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Ground Investigations Ireland

Housing Bundle 4 & 5 - Lot 2 – Ballymun

National Development Finance Agency

Factual Ground Investigation Report

March 2024

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Ground Investigations Ireland Ltd. present the results of the fieldworks and laboratory testing in accordance with the specification and related documents provided by or on behalf of the client The possibility of variation in the ground and/or groundwater conditions between or below exploratory locations or due to the investigation techniques employed must be taken into account when this report and the appendices inform designs or decisions where such variation may be considered relevant. Ground and/or groundwater conditions may vary due to seasonal, man-made or other activities not apparent during the fieldworks and no responsibility can be taken for such variation. The data presented and the recommendations included in this report and associated appendices are intended for the use of the client and the client's geotechnical representative only and any duty of care to others is excluded unless approved in writing.

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CONTENTS

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APPENDICES

1.0 Preamble

On the instructions of Malone O'Regan Consultant Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between November 2023 and March 2024 at the site of the proposed residential development, Housing Bundle 4 & 5 Lot 2, Ballymun, County Dublin.

2.0 Overview

2.1. Background

It is proposed to construct a new residential development with associated services, access roads and car parking at the proposed site. The site is currently brownfield and is used as a greenspace between apartment buildings to the north and a housing estate to the west. This site was previously the location of the Ballymun Flats before it was redeveloped as a greenspace. 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 12 No. Trial Pits to a maximum depth of 3.70m BGL
- Carry out 5 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 22 No. Cable Percussion boreholes to a maximum depth of 7.60m BGL
- Carry out 5 No. Rotary Core Boreholes to a maximum depth of 28.00m BGL
- Carry out 14 No. Slit Trench to locate services and old foundations
- Installation of 3 No. Groundwater monitoring wells
- 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. Trial Pits

The trial pits were excavated using a JCB 3CX 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 trial pits were sampled, logged and photographed by an Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.

3.4. 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.

3.3. Slit Trenching

The slit trenches were excavated using a 3.5T 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 soil was slowly stripped using a spotter on the trench to alert the driver if any services were seen, to avoid damage to any underlying services. The slit trenches were sampled, logged and photographed by an Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the slit trench records which are provided in Appendix 4 of this Report.

3.5. 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 5 of this Report.

3.6. Rotary Boreholes

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown on the location plan in Appendix 1. The rotary boreholes were completed from the ground surface or alternatively, where noted on the individual borehole log, from the base of the cable percussion borehole where a temporary liner was installed to facilitate follow-on rotary coring.
The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the "overshoot" recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids.
It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 5 of this Report.

3.7. Surveying

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 as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

3.8. Groundwater Monitoring Installations

Groundwater 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 uPVC/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. 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/Engineers Ireland Suite I, organic matter, 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, Particle Size Distribution (PSD), hydrometer, tests were carried out in NMTL's Geotechnical Laboratory in Carlow. California Bearing Ratio (CBR), resistivity and redox tests were carried out in Professional Soils Laboratory (PSL Ltd) in the UK.
Rock strength testing including Point Load (Is_{50}) and Unconfined Compressive Strength (UCS) testing was carried out in CMTL Geotechnical Laboratory in Portlaoise.
The results of the laboratory testing are included in Appendix 6 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 consistent across the site and generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits
- Granular
- Bedrock

TOPSOIL: Topsoil was encountered in the majority of exploratory holes and was present to a maximum depth of 0.30m BGL.

MADE GROUND: Made Ground deposits were encountered beneath the Topsoil or from Surface and were present to depths between 0.60m and 4.10m BGL. These deposits were described generally as *brown slightly sandy gravelly CLAY* or *dark grey slightly sandy slightly gravelly CLAY with occasional fragments of concrete, red brick, metal, pipe and plastic.*

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Made Ground and were described typically as *brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders* overlying a *dark grey slightly sandy 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 2.0m BGL in the majority of the exploratory holes. These deposits had occasional, some or frequent cobble and boulder content, where noted on the exploratory hole logs.

GRANULAR DEPOSITS: A Granular deposit was encountered within the cohesive deposits at location BH02 and was typically described as *grey clayey sandy sub rounded to sub angular fine to coarse GRAVEL with occasional cobbles and rare boulders.* The secondary sand/gravel and silt/clay constituents may vary across the site and with depth while occasional or frequent cobble and boulder content also present where noted on the exploratory hole logs. Based on the SPT N values the deposit is typically dense.

BEDROCK: The rotary core boreholes recovered strong to very strong grey/dark grey massive fine grained argillaceous LIMESTONE. This is typical of the Calp Formation, which is noted on the geological mapping to the east of the proposed site. Rare visible pyrite veins were noted during logging which are typically present within the Calp Limestone.
The depth to rock varies from 16.30m BGL in BH02 to a maximum of 18.80m BGL in BH19 to the south of the site. The total core recovery is good, typically 100% with some of the uppermost runs dropping to 80 or 90%. The SCR and RQD both are relatively poor in the upper weathered zone, often recovered as non-intact, however both indices show an increase with depth in each of the boreholes.

4.2. Groundwater

Groundwater strikes are noted on the exploratory hole logs where they occurred and where possible drilling was suspended for twenty minutes to allow the subsequent rise in groundwater to be recorded. 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 tide, time of year, rainfall, nearby construction and other factors. For this reason, standpipes were installed in BH04, BH14A and BH19 to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendix 8 of this Report.

4.3. Laboratory Testing

4.3.1. 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 17.50% and 49.7% generally with fines contents of 18.50% to 65%.

The CBR testing on remoulded samples gave results ranging between 0.70% and 1.70% for the cohesive deposits. The Thermal Resistivity results range from 13.433 to 26.138 Ohms/m while the Redox potential range from 510 to 540 mV.

4.3.2. Chemical Laboratory Testing

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 with the exception of BH04 at 0.5m BGL. This sample was present in the more variable Made Ground stratum and the material testing indicates a DS-2 Classification for the specification of concrete. No special precautions are required for concrete foundations to prevent sulphate attack, with the exception of BH04 sample above. The samples tested were below the limits of DS-1 for the majority of tests completed, with one result below the limits of DS-2 in the BRE Special Digest 1:2005.

4.3.3. 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. A waste classification report is recommended to be carried out to provide an interpretation of the laboratory data should any material be required to be disposed of off site.

4.3.4. Rock Laboratory Testing

The rock testing carried out on samples recovered from the boreholes reported Unconfined Compressive Strength (UCS) values ranging between 87.3 and 118.5 MPa while the point load testing gave Is50 values ranging between 3.00 to 6.93 MPa. The Is_{50} results correlate to the UCS values using a factor of approximately 20, giving values of 60 MPa and 138.6 MPa. These results correlate to the strength descriptions ranging between of Strong to very Strong and confirming the variability of this stratum and the descriptions on the logs.

The results from the completed laboratory testing are included in Appendix 6 of this report.

The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations.

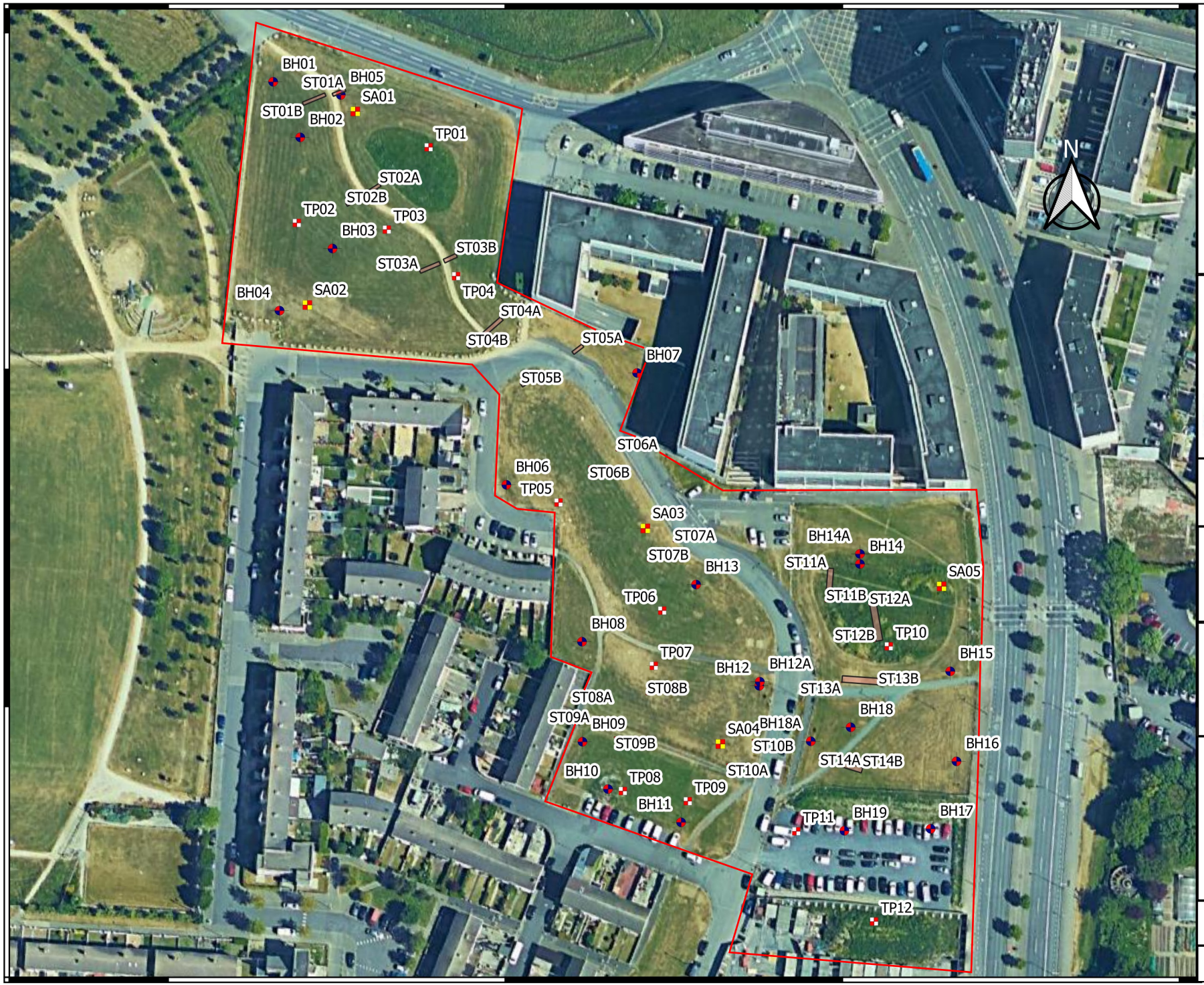
Any waste material to be removed off site should be disposed of to a suitably licenced landfill.

5.5. Soakaway Design

At the locations of SA01, SA02, SA03, SA04 and SA05 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



Trial Pit
Soakaway
Boreholes
Slit Trench
Site Location
Indicative Site Boundary

Client:

MALONE O'REGAN
CONSULTING ENGINEERS

Project Code:

13061-08-23

Project Title:

Housing Bundle 4 & 5 - Lot 2
Ballymun

Drawing Title:

Figure 1 Site Location

GROUND INVESTIGATIONS IRELAND
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Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

0 10 20 30 40 50 m

Drawn By:	Date:
DML	11.01.24

APPENDIX 2 – Trial Pit Records

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP01

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	2.70m x 0.70m x 2.80m (L x W x D)	65.15	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715277.3 E 740365.8 N	19/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				64.85	0.30	MADE GROUND brown slightly sandy gravelly Clay with occasional sub angular to sub rounded cobbles and fragments of red brick, timber and wire		
0.70	B1				(0.70)			
				64.15	1.00	Firm brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
1.20	B2				(0.60)			
				63.55	1.60	Stiff brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
2.00	B3				(1.00)			
				62.55	2.60	Stiff grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles		▽1
2.60	B4		Slow(1) at 2.70m.		(0.20)			
				62.35	2.80	OBSTRUCTION: Due to possible boulder or bedrock		
						Complete at 2.80m		

Plan

Remarks

Groundwater encountered at 2.70m BGL
Trial pit side walls collapsing
Trial pit terminated due to bedrock
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP01

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP02

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.50m x 0.70m x 3.40m (L x W x D)	64.74	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715238.1 E 740343.3 N	19/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				64.44	0.30			
0.50	B1					MADE GROUND brown slightly sandy gravelly Clay with fragments of plastic, pipe and fabric		
					(0.70)			
				63.74	1.00			
1.20	B2					MADE GROUND grey slightly sandy gravelly Clay with fragments of wire, plastic and metal		
					(0.80)			
			Slow(1) at 1.70m.					▽1
				62.94	1.80			
2.00	B3					Firm brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles and boulders		
					(1.40)			
3.00	B4							
				61.54	3.20			
					(0.20)	Firm dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles and boulders		
3.30	B5			61.34	3.40	OBSTRUCTION: Due to large boulder		
						Complete at 3.40m		

Plan

Remarks

Groundwater encountered at 1.70m BGL
Trial pit side walls collapsing
Trial pit terminated due to a large boulder or bedrock
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP02

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP03

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	4.00m x 0.50m x 3.50m (L x W x D)	63.78	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715264.8 E 740341.3 N	23/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				63.48	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic and red bricks		
0.50	B1				(0.60)			
				62.88	0.90	Soft to firm brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles and boulders		
1.00	B2				(0.60)			▽1
			Slow/ Moderate(1) at 1.40m.	62.28	1.50	Firm dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
2.00	B3				(1.10)			
				61.18	2.60	Firm to stiff dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
					(0.50)			
3.00	B4			60.68	3.10	Stiff dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles and boulders		
					(0.40)			
3.50	B5			60.28	3.50	OBSTRUCTION: Due to large boulder		
						Complete at 3.50m		

Plan

Remarks

Groundwater encountered at 1.40m BGL
Trial pit side walls stable
Trial pit terminated due to a large boulder
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP03

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP04

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	4.60m x 0.50m x 1.00m (L x W x D)	63.43	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715285.4 E 740327.5 N	23/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				63.13	0.30			
0.50	B1				(0.60)	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic, concrete, metal, pipe		
			Slow(1) at 0.90m.	62.53	0.90	OBSTRUCTION: Due to old foundation		▽1
						Complete at 1.00m		

Plan

Remarks

Groundwater encountered at 0.90m BGL
Trial pit side walls stable
Trial pit terminated due to possible foundation
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP04

Ground Investigations Ireland Ltd
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Site	Trial Pit Number
Housing Bundle_Ballymun	TP05

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.30m x 0.50m x 3.70m (L x W x D)	63.60	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715315.8 E 740260.3 N	23/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				63.30	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic and red bricks		
0.50	B1				(0.60)			
				62.70	0.90	Firm dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
1.00	B2				(0.70)			
				62.00	1.60	Firm to stiff dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
2.00	B3				(0.80)			
			Slow(1) at 2.40m.	61.20	2.40	Stiff dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		▽1
					(0.80)			
3.00	B4							
				60.40	3.20	Stiff dark grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles and boulders		
					(0.50)			
3.70	B5			59.90	3.70	OBSTRUCTION: Due to large boulder		
						Complete at 3.70m		

Plan

Remarks

Groundwater encountered at 2.40m BGL
Trial pit side walls collapsing
Trial pit terminated due to a large boulder
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP05

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP06

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.40m x 0.50m x 1.60m (L x W x D)	63.07	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715346.5 E 740228.3 N	23/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				62.77	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic, concrete, red brick, pipe		
0.50	B1				(0.50)			
				62.27	0.80	Firm grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
1.00	B2				(0.80)			▽1
			Fast(1) at 1.30m.					
				61.47	1.60	Terminated Trial pit due to groundwater		
						Complete at 1.60m		

Plan

Remarks

Groundwater encountered at 1.30m BGL
Trial pit side walls stable
Trial pit terminated due to groundwater
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP06

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP07

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.80m x 1.00m x 3.50m (L x W x D)	63.21	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715344 E 740211.8 N	23/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				62.91	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic, wire, metal, pipe		
0.50	B1				(0.90)			
1.00	B2			62.01	1.20	Firm grey slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
					(0.80)			
2.00	B3			61.21	2.00	Stiff grey slightly sandy very gravelly CLAY with some sub angular to sub rounded cobbles		
			Slow(1) at 2.60m.		(1.00)			▽1
3.00	B4			60.21	3.00	Stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
					(0.50)			
3.50	B5			59.71	3.50	OBSTRUCTION: Due to large boulder		
						Complete at 3.50m		

Plan

Remarks

Groundwater encountered at 2.60m BGL
Trial pit side walls collapsing
Trial pit terminated due to a large boulder
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP07

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP08

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.30m x 0.50m x 3.40m (L x W x D)	63.31	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715334.9 E 740174.7 N	23/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				63.01	0.30	MADE GROUND brown slightly sandy slightly gravelly Clay with grass and rootlets and rare fragments of red bricks		
0.50	B1				(0.60)			
				62.41	0.90	Firm light brown slightly sandy slightly gravelly CLAY		
1.00	B2				(0.60)			
				61.81	1.50	Firm greyish brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
2.00	B3				(0.90)			
			Slow(1) at 2.30m.					▽1
				60.91	2.40	Firm greyish brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
					(0.50)			
				60.41	2.90	Stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
3.00	B4				(0.50)			
3.40	B5		Slow(2) at 3.40m.	59.91	3.40	OBSTRUCTION: Due to large boulder		▽2
						Complete at 3.40m		

Plan

Remarks

Groundwater encountered at 2.30m and 3.40m BGL
Trial pit side walls spalling
Trial pit terminated due to a large boulder
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP08

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP09

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	2.20m x 0.50m x 2.00m (L x W x D)	63.00	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715354.1 E 740171.7 N	24/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				62.70	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic		
0.50	B1				(0.50)			
				62.20	0.80	POSSIBLE MADE GROUND brown slightly sandy gravelly Clay with occasional sub angular to sub rounded cobbles and boulders		
					(0.40)			
1.20	B2		Slow(1) at 1.20m.	61.80	1.20	Soft to firm brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		▽1
					(0.40)			
				61.40	1.60	Firm brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
					(0.60)			
2.20	B3			60.80	2.20	Terminated Trial pit due to side walls collapsing		
						Complete at 2.20m		

Plan

Remarks

Groundwater encountered at 1.20m BGL
Trial pit side walls collapsing
Trial pit terminated due to side walls collapsing
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP09

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP10

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	4.20m x 0.50m x 1.70m (L x W x D)	62.66	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715413.8 E 740217.6 N	24/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				62.36	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic		
0.50	B1							
					(1.30)			
1.00	B2							
				61.06	1.60			
					(0.10)	MADE GROUND brown very sandy gravelly CLAY with pipe		
				60.96	1.70	OBSTRUCTION: Due to services		
						Complete at 1.70m		

Plan

Remarks

No groundwater encountered
Trial pit side walls stable
Trial pit terminated due to services
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP10

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP11

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	2.80m x 0.50m x 3.30m (L x W x D)	63.06	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715386.3 E 740162.8 N	24/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				62.76	0.30			
					(0.10)	MADE GROUND grey slightly sandy very gravelly Clay with grass and rootlets and fragments of plastic and geotextile		
			Slow(1) at 0.40m.	62.66	0.40			▽1
0.50	B1				(0.50)	MADE GROUND brown slightly sandy gravelly Clay with rare sub angular to sub rounded cobbles		
				62.16	0.90			
1.00	B2				(0.90)	Stiff brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
				61.26	1.80			
2.00	B3				(1.10)	Stiff brown slightly sandy gravelly CLAY with occasional sub angular to sub rounded cobbles		
				60.16	2.90			
3.00	B4				(0.40)	Stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
				59.76	3.30	OBSTRUCTION: Due to large boulder		
						Complete at 3.30m		

Plan

Remarks

Groundwater encountered at 0.40m BGL
Trial pit side walls stable
Trial pit terminated due to possible large boulder
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP11

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	TP12

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	2.90m x 0.50m x 1.50m (L x W x D)	63.40	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715409.4 E 740135.9 N	24/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
				63.10	0.30	MADE GROUND brown slightly sandy gravelly Clay with grass and rootlets and fragments of plastic, concrete, metal		
0.50	B1							
					(1.20)			
1.00	B2							
			Slow/ Moderate(1) at 1.40m.					▽1
				61.90	1.50	OBSTRUCTION: Due to old foundation		
						Complete at 1.50m		

Plan

Remarks

Groundwater encountered at 1.40m BGL
Trial pit side walls stable
Trial pit terminated due to possible foundation
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	GGR	13061-08-23(4).TP12

Housing Bundle - Ballymun

TP01

Housing Bundle - Ballymun

TP02

Housing Bundle - Ballymun

TP03

Housing Bundle - Ballymun

TP04

Housing Bundle - Ballymun

TP05

Housing Bundle - Ballymun

TP06

Housing Bundle - Ballymun

TP07

Housing Bundle - Ballymun

TP08

Housing Bundle - Ballymun

TP09

Housing Bundle - Ballymun

TP10

Housing Bundle - Ballymun

TP11

Housing Bundle - Ballymun

TP12

APPENDIX 3 – Soakaway 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

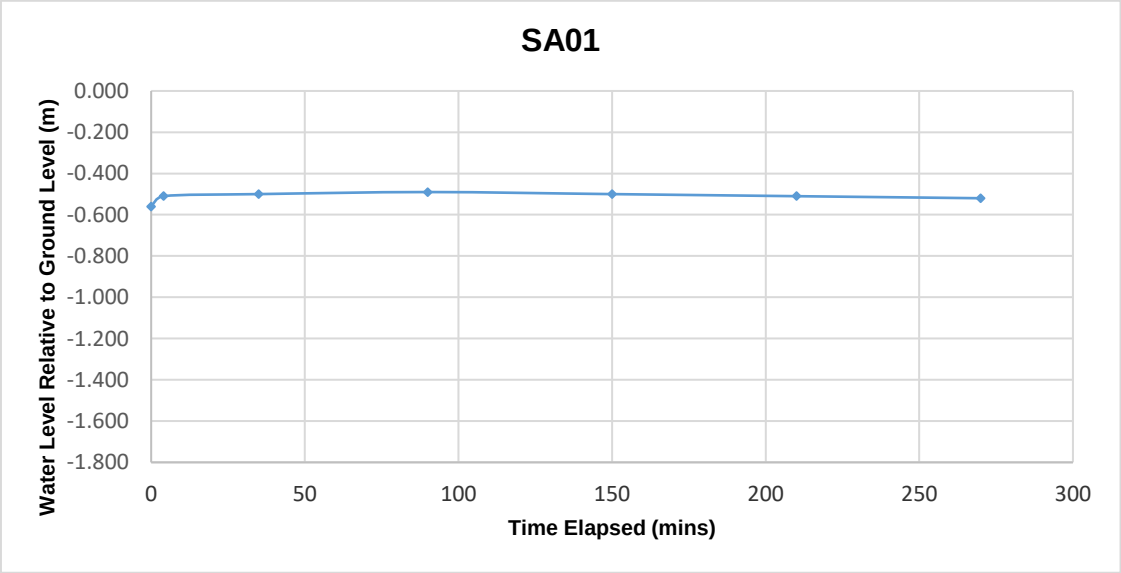
SA01

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 3.60m x 0.50m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
26/10/2023	0	-0.560
26/10/2023	4	-0.510
26/10/2023	35	-0.500
26/10/2023	90	-0.490
26/10/2023	150	-0.500
26/10/2023	210	-0.510
26/10/2023	270	-0.520

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.56	1.800	1.240	0.87	1.49



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

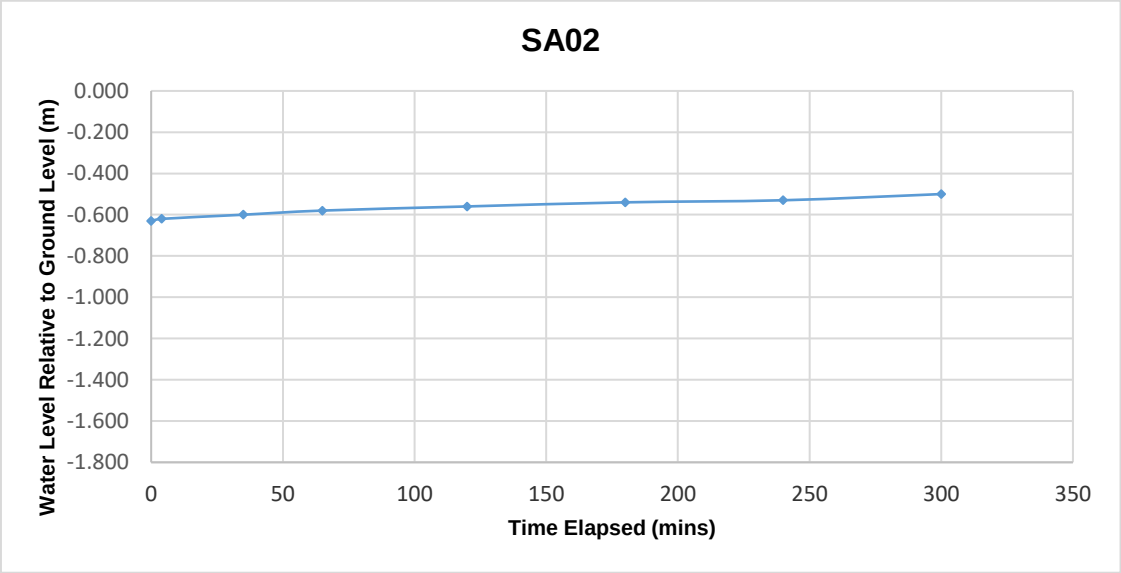
SA02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 3.10m x 0.50m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
26/10/2023	0	-0.630
26/10/2023	4	-0.620
26/10/2023	35	-0.600
26/10/2023	65	-0.580
26/10/2023	120	-0.560
26/10/2023	180	-0.540
26/10/2023	240	-0.530
26/10/2023	300	-0.500

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.63	1.800	1.170	0.9225	1.5075



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

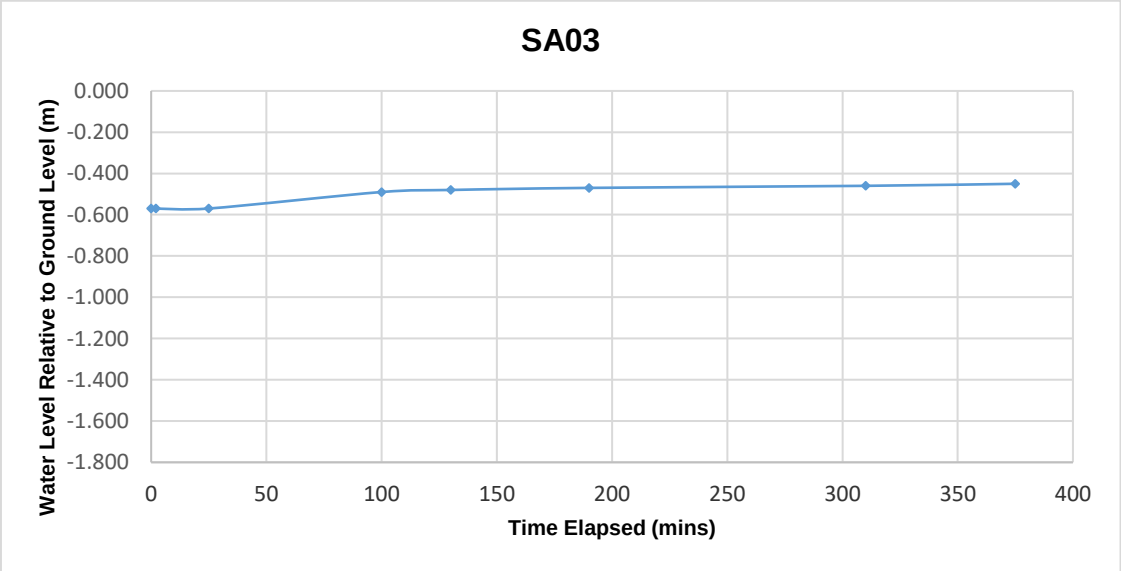
SA03

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 3.20m x 0.50m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
25/10/2023	0	-0.570
25/10/2023	2	-0.570
25/10/2023	25	-0.570
25/10/2023	100	-0.490
25/10/2023	130	-0.480
25/10/2023	190	-0.470
25/10/2023	310	-0.460
25/10/2023	375	-0.450

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.57	1.800	1.230	0.8775	1.4925



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

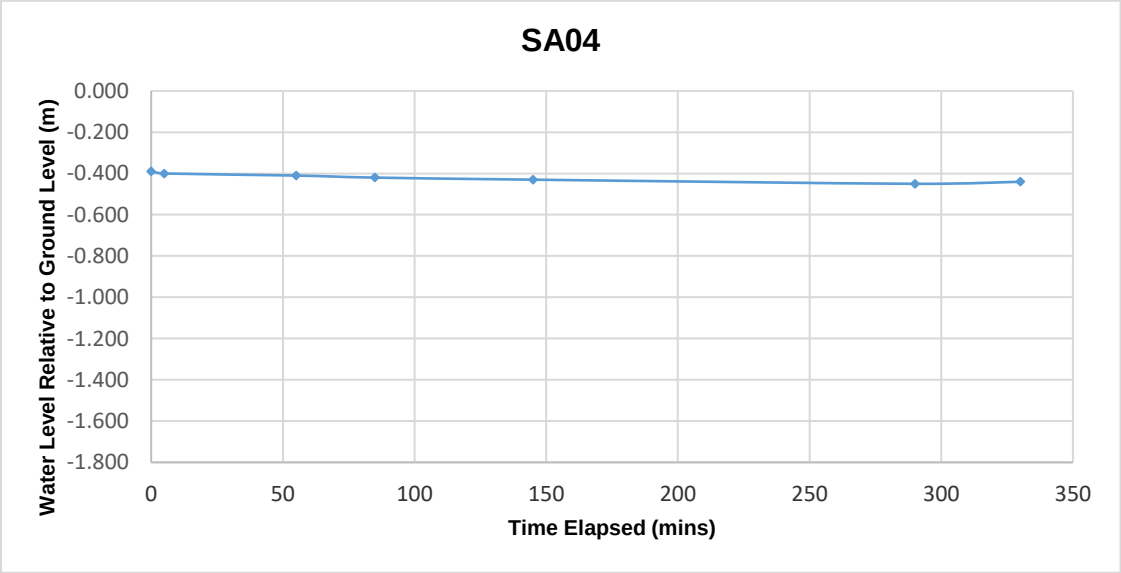
SA04

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 3.40m x 0.50m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
25/10/2023	0	-0.390
25/10/2023	5	-0.400
25/10/2023	55	-0.410
25/10/2023	85	-0.420
25/10/2023	145	-0.430
25/10/2023	290	-0.450
25/10/2023	330	-0.440

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.39	1.800	1.410	0.7425	1.4475



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

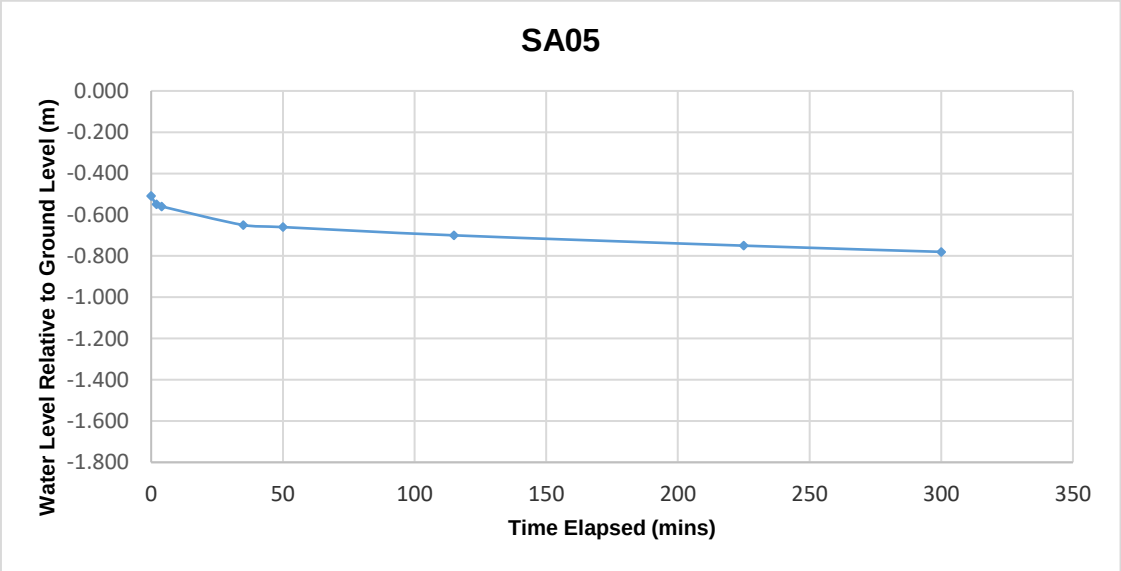
SA05

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.60m x 0.50m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
25/10/2023	0	-0.510
25/10/2023	2	-0.550
25/10/2023	4	-0.560
25/10/2023	35	-0.650
25/10/2023	50	-0.660
25/10/2023	115	-0.700
25/10/2023	225	-0.750
25/10/2023	300	-0.780

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.51	1.800	1.290	0.8325	1.4775



Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	SA01

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.60m x 0.50m x 1.80m (L x W x D)	64.96	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715255.4 E 740376.4 N	26/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly sandy slightly gravelly TOPSOIL with grass and roots		
				64.76	0.20			
					(0.50)	MADE GROUND: brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of concrete. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
				64.26	0.70			
					(1.10)	MADE GROUND: brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and boulders with concrete and brick fragments. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
				63.16	1.80	Complete at 1.80m		

Plan

Remarks

No groundwater encountered
Sidewalls stable
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	JI	13061-08-23(4).SA01

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	SA02

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.10m x 0.50m x 1.80m (L x W x D)	64.34	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715241.2 E 740318.9 N	26/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly sandy slightly gravelly TOPSOIL with grass and roots		
				64.14	0.20			
					(0.30)	MADE GROUND: Brown slightly sandy gravelly Clay with concrete fragments and occasional subangular to subrounded cobbles and boulders. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
				63.84	0.50			
			Water strike(1) at 0.80m.			MADE GROUND: Brown slightly sandy gravelly Clay with concrete fragments. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		▽1
					(1.30)			
				62.54	1.80			
						Complete at 1.80m		

Plan

Remarks

Groundwater encountered at 0.80m BGL slow rate
Sidewalls stable
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	JI	13061-08-23(4).SA02

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	SA03

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.20m x 0.50m x 1.80m (L x W x D)	62.40	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715341.4 E 740252.6 N	25/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly sandy slightly gravelly TOPSOIL with grass and roots		
				62.20	0.20			
					(0.70)	MADE GROUND: Grey slightly sandy gravelly Clay with concrete fragments. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
				61.50	0.90			
			Water strike(1) at 1.00m.		(0.90)	MADE GROUND: Dark grey slightly sandy gravelly Clay with pipe fragments. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		▽1
				60.60	1.80			
						Complete at 1.80m		

Plan

Remarks

Groundwater encountered at 1.00m BGL moderate rate
Trial pit terminated at 1.80m due to pipe
Sidewalls stable
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	JI	13061-08-23(4).SA03

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	SA04

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	3.40m x 0.50m x 1.80m (L x W x D)	62.63	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715363.7 E 740188.6 N	25/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly sandy slightly gravelly TOPSOIL		
				62.43	0.20	MADE GROUND: Grey slightly sandy slightly gravelly Clay with concrete fragments. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
					(0.70)			
				61.73	0.90	Soft to firm brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
					(0.50)			
				61.23	1.40	Firm brown slightly sandy slightly gravelly CLAY with occasional subangular to subrounded cobbles. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
					(0.40)			
				60.83	1.80	Complete at 1.80m		

Plan

Remarks

No groundwater encountered
Sidewalls stable
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	JI	13061-08-23(4).SA04

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Housing Bundle_Ballymun	SA05

Excavation Method	Dimensions	Ground Level (mOD)	Client	Job Number
Trial Pit	2.60m x 0.50m x 1.80m (L x W x D)	62.35	National Development Finance Agency	13061-08-23(4)
	Location	**Dates**	**Engineer**	**Sheet**
	715429.3 E 740235.4 N	25/10/2023		1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	Brown slightly sandy slightly gravelly TOPSOIL with grass and roots		
				62.15	0.20			
					(0.30)	MADE GROUND: Grey slightly sandy gravelly Clay with concrete and pipe fragments. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		
				61.85	0.50			
			Water strike(1) at 1.40m.		(1.30)	MADE GROUND: Brown slightly sandy gravelly Clay with pipe at 1.80m. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse.		▽1
				60.55	1.80	Complete at 1.80m		

Plan

Remarks

Groundwater encounteres at 1.4m BGL slow/moderate rate
Sidewalls collapsing
Trial pit terminated at 1.80m due to pipe
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	JI	13061-08-23(4).SA05

Housing Bundle_ Ballymun

IT01

Housing Bundle_ Ballymun

IT02

Housing Bundle_ Ballymun

IT03

Housing Bundle_ Ballymun

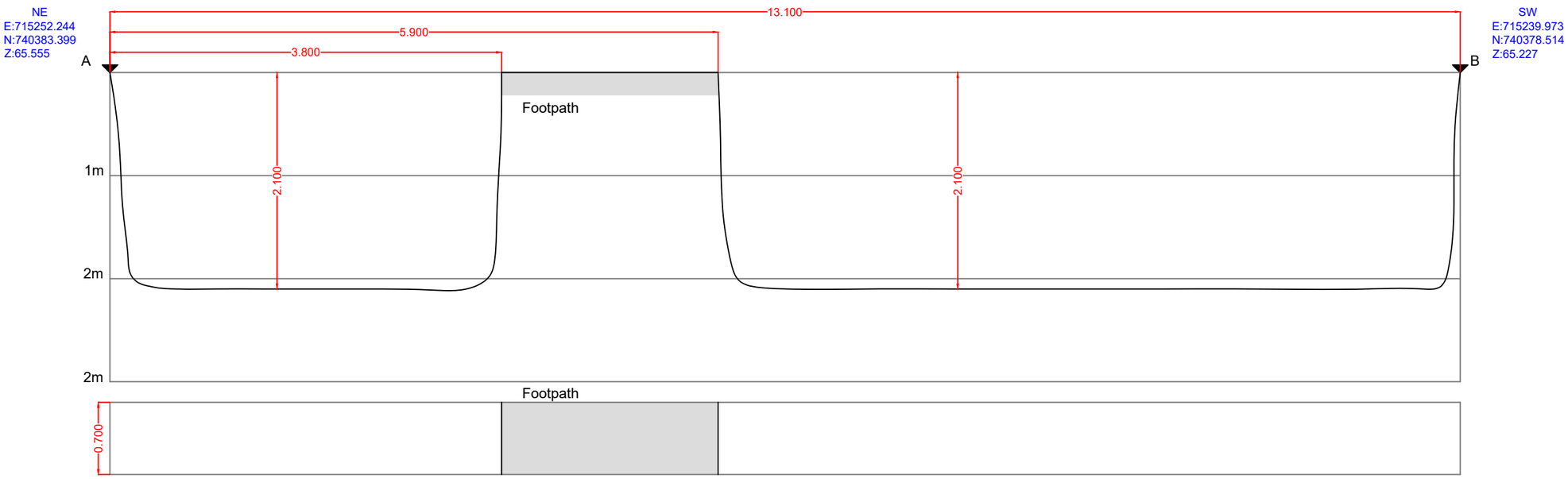
IT04

Housing Bundle_ Ballymun

IT05

APPENDIX 4 – Slit Trench Records

ST-01



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	3.80	GRASS
3.80	5.90	GRAVEL
5.90	13.10	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	1.30	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of plastic, styrofoam, metal, wire.
1.30	2.10	Firm to stiff brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders.

Groundwater	Y/N	Depth	Notes
Slow	Y	0.50	

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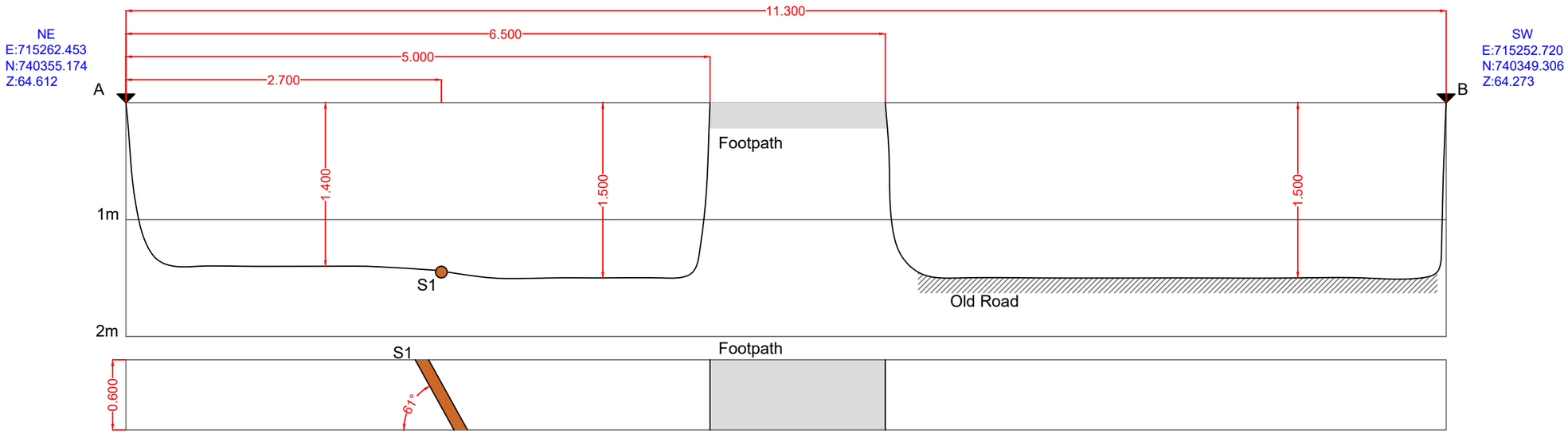
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-01
DATE:	12/12/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	13/12/2023	J.S.	G.R.

ST-02



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	
S1	0.100	Brown - Plastic	Storm water	61°	715260.240	740353.563	64.429

Surface from/to (m)		Surface type
0.00	5.00	GRASS
5.00	6.50	GRAVEL
6.50	11.30	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	1.50	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of plastic, metal, service pipe.

