**Project**

# SHD Development at Cooldown Commons Phase 3

**Report Title**

# Ground Investigation Report October 2020

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

# Ground Investigations Ireland

# The Quarter Citywest Cooldown Commons Phase 3

## DBFL

## Ground Investigation Report

## October 2020

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D22 YD52

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

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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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# APPENDICES

## 1.0 Preamble

On the instructions of DBFL Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between July and October 2020 at the site of the proposed Residential development. The Quarter Citywest Cooldown Commons Phase 3, Dublin 24.

## 2.0 Overview

### 2.1. Background

It is proposed to construct a High Rise Residential Apartments and Housing development with associated services, access roads and car parking at the proposed site. The site is currently occupied by an active construction site and is situated on Citywest Avenue off the N82 Citywest Cooldown Commons Dublin. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant and a basement.

### 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 9 No. Trial Pits to a maximum depth of 3.60m BGL
- Carry out 2 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 18 No. Window Sample Boreholes to recover soil samples
- Carry out 11 No. Dynamic Probes to determine soil strength/density characteristics
- Carry out 17 No. Cable Percussion boreholes to a maximum depth of 10.00m BGL
- Carry out 15 No. Rotary Core Boreholes to a maximum depth of 15m BGL
- Installation of 5 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 3.5 Tonne 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 trial pits were sampled, logged and photographed by a Geotechnical Engineer/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.

### 3.3. Soakaway Testing

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

### 3.4. Window Sampling

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

### 3.5. Dynamic Probing

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

### 3.6. Insitu Plate Bearing Test

The plate bearing tests were carried out using a 305mm or 450mm diameter plate at the locations shown on the site plan in Appendix 1. The plate was loaded in increments using a hydraulic jack and an excavator to provide a reaction and the displacement was monitored in accordance with BS1377 Part 9 using independently mounted digital strain gauges. The constrained modulus and equivalent CBR are calculated in accordance with HD29/75 and are provided on the test reports in Appendix 6 of this Report.

### 3.7. 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 7 of this Report.

### 3.8. 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 7 of this Report.

### 3.9. Surveying

The exploratory hole locations have been recorded using a Trimble R10 GNSS System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

### 3.10. Groundwater Monitoring Installations

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

### 3.11. Laboratory Testing

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design.

Environmental & Chemical testing as required by the specification, including the Rilta Suite, pH and sulphate testing was carried out by Element Materials Technology Laboratory in the UK. The Rilta suite testing includes both Solid Waste and Leachate Waste Acceptance Criteria.

Geotechnical testing consisting of moisture content, Atterberg limits, Particle Size Distribution (PSD), hydrometer tests were carried out in NMTL's Geotechnical Laboratory in Carlow.

The results of the laboratory testing are included in Appendix 8 of this Report.

## 4.0 Ground Conditions

### 4.1. General

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

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

- Topsoil
- Made Ground
- Cohesive Deposits
- Granular Deposits

**TOPSOIL:** Topsoil was encountered in exploration holes to the south and southeast of the site and was present to a maximum depth of 0.3m BGL. The majority of other exploratory holes encountered made ground from or cohesive deposits from ground level.

**MADE GROUND:** Made Ground deposits were encountered from ground level in several exploratory holes and were present to a relatively consistent depth of between 0.2m and 0.60m BGL. These deposits were described generally as *brown slightly sandy slightly gravelly CLAY* or *Dark grey slightly clayey sandy fine to coarse angular to subangular Crushed Rock Fill with occasional cobbles and boulders and contained occasional fragments of concrete, metal, red brick, glass and plastic.*

**COHESIVE DEPOSITS:** Cohesive deposits were encountered beneath the Made Ground and were described typically as *brown mottled grey sandy slightly gravelly CLAY* and *brown sandy slightly gravelly CLAY with occasional cobbles and boulders.* These upper brown cohesive deposits vary in composition across the site and contain granular lenses of sand and gravel. Groundwater strikes are noted on the exploratory hole logs.

These deposits overlay a *stiff dark grey slightly sandy slightly gravelly CLAY with occasional cobbles and boulders*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was firm to stiff or stiff below 2.00m BGL in the majority of the exploratory holes. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

**GRANULAR DEPOSITS:** The granular deposits were encountered within the cohesive deposits and were typically described as Dark g*rey or brown clayey slightly silty gravelly SAND or Brown clayey sandy subangular to subrounded fine to coarse GRAVEL.* The secondary sand/gravel and silt/clay constituents

varied 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 deposits are typically medium dense and become dense with depth. It should be noted that many of the trial pits where granular deposits or groundwater were encountered, experienced instability. This was described either as side wall spalling or as side wall collapse in the remarks section at the base of the trial pit logs. A significant groundwater strike was noted in the boreholes on encountering the granular deposits and the driller noted blowing sands or gravels during drilling.

### 4.2. Insitu Strength Testing

The correlated DPH blow counts indicate that the overburden deposits are soft or soft to firm to depth of 1.0m to 1.2m BGL and become firm or firm to stiff with depth. DPH04 had low blow counts in the soft to firm cohesive deposits to a depth of 2.10m BGL which corresponds to the description on trial pit TP05.

### 4.3. 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 BH01, BH02, BH08, BH10 and BH17 to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendix 9 of this Report.

### 4.4. Laboratory Testing

#### 4.4.1. Geotechnical Laboratory Testing

The geotechnical testing carried out on soil samples recovered generally confirm the descriptions on the logs with the primary constituent of the cohesive deposits found to be a CLAY of low to intermediate plasticity. The Particle Size Distribution tests confirm that generally the cohesive deposits are well-graded with percentages of sands and gravels ranging between 45.2% and 79.2% generally with fines contents of 6% to 23.2%.
The Particle Size Distribution tests confirm that generally the granular deposits are gap graded with percentages of sands/gravels and silt/clay typically between 3% and 7.5% with a gravel/sand content of typically 10.3% to 79.2%.

#### 4.4.2. Chemical Laboratory Testing

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

### 4.4.3. 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. The waste classification report is included under the cover of a sperate report by Ground Investigations Ireland.

The results from the completed laboratory testing is included in Appendix 8 of this report.

## 5.0 Recommendations & Conclusions

### 5.1. General

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

### 5.2. Foundations

The allowable bearing capacity recommendations are separated into three separate sections. The housing estate to the northeast of the site and the Apartment complexes with basements at the west and south of the site. Recommended allowable bearing capacities for each area are out lined in the tables below.

| Allowable Bearing Capacities (ABC) kN/m2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Block | Dynamic Probe | ABC | Depth | Depth | Comment | ABC | Depth | Depth | Comment |
| | No. | kN/m2 | m BGL | m OD | | kN/m2 | m BGL | m OD | |
| Housing Block | DPH01 | 70 | 1.20 | 109.97 | Cohesive | 100 | 2.10 | 109.07 | Granular |
| | DPH02 | 70 | 1.10 | 110.07 | Cohesive | 100 | 2.00 | 109.17 | cohesive |
| | DPH03 | 70 | 1.40 | 110.03 | cohesive | 100 | 2.40 | 109.03 | Granular |
| | DPH04 | 100 | 2.40 | 109.92 | cohesive | - | | | |
| | DPH05 | 70 | 1.00 | 110.87 | cohesive | 100 | 2.00 | 109.87 | cohesive |
| | DPH06 | 100 | 0.70 | 111.10 | Cohesive | | | | |
| | DPH07 | 70 | 0.70 | 110.95 | Cohesive | 125 | 1.80 | 109.85 | cohesive |
| | DPH08 | 70 | 1.00 | 110.37 | Cohesive | 125 | 2.00 | 109.37 | cohesive |
| | DPH09 | 70 | 0.50 | 110.50 | Cohesive | 100 | 1.40 | 109.60 | cohesive |
| | DPH10 | 100 | 0.80 | 110.20 | Cohesive | | | | |
| | DPH11 | 100 | 1.00 | 110.08 | Cohesive | 125 | 1.50 | 109.58 | cohesive |

An allowable bearing capacity of 70 kN/m$^2$ is recommended for conventional strip or pad foundations on the firm cohesive deposits between 0.50m and 1.20m BGL for the housing estate area.
Where the cohesive deposits are deeper, such as at the location of DPH04 and DPH03, lean mix trench fill to a depth of 2.40m and 1.40m BGL is recommended to achieve the recommended allowable bearing capacity.

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

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

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

| Allowable Bearing Capacities (ABC) kN/m2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Block | Dynamic Probe | ABC | Depth | Depth | Comment | ABC | Depth | Depth | Comment |
| | No. | kN/m2 | m BGL | m OD | | kN/m2 | m BGL | m OD | |
| Apartment Block South | BH01 | 80 | 2.00 | 109.81 | cohesive | 250 | 4.00 | -4.00 | Cohesive |
| | BH02 | 160 | 2.00 | 110.06 | cohesive | 250 | 4.00 | -4.00 | cohesive |
| | BH03 | 120 | 2.00 | 110.45 | cohesive | 250 | 4.00 | -4.00 | cohesive |
| | BH04 | 100 | 2.00 | 111.07 | cohesive | 250 | 4.00 | -4.00 | cohesive |
| | BH05 | 45 | 2.00 | 111.29 | cohesive | 250 | 4.00 | -4.00 | cohesive |
| Apartment Block West | BH06 | 40 | 3.00 | 112.93 | Cohesive | 250 | 5.00 | -5.00 | cohesive |
| | BH07 | 80 | 3.00 | 113.04 | cohesive | 150 | 6.00 | -6.00 | cohesive |
| | BH08 | 125 | 3.00 | 113.81 | cohesive | 250 | 5.00 | -5.00 | cohesive |
| | BH09 | 250 | 3.00 | 111.35 | cohesive | | | | |
| | BH10 | 250 | 3.00 | 111.29 | cohesive | | | | |
| | BH11 | 250 | 3.00 | 110.26 | cohesive | | | | |
| | BH12 | 250 | 3.00 | 109.79 | cohesive | | | | |
| | BH13 | 250 | 3.00 | 109.85 | cohesive | | | | |
| | BH14 | 250 | 3.00 | 109.71 | cohesive | | | | |
| | BH15 | 250 | 3.00 | 109.53 | cohesive | | | | |
| | BH16 | 250 | 3.00 | 109.00 | cohesive | | | | |
| | BH17 | 250 | 3.00 | 109.00 | cohesive | | | | |

Due to the presence of soft and compressible Cohesive deposits beneath the footprint of the proposed structure//high loading anticipated for the Apartment Blocks piled foundations may be more economically advantageous for the proposed building. The type, size and depth of the pile foundations should be confirmed by a specialist piling contractor based on the loading from the proposed building. The floor slab is recommended be suspended and also supported on the building piles.

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

### 5.3. Excavations

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry.

Excavations in the Made Ground, or soft Cohesive Deposits will require to be appropriately battered or the sides supported due to the low strength of these deposits.

Any excavations which penetrate the granular deposits will require to be appropriately battered or the sides supported and are likely to require dewatering due to the groundwater seepages noted in the exploratory hole logs in the Appendices 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. Generally, where significant excavations are required in water bearing granular deposits a cut-off wall may be more cost effective than extensive dewatering. An assessment by a specialist dewatering contractor is recommended to determine the most cost effective approach to the proposed excavation.

### 5.4. External Pavements

The proposed pavements are recommended to be designed in accordance with the CBR test results included in the Appendixes of this Report. The low CBR test results indicate that a capping layer or a sufficient depth of crushed stone fill may be required. Plate bearing tests are recommended at the time of construction to verify the design assumptions for the proposed pavement make up and to verify adequate compaction has been achieved.

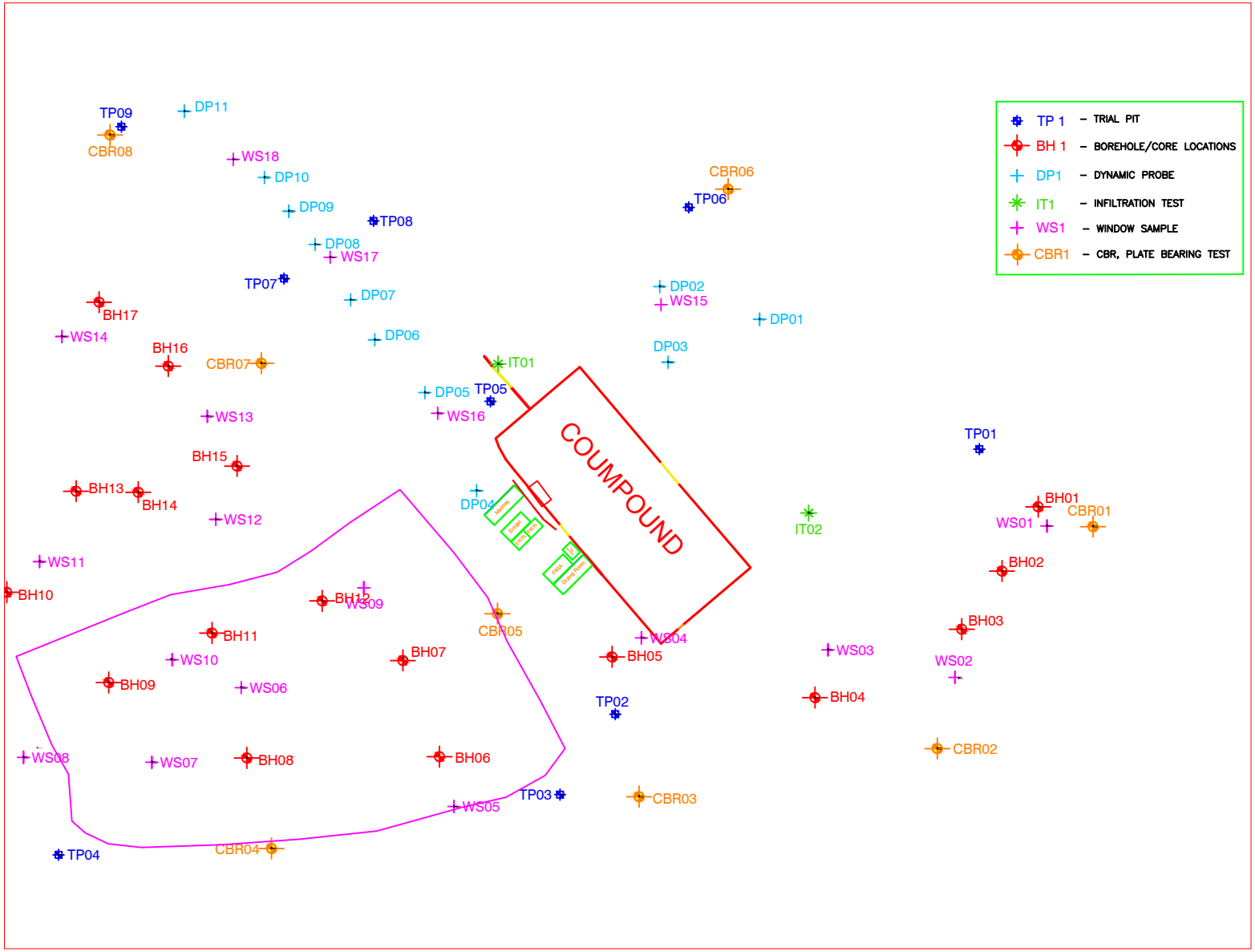
The use of a geogrid and separation membrane may improve the performance of the proposed pavement and enable a more economical pavement design to be achieved, a specialist supplier is recommended to advise of the required strength, depth and type of geotextile for the proposed design.

### 5.5. Soakaway Design

At the locations of IT01 and IT02 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


TP 1 – TRIAL PIT
BH 1 – BOREHOLE/CORE LOCATIONS
DP1 – DYNAMIC PROBE
IT1 – INFILTRATION TEST
WS1 – WINDOW SAMPLE
CBR1 – CBR, PLATE BEARING TEST
COUMPOUND
TP09
DP11
CBR08
WS18
DP10
DP09
TP08
DP08
WS17
TP07
DP07
BH17
WS14
DP06
BH16
CBR07
IT01
DP05
TP05
WS16
WS13
BH15
BH13
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WS12
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TP04
CBR04
CBR06
TP06
DP02
WS15
DP01
DP03
TP01
BH01
CBR01
WS01
IT02
BH02
BH03
WS04
BH05
WS03
WS02
TP02
BH04
CBR02


Indicative Site Boundary

Window Sample

Trial Pit

Soakaway

**Client:**

**Project Code:**
9766-07-20

**Project Title:**
The Quarter Citywest,
Cooldown Commons Phase 3

**Drawing Title:**
Figure 2 SI Points

GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
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: |
|---|---|
| J McDowell | 12/11/2020 |


Indicative Site Boundary
Dynamic Probe
CBR Test
CP RC Borehole

**Client:**

**Project Code:**
9766-07-20

**Project Title:**
The Quarter Citywest,
Cooldown Commons Phase 3

**Drawing Title:**
Figure 3 SI Points

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0 10 20 30 40 50 m

| Drawn By: | Date: |
|---|---|
| J McDowell | 12/11/2020 |

# **APPENDIX 2** – Trial Pit Records

# Ground Investigations Ireland Ltd
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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** IT01 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 1.80m x 0.70m x 1.50m (L x W x D) | **Ground Level (mOD)** 111.65 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705047.7 E 727260.6 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.40) | MADE GROUND: brown slightly clayey sandy angular to subangular fine to coarse Gravel with occasional angular to subangular cobbles and geotextiles. | | |
| | | | | 111.25 | 0.40 | | | |
| | | | | | (0.25) | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 111.00 | 0.65 | | | |
| | | | | | (0.85) | Soft to firm brown mottled grey sandy gravelly CLAY with some subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.15 | 1.50 | Complete at 1.50m | | |

**Plan**

**Remarks**

No groundwater encountered.
Side walls stable.
Trial pit backfilled on completion

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.IT01 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** IT02 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 1.50m x 0.70m x 1.50m (L x W x D) | **Ground Level (mOD)** 112.09 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705114.1 E 727228.8 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.50) | MADE GROUND: Brown clayey sandy subangular to subrounded fine to coarse Gravel with some subangular to subrounded cobbles and geotextiles. | | |
| | | | | 111.59 | 0.50 | | | |
| | | | | | (0.30) | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 111.29 | 0.80 | | | |
| | | | Water strike(1) at 1.20m. | | (0.70) | Soft brown/grey slightly sandy gravelly slightly silty CLAY with some angular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | ▽1 |
| | | | | 110.59 | 1.50 | Complete at 1.50m | | |

**Plan**

**Remarks**

Groundwater encountered at 1.20m BGL (medium seepage).
Side walls stable.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.IT02 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP01 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.70m x 0.70m x 3.00m (L x W x D) | **Ground Level (mOD)** 111.63 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705150.6 E 727242.4 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | 111.43 | (0.20)<br>0.20 | MADE GROUND: Brown slightly sandy slightly gravelly Clay with rootlets and plastic fragments. Gravel is subangular to rounded fine to coarse. | | |
| 0.50 | B | | | | (0.55) | Soft to firm brown sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse. | | |
| 1.00 | B | | | 110.88 | 0.75 | Firm brown mottled grey sandy gravelly slightly silty CLAY with occasional subangular to rounded cobbles, some subrounded to rounded boulders and grey sand lenses. Gravel is subangular to rounded fine to coarse. | | |
| | | | Water strike(1) at 1.80m. | | (1.25) | | | ▽1 |
| 2.00 | B | | | 109.63 | 2.00 | Dark grey clayey slightly silty gravelly fine to medium SAND with some subangular to rounded cobbles. Gravel is subangular to rounded fine to coarse. | | |
| | | | | | (0.70) | | | |
| 2.90 | B | | | 108.93 | 2.70<br>(0.30) | Stiff dark grey slightly sandy slightly gravelly silty CLAY with some subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 108.63 | 3.00 | Complete at 3.00m | | |

**Plan**

**Remarks**

Groundwater encountered at 1.80m BGL (medium seepage).
Side walls spalling at 1.10m BGL.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP01 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP02 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.80m x 0.70m x 3.00m (Lx W x D) | **Ground Level (mOD)** 113.42 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705072.8 E 727185.8 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.60) | MADE GROUND: Brown slightly clayey gravelly fine to medium Sand with large concrete slabs, plastic, metal bars and geotextiles. Gravel is angular to subangular fine to coarse. | | |
| 0.60 | B | | | 112.82 | 0.60 | | | |
| | | | | | (0.30) | Firm brown slightly sandy slightly gravelly silty CLAY with some subangular cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| 1.00 | B | | | 112.52 | 0.90 | | | |
| | | | | | (0.90) | Soft to firm brown slightly sandy slightly gravelly silty CLAY with some subangular cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| 2.00 | B | | | 111.62 | 1.80 | | | |
| | | | | | (1.00) | Soft to firm brown slightly sandy gravelly silty CLAY with some subangular to subrounded cobbles and subrounded boulders. Gravel is subangular to rounded fine to coarse. | | |
| 2.90 | B | | | 110.62 | 2.80 | | | |
| | | | | | (0.20) | Stiff dark grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.42 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Plan**

**Remarks**

No groundwater encountered.
Side walls stable.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP02 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP03 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.90m x 0.70m x 3.00m (L x W x D) | **Ground Level (mOD)** 113.89 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705060.9 E 727168.6 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.65) | MADE GROUND: Brown sandy gravelly Clay with occasional subrounded cobbles and concrete and plastic fragments. Gravel is subangular to subrounded fine to coarse. | | |
| 0.50 | B | | | 113.24 | 0.65 | | | |
| | | | | | (0.25) | Soft to firm brown mottled grey slightly sandy slightly gravelly slightly silty CLAY with some subangular to rounded cobbles. Gravel is subangular to rounded fine to coarse. | | |
| | | | | 112.99 | 0.90 | | | |
| 1.00 | B | | | | | Firm brown mottled grey slightly sandy slightly gravelly slightly silty CLAY with some subangular to rounded cobbles and subrounded to rounded boulders. Gravel is subangular to rounded fine to coarse. | | |
| | | | | | (1.00) | | | |
| | | | Water strike(1) at 1.60m. | | | | | ▽1 |
| | | | | 111.99 | 1.90 | | | |
| 2.00 | B | | | | | Soft to firm brown sandy gravelly silty CLAY with some subangular to rounded cobbles and subrounded boulders. Gravel is subangular to rounded fine to coarse. | | |
| | | | | | (1.00) | | | |
| | | | | 110.99 | 2.90 | | | |
| | | | | | (0.10) | Stiff Dark grey/black slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| 3.00 | B | | | 110.89 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Plan**

**Remarks**

Groundwater encountered at 1.60m BGL (slow seepage).
Side walls spalling at 2.20m BGL.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP03 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP04 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.00m x 0.70m x 3.00m (L x W x D) | **Ground Level (mOD)** 116.17 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704953.8 E 727155.7 N | **Dates** 31/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.20) | MADE GROUND: Brown/grey slightly sandy gravelly Clay with some subrounded to rounded cobbles and boulders and plywood, plastic and geotextile fragments. Gravel is angular to subrounded fine to coarse. | | |
| | | | | 115.97 | 0.20 | | | |
| 0.50 | B | | | | (0.90) | Firm brown slightly sandy slightly gravelly CLAY. Gravel is angular to subrounded fine to coarse. | | |
| 1.00 | B | | | 115.07 | 1.10 | | | |
| | | | | | (0.70) | Firm brown slightly sandy gravelly slightly silty CLAY with occasional angular to subrounded cobbles and boulders. Gravel is angular to subrounded fine to coarse. | | |
| | | | | 114.37 | 1.80 | | | |
| 2.00 | B | | | | (0.80) | Soft to firm brown sandy gravelly slightly silty CLAY with frequent subangular to rounded cobbles and boulders. Gravel is subangular to rounded fine to coarse. | | |
| | | | Water strike(1) at 2.60m. | 113.57 | 2.60 | | | ▽1 |
| | | | | | (0.40) | Light brown clayey sandy subangular to subrounded fine to coarse GRAVEL with occasional subangular to rounded cobbles and boulders. | | |
| | | | | 113.17 | 3.00 | | | |
| 3.00 | B | | | | | Complete at 3.00m | | |

**Plan**

**Remarks**

Groundwater encountered at 2.60m BGL (slow seepage).
Side walls spalling at 2.60m BGL.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP04 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP05 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.90m x 0.70m x 3.00m (L x W x D) | **Ground Level (mOD)** 111.92 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705046.1 E 727252.6 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.55) | MADE GROUND: Grey slightly clayey sandy angular to subangular fine to coarse Gravel with occasional angular to subangular cobbles and geotextiles. | | |
| | | | | 111.37 | 0.55 | | | |
| 0.60 | B | | | | (0.35) | Soft to firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 111.02 | 0.90 | | | |
| 1.10 | B | | | | (0.60) | Soft to firm dark brown mottled grey slightly sandy slightly gravelly silty CLAY with some subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.42 | 1.50 | | | |
| | | | Water strike(1) at 1.80m. | | (0.70) | Firm dark brown mottled grey slightly sandy gravelly silty CLAY with occasional subangular to rounded cobbles and boulders and sand lenses. Gravel is subangular to rounded fine to coarse. | | ▽1 |
| 2.00 | B | | | | | | | |
| | | | | 109.72 | 2.20 | | | |
| | | | | | (0.50) | Medium dense brown/grey clayey gravelly fine to medium SAND with occasional subangular to rounded cobbles. Gravel is subangular to rounded fine to coarse. | | |
| | | | | 109.22 | 2.70 | | | |
| | | | | | (0.30) | Stiff dark grey slightly sandy slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 108.92 | 3.00 | | | |
| 3.00 | B | | | | | Complete at 3.00m | | |

**Plan**

**Remarks**

Groundwater encountered at 1.80m BGL (slow seepage).
Side walls spalling at 1.80m BGL.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP05 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP06 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.80m x 0.70m x 3.60m (L x W x D) | **Ground Level (mOD)** 111.16 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705088.5 E 727294.1 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.20) | MADE GROUND: Brown sandy slightly gravelly Clay with fabric fragments. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.96 | 0.20 | | | |
| 0.50 | B | | | | (0.70) | Soft to firm brown mottled grey slightly sandy slightly gravelly slightly silty CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.26 | 0.90 | | | |
| 1.00 | B | | | | (1.20) | Soft to firm grey mottled brown slightly sandy gravelly slightly silty CLAY with occasional subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 109.06 | 2.10 | | | |
| 2.10 | B | | | | (0.80) | Firm brown mottled grey sandy gravelly slightly silty CLAY with occasional angular to subangular cobbles. Gravel is angular to subangular fine to coarse. | | |
| | | | Water strike(1) at 2.80m. | | | | | ▽1 |
| | | | | 108.26 | 2.90 | | | |
| 3.00 | B | | | | (0.40) | Stiff grey slightly sandy slightly gravelly silty CLAY with some subrounded to rounded cobbles. Gravel is subangular to rounded fine to coarse. | | |
| | | | | 107.86 | 3.30 | | | |
| | | | | | (0.30) | Very stiff grey/brown sandy slightly gravelly silty CLAY with some subangular to rounded cobbles. Gravel is subrounded to rounded fine to coarse. | | |
| | | | | 107.56 | 3.60 | | | |
| | | | | | | Complete at 3.60m | | |

**Plan**

**Remarks**

Groundwater encountered at 2.80m BGL (slow seepage).
Side walls spalling at 1.60m BGL.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP06 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP07 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.40m x 0.70m x 2.00m (L x W x D) | **Ground Level (mOD)** 111.52 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705001.9 E 727278.9 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.50) | MADE GROUND: Grey/brown slightly clayey sandy angular to subangular fine to coarse Gravel with some angular to subangular cobbles. | | |
| | | | | 111.02 | 0.50 | | | |
| 0.70 | B | | | | (0.40) | Firm brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles and some rootlets. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.62 | 0.90 | | | |
| 1.00 | B | | | | (0.80) | Firm brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles, angular to subrounded boulders and some rootlets. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 109.82 | 1.70 | | | |
| 1.90 | B | | Water strike(1) at 1.80m. | | (0.30) | Medium dense clayey gravelly fine to medium SAND with occasional subangular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse. | | ▽1 |
| | | | | 109.52 | 2.00 | Complete at 2.00m | | |

**Plan**

**Remarks**

Groundwater encountered at 1.80m BGL.
Side walls spalling at 1.80m BGL.
Trial pit terminated due to confined work area.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP07 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP08 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.40m x 0.70m x 2.80m (L x W x D) | **Ground Level (mOD)** 111.32 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705021.1 E 727291.3 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.40) | MADE GROUND: Grey/brown slightly clayey sandy angular to subangular fine to coarse Gravel with some angular to subangular cobbles. | | |
| | | | Water strike(1) at 0.30m. | 110.92 | 0.40 | | | ▽1 |
| | | | | | (0.20) | Firm brown mottled grey sandy gravelly slightly silty CLAY with some angular to subrounded cobbles. Gravel is subangular to rounded fine to coarse. | | |
| 0.60 | B | | | 110.72 | 0.60 | Firm brown sandy gravelly slightly silty CLAY with occasional angular to subrounded cobbles and boulders. Gravel is angular to subrounded fine to coarse. | | |
| 1.00 | B | | | | | | | |
| | | | | | (1.40) | | | |
| 2.00 | B | | | 109.32 | 2.00 | Stiff brown sandy gravelly slightly silty CLAY with occasional angular to subrounded cobbles and boulders. Gravel is angular to subrounded fine to coarse. | | |
| | | | | | (0.60) | | | |
| | | | | 108.72 | 2.60 | | | |
| | | | | | (0.20) | Stiff brown sandy gravelly slightly silty CLAY with occasional angular to subrounded cobbles and boulders and sand lenses. Gravel is angular to subrounded fine to coarse. OBSTRUCTION at 2.80m BGL. | | |
| 2.80 | B | | | 108.52 | 2.80 | Complete at 2.80m | | |

**Plan**

**Remarks**

Groundwater encountered at 0.30m BGL (slow seepage).
Side walls spalling at 1.50m BGL.
Trial pit terminated due to boulders.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP08 |

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** TP09 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 2.80m x 0.70m x 3.00m (L x W x D) | **Ground Level (mOD)** 111.13 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704967.2 E 727311.4 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | MADE GROUND: Grey/brown slightly clayey sandy angular to subangular fine to coarse Gravel with occasional angular to subangular cobbles. | | |
| | | | | 110.83 | 0.30 | | | |
| | | | | | (0.10) | Stiff brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles and some roots. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.73 | 0.40 | | | |
| 0.50 | B | | | | (0.40) | Stiff brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.33 | 0.80 | | | |
| 1.00 | B | | | | | Stiff brown mottled grey slightly sandy slightly silty gravelly CLAY with occasional angular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | | (1.50) | | | |
| 2.00 | B | | | | | | | |
| | | | Water strike(1) at 2.30m. | 108.83 | 2.30 | Medium dense brown clayey gravelly slightly silty fine to coarse SAND with occasional angular to subrounded cobbles and boulders. Gravel is subangular to subrounded fine to coarse. | | ▽1 |
| | | | | | (0.70) | | | |
| | | | | 108.13 | 3.00 | Complete at 3.00m | | |

**Plan**

**Remarks**

Groundwater encountered at 2.30m BGL.
Side walls spalling at 2.20m BGL.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.TP09 |

City West Phase 3 Trial Pit Photos

TP01

TP01

TP01

TP02

TP02

TP02

TP03

TP03

TP03

TP04

TP04

TP04

TP05

TP05

TP05

TP06

TP06

TP06

TP07

TP07

TP07

TP08

TP08

TP08

TP09

TP09

TP09

# **APPENDIX 3** – Soakaway Results

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

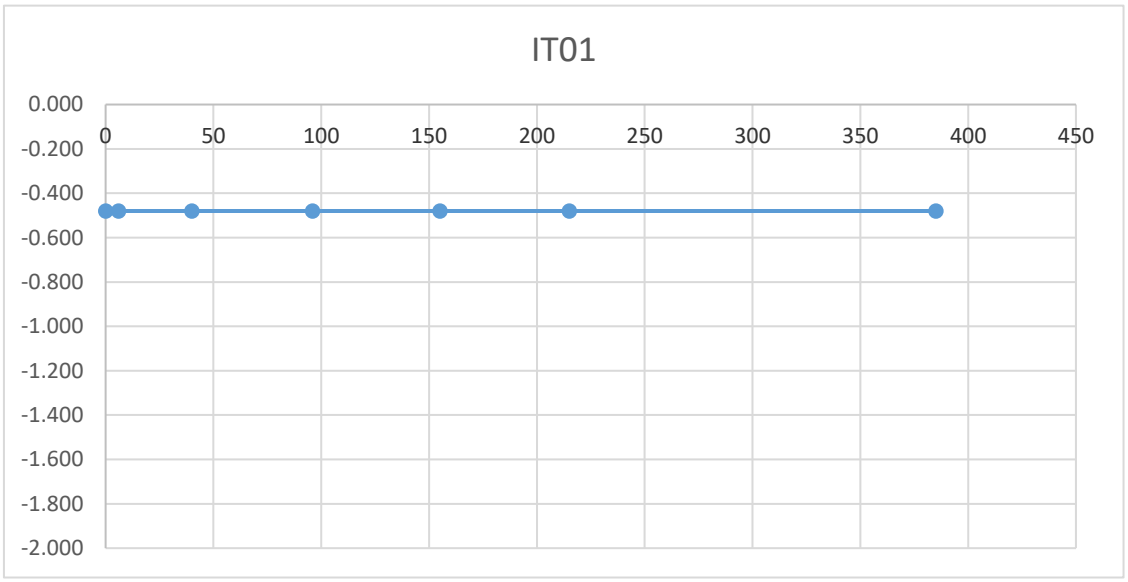
# IT01

**Infiltration Test to BRE Digest 365**
**Trial Pit Dimensions: 1.8m x 0.70m 1.50m (L x W x D)**

| Date | Time | Water level (m bgl) |
|---|---|---|
| 30/07/2020 | 0 | -0.480 |
| 30/07/2020 | 6 | -0.480 |
| 30/07/2020 | 40 | -0.480 |
| 30/07/2020 | 96 | -0.480 |
| 30/07/2020 | 155 | -0.480 |
| 30/07/2020 | 215 | -0.480 |
| 30/07/2020 | 385 | -0.480 |

***Soakaway failed - Pit backfilled**

| Start depth | Depth of Pit | Diff | 75% full | 25%full |
|---|---|---|---|---|
| 0.48 | 1.500 | 1.020 | 0.735 | 1.245 |



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

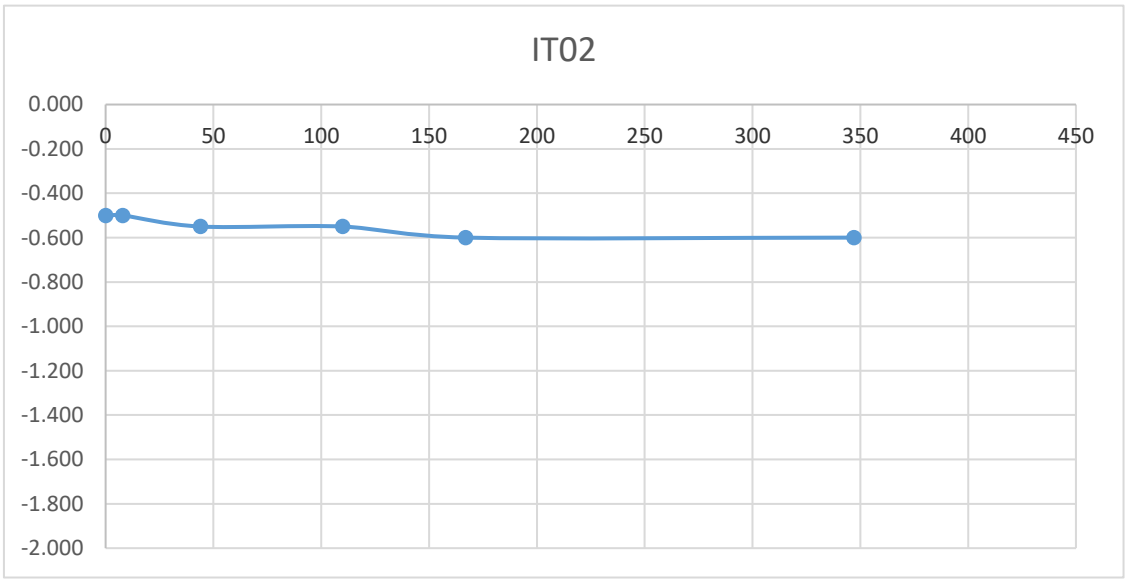
# IT02

**Infiltration Test to BRE Digest 365**
**Trial Pit Dimensions: 1.50m x 0.70m 1.50m (L x W x D)**

| Date | Time | Water level (m bgl) |
|---|---|---|
| 30/07/2020 | 0 | -0.500 |
| 30/07/2020 | 8 | -0.500 |
| 30/07/2020 | 44 | -0.550 |
| 30/07/2020 | 110 | -0.550 |
| 30/07/2020 | 167 | -0.600 |
| 30/07/2020 | 347 | -0.600 |

***Soakaway failed - Pit backfilled**

| Start depth | Depth of Pit | Diff | 75% full | 25%full |
|---|---|---|---|---|
| 0.50 | 1.500 | 1.000 | 0.75 | 1.25 |



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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** IT01 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 1.80m x 0.70m x 1.50m (L x W x D) | **Ground Level (mOD)** 111.65 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705047.7 E 727260.6 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.40) | MADE GROUND: brown slightly clayey sandy angular to subangular fine to coarse Gravel with occasional angular to subangular cobbles and geotextiles. | | |
| | | | | 111.25 | 0.40 | | | |
| | | | | | (0.25) | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 111.00 | 0.65 | | | |
| | | | | | (0.85) | Soft to firm brown mottled grey sandy gravelly CLAY with some subangular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.15 | 1.50 | Complete at 1.50m | | |

**Plan**

**Remarks**

No groundwater encountered.
Side walls stable.
Trial pit backfilled on completion

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.IT01 |

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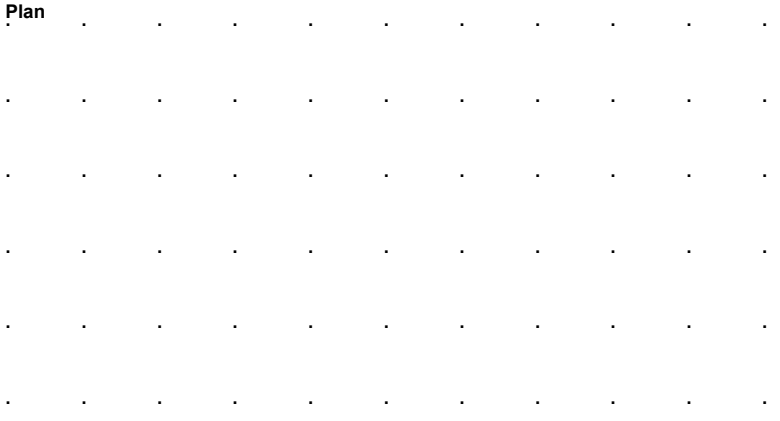
| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Trial Pit Number** IT02 |
| **Machine :** 8 Tonne Tracked Excavator<br>**Method :** Trial Pit | **Dimensions** 1.50m x 0.70m x 1.50m (L x W x D) | **Ground Level (mOD)** 112.09 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705114.1 E 727228.8 N | **Dates** 30/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.50) | MADE GROUND: Brown clayey sandy subangular to subrounded fine to coarse Gravel with some subangular to subrounded cobbles and geotextiles. | | |
| | | | | 111.59 | 0.50 | | | |
| | | | | | (0.30) | Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 111.29 | 0.80 | | | |
| | | | | | (0.70) | Soft brown/grey slightly sandy gravelly slightly silty CLAY with some angular to subrounded cobbles. Gravel is subangular to subrounded fine to coarse. | | |
| | | | | 110.59 | 1.50 | | | |
| | | | | | | Complete at 1.50m | | |

**Plan**



**Remarks**

Groundwater encountered at 1.20m BGL (medium seepage).
Side walls stable.
Trial pit backfilled on completion.

