6. SOIL AND GEOLOGY

6.1 Introduction

This chapter of the EIAR comprises of an assessment of the likely impact of the proposed development on soils and the geological environment as well as identifying proposed mitigation measures to minimise any impacts.

Refer to Chapter 2.0 (Site Description) and Chapter 3.0 (Description of Development) and for a detailed proposed development site and proposed development description.

6.2 Characteristics of the Proposed Development

Site development works will include stripping of the 0.2m to 0.4m thick topsoil layer. It is expected that all stripped topsoil will be reused on the proposed development site, incorporated into landscaping of back gardens and public open spaces.

Excavation of subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of underground attenuation of surface water. Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material).

Where bedrock is encountered in excavations, the rock will be crushed, screened and tested for use within the designed works as fill material for road construction and backfill to service trenches.

6.3 Receiving Environment

6.3.1 Soils

Review of information available on the Geological Survey Ireland (GSI) online mapping service (Teagasc Soils and Subsoils Map) shows that the majority of the site's topsoil layer consists of a "deep well drained mineral (mainly basic)", while the southern end of the site consists of a topsoil layer described as "deep well drained mineral (mainly acidic)". The vast majority of the site is underlain by a subsoil layer described as "till derived from limestones" except for the southern end of the site which is underlain by a subsoil layer described as 'till derived from Lower Palaezoic sandstones and shales'. Refer to Figure 6.1 and Figure 6.2 below.

A preliminary ground investigation carried out by Ground Investigations Ireland (Appendix 6.A) summarises the ground conditions of the proposed development site as follows:

- Maximum of 0.4m thick Topsoil layer overlying;
- Made ground layer encountered beneath Topsoil in TP10 and BH02 to a maximum depth of 2.3m overlying;
- Cohesive deposits with granular deposits encountered beneath made ground or topsoil overlying;

- Limestone rock encountered between 3m to 11m depth.

Some stockpiles of existing topsoil are located in the southern area of the proposed development site associated with previous development within the Newcastle site.

Groundwater seepage was observed in three trial pit locations TP15, TP 29 and TP53 at a depth of 2m BGL, 3.40m BGL and 2m BGL respectively.

All Infiltration tests carried out indicated negligible soakage rates.

Figure 6.1 Extract from Teagasc Soil Map

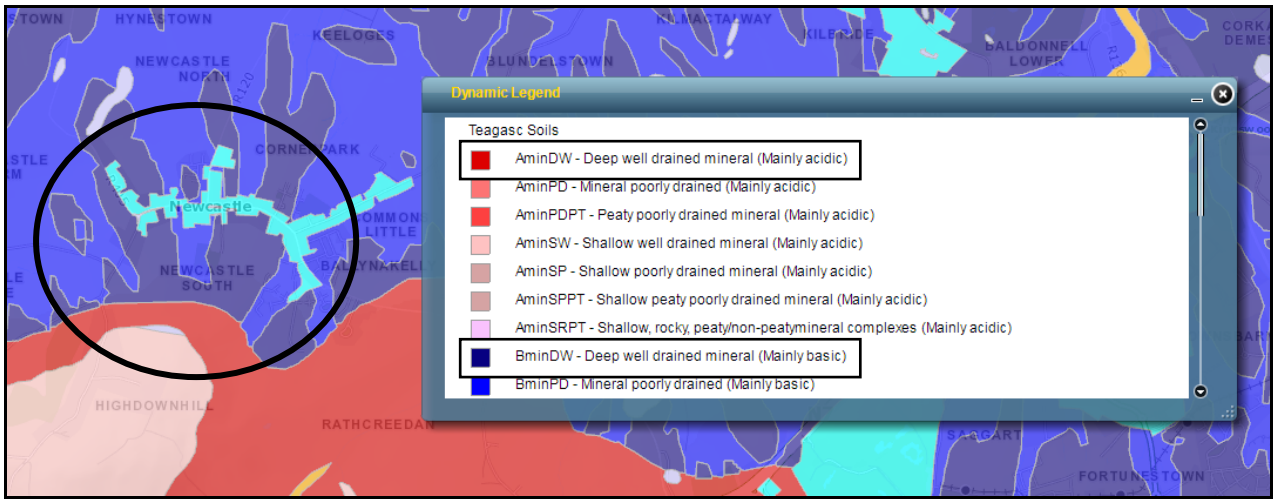
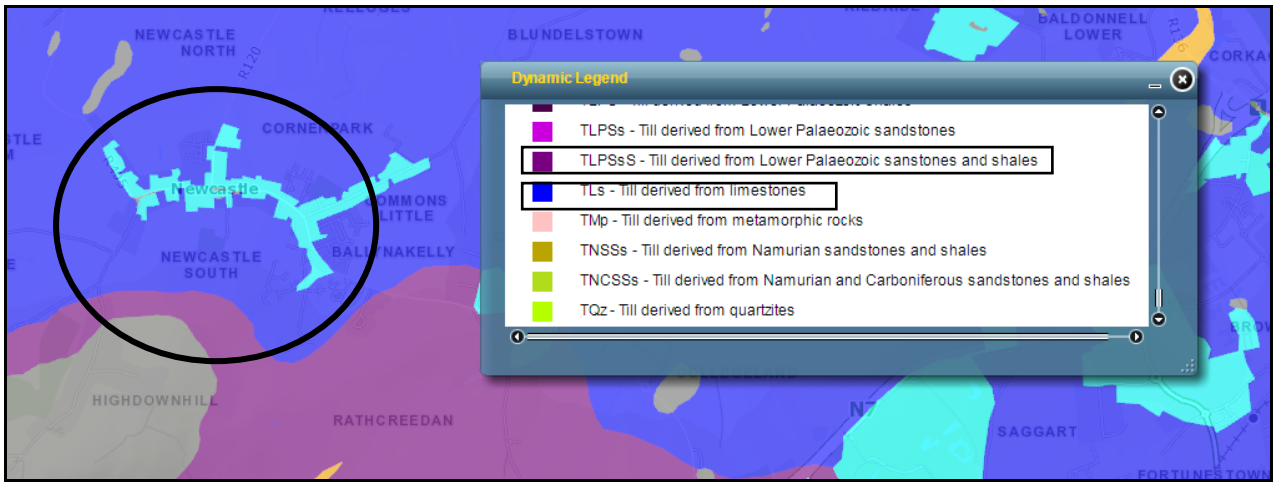


Figure 6.2 Extract from Teagasc Subsoil Map



6.3.2 Geology

Review of GSI's online mapping service (1:100 Bedrock Unit Groups) describes the geology in the majority of the site as 'dark limestone and shale ('calp)' and as 'nodular and muddy limestone and shale' in the south-western end of the site.

GSI classifies the site's groundwater vulnerability from low to high. Low vulnerability is located in the central area, and moderate vulnerability is located to the north and south of the proposed development site. High vulnerability is present in small areas at the north-western and southern end of the site (refer to figure 6.3). The underlying aquifer is classified as "Locally important aquifer – Bedrock which is moderately productive

only in local zones" as shown in Figure 6.4 below. Refer to Chapter 7.0 Water: Hydrogeology & Hydrology for further information regarding Hydrogeology.

Figure 6.3 Extract from GSI Groundwater Vulnerability Map

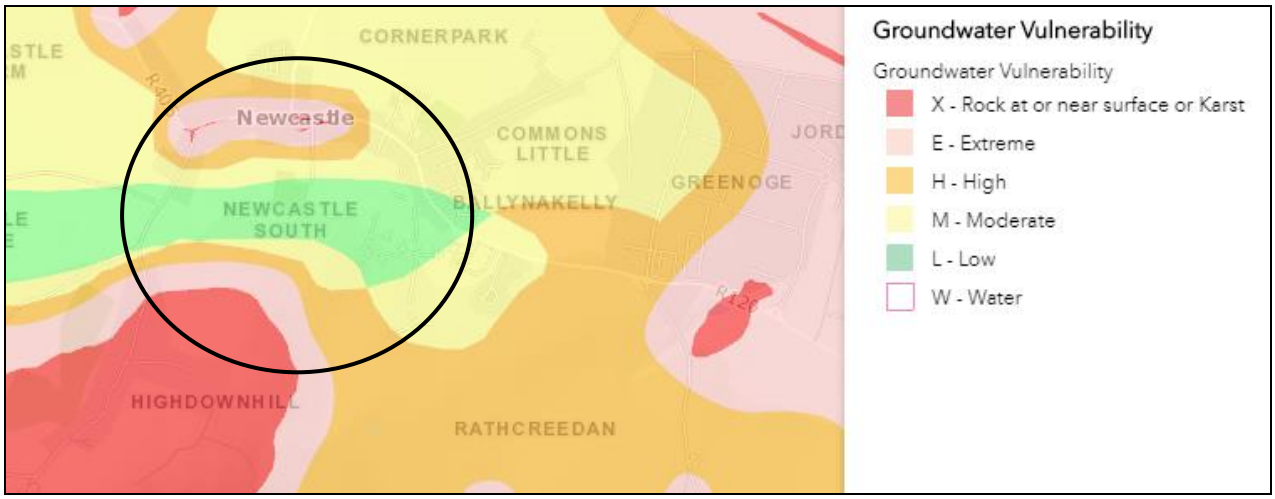
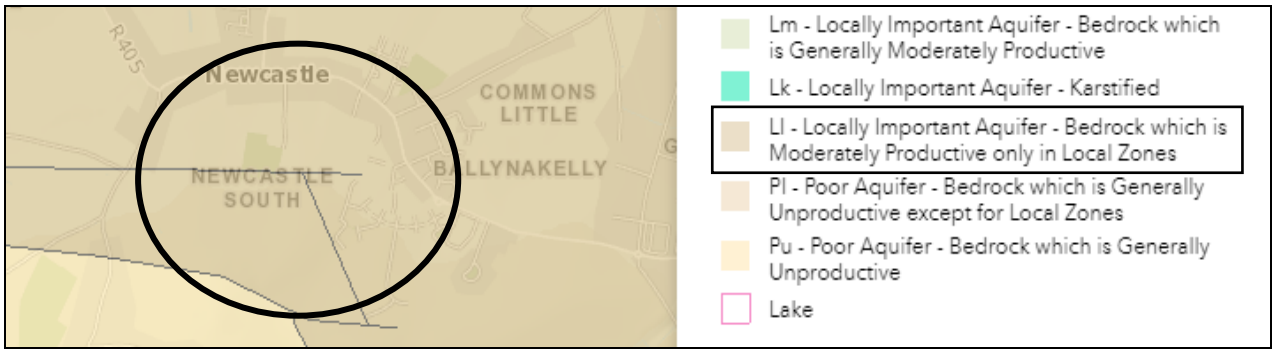


Figure 6.4 Extract from GSI Groundwater Resources (Aquifers) Map



6.4 Assessment Methodology

Description of the baseline environment and the assessment of the likely impact of the proposed development on soils and the geological environment included the following activities:

- Preliminary Ground Investigations.
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.

Preliminary Ground Investigations for the proposed development were carried out by Ground Investigations Ireland Limited between May and June 2018 and included the following scope of work within the proposed development site:

- 25 No. Trial Pits.
- 4 No. Infiltration Tests.
- 7 No. Slit Trenches.

- 11 No. CP/RC Boreholes.

Refer to Appendix 6.A Ground Investigation Report (Ground Investigations Ireland Limited, Issue Date 30 July 2018).

6.5 Identification of Likely Significant Impacts

6.5.1 Construction Phase

This section identifies a list of likely and significant impacts to the soil and geology of the proposed development site caused by the construction of the proposed development in Newcastle.

6.5.1.1 Stripping of Topsoil

Removal of the existing topsoil layer will be required across the site. As noted previously, it is expected that all stripped topsoil will be reused on site (incorporated into landscaping of back gardens and public open spaces).

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden runoff.

Table 6.1 Preliminary Estimated Topsoil Volumes (Approximate)

	Volume (m^3)
Topsoil Strip (200mm thick layer)	24,300
Topsoil Reuse (landscaping of open spaces etc.)	24,300

6.5.1.2 Excavation of Subsoil Layers

Excavation of existing subsoil layers will be required in order to allow road construction, foundation excavation, drainage and utility installation and provision of surface water attenuation facilities.

Where feasible, excavated material will be reused as part of the site development works (e.g. use as fill material beneath houses and roads) however, unsuitable excavated subsoil is expected and will have to be removed to an approved landfill.

Table 6.2 Estimated Cut/Fill Volumes (Approximate)

	Volume (m^3)
Cut	45,400
Fill	9,000
Removal of Unsuitable Material	36,400

6.5.1.3 Construction Traffic

Earthworks plant (e.g. dump trucks) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries etc.) have potential to cause rutting and deterioration of the topsoil layer and any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can be

particularly noticeable at site access points (resulting in deposition of mud and soil on the surrounding road network). Dust generation can also occur during extended dry weather periods as a result of construction traffic.

6.5.1.4 Accidental Spills and Leaks

During the construction phase there is a risk of accidental pollution from the sources noted below. Accidental spills and leaks may result in contamination of the soils underlying the site.

- Storage of oils and fuels on site
- Oils and fuels leaking from construction machinery
- Spillage during refueling and maintenance of construction machinery
- Use of cement and concrete during construction works

6.5.1.5 Geological Environment

Limestone was encountered in six of the exploratory holes (BH01, RC02, BH03, BH04, BH13 and BH14) excavated as part of the Preliminary Ground Investigation. It is expected that the installation of drainage will require excavation of bedrock in some locations only due to the depths to rock. It is not envisaged that this will have any discernable impact on the environment. Excavations associated with development of the site have been designed as shallow as possible. Where bedrock is encountered it will be crushed, screened and tested for use within the designed works.

6.5.2 Operational Phase

On completion of the construction phase, there will be no further impact on soils and the geological environment.

6.6 'Do Nothing' Scenario

There will be no impact on soils and the geological environment if the development does not proceed.

6.7 Mitigation Measures

6.7.1 Construction Phase

6.7.1.1 Stripping of Topsoil

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.

At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.

Topsoil stockpiles will also be located so as not to necessitate double handling.

6.7.1.2 Excavation of Subsoil Layers

The design of road levels and finished floor levels has been carried out in such a way as to minimize cut/fill type earthworks operations.

The duration that subsoil layers are exposed to the effects of weather will be minimized. Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping).

Similar to stripped topsoil, stockpiles of excavated subsoil material will be protected for the duration of the works. Stockpiles of subsoil material will be located separately from topsoil stockpiles.

Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection and earth bunding adjacent to open drainage ditches).

6.7.1.3 Construction Traffic

Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site.

Vehicle wheel wash facilities will be installed in the vicinity of any site entrances and road sweeping implemented as necessary in order to maintain the road network in the immediate vicinity of the site.

Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods.

6.7.1.4 Accidental Spills and Leaks

In order to mitigate against spillages contaminating underlying soils, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

Refueling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).

6.7.1.5 Geological Environment

A more detailed Ground Investigation will be undertaken prior to construction to verify the Preliminary Ground Investigation and where possible the works will be designed to minimize the bedrock excavation required. At any given time, the extent of exposed bedrock will be limited to the immediate vicinity of active work areas. Where bedrock is encountered, it will be crushed, screened and tested for use within the designed works to reduce the volume of material required to leave site. This will also reduce the volume of material to be imported to the site.

6.7.2 Operational Phase

On completion of the construction phase no further mitigation measures are proposed as there will be no further impact on soils and the geological environment.

6.8 Residual impacts

6.8.1 Construction Phase

Implementation of the measures outlined in Section 6.7 will ensure that the potential impacts of the proposed development on soils and the geological environment do not occur during the construction phase and that any residual impacts will be short term.

The primary residual impact is the removal of material unsuitable for reuse as fill material. This impact is unavoidable given the nature of the proposed development.

6.8.2 Operational Phase

There are no predicted impacts arising from the operational phase.

6.8.3 'Do Nothing' Scenario

There are no predicted impacts should the proposed development not proceed.

6.9 Reinstatement

All temporary construction compounds and site entrances are to be removed upon completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

All construction waste and / or scrapped building materials are to be removed from site on completion of the construction phase.

Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed at an appropriate licenced facility.

All sediment control measures (e.g. sediment retention ponds) are to be decommissioned on completion of the construction phase. Such areas are to be reinstated in accordance with the landscape architects plan and engineer's drawings.

6.10 Interactions Arising

6.10.1 Interactions

6.10.1.1 Traffic and Transportation

Quality of Effect: Negative.

Significance of Effect: Slight.

Haulage of excavated material off-site and delivery of materials to site (e.g. aggregates for road construction, concrete for foundations, delivery of construction plant to site) will lead to potential impact on the surrounding road network.

The mitigation measures described in Section 6.7.13 should suffice in minimising the impact of this temporary effect.

6.10.1.2 Water and Hydrology

Quality of Effect: Negative.

Significance of Effect: Moderate.

Stripping of topsoil will result in exposure of the underlying subsoil layers to the effects of weather and construction traffic and may result in subsoil erosion and generation of sediment laden surface water runoff.

The mitigation measures in Section 6.7.11 should suffice in minimising the impact of this temporary effect. In addition, the stripped topsoil will be reused for landscaping of open spaces, back gardens or similar.

6.10.1.3 Waste Management

Quality of Effect: Negative.

Significance of Effect: Moderate.

Where feasible, excavated material will be reused as part of the site development works, however some unsuitable excavated subsoil is expected and will have to be removed to an approved landfill.

Oil, fuel etc. storage areas are to be decommissioned on completion of the construction phase. Any remaining liquids are to be removed from site and disposed of at an appropriate licenced facility.

6.10.1.4 Noise and Vibration

Quality of Effect: Negative.

Significance of Effect: Slight.

Development of the site will result in a level of construction related noise and vibration, however the site is partly surrounded by greenfield and working hours on site will be regulated as specified in the 'Construction Management Plan' to reduce potential impacts to human health.

6.10.1.5 Air Quality

Quality of Effect: Negative

Significance of Effect: Slight.

Dust generation can also occur during extended dry weather periods as a result of construction traffic and rock breaking.

Dust suppression methods will be applied on site when necessary to minimize the impacts of this temporary effect.

6.10.1.6 Flora and Fauna

Quality of Effect: Neutral.

Significance of Effect: Not significant.

Removal of the existing topsoil layer will be required across the site as well as removal of some hedgerows. On the other hand, the proposed development integrates green areas and SUDS features on the design that create a positive impact by creating new ecosystems for the enhancement of biodiversity of flora and fauna throughout the site.

6.10.2 Potential Cumulative Impacts

Should any other developments be under construction or planned in the vicinity of the site, potential cumulative impacts are not anticipated once similar mitigation measures are implemented.

6.11 Monitoring

Proposed monitoring during the construction phase in relation to the soil and geological environment are as follows:

- Adherence to the Construction Management Plan.
- Construction monitoring of the works (e.g. inspection of existing ground conditions on completion of cut to road sub-formation level in advance of placing capping material, stability of excavations etc.).
- Inspection of fuel / oil storage areas.
- Monitoring cleanliness of adjacent road network, implementation of dust suppression and provision of vehicle wheel wash facilities.
- Monitoring of contractor's stockpile management (e.g. protection of excavated material to be reused as fill, protection of soils for removal from site from contamination)
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.)

No ongoing monitoring is proposed on completion of the construction phase.

6.12 References

The baseline environment and the assessment of the development in this chapter was described based on the information collected from the sources mentioned under the section 6.4.

APPENDIX 6.A Ground Investigation Report

Ground Investigations Ireland Limited, 30 July 2018

Ground Investigations Ireland Ltd.,
Catherinestown House,
Hazelhatch Road,
Newcastle, Co Dublin.
Tel: 01 601 5175 / 5176 | Fax: 01 601 5173
Email: info@gii.ie | Web: gii.ie

Ground Investigations Ireland

Newcastle Lands

Ground Investigation Report

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GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.,
Catherinestown House,
Hazelhatch Road,
Newcastle, Co Dublin.
Tel: 01 601 5175 / 5176 | Fax: 01 601 5173
Email: info@gii.ie | Web: gii.ie

CONTENTS

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.,
Catherinestown House,
Hazelhatch Road,
Newcastle, Co Dublin.
Tel: 01 601 5175 / 5176 | Fax: 01 601 5173
Email: info@gii.ie | Web: gii.ie

APPENDICES

1.0 Preamble

On the instructions of DBFL Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between May and June 2018 at the site of the proposed residential development in Newcastle, Co. Dublin.

2.0 Overview

2.1. Background

It is proposed to construct a new residential development with associated services, access roads and car parking at the proposed site. The site is currently greenfield and is situated in Newcastle, Co. Dublin. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

2.2. Purpose and Scope

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

- Visit project site to observe existing conditions
- Carry out 50 No. Trial Pits to a maximum depth of 4.20m BGL
- Carry out 6 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 9 No. Slit Trenches to locate underground services and concrete tanks
- Carry out 15 No. Cable Percussion boreholes to a maximum depth of 6.00m BGL
- Carry out 10 No. Rotary Core Boreholes to a maximum depth of 14.40m BGL
- Carry out 34 Plate Bearing Tests
- Installation of 4 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 15T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The 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. Slit trenching

The slit trenches were excavated using a JCB at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The soil was slowly stripped using a spotter on the trench to alert the driver if any services were seen, to avoid damage to any underlying services. The slit trenches were sampled, logged and photographed by 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 slit trench records.
The slit trench records are provided in Appendix 2 with associated photos in Appendix 4 of this Report.

3.5. Cable Percussion Boreholes

The Cable Percussion Boreholes were drilled using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing.
The standard method of boring in soil for site investigation is known as the Cable Percussion method. It consists of using a Shell in non cohesive soils and a clay cutter in cohesive soils, both operated on a wire cable. Very hard soils, boulders and other hard obstructions are broken up by chiselling and the fragments removed with the Shell. Where ground conditions made it necessary, the borehole was lined with 200mm diameter steel casing. While the use of the Cable Percussion method of boring gives the maximum data on soil conditions, some mixing of laminated soil is inevitable. For this reason, thin lenses of granular material may not be noticed. Disturbed samples were taken from the boring tools at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata.
Standard Penetration Tests were carried out in the boreholes. The results of these tests, together with the depths at which the tests were taken are shown on the accompanying borehole records. The test consists of a thick wall sampler tube, 50mm external diameter, being driven into the soil by a monkey weighing 63.5kg and with a free drop of 760mm. For gravels and glacial till the driving shoe was replaced by a solid 60º cone. The Standard Penetration Test number referred to as the 'N' value is the number of blows required to drive the tube 300mm, after an initial penetration of 150mm. The number gives a guide to the consistency of the soil and can also be used to estimate the relative strength/density at the depth of the test and also to estimate the bearing capacity and compressibility of the soil. The cable percussion borehole logs are provided in Appendix 5 of this Report.