Groundwater	Y/N	Depth	Notes
Slow	Y	1.50	

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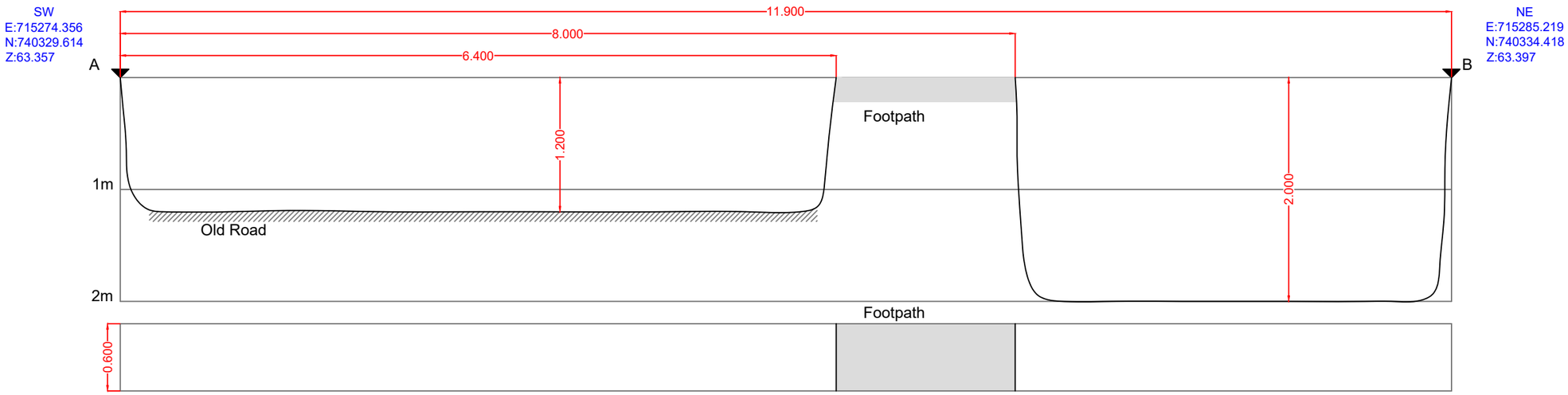
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-02
DATE:	15/11/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	13/12/2023	J.S.	G.R.

ST-03



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	6.40	GRASS
6.40	8.00	GRAVEL
8.00	11.90	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	1.10	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of plastic, timber, concrete.
1.10	2.00	Possible MADE GROUND: Grey slightly sandy gravelly Clay with occasional subangular to subrounded cobbles.

Groundwater	Y/N	Depth	Notes
Moderate	Y	1.10	

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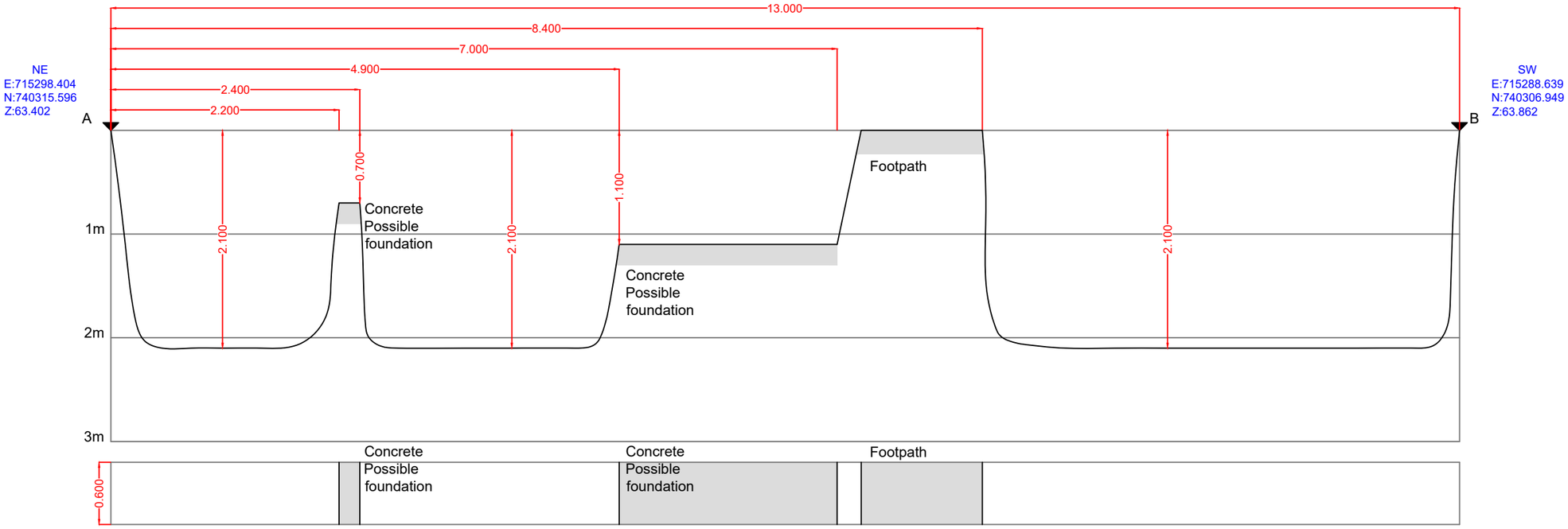
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-03
DATE:	15/11/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	13/12/2023	J.S.	G.R.

ST-04



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	7.00	GRASS
7.00	8.40	GRAVEL
8.40	13.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	0.70	MADE GROUND: Grey slightly sandy gravelly Clay with some subangular to subrounded cobbles and fragments of timber, plastic, tarmacadam.
0.70	2.10	MADE GROUND: Brown slightly sandy gravelly Clay with some subangular to subrounded cobbles and tarmacadam at bottom of trench (old road).

Groundwater	Y/N	Depth	Notes
Slow	Y	2.00	

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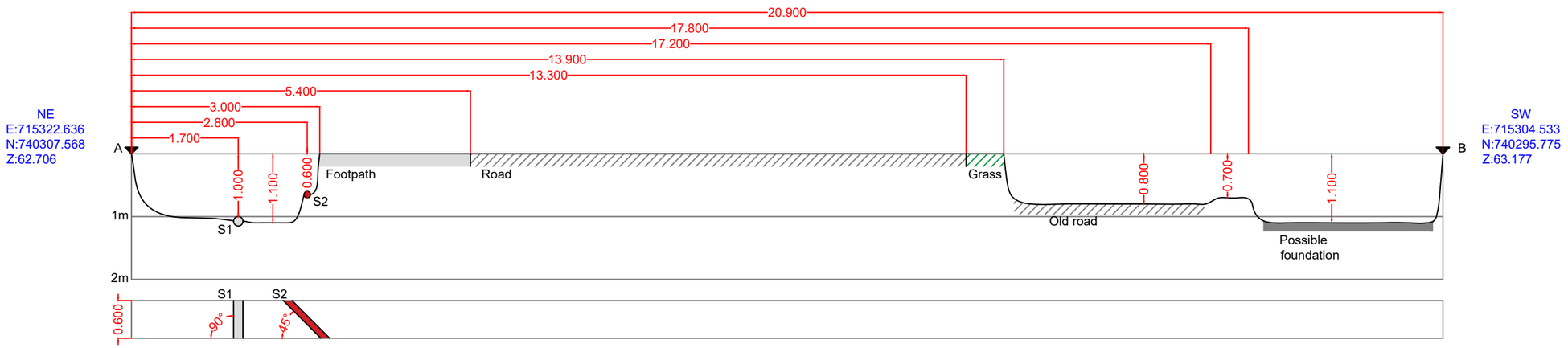
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-04
DATE:	14/11/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	13/12/2023	J.S.	G.R.

ST-05



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	
S1	0.150	Concrete	GW	90°	715321.221	740306.082	62.390
S2	0.100	Red - Plastic	ESB	65°	715320.286	740305.749	61.717

Surface from/to (m)		Surface type
0.00	3.00	GRASS
3.00	13.30	TARMACADAM
13.30	20.90	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	1.10	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles, service pipes and fragments of timber, plastic.

Groundwater	Y/N	Depth	Notes
Slow	Y	1.00	

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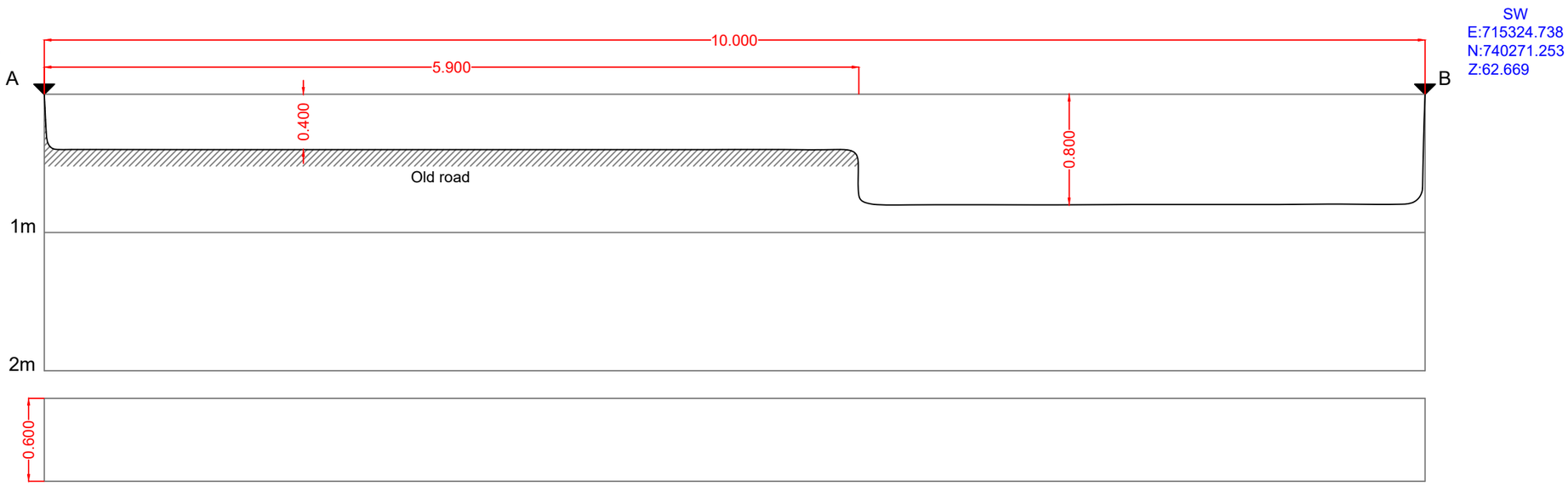
DRAWING No.:	ST-05
DATE:	14/11/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	13/12/2023	J.S.	G.R.

ST-06

NE
E:715332.969
N:740275.956
Z:62.007

SW
E:715324.738
N:740271.253
Z:62.669



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	0.80	MADE GROUND: Brown slightly sandy gravelly Clay with fragments of concrete, tarmacadam, pipe, plastic, steel.

Groundwater	Y/N	Depth	Notes
	N		

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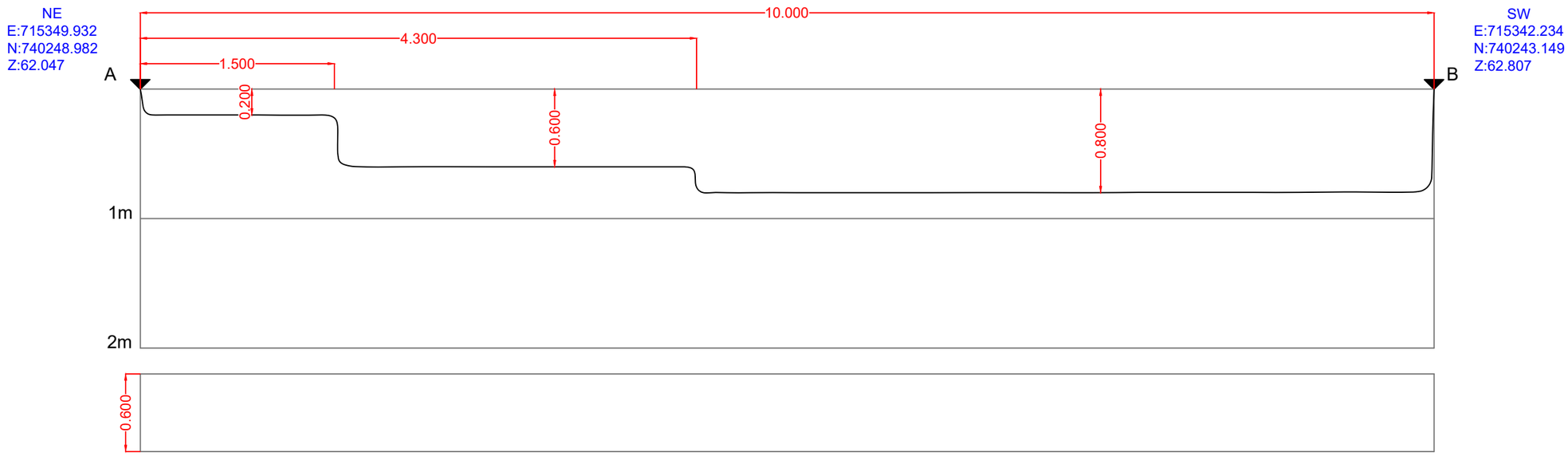
DRAWING No.:	ST-06
DATE:	27/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-07



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	0.80	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of plastic, tarmacadam, concrete.

Groundwater	Y/N	Depth	Notes
Slow	Y	0.50	

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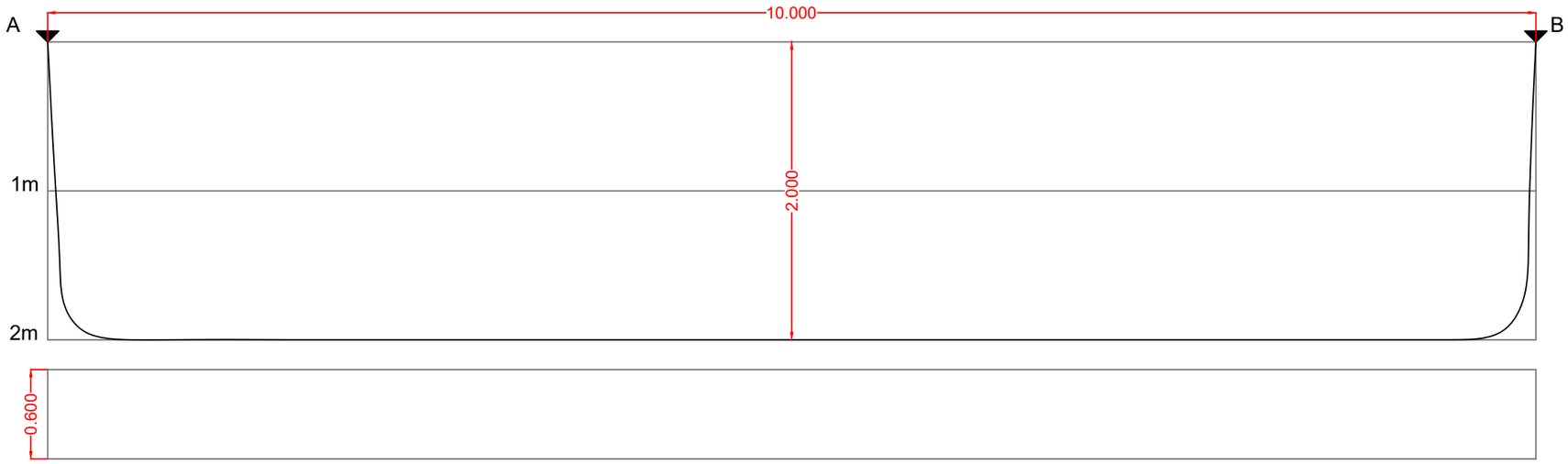
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-07
DATE:	27/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-08

SE
E:715331.987
N:740200.927
Z:63.236

NW
E:715341.886
N:740203.603
Z:63.204



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	2.00	MADE GROUND: Brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles and boulders.

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

Groundwater	Y/N	Depth	Notes
Slow	Y	1.90	

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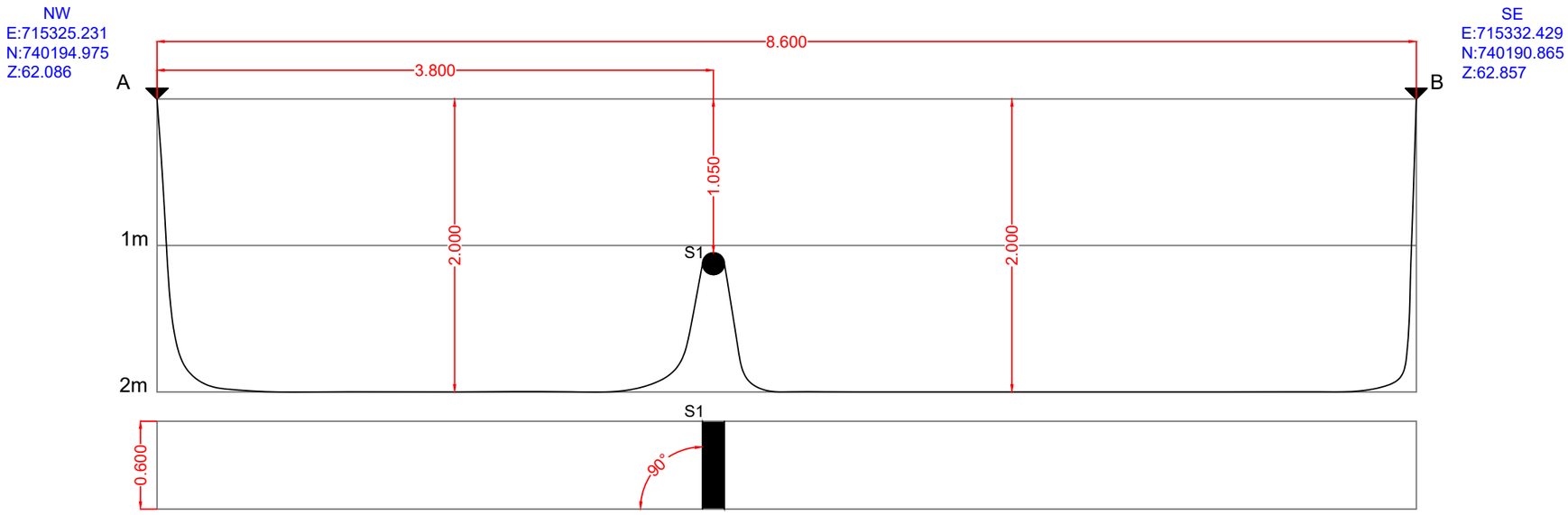
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-08
DATE:	26/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-09



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	
S1	0.150	Black - Steel	Water main	90°	715327.812	740192.635	62.940

Surface from/to (m)		Surface type
0.00	8.60	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Dark brown TOPSOIL with rootlets.
0.20	0.70	MADE GROUND: Dark brown slightly gravelly Clay. Gravel is fine to coarse subangular to subrounded with low subangular cobbles with fragments of plastic (medium), red brick and metal fragments.
0.70	2.00	MADE GROUND: Brown slightly gravelly Clay. Gravel is fine to coarse angular to subrounded with low subangular cobbles, red brick with low subrounded boulders and plastic fragments.

Groundwater	Y/N	Depth	Notes
Slow	Y	1.70	

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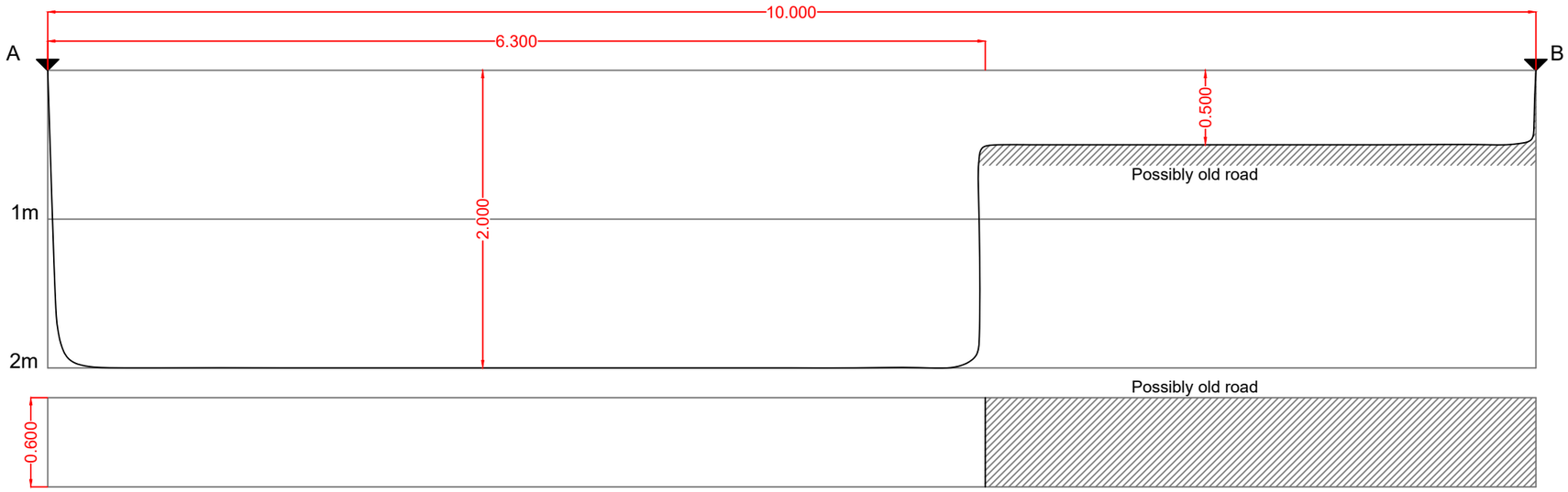
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-09
DATE:	27/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-10

SW
E:715365.760
N:740182.832
Z:62.257

NE
E:715373.337
N:740190.078
Z:62.118



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	1.60	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of plastic, concrete, steel, timber.
1.60	2.00	Firm brown slightly sandy gravelly CLAY with occasional subangular to subrounded cobbles.

Groundwater	Y/N	Depth	Notes
	N		

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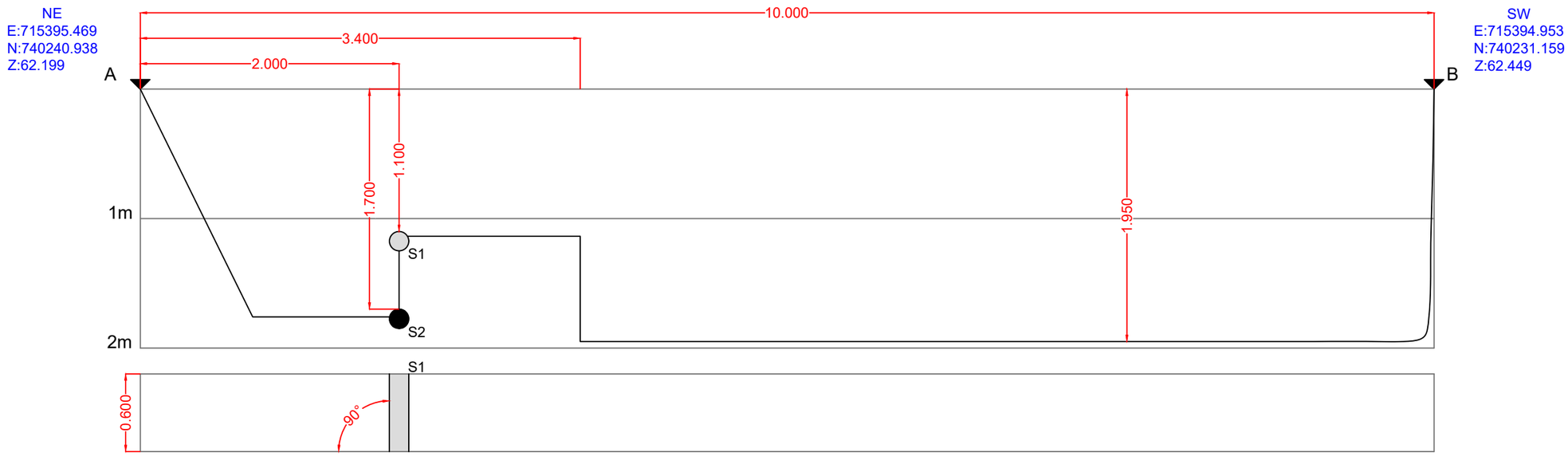
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-10
DATE:	26/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-11



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	
S1	-	Concrete	Sewer	90°			
S2	-	Black - Steel	Water main	90°			

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	0.80	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of red brick, concrete, timber, plastic.
0.80	1.95	MADE GROUND: Grey slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of concrete.

Groundwater	Y/N	Depth	Notes
Slow	Y	1.95	

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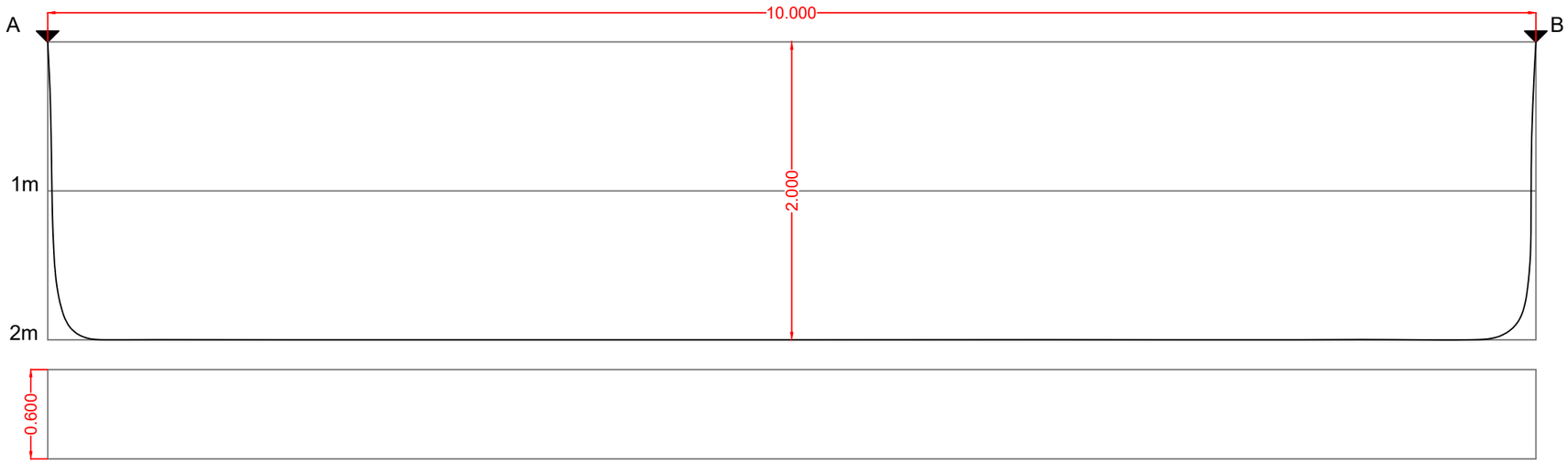
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-11
DATE:	25/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-12

NW
E:715407.883
N:740230.183
Z:63.016

SE
E:715409.781
N:740219.318
Z:62.748



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	2.00	MADE GROUND: Brown slightly sandy gravelly Clay with occasional subangular to subrounded cobbles and fragments of plastic, timber, red brick, metal, concrete.

Groundwater	Y/N	Depth	Notes
	N		

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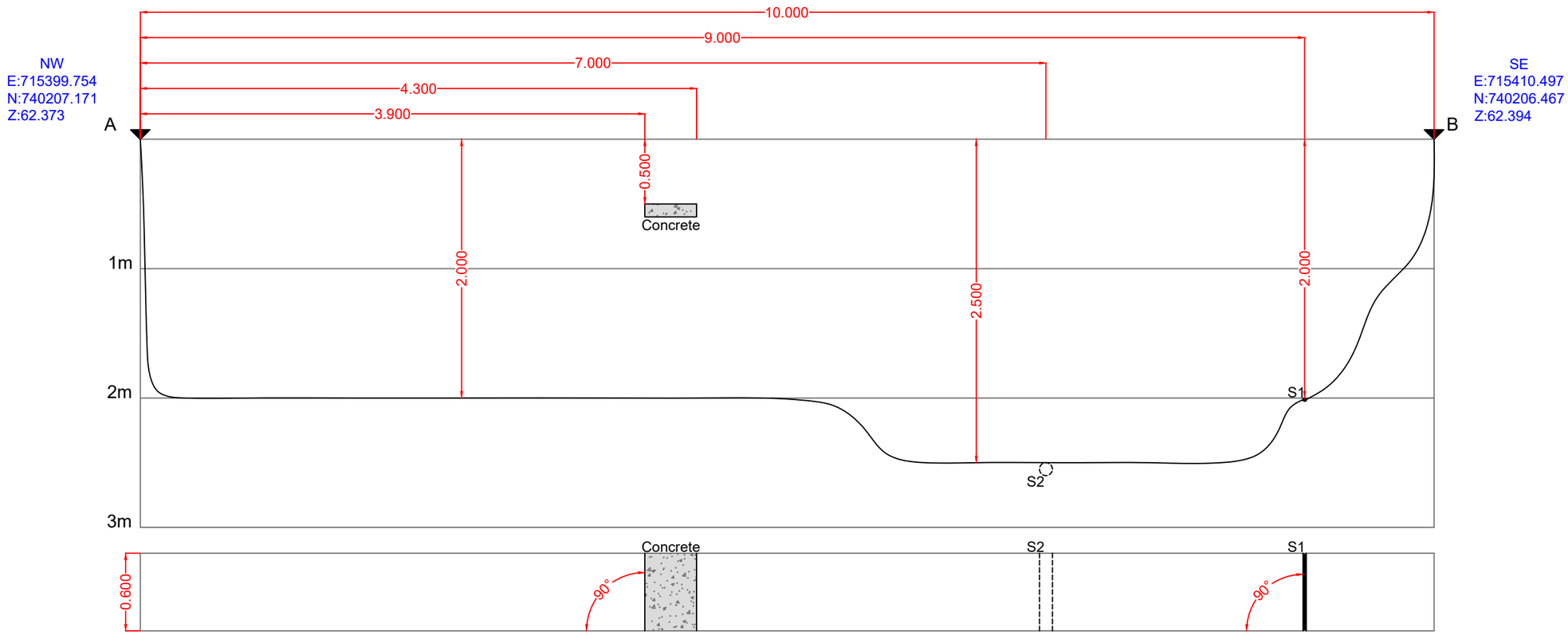
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-12
DATE:	25/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-13



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	
S1	0.025	Black	Telecom	90°	715408.466	740206.892	62.440
S2	-	-	-	-			

Surface from/to (m)		Surface type
0.00	10.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	TOPSOIL.
0.20	0.60	Crushed rock FILL grey sandy clayey fine to coarse angular to subangular GRAVEL with fragments of concrete, rebar, red brick.
0.60	2.50	MADE GROUND: Dark grey slightly sandy gravelly CLAY with fragments of plastic, red brick.

Groundwater	Y/N	Depth	Notes
Slow	Y	0.50	
Medium	Y	2.00	

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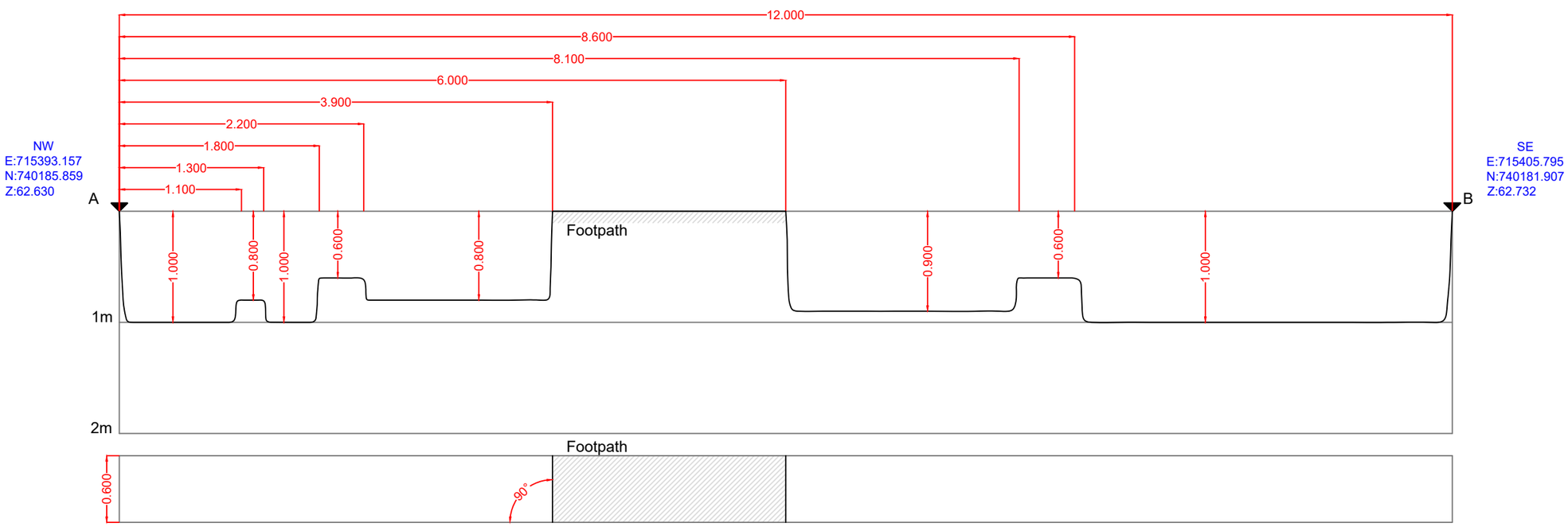
PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-13
DATE:	24/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

ST-14



Service No	ø (m)	Colour - Material	Utility	Angle to trench	Coordinates		Level
					East	North	

Surface from/to (m)		Surface type
0.00	12.00	GRASS

Sample depth (m)	Sample type

From (m)	To (m)	Description
0.00	0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets.
0.20	1.00	MADE GROUND: Brown slightly sandy gravelly Clay with fragments of red brick, plastic, wire, concrete.

Groundwater	Y/N	Depth	Notes
Slow	Y	0.90	

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PROJECT:	13061-08-23 - Housing Bundle 4 & 5 - Lot 2 - Ballymun
DRAWING No.:	ST-14
DATE:	26/10/2023
CLIENT:	NDFA
SCALE:	NTS

Version:	Date:	Drawn By:	Checked By:
1	14/11/2023	J.S.	G.R.

Housing Bundle _ Ballymun

ST01

Housing Bundle _ Ballymun

ST02

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST03

Housing Bundle _ Ballymun

ST04

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST05

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST06

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST07

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST08

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST09

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST10

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST11

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST12

Housing Bundle _ Ballymun

ST13

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun

ST14

Housing Bundle _ Ballymun

APPENDIX 5 –Borehole Records

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Site Housing Bundle_Ballymun			**Borehole Number** BH01
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.20m	**Ground Level (mOD)** 65.29	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715231.1 E 740385.2 N	**Dates** 08/12/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					65.09	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL with rootlets. Gravel is subangular to subrounded fine to coarse.		
0.50	B1				64.59	(0.50) 0.70	MADE GROUND (reworked): Brown slightly sandy gravelly Clay. Gravel is angular to subrounded fine to coarse.		
1.00-1.45 1.00	SPT(C) N=15 B2			1,2/4,4,4,3		(2.10)	Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse.		
2.00-2.45 2.00	SPT(C) N=20 B3			2,3/4,5,6,5					
					62.49	2.80			
3.00-3.45 3.00	SPT(C) N=29 B4			3,4/5,6,8,10			Stiff grey to dark grey slightly sandy gravelly CLAY with occasional subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
4.00-4.45 4.00	SPT(C) N=43 B5			7,9/10,11,11,11		(2.20)			
					60.29	5.00			
5.00-5.19 5.00	SPT(C) 50/40 B6			8,9/10,12,13,15			Very stiff grey to dark grey slightly sandy gravelly CLAY with occasional subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
						(1.20)			
6.00-6.21 6.00	SPT(C) 50/60 B7			7,7/13,17,20	59.09	6.20			
							Terminated at 6.20m		

Remarks
No groundwater encountered.
Cable percussion boring techniques carried out from ground level to 6.20m BGL.
Borehole backfilled on completion.
Chiselling from 5.50m to 5.50m for 1 hour.

Scale (approx)	Logged By
1:50	CE

Figure No. 13061-08-23(4).BH01

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Site Housing Bundle_Ballymun			**Borehole Number** BH02
Machine : Dando 2000 and Baretha T-41 **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 5.50m 63.50mm cased to 28.00m	**Ground Level (mOD)** 64.69	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715239.1 E 740368.7 N	**Dates** 16/11/2023-14/02/2024	**Engineer**	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							MADE GROUND: Brown sandy gravelly Clay.		
0.50	B1					(0.90)			
					63.79	0.90			
1.00-1.45 1.00	SPT(C) N=12 B2			2,2/3,3,3,3	63.69	1.00	Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
						(1.00)	Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
					62.69	2.00			
2.00-2.45 2.00	SPT(C) N=25 B3			3,4/7,6,7,5			Stiff dark grey/black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to angular.		
3.00-3.45 3.00	SPT(C) N=43 B4			5,7/7,9,12,15		(2.00)			
	26.67 0	0							
					60.69	4.00			
4.00-4.45 4.00	SPT(C) N=50 B5			6,9/12,16,22			Very stiff dark grey/black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to angular.		
						(1.50)			
5.00-5.45 5.00	SPT(C) N=50 B6			8,11/15,17,18					
					59.19	5.50			
				7,9/9,11,13,13			Dense grey slightly sandy slightly clayey fine to coarse sub angular to sub rounded GRAVEL with occasional sub angular to sub rounded cobbles		
7.00-7.45 7.00	SPT(C) N=46					(3.00)			
	TCR 40 SCR 0 RQD 0		FI						
8.50-8.94 8.50	6,8/10,12,14,14 SPT(C) 50/290				56.19	8.50	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
	TCR 73.33 SCR 0 RQD 0		23						
10.00									

Remarks
Cable percussion boring techniques carried out from ground level to 5.50m BGL. Obstruction - due to possible boulder or bedrock.
Rotary coring carried out to 28.00m BGL.
Borehole backfilled on completion.
Chiselling from 5.50m to 5.50m for 1 hour.

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH02

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Site Housing Bundle_Ballymun			**Borehole Number** BH02
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 5.50m 63.50mm cased to 28.00m	**Ground Level (mOD)** 64.69	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715239.1 E 740368.7 N	**Dates** 16/11/2023-14/02/2024	**Engineer**	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00-10.22	100	0	0		SPT(C) 50/70 20,5/50			... as previous		
11.50-11.72	86.67	0	0		20,5/50 SPT(C) 50/65		(7.80)			
13.00-13.22	100	0	0		20,5/50 SPT(C) 50/70					
14.50-14.72	100	0	0		20,5/50 SPT(C) 50/70					
16.00	100	56	50			48.39	16.30	Strong to very strong massive dark grey to black argillaceous LIMESTONE with rare calcite veining and rare pyrite mineralisation. Partially weathered		
17.50	100	66.67	53.33	21						
19.00	100	66	39.33	32						

Remarks

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH02

Ground Investigations Ireland Ltd
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Site Housing Bundle_Ballymun			**Borehole Number** BH02
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 5.50m 63.50mm cased to 28.00m	**Ground Level (mOD)** 64.69	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715239.1 E 740368.7 N	**Dates** 16/11/2023-14/02/2024	**Engineer**	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								... as previous		
20.50	100	60.67	46	22						
22.00	100	62.67	38.67	28			(11.70)	16.30m to 28.00m BGL: 3 Fracture sets - F1: Fractures are dipping 0 - 30 degrees, very close to medium spaced, undulating smooth to planar smooth, with slight clay smearing. F2: Fractures are dipping 50 - 70 degrees, wide to very wide spaced, undulating rough, with slight brown staining. F3: Fractures are dipping 70 - 90 degrees, medium to wide spaced, undulating rough to planar rough, with slight clay smearing and brown staining.		
23.50	100	68.67	52.67	23						
25.00	100	80	73.33	15						
26.50	100	49.33	27.33	29						
28.00						36.69	28.00	Terminated at 28.00m		

Remarks

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH02

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Site Housing Bundle_Ballymun			**Borehole Number** BH03
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 5.20m	**Ground Level (mOD)** 64.62	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715248.7 E 740335.7 N	**Dates** 17/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					64.52	0.10	TOPSOIL		
0.50	B1						MADE GROUND: Brown/ Dark grey slightly sandy gravelly Clay with fragments of steel, concrete and plastic		
1.00-1.45 1.00	SPT(C) N=8 B2			1,1/2,2,2,2					
2.00-2.45 2.00	SPT(C) N=10 B3			2,1/2,2,3,3		(4.00)			
3.00-3.45 3.00	SPT(C) N=12 B4			2,3/2,3,4,3					
4.00-4.45 4.00	SPT(C) N=45 B5			5,79/11,15,19	60.52	4.10	Very stiff black slightly sandy slightly gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
						(0.90)			
5.00-5.45 5.00	SPT(C) N=50 B6			20,20/50	59.62	5.00	Terminated at 5.20m		

Remarks
Cable percussion boring techniques carried out from ground level to 5.00m BGL
Borehole terminated at 5.00m BGL due to obstruction - possible boulder or bedrock.
Borehole backfilled on completion.
Chiselling from 5.00m to 5.20m for 1 hour.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH03

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Site Housing Bundle_Ballymun			**Borehole Number** BH04
Machine : Dando 2000 and Baretha T-41 **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 5.00m 63.50mm cased to 28.00m	**Ground Level (mOD)** 64.21	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715233 E 740317.3 N	**Dates** 20/11/2023-08/02/2024	**Engineer**	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					64.01	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets			
0.50	B1					(0.50)	MADE GROUND brown grey gravelly Clay			
					63.51	0.70	Firm to stiff Brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.			
1.00	B2									
1.20-1.65	SPT(C) N=12			2,2/3,2,3,4						
						(1.70)				
2.00-2.45	SPT(C) N=15			2,3/3,3,4,5						
2.00	B3									
					61.81	2.40	Very stiff dark grey/black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.			
	100 0	0								
3.00-3.45	SPT(C) N=35			4,4/7,9,9,10						
3.00	B4									
						(2.60)				
4.00-4.45	SPT(C) N=43			6,7/9,8,10,16						
4.00	B5									
5.00	B6									
5.00-5.00	SPT(C) 20*/0			9,11/16,34	59.21	5.00	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders			
	50/0									
	TCR **SCR**	**RQD**	**FI**							
5.50										
	93.33 0	0								
7.00-7.45				8,13/50 SPT(C) N=50						
7.00										
	100 0	0								
8.50-8.72				20,5/50 SPT(C) 50/70						
8.50										
	86.67 0	0								
			33							
10.00										

Remarks
Cable percussion boring techniques carried out from ground level to 5.00m BGL. Obstruction - possible boulder or bedrock.
Rotary coring carried out to 28.00m BGL.
Standpipe installed in borehole upon completion. Slotted standpipe from 28.00m to 1.00m BGL with a pea gravel surround. Plain standpipe installed from 1.00m BGL to GL with a bentonite seal and a flush cover
Borehole backfilled upon completion

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH04

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Site Housing Bundle_Ballymun			**Borehole Number** BH04
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 5.00m 63.50mm cased to 28.00m	**Ground Level (mOD)** 64.21	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715233 E 740317.3 N	**Dates** 20/11/2023-08/02/2024	**Engineer**	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.22	100	0	0		SPT(C) 50/70 20,5/50			... as previous			
11.50-11.72	100	0	0		20,5/50 SPT(C) 50/65		(12.50)				
13.00-13.22	86.67	0	0		20,5/50 SPT(C) 50/70						
14.50-14.71	100	0	0		20,5/50 SPT(C) 50/60						
16.00-16.22	80	0	0		20,5/50 SPT(C) 50/70						
17.50-17.72	100	38	11.33		20,5/50 SPT(C) 50/65	46.71	17.50	Strong to very strong massive dark grey fine grained argillaceous LIMESTONE with rare white calcite veining and rare pyrite mineralisation. Partially weathered			
19.00	100	56	29.33	28							

Remarks

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH04

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Site Housing Bundle_Ballymun			**Borehole Number** BH04
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 5.00m 63.50mm cased to 28.00m	**Ground Level (mOD)** 64.21	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715233 E 740317.3 N	**Dates** 20/11/2023-08/02/2024	**Engineer**	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
								... as previous			
20.50	100	42	23.33	25							
22.00	100	56.67	28.66	25			(10.50)				
23.50	100	74.67	46.66	21				17.50m to 28.00m BGL: Sequence consists of three fracture sets. F1: Dipping 0-30 degrees, very close to medium spaced, undulating to planar smooth, with brown staining. F2: Dipping 70-90 degrees, medium to wide spaced, undulating smooth to planar rough with clay smearing. F3: Dipping 40-60 degrees, medium to very wide spaced, planar rough.			
25.00	90	45.33	25.33	18							
26.50	100	69.33	69.33	22							
28.00						36.21	28.00	Terminated at 28.00m			

Remarks

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH04

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Site Housing Bundle_Ballymun			**Borehole Number** BH05
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 7.40m	**Ground Level (mOD)** 65.23	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715251.1 E 740381.3 N	**Dates** 11/12/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					65.03	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL with rootlets. Gravel is subangular to subrounded fine to coarse.		
					64.83	(0.20) 0.40	MADE GROUND (reworked): Brown slightly sandy gravelly Clay. Gravel is angular to subrounded fine to coarse.		
0.50	B1						Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
1.00-1.45 1.00	SPT(C) N=14 B2			1,2/4,3,3,4		(1.60)			
2.00-2.45 2.00	SPT(C) N=22 B3			5,4/6,6,5,5	63.23	2.00	Stiff brown slightly sandy slightly gravelly CLAY with occasional subrounded cobbles. Gravel is subangular to subrounded fine to coarse.		
						(0.60)			
3.00-3.45 3.00	SPT(C) N=35 B4			3,6/7,8,10,10	62.63	2.60	Stiff grey to dark grey slightly sandy gravelly CLAY with occasional subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.		
						(1.40)			
4.00-4.45 4.00	SPT(C) N=49 B5			8,9/11,10,12,16	61.23	4.00	Very stiff grey to dark grey slightly sandy gravelly CLAY with occasional subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse.		
5.00-5.20 5.00	SPT(C) 50/50 B6			8,10/17,13,17,3					
						(3.40)			
6.00-6.20 6.00	SPT(C) 50/50 B7			9,9/10,10,17,13					
7.00-7.23 7.00	SPT(C) 50/75 B8			10,17/19,31					
					57.83	7.40	Terminated at 7.40m		

Remarks
No groundwater encountered.
Cable percussion boring techniques carried out from ground level to 7.40m BGL.
Borehole backfilled on completion.
Chiselling from 5.50m to 5.50m for 1 hour.