| Scale (approx) | Logged By | Figure No. |
|---|---|---|
| 1:25 | MS | 9766-07-20.IT02 |

**City West Phase 3 Infiltration Test Photos**

IT01

IT01

IT01

IT02

IT02

IT02

# **APPENDIX 4** – Window Sample Records

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS01 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 111.88 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705165.1 E 727226 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | TOPSOIL | | |
| | | | | 111.58 | 0.30 | Firm brown mottled grey slightly sandy slightly gravelly CLAY with occasional subangular cobbles | | |
| 0.50 | B | | | | (0.70) | | | |
| 0.70 | EN | | | | | | | |
| | | | | 110.88 | 1.00 | Firm brown mottled grey slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.80) | | | |
| 1.50 | B | | | | | | | |
| 1.70 | EN | | | | | | | |
| | | | | 110.08 | 1.80 | Firm dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (1.20) | | | |
| 2.50 | B | | | | | | | |
| | | | | 108.88 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 90% Recovery
2.00m-3.00m BGL: 100% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS01

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS02 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 112.61 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705146.2 E 727193.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | TOPSOIL | | |
| | | | | 112.31 | 0.30 | Firm to stiff brown mottled grey slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 0.50 | B | | | | | | | |
| 0.70 | EN | | | | | | | |
| | | | | | (1.20) | | | |
| 1.50 | B | | | 111.11 | 1.50 | Firm brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.70 | EN | | | | | | | |
| | | | | | (0.60) | | | |
| | | | | 110.51 | 2.10 | Stiff brown sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.40) | | | |
| 2.50 | B | | | 110.11 | 2.50 | Medium dense dark greyish brown clayey gravelly fine to coarse SAND. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.50) | | | |
| | | | | 109.61 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 85% Recovery
1.00m-2.00m BGL: 95% Recovery
2.00m-3.00m BGL: 65% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS02

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS03 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 112.77 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705118.3 E 727199.5 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.40) | Fill: Dark grey slightly clayey sandy fine to coarse angular to subangular GRAVEL (Crushed Rock Fill) | | |
| | | | | 112.37 | 0.40 | | | |
| 0.50 | B | | | | (0.50) | Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles | | |
| 0.70 | EN | | | | | | | |
| | | | | 111.87 | 0.90 | | | |
| | | | | | (0.60) | Firm greyish brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | 111.27 | 1.50 | | | |
| 1.70 | EN | | | | | Medium dense brown clayey gravelly fine to coarse SAND with gravelly lenses. gravel is fine to coarse, angular to subangular | | |
| | | | | | (1.50) | | | |
| 2.50 | B | | | | | 2.00m-3.00m BGL: Poor recovery | | |
| | | | | 109.77 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 65% Recovery
2.00m-3.00m BGL: 30% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS03

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS04 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 112.80 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705078.4 E 727202.1 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | MADE GROUND: Brown/black sandy gravelly Clay with charcoal and concrete fragments. Gravel is fine to coarse, angular to subangular | | |
| | | | | 112.50 | 0.30 | Soft brown slightly sandy slightly gravelly CLAY | | |
| 0.50 | B | | | | (0.40) | | | |
| 0.70 | EN | | | 112.10 | 0.70 | Soft to firm brown mottled grey slightly sandy slightly gravelly CLAY | | |
| | | | | | (0.30) | | | |
| | | | | 111.80 | 1.00 | Soft to firm brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | | (1.00) | | | |
| 1.70 | EN | | | | | | | |
| | | | | 110.80 | 2.00 | Soft brown slightly sandy slightly gravelly CLAY | | |
| | | | | | (0.60) | | | |
| 2.50 | B | | | 110.20 | 2.60 | Firm to stiff dark brownish grey slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.40) | | | |
| | | | | 109.80 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 70% Recovery
2.00m-3.00m BGL: 85% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS04

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS05 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 113.88 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705038.3 E 727166.1 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.40) | Soft to firm reddish brown slightly sandy slightly gravelly CLAY (Possible Made ground) | | |
| | | | | 113.48 | 0.40 | | | |
| 0.50 | B | | | | | Firm to stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 0.70 | EN | | | | (0.60) | | | |
| | | | | 112.88 | 1.00 | | | |
| | | | | | | Soft to firm light brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | | | | | |
| 1.70 | EN | | | | (1.50) | | | |
| | | | | 111.38 | 2.50 | | | |
| 2.50 | B | | | | | Firm to stiff brownish grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 2.70 | EN | | | | (0.50) | | | |
| | | | | 110.88 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 75% Recovery
2.00m-3.00m BGL: 80% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS05

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS06 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m | **Ground Level (mOD)** 113.56 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704992.8 E 727191.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| 0.50 | B | | | | (1.00) | Firm brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 0.70 | EN | | | | | | | |
| | | | | 112.56 | 1.00 | | | |
| | | | | | (1.00) | Firm brown mottled grey slightly sandy gravelly CLAY with many subangular cobbles Gravel is fine to coarse, angular to subangular<br>1.00m-2.00m BGL: Poor recovery due to cobble | | |
| 1.70 | EN | | | | | | | |
| | | | | 111.56 | 2.00 | Complete at 2.00m | | |

**Remarks**
0.00m-1.00m BGL: 95% Recovery
1.00-2.00m BGL: 30% Recovery
Refusal at 2.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS06

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS07 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 2.80m | **Ground Level (mOD)** 114.70 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704973.7 E 727175.5 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.90) | Firm to stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 0.50 | B | | | | | | | |
| 0.70 | EN | | | | | | | |
| | | | | 113.80 | 0.90 | | | |
| | | | | | (0.60) | Firm greyish brown slightly gravelly sandy CLAY with occasional subangular cobbles | | |
| 1.50 | B | | | 113.20 | 1.50 | | | |
| 1.70 | EN | | | | | Stiff brown slightly sandy gravelly CLAY with some subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (1.30) | | | |
| 2.50 | B | | | | | | | |
| 2.70 | EN | | | | | | | |
| | | | | 111.90 | 2.80 | Complete at 2.80m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 90% Recovery
2.00m-2.80m BGL: 100% Recovery
Refusal at 2.80m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS07

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS08 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 115.58 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704946.3 E 727176.6 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.20) | MADE GROUND: Greyish brown slightly gravelly sandy Clay with plastic | | |
| | | | | 115.38 | 0.20 | (Possible made ground) Firm to stiff brown slightly sandy gravelly CLAY with organic matter and occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 0.50 | B | | | | (0.70) | | | |
| 0.70 | EN | | | | | | | |
| | | | | 114.68 | 0.90 | Soft to firm light brown slightly sandy gravelly CLAY with occasional rootlets. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.50) | | | |
| | | | | 114.18 | 1.40 | Soft to firm dark brown slightly sandy organic CLAY | | |
| 1.50 | B | | | | (0.20) | | | |
| | | | | 113.98 | 1.60 | Firm brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.70 | EN | | | | (0.40) | | | |
| | | | | 113.58 | 2.00 | Soft to firm greyish brown slightly sandy gravelly CLAY with rootlets | | |
| | | | | | (1.00) | 2.00m-3.00m BGL: Poor recovery | | |
| 2.70 | EN | | | | | | | |
| | | | | 112.58 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 70% Recovery
2.00m-3.00m BGL: 25% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS08

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS09 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | Soft to firm greyish brown slightly sandy slightly gravelly CLAY with occasional rootlets (Possible Made Ground) | | |
| | | | | | 0.30 | | | |
| | | | | | (0.30) | Firm to stiff reddish brown slightly sandy slightly gravelly CLAY | | |
| 0.50 | B | | | | 0.60 | | | |
| 0.70 | EN | | | | (0.60) | Soft to firm greyish brown slightly sandy slightly gravelly CLAY with occasional subrounded cobbles | | |
| | | | | | 1.20 | | | |
| 1.50 | B | | | | (0.70) | Soft grey mottled brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 1.70 | EN | | | | 1.90 | | | |
| 2.50 | B | | | | (1.10) | Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 2.70 | EN | | | | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 90% Recovery
2.00m-3.00m BGL: 60% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS09

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS10 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 1.30m | **Ground Level (mOD)** 113.90 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704977.8 E 727197.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.35) | MADE GROUND: Greyish brown slightly gravelly sandy CLAY with occasional rootlets | | |
| | | | | 113.55 | 0.35 | | | |
| 0.50 | B | | | | (0.45) | Soft to firm dark brown slightly sandy slightly gravelly CLAY with organic matter | | |
| 0.70 | EN | | | 113.10 | 0.80 | | | |
| | | | | | (0.50) | Firm to stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.30 | B | | | 112.60 | 1.30 | Complete at 1.30m | | |

**Remarks**
0.00m-1.00m BGL: 90% Recovery
1.00m-1.30m BGL: 100% Recovery
Refusal at 1.30m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS10

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS11 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 2.80m | **Ground Level (mOD)** 113.86 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704949.7 E 727218.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.15) | Greyish brown slightly sandy slightly gravelly CLAY with organic matter (Possible Made Ground) | | |
| | | | | 113.71 | 0.15 | Stiff brown slightly sandy slightly gravelly CLAY | | |
| 0.50 | B | | | | (0.85) | | | |
| 0.70 | EN | | | | | | | |
| | | | | 112.86 | 1.00 | Firm to stiff brown sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.40) | | | |
| | | | | 112.46 | 1.40 | Stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | | | | | |
| 1.70 | EN | | | | | | | |
| | | | | | (1.40) | | | |
| | | | | | | 2.00m-2.80m BGL: Poor Recovery | | |
| 2.70 | EN | | | | | | | |
| | | | | 111.06 | 2.80 | Complete at 2.80m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 90% Recovery
2.00m-2.80m BGL: 25% Recovery
Refusal at 2.80m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS11

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS12 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 112.74 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704987.4 E 727227.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | FILL: Brown slightly clayey sandy fine to coarse angular to subangular GRAVEL (Crushed Rock Fill) | | |
| | | | | 112.44 | 0.30 | Stiff brown slightly sandy slightly gravelly CLAY with some subangular cobbles | | |
| 0.50 | B | | | | | | | |
| 0.70 | EN | | | | (0.90) | | | |
| | | | | 111.54 | 1.20 | Stiff brown slightly sandy very gravelly CLAY with some subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | | | | | |
| 1.70 | EN | | | | (0.80) | | | |
| | | | | 110.74 | 2.00 | Stiff brown sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 2.50 | B | | | | (1.00) | | | |
| 2.70 | EN | | | | | | | |
| | | | | 109.74 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 90% Recovery
1.00m-2.00m BGL: 70% Recovery
2.00m-3.00m BGL: 95% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS12

# Ground Investigations Ireland Ltd
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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS13 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 111.81 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704985.6 E 727249.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | 111.77 | 0.04 | MADE GROUND: Brownish grey slightly sandy slightly gravelly Clay | | |
| | | | | 111.76 | 0.05<br>(0.20) | GEOTEXTILE | | |
| | | | | 111.56 | 0.25 | Stiff brown slightly sandy slightly gravelly CLAY | | |
| 0.50 | B | | | | | Firm to stiff greyish brown slightly sandy gravelly CLAY with some subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 0.70 | EN | | | | (0.80) | | | |
| | | | | 110.76 | 1.05 | Firm brown slightly sandy gravelly CLAY with some subangular cobbles | | |
| | | | | | (0.25) | | | |
| | | | | 110.51 | 1.30 | Medium dense brown slightly clayey gravelly fine to coarse SAND with occasional cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | | | | | |
| 1.70 | EN | | | | (1.00) | | | |
| | | | | 109.51 | 2.30 | Medium dense brown sandy very gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 2.50 | B | | | | | | | |
| 2.70 | EN | | | | (0.70) | | | |
| | | | | 108.81 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 85% Recovery
1.00m-2.00m BGL: 55% Recovery
2.00m-3.00m BGL: 45% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS13

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS14 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 112.69 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704954.4 E 727266.5 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.60) | Fill: Brown sandy fine to coarse angular to subangular Gravel with occasional angular cobbles (Crushed Rock Fill) | | |
| 0.50 | B | | | 112.09 | 0.60 | | | |
| 0.70 | EN | | | | (0.60) | Stiff brown slightly sandy slightly gravelly CLAY with occasional rootlets | | |
| | | | | 111.49 | 1.20 | | | |
| | | | | | (0.50) | Stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | 110.99 | 1.70 | | | |
| 1.70 | EN | | | | (0.70) | Medium dense brown clayey sandy fine to coarse angular to subangular GRAVEL with occasional subangular cobbles | | |
| | | | | 110.29 | 2.40 | | | |
| 2.50 | B | | | | (0.60) | Stiff brown sandy gravelly CLAY with occasional sand lenses | | |
| 2.70 | EN | | | 109.69 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 85% Recovery
2.00m-3.00m BGL: 80% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS14

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS15 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 111.17 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705082.3 E 727277.2 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | 111.07 | (0.10) 0.10 | FILL: Grey slightly clayey sandy fine to coarse angular to subangular GRAVEL with occasional angular cobbles (Crushed Rock Fill) | | |
| | | | | | (0.40) | Soft to firm brown slightly sandy slightly gravelly CLAY with occasional rootlets | | |
| 0.50 | B | | | 110.67 | 0.50 | Firm to stiff grey mottled brown slightly sandy gravelly CLAY with occasional rootlets. Gravel is fine to coarse, angular to subangular | | |
| 0.70 | EN | | | | (1.00) | | | |
| 1.50 | B | | | 109.67 | 1.50 | Firm grey mottled brown sandy gravelly CLAY with occasional rootlets. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.60) | | | |
| 2.50 | B | | | 109.07 | 2.10 | Stiff dark brownish grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.90) | | | |
| | | | | 108.17 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 90% Recovery
1.00m-2.00m BGL: 90% Recovery
2.00m-3.00m BGL: 60% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS15

# Ground Investigations Ireland Ltd
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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS16 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 112.07 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705034.8 E 727250.1 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.50) | FILL: Dark grey sandy fine to coarse angular Gravel with angular cobbles (Crushed Rock Fill) | | |
| 0.50 | B | | | 111.57 | 0.50 | | | |
| 0.70 | EN | | | | (0.50) | Stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | 111.07 | 1.00 | | | |
| | | | | | (0.50) | Firm brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | 110.57 | 1.50 | | | |
| | | | | | (0.50) | Soft to firm light brown sandy gravelly CLAY with occasional sand lenses | | |
| | | | | 110.07 | 2.00 | | | |
| | | | | | (0.50) | Firm light brown sandy gravelly CLAY with occasional sand lenses | | |
| 2.50 | B | | | 109.57 | 2.50 | | | |
| | | | | | (0.50) | Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| | | | | 109.07 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 95% Recovery
1.00m-2.00m BGL: 85% Recovery
2.00m-3.00m BGL: 60% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS16

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS17 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 111.43 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705011.8 E 727283.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.25) | FILL: Grey slightly clayey sandy medium to coarse angular to subangular Gravel (Crushed Rock Fill) | | |
| | | | | 111.18 | 0.25 | Firm to stiff greyish brown slightly sandy gravelly CLAY with many subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 0.50 | B | | | | (0.45) | | | |
| 0.70 | EN | | | 110.73 | 0.70 | Stiff greyish brown slightly sandy gravelly CLAY with many subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | | (0.40) | | | |
| | | | | 110.33 | 1.10 | Firm greyish brown slightly sandy gravelly CLAY with many subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | | (0.90) | 1.00m-2.00m BGL: Poor recovery | | |
| | | | | 109.43 | 2.00 | Stiff brown slightly sandy gravelly CLAY with occasional sandy lenses. Gravel is fine to coarse, angular to subangular | | |
| 2.50 | B | | | | (1.00) | 2.00m-3.00m BGL: Poor recovery | | |
| | | | | 108.43 | 3.00 | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 40% Recovery
2.00m-3.00m BGL: 20% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS17

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Number** WS18 |
| **Machine :** Tecop 10<br>**Method :** Drive-in Windowless Sampler | **Dimensions** 88mm to 2.00m<br>68mm to 3.00m | **Ground Level (mOD)** 111.12 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704991.1 E 727304.4 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|
| | | | | | (0.50) | FILL: Greyish brown slightly clayey sandy fine to coarse angular to subangular Gravel (Crushed Rock Fill) | | |
| 0.50 | B | | | 110.62 | 0.50 | | | |
| 0.70 | EN | | | | (0.70) | Stiff brown mottled grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | 109.92 | 1.20 | | | |
| | | | | | (0.50) | Stiff brown sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.50 | B | | | 109.42 | 1.70 | | | |
| | | | | | (1.30) | Stiff light brown sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 2.50 | B | | | | | 2.00m-3.00m BGL: Poor recovery | | |
| | | | | 108.12 | 3.00 | | | |
| | | | | | | Complete at 3.00m | | |

**Remarks**
0.00m-1.00m BGL: 100% Recovery
1.00m-2.00m BGL: 75% Recovery
2.00m-3.00m BGL: 20% Recovery
Complete at 3.00m BGL
Borehole backfilled upon completion

| Scale (approx) | Logged By |
|---|---|
| 1:25 | AB |

**Figure No.** 9766-07-20.WS18

**The Quarter, Citywest Phase 3**

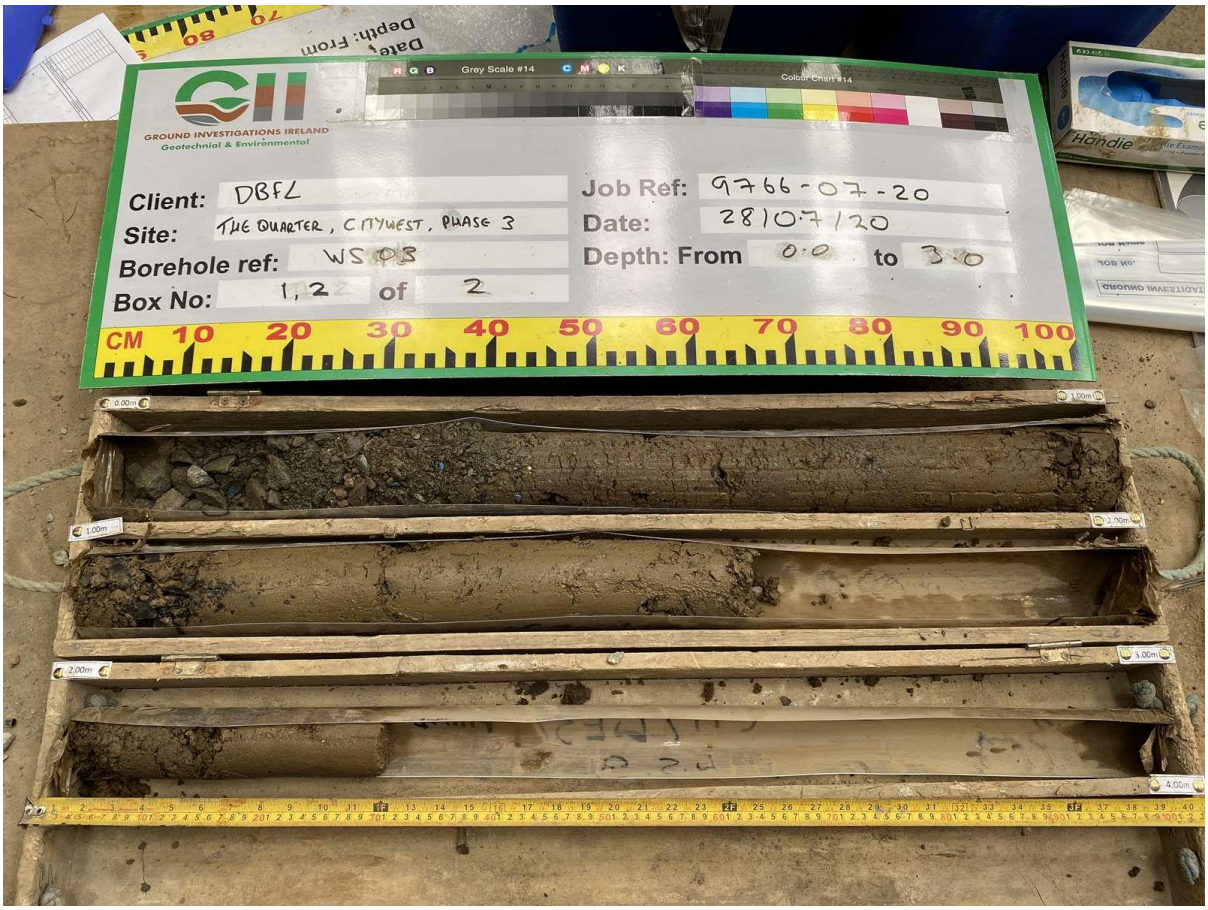
**WS Photos**

**WS01**

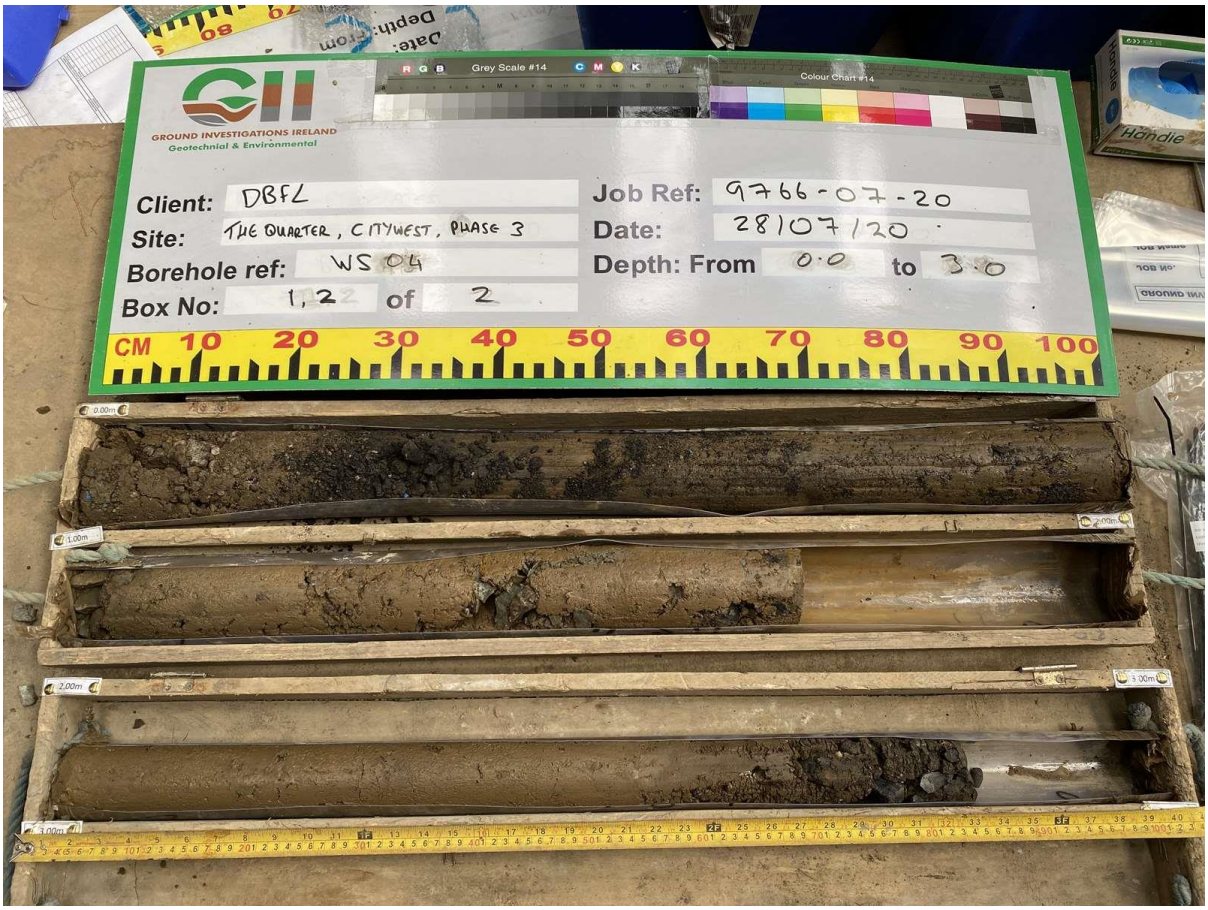
**WS02**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS02
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS03**


GII
GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS03
Box No: 1,2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS04**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS 04
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS05**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS05
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.50
CM 10 20 30 40 50 60 70 80 90 100

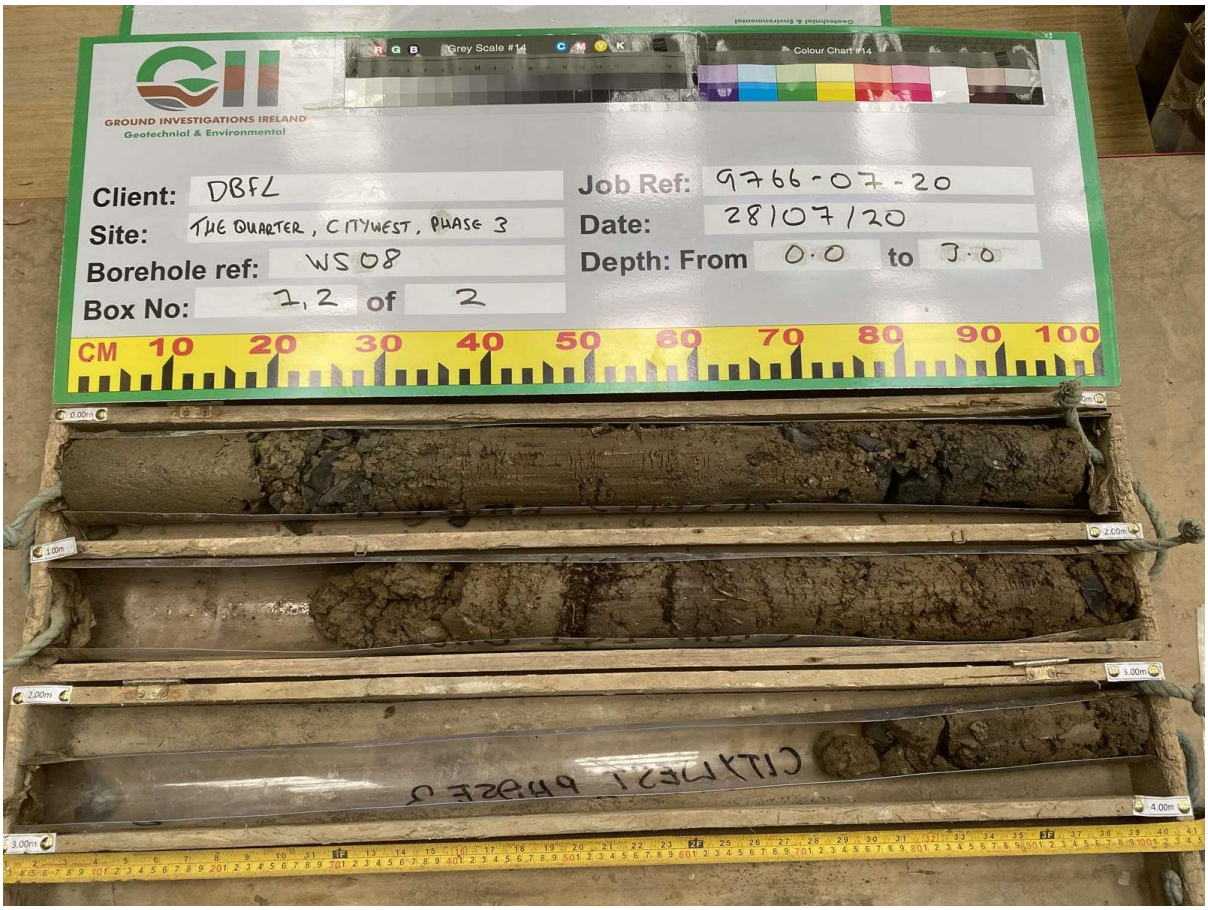
**WS06**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS06
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 2.0
CM 10 20 30 40 50 60 70 80 90 100

**WS07**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS07
Box No: 1,2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 2.8
CM 10 20 30 40 50 60 70 80 90 100

**WS08**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS08
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS09**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS09
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.50
CM 10 20 30 40 50 60 70 80 90 100

**WS10**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Job Ref: 9766-07-20
Site: THE QUARTER, CITYWEST, PHASE 3
Date: 28/07/20
Borehole ref: WS10
Depth: From 0.0 to 1.3
Box No: 1 of 1
CM 10 20 30 40 50 70 80 90 100
0.00m
1.00m
2.00m

**WS11**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS 11
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 2.8
CM 10 20 30 40 50 60 70 80 90 100

**WS12**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS 12
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

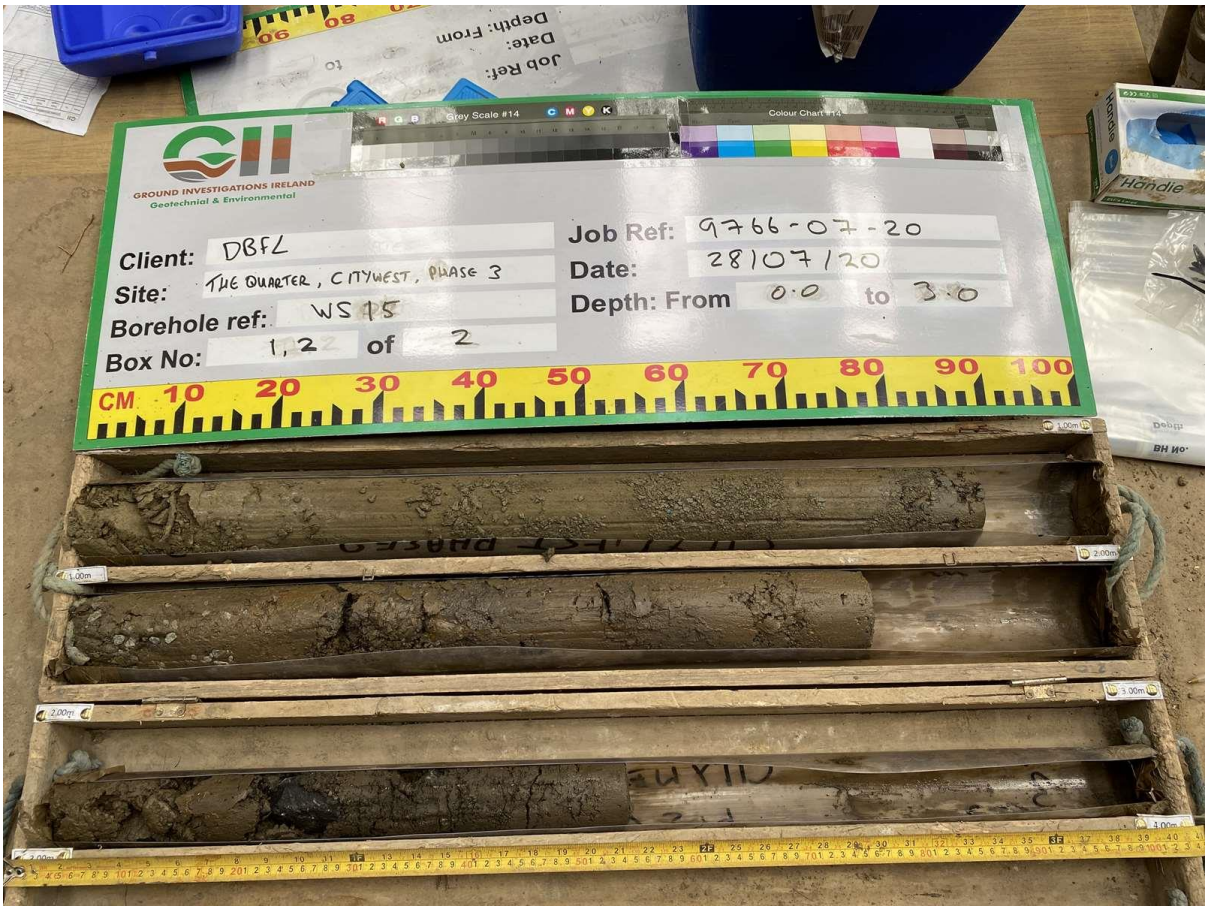
**WS13**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS13
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS14**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Grey Scale #14
Colour Chart #14
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS14
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS15**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS 15
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS16**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS16
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS17**


GROUND INVESTIGATIONS IRELAND
Geotechnial & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS17
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

**WS18**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: THE QUARTER, CITYWEST, PHASE 3
Borehole ref: WS18
Box No: 1, 2 of 2
Job Ref: 9766-07-20
Date: 28/07/20
Depth: From 0.0 to 3.0
CM 10 20 30 40 50 60 70 80 90 100

# **APPENDIX 5** – Dynamic Probe Results

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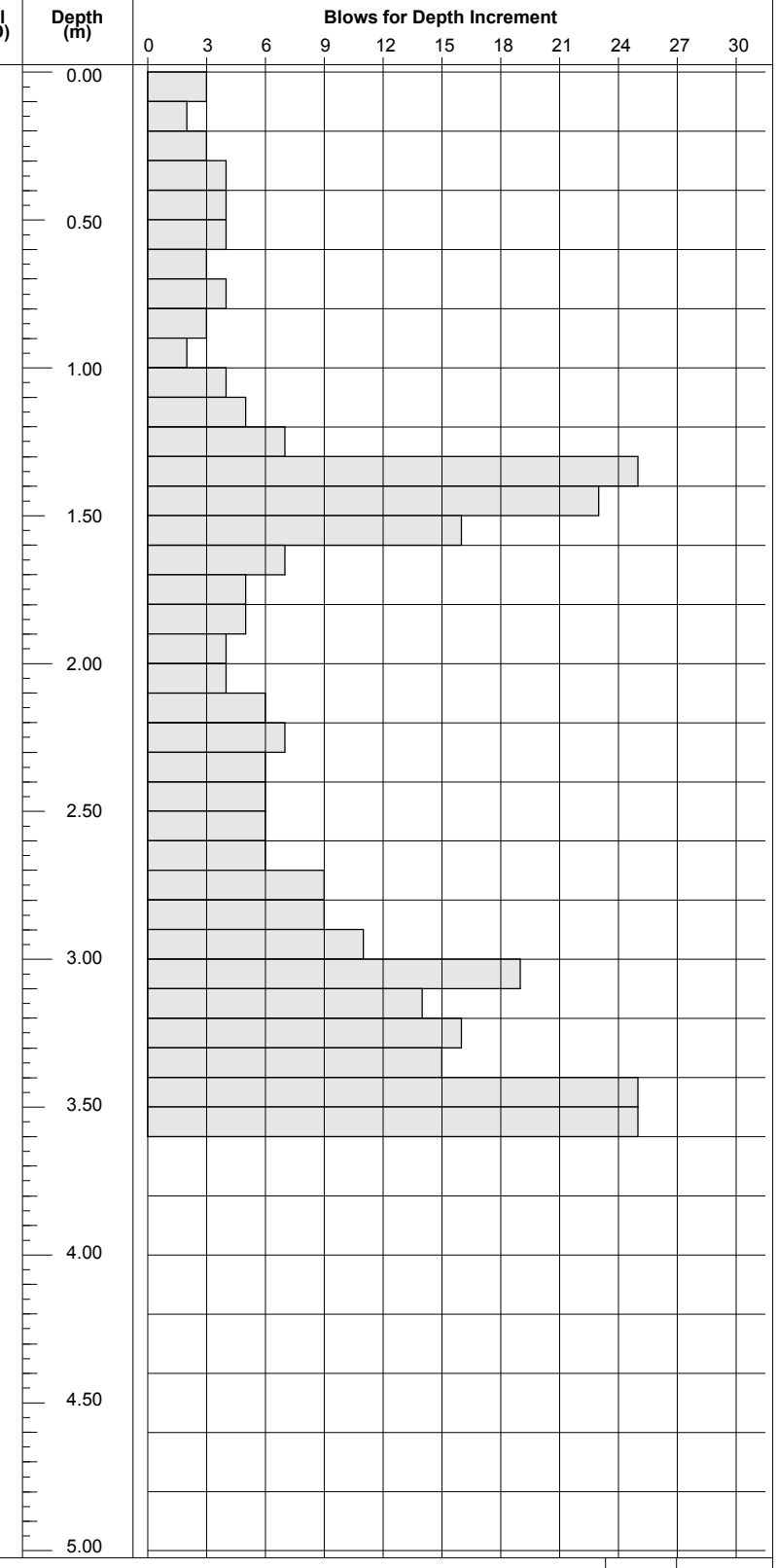
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP01 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) |
|---|---|---|---|
| 0.00-0.10 | 3 | | |
| 0.10-0.20 | 2 | | |
| 0.20-0.30 | 3 | | |
| 0.30-0.40 | 4 | | |
| 0.40-0.50 | 4 | | |
| 0.50-0.60 | 4 | | |
| 0.60-0.70 | 3 | | |
| 0.70-0.80 | 4 | | |
| 0.80-0.90 | 3 | | |
| 0.90-1.00 | 2 | | |
| 1.00-1.10 | 4 | | |
| 1.10-1.20 | 5 | | |
| 1.20-1.30 | 7 | | |
| 1.30-1.40 | 25 | | |
| 1.40-1.50 | 23 | | |
| 1.50-1.60 | 16 | | |
| 1.60-1.70 | 7 | | |
| 1.70-1.80 | 5 | | |
| 1.80-1.90 | 5 | | |
| 1.90-2.00 | 4 | | |
| 2.00-2.10 | 4 | | |
| 2.10-2.20 | 6 | | |
| 2.20-2.30 | 7 | | |
| 2.30-2.40 | 6 | | |
| 2.40-2.50 | 6 | | |
| 2.50-2.60 | 6 | | |
| 2.60-2.70 | 6 | | |
| 2.70-2.80 | 9 | | |
| 2.80-2.90 | 9 | | |
| 2.90-3.00 | 11 | | |
| 3.00-3.10 | 19 | | |
| 3.10-3.20 | 14 | | |
| 3.20-3.30 | 16 | | |
| 3.30-3.40 | 15 | | |
| 3.40-3.50 | 25 | | |
| 3.50-3.60 | 25 | | |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP01