3.6. Rotary Boreholes

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

It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 6 of this Report.

3.7. 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.

3.8. Groundwater Monitoring Installations

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

3.9. 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 7 of this Report.

3.10. Laboratory Testing

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design.
Environmental testing, including Waste Acceptance Criteria (WAC), pH and sulphate testing was carried out by Jones Environmental Laboratory in the UK.
Geotechnical testing consisting of moisture content, Atterberg limits, Particle Size Distribution (PSD), and California Bearing Ratio (CBR) tests were carried out in NMTL's Geotechnical Laboratory in Carlow.
Rock strength testing consisting of Point Load (Is_{50}) testing was carried out in Trinity College Dublin's Geotechnical Laboratory

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 consistent across the site and are generally comprised;

- Topsoil
- Made Ground
- Cohesive Deposits
- Granular Deposits

TOPSOIL: Topsoil was encountered in the majority of the exploratory holes and was present to a maximum depth of 0.40m BGL.

MADE GROUND: Made Ground deposits were encountered beneath the Topsoil in TP10 and BH02 and was present to a maximum depth of 2.30m BGL. These deposits were described generally as *brown sandy gravelly Clay with occasional angular cobbles and fragments of concrete, red brick and wood.*

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Made Ground or Topsoil and were described typically as *brown/grey sandy gravelly CLAY with occasional cobbles* overlying a *dark brown/black slightly sandy gravelly CLAY with occasional cobbles and boulders*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was stiff below 1.00m BGL in the majority of the exploratory holes. These deposits had 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 *grey fine to coarse angular to sub-angular GRAVEL with occasional cobbles.* The secondary sand/gravel and constituents varied across the site and with depth while occasional cobble content also present where noted on the exploratory hole logs.
Based on the SPT N values the deposits are typically medium dense or dense.

BEDROCK: The rotary core boreholes recovered Medium strong to strong dark grey very fine to fine LIMESTONE with rare to many calcite veins.

The depth to rock varies from 3.00m BGL in BH05 to a maximum of 11.00m BGL in BH01. The total core recovery is good, between 70% and 100%. The SCR and RQD both are relatively poor in the highly fractured zones, often recovered as non-intact.

4.2. Groundwater

Groundwater strikes are noted on the exploratory hole logs where they occurred and where possible drilling was suspended for twenty minutes to allow the subsequent rise in groundwater to be recorded. We would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the tide, time of year, rainfall, nearby construction and other factors. For this reason, standpipes were installed in BH03, BH05, BH10 and BH13 to allow the equilibrium groundwater level to be determined. The groundwater monitoring is included in Appendix 9 of this Report.

4.3. 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 with the exception of TP54 at 1.00mBGL which was found to be PEAT of extremely high plasticity. The Particle Size Distribution tests confirm that generally the cohesive deposits are well-graded with percentages of sands and gravels ranging between 21% and 38% generally with fines contents of 21 to 61%. The Particle Size Distribution tests confirm that generally the granular deposits are well-graded with percentages of sands and gravels ranging between 13% and 79% generally with fines contents of 13 to 43%.

The CBR testing on remoulded samples gave results ranging between 0.20% and 3.80% for the cohesive deposits.

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.

The results of the Waste Acceptance Criterial Test Suite are presented with the individual parameter limits for “Inert” “Non Hazardous” and “Hazardous” as outlined within European Council Directive 1999 131/EC Article 16 Annex II, “Criteria and procedures for the acceptance of waste at landfills”. The intended disposal site should be consulted to ensure compliance with their specific requirements.

The results indicate that the results are below the inert limits with the exception of TP54 at 1.00mBGL where the results indicate that the total organic carbon is above the inert limits (3.86% vs 3%). All spoil disposed of off-site should be sent to a suitably licenced facility. 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 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

An allowable bearing capacity of 100 kN/m^2 is recommended for conventional strip or pad foundations on the stiff cohesive deposits at a depth of 2.00m BGL.
A ground bearing floor slab is recommended to be based on the firm or 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.
The pH and sulphate testing completed on samples recovered from the trial pits 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.

5.3. External Pavements

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

5.4. Excavations

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry.
Excavations in the Peat 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.
Excavations in the upper cohesive and weathered rock deposits are expected to be excavatable with conventional excavation equipment, with zones of more intact bedrock below this depth requiring rock breaking techniques. Based on the fracture spacing, the rock strength testing and Pettifer & Fookes (1994) Revised Excavatability Graph, the Limestone ranges from easy ripping to hard ripping, however the zones recovered as non-intact should be hard digging to easy ripping.
Any material to be removed off site should be disposed of to a suitably licenced landfill.

5.5. Soakaway Design

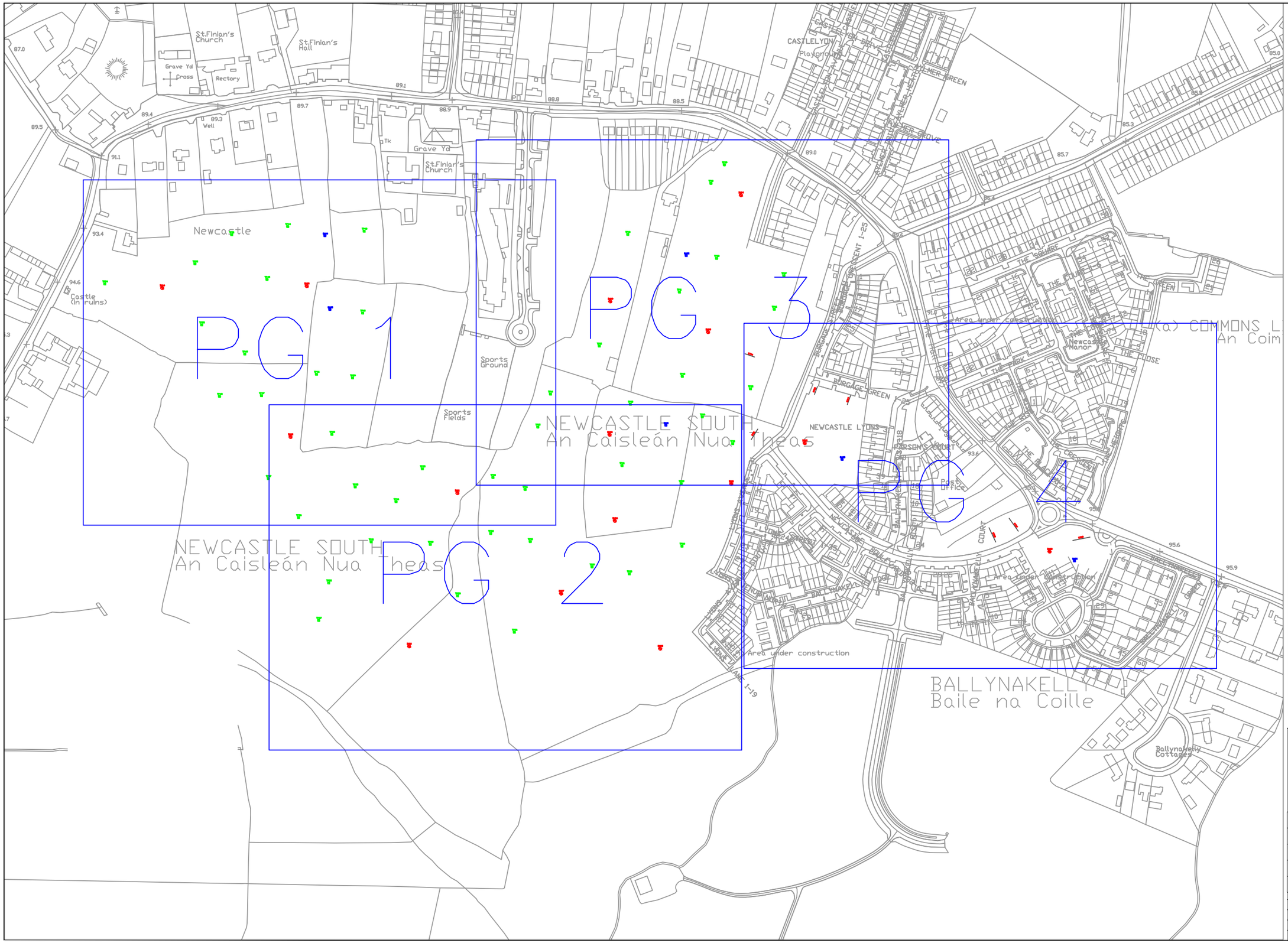
At the locations of SA01 to SA06, the water level dropped too slowly to allow calculation of 'f' the soil infiltration rate. These locations are therefore not recommended as suitable for soakaway design and construction.

5.6. Attenuation Tanks

Trial pits TP10 and TP11, were carried out at the location of possible attenuation tanks. At both locations, concrete was encountered at 0.50mBGL in TP10 and 2.50mBGL in TP11, this is assumed to be the top of the tanks. Slit trenches ST07, ST08 and ST09, were carried out at the location of possible attenuation tanks. At all three locations, concrete was encountered at 1.60mBGL in ST07, 1.60mBGL in ST08 and 1.20mBGL in ST09. This is assumed to be the top of the tanks.
Slit trenches ST05 and ST06, were also carried out at the location of a possible attenuation tank. However, no evidence for an attenuation tank was found.

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



LEGEND:

ST	**SLIT TRENCH**
TP01	**TRIAL PIT**
SA01	**SOAKAWAY PIT**
BH01	**CP/RC BOREHOLE**

NB: ALL m OD LEVELS ARE TO GROUND LEVEL ABOVE SERVICES

Ground Investigations Ireland Ltd.
Catherinestown
Hazelhatch Road,
Newcastle,
Co Dublin
Tel: +353-(0)1 6015175/6
Fax: +353-(0)1 601 5173
Email: info@gii.ie
Web: www.gii.ie

PROJECT: Newcastle Lands

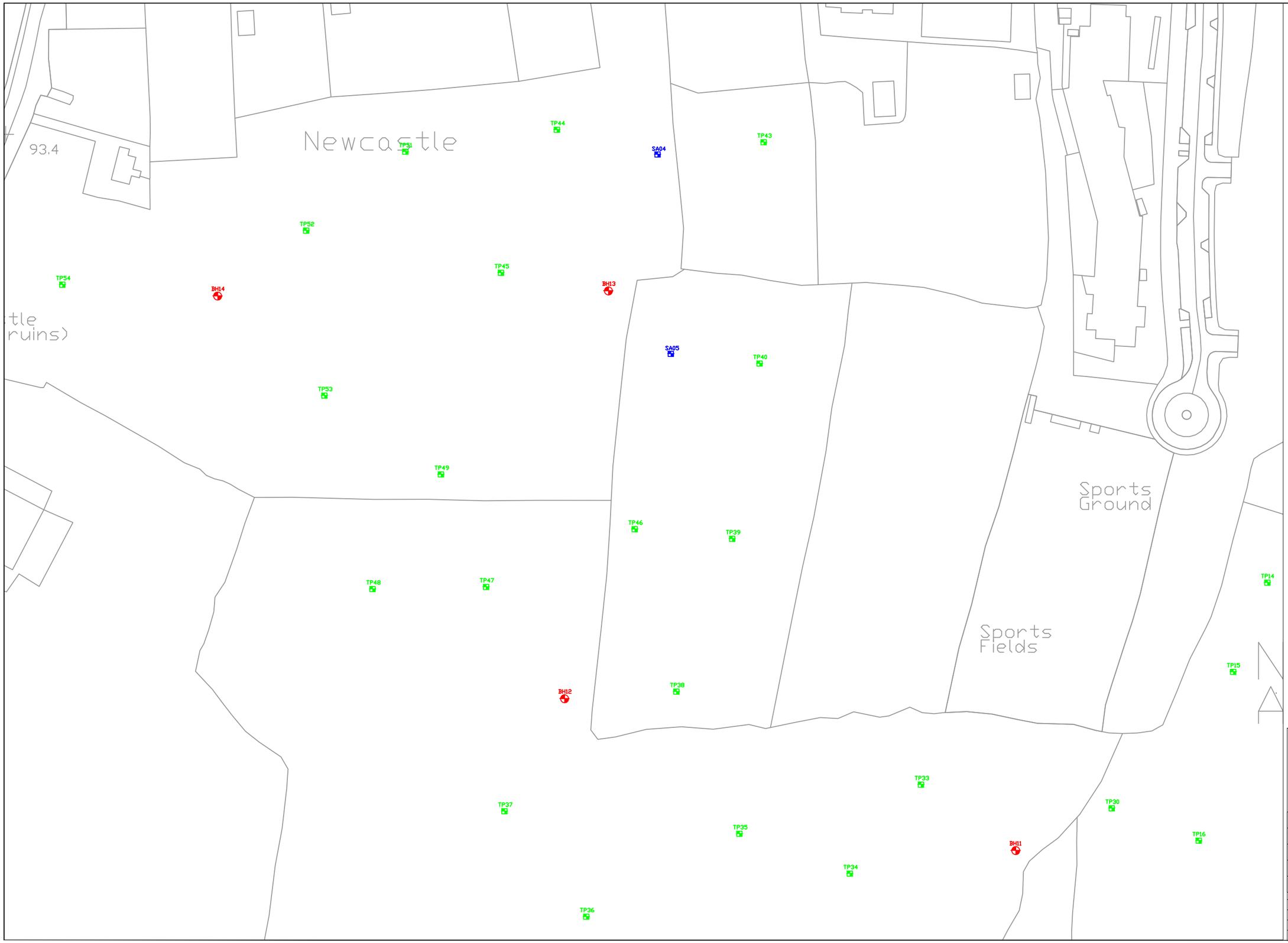
DRAWING No.: Newcastle Lands Site Location Plan

DATE: July 2018

ENGINEER: DBFL

SCALE: NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
	27.07.18	SC	AMCD



LEGEND:

ST	SLIT TRENCH
TP01	TRIAL PIT
SA01	SOAKAWAY PIT
BH01	CP/RC BOREHOLE

NB: ALL m OD LEVELS ARE TO GROUND LEVEL ABOVE SERVICES

Ground Investigations Ireland Ltd.
Catherinestown
Hazelhatch Road,
Newcastle,
Co Dublin
Tel: +353-(0)1 6015175/6
Fax: +353-(0)1 601 5173
Email: info@gii.ie
Web: www.gii.ie

PROJECT:	Newcastle Lands
DRAWING No.:	Newcastle Lands Site Location Plan1
DATE:	July 2018
ENGINEER:	DBFL
SCALE:	NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
	27.07.18	SC	AMCD

Sports Fields

NEWCASTLE SOUT
An Caisleán Nua

LE SOUTH
eán Nua Theas

TP38 TP33 TP35 TP34 TP36 TP31 TP29 TP32 TP28 TP27 TP30 TP16 TP15 TP22 TP18 TP26 TP21 TP25 TP24 TP19 TP20 TP04 TP01

BH12 BH11 BH10 BH08 BH06 BH07 BH05 BH01

SA01

LYONS AVENUE
LYONS DRIVE
LYONS LAWN

LEGEND:

ST	SLIT TRENCH
TP01	TRIAL PIT
SA01	SOAKAWAY PIT
BH01	CP/RC BOREHOLE

NB: ALL m OD LEVELS ARE TO GROUND LEVEL ABOVE SERVICES

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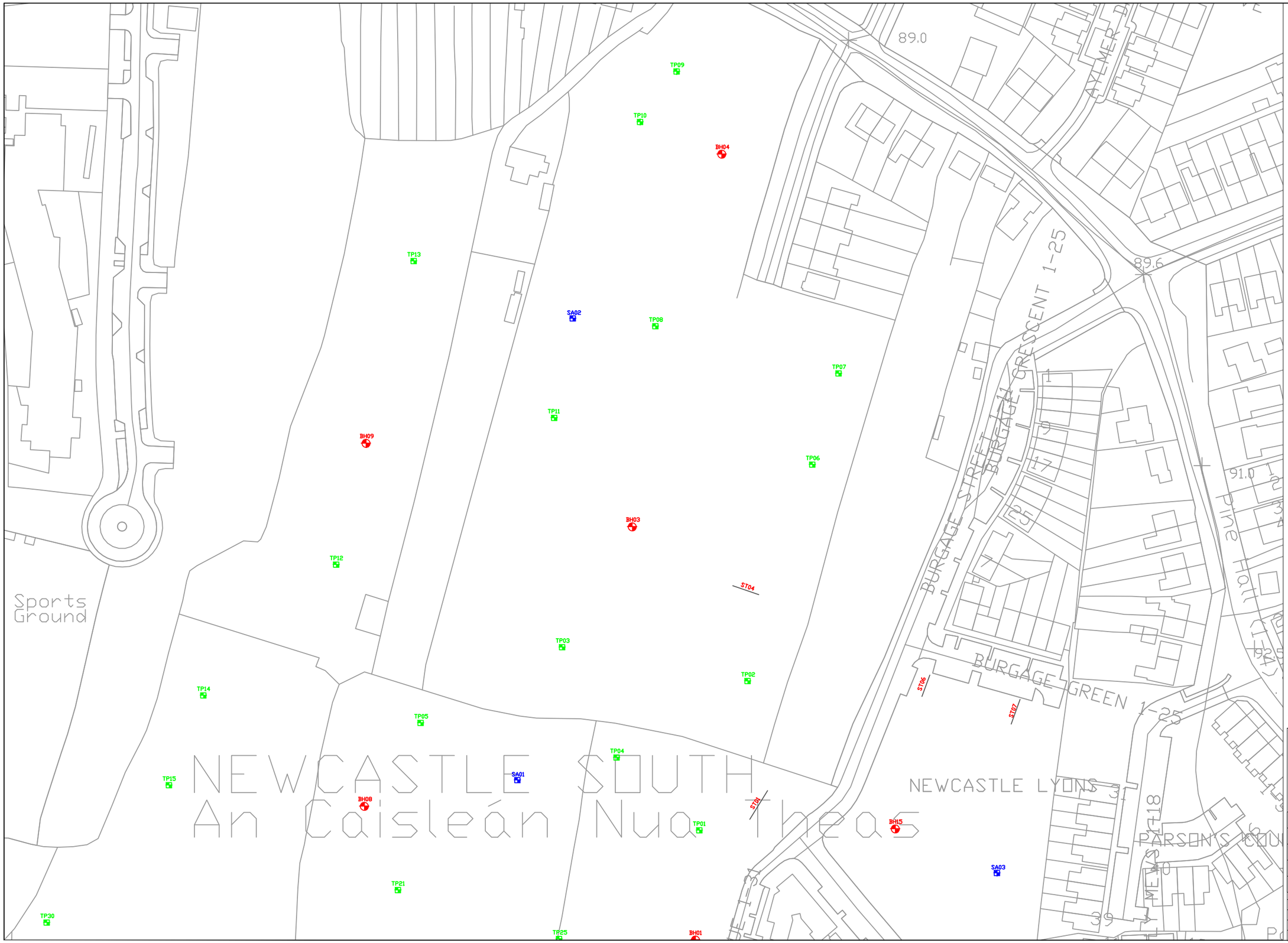
Ground Investigations Ireland Ltd.
Catherinestown
Hazelhatch Road,
Newcastle,
Co Dublin
Tel: +353-(0)1 6015175/6
Fax: +353-(0)1 601 5173
Email: info@gii.ie
Web: www.gii.ie

PROJECT:	Newcastle Lands
DRAWING No.:	Newcastle Lands Site Location Plan 2
DATE:	July 2018
ENGINEER:	DBFL
SCALE:	NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
	27.07.18	SC	AMCD



LEGEND:

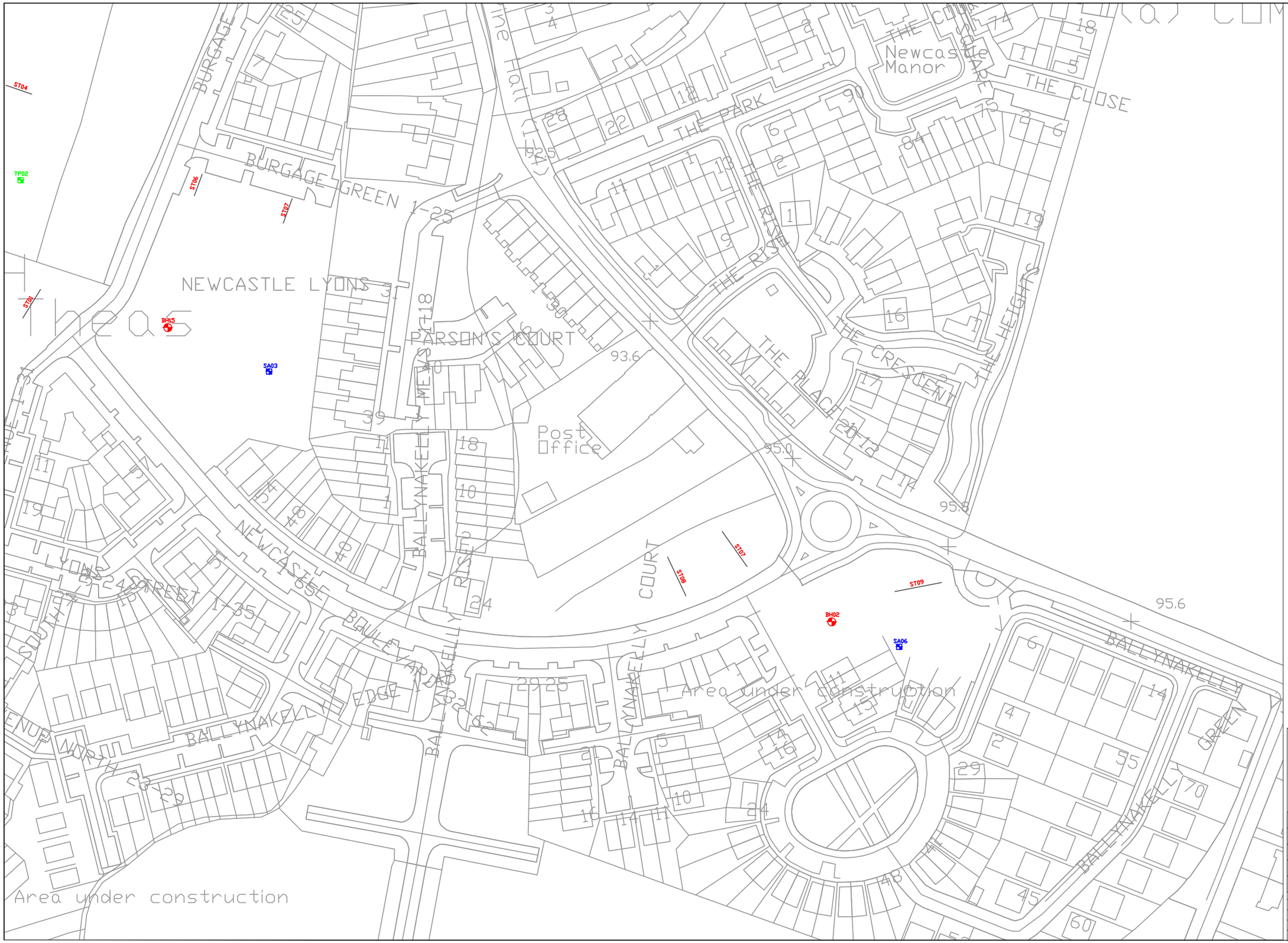
ST	SLIT TRENCH
TP01	TRIAL PIT
SA01	SOAKAWAY PIT
BH01	CP/RC BOREHOLE

NB: ALL m OD LEVELS ARE TO GROUND LEVEL ABOVE SERVICES

Ground Investigations Ireland Ltd.
Catherinestown
Hazelhatch Road,
Newcastle,
Co Dublin
Tel: +353-(0)1 6015175/6
Fax: +353-(0)1 601 5173
Email: info@gii.ie
Web: www.gii.ie