Scale (approx)	Logged By
1:50	CE

Figure No. 13061-08-23(4).BH05

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Site Housing Bundle_Ballymun			**Borehole Number** BH06
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.00m	**Ground Level (mOD)** 63.75	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715300.3 E 740265.6 N	**Dates** 20/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					63.60	(0.15) 0.15	TOPSOIL		
					63.50	0.25	MADE GROUND: Brown slightly sandy slightly gravelly Clay		
0.50	B1				63.40	0.35	MADE GROUND: Tarmac		
						(0.95)	MADE GROUND: Brownish grey slightly sandy Clay with fragments of plastic and red brick		▼1 ▽1
1.20-1.65	SPT(C) N=9			2,4/2,2,2,3 Water strike(1) at 1.30m, rose to 1.15m in 20 mins.	62.45	1.30	Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
1.50	B2								
2.00-2.45	SPT(C) N=12			2,2/2,3,3,4		(1.70)			
2.50	B3								
3.00-3.45	SPT(C) N=25			3,5/5,6,6,8	60.75	3.00	Stiff dark grey/black slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
3.40	B4					(1.00)			
4.00-4.45	SPT(C) N=50			5,7/10,12,14,14	59.75	4.00	Very stiff dark grey/black slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
4.50	B5								
5.00-5.45	SPT(C) N=50			6,9/11,17,20,2		(2.10)			
5.50	B6								
6.00-6.45	SPT(C) N=50			10,19/50	57.65	6.10	Terminated at 6.10m		

Remarks
Cable percussion boring techniques carried out from ground level to 6.1m bGL.
Borehole terminated at 6.1m bGL due to obstruction - possible boulder or bedrock.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH06

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Site Housing Bundle_Ballymun			**Borehole Number** BH07
Machine : Dando 2000 and Baretha T-41 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.00m 63.50mm cased to 26.50m	**Ground Level (mOD)** 62.84	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715339.1 E 740298.8 N	**Dates** 14/11/2023-06/02/2024	**Engineer**	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					62.64	(0.20) 0.20	TOPSOIL		
					62.34	(0.30) 0.50	MADE GROUND: Dark blue slightly sandy clayey fine to coarse angular to sub angular Gravel		
0.60	B1					(0.60)	MADE GROUND: Brown sandy gravelly Clay with fragments of timber and red brick		
1.00-1.45	SPT(C) N=13			2,1/2,2,2,7	61.74	1.10			
						(0.40)	Firm brown slightly sandy gravelly CLAY gravel is fine to coarse angular to very angular.		
1.50	B2				61.34	1.50			
2.00-2.45	SPT(C) N=18			2,2/3,4,4,7			Stiff grey to black slightly sandy gravelly CLAY. Gravel is fine to medium angular.		
						(1.50)			
2.50	B3								
3.00-3.45	90 0 SPT(C) N=45	0		8,6/8,11,12,14	59.84	3.00	Very stiff grey to black slightly sandy gravelly CLAY. Gravel is fine to medium angular.		
3.50	B4								
4.00-4.45	SPT(C) N=50			6,9/12,14,16,8					
						(3.00)			
4.50	B5								
5.00-5.45	SPT(C) N=50			15,18/25,25					
6.00-6.45	TCR SCR RQD FI			20,20/50 SPT(C) N=50 Water strike(1) at 6.00m, rose to 5.80m in 20 mins.	56.84	6.00	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to rounded cobbles and boulders		
6.00									
7.00-7.45				6,9/12,19,19 SPT(C) N=50					
	46.67 0	0	0						
8.50-8.88				9,15/20,25,5 SPT(C) 50/225		(4.70)			
8.50									
	80 0	0							
10.00									

Remarks
Cable percussion boring techniques carried out from ground level to 6.00m BGL.
Rotary coring techniques carried out to 26.50m BGL
Groundwater encountered at 6.00m BGL
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH07

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Site Housing Bundle_Ballymun			**Borehole Number** BH07
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.00m 63.50mm cased to 26.50m	**Ground Level (mOD)** 62.84	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715339.1 E 740298.8 N	**Dates** 14/11/2023-06/02/2024	**Engineer**	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
10.00-10.30	100	0	0		SPT(C) 50/150 9,16/22,28			... as previous		
						52.14	10.70	Very stiff brownish dark grey very sandy gravelly CLAY with some sub angular to rounded cobbles and boulders		
							(0.80)			
11.50-11.50 11.50	100	0	0		11,14/36,14 SPT(C)	51.34	11.50	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to rounded cobbles and boulders		
13.00-13.21 13.00	100	0	0		19,6/50 SPT(C) 50/60					
14.50-14.72 14.50	96.67	0	0		18,7/50 SPT(C) 50/70		(5.70)			
16.00-16.22 16.00	100	5.33	0	5	20,5/50 SPT(C) 50/65					
17.50-17.73 17.50	93.33	38.67	14	32	20,5/50 SPT(C) 50/75	45.64	17.20	Strong massive dark grey fine grained argillaceous LIMESTONE with rare calcite veins and rare pyrite mineralisation. Partially weathered.		
19.00	100	52.67	8	43						

Remarks

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH07

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Site Housing Bundle_Ballymun			**Borehole Number** BH07
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.00m 63.50mm cased to 26.50m	**Ground Level (mOD)** 62.84	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715339.1 E 740298.8 N	**Dates** 14/11/2023-06/02/2024	**Engineer**	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								... as previous		
20.50	100	76.67	65.83	20			(9.30)			
22.00	100	73.33	62	15						
23.50	100	36	21.33	29				17.20m to 26.50m BGL: Sequence consists of three fracture sets. F1: Dipping 0-30 degrees, very close to medium spaced, planar rough, with clay smearing. F2: Dipping 40-60 degrees, wide to very wide spaced, undulating rough. F3: Dipping 70-90 degrees, medium to wide spaced, undulating rough.		
25.00	93.33	49.33	38	21						
26.50						36.34	26.50	Terminated at 26.50m		

Remarks

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH07

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Site Housing Bundle_Ballymun			**Borehole Number** BH08
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 7.00m	**Ground Level (mOD)** 63.55	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715322.7 E 740219 N	**Dates** 15/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					63.35	(0.20) 0.20	TOPSOIL		
						(0.40)	MADE GROUND: Brown slightly sandy slightly gravelly Clay with fragments of plastic.		
					62.95	0.60	Firm dark grey/black mottled orange slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to very angular.		
1.00	B1								
1.20-1.65	SPT(C) N=11			3,2/3,3,2,3		(1.40)			
2.00-2.45	SPT(C) N=12			1,2/3,2,4,3	61.55	2.00	Stiff grey to black slightly sandy gravelly CLAY. Gravel is fine to medium angular.		
2.00	B2					(1.00)			
3.00-3.45	SPT(C) N=33			4,6/6,9,8,10	60.55	3.00	Very stiff grey to black slightly sandy gravelly CLAY. Gravel is fine to medium angular.		
3.00	B3								
4.00-4.45	SPT(C) N=50			5,8/8,12,14,16					
4.00	B4								
5.00-5.45	SPT(C) N=50			5,6/15,16,19		(4.00)			
5.00	B5								
6.00-6.45	SPT(C) N=50			9,10/20,25,5					
6.00	B6								
7.00	B7				56.55	7.00	Terminated at 7.00m		

Remarks
Borehole terminated at 7.00m BGL due to obstruction - possible boulder or bedrock.
Cable percussion boring techniques carried out from ground level to 7.00m BGL.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH08

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Site Housing Bundle_Ballymun			**Borehole Number** BH09
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 7.00m	**Ground Level (mOD)** 63.20	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715322.9 E 740189.3 N	**Dates** 17/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					63.00	(0.20) 0.20	TOPSOIL		
0.50	B1					(0.70)	MADE GROUND: Brown slightly sandy slightly gravelly Clay . Gravel is fine to coarse sub-angular to sub-rounded with plastic, red brick and glass fragments.		
1.20-1.65	SPT(C) N=8			2,2/1,2,2,3	62.30	0.90	Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to angular.		
1.50	B2					(1.80)			
2.00-2.45	SPT(C) N=10			1,2/2,2,3,3					
3.00-3.45	SPT(C) N=41			6,8/8,10,11,11,12	60.50	2.70	Very stiff Black/dark grey slightly sandy slightly gravelly CLAY gravel is medium to coarse angular to very angular with medium cobble content.		
3.00	B3								
4.00-4.45	SPT(C) N=50			5,9/11,13,14,12					
4.00	B4					(4.30)			
5.00-5.45	SPT(C) N=50			7,11/16,19,15					
5.00	B5								
6.00-6.45	SPT(C) N=50			10,20/25,25					
6.00	B6								
					56.20	7.00	Terminated at 7.00m		

Remarks
Cable percussion boring techniques carried out from ground level to 7.00m BGL.
Borehole terminated at 7.00m BGL due to obstruction - possible boulder or bedrock.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH09

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Site Housing Bundle_Ballymun			**Borehole Number** BH10
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 7.00m	**Ground Level (mOD)** 63.33	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715330.4 E 740175.3 N	**Dates** 16/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B1					(1.00)	MADE GROUND: Brown sandy slightly gravelly Clay. Gravel is fine to coarse sub-angular to sub-rounded with fragments of steel, plastic and red brick		
					62.33	1.00			
1.20-1.65 1.20	SPT(C) N=11 B2			2,3/3,2,3,3		(1.00)	Firm to stiff brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
2.00-2.45 2.00	SPT(C) N=11 B3			1,3/2,3,3,3	61.33	2.00	Firm to stiff dark grey/black slightly sandy slightly gravelly CLAY. gravel is medium to coarse angular to very angular with medium cobble content.		
						(1.00)			
3.00-3.45 3.00	SPT(C) N=30 B4			3,4/6,7,8,9	60.33	3.00	Very stiff dark grey/black slightly sandy slightly gravelly CLAY. gravel is medium to coarse angular to very angular with medium cobble content.		
4.00-4.45 4.00	SPT(C) N=50 B5			12,8/9,13,17,11					
5.00-5.45 5.00	SPT(C) N=50 B6			8,12/15,17,18		(4.00)			
6.00-6.45 6.00	SPT(C) N=50 B7			12,25/50					
					56.33	7.00	Terminated at 7.00m		

Remarks
Borehole terminated at 7.00m BGL due to obstruction - possible boulder or bedrock.
Cable percussion boring techniques carried out from ground level to 7.00m BGL.
Borehole backfilled upon completion

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH10

Ground Investigations Ireland Ltd
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Site Housing Bundle_Ballymun			**Borehole Number** BH11
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 7.00m	**Ground Level (mOD)** 63.10	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715352.1 E 740165.4 N	**Dates** 10/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					62.90	(0.20) 0.20	TOPSOIL		
0.50	B1					(0.60)	MADE GROUND: Brown sandy gravelly Clay. Gravel is fine to coarse sub-angular to sub-rounded with plastic, plaster and mortar fragments.		
1.00-1.45	SPT(C) N=7			1,1/2,1,2,2	62.30	0.80	Soft to firm yellowish/brown slightly gravelly CLAY. Gravel is fine to coarse angular.		
1.50	B2					(1.20)			
2.00-2.45	SPT(C) N=8			1,2/2,2,2,2	61.10	2.00	Firm to stiff black/dark grey slightly sandy gravelly CLAY. Gravel is medium to coarse angular to very angular with high cobble content.		
2.80	B3					(1.00)			
3.00-3.45	SPT(C) N=31			3,3/6,8,8,9	60.10	3.00	Very stiff black/dark grey slightly sandy gravelly CLAY. Gravel is medium to coarse angular to very angular with high cobble content.		
3.50	B4								
4.00-4.45	SPT(C) N=41			4,6/8,10,10,13					
4.50	B5								
5.00-5.45	SPT(C) N=48			5,6/11,13,13,11		(4.00)			
5.50	B6								
6.00-6.45	SPT(C) N=50			4,8/12,16,22					
6.50	B7								
					56.10	7.00	Terminated at 7.00m		

Remarks
Borehole backfilled on completion.
Cable percussion boring techniques carried out from ground level to 7.00m BGL.
Borehole terminated at 7.00m BGL due to obstruction - possible boulder or bedrock.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH11

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Site Housing Bundle_Ballymun			**Borehole Number** BH12
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 0.80m	**Ground Level (mOD)** 62.16	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715375.3 E 740205.9 N	**Dates** 15/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					62.06	0.10	TOPSOIL		
						(0.40)	MADE GROUND: Brown gravelly Clay		
0.50	B1				61.66	0.50	MADE GROUND: Brown slightly clayey Sand		
						(0.30)			
					61.36	0.80	Abandoned at 0.80m		

Remarks
Borehole backfilled on completion.
Borehole abandoned due to encountering water main.
Borehole re drilled at location BH12A.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH12

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Site Housing Bundle_Ballymun			**Borehole Number** BH12A
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 3.40m	**Ground Level (mOD)** 62.12	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715375.4 E 740207.1 N	**Dates** 15/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					61.92	(0.20) 0.20	TOPSOIL.		
0.50	B1					(0.80)	MADE GROUND: Brown/Dark brown silty sandy Clay.		
1.00-1.45 1.00	SPT(C) N=7 B2			1,1/1,2,2,2	61.12	1.00	Soft to firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
						(1.00)			
2.00-2.45 2.00	SPT(C) N=9 B3			1,2/2,3,2,2	60.12	2.00	Firm greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
						(1.40)			
3.00-3.45 3.00	SPT(C) N=15 B4			1,2/2,3,2,8	58.72	3.40	Terminated at 3.40m		

Remarks
Cable percussion boring techniques carried out from ground level to 3.40m BGL.
Borehole abandoned at 3.40m BGL due to possible presence of services.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC

Figure No.
13061-08-23(4).BH12A

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Site Housing Bundle_Ballymun			**Borehole Number** BH13
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 5.20m	**Ground Level (mOD)** 62.43	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715356.6 E 740236 N	**Dates** 21/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					62.23	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
0.50	B1					(0.80)	MADE GROUND: Brown slightly slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		
1.00	B2				61.43	1.00			
1.20-1.65	SPT(C) N=11			2,2/3,2,3,3		(0.90)	Firm Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded.		▼1
				Water strike(1) at 1.80m, rose to 1.10m in 5 mins.	60.53	1.90			▽1
2.00 2.00-2.45	B3 SPT(C) N=33			3,5/7,9,9,8			Very stiff dark grey/black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to sub-rounded. with low cobble content.		
3.00-3.45 3.00	SPT(C) N=50 B4			6,9/12,16,22		(3.30)			
4.00-4.45 4.00	SPT(C) N=50 B5			7,11/14,17,19					
5.00-5.20 5.00	SPT(C) 50/0 B6			25/50	57.23	5.20	Terminated at 5.20m		

Remarks
Cable percussion boring techniques carried out from ground level to 5.20m BGL
Borehole terminated at 5.20m BGL due to obstruction - possible boulder or bedrock.
Inspection pit hand dug to 1.20m BGL
Borehole backfilled upon completion
Chiselling from 2.60m to 3.00m for 0.33 hours. Chiselling from 5.00m to 5.20m for 1 hour.

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH13

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Site Housing Bundle_Ballymun			**Borehole Number** BH14
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 2.30m	**Ground Level (mOD)** 62.09	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715405.2 E 740242.1 N	**Dates** 21/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					61.94	(0.15) 0.15	TOPSOIL		
					61.69	(0.25) 0.40	MADE GROUND: Brown slightly sandy slightly gravelly Clay with red brick and plastic fragments		
1.00	B1						MADE GROUND: Brownish grey slightly sandy slightly gravelly Clayey with some sub angular to sub rounded cobbles and fragments of concrete and mortar		
1.20-1.65	SPT(C) N=50			20,30/50 Water strike(1) at 1.55m, fell to 1.60m in 20 mins.		(1.90)			▼1
2.00-2.45 2.00	SPT(C) N=50 B2			15,20/50	59.79	2.30	Terminated at 2.30m		

Remarks
Cable percussion boring techniques carried out from ground level to 2.30m BGL
Borehole backfilled on completion.
Borehole terminated at 2.50m BGL due to casing not advancing. Possible foundations of demolished buildings.
Borehole re drilled at location BH14A
Chiselling from 1.30m to 1.50m for 0.5 hours. Chiselling from 2.30m to 2.30m for 0.5 hours.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH14

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Site Housing Bundle_Ballymun			**Borehole Number** BH14A
Machine : Dando 2000 and Baretha T-41 **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 6.20m 63.50mm cased to 27.50m	**Ground Level (mOD)**	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location	**Dates** 21/11/2023-16/02/2024	**Engineer**	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL.			
							MADE GROUND: Brown slightly sandy slightly gravelly Clay with fragments of red bricks and pieces of timber			
1.00	B1					(1.30)				
1.20-1.65 1.20	SPT(C) N=4 B2			0,1/1,0,1,2						
				Water strike(1) at 1.70m, rose to 1.60m in 20 mins.		1.50 (0.30) 1.80	Soft brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to angular.		▼1	
2.00-2.45	SPT(C) N=23			3,3/5,5,6,7		(0.70)	Stiff dark grey/black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to angular.			
2.50	B3					2.50	Very stiff dark grey/black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to angular.			
3.00-3.45	SPT(C) N=41 0 0	0		4,6/9,10,11,11						
3.50	B4									
4.00-4.45	SPT(C) N=50			6,7/12,15,14,9		(3.70)				
4.50	B4									
5.00-5.45	SPT(C) N=50			7,10/13,15,18,4						
5.50	B6									
6.00-6.45				9,15/19,23,8 SPT(C) N=50						
	TCR / **SCR** / **RQD** / **FI**									
6.20	87.5 / 0 / 0					6.20	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders			
7.00-7.21 7.00			0	20,5/50 SPT(C) 50/60						
	100 / 0 / 0									
8.50-8.72 8.50				20,5/50 SPT(C) 50/70						
	100 / 0 / 0									
10.00										

Remarks
Cable percussion boring techniques carried out from ground level to 6.20m BGL. Obstruction - due to possible boulder or bedrock.
Rotary coring carried out to 27.50m BGL
Standpipe installed in borehole upon completion. Slotted standpipe from 27.50m to 1.00m BGL with a pea gravel surround. Plain standpipe installed from 1.00m BGL to GL with a bentonite seal and a flush cover
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH14A

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Site Housing Bundle_Ballymun			**Borehole Number** BH14A
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 6.20m 63.50mm cased to 27.50m	**Ground Level (mOD)**	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location	**Dates** 21/11/2023-16/02/2024	**Engineer**	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.22	100	0	0		SPT(C) 50/70 20,5/50		(9.20)	... as previous			
11.50-11.73 11.50	100	0	0		20,5/50 SPT(C) 50/75						
13.00	100	0	0								
14.50	100	14.67	14.67	10			15.40	Very strong massive dark grey to black argillaceous LIMESTONE with rare calcite veining and rare pyrite mineralisation. Partially weathered			
16.00	100	42	14.67	26							
17.50	100	58	28.67	31							
19.00	100	67.33	56.67	19							

Remarks

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH14A

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Site Housing Bundle_Ballymun			**Borehole Number** BH14A
Machine : Dando 2000 and Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 6.20m 63.50mm cased to 27.50m	**Ground Level (mOD)**	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location	**Dates** 21/11/2023-16/02/2024	**Engineer**	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
								... as previous			
20.50	100	58.67	31.33	26			(12.10)				
22.00	100	81.33	58	18				15.40m to 27.50m BGL: 2 Fracture sets - F1: Fractures are dipping 0 - 20 degrees, very close to medium spaced, smooth planar to smooth undulating, with slightl clay smearing. F2: Fracture are dipping 70 - 90 degrees, wide to very wide spaced, undulating rough, with slight clay smearing.			
23.50	100	64	36	26							
25.00	93.33	68	32.67	19							
26.50	100	73	73	8							
27.50							27.50	Terminated at 27.50m			

Remarks

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH14A

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Site Housing Bundle_Ballymun			**Borehole Number** BH15
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.00m	**Ground Level (mOD)** 62.24	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715431.9 E 740210.2 N	**Dates** 22/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					62.09	(0.15) 0.15	Brown slightly sandy slightly gravelly TOPSOIL with grass and rootlets		
0.40	B1					(1.15)	MADE GROUND: Brownish grey slightly sandy slightly gravelly Clay with fragments of steel, brick and plastic		
1.20-1.65	SPT(C) N=11			5,3/3,2,1,5	60.94	1.30	Firm greyish brown slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
1.50	B2					(1.10)			
2.00-2.45	SPT(C) N=13			2,2/3,3,2,5					
2.50	B3			Water strike(1) at 2.50m, rose to 2.40m in 20 mins.	59.84	2.40	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		▼1 ▽1
3.00-3.45	SPT(C) N=33			5,5/7,8,9,9					
3.50	B4								
4.00-4.45	SPT(C) N=50			6,8/12,13,16,9		(3.60)			
4.50	B5								
5.00-5.45	SPT(C) N=50			7,9/13,15,22					
5.50	B6								
6.00-6.45	SPT(C) N=50			6,15/22,28	56.24	6.00	Complete at 6.00m		

Remarks
Cable percussion boring techniques carried out from ground level to 6.00 m BGL.
Borehole terminated at 6.00 BGL due to obstruction - possible boulder or bedrock.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	GGR

Figure No. 13061-08-23(4).BH15

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Site Housing Bundle_Ballymun			**Borehole Number** BH16
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 7.00m	**Ground Level (mOD)** 62.09	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715433.8 E 740183.5 N	**Dates** 13/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.40)	MADE GROUND: Brown slightly sandy gravelly Clay with fragments of steel and plastic		
					61.69	0.40			
0.50	B1						Firm brown sandy slightly gravelly CLAY		
						(1.10)			
1.00-1.45 1.00	SPT(C) N=11 B2			1,1/2,3,3,3					
					60.59	1.50	Firm to stiff grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
2.00-2.45 2.00	SPT(C) N=14 B3			2,3/3,4,3,4		(1.30)			
					59.29	2.80	Very stiff black slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders		
3.00-3.45 3.00	SPT(C) N=33 B4			6,7/8,8,9,8					
4.00-4.45 4.00	SPT(C) N=45 B5			4,9/10,11,11,13					
						(4.20)			
5.00-5.45 5.00	SPT(C) N=50 B6			7,10/12,16,16,6					
6.00-6.45 6.00	SPT(C) N=50 B7			9,11/16,21,13					
7.00-7.45 7.00	SPT(C) N=50 B8			30,20/50	55.09	7.00	Complete at 7.00m		

Remarks
Cable percussion boring techniques carried out from ground level to 7.00 m BGL.
Borehole terminated at 7.00 BGL due to obstruction - possible boulder or bedrock.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH16

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Site Housing Bundle_Ballymun			**Borehole Number** BH17
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 8.00m	**Ground Level (mOD)** 62.59	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715426.1 E 740163.4 N	**Dates** 07/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B1					(1.70)	MADE GROUND: Soft brown sandy gravelly Clay. Gravel is fine to coarse sub-angular to sub-rounded with plastic and steel wire fragments.		
1.00-1.45 1.00	SPT(C) N=16 B2			1,2/3,3,4,6					
					60.89	1.70			
2.00-2.45 2.00	SPT(C) N=14 B3			2,3/4,3,3,4		(1.00)	Firm to stiff greyish brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-rounded to angular.		
					59.89	2.70			
3.00-3.45 3.00	SPT(C) N=32 B4			4,5/6,8,9,9			Very stiff black/Dark grey slightly sandy slightly gravelly CLAY. Gravel is medium to coarse angular to very angular with medium cobble content.		
4.00-4.45 4.00	SPT(C) N=37 B5			5,6/9,8,10,10					
5.00-5.45 5.00	SPT(C) N=50 B6			7,9/10,12,14,14		(5.30)			
6.00-6.45 6.00	SPT(C) N=50 B7			5,10/13,15,19,3					
7.00	B8								
7.50-7.95	SPT(C) N=50			10,16/20,17,13					
					54.59	8.00	Terminated at 8.00m		

Remarks
Cable percussion boring techniques carried out from ground level to 8.00 BGL.
Borehole terminated at 8.00 BGL due to obstruction - possible boulder or bedrock.
Borehole backfilled upon completion

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH17

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Site Housing Bundle_Ballymun			**Borehole Number** BH18
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 0.80m	**Ground Level (mOD)** 62.56	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715402.4 E 740193.6 N	**Dates** 14/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					62.46	0.10	TOPSOIL		
0.50	B1					(0.70)	MADE GROUND: Brown slightly gravelly Clay with low cobble content.		
					61.76	0.80	Terminated at 0.80m		

Remarks
Cable percussion boring techniques carried out from ground level to 0.80 BGL.
Borehole terminated at 0.80 BGL due to obstruction - possible boulder or bedrock
Borehole re drilled as BH18A
Borehole backfilled on completion.
Chiselling from 0.80m to 0.80m for 1 hour.

Scale (approx)	Logged By
1:50	JC

Figure No. 13061-08-23(4).BH18

Ground Investigations Ireland Ltd
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Site Housing Bundle_Ballymun			**Borehole Number** BH18A
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter** 200mm cased to 6.00m	**Ground Level (mOD)** 62.65	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715390.6 E 740189.4 N	**Dates** 14/11/2023	**Engineer**	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.70)	MADE GROUND: Brown sandy gravelly Clay		
0.50	B1				61.95	0.70			
						(0.20)	Concrete.		
					61.75	0.90			
1.00-1.45 1.00	SPT(C) N=13 B2			1,2/3,4,3,3			Firm to stiff brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded with low cobble content.		
						(1.10)			
2.00-2.45 2.00	SPT(C) N=16 B3			2,3/4,3,5,4	60.65	2.00			
						(1.00)	Stiff brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded with low cobble content.		
3.00-3.45 3.00	SPT(C) N=39 B4			5,6/6,9,11,13	59.65	3.00			
4.00-4.45 4.00	SPT(C) N=49 B5			5,7/9,11,14,15			Very stiff dark grey/black slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to angular.		
						(3.00)			
5.00-5.45 5.00	SPT(C) N=50 B6			6,10/13,16,19,2					
6.00-6.45 6.00	SPT(C) N=50 B7			9,12/14,36	56.65	6.00			
							Terminated at 6.00m		

Remarks
Borehole terminated at 6.00 BGL due to obstruction - possible boulder or bedrock.
Borehole backfilled on completion.
Cable percussion boring techniques carried out from ground level to 6.00 BGL.

Scale (approx)	Logged By
1:50	JC

Figure No.
13061-08-23(4).BH18A

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Site Housing Bundle_Ballymun			**Borehole Number** BH19
Machine : Dando 2000 & Baretha T-41 **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 7.60m 63.50mm cased to 26.50m	**Ground Level (mOD)** 62.95	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715400.6 E 740162.9 N	**Dates** 08/11/2023	**Engineer**	**Sheet** 1/3

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					62.75	(0.20) 0.20	TOPSOIL			
0.50	B1					(0.80)	MADE GROUND: Brown sandy gravelly Clay. Gravel is fine to coarse sub-angular to sub-rounded with fragments of concrete.			
1.00-1.45 1.00	SPT(C) N=50 B2			20,31/50	61.95	1.00	Very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is medium to coarse sub-angular to sub-rounded.			
2.00-2.45 2.00	SPT(C) N=50 B3			16,21/19,17,14		(1.50)				
3.00-3.45 3.00	SPT(C) N=34 B4			3,5/7,8,9,10	60.45	2.50	Very stiff dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse angular to very angular with medium cobble content.			
	100 0	0								
4.00-4.45 4.00	SPT(C) N=41 B5			7,8/9,10,11,11						
5.00-5.45 5.00	SPT(C) N=50 B6			8,10/12,14,14,10		(5.10)				
6.00-6.45 6.00	SPT(C) N=50 B7			9,12/16,19,15						
7.00	**TCR** **SCR**	**RQD**	**FI**	B8						
7.00	100 0	0			55.35	7.60	Very stiff dark grey slightly sandy very gravelly CLAY with some sub angular to sub rounded cobbles and boulders			
8.50-8.71 8.50	53.33 0	0	0	11,14/50 SPT(C) 50/60						
10.00										

Remarks
Cable percussion boring techniques carried out from ground level to 7.60 BGL. Obstruction - due to possible boulder or bedrock.
Rotary Follow-on carried out to 26.50m BGL.
Standpipe installed in borehole upon completion. Slotted standpipe installed from 26.50m to 1.00m BGL with a pea gravel surround. Plain standpipe installed from 1.00m BGL to GL with a bentonite seal and a flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH19

Ground Investigations Ireland Ltd
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Site Housing Bundle_Ballymun			**Borehole Number** BH19
Machine : Dando 2000 & Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 7.60m 63.50mm cased to 26.50m	**Ground Level (mOD)** 62.95	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715400.6 E 740162.9 N	**Dates** 08/11/2023	**Engineer**	**Sheet** 2/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.21	26.67	0	0		SPT(C) 50/60 20,5/50		(6.30)	... as previous			
11.50-11.71 11.50	20	0	0		20,5/50 SPT(C) 50/55						
13.00-13.22 13.00	56	0	0		20,5/50 SPT(C) 50/65	49.05	13.90	Very stiff brownish dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders			
14.50-14.72 14.50	100	0	0		20,5/50 SPT(C) 50/65		(3.60)				
16.00-16.22 16.00	100	0	0		20,5/50 SPT(C) 50/70						
17.50-17.72 17.50	78.67	12.67	6.67	9	20,5/50 SPT(C) 50/70	45.45	17.50	Very stiff dark grey slightly sandy gravelly CLAY with some sub angular to sub rounded cobbles and boulders			
19.00	76.67	17.33	17.33	17		44.15	(1.30) 18.80	Strong to very strong massive dark grey to black fine grained argillaceous LIMESTONE with rare calcite veining and rare pyrite mineralisation. Distinctly to partially weathered.			

Remarks

Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH19

Ground Investigations Ireland Ltd
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Site Housing Bundle_Ballymun			**Borehole Number** BH19
Machine : Dando 2000 & Baretha T-41 **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow-on	**Casing Diameter** 200mm cased to 7.60m 63.50mm cased to 26.50m	**Ground Level (mOD)** 62.95	**Client** National Development Finance Agency	**Job Number** 13061-08-23(4)
	Location 715400.6 E 740162.9 N	**Dates** 08/11/2023	**Engineer**	**Sheet** 3/3

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
								... as previous			
20.50	86.67	44	34.67	19							
22.00	100	46	43.33	32			(7.70)	18.80m to 26.50m BGL: 3 Fracture sets - F1: Fracture are dipping 0 - 30 degrees, very close to medium spaced, planar smooth to undulating rough. F2: Fractures are 70 - 90 degrees, medium to wide spaced, planar to undulating smooth, with clay smearing. F3: Fracture are dipping 50 - 70 degrees, wide to very wide spaced, undulating smooth, with clay smearing.			
23.50	100	51.33	29.33	32							
25.00	86.67	54.67	29.33	25							
26.50						36.45	26.50	Terminated at 26.50m			