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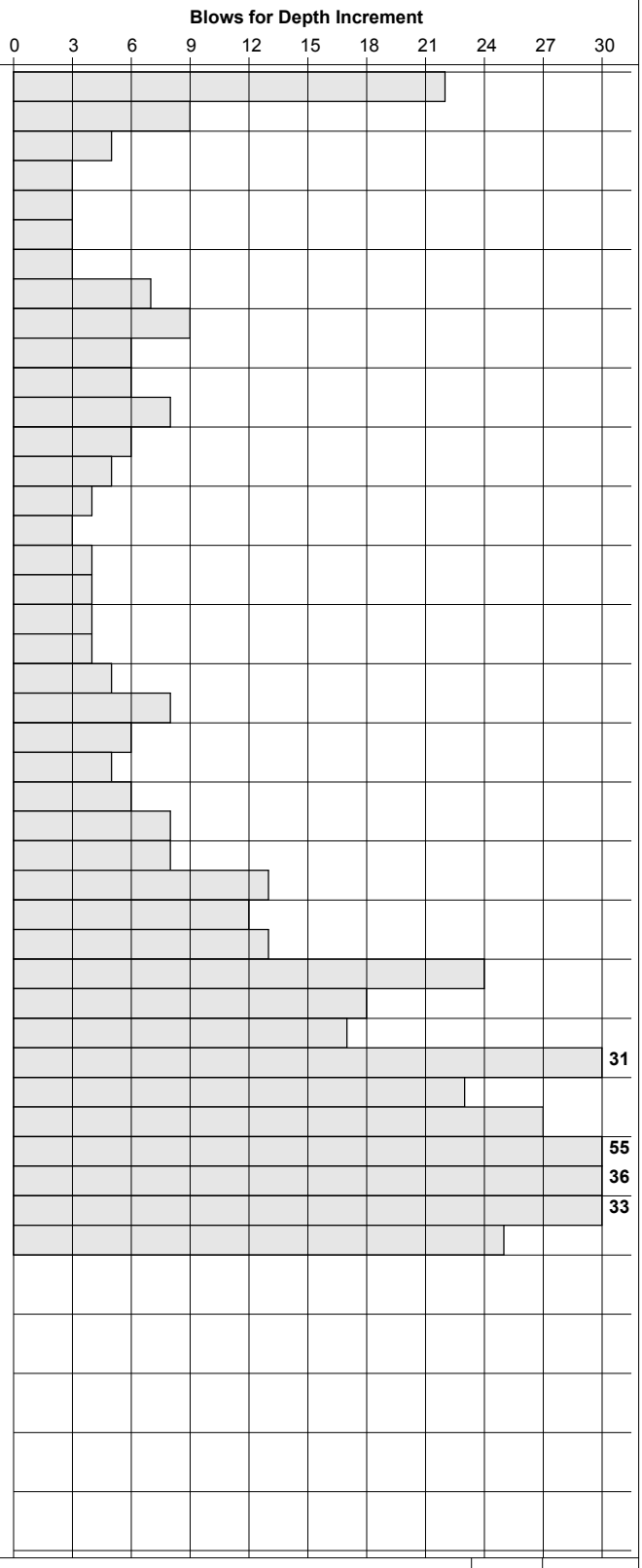
| Site | Probe Number |
|---|---|
| The Quarter at Citywest, Cooldown Commons Phase 3 | DP02 |

| Machine : TECOP 10<br>Method : Dynamic Probe | Cone Dimensions<br>Diameter 43.7mm | Ground Level (mOD)<br>111.17 | Client<br>DBFL | Job Number<br>9766-07-20 |
|---|---|---|---|---|
| | Location<br>705082.3 E 727277.2 N | Dates<br>28/07/2020 | Engineer | Sheet<br>1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) | Depth (m) |
|---|---|---|---|---|
| 0.00-0.10 | 22 | | 111.17 | 0.00 |
| 0.10-0.20 | 9 | | | |
| 0.20-0.30 | 5 | | | |
| 0.30-0.40 | 3 | | | |
| 0.40-0.50 | 3 | | | |
| 0.50-0.60 | 3 | | 110.67 | 0.50 |
| 0.60-0.70 | 3 | | | |
| 0.70-0.80 | 7 | | | |
| 0.80-0.90 | 9 | | | |
| 0.90-1.00 | 6 | | | |
| 1.00-1.10 | 6 | | 110.17 | 1.00 |
| 1.10-1.20 | 8 | | | |
| 1.20-1.30 | 6 | | | |
| 1.30-1.40 | 5 | | | |
| 1.40-1.50 | 4 | | | |
| 1.50-1.60 | 3 | | 109.67 | 1.50 |
| 1.60-1.70 | 4 | | | |
| 1.70-1.80 | 4 | | | |
| 1.80-1.90 | 4 | | | |
| 1.90-2.00 | 4 | | | |
| 2.00-2.10 | 5 | | 109.17 | 2.00 |
| 2.10-2.20 | 8 | | | |
| 2.20-2.30 | 6 | | | |
| 2.30-2.40 | 5 | | | |
| 2.40-2.50 | 6 | | | |
| 2.50-2.60 | 8 | | 108.67 | 2.50 |
| 2.60-2.70 | 8 | | | |
| 2.70-2.80 | 13 | | | |
| 2.80-2.90 | 12 | | | |
| 2.90-3.00 | 13 | | | |
| 3.00-3.10 | 24 | | 108.17 | 3.00 |
| 3.10-3.20 | 18 | | | |
| 3.20-3.30 | 17 | | | |
| 3.30-3.40 | 31 | | | |
| 3.40-3.50 | 23 | | | |
| 3.50-3.60 | 27 | | 107.67 | 3.50 |
| 3.60-3.70 | 55 | | | |
| 3.70-3.80 | 36 | | | |
| 3.80-3.90 | 33 | | | |
| 3.90-4.00 | 25 | | 107.17 | 4.00 |
| | | | 106.67 | 4.50 |
| | | | 106.17 | 5.00 |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.**
9766-07-20.DP02

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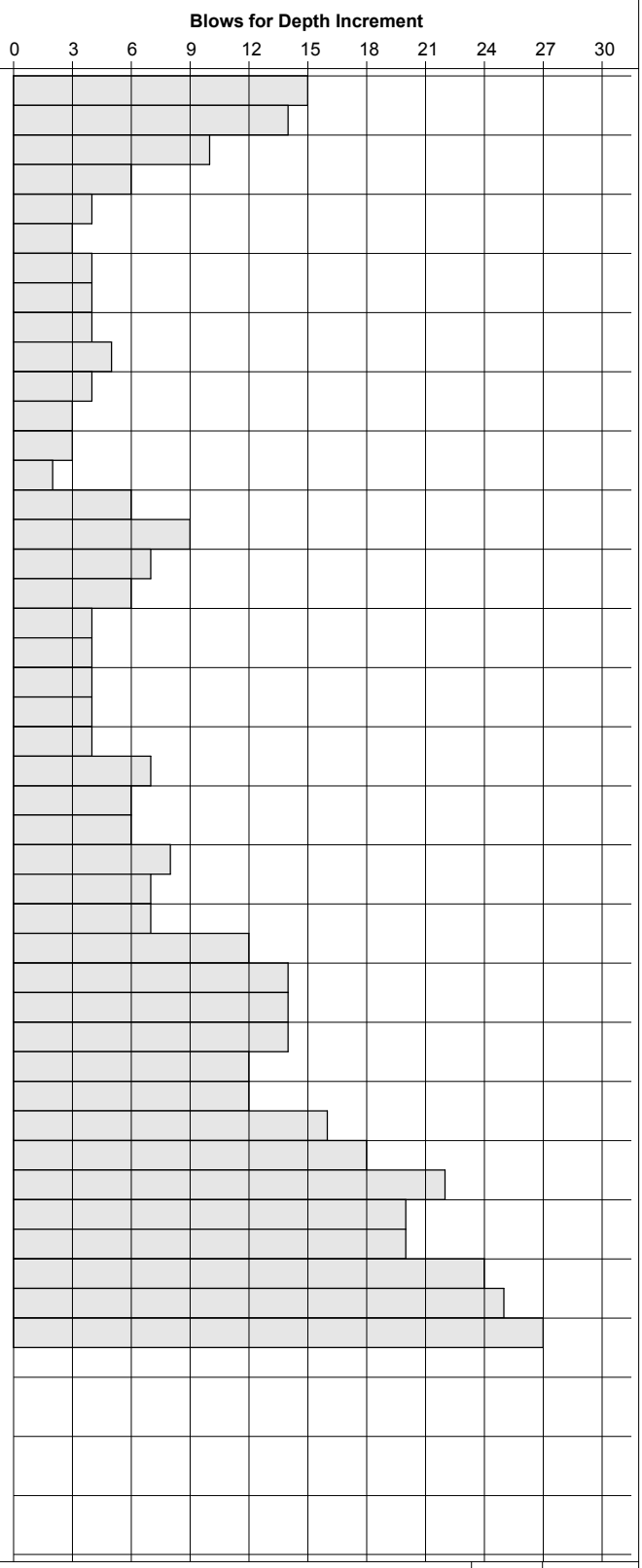
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP03 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 111.43 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705084.1 E 727261 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) | Depth (m) |
|---|---|---|---|---|
| 0.00-0.10 | 15 | | 111.43 | 0.00 |
| 0.10-0.20 | 14 | | | |
| 0.20-0.30 | 10 | | | |
| 0.30-0.40 | 6 | | | |
| 0.40-0.50 | 4 | | | |
| 0.50-0.60 | 3 | | 110.93 | 0.50 |
| 0.60-0.70 | 4 | | | |
| 0.70-0.80 | 4 | | | |
| 0.80-0.90 | 4 | | | |
| 0.90-1.00 | 5 | | | |
| 1.00-1.10 | 4 | | 110.43 | 1.00 |
| 1.10-1.20 | 3 | | | |
| 1.20-1.30 | 3 | | | |
| 1.30-1.40 | 2 | | | |
| 1.40-1.50 | 6 | | | |
| 1.50-1.60 | 9 | | 109.93 | 1.50 |
| 1.60-1.70 | 7 | | | |
| 1.70-1.80 | 6 | | | |
| 1.80-1.90 | 4 | | | |
| 1.90-2.00 | 4 | | | |
| 2.00-2.10 | 4 | | 109.43 | 2.00 |
| 2.10-2.20 | 4 | | | |
| 2.20-2.30 | 4 | | | |
| 2.30-2.40 | 7 | | | |
| 2.40-2.50 | 6 | | | |
| 2.50-2.60 | 6 | | 108.93 | 2.50 |
| 2.60-2.70 | 8 | | | |
| 2.70-2.80 | 7 | | | |
| 2.80-2.90 | 7 | | | |
| 2.90-3.00 | 12 | | | |
| 3.00-3.10 | 14 | | 108.43 | 3.00 |
| 3.10-3.20 | 14 | | | |
| 3.20-3.30 | 14 | | | |
| 3.30-3.40 | 12 | | | |
| 3.40-3.50 | 12 | | | |
| 3.50-3.60 | 16 | | 107.93 | 3.50 |
| 3.60-3.70 | 18 | | | |
| 3.70-3.80 | 22 | | | |
| 3.80-3.90 | 20 | | | |
| 3.90-4.00 | 20 | | | |
| 4.00-4.10 | 24 | | 107.43 | 4.00 |
| 4.10-4.20 | 25 | | | |
| 4.20-4.30 | 27 | | | |
| | | | 106.93 | 4.50 |
| | | | 106.43 | 5.00 |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP03

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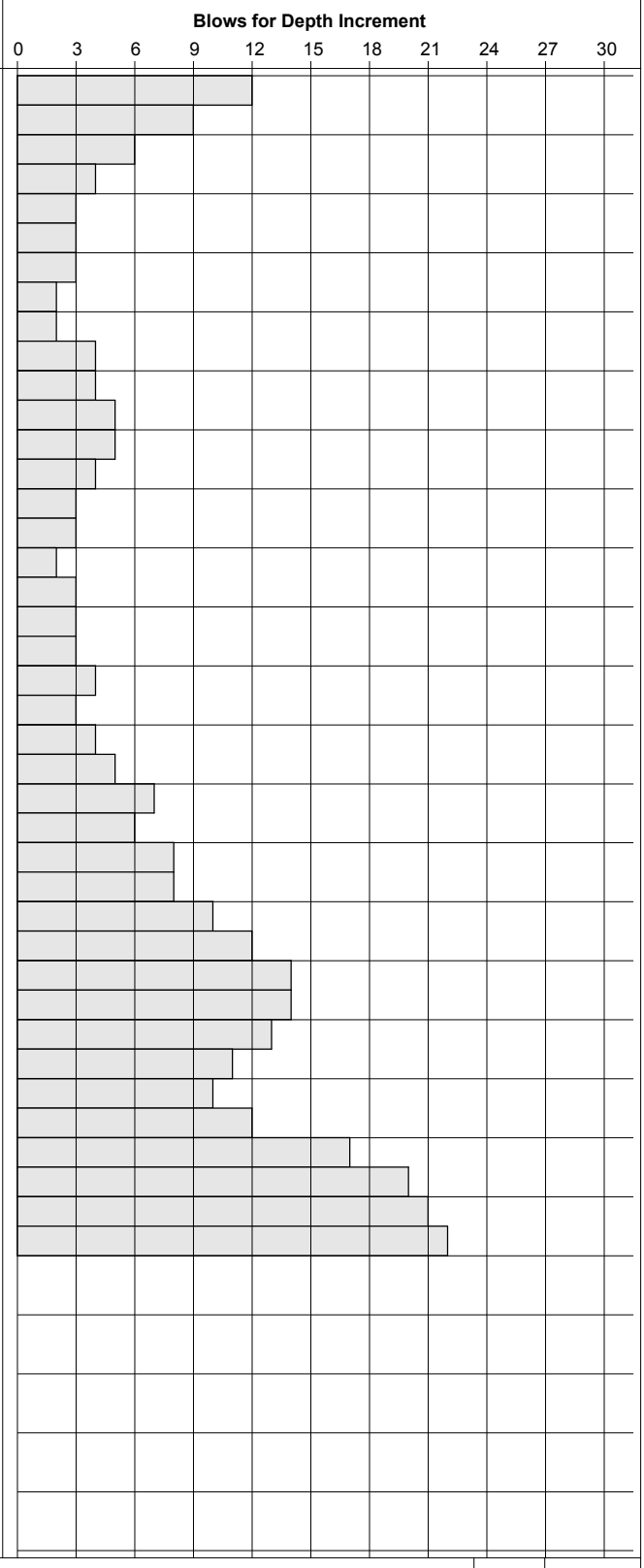
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP04 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 112.32 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705043.1 E 727233.6 N | **Dates** 28/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) | Depth (m) |
|---|---|---|---|---|
| 0.00-0.10 | 12 | | 112.32 | 0.00 |
| 0.10-0.20 | 9 | | | |
| 0.20-0.30 | 6 | | | |
| 0.30-0.40 | 4 | | | |
| 0.40-0.50 | 3 | | | |
| 0.50-0.60 | 3 | | 111.82 | 0.50 |
| 0.60-0.70 | 3 | | | |
| 0.70-0.80 | 2 | | | |
| 0.80-0.90 | 2 | | | |
| 0.90-1.00 | 4 | | | |
| 1.00-1.10 | 4 | | 111.32 | 1.00 |
| 1.10-1.20 | 5 | | | |
| 1.20-1.30 | 5 | | | |
| 1.30-1.40 | 4 | | | |
| 1.40-1.50 | 3 | | | |
| 1.50-1.60 | 3 | | 110.82 | 1.50 |
| 1.60-1.70 | 2 | | | |
| 1.70-1.80 | 3 | | | |
| 1.80-1.90 | 3 | | | |
| 1.90-2.00 | 3 | | | |
| 2.00-2.10 | 4 | | 110.32 | 2.00 |
| 2.10-2.20 | 3 | | | |
| 2.20-2.30 | 4 | | | |
| 2.30-2.40 | 5 | | | |
| 2.40-2.50 | 7 | | | |
| 2.50-2.60 | 6 | | 109.82 | 2.50 |
| 2.60-2.70 | 8 | | | |
| 2.70-2.80 | 8 | | | |
| 2.80-2.90 | 10 | | | |
| 2.90-3.00 | 12 | | | |
| 3.00-3.10 | 14 | | 109.32 | 3.00 |
| 3.10-3.20 | 14 | | | |
| 3.20-3.30 | 13 | | | |
| 3.30-3.40 | 11 | | | |
| 3.40-3.50 | 10 | | | |
| 3.50-3.60 | 12 | | 108.82 | 3.50 |
| 3.60-3.70 | 17 | | | |
| 3.70-3.80 | 20 | | | |
| 3.80-3.90 | 21 | | | |
| 3.90-4.00 | 22 | | 108.32 | 4.00 |
| | | | 107.82 | 4.50 |
| | | | 107.32 | 5.00 |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP04

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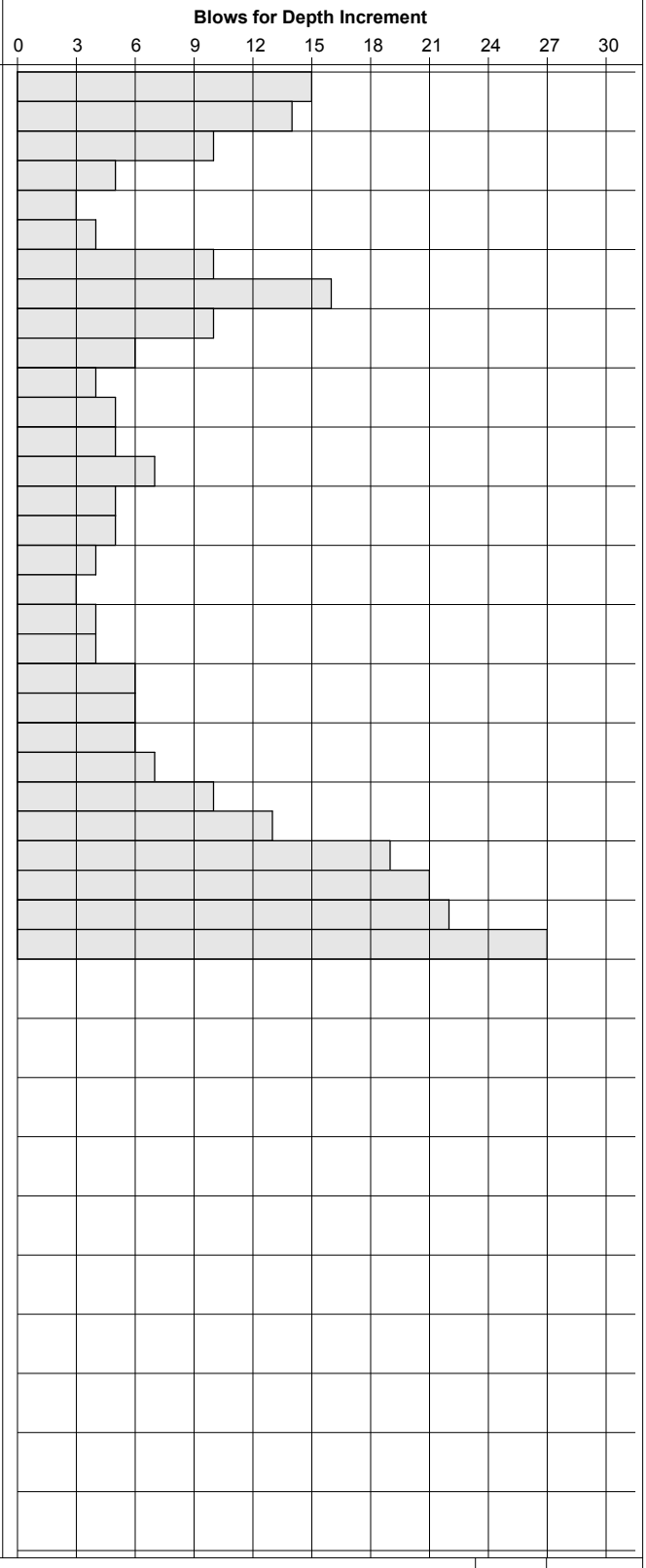
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP05 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 111.87 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705032.1 E 727254.5 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records |
|---|---|---|
| 0.00-0.10 | 15 | |
| 0.10-0.20 | 14 | |
| 0.20-0.30 | 10 | |
| 0.30-0.40 | 5 | |
| 0.40-0.50 | 3 | |
| 0.50-0.60 | 4 | |
| 0.60-0.70 | 10 | |
| 0.70-0.80 | 16 | |
| 0.80-0.90 | 10 | |
| 0.90-1.00 | 6 | |
| 1.00-1.10 | 4 | |
| 1.10-1.20 | 5 | |
| 1.20-1.30 | 5 | |
| 1.30-1.40 | 7 | |
| 1.40-1.50 | 5 | |
| 1.50-1.60 | 5 | |
| 1.60-1.70 | 4 | |
| 1.70-1.80 | 3 | |
| 1.80-1.90 | 4 | |
| 1.90-2.00 | 4 | |
| 2.00-2.10 | 6 | |
| 2.10-2.20 | 6 | |
| 2.20-2.30 | 6 | |
| 2.30-2.40 | 7 | |
| 2.40-2.50 | 10 | |
| 2.50-2.60 | 13 | |
| 2.60-2.70 | 19 | |
| 2.70-2.80 | 21 | |
| 2.80-2.90 | 22 | |
| 2.90-3.00 | 27 | |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP05

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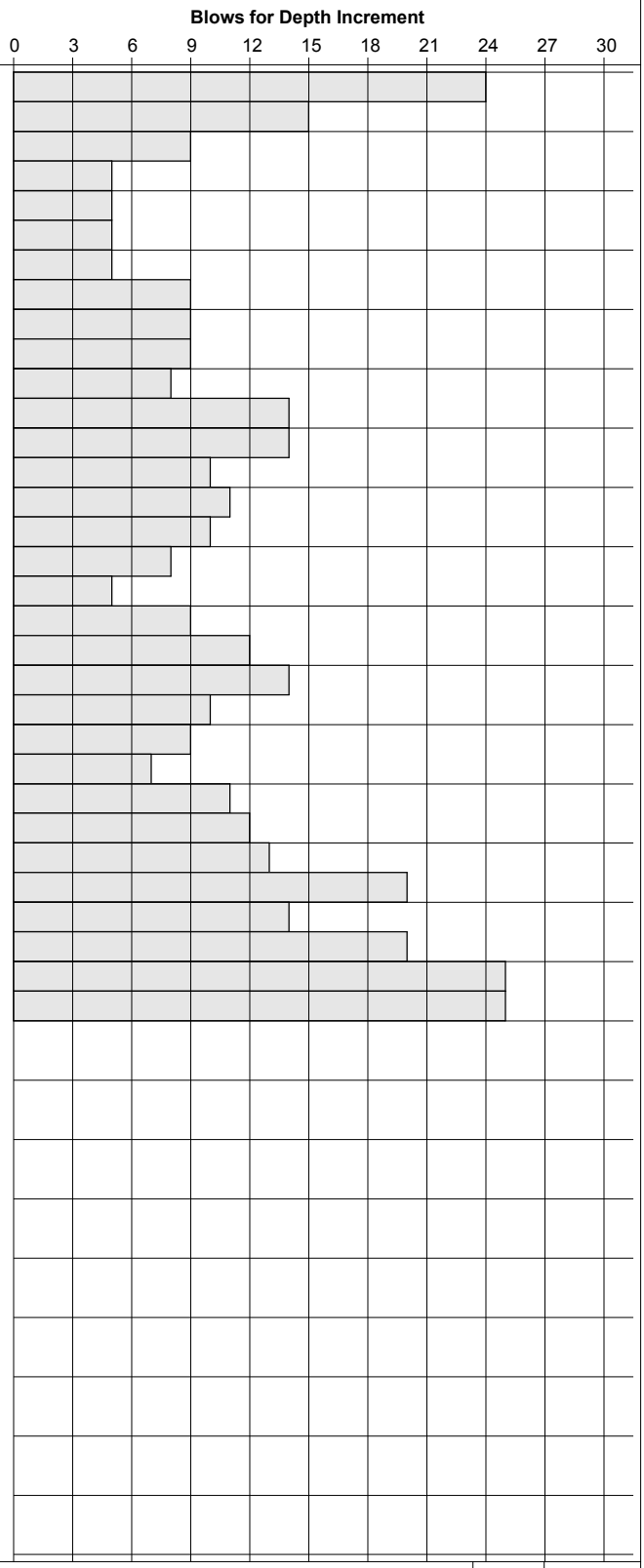
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP06 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 111.80 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705021.4 E 727265.8 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) | Depth (m) |
|---|---|---|---|---|
| 0.00-0.10 | 24 | | 111.80 | 0.00 |
| 0.10-0.20 | 15 | | | |
| 0.20-0.30 | 9 | | | |
| 0.30-0.40 | 5 | | | |
| 0.40-0.50 | 5 | | | |
| 0.50-0.60 | 5 | | 111.30 | 0.50 |
| 0.60-0.70 | 5 | | | |
| 0.70-0.80 | 9 | | | |
| 0.80-0.90 | 9 | | | |
| 0.90-1.00 | 9 | | | |
| 1.00-1.10 | 8 | | 110.80 | 1.00 |
| 1.10-1.20 | 14 | | | |
| 1.20-1.30 | 14 | | | |
| 1.30-1.40 | 10 | | | |
| 1.40-1.50 | 11 | | | |
| 1.50-1.60 | 10 | | 110.30 | 1.50 |
| 1.60-1.70 | 8 | | | |
| 1.70-1.80 | 5 | | | |
| 1.80-1.90 | 9 | | | |
| 1.90-2.00 | 12 | | | |
| 2.00-2.10 | 14 | | 109.80 | 2.00 |
| 2.10-2.20 | 10 | | | |
| 2.20-2.30 | 9 | | | |
| 2.30-2.40 | 7 | | | |
| 2.40-2.50 | 11 | | | |
| 2.50-2.60 | 12 | | 109.30 | 2.50 |
| 2.60-2.70 | 13 | | | |
| 2.70-2.80 | 20 | | | |
| 2.80-2.90 | 14 | | | |
| 2.90-3.00 | 20 | | | |
| 3.00-3.10 | 25 | | 108.80 | 3.00 |
| 3.10-3.20 | 25 | | | |
| | | | 108.30 | 3.50 |
| | | | 107.80 | 4.00 |
| | | | 107.30 | 4.50 |
| | | | 106.80 | 5.00 |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP06

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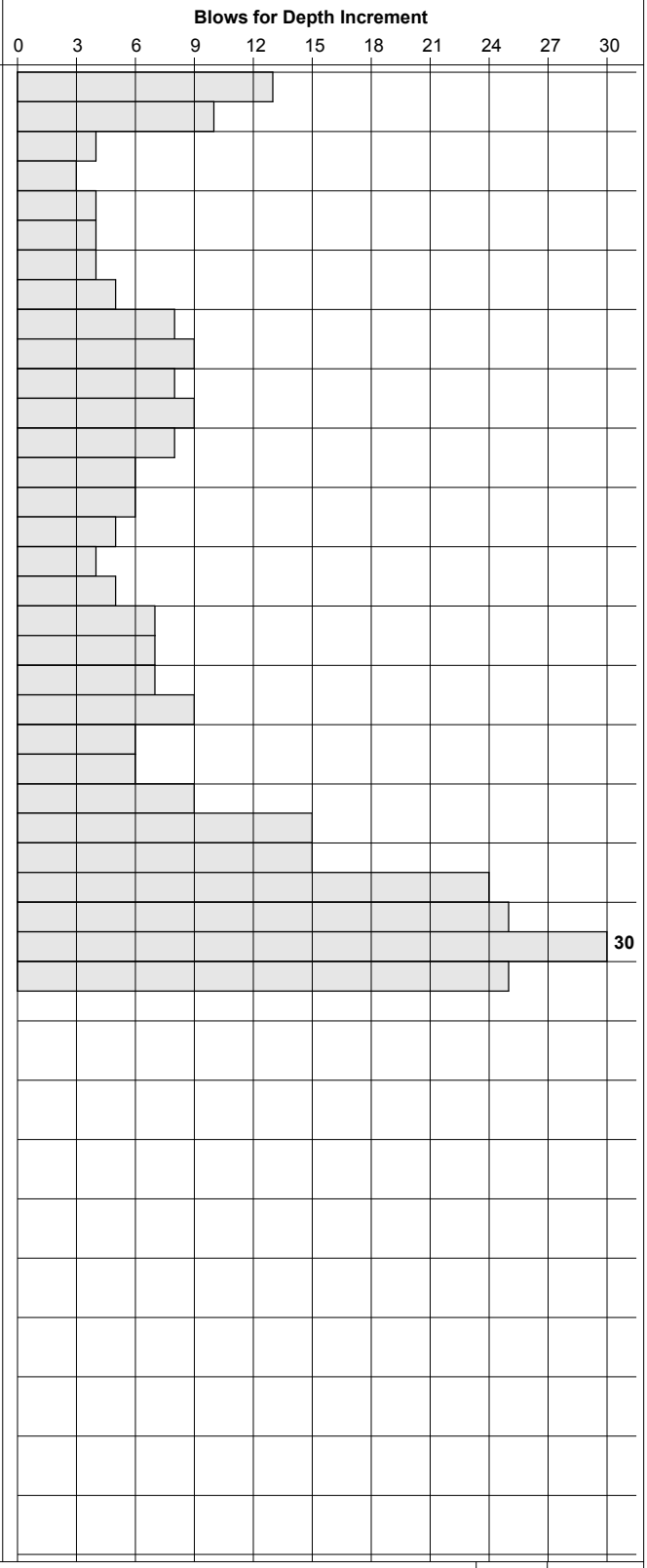
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP07 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 111.65 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705016.2 E 727274.3 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records |
|---|---|---|
| 0.00-0.10 | 13 | |
| 0.10-0.20 | 10 | |
| 0.20-0.30 | 4 | |
| 0.30-0.40 | 3 | |
| 0.40-0.50 | 4 | |
| 0.50-0.60 | 4 | |
| 0.60-0.70 | 4 | |
| 0.70-0.80 | 5 | |
| 0.80-0.90 | 8 | |
| 0.90-1.00 | 9 | |
| 1.00-1.10 | 8 | |
| 1.10-1.20 | 9 | |
| 1.20-1.30 | 8 | |
| 1.30-1.40 | 6 | |
| 1.40-1.50 | 6 | |
| 1.50-1.60 | 5 | |
| 1.60-1.70 | 4 | |
| 1.70-1.80 | 5 | |
| 1.80-1.90 | 7 | |
| 1.90-2.00 | 7 | |
| 2.00-2.10 | 7 | |
| 2.10-2.20 | 9 | |
| 2.20-2.30 | 6 | |
| 2.30-2.40 | 6 | |
| 2.40-2.50 | 9 | |
| 2.50-2.60 | 15 | |
| 2.60-2.70 | 15 | |
| 2.70-2.80 | 24 | |
| 2.80-2.90 | 25 | |
| 2.90-3.00 | 30 | |
| 3.00-3.10 | 25 | |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP07

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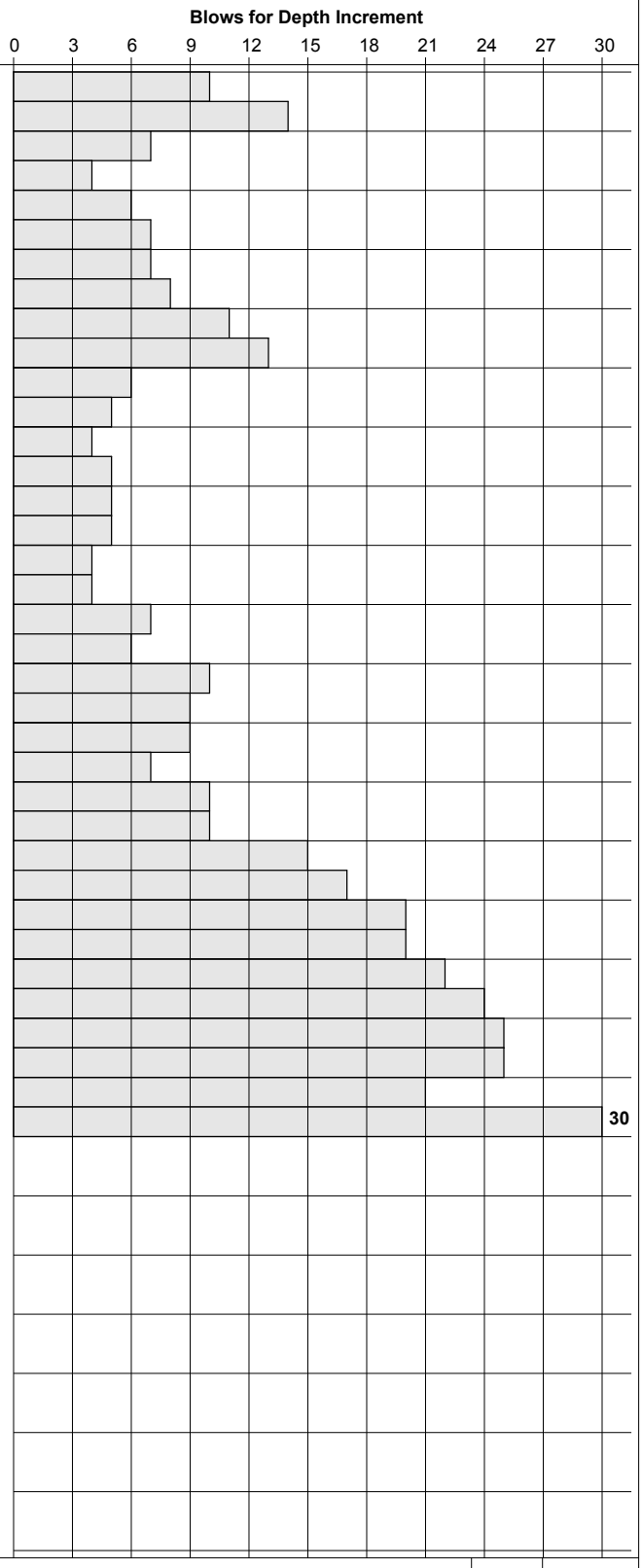
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP08 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 111.37 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 705008.6 E 727286.2 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) | Depth (m) |
|---|---|---|---|---|
| 0.00-0.10 | 10 | | 111.37 | 0.00 |
| 0.10-0.20 | 14 | | | |
| 0.20-0.30 | 7 | | | |
| 0.30-0.40 | 4 | | | |
| 0.40-0.50 | 6 | | | |
| 0.50-0.60 | 7 | | 110.87 | 0.50 |
| 0.60-0.70 | 7 | | | |
| 0.70-0.80 | 8 | | | |
| 0.80-0.90 | 11 | | | |
| 0.90-1.00 | 13 | | | |
| 1.00-1.10 | 6 | | 110.37 | 1.00 |
| 1.10-1.20 | 5 | | | |
| 1.20-1.30 | 4 | | | |
| 1.30-1.40 | 5 | | | |
| 1.40-1.50 | 5 | | | |
| 1.50-1.60 | 5 | | 109.87 | 1.50 |
| 1.60-1.70 | 4 | | | |
| 1.70-1.80 | 4 | | | |
| 1.80-1.90 | 7 | | | |
| 1.90-2.00 | 6 | | | |
| 2.00-2.10 | 10 | | 109.37 | 2.00 |
| 2.10-2.20 | 9 | | | |
| 2.20-2.30 | 9 | | | |
| 2.30-2.40 | 7 | | | |
| 2.40-2.50 | 10 | | | |
| 2.50-2.60 | 10 | | 108.87 | 2.50 |
| 2.60-2.70 | 15 | | | |
| 2.70-2.80 | 17 | | | |
| 2.80-2.90 | 20 | | | |
| 2.90-3.00 | 20 | | | |
| 3.00-3.10 | 22 | | 108.37 | 3.00 |
| 3.10-3.20 | 24 | | | |
| 3.20-3.30 | 25 | | | |
| 3.30-3.40 | 25 | | | |
| 3.40-3.50 | 21 | | | |
| 3.50-3.60 | 30 | | 107.87 | 3.50 |
| | | | 107.37 | 4.00 |
| | | | 106.87 | 4.50 |
| | | | 106.37 | 5.00 |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP08

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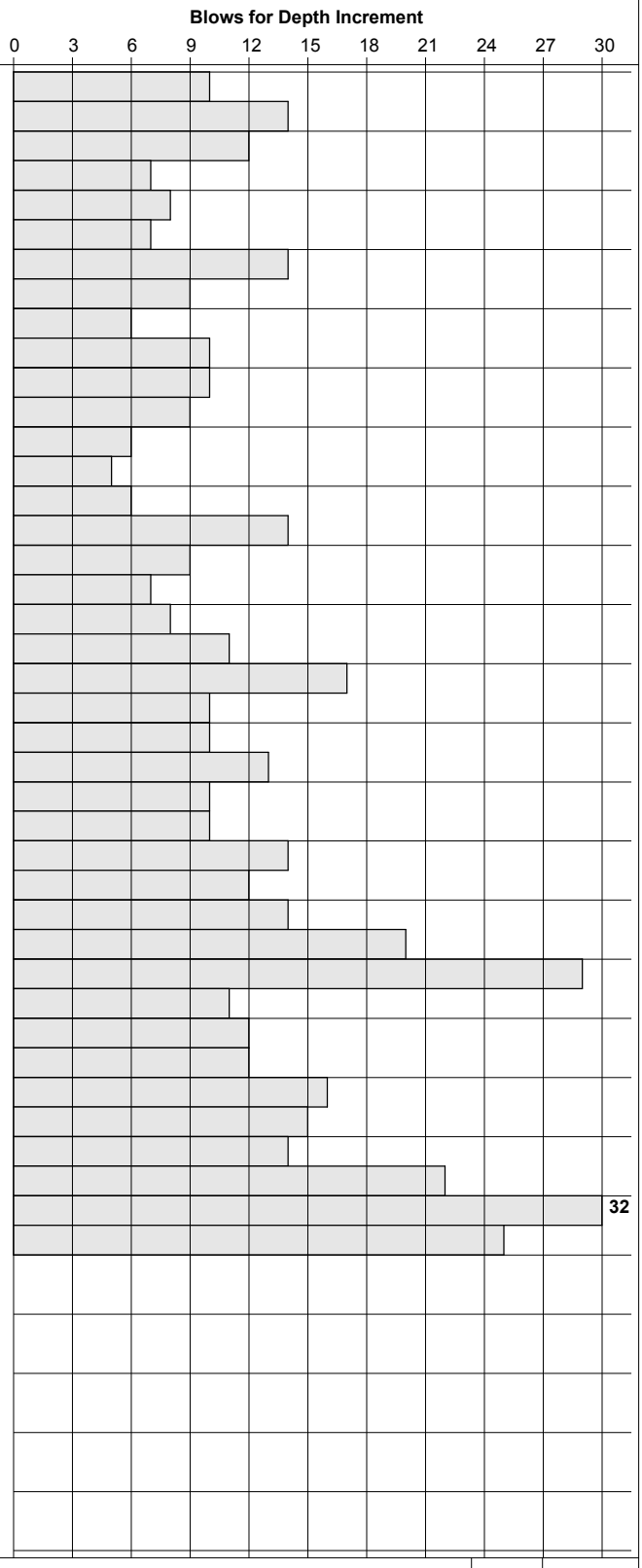
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP09 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** | **Ground Level (mOD)** | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) |
|---|---|---|---|
| 0.00-0.10 | 10 | | |
| 0.10-0.20 | 14 | | |
| 0.20-0.30 | 12 | | |
| 0.30-0.40 | 7 | | |
| 0.40-0.50 | 8 | | |
| 0.50-0.60 | 7 | | |
| 0.60-0.70 | 14 | | |
| 0.70-0.80 | 9 | | |
| 0.80-0.90 | 6 | | |
| 0.90-1.00 | 10 | | |
| 1.00-1.10 | 10 | | |
| 1.10-1.20 | 9 | | |
| 1.20-1.30 | 6 | | |
| 1.30-1.40 | 5 | | |
| 1.40-1.50 | 6 | | |
| 1.50-1.60 | 14 | | |
| 1.60-1.70 | 9 | | |
| 1.70-1.80 | 7 | | |
| 1.80-1.90 | 8 | | |
| 1.90-2.00 | 11 | | |
| 2.00-2.10 | 17 | | |
| 2.10-2.20 | 10 | | |
| 2.20-2.30 | 10 | | |
| 2.30-2.40 | 13 | | |
| 2.40-2.50 | 10 | | |
| 2.50-2.60 | 10 | | |
| 2.60-2.70 | 14 | | |
| 2.70-2.80 | 12 | | |
| 2.80-2.90 | 14 | | |
| 2.90-3.00 | 20 | | |
| 3.00-3.10 | 29 | | |
| 3.10-3.20 | 11 | | |
| 3.20-3.30 | 12 | | |
| 3.30-3.40 | 12 | | |
| 3.40-3.50 | 16 | | |
| 3.50-3.60 | 15 | | |
| 3.60-3.70 | 14 | | |
| 3.70-3.80 | 22 | | |
| 3.80-3.90 | 32 | | |
| 3.90-4.00 | 25 | | |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP09