PROJECT:	Newcastle Lands
DRAWING No.:	Newcastle Lands Site Location Plan 3
DATE:	July 2018
ENGINEER:	DBFL
SCALE:	NTS @ A3

Version:	Date:	Drawn By:	Checked:
No.	Initials	Initials	Initials
	27.07.18	SC	AMCD



LEGEND:

ST	SLIT TRENCH
TP01	TRIAL PIT
SA01	SOAKAWAY PIT
BH01	CP/RC BOREHOLE

NB: ALL m OD LEVELS ARE TO GROUND LEVEL ABOVE SERVICES

Ground Investigations Ireland Ltd.
Catherinestown
Hazelhatch Road,
Newcastle,
Co Dublin
Tel: +353-(0)1 6015175/6
Fax: +353-(0)1 601 5173
Email: info@gii.ie
Web: www.gii.ie

PROJECT:	Newcastle Lands
DRAWING No.:	Newcastle Lands Site Location Plan 4
DATE:	July 2018
ENGINEER:	DBFL
SCALE:	NTS @ A3

Version: No.	Date: Initials	Drawn By: Initials	Checked: Initials
	27.07.18	SC	AMCD

APPENDIX 2 – Trial Pit Records

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Newcastle Lands	TP01

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		99.91	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	700211 E 728397.2 N	23/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	TOPSOIL		
0.50	B			99.51	0.40	Soft to firm brown slightly sandy gravelly silty CLAY with occasional angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				99.01	0.90	Stiff light brown mottled grey sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles are rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(2.80)			
3.40	B							
				96.21	3.70	Complete at 3.70m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP01

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP02
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 97.77	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700230.5 E 728457.5 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				97.67	(0.10) 0.10	MADE GROUND consisting of grey angular Gravel Fill		
0.60	B				(1.30)	Soft to firm brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
				96.37	1.40	Firm to stiff becoming stiff below 2.00mBGL brown/light brown mottled grey sandy gravelly CLAY with frequent angular to sub-angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(2.80)			

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP02

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP02
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 97.77	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700230.5 E 728457.5 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				93.57	4.20	Complete at 4.20m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP02

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP03
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 97.98	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700155.6 E 728471.1 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				97.78	0.20	Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
0.50	B				(0.90)			
				96.88	1.10	Firm to stiff becoming stiff below 2.30mBGL light brown mottled grey sandy gravelly CLAY with frequent angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
			Slow trickle(1) at 2.40m.		(2.20)			▽1
				94.68	3.30	Stiff dark brown/grey slightly sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.90)			

Plan

Remarks

Trial pit spalling below 1.20mBGL
Groundwater encountered at 2.40mBGL as a slow trickle
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP03

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP03
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 97.98	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700155.6 E 728471.1 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 2/2

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				93.78	4.20	Complete at 4.20m		

Plan

Remarks

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP03

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Newcastle Lands	TP04

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		99.06	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	700177.6 E 728426.6 N	23/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.80)	MADE GROUND consisting of grey angular Gravel Fill		
0.90	B		Slow trickle(1) at 0.80m.	98.26	0.80	Firm to stiff light brown/brown sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		▽1
					(1.60)			
				96.66	2.40	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles are rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.60)			
				95.06	4.00			

Plan

Remarks

Trial pit stable
Groundwater encountered at 0.80mBGL as a slow trickle
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP04

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP05
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 98.73	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700098.4 E 728440.6 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				98.68	0.05	TOPSOIL		
						Firm brown slightly sandy gravelly silty CLAY with occasional angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-angular		
0.90	B				(1.75)			
				96.93	1.80	Firm to stiff brown mottled grey sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.70)			
				95.23	3.50	Complete at 3.50m		

Plan

Remarks

Trial pit spalling below 1.50mBGL
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP05

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP06
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.98	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700256.6 E 728544.9 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				94.78	0.20	Soft to firm brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
0.80	B				(1.30)			
				93.48	1.50	Firm to stiff becoming stiff below 2.10mBGL light brown/grey sandy gravelly CLAY with frequent angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.90)			
3.00	B							
				91.58	3.40	Stiff dark brown/grey sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.60)			
				90.98	4.00			

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP06

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP07
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.92	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700267.3 E 728581.8 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-2.00	B				(2.00)	Soft to firm brown slightly sandy gravelly CLAY with occasional rounded cobbles and rare boulders. Gravel is fine to coarse angular to sub-angular		
				92.92	2.00	Complete at 2.00m		

Plan

Remarks

Trial pit conducted in a mound for composite sample
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP07

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP08
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 93.46	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700193.3 E 728600.8 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				93.33	(0.13) 0.13	TOPSOIL		
						Soft to firm brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.77)			
				92.56	0.90	Stiff brown mottled grey sandy gravelly CLAY with frequent angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.50)			
				91.06	2.40	Stiff dark brown/grey slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-rounded		
					(1.20)			
				89.86	3.60	Complete at 3.60m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP08

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP09
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 91.31	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700201.9 E 728703.7 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.80	B				(1.80)	Soft to firm brown/grey slightly sandy gravelly CLAY with frequent angular cobbles and occasional boulders. Gravel is fine to coarse angular to sub-angular		
				89.51	1.80	Complete at 1.80m		

Plan

Remarks

Trial pit conducted in a mound for composite sample
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP09

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP10
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)**	**Client** Cairn Homes **Job Number** 7612-04-18
	Location	**Dates** 23/04/2018	**Engineer** DBFL **Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05	TOPSOIL		
					(0.35)	MADE GROUND consiting of brown slightly sandy gravelly Clay		
					0.40	CONCRETE: Possible attenuation tank		
					(0.10)			
					0.50	Complete at 0.50m		

Plan

Remarks

Concrete encountered at 0.50mBGL
Trial pit moved upon encountering concrete
Trial pit backfilled

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP10

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP10A
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 90.95	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700187.1 E 728683.3 N	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				90.90	0.05	TOPSOIL		
						MADE GROUND consiting of brown slightly sandy gravelly Clay		
					(0.85)			
				90.05	0.90	Firm to stiff brown mottled grey sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.20)			
				88.85	2.10	Stiff brown/grey slightly sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.50)			
3.50	B			87.35	3.60	Complete at 3.60m		

Plan

Remarks

Trial pit spalling below 0.80mBGL
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP10

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP11
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 23/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05	TOPSOIL		
					(1.05)	Soft to firm brown/grey slightly sandy gravelly CLAY with occasional angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					1.10	Stiff brown/grey slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.30)			
					2.40	CONCRETE: Possible attenuation tank		
					(0.10)			
					2.50	Complete at 2.50m		

Plan

Remarks

Excavating from 0.00m.
Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion
Trial pit terminated upon encountering possible concrete tank

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP11

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP12
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 96.38	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700064.3 E 728504.5 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				96.08	0.30	Soft to firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
			Slow trickle(1) at 0.50m.		(1.40)			▽1
				94.68	1.70	Firm to stiff brown/grey sandy gravelly CLAY with occasional angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.20)			
				93.48	2.90	Stiff dark grey/black slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				92.98	3.40	Complete at 3.40m		

Plan

Remarks

Trial pit sidewall collapse below 0.80mBGL
Groundwater encountered at 0.50mBGL as a slow trickle
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP12

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Site Newcastle Lands			**Trial Pit Number** TP13
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 93.02	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700095.6 E 728627.1 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				92.82	0.20	Soft to firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(2.00)			
			Slow trickle(1) at 2.20m.	90.82	2.20	Firm to stiff brown/grey sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		▽1
					(1.20)			
3.40	B			89.62	3.40	Complete at 3.40m		

Plan

Remarks

Trial pit sidewall collapse below 0.50mBGL
Groundwater encountered at 2.20mBGL as a slow trickle
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP13

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP14
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 98.25	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700011.3 E 728453.6 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				97.95	0.30	Firm brown mottled grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.60)			
				97.35	0.90	Stiff light brown sandy gravelly CLAY with occasional angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.80)			
				96.55	1.70	Stiff brown/grey sandy gravelly CLAY with frequent angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.40)			
				95.15	3.10	Complete at 3.10m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP14

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP15
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 98.70	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699997.4 E 728417.3 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				98.50	0.20	Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(1.40)			
				97.10	1.60	Firm brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse angular to sub-angular		
			Slow seepage(1) at 2.00m.					▽1
					(1.40)			
2.50	B							
				95.70	3.00	Complete at 3.00m		

Plan

Remarks

Trial pit sidewall collapse below 0.80mBGL
Groundwater encountered at 2.00mBGL as slow seepage
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP15

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Site Newcastle Lands			**Trial Pit Number** TP16
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 100.73	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699983.4 E 728348.7 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				100.43	0.30	Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(1.30)			
				99.13	1.60	Firm to stiff brown/grey slightly sandy gravelly CLAY with occasional angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.90)			
				97.23	3.50	Complete at 3.50m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP16

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP18
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 102.11	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699989.1 E 728291.4 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.50	B				(1.50)	TOPSOIL with rootlets		
				100.61	1.50	Complete at 1.50m		

Plan

Remarks

Trial pit conducted in a mound for composite sample
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP18

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Site Newcastle Lands			**Trial Pit Number** TP19
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 103.58	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700057 E 728263.6 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				103.28	0.30	Firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.80)			
				102.48	1.10	Stiff brown/grey slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.50)			
				100.98	2.60	Stiff dark grey/black slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
2.80	B				(1.20)			
				99.78	3.80	Complete at 3.80m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP19

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP20
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 103.83	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700097.9 E 728256 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND consisting of brown angular Gravel Fill		
				103.53	0.30	Dense light brown slightly clayey sandy fine to coarse angular to sub-rounded GRAVEL. Sand is fine to coarse		
					(1.40)			
1.20	B		Rapid flow(1) at 1.20m.					▽1
				102.13	1.70	Stiff black/grey slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.20)			
				100.93	2.90	Complete at 2.90m		

Plan

Remarks

Trial pit stable
Groundwater encountered at 1.20mBGL as a rapid flow
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP20

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP21
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 100.72	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700089.9 E 728374.9 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				100.52	0.20	Soft to firm brown/grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.80)			
				99.72	1.00	Firm to stiff brown/grey slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				99.22	1.50	Stiff light brown slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles		
2.00	B							
					(1.90)			
				97.32	3.40	Complete at 3.40m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP21

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Site	Trial Pit Number
Newcastle Lands	TP22

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		101.98	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	699945.6 E 728300.3 N	24/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				101.68	0.30	Soft to firm brown slightly sandy gravelly CLAY with rare angular cobbles. Gravel is fine to coarse angular to sub-angular		
0.80	B				(1.10)			
				100.58	1.40	Firm to stiff brown/grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(2.30)			
				98.28	3.70	Complete at 3.70m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP22

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Site Newcastle Lands			**Trial Pit Number** TP24
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 102.35	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700155.9 E 728286.4 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				102.05	0.30	Firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.70)			
				101.35	1.00	Stiff brown/grey slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(1.40)			
				99.95	2.40	Stiff light brown slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.70)			
				99.25	3.10	Complete at 3.10m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP24

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP25
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 101.65	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700154.9 E 728355.3 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	TOPSOIL		
				101.25	0.40	Soft to firm brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.70)			
				100.55	1.10	Stiff grey/brown slightly sandy gravelly CLAY with frequent angular to sub-angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(2.50)			
				98.05	3.60	Complete at 3.60m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP25

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Site Newcastle Lands			**Trial Pit Number** TP26
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 108.81	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699971.6 E 728191.8 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(1.50)	TOPSOIL with rootlets		
				107.31	1.50			
2.00	B					Firm to stiff grey mottled brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium angular to sub-rounded		
					(2.40)			
				104.91	3.90			
						Complete at 3.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP26

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP27
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 104.87	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699756.6 E 728204.8 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.40)	TOPSOIL		
				104.47	0.40	Soft to firm light brown/red slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-rounded		
1.50	B				(1.40)			
				103.07	1.80	Firm to stiff blue/white mottled red slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to corase angular to sub-rounded		
					(1.30)			
				101.77	3.10	Complete at 3.10m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP27

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP28
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 103.79	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699909.2 E 728231.8 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				103.49	0.30	Firm light brown/brown slightly sandy gravelly CLAY with occasional angular to sub-angular cobbles. Gravel is fine to medium angular to sub-rounded		
					(1.20)			
				102.29	1.50	Stiff brown/grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(1.80)			
				100.49	3.30	Complete at 3.30m		

Plan

Remarks

Trial pit spalling below 1.30mBGL
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP28

Ground Investigations Ireland Ltd
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Site	Trial Pit Number
Newcastle Lands	TP29

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		102.01	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	699879.3 E 728288.3 N	26/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				101.81	0.20	Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded		
					(1.20)			
				100.61	1.40	Firm to stiff brown/grey sandy gravelly CLAY with frequent angular cobbles and rare boulders. Gravel is fine to corase angular to sub-rounded		
					(2.00)			
			Slow seepage(1) at 3.40m.	98.61	3.40	Complete at 3.40m		▽1

Plan

Remarks

Trial pit stable
Groundwater encountered at 3.40mBGL as slow seepage
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP29

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** TP30
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 100.11	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699948.1 E 728361.9 N	**Dates** 24/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				99.91	0.20	Firm brown slightly sandy gravelly CLAY with rare angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-angular		
			Slow trickle(1) at 2.20m.		(2.10)			▽1
				97.81	2.30	Firm to stiff brown/grey sandy gravelly CLAY with frequent angular to sub-angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.60)			
				97.21	2.90	Complete at 2.90m		

Plan

Remarks

Trial pit sidewall collapse below 2.10mBGL
Groundwater encountered at 2.20mBGL as a slow trickle
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP30

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Site	Trial Pit Number
Newcastle Lands	TP31

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		101.61	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	699814.2 E 728291.2 N	26/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				101.51	(0.10) 0.10	TOPSOIL		
						Soft to firm light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-rounded		
					(0.80)			
				100.71	0.90	Firm to stiff light brown mottled grey/blue sandy gravelly CLAY with occasional angular cobbles and rare boulders. Gravel is fine to corase angular to sub-rounded		
					(0.90)			
				99.81	1.80	Stiff dark brown sandy gravelly CLAY with rare angular cobbles		
					(0.70)			
2.50	B			99.11	2.50	Stiff dark grey/black slightly sandy gravelly CLAY with frequent angular cobbles		
					(0.70)			
				98.41	3.20	Complete at 3.20m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP31

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Site Newcastle Lands			**Trial Pit Number** TP32
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 103.11	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699767.6 E 728246 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				102.91	0.20	Soft to firm light brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-rounded		
					(0.40)			
				102.51	0.60	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse angular to sub-rounded		
					(0.90)			
				101.61	1.50	Stiff light brown mottled grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse angular to sub-rounded		
					(1.10)			
			Rapid flow(1) at 2.60m.	100.51	2.60	Stiff blue/white slightly sandy gravelly CLAY. Gravel is fine to corase angular to sub-rounded		▽1
3.00	B				(0.80)			
				99.71	3.40	Complete at 3.40m		

Plan

Remarks

Trial pit stable
Groundwater encountered at 2.60mBGL as a rapid flow
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP32

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Site Newcastle Lands			**Trial Pit Number** TP33
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 99.55	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699870.5 E 728371.5 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				99.25	0.30	Firm light brown slightly sandy gravelly silty CLAY with rare angular cobbles. Gravel is fine to medium angular to sub-rounded		
					(0.50)			
				98.75	0.80	Stiff brown/grey sandy gravelly CLAY with frequent sub-angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(0.80)			
			Rapid flow(1) at 1.60m.	97.95	1.60	Dense grey clayey sandy fine to coarse GRAVEL with frequent rounded cobbles		▽1
2.50	B				(1.70)			
				96.25	3.30	Complete at 3.30m		

Plan

Remarks

Trial pit collapse below 1.60mBGL
Groundwater encountered at 1.60mBGL as a rapid flow
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP33

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Site Newcastle Lands			**Trial Pit Number** TP34
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 100.15	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699841.6 E 728335.3 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				99.95	0.20	Firm light brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to medium angular to sub-rounded		
					(0.80)			
				99.15	1.00	Stiff brown/grey sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to medium angular to sub-rounded		
					(1.10)			
			Rapid flow(1) at 2.10m.	98.05	2.10	Medium dense grey clayey sandy fine to coarse GRAVEL with frequent sub-rounded cobbles		▽1
					(1.40)			
				96.65	3.50	Complete at 3.50m		

Plan

Remarks

Trial pit collapse below 2.10mBGL
Groundwater encountered at 2.10mBGL as a rapid flow
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP34

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP35
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 99.80	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699796.7 E 728351.5 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				99.60	0.20	Firm light brown/brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular to sub-rounded		
					(0.80)			
				98.80	1.00	Firm to stiff becoming stiff below 2.20mBGL brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to medium angular to sub-rounded		
					(2.40)			
				96.40	3.40	Complete at 3.40m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP35

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP36
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 100.87	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699734.4 E 728317.8 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				100.67	0.20	Soft to firm light brown/brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular to sub-rounded		
					(0.50)			
				100.17	0.70	Firm to stiff becoming stiff below 1.10mBGL brown/grey sandy gravelly CLAY with occasional angular cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(1.00)			
				99.17	1.70	Stiff light brown sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
2.00	B							
					(1.50)			
				97.67	3.20	Complete at 3.20m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP36

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP37
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 99.50	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699701.2 E 728360.7 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				99.30	0.20	Soft to firm light brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium angular to sub-rounded		
					(0.60)			
				98.70	0.80	Firm to stiff brown/grey sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(2.70)			
				96.00	3.50	Complete at 3.50m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP37

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP38
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 98.53	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699771.1 E 728409.3 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				98.33	0.20	Soft to firm brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(1.50)			
				96.83	1.70	Firm to stiff light brown sandy gravelly CLAY with frequent angular cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.10)			
2.80	B			95.73	2.80	Complete at 2.80m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP38

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP39
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 96.98	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699793.8 E 728471.4 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				96.78	0.20	Soft to firm light brown mottled grey slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(1.10)			
				95.68	1.30	Stiff light brown sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(2.10)			
				93.58	3.40	Complete at 3.40m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP39

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP40
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 95.54	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699804.9 E 728542.6 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				95.34	0.20	Firm brown mottled grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(2.40)			
				92.94	2.60	Stiff dark grey/black slightly sandy gravelly CLAY with occasional angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				92.44	3.10	Complete at 3.10m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP40

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP43
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.10	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699806.5 E 728632.6 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				93.80	0.30	Soft to firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(1.10)			
				92.70	1.40	Firm to stiff brown mottled grey sandy gravelly CLAY with occasional angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
2.50	B				(1.80)			
				90.90	3.20	Complete at 3.20m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP43

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Newcastle Lands	TP44

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		94.18	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	699722.5 E 728637.7 N	25/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				93.88	0.30	Firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.80)			
				93.08	1.10	Stiff light brown slightly sandy gravelly CLAY with occasional angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
			Fast trickle(1) at 2.20m.		(1.70)			▽1
				91.38	2.80	Stiff dark grey/black slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				90.88	3.30	Complete at 3.30m		

Plan

Remarks

Trial pit stable
Groundwater encountered at 2.20mBGL as a fast trickle
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP44

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP45
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 95.34	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699699.8 E 728579.5 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				95.14	0.20	Firm becoming stiff below 2.00mBGL light brown mottled grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(2.70)			
				92.44	2.90	Complete at 2.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP45

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Newcastle Lands	TP46

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		97.07	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	699754.1 E 728475.3 N	25/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				96.87	0.20	Firm becoming stiff below 1.80mBGL light brown mottled grey sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(2.80)			
				94.07	3.00	Complete at 3.00m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP46

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP47
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 97.39	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699693.7 E 728541.8 N	**Dates** 26/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				97.19	0.20	Soft to firm light brown slightly sandy slightly gravelly CLAY with occasional angular cobbles. Gravel is fine to medium angular to sub-rounded		
					(0.40)			
				96.79	0.60	Stiff brown/grey sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to medium angular to sub-rounded		
1.50	B							
					(3.00)			
				93.79	3.60	Complete at 3.60m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP47