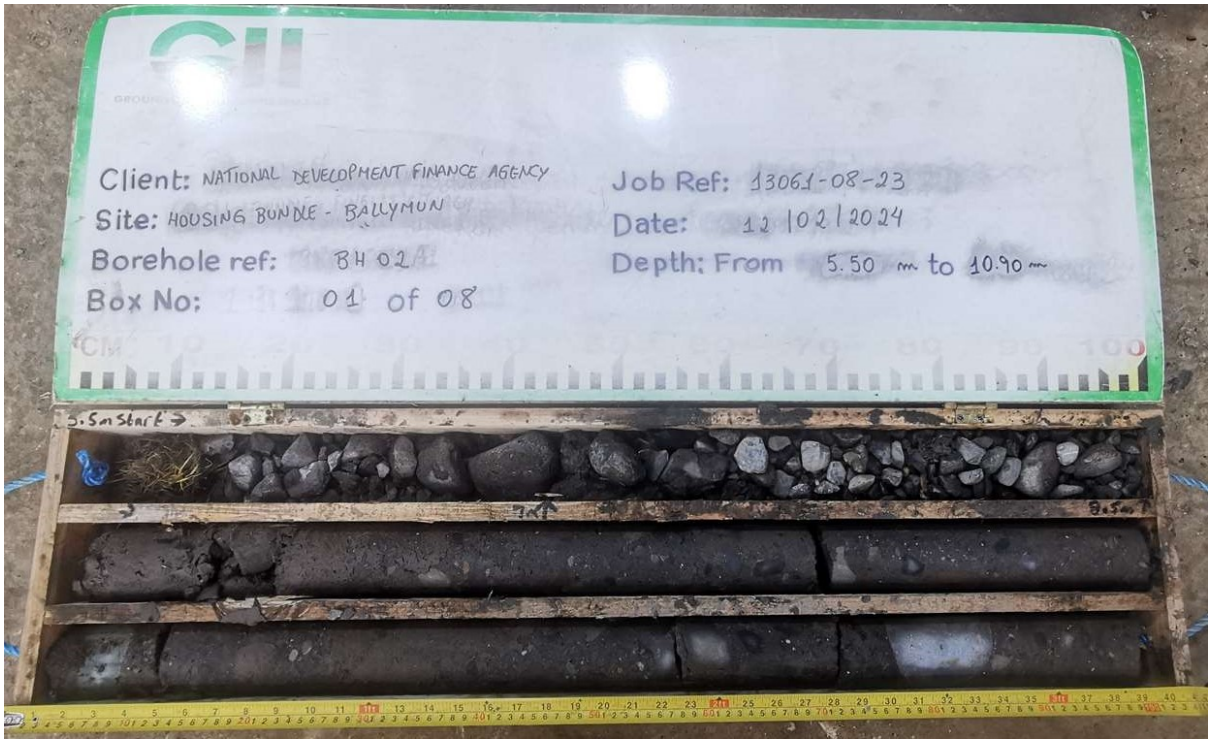
Remarks

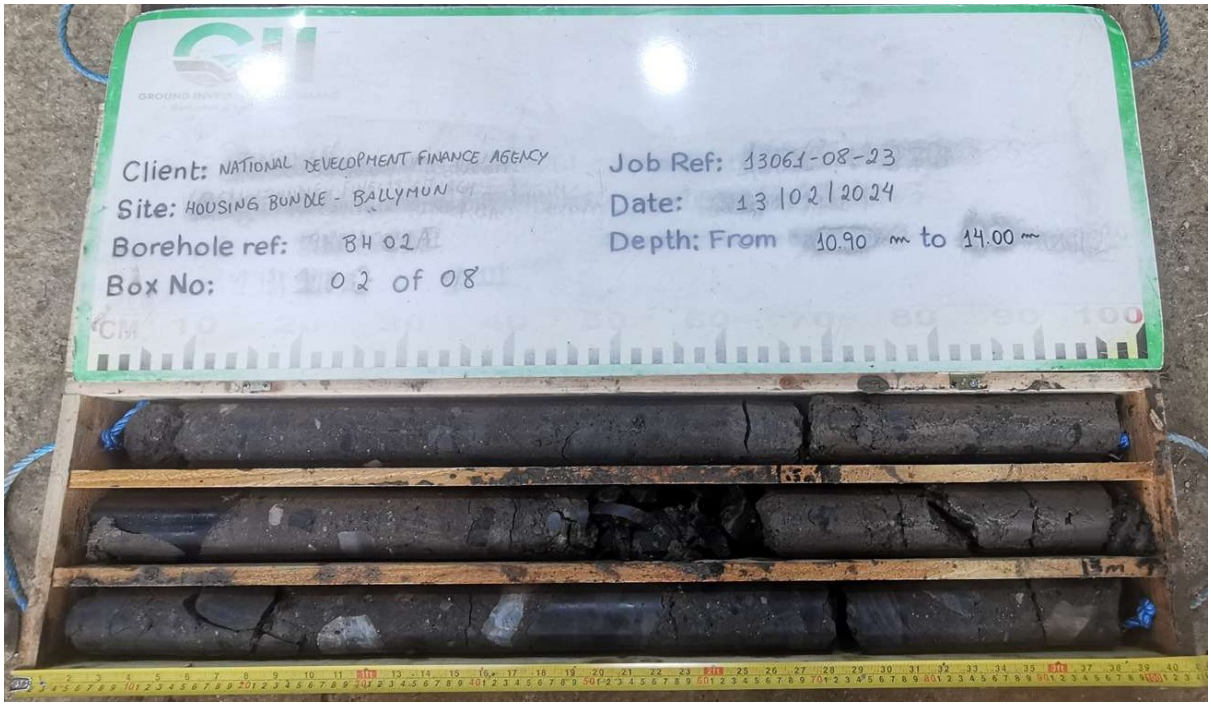
Scale (approx)	Logged By
1:50	JC & GGR

Figure No. 13061-08-23(4).BH19

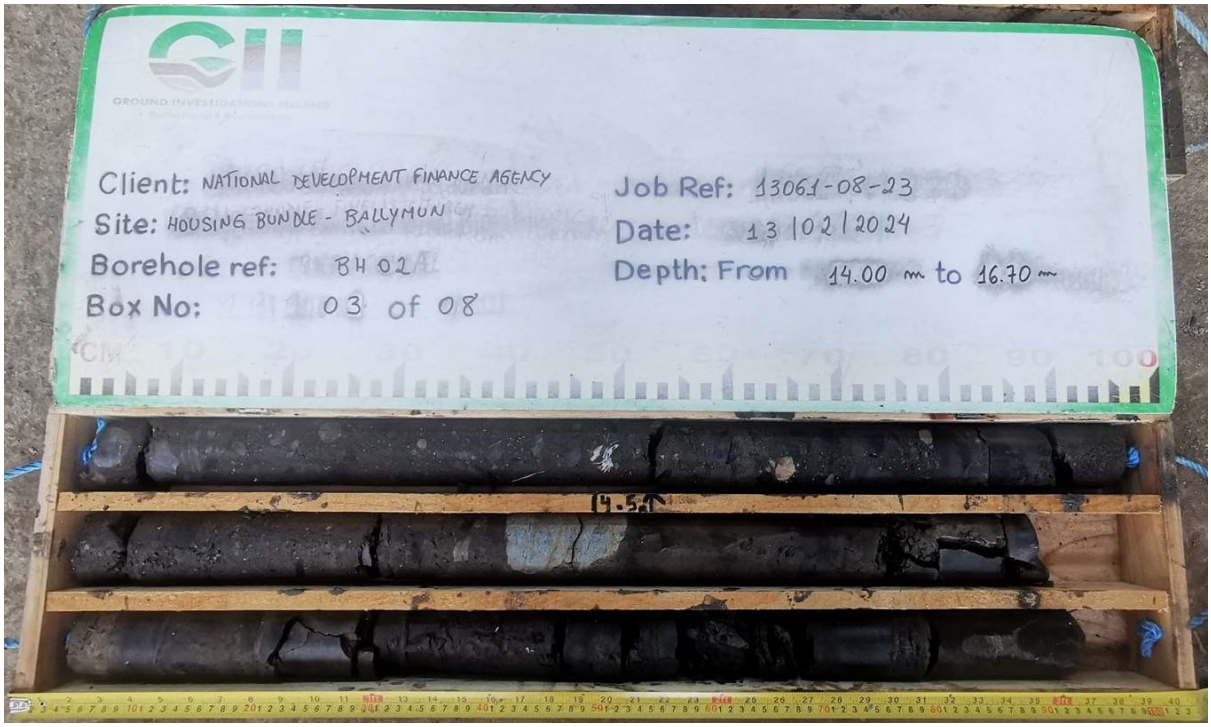
Housing Bundle _ Ballymun

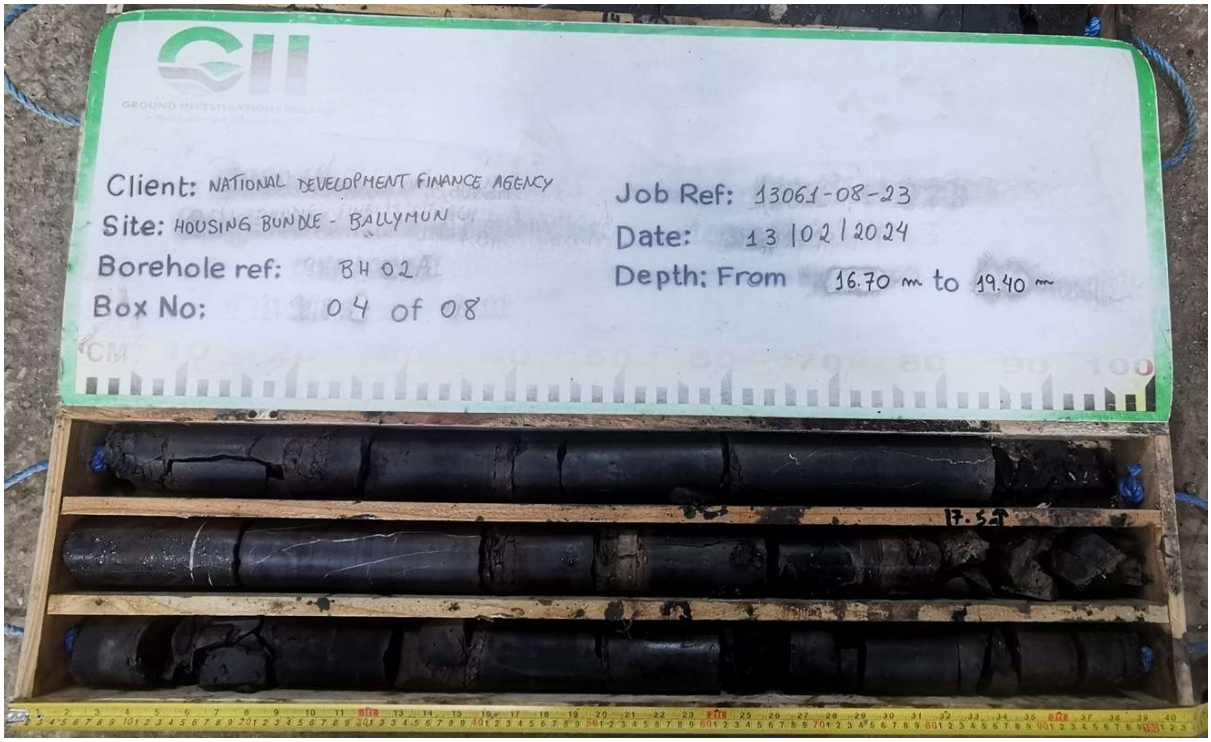
BH02





Housing Bundle _ Ballymun





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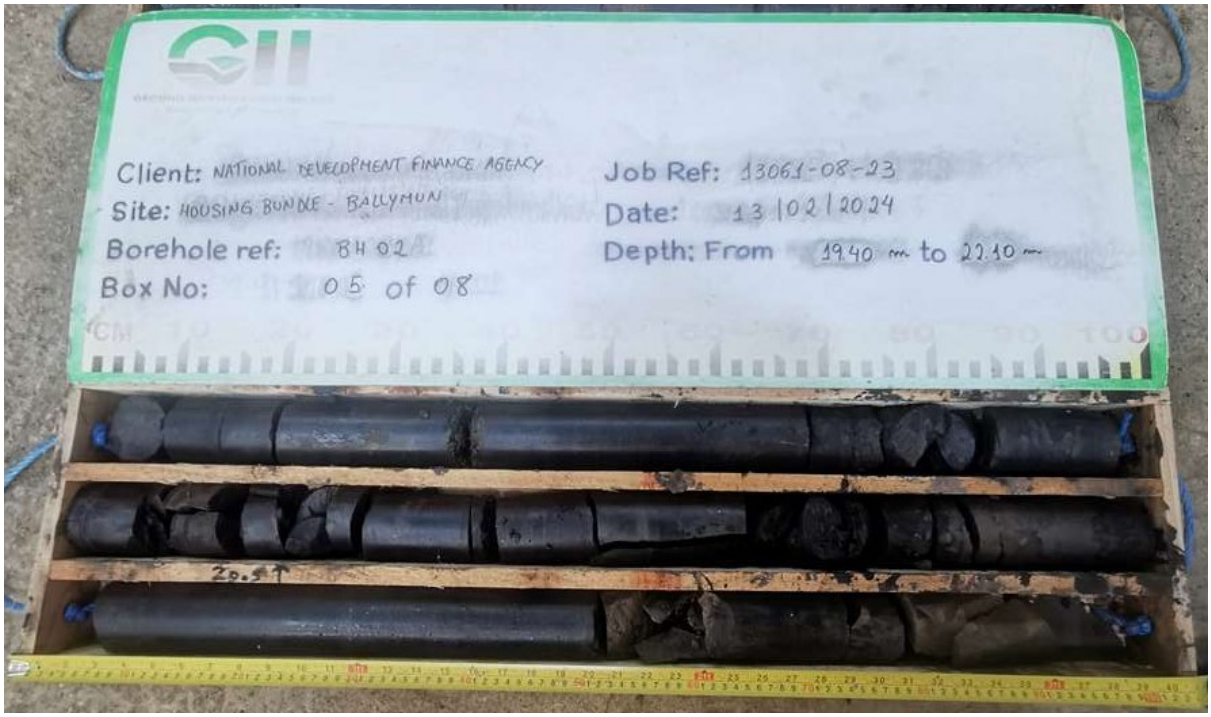
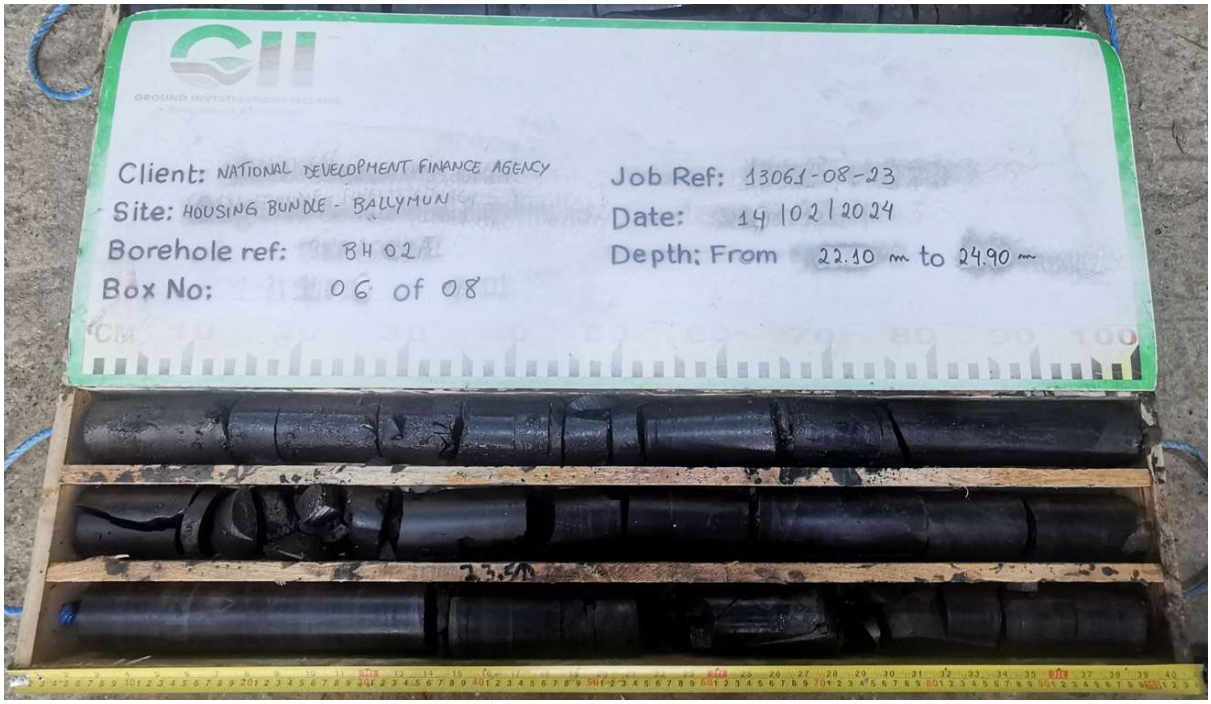
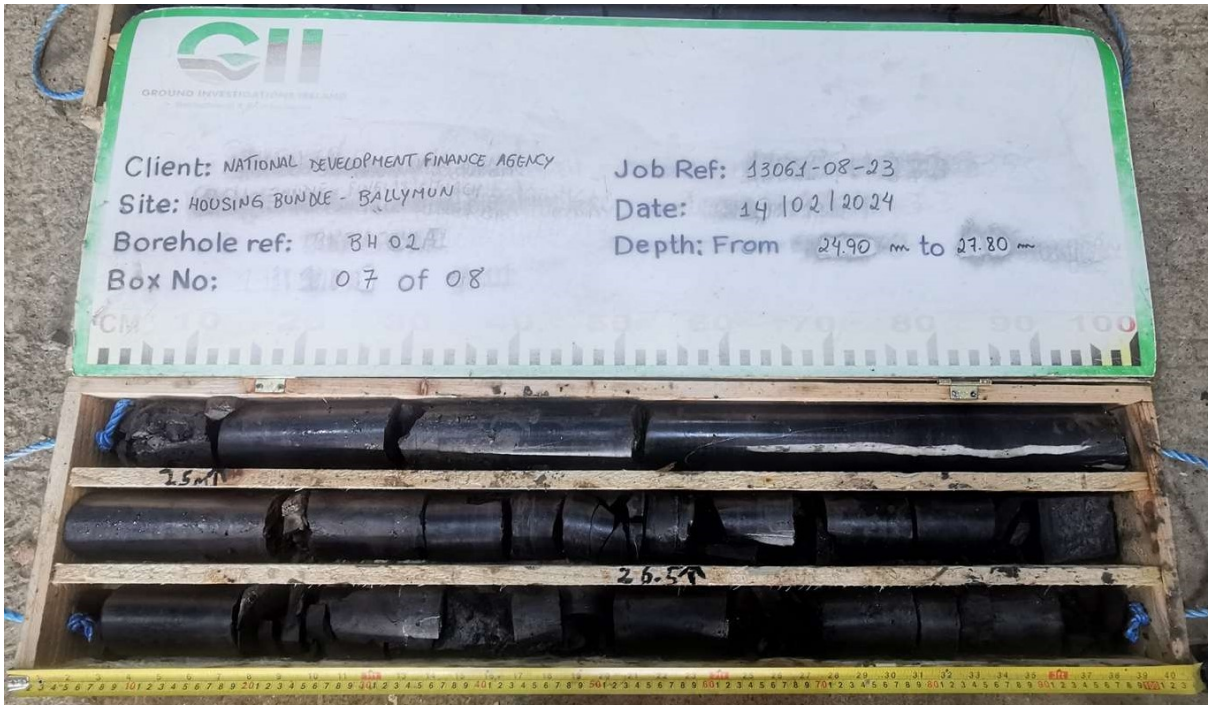
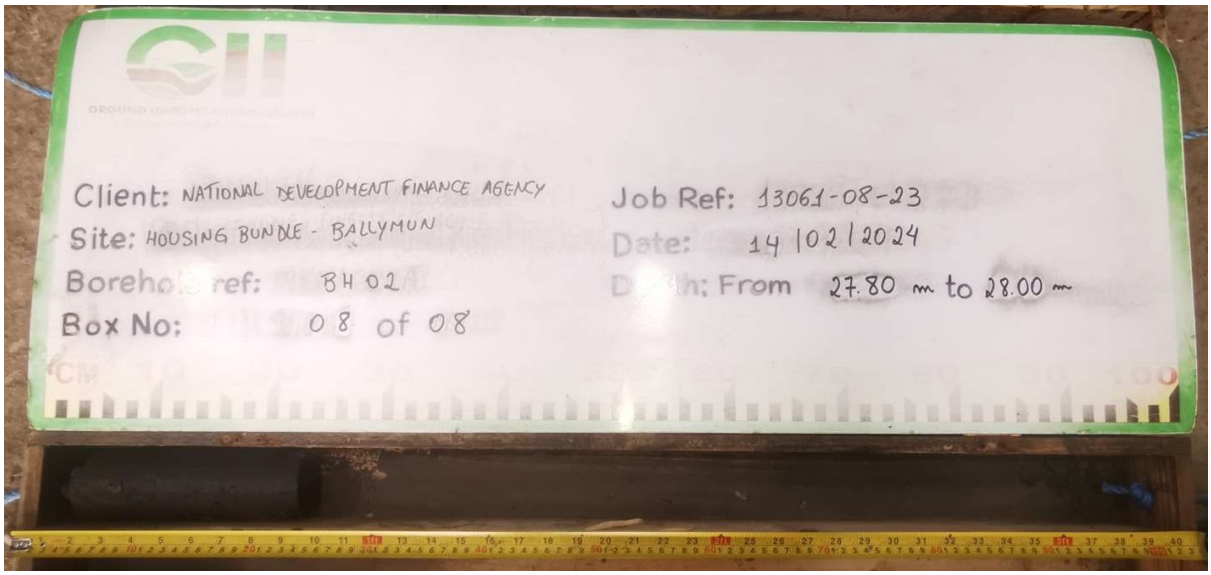




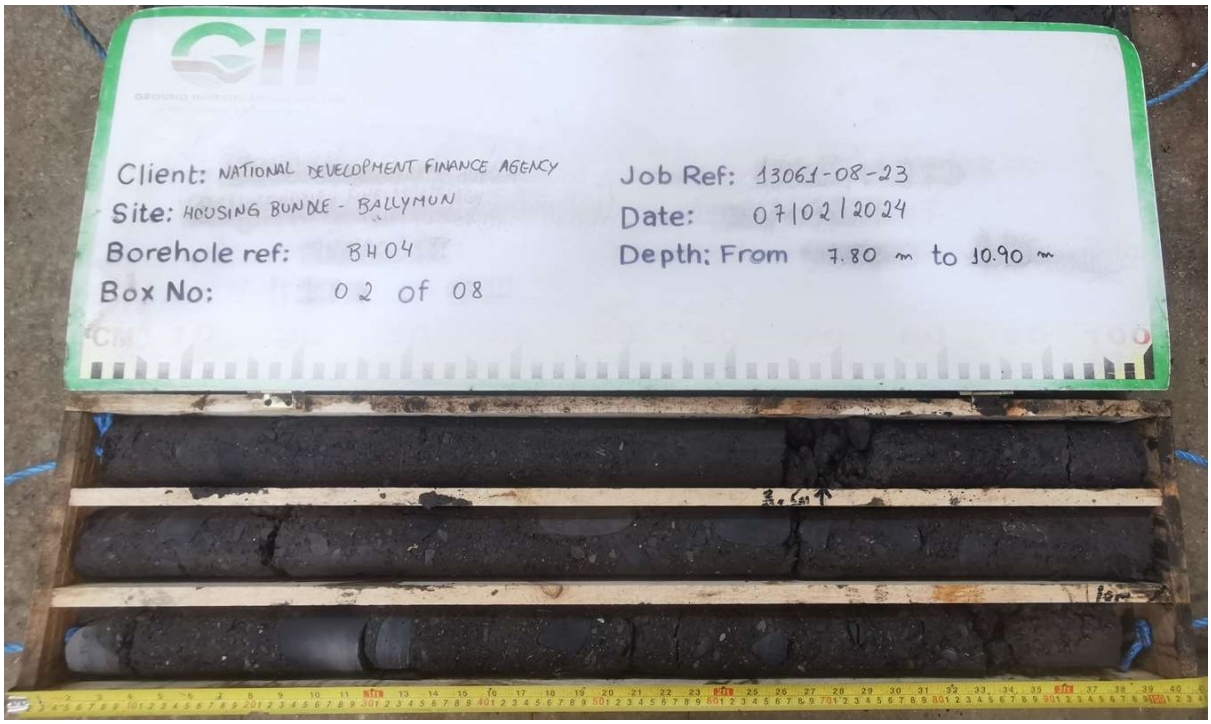
Housing Bundle _ Ballymun





Housing Bundle _ Ballymun

BH04



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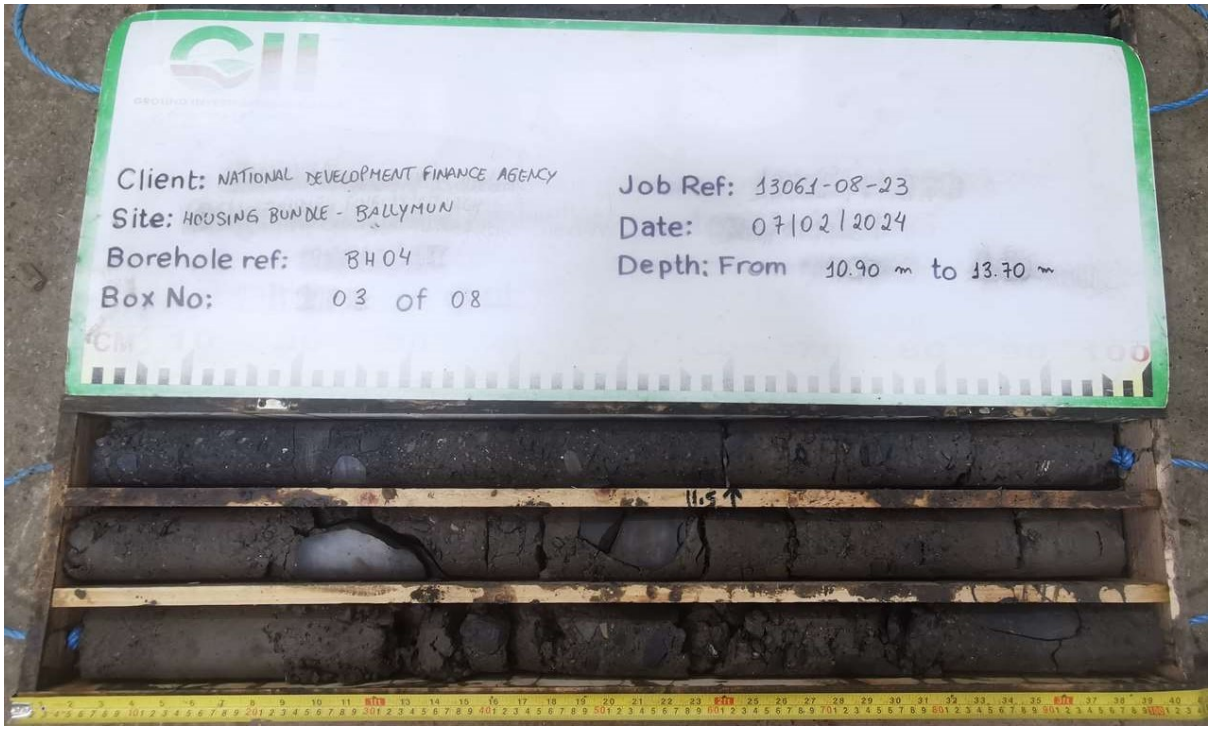

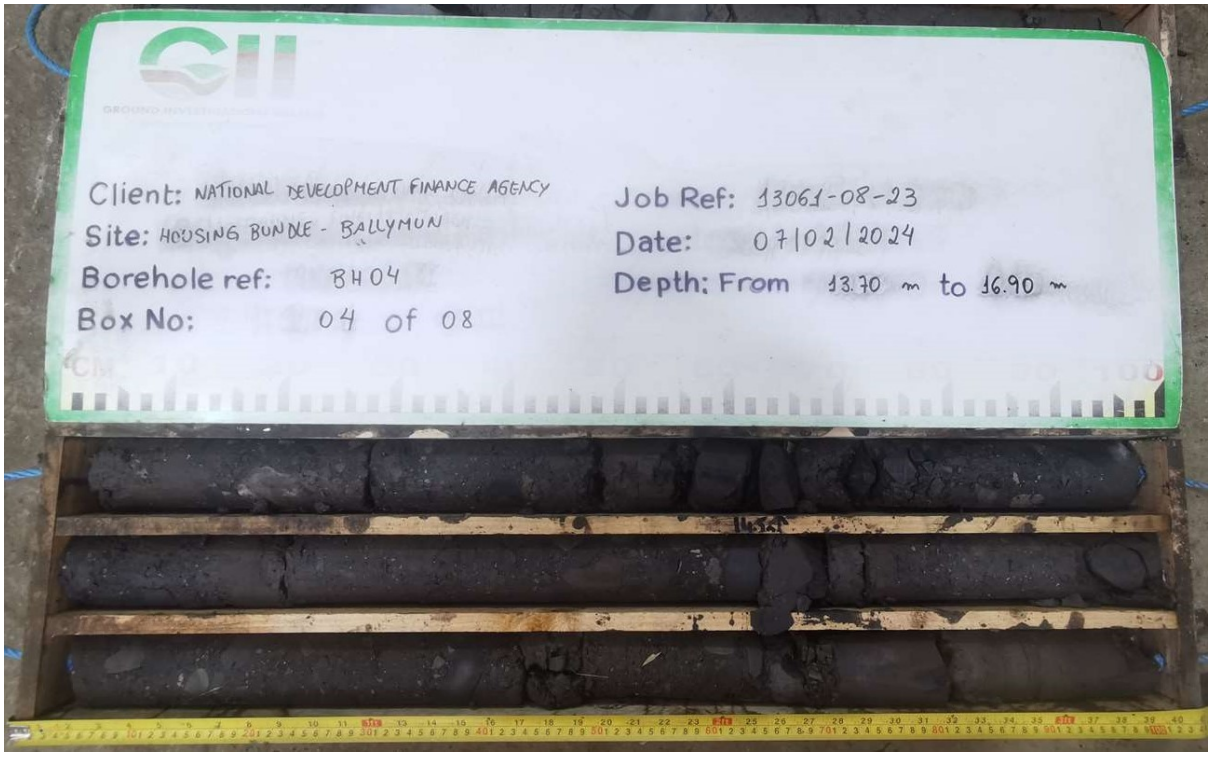

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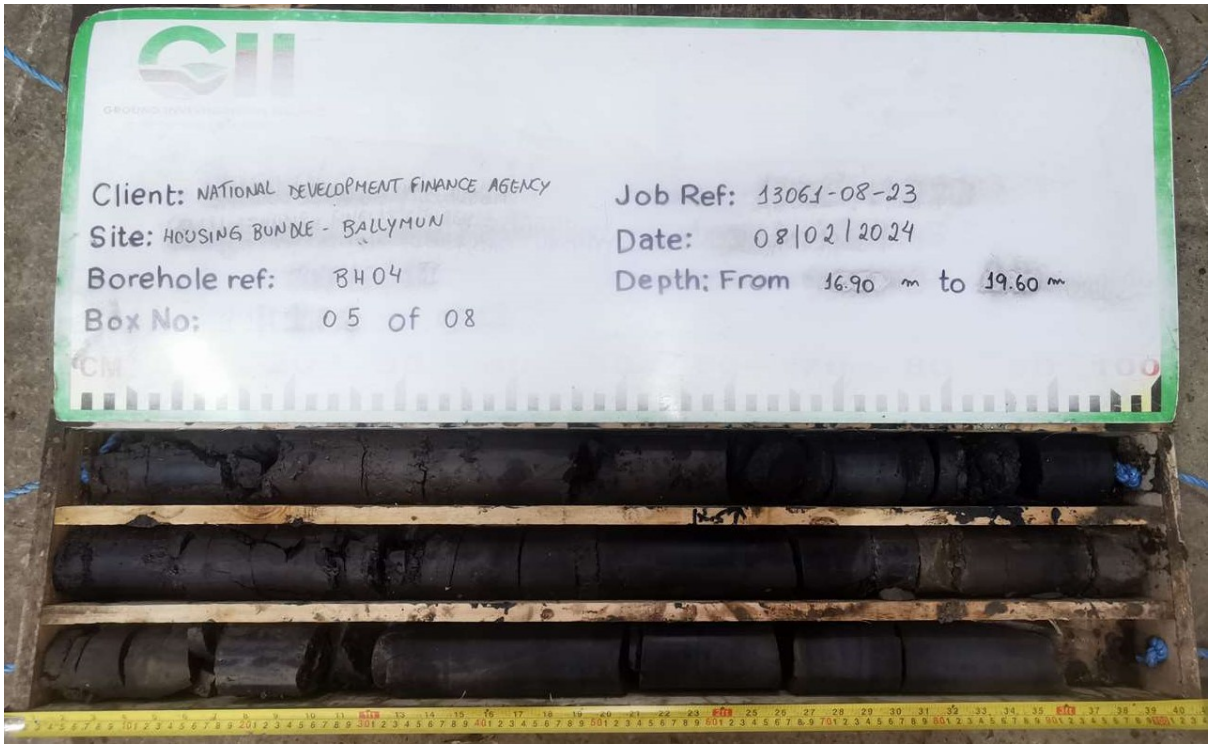

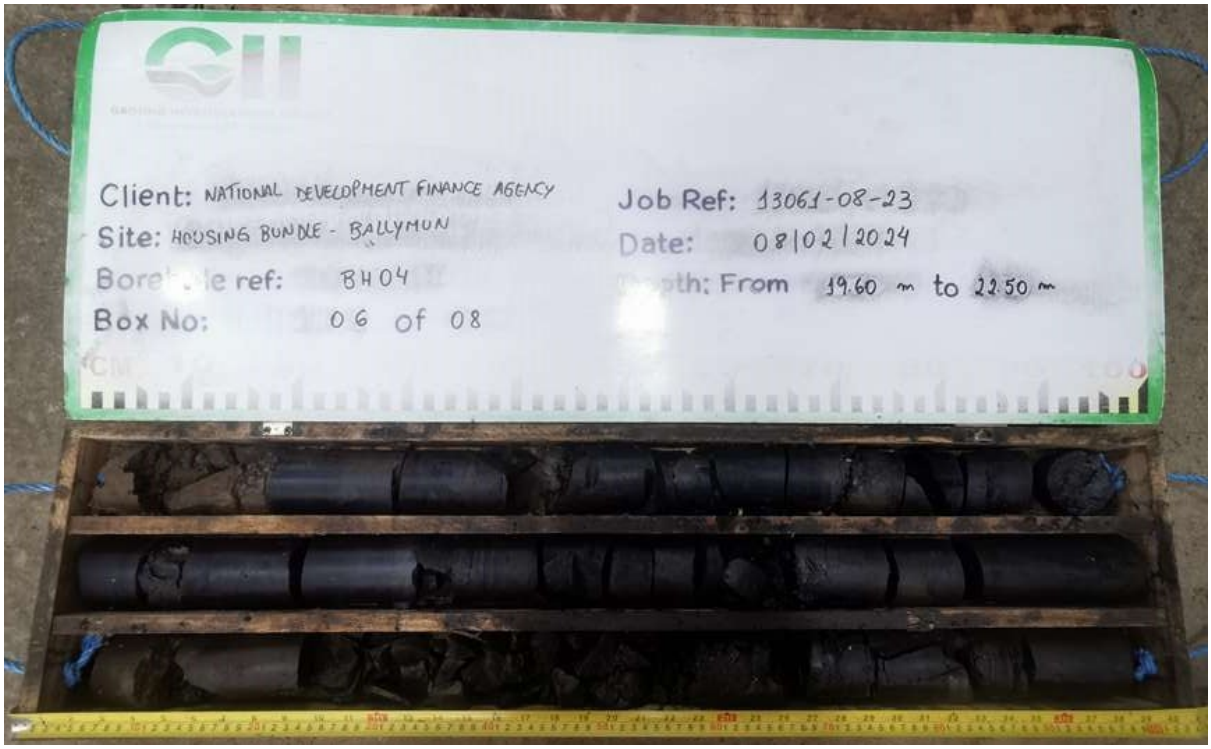

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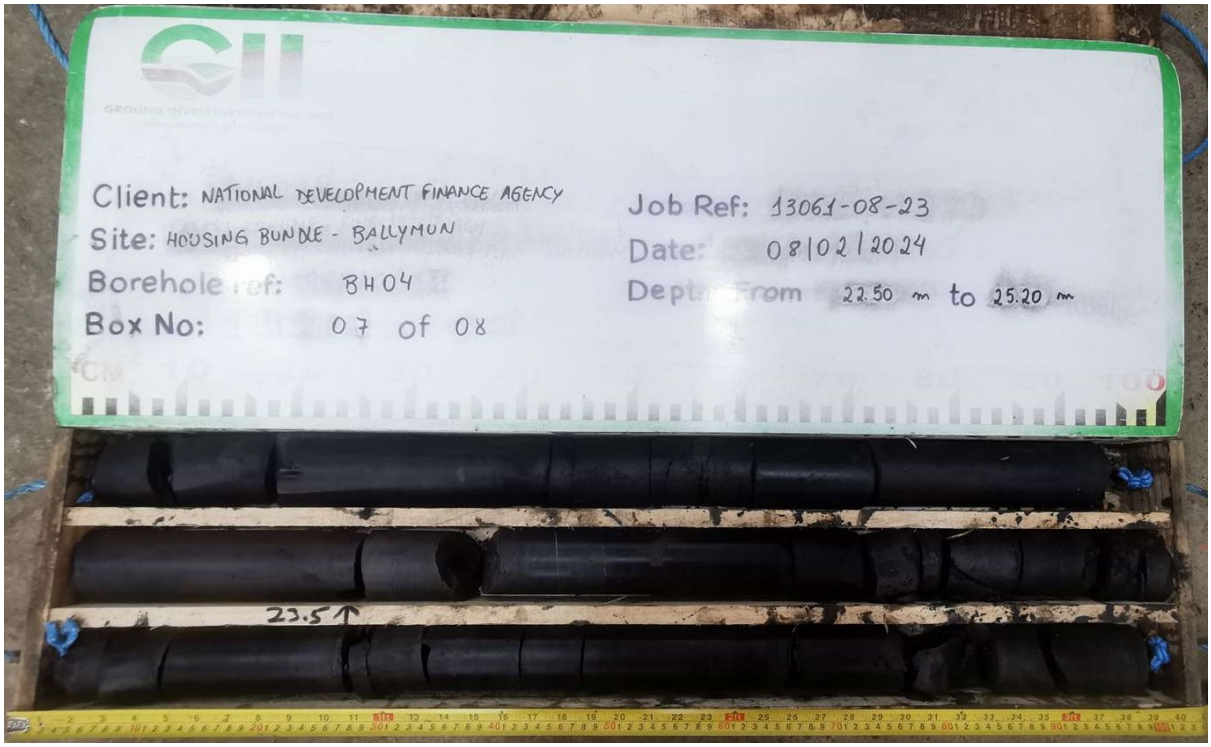
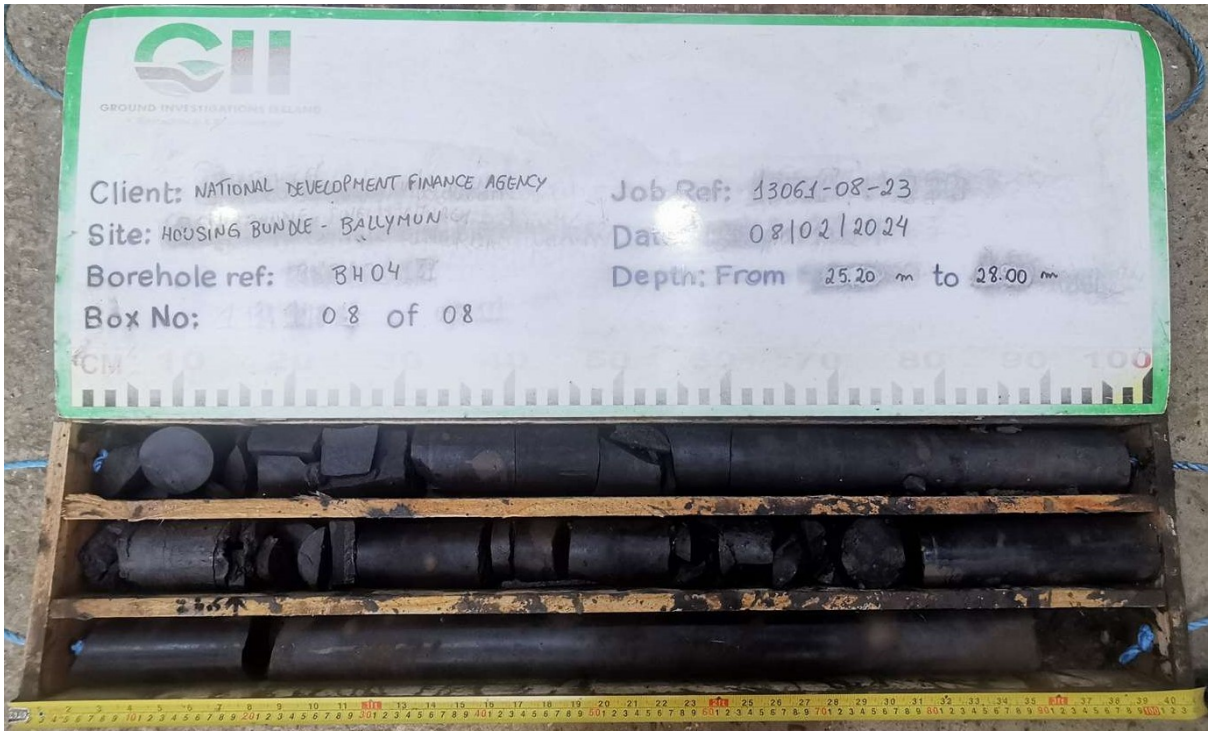
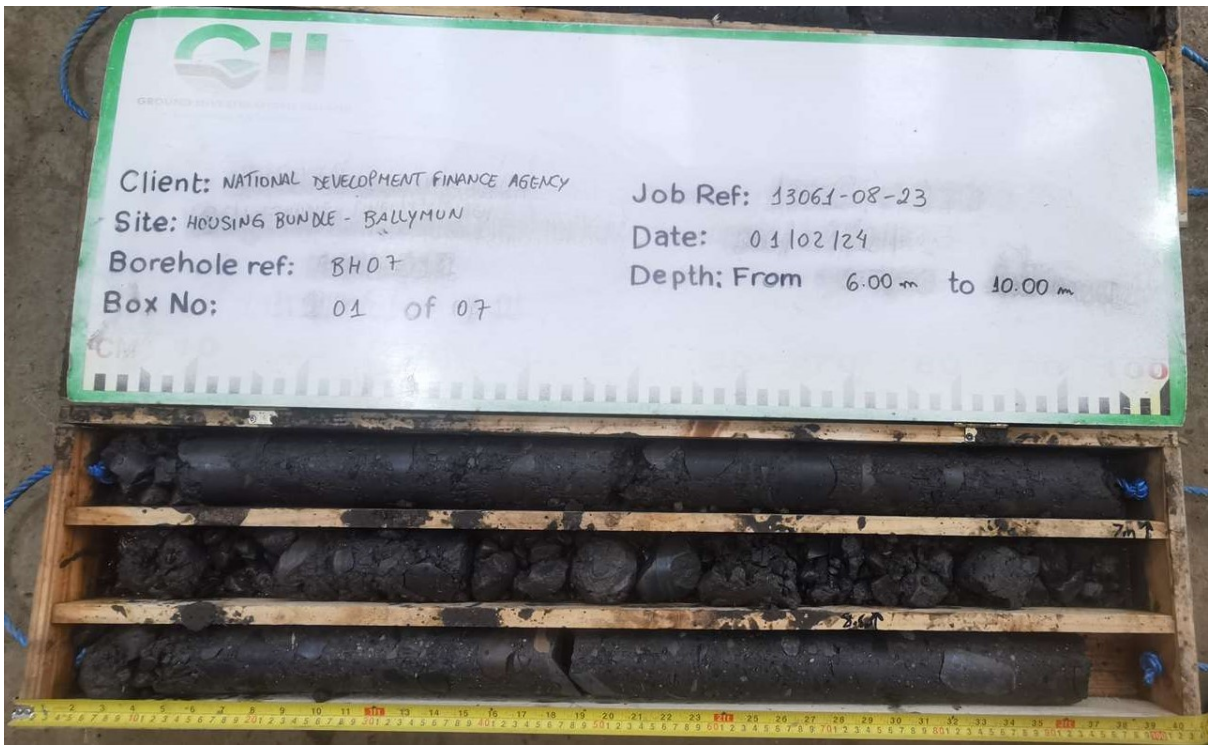
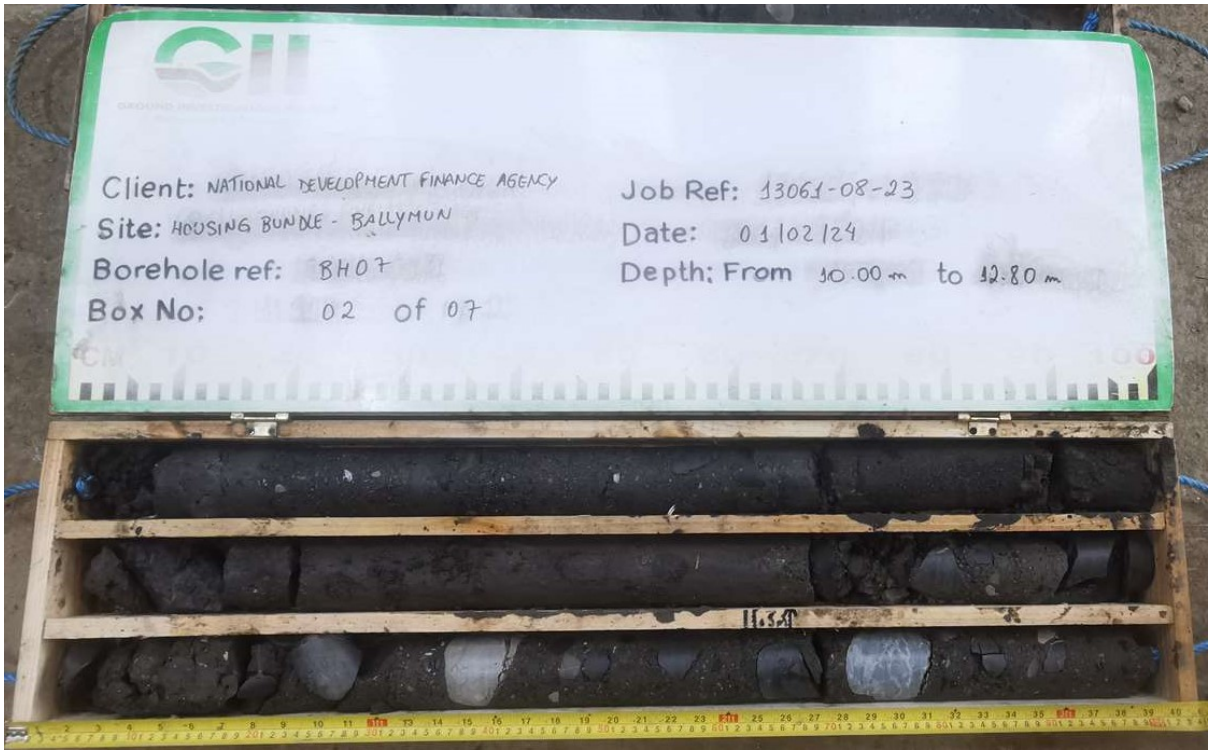




Housing Bundle _ Ballymun

BH07





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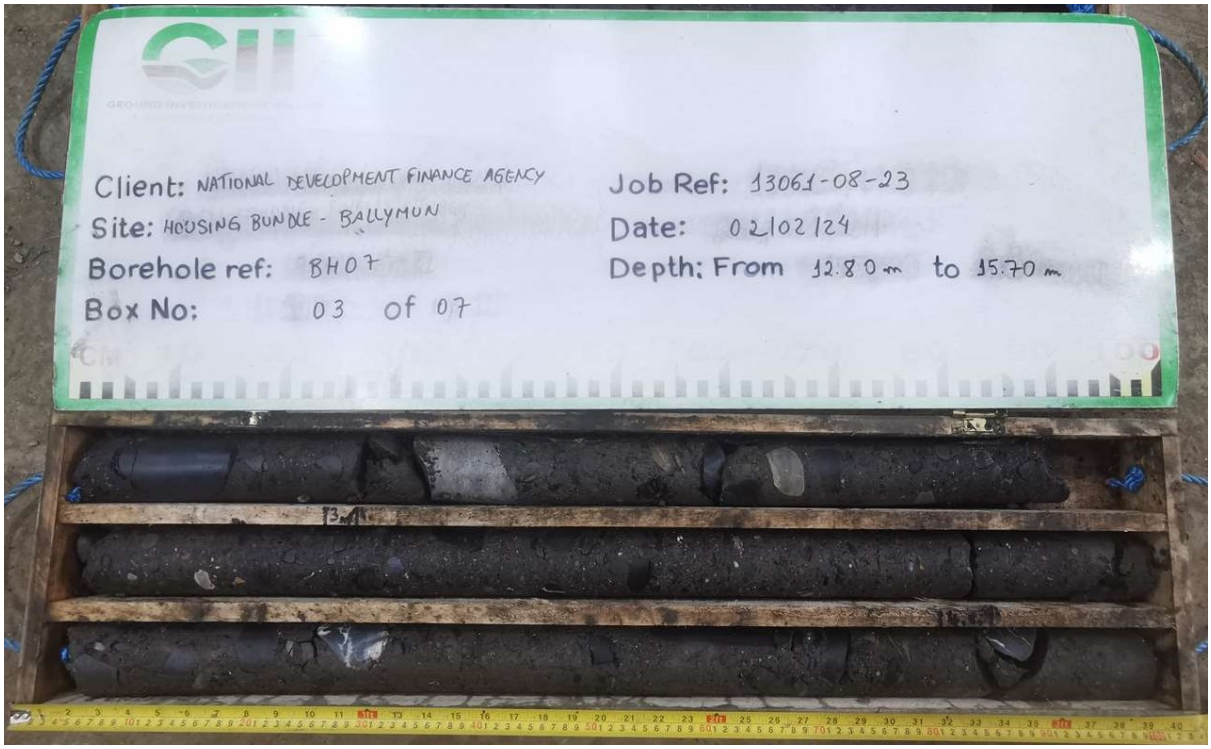