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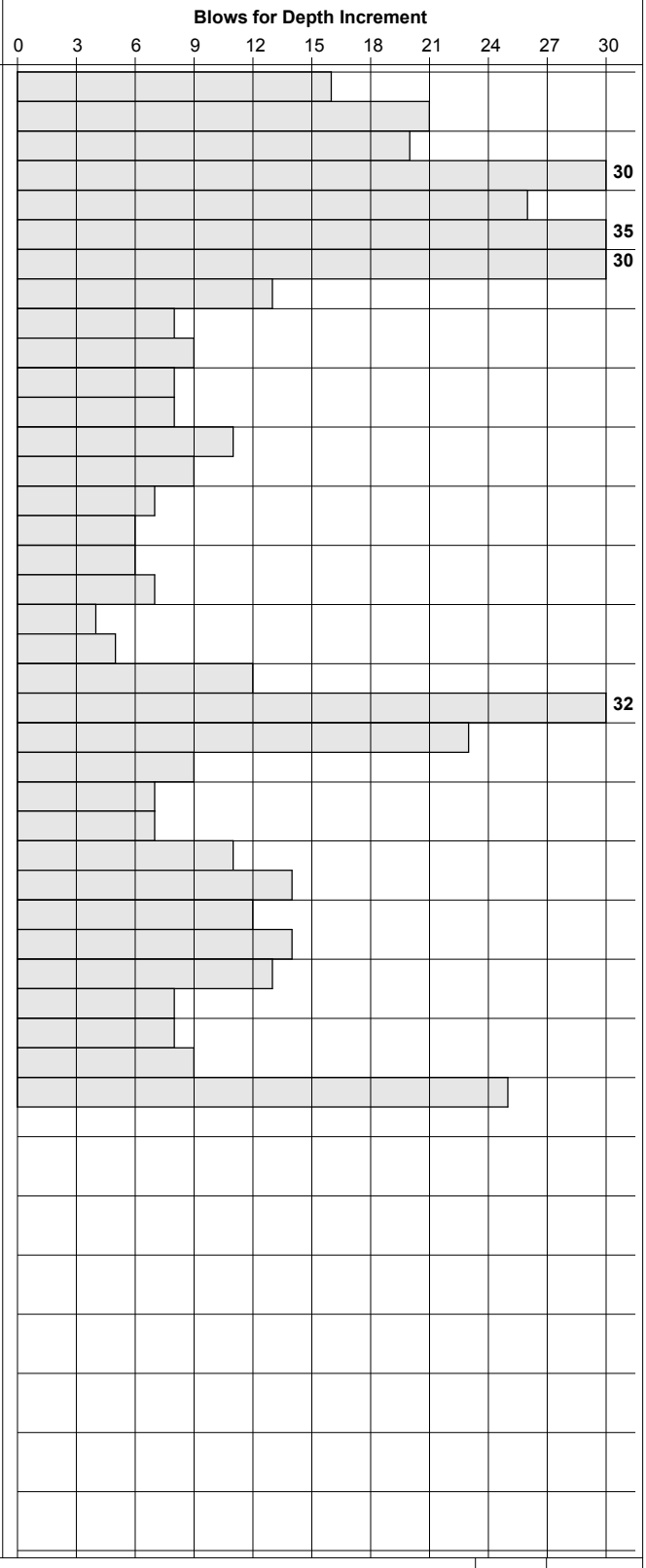
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP10 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) |
|---|---|---|---|
| 0.00-0.10 | 16 | | |
| 0.10-0.20 | 21 | | |
| 0.20-0.30 | 20 | | |
| 0.30-0.40 | 30 | | |
| 0.40-0.50 | 26 | | |
| 0.50-0.60 | 35 | | |
| 0.60-0.70 | 30 | | |
| 0.70-0.80 | 13 | | |
| 0.80-0.90 | 8 | | |
| 0.90-1.00 | 9 | | |
| 1.00-1.10 | 8 | | |
| 1.10-1.20 | 8 | | |
| 1.20-1.30 | 11 | | |
| 1.30-1.40 | 9 | | |
| 1.40-1.50 | 7 | | |
| 1.50-1.60 | 6 | | |
| 1.60-1.70 | 6 | | |
| 1.70-1.80 | 7 | | |
| 1.80-1.90 | 4 | | |
| 1.90-2.00 | 5 | | |
| 2.00-2.10 | 12 | | |
| 2.10-2.20 | 32 | | |
| 2.20-2.30 | 23 | | |
| 2.30-2.40 | 9 | | |
| 2.40-2.50 | 7 | | |
| 2.50-2.60 | 7 | | |
| 2.60-2.70 | 11 | | |
| 2.70-2.80 | 14 | | |
| 2.80-2.90 | 12 | | |
| 2.90-3.00 | 14 | | |
| 3.00-3.10 | 13 | | |
| 3.10-3.20 | 8 | | |
| 3.20-3.30 | 8 | | |
| 3.30-3.40 | 9 | | |
| 3.40-3.50 | 25 | | |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP10

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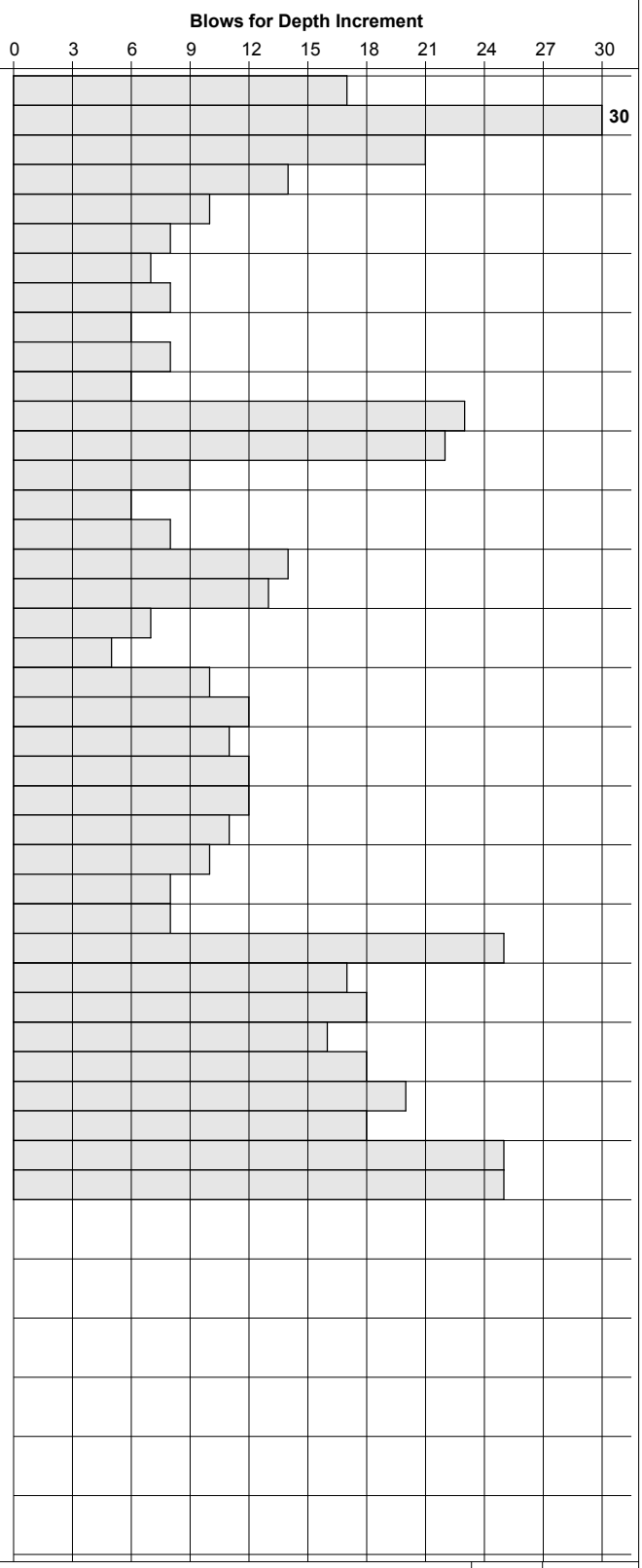
| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Probe Number** DP11 |
| **Machine :** TECOP 10<br>**Method :** Dynamic Probe | **Cone Dimensions** Diameter 43.7mm | **Ground Level (mOD)** 111.08 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** 704980.6 E 727314.7 N | **Dates** 29/07/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Blows for Depth Increment | Field Records | Level (mOD) | Depth (m) |
|---|---|---|---|---|
| 0.00-0.10 | 17 | | 111.08 | 0.00 |
| 0.10-0.20 | 30 | | | |
| 0.20-0.30 | 21 | | | |
| 0.30-0.40 | 14 | | | |
| 0.40-0.50 | 10 | | | |
| 0.50-0.60 | 8 | | 110.58 | 0.50 |
| 0.60-0.70 | 7 | | | |
| 0.70-0.80 | 8 | | | |
| 0.80-0.90 | 6 | | | |
| 0.90-1.00 | 8 | | | |
| 1.00-1.10 | 6 | | 110.08 | 1.00 |
| 1.10-1.20 | 23 | | | |
| 1.20-1.30 | 22 | | | |
| 1.30-1.40 | 9 | | | |
| 1.40-1.50 | 6 | | | |
| 1.50-1.60 | 8 | | 109.58 | 1.50 |
| 1.60-1.70 | 14 | | | |
| 1.70-1.80 | 13 | | | |
| 1.80-1.90 | 7 | | | |
| 1.90-2.00 | 5 | | | |
| 2.00-2.10 | 10 | | 109.08 | 2.00 |
| 2.10-2.20 | 12 | | | |
| 2.20-2.30 | 11 | | | |
| 2.30-2.40 | 12 | | | |
| 2.40-2.50 | 12 | | | |
| 2.50-2.60 | 11 | | 108.58 | 2.50 |
| 2.60-2.70 | 10 | | | |
| 2.70-2.80 | 8 | | | |
| 2.80-2.90 | 8 | | | |
| 2.90-3.00 | 25 | | | |
| 3.00-3.10 | 17 | | 108.08 | 3.00 |
| 3.10-3.20 | 18 | | | |
| 3.20-3.30 | 16 | | | |
| 3.30-3.40 | 18 | | | |
| 3.40-3.50 | 20 | | | |
| 3.50-3.60 | 18 | | 107.58 | 3.50 |
| 3.60-3.70 | 25 | | | |
| 3.70-3.80 | 25 | | | |
| | | | 107.08 | 4.00 |
| | | | 106.58 | 4.50 |
| | | | 106.08 | 5.00 |




**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:25 | JMD |

**Figure No.** 9766-07-20.DP11

# **APPENDIX 6** – Plate Bearing Test Results

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -2.265 |
| 69 | -4.15 |
| 138 | -6.76 |
| 0 | -3 |
| 69 | -5.635 |
| 138 | -7.205 |
| 0 | -3.415 |
| | |

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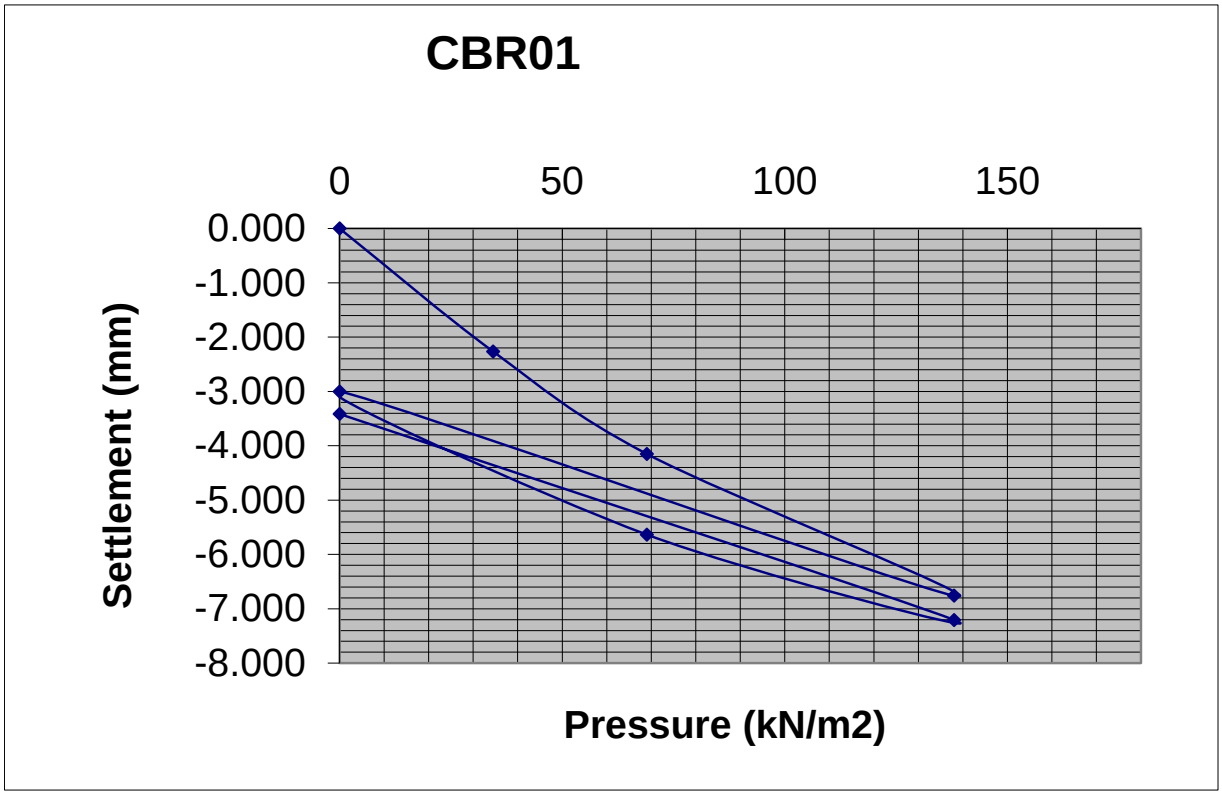
| | | | |
|---|---|---|---|
| **LOCATION** | The Quarter at Citwest, Cooldown Commons Phase 3 | **MATERIAL** | Soft brown slightly sandy slightly gravelly CLAY with some rootlets. Gravel is subangular to rounded fine to coarse. |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 29/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR01 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **11.23 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **17.69 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **0.64 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **1.40 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -0.87 |
| 69 | -1.35 |
| 138 | -1.86 |
| 0 | -1.315 |
| 69 | -1.715 |
| 138 | -1.975 |
| 0 | -1.435 |
| | |

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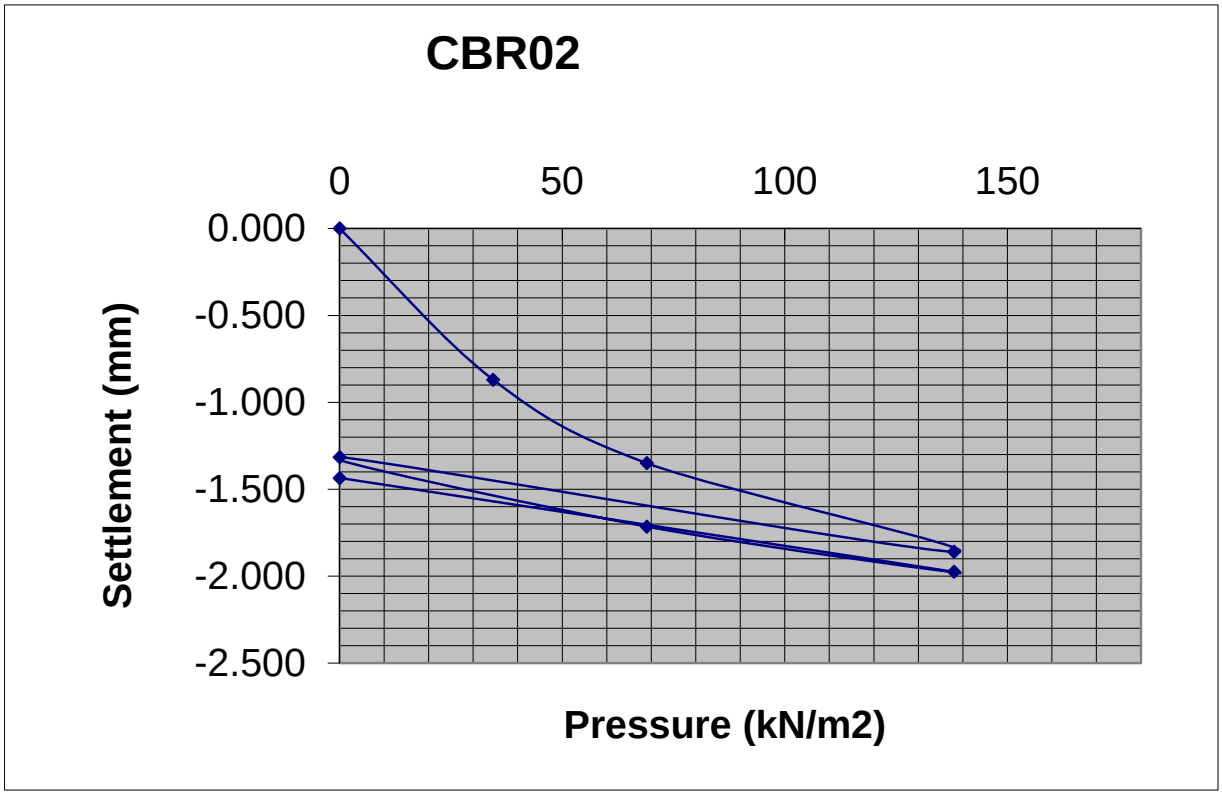
| | | | |
|---|---|---|---|
| | The Quarter at Citwest, Cooldown Commons | | Soft brown mottled grey slightly sandy slightly silty gravelly CLAY with some subangular cobbles. Gravel is subangular to subrounded fine to coarse. |
| **LOCATION** | Phase 3 | **MATERIAL** | |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 29/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR02 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **34.54 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **116.56 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **4.47 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **36.78 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -1.81 |
| 69 | -2.935 |
| 138 | -4.22 |
| 0 | -3.09 |
| 69 | -3.97 |
| 138 | -4.53 |
| 0 | -3.455 |
| | |

GROUND INVESTIGATIONS IRELAND
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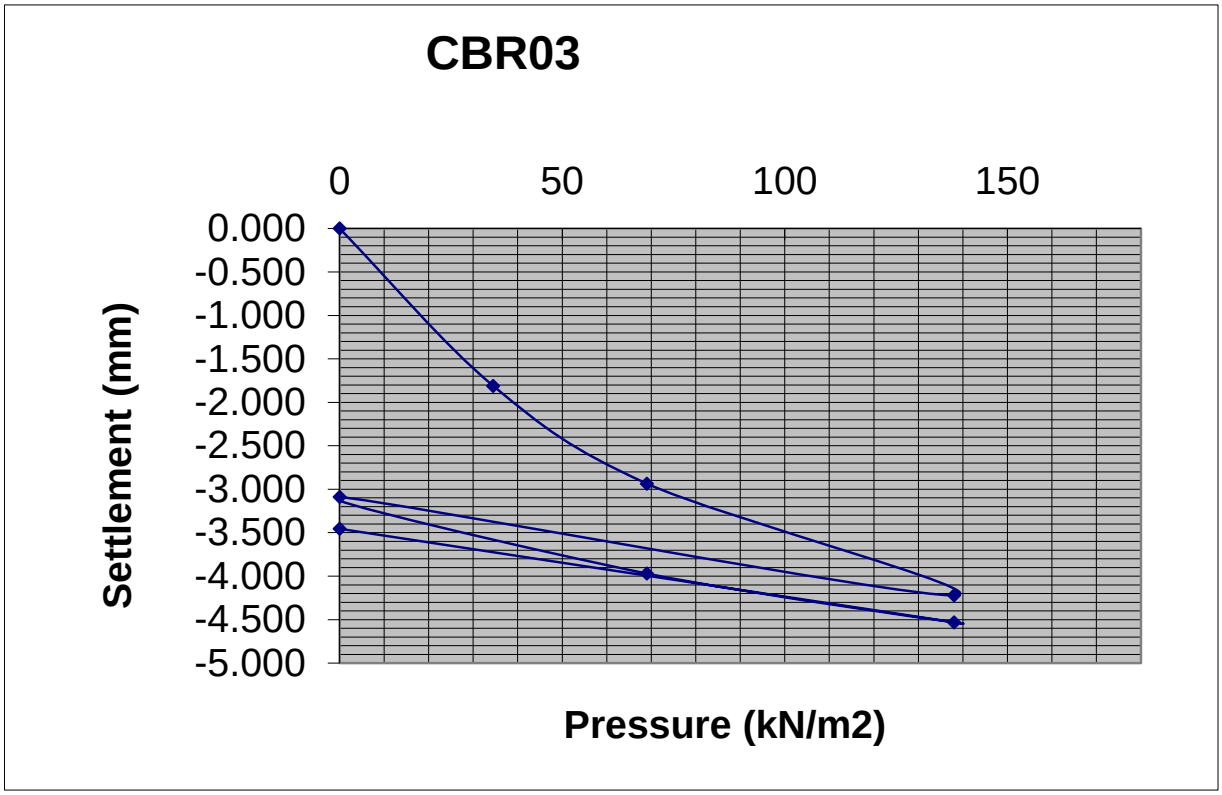
| | | | |
|---|---|---|---|
| | The Quarter at Citwest, Cooldown Commons | | Soft brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles. Gravel is angular to subrounded fine to coarse. |
| **LOCATION** | Phase 3 | **MATERIAL** | |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 31/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR03 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **15.89 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **52.98 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **1.16 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **9.38 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -0.315 |
| 69 | -0.785 |
| 138 | -1.745 |
| 0 | -0.84 |
| 69 | -1.56 |
| 138 | -1.915 |
| 0 | -1.03 |
| | |

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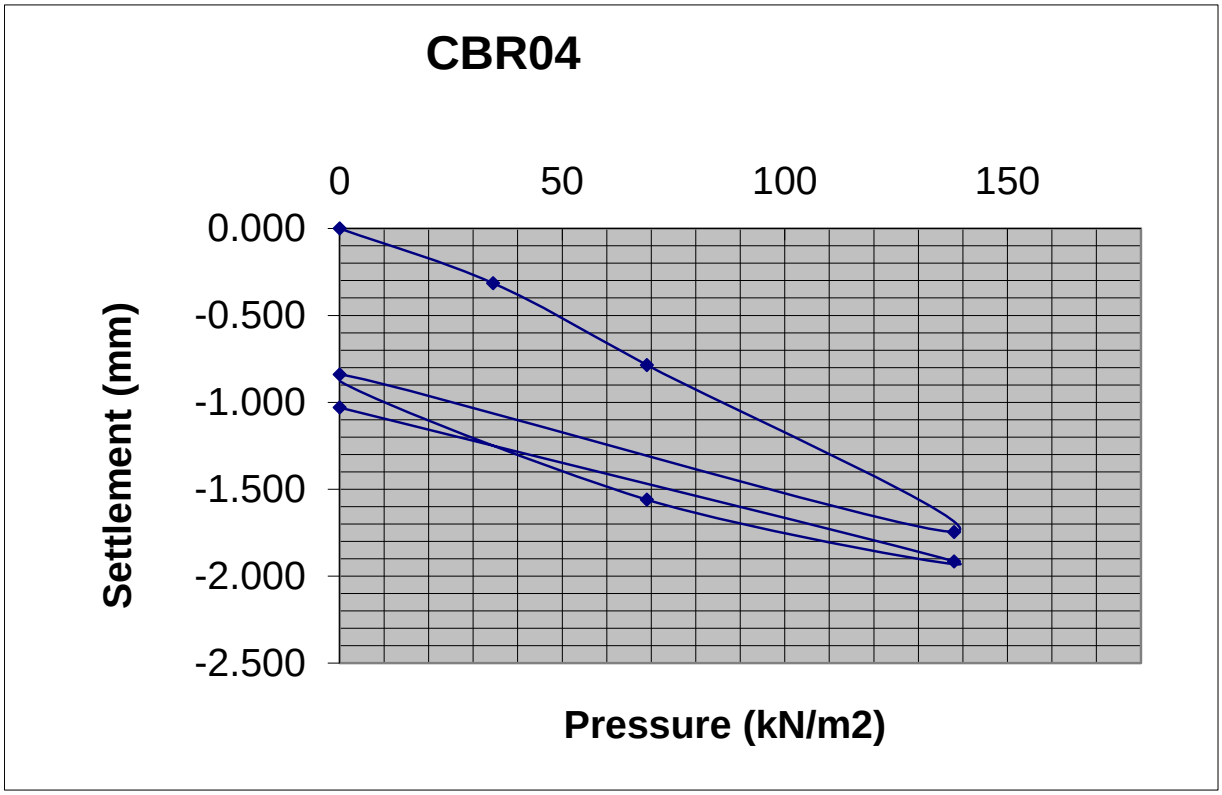
| | | | |
|---|---|---|---|
| **LOCATION** | The Quarter at Citwest, Cooldown Commons Phase 3 | **MATERIAL** | Soft to firm brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse. |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 31/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR04 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **59.39 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **64.75 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **11.43 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **13.28 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -0.06 |
| 69 | -0.065 |
| 138 | -0.145 |
| 0 | -0.025 |
| 69 | -0.17 |
| 138 | -0.18 |
| 0 | -0.03 |
| | |

GROUND INVESTIGATIONS IRELAND
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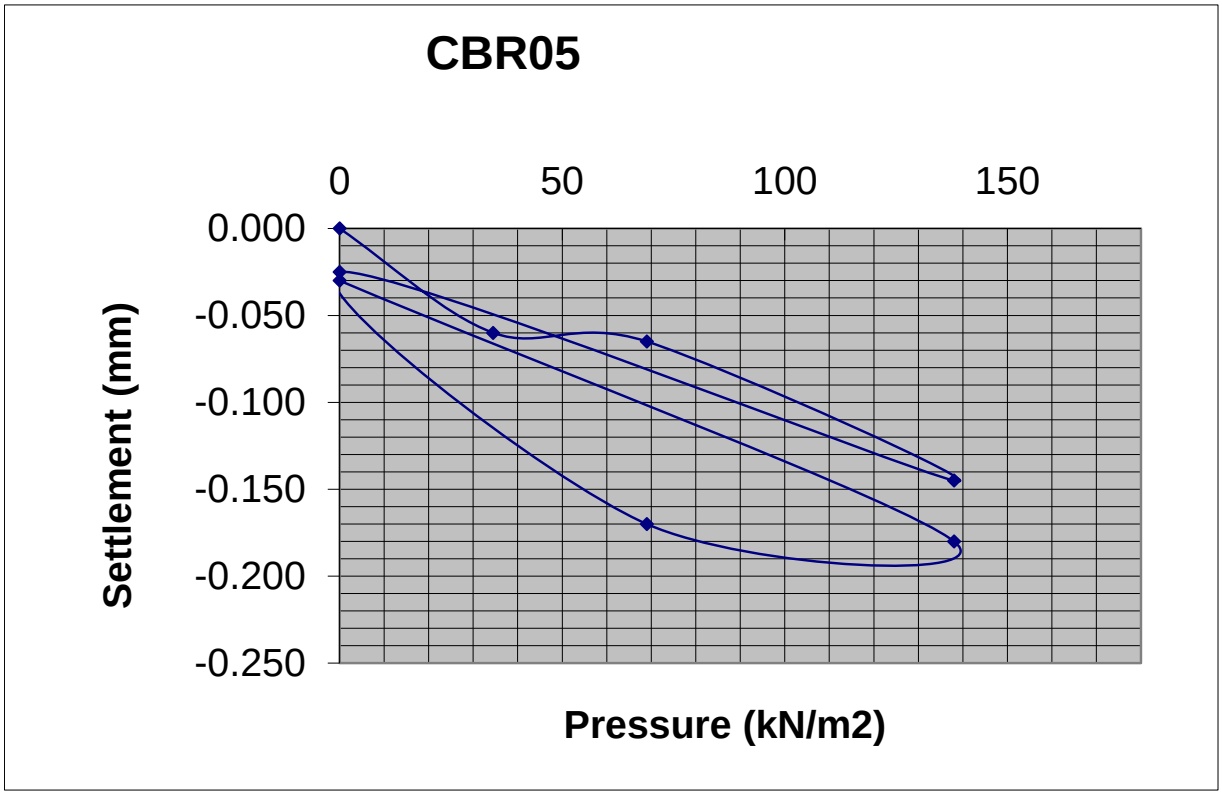
| | | | |
|---|---|---|---|
| **LOCATION** | The Quarter at Citwest, Cooldown Commons Phase 3 | **MATERIAL** | Soft brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 31/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR05 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **717.28 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **321.54 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **857.51 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **213.49 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -1.005 |
| 69 | -2.815 |
| 138 | -5.225 |
| 0 | -1.675 |
| 69 | -4.125 |
| 138 | -5.605 |
| 0 | -2.1 |
| | |

GROUND INVESTIGATIONS IRELAND
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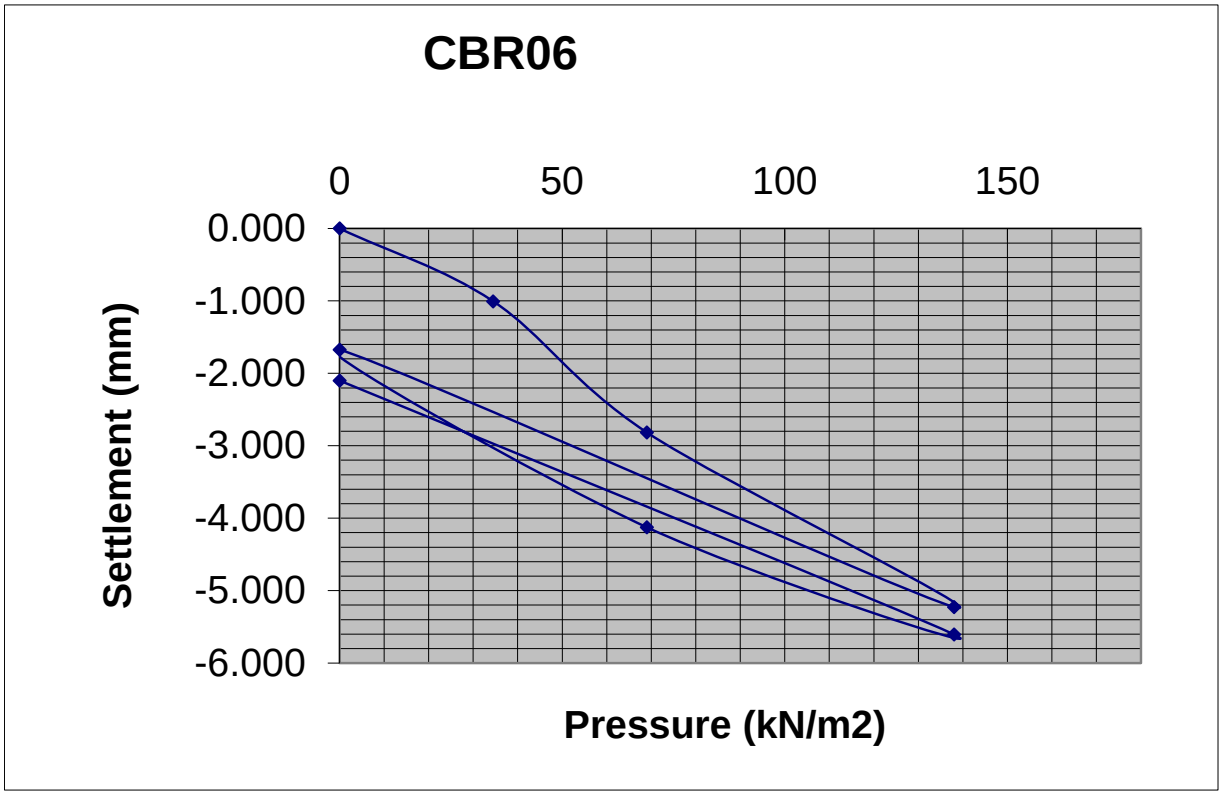
| | | | |
|---|---|---|---|
| **LOCATION** | The Quarter at Citwest, Cooldown Commons Phase 3 | **MATERIAL** | Soft brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 29/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR06 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **16.56 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **19.03 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **1.25 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **1.59 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -0.39 |
| 69 | -0.76 |
| 138 | -1.245 |
| 0 | -0.735 |
| 69 | -1.05 |
| 138 | -1.34 |
| 0 | -0.82 |
| | |

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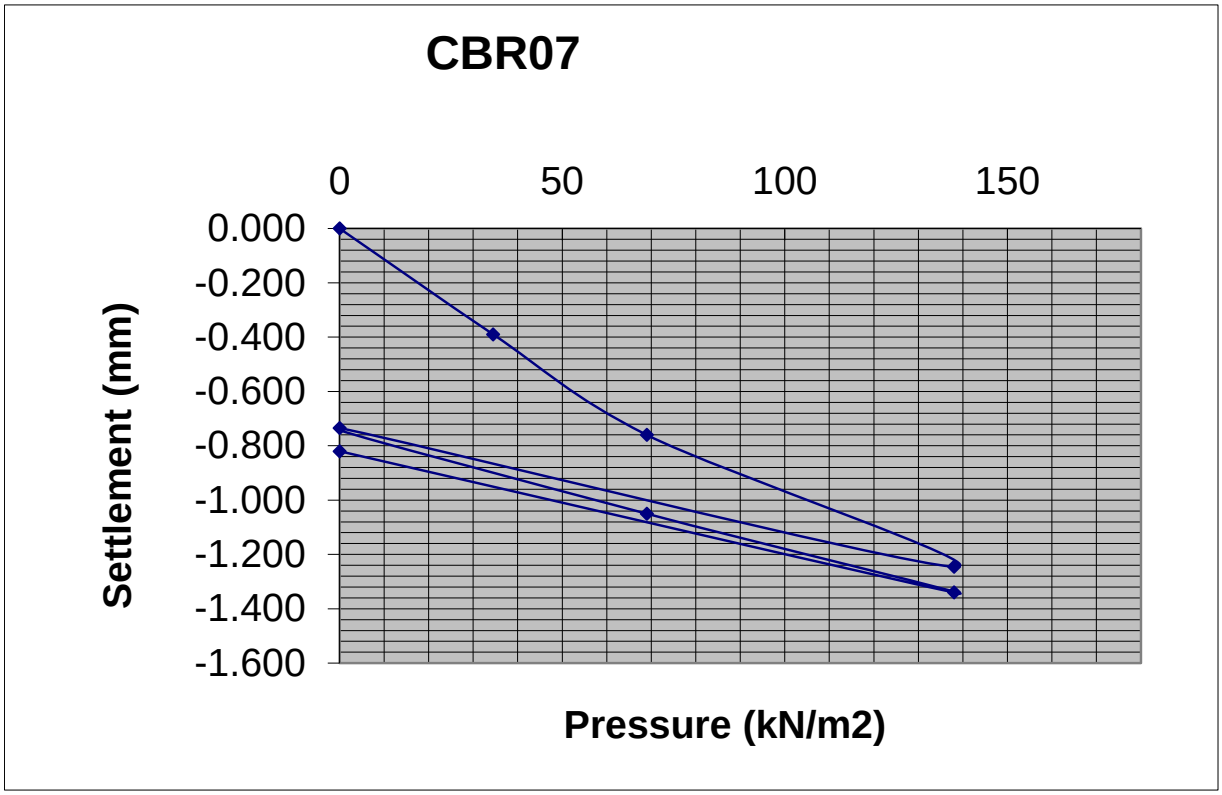
| | | | |
|---|---|---|---|
| **LOCATION** | The Quarter at Citwest, Cooldown Commons Phase 3 | **MATERIAL** | MADE GROUND: Grey slightly clayey sandy angular to subangular fine to coarse Gravel. |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 29/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR07 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **61.35 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **148.01 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **12.09 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **55.65 %**

| Applied Load | Gauge settlement |
|---|---|
| 0 | **0.000** |
| 34.5 | -0.35 |
| 69 | -0.495 |
| 138 | -0.605 |
| 0 | -0.09 |
| 69 | -0.55 |
| 138 | -0.495 |
| 0 | -0.115 |
| | |

GROUND INVESTIGATIONS IRELAND
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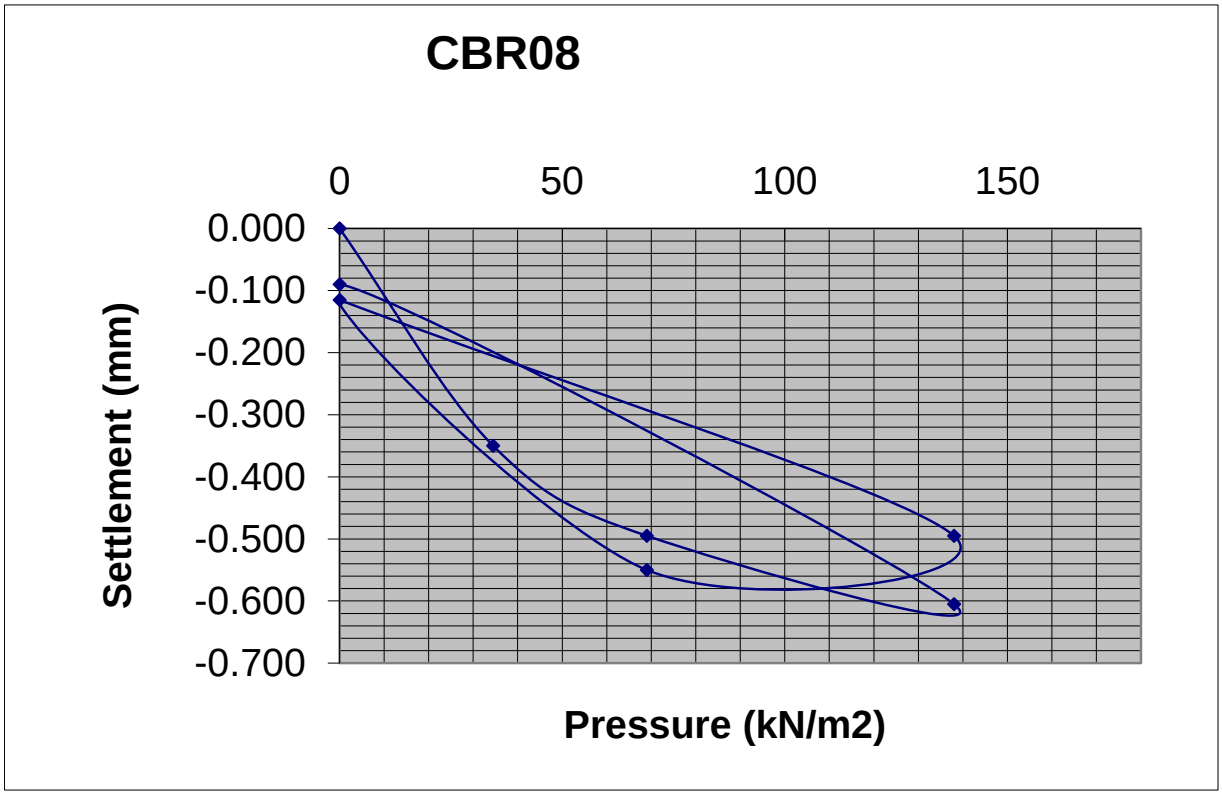
| | | | |
|---|---|---|---|
| **LOCATION** | The Quarter at Citwest, Cooldown Commons Phase 3 | **MATERIAL** | Soft brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse. |
| **CONTRACT NO.** | 9766-07-20 | | |
| **DATE** | 31/07/2020 | | |
| **CLIENT** | DBLF | **DEPTH** | 0.5m |
| **PLATE DIAMETER** | 457mm | **NOTES** | |
| **TEST NO.** | CBR08 | **SAMPLES** | |




