phiarsaigh			GII Project ID-9855-08-20		Sample No.	B
Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	23/09/2020	Depth	1.40-2.0m

NM TL Ltd

Element Materials Technology
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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Mike Sutton
Date :	14th September, 2020
Your reference :	9901-08-20
Our reference :	Test Report 20/11850 Batch 1
Location :	Gaelcholaiste Phiarsaigh, Rathfarnham
Date samples received :	3rd September, 2020
Status :	Final report
Issue :	1

Fourteen samples were received for analysis on 3rd September, 2020 of which fourteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Phil Sommerton BSc
Senior Project Manager

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	WS03	WS03	WS04	WS04	WS05	WS06	WS06	WS07	WS07	BH02A			
Depth	1.20	2.20	0.20	0.70	1.70	0.70	1.60	0.70	1.70	1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020			
Antimony	2	2	<1	2	2	<1	1	2	2	<1	<1	mg/kg	TM30/PM15
Arsenic #	10.0	10.4	5.5	15.1	8.7	5.5	7.6	10.0	9.6	11.4	<0.5	mg/kg	TM30/PM15
Barium #	46	74	35	95	41	46	107	42	39	57	<1	mg/kg	TM30/PM15
Cadmium #	1.8	1.7	0.6	1.8	2.5	1.3	1.6	2.1	2.0	0.5	<0.1	mg/kg	TM30/PM15
Chromium #	20.4	26.7	40.1	32.8	22.0	22.6	20.5	20.3	19.4	34.2	<0.5	mg/kg	TM30/PM15
Copper #	47	28	13	20	27	15	31	29	26	24	<1	mg/kg	TM30/PM15
Lead #	20	38	14	22	25	11	15	16	17	30	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.9	2.6	1.0	3.4	3.0	2.1	2.8	1.8	2.9	1.7	<0.1	mg/kg	TM30/PM15
Nickel #	35.7	35.5	17.5	31.2	33.2	22.1	31.4	34.6	34.6	28.2	<0.7	mg/kg	TM30/PM15
Selenium #	2	2	1	2	1	<1	1	<1	<1	2	<1	mg/kg	TM30/PM15
Zinc #	89	90	57	93	90	53	67	79	81	61	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	0.28	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.12	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	1.00	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	0.96	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.17	5.35	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.41	<0.03	mg/kg	TM4/PM8
Anthracene #	0.08	1.95	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.22	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.56	6.56	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.81	<0.03	mg/kg	TM4/PM8
Pyrene #	0.53	4.91	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	1.75	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.28	2.33	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.91	<0.06	mg/kg	TM4/PM8
Chrysene #	0.30	2.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.09	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.70	3.96	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2.31	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.41	2.16	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	1.34	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	0.26	1.31	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.96	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.04	0.23	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.18	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.28	1.36	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	1.13	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	0.22	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.19	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	2.21	15.35	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	7.55	<0.22	mg/kg	TM4/PM8
PAH 17 Total	3.61	34.81	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	12.42	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.50	2.85	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.66	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.20	1.11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.65	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	108	109	109	107	106	109	106	102	104	106	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30	<30	<30	<30	79	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	WS03	WS03	WS04	WS04	WS05	WS06	WS06	WS07	WS07	BH02A			
Depth	1.20	2.20	0.20	0.70	1.70	0.70	1.60	0.70	1.70	1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020			
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1 SV	<0.1 SV	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1 SV	<0.1 SV	0.2	<0.1	<0.1	0.1	0.1	0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7	<7	<7	<7	<7	58	<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7	<7	<7	<7	21	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26	<26	<26	<26	<26	79	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1 SV	<0.1 SV	0.2	<0.1	<0.1	0.1	0.1	0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10	<10	<10	<10	<10	52	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	7	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	39	<7	<7	<7	<7	<7	<7	<7	14	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	154	<7	<7	<7	<7	<7	<7	<7	267	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7	<7	<7	<7	<7	103	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	200	<26	<26	<26	<26	<26	<26	<26	384	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	200	<52	<52	<52	<52	<52	<52	<52	463	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	90	<10	<10	<10	<10	<10	<10	<10	48	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	75	<10	<10	<10	<10	<10	<10	<10	233	<10	mg/kg	TM5/PM8/PM16
MTBE #	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	<5	<5 SV	<5	ug/kg	TM36/PM12
Benzene #	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	<5	<5 SV	<5	ug/kg	TM36/PM12
Toluene #	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	<5	<5 SV	<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	<5	<5 SV	<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	<5	<5 SV	<5	ug/kg	TM36/PM12
o-Xylene #	<5 SV	<5 SV	<5	<5	<5	<5	<5	<5	<5	<5 SV	<5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	WS03	WS03	WS04	WS04	WS05	WS06	WS06	WS07	WS07	BH02A			
Depth	1.20	2.20	0.20	0.70	1.70	0.70	1.60	0.70	1.70	1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020			
Natural Moisture Content	8.6	15.9	17.0	20.8	12.4	9.2	11.3	12.6	10.9	10.9	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	7.9	13.7	14.5	17.2	11.1	8.4	10.2	11.2	9.8	9.8	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	-	-	-	-	-	-	-	-	-	<0.0015	g/l	TM38/PM20
Chromium III	20.4	26.7	40.1	32.8	22.0	22.6	20.5	20.3	19.4	34.2	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.21	1.16	0.28	0.62	0.23	0.23	0.31	0.27	0.30	0.87	<0.02	%	TM21/PM24
pH #	8.44	8.03	8.16	8.38	8.38	8.79	8.73	8.64	8.74	8.51	<0.01	pH units	TM73/PM11
Mass of raw test portion	0.098	0.1023	0.1074	0.112	0.1024	0.0984	0.1044	0.1037	0.1026	0.1041		kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	31-33	34-36	37	38							LOD/LOR	Units	Method No.
Sample ID	IT01	IT01	BH02A	WS07									
Depth	0.50	1.50	3.00	1.50									
COC No / misc													
Containers	V J T	V J T	T	T									
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020									
Antimony	1	1	-	-							<1	mg/kg	TM30/PM15
Arsenic #	12.0	12.4	-	-							<0.5	mg/kg	TM30/PM15
Barium #	54	79	-	-							<1	mg/kg	TM30/PM15
Cadmium #	0.9	1.4	-	-							<0.1	mg/kg	TM30/PM15
Chromium #	43.1	40.7	-	-							<0.5	mg/kg	TM30/PM15
Copper #	18	25	-	-							<1	mg/kg	TM30/PM15
Lead #	29	48	-	-							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	-	-							<0.1	mg/kg	TM30/PM15
Molybdenum #	1.0	2.4	-	-							<0.1	mg/kg	TM30/PM15
Nickel #	23.6	28.4	-	-							<0.7	mg/kg	TM30/PM15
Selenium #	<1	1	-	-							<1	mg/kg	TM30/PM15
Zinc #	71	72	-	-							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	-	-							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	-	-							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	-	-							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	-	-							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.16	-	-							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	-	-							<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	0.26	-	-							<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.25	-	-							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	0.18	-	-							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.16	-	-							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	0.27	-	-							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.17	-	-							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene	<0.04	0.10	-	-							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	-	-							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	0.12	-	-							<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	-	-							<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	0.92	-	-							<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	1.67	-	-							<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	0.19	-	-							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	0.08	-	-							<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	-	-							<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	104	101	-	-							<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	-	-							<30	mg/kg	TM5/PM8/PM16