Ground Investigations Ireland Ltd
www.gii.ie

Site	Trial Pit Number
Newcastle Lands	TP48

Machine : 15T Tracked Excavator Method : Trial Pit	Dimensions	Ground Level (mOD)	Client	Job Number
		97.49	Cairn Homes	7612-04-18
	Location	**Dates**	**Engineer**	**Sheet**
	699674.6 E 728451 N	26/04/2018	DBFL	1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				97.19	0.30	Stiff brown/grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(1.60)			
				95.59	1.90	Stiff light brown mottled grey sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(0.80)			
				94.79	2.70	Stiff dark grey/black slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to medium angular to sub-rounded		
					(0.40)			
				94.39	3.10	Complete at 3.10m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP48

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP49
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 96.50	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699675.3 E 728497.6 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				96.30	0.20	Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				95.80	0.70	Firm to stiff brown/grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and occasional boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.10)			
2.00	B			94.70	1.80	Stiff light brown slightly sandy gravelly CLAY with occasional angular cobbles		
					(1.10)			
				93.60	2.90	Complete at 2.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP49

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP51
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.21	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699660.9 E 728628.8 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				94.01	0.20	Soft to firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(1.20)			
				92.81	1.40	Firm to stiff light brown/grey sandy gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.80)			
				92.01	2.20	Stiff dark grey/black slightly sandy gravelly CLAY with frequent angular shards of Mudstone. Gravel is fine to coarse angular to sub-angular		
2.50	B				(0.40)			
				91.61	2.60	WEATHERED ROCK: Recovered as black angular cobbles and boulders		
				91.51	(0.10) 2.70			
						Complete at 2.70m		

Plan

Remarks

Trial pit spalling below 2.10mBGL
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP51

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP52
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.70	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699620.6 E 728596.7 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				94.40	0.30	Soft to firm brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to sub-angular		
					(1.80)			
				92.60	2.10	Stiff brownmottled grey sandy gravelly CLAY with occasional angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(0.20)			
				92.40	2.30	Stiff dark grey/black slightly sandy very gravelly CLAY with frequent angular shards of Mudstone. Gravel is fine to coarse angular to sub-angular		
					(0.20)			
				92.20	2.50	WEATHERED ROCK: Recovered as black angular cobbles and boulders		
					(0.10)			
				92.10	2.60	Complete at 2.60m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP52

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP53
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 96.10	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699627.9 E 728529.6 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				95.90	0.20	Soft to firm brown slightly sandy gravelly CLAY with occasional angular cobbles		
					(1.10)			
				94.80	1.30	Stiff brown/grey slightly sandy very gravelly CLAY with frequent angular to sub-rounded cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
			Slow seepage(1) at 2.00m.		(0.90)			▽1
				93.90	2.20	Firm to stiff light brown/grey sandy gravelly CLAY with frequent angular cobbles with lenses of sandy Gravel. Gravel is fine to coarse angular to sub-angular		
					(0.90)			
				93.00	3.10	Complete at 3.10m		

Plan

Remarks

Trial pit spalling below 0.60mBGL
Groundwater encountered below 2.00mBGL as slow seepage
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP53

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** TP54
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.82	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699521.4 E 728574.7 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				94.62	0.20	Soft black slightly sandy PEAT		
1.00	B				(1.30)			
				93.32	1.50	Stiff brown/grey sandy gravelly CLAY with frequent angular cobbles and rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.40)			
				91.92	2.90	Complete at 2.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Trial pit backfilled upon completion

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.TP54

Newcastle Lands – Trial Pit Photos

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TP01

TP01

TP01

TP02

TP02

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APPENDIX 3 – Soakaway Results

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Trial Pit Number** SA01
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 99.64	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700138.2 E 728419.4 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				99.44	0.20	Soft to firm brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				98.94	0.70	Firm to stiff light brown sandy gravelly CLAY with frequent sub-angular to sub-rounded cobbles are rare boulders of Limestone. Gravel is fine to coarse angular to sub-angular		
					(1.20)			
				97.74	1.90	Complete at 1.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Soakaway completed in trial pit

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.SA01

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** SA02
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 93.45	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700159.9 E 728603.9 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.20)	TOPSOIL		
				93.25	0.20	Soft to firm light brown slightly sandy gravelly CLAY with rare angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(1.40)			
				91.85	1.60	Firm to stiff brown/grey sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-angular		
					(0.30)			
				91.55	1.90	Complete at 1.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Soakaway completed in trial pit

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.SA02

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Site Newcastle Lands			**Trial Pit Number** SA03
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 96.80	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700331.8 E 728381.9 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	MADE GROUND consisting of grey angular Gravel Fill		
				96.50	0.30	Firm to stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-angular		
					(0.50)			
				96.00	0.80	Stiff brown sandy gravelly CLAY with rare angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-angular		
					(1.00)			
				95.00	1.80	Complete at 1.80m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Soakaway completed in trial pit

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.SA03

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** SA04
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 94.19	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699763.4 E 728627.6 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				93.89	0.30	Soft to firm brown slightly sandy silty CLAY		
					(0.60)			
				93.29	0.90	Firm to stiff brown mottled grey sandy gravelly CLAY with rare angular to sub-rounded cobbles and rare angular boulders. Gravel is fine to coarse angular to sub-angular		
					(1.10)			
				92.19	2.00	Complete at 2.00m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Soakaway completed in trial pit

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.SA04

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Site Newcastle Lands			**Trial Pit Number** SA05
Machine : 15T Tracked Excavator **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)** 95.51	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699768.8 E 728546.6 N	**Dates** 25/04/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.30)	TOPSOIL		
				95.21	0.30	Firm to stiff light brown mottled grey sandy gravelly CLAY with frequent angular to sub-angular cobbles. Gravel is fine to coarse angular to sub-angular		
					(1.60)			
				93.61	1.90	Complete at 1.90m		

Plan

Remarks

Trial pit stable
No groundwater encountered
Soakaway completed in trial pit

Scale (approx)	Logged By	Figure No.
1:25	S. Worth	7612-04-18.SA05

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Trial Pit Number** SA06
Machine : JCB 3CX **Method :** Trial Pit	**Dimensions** 2.00m X 0.35m X 1.80m	**Ground Level (mOD)** 96.70	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700587.3 E 728270.3 N	**Dates** 29/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				96.60	(0.10) 0.10	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets.		
					(0.30)	FILL: Brown slightly sandy clayey angular to subrounded fine to coarse Gravel.		
				96.30	0.40	Soft to firm brown slightly sandy slightly gravelly CLAY with occasional subrounded cobbled and boulders		
					(1.40)			
				94.90	1.80	Trial pit terminated at scheduled depth.		
						Complete at 1.80m		

Plan

Remarks

Trial pit stable.
No Groundwater encountered.
Soakaway completed in trial pit.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	7612-04-18.SA06

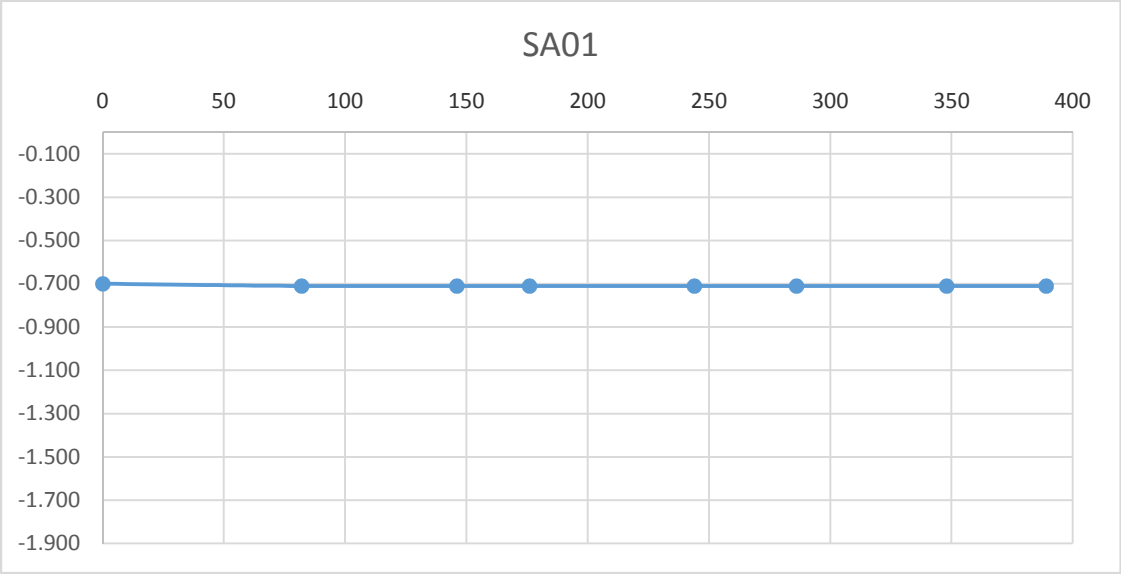
SA01

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.40m x 1.10m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2018	0	-0.700
25/04/2018	82	-0.710
25/04/2018	146	-0.710
25/04/2018	176	-0.710
25/04/2018	244	-0.710
25/04/2018	286	-0.710
25/04/2018	348	-0.710
25/04/2018	389	-0.710

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.70	1.900	1.200	1	1.6



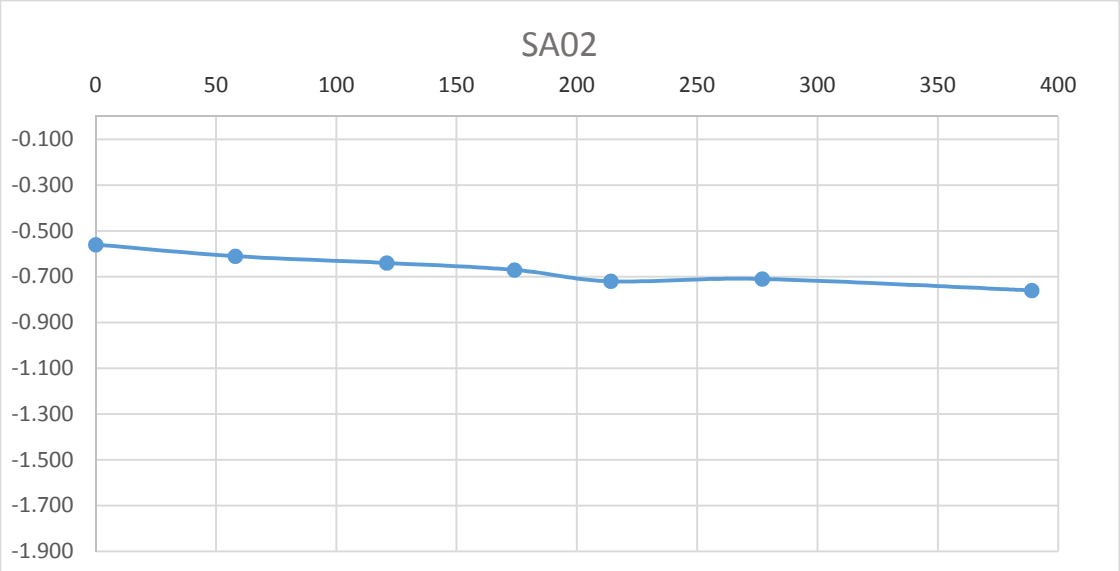
SA02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.30m x 1.10m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2018	0	-0.560
25/04/2018	58	-0.610
25/04/2018	121	-0.640
25/04/2018	174	-0.670
25/04/2018	214	-0.720
25/04/2018	277	-0.710
25/04/2018	389	-0.760

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.56	1.900	1.340	0.895	1.565



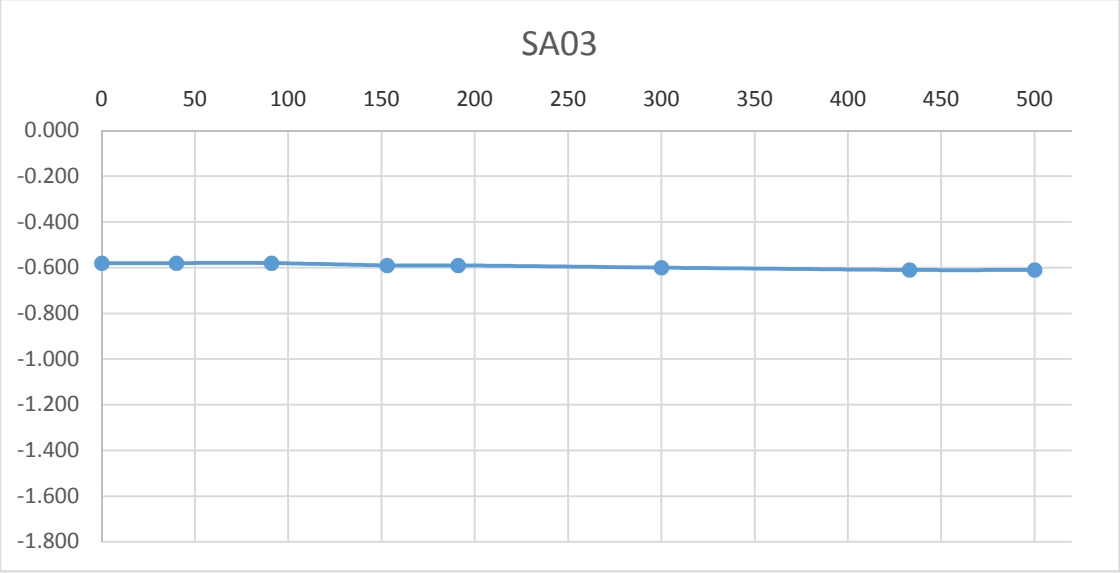
SA03

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.20m x 1.20m x 1.80m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2018	0	-0.580
25/04/2018	40	-0.580
25/04/2018	91	-0.580
25/04/2018	153	-0.590
25/04/2018	191	-0.590
25/04/2018	300	-0.600
25/04/2018	433	-0.610
25/04/2018	500	-0.610

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.58	1.800	1.220	0.885	1.495



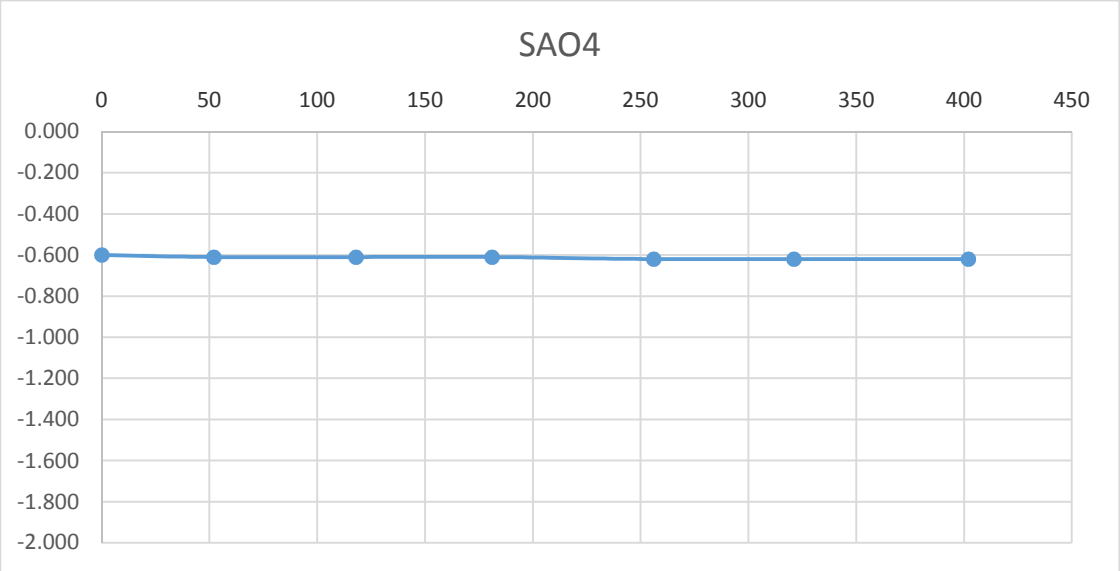
SA04

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.00m x 1.00m x 2.00m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2018	0	-0.600
25/04/2018	52	-0.610
25/04/2018	118	-0.610
25/04/2018	181	-0.610
25/04/2018	256	-0.620
25/04/2018	321	-0.620
25/04/2018	402	-0.620

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.60	2.000	1.400	0.95	1.65



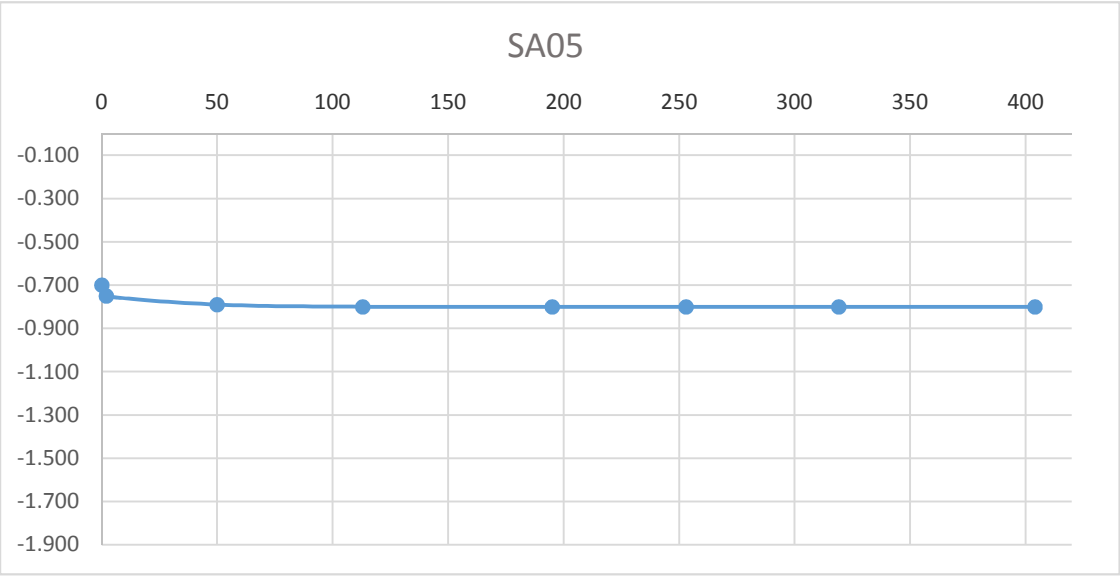
SA05

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.40m x 1.00m x 1.90m (L x W x D)

Date	Time	Water level (m bgl)
25/04/2018	0	-0.700
25/04/2018	2	-0.750
25/04/2018	50	-0.790
25/04/2018	113	-0.800
25/04/2018	195	-0.800
25/04/2018	253	-0.800
25/04/2018	319	-0.800
25/04/2018	404	-0.800

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.70	1.900	1.200	1	1.6



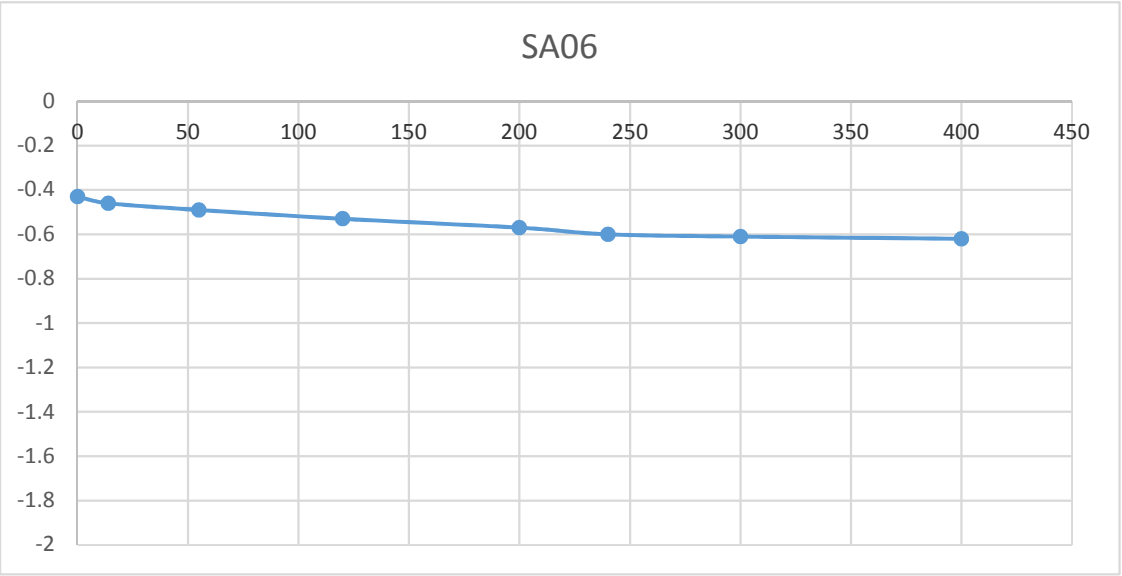
SA06

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.0m x 0.35m 1.8m (L x W x D)

Date	Time	Water level (m bgl)
29/05/2018	0	-0.430
29/05/2018	14	-0.460
29/05/2018	55	-0.490
29/05/2018	120	-0.530
29/05/2018	200	-0.570
29/05/2018	240	-0.600
29/05/2018	300	-0.610
29/05/2018	400	-0.620