Modulus of subgrade reaction, K (Initial) = **94.19 MN/m2/m**

Modulus of subgrade reaction, K (Reload) = **101.36 MN/m2/m**

Equivalent CBR(initial)in accordance with HD25/94 volume7 section2 = **25.43 %**

Equivalent CBR(reload)in accordance with HD25/94 volume7 section2 = **28.87 %**

# **APPENDIX 7** – Borehole Records

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH01 |
| **Machine :** Dando 2000 & Beretta T44<br>**Method :** Cable Percussion & Rotary follow on | **Casing Diameter** 200mm cased to 6.50m 96mm cased to 15.00m | **Ground Level (mOD)** 111.81 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705163.2 E 727230.1 N | **Dates** 04/08/2020-16/09/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.40) | Brown slightly sandy slightly gravelly CLAY | | | |
| | | | | | 111.41 | 0.40 | | | | |
| 0.50 | B | | | | | (0.60) | Brown mottled grey slightly sandy slightly gravelly CLAY | | | |
| 1.00 | B | | | | 110.81 | 1.00 | | | | |
| 1.00-1.45 | SPT(C) N=11 | | | 1,1/2,3,3,3 | | (0.30) | Firm brown mottled grey slightly sandy slightly gravelly CLAY with occasional subrounded cobbles | | | |
| | | | | | 110.51 | 1.30 | | | | |
| | | | | | | (0.70) | Firm brown slightly sandy slightly gravelly CLAY | | | |
| 2.00 | B | | | | 109.81 | 2.00 | | | | |
| 2.00-2.45 | SPT(C) N=9 | | | 1,1/2,2,2,3 | | (1.00) | Firm dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | | |
| 3.00 | B | | | | 108.81 | 3.00 | | | | |
| 3.00-3.32 | SPT(C) 50/165 | | | 17,20/10,17,23 | | | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | | |
| 4.00 | B | | | | | | | | ▼1 | |
| 4.00-4.44 | SPT(C) 50/285 | | | 6,10/10,15,15,10 | | | | | ▽1 | |
| | | | | Water strike(1) at 4.20m, rose to 4.10m in 20 mins, sealed at 4.50m. | | (3.50) | | | | |
| 5.00 | B | | | | | | | | | |
| 5.00-5.40 | SPT(C) 50/245 | | | 7,11/11,16,18,5 | | | | | | |
| 6.00 | B | | | | | | | | | |
| 6.00-6.32 | SPT(C) 50/170 | | | 5,11/15,25,10 | | | | | | |
| | **TCR** / **SCR** | | **RQD** | **FI** | | | | | | |
| 6.50 | 20 | | | | 105.31 | 6.50 | Poor recovery - recovery consists of: Brown/grey slightly sandy slightly clayey medium to coarse subangular to subrounded Gravel. Driller notes sandy gravelly CLAY (Very Stiff) | | | |
| | | | | | | (1.50) | | | | |
| 8.00-8.45 | | | | 5,6/6,7,8,8 SPT(C) N=29 | | | | | | |
| 8.00 | 33 | | | | 103.81 | 8.00 | Poor recovery - recovery consists of: Brown/grey slightly sandy clayey fine to coarse subangular to subrounded Gravel with occasional clay bands. Driller notes brown sandy gravelly CLAY (Very Stiff) | | | |
| 9.50-9.65 | | | | 21,29/50 SPT(C) 50/0 | | | | | | |
| 9.50 | | | | | | | | | | |

**Remarks**
Groundwater encountered at 4.20m BGL
Rotary follow on from 6.50m BGL
Complete at 15.00m BGL
50mm Standpipe installed in borehole upon completion, slotted from 15.00m BGL to 1.00m BGL, plain from 1.00m BGL to ground level with bentonite seal and raised cover.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH01

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH01 |
| **Machine :** Dando 2000 & Beretta T44<br>**Flush :** Water<br>**Core Dia :** 64 mm<br>**Method :** Cable Percussion & Rotary follow on | **Casing Diameter** 200mm cased to 6.50m<br>96mm cased to 15.00m | **Ground Level (mOD)** 111.81 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705163.2 E 727230.1 N | **Dates** 04/08/2020-16/09/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 23 | | | | 50/50<br>SPT(C) 50*/75<br>50/0 | | (6.00) | | | | |
| 11.00-11.08<br>11.00 | | | | | | | | | | | |
| | 33 | | | | 22,28/50<br>SPT(C) 50/0 | | | | | | |
| 12.50-12.65<br>12.50 | | | | | | | | | | | |
| | 20 | | | | 15,17/50<br>SPT(C) 50/75 | | | | | | |
| 14.00-14.23<br>14.00 | | | | | | 97.81 | 14.00 | Poor recovery - recovery consists of: Brown/grey slightly sandy slightly clayey medium to coarse Gravel with many cobbles. Driller notes coarse GRAVEL with many cobbles and boulders (Dense) | | | |
| | 60 | | | | | | (1.00) | | | | |
| 15.00 | | | | | | 96.81 | 15.00 | Complete at 15.00m | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH01

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH02 |
| **Machine :** Dando 2000 & Beretta T44<br>**Method :** Cable Percussion & Rotary follow on | **Casing Diameter** 200mm cased to 7.50m 96mm cased to 15.00m | **Ground Level (mOD)** 112.06 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705155.4 E 727216.4 N | **Dates** 05/08/2020-17/09/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.40) | TOPSOIL | | | |
| 0.50 | B | | | | 111.66 | 0.40 | Brown mottled grey slightly sandy gravelly CLAY with occasional subangular cobbles | | | |
| 1.00 | B | | | | | (0.60) | | | | |
| 1.00-1.45 | SPT(C) N=14 | | | 2,4/4,3,3,4 | 111.06 | 1.00 | Firm to stiff brown mottled grey slightly sandy gravelly CLAY with occasional subangular cobbles | | | |
| | | | | | | (0.70) | | | | |
| | | | | | 110.36 | 1.70 | | | | |
| | | | | | | (0.30) | Firm to stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles, gravel is fine to coarse, angular to subangular | | ▼1 | |
| 2.00 | B | | | Water strike(1) at 2.00m, rose to 1.95m in 20 mins, sealed at 2.10m. | 110.06 | 2.00 | | | | |
| 2.00-2.45 | SPT(C) N=21 | | | 3,3/4,5,5,7 | | | Stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles, gravel is fine to coarse, angular to subangular | | | |
| 3.00 | B | | | | | (2.00) | | | | |
| 3.00-3.45 | SPT(C) N=26 | | | 6,6/6,6,7,7 | | | | | | |
| 4.00 | B | | | | 108.06 | 4.00 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles, gravel is fine to coarse, angular to subangular | | | |
| 4.00-4.39 | SPT(C) 50/240 | | | 7,7/10,12,14,14 | | | | | | |
| 5.00 | B | | | | | | | | | |
| 5.00-5.39 | SPT(C) 50/235 | | | 6,9/12,13,20,5 | | | | | | |
| | | | | | | (3.50) | | | | |
| 6.00 | B | | | | | | | | | |
| 6.00-6.35 | SPT(C) 50/200 | | | 7,11/14,19,17 | | | | | | |
| 7.00 | B | | | | | | | | | |
| 7.00-7.20 | SPT(C) 50/45 | | | 15,20/20,30 | | | | | | |
| | **TCR** / **SCR** | **RQD** | **FI** | | | | | | | |
| 7.50 | 40 | | | | 104.56 | 7.50 | Very stiff dark grey slightly sandy gravelly CLAY with some cobbles and boulders. Gravel is fine to coarse, angular to subangular | | | |
| 8.00-8.30 | | | | 12,12/17,33 SPT(C) 50/150 | | | | | | |
| 8.00 | 100 | | | | | | | | | |
| | | | | | | (3.50) | | | | |
| 9.50-9.80 | | | | 7,17/16,34 SPT(C) 50/150 | | | | | | |
| 9.50 | | | | | | | | | | |

**Remarks**
Groundwater encountered at 2.00m BGL
Rotary follow on from 7.50m BGL
50mm Standpipe installed in borehole upon completion, slotted from 7.50m BGL to 1.00m BGL, plain from 1.00m BGL to ground level, with bentonite seal and raised cover.
Chiselling from 7.50m to 7.50m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH02

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH02 |
| **Machine :** Dando 2000 & Beretta T44<br>**Flush :** Water<br>**Core Dia :** 64 mm<br>**Method :** Cable Percussion & Rotary follow on | **Casing Diameter** 200mm cased to 7.50m<br>96mm cased to 15.00m | **Ground Level (mOD)** 112.06 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705155.4 E 727216.4 N | **Dates** 05/08/2020-17/09/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 60 | | | | 8,9/10,12,14,12<br>SPT(C) N=48 | 101.06 | 11.00 | | | | |
| 11.00-11.45<br>11.00 | | | | | | | (0.50) | Brown slightly clayey slightly gravelly fine to medium SAND | | | |
| | 50 | | | | | 100.56 | 11.50 | Poor recovery - recovery consists of: Grey slightly sandy slightly clayey fine to coarse angular to subangular Gravel. Driller notes Boulder Clay (Very Stiff) | | | |
| 12.50-12.80<br>12.50 | | | | | 8,10/16,34<br>SPT(C) 50/150 | | (1.00) | | | | |
| | 40 | | | | | 99.56 | 12.50 | Poor recovery - recovery consists of: Dark grey slightly sandy clayey fine to coarse angular to subangular Gravel with occasional cobbles. Driller notes Boulder Clay (Very Stiff) | | | |
| 14.00-14.23<br>14.00 | | | | | 4,25/50<br>SPT(C) 50/75 | | (1.20) | | | | |
| | 40 | | | | | 98.36 | 13.70 | Poor recovery - recovery consists of: Grey/brown slightly clayey fine to coarse angular to subangular Gravel with occasional cobbles. Driller notes Gravel with cobbles (Dense) | | | |
| 15.00 | | | | | | | (1.30) | | | | |
| | | | | | | 97.06 | 15.00 | Complete at 15.00m | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH02

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH03 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.70m<br>98mm to 15.00m | **Ground Level (mOD)** 112.45 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705146.8 E 727203.9 N | **Dates** 06/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.30) | FILL: Grey sandy fine to coarse angular Gravel (Crushed Rock Fill) | | |
| | | | | | 112.15 | 0.30 | | | |
| 0.50 | B | | | | | (0.70) | Brown mottled grey slightly sandy gravelly CLAY with occasional subangular cobbles, Gravel is fine to coarse, angular to subangular | | |
| 1.00 | B | | | | 111.45 | 1.00 | | | |
| 1.00-1.45 | SPT(C) N=12 | | | 1,2/2,3,3,4 | | | Firm to stiff brown mottled grey slightly sandy gravelly CLAY with occasional subangular cobbles, Gravel is fine to coarse, angular to subangular | | |
| | | | | Water strike(1) at 1.50m, rose to 1.40m in 20 mins, sealed at 3.40m. | | (1.00) | | | ▼1 ▽1 |
| 2.00 | B | | | | 110.45 | 2.00 | | | |
| 2.00-2.45 | SPT(C) N=14 | | | 2,2/2,3,4,5 | | | Firm to stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | | | (1.00) | | | |
| 3.00 | B | | | | 109.45 | 3.00 | | | |
| 3.00-3.45 | SPT(C) N=33 | | | 3,5/6,7,9,11 | | | Very stiff dark brownish grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 4.00 | B | | | | | | | | |
| 4.00-4.45 | SPT(C) N=49 | | | 4,5/9,11,14,15 | | | | | ▼2 |
| 5.00 | B | | | Water strike(2) at 5.00m, rose to 4.50m in 20 mins. | | | | | ▽2 |
| 5.00-5.43 | SPT(C) 50/275 | | | 6,9/11,14,16,9 | | (4.70) | | | |
| 6.00 | B | | | | | | | | |
| 6.00-6.33 | SPT(C) 50/180 | | | 10,12/14,17,19 | | | | | |
| 7.00 | B | | | | | | | | |
| 7.00-7.31 | SPT(C) 50/160 | | | 14,16/17,24,9 | | | | | |
| | **TCR** / **SCR** | **RQD** | **FI** | | | | | | |
| 7.70 | 100 | | | 7,9/11,11,13,14 | 104.75 | 7.70 | Poor recovery - recovery consists of: Grey fine to coarse subangular Gravel of Limestone with cobble fragments. | | |
| 8.00-8.45 | | | | SPT(C) N=49 | | (0.30) | Drillers notes: Boulder CLAY (Very stiff) | | |
| 8.00 | | | | | 104.45 | 8.00 | | | |
| | 46 | | | | | | Recovery consists of: Very stiff grey/dark grey slightly sandy gravelly CLAY with occasional cobble fragments | | |
| 9.30-9.75 | | | | 5,7/10,11,12,13 | | | | | |
| 9.30 | | | | SPT(C) N=46 | | | | | |
| | 53 | | | | | (3.20) | | | |

**Remarks**
Groundwater encountered at 1.50m BGL and 5.00m BGL
Rotary Core follow on from 7.70m BGL
Borehole backfilled upon compleion
Chiselling from 7.70m to 7.70m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH03

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH03 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia :** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.70m<br>98mm to 15.00m | **Ground Level (mOD)** 112.45 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705146.8 E 727203.9 N | **Dates** 06/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.30-10.75 | | | | | 7,10/12,11,13,14 SPT(C) N=50 | | | | | |
| 10.30 | 100 | | | | | | | | | |
| 11.20-11.65 | | | | | 5,4/9,8,10,9 SPT(C) N=36 | 101.25 | 11.20 | Poor recovery - recovery consists of: Grey clayey fine to coarse subangular to subrounded gravel of Limestone. Drillers notes: Boulder CLAY (Very stiff) | | |
| 11.20 | 25 | | | | | | | | | |
| 12.70-13.15 | | | | | 4,6/9,7,10,8 SPT(C) N=34 | | | | | |
| 12.70 | 26 | | | | | | (3.80) | | | |
| 14.00-14.45 | | | | | 5,7/9,11,13,10 SPT(C) N=43 | | | | | |
| 14.00 | 31 | | | | | | | | | |
| 15.00 | | | | | | 97.45 | 15.00 | Complete at 15.00m | | |
| | **Sample / Tests** | | **Casing Depth (m)** | **Water Depth (m)** | | | | | | |
| 15.00-15.45 | SPT(C) N=47 | | | | 7,7/11,13,10,13 | | | | | |

**Remarks**

| **Scale (approx)** | **Logged By** |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH03

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| Site | Borehole Number |
|---|---|
| The Quarter at Citywest, Cooldown Commons Phase 3 | BH04 |

| Machine : Dando 2000<br>Method : Cable Percussion | Casing Diameter<br>200mm cased to 10.00m | Ground Level (mOD)<br>113.07 | Client<br>DBFL | Job Number<br>9766-07-20 |
|---|---|---|---|---|
| | Location (dGPS)<br>705115.4 E 727189.3 N | Dates<br>05/08/2020 | Engineer | Sheet<br>1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 112.87 | (0.20)<br>0.20 | TOPSOIL | | |
| 0.50 | B | | | | | (0.50) | Brown slightly sandy slightly gravelly CLAY with occasional rootlets | | |
| | | | | | 112.37 | 0.70<br>(0.30) | Brown mottled grey slightly sandy slightly gravelly CLAY | | |
| 1.00-1.45<br>1.00 | SPT(C) N=11<br>B | | | 2,3/3,2,3,3 | 112.07 | 1.00<br>(0.50) | Firm brown mottled grey slightly sandy slightly gravelly CLAY | | |
| | | | | | 111.57 | 1.50<br>(0.50) | Firm brown slightly sandy gravelly CLAY with occasional subangular cobbles | | |
| 2.00-2.45<br>2.00 | SPT(C) N=12<br>B | | | 1,1/2,2,3,5 | 111.07 | 2.00<br>(0.40) | Firm to stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles | | |
| | | | | | 110.67 | 2.40<br>(0.60) | Firm to stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles | | |
| 3.00-3.45<br>3.00 | SPT(C) N=24<br>B | | | 8,9/3,4,5,12 | 110.07 | 3.00<br>(1.00) | Stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles | | |
| 4.00-4.45<br>4.00 | SPT(C) N=46<br>B | | | 4,5/7,9,14,16 | 109.07 | 4.00 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles | | |
| 5.00-5.37<br>5.00 | SPT(C) 50/220<br>B | | | 9,11/14,14,22<br>Water strike(1) at 5.20m, rose to 5.00m in 20 mins, sealed at 5.60m. | | | | ▼1<br>▽1 | |
| 6.00-6.38<br>6.00 | SPT(C) 50/225<br>B | | | 10,14/14,16,20 | | | | | |
| 7.00-7.34<br>7.00 | SPT(C) 50/190<br>B | | | 10,10/16,20,14 | | (6.00) | | | |
| 8.00-8.30<br>8.00 | SPT(C) 50/145<br>B | | | 11,12/17,33 | | | | | |
| 9.00-9.28<br>9.00 | SPT(C) 50/125<br>B | | | 12,16/24,26 | | | | | |
| 10.00-10.24 | SPT(C) 50/85 | | | 14,22/34,16 | 103.07 | 10.00 | | | |

**Remarks**
Groundwater encountered at 5.20m BGL
Complete at 10.00m BGL
Borehole backfilled upon compleion

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.**
9766-07-20.BH04

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| | | | | |
|---|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | | **Borehole Number** BH04 |
| **Machine :** Dando 2000<br>**Method :** Cable Percussion | **Casing Diameter** 200mm cased to 10.00m | **Ground Level (mOD)** 113.07 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705115.4 E 727189.3 N | **Dates** 05/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| 10.00 | B | | | | | | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH04

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH05 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.00m<br>98mm to 15.00m | **Ground Level (mOD)** 113.29 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705072.1 E 727198 N | **Dates** 06/08/2020-07/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.80) | MADE GROUND: Brown mottled grey slightly sandy slightly gravelly Clay with fragments of concrete | | |
| 1.00<br>1.00-1.45 | B<br>SPT(C) N=10 | | | 1,1/2,3,2,3 | 112.49<br>112.29 | 0.80<br>(0.20)<br>1.00 | Brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles | | |
| | | | | | | (1.00) | Firm brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles | | |
| 2.00<br>2.00-2.45 | B<br>SPT(C) N=5 | | | 2,1/1,1,1,2 | 111.29 | 2.00 | Soft brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles | | |
| | | | | | | (1.00) | | | |
| 3.00 | B | | | Water strike(1) at 3.00m, rose to 2.80m in 20 mins, sealed at 3.30m. | 110.29 | 3.00 | Firm to stiff brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles | | |
| 3.00-3.45 | SPT(C) N=16 | | | 2,3/4,4,4,4 | | (0.70) | | | |
| 4.00<br>4.00-4.45 | B<br>SPT(C) N=32 | | | 5,6/7,10,7,8 | 109.59<br>109.29 | 3.70<br>(0.30)<br>4.00 | Firm to stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | | | | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 5.00<br>5.00-5.35 | B<br>SPT(C) 50/200 | | | 8,11/19,16,15 | | (3.00) | | | |
| 6.00<br>6.00-6.33 | B<br>SPT(C) 50/180 | | | 11,15/21,17,12 | | | | | |
| 7.00<br>7.00-7.21 | TCR / SCR | RQD | FI | 16,23/50<br>B<br>SPT(C) 50/60 | 106.29 | 7.00 | Poor recovery - recovery consists of: Brown gravelly fine to coarse Sand. Drillers notes: Boulder CLAY (Very stiff)<br>Rotary Core follow on from 7.00m BGL | | |
| 7.00 | 22 | | | | | (1.30) | | | |
| 8.30-8.75<br>8.30 | | | | 5,5/9,10,9,11<br>SPT(C) N=39 | 104.99 | 8.30 | Poor recovery - recovery consists of: Grey fine to coarse subangular to subrounded gravel of Limestone with cobble fragments. Drillers notes: Boulder CLAY (Very stiff) | | |
| | 24 | | | | | | | | |
| 9.40-9.85<br>9.40 | | | | 2,6/7,9,9,13<br>SPT(C) N=38 | | | | | |

**Remarks**
Groundwater encountered at 3.00m BGL
Rotary Core follow on from 7.00m BGL
Borehole backfilled upon compleion
Chiselling from 7.00m to 7.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH05

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH05 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :**<br>**Core Dia :** mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.00m 98mm to 15.00m | **Ground Level (mOD)** 113.29 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705072.1 E 727198 N | **Dates** 06/08/2020-07/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| | 17 | | | | 1,1/5,7,9,12 SPT(C) N=33 | | (4.40) | | | |
| 11.10-11.55 11.10 | 27 | | | | 9,10/25,25 SPT(C) 50/150 | | | | | |
| 12.60-12.90 12.60 | 19 | | | | 6,7/11,13,13,13 SPT(C) N=50 | 100.59 | 12.70 | Poor recovery - recovery consists of: Grey/brown gravelly fine to coarse Sand. Drillers notes: Boulder CLAY and Sand. (Very stiff) | | |
| 14.00-14.45 14.00 | 30 | | | | | | (2.30) | | | |
| 15.00 | Sample / Tests | | Casing Depth (m) | Water Depth (m) | | 98.29 | 15.00 | Complete at 15.00m | | |
| 15.00-15.45 | SPT(C) N=50 | | | | 6,7/12,13,16,9 | | | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH05

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH06 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 10.00m<br>98mm to 18.00m | **Ground Level (mOD)** 115.93 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705035.2 E 727176.7 N | **Dates** 03/09/2020-04/09/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MADE GROUND: Brown slightly sandy slightly gravelly Clay (Stockpile) | | |
| 1.00-1.45<br>1.00 | SPT(C) N=4<br>B | | | 1,1/1,1,1,1 | | (2.70) | | | |
| 2.00-2.45<br>2.00 | SPT(C) N=5<br>B | | | 2,1/2,1,1,1 | | | | | |
| | | | | | 113.23 | 2.70 | Soft brown slightly sandy gravelly CLAY with some subangular cobbles and rootlets. Gravel is fine to coarse, angular to subangular. | | |
| 3.00-3.45<br>3.00 | SPT(C) N=5<br>B | | | 7,2/1,1,1,2 | | (1.30) | | | |
| 4.00-4.45<br>4.00 | SPT(C) N=7<br>B | | | 3,3/1,1,3,2 | 111.93 | 4.00 | Soft to firm brown slightly sandy gravelly CLAY with some subangular cobbles and rootlets. Gravel is fine to coarse, angular to subangular. | | |
| | | | | | | (1.00) | | | ▼1 |
| 5.00-5.45<br>5.00 | SPT(C) N=38<br>B | | | 7,9/11,9,9,9 | 110.93<br>110.73 | 5.00<br>(0.20)<br>5.20 | Very stiff brown slightly sandy gravelly CLAY with some subangular cobbles and rootlets. Gravel is fine to coarse, angular to subangular. | | |
| | | | | | | | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 6.00 | B | | | Water strike(1) at 6.00m, rose to 4.50m in 20 mins, sealed at 8.00m. | | | | | ▽1 |
| 6.00-6.42 | SPT(C) 50/265 | | | 5,13/13,13,14,10 | | | | | |
| 7.00-7.29<br>7.00 | SPT(C) 50/135<br>B | | | 14,18/18,32 | | | | | |
| | | | | | | (4.80) | | | |
| 8.00-8.28<br>8.00 | SPT(C) 50/125<br>B | | | 16,16/25,25 | | | | | |
| 9.00-9.14<br>9.00 | SPT(C) 46*/135<br>50/0<br>B | | | 13,33/50 | | | | | |
| 10.00 | | | | | | | | | |

**Remarks**
Groundwater encountered at 6.00m BGL
Rotary Core follow on from 10.00m BGL
Borehole backfilled upon compleion
Chiselling from 10.00m to 10.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH06

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH06 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia :** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 10.00m<br>98mm to 18.00m | **Ground Level (mOD)** 115.93 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705035.2 E 727176.7 N | **Dates** 03/09/2020-04/09/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.00 | | | | | B | | | | | |
| 10.00-10.16 | | | | | SPT(C) 50/10<br>20,30/50 | 105.93 | 10.00 | Poor recovery - recovery consists of: Grey/brown slightly clayey fine to coarse angular to subrounded Gravel of Mixed Lithology. Drillers notes: Boulder CLAY (Very stiff) | | |
| | 17 | | | | | | | | | |
| 11.20-11.65 | | | | | 3,3/7,7,10,11<br>SPT(C) N=35 | | | | | |
| 11.20 | 30 | | | | | | | | | |
| 12.20-12.65 | | | | | 6,7/9,9,11,10<br>SPT(C) N=39 | | (4.20) | | | |
| 12.20 | 29 | | | | | | | | | |
| 13.60-14.05 | | | | | 5,7/10,10,12,15<br>SPT(C) N=47 | | | | | |
| 13.60 | 45 | | | | | | | | | |
| 14.20-14.65 | | | | | 7,9/9,11,11,13<br>SPT(C) N=44 | 101.73 | 14.20 | Poor recovery - recovery consists of: Grey fine to coarse angular to subrounded Gravel of Limestone. Drillers notes: Boulder CLAY (Very stiff) | | |
| 14.20 | 20 | | | | | | | | | |
| 15.50-15.88 | | | | | 6,9/12,10,28<br>SPT(C) 50/225 | | (2.90) | | | |
| 15.50 | 22 | | | | | | | | | |
| 17.00-17.45 | | | | | 4,4/7,6,8,10<br>SPT(C) N=31 | | | | | |
| 17.00 | | | | | | 98.83 | 17.10 | Poor recovery - recovery consists of: Grey/green Cobble and Boulder fragments of Limestone and Sandstone. Drillers notes: Boulder CLAY (Very stiff0 | | |
| | 52 | | | | | | (0.90) | | | |
| 18.00-18.03 | | | | | 25/50<br>SPT(C) 25*/30<br>50/0 | 97.93 | 18.00 | Complete at 18.00m | | |
| 18.00 | | | | | | | | | | |

**Remarks**
Chiselling from 10.00m to 10.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH06

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH07 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 11.00m<br>98mm to 18.00m | **Ground Level (mOD)** 116.04 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705027.5 E 727197.8 N | **Dates** 02/09/2020-03/09/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MADE GROUND: Brown slightly sandy slightly gravelly Clay with rootlets and fragments of plastic (Stockpile) | | |
| 1.00<br>1.00-1.45 | B<br>SPT(C) N=15 | | | 1,1/2,3,5,5 | | | | | |
| | | | | | | (3.30) | | | |
| 2.00<br>2.00-2.45 | B<br>SPT(C) N=9 | | | 2,2/2,4,1,2 | | | | | |
| 3.00<br>3.00-3.45 | B<br>SPT(C) N=10 | | | 3,2/2,2,3,3 | | | | | |
| | | | | | 112.74 | 3.30 | Firm light brown slightly sandy gravelly CLAY with some subangular cobbles and rootlets. Gravel is fine to coarse, angular to subangular. | | |
| 4.00<br>4.00-4.45 | B<br>SPT(C) N=8 | | | 1,2/2,2,3,1 | | | | | |
| | | | | | | (1.70) | | | |
| 5.00<br>5.00-5.45 | B<br>SPT(C) N=13 | | | 3,3/3,3,3,4 | 111.04 | 5.00 | Firm to stiff light brown slightly sandy gravelly CLAY with some subangular cobbles and rootlets. Gravel is fine to coarse, angular to subangular. | | |
| | | | | | | (1.00) | | | |
| 6.00<br>6.00-6.45 | B<br>SPT(C) N=19 | | | 3,3/4,4,4,7 | 110.04 | 6.00 | Stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| | | | | | | (1.00) | | | |
| 7.00<br>7.00-7.45 | B<br>SPT(C) N=34 | | | 6,8/9,9,9,7 | 109.04 | 7.00 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 8.00<br>8.00-8.41 | B<br>SPT(C) 50/255 | | | 11,14/10,16,10,14 | | | | | |
| | | | | | | (3.00) | | | |
| 9.00<br>9.00-9.35 | B<br>SPT(C) 50/200 | | | 17,17/23,17,10 | | | | | |
| 9.60<br>10.00-10.07<br>10.00 | | | | 50/50<br>SPT(C) 50*/70<br>50/0<br>B | | | | | |

| TCR | SCR | RQD | FI |
|---|---|---|---|
| 100<br>8.85 | | | |
| 56<br>9.10 | | | |

**Remarks**
No groundwater encountered
Rotary Core follow on from 11.00m BGL
Borehole backfilled upon compleion

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH07

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH07 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :**<br>**Core Dia :** mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 11.00m<br>98mm to 18.00m | **Ground Level (mOD)** 116.04 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705027.5 E 727197.8 N | **Dates** 02/09/2020-03/09/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 106.04 | 10.00 | Poor recovery - recovery consists of: Grey fine to coarse subangular to subrounded Gravel of Mixed Lithology with occasional cobble and boulder fragments. Drillers notes: Boulder CLAY (Very stiff) | | |
| | 29 | | | | 50/50 | | | | | |
| 11.00-11.07 | | | | | SPT(C) 50*/70 | | | | | |
| 11.00 | | | | | 50/0 | | | | | |
| 11.00 | | | | | B | | | | | |
| | 45 | | | | | | | | | |
| | | | | | 5,5/9,11,11,9 | | | | | |
| 12.10-12.55 | | | | | SPT(C) N=40 | | | | | |
| 12.10 | | | | | | | (4.60) | | | |
| | 30 | | | | | | | | | |
| | | | | | 6,7/10,13,10,12 | | | | | |
| 13.20-13.65 | | | | | SPT(C) N=45 | | | | | |
| 13.40 | | | | | | | | | | |
| | 38 | | | | | | | | | |
| | | | | | 25/50 | | | | | |
| 14.20-14.23 | | | | | SPT(C) 25*/30 | | | | | |
| 14.20 | | | | | 50/0 | | | | | |
| | 100 | | | | | | | | | |
| 14.60 | | | | | | 101.44 | 14.60 | Poor recovery - recovery consists of: Grey fine to medium angular to subrounded Gravel of Limestone with occasional cobble fragments. Drillers notes: Boulder CLAY (Very stiff) | | |
| | 13 | | | | | | | | | |
| | | | | | 3,3/9,9,11,13 | | | | | |
| 16.10-16.55 | | | | | SPT(C) N=42 | | | | | |
| 16.10 | | | | | | | (3.40) | | | |
| | 26 | | | | | | | | | |
| | | | | | 5,4/7,9,13,11 | | | | | |
| 17.10-17.55 | | | | | SPT(C) N=40 | | | | | |
| 17.10 | | | | | | | | | | |
| | 50 | | | | | | | | | |
| | | | | | 3,6/6,8,7,9 | | | | | |
| 18.00-18.45 | | | | | SPT(C) N=30 | | | | | |
| 18.00 | | | | | | 98.04 | 18.00 | Complete at 18.00m | | |

**Remarks**
Chiselling from 11.00m to 11.00m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH07

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH08 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 11.00m<br>98mm to 18.00m | **Ground Level (mOD)** 116.81 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704994 E 727176.4 N | **Dates** 01/09/2020-02/09/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MADE GROUND: Brown slightly sandy slightly gravelly Clay with occasional subangular cobbles (Stockpile) | | | |
| 1.00-1.45<br>1.00 | SPT(C) N=7<br>B | | | 2,2/1,2,2,2 | | | | | | |
| | | | | | | (2.80) | | | | |
| 2.00-2.45<br>2.00 | SPT(C) N=6<br>B | | | 3,2/1,1,2,2 | | | | | | |
| | | | | | 114.01 | 2.80 | | | | |
| | | | | | | (0.20) | Soft to firm brown slightly sandy slightly gravelly CLAY | | | |
| 3.00-3.45<br>3.00 | SPT(C) N=16<br>B | | | 4,5/5,5,3,3 | 113.81 | 3.00 | Stiff brown slightly sandy slightly gravelly CLAY | | | |
| | | | | | | (1.50) | | | | |
| 4.00-4.45<br>4.00 | SPT(C) N=18<br>B | | | 7,6/6,3,4,5 | | | | | | |
| | | | | | 112.31 | 4.50 | | | | |
| | | | | | | (0.50) | Stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | | |
| 5.00-5.45<br>5.00 | SPT(C) N=44<br>B | | | 9,10/11,9,12,12 | 111.81 | 5.00 | | | | |
| | | | | | | (0.40) | Very stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | | |
| | | | | | 111.41 | 5.40 | | | | |
| 6.00-6.34<br>6.00 | SPT(C) 50/190<br>B | | | 7,7/17,19,14 | | | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | | |
| 7.00-7.39<br>7.00 | SPT(C) 50/235<br>B | | | 14,15/21,16,12,1 | | | | | | |
| 8.00-8.31<br>8.00 | SPT(C) 50/160<br>B | | | 19,19/23,22,5 | | | | | | |
| 9.00-9.37<br>9.00 | SPT(C) 50/220<br>B | | | 3,11/15,12,23 | | | | | | |
| | | | | | | (7.60) | | | | |
| 10.00-10.35 | SPT(C) 50/200 | | | 16,17/21,20,9 | | | | | | |

**Remarks**
No groundwater encountered.
Rotary Core follow on from 13.00m BGL
Slotted standpipe installed from 18.00m BGL to 9.00m BGL with a pea gravel suroound, with a plain standpipe installed from 9.00m BGL to GL with a betonie seal and a raised cover

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH08

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH08 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 11.00m 98mm to 18.00m | **Ground Level (mOD)** 116.81 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704994 E 727176.4 N | **Dates** 01/09/2020-02/09/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | Sample / Tests | TCR | SCR | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10.00 | B | | | | | | | | | | | |
| 11.00<br>11.00-11.21 | B<br>SPT(C) 50/60 | | | | | 30,21/50 | | | | | | |
| 12.00<br>12.00-12.27 | B<br>SPT(C) 50/115 | | | | | 22,24/32,18 | | | | | | |
| 13.00<br>13.00-13.13 | | TCR | SCR | RQD | FI | 38,50/50<br>B<br>SPT(C) 88*/125<br>50/0 | 103.81 | 13.00 | Poor recovery - recovery consists of: Dark grey clayey fine to coarse angular to subrounded Gravel of Mixed Lithology. Drillers notes: Boulder CLAY (Very stiff) | | | |
| 13.00 | | 34 | | | | | | (1.20) | | | | |
| 14.20-14.65<br>14.20 | | 46 | | | | 4,7/9,9,12,10<br>SPT(C) N=40 | 102.61 | 14.20 | Poor recovery - recovery consists of: Grey slightly clayey fine to coarse angular to subrounded Gravel of Mixed Lithology with occasional cobble and boulder fragments. Drillers notes: Boulder CLAY (Very stiff) | | | |
| 15.00-15.45<br>15.00 | | 19 | | | | 7,9/11,13,11,10<br>SPT(C) N=45 | | (3.80) | | | | |
| 16.50-16.73<br>16.50 | | 37 | | | | 5,5/10,40<br>SPT(C) 50/75 | | | | | | |
| 18.00-18.03<br>18.00 | | | | | | 25/50<br>SPT(C) 25*/30<br>50/0 | 98.81 | 18.00 | Complete at 18.00m | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH08

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH09 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 8.10m<br>98mm to 15.00m | **Ground Level (mOD)** 114.35 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704964.5 E 727192.5 N | **Dates** 10/08/2020-11/10/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (1.00) | Brown slightly sandy slightly gravelly CLAY | | |
| 1.00-1.45<br>1.00 | SPT(C) N=14<br>B | | | 2,3/3,3,4,4 | 113.35 | 1.00 | | | |
| | | | | | | (1.00) | Firm to stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 2.00-2.37<br>2.00 | SPT(C) 44/220<br>B | | | 8,6/9,17,18 | 112.35 | 2.00 | | | |
| | | | | | | (0.60) | Very stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 3.00-3.22<br>3.00 | SPT(C) 50/70<br>B | | | 12,15/50 | 111.75 | 2.60 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 4.00-4.38<br>4.00 | SPT(C) 50/230<br>B | | | 4,9/11,16,19,4 | | | | | |
| | | | | | | (4.10) | | | |
| 5.00-5.35<br>5.00 | SPT(C) 50/200<br>B | | | 5,11/17,19,14 | | | | | |
| 6.00-6.35<br>6.00 | SPT(C) 50/200<br>B | | | 6,11/19,20,11 | | | | | |
| | | | | | 107.65 | 6.70 | Medium dense brown slightly clayey gravelly fine to medium SAND. Gravel is fine to coarse, angular to subangular | | |
| 7.00-7.45<br>7.00 | SPT(C) N=16<br>B | | | 4,4/4,3,4,5 | | (0.80) | | | |
| | | | | | 106.85 | 7.50 | Very stiff greyish brown slightly gravelly sandy CLAY | | |
| 8.00-8.16<br>8.00 | SPT(C) 50/10<br>B | | | 17,21/50 | | | | | |
| | | | | | | (2.50) | | | |
| 10.00 | | | | | | | | | |

**Remarks**
No groundwater encountered
Rotary Core follow on from 8.10m BGL
Borehole backfilled upon compleion
Chiselling from 3.20m to 3.40m for 1 hour. Chiselling from 8.10m to 8.10m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH09

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH09 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia :** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 8.10m<br>98mm to 15.00m | **Ground Level (mOD)** 114.35 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704964.5 E 727192.5 N | **Dates** 10/08/2020-11/10/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.00-10.45 | 30 | | | | SPT(C) N=37<br>5,5/9,11,9,8 | 104.35 | 10.00 | Poor recovery - recovery consists of: grey/brown clayey fine to coarse angular to subrounded Gravel of Mixed Lithology with occasional cobble fragments. Drillers notes: Boulder CLAY (Stiff) | | |
| 11.00-11.45<br>11.00 | 15 | | | | 3,2/6,6,8,7<br>SPT(C) N=27 | | (3.20) | | | |
| 12.10-12.55<br>12.10 | 38 | | | | 6,7/9,11,10,9<br>SPT(C) N=39 | | | | | |
| 13.20-13.65<br>13.20 | 75 | | | | 5,4/7,8,10,11<br>SPT(C) N=36 | 101.15 | 13.20 | Recovery consists of: Very stiff brown slightly sandy gravelly CLAY with occasional cobble and boulder fragments. Gravel is fine to coarse subangular to subrounded | | |
| 14.20-14.65<br>14.20 | 75 | | | | 6,6/9,10,10,12<br>SPT(C) N=41 | | (1.80) | | | |
| 15.00 | **Sample / Tests** | | **Casing Depth (m)** | **Water Depth (m)** | | 99.35 | 15.00 | Complete at 15.00m | | |
| 15.00-15.45 | SPT(C) N=41 | | | | 5,7/8,11,12,10 | | | | | |

**Remarks**

| **Scale (approx)** | **Logged By** |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH09

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH10 |
| **Machine :** Dando 2000<br>**Method :** Cable Percussion | **Casing Diameter** 200mm to 9.4m | **Ground Level (mOD)** 114.29 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704942.7 E 727211.9 N | **Dates** 14/08/2020-17/08/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.50 | B | | | | | | Stiff to very stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to subangular. | | | |
| 1.00-1.45<br>1.00 | SPT(C) N=25<br>B | | | 3,4/5,6,7,7 | | | | | | |
| 2.00-2.45<br>2.00 | SPT(C) N=42<br>B | | | 7,9/10,10,11,11 | | (3.80) | | | | |
| 3.00-3.45<br>3.00 | SPT(C) N=43<br>B | | | 5,8/10,10,11,12 | | | | | ▼1 | |
| 4.00 | B | | | Water strike(1) at 3.80m, rose to 3.70m in 20 mins, sealed at 4.00m. | 110.49 | 3.80 | Very stiff brown sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | ▽1 | |
| 4.00-4.45 | SPT(C) N=33 | | | 4,4/7,7,9,10 | | | | | | |
| 5.00-5.45<br>5.00 | SPT(C) N=39<br>B | | | 4,6/9,8,10,12 | | (3.00) | | | ▼2 | |
| 6.00-6.45<br>6.00 | SPT(C) N=50<br>B | | | 12,16/25,25<br>Water strike(2) at 6.30m, rose to 5.00m in 20 mins. | | | | | ▽2 | |
| 7.00-7.45<br>7.00 | SPT(C) N=50<br>B | | | 16,16/16,25,9 | 107.49 | 6.80 | Dense brown/grey slightly clayey sandy fine to coarse angular to subangular GRAVEL with frequent subangular cobbles. | | | |
| 8.00-8.45<br>8.00 | SPT(C) N=50<br>B | | | 10,10/26,24 | | (2.60) | | | | |
| 9.00-9.45<br>9.00 | SPT(C) N=50<br>B | | | 16,25/50 | | | | | | |
| | | | | | 104.89 | 9.40 | OBSTRUCTION due to possible boulder or bedrock. | | | |
| | | | | | | | Complete at 9.40m | | | |

**Remarks**
Groundwater encountered at 3.80m BGL and 6.30m BGL.
Refusal at 9.40m BGL.
Slotted standpipe installed from 9.40m BGL to 1.00m BGL with a pea gravel surround, with a plain standpipe installed from 1.00m BGL to GLwith a bentonite seal and a raised cover
Chiselling from 9.40m to 9.40m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH10