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37	38							LOD/LOR	Units	Method No.
Sample ID	IT01	IT01	BH02A	WS07									
Depth	0.50	1.50	3.00	1.50									
COC No / misc													
Containers	V J T	V J T	T	T									
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020									
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	-	-							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	-	-							<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	-	-							<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	-	-							<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	-	-							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	-	-							<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	-	-							<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	-	-							<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	-	-							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	-	-							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	-	-							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	-	-							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	-	-							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	-	-							<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	-	-							<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1	-	-							<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	-	-							<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	-	-							<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	-	-							<5	ug/kg	TM36/PM12
Benzene #	<5	<5	-	-							<5	ug/kg	TM36/PM12
Toluene #	<5	<5	-	-							<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	-	-							<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	-	-							<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	-	-							<5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	-	-							<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	-	-							<35	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	31-33	34-36	37	38							LOD/LOR	Units	Method No.
Sample ID	IT01	IT01	BH02A	WS07									
Depth	0.50	1.50	3.00	1.50									
COC No / misc													
Containers	V J T	V J T	T	T									
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020									
Natural Moisture Content	14.7	11.7	-	-							<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	12.8	10.5	-	-							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	-	-							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	-	0.1184	0.0125							<0.0015	g/l	TM38/PM20
Chromium III	43.1	40.7	-	-							<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.78	0.91	-	-							<0.02	%	TM21/PM24
pH #	8.37	8.44	8.45	8.56							<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1092	0.1008	-	-								kg	NONE/PM17
Mass of dried test portion	0.09	0.09	-	-								kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	WS03	WS03	WS04	WS04	WS05	WS06	WS06	WS07	WS07	BH02A			
Depth	1.20	2.20	0.20	0.70	1.70	0.70	1.60	0.70	1.70	1.00			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020			
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.0029	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.029	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.009	0.005	0.004	<0.003	0.011	<0.003	0.004	<0.003	<0.003	0.012	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.09	0.05	0.04	<0.03	0.11	<0.03	0.04	<0.03	<0.03	0.12	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.022	0.024	0.002	0.011	0.012	0.012	0.018	0.009	0.015	0.008	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.22	0.24	<0.02	0.11	0.12	0.12	0.18	0.09	0.15	0.08	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	0.004	<0.003	0.004	<0.003	<0.003	<0.003	0.003	<0.003	0.004	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	0.04	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	0.04	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	0.4	0.5	<0.3	<0.3	<0.3	0.4	0.4	0.3	0.4	<0.3	mg/l	TM173/PM0
Fluoride	<3	4	5	<3	<3	<3	4	4	<3	4	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	77.4	26.0	0.6	1.6	4.7	2.2	1.5	0.5	1.4	4.1	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	774	260	6	16	47	22	15	<5	14	41	<5	mg/kg	TM38/PM0
Chloride #	13.2	33.4	0.7	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	mg/l	TM38/PM0
Chloride #	132	334	7	<3	<3	<3	<3	<3	<3	3	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	<2	3	4	3	<2	<2	<2	2	<2	3	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	30	40	30	<20	<20	<20	<20	<20	30	<20	mg/kg	TM60/PM0
pH	8.08	7.93	8.12	8.10	8.21	8.48	8.39	8.32	8.39	7.77	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	194	174	71	52	66	<35	43	40	48	59	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1941	1740	710	520	660	<350	430	400	480	590	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	31-33	34-36									LOD/LOR	Units	Method No.
Sample ID	IT01	IT01											
Depth	0.50	1.50											
COC No / misc													
Containers	V J T	V J T											
Sample Date	01/09/2020	01/09/2020											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	03/09/2020	03/09/2020											
Dissolved Antimony #	<0.002	0.003									<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	0.03									<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025									<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025									<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.007	0.006									<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.07	0.06									<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005									<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005									<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015									<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015									<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007									<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07									<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005									<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05									<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.010	0.009									<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.10	0.09									<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002									<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02									<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003									<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03									<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.004	0.003									<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.04	0.03									<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001									<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001									<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01									<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1									<0.1	mg/kg	TM26/PM0
Fluoride	0.6	0.6									<0.3	mg/l	TM173/PM0
Fluoride	6	6									<3	mg/kg	TM173/PM0
Sulphate as SO4 #	13.9	8.2									<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	139	82									<5	mg/kg	TM38/PM0
Chloride #	3.9	2.1									<0.3	mg/l	TM38/PM0
Chloride #	39	21									<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	5	5									<2	mg/l	TM60/PM0
Dissolved Organic Carbon	50	50									<20	mg/kg	TM60/PM0
pH	8.06	8.15									<0.01	pH units	TM73/PM0
Total Dissolved Solids #	161	129									<35	mg/l	TM20/PM0
Total Dissolved Solids #	1609	1290									<350	mg/kg	TM20/PM0