***Soakaway failed - Pit backfilled**

Start depth	Depth of Pit	Diff	75% full	25%full
0.43	1.800	1.370	0.7725	1.4575



Newcastle Lands – Soakaway Photos

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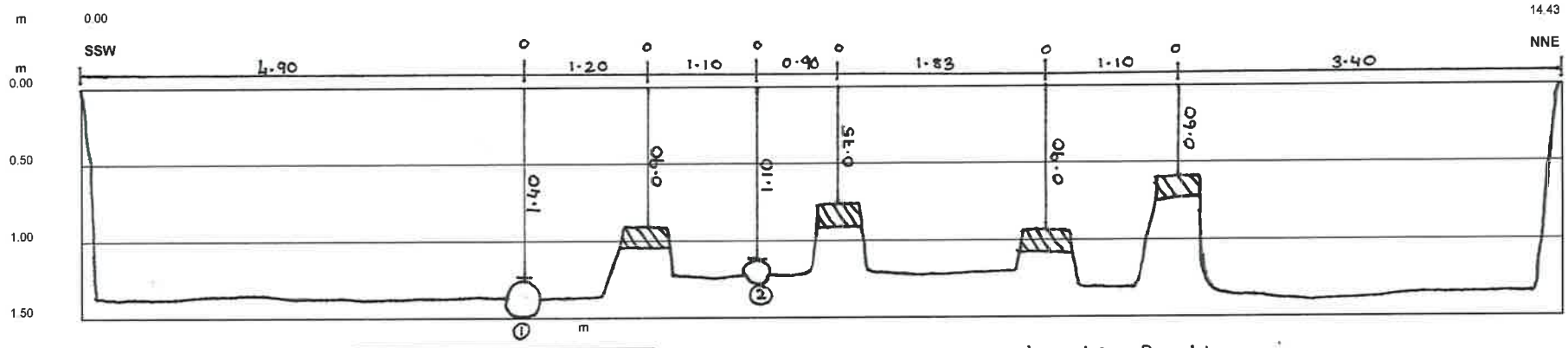
APPENDIX 4 – Slit Trench Records

SLIT TRENCH RECORD - SLIT TRENCH ST-01

		Survey Point:	A	B	
Contract No.:	7612-04-18	E	700231·351	700238·545	
Client:	DBFL				
Site Address:	Newcastle Lands	N	728401·545	728413·156	
Date Commenced:	28/05/2018				
Date Completed:	28/05/2018	Ground Level	98·931	98·981	(m OD)
Logged by:	Sarah Worth				



Trench Profile: (m)

Gravel	0.00 - 14.43

Zero taken at	South south east end
Start of ST	0.00
End of ST	14.43
ST Length	14.43
Max Depth	1.40
Facing Direction	SSW-NNE
Width of ST	1.00

Notes ▨ → Concrete haunching. Possible service

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle
1	250	Orange PVC	Possible waste	1.40m	4.90m	80
2	180	Blue PVC	Water	1.10m	7.20m	80

Soil Profile:

From (m)	To (m)	Description
0.00	1.30	MADE GROUND: Blue/grey angular crushed rock Fill
1.30	1.40	Firm brown slightly sandy gravelly CLAY

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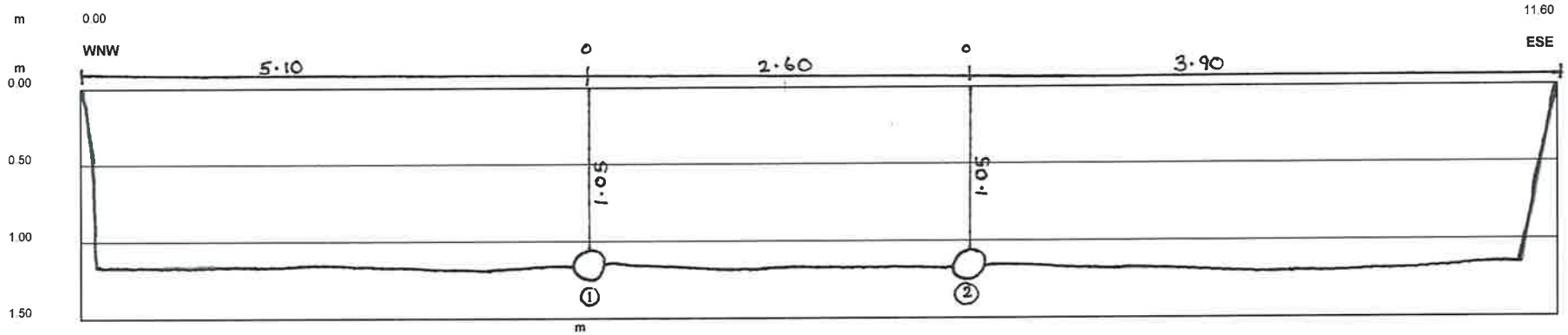
Tel: 353-1-601-5176
Fax: 353-1-601-5173
Email: info@gii.ie

SLIT TRENCH RECORD - SLIT TRENCH ST-04

Contract No.:	7612-04-18
Client:	DBFL
Site Address:	Newcastle Lands
Date Commenced:	28/05/2018
Date Completed:	28/05/2018
Logged by:	Sarah Worth

Survey Point:	A	B	
E	700224.483	700234.982	
N	728495.921	728492.316	
Ground Level	97.182	97.176	(m OD)



Trench Profile: (m)

Gravel	0.00 - 11.60

Zero taken at	West north west end
Start of ST	0.00
End of ST	11.60
ST Length	11.60
Max Depth	1.10
Facing Direction	WNW-ESE
Width of ST	1.00

Notes

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle
1	225	Black PVC	Possible storm	1.05m	5.10m	90
2	200	Orange PVC	Possible waste	1.05m	7.70m	90

Soil Profile:

From (m)	To (m)	Description
0.00	0.50	MADE GROUND: Grey angular crushed rock Fill
0.50	1.10	Firm brown slightly sandy gravelly CLAY

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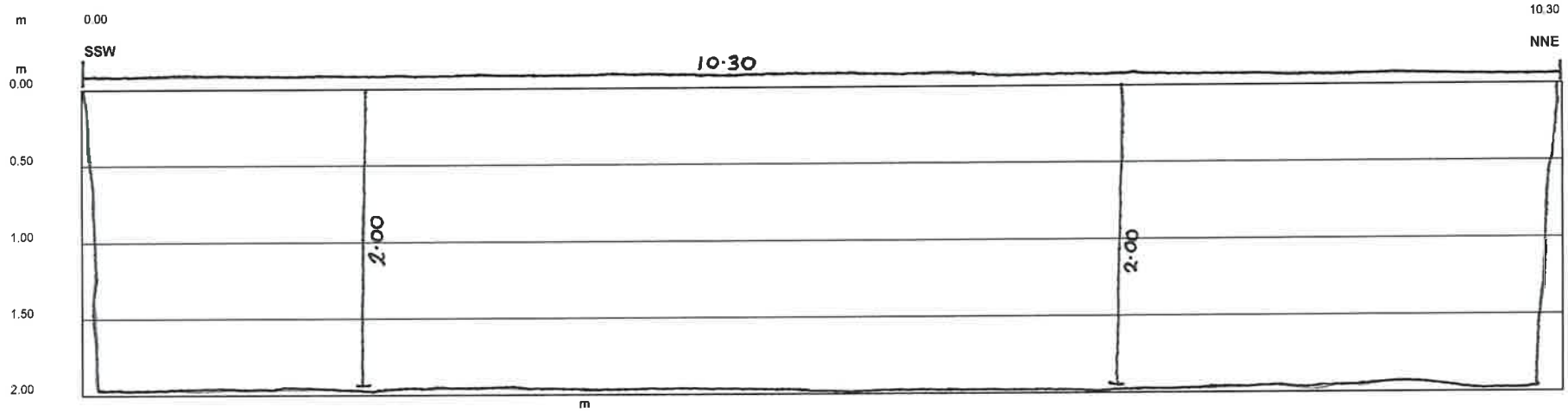
SLIT TRENCH RECORD - SLIT TRENCH ST-05

Contract No.:	7612-04-18	Survey Point:	A	B	
Client:	DBFL	E	700336.932	700340.513	
Site Address:	Newcastle Lands	N	728440.019	728449.981	
Date Commenced:	29/05/2018				
Date Completed:	29/05/2018	Ground Level	94.910		(m OD)
Logged by:	Sarah Worth				



Trench Profile: (m)

Grass	0.00 - 10.30

Zero taken at	South south west end
Start of ST	0.00
End of ST	10.30
ST Length	10.30
Max Depth	2.00
Facing Direction	SSW-NNE
Width of ST	0.40

Notes

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle

Soil Profile:

From (m)	To (m)	Description
0.00	0.10	Topsoil
0.10	1.40	MADE GROUND: Brown slightly sandy gravelly Clay with
		fragments of wood and plastic
1.40	2.00	Firm to stiff light brown slightly sandy gravelly CLAY

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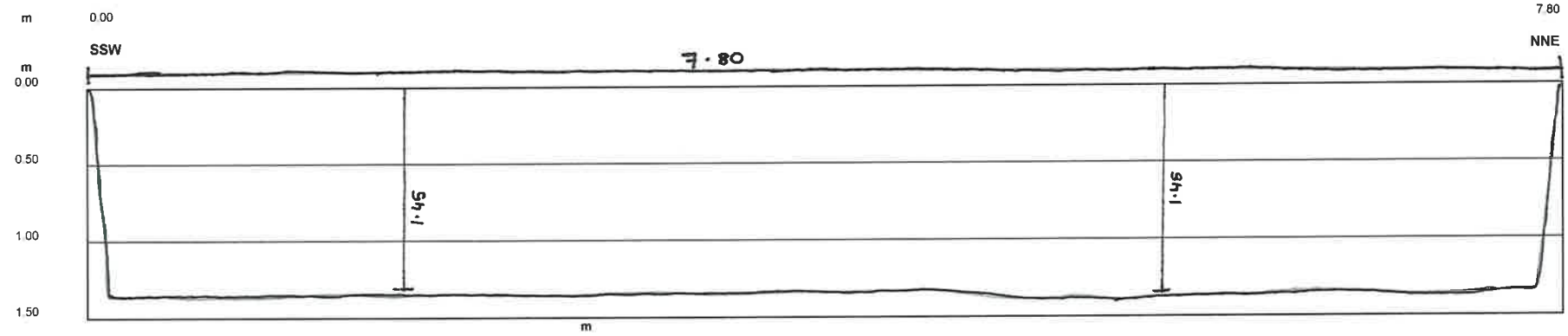
Email: info@gii.ie

SLIT TRENCH RECORD - SLIT TRENCH ST-06

Contract No.:	7612-04-18	Survey Point:	A	B	
Client:	DBFL	E	700300.884	700304.071	
Site Address:	Newcastle Lands	N	728451.189	728459.827	
Date Commenced:	29/05/2018				
Date Completed:	29/05/2018	Ground Level	95.803		(m OD)
Logged by:	Sarah Worth				



Trench Profile: (m)

Grass	0.00 - 7.80

Zero taken at	South south west end
Start of ST	0.00
End of ST	7.80
ST Length	7.80
Max Depth	1.45
Facing Direction	SSW-NNE
Width of ST	0.40

Notes

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle

Soil Profile:

From (m)	To (m)	Description
0.00	0.10	Topsoil
0.10	1.45	MADE GROUND: Brown slightly sandy gravelly Clay with fragments of wood and plastic

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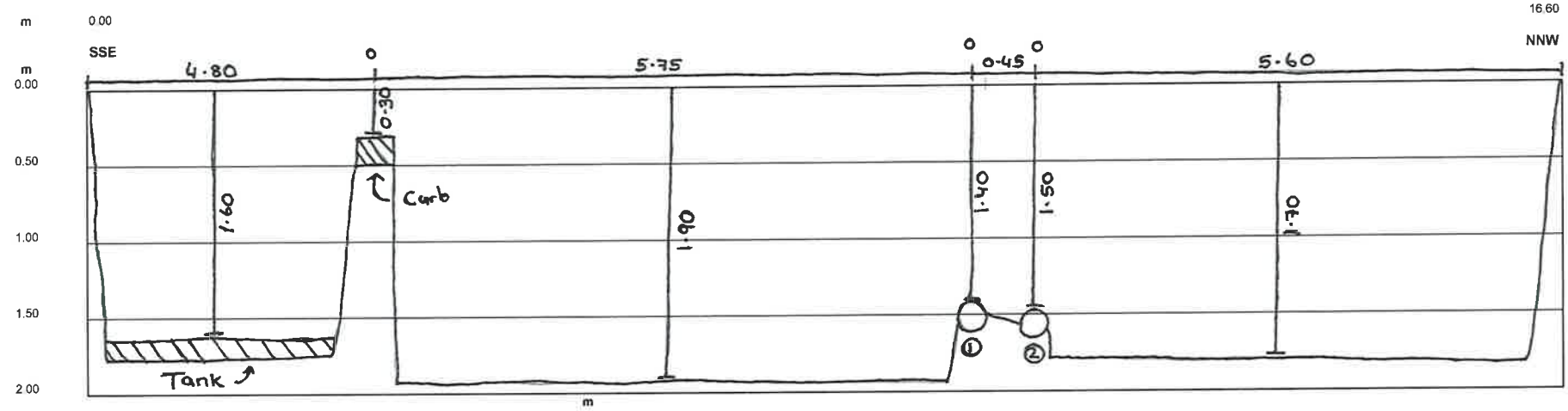
Email: info@gii.ie

SLIT TRENCH RECORD - SLIT TRENCH ST-07

Contract No.:	7612-04-18
Client:	DBFL
Site Address:	Newcastle Lands
Date Commenced:	29/05/2018
Date Completed:	29/05/2018
Logged by:	Sarah Worth

Survey Point:	A	B	
E	700524.878	700514.796	
N	728300.880	728315.088	
Ground Level	96.883		(m OD)



Trench Profile: (m)

Grass	0.00 - 16.60

Zero taken at	South south east end
Start of ST	0.00
End of ST	16.60
ST Length	16.60
Max Depth	1.90
Facing Direction	SSE-NNW
Width of ST	0.40

Notes → Concrete

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle
1	200	Blue PVC	Water	1.40m	10.55m	90
2	100	Yellow PVC	Gas	1.50m	11.00m	90

Soil Profile:

From (m)	To (m)	Description
0.00	0.40	Topsoil
0.40	1.60	MADE GROUND: Brown sandy gravelly Clay with fragments of wood and plastic
1.40	2.00	Firm to stiff light brown slightly sandy gravelly CLAY

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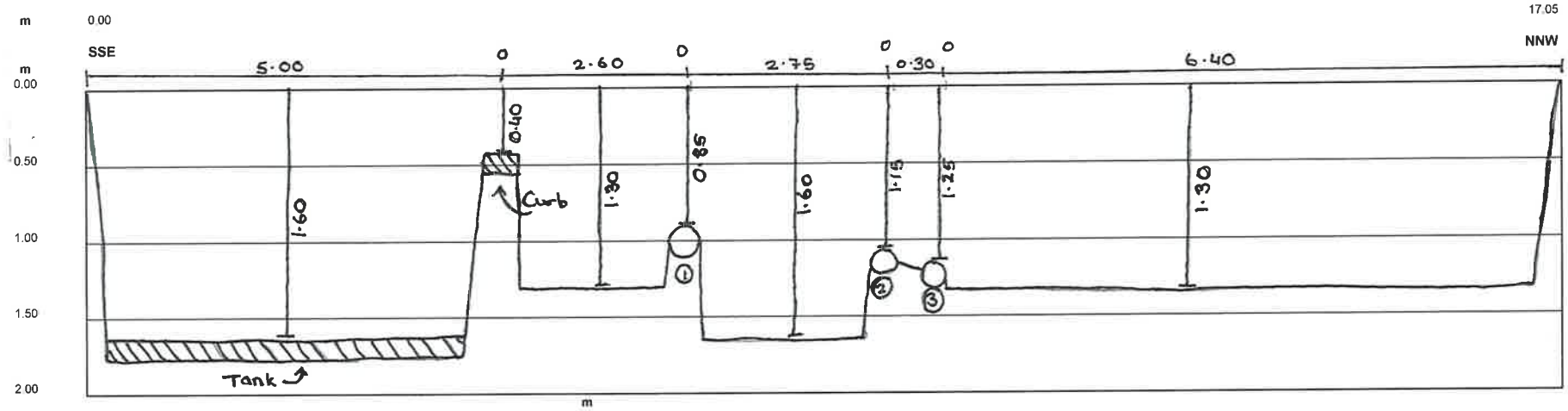
Tel: 353-1-601-5176
Fax: 353-1-601-5173
Email: info@gii.ie

SLIT TRENCH RECORD - SLIT TRENCH ST-08

Contract No.:	7612-04-18
Client:	DBFL
Site Address:	Newcastle Lands
Date Commenced:	29/05/2018
Date Completed:	29/05/2018
Logged by:	Sarah Worth

Survey Point:	A	B	
E	700500.118	700492.695	
N	728288.952	728304.677	
Ground Level	97.058		(m OD)



Trench Profile: (m)

Grass	0.00 - 17.05

Zero taken at	South south east end
Start of ST	0.00
End of ST	17.05
ST Length	17.05
Max Depth	1.60
Facing Direction	SSE-NNW
Width of ST	0.40

Notes ▨ → Concrete

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle
1	200	Orange PVC Ridged	Unknown	0.85m	7.60m	80
2	200	Blue PVC	Water	1.15m	10.35m	90
3	100	Yellow PVC	Gas	1.25m	10.65m	90

Soil Profile:

From (m)	To (m)	Description
0.00	0.40	Topsoil
0.40	1.50	MADE GROUND: Brown sandy gravelly Clay with fragments
		of wood, plastic, metal and brick
1.50	1.60	Firm to stiff light brown slightly sandy gravelly CLAY

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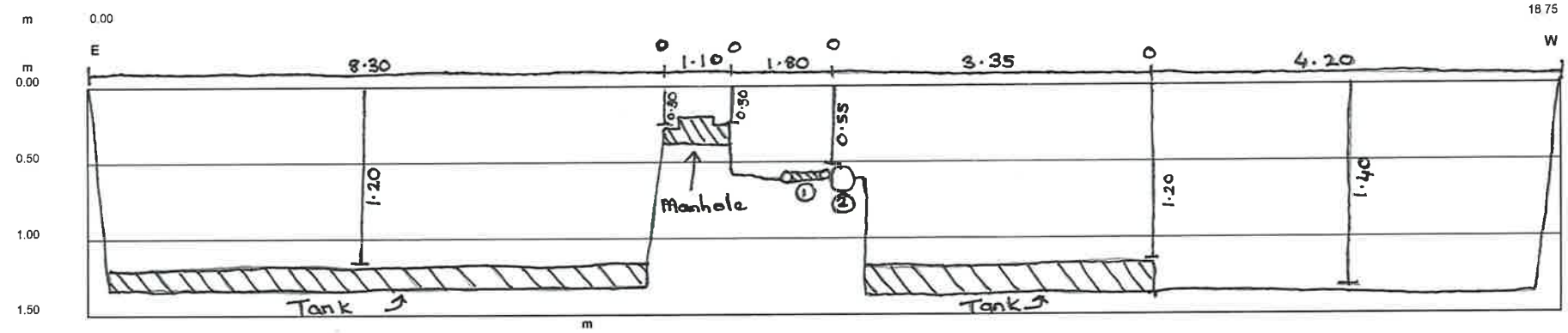
Fax: 353-1-601-5173
Email: info@gii.ie

SLIT TRENCH RECORD - SLIT TRENCH ST-09

Contract No.:	7612-04-18
Client:	DBFL
Site Address:	Newcastle Lands
Date Commenced:	30/05/2018
Date Completed:	30/05/2018
Logged by:	Sarah Worth

Survey Point:	A	B	
E	700603.694	700584.801	
N	728294.380	728290.723	
Ground Level	96.566		(m OD)



Trench Profile: (m)

Grass	0.00 - 18.75

Zero taken at	East end
Start of ST	0.00
End of ST	18.75
ST Length	18.75
Max Depth	1.40
Facing Direction	E-W
Width of ST	0.40

Notes

→ Concrete

Pipe No.	ø (mm)	Colour - Material	Utility	Depth	Distance from zero	Angle
1	50	Black Plastic	Unknown	0.55m	11.20m	180
2	200	Black Plastic Ridged	Unknown	0.55m	11.20m	80

Soil Profile:

From (m)	To (m)	Description
0.00	0.30	Topsoil
0.30	1.40	MADE GROUND: Brown sandy gravelly Clay with fragments of wood, plastic and 804 gravel

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Email: info@gii.ie

Newcastle Lands – Slit Trench Photos

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APPENDIX 5 – Cable Percussion Borehole Records

Ground Investigations Ireland Ltd
www.gii.ie

Site	Borehole Number
Newcastle Lands	BH01

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 30/04/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.10	TOPSOIL		
0.50	B					(0.90)	Stiff brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub-rounded		
1.00-1.45 1.00	SPT(C) N=16 B			1,3/3,3,5,5		1.00			
1.50	B						Stiff brown slightly sandy gravelly CLAY with frequent angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=20 B			4,4/3,5,6,6					
3.00-3.31 3.00	SPT(C) 50/160 B			7,13/14,17,19		(5.00)			
4.00-4.15 4.00	SPT(C) B			3,8/11,21,18					
5.00-5.40 5.00	SPT(C) 50/250 B			5,6/10,13,19,8		6.00	Complete at 6.00m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.40m to 3.70m for 1 hour. Chiselling from 5.70m to 6.00m for 0.5 hours.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH01

Ground Investigations Ireland Ltd
www.gii.ie

Site	Borehole Number
Newcastle Lands	BH02

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 11/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.40)	TOPSOIL		
						0.40			
0.50	B						MADE GROUND: Brown sandy gravelly Clay with occasional angular cobbles and fragments of brick, wood and concrete blocks		
1.00-1.45 1.00	SPT(C) N=13 B			1,2/2,2,4,5		(1.90)			
1.50	B								
2.00-2.25 2.00	SPT(C) 50/100 B			1,4/12,38		2.30	Complete at 2.30m		

Remarks
Borehole backfilled upon completion
Chiselling from 2.20m to 2.30m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH02

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Borehole Number** BH03
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 03/05/2018-08/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B					(1.00)	Firm brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=13 B			1,1/2,3,3,5		1.00	Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
1.50	B								
2.00-2.45 2.00	SPT(C) N=23 B			2,4/5,5,6,7		(3.10)			
3.00-3.45 3.00	SPT(C) N=43 B			2,3/7,7,11,18					
4.00-4.20 4.00	SPT(C) 50/50 B			25/50		4.10	Complete at 4.10m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.90m to 4.10m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH03

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Borehole Number** BH04
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 08/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B					(1.20)	Firm brown sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=11 B			1,2/2,2,4,3		1.20			
1.50	B						Firm brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=14 B			1,2/2,4,4,4		(2.00)			
3.00-3.20 3.00	SPT(C) 50/50 B			3,11/50		3.20	Complete at 3.20m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.00m to 3.20m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH04