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH11 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 8.10m<br>98mm to 15.00m | **Ground Level (mOD)** 113.26 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704986.6 E 727203.1 N | **Dates** 12/08/2020-13/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| 0.50 | B | | | | | (1.00) | Brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.00-1.45<br>1.00 | SPT(C) N=20<br>B | | | 3,4/5,5,5,5 | 112.26 | 1.00 | Stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | ▼1 |
| 2.00 | B | | | Water strike(1) at 1.90m, rose to 1.70m in 20 mins, sealed at 4.50m. | | (1.80) | | | ▽1 |
| 2.00-2.45 | SPT(C) N=23 | | | 4,4/5,5,6,7 | | | | | |
| 3.00-3.35<br>3.00 | SPT(C) 50/200<br>B | | | 8,10/15,20,15 | 110.46 | 2.80 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 4.00-4.45<br>4.00 | SPT(C) N=45<br>B | | | 5,7/9,11,11,14 | | | | | |
| 5.00-5.44<br>5.00 | SPT(C) 50/285<br>B | | | 4,10/12,14,16,8 | | | | | |
| 6.00-6.37<br>6.00 | SPT(C) 50/220<br>B | | | 7,11/16,16,18 | | | | | |
| 7.00-7.32<br>7.00 | SPT(C) 50/170<br>B | | | 11,15/19,23,8 | | (9.00) | | | |
| 8.00-8.08<br>8.00 | SPT(C) 50*/80<br>50/0<br>B | | | 30,20/50 | | | | | |

**Remarks**
Groundwater encountered at 1.90m BGL
Rotary Core follow on from 8.10m BGL
Borehole backfilled upon compleion
Chiselling from 8.10m to 8.10m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH11

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH11 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 8.10m<br>98mm to 15.00m | **Ground Level (mOD)** 113.26 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704986.6 E 727203.1 N | **Dates** 12/08/2020-13/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | Sample / Tests | | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 7,7/8,10,10,9 SPT(C) N=37 | | | | | |
| 11.80-12.25 | TCR | SCR | RQD | FI | | 101.46 | 11.80 | | | |
| 11.80 | 43 | | | | | | (1.00) | Poor recovery - recovery consists of: Dark grey slightly clayey slightly sandy fine to coarse angular to subrounded Gravel of Mixed Lithology. Drillers notes: Boulder CLAY (Very stiff) | | |
| 12.80-12.83 | | | | | 25/50 SPT(C) 25*/30 50/0 | | | | | |
| 12.80 | 36 | | | | | 100.46 | 12.80 | Poor recovery - recovery consists of: Grey slightly clayey fine to coarse angular to rounded Gravel of Limestone with occasional cobble fragments. Drillers notes: Boulder CLAY (Stiff) | | |
| 13.90-14.35 | | | | | 3,2/5,5,7,9 SPT(C) N=26 | | | | | |
| 13.90 | 44 | | | | | | (2.20) | | | |
| 15.00 | | | | | | 98.26 | 15.00 | Complete at 15.00m | | |
| | Sample / Tests | | Casing Depth (m) | Water Depth (m) | | | | | | |
| 15.00-15.45 | SPT(C) | N=44 | | | 6,7/9,9,12,14 | | | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH11

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH12 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 10.00m<br>98mm to 15.00m | **Ground Level (mOD)** 112.79 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705010.1 E 727210 N | **Dates** 11/08/2020-12/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| 0.50 | B | | | | | (1.00) | Brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 1.00<br>1.00-1.45 | B<br>SPT(C) N=12 | | | 1,2/2,3,3,4 | 111.79 | 1.00<br>(1.00) | Firm to stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | ▼1 |
| 2.00<br>2.00-2.17 | B<br>SPT(C) 50/20 | | | Water strike(1) at 1.70m, no rise after 20 mins, sealed at 4.00m.<br>17,27/50 | 110.79 | 2.00<br>(0.60) | Stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 3.00<br>3.00-3.45 | B<br>SPT(C) N=34 | | | 6,6/7,7,9,11 | 110.19 | 2.60 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 4.00<br>4.00-4.45 | B<br>SPT(C) N=50 | | | 5,7/11,11,14,14 | | | | | |
| 5.00<br>5.00-5.39 | B<br>SPT(C) 50/235 | | | 7,7/10,17,18,5 | | (6.00) | | | |
| 6.00<br>6.00-6.36 | B<br>SPT(C) 50/210 | | | 9,14/17,19,14 | | | | | |
| 7.00<br>7.00-7.35 | B<br>SPT(C) 50/200 | | | 10,14/18,20,12 | | | | | |
| 8.00<br>8.00-8.29 | B<br>SPT(C) 50/135 | | | 10,16/23,27 | | | | | ▼2 |
| 9.00<br>9.00-9.45 | B<br>SPT(C) N=34 | | | Water strike(2) at 8.60m, rose to 8.00m in 20 mins.<br>6,7/7,8,8,11 | 104.19 | 8.60<br>(1.40) | Dense grey sandy medium to coarse angular to subangular GRAVEL with occasional subangular cobbles. | | ▽2 |
| | **TCR** / **SCR** | **RQD** | **FI** | | | | | | |
| 9.70<br>10.00<br>10.00 | 100 | | | B | | | | | |

**Remarks**
Groundwater encountered at 1.70m BGL and 8.60m BGL
Rotary Core follow on from 10.00m BGL
Borehole backfilled upon compleion
Chiselling from 1.80m to 2.30m for 1 hour.

| **Scale (approx)** | **Logged By** |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH12

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH12 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia :** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 10.00m<br>98mm to 15.00m | **Ground Level (mOD)** 112.79 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 705010.1 E 727210 N | **Dates** 11/08/2020-12/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.00-10.45 | 27 | | | | SPT(C) N=50<br>7,9/10,11,14,15 | 102.79 | 10.00 | Poor recovery - recovery consists of Grey fine to coarse angular to rounded GRAVEL of Limestone with occasional cobble and boulder fragments. Drillers notes: Boulder CLAY (Stiff) | | |
| 11.10-11.55<br>11.10 | 49 | | | | 7,8/10,10,12,13<br>SPT(C) N=45 | | | | | |
| 12.30-12.75<br>12.30 | 72 | | | | 5,6/7,7,9,10<br>SPT(C) N=33 | | (5.00) | | | |
| 12.90 | 28 | | | | | | | | | |
| 13.90-14.35<br>13.90 | 25 | | | | 6,6/10,11,9,6<br>SPT(C) N=36 | | | | | |
| 15.00 | | | | | | 97.79 | 15.00 | Complete at 15.00m | | |
| | **Sample / Tests** | | **Casing Depth (m)** | **Water Depth (m)** | | | | | | |
| 15.00-15.20 | SPT(C) 50/50 | | | | 7,11/50 | | | | | |

**Remarks**

| **Scale (approx)** | **Logged By** |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH12

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH13 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 10.00m<br>98mm to 15.00m | **Ground Level (mOD)** 112.85 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704957.5 E 727233.4 N | **Dates** 13/08/2020-14/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 112.75 | 0.10 | FILL: Grey sandy coarse angular Gravel with angular cobbles (Crushed Rock Fill) | | |
| | | | | | | (0.60) | Reddish brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular | | |
| 0.50 | B | | | | 112.15 | 0.70 | | | |
| | | | | | | (0.30) | Stiff brown slightly sandy gravelly CLAY with some angular cobbles. Gravel is fine to coarse, anguler to subangular | | |
| 1.00 | B | | | | 111.85 | 1.00 | | | |
| 1.00-1.45 | SPT(C) N=22 | | | 4,3/4,3,8,7 | | | Stiff brown slightly sandy gravelly CLAY with some angular cobbles. Gravel is fine to coarse, anguler to subangular | | |
| | | | | | | (1.00) | | | |
| 2.00 | B | | | | 110.85 | 2.00 | | | |
| 2.00-2.45 | SPT(C) N=39 | | | 3,3/13,9,10,7 | | | Very stiff brown slightly sandy gravelly CLAY with some angular cobbles. Gravel is fine to coarse, anguler to subangular | | ▼1 |
| | | | | Water strike(1) at 2.50m, rose to 2.30m in 20 mins, sealed at 4.00m. | | | | | ▽1 |
| 3.00 | B | | | | | (1.80) | | | |
| 3.00-3.45 | SPT(C) N=41 | | | 6,8/9,10,10,12 | | | | | |
| | | | | | 109.05 | 3.80 | | | |
| 4.00 | B | | | | | | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse, angular to subangular | | |
| 4.00-4.45 | SPT(C) N=45 | | | 7,9/10,11,11,13 | | | | | |
| 5.00 | B | | | | | | | | |
| 5.00-5.45 | SPT(C) 50/295 | | | 6,9/11,12,12,15 | | | | | |
| 6.00 | B | | | | | | | | |
| 6.00-6.43 | SPT(C) 50/275 | | | 3,10/9,11,19,11 | | | | | |
| 7.00 | B | | | | | (6.20) | | | |
| 7.00-7.39 | SPT(C) 50/235 | | | 6,10/12,14,19,5 | | | | | |
| 8.00 | B | | | | | | | | |
| 8.00-8.36 | SPT(C) 50/210 | | | 10,12/14,19,17 | | | | | |
| 9.00 | B | | | | | | | | |
| 9.00-9.34 | SPT(C) 50/190 | | | 7,11/16,22,12 | | | | | |
| | **TCR** / **SCR** | | **RQD** | **FI** | | | | | |
| 9.60 | 99 | | | | | | | | |
| 10.00 | | | | B | | | | | |
| 10.00 | | | | | | | | | |

**Remarks**
Groundwater encountered at 2.50m BGL
Rotary Core follow on from 10.00m BGL
Borehole backfilled upon compleion

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH13

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH13 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia :** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 10.00m<br>98mm to 15.00m<br>**Location** (dGPS) 704957.5 E 727233.4 N | **Ground Level (mOD)** 112.85<br>**Dates** 13/08/2020-14/08/2020 | **Client** DBFL<br>**Engineer** | **Job Number** 9766-07-20<br>**Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| 10.00-10.32 | 50 | | | | SPT(C) 50/170<br>11,13/18,26,6 | 102.85 | 10.00 | Poor recovery - recovery consists of: Dark grey/grey slightly clayey fine to coarse angular to subrounded Gravel of Mixed Lithology. Drillers notes: Boulder CLAY (Very stiff) | | |
| 11.00-11.45 | | | | | 5,5/7,9,11,10<br>SPT(C) N=37 | | (2.50) | | | |
| 11.00 | 26 | | | | | | | | | |
| 12.50-12.95 | | | | | 6,8/11,10,13,9<br>SPT(C) N=43 | 100.35 | 12.50 | Poor recovery - recovery consists of: Grey slightly clayey slightly sandy fine to coarse angular to subrounded GRAVEL of Mixed Lithology with some cobble and boulder fragments. Drillers notes: BOulder CLAY (very stiff) | | |
| 12.50 | 90 | | | | | | | | | |
| 13.50-13.95 | | | | | 5,5/9,12,14,13<br>SPT(C) N=48 | | (2.50) | | | |
| 13.50 | 41 | | | | | | | | | |
| 15.00 | | | | | | 97.85 | 15.00 | Complete at 15.00m | | |
| | **Sample / Tests** | | **Casing Depth (m)** | **Water Depth (m)** | | | | | | |
| 15.00-15.45 | SPT(C) N=46 | | | | 7,6/9,11,14,12 | | | | | |

**Remarks**

| **Scale (approx)** | **Logged By** |
|---|---|
| 1:50 | AB |

**Figure No.** 9766-07-20.BH13

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH14 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.50m<br>98mm to 15.00m | **Ground Level (mOD)** 112.71 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704970.8 E 727233.2 N | **Dates** 20/08/2020-21/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.60) | Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular. | | |
| 0.50 | B | | | | 112.11 | 0.60 | | | |
| 1.00-1.45<br>1.00 | SPT(C) N=20<br>B | | | 6,4/5,5,5,5 | | | Stiff to very stiff brown slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to subangular. | | |
| | | | | | | (2.00) | | | |
| 2.00-2.45<br>2.00 | SPT(C) N=28<br>B | | | 4,4/6,6,7,9 | | | | | ▼1 |
| | | | | Water strike(1) at 2.60m, rose to 2.00m in 20 mins, sealed at 5.00m. | 110.11 | 2.60 | | | ▽1 |
| 3.00<br>3.00-3.45 | B<br>SPT(C) N=35 | | | 7,7/8,8,10,9 | | | Medium dense to dense brown clayey gravelly medium to coarse SAND with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | |
| | | | | | | (2.80) | | | |
| 4.00-4.45<br>4.00 | SPT(C) N=42<br>B | | | 6,8/8,11,11,12 | | | | | |
| 5.00-5.45<br>5.00 | SPT(C) N=29<br>B | | | 5,5/6,6,7,10 | | | | | |
| | | | | | 107.31 | 5.40 | Very stiff dark grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular. | | |
| 6.00-6.45<br>6.00 | SPT(C) N=50<br>B | | | 9,10/12,14,18,6 | | | | | |
| 7.00-7.45<br>7.00 | SPT(C) N=50<br>B | | | 10,16/16,18,16 | | | Rotary Core follow on from 7.50m BGL | | |
| | | | | | | (6.40) | | | |

**Remarks**
Groundwater encountered at 2.60m BGL.
Rotary Core follow on from 7.50m BGL
Borehole backfilled on completion.
Chiselling from 7.50m to 7.50m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH14

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH14 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.50m<br>98mm to 15.00m | **Ground Level (mOD)** 112.71 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704970.8 E 727233.2 N | **Dates** 20/08/2020-21/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | Sample / Tests | | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 7,6/10,13,13,11 SPT(C) N=47 | | | | | |
| 11.80-12.25 | TCR | SCR | RQD | FI | | | | | | |
| 11.80 | 35 | | | | | 100.91 | 11.80<br>(1.00) | Poor recovery - recovery consists of: Grey very clayey slightly sandy fine to coarse angular to subrounded Gravel of Limestone. Drillers notes: Boulder CLAY (Very stiff) | | |
| 12.80-12.83 | | | | | 25/50 SPT(C) 25*/30 50/0 | | | | | |
| 12.80 | 37 | | | | | 99.91 | 12.80 | Poor recovery - recovery consists of: Grey fine to coarse subangular to subrounded Gravel of Limestone and Sandstone with occasional cobble and boulder fragments. Drillers notes: Boulder CLAY (very stiff) | | |
| 13.80-14.25 | | | | | 4,5/9,8,7,9 SPT(C) N=33 | | (1.80) | | | |
| 13.80 | 61 | | | | | 98.11 | 14.60 | | | |
| | | | | | | | (0.40) | Poor recovery - recovery consists of: Grey very clayey slightly sandy fine to coarse subangular to subrounded Gravel of Limestone with occasional cobble and boulder fragments. Drillers notes: Boulder CLAY (Very stiff) | | |
| 15.00 | | | | | | 97.71 | 15.00 | Complete at 15.00m | | |
| | Sample / Tests | | Casing Depth (m) | Water Depth (m) | | | | | | |
| 15.00-15.45 | SPT(C) | N=46 | | | 7,7/11,13,10,12 | | | | | |

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH14

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH15 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 9.30m<br>98mm to 15.00m | **Ground Level (mOD)** 112.53 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704991.9 E 727238.8 N | **Dates** 17/08/2020-18/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 112.33 | (0.20)<br>0.20 | MADE GROUND: Crushed Rock Fill. | | |
| 0.50 | B | | | | | | Firm to very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | |
| 1.00<br>1.00-1.45 | B<br>SPT(C) N=13 | | | 1,2/2,3,4,4 | | | | | |
| 2.00<br>2.00-2.45 | B<br>SPT(C) N=33 | | | 3,4/6,7,9,11 | | (3.40) | | | |
| 3.00<br>3.00-3.45 | B<br>SPT(C) N=39 | | | 6,7/7,10,11,11 | | | | | |
| | | | | | 108.93 | 3.60 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | |
| 4.00<br>4.00-4.45 | B<br>SPT(C) N=44 | | | 6,8/10,10,11,13 | | | | | |
| 5.00<br>5.00-5.45 | B<br>SPT(C) N=50 | | | 8,8/10,10,14,16 | | | | | |
| 6.00<br>6.00-6.45 | B<br>SPT(C) N=50 | | | 12,25/37,13 | | (4.40) | | | |
| 7.00<br>7.00-7.45 | B<br>SPT(C) N=50 | | | 11,15/17,20,13 | | | | | |
| 8.00<br>8.00-8.45 | B<br>SPT(C) N=50 | | | 10,16/22,26,2 | 104.53 | 8.00 | Very stiff dark grey/brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | |
| 9.00<br>9.00-9.45 | B<br>SPT(C) N=50 | | | 25/50<br>SPT(C) 25*/30<br>14,17/29,21 | | (1.30) | | | |
| 9.30-9.33<br>9.30 | TCR / SCR | RQD | FI | 50/0 | 103.23 | 9.30 | Recovery consists of: Very stiff grey slightly sandy gravelly CLAY with some cobble and boulder fragments. Gravel is fine to coarse subangular to subrounded | | |

**Remarks**
No groundwater encountered.
Rotary Core follow on from 9.30m BGL
Borehole backfilled upon completion
Chiselling from 9.30m to 9.30m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH15

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH15 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia:** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 9.30m<br>98mm to 15.00m | **Ground Level (mOD)** 112.53 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704991.9 E 727238.8 N | **Dates** 17/08/2020-18/08/2020 | **Engineer** | **Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|---|
| | 53 | | | | 5,5/9,8,11,13<br>SPT(C) N=41 | | (1.50) | | | |
| 10.80-11.25<br>10.80 | | | | | | 101.73 | 10.80 | Poor recovery - recovery consists of: Dark grey fine to coarse angular to subrounded Gravel with some cobbles and boulders fragments of predominately Limestone.<br>Drillers notes: Boulder CLAY (Very stiff) | | |
| | 89 | | | | 7,7/11,9,9,14<br>SPT(C) N=43 | | | | | |
| 11.70-12.15<br>11.70 | | | | | | | | | | |
| | 29 | | | | 6,5/9,9,12,14<br>SPT(C) N=44 | | | | | |
| 12.70-13.15<br>12.70 | | | | | | | (4.20) | | | |
| | 25 | | | | 5,9/11,11,13,15<br>SPT(C) N=50 | | | | | |
| 14.00-14.45<br>14.00 | | | | | | | | | | |
| | 36 | | | | | | | | | |
| 15.00 | | | | | | 97.53 | 15.00 | Complete at 15.00m | | |

| Sample / Tests | | Casing Depth (m) | Water Depth (m) |
|---|---|---|---|
| 15.00-15.03 | SPT(C) 25*/30 50/0 | | |

25/50

**Remarks**

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH15

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH16 |
| **Machine :** Dando 2000<br>**Method :** Cable Percussion | **Casing Diameter** 200mm to 1.50m | **Ground Level (mOD)** 112.00 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704977.2 E 727260.2 N | **Dates** 17/08/2020-18/08/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 111.80 | (0.20) 0.20 | MADE GROUND: Crushed Rock Fill. | | |
| | | | | Water strike(1) at 0.30m, rose to 0.00m in 20 mins. | | | Firm to very stiff brown slightly sandy slightly gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | ▽1 |
| 0.50 | B | | | | | (1.30) | | | |
| 1.00-1.45 | SPT(C) N=13 | | | 1,2/2,3,4,4 | | | | | |
| | | | | | 110.50 | 1.50 | OBSTRUCTION due to boulder | | |
| | | | | | | | Complete at 1.50m | | |

**Remarks**
No groundwater encountered.
Refusal at 1.50m BGL.
Borehole backfilled on completion.
Chiselling from 1.50m to 1.50m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH16

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH16A |
| **Machine :** Dando 2000<br>**Method :** Cable Percussion | **Casing Diameter** 200mm to 9.40m | **Ground Level (mOD)** | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** Adjacent to BH16 | **Dates** 19/08/2020-20/08/2020 | **Engineer** | **Sheet** 1/1 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.30) 0.30 | MADE GROUND: Crushed Rock Fill. | | ▼1 | |
| | | | | Water strike(1) at 0.40m, rose to 0.10m in 20 mins, sealed at 1.00m. | | | Firm to very stiff brown slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | ▽1 | |
| 1.00-1.45 | SPT(C) N=13 | | | 2,2/3,4,3,3 | | | | | | |
| 2.00-2.45 | SPT(C) N=29 | | | 5,5/6,7,7,9 | | | | | ▼2 | |
| | | | | Water strike(2) at 2.40m, rose to 2.20m in 20 mins, sealed at 3.00m. | | (4.50) | | | ▽2 | |
| 3.00-3.45 | SPT(C) N=50 | | | 6,11/11,14,16,9 | | | | | | |
| 4.00-4.45 | SPT(C) N=50 | | | 7,11/11,11,14,14 | | | | | | |
| | | | | | | 4.80 | Very stiff dark grey slightly sandy gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | | |
| 5.00-5.45 | SPT(C) N=50 | | | 6,7/12,15,23 | | | | | | |
| 6.00-6.45 | SPT(C) N=50 | | | 7,9/14,16,16,4 | | | | | | |
| | | | | | | (3.30) | | | | |
| 7.00-7.45 | SPT(C) N=50 | | | 7,11/17,24,9 | | | | | | |
| 8.00-8.45 | SPT(C) N=50 | | | 10,14/20,30 | | 8.10 | Very stiff dark grey/brown slightly sandy gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to subangular. | | ▼3 | |
| | | | | | | (1.30) | | | | |
| 9.00-9.45 | SPT(C) N=50 | | | 11,24/38,12 | | | | | | |
| | | | | Water strike(3) at 9.40m, rose to 8.00m in 20 mins. | | 9.40 | OBSTRUCTION due to possible boulder or bedrock. | | ▽3 | |
| | | | | | | | Complete at 9.40m | | | |

**Remarks**
Groundwater encountered at 0.40m BGL, 2.40m BGL and 9.40m BGL.
Refusal at 9.40m BGL.
Slotted standpipe installed from 9.40m BGL to 1.00m BGL with a pea gravel surround, with a plain standpipe installed from 1.00m BGL to GLwith a bentonite seal and a raised cover. Standpipe damaged
Chiselling from 9.40m to 9.40m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH16A

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH17 |
| **Machine :** Dando 2000 & Beretta T47<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.60m<br>98mm to 15.00m | **Ground Level (mOD)** 112.00 | **Client** DBFL | **Job Number** 9766-07-20 |
| | **Location** (dGPS) 704962.4 E 727273.8 N | **Dates** 21/08/2020-31/08/2020 | **Engineer** | **Sheet** 1/2 |

| Depth (m) | Sample / Tests | Casing Depth (m) | Water Depth (m) | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (0.40) | MADE GROUND: Crushed Rock Fill with brown Clay. | | | |
| | | | | | 111.60 | 0.40 | | | | |
| 0.50 | B | | | | | (0.40) | Firm to stiff brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular. | | | |
| | | | | | 111.20 | 0.80 | | | | |
| 1.00 | B | | | | | | Stiff brown slightly gravelly sandy CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | | |
| 1.00-1.45 | SPT(C) N=17 | | | 2,3/3,4,5,5 | | (1.20) | | | ▼1 | |
| | | | | Water strike(1) at 1.80m, rose to 1.60m in 20 mins, sealed at 2.90m. | | | | | ▽1 | |
| 2.00 | B | | | | 110.00 | 2.00 | Stiff light brown slightly sandy slightly gravelly CLAY with occasional cobbles. Gravel is fine to coarse angular to subangular. | | | |
| 2.00-2.45 | SPT(C) N=23 | | | 3,3/4,5,6,8 | | (0.90) | | | | |
| 3.00 | B | | | | 109.10 | 2.90 | Very stiff dark grey slightly sandy slightly gravelly CLAY with occasional subangular cobbles. Gravel is fine to coarse angular to subangular. | | | |
| 3.00-3.45 | SPT(C) N=46 | | | 7,10/10,11,11,14 | | | | | | |
| 4.00 | B | | | | | | | | | |
| 4.00-4.45 | SPT(C) N=50 | | | 7,7/12,13,17,8 | | | | | | |
| 5.00 | B | | | | | | | | | |
| 5.00-5.45 | SPT(C) N=50 | | | 6,9/14,15,19,2 | | (4.70) | | | | |
| 6.00 | B | | | | | | | | | |
| 6.00-6.45 | SPT(C) N=50 | | | 12,10/15,15,20 | | | | | | |
| 7.00 | B | | | | | | | | | |
| 7.00-7.45 | SPT(C) N=50 | | | 14,20/23,27 | | | | | | |
| | **TCR** | **SCR** | **RQD** | **FI** | | | | | | |
| 7.60 | | | | | 104.40 | 7.60 | Poor recovery - recovery consists of: Dark grey slightly clayey fine to coarse angular to subrounded Gravel of predominately Limestone with occasional cobble and boulder fragments.<br>Drillers notes: Boulder CLAY (Very stiff)<br>Rotary Core follow on from 7.60m BGL | | | |
| | 49 | | | | | | | | | |
| 8.60-9.05 | | | | 5,7/9,11,11,9<br>SPT(C) N=40 | | | | | | |
| 8.60 | | | | | | | | | | |
| | 40 | | | | | (3.40) | | | | |

**Remarks**
Groundwater encountered at 1.80m BGL.
Rotary Core follow on from 7.60m BGL.
Slotted standpipe installed from 15.00m BGL to 2.00m BGL with a pea gravel surround, with a plain standpipe installed from 2.00m BGL to GLwith a bentonite seal and a raised cover
No SPT at 11.00m BGL due to blowing Sands
Chiselling from 7.60m to 7.60m for 1 hour.

| Scale (approx) | Logged By |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH17

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| | | | |
|---|---|---|---|
| **Site** The Quarter at Citywest, Cooldown Commons Phase 3 | | | **Borehole Number** BH17 |
| **Machine :** Dando 2000 & Beretta T47<br>**Flush :** Water<br>**Core Dia :** 68 mm<br>**Method :** Cable Percussion with Rotary Core follow on | **Casing Diameter** 200mm to 7.60m<br>98mm to 15.00m<br>**Location** (dGPS) 704962.4 E 727273.8 N | **Ground Level (mOD)** 112.00<br>**Dates** 21/08/2020-31/08/2020 | **Client** DBFL<br>**Engineer** | **Job Number** 9766-07-20<br>**Sheet** 2/2 |

| Depth (m) | TCR (%) | SCR (%) | RQD (%) | FI | Field Records | Level (mOD) | Depth (m) (Thickness) | Description | Legend | Water | Instr |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10.10-10.25 | | | | | SPT(C) 50/0 | | | | | | |
| 10.10 | 66 | | | | 7,14/50 | | | | | | |
| 11.00 | 100 | | | | 6,6/9,11,30<br>SPT(C) 50/225 | 101.00 | 11.00<br>(1.00) | Recovery consists of: Grey/brown graded Sand into Gravel with cobble and boulder fragments at base. Drillers notes: Boulder CLAY and blowing Sand (Very stiff) | | | |
| 12.00-12.38 | | | | | | 100.00 | 12.00<br>(0.20) | | | | |
| 12.00 | 63 | | | | | 99.80 | 12.20 | Recovery consists of: Grey fine to medium subrounded Gravel of Mixed Lithology. Drillers notes: Boulder CLAY (Very stiff) | | | |
| 13.50-13.95 | | | | | 7,5/9,11,11,13<br>SPT(C) N=44 | | (1.30) | Recovery consists of: Very stiff brown slightly sandy gravelly CLAY with some cobble and boulder fragments. | | | |
| 13.50 | 39 | | | | | 98.50 | 13.50 | Poor recovery - recovery consists of: Dark grey slightly clayey fine to coarse angular to subrounded Gravel of Limestone with occasional cobble fragments. Drillers notes: Boulder CLAY (very stiff) | | | |
| 15.00 | | | | | | 97.00 | (1.50)<br>15.00 | Complete at 15.00m | | | |
| | **Sample / Tests** | | **Casing Depth (m)** | **Water Depth (m)** | | | | | | | |
| 15.00-15.45 | SPT(C) N=36 | | | | 4,6/8,8,10,10 | | | | | | |

**Remarks**

| **Scale (approx)** | **Logged By** |
|---|---|
| 1:50 | AB & JMD |

**Figure No.** 9766-07-20.BH17

# The Quarter Citywest Phase 2 Rotary Core Photographs


**BH03**


**BH03**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UCFL
Site: Citywest Phase 2
Borehole ref: BH05
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 26-28-9-20
Depth: From 7.00 to 15.00
CM 10 20 30 40 50 60 70 80 90 100
8.3 M
9.4 M
11.1 M
12.6 M
14.0 M
15.0 M

**BH05**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UCFL
Site: Citywest Phase 2
Borehole ref: BH06
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 28-29-9-20
Depth: From 10.00 to 18.00
CM 10 20 30 40 50 60 70 80 90 100
11.2 M
12.2 M
13.6 M
14.2 M
15.5 M
17.0 M
18.0 M

**BH06**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UCFL
Site: Citywest Phase 2
Borehole ref: BH07
Box No: 1 of 2
Job Ref: 9766-07-20
Date: 29-30-9-20
Depth: From 8.85 to 17.00
CM 10 20 30 40 50 60 70 80 90 100
9.1 M
9.6 M
11.0 M
12.1 M
13.4 M
14.2 M
14.6 M
16.1 M

**BH07**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UCFL
Site: Citywest Phase 2
Borehole ref: BH07
Box No: 2 of 2
Job Ref: 9766-07-20
Date: 29-30-9-20
Depth: From 17.00 to 18.00
CM 10 20 30 40 50 60 70 80 90 100
17.1 M
18.0 M

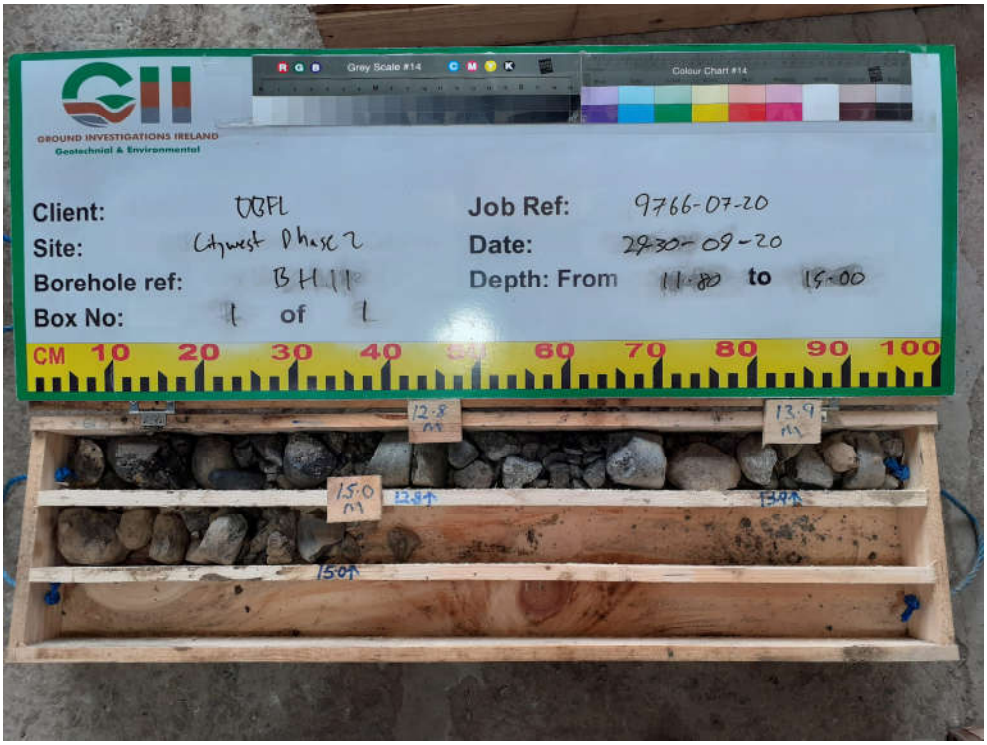
**BH07**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: Citywest Phase 2
Borehole ref: BH08
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 29-9-20
Depth: From 13.00 to 18.00
CM 10 20 30 40 50 60 70 80 90 100
GL
14.2 M
15.0 M
16.5 M
18.0 M

**BH08**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: Citywest Phase 2
Borehole ref: BH09
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 1-10-20
Depth: From 10.00 to 15.00
CM 10 20 30 40 50 60 70 80 90 100
GL
11.0 M
12.1 M
14.2 M
15.0 M

**BH09**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: Citywest Phase 2
Borehole ref: BH11
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 29-30-09-20
Depth: From 11.80 to 15.00
CM 10 20 30 40 60 70 80 90 100
12.8 M
13.9 M
15.0 M

**BH11**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: DBFL
Site: Citywest Phase 2
Borehole ref: BH12
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 01-10-20
Depth: From 4.70 to 15.00
CM 10 20 30 40 50 60 70 80 90 100
10.0 M
12.3 M
12.9 M
13.9 M
15.0 M

**BH12**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UCFL
Site: Citywest Phase 2
Borehole ref: BH13
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 02-10-20
Depth: From 0.60 to 15.00
CM 10 20 30 40 50 60 70 80 90 100

**BH13**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UCFL
Site: Citywest Phase 2
Borehole ref: BH14
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 01-10-20
Depth: From 1.80 to 15.00
CM 10 20 30 40 50 60 70 80 90 100

**BH14**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UBFL
Site: Citywest Phase 2
Borehole ref: BH15
Box No: 1 of 1
Job Ref: 9766-07-20
Date: 05-10-20
Depth: From 9.30 to 15.00
CM 10 20 30 40 50 60 70 80 90 100
11.7 M
12.7 M
14.0 M
15.0 M

**BH15**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UBFL
Site: Citywest Phase 2
Borehole ref: BH17
Box No: 1 of 2
Job Ref: 9766-07-20
Date: 06-06-10-20
Depth: From 7.60 to 11.60
CM 10 20 30 40 50 60 70 80 90 100
8.6 M
10.1 M
11.0 M

**BH17**


GROUND INVESTIGATIONS IRELAND
Geotechnical & Environmental
Client: UBFL
Site: Citywest Phase 2
Borehole ref: BH17
Box No: 2 of 2
Job Ref: 9766-07-20
Date: 05-08-10-20
Depth: From 11.50 to 15.00
CM 10 20 30 40 50 60 70 80 90 100
12.0 M
13.5 M
15.0 M

**BH17**

# **APPENDIX 8** – 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 | 2.00 | B | 10.8 | | 34.8 | 21 | 15 | 6 | | | | | | |
| TP04 | 3.00 | B | 14.1 | | 13.2 | 29 | 20 | 9 | | | | | | |
| TP06 | 2.10 | B | 13.0 | | 41.9 | 23 | 16 | 7 | | | | | | |
| TP09 | 1.00 | B | 12.6 | | 42.2 | 26 | 17 | 9 | | | | | | |
| BH11 | 2.00 | B | 13.9 | | 42.5 | 25 | 17 | 8 | | | | | | |
| | | | | | | | | | | | | | | |
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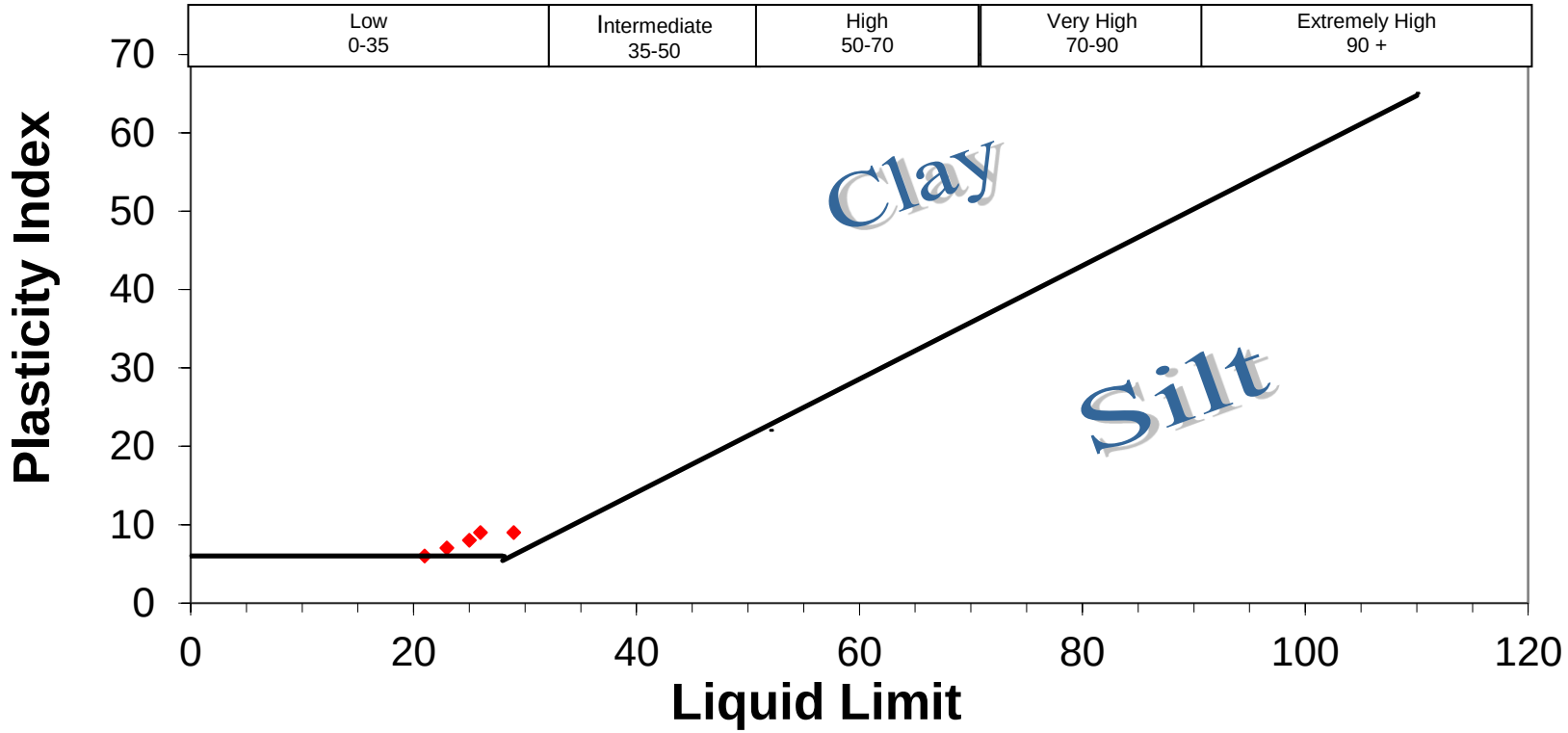
| NMTL | | Notes : | | | | | | | | | Job ref No. | NMTL 3295 | GII Project ID: | 9766-07-20 |
| | | 1. All BS tests carried out using preferred (definitive) method unless otherwise stated. | | | | | | | | | Location | The Quarter Citywest Phase 3 | | |

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

| | |
|---|---|
| **Contract:** | **The Quarter Citywest Phase 3** |
| **Client:** | **Ground Investigations Ireland Ltd** |
| **Engineer:** | **Conor Finnerty** |
| **GII Project ID** | **9766-07-20** |
| **Date:** | **13/10/2020** |
| **Tested By:** | **Sb/Tch/Ms** **Checked:** **Bc** |
| **Job ref No.** | **NMTL 3295** |



**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 | 94.7 |
| 37.500 | 88.1 |
| 28.000 | 84.0 |
| 20.000 | 83.6 |
| 14.000 | 79.1 |
| 10.000 | 76.7 |
| 6.300 | 71.9 |
| 5.000 | 66.7 |
| 3.350 | 62.0 |
| 2.000 | 54.8 |
| 1.180 | 47.6 |
| 0.600 | 38.8 |
| 0.425 | 34.8 |
| 0.300 | 31.3 |
| 0.212 | 28.3 |
| 0.150 | 25.9 |
| 0.063 | 22.1 |
| 0.056 | 21.2 |
| 0.040 | 18.5 |
| 0.020 | 14.3 |
| 0.011 | 10.6 |
| 0.008 | 9.7 |
| 0.005 | 8.8 |
| 0.004 | 7.9 |
| 0.002 | 6.0 |