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30						
Sample ID	WS03	WS03	WS04	WS04	WS05	WS06	WS06	WS07	WS07	BH02A						
Depth	1.20	2.20	0.20	0.70	1.70	0.70	1.60	0.70	1.70	1.00						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020	01/09/2020						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Date of Receipt	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020						
Solid Waste Analysis																
Total Organic Carbon #	1.21	1.16	0.28	0.62	0.23	0.23	0.31	0.27	0.30	0.87	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025 SV	<0.025 SV	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025 SV	6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	<30	<30	<30	79	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	2.21	15.35	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	7.55	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	3.61	34.81	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	12.42	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.029	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.09	0.05	0.04	<0.03	0.11	<0.03	0.04	<0.03	<0.03	0.12	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.22	0.24	<0.02	0.11	0.12	0.12	0.18	0.09	0.15	0.08	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	0.04	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	0.04	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1941	1740	710	520	660	<350	430	400	480	590	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	30	40	30	<20	<20	<20	<20	<20	30	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.098	0.1023	0.1074	0.112	0.1024	0.0984	0.1044	0.1037	0.1026	0.1041	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	91.6	88.4	83.6	80.6	88.0	91.5	85.9	86.6	87.4	86.3	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.892	0.888	0.882	0.878	0.888	0.892	0.885	0.886	0.887	0.886	-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	-	-	-		l	NONE/PM17
pH #	8.44	8.03	8.16	8.38	8.38	8.79	8.73	8.64	8.74	8.51	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	4	5	<3	<3	<3	4	4	<3	4	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	774	260	6	16	47	22	15	<5	14	41	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	132	334	7	<3	<3	<3	<3	<3	<3	3	800	15000	25000	<3	mg/kg	TM38/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton
EMT Job No: 20/11850