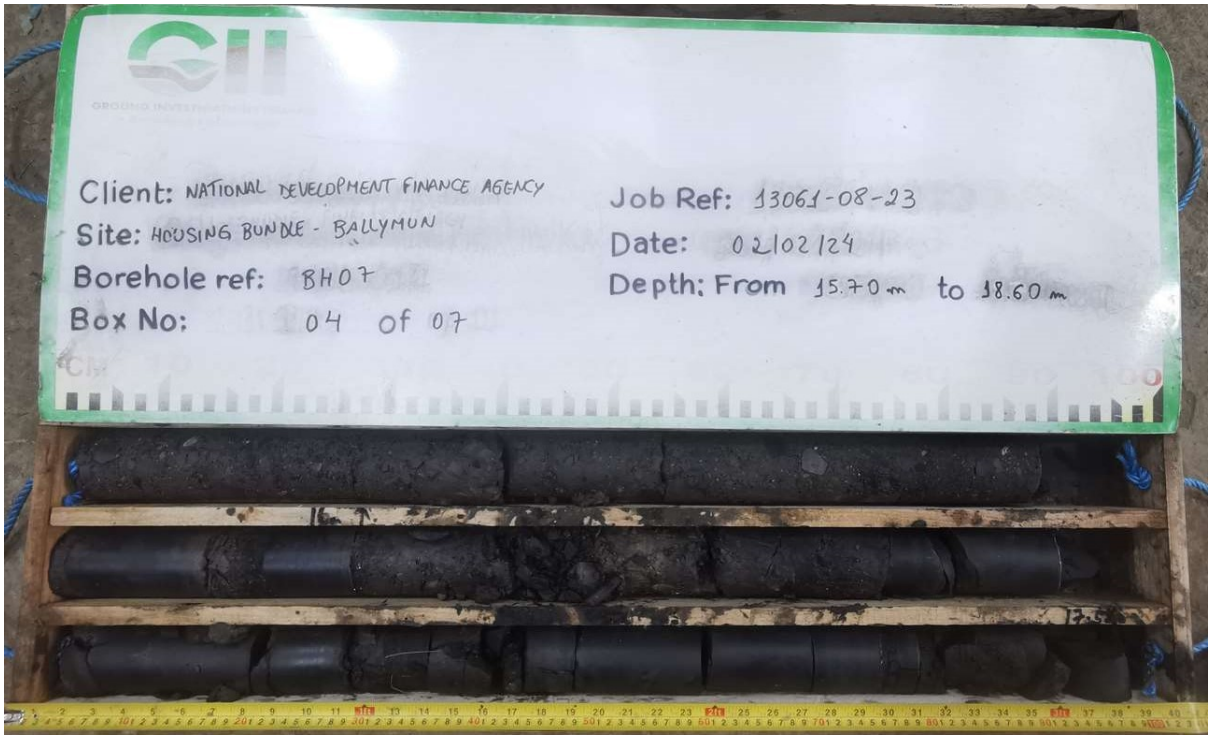

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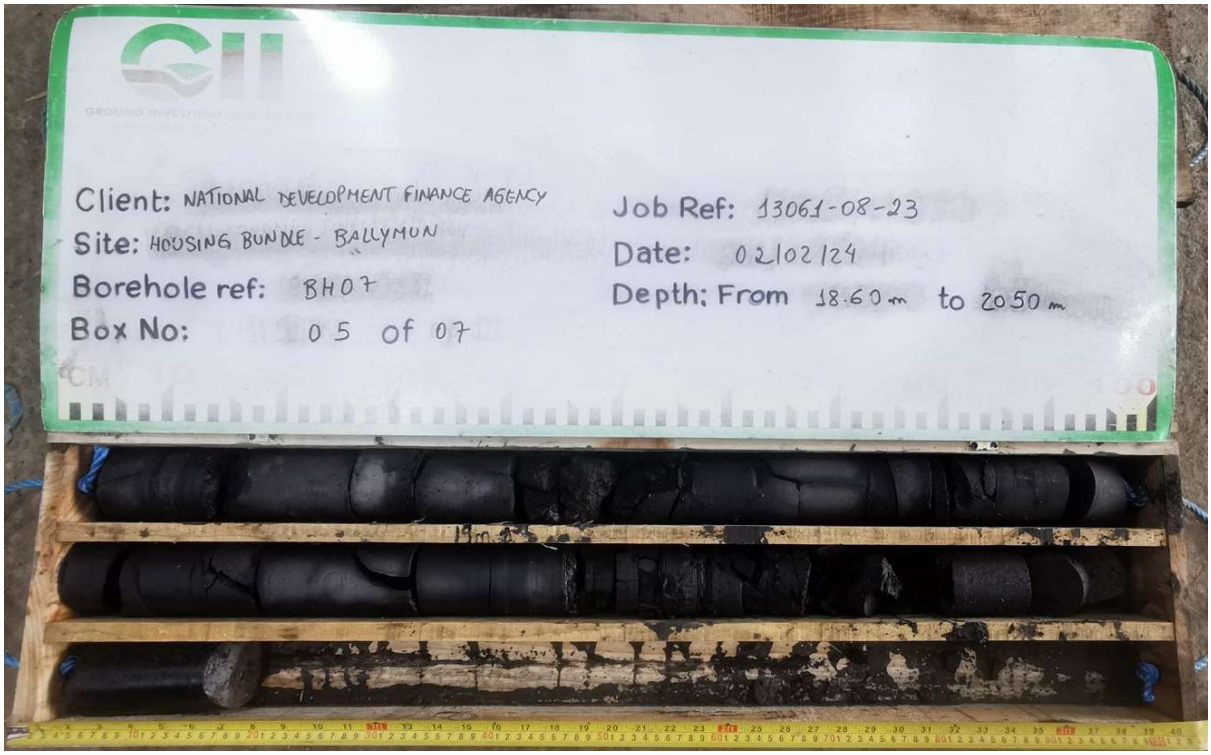
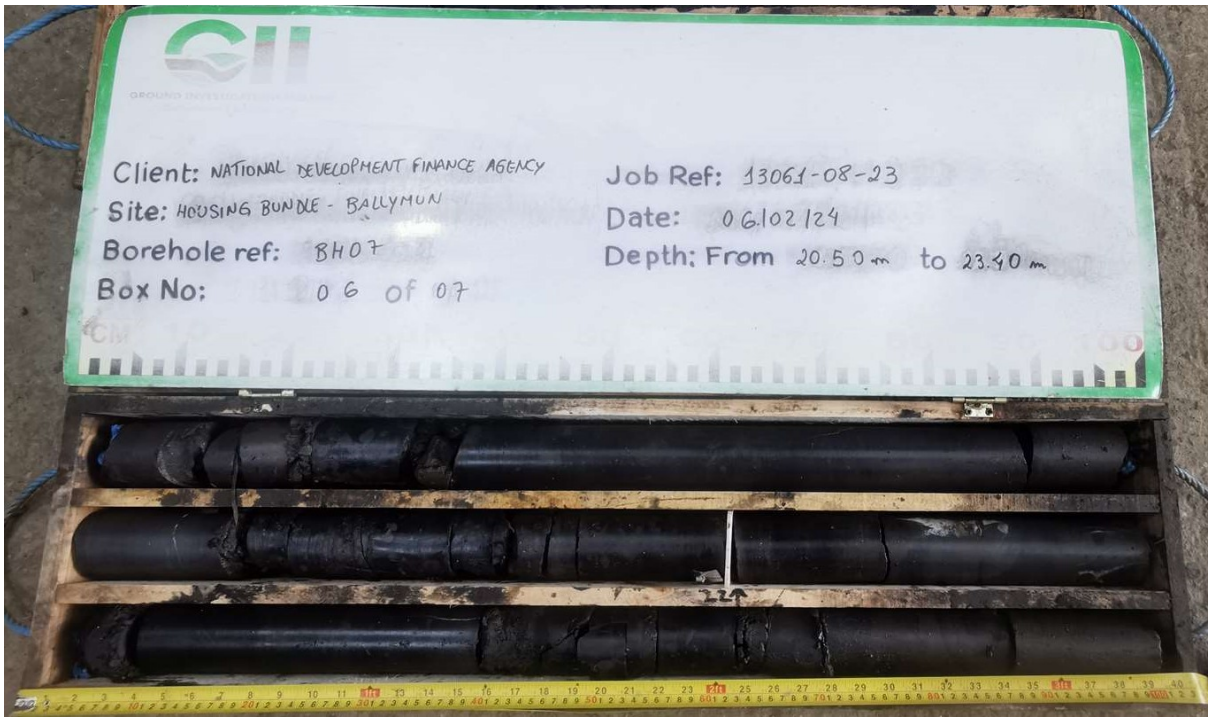
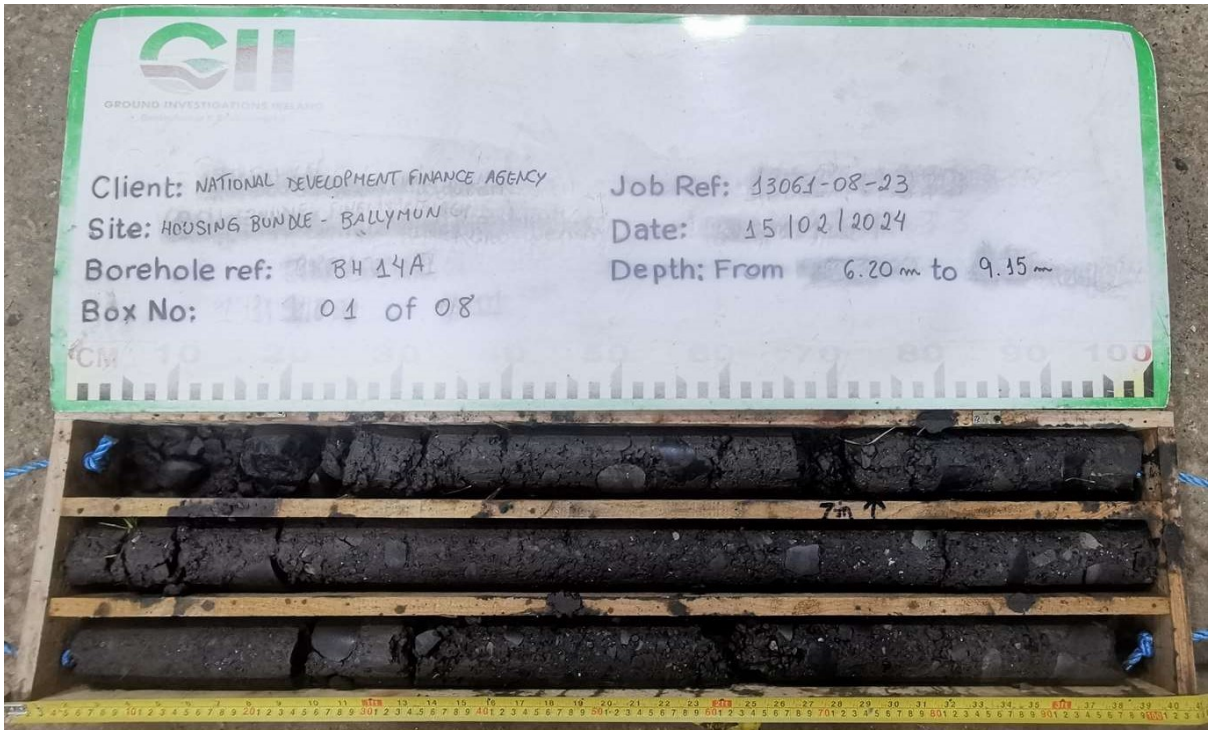


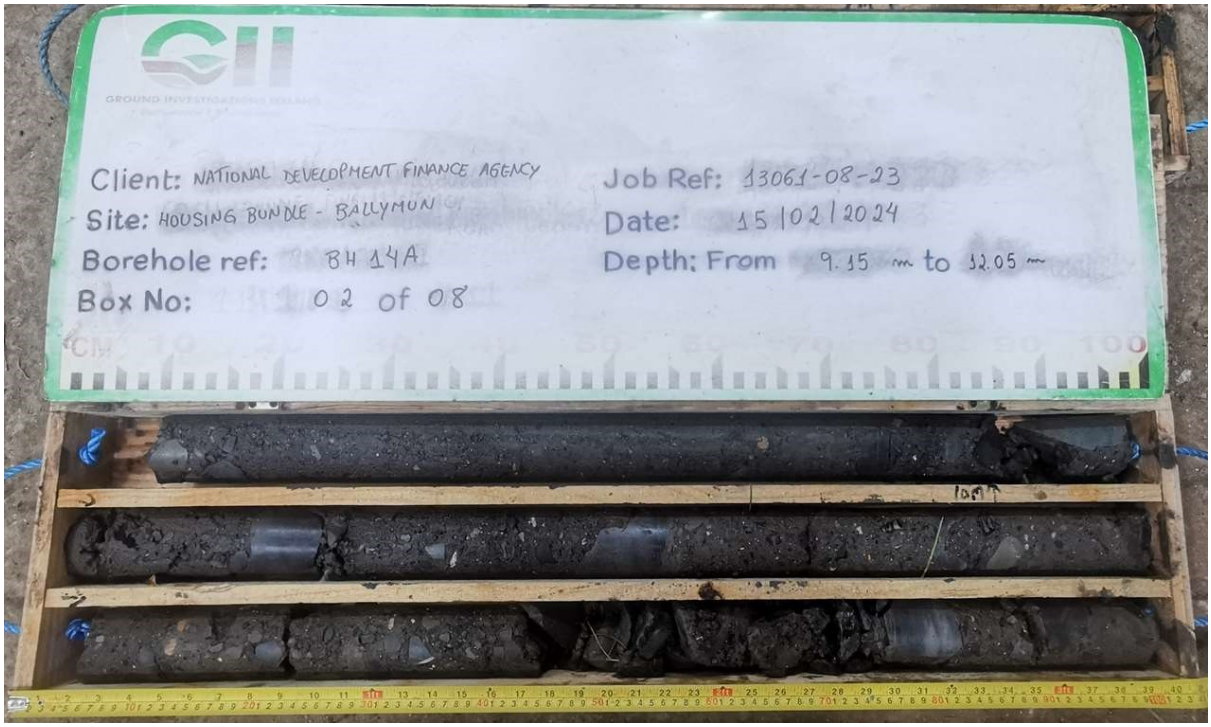


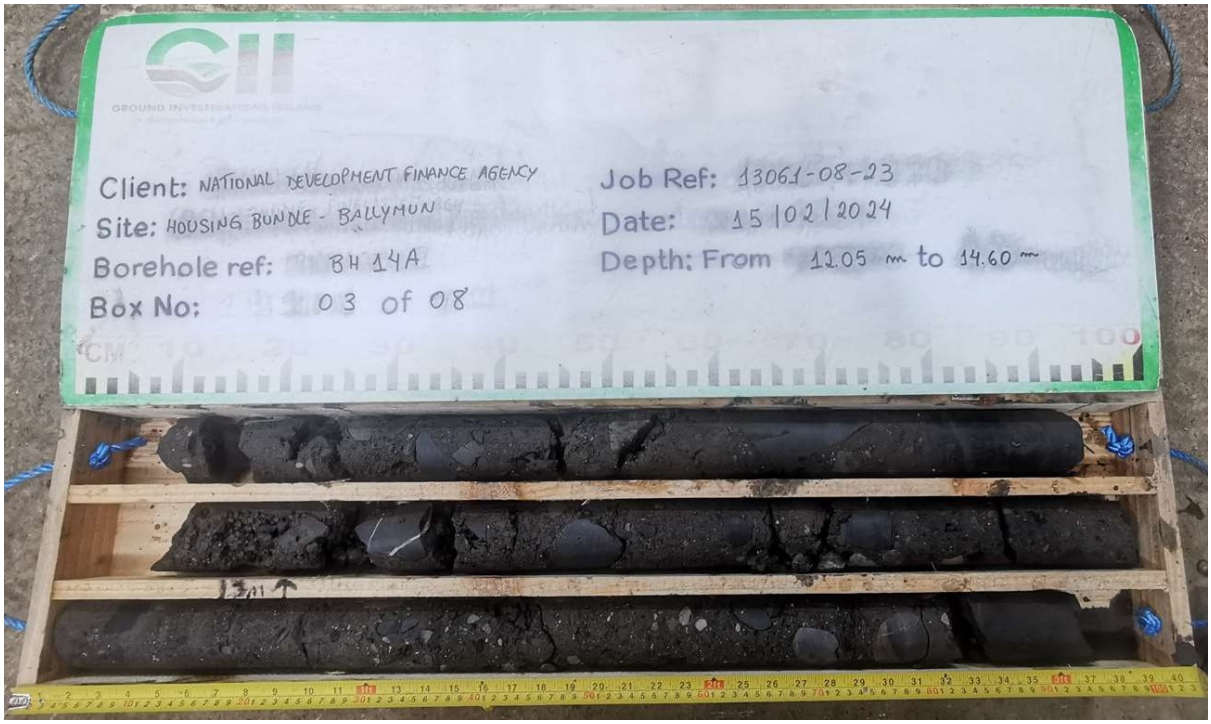
Housing Bundle _ Ballymun

BH14A



Housing Bundle _ Ballymun





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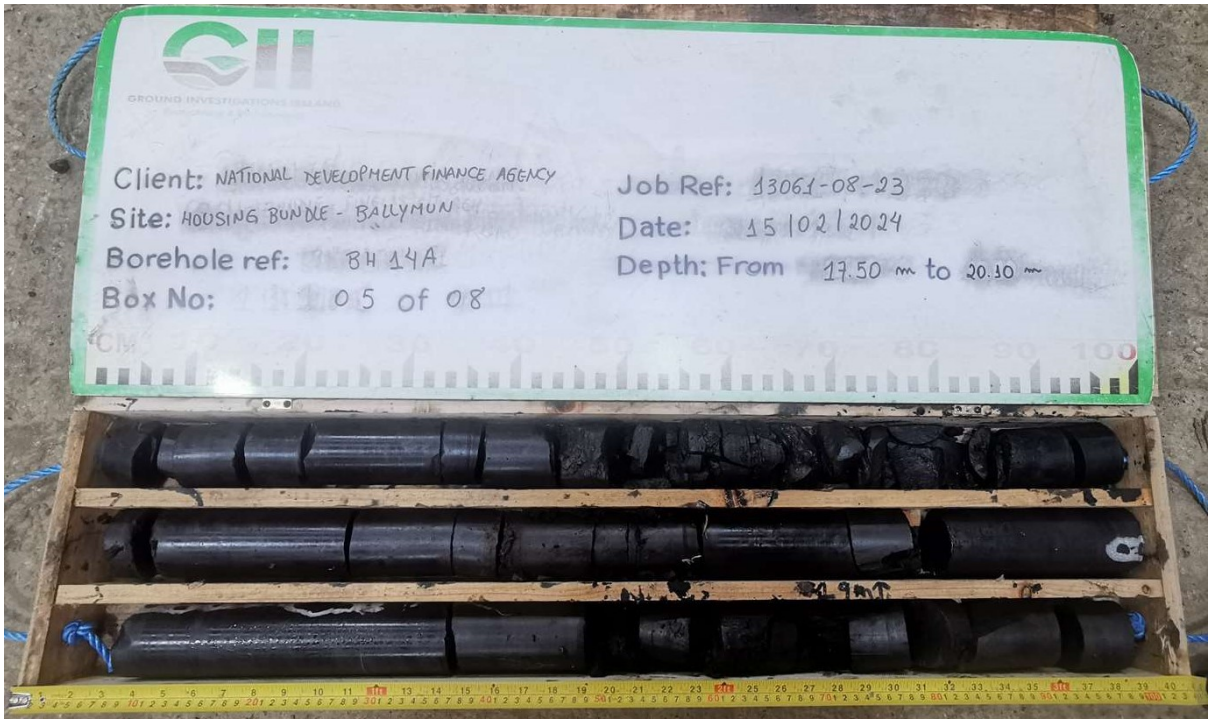

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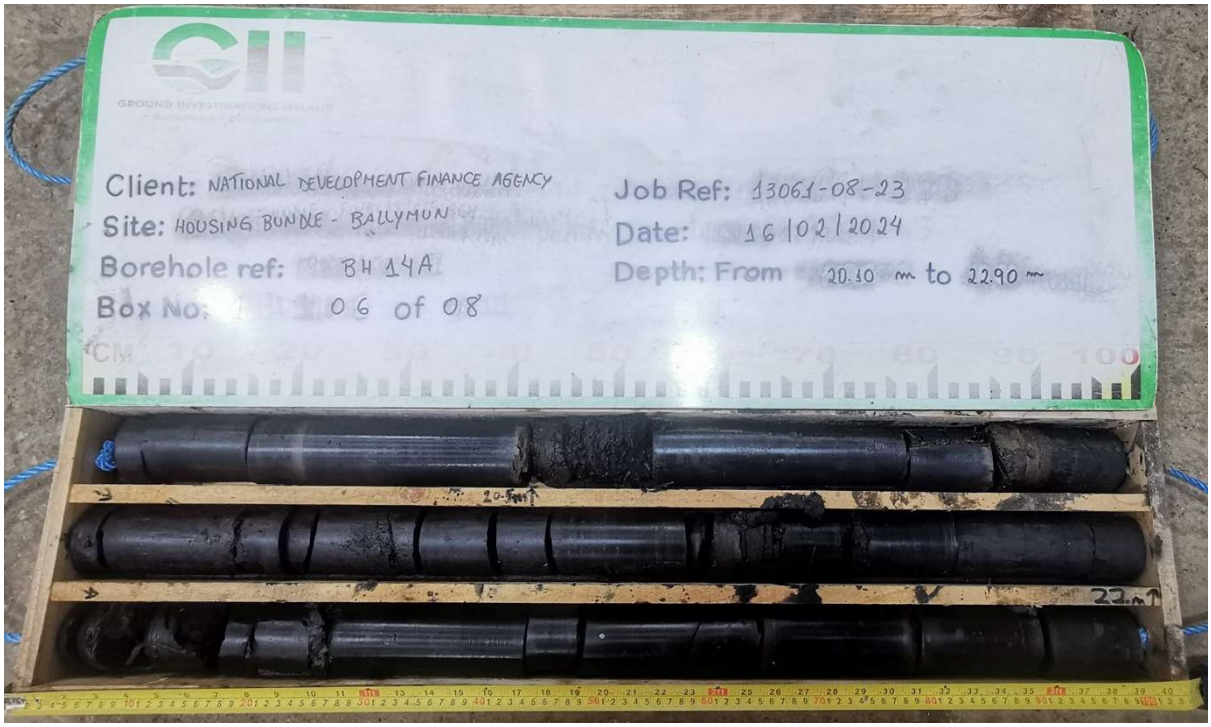
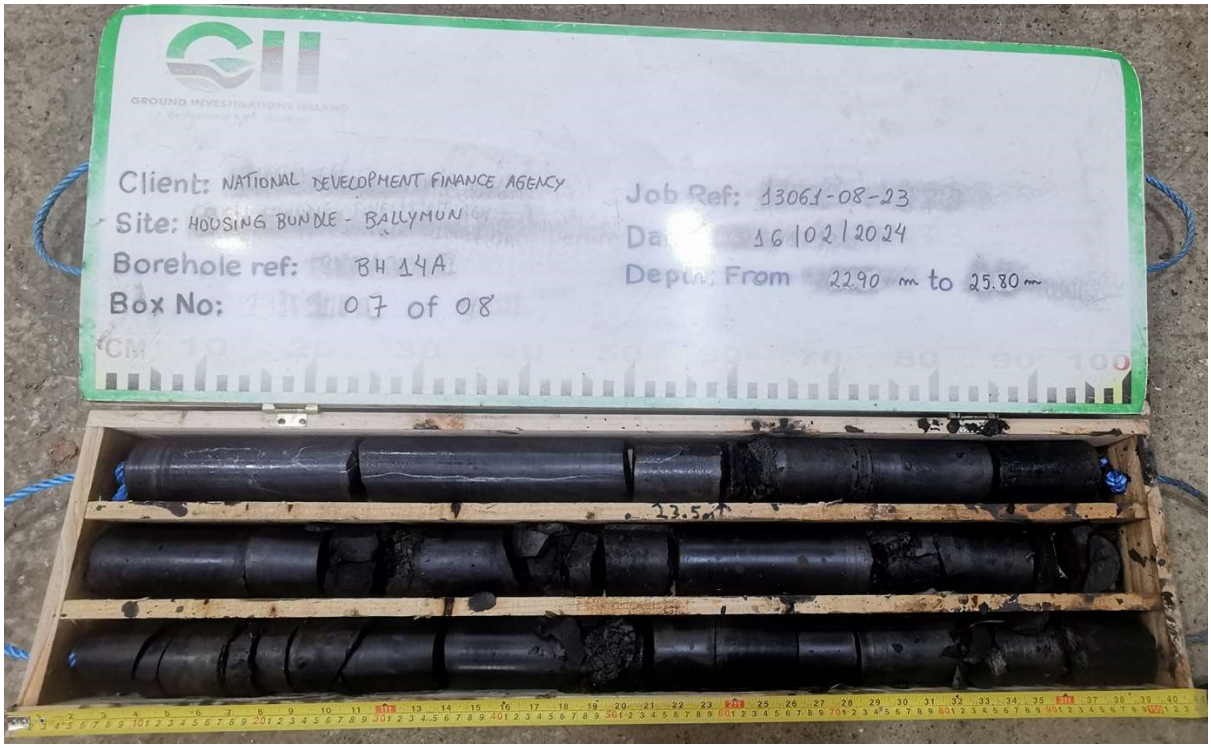
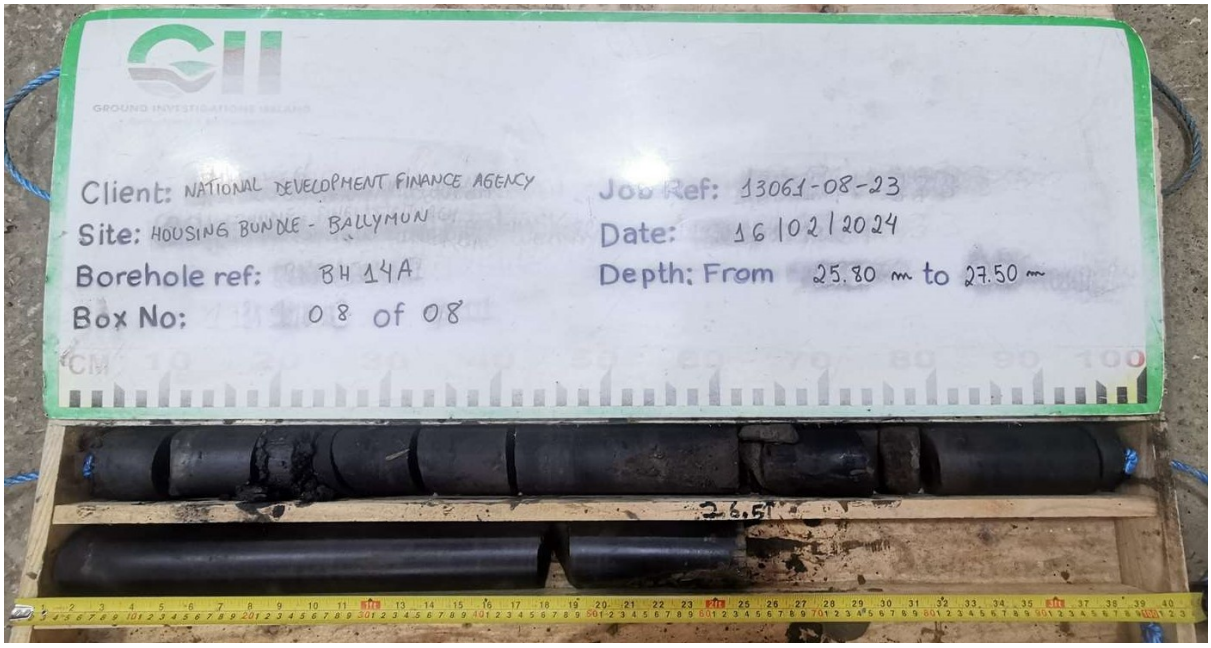




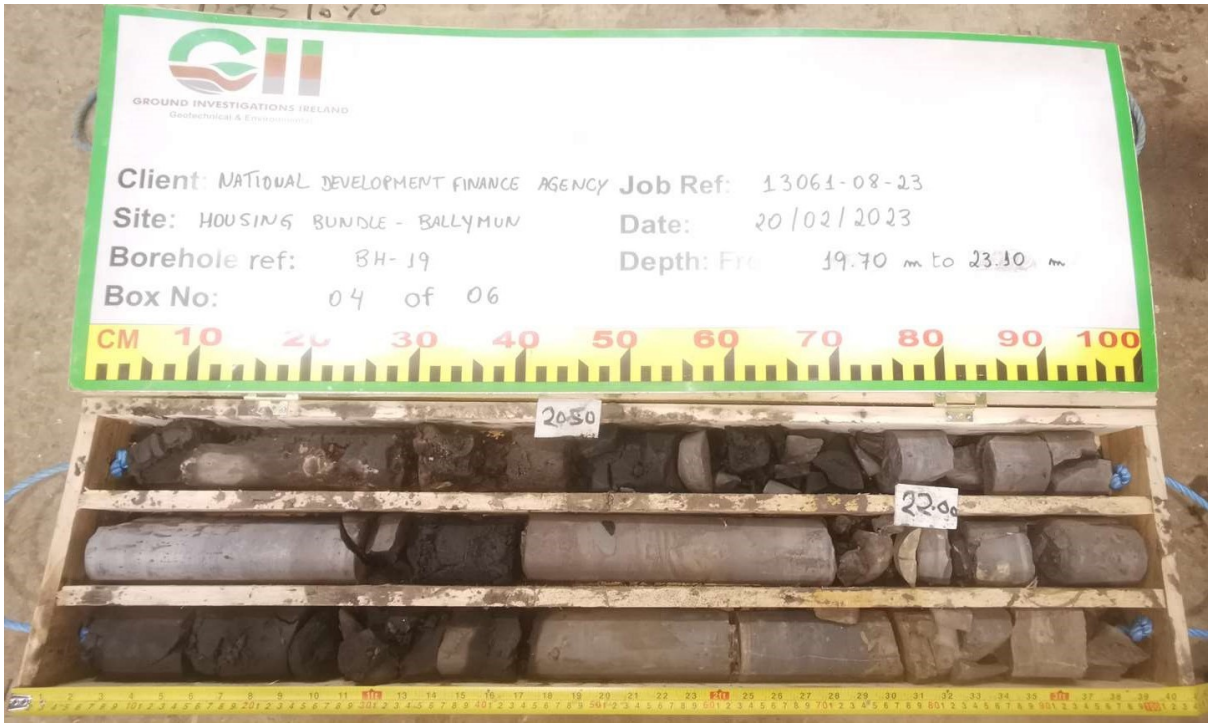
Housing Bundle _ Ballymun



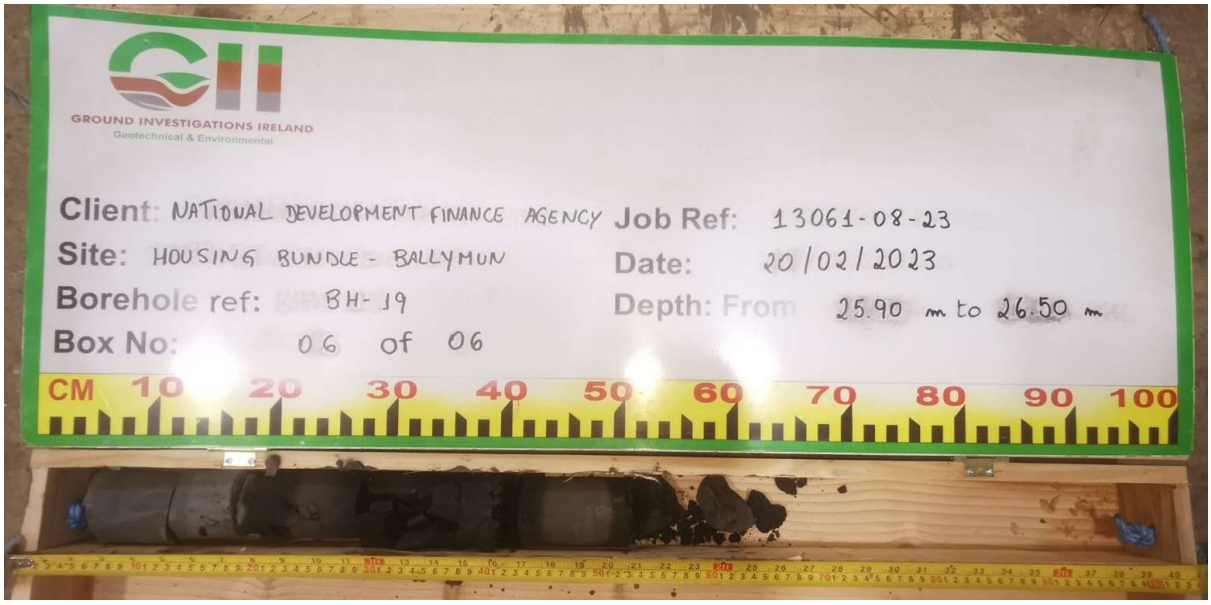
BH19

Housing Bundle _ Ballymun

Housing Bundle _ Ballymun



Housing Bundle _ Ballymun



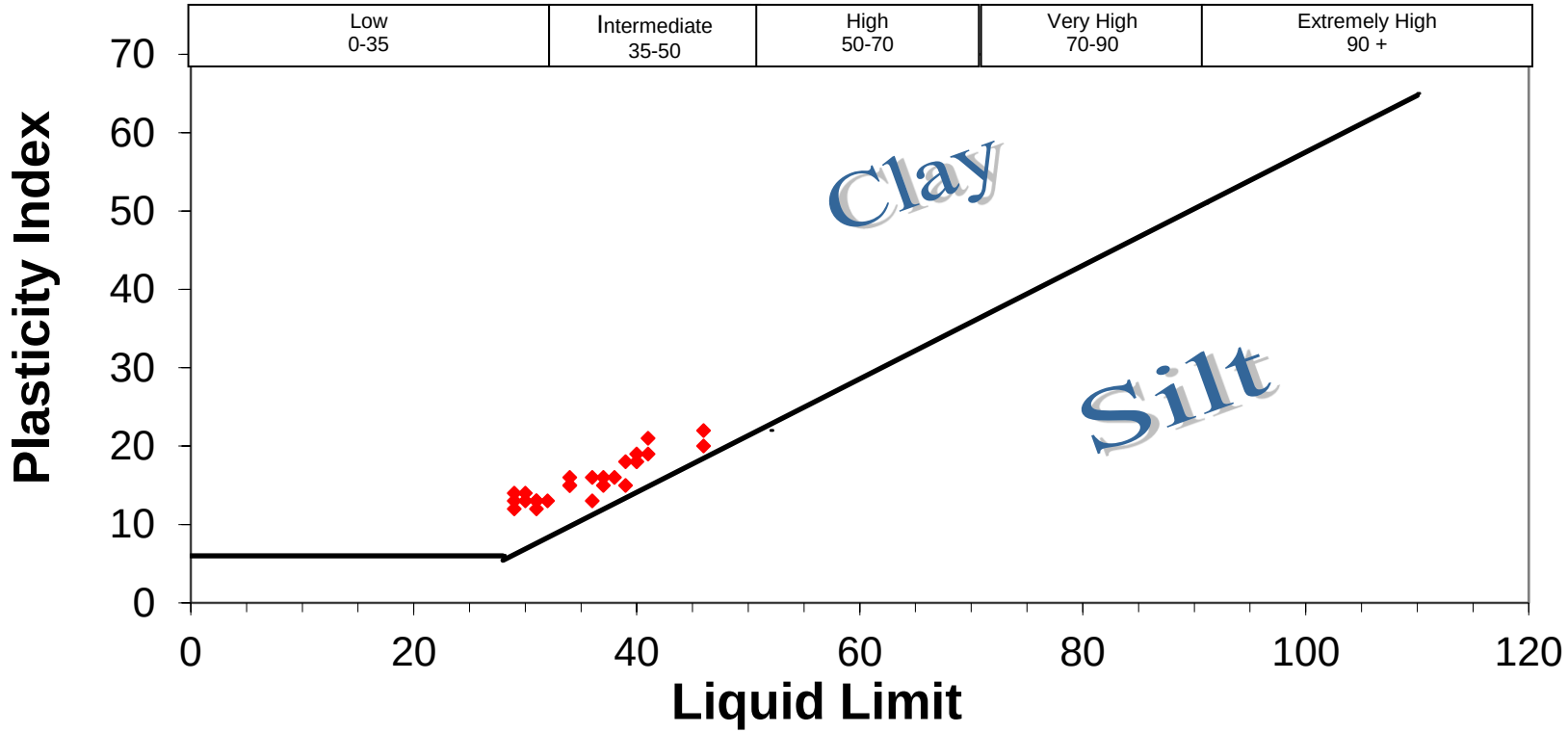
APPENDIX 6 – Laboratory Results

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	
TP01	1.20	B	23.8		73.7	46	24	22						
TP01	2.00	B	15.4		51.0	32	19	13						
TP02	2.00	B	21.3		40.8	41	22	19						
TP02	3.30	B	13.5		60.6	29	16	13						
TP03	1.00	B	24.5		48.2	41	20	21						
TP03	2.00	B	21.9		56.2	37	21	16						
TP05	1.00	B	19.1		58.8	34	19	15						
TP05	2.00	B	24.4		70.1	37	22	15						
TP06	1.00	B	20.4		43.0	38	22	16						
TP07	2.00	B	15.9		58.9	31	18	13						
TP07	3.00	B	14.5		47.5	30	17	13						
TP08	1.00	B	26.7		68.5	40	22	18						
BH02	1.00	B	20.8		48.8	36	23	13						
BH04	1.00	B	15.8		53.3	34	19	15						
BH06	2.50	B	17.6		51.4	39	21	18						
BH07	1.50	B	13.4		64.1	34	18	16						
BH08	1.00	B	24.0		50.5	40	21	19						
BH08	3.00	B	10.7		49.1	29	17	12						
BH09	1.50	B	21.0		56.6	40	22	18						
BH10	1.20	B	24.7		93.7	36	20	16						
BH10	4.00	B	12.8		58.7	39	24	15						
BH12A	2.00	B	28.4		55.0	46	26	20						
BH14A	2.50	B	11.8		60.5	29	15	14						
BH17	2.00	B	12.9		58.6	30	16	14						
BH18A	1.00	B	14.0		46.6	31	18	13						
BH19	3.00	B	12.8		47.9	31	19	12						
NMTL		Notes :									Job ref No.	NMTL 3693	GII Project ID:	13061-08-23(5)
		1. All BS tests carried out using preferred (definitive) method unless otherwise stated.									Location	Housing Bundle 4&5Ballymun Lot 4		

NMTL LTD	**Contract:** Housing Bundle 4&5Ballymun Lot 4
Unit 18c, Tullow Industrial Estate	**Client:** Ground Investigations Ireland ltd
Tullow	**Engineer:** Diarmaid maglochlainn
County Carlow	**GII Project ID** 13061-08-23(5)
Tel: 00353 59 9180822	**Date:** 31/01/2024
Mob: 00353 872575508	**Tested By:** Js **Checked:** Bc
billa@nmtl.ie	**Job ref No.** NMTL 3693



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	100.0
37.500	100.0
28.000	96.8
20.000	93.5
14.000	91.5
10.000	90.3
6.300	86.8
5.000	85.0
3.350	84.0
2.000	81.4
1.180	78.9
0.600	75.7
0.425	73.7
0.300	71.7
0.212	69.1
0.150	66.1
0.063	59.4
0.052	56.3
0.037	51.7
0.019	42.4
0.010	34.8
0.007	28.6
0.005	24.0
0.004	20.0
0.002	16.0

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
16.0		43.4			22.0			18.6		0.0	0.0

Sample Description	Brown slightly gravelly slightlty sandy silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP01
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 25/01/2024	Depth	1.20m

NM TL Ltd

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	91.4
37.500	86.7
28.000	84.2
20.000	82.2
14.000	79.3
10.000	76.1
6.300	70.6
5.000	68.3
3.350	66.2
2.000	62.6
1.180	58.4
0.600	53.4
0.425	51.0
0.300	48.4
0.212	45.7
0.150	42.9
0.063	37.2
0.052	34.7
0.038	31.4
0.019	26.5
0.010	21.3
0.007	18.2
0.005	15.1
0.004	13.4
0.002	7.4

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.4		29.8			25.4			37.4		0.0	0.0

Sample Description	Light brown slightly sandy gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	TP01
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	25/01/2024	Depth	2.00m

NM TL Ltd

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	100.0
37.500	92.6
28.000	84.7
20.000	79.9
14.000	74.0
10.000	69.3
6.300	62.7
5.000	59.8
3.350	57.6
2.000	52.8
1.180	48.2
0.600	43.3
0.425	40.8
0.300	38.4
0.212	35.8
0.150	33.1
0.063	28.0
0.052	26.5
0.038	24.2
0.019	20.8
0.010	16.4
0.007	14.2
0.005	11.9
0.004	9.6
0.002	7.0

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.0		21.0			24.8			47.2		0.0	0.0

Sample Description	Brown/grey slightly sandy gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP02
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 25/01/2024	Depth	2.00m

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	100.0
37.500	100.0
28.000	98.7
20.000	98.0
14.000	91.3
10.000	87.7
6.300	82.5
5.000	80.4
3.350	78.2
2.000	73.8
1.180	69.3
0.600	63.5
0.425	60.6
0.300	57.6
0.212	54.5
0.150	51.1
0.063	43.7
0.054	41.7
0.039	38.8
0.020	32.9
0.010	26.8
0.007	21.3
0.005	16.9
0.004	13.7
0.002	8.7