Percentage Particle Size

| Clay | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | Cobbles | Boulder |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Silt | | | Sand | | | Gravel | | | |
| 6.0 | | 16.1 | | | 32.7 | | | 45.2 | | 0.0 | 0.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Description | Dark brown slightly sandy gravelly clayey SILT | | | | | Project No. | NMTL 3295 |
| | | | | | | BH/TP No. | TP01 |
| Project | The Quarter Citywest, Phase 3 | | | GII Project ID-9766-07-20 | | Sample No. | B |
| Operator | Tzr | Checked | Nc | Approved | Bc | Depth | 2.0m |
| | | | | Date sample tested | 07/10/2020 | | |

**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 | 93.0 |
| 37.500 | 78.7 |
| 28.000 | 70.4 |
| 20.000 | 61.3 |
| 14.000 | 54.6 |
| 10.000 | 49.6 |
| 6.300 | 40.7 |
| 5.000 | 33.7 |
| 3.350 | 27.0 |
| 2.000 | 20.8 |
| 1.180 | 16.8 |
| 0.600 | 14.0 |
| 0.425 | 13.2 |
| 0.300 | 12.6 |
| 0.212 | 12.0 |
| 0.150 | 11.6 |
| 0.063 | 10.5 |
| 0.054 | 10.0 |
| 0.038 | 9.4 |
| 0.020 | 7.7 |
| 0.010 | 6.4 |
| 0.007 | 5.6 |
| 0.005 | 4.7 |
| 0.004 | 3.9 |
| 0.002 | 3.0 |


Percentage Particle Size

| Clay | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | Cobbles | Boulder |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Silt | | | Sand | | | Gravel | | | |
| 3.0 | | 7.5 | | | 10.3 | | | 79.2 | | 0.0 | 0.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Description | Brown silty sandy GRAVEL. | | | | | Project No. | NMTL 3295 |
| | | | | | | BH/TP No. | TP04 |
| Project | The Quarter Citywest, Phase 3 | | | GII Project ID-9766-07-20 | | Sample No. | B |
| Operator | Tzr | Checked | Nc | Approved | Bc | Depth | 3.0m |
| | | | | Date sample tested | 07/10/2020 | | |

**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 | 94.8 |
| 28.000 | 91.0 |
| 20.000 | 87.4 |
| 14.000 | 81.5 |
| 10.000 | 74.4 |
| 6.300 | 68.2 |
| 5.000 | 64.0 |
| 3.350 | 60.0 |
| 2.000 | 54.9 |
| 1.180 | 49.9 |
| 0.600 | 44.5 |
| 0.425 | 41.9 |
| 0.300 | 39.3 |
| 0.212 | 36.5 |
| 0.150 | 33.9 |
| 0.063 | 28.0 |
| 0.054 | 26.6 |
| 0.039 | 24.1 |
| 0.020 | 21.0 |
| 0.010 | 16.5 |
| 0.007 | 15.4 |
| 0.005 | 13.0 |
| 0.004 | 11.3 |
| 0.002 | 8.6 |


Percentage Particle Size

| Clay | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | Cobbles | Boulder |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Silt | | | Sand | | | Gravel | | | |
| 8.6 | | 19.5 | | | 26.9 | | | 45.1 | | 0.0 | 0.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Description | Brown slightly sandy gravelly silty CLAY. | | | | | Project No. | NMTL 3295 |
| | | | | | | BH/TP No. | TP06 |
| Project | The Quarter Citywest, Phase 3 | | | GII Project ID-9766-07-20 | | Sample No. | B |
| Operator | Tzr | Checked | Nc | Approved | Bc | Depth | 2.10m |
| | | | | Date sample tested | 07/10/2020 | | |

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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 | 86.3 |
| 37.500 | 81.1 |
| 28.000 | 79.0 |
| 20.000 | 76.3 |
| 14.000 | 70.1 |
| 10.000 | 65.8 |
| 6.300 | 61.8 |
| 5.000 | 59.6 |
| 3.350 | 56.9 |
| 2.000 | 52.8 |
| 1.180 | 48.9 |
| 0.600 | 44.4 |
| 0.425 | 42.2 |
| 0.300 | 40.1 |
| 0.212 | 38.0 |
| 0.150 | 36.1 |
| 0.063 | 32.1 |
| 0.053 | 30.9 |
| 0.038 | 29.1 |
| 0.019 | 25.2 |
| 0.010 | 20.3 |
| 0.007 | 18.0 |
| 0.005 | 15.2 |
| 0.004 | 13.3 |
| 0.002 | 9.4 |


Percentage Particle Size

| Clay | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | Cobbles | Boulder |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Silt | | | Sand | | | Gravel | | | |
| 9.4 | | 22.7 | | | 20.7 | | | 47.2 | | 0.0 | 0.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Description | Brown slightly sandy gravelly silty CLAY. | | | | | Project No. | NMTL 3295 |
| | | | | | | BH/TP No. | TP09 |
| Project | The Quarter Citywest, Phase 3 | | | GII Project ID-9766-07-20 | | Sample No. | B |
| Operator | Tzr | Checked | Nc | Approved | Bc | Depth | 1.0m |
| | | | | Date sample tested | 07/10/2020 | | |

**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 | 89.6 |
| 37.500 | 83.9 |
| 28.000 | 78.7 |
| 20.000 | 75.8 |
| 14.000 | 73.3 |
| 10.000 | 70.0 |
| 6.300 | 65.3 |
| 5.000 | 61.2 |
| 3.350 | 57.5 |
| 2.000 | 52.3 |
| 1.180 | 48.3 |
| 0.600 | 44.4 |
| 0.425 | 42.5 |
| 0.300 | 40.5 |
| 0.212 | 38.4 |
| 0.150 | 36.3 |
| 0.063 | 31.7 |
| 0.053 | 30.2 |
| 0.038 | 27.5 |
| 0.020 | 22.4 |
| 0.010 | 17.9 |
| 0.007 | 16.0 |
| 0.005 | 14.2 |
| 0.004 | 12.3 |
| 0.002 | 8.6 |


Percentage Particle Size

| Clay | Fine | Medium | Coarse | Fine | Medium | Coarse | Fine | Medium | Coarse | Cobbles | Boulder |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Silt | | | Sand | | | Gravel | | | |
| 8.6 | | 23.2 | | | 20.6 | | | 47.7 | | 0.0 | 0.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sample Description | Brown slightly sandy gravelly silty CLAY. | | | | | Project No. | NMTL 3295 |
| | | | | | | BH/TP No. | BH11 |
| Project | The Quarter Citywest, Phase 3 | | | GII Project ID-9766-07-20 | | Sample No. | B |
| Operator | Tzr | Checked | Nc | Approved | Bc | Depth | 2.00m |
| | | | | Date sample tested | 07/10/2020 | | |

**NMTL Ltd**

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

| | |
|---|---|
| **Attention :** | Diarmaid MagLochlainn |
| **Date :** | 17th August, 2020 |
| **Your reference :** | 9766-07-20 |
| **Our reference :** | Test Report 20/10462 Batch 1 |
| **Location :** | The Quarter, Citywest, Phase 3 |
| **Date samples received :** | 7th August, 2020 |
| **Status :** | Final report |
| **Issue :** | 1 |

Nineteen samples were received for analysis on 7th August, 2020 of which nineteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Authorised By:**

**Bruce Leslie**
**Project Manager**

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : Solid**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS05 | WS05 | WS05 | WS06 | WS06 | WS07 | WS07 | WS07 | WS08 | WS08 | | | |
| Depth | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | |
| Antimony | 1 | 1 | 1 | 1 | <1 | <1 | 1 | 1 | 2 | 2 | <1 | mg/kg | TM30/PM15 |
| Arsenic # | 7.5 | 15.2 | 7.7 | 12.9 | 12.9 | 6.5 | 13.6 | 15.0 | 17.4 | 12.5 | <0.5 | mg/kg | TM30/PM15 |
| Barium # | 32 | 43 | 56 | 41 | 28 | 15 | 49 | 42 | 77 | 56 | <1 | mg/kg | TM30/PM15 |
| Cadmium # | 1.8 | 1.4 | 1.3 | 2.0 | 1.0 | 1.0 | 1.6 | 2.1 | 2.0 | 1.9 | <0.1 | mg/kg | TM30/PM15 |
| Chromium # | 19.5 | 22.4 | 21.6 | 27.5 | 15.4 | 16.8 | 25.3 | 26.9 | 27.8 | 30.2 | <0.5 | mg/kg | TM30/PM15 |
| Copper # | 21 | 24 | 19 | 27 | 14 | 13 | 24 | 27 | 33 | 27 | <1 | mg/kg | TM30/PM15 |
| Lead # | 10 | 19 | 13 | 19 | 11 | 7 | 17 | 15 | 38 | 21 | <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 # | 1.5 | 1.6 | 1.5 | 1.8 | 0.9 | 1.1 | 1.7 | 2.4 | 2.5 | 2.6 | <0.1 | mg/kg | TM30/PM15 |
| Nickel # | 29.2 | 29.7 | 25.3 | 38.8 | 17.8 | 18.1 | 32.8 | 29.8 | 39.4 | 38.8 | <0.7 | mg/kg | TM30/PM15 |
| Selenium # | <1 | <1 | 1 | <1 | <1 | <1 | <1 | <1 | 1 | 1 | <1 | mg/kg | TM30/PM15 |
| Zinc # | 73 | 92 | 75 | 97 | 53 | 43 | 92 | 87 | 138 | 103 | <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 | <0.03 | <0.03 | <0.03 | 0.14 | <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 | <0.03 | <0.03 | <0.03 | <0.03 | 0.06 | 0.15 | <0.03 | mg/kg | TM4/PM8 |
| Pyrene # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.06 | 0.13 | <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 | 0.07 | 0.08 | <0.06 | mg/kg | TM4/PM8 |
| Chrysene # | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.05 | 0.06 | <0.02 | mg/kg | TM4/PM8 |
| Benzo(bk)fluoranthene # | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 | 0.08 | 0.10 | <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 | 0.05 | <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 | 0.30 | <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 | 0.71 | <0.64 | mg/kg | TM4/PM8 |
| Benzo(b)fluoranthene | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.06 | 0.07 | <0.05 | mg/kg | TM4/PM8 |
| Benzo(k)fluoranthene | <0.02 | <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(j)fluoranthene | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | TM4/PM8 |
| PAH Surrogate % Recovery | 102 | 92 | 97 | 101 | 93 | 102 | 99 | 97 | 96 | 93 | <0 | % | TM4/PM8 |
| Mineral Oil (C10-C40) | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | mg/kg | TM5/PM8/PM16 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : Solid**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS05 | WS05 | WS05 | WS06 | WS06 | WS07 | WS07 | WS07 | WS08 | WS08 | | | |
| Depth | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | |
| TPH CWG | | | | | | | | | | | | | |
| **Aliphatics** | | | | | | | | | | | | | |
| >C5-C6 # | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C6-C8 # | 0.3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C8-C10 | 3.7 | <0.1 | <0.1 | <0.1 | 0.2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C10-C12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | mg/kg | TM5/PM8/PM16 |
| >C12-C16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | mg/kg | TM5/PM8/PM16 |
| >C16-C21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >C21-C35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >C35-C40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| Total aliphatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >C6-C10 | 4.0 | <0.1 | <0.1 | <0.1 | 0.2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C10-C25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| >C25-C35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| **Aromatics** | | | | | | | | | | | | | |
| >C5-EC7 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC7-EC8 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC8-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | mg/kg | TM5/PM8/PM16 |
| >EC12-EC16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | mg/kg | TM5/PM8/PM16 |
| >EC16-EC21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >EC21-EC35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >EC35-EC40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| Total aromatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| Total aliphatics and aromatics(C5-40) | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >EC6-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| >EC25-EC35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| | | | | | | | | | | | | | |
| MTBE # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Benzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Toluene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 128 | <5 | <5 | ug/kg | TM36/PM12 |
| Ethylbenzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| m/p-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| o-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <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:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : Solid**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID** | WS05 | WS05 | WS05 | WS06 | WS06 | WS07 | WS07 | WS07 | WS08 | WS08 | | | |
| **Depth** | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | | | |
| **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** | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| **Sample Type** | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| **Batch Number** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| **Date of Receipt** | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | |
| Natural Moisture Content | 8.4 | 12.3 | 9.6 | 13.1 | 8.6 | 10.7 | 12.6 | 11.5 | 17.0 | 14.0 | <0.1 | % | PM4/PM0 |
| Moisture Content (% Wet Weight) | 7.7 | 11.0 | 8.8 | 11.6 | 7.9 | 9.7 | 11.2 | 10.3 | 14.5 | 12.3 | <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 |
| Chromium III | 19.5 | 22.4 | 21.6 | 27.5 | 15.4 | 16.8 | 25.3 | 26.9 | 27.8 | 30.2 | <0.5 | mg/kg | NONE/NONE |
| Total Organic Carbon # | 0.18 | 0.27 | 0.24 | 0.17 | 0.17 | 0.09 | 0.16 | 0.29 | 1.72 | 0.36 | <0.02 | % | TM21/PM24 |
| pH # | 8.65 | 8.68 | 8.89 | 8.37 | 8.86 | 8.64 | 8.78 | 8.67 | 7.92 | 8.24 | <0.01 | pH units | TM73/PM11 |
| Mass of raw test portion | 0.096 | 0.1022 | 0.1003 | 0.1037 | 0.1012 | 0.1007 | 0.1008 | 0.102 | 0.1379 | 0.1025 | | kg | NONE/PM17 |
| Mass of dried test portion | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | | kg | NONE/PM17 |

Please see attached notes for all abbreviations and acronyms

## Element Materials Technology

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : Solid**

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

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS08 | WS09 | WS09 | WS09 | WS10 | WS13 | WS13 | WS13 | WS17 | | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 1.70 | 2.70 | 0.70 | | | | |
| 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 | | | | |
| Sample Date | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | | |
| Antimony | 2 | 2 | 1 | 2 | 1 | 1 | <1 | 2 | 2 | | <1 | mg/kg | TM30/PM15 |
| Arsenic # | 8.9 | 10.2 | 12.4 | 15.6 | 12.9 | 7.2 | 6.5 | 8.4 | 8.6 | | <0.5 | mg/kg | TM30/PM15 |
| Barium # | 47 | 42 | 117 | 55 | 47 | 33 | 27 | 74 | 68 | | <1 | mg/kg | TM30/PM15 |
| Cadmium # | 1.2 | 1.0 | 1.8 | 2.5 | 1.8 | 1.4 | 1.0 | 0.8 | 2.0 | | <0.1 | mg/kg | TM30/PM15 |
| Chromium # | 47.0 | 47.0 | 26.1 | 36.5 | 32.6 | 18.0 | 19.1 | 40.4 | 22.4 | | <0.5 | mg/kg | TM30/PM15 |
| Copper # | 26 | 21 | 22 | 21 | 27 | 20 | 15 | 26 | 26 | | <1 | mg/kg | TM30/PM15 |
| Lead # | 21 | 14 | 19 | 18 | 29 | 12 | 11 | 12 | 12 | | <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 | mg/kg | TM30/PM15 |
| Molybdenum # | 1.4 | 2.3 | 2.1 | 1.8 | 2.2 | 1.7 | 0.9 | 0.7 | 2.2 | | <0.1 | mg/kg | TM30/PM15 |
| Nickel # | 38.3 | 30.4 | 34.7 | 40.1 | 40.4 | 19.6 | 19.4 | 47.3 | 47.6 | | <0.7 | mg/kg | TM30/PM15 |
| Selenium # | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | <1 | mg/kg | TM30/PM15 |
| Zinc # | 93 | 87 | 79 | 433 | 108 | 56 | 60 | 87 | 81 | | <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 | 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 | 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 | 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 | mg/kg | TM4/PM8 |
| Phenanthrene # | 0.08 | <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 | mg/kg | TM4/PM8 |
| Fluoranthene # | 0.11 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | | <0.03 | mg/kg | TM4/PM8 |
| Pyrene # | 0.08 | <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 # | 0.08 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | <0.06 | | <0.06 | mg/kg | TM4/PM8 |
| Chrysene # | 0.06 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | | <0.02 | mg/kg | TM4/PM8 |
| Benzo(bk)fluoranthene # | 0.11 | <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 # | 0.05 | <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 | 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 | 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 | 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 | 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 | 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 | mg/kg | TM4/PM8 |
| Benzo(b)fluoranthene | 0.08 | <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 | mg/kg | TM4/PM8 |
| Benzo(j)fluoranthene | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | <1 | mg/kg | TM4/PM8 |
| PAH Surrogate % Recovery | 100 | 99 | 96 | 92 | 96 | 94 | 95 | 96 | 96 | | <0 | % | TM4/PM8 |
| Mineral Oil (C10-C40) | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | | <30 | mg/kg | TM5/PM8/PM16 |

Please see attached notes for all abbreviations and acronyms




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

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : Solid**

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

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS08 | WS09 | WS09 | WS09 | WS10 | WS13 | WS13 | WS13 | WS17 | | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 1.70 | 2.70 | 0.70 | | | | |
| 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 | | | | |
| Sample Date | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | | |
| TPH CWG | | | | | | | | | | | | | |
| **Aliphatics** | | | | | | | | | | | | | |
| >C5-C6 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >C6-C8 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >C8-C10 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >C10-C12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | | <0.2 | mg/kg | TM5/PM8/PM16 |
| >C12-C16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | | <4 | mg/kg | TM5/PM8/PM16 |
| >C16-C21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | | <7 | mg/kg | TM5/PM8/PM16 |
| >C21-C35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | | <7 | mg/kg | TM5/PM8/PM16 |
| >C35-C40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | | <7 | mg/kg | TM5/PM8/PM16 |
| Total aliphatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >C6-C10 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >C10-C25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | <10 | mg/kg | TM5/PM8/PM16 |
| >C25-C35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | <10 | mg/kg | TM5/PM8/PM16 |
| **Aromatics** | | | | | | | | | | | | | |
| >C5-EC7 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >EC7-EC8 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >EC8-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | | <0.2 | mg/kg | TM5/PM8/PM16 |
| >EC12-EC16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | | <4 | mg/kg | TM5/PM8/PM16 |
| >EC16-EC21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | | <7 | mg/kg | TM5/PM8/PM16 |
| >EC21-EC35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | | <7 | mg/kg | TM5/PM8/PM16 |
| >EC35-EC40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | | <7 | mg/kg | TM5/PM8/PM16 |
| Total aromatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| Total aliphatics and aromatics(C5-40) | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | | <52 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >EC6-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | <10 | mg/kg | TM5/PM8/PM16 |
| >EC25-EC35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | | <10 | mg/kg | TM5/PM8/PM16 |
| | | | | | | | | | | | | | |
| MTBE # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | | <5 | ug/kg | TM36/PM12 |
| Benzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | | <5 | ug/kg | TM36/PM12 |
| Toluene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | | <5 | ug/kg | TM36/PM12 |
| Ethylbenzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | | <5 | ug/kg | TM36/PM12 |
| m/p-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | | <5 | ug/kg | TM36/PM12 |
| o-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | | <5 | ug/kg | TM36/PM12 |
| | | | | | | | | | | | | | |
| PCB 28 # | <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 | ug/kg | TM17/PM8 |
| PCB 101 # | <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 | ug/kg | TM17/PM8 |
| PCB 138 # | <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 | ug/kg | TM17/PM8 |
| PCB 180 # | <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 | ug/kg | TM17/PM8 |

Please see attached notes for all abbreviations and acronyms

## Element Materials Technology

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : Solid**

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

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS08 | WS09 | WS09 | WS09 | WS10 | WS13 | WS13 | WS13 | WS17 | | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 1.70 | 2.70 | 0.70 | | | | |
| 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 | | | | |
| Sample Date | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | | |
| Natural Moisture Content | 18.5 | 22.0 | 14.6 | 11.3 | 17.7 | 9.0 | 7.1 | 7.0 | 9.8 | | <0.1 | % | PM4/PM0 |
| Moisture Content (% Wet Weight) | 15.6 | 18.1 | 12.7 | 10.1 | 15.0 | 8.3 | 6.7 | 6.6 | 8.9 | | <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 | mg/kg | TM38/PM20 |
| Chromium III | 47.0 | 47.0 | 26.1 | 36.5 | 32.6 | 18.0 | 19.1 | 40.4 | 22.4 | | <0.5 | mg/kg | NONE/NONE |
| Total Organic Carbon # | 0.64 | 0.35 | 0.14 | 0.21 | 0.46 | 0.36 | 0.13 | 0.10 | 0.31 | | <0.02 | % | TM21/PM24 |
| pH # | 7.70 | 8.29 | 8.45 | 8.59 | 8.00 | 8.60 | 8.72 | 8.82 | 8.70 | | <0.01 | pH units | TM73/PM11 |
| Mass of raw test portion | 0.1024 | 0.1118 | 0.1037 | 0.1015 | 0.101 | 0.0966 | 0.0983 | 0.0989 | 0.0987 | | | kg | NONE/PM17 |
| Mass of dried test portion | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | | | kg | NONE/PM17 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : CEN 10:1 1 Batch**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS05 | WS05 | WS05 | WS06 | WS06 | WS07 | WS07 | WS07 | WS08 | WS08 | | | |
| Depth | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | |
| 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 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | 0.0028 | <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 | 0.028 | <0.025 | <0.025 | mg/kg | TM30/PM17 |
| Dissolved Barium # | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | 0.016 | <0.003 | <0.003 | mg/l | TM30/PM17 |
| Dissolved Barium (A10) # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.16 | <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 | 0.004 | 0.009 | 0.008 | 0.008 | 0.003 | 0.005 | 0.014 | 0.029 | 0.013 | <0.002 | mg/l | TM30/PM17 |
| Dissolved Molybdenum (A10) # | 0.03 | 0.04 | 0.09 | 0.08 | 0.08 | 0.03 | 0.05 | 0.14 | 0.29 | 0.13 | <0.02 | mg/kg | TM30/PM17 |
| Dissolved Nickel # | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | 0.006 | <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 | 0.06 | <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 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 | 0.003 | 0.006 | 0.004 | <0.003 | mg/l | TM30/PM17 |
| Dissolved Zinc (A10) # | <0.03 | <0.03 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | <0.03 | 0.06 | 0.04 | <0.03 | mg/kg | TM30/PM17 |
| Mercury Dissolved by CVAF # | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | mg/l | TM61/PM0 |
| Mercury Dissolved by CVAF # | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | mg/kg | TM61/PM0 |
| Phenol | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/l | TM26/PM0 |
| Phenol | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM26/PM0 |
| Fluoride | <0.3 | 0.4 | <0.3 | 0.3 | 0.3 | 0.4 | <0.3 | 0.3 | <0.3 | <0.3 | <0.3 | mg/l | TM173/PM0 |
| Fluoride | <3 | 4 | <3 | 3 | 3 | 4 | <3 | <3 | <3 | <3 | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 0.6 | 1.3 | 1.2 | <0.5 | <0.5 | <0.5 | 1.0 | 0.6 | <0.5 | <0.5 | <0.5 | mg/l | TM38/PM0 |
| Sulphate as SO4 # | 6 | 13 | 12 | <5 | <5 | <5 | 10 | 6 | <5 | <5 | <5 | mg/kg | TM38/PM0 |
| Chloride # | <0.3 | 0.7 | 1.1 | 0.7 | 0.8 | 1.0 | 0.8 | 0.7 | 3.8 | 1.1 | <0.3 | mg/l | TM38/PM0 |
| Chloride # | <3 | 7 | 11 | 7 | 8 | 10 | 8 | 7 | 38 | 11 | <3 | mg/kg | TM38/PM0 |
| Dissolved Organic Carbon | <2 | <2 | 4 | 5 | 4 | 3 | 3 | 3 | 51 | 4 | <2 | mg/l | TM60/PM0 |
| Dissolved Organic Carbon | <20 | <20 | 40 | 50 | 40 | 30 | 30 | 30 | 510 | 40 | <20 | mg/kg | TM60/PM0 |
| pH | 8.36 | 8.60 | 8.75 | 8.55 | 7.89 | 8.27 | 8.57 | 8.89 | 8.19 | 8.53 | <0.01 | pH units | TM73/PM0 |
| Total Dissolved Solids # | 50 | 47 | <35 | 36 | 44 | 47 | 41 | <35 | 210 | 40 | <35 | mg/l | TM20/PM0 |
| Total Dissolved Solids # | 500 | 470 | <350 | 360 | 440 | 470 | 410 | <350 | 2101 | 400 | <350 | mg/kg | TM20/PM0 |

Please see attached notes for all abbreviations and acronyms





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

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : CEN 10:1 1 Batch**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS08 | WS09 | WS09 | WS09 | WS10 | WS13 | WS13 | WS13 | WS17 | | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 1.70 | 2.70 | 0.70 | | | | |
| 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 | | | | |
| Sample Date | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | | |
| Dissolved Antimony # | 0.004 | 0.003 | <0.002 | <0.002 | 0.003 | <0.002 | <0.002 | <0.002 | <0.002 | | <0.002 | mg/l | TM30/PM17 |
| Dissolved Antimony (A10) # | 0.04 | 0.03 | <0.02 | <0.02 | 0.03 | <0.02 | <0.02 | <0.02 | <0.02 | | <0.02 | mg/kg | TM30/PM17 |
| Dissolved Arsenic # | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | | <0.0025 | mg/l | TM30/PM17 |
| Dissolved Arsenic (A10) # | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | | <0.025 | mg/kg | TM30/PM17 |
| Dissolved Barium # | 0.006 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | | <0.003 | mg/l | TM30/PM17 |
| Dissolved Barium (A10) # | 0.06 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <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 | 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 | 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 | 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 | 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 | 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 | 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 | 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 | mg/kg | TM30/PM17 |
| Dissolved Molybdenum # | 0.013 | 0.006 | 0.007 | 0.003 | 0.013 | 0.004 | 0.004 | 0.006 | 0.006 | | <0.002 | mg/l | TM30/PM17 |
| Dissolved Molybdenum (A10) # | 0.13 | 0.06 | 0.07 | 0.03 | 0.13 | 0.04 | 0.04 | 0.06 | 0.06 | | <0.02 | mg/kg | TM30/PM17 |
| Dissolved Nickel # | <0.002 | <0.002 | <0.002 | <0.002 | 0.003 | <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 | 0.03 | <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 | 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 | mg/kg | TM30/PM17 |
| Dissolved Zinc # | 0.004 | 0.005 | <0.003 | 0.005 | <0.003 | <0.003 | <0.003 | <0.003 | 0.004 | | <0.003 | mg/l | TM30/PM17 |
| Dissolved Zinc (A10) # | 0.04 | 0.05 | <0.03 | 0.05 | <0.03 | <0.03 | <0.03 | <0.03 | 0.04 | | <0.03 | mg/kg | TM30/PM17 |
| Mercury Dissolved by CVAF # | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | | <0.00001 | 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 | 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 | 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 | mg/kg | TM26/PM0 |
| Fluoride | <0.3 | 0.5 | 0.3 | <0.3 | 0.3 | <0.3 | <0.3 | 1.1 | 0.4 | | <0.3 | mg/l | TM173/PM0 |
| Fluoride | <3 | 5 | 3 | <3 | <3 | <3 | <3 | 11 | 4 | | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 1.1 | 0.5 | 1.4 | 0.5 | 0.9 | 0.7 | 0.6 | 0.7 | 0.9 | | <0.5 | mg/l | TM38/PM0 |
| Sulphate as SO4 # | 11 | <5 | 14 | <5 | 9 | 7 | 6 | 7 | 9 | | <5 | mg/kg | TM38/PM0 |
| Chloride # | 0.9 | 1.1 | 0.6 | 0.8 | 1.2 | 0.6 | 0.5 | 0.5 | 0.5 | | <0.3 | mg/l | TM38/PM0 |
| Chloride # | 9 | 11 | 6 | 8 | 12 | 6 | 5 | 5 | 5 | | <3 | mg/kg | TM38/PM0 |
| Dissolved Organic Carbon | 5 | 5 | 3 | 5 | 8 | 3 | <2 | <2 | 4 | | <2 | mg/l | TM60/PM0 |
| Dissolved Organic Carbon | 50 | 50 | 30 | 50 | 80 | 30 | <20 | <20 | 40 | | <20 | mg/kg | TM60/PM0 |
| pH | 8.41 | 8.48 | 8.38 | 8.50 | 8.44 | 8.64 | 8.87 | 8.94 | 8.55 | | <0.01 | pH units | TM73/PM0 |
| Total Dissolved Solids # | 77 | 70 | 51 | <35 | 90 | <35 | <35 | 35 | <35 | | <35 | mg/l | TM20/PM0 |
| Total Dissolved Solids # | 770 | 700 | 510 | <350 | 900 | <350 | <350 | 350 | <350 | | <350 | mg/kg | TM20/PM0 |




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

## Element Materials Technology

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : EN12457_2**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS05 | WS05 | WS05 | WS06 | WS06 | WS07 | WS07 | WS07 | WS08 | WS08 | | | | | | |
| Depth | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | | | | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | Inert | Stable Non-reactive | Hazardous | LOD LOR | Units | Method No. |
| **Solid Waste Analysis** | | | | | | | | | | | | | | | | |
| Total Organic Carbon # | 0.18 | 0.27 | 0.24 | 0.17 | 0.17 | 0.09 | 0.16 | 0.29 | 1.72 | 0.36 | 3 | 5 | 6 | <0.02 | % | TM21/PM24 |
| Sum of BTEX | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 0.128 | <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 | <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 | <0.22 | <0.22 | <0.22 | <0.22 | 0.30 | - | - | - | <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 | 0.71 | 100 | - | - | <0.64 | mg/kg | TM4/PM8 |
| **CEN 10:1 Leachate** | | | | | | | | | | | | | | | | |
| Arsenic # | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | 0.028 | <0.025 | 0.5 | 2 | 25 | <0.025 | mg/kg | TM30/PM17 |
| Barium # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.16 | <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 | 0.04 | 0.09 | 0.08 | 0.08 | 0.03 | 0.05 | 0.14 | 0.29 | 0.13 | 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 | 0.06 | <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 | <0.03 | <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 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | <0.03 | 0.06 | 0.04 | 4 | 50 | 200 | <0.03 | mg/kg | TM30/PM17 |
| Total Dissolved Solids # | 500 | 470 | <350 | 360 | 440 | 470 | 410 | <350 | 2101 | 400 | 4000 | 60000 | 100000 | <350 | mg/kg | TM20/PM0 |
| Dissolved Organic Carbon | <20 | <20 | 40 | 50 | 40 | 30 | 30 | 30 | 510 | 40 | 500 | 800 | 1000 | <20 | mg/kg | TM60/PM0 |
| Mass of raw test portion | 0.096 | 0.1022 | 0.1003 | 0.1037 | 0.1012 | 0.1007 | 0.1008 | 0.102 | 0.1379 | 0.1025 | - | - | - | | kg | NONE/PM17 |
| Dry Matter Content Ratio | 93.7 | 88.5 | 89.6 | 87.1 | 89.0 | 89.0 | 89.5 | 88.5 | 65.5 | 88.2 | - | - | - | <0.1 | % | NONE/PM4 |
| Leachant Volume | 0.894 | 0.888 | 0.89 | 0.887 | 0.889 | 0.889 | 0.889 | 0.888 | 0.853 | 0.888 | - | - | - | | l | NONE/PM17 |
| Eluate Volume | 0.85 | 0.86 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | - | - | - | | l | NONE/PM17 |
| pH # | 8.65 | 8.68 | 8.89 | 8.37 | 8.86 | 8.64 | 8.78 | 8.67 | 7.92 | 8.24 | - | - | - | <0.01 | pH units | TM73/PM11 |
| Phenol | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 1 | - | - | <0.1 | mg/kg | TM26/PM0 |
| Fluoride | <3 | 4 | <3 | 3 | 3 | 4 | <3 | <3 | <3 | <3 | - | - | - | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 6 | 13 | 12 | <5 | <5 | <5 | 10 | 6 | <5 | <5 | 1000 | 20000 | 50000 | <5 | mg/kg | TM38/PM0 |
| Chloride # | <3 | 7 | 11 | 7 | 8 | 10 | 8 | 7 | 38 | 11 | 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:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10462

**Report : EN12457_2**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS08 | WS09 | WS09 | WS09 | WS10 | WS13 | WS13 | WS13 | WS17 | | | | | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 1.70 | 2.70 | 0.70 | | | | | | | |
| 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 | | | | | | | |
| Sample Date | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | |
| Date of Receipt | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | 07/08/2020 | | | | | | | |
| **Solid Waste Analysis** | | | | | | | | | | | | | | | | |
| Total Organic Carbon # | 0.64 | 0.35 | 0.14 | 0.21 | 0.46 | 0.36 | 0.13 | 0.10 | 0.31 | | 3 | 5 | 6 | <0.02 | % | TM21/PM24 |
| Sum of BTEX | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <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 | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | | 1 | - | - | <0.035 | mg/kg | TM17/PM8 |
| Mineral Oil | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | | 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 | 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 | | 100 | - | - | <0.64 | mg/kg | TM4/PM8 |
| **CEN 10:1 Leachate** | | | | | | | | | | | | | | | | |
| Arsenic # | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | | 0.5 | 2 | 25 | <0.025 | mg/kg | TM30/PM17 |
| Barium # | 0.06 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <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 | | 0.04 | 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 | | 0.5 | 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 | | 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 | | 0.01 | 0.2 | 2 | <0.0001 | mg/kg | TM61/PM0 |
| Molybdenum # | 0.13 | 0.06 | 0.07 | 0.03 | 0.13 | 0.04 | 0.04 | 0.06 | 0.06 | | 0.5 | 10 | 30 | <0.02 | mg/kg | TM30/PM17 |
| Nickel # | <0.02 | <0.02 | <0.02 | <0.02 | 0.03 | <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 | | 0.5 | 10 | 50 | <0.05 | mg/kg | TM30/PM17 |
| Antimony # | 0.04 | 0.03 | <0.02 | <0.02 | 0.03 | <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 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | | 0.1 | 0.5 | 7 | <0.03 | mg/kg | TM30/PM17 |
| Zinc # | 0.04 | 0.05 | <0.03 | 0.05 | <0.03 | <0.03 | <0.03 | <0.03 | 0.04 | | 4 | 50 | 200 | <0.03 | mg/kg | TM30/PM17 |
| Total Dissolved Solids # | 770 | 700 | 510 | <350 | 900 | <350 | <350 | 350 | <350 | | 4000 | 60000 | 100000 | <350 | mg/kg | TM20/PM0 |
| Dissolved Organic Carbon | 50 | 50 | 30 | 50 | 80 | 30 | <20 | <20 | 40 | | 500 | 800 | 1000 | <20 | mg/kg | TM60/PM0 |
| Mass of raw test portion | 0.1024 | 0.1118 | 0.1037 | 0.1015 | 0.101 | 0.0966 | 0.0983 | 0.0989 | 0.0987 | | - | - | - | | kg | NONE/PM17 |
| Dry Matter Content Ratio | 88.3 | 80.6 | 87.0 | 88.5 | 89.1 | 93.3 | 92.0 | 91.5 | 91.4 | | - | - | - | <0.1 | % | NONE/PM4 |
| Leachant Volume | 0.888 | 0.878 | 0.887 | 0.888 | 0.889 | 0.894 | 0.892 | 0.892 | 0.892 | | - | - | - | | l | NONE/PM17 |
| Eluate Volume | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | | - | - | - | | l | NONE/PM17 |
| pH # | 7.70 | 8.29 | 8.45 | 8.59 | 8.00 | 8.60 | 8.72 | 8.82 | 8.70 | | - | - | - | <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 | | 1 | - | - | <0.1 | mg/kg | TM26/PM0 |
| Fluoride | <3 | 5 | 3 | <3 | <3 | <3 | <3 | 11 | 4 | | - | - | - | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 11 | <5 | 14 | <5 | 9 | 7 | 6 | 7 | 9 | | 1000 | 20000 | 50000 | <5 | mg/kg | TM38/PM0 |
| Chloride # | 9 | 11 | 6 | 8 | 12 | 6 | 5 | 5 | 5 | | 800 | 15000 | 25000 | <3 | mg/kg | TM38/PM0 |



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

**Client Name:** Ground Investigations Ireland

**Reference:** 9766-07-20

**Location:** The Quarter, Citywest, Phase 3

**Contact:** Diarmaid MagLochlainn

**Matrix : Solid**

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | EPH Interpretation |
|---|---|---|---|---|---|
| 20/10462 | 1 | WS05 | 0.70 | 1-3 | No interpretation possible |
| 20/10462 | 1 | WS05 | 1.70 | 4-6 | No interpretation possible |
| 20/10462 | 1 | WS05 | 2.70 | 7-9 | No interpretation possible |
| 20/10462 | 1 | WS06 | 0.70 | 10-12 | No interpretation possible |
| 20/10462 | 1 | WS06 | 1.70 | 13-15 | No interpretation possible |
| 20/10462 | 1 | WS07 | 0.70 | 16-18 | No interpretation possible |
| 20/10462 | 1 | WS07 | 1.70 | 19-21 | No interpretation possible |
| 20/10462 | 1 | WS07 | 2.70 | 22-24 | No interpretation possible |
| 20/10462 | 1 | WS08 | 0.70 | 25-27 | No interpretation possible |
| 20/10462 | 1 | WS08 | 1.70 | 28-30 | No interpretation possible |
| 20/10462 | 1 | WS08 | 2.70 | 31-33 | No interpretation possible |
| 20/10462 | 1 | WS09 | 0.70 | 34-36 | No interpretation possible |
| 20/10462 | 1 | WS09 | 1.70 | 37-39 | No interpretation possible |
| 20/10462 | 1 | WS09 | 2.70 | 40-42 | No interpretation possible |
| 20/10462 | 1 | WS10 | 0.70 | 43-45 | No interpretation possible |
| 20/10462 | 1 | WS13 | 0.70 | 46-48 | No interpretation possible |
| 20/10462 | 1 | WS13 | 1.70 | 49-51 | No interpretation possible |
| 20/10462 | 1 | WS13 | 2.70 | 52-54 | No interpretation possible |
| 20/10462 | 1 | WS17 | 0.70 | 55-57 | No interpretation possible |

**Client Name:** Ground Investigations Ireland
**Reference:** 20/07/9766
**Location:** The Quarter, Citywest, Phase 3
**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). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

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

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

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Date Of Analysis | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 20/10462 | 1 | WS05 | 0.70 | 2 | 11/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS05 | 1.70 | 5 | 11/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS05 | 2.70 | 8 | 11/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS06 | 0.70 | 11 | 11/08/2020 | **General Description (Bulk Analysis)** | soil/stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS06 | 1.70 | 14 | 11/08/2020 | **General Description (Bulk Analysis)** | soil/stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS07 | 0.70 | 17 | 11/08/2020 | **General Description (Bulk Analysis)** | soil/stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS07 | 1.70 | 20 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |

**Client Name:** Ground Investigations Ireland
**Reference:** 20/07/9766
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Date Of Analysis | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 20/10462 | 1 | WS07 | 1.70 | 20 | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS07 | 2.70 | 23 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS08 | 0.70 | 26 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS08 | 1.70 | 29 | 11/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS08 | 2.70 | 32 | 11/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS09 | 0.70 | 35 | 11/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS09 | 1.70 | 38 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stone |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS09 | 2.70 | 41 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stone |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS10 | 0.70 | 44 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stone |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS13 | 0.70 | 47 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stone |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |

**Client Name:** Ground Investigations Ireland
**Reference:** 20/07/9766
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Date Of Analysis | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 20/10462 | 1 | WS13 | 0.70 | 47 | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS13 | 1.70 | 50 | 11/08/2020 | **General Description (Bulk Analysis)** | Soil/Stone |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS13 | 2.70 | 53 | 11/08/2020 | **General Description (Bulk Analysis)** | soil/stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10462 | 1 | WS17 | 0.70 | 56 | 11/08/2020 | **General Description (Bulk Analysis)** | soil/stones |
| | | | | | 11/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 11/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 11/08/2020 | **Asbestos Type** | NAD |
| | | | | | 11/08/2020 | **Asbestos Level Screen** | NAD |