Ground Investigations Ireland Ltd
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Site	Borehole Number
Newcastle Lands	BH05

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 01/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						0.10	TOPSOIL		
0.50	B					(0.80)	Soft to firm brown/grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=10 B			1,2/1,2,3,4		0.90	Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
1.50	B								▼1
2.00-2.20 2.00	SPT(C) 50/50 B			4,15/50		(2.30)			
3.00-3.19 3.00	SPT(C) 50/40 B			25/50 Water strike(1) at 3.10m, rose to 1.70m in 20 mins.		3.20	Complete at 3.20m		▽1

Remarks
Borehole left open for rotary core follow on
Chiselling from 2.20m to 2.50m for 0.5 hours. Chiselling from 3.10m to 3.20m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH05

Ground Investigations Ireland Ltd
www.gii.ie

Site	Borehole Number
Newcastle Lands	BH06

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 02/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL		
						0.30			
0.50	B					(0.70)	Firm brown/grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=15 B			1,2/2,4,4,5		1.00			
1.50	B						Firm becoming stiff below 3.00mBGL brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=8 B			1,0/1,3,2,2					▼1
						(3.30)			▽1
3.00 3.00-3.45	B SPT(C) N=26			Water strike(1) at 2.70m, rose to 2.10m in 20 mins. 1,1/4,7,7,8					
4.00-4.25 4.00	SPT(C) 50/100 B			3,11/23,27		4.30			
							Complete at 4.30m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 4.20m to 4.30m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH06

Ground Investigations Ireland Ltd
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Site	Borehole Number
Newcastle Lands	BH07

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 01/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.60)	MADE GROUND: Brown slightly sandy gravelly Clay with fragments of tar		
0.50	B					0.60 (0.50)	Firm brown/grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=18 B			1,3/3,5,5,5		1.10	Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
1.50	B								
2.00-2.45 2.00	SPT(C) N=23 B			2,4/5,6,5,7		(2.50)			
3.00-3.20 3.00	SPT(C) 50/50 B			25/50 Water strike(1) at 3.20m, rose to 1.90m in 20 mins.		3.60	Complete at 3.60m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.10m to 3.60m for 1.2 hours.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH07

Ground Investigations Ireland Ltd
www.gii.ie

Site Newcastle Lands			**Borehole Number** BH08
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 02/05/2018-03/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	TOPSOIL		
0.50	B					(1.30)	Firm to stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=10 B			1,2/2,2,3,3		1.50			
1.50	B					(2.10)	Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		▼1
2.00-2.45 2.00	SPT(C) N=24 B			1,1/3,4,4,13					
3.00-3.45 3.00	SPT(C) N=50 B			6,6/5,10,14,21					▽1
				Water strike(1) at 3.50m, rose to 2.70m in 20 mins, sealed at 3.80m.		3.60			
4.00-4.23 4.00	SPT(C) 50/80 B			4,9/12,38		(1.10)	Stiff dark brown/black slightly sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-rounded		
						4.70	Complete at 4.70m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 2.70m to 2.70m for 1 hour. Chiselling from 4.60m to 4.70m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH08

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH09
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 08/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	TOPSOIL		
0.50	B						Soft brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=5 B			1,0/1,0,2,2		(1.30) 1.50			
1.50	B						Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=20 B			1,2/4,5,5,6		(0.70) 2.20			
							Stiff black slightly sandy gravelly CLAY with frequent angular cobbles and rare boulders. Gravel is fine to coarse sub-angular to rounded		
3.00-3.20 3.00	SPT(C) 36/50 B			3,5/9,10,8,9 Water strike(1) at 3.10m, rose to 2.90m in 20 mins.		(1.60) 3.80			▼1 ▽1
							Complete at 3.80m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.70m to 3.80m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH09

Ground Investigations Ireland Ltd
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Site	Borehole Number
Newcastle Lands	BH10

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 09/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	TOPSOIL		
0.50	B					(1.10)	Firm to stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=19 B			1,3/3,5,6,5		1.30			
1.50	B						Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=16 B			1,2/2,4,5,5		(2.30)			
3.00-3.45 3.00	SPT(C) N=38 B			3,6/7,7,10,14		3.60			
4.00-4.20 4.00	SPT(C) 50/50 B			7,20/50		(2.40)	Stiff dark brown slightly sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-rounded		
5.00-5.19 5.00	SPT(C) 50/40 B			25/50					
6.00-6.17 6.00	SPT(C) 50/20 B			25/50		6.00	Complete at 6.00m		

Remarks
Borehole left open for rotary core follow on

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH10

Ground Investigations Ireland Ltd
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Site	Borehole Number
Newcastle Lands	BH11

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 09/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL		
						0.30	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
0.50	B								
1.00-1.45	SPT(C) N=20			2,2/3,4,5,8					
1.00	B					(1.90)			
1.50	B								
2.00-2.45	SPT(C) N=39			1,4/7,7,12,13					
2.00	B					2.20			
							Stiff dark brown slightly sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-rounded		
						(1.00)			
3.00-3.20	SPT(C) 50/50			3,16/50					
3.00	B					3.20			
							Complete at 3.20m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.10m to 3.20m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH11

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH12
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 10/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL		
						0.30			
0.50	B					(0.60)	Stiff brown slightly sandy slightly gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
						0.90			
1.00-1.24 1.00	SPT(C) 50/90 B			3,4/4,8,38			Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
1.50	B					(1.60)			
2.00-2.22 2.00	SPT(C) 50/70 B			4,4/23,27					
						2.50	Complete at 2.50m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 1.30m to 1.50m for 0.5 hours. Chiselling from 2.40m to 2.50m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH12

Ground Investigations Ireland Ltd
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Site	Borehole Number
Newcastle Lands	BH13

Machine : Dando 2000 Method : Cable Percussion	Casing Diameter	Ground Level (mOD)	Client Cairn Homes	Job Number 7612-04-18
	Location	Dates 10/05/2018	Engineer DBFL	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.20) 0.20	TOPSOIL		
0.50	B					(0.90)	Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to rounded		
1.00-1.45 1.00	SPT(C) N=19 B			1,3/3,6,5,5		1.10			
1.50	B					(1.70)	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=49 B			5,5/7,11,10,21		2.80	Complete at 2.80m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 2.60m to 2.80m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No.
7612-04-18.BH13

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH14
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 10/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.30)	TOPSOIL		
						0.30	Firm brown sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
0.50	B								
1.00-1.45 1.00	SPT(C) N=10 B			1,2/2,2,3,3		(1.40)			
1.50	B								
						1.70	Firm to stiff brown mottled grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00-2.45 2.00	SPT(C) N=13 B			1,1/3,3,4,4,3					
						(1.60)			
3.00-3.25 3.00	SPT(C) 50/100 B			4,9/17,33					
						3.30	Complete at 3.30m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 3.20m to 3.30m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH14

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH15
Machine : Dando 2000 **Method :** Cable Percussion	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location	**Dates** 11/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.80)	MADE GROUND: Brown/grey angular gravel Fill		
0.50	B					0.80			
1.00-1.45 1.00	SPT(C) N=40 B			2,4/5,9,10,16		(0.80)	Stiff brown sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
1.50	B					1.60			
2.00-2.22 2.00	SPT(C) 50/70 B			8,13/20,30		(1.40)	Stiff dark brown sandy gravelly CLAY with occasional angular cobbles and rare rounded boulders. Gravel is fine to coarse sub-angular to sub-rounded		
3.00-3.20 3.00	SPT(C) 50/50 B			25/50		3.00	Complete at 3.00m		

Remarks
Borehole left open for rotary core follow on
Chiselling from 2.40m to 2.70m for 0.5 hours. Chiselling from 2.90m to 3.00m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH15

APPENDIX 6 – Rotary Core Records

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH01
Machine : Dando 2000 with Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 100.79	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700210.1 E 728354 N	**Dates** 30/04/2018-29/05/2018	**Engineer** DBFL	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					100.69	0.10	TOPSOIL		
0.50	B					(0.90)	Stiff brown slightly sandy gravelly silty CLAY. Gravel is fine to coarse angular to sub-rounded		
1.00 1.00-1.45	B SPT(C) N=16			1,3/3,3,5,5	99.79	1.00	Stiff brown slightly sandy gravelly CLAY with frequent angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-rounded		
1.50	B								
2.00 2.00-2.45	B SPT(C) N=20			4,4/3,5,6,6					
3.00 3.00-3.31	B SPT(C) 50/160			7,13/14,17,19		(4.00)			
4.00 4.00-4.20	B SPT(C) 50/50			3,8/11,21,18					
5.00 5.00-5.40	B SPT(C) 50/250			5,6/10,13,19,8	95.79	5.00	OVERBURDEN: Recovery of stiff brown slightly sandy gravelly CLAY with frequent angular to sub-rounded cobbles. Gravel is fine to coarse angular to sub-rounded		
	TCR / **SCR** / **RQD** / **FI**								
5.50	79 -								
6.90-7.25				8,11/16,20,14 SPT(C) 50/195		(3.40)			
6.90	37 -								
8.40-8.83				6,7/7,10,19,14 SPT(C) 50/275					
8.40	20 -				92.39	8.40	OVERBURDEN: Driller notes grey Gravel. Recovery consists of grey fine to coarse angular to sub angular GRAVEL		
						(1.50)			
9.90					90.89	9.90			

Remarks
Cable percussion from 0.00-5.50mBGL with rotary core follow on from 5.50-12.90mBGL
Borehole backfilled upon completion
Chiselling from 3.40m to 3.70m for 1 hour. Chiselling from 5.70m to 6.00m for 0.5 hours.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH01

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH01
Machine : Dando 2000 with Beretta T47s **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 100.79	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700210.1 E 728354 N	**Dates** 30/04/2018-29/05/2018	**Engineer** DBFL	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
9.90-10.12	83	27	27		SPT(C) 50/70 9,16/50		(1.10)	OVERBURDEN: Stiff brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded		
11.00						89.79	11.00	Medium strong dark grey very fine to fine LIMESTONE with clay smearing along fractures. Partially weathered		
11.40	100	47	43	0			(1.90)	11.00-12.10 - Intact		
12.10				5				12.10-12.90 - Two fracture sets. F1: Closely to medium spaced, sub-horizontal to 20 degrees, undulating rough. F2: Closely spaced, sub-vertical to 80 degrees, stepped rough		
12.90						87.89	12.90	Complete at 12.90m		

Remarks

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH01

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** RC02
Machine : Beretta T47s **Flush :** **Core Dia :** mm **Method :** Rotary Cored	**Casing Diameter**	**Ground Level (mOD)**	**Client** Cairn Homes **Job Number** 7612-04-18
	Location	**Dates** 06/06/2018-11/06/2018	**Engineer** DBFL **Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00							(0.15) 0.15	TOPSOIL		
	31	0	0				(1.85)	MADE GROUND: Driller notes light brown sandy gravelly Clay. Recovery consists of grey fine to coarse angular Gravel		
2.00				NI			2.00	Medium strong dark grey very fine to fine LIMESTONE with many calcite veins. Partially to distinctly weathered		
2.40	100	45	43	7				2.00-2.40 - Non intact		
3.50				2				2.40-3.50 - Medium spaced, sub-horizontal to 20 degrees, undulating rough		
3.90	100	100	100	1			(4.40)	3.50-3.90 - Closely spaced, sub-horizontal to 40 degrees, undulating rough		
5.40	100	80	73	5				3.90-5.40 - Very widely spaced, sub-horizontal to 45 degrees, undulating rough		
6.40							6.40	5.40-6.40 - Medium to widely spaced, sub-horizontal to 45 degrees, undulating rough		
								Complete at 6.40m		

Remarks
Completed adjacent to BH02
Borehole backfilled upon completion

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.RC02

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH03
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 96.37	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700183.9 E 728519.8 N	**Dates** 03/05/2018-28/05/2018	**Engineer** DBFL	**Sheet** 1/2

Depth (m)	Sample / Tests	TCR	SCR	RQD	FI	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B									(1.00)	Firm brown sandy gravelly CLAY. Gravel is fine to coarse sub-angular to rounded			
1.00 1.00-1.45	B SPT(C) N=13							1,1/2,3,3,5	95.37	1.00				
1.50	B										Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded			
2.00 2.00-2.45	B SPT(C) N=23							2,4/5,5,6,7		(3.00)				
3.00 3.00-3.45	B SPT(C) N=43							2,3/7,7,11,18						
4.00 4.00-4.20	B SPT(C) 50/50							25/50	92.37	4.00				
4.00 5.40-5.60		47	-					11,13/25,25 SPT(C) 50/50		(2.90)	OVERBURDEN: Recovery of stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded			
5.40 6.90-7.21		81	-					7,12/13,18,19 SPT(C) 50/155						
6.90 8.40-8.61		27	-					6,10/25,25 SPT(C) 50/55	89.47	6.90 (2.80)	OVERBURDEN: Stiff dark grey slightly sandy gravelly CLAY with many angular cobble fragments. Gravel is fine to coarse sub-angular to sub-rounded			
8.40 9.70		69	15	15					86.67	9.70	Weak to medium strong light grey/grey fine to medium LIMESTONE with many calcite veins.			
9.90														

Remarks
Cable percussion from 0.00-4.00mBGL with rotary core follow on from 4.00-11.40mBGL
Slotted pipe installed from 11.40-2.40m with gravel surround. Plain pipe installed from 2.40mBGL to ground level with bentonite seal
Chiselling from 3.90m to 4.10m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH03

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH03
Machine : Dando 2000 & Beretta T47s **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 96.37	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700183.9 E 728519.8 N	**Dates** 03/05/2018-28/05/2018	**Engineer** DBFL	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
				4			(1.70)	Partially to distinctly weathered 9.70-10.70 - Widely spaced, sub-horizontal to 10 degrees, undulating rough			
10.70	80	49	45	NI				10.70-11.40 - Mostly non intact with sub-horizontal to 10 degrees, undulating rough			
11.40						84.97	11.40	Complete at 11.40m			

Remarks

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH03

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH04
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 91.02	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700220.1 E 728670.3 N	**Dates** 08/05/2018-28/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	TCR	SCR	RQD	FI	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B									(1.20)	Firm brown sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
1.00 1.00-1.45	B SPT(C) N=11							1,2/2,2,4,3	89.82	1.20			
1.50	B										Firm brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00 2.00-2.45	B SPT(C) N=14							1,2/2,4,4,4		(2.40)			
3.00 3.00-3.20	B SPT(C) 50/50							3,11/50					
3.60 3.90-4.11		73	-					13,12/50 SPT(C) 50/60	87.42	3.60	OVERBURDEN: Recovery of firm brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
3.90 5.40-5.59		43	-					8,17/50 SPT(C) 50/40		(1.80)			
5.40		97	56	51	6				85.62	5.40	Strong dark grey very fine to fine fossilifeous LIMESTONE with rare calcite veins. Partially to distinctly weathered with clay infilling between 6.08-6.21, 6.51-6.57, 6.76-6.98mBGL 5.40-6.60 - Two fracture sets. F1: Medium spaced, sub-horizontal to 10 degrees, undulating rough. F2: Widely spaced, sub-vertical to 70 degrees, stepped rough. With clasy infilling along fractures		
6.60 6.90					3					(3.00)			
7.55		84	32	30	4						6.60-7.55 - Widely spaced, sub-horizontal to 15 degrees, undulating rough. With clay infilling along fractures 7.55-8.40 - Closely to medium spaced, sub-horizontal to 45 degrees, undulating rough		
8.40									82.62	8.40	Complete at 8.40m		

Remarks
Cable percussion from 0.00-3.60mBGL with rotary core follow on from 3.60-8.40mBGL
Borehole backfilled upon completion
Chiselling from 3.00m to 3.20m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH04

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH05
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 103.97	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 700131.9 E 728173.8 N	**Dates** 29/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	TCR	SCR	RQD	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
								103.87	0.10	TOPSOIL			
0.50	B								(0.80)	Soft to firm brown/grey slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse sub-angular to rounded			
1.00	B							103.07	0.90				
1.00-1.45	SPT(C) N=10						1,2/1,2,3,4			Stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded			
1.50	B											▼1	
2.00	B								(2.10)				
2.00-2.20	SPT(C) 50/50						4,15/50						
							25/50						
3.00-3.19							SPT(C) 50/40						
2.90		TCR	SCR	RQD	Casing Depth (m)	Water Depth (m)	Field Records						
3.00								100.97	3.00	Weak to medium strong dark grey very fine to fine fossillifeous LIMESTONE with rare calcite veins. Destructured weathering		▽1	
3.00		83	23	11			Water strike(1) at B 3.10m, rose to 1.70m in 20 mins.						
3.90						NI				2.90-5.60 - Non intact			
		65	7	7					(3.90)				
5.40													
5.60						12				5.60-6.60 - Closely to medium spaced, sub-horizontal to 10 degrees, undulating rough			
		100	60	16									
6.60						5				6.60-6.90 - Closely to medium spaced, sub-horizontal to 10 degrees, undulating rough			
6.90								97.07	6.90	Complete at 6.90m			

Remarks
Cable percussion from 0.00-2.90mBGL with rotary core follow on from 2.90-6.90mBGL
Slotted pipe installed from 6.90-1.00mBGL with gravel surround. Plain pipe installed from 1.00mBGL to ground level with bentonite seal
Chiselling from 2.20m to 2.50m for 0.5 hours. Chiselling from 3.10m to 3.20m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH05

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH10
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 105.34	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699856 E 728176.3 N	**Dates** 09/05/2018-30/05/2018	**Engineer** DBFL	**Sheet** 1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					105.14	(0.20) 0.20	TOPSOIL			
0.50	B						Firm to stiff brown slightly sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded			
1.00 1.00-1.45	B SPT(C) N=19			1,3/3,5,6,5		(1.10)				
1.50	B				104.04	1.30	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded			
2.00 2.00-2.45	B SPT(C) N=16			1,2/2,4,5,5		(2.30)				
3.00 3.00-3.45	B SPT(C) N=38			3,6/7,7,10,14						
					101.74	3.60	Stiff brown slightly sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-rounded			
4.00 4.00-4.20	B SPT(C) 50/50			7,20/50						
						(2.10)				
5.00 5.00-5.19	B SPT(C) 50/40			25/50						
	TCR / **SCR** / **RQD** / **FI**									
6.00 5.70 6.00-6.17	36 -			B 25/50 SPT(C) 50/20	99.64	5.70	OVERBURDEN: Recovery of stiff brown slightly sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-rounded			
						(1.20)				
6.90-7.35 6.90	43 -			3,3/4,3,4,4 SPT(C) N=15	98.44	6.90	OVERBURDEN: Recovery of stiff brown/orange sandy slightly gravelly CLAY. Gravel is fine to coarse sub-angular to sub-rounded			
8.40-8.85 8.40	63 -			2,4/3,3,4,5 SPT(C) N=15		(3.00)				
9.90					95.44	9.90				

Remarks
Cable percussion from 0.00-5.70mBGL with rotary core follow on from 5.70-14.40mBGL
Slotted pipe installed from 14.40-2.40mBGL with gravel surround. Plain pipe installed from 2.40mBGL to ground level with bentonite seal

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH10

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH10
Machine : Dando 2000 & Beretta T47s **Flush :** **Core Dia :** mm **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 105.34	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699856 E 728176.3 N	**Dates** 09/05/2018-30/05/2018	**Engineer** DBFL	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
9.90-10.35	31	-			SPT(C) N=44 4,7/7,11,14,12		(1.50)	OVERBURDEN: Recovery of dense brown/orange slightly gravelly fine to coarse SAND. Gravel is fine to coarse angular to subangular			
11.40-11.85 11.40	28	-			3,4/5,5,6,5 SPT(C) N=21	93.94	11.40	OVERBURDEN: Recovery of stiff orange/brown sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded			
12.90-13.35 12.90	43	-			4,4/6,4,6,7 SPT(C) N=23		(3.00)				
14.40						90.94	14.40	Complete at 14.40m			

Remarks

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH10

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH11
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 100.52	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699909 E 728344.7 N	**Dates** 09/05/2018-30/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	TCR	SCR	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								(0.30)	TOPSOIL		
							100.22	0.30	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
0.50	B										
1.00 1.00-1.45	B SPT(C) N=20					2,2/3,4,5,8		(1.90)			
1.50	B										
2.00 2.00-2.45	B SPT(C) N=39					1,4/7,7,12,13	98.32	2.20			
								(0.60)	Stiff dark brown slightly sandy gravelly CLAY with frequent angular cobbles. Gravel is fine to coarse angular to sub-rounded		
3.00		TCR	SCR	RQD	FI	B	97.72	2.80			
2.80 3.00-3.20		26	-			3,16/50 SPT(C) 50/50			OVERBURDEN: Driller notes brown sandy gravelly CLAY. Recovery consists of grey fine to coarse angular to sub-angular Gravel		
3.90-4.35						3,4/4,6,4,7 SPT(C) N=21					
3.90		34	-					(2.60)			
5.40-5.85						3,4/6,6,8,9 SPT(C) N=29					
5.40		21	-				95.12	5.40	OVERBURDEN: Recovery consists of dark grey slightly sandy gravelly CLAY. Gravel is fine to coarse angular to sub-rounded		
								(1.50)			
6.90							93.62	6.90	Complete at 6.90m		

Remarks
Cable percussion from 0.00-2.80mBGL with rotary core follow on from 2.80-6.90mBGL
Borehole backfilled upon completion
Chiselling from 3.10m to 3.20m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH11

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH12
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 98.35	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699725.6 E 728406.4 N	**Dates** 10/05/2018-31/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	TCR	SCR	Casing Depth (m)	RQD	Water Depth (m)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
									98.05	(0.30) 0.30	TOPSOIL		
0.50	B										Stiff brown slightly sandy slightly gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
1.00	B								97.45	(0.60) 0.90			
1.00-1.24	SPT(C) 50/90							3,4/4,8,38			Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
1.50	B									(1.60)			
2.00	B												
2.00-2.22	SPT(C) 50/70							4,4/23,27					
2.50		59	-						95.85	2.50	OVERBURDEN: Driller notes grey GRAVEL. Recovery consists of dark grey angular cobble fragments		
3.90-4.18								4,7/19,25,6 SPT(C) 50/125		(1.90)			
3.90													
4.40		87	18		10		NI		93.95	4.40	Medium strong brown/grey very fine to fine fossiliferous LIMESTONE with many calcite veins 4.40-5.30 - Non intact		
5.30													
5.40							7			(2.50)	5.30-6.30 - Very closely spaced sub-horizontal to 10 degrees, stepped rough		
6.30		90	0		0		NI				6.30-6.90 - Non intact		
6.90									91.45	6.90	Complete at 6.90m		