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	31-33	34-36									Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	IT01	IT01														
Depth	0.50	1.50														
COC No / misc																
Containers	V J T	V J T														
Sample Date	01/09/2020	01/09/2020														
Sample Type	Soil	Soil														
Batch Number	1	1														
Date of Receipt	03/09/2020	03/09/2020														
Solid Waste Analysis																
Total Organic Carbon #	0.78	0.91									3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025									6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035									1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30									500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	0.92									-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	1.67									100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025									0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.07	0.06									20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005									0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015									0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07									2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001									0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.10	0.09									0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02									0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05									0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	0.03									0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03									0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	0.04	0.03									4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1609	1290									4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	50	50									500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1092	0.1008									-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	82.2	89.0									-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.88	0.889									-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8									-	-	-		l	NONE/PM17
pH #	8.37	8.44									-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1									1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	6	6									-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	139	82									1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	39	21									800	15000	25000	<3	mg/kg	TM38/PM0

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland

Matrix : Solid

Reference: 9901-08-20

Location: Gaelcholaiste Phiarsaigh, Rathfarnham

Contact: Mike Sutton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
20/11850	1	WS03	1.20	1-3	No interpretation possible
20/11850	1	WS03	2.20	4-6	PAH's
20/11850	1	WS04	0.20	7-9	No interpretation possible
20/11850	1	WS04	0.70	10-12	No interpretation possible
20/11850	1	WS05	1.70	13-15	No interpretation possible
20/11850	1	WS06	0.70	16-18	No interpretation possible
20/11850	1	WS06	1.60	19-21	No interpretation possible
20/11850	1	WS07	0.70	22-24	No interpretation possible
20/11850	1	WS07	1.70	25-27	No interpretation possible
20/11850	1	BH02A	1.00	28-30	PAH's, Possible tarmac/bitumen & Trace of lubricating oil
20/11850	1	IT01	0.50	31-33	No interpretation possible
20/11850	1	IT01	1.50	34-36	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 20/08/9901
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton

Note:

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/11850	1	WS03	1.20	2	07/09/2020	**General Description (Bulk Analysis)**	Soil/Stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS03	2.20	5	07/09/2020	**General Description (Bulk Analysis)**	Soil/Stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS04	0.20	8	07/09/2020	**General Description (Bulk Analysis)**	Soil/Stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS04	0.70	11	07/09/2020	**General Description (Bulk Analysis)**	soil.stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS05	1.70	14	07/09/2020	**General Description (Bulk Analysis)**	soil.stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS06	0.70	17	07/09/2020	**General Description (Bulk Analysis)**	soil.stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS06	1.60	20	07/09/2020	**General Description (Bulk Analysis)**	soil.stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD

Client Name: Ground Investigations Ireland
Reference: 20/08/9901
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
20/11850	1	WS06	1.60	20	07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS07	0.70	23	07/09/2020	**General Description (Bulk Analysis)**	soil.stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	WS07	1.70	26	07/09/2020	**General Description (Bulk Analysis)**	soil.stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	BH02A	1.00	29	07/09/2020	**General Description (Bulk Analysis)**	soil-stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	IT01	0.50	32	07/09/2020	**General Description (Bulk Analysis)**	soil-stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD
20/11850	1	IT01	1.50	35	07/09/2020	**General Description (Bulk Analysis)**	soil-stones
					07/09/2020	**Asbestos Fibres**	NAD
					07/09/2020	**Asbestos ACM**	NAD
					07/09/2020	**Asbestos Type**	NAD
					07/09/2020	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 9901-08-20
Location: Gaelcholaiste Phiarsaigh, Rathfarnham
Contact: Mike Sutton

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 20/11850						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/11850

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

EMT Job No: 20/11850

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

EMT Job No: 20/11850

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE re	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

APPENDIX 9 – Groundwater Monitoring

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental

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GROUNDWATER MONITORING

Geal Cholaiste An Phiarsaigh

BOREHOLE	DATE	TIME	GROUNDWATER (m BGL)	Comments
WS06A	19/10/2020	18.10	1.58	