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Analysis | Reason |
|---|---|---|---|---|---|---|
| No deviating sample report results for job 20/10462 | | | | | | |

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

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

***EMT Job No.:*** 20/10462

**SOILS**

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

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

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

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

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

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

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

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

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

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

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

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

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

**WATERS**

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

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

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

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

**DEVIATING SAMPLES**

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

**SURROGATES**

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

**DILUTIONS**

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

**BLANKS**

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

**NOTE**

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

**REPORTS FROM THE SOUTH AFRICA LABORATORY**

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

**Measurement Uncertainty**

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

**ABBREVIATIONS and ACRONYMS USED**

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

**EMT Job No:** 20/10462

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

**EMT Job No:** 20/10462

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

**EMT Job No:** 20/10462

| 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 |
|---|---|---|---|---|---|---|---|
| TM65 | Asbestos Bulk Identification method based on HSG 248 First edition (2006) | PM42 | Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065. | Yes | | AR | |
| TM73 | Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser. | PM0 | No preparation is required. | | | AR | Yes |
| TM73 | Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser. | PM11 | Extraction of as received solid samples using one part solid to 2.5 parts deionised water. | Yes | | AR | No |
| TM173 | Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998) | PM0 | No preparation is required. | | | AR | Yes |
| NONE | No Method Code | NONE | No Method Code | | | AD | Yes |
| NONE | No Method Code | PM17 | Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio. | | | | |
| NONE | No Method Code | PM17 | Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio. | | | AR | |
| NONE | No Method Code | PM4 | Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990. | | | AR | |
| | | | | | | | |
| | | | | | | | |

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

| | |
|---|---|
| **Attention :** | Diarmaid MagLochlainn |
| **Date :** | 18th August, 2020 |
| **Your reference :** | 9766-07-20 |
| **Our reference :** | Test Report 20/10583 Batch 1 |
| **Location :** | The Quater, Citywest, Phase 3 |
| **Date samples received :** | 10th August, 2020 |
| **Status :** | Final report |
| **Issue :** | 1 |

Twenty samples were received for analysis on 10th August, 2020 of which twenty were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Authorised By:**

**Bruce Leslie**
**Project Manager**

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : Solid**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS01 | WS01 | WS02 | WS02 | WS03 | WS03 | WS04 | WS04 | WS11 | WS11 | | | |
| Depth | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| Antimony | 4 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | <1 | mg/kg | TM30/PM15 |
| Arsenic # | 8.6 | 9.7 | 11.2 | 10.7 | 16.2 | 9.3 | 11.3 | 12.6 | 8.4 | 9.4 | <0.5 | mg/kg | TM30/PM15 |
| Barium # | 40 | 64 | 106 | 54 | 69 | 32 | 48 | 46 | 28 | 38 | <1 | mg/kg | TM30/PM15 |
| Cadmium # | 1.8 | 1.8 | 3.3 | 2.1 | 2.6 | 2.0 | 2.0 | 1.6 | 1.8 | 1.6 | <0.1 | mg/kg | TM30/PM15 |
| Chromium # | 28.1 | 19.7 | 45.5 | 20.7 | 64.5 | 17.3 | 35.3 | 23.7 | 51.9 | 43.1 | <0.5 | mg/kg | TM30/PM15 |
| Copper # | 24 | 25 | 31 | 27 | 25 | 22 | 23 | 21 | 19 | 22 | <1 | mg/kg | TM30/PM15 |
| Lead # | 15 | 14 | 15 | 14 | 18 | 14 | 15 | 19 | 15 | 16 | <5 | mg/kg | TM30/PM15 |
| Mercury # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM30/PM15 |
| Molybdenum # | 2.6 | 2.2 | 2.4 | 2.3 | 1.8 | 1.6 | 1.4 | 2.1 | 1.6 | 1.4 | <0.1 | mg/kg | TM30/PM15 |
| Nickel # | 35.4 | 34.7 | 50.7 | 36.4 | 59.9 | 30.1 | 33.4 | 30.7 | 27.5 | 29.1 | <0.7 | mg/kg | TM30/PM15 |
| Selenium # | <1 | <1 | <1 | 2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | TM30/PM15 |
| Zinc # | 77 | 86 | 90 | 85 | 103 | 74 | 85 | 85 | 79 | 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 # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | mg/kg | TM4/PM8 |
| 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 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | mg/kg | TM4/PM8 |
| Pyrene # | <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 |
| 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 # | <0.02 | <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(bk)fluoranthene # | <0.07 | <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 # | <0.04 | <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 | <0.05 | <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 | <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 | 88 | 102 | 99 | 96 | 92 | 98 | 96 | 95 | 96 | 98 | <0 | % | TM4/PM8 |
| | | | | | | | | | | | | | |
| Mineral Oil (C10-C40) | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | mg/kg | TM5/PM8/PM16 |

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:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : Solid**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS01 | WS01 | WS02 | WS02 | WS03 | WS03 | WS04 | WS04 | WS11 | WS11 | | | |
| Depth | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| TPH CWG | | | | | | | | | | | | | |
| **Aliphatics** | | | | | | | | | | | | | |
| >C5-C6 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C6-C8 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C8-C10 | 0.1 | <0.1 | <0.1 | <0.1 | 0.6 | <0.1 | <0.1 | <0.1 | <0.1 | 0.3 | <0.1 | mg/kg | TM36/PM12 |
| >C10-C12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | mg/kg | TM5/PM8/PM16 |
| >C12-C16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | mg/kg | TM5/PM8/PM16 |
| >C16-C21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >C21-C35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >C35-C40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| Total aliphatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >C6-C10 | 0.1 | <0.1 | <0.1 | <0.1 | 0.6 | <0.1 | <0.1 | <0.1 | <0.1 | 0.3 | <0.1 | mg/kg | TM36/PM12 |
| >C10-C25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| >C25-C35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| **Aromatics** | | | | | | | | | | | | | |
| >C5-EC7 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC7-EC8 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC8-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | mg/kg | TM5/PM8/PM16 |
| >EC12-EC16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | mg/kg | TM5/PM8/PM16 |
| >EC16-EC21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >EC21-EC35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >EC35-EC40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| Total aromatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| Total aliphatics and aromatics(C5-40) | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >EC6-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| >EC25-EC35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| | | | | | | | | | | | | | |
| MTBE # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Benzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Toluene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Ethylbenzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| m/p-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| o-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <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:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : Solid**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS01 | WS01 | WS02 | WS02 | WS03 | WS03 | WS04 | WS04 | WS11 | WS11 | | | |
| Depth | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| Natural Moisture Content | 9.8 | 13.2 | 13.0 | 14.1 | 14.6 | 14.7 | 13.4 | 12.2 | 8.4 | 9.4 | <0.1 | % | PM4/PM0 |
| Moisture Content (% Wet Weight) | 8.9 | 11.6 | 11.5 | 12.4 | 12.7 | 12.8 | 11.8 | 10.9 | 7.7 | 8.6 | <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 |
| Chromium III | 28.1 | 19.7 | 45.5 | 20.7 | 64.5 | 17.3 | 35.3 | 23.7 | 51.9 | 43.1 | <0.5 | mg/kg | NONE/NONE |
| Total Organic Carbon # | 0.19 | 0.29 | 0.26 | 0.50 | 0.34 | 0.16 | 0.21 | 0.14 | 0.22 | 0.16 | <0.02 | % | TM21/PM24 |
| pH # | 8.65 | 8.45 | 8.65 | 8.48 | 8.54 | 8.75 | 8.57 | 8.59 | 8.75 | 8.81 | <0.01 | pH units | TM73/PM11 |
| Mass of raw test portion | 0.113 | 0.102 | 0.1028 | 0.102 | 0.1022 | 0.1002 | 0.1053 | 0.1033 | 0.098 | 0.0999 | | kg | NONE/PM17 |
| Mass of dried test portion | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | | kg | NONE/PM17 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : Solid**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | 58-60 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS11 | WS12 | WS12 | WS12 | WS14 | WS14 | WS14 | WS15 | WS16 | WS18 | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 0.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| Antimony | <1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | <1 | mg/kg | TM30/PM15 |
| Arsenic # | 6.7 | 13.1 | 7.7 | 11.0 | 18.5 | 8.9 | 8.3 | 16.4 | 6.7 | 9.1 | <0.5 | mg/kg | TM30/PM15 |
| Barium # | 21 | 50 | 30 | 48 | 267 | 46 | 40 | 131 | 173 | 40 | <1 | mg/kg | TM30/PM15 |
| Cadmium # | 1.1 | 2.1 | 1.2 | 1.5 | 2.8 | 1.7 | 1.8 | 1.5 | 1.4 | 2.0 | <0.1 | mg/kg | TM30/PM15 |
| Chromium # | 25.0 | 27.5 | 28.6 | 25.0 | 86.7 | 46.7 | 43.7 | 45.5 | 33.8 | 34.0 | <0.5 | mg/kg | TM30/PM15 |
| Copper # | 13 | 31 | 15 | 20 | 26 | 16 | 20 | 22 | 9 | 25 | <1 | mg/kg | TM30/PM15 |
| Lead # | 25 | 16 | 13 | 18 | 26 | 18 | 13 | 21 | 7 | 14 | <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 # | 1.9 | 2.8 | 1.0 | 1.9 | 7.3 | 1.8 | 3.3 | 3.0 | 2.4 | 3.4 | <0.1 | mg/kg | TM30/PM15 |
| Nickel # | 20.4 | 43.6 | 21.5 | 30.1 | 40.1 | 24.0 | 41.0 | 40.4 | 16.2 | 29.4 | <0.7 | mg/kg | TM30/PM15 |
| Selenium # | <1 | 1 | <1 | <1 | 3 | <1 | <1 | <1 | 1 | <1 | <1 | mg/kg | TM30/PM15 |
| Zinc # | 58 | 104 | 63 | 82 | 163 | 84 | 77 | 93 | 39 | 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 # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | mg/kg | TM4/PM8 |
| 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 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | mg/kg | TM4/PM8 |
| Pyrene # | <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 |
| 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 # | <0.02 | <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(bk)fluoranthene # | <0.07 | <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 # | <0.04 | <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 | <0.05 | <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 | <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 | 97 | 94 | 97 | 82 | 96 | 95 | 91 | 80 | 91 | 95 | <0 | % | TM4/PM8 |
| | | | | | | | | | | | | | |
| Mineral Oil (C10-C40) | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | mg/kg | TM5/PM8/PM16 |

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : Solid**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | 58-60 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS11 | WS12 | WS12 | WS12 | WS14 | WS14 | WS14 | WS15 | WS16 | WS18 | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 0.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| TPH CWG | | | | | | | | | | | | | |
| **Aliphatics** | | | | | | | | | | | | | |
| >C5-C6 # | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C6-C8 # | 0.3 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C8-C10 | 4.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C10-C12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | mg/kg | TM5/PM8/PM16 |
| >C12-C16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | mg/kg | TM5/PM8/PM16 |
| >C16-C21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >C21-C35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >C35-C40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| Total aliphatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >C6-C10 | 4.4 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >C10-C25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| >C25-C35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| **Aromatics** | | | | | | | | | | | | | |
| >C5-EC7 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC7-EC8 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC8-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC12 # | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | mg/kg | TM5/PM8/PM16 |
| >EC12-EC16 # | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | <4 | mg/kg | TM5/PM8/PM16 |
| >EC16-EC21 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >EC21-EC35 # | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| >EC35-EC40 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | <7 | mg/kg | TM5/PM8/PM16 |
| Total aromatics C5-40 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | <26 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| Total aliphatics and aromatics(C5-40) | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | <52 | mg/kg | TM5/TM36/PM8/PM12/PM16 |
| >EC6-EC10 # | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | mg/kg | TM36/PM12 |
| >EC10-EC25 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| >EC25-EC35 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | mg/kg | TM5/PM8/PM16 |
| | | | | | | | | | | | | | |
| MTBE # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Benzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Toluene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| Ethylbenzene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| m/p-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | ug/kg | TM36/PM12 |
| o-Xylene # | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <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 |

## Element Materials Technology

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : Solid**

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

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | 58-60 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample ID** | WS11 | WS12 | WS12 | WS12 | WS14 | WS14 | WS14 | WS15 | WS16 | WS18 | | | |
| **Depth** | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 0.70 | | | |
| **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** | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| **Sample Type** | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| **Batch Number** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| **Date of Receipt** | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| Natural Moisture Content | 8.3 | 14.8 | 10.0 | 10.3 | 21.0 | 8.8 | 12.0 | 17.8 | 22.7 | 9.4 | <0.1 | % | PM4/PM0 |
| Moisture Content (% Wet Weight) | 7.7 | 12.9 | 9.1 | 9.4 | 17.4 | 8.1 | 10.7 | 15.1 | 18.5 | 8.6 | <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 |
| Chromium III | 25.0 | 27.5 | 28.6 | 25.0 | 86.7 | 46.7 | 43.7 | 45.5 | 33.8 | 34.0 | <0.5 | mg/kg | NONE/NONE |
| Total Organic Carbon # | 0.15 | 0.39 | 0.14 | 0.18 | 0.70 | 0.28 | 0.29 | 0.24 | 0.13 | 0.21 | <0.02 | % | TM21/PM24 |
| pH # | 8.84 | 8.51 | 8.89 | 8.76 | 7.86 | 8.72 | 8.60 | 8.48 | 8.41 | 8.71 | <0.01 | pH units | TM73/PM11 |
| Mass of raw test portion | 0.1 | 0.1122 | 0.099 | 0.1011 | 0.1018 | 0.0971 | 0.0978 | 0.1122 | 0.1046 | 0.0977 | | kg | NONE/PM17 |
| Mass of dried test portion | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | 0.09 | | kg | NONE/PM17 |

Please see attached notes for all abbreviations and acronyms

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : CEN 10:1 1 Batch**

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

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS01 | WS01 | WS02 | WS02 | WS03 | WS03 | WS04 | WS04 | WS11 | WS11 | | | |
| Depth | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| Dissolved Antimony # | 0.003 | <0.002 | <0.002 | <0.002 | 0.003 | <0.002 | <0.002 | <0.002 | <0.002 | 0.003 | <0.002 | mg/l | TM30/PM17 |
| Dissolved Antimony (A10) # | 0.03 | <0.02 | <0.02 | <0.02 | 0.03 | <0.02 | <0.02 | <0.02 | <0.02 | 0.03 | <0.02 | mg/kg | TM30/PM17 |
| Dissolved Arsenic # | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <0.0025 | <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 | <0.025 | <0.025 | <0.025 | mg/kg | TM30/PM17 |
| Dissolved Barium # | <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 Barium (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 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 # | 0.006 | 0.009 | 0.007 | 0.003 | 0.005 | 0.006 | 0.005 | 0.006 | <0.002 | <0.002 | <0.002 | mg/l | TM30/PM17 |
| Dissolved Molybdenum (A10) # | 0.06 | 0.09 | 0.07 | 0.03 | 0.05 | 0.06 | 0.05 | 0.06 | <0.02 | <0.02 | <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 | 0.5 | 0.3 | 0.5 | 0.3 | 0.4 | 0.3 | 0.6 | 0.3 | <0.3 | <0.3 | <0.3 | mg/l | TM173/PM0 |
| Fluoride | 5 | 3 | 5 | 3 | 4 | <3 | 6 | 3 | <3 | <3 | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 0.5 | 0.6 | <0.5 | 0.6 | <0.5 | <0.5 | 2.5 | 2.3 | 0.7 | 0.7 | <0.5 | mg/l | TM38/PM0 |
| Sulphate as SO4 # | 5 | 6 | <5 | 6 | <5 | <5 | 25 | 23 | 7 | 7 | <5 | mg/kg | TM38/PM0 |
| Chloride # | 0.3 | 0.3 | <0.3 | 0.3 | 0.4 | 0.4 | 0.3 | <0.3 | <0.3 | <0.3 | <0.3 | mg/l | TM38/PM0 |
| Chloride # | 3 | 3 | <3 | 3 | 4 | 4 | 3 | <3 | <3 | <3 | <3 | mg/kg | TM38/PM0 |
| Dissolved Organic Carbon | 3 | 2 | 3 | <2 | 4 | <2 | 3 | 2 | <2 | 3 | <2 | mg/l | TM60/PM0 |
| Dissolved Organic Carbon | 30 | 20 | 30 | <20 | 40 | <20 | 30 | 20 | <20 | 30 | <20 | mg/kg | TM60/PM0 |
| pH | 8.13 | 8.39 | 8.24 | 8.22 | 8.40 | 8.36 | 8.26 | 8.43 | 8.31 | 8.11 | <0.01 | pH units | TM73/PM0 |
| Total Dissolved Solids # | 41 | 43 | <35 | 37 | 44 | <35 | 67 | 55 | 42 | 46 | <35 | mg/l | TM20/PM0 |
| Total Dissolved Solids # | 410 | 430 | <350 | 370 | 440 | <350 | 670 | 550 | 420 | 460 | <350 | mg/kg | TM20/PM0 |

Please see attached notes for all abbreviations and acronyms





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

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : CEN 10:1 1 Batch**

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

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | 58-60 | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS11 | WS12 | WS12 | WS12 | WS14 | WS14 | WS14 | WS15 | WS16 | WS18 | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 0.70 | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | | | |
| Dissolved Antimony # | 0.003 | <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) # | 0.03 | <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 | <0.0025 | <0.0025 | <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 | <0.025 | <0.025 | <0.025 | mg/kg | TM30/PM17 |
| Dissolved Barium # | <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 Barium (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 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 # | 0.002 | <0.002 | 0.003 | 0.004 | <0.002 | 0.007 | 0.006 | 0.002 | 0.004 | 0.008 | <0.002 | mg/l | TM30/PM17 |
| Dissolved Molybdenum (A10) # | 0.02 | <0.02 | 0.03 | 0.04 | <0.02 | 0.07 | 0.06 | 0.02 | 0.04 | 0.08 | <0.02 | mg/kg | TM30/PM17 |
| Dissolved Nickel # | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | mg/l | TM30/PM17 |
| Dissolved Nickel (A10) # | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | mg/kg | TM30/PM17 |
| Dissolved Selenium # | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | <0.003 | mg/l | TM30/PM17 |
| Dissolved Selenium (A10) # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | mg/kg | TM30/PM17 |
| Dissolved Zinc # | <0.003 | <0.003 | <0.003 | <0.003 | 0.004 | <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 | 0.04 | <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 | <0.3 | <0.3 | 0.3 | <0.3 | <0.3 | <0.3 | <0.3 | 0.5 | 0.5 | 0.3 | <0.3 | mg/l | TM173/PM0 |
| Fluoride | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 5 | 5 | 3 | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 0.7 | 1.3 | 0.8 | 0.5 | <0.5 | <0.5 | <0.5 | 0.9 | 1.0 | <0.5 | <0.5 | mg/l | TM38/PM0 |
| Sulphate as SO4 # | 7 | 13 | 8 | 5 | <5 | <5 | <5 | 9 | 10 | <5 | <5 | mg/kg | TM38/PM0 |
| Chloride # | <0.3 | 0.5 | 0.3 | <0.3 | 0.4 | 0.4 | 0.4 | 0.7 | 0.5 | 0.3 | <0.3 | mg/l | TM38/PM0 |
| Chloride # | <3 | 5 | <3 | <3 | 4 | 4 | 4 | 7 | 5 | 3 | <3 | mg/kg | TM38/PM0 |
| Dissolved Organic Carbon | 3 | 3 | <2 | <2 | 3 | <2 | <2 | <2 | <2 | 2 | <2 | mg/l | TM60/PM0 |
| Dissolved Organic Carbon | 30 | 30 | <20 | <20 | 30 | <20 | <20 | <20 | <20 | 20 | <20 | mg/kg | TM60/PM0 |
| pH | 8.48 | 8.12 | 8.64 | 8.42 | 7.91 | 8.41 | 8.51 | 8.32 | 7.76 | 8.30 | <0.01 | pH units | TM73/PM0 |
| Total Dissolved Solids # | 47 | 42 | 42 | 43 | 39 | 45 | 38 | 71 | 65 | 47 | <35 | mg/l | TM20/PM0 |
| Total Dissolved Solids # | 470 | 420 | 420 | 430 | 390 | 450 | 380 | 710 | 650 | 470 | <350 | mg/kg | TM20/PM0 |

Please see attached notes for all abbreviations and acronyms

## Element Materials Technology

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : EN12457_2**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 1-3 | 4-6 | 7-9 | 10-12 | 13-15 | 16-18 | 19-21 | 22-24 | 25-27 | 28-30 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS01 | WS01 | WS02 | WS02 | WS03 | WS03 | WS04 | WS04 | WS11 | WS11 | | | | | | |
| Depth | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | 0.70 | 1.70 | | | | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | Inert | Stable Non-reactive | Hazardous | LOD LOR | Units | Method No. |
| **Solid Waste Analysis** | | | | | | | | | | | | | | | | |
| Total Organic Carbon # | 0.19 | 0.29 | 0.26 | 0.50 | 0.34 | 0.16 | 0.21 | 0.14 | 0.22 | 0.16 | 3 | 5 | 6 | <0.02 | % | TM21/PM24 |
| Sum of BTEX | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <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 | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | 1 | - | - | <0.035 | mg/kg | TM17/PM8 |
| Mineral Oil | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <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 | <0.025 | <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 # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <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 # | 0.06 | 0.09 | 0.07 | 0.03 | 0.05 | 0.06 | 0.05 | 0.06 | <0.02 | <0.02 | 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 # | 0.03 | <0.02 | <0.02 | <0.02 | 0.03 | <0.02 | <0.02 | <0.02 | <0.02 | 0.03 | 0.06 | 0.7 | 5 | <0.02 | mg/kg | TM30/PM17 |
| Selenium # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 0.1 | 0.5 | 7 | <0.03 | mg/kg | TM30/PM17 |
| Zinc # | <0.03 | 0.03 | <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 # | 410 | 430 | <350 | 370 | 440 | <350 | 670 | 550 | 420 | 460 | 4000 | 60000 | 100000 | <350 | mg/kg | TM20/PM0 |
| Dissolved Organic Carbon | 30 | 20 | 30 | <20 | 40 | <20 | 30 | 20 | <20 | 30 | 500 | 800 | 1000 | <20 | mg/kg | TM60/PM0 |
| Mass of raw test portion | 0.113 | 0.102 | 0.1028 | 0.102 | 0.1022 | 0.1002 | 0.1053 | 0.1033 | 0.098 | 0.0999 | - | - | - | | kg | NONE/PM17 |
| Dry Matter Content Ratio | 79.4 | 88.1 | 87.5 | 88.1 | 87.7 | 89.5 | 85.5 | 87.3 | 92.2 | 89.6 | - | - | - | <0.1 | % | NONE/PM4 |
| Leachant Volume | 0.877 | 0.888 | 0.887 | 0.888 | 0.887 | 0.889 | 0.885 | 0.887 | 0.892 | 0.89 | - | - | - | | l | NONE/PM17 |
| Eluate Volume | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | - | - | - | | l | NONE/PM17 |
| pH # | 8.65 | 8.45 | 8.65 | 8.48 | 8.54 | 8.75 | 8.57 | 8.59 | 8.75 | 8.81 | - | - | - | <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 | 5 | 3 | 4 | <3 | 6 | 3 | <3 | <3 | - | - | - | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 5 | 6 | <5 | 6 | <5 | <5 | 25 | 23 | 7 | 7 | 1000 | 20000 | 50000 | <5 | mg/kg | TM38/PM0 |
| Chloride # | 3 | 3 | <3 | 3 | 4 | 4 | 3 | <3 | <3 | <3 | 800 | 15000 | 25000 | <3 | mg/kg | TM38/PM0 |





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

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/10583

**Report : EN12457_2**

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

Please see attached notes for all abbreviations and acronyms

| EMT Sample No. | 31-33 | 34-36 | 37-39 | 40-42 | 43-45 | 46-48 | 49-51 | 52-54 | 55-57 | 58-60 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | WS11 | WS12 | WS12 | WS12 | WS14 | WS14 | WS14 | WS15 | WS16 | WS18 | | | | | | |
| Depth | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 1.70 | 2.70 | 0.70 | 0.70 | 0.70 | | | | | | |
| 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 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | 28/07/2020 | | | | | | |
| Sample Type | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | Soil | | | | | | |
| Batch Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Date of Receipt | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | 10/08/2020 | Inert | Stable Non-reactive | Hazardous | LOD LOR | Units | Method No. |
| **Solid Waste Analysis** | | | | | | | | | | | | | | | | |
| Total Organic Carbon # | 0.15 | 0.39 | 0.14 | 0.18 | 0.70 | 0.28 | 0.29 | 0.24 | 0.13 | 0.21 | 3 | 5 | 6 | <0.02 | % | TM21/PM24 |
| Sum of BTEX | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <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 | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | <0.035 | 1 | - | - | <0.035 | mg/kg | TM17/PM8 |
| Mineral Oil | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <30 | <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 | <0.025 | <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 # | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | <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 # | 0.02 | <0.02 | 0.03 | 0.04 | <0.02 | 0.07 | 0.06 | 0.02 | 0.04 | 0.08 | 0.5 | 10 | 30 | <0.02 | mg/kg | TM30/PM17 |
| Nickel # | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | 0.4 | 10 | 40 | <0.02 | mg/kg | TM30/PM17 |
| Lead # | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 0.5 | 10 | 50 | <0.05 | mg/kg | TM30/PM17 |
| Antimony # | 0.03 | <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 | <0.03 | <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 | 0.04 | <0.03 | <0.03 | <0.03 | <0.03 | <0.03 | 4 | 50 | 200 | <0.03 | mg/kg | TM30/PM17 |
| Total Dissolved Solids # | 470 | 420 | 420 | 430 | 390 | 450 | 380 | 710 | 650 | 470 | 4000 | 60000 | 100000 | <350 | mg/kg | TM20/PM0 |
| Dissolved Organic Carbon | 30 | 30 | <20 | <20 | 30 | <20 | <20 | <20 | <20 | 20 | 500 | 800 | 1000 | <20 | mg/kg | TM60/PM0 |
| Mass of raw test portion | 0.1 | 0.1122 | 0.099 | 0.1011 | 0.1018 | 0.0971 | 0.0978 | 0.1122 | 0.1046 | 0.0977 | - | - | - | | kg | NONE/PM17 |
| Dry Matter Content Ratio | 89.6 | 80.5 | 91.2 | 88.7 | 88.1 | 92.7 | 91.6 | 80.3 | 86.4 | 91.8 | - | - | - | <0.1 | % | NONE/PM4 |
| Leachant Volume | 0.89 | 0.878 | 0.891 | 0.889 | 0.888 | 0.893 | 0.892 | 0.878 | 0.886 | 0.892 | - | - | - | | l | NONE/PM17 |
| Eluate Volume | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | 0.8 | - | - | - | | l | NONE/PM17 |
| pH # | 8.84 | 8.51 | 8.89 | 8.76 | 7.86 | 8.72 | 8.60 | 8.48 | 8.41 | 8.71 | - | - | - | <0.01 | pH units | TM73/PM11 |
| Phenol | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 1 | - | - | <0.1 | mg/kg | TM26/PM0 |
| Fluoride | <3 | <3 | <3 | <3 | <3 | <3 | <3 | 5 | 5 | 3 | - | - | - | <3 | mg/kg | TM173/PM0 |
| Sulphate as SO4 # | 7 | 13 | 8 | 5 | <5 | <5 | <5 | 9 | 10 | <5 | 1000 | 20000 | 50000 | <5 | mg/kg | TM38/PM0 |
| Chloride # | <3 | 5 | <3 | <3 | 4 | 4 | 4 | 7 | 5 | 3 | 800 | 15000 | 25000 | <3 | mg/kg | TM38/PM0 |



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

**Client Name:** Ground Investigations Ireland

**Reference:** 9766-07-20

**Location:** The Quater, Citywest, Phase 3

**Contact:** Diarmaid MagLochlainn

**Matrix : Solid**

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | EPH Interpretation |
|---|---|---|---|---|---|
| 20/10583 | 1 | WS01 | 0.70 | 1-3 | No interpretation possible |
| 20/10583 | 1 | WS01 | 1.70 | 4-6 | No interpretation possible |
| 20/10583 | 1 | WS02 | 0.70 | 7-9 | No interpretation possible |
| 20/10583 | 1 | WS02 | 1.70 | 10-12 | No interpretation possible |
| 20/10583 | 1 | WS03 | 0.70 | 13-15 | No interpretation possible |
| 20/10583 | 1 | WS03 | 1.70 | 16-18 | No interpretation possible |
| 20/10583 | 1 | WS04 | 0.70 | 19-21 | No interpretation possible |
| 20/10583 | 1 | WS04 | 1.70 | 22-24 | No interpretation possible |
| 20/10583 | 1 | WS11 | 0.70 | 25-27 | No interpretation possible |
| 20/10583 | 1 | WS11 | 1.70 | 28-30 | No interpretation possible |
| 20/10583 | 1 | WS11 | 2.70 | 31-33 | No interpretation possible |
| 20/10583 | 1 | WS12 | 0.70 | 34-36 | No interpretation possible |
| 20/10583 | 1 | WS12 | 1.70 | 37-39 | No interpretation possible |
| 20/10583 | 1 | WS12 | 2.70 | 40-42 | No interpretation possible |
| 20/10583 | 1 | WS14 | 0.70 | 43-45 | No interpretation possible |
| 20/10583 | 1 | WS14 | 1.70 | 46-48 | No interpretation possible |
| 20/10583 | 1 | WS14 | 2.70 | 49-51 | No interpretation possible |
| 20/10583 | 1 | WS15 | 0.70 | 52-54 | No interpretation possible |
| 20/10583 | 1 | WS16 | 0.70 | 55-57 | No interpretation possible |
| 20/10583 | 1 | WS18 | 0.70 | 58-60 | No interpretation possilbe |

**Client Name:** Ground Investigations Ireland
**Reference:** 20/07/9766
**Location:** The Quater, Citywest, Phase 3
**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). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

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

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

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Date Of Analysis | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 20/10583 | 1 | WS01 | 0.70 | 2 | 12/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS01 | 1.70 | 5 | 12/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS02 | 0.70 | 8 | 12/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS02 | 1.70 | 11 | 12/08/2020 | **General Description (Bulk Analysis)** | soil-stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS03 | 0.70 | 14 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS03 | 1.70 | 17 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS04 | 0.70 | 20 | 12/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |

**Client Name:** Ground Investigations Ireland
**Reference:** 20/07/9766
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Date Of Analysis | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 20/10583 | 1 | WS04 | 0.70 | 20 | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS04 | 1.70 | 23 | 12/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS11 | 0.70 | 26 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS11 | 1.70 | 29 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS11 | 2.70 | 32 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS12 | 0.70 | 35 | 12/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS12 | 1.70 | 38 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS12 | 2.70 | 41 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS14 | 0.70 | 44 | 13/08/2020 | **General Description (Bulk Analysis)** | soil-stones |
| | | | | | 13/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 13/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 13/08/2020 | **Asbestos Type** | NAD |
| | | | | | 13/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS14 | 1.70 | 47 | 12/08/2020 | **General Description (Bulk Analysis)** | soil.stones |
| | | | | | 12/08/2020 | **Asbestos Fibres** | NAD |

**Client Name:** Ground Investigations Ireland
**Reference:** 20/07/9766
**Location:** The Quater, Citywest, Phase 3
**Contact:** Diarmaid MagLochlainn

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Date Of Analysis | Analysis | Result |
|---|---|---|---|---|---|---|---|
| 20/10583 | 1 | WS14 | 1.70 | 47 | 12/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 12/08/2020 | **Asbestos Type** | NAD |
| | | | | | 12/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS14 | 2.70 | 50 | 13/08/2020 | **General Description (Bulk Analysis)** | soil-stones |
| | | | | | 13/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 13/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 13/08/2020 | **Asbestos Type** | NAD |
| | | | | | 13/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS15 | 0.70 | 53 | 13/08/2020 | **General Description (Bulk Analysis)** | soil-stones |
| | | | | | 13/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 13/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 13/08/2020 | **Asbestos Type** | NAD |
| | | | | | 13/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS16 | 0.70 | 56 | 13/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 13/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 13/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 13/08/2020 | **Asbestos Type** | NAD |
| | | | | | 13/08/2020 | **Asbestos Level Screen** | NAD |
| 20/10583 | 1 | WS18 | 0.70 | 59 | 13/08/2020 | **General Description (Bulk Analysis)** | Soil/Stones |
| | | | | | 13/08/2020 | **Asbestos Fibres** | NAD |
| | | | | | 13/08/2020 | **Asbestos ACM** | NAD |
| | | | | | 13/08/2020 | **Asbestos Type** | NAD |
| | | | | | 13/08/2020 | **Asbestos Level Screen** | NAD |

**Client Name:** Ground Investigations Ireland

**Reference:** 9766-07-20

**Location:** The Quater, Citywest, Phase 3

**Contact:** Diarmaid MagLochlainn

**Matrix : Solid**

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Analysis | Reason |
|---|---|---|---|---|---|---|
| 20/10583 | 1 | WS01 | 0.70 | 1-3 | GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS01 | 1.70 | 4-6 | GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS02 | 0.70 | 7-9 | GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS02 | 1.70 | 10-12 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS03 | 0.70 | 13-15 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS03 | 1.70 | 16-18 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS04 | 0.70 | 19-21 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS04 | 1.70 | 22-24 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS11 | 0.70 | 25-27 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS11 | 1.70 | 28-30 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS11 | 2.70 | 31-33 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS12 | 0.70 | 34-36 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS12 | 1.70 | 37-39 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS12 | 2.70 | 40-42 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS14 | 0.70 | 43-45 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS14 | 1.70 | 46-48 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS14 | 2.70 | 49-51 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS15 | 0.70 | 52-54 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS16 | 0.70 | 55-57 | EPH, GRO, PAH, PCB | Sample holding time exceeded |
| 20/10583 | 1 | WS18 | 0.70 | 58-60 | EPH, GRO, PAH, PCB | 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.**

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

***EMT Job No.:*** 20/10583

**SOILS**

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

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

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

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

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

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

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

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

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

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

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

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

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

**WATERS**

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

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

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

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

**DEVIATING SAMPLES**

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

**SURROGATES**

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

**DILUTIONS**

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

**BLANKS**

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

**NOTE**

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

**REPORTS FROM THE SOUTH AFRICA LABORATORY**

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

**Measurement Uncertainty**

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

**ABBREVIATIONS and ACRONYMS USED**

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

**EMT Job No:** 20/10583

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

**EMT Job No:** 20/10583

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

**EMT Job No:** 20/10583

| 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 |
|---|---|---|---|---|---|---|---|
| TM65 | Asbestos Bulk Identification method based on HSG 248 First edition (2006) | PM42 | Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065. | Yes | | AR | |
| TM73 | Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser. | PM0 | No preparation is required. | | | AR | Yes |
| TM73 | Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser. | PM11 | Extraction of as received solid samples using one part solid to 2.5 parts deionised water. | Yes | | AR | No |
| TM173 | Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998) | PM0 | No preparation is required. | | | AR | Yes |
| NONE | No Method Code | NONE | No Method Code | | | AD | Yes |
| NONE | No Method Code | PM17 | Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio. | | | | |
| NONE | No Method Code | PM17 | Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio. | | | AR | |
| NONE | No Method Code | PM4 | Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990. | | | AR | |
| | | | | | | | |
| | | | | | | | |

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

| | |
|---|---|
| **Attention :** | Diarmaid MagLochlainn |
| **Date :** | 28th September, 2020 |
| **Your reference :** | 9766-07-20 |
| **Our reference :** | Test Report 20/12902 Batch 1 |
| **Location :** | The Quarter Citywest Phase 3 |
| **Date samples received :** | 22nd September, 2020 |
| **Status :** | Final report |
| **Issue :** | 1 |

Three samples were received for analysis on 22nd September, 2020 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

**Authorised By:**

**Lucas Halliwell**
**Project Co-ordinator**

## Element Materials Technology

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter Citywest Phase 3
**Contact:** Diarmaid MagLochlainn
**EMT Job No:** 20/12902

**Report : Solid**

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

| EMT Sample No. | 1 | 2 | 3 | | | | | | | | LOD/LOR | Units | Method No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | BH01 | BH07 | BH13 | | | | | | | | | | |
| Depth | 3.00 | 7.00 | 1.00 | | | | | | | | | | |
| COC No / misc | | | | | | | | | | | | | |
| Containers | T | T | T | | | | | | | | | | |
| Sample Date | 18/09/2020 | 18/09/2020 | 18/09/2020 | | | | | | | | | | |
| Sample Type | Soil | Soil | Soil | | | | | | | | | | |
| Batch Number | 1 | 1 | 1 | | | | | | | | | | |
| Date of Receipt | 22/09/2020 | 22/09/2020 | 22/09/2020 | | | | | | | | | | |
| Sulphate as SO4 (2:1 Ext) # | 0.0860 | 0.0975 | 0.0096 | | | | | | | | <0.0015 | g/l | TM38/PM20 |
| pH # | 8.43 | 8.49 | 8.74 | | | | | | | | <0.01 | pH units | TM73/PM11 |

Please see attached notes for all abbreviations and acronyms




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

**Client Name:** Ground Investigations Ireland
**Reference:** 9766-07-20
**Location:** The Quarter Citywest Phase 3
**Contact:** Diarmaid MagLochlainn

| EMT Job No. | Batch | Sample ID | Depth | EMT Sample No. | Analysis | Reason |
|---|---|---|---|---|---|---|
| No deviating sample report results for job 20/12902 | | | | | | |

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

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

***EMT Job No.:*** 20/12902

**SOILS**

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

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

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

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

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

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

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

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

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

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

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

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

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

**WATERS**

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

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

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

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

**DEVIATING SAMPLES**

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

**SURROGATES**

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

**DILUTIONS**

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

**BLANKS**

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

**NOTE**

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

**REPORTS FROM THE SOUTH AFRICA LABORATORY**

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

**Measurement Uncertainty**

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

**ABBREVIATIONS and ACRONYMS USED**

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

**EMT Job No:** 20/12902

| 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 |
|---|---|---|---|---|---|---|---|
| TM38 | Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl | PM20 | Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker. | Yes | | AD | Yes |
| 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 |
| | | | | | | | |
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# **APPENDIX 9** – 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

## The Quarter Citywest Cooldown Commons

| BOREHOLE | DATE | TIME | GROUNDWATER (m BGL ) | Comments |
|---|---|---|---|---|
| **BH01** | 14/10/2020 | 9.25 | 2.56 | 109.24m OD |
| **BH02** | 14/10/2020 | 9.28 | 1.27 | 110.7m OD |
| **BH08** | 14/10/2020 | | | No data gathered -obstruction |
| **BH10** | 14/10/2020 | | | No data gathered -obstruction |
| **BH16** | 14/10/2020 | 9.44 | 1.77 | 110.22m OD |
| **BH17** | 14/10/2020 | 9.50 | 2.68 | 109.32m OD |
| **BH01** | 20/10/2020 | 10.05 | 2.60 | 109.2m OD |
| **BH02** | 20/10/2020 | 10.10 | 1.20 | 110.85m OD |
| **BH08** | 20/10/2020 | | | No data gathered -obstruction |
| **BH10** | 20/10/2020 | | | No data gathered -obstruction |
| **BH17** | 20/10/2020 | 10.22 | 2.60 | 109.4m OD |
| **BH01** | 21/10/2020 | 9.00 | 2.60 | 109.2m OD |
| **BH02** | 21/10/2020 | 9.05 | 1.30 | 110.7m OD |
| **BH08** | 21/10/2020 | 9.10 | 7.70 | 108.9m OD |
| **BH10** | 21/10/2020 | 9.15 | 4.90 | 109.3m OD |
| **BH17** | 21/10/2020 | 9.20 | 2.60 | 109.0m OD |