Remarks
Cable percussion from 0.00-2.50mBGL with rotary core follow on from 2.50-6.90mBGL
Borehole backfilled upon completion
Chiselling from 1.30m to 1.50m for 0.5 hours. Chiselling from 2.40m to 2.50m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH12

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH13
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 95.16	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699743.4 E 728572.2 N	**Dates** 10/05/2018-31/05/2018	**Engineer** DBFL	**Sheet** 1/1

Depth (m)	Sample / Tests	TCR	SCR	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							94.96	(0.20) 0.20	TOPSOIL			
0.50	B							(0.90)	Stiff brown slightly sandy gravelly CLAY. Gravel is fine to coarse sub-angular to rounded			
1.00 1.00-1.45	B SPT(C) N=19					1,3/3,6,5,5	94.06	1.10				
1.50	B							(1.50)	Stiff brown/grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded			
2.00 2.00-2.45	B SPT(C) N=49					5,5/7,11,10,21						
2.60		52	-				92.56	2.60	OVERBURDEN: Recovery of stiff dark grey slightly sandy gravelly CLAY with many angular cobbles. Gravel is fine to coarse angular to sub-rounded			
3.90-4.35						4,5/7,7,12,14 SPT(C) N=40						
3.90		39	-					(3.00)				
5.40-5.85						3,8/8,10,10,16 SPT(C) N=44						
5.40		76	29	9			89.56	5.60	OVERBURDEN: Recovery of medium dense dark grey fine to coarse sub-angular to sub-rounded GRAVEL			
6.50					4			(0.90)				
6.90		100	48	7	20		88.66	6.50	Medium strong dark grey very fine LIMESTONE with some calcite veins. Partially weathered 6.50-6.90 - Closely to medium spaced, sub-horizontal to 10 degrees, planar rough			
								(1.90)	6.90-8.40 - Two fracture sets. F1: Very closely spaced, sub-horizontal to 10 degrees, planar smooth. F2: Closely spaced, sub-vertical to 80 degrees, stepped rough			
8.40							86.76	8.40	Complete at 8.40m			

Remarks
Cable percussion from 0.00-2.60mBGL with rotary core follow on from 2.60-8.40mBGL
Slotted pipe installed from 8.40-2.40mBGL with gravel surround. Plain pipe installed from 2.40mBGL to ground level with bentonite seal
Chiselling from 2.60m to 2.80m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH13

Ground Investigations Ireland Ltd
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Site Newcastle Lands			**Borehole Number** BH14
Machine : Dando 2000 & Beretta T47s **Method :** Cable Percussion with Rotary Core Follow On	**Casing Diameter**	**Ground Level (mOD)** 95.31	**Client** Cairn Homes	**Job Number** 7612-04-18
	Location 699584.6 E 728570.1 N	**Dates** 10/05/2018-05/06/2018	**Engineer** DBFL	**Sheet** 1/1

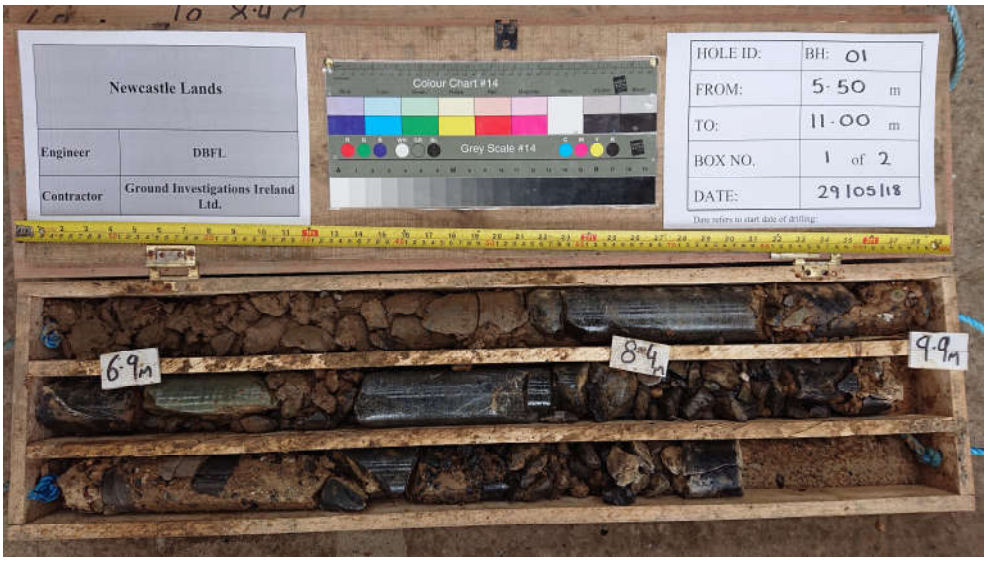
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					95.01	(0.30) 0.30	TOPSOIL		
0.50	B						Firm brown sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to rounded		
1.00 1.00-1.45	B SPT(C) N=10			1,2/2,2,3,3		(1.40)			
1.50	B				93.61	1.70	OVERBURDEN: Recovery conists of firm to stiff brown mottled grey sandy gravelly CLAY with occasional angular cobbles. Gravel is fine to coarse sub-angular to sub-rounded		
2.00 2.00-2.45	B SPT(C) N=13			1,1/3,3,4,3					
	TCR / **SCR** / **RQD** / **FI**								
2.50						(1.80)			
3.00-3.25 3.00	59 / 24 / 21			4,9/17,33 SPT(C) 50/100 B					
3.50					91.81	3.50	Medium strong to strong dark grey very fine to fine LIMESTONE with occasional calcite veins. Partially weathered		
3.90	95 / 87 / 76 / 9						3.50-5.90 - Closely to medium spaced, sub-horizontal to 10 degrees, planar smooth		
5.40						(3.40)			
5.90	100 / 89 / 55 / 12						5.90-6.90 - Two fracture sets. F1: Closely to medium spaced, sub-horizontal to 15 degrees, planar smooth. F2: Mediium spaced, sub-vertical to 80 degrees, undulating rough		
6.90					88.41	6.90	Complete at 6.90m		

Remarks
Cable percussion from 0.00-2.50mBGL with rotary core follow on from 2.50-6.90mBGL with bentonite seal
Borehole backfilled upon completion
Chiselling from 3.20m to 3.30m for 1 hour.

Scale (approx)	Logged By
1:50	S. Worth

Figure No. 7612-04-18.BH14

Newcastle Lands – Rotary Core Photos



BH01 Box 1

BH01 Box 2

RC02 Box 1

RC02 Box 2

BH03 Box 1

BH03 Box 2

BH04 Box 1

BH04 Box 2

BH05 Box 1

BH05 Box 2

BH10 Box 1

BH10 Box 2

BH11 Box 1

BH12 Box 1

BH12 Box 2

BH13 Box 1

BH13 Box 2

BH14 Box 1


Newcastle Lands
Engineer
DBFL
Contractor
Ground Investigations Ireland Ltd.
Colour Chart #14
Grey Scale #14
HOLE ID:
BH: 14
FROM:
5·90 m
TO:
6·90 m
BOX NO.
2 of 2
DATE:
05/06/18
6·9m
BH14 Box 2

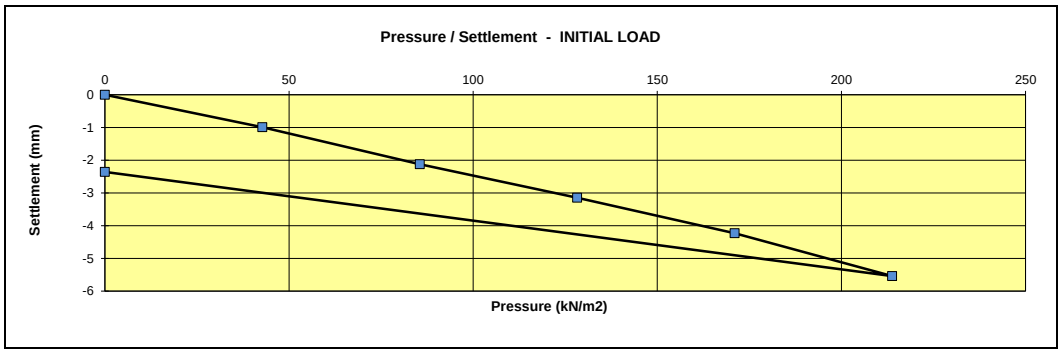
APPENDIX 7 – Plate Test Records

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

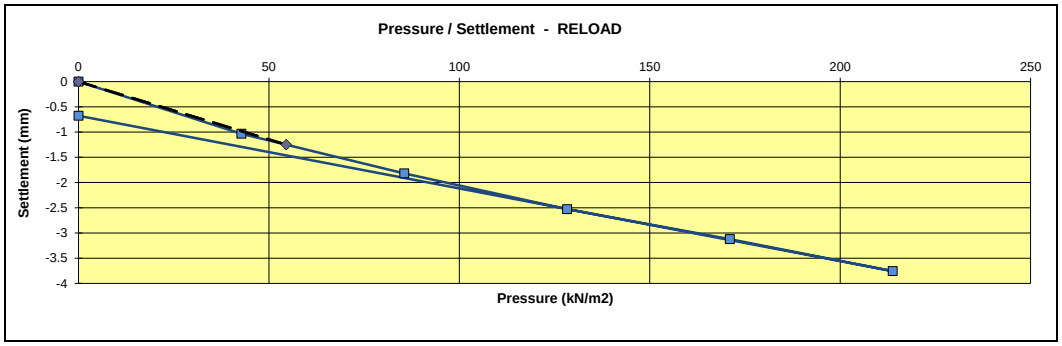
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6488**	**Site / Client Ref. No.**	EW/30/4/1
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Orange Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 2	**Offset**	
Date Tested / Operator	30/04/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	5.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.99
86	-2.12
128	-3.15
171	-4.23
214	-5.54
0	-2.36



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-1.03
86	-1.82
128	-2.53
171	-3.12
214	-3.76
0	-0.68

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	19	MN / m²
Modulus of subgrade reaction (k)	=	27031	28042	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivalent CBR % value in accordance with HD25/94	=	**3**	**3**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

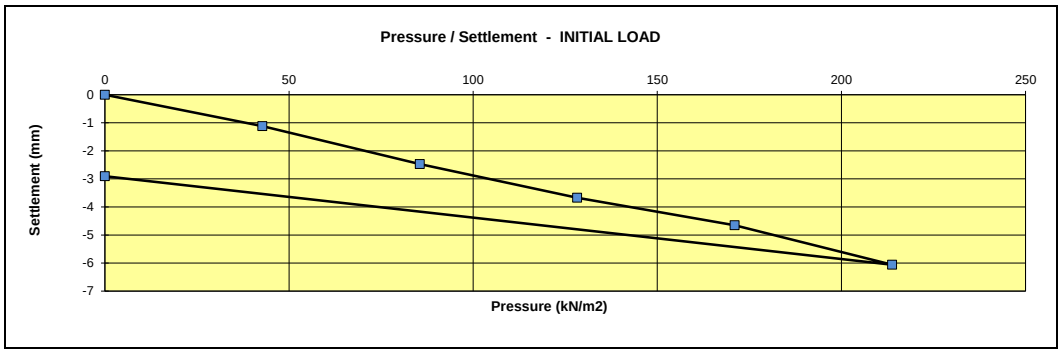
UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

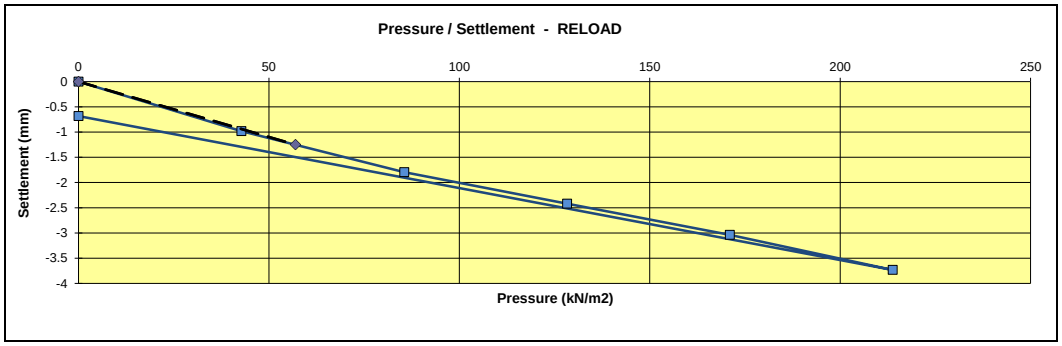
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6489**	**Site / Client Ref. No.**	EW/30/4/2
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Orange Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 6	**Offset**	
Date Tested / Operator	30/04/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	6.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-1.12
86	-2.47
128	-3.67
171	-4.65
214	-6.06
0	-2.91



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.98
86	-1.79
128	-2.42
171	-3.04
214	-3.73
0	-0.68

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	19	MN / m²
Modulus of subgrade reaction (k)	=	24099	29286	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.6	
Equivalent CBR % value in accordance with HD25/94	=	**2**	**3**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
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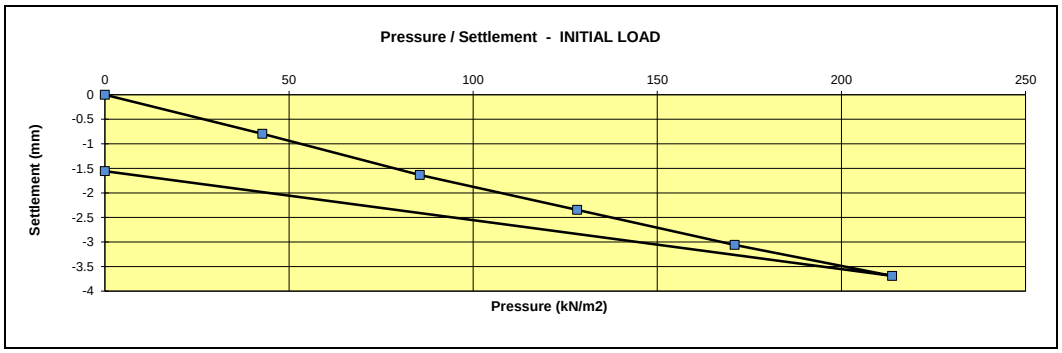
Co. Fermanagh
BT92 8BJ

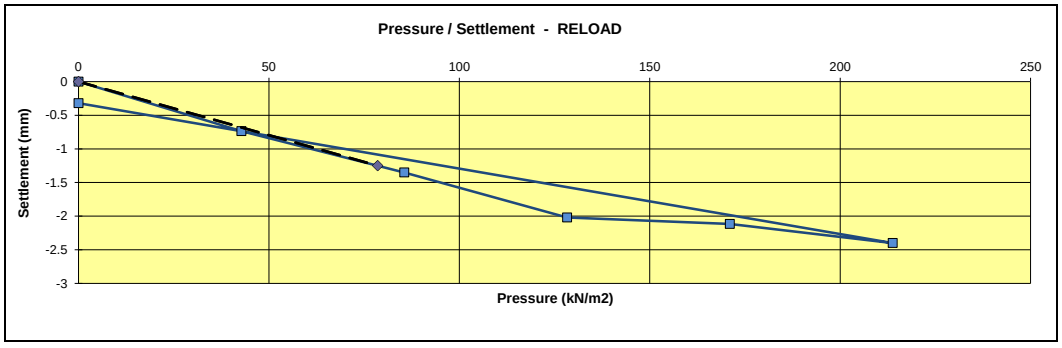
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6490**	**Site / Client Ref. No.**	EW/30/4/3
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 11	**Offset**	
Date Tested / Operator	30/04/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	3.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.80
86	-1.63
128	-2.35
171	-3.06
214	-3.69
0	-1.56



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.74
86	-1.35
128	-2.02
171	-2.12
214	-2.40
0	-0.32

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	19	29	MN / m²
Modulus of subgrade reaction (k)	=	33900	40389	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivalent CBR % value in accordance with HD25/94	=	**4**	**6**	

Remarks:

Signed: for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician **Date:** 03/05/2018

UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
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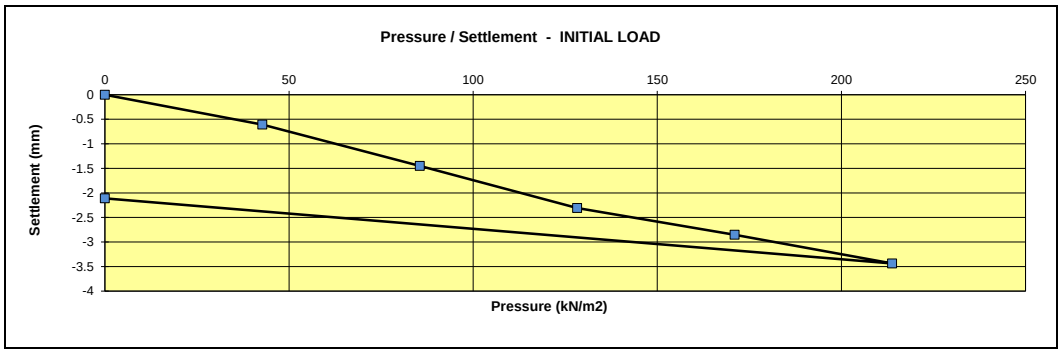
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6491**	**Site / Client Ref. No.**	EW/30/4/4
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Clay with Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 10	**Offset**	
Date Tested / Operator	30/04/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	3.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
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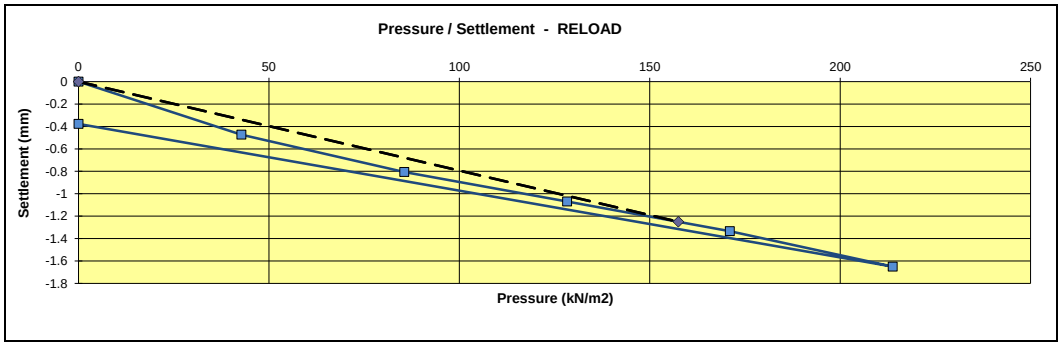
43	-0.61
86	-1.45
128	-2.31
171	-2.85
214	-3.44
0	-2.11



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.47
86	-0.81
128	-1.07
171	-1.33
214	-1.65
0	-0.38

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	20	42	MN / m²
Modulus of subgrade reaction (k)	=	38759	80989	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		2.1	
Equivalent CBR % value in accordance with HD25/94	=	**5**	**20**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

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Testall Ltd
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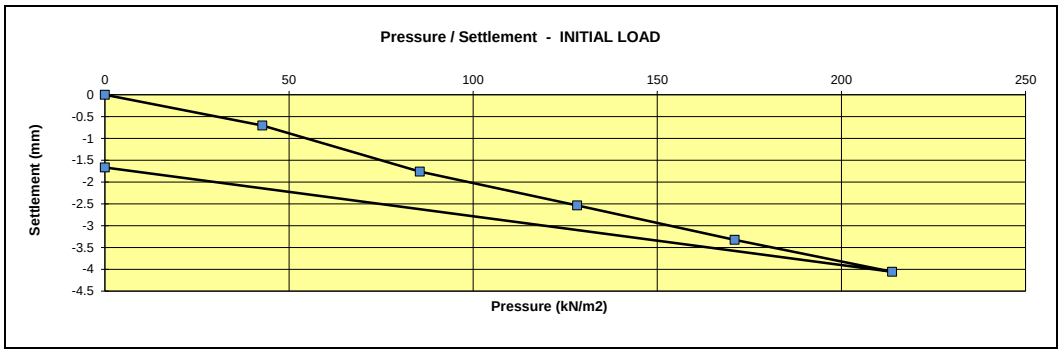
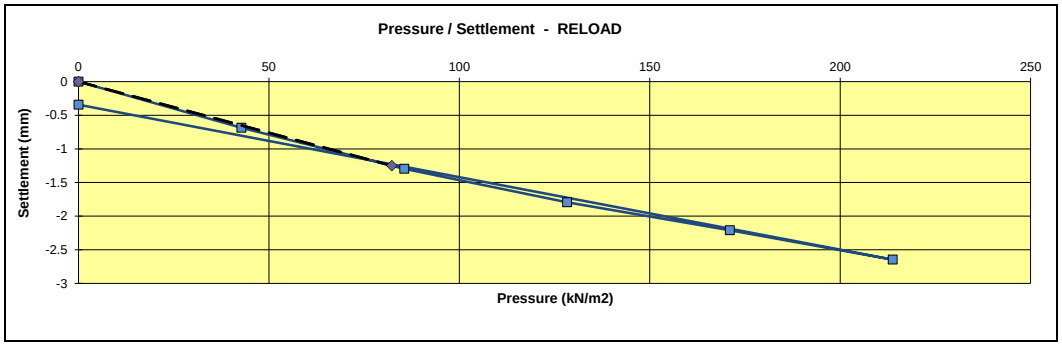
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6492**	**Site / Client Ref. No.**	EW/30/4/5
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Yellow Brown Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 3	**Offset**	
Date Tested / Operator	30/04/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	4.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.71
86	-1.76
128	-2.54
171	-3.33
214	-4.06
0	-1.67



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.69
86	-1.30
128	-1.79
171	-2.21
214	-2.65
0	-0.34

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	17	26	MN / m²
Modulus of subgrade reaction (k)	=	33292	42291	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivalent CBR % value in accordance with HD25/94	=	**4**	**6**	