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
8.7		35.0			30.1			26.2		0.0	0.0

Sample Description	Grey slightly gravelly slightly sandy silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	TP03
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	25/01/2024	Depth	3.30m

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	94.0
37.500	94.0
28.000	89.4
20.000	81.7
14.000	73.3
10.000	71.1
6.300	67.6
5.000	65.8
3.350	63.8
2.000	60.6
1.180	57.2
0.600	51.5
0.425	48.2
0.300	44.5
0.212	40.5
0.150	36.1
0.063	27.7
0.054	25.5
0.039	23.2
0.020	19.5
0.010	15.0
0.008	13.0
0.005	10.0
0.004	8.7
0.002	5.1

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
5.1		22.6			32.9			39.4		0.0	0.0

Sample Description	Light brown slightly sandy gravelly silty silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP03
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 23/04/2024	Depth	1.00m

NM TL Ltd

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	100.0
37.500	100.0
28.000	92.1
20.000	89.4
14.000	86.7
10.000	84.5
6.300	79.4
5.000	76.0
3.350	73.9
2.000	69.5
1.180	64.9
0.600	59.0
0.425	56.0
0.300	52.8
0.212	49.5
0.150	46.2
0.063	39.0
0.052	37.8
0.037	33.9
0.019	28.5
0.010	22.7
0.007	19.2
0.005	15.3
0.004	13.8
0.002	8.9

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
8.9		30.2			30.4			30.5		0.0	0.0

Sample Description	Dark grey/brown slightly sandy slightly gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	TP03
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	23/01/2024	Depth	2.00m

NM TL Ltd

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	100.0
37.500	100.0
28.000	94.7
20.000	91.1
14.000	90.3
10.000	84.9
6.300	80.2
5.000	77.6
3.350	74.9
2.000	70.8
1.180	66.6
0.600	61.4
0.425	58.8
0.300	56.2
0.212	53.3
0.150	50.3
0.063	43.9
0.052	42.5
0.037	38.7
0.019	33.7
0.010	27.8
0.007	23.3
0.005	19.7
0.004	17.3
0.002	12.1

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
12.1		31.8			26.9			29.2		0.0	0.0

Sample Description	Grey/brown slightly sandy slightly gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP05
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 23/01/2024	Depth	1.00m

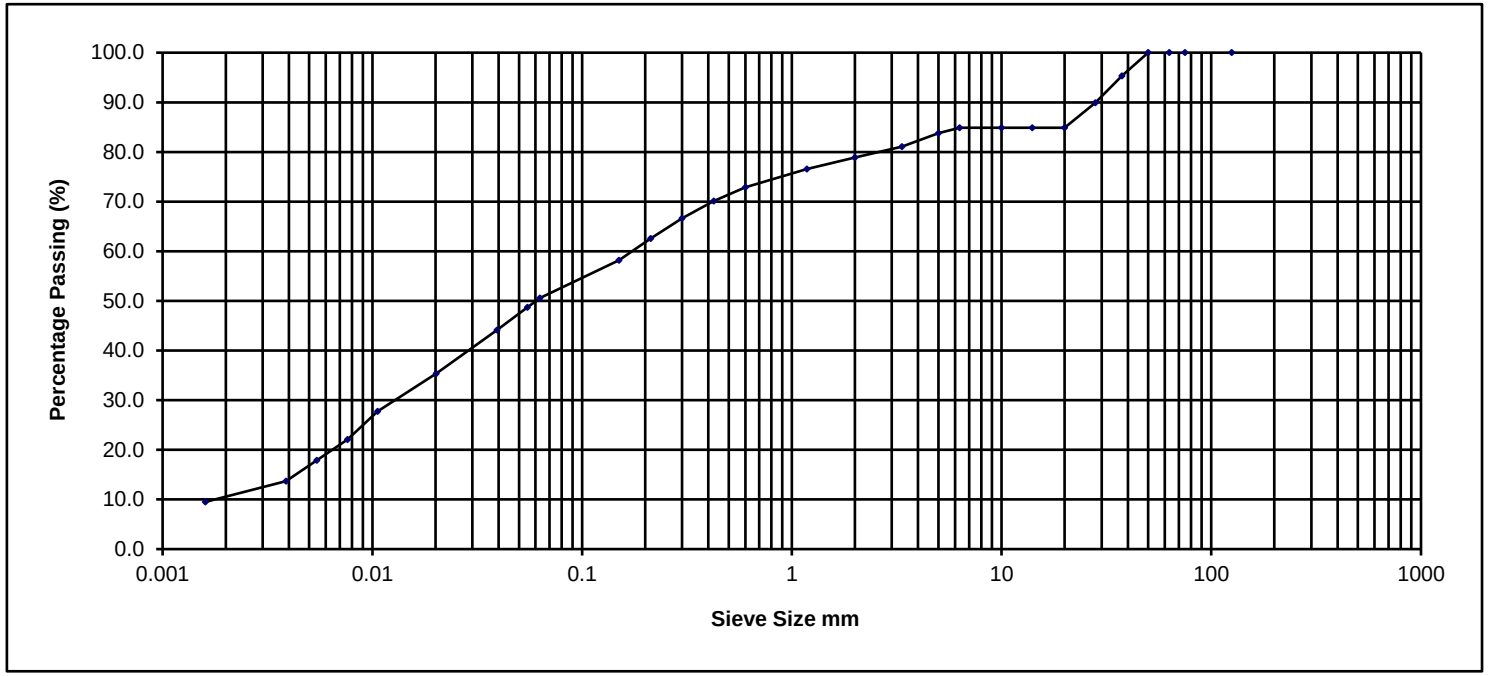
NM TL Ltd

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	100.0
37.500	95.3
28.000	89.9
20.000	84.9
14.000	84.9
10.000	84.9
6.300	84.9
5.000	83.8
3.350	81.1
2.000	78.9
1.180	76.5
0.600	72.9
0.425	70.1
0.300	66.6
0.212	62.5
0.150	58.2
0.063	50.6
0.055	48.7
0.039	44.1
0.020	35.4
0.011	27.8
0.008	22.1
0.005	17.9
0.004	13.7
0.002	9.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
9.5		41.1			28.3			21.1		0.0	0.0

Sample Description	Brown grey slightly gravelly slightly sandy silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	TP05
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	25/01/2024	Depth	3.00m

NM TL Ltd

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	92.7
37.500	87.4
28.000	84.3
20.000	81.6
14.000	73.6
10.000	69.0
6.300	61.8
5.000	59.4
3.350	57.4
2.000	53.6
1.180	50.0
0.600	45.3
0.425	43.0
0.300	40.4
0.212	37.8
0.150	35.0
0.063	29.7
0.052	28.7
0.037	27.1
0.019	22.9
0.010	18.8
0.007	16.3
0.005	13.8
0.004	11.3
0.002	8.0

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
8.0		21.8			23.9			46.4		0.0	0.0

Sample Description	Brown grey slightly sandy gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP06
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 25/01/2024	Depth	1.00m

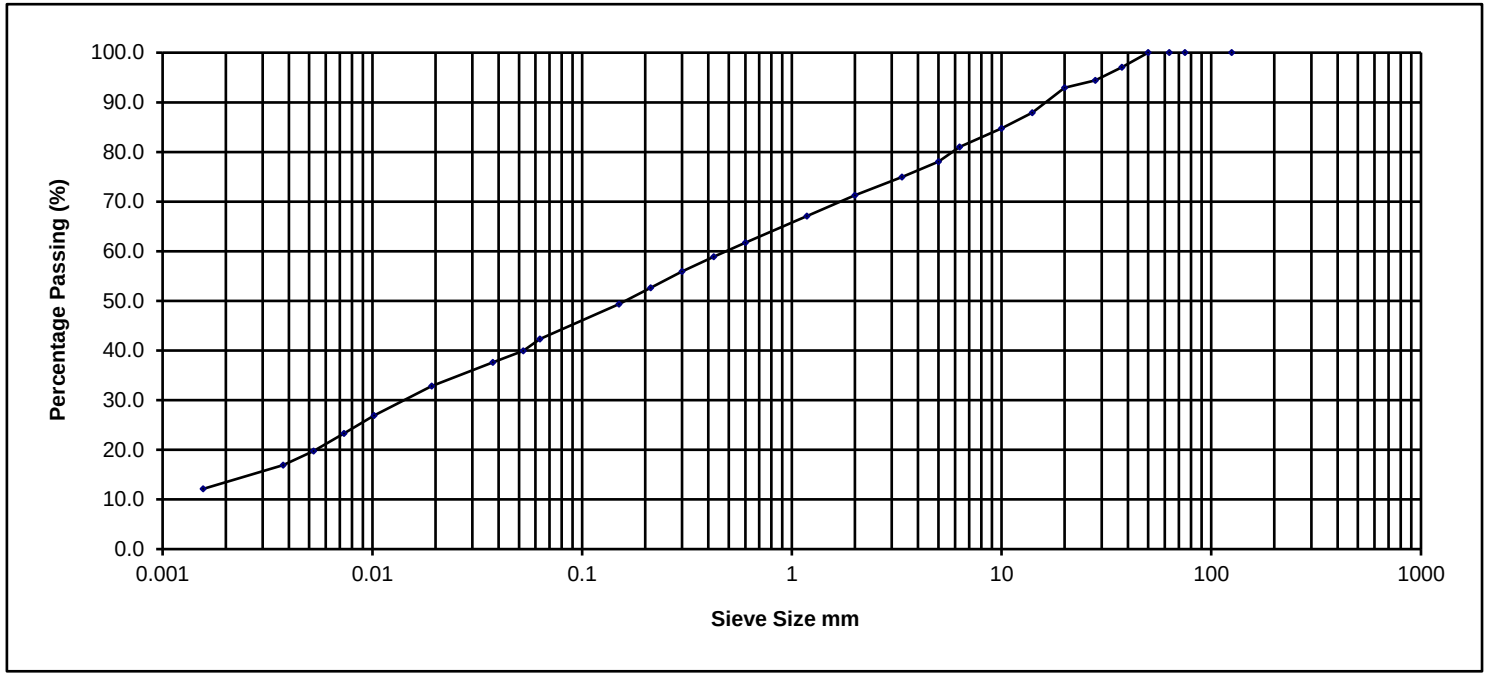
NM TL Ltd

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	100.0
37.500	97.1
28.000	94.4
20.000	93.0
14.000	87.9
10.000	84.8
6.300	81.0
5.000	78.0
3.350	75.0
2.000	71.3
1.180	67.1
0.600	61.7
0.425	58.9
0.300	55.9
0.212	52.7
0.150	49.3
0.063	42.3
0.052	40.0
0.038	37.6
0.019	32.8
0.010	26.9
0.007	23.3
0.005	19.7
0.004	16.9
0.002	12.1



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
12.1		30.2			28.9			28.7		0.0	0.0

Sample Description	Brown grey slightly sandy slightly gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP07
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 25/01/2024	Depth	2.00m

NM TL Ltd

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	89.7
37.500	86.2
28.000	81.4
20.000	77.9
14.000	71.6
10.000	69.6
6.300	65.9
5.000	64.6
3.350	62.7
2.000	59.2
1.180	54.9
0.600	49.9
0.425	47.5
0.300	45.0
0.212	42.6
0.150	40.1
0.063	35.0
0.053	33.2
0.038	31.0
0.019	26.5
0.010	21.0
0.007	17.8
0.005	13.8
0.004	12.3
0.002	7.7

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.7		27.3			24.2			40.8		0.0	0.0

Sample Description	Dark brown slightly sandy gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP07
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 23/01/2024	Depth	3.00m

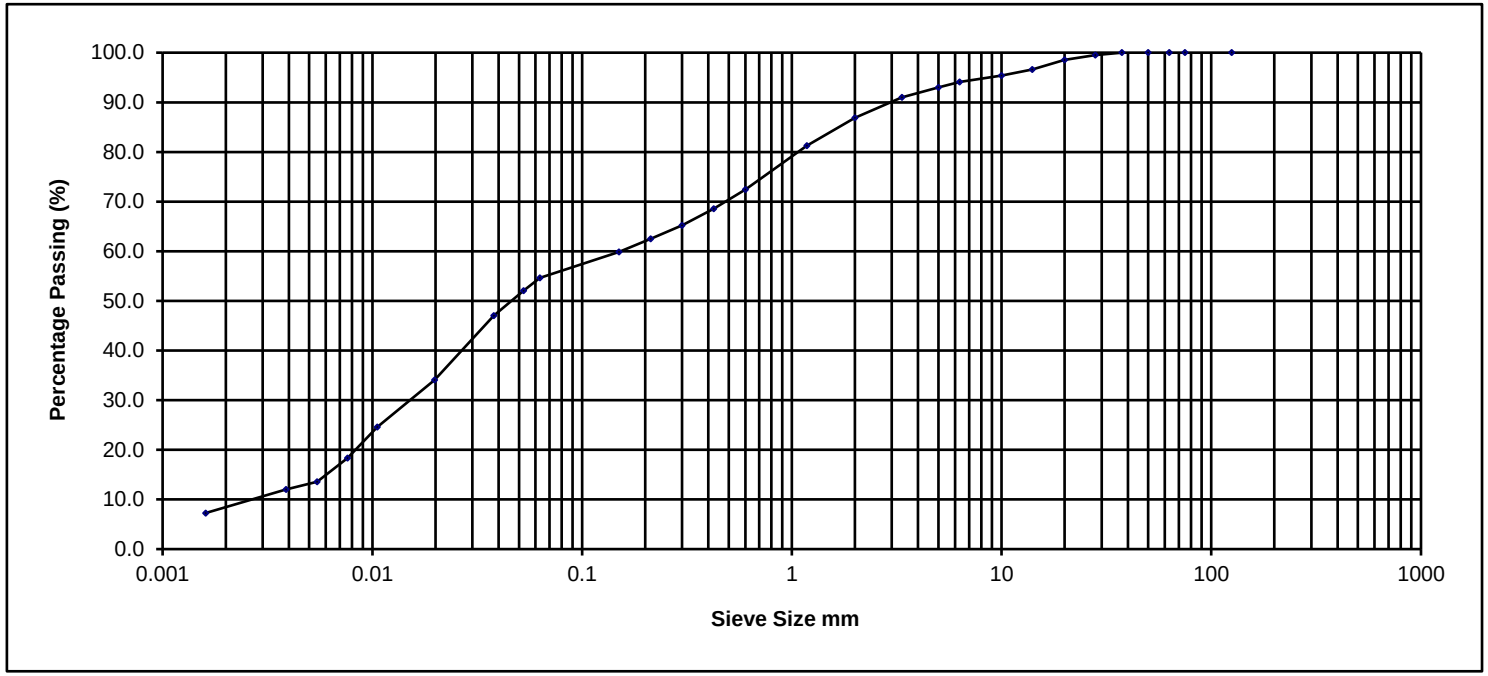
NM TL Ltd

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	100.0
37.500	100.0
28.000	99.5
20.000	98.5
14.000	96.6
10.000	95.4
6.300	94.1
5.000	93.0
3.350	91.0
2.000	86.9
1.180	81.2
0.600	72.5
0.425	68.5
0.300	65.2
0.212	62.5
0.150	59.9
0.063	54.6
0.053	52.1
0.038	47.0
0.020	34.1
0.011	24.6
0.008	18.3
0.005	13.6
0.004	12.0
0.002	7.3



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.3		47.3			32.3			13.1		0.0	0.0

Sample Description	Brown slightly gravelly slightly sandy silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	TP08
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 25/01/2024	Depth	1.00m

NM TL Ltd

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	93.9
37.500	87.9
28.000	82.0
20.000	74.8
14.000	69.3
10.000	66.3
6.300	62.7
5.000	61.2
3.350	60.0
2.000	57.1
1.180	54.2
0.600	50.7
0.425	48.8
0.300	46.6
0.212	44.2
0.150	41.5
0.063	35.5
0.054	33.2
0.039	30.9
0.020	26.3
0.010	21.6
0.007	17.2
0.005	13.5
0.004	11.2
0.002	7.7

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.7		27.9			21.6			42.9		0.0	0.0

Sample Description	Brown slightly sandy gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH02
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	26/01/2024	Depth	1.00m

NM TL Ltd

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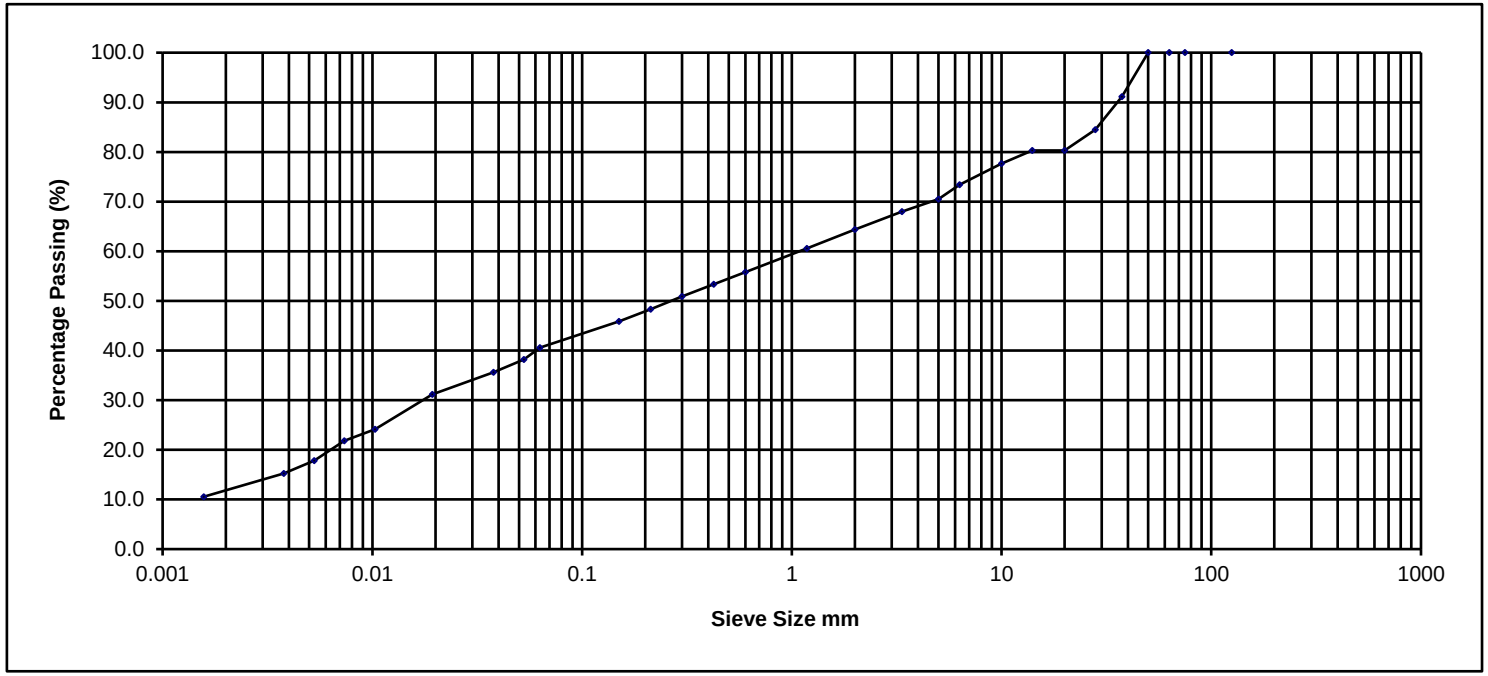
Determination of Particle Size Distribution

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	91.1
28.000	84.5
20.000	80.3
14.000	80.3
10.000	77.6
6.300	73.4
5.000	70.5
3.350	68.0
2.000	64.4
1.180	60.5
0.600	55.8
0.425	53.3
0.300	50.9
0.212	48.3
0.150	45.8
0.063	40.6
0.053	38.2
0.038	35.6
0.019	31.2
0.010	24.1
0.007	21.8
0.005	17.8
0.004	15.2
0.002	10.5



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
10.5		30.0			23.8			35.6		0.0	0.0

Sample Description	Dark brown slightly sandy gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH04
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 26/01/2024	Depth	1.00m

NM TL Ltd

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	96.8
50.000	90.7
37.500	84.0
28.000	80.6
20.000	77.7
14.000	77.1
10.000	75.1
6.300	71.6
5.000	68.9
3.350	67.1
2.000	63.5
1.180	59.3
0.600	54.0
0.425	51.4
0.300	48.7
0.212	46.0
0.150	43.4
0.063	37.5
0.053	35.9
0.038	33.6
0.020	28.9
0.010	24.2
0.007	21.6
0.005	18.3
0.004	16.2
0.002	12.0

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
12.0		25.6			26.0			33.3		3.2	0.0

Sample Description	Grey brown slightly sandy slightly gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH06
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	26/01/2024	Depth	2.50m

NM TL Ltd

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	100.0
37.500	100.0
28.000	96.2
20.000	94.7
14.000	90.3
10.000	87.4
6.300	82.8
5.000	80.7
3.350	78.3
2.000	74.8
1.180	71.0
0.600	66.4
0.425	64.1
0.300	61.6
0.212	58.8
0.150	56.0
0.063	48.8
0.051	46.6
0.037	43.9
0.019	36.5
0.010	29.8
0.007	25.4
0.005	21.7
0.004	18.0
0.002	12.8

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
12.8		36.0			25.9			25.2		0.0	0.0

Sample Description	Light Grey brownslightly gravelly slightly sandy silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH07
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	23/01/2024	Depth	1.50m

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	92.3
37.500	84.7
28.000	81.0
20.000	77.9
14.000	74.7
10.000	71.3
6.300	68.4
5.000	66.4
3.350	64.3
2.000	60.2
1.180	56.1
0.600	50.8
0.425	50.5
0.300	47.9
0.212	45.3
0.150	42.8
0.063	37.9
0.052	36.0
0.037	34.6
0.019	30.3
0.010	25.2
0.007	21.9
0.005	18.0
0.004	16.0
0.002	11.3

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
11.3		26.6			22.4			39.8		0.0	0.0

Sample Description	Grey brown slightly sandy gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH08
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	23/01/2024	Depth	1.00m

NM TL Ltd

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	100.0
37.500	91.9
28.000	84.0
20.000	76.5
14.000	76.0
10.000	72.6
6.300	69.0
5.000	66.9
3.350	63.8
2.000	60.0
1.180	56.3
0.600	51.5
0.425	49.1
0.300	46.7
0.212	44.2
0.150	41.7
0.063	36.5
0.052	35.5
0.037	33.5
0.019	29.3
0.010	24.3
0.007	20.5
0.005	18.5
0.004	16.0
0.002	12.6

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
12.6		23.9			23.5			40.0		0.0	0.0

Sample Description	Grey slightly sandy gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH08
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 23/01/2024	Depth	3.00m

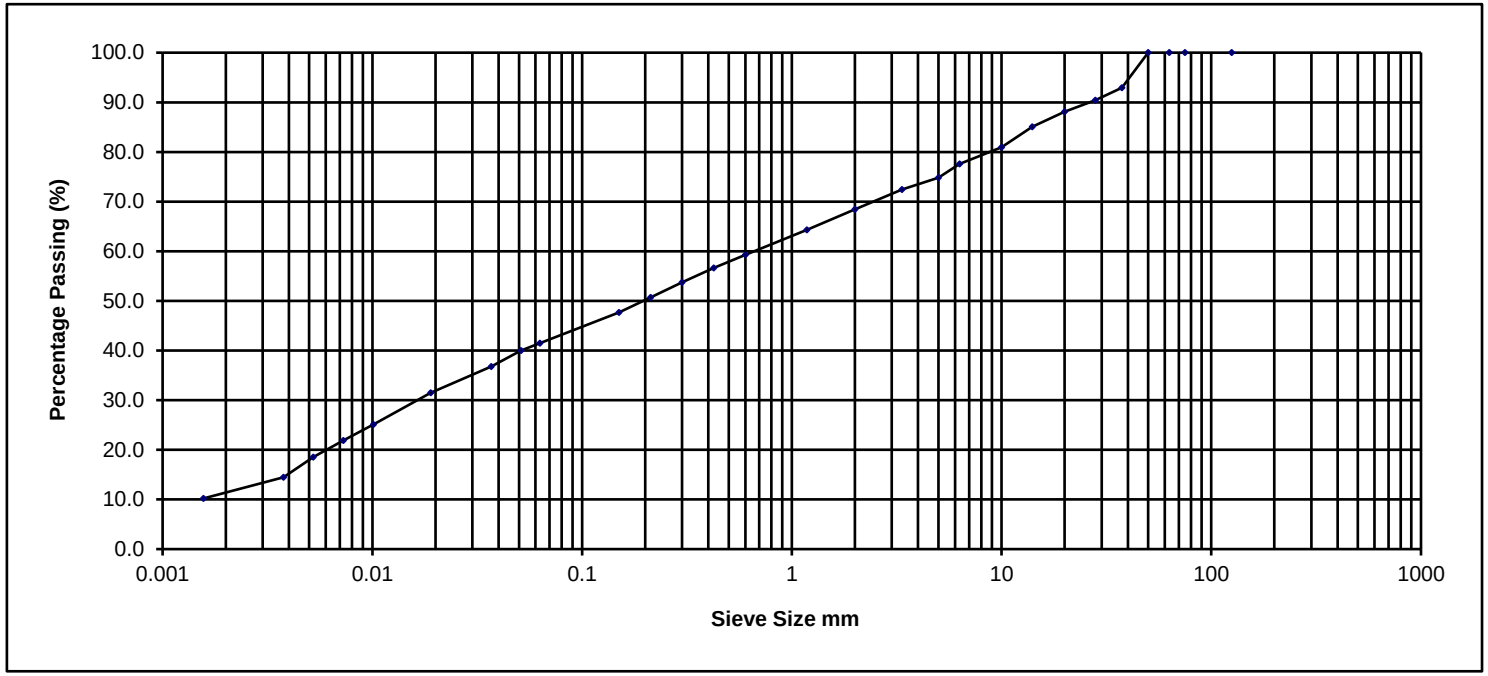
NMTL Ltd

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	100.0
37.500	92.9
28.000	90.4
20.000	88.1
14.000	85.1
10.000	80.9
6.300	77.6
5.000	74.8
3.350	72.5
2.000	68.4
1.180	64.3
0.600	59.3
0.425	56.6
0.300	53.7
0.212	50.7
0.150	47.7
0.063	41.5
0.051	40.0
0.037	36.8
0.019	31.5
0.010	25.1
0.007	21.9
0.005	18.5
0.004	14.5
0.002	10.2



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
10.2		31.3			27.0			31.6		0.0	0.0

Sample Description	Brown slightly sandy slightly gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH09
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	23/01/2024	Depth	1.50m

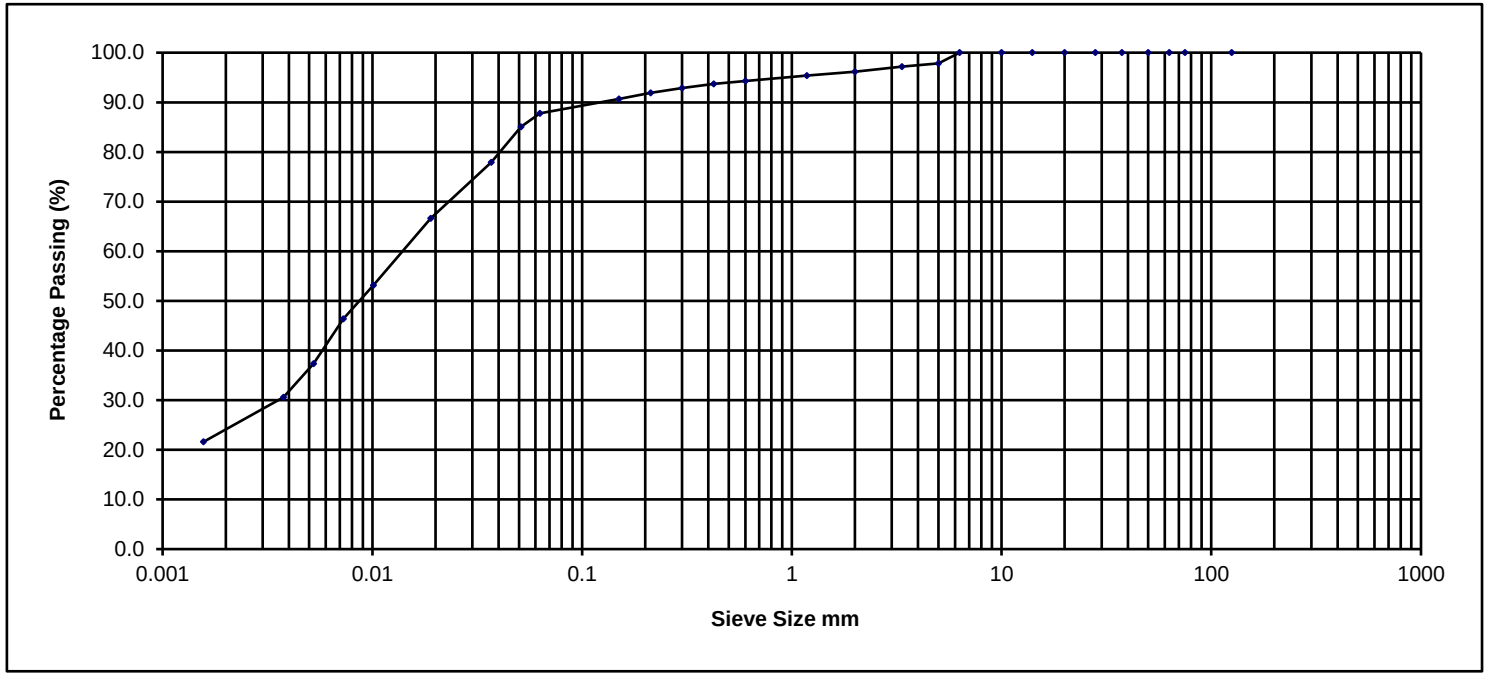
NM TL Ltd

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	100.0
37.500	100.0
28.000	100.0
20.000	100.0
14.000	100.0
10.000	100.0
6.300	100.0
5.000	97.9
3.350	97.2
2.000	96.2
1.180	95.4
0.600	94.3
0.425	93.7
0.300	92.9
0.212	91.9
0.150	90.7
0.063	87.8
0.051	85.1
0.037	77.9
0.019	66.6
0.010	53.1
0.007	46.4
0.005	37.4
0.004	30.6
0.002	21.6



Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
21.6		66.2			8.4			3.8		0.0	0.0

Sample Description	Grey/brown slightly gravelly slightly sandy silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH10
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 23/01/2024	Depth	1.20m

NMTL Ltd

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	100.0
37.500	100.0
28.000	98.3
20.000	96.7
14.000	92.7
10.000	88.2
6.300	81.1
5.000	78.4
3.350	76.5
2.000	72.1
1.180	67.5
0.600	61.6
0.425	58.7
0.300	55.9
0.212	53.0
0.150	49.9
0.063	43.1
0.052	41.1
0.037	39.4
0.019	33.4
0.010	28.1
0.007	23.7
0.005	21.3
0.004	18.6
0.002	13.3

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
13.3		29.8			29.1			27.9		0.0	0.0

Sample Description	Brown slightly gravelly slightly sandy silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH10
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 23/01/2024	Depth	4.00m

NM TL Ltd

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	100.0
37.500	92.5
28.000	88.0
20.000	83.1
14.000	79.2
10.000	76.5
6.300	72.7
5.000	70.6
3.350	68.8
2.000	65.1
1.180	61.5
0.600	57.2
0.425	55.0
0.300	52.8
0.212	50.4
0.150	47.9
0.063	42.6
0.055	40.9
0.040	38.5
0.020	31.5
0.011	26.7
0.008	23.6
0.005	19.8
0.004	16.3
0.002	8.0

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
8.0		34.7			22.5			34.9		0.0	0.0

Sample Description	Brown slightly sandy slightly gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH12A
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	24/01/2024	Depth	2.00m

NM TL Ltd

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	100.0
37.500	100.0
28.000	95.3
20.000	94.5
14.000	88.0
10.000	85.6
6.300	81.4
5.000	79.2
3.350	77.1
2.000	73.2
1.180	68.9
0.600	63.4
0.425	60.5
0.300	57.5
0.212	54.2
0.150	50.8
0.063	43.3
0.054	41.8
0.038	38.4
0.020	33.4
0.010	27.7
0.007	24.3
0.005	20.6
0.004	17.8
0.002	12.7

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
12.7		30.5			30.0			26.8		0.0	0.0

Sample Description	Grey slightly gravelly slightly sandy silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH14A
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 24/01/2024	Depth	2.50m

NMTL Ltd

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	100.0
37.500	97.5
28.000	93.6
20.000	90.9
14.000	85.3
10.000	81.2
6.300	76.8
5.000	74.6
3.350	72.8
2.000	69.4
1.180	65.8
0.600	61.1
0.425	58.6
0.300	55.9
0.212	53.1
0.150	50.0
0.063	43.1
0.051	42.0
0.037	38.7
0.019	34.2
0.010	27.9
0.007	24.1
0.005	20.8
0.004	18.5
0.002	14.5

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
14.5		28.6			26.2			30.6		0.0	0.0

Sample Description	Grey brown slightly sandy slightly gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH17
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 24/01/2024	Depth	2.00m

NM TL Ltd

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	92.9
50.000	85.4
37.500	79.0
28.000	74.4
20.000	72.9
14.000	70.3
10.000	67.9
6.300	65.2
5.000	63.6
3.350	61.2
2.000	57.6
1.180	53.5
0.600	48.8
0.425	46.6
0.300	44.3
0.212	41.9
0.150	39.4
0.063	34.1
0.054	33.0
0.039	29.7
0.020	25.2
0.010	18.5
0.007	16.3
0.005	12.7
0.004	10.5
0.002	7.1

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.1		27.0			23.4			35.3		7.1	0.0

Sample Description	Brown grey slightly sandy gravelly silty CLAY.					Project No.	NMTL 3693
						BH/TP No.	BH18A
Project	Bousing Bundle 4 & 5-Ballymun lot 4			GII PROJECT ID:13061-08-23(5)		Sample No.	B
Operator	Sb	Checked	Nc	Approved	Bc	Date sample tested	25/01/2024	Depth	1.00m

NM TL Ltd

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	100.0
37.500	92.1
28.000	85.5
20.000	77.7
14.000	75.4
10.000	72.8
6.300	68.1
5.000	66.4
3.350	63.8
2.000	59.3
1.180	55.2
0.600	50.2
0.425	47.9
0.300	45.6
0.212	43.4
0.150	41.2
0.063	36.7
0.053	35.6
0.038	33.4
0.019	29.0
0.010	23.6
0.007	19.2
0.005	15.9
0.004	13.5
0.002	7.9

Percentage Particle Size

Clay	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	Cobbles	Boulder
		Silt			Sand			Gravel			
7.9		28.8			22.7			40.7		0.0	0.0

Sample Description	Grey brown slightly sandy gravelly silty CLAY.			Project No.	NMTL 3693
				BH/TP No.	BH19
Project	Bousing Bundle 4 & 5-Ballymun lot 4		GII PROJECT ID:13061-08-23(5)	Sample No.	B
Operator Sb	Checked Nc	Approved Bc	Date sample tested 25/01/2024	Depth	3.00m

NM TL Ltd

LABORATORY REPORT

Contract Number: PSL24/1016

Report Date:	01 March 2024
Client's Reference:	13061-08-23(5)
Client Name:	Ground Investigations Ireland Ltd Catherinestown House Hazelhatch Road Newcastle Co Dublin D22 YD52
For the attention of:	**Diarmaid MagLochlainn**
Contract Title:	Housing Bundle 4&5 - Lot 4 - Ballymun (AKA Ballymun PPP)
Date Received:	8/2/2024
Date Commenced:	8/2/2024
Date Completed:	1/3/2024
Notes:	**Opinions and Interpretations are outside the UKAS Accreditation**

Checked and Approved Signatories:

A Watkins (Managing Director)	R Berriman (Associate Director)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	T Watkins (Senior Technician)

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Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
TP01		B	0.70		Brown sandy gravelly CLAY.
TP02		B	0.50		Brown sandy slightly gravelly CLAY.
TP02		B	1.20		Brown sandy gravelly CLAY.
TP03		B	0.50		Brown sandy gravelly CLAY.
TP04		B	0.50		Brown sandy gravelly CLAY.
TP10		B	0.50		Brown sandy slightly gravelly CLAY.
TP11		B	0.50		Brown sandy slightly gravelly CLAY.
TP12		B	0.50		Brown sandy gravelly CLAY.
TP12		B	1.00		Brown slightly sandy gravelly CLAY.