Remarks:

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UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
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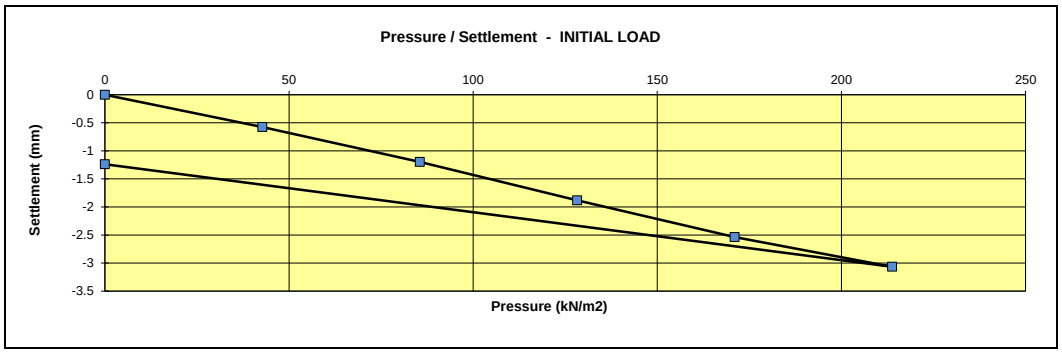
Newtownbutler
Co. Fermanagh
BT92 8BJ

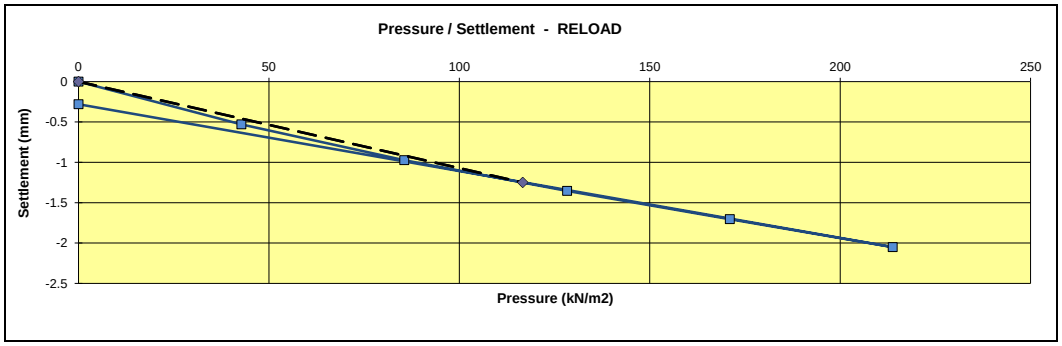
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6493**	**Site / Client Ref. No.**	EW/30/4/6
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 4	**Offset**	
Date Tested / Operator	30/04/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	3.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.58
86	-1.20
128	-1.88
171	-2.54
214	-3.07
0	-1.24



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.53
86	-0.97
128	-1.35
171	-1.70
214	-2.05
0	-0.28

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	23	34	MN / m²
Modulus of subgrade reaction (k)	=	45681	59981	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivalent CBR % value in accordance with HD25/94	=	**7**	**12**	

Remarks:

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UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
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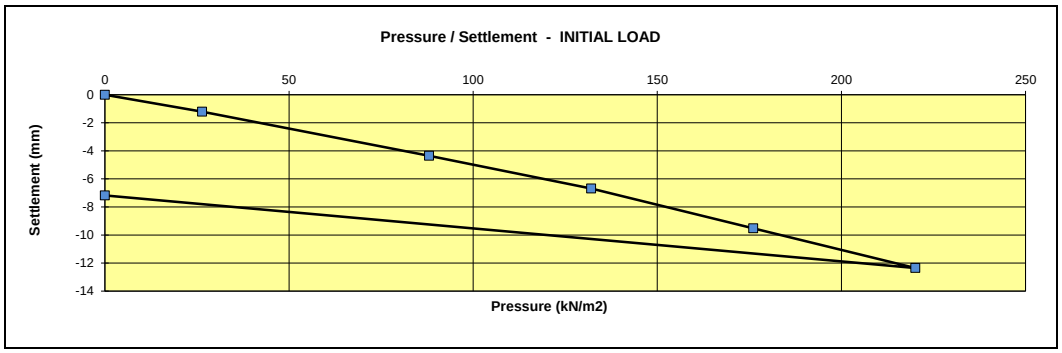
BT92 8BJ

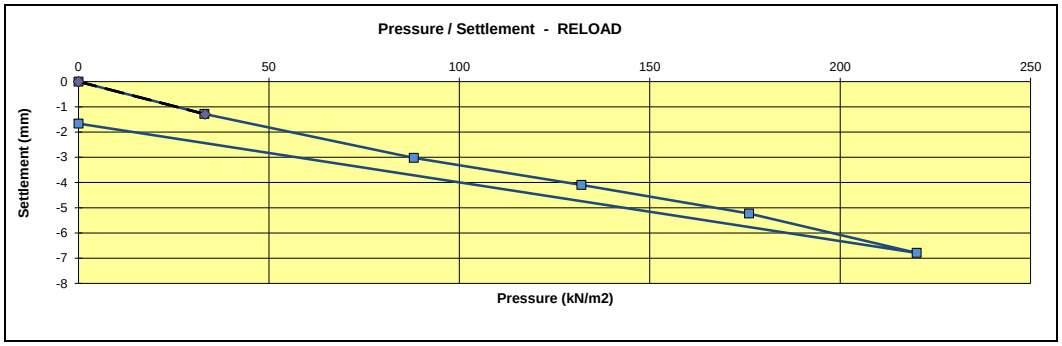
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6494**	**Site / Client Ref. No.**	EW/1/5/1
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Orange Brown Sandy Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 1	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	220	**Max Deformation (mm)**	12.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
26	-1.21
88	-4.35
132	-6.69
176	-9.52
220	-12.35
0	-7.17



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
33	-1.28
88	-3.02
132	-4.10
176	-5.23
220	-6.79
0	-1.67

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	6	11	MN / m²
Modulus of subgrade reaction (k)	=	13983	16554	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.8	
Equivalent CBR % value in accordance with HD25/94	=	**0.9**	**1.2**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

UKAS TESTING 8995

Testall Ltd
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Co. Fermanagh
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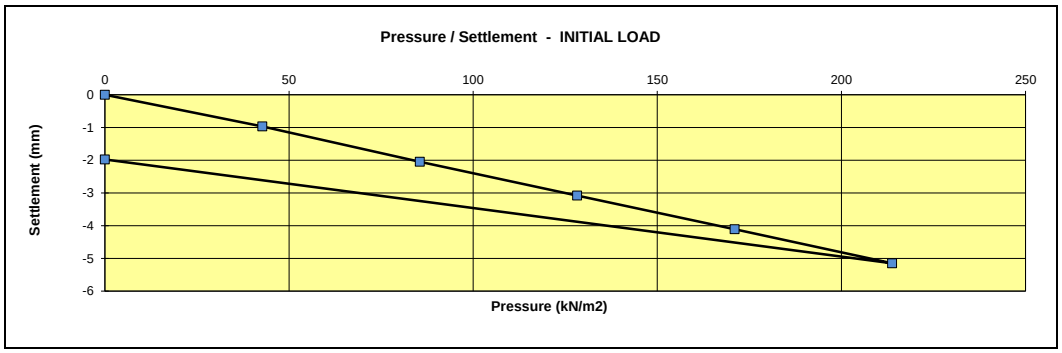
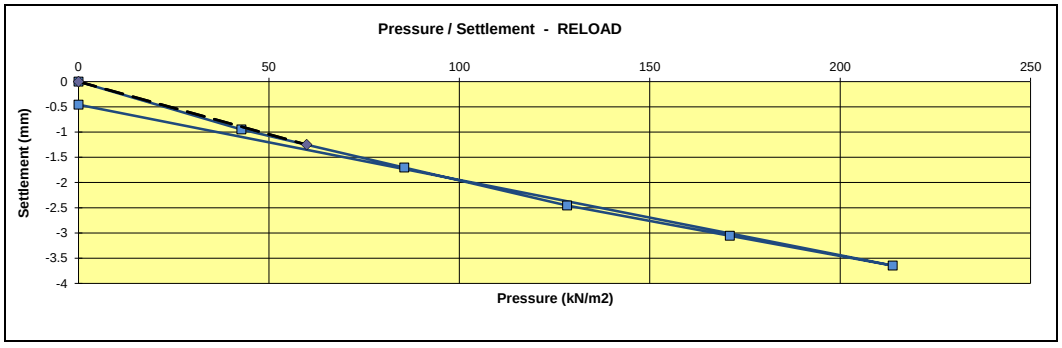
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6495**	**Site / Client Ref. No.**	EW/1/5/2
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 25	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-250mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	5.2



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.97
86	-2.05
128	-3.08
171	-4.11
214	-5.15
0	-1.98



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.95
86	-1.70
128	-2.46
171	-3.06
214	-3.65
0	-0.46

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	14	19	MN / m²
Modulus of subgrade reaction (k)	=	27737	30801	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.4	
Equivalent CBR % value in accordance with HD25/94	=	**3**	**4**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

UKAS TESTING 8995

Testall Ltd
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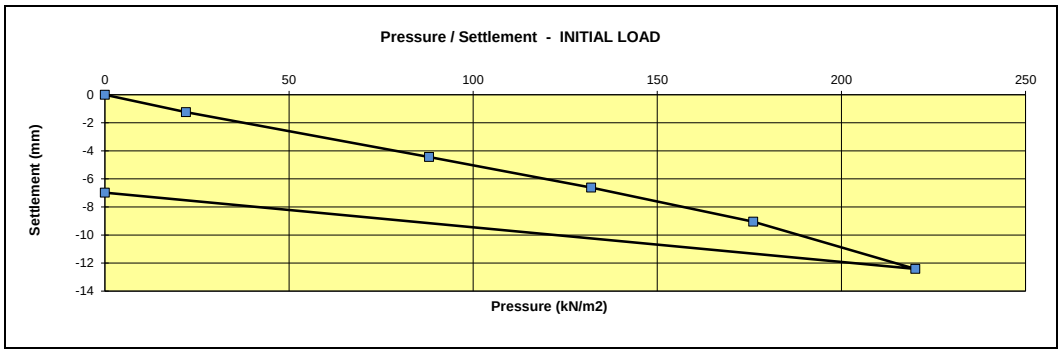
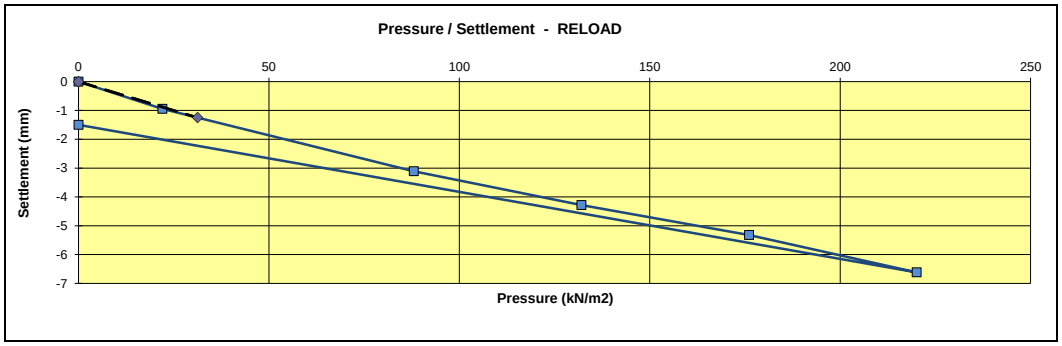
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6496**	**Site / Client Ref. No.**	EW/1/5/3
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 21	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-200mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	220	**Max Deformation (mm)**	12.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
22	-1.24
88	-4.44
132	-6.62
176	-9.05
220	-12.42
0	-6.99



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
22	-0.95
88	-3.11
132	-4.28
176	-5.32
220	-6.62
0	-1.50

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	6	11	MN / m²
Modulus of subgrade reaction (k)	=	11458	16077	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.9	
Equivalent CBR % value in accordance with HD25/94	=	**0.7**	**1.2**	

Remarks:

Signed: for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician **Date:** 03/05/2018

UKAS TESTING 8995

Testall Ltd
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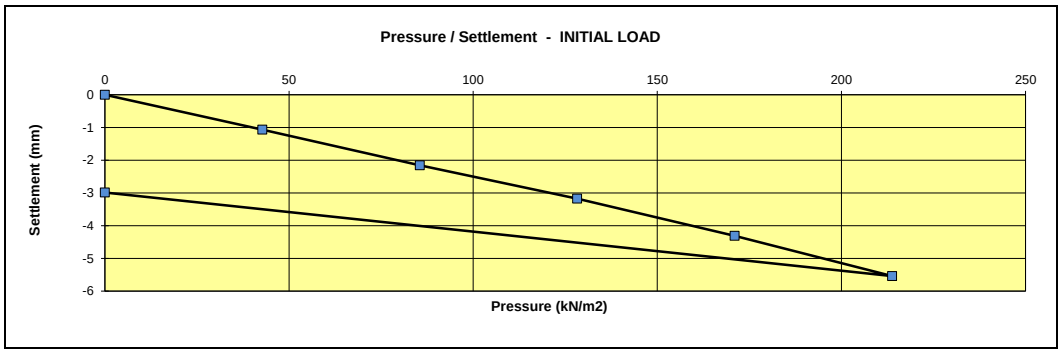
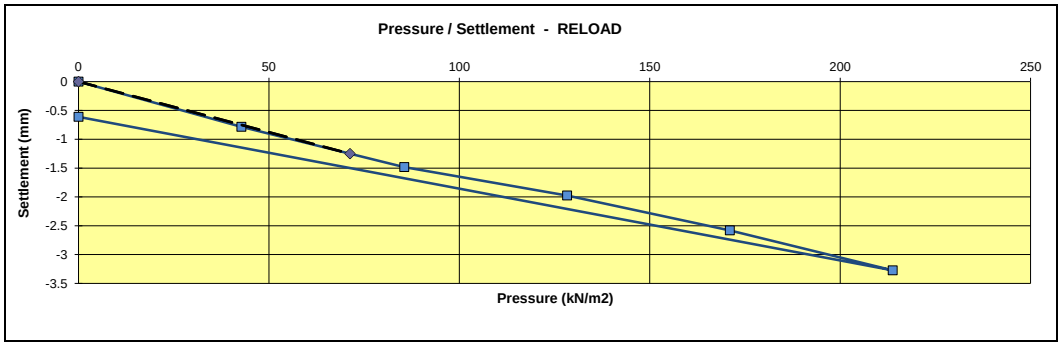
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6497**	**Site / Client Ref. No.**	EW/1/5/4
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Yellow Brown Silty Sandy Clay with Occasional Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 15	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-300mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	5.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-1.07
86	-2.16
128	-3.18
171	-4.31
214	-5.54
0	-2.99



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.78
86	-1.48
128	-1.98
171	-2.58
214	-3.27
0	-0.61

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	21	MN / m²
Modulus of subgrade reaction (k)	=	25685	36644	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.7	
Equivalent CBR % value in accordance with HD25/94	=	**3**	**5**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

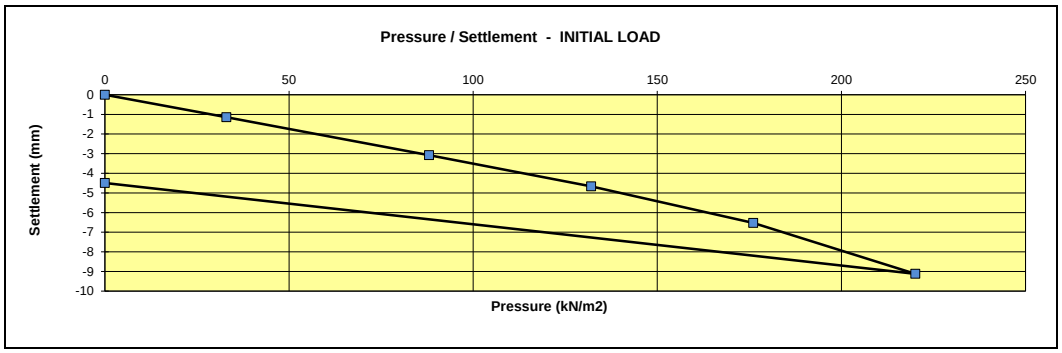
UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

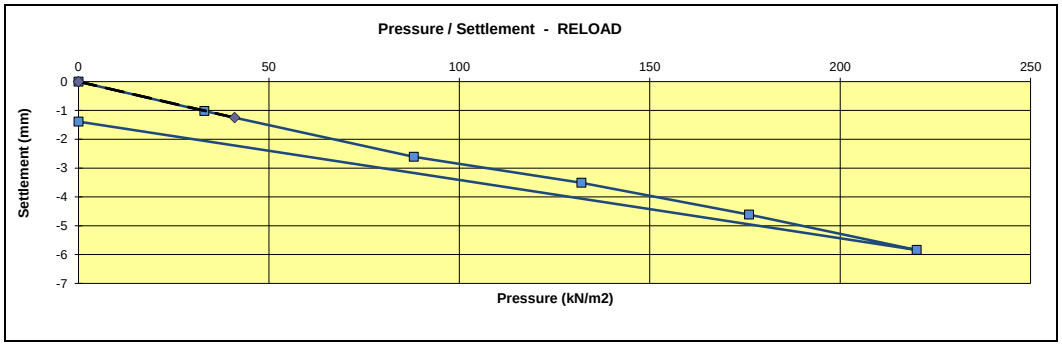
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6498**	**Site / Client Ref. No.**	EW/1/5/5
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 14	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-300mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	220	**Max Deformation (mm)**	9.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
33	-1.15
88	-3.08
132	-4.67
176	-6.53
220	-9.12
0	-4.49



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
33	-1.02
88	-2.61
132	-3.51
176	-4.61
220	-5.84
0	-1.39

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	8	12	MN / m²
Modulus of subgrade reaction (k)	=	18487	21068	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivalent CBR % value in accordance with HD25/94	=	**2**	**2**	

Remarks:

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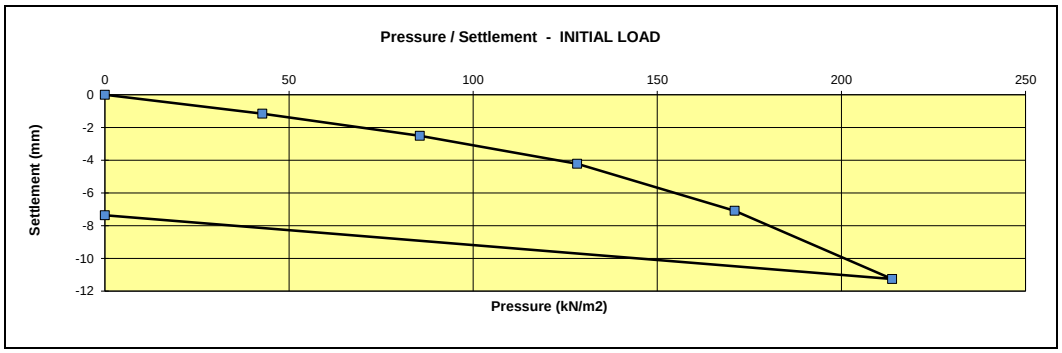
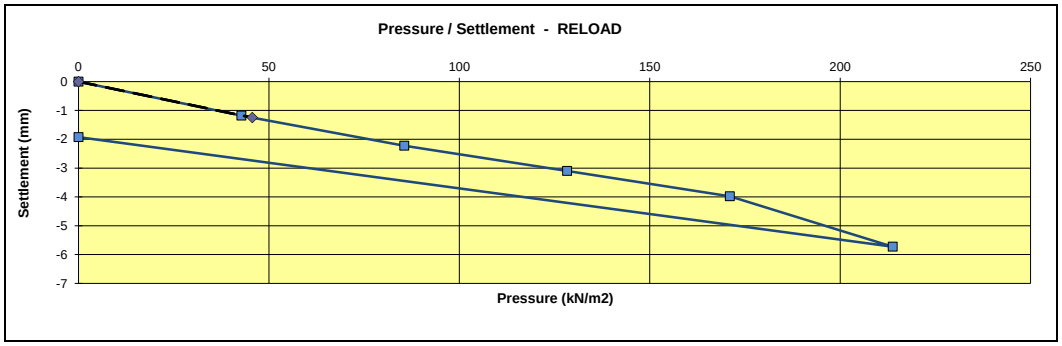
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6499**	**Site / Client Ref. No.**	EW/1/5/6
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Sandy Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 12	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-300mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	11.3



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-1.16
86	-2.51
128	-4.22
171	-7.09
214	-11.26
0	-7.37



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-1.18
86	-2.22
128	-3.10
171	-3.98
214	-5.73
0	-1.92

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	6	12	MN / m²
Modulus of subgrade reaction (k)	=	23456	23462	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		2.0	
Equivalent CBR % value in accordance with HD25/94	=	**2**	**2**	

Remarks:

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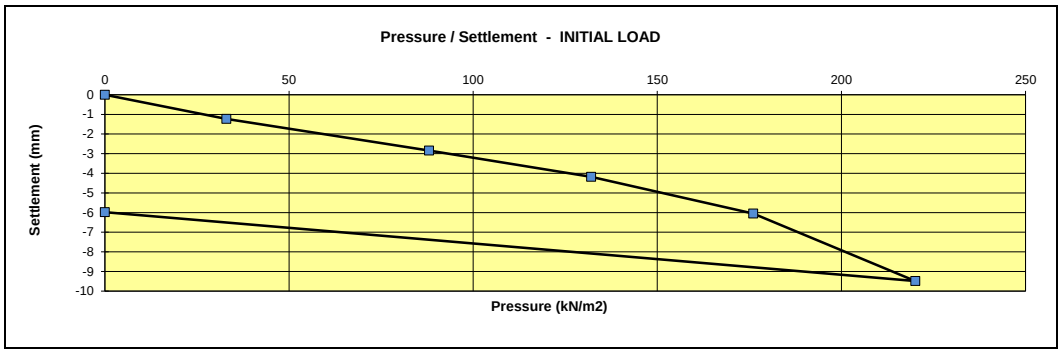