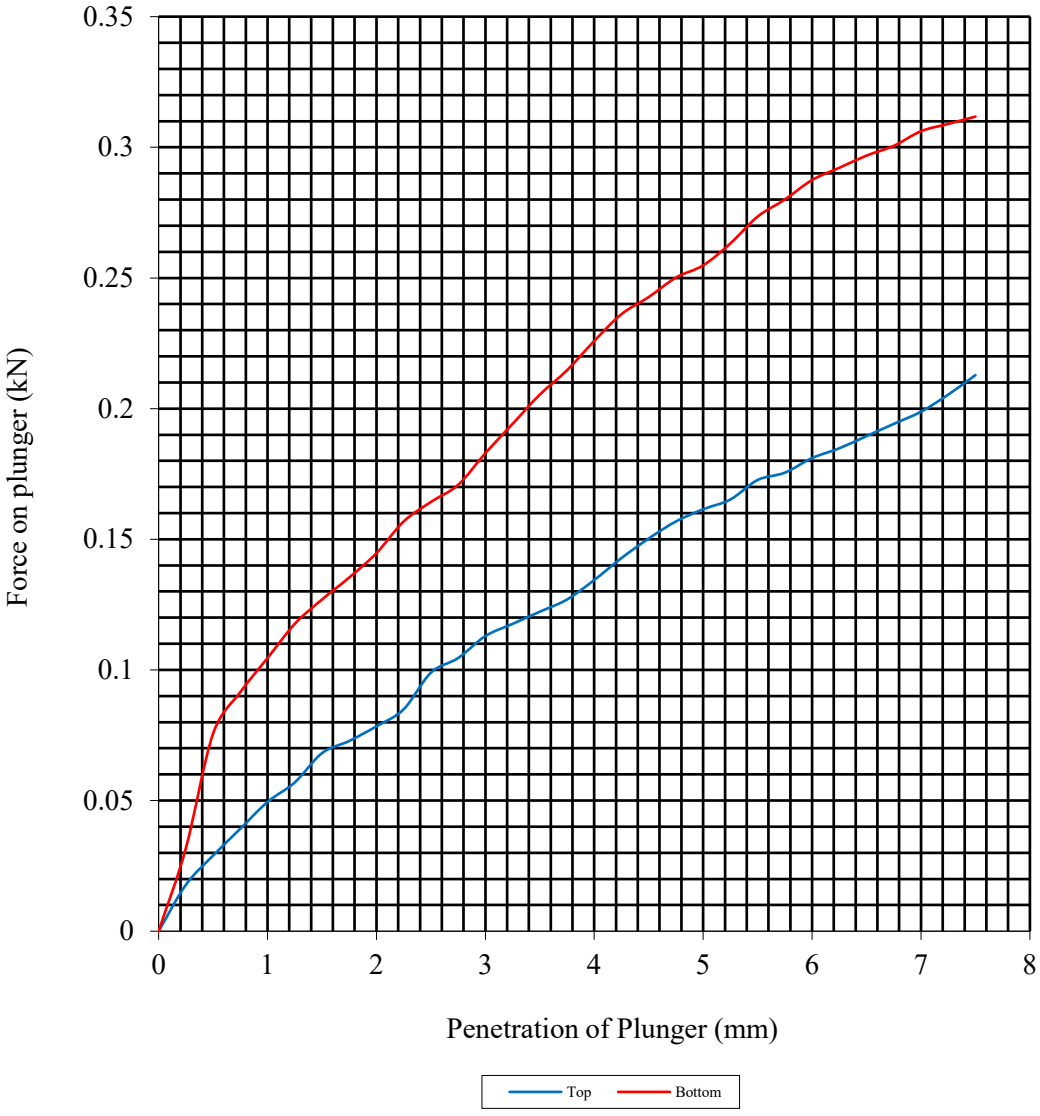
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP01 **Top Depth (m):** 0.70

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	17	Surcharge Kg:	4.20	Sample Top	17	Sample Top	0.8
Bulk Density Mg/m3:	1.98	Soaking Time hrs	0	Sample Bottom	17	Sample Bottom	1.3
Dry Density Mg/m3:	1.70	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			13				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Housing Bundle 4 & 5 - Lot 4 - Ballymun (AKA Ballymun PPP)

Contract No: PSL24/1016

Client Ref: 13061-08-23(5)

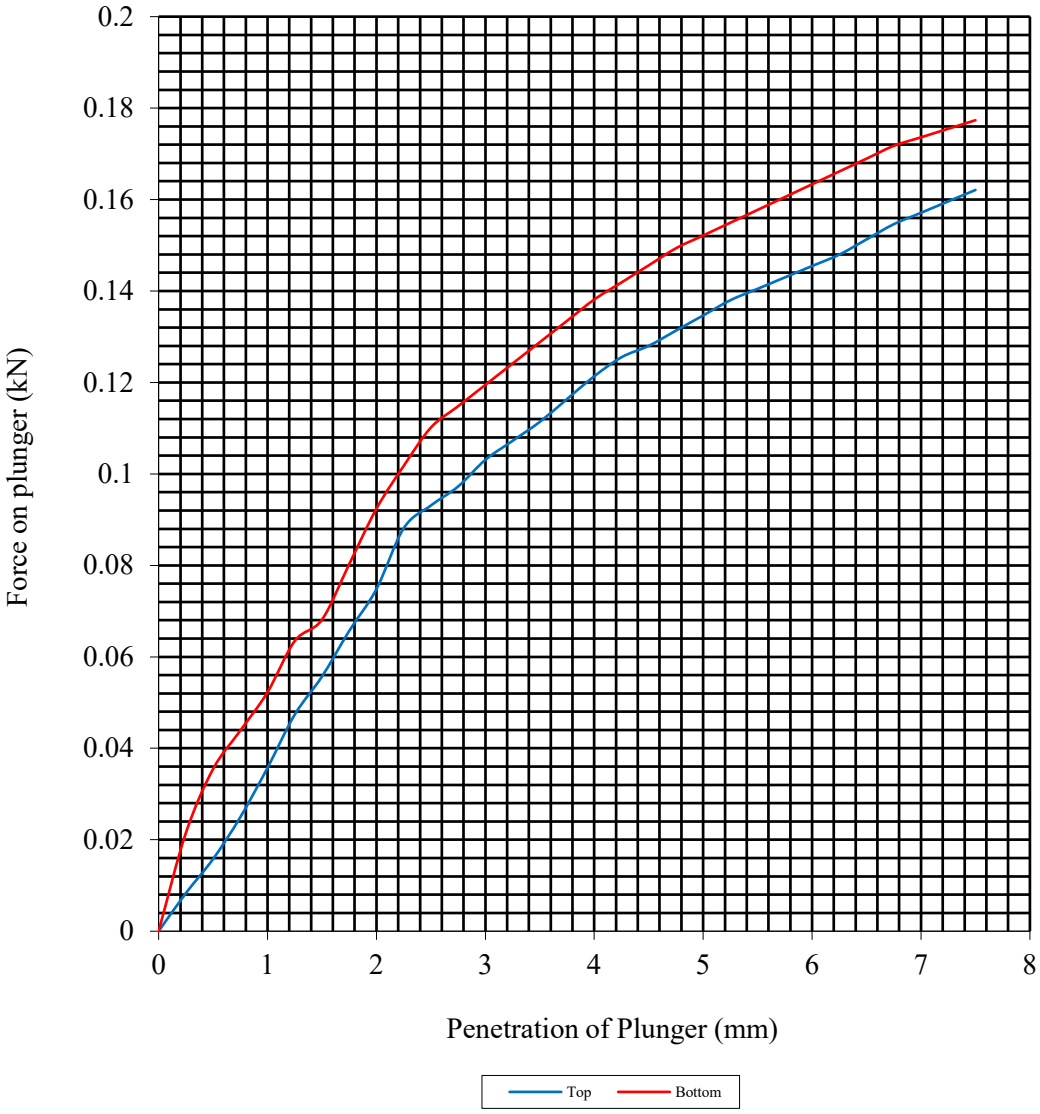
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP02 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	21	Surcharge Kg:	4.20	Sample Top	21	Sample Top	0.7
Bulk Density Mg/m3:	2.00	Soaking Time hrs	0	Sample Bottom	21	Sample Bottom	0.8
Dry Density Mg/m3:	1.66	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			2				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Housing Bundle 4 & 5 - Lot 4 - Ballymun (AKA Ballymun PPP)

Contract No: PSL24/1016

Client Ref: 13061-08-23(5)

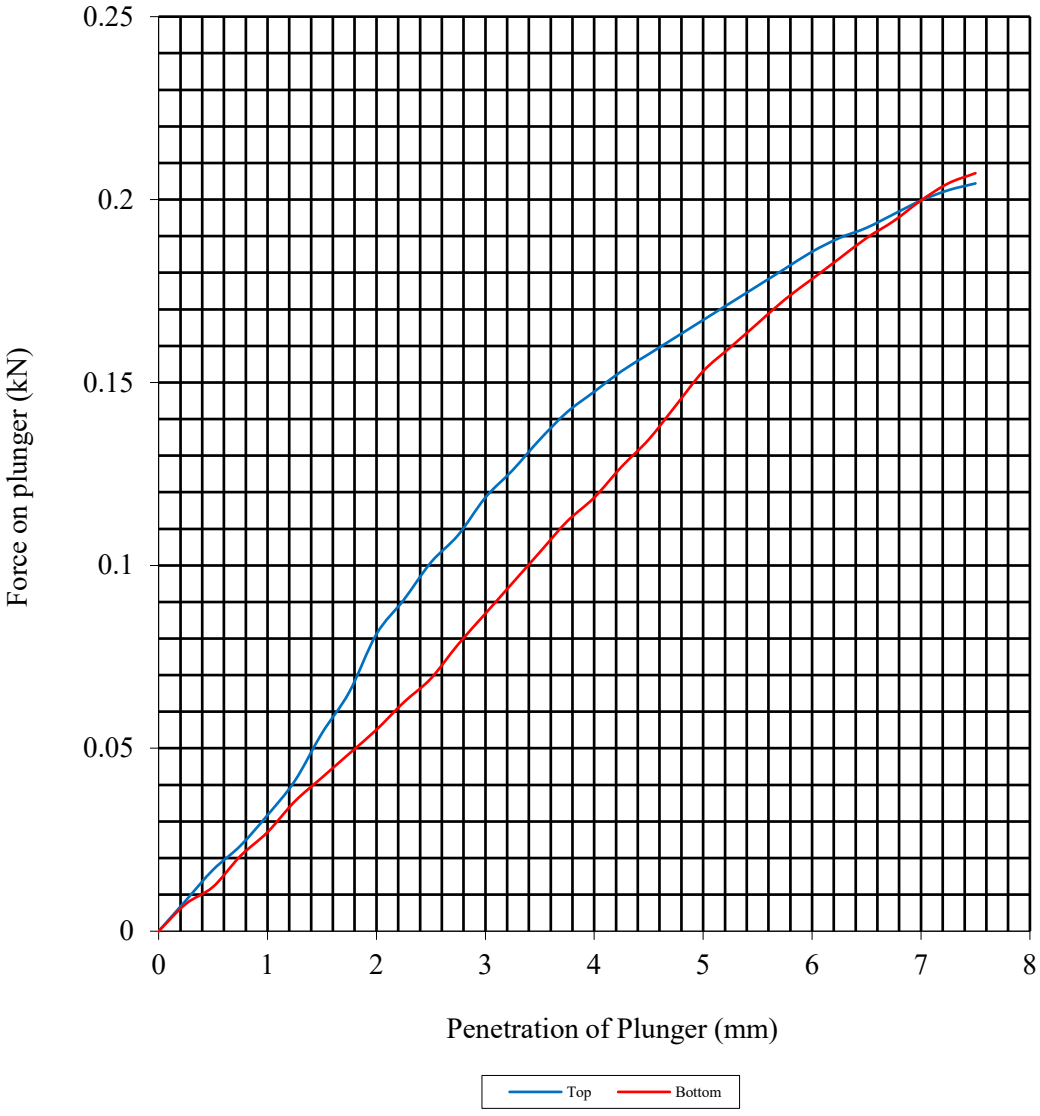
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP04 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	20	Surcharge Kg:	4.20	Sample Top	20	Sample Top	0.8
Bulk Density Mg/m3:	2.07	Soaking Time hrs	0	Sample Bottom	20	Sample Bottom	0.8
Dry Density Mg/m3:	1.72	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			11				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Housing Bundle 4 & 5 - Lot 4 - Ballymun (AKA Ballymun PPP)

Contract No: PSL24/1016

Client Ref: 13061-08-23(5)

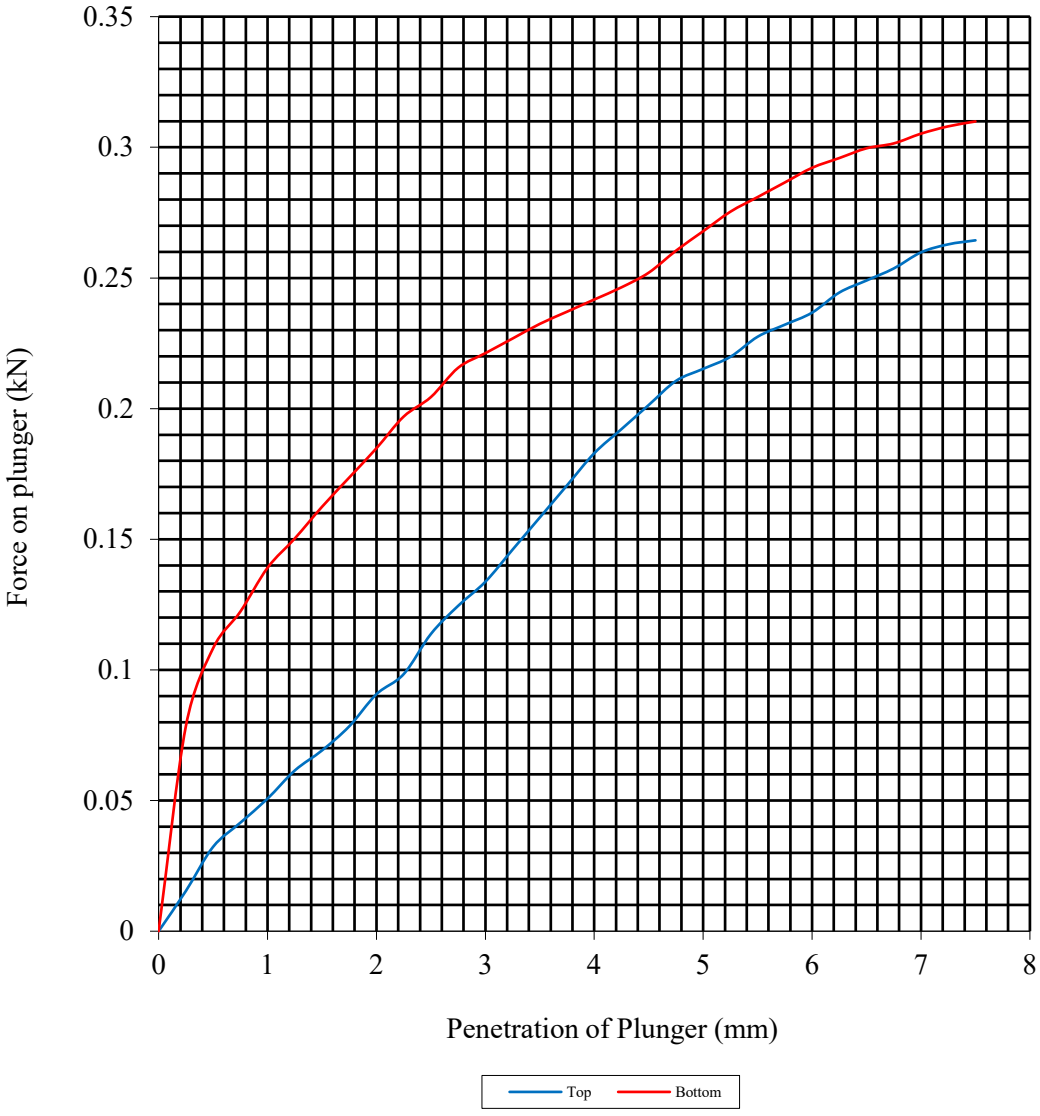
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP10 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	26	Surcharge Kg:	4.20	Sample Top	26	Sample Top	1.1
Bulk Density Mg/m3:	1.97	Soaking Time hrs	0	Sample Bottom	26	Sample Bottom	1.5
Dry Density Mg/m3:	1.56	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			4				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Housing Bundle 4 & 5 - Lot 4 - Ballymun (AKA Ballymun PPP)

Contract No: PSL24/1016

Client Ref: 13061-08-23(5)

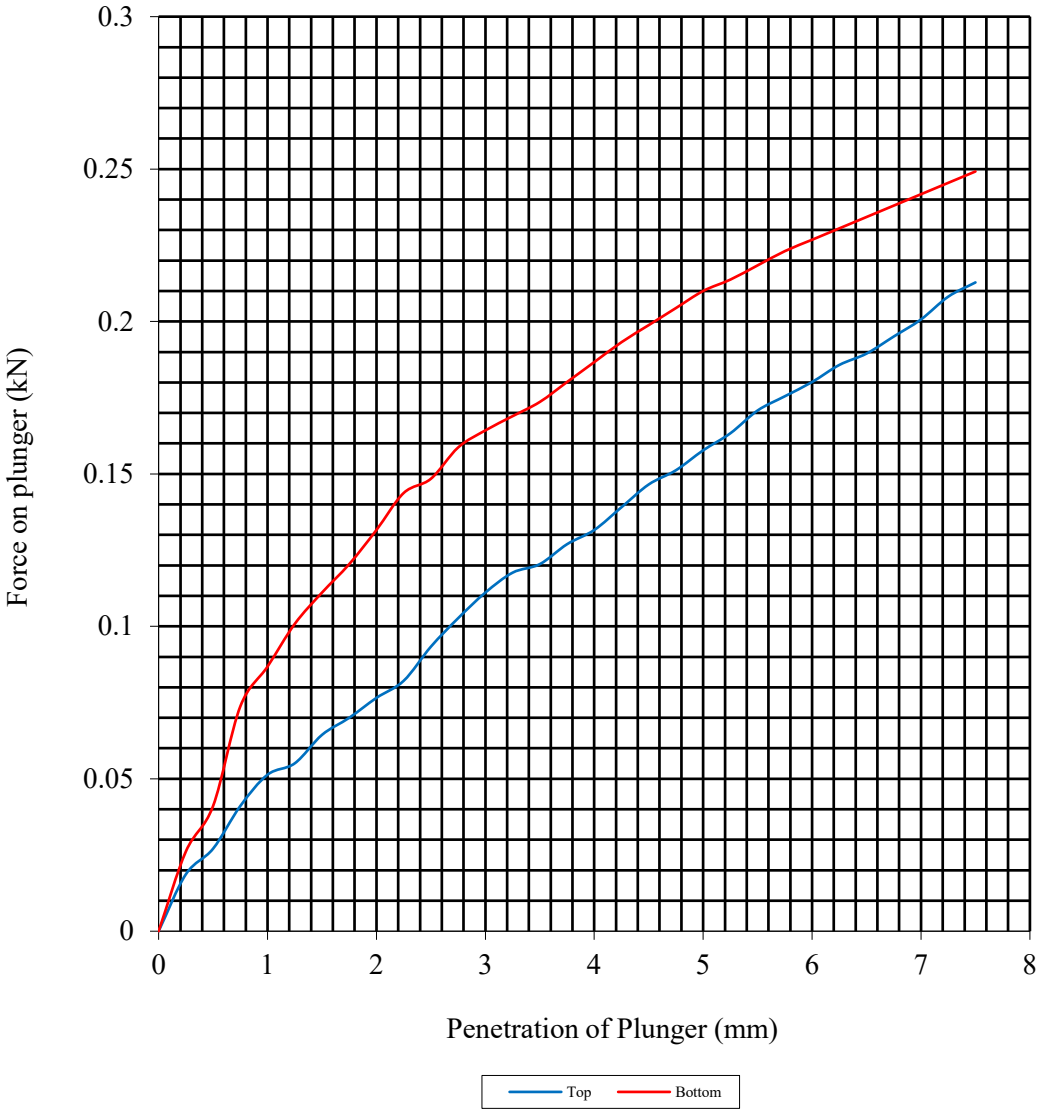
CALIFORNIA BEARING RATIO TEST

BS 1377 : Part 4 : 1990

Hole Number: TP12 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B



Initial Sample Conditions		Sample Preparation		Final Moisture Content %		C.B.R. Value %	
Moisture Content:	19	Surcharge Kg:	4.20	Sample Top	19	Sample Top	0.8
Bulk Density Mg/m3:	2.02	Soaking Time hrs	0	Sample Bottom	19	Sample Bottom	1.1
Dry Density Mg/m3:	1.69	Swelling mm:	0	Remarks : See Summary of Soil Descriptions.			
Percentage retained on 20mm BS test sieve:			11				
Compaction Conditions		2.5kg					

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Housing Bundle 4 & 5 - Lot 4 - Ballymun (AKA Ballymun PPP)

Contract No: PSL24/1016

Client Ref: 13061-08-23(5)

DETERMINATION OF THE RESISTIVITY OF SOIL

BS 1377 : Part 3: 1990, Clause 10.3

Hole Number: TP02 **Top Depth (m):** 1.20

Sample Number: **Base Depth (m):**

Sample Type: B **Sample Date:**

Sample Description: See summary of soil descriptions

Length of test specimen (mm)	455
Diameter of test specimen (mm)	102
Method of Remoulding:	2.5kg effort at received
Bulk Density	1.78
Moisture Content (%)	33
Dry Density (Mg/m3)	1.33
Steel Probe Diameter (mm)	5
Steel Probe Penetration (mm)	60
Steel Probe Spacing (mm)	20
Electrical Resistivity @ 20C =	**13.433 Ohms.m**

DETERMINATION OF THE REDOX POTENTIAL OF SOIL

BS 1377 : Part 3: 1990, Clause 11

pH of sample:	8.5
Reading A (mV)	200
Reading B (mV)	200
Temperature of specimen at time of test (^{o}C)	NA
Testing Method.	Calomel Reference Probe
Redox Potential (mV)	**540**

DETERMINATION OF THE RESISTIVITY OF SOIL

BS 1377 : Part 3: 1990, Clause 10.3

Hole Number: TP03 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B **Sample Date:**

Sample Description: See summary of soil descriptions

Length of test specimen (mm)	455
Diameter of test specimen (mm)	102
Method of Remoulding:	2.5kg effort at received
Bulk Density	2.00
Moisture Content (%)	22
Dry Density (Mg/m3)	1.63
Steel Probe Diameter (mm)	5
Steel Probe Penetration (mm)	60
Steel Probe Spacing (mm)	20
Electrical Resistivity @ 20C =	**26.138 Ohms.m**

DETERMINATION OF THE REDOX POTENTIAL OF SOIL

BS 1377 : Part 3: 1990, Clause 11

pH of sample:	8.5
Reading A (mV)	171
Reading B (mV)	171
Temperature of specimen at time of test (^{o}C)	NA
Testing Method.	Calomel Reference Probe
Redox Potential (mV)	**510**

DETERMINATION OF THE RESISTIVITY OF SOIL

BS 1377 : Part 3: 1990, Clause 10.3

Hole Number: TP11 **Top Depth (m):** 0.50

Sample Number: **Base Depth (m):**

Sample Type: B **Sample Date:**

Sample Description: See summary of soil descriptions

Length of test specimen (mm)	455
Diameter of test specimen (mm)	102
Method of Remoulding:	2.5kg effort at received
Bulk Density	1.97
Moisture Content (%)	22
Dry Density (Mg/m3)	1.61
Steel Probe Diameter (mm)	5
Steel Probe Penetration (mm)	60
Steel Probe Spacing (mm)	20
Electrical Resistivity @ 20C =	**17.316 Ohms.m**

DETERMINATION OF THE REDOX POTENTIAL OF SOIL

BS 1377 : Part 3: 1990, Clause 11

pH of sample:	8.5
Reading A (mV)	175
Reading B (mV)	175
Temperature of specimen at time of test (^{o}C)	NA
Testing Method.	Calomel Reference Probe
Redox Potential (mV)	**520**

DETERMINATION OF THE RESISTIVITY OF SOIL

BS 1377 : Part 3: 1990, Clause 10.3

Hole Number: TP12 **Top Depth (m):** 1.00

Sample Number: **Base Depth (m):**

Sample Type: B **Sample Date:**

Sample Description: See summary of soil descriptions

Length of test specimen (mm)	455
Diameter of test specimen (mm)	102
Method of Remoulding:	2.5kg effort at received
Bulk Density	1.93
Moisture Content (%)	24
Dry Density (Mg/m3)	1.55
Steel Probe Diameter (mm)	5
Steel Probe Penetration (mm)	60
Steel Probe Spacing (mm)	20
Electrical Resistivity @ 20C =	**22.418 Ohms.m**

DETERMINATION OF THE REDOX POTENTIAL OF SOIL

BS 1377 : Part 3: 1990, Clause 11

pH of sample:	8.5
Reading A (mV)	175
Reading B (mV)	175
Temperature of specimen at time of test (^{o}C)	NA
Testing Method.	Calomel Reference Probe
Redox Potential (mV)	**520**

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Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland
D22 K5P8

Attention :	Diarmaid MagLochlainn
Date :	3rd January, 2024
Your reference :	13061-08-23
Our reference :	Test Report 23/21539 Batch 1
Location :	Housing Bundle- Ballymun Lot 4 (AKA Ballymun
Date samples received :	18th December, 2023
Status :	Final Report
Issue :	202401031332

Twenty one samples were received for analysis on 18th December, 2023 of which twenty one 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.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 102.446 kg of CO2

Scope 1&2&3 emissions - 242.107 kg of CO2

Authorised By:

Liza Klebe
Project Co-ordinator

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-02	TP-03	TP-03	TP-03	TP-04	TP-05	TP-05			
Depth	0.70	2.00	1.20	3.00	0.50	2.00	3.50	0.50	1.00	3.00			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Antimony	2	2	4	2	2	2	2	2	2	2	<1	mg/kg	TM30/PM15
Arsenic #	11.4	9.3	15.5	13.3	13.7	12.3	12.1	11.3	9.3	14.1	<0.5	mg/kg	TM30/PM15
Barium #	92	47	142	81	83	79	115	82	73	44	<1	mg/kg	TM30/PM15
Cadmium #	1.6	1.8	1.1	1.1	1.3	2.0	1.9	1.6	3.1	1.3	<0.1	mg/kg	TM30/PM15
Chromium #	20.2	14.0	42.1	16.5	24.6	26.8	31.0	21.9	54.2	21.4	<0.5	mg/kg	TM30/PM15
Copper #	28	23	56	26	39	34	30	26	26	23	<1	mg/kg	TM30/PM15
Lead #	56	14	72	27	42	34	26	32	21	19	<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.7	2.9	4.6	2.0	2.9	3.3	5.0	2.4	6.2	3.5	<0.1	mg/kg	TM30/PM15
Nickel #	33.7	32.7	39.4	29.2	40.2	44.1	41.3	33.3	34.8	40.9	<0.7	mg/kg	TM30/PM15
Selenium #	1	1	2	1	1	1	3	2	2	<1	<1	mg/kg	TM30/PM15
Zinc #	89	73	226	82	129	167	86	94	87	89	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<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	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<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	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.11	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.20	<0.03	0.05	0.07	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	0.29	<0.03	0.04	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.13	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	0.19	<0.02	0.05	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.23	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.07	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	0.55	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	1.33	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.17	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<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	74	99	97	104	97	79	104	105	104	107	<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	<30	<30	51	<30	<30	35	<30	<30	<30	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-02	TP-03	TP-03	TP-03	TP-04	TP-05	TP-05			
Depth	0.70	2.00	1.20	3.00	0.50	2.00	3.50	0.50	1.00	3.00			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	<0.2	<0.2	1.1	<0.2	<0.2	1.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	<4	<4	9	<4	<4	8	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7	<7	41	<7	<7	26	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	<26	51	<26	<26	35	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	<10	<10	50	<10	<10	35	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<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 (EH_CU_1D_AR)#	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	72	70	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	<7	14	21	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	<26	86	91	<26	<26	<26	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	<52	86	142	<52	<52	<52	<52	<52	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10	<10	67	65	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
MTBE#	<5	<5	<5	<5	<5	<5 SV	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5	<5	<5	<5 SV	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene#	<5	<5	16	<5	<5	<5 SV	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5	<5	<5	<5 SV	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5	6	<5	<5 SV	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5	<5	<5	<5 SV	<5 SV	<5	<5	<5	<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	11	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101#	<5	<5	15	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118#	<5	<5	10	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138#	<5	<5	10	6	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153#	<5	<5	6	<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	52	<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: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-02	TP-03	TP-03	TP-03	TP-04	TP-05	TP-05			
Depth	0.70	2.00	1.20	3.00	0.50	2.00	3.50	0.50	1.00	3.00			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Natural Moisture Content	16.8	13.2	26.8	14.4	21.9	19.5	17.1	18.5	15.4	18.0	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	14.4	11.7	21.1	12.6	18.0	16.3	14.6	15.6	13.3	15.3	<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) #	-	0.0086	-	0.1734	-	0.1379	-	0.0148	-	0.0092	<0.0015	g/l	TM38/PM20
Chromium III	20.2	14.0	42.1	16.5	24.6	26.8	31.0	21.9	54.2	21.4	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.83	0.31	2.19	0.52	1.17	1.02	0.93	1.11	0.77	0.40	<0.02	%	TM21/PM24
Organic Matter	-	0.5	-	0.9	-	1.8	-	1.9	-	0.7	<0.2	%	TM21/PM24
pH #	8.48	8.65	7.64	10.88	8.41	7.91	7.99	8.33	7.97	8.47	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72	73-76	77-80	LOD/LOR	Units	Method No.
Sample ID	TP-06	TP-07	TP-07	TP-08	TP-08	TP-09	TP-10	TP-11	TP-11	TP-12			
Depth	0.50	1.00	3.00	2.00	3.40	2.20	1.00	0.50	3.00	0.50			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Antimony	2	2	2	2	1	2	2	3	2	2	<1	mg/kg	TM30/PM15
Arsenic #	14.3	12.3	8.1	10.7	8.2	11.1	10.7	14.9	8.9	12.6	<0.5	mg/kg	TM30/PM15
Barium #	120	84	54	64	102	63	88	114	88	89	<1	mg/kg	TM30/PM15
Cadmium #	2.2	2.2	1.3	1.8	1.2	1.8	1.0	2.0	1.7	1.4	<0.1	mg/kg	TM30/PM15
Chromium #	51.9	19.9	34.9	19.6	35.1	21.0	42.6	23.3	12.5	19.8	<0.5	mg/kg	TM30/PM15
Copper #	35	32	23	28	20	29	36	41	25	25	<1	mg/kg	TM30/PM15
Lead #	48	32	16	19	15	18	39	44	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 #	5.4	3.2	3.7	3.4	4.5	3.6	2.2	3.4	3.5	2.7	<0.1	mg/kg	TM30/PM15
Nickel #	47.9	41.0	41.1	38.1	28.6	41.8	44.3	42.2	32.8	30.2	<0.7	mg/kg	TM30/PM15
Selenium #	1	1	2	<1	3	<1	<1	1	5	2	<1	mg/kg	TM30/PM15
Zinc #	128	89	79	77	56	92	112	113	69	80	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<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	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<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	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.08	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	mg/kg	TM4/PM8
Pyrene #	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.12	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.07	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	0.27	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<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	104	108	105	109	108	109	110	107	111	109	<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	<30	38	<30	59	<30	<30	<30	45	61	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72	73-76	77-80	LOD/LOR	Units	Method No.
Sample ID	TP-06	TP-07	TP-07	TP-08	TP-08	TP-09	TP-10	TP-11	TP-11	TP-12			
Depth	0.50	1.00	3.00	2.00	3.40	2.20	1.00	0.50	3.00	0.50			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<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 (EH_CU_1D_AL)#	<4	<4	7	<4	9	<4	<4	<4	6	7	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7	19	<7	21	<7	<7	<7	16	21	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7	<7	12	<7	29	<7	<7	<7	23	33	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	38	<26	59	<26	<26	<26	45	61	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	<10	38	<10	41	<10	<10	<10	34	40	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10	<10	<10	<10	16	<10	<10	<10	<10	21	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<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 (EH_CU_1D_AR)#	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	<52	<52	<52	59	<52	<52	<52	<52	61	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1 SV	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
MTBE#	<5	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
Toluene#	<5	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5 SV	<5	<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5 SV	<5	<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: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72	73-76	77-80	LOD/LOR	Units	Method No.
Sample ID	TP-06	TP-07	TP-07	TP-08	TP-08	TP-09	TP-10	TP-11	TP-11	TP-12			
Depth	0.50	1.00	3.00	2.00	3.40	2.20	1.00	0.50	3.00	0.50			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Natural Moisture Content	18.1	19.3	10.9	15.3	11.5	15.8	18.5	18.2	13.0	15.3	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	15.3	16.2	9.9	13.3	10.3	13.6	15.6	15.4	11.5	13.3	<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) #	-	0.0160	-	0.0938	-	0.0081	-	0.0598	-	0.0976	<0.0015	g/l	TM38/PM20
Chromium III	51.9	19.9	34.9	19.6	35.1	21.0	42.6	23.3	12.5	19.8	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.21	0.97	0.46	0.42	0.48	0.46	1.31	1.27	0.86	0.97	<0.02	%	TM21/PM24
Organic Matter	-	1.7	-	0.7	-	0.8	-	2.2	-	1.7	<0.2	%	TM21/PM24
pH #	8.27	8.44	8.71	8.42	8.59	8.58	8.30	8.31	8.73	8.54	<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	81-84												
Sample ID	TP-12												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	13/12/2023												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	18/12/2023												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Antimony	3										<1	mg/kg	TM30/PM15
Arsenic #	15.5										<0.5	mg/kg	TM30/PM15
Barium #	123										<1	mg/kg	TM30/PM15
Cadmium #	1.8										<0.1	mg/kg	TM30/PM15
Chromium #	47.2										<0.5	mg/kg	TM30/PM15
Copper #	40										<1	mg/kg	TM30/PM15
Lead #	51										<5	mg/kg	TM30/PM15
Mercury #	0.2										<0.1	mg/kg	TM30/PM15
Molybdenum #	4.9										<0.1	mg/kg	TM30/PM15
Nickel #	42.6										<0.7	mg/kg	TM30/PM15
Selenium #	1										<1	mg/kg	TM30/PM15
Zinc #	114										<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04										<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03										<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05										<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04										<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03										<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.06										<0.03	mg/kg	TM4/PM8
Pyrene #	0.05										<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06										<0.06	mg/kg	TM4/PM8
Chrysene #	0.05										<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07										<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04										<0.04	mg/kg	TM4/PM8
Coronene	<0.04										<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22										<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64										<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05										<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02										<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1										<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	106										<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30										<30	mg/kg	TM5/PM8/PM16

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	81-84												
Sample ID	TP-12												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	13/12/2023												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	18/12/2023												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1										<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1										<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1										<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4										<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7										<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7										<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7										<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26										<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1										<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10										<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10										<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1										<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1										<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1										<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2										<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4										<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7										<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7										<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7										<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26										<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52										<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1										<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10										<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10										<10	mg/kg	TM5/PM8/PM16
MTBE#	<5										<5	ug/kg	TM36/PM12
Benzene#	<5										<5	ug/kg	TM36/PM12
Toluene#	<5										<5	ug/kg	TM36/PM12
Ethylbenzene#	<5										<5	ug/kg	TM36/PM12
m/p-Xylene#	<5										<5	ug/kg	TM36/PM12
o-Xylene#	<5										<5	ug/kg	TM36/PM12
PCB 28#	<5										<5	ug/kg	TM17/PM8
PCB 52#	<5										<5	ug/kg	TM17/PM8
PCB 101#	<5										<5	ug/kg	TM17/PM8
PCB 118#	<5										<5	ug/kg	TM17/PM8
PCB 138#	<5										<5	ug/kg	TM17/PM8
PCB 153#	<5										<5	ug/kg	TM17/PM8
PCB 180#	<5										<5	ug/kg	TM17/PM8
Total 7 PCBs#	<35										<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : Solid

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

EMT Sample No.	81-84												
Sample ID	TP-12												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	13/12/2023												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	18/12/2023												
												LOD/LOR	Units	Method No.
Natural Moisture Content	25.5											<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	20.3											<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3											<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-											<0.0015	g/l	TM38/PM20
Chromium III	47.2											<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.88											<0.02	%	TM21/PM24
Organic Matter	-											<0.2	%	TM21/PM24
pH #	8.40											<0.01	pH units	TM73/PM11

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : CEN 10:1 1 Batch

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-02	TP-03	TP-03	TP-03	TP-04	TP-05	TP-05			
Depth	0.70	2.00	1.20	3.00	0.50	2.00	3.50	0.50	1.00	3.00			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Dissolved Antimony #	<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 Antimony (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 Arsenic #	<0.0025	0.0028	<0.0025	0.0094	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	0.028	<0.025	0.094	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.008	<0.003	0.051	0.015	0.008	0.078	0.029	0.011	0.082	0.012	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.08	<0.03	0.51	0.15	0.08	0.78	0.29	0.11	0.82	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	0.0017	<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	0.017	<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	0.032	<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	0.32	<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 #	0.015	0.021	0.009	0.009	0.016	0.015	0.019	0.014	0.016	0.009	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.15	0.21	0.09	0.09	0.16	0.15	0.19	0.14	0.16	0.09	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	0.011	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	0.11	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	0.025	<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	0.25	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<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	0.5	<0.3	0.4	<0.3	0.6	0.5	0.4	0.5	0.3	0.4	<0.3	mg/l	TM173/PM0
Fluoride	5	<3	4	<3	6	5	4	5	3	4	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	1.4	1.8	25.0	32.8	6.1	43.3	103.1	4.3	37.5	2.4	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	14	18	250	328	61	433	1031	43	375	24	<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1059	0.1039	0.1183	0.1082	0.1121	0.1055	0.1039	0.1096	0.1056	0.1096		kg	NONE/PM17
Chloride #	0.4	<0.3	0.7	1.2	<0.3	0.4	<0.3	<0.3	0.4	0.5	<0.3	mg/l	TM38/PM0
Chloride #	4	<3	7	12	<3	4	<3	<3	4	5	<3	mg/kg	TM38/PM0
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
Dissolved Organic Carbon	4	<2	<2	10	3	<2	<2	2	<2	2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	40	<20	<20	100	30	<20	<20	<20	<20	<20	<20	mg/kg	TM60/PM0
pH	8.14	8.03	8.16	10.45	8.08	8.08	7.91	8.20	8.26	8.34	<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : CEN 10:1 1 Batch

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	TP-01	TP-01	TP-02	TP-02	TP-03	TP-03	TP-03	TP-04	TP-05	TP-05			
Depth	0.70	2.00	1.20	3.00	0.50	2.00	3.50	0.50	1.00	3.00			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Total Dissolved Solids #	71	51	200	177	76	161	216	73	157	74	<35	mg/l	TM20/PM0
Total Dissolved Solids #	710	510	2000	1769	760	1610	2161	730	1570	740	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : CEN 10:1 1 Batch

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

EMT Sample No.	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72	73-76	77-80	LOD/LOR	Units	Method No.
Sample ID	TP-06	TP-07	TP-07	TP-08	TP-08	TP-09	TP-10	TP-11	TP-11	TP-12			
Depth	0.50	1.00	3.00	2.00	3.40	2.20	1.00	0.50	3.00	0.50			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Dissolved Antimony #	0.002	0.002	0.003	<0.002	<0.002	0.003	<0.002	0.003	0.003	0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	0.02	<0.02	0.03	<0.02	<0.02	0.03	<0.02	0.03	0.03	0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	0.0029	0.0030	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.0030	0.0026	0.0037	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	0.029	0.030	<0.025	<0.025	<0.025	<0.025	<0.025	0.030	0.026	0.037	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.011	0.008	0.007	0.006	0.018	0.009	0.010	0.010	0.008	0.011	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.11	0.08	0.07	0.06	0.18	0.09	0.10	0.10	0.08	0.11	<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	0.0031	<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	0.031	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	0.013	<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	0.13	<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 #	0.010	0.012	0.028	0.013	0.033	0.009	0.011	0.011	0.032	0.011	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.10	0.12	0.28	0.13	0.33	0.09	0.11	0.11	0.32	0.11	<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	0.006	<0.003	<0.003	<0.003	0.007	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	0.07	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.006	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.06	<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	0.4	0.5	0.3	<0.3	0.4	0.7	0.4	0.5	0.4	0.3	<0.3	mg/l	TM173/PM0
Fluoride	4	5	3	<3	4	7	4	5	4	3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	3.1	3.8	2.5	17.4	7.5	2.1	<0.5	10.9	5.0	5.1	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	31	38	25	174	75	21	<5	109	50	51	<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1062	0.1105	0.1062	0.1112	0.1042	0.1089	0.118	0.1066	0.1042	0.1081		kg	NONE/PM17
Chloride #	14.8	<0.3	0.3	2.7	0.5	<0.3	<0.3	<0.3	<0.3	0.4	<0.3	mg/l	TM38/PM0
Chloride #	148	<3	3	27	5	<3	<3	<3	<3	4	<3	mg/kg	TM38/PM0
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
Dissolved Organic Carbon	3	2	<2	<2	<2	2	2	2	<2	3	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	<20	<20	<20	<20	20	<20	20	<20	30	<20	mg/kg	TM60/PM0
pH	7.87	8.11	8.01	7.97	7.97	8.02	8.07	8.03	7.95	8.01	<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : CEN 10:1 1 Batch

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

EMT Sample No.	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72	73-76	77-80	LOD/LOR	Units	Method No.
Sample ID	TP-06	TP-07	TP-07	TP-08	TP-08	TP-09	TP-10	TP-11	TP-11	TP-12			
Depth	0.50	1.00	3.00	2.00	3.40	2.20	1.00	0.50	3.00	0.50			
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023			
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023			
Total Dissolved Solids #	116	73	46	76	53	56	67	83	46	82	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1161	730	460	760	530	560	670	830	460	820	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

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.	81-84										LOD/LOR	Units	Method No.
Sample ID	TP-12												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	13/12/2023												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	18/12/2023												
Dissolved Antimony #	0.002										<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	0.02										<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	0.0041										<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	0.041										<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.010										<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.10										<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005										<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005										<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015										<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015										<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007										<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07										<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005										<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05										<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.012										<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.12										<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001										<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001										<0.0001	mg/kg	TM61/PM0
Phenol	<0.01										<0.01	mg/l	TM26/PM0
Phenol	<0.1										<0.1	mg/kg	TM26/PM0
Fluoride	0.5										<0.3	mg/l	TM173/PM0
Fluoride	5										<3	mg/kg	TM173/PM0
Sulphate as SO4 #	6.2										<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	62										<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1076											kg	NONE/PM17
Chloride #	<0.3										<0.3	mg/l	TM38/PM0
Chloride #	<3										<3	mg/kg	TM38/PM0
Mass of dried test portion	0.09											kg	NONE/PM17
Dissolved Organic Carbon	3										<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30										<20	mg/kg	TM60/PM0
pH	7.99										<0.01	pH units	TM73/PM0

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

Report : CEN 10:1 1 Batch

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

EMT Sample No.	81-84												
Sample ID	TP-12												
Depth	1.00												
COC No / misc													
Containers	V J T												
Sample Date	13/12/2023												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	18/12/2023												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Total Dissolved Solids #	79										<35	mg/l	TM20/PM0
Total Dissolved Solids #	790										<350	mg/kg	TM20/PM0

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

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.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40						
Sample ID	TP-01	TP-01	TP-02	TP-02	TP-03	TP-03	TP-03	TP-04	TP-05	TP-05						
Depth	0.70	2.00	1.20	3.00	0.50	2.00	3.50	0.50	1.00	3.00						
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023						
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.83	0.31	2.19	0.52	1.17	1.02	0.93	1.11	0.77	0.40	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025 [SV]	<0.025 [SV]	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	0.052	<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	51	<30	<30	35	<30	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	0.55	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	1.33	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	0.028	<0.025	0.094	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.08	<0.03	0.51	0.15	0.08	0.78	0.29	0.11	0.82	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	0.017	<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	0.32	<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 #	0.15	0.21	0.09	0.09	0.16	0.15	0.19	0.14	0.16	0.09	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	0.11	<0.02	0.04	<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	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	0.25	<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	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	710	510	2000	1769	760	1610	2161	730	1570	740	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	40	<20	<20	100	30	<20	<20	<20	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1059	0.1039	0.1183	0.1082	0.1121	0.1055	0.1039	0.1096	0.1056	0.1096	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	84.6	87.0	76.4	82.8	80.4	85.6	86.3	82.0	84.8	82.1	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.884	0.887	0.872	0.881	0.878	0.885	0.886	0.88	0.884	0.88	-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	18.2	14.9	30.9	20.7	24.3	16.9	15.9	22.0	17.9	21.7	-	-	-	<0.1	%	PM4/PM0
pH #	8.48	8.65	7.64	10.88	8.41	7.91	7.99	8.33	7.97	8.47	-	-	-	<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	5	<3	4	<3	6	5	4	5	3	4	10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	14	18	250	328	61	433	1031	43	375	24	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	4	<3	7	12	<3	4	<3	<3	4	5	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
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

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.	41-44	45-48	49-52	53-56	57-60	61-64	65-68	69-72	73-76	77-80						
Sample ID	TP-06	TP-07	TP-07	TP-08	TP-08	TP-09	TP-10	TP-11	TP-11	TP-12						
Depth	0.50	1.00	3.00	2.00	3.40	2.20	1.00	0.50	3.00	0.50						
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	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023	13/12/2023						
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	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	18/12/2023	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	1.21	0.97	0.46	0.42	0.48	0.46	1.31	1.27	0.86	0.97	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025 SV	<0.025	<0.025 SV	<0.025	<0.025	<0.025	<0.025 SV	<0.025	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	38	<30	59	<30	<30	<30	45	61	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	0.27	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	0.029	0.030	<0.025	<0.025	<0.025	<0.025	<0.025	0.030	0.026	0.037	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.11	0.08	0.07	0.06	0.18	0.09	0.10	0.10	0.08	0.11	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	0.031	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	0.13	<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 #	0.10	0.12	0.28	0.13	0.33	0.09	0.11	0.11	0.32	0.11	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	0.03	<0.02	<0.02	0.03	<0.02	0.03	0.03	0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	0.07	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.06	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1161	730	460	760	530	560	670	830	460	820	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	<20	<20	<20	<20	20	<20	20	<20	30	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1062	0.1105	0.1062	0.1112	0.1042	0.1089	0.118	0.1066	0.1042	0.1081	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	84.6	81.2	84.9	9072.1	86.7	83.0	76.0	84.0	86.7	83.2	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.884	0.879	0.884	0.9	0.886	0.882	0.871	0.883	0.886	0.882	-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	18.3	23.1	17.8	<0.1	15.4	20.5	31.7	19.1	15.3	20.3	-	-	-	<0.1	%	PM4/PM0
pH #	8.27	8.44	8.71	8.42	8.59	8.58	8.30	8.31	8.73	8.54	-	-	-	<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	4	5	3	<3	4	7	4	5	4	3	10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	31	38	25	174	75	21	<5	109	50	51	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	148	<3	3	27	5	<3	<3	<3	<3	4	800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn
EMT Job No: 23/21539

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.	81-84															
Sample ID	TP-12															
Depth	1.00															
COC No / misc																
Containers	V J T															
Sample Date	13/12/2023															
Sample Type	Soil															
Batch Number	1															
Date of Receipt	18/12/2023											Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																	
Total Organic Carbon #	1.88											3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025											6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035											1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30											500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22											-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64											100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																	
Arsenic #	0.041											0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.10											20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005											0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015											0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07											2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001											0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.12											0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02											0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05											0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	0.02											0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03											0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03											4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	790											4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30											500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1076											-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	84.0											-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.883											-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	19.1											-	-	-	<0.1	%	PM4/PM0
pH #	8.40											-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1											1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	5											10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	62											1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	<3											800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland

Matrix : Solid

Reference: 13061-08-23

Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)

Contact: Diarmaid MagLochlainn

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
23/21539	1	TP-01	0.70	1-4	No Interpretation Possible
23/21539	1	TP-01	2.00	5-8	No Interpretation Possible
23/21539	1	TP-02	1.20	9-12	possible Naturally Occurring Compounds
23/21539	1	TP-02	3.00	13-16	possible Degraded Diesel, Naturally Occurring Compounds
23/21539	1	TP-03	0.50	17-20	No Interpretation Possible
23/21539	1	TP-03	2.00	21-24	No Interpretation Possible
23/21539	1	TP-03	3.50	25-28	trace of possible Degraded Diesel
23/21539	1	TP-04	0.50	29-32	No Interpretation Possible
23/21539	1	TP-05	1.00	33-36	No Interpretation Possible
23/21539	1	TP-05	3.00	37-40	No Interpretation Possible
23/21539	1	TP-06	0.50	41-44	No Interpretation Possible
23/21539	1	TP-07	1.00	45-48	No Interpretation Possible
23/21539	1	TP-07	3.00	49-52	trace of possible Degraded Diesel
23/21539	1	TP-08	2.00	53-56	No Interpretation Possible
23/21539	1	TP-08	3.40	57-60	trace of possible Degraded Diesel
23/21539	1	TP-09	2.20	61-64	No Interpretation Possible
23/21539	1	TP-10	1.00	65-68	No Interpretation Possible
23/21539	1	TP-11	0.50	69-72	No Interpretation Possible
23/21539	1	TP-11	3.00	73-76	trace of possible Degraded Diesel
23/21539	1	TP-12	0.50	77-80	trace of possible Degraded Diesel
23/21539	1	TP-12	1.00	81-84	No Interpretation Possible

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn

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). Asbestos sub-samples are retained for not less than 6 months from the date of analysis unless specifically requested.

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

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

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/21539	1	TP-01	0.70	3	Bart Kuznicki	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	21/12/2023	**Asbestos Fibres**	Fibre Bundles
					Bart Kuznicki	21/12/2023	**Asbestos ACM**	Asbestos Cement
					Bart Kuznicki	21/12/2023	**Asbestos Type**	Chrysotile
23/21539	1	TP-01	2.00	7	Mathew Day	21/12/2023	**General Description (Bulk Analysis)**	brown soil
					Mathew Day	21/12/2023	**Asbestos Fibres**	NAD
					Mathew Day	21/12/2023	**Asbestos ACM**	NAD
					Mathew Day	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-02	1.20	11	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones and vegetation
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD
					Emily Anderton	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-02	3.00	15	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD
					Emily Anderton	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-03	0.50	19	Charlotte Taylor	21/12/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	21/12/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-03	2.00	23	Charlotte Taylor	21/12/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	21/12/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-03	3.50	27	Bart Kuznicki	22/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	22/12/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	22/12/2023	**Asbestos Fibres (2)**	NAD
					Bart Kuznicki	22/12/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	22/12/2023	**Asbestos ACM (2)**	NAD
					Bart Kuznicki	22/12/2023	**Asbestos Type**	NAD
					Bart Kuznicki	22/12/2023	**Asbestos Type (2)**	NAD

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/21539	1	TP-04	0.50	31	Charlotte Taylor	22/12/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	22/12/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	22/12/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	22/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-05	1.00	35	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD
					Emily Anderton	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-05	3.00	39	Mathew Day	21/12/2023	**General Description (Bulk Analysis)**	brown soil
					Mathew Day	21/12/2023	**Asbestos Fibres**	NAD
					Mathew Day	21/12/2023	**Asbestos ACM**	NAD
					Mathew Day	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-06	0.50	43	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD
					Emily Anderton	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-07	1.00	47	Bart Kuznicki	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	21/12/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	21/12/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-07	3.00	51	Bart Kuznicki	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	21/12/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	21/12/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-08	2.00	55	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with clay and stones
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD
					Emily Anderton	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-08	3.40	59	Bart Kuznicki	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Bart Kuznicki	21/12/2023	**Asbestos Fibres**	NAD
					Bart Kuznicki	21/12/2023	**Asbestos ACM**	NAD
					Bart Kuznicki	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-09	2.20	63	Charlotte Taylor	21/12/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	21/12/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-10	1.00	67	Charlotte Taylor	21/12/2023	**General Description (Bulk Analysis)**	brown soil/stones
					Charlotte Taylor	21/12/2023	**Asbestos Fibres**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos ACM**	NAD
					Charlotte Taylor	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-11	0.50	71	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/21539	1	TP-11	0.50	71	Emily Anderton	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-11	3.00	75	Mathew Day	21/12/2023	**General Description (Bulk Analysis)**	brown soil
					Mathew Day	21/12/2023	**Asbestos Fibres**	NAD
					Mathew Day	21/12/2023	**Asbestos ACM**	NAD
					Mathew Day	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-12	0.50	79	Mathew Day	21/12/2023	**General Description (Bulk Analysis)**	brown soil
					Mathew Day	21/12/2023	**Asbestos Fibres**	NAD
					Mathew Day	21/12/2023	**Asbestos ACM**	NAD
					Mathew Day	21/12/2023	**Asbestos Type**	NAD
23/21539	1	TP-12	1.00	83	Emily Anderton	21/12/2023	**General Description (Bulk Analysis)**	Brown soil with stones
					Emily Anderton	21/12/2023	**Asbestos Fibres**	NAD
					Emily Anderton	21/12/2023	**Asbestos ACM**	NAD
					Emily Anderton	21/12/2023	**Asbestos Type**	NAD

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle- Ballymun Lot 4 (AKA Ballymun PPP)
Contact: Diarmaid MagLochlainn

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/21539						

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.
It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

EMT Job No.: 23/21539

SOILS and ASH

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. Asbestos samples are retained for 6 months.

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. Ash samples are dried at 37°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.

STACK EMISSIONS

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 for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

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 requirement of our Accreditation Body 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.
Laboratory records are kept for a period of no less than 6 years.

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.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

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 quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/21539

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	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes

EMT Job No: 23/21539

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
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	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 results will be re-run using GC-MS to double check, when requested.	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 results will be re-run using GC-MS to double check, when requested.	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) – All anions comparable to BS ISO 15923-1: 2013I	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) – All anions comparable to BS ISO 15923-1: 2013I	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) – All anions comparable to BS ISO 15923-1: 2013I	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

EMT Job No: 23/21539

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
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
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 Second edition (2021)	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	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	

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Hazelhatch Road
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D22 K5P8

Attention :	Scott Graydon
Date :	19th December, 2023
Your reference :	13061-08-23
Our reference :	Test Report 23/20297 Batch 1
Location :	Housing Bundle Ballymum
Date samples received :	1st December, 2023
Status :	Final Report
Issue :	202312191428

Eight samples were received for analysis on 1st December, 2023 of which seven 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.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 32.508 kg of CO2

Scope 1&2&3 emissions - 76.824 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle Ballymum
Contact: Scott Graydon
EMT Job No: 23/20297

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32				LOD/LOR	Units	Method No.
Sample ID	BH04	BH04	BH13	BH13	BH14A	BH15	BH15						
Depth	0.50	1.00	0.50	1.00	1.00	0.40	1.50						
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						
Sample Date	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023						
Antimony	2	2	2	2	1	3	2				<1	mg/kg	TM30/PM15
Arsenic #	10.9	12.0	13.7	14.0	8.9	14.6	8.8				<0.5	mg/kg	TM30/PM15
Barium #	81	65	66	85	74	149	79				<1	mg/kg	TM30/PM15
Cadmium #	2.2	1.8	0.7	1.2	1.1	9.4	2.0				<0.1	mg/kg	TM30/PM15
Chromium #	25.3	38.1	26.8	20.3	35.2	37.1	22.6				<0.5	mg/kg	TM30/PM15
Copper #	30	30	29	26	26	35	26				<1	mg/kg	TM30/PM15
Lead #	25	32	33	30	35	41	16				<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1				<0.1	mg/kg	TM30/PM15
Molybdenum #	4.0	4.6	2.3	2.7	3.0	4.9	3.9				<0.1	mg/kg	TM30/PM15
Nickel #	38.5	37.9	30.0	35.2	28.6	39.6	35.2				<0.7	mg/kg	TM30/PM15
Selenium #	2	2	<1	2	<1	1	<1				<1	mg/kg	TM30/PM15
Zinc #	96	87	106	104	73	110	71				<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	0.07	<0.03				<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	<0.03	0.11	<0.03				<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	<0.03				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	0.09	<0.06				<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	0.13	<0.07				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04				<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04				<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<0.22	<0.22	<0.22	<0.22	0.36	<0.22				<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	0.69	<0.64				<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	<0.05				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02				<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1				<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	92	96	94	94	94	93	92				<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	<30	<30	<30	<30	<30	<30				<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle Ballymum
Contact: Scott Graydon
EMT Job No: 23/20297

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32				LOD/LOR	Units	Method No.
Sample ID	BH04	BH04	BH13	BH13	BH14A	BH15	BH15						
Depth	0.50	1.00	0.50	1.00	1.00	0.40	1.50						
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						
Sample Date	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023						
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	<26	<26	<26	<26	<26				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10				<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	<10				<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	<4	<4	<4	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	<7	<7	<7	<7	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	<26	<26	<26	<26	<26	<26				<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	<52	<52	<52	<52	<52	<52				<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1	<0.1 SV	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10				<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	<10				<10	mg/kg	TM5/PM8/PM16
MTBE#	<5 SV	<5	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
Benzene#	<5 SV	<5	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
Toluene#	<5 SV	<5	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
Ethylbenzene#	<5 SV	<5	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
m/p-Xylene#	<5 SV	<5	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
o-Xylene#	<5 SV	<5	<5	<5 SV	<5	<5	<5				<5	ug/kg	TM36/PM12
PCB 28#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 52#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 101#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 118#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 138#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 153#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
PCB 180#	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM17/PM8
Total 7 PCBs#	<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: 13061-08-23
Location: Housing Bundle Ballymum
Contact: Scott Graydon
EMT Job No: 23/20297

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32				LOD/LOR	Units	Method No.
Sample ID	BH04	BH04	BH13	BH13	BH14A	BH15	BH15						
Depth	0.50	1.00	0.50	1.00	1.00	0.40	1.50						
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						
Sample Date	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023						
Natural Moisture Content	13.6	18.3	13.7	16.8	17.5	16.8	14.2				<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	12.0	15.5	12.1	14.4	14.9	14.4	12.4				<0.1	%	PM4/PM0
Hexavalent Chromium #	<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) #	1.4924	-	-	0.0582	-	-	0.0260				<0.0015	g/l	TM38/PM20
Chromium III	25.3	38.1	26.8	20.3	35.2	37.1	22.6				<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.82	1.22	1.01	0.93	1.03	1.32	0.39				<0.02	%	TM21/PM24
Organic Matter	1.4	-	-	1.6	-	-	0.7				<0.2	%	TM21/PM24
pH #	7.69	7.46	8.07	8.28	8.06	8.13	8.32				<0.01	pH units	TM73/PM11
Asbestos Type*	NAD	NAD	NAD	NAD	NAD	NAD	NAD					None	Subcontracted

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle Ballymum
Contact: Scott Graydon
EMT Job No: 23/20297

Report : CEN 10:1 1 Batch

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

EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32				LOD/LOR	Units	Method No.
Sample ID	BH04	BH04	BH13	BH13	BH14A	BH15	BH15						
Depth	0.50	1.00	0.50	1.00	1.00	0.40	1.50						
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						
Sample Date	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023						
Dissolved Antimony #	<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	0.03				<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025				<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025				<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.018	0.021	<0.003	<0.003	0.006	0.007	0.010				<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.18	0.21	<0.03	<0.03	0.06	0.07	0.10				<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<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	mg/kg	TM30/PM17
Dissolved Chromium #	<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	mg/kg	TM30/PM17
Dissolved Copper #	<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	mg/kg	TM30/PM17
Dissolved Lead #	<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	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.005	0.009	0.006	0.007	0.004	0.003	0.020				<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.05	0.09	0.06	0.07	0.04	0.03	0.20				<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<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	mg/kg	TM30/PM17
Dissolved Selenium #	<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	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				<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	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<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	mg/l	TM26/PM0
Phenol	<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	0.6	0.5	0.4	0.3	<0.3				<0.3	mg/l	TM173/PM0
Fluoride	<3	4	6	5	4	3	<3				<3	mg/kg	TM173/PM0
Sulphate as SO4 #	712.9	229.1	4.1	5.3	16.0	0.6	3.9				<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	7126	2290	41	53	160	6	39				<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1032	0.1106	0.111	0.1075	0.1186	0.113	0.1055					kg	NONE/PM17
Chloride #	0.7	1.0	0.5	0.6	0.4	0.5	0.5				<0.3	mg/l	TM38/PM0
Chloride #	7	10	5	6	4	5	5				<3	mg/kg	TM38/PM0
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09					kg	NONE/PM17
Dissolved Organic Carbon	<2	<2	<2	<2	2	2	<2				<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	20	20	<20				<20	mg/kg	TM60/PM0
pH	7.98	8.01	8.17	8.09	8.16	8.13	8.05				<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle Ballymum
Contact: Scott Graydon
EMT Job No: 23/20297

Report : CEN 10:1 1 Batch

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

EMT Sample No.	1-4	5-8	9-12	13-16	21-24	25-28	29-32				LOD/LOR	Units	Method No.
Sample ID	BH04	BH04	BH13	BH13	BH14A	BH15	BH15						
Depth	0.50	1.00	0.50	1.00	1.00	0.40	1.50						
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						
Sample Date	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023						
Total Dissolved Solids #	1193	423	91	78	100	86	60				<35	mg/l	TM20/PM0
Total Dissolved Solids #	11926	4228	910	780	1000	860	600				<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle Ballymum
Contact: Scott Graydon
EMT Job No: 23/20297

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.	1-4	5-8	9-12	13-16	21-24	25-28	29-32								
Sample ID	BH04	BH04	BH13	BH13	BH14A	BH15	BH15								
Depth	0.50	1.00	0.50	1.00	1.00	0.40	1.50								
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								
Sample Date	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023	24/11/2023								
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1	1	1								
Date of Receipt	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023	01/12/2023				Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.82	1.22	1.01	0.93	1.03	1.32	0.39				3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025 SV	<0.025	<0.025	<0.025 SV	<0.025	<0.025	<0.025				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				1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	<30				500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	0.36	<0.22				-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	0.69	<0.64				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				0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.18	0.21	<0.03	<0.03	0.06	0.07	0.10				20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				0.04	1	5	<0.005	mg/kg	TM30/PM17
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015				0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<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				0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.05	0.09	0.06	0.07	0.04	0.03	0.20				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				0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<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				0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03				4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	11926	4228	910	780	1000	860	600				4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	20	20	<20				500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1032	0.1106	0.111	0.1075	0.1186	0.113	0.1055				-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	86.8	81.5	81.2	83.9	76.2	80.0	85.2				-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.886	0.879	0.879	0.883	0.872	0.878	0.884				-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	15.2	22.8	23.1	19.3	31.3	24.9	17.4				-	-	-	<0.1	%	PM4/PM0
pH #	7.69	7.46	8.07	8.28	8.06	8.13	8.32				-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	4	6	5	4	3	<3				10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	7126	2290	41	53	160	6	39				1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	7	10	5	6	4	5	5				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

Reference: 13061-08-23

Location: Housing Bundle Ballymum

Contact: Scott Graydon

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
23/20297	1	BH04	0.50	1-4	No interpretation possible
23/20297	1	BH04	1.00	5-8	No interpretation possible
23/20297	1	BH13	0.50	9-12	No interpretation possible
23/20297	1	BH13	1.00	13-16	No interpretation possible
23/20297	1	BH14A	1.00	21-24	No interpretation possible
23/20297	1	BH15	0.40	25-28	No interpretation possible
23/20297	1	BH15	1.50	29-32	No interpretation possible

Client Name: Ground Investigations Ireland

Matrix : Solid

Reference: 13061-08-23

Location: Housing Bundle Ballymum

Contact: Scott Graydon

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/20297	1	BH04	0.50	1-4	GRO	Sample holding time exceeded
23/20297	1	BH04	1.00	5-8	GRO	Sample holding time exceeded
23/20297	1	BH13	0.50	9-12	GRO	Sample holding time exceeded
23/20297	1	BH13	1.00	13-16	GRO	Sample holding time exceeded
23/20297	1	BH14A	1.00	21-24	GRO	Sample holding time exceeded
23/20297	1	BH15	0.40	25-28	GRO	Sample holding time exceeded
23/20297	1	BH15	1.50	29-32	GRO	Sample holding time exceeded

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.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

SOILS and ASH

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. Asbestos samples are retained for 6 months.

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. Ash samples are dried at 37°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.

STACK EMISSIONS

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 for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

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 requirement of our Accreditation Body 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.
Laboratory records are kept for a period of no less than 6 years.

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.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

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 quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/20297

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	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes

EMT Job No: 23/20297

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
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	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 results will be re-run using GC-MS to double check, when requested.	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 results will be re-run using GC-MS to double check, when requested.	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) – All anions comparable to BS ISO 15923-1: 2013I	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) – All anions comparable to BS ISO 15923-1: 2013I	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) – All anions comparable to BS ISO 15923-1: 2013I	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

EMT Job No: 23/20297

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
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
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
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	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	
Subcontracted	See attached subcontractor report for accreditation status and provider.					AR	

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Hazelhatch Road
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D22 K5P8

Attention :	Conor Finnerty
Date :	19th December, 2023
Your reference :	13061-08-23
Our reference :	Test Report 23/20105 Batch 1
Location :	Housing Bundle - Ballymum
Date samples received :	29th November, 2023
Status :	Final Report
Issue :	202312191428

Fourteen samples were received for analysis on 29th November, 2023 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.

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 65.739 kg of CO2

Scope 1&2&3 emissions - 155.359 kg of CO2

Authorised By:

Bruce Leslie
Project Manager

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	BH07	BH07	BH08	BH08	BH09	BH09	BH10	BH10	BH11	BH11			
Depth	0.60	1.50	1.00	2.00	0.50	1.50	0.50	1.20	0.50	1.50			
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	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023			
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	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023			
Antimony	2	2	2	2	3	2	6	3	2	1	<1	mg/kg	TM30/PM15
Arsenic #	17.6	11.0	14.6	10.0	18.8	8.0	18.4	14.5	14.3	8.5	<0.5	mg/kg	TM30/PM15
Barium #	107	64	99	64	121	45	144	122	70	47	<1	mg/kg	TM30/PM15
Cadmium #	1.5	2.2	2.3	1.6	2.2	1.9	2.3	1.8	1.4	1.6	<0.1	mg/kg	TM30/PM15
Chromium #	24.0	17.7	21.5	19.7	24.2	13.1	35.9	30.1	18.1	11.3	<0.5	mg/kg	TM30/PM15
Copper #	42	32	39	26	52	27	51	36	37	24	<1	mg/kg	TM30/PM15
Lead #	55	17	40	17	83	13	83	21	58	15	<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1	0.1	0.1	0.2	<0.1	0.3	<0.1	0.2	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.4	4.1	3.4	3.6	3.9	3.0	3.8	3.2	2.5	3.1	<0.1	mg/kg	TM30/PM15
Nickel #	42.0	48.4	45.9	36.4	50.4	36.8	47.1	62.2	35.8	31.7	<0.7	mg/kg	TM30/PM15
Selenium #	1	<1	<1	1	2	1	2	1	<1	<1	<1	mg/kg	TM30/PM15
Zinc #	96	85	106	74	133	72	143	103	99	65	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<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	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<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	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	0.07	<0.03	0.05	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	0.05	<0.03	0.07	<0.03	0.04	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.09	<0.06	0.09	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	0.07	<0.02	0.12	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.14	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<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	95	91	97	95	104	98	94	97	97	100	<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	<30	<30	<30	<30	<30	3724	<30	<30	<30	<30	mg/kg	TM5/PM8/PM16

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	BH07	BH07	BH08	BH08	BH09	BH09	BH10	BH10	BH11	BH11			
Depth	0.60	1.50	1.00	2.00	0.50	1.50	0.50	1.20	0.50	1.50			
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	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023			
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	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023			
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	0.8 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 SV	<0.1	<0.1 SV	0.2	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<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 (EH_CU_1D_AL)#	<4	<4	<4	<4	<4	<4	10	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7	<7	51	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7	<7	<7	<7	<7	<7	3501	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	<7	<7	<7	<7	162	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	<26	<26	<26	<26	3724	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	0.8 SV	<0.1	<0.1 SV	0.2	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	520	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10	<10	<10	<10	<10	<10	3044	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<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 (EH_CU_1D_AR)#	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	<7	<7	<7	<7	241	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	<7	<7	<7	<7	<7	25	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	<26	<26	<26	<26	<26	266	<26	<26	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	<52	<52	<52	<52	<52	3990	<52	<52	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1 SV	<0.1	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	41	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10	<10	<10	<10	<10	<10	202	<10	<10	<10	<10	mg/kg	TM5/PM8/PM16
MTBE#	<5 SV	<5	<5 SV	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
Benzene#	<5 SV	<5	<5 SV	<5	<5 SV	<5	7 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
Toluene#	13 SV	<5	<5 SV	<5	<5 SV	<5	22 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
Ethylbenzene#	<5 SV	<5	<5 SV	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
m/p-Xylene#	8 SV	<5	<5 SV	<5	<5 SV	<5	<5 SV	<5	<5	<5	<5	ug/kg	TM36/PM12
o-Xylene#	<5 SV	<5	<5 SV	10	<5 SV	<5	7 SV	<5	<5	<5	<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: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : Solid

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	BH07	BH07	BH08	BH08	BH09	BH09	BH10	BH10	BH11	BH11			
Depth	0.60	1.50	1.00	2.00	0.50	1.50	0.50	1.20	0.50	1.50			
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	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023			
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	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023			
Natural Moisture Content	20.6	14.8	23.5	13.1	31.9	14.4	24.9	20.0	23.6	12.4	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	17.1	12.9	19.0	11.6	24.2	12.6	19.9	16.7	19.1	11.0	<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) #	0.0896	-	0.0405	-	0.0217	-	0.0279	0.0409	-	0.0141	<0.0015	g/l	TM38/PM20
Chromium III	24.0	17.7	21.5	19.7	24.2	13.1	35.9	30.1	18.1	11.3	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.90	0.39	2.01	0.51	3.03	0.66	3.64	0.32	1.90	0.32	<0.02	%	TM21/PM24
Organic Matter	3.3	-	3.5	-	5.2	-	6.3	0.6	-	0.6	<0.2	%	TM21/PM24
pH #	8.15	8.51	8.37	8.19	8.11	8.62	8.25	8.39	7.84	8.65	<0.01	pH units	TM73/PM11
Asbestos Type*	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		None	Subcontracted

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

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.	41-44	45-48	49-52	53-56							LOD/LOR	Units	Method No.
Sample ID	BH17	BH17	BH19	BH19									
Depth	0.50	2.00	0.50	2.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	23/11/2023	23/11/2023	23/11/2023	23/11/2023									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	29/11/2023	29/11/2023	29/11/2023	29/11/2023									
Antimony	2	2	2	2							<1	mg/kg	TM30/PM15
Arsenic #	13.3	10.1	12.7	11.7							<0.5	mg/kg	TM30/PM15
Barium #	101	178	107	65							<1	mg/kg	TM30/PM15
Cadmium #	2.3	1.9	1.4	0.8							<0.1	mg/kg	TM30/PM15
Chromium #	20.7	13.5	25.7	38.6							<0.5	mg/kg	TM30/PM15
Copper #	36	28	28	17							<1	mg/kg	TM30/PM15
Lead #	38	18	32	22							<5	mg/kg	TM30/PM15
Mercury #	0.2	<0.1	0.2	<0.1							<0.1	mg/kg	TM30/PM15
Molybdenum #	3.2	3.5	3.2	1.5							<0.1	mg/kg	TM30/PM15
Nickel #	44.6	42.2	35.3	21.8							<0.7	mg/kg	TM30/PM15
Selenium #	1	<1	1	<1							<1	mg/kg	TM30/PM15
Zinc #	106	77	81	65							<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	0.05	<0.03							<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	0.04	<0.03							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<0.22	<0.22	<0.22							<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64							<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02							<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1							<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	101	96	97	98							<0	%	TM4/PM8
Mineral Oil (C10-C40) (EH_CU_1D_AL)	<30	<30	109	<30							<30	mg/kg	TM5/PM8/PM16

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : Solid

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

EMT Sample No.	41-44	45-48	49-52	53-56									
Sample ID	BH17	BH17	BH19	BH19									
Depth	0.50	2.00	0.50	2.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	23/11/2023	23/11/2023	23/11/2023	23/11/2023									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	29/11/2023	29/11/2023	29/11/2023	29/11/2023									

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL)#	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL)#	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL)#	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL)#	<7	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL)#	<7	<7	86	<7							<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	<7	<7	23	<7							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40 (EH_CU+HS_1D_AL)	<26	<26	109	<26							<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_CU_1D_AL)	<10	<10	<10	<10							<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_CU_1D_AL)	<10	<10	82	<10							<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR)#	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR)#	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR)#	<7	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR)#	<7	<7	298	126							<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	<7	<7	77	43							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40 (EH_CU+HS_1D_AR)	<26	<26	375	169							<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH_CU+HS_1D_Total)	<52	<52	484	169							<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR)#	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_CU_1D_AR)	<10	<10	38	<10							<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_CU_1D_AR)	<10	<10	266	121							<10	mg/kg	TM5/PM8/PM16
MTBE#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Benzene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
Toluene#	<5	<5	<5	7							<5	ug/kg	TM36/PM12
Ethylbenzene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
m/p-Xylene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
o-Xylene#	<5	<5	<5	<5							<5	ug/kg	TM36/PM12
PCB 28#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
PCB 52#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
PCB 101#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
PCB 118#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
PCB 138#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
PCB 153#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
PCB 180#	<5	<5	<5	<5							<5	ug/kg	TM17/PM8
Total 7 PCBs#	<35	<35	<35	<35							<35	ug/kg	TM17/PM8

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : Solid

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

EMT Sample No.	41-44	45-48	49-52	53-56							LOD/LOR	Units	Method No.
Sample ID	BH17	BH17	BH19	BH19									
Depth	0.50	2.00	0.50	2.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	23/11/2023	23/11/2023	23/11/2023	23/11/2023									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	29/11/2023	29/11/2023	29/11/2023	29/11/2023									
Natural Moisture Content	23.6	12.2	18.8	14.1							<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	19.1	10.9	15.8	12.3							<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3							<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0720	-	0.2287							<0.0015	g/l	TM38/PM20
Chromium III	20.7	13.5	25.7	38.6							<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.17	0.40	0.99	1.24							<0.02	%	TM21/PM24
Organic Matter	-	0.7	-	2.1							<0.2	%	TM21/PM24
pH #	7.95	8.48	9.45	11.53							<0.01	pH units	TM73/PM11
Asbestos Type*	NAD	NAD	NAD	NAD								None	Subcontracted

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : CEN 10:1 1 Batch

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	BH07	BH07	BH08	BH08	BH09	BH09	BH10	BH10	BH11	BH11			
Depth	0.60	1.50	1.00	2.00	0.50	1.50	0.50	1.20	0.50	1.50			
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	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023			
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	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023			
Dissolved Antimony #	<0.002	<0.002	0.003	<0.002	0.003	<0.002	0.023	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	0.03	<0.02	0.03	<0.02	0.23	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	0.0034	0.0026	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.0037	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	0.034	0.026	<0.025	<0.025	<0.025	<0.025	<0.025	0.037	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	<0.003	0.034	0.003	0.006	<0.003	0.009	<0.003	0.013	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	0.34	0.03	0.06	<0.03	0.09	<0.03	0.13	<0.03	<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 #	0.003	0.014	0.010	0.020	0.004	0.012	0.009	<0.002	0.004	0.010	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.03	0.14	0.10	0.20	0.04	0.12	0.09	<0.02	0.04	0.10	<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	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (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
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	0.4	<0.3	0.3	<0.3	0.4	<0.3	0.3	<0.3	0.4	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	4	<3	3	<3	4	<3	<3	<3	4	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	20.7	15.1	21.8	2.9	0.9	0.9	<0.5	10.1	116.7	2.7	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	207	151	218	29	9	9	<5	101	1167	27	<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1132	0.1023	0.1177	0.1046	0.1209	0.1025	0.1154	0.1116	0.1152	0.1041		kg	NONE/PM17
Chloride #	0.4	<0.3	0.6	0.3	1.2	<0.3	1.8	4.5	0.8	<0.3	<0.3	mg/l	TM38/PM0
Chloride #	4	<3	6	3	12	<3	18	45	8	<3	<3	mg/kg	TM38/PM0
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
Dissolved Organic Carbon	2	<2	3	4	<2	<2	4	<2	<2	<2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	30	40	<20	<20	40	<20	<20	<20	<20	mg/kg	TM60/PM0
pH	7.96	7.99	7.56	7.84	8.26	8.09	8.33	7.93	7.92	8.07	<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : CEN 10:1 1 Batch

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

EMT Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40	LOD/LOR	Units	Method No.
Sample ID	BH07	BH07	BH08	BH08	BH09	BH09	BH10	BH10	BH11	BH11			
Depth	0.60	1.50	1.00	2.00	0.50	1.50	0.50	1.20	0.50	1.50			
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	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023			
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	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023			
Total Dissolved Solids #	117	62	143	57	137	53	132	87	284	53	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1170	620	1431	570	1369	530	1320	870	2841	530	<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : CEN 10:1 1 Batch

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

EMT Sample No.	41-44	45-48	49-52	53-56							LOD/LOR	Units	Method No.
Sample ID	BH17	BH17	BH19	BH19									
Depth	0.50	2.00	0.50	2.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	23/11/2023	23/11/2023	23/11/2023	23/11/2023									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	29/11/2023	29/11/2023	29/11/2023	29/11/2023									
Dissolved Antimony #	<0.002	<0.002	0.003	<0.002							<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	0.03	<0.02							<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	0.0043	<0.0025							<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	0.043	<0.025							<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.023	0.012	0.006	0.019							<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.23	0.12	0.06	0.19							<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<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	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	0.0077							<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	0.077							<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	0.020	0.014							<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	0.20	0.14							<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<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	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.008	0.012	0.015	0.007							<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.08	0.12	0.15	0.07							<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	0.006	0.005							<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	0.06	0.05							<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<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	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003							<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03							<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<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	mg/kg	TM61/PM0
Phenol	<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	mg/kg	TM26/PM0
Fluoride	0.3	<0.3	<0.3	<0.3							<0.3	mg/l	TM173/PM0
Fluoride	3	<3	<3	<3							<3	mg/kg	TM173/PM0
Sulphate as SO4 #	90.9	20.0	39.4	43.4							<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	909	200	394	434							<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1059	0.1037	0.112	0.1081								kg	NONE/PM17
Chloride #	0.5	<0.3	1.5	2.1							<0.3	mg/l	TM38/PM0
Chloride #	5	<3	15	21							<3	mg/kg	TM38/PM0
Mass of dried test portion	0.09	0.09	0.09	0.09								kg	NONE/PM17
Dissolved Organic Carbon	<2	<2	8	4							<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	80	40							<20	mg/kg	TM60/PM0
pH	7.95	8.08	9.63	11.38							<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

Report : CEN 10:1 1 Batch

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

EMT Sample No.	41-44	45-48	49-52	53-56							LOD/LOR	Units	Method No.
Sample ID	BH17	BH17	BH19	BH19									
Depth	0.50	2.00	0.50	2.00									
COC No / misc													
Containers	V J T	V J T	V J T	V J T									
Sample Date	23/11/2023	23/11/2023	23/11/2023	23/11/2023									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	29/11/2023	29/11/2023	29/11/2023	29/11/2023									
Total Dissolved Solids #	231	80	146	211							<35	mg/l	TM20/PM0
Total Dissolved Solids #	2311	800	1461	2109							<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

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.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36	37-40						
Sample ID	BH07	BH07	BH08	BH08	BH09	BH09	BH10	BH10	BH11	BH11						
Depth	0.60	1.50	1.00	2.00	0.50	1.50	0.50	1.20	0.50	1.50						
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	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023	23/11/2023						
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	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	29/11/2023	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	1.90	0.39	2.01	0.51	3.03	0.66	3.64	0.32	1.90	0.32	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025 SV	<0.025	<0.025 SV	<0.025	<0.025 SV	<0.025	0.036 SV	<0.025	<0.025	<0.025	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	3724	<30	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	0.034	0.026	<0.025	<0.025	<0.025	<0.025	<0.025	0.037	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	<0.03	0.34	0.03	0.06	<0.03	0.09	<0.03	0.13	<0.03	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 #	0.03	0.14	0.10	0.20	0.04	0.12	0.09	<0.02	0.04	0.10	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	0.03	<0.02	0.03	<0.02	0.23	<0.02	<0.02	<0.02	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	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1170	620	1431	570	1369	530	1320	870	2841	530	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	30	40	<20	<20	40	<20	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1132	0.1023	0.1177	0.1046	0.1209	0.1025	0.1154	0.1116	0.1152	0.1041	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	79.8	88.1	76.6	86.2	74.6	87.4	77.7	81.0	78.0	86.9	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.877	0.888	0.873	0.886	0.869	0.887	0.874	0.879	0.875	0.887	-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	25.4	13.5	30.5	16.0	34.0	14.4	28.7	23.5	28.2	15.0	-	-	-	<0.1	%	PM4/PM0
pH #	8.15	8.51	8.37	8.19	8.11	8.62	8.25	8.39	7.84	8.65	-	-	-	<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	4	<3	3	<3	4	<3	<3	<3	4	<3	10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	207	151	218	29	9	9	<5	101	1167	27	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	4	<3	6	3	12	<3	18	45	8	<3	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
Reference: 13061-08-23
Location: Housing Bundle - Ballymum
Contact: Conor Finnerty
EMT Job No: 23/20105

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.	41-44	45-48	49-52	53-56							Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	BH17	BH17	BH19	BH19												
Depth	0.50	2.00	0.50	2.00												
COC No / misc																
Containers	V J T	V J T	V J T	V J T												
Sample Date	23/11/2023	23/11/2023	23/11/2023	23/11/2023												
Sample Type	Soil	Soil	Soil	Soil												
Batch Number	1	1	1	1												
Date of Receipt	29/11/2023	29/11/2023	29/11/2023	29/11/2023												
Solid Waste Analysis																
Total Organic Carbon #	1.17	0.40	0.99	1.24							3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025							6	-	-	<0.025	mg/kg	TM36/PM12
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035							1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	109	<30							500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22							-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64							100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	0.043	<0.025							0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.23	0.12	0.06	0.19							20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<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	0.077							0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	0.20	0.14							2	50	100	<0.07	mg/kg	TM30/PM17
Mercury #	<0.0001	<0.0001	0.0001	<0.0001							0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.08	0.12	0.15	0.07							0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	0.06	0.05							0.4	10	40	<0.02	mg/kg	TM30/PM17
Lead #	<0.05	<0.05	<0.05	<0.05							0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	0.03	<0.02							0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03							0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	<0.03	<0.03	<0.03							4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	2311	800	1461	2109							4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	80	40							500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1059	0.1037	0.112	0.1081							-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	85.3	86.9	80.1	83.5							-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.885	0.886	0.878	0.882							-	-	-		l	NONE/PM17
Moisture Content 105C (% Dry Weight)	17.2	15.1	24.9	19.7							-	-	-	<0.1	%	PM4/PM0
pH #	7.95	8.48	9.45	11.53							-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1							1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	3	<3	<3	<3							10	150	500	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	909	200	394	434							1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	5	<3	15	21							800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland

Reference: 13061-08-23

Location: Housing Bundle - Ballymum

Contact: Conor Finnerty

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
23/20105	1	BH07	0.60	1-4	No interpretation possible
23/20105	1	BH07	1.50	5-8	No interpretation possible
23/20105	1	BH08	1.00	9-12	No interpretation possible
23/20105	1	BH08	2.00	13-16	No interpretation possible
23/20105	1	BH09	0.50	17-20	No interpretation possible
23/20105	1	BH09	1.50	21-24	No interpretation possible
23/20105	1	BH10	0.50	25-28	Lubricating oil, Possible PAH's & Possible trace of degraded diesel
23/20105	1	BH10	1.20	29-32	No interpretation possible
23/20105	1	BH11	0.50	33-36	No interpretation possible
23/20105	1	BH11	1.50	37-40	No interpretation possible
23/20105	1	BH17	0.50	41-44	No interpretation possible
23/20105	1	BH17	2.00	45-48	No interpretation possible
23/20105	1	BH19	0.50	49-52	Trace of PAH's, Trace of lubricating oil & Possible tarmac/bitumen
23/20105	1	BH19	2.00	53-56	Possible tarmac/bitumen

Client Name: Ground Investigations Ireland

Reference: 13061-08-23

Location: Housing Bundle - Ballymum

Contact: Conor Finnerty

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
23/20105	1	BH07	0.60	1-4	EPH	Sample holding time exceeded
23/20105	1	BH07	1.50	5-8	EPH	Sample holding time exceeded
23/20105	1	BH08	1.00	9-12	EPH	Sample holding time exceeded
23/20105	1	BH08	2.00	13-16	EPH	Sample holding time exceeded
23/20105	1	BH09	0.50	17-20	EPH	Sample holding time exceeded
23/20105	1	BH09	1.50	21-24	EPH	Sample holding time exceeded
23/20105	1	BH10	0.50	25-28	EPH	Sample holding time exceeded
23/20105	1	BH10	1.20	29-32	EPH	Sample holding time exceeded
23/20105	1	BH11	0.50	33-36	EPH	Sample holding time exceeded
23/20105	1	BH11	1.50	37-40	EPH	Sample holding time exceeded
23/20105	1	BH17	0.50	41-44	EPH	Sample holding time exceeded
23/20105	1	BH17	2.00	45-48	EPH, GRO	Sample holding time exceeded
23/20105	1	BH19	0.50	49-52	EPH, GRO	Sample holding time exceeded
23/20105	1	BH19	2.00	53-56	EPH, GRO	Sample holding time exceeded

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.

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

EMT Job No.: 23/20105

SOILS and ASH

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. Asbestos samples are retained for 6 months.

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. Ash samples are dried at 37°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.

STACK EMISSIONS

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 for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

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 requirement of our Accreditation Body 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.
Laboratory records are kept for a period of no less than 6 years.

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.

Customer Provided Information

Sample ID and depth is information provided by the customer.

Age of Diesel

The age of release estimation is based on the nC17/pristane ratio only as prescribed by Christensen and Larsen (1993) and Kaplan, Galperin, Alimi et al., (1996).
Age estimation should be treated with caution as it can be influenced by site specific factors of which the laboratory are not aware.

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 quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	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

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 23/20105

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	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.			AD	Yes

EMT Job No: 23/20105

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
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	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	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 results will be re-run using GC-MS to double check, when requested.	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 results will be re-run using GC-MS to double check, when requested.	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) – All anions comparable to BS ISO 15923-1: 2013I	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) – All anions comparable to BS ISO 15923-1: 2013I	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) – All anions comparable to BS ISO 15923-1: 2013I	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

EMT Job No: 23/20105

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
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
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
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	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	
Subcontracted	See attached subcontractor report for accreditation status and provider.					AR	

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CMTL
CONSTRUCTION MATERIALS TESTING LABORATORIES
A PHENNA GROUP COMPANY

Laboratory Test Report
Point Load Strength Index

Project :	Housing Bundle, Ballymun	**Job Number**	13061-08-23
Client :	Ground Investigations Ireland	**Lab Ref No**	ST 27728
	Catherinestown House, Hazelhatch Road	**Date Received**	29/02/2024
	Newcastle, Co. Dublin	**Date Tested**	04/03/2024
Originator :	Diarmaid MagLochlainn	**Date Reported**	05/03/2024

Point Load Strength Index

Sample No:-	Depth (m)	Description	Type	Orientation	W (mm)	D (mm)	P (kN)	A	De (mm)	I_s	F	$I_{s(50)}$MN/m²
BH02	27.09-27.25	1	D	⊥	63.0	63.0	20.00	3969	63.0	5.039	1.11	5.59
BH04	18.33-18.51	1	D	⊥	63.0	64.0	14.00	4032	64.0	3.418	1.12	3.82
BH07	17.97-18.08	1	D	⊥	63.0	65.0	26.00	4095	65.0	6.154	1.13	6.93
BH14	17.10-17.25	1	D	⊥	63.0	64.0	11.00	4032	64.0	2.686	1.12	3.00
BH19	19.27-19.40	1	D	⊥	63.0	63.0	24.00	3969	63.0	6.047	1.11	6.71

Description 1 : Black/Grey

$I_{s(50)}$MN/m² for	Description 1	
Min	3.00	
Mean	5.21	
Max	6.93	

Test
A = axial
D = diametrical

Relationship to planes of weakness
IL = irregular lump
II = parallel
⊥ = perpendicular

Mean Value

	$I_{s(50)}$MN/m²	U.C.S. MN/m²
Extremely Weak	<0.05	0.6-1.0
Very Weak	0.05-0.20	1.0-5.0
Weak	0.20-0.50	5.0-25.0
Medium Strong	0.50-2.00	25-50
Strong	2.00-4.50	50-100
Very Strong	4.50-9.00	100-250
Extremely Strong	9.00 +	>250

JR Ward

Approved Signature
James Ward, Operations Manager
CMTL Ireland Limited

CMTL Ireland Limited
Unit D, Zone 5, Clonminam Business Park
Portlaoise, Co. Laois R32 W30Y
Tel: 057 8664885

CMTL
CONSTRUCTION MATERIALS TESTING LABORATORIES
A PHENNA GROUP COMPANY

Laboratory Test Report
Uniaxial Compressive Strength

Project:	Housing Bundle, Ballymun	**Job Number**	13061-08-23
Client:	Ground Investigations Ireland	**Lab Ref No**	ST 27729
	Catherinestown House, Hazelhatch Road	**Date Received**	29/02/2024
	Newcastle. Co. Dublin	**Date Tested**	04/03/2024
Originator:	Diarmaid MagLochlainn	**Date Reported**	05/03/2024

Sample Reference	Moisture Content	Density (Mg/m^3)	Uniaxial Compressive Strength (N/mm^2)
BH02 27.25-27.50	1.1	2696	113.3
BH04 19.00-19.22	0.3	2675	87.3
BH07 20.85-21.38	0.3	2697	118.5
BH14A 18.30-18.47	3.2	2684	71.2
BH19 21.03-21.27	0.8	2700	109.3

Remarks: None

JR Ward

Approved Signature
James Ward, Operations Manager
CMTL Ireland Limited

APPENDIX 7 Groundwater Monitoring

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

GROUNDWATER MONITORING

Housing Bundle Ballymun

BOREHOLE	DATE	TIME	GROUNDWATER (m BGL)	Comments
BH04	01/03/2024	11:20:00	7.20	
BH14A	01/03/2024	10:45:00	0.42	
BH19	01/03/2024			Couldn't find the BH due to snow
BH19	05/03/2024	09:55:00	3.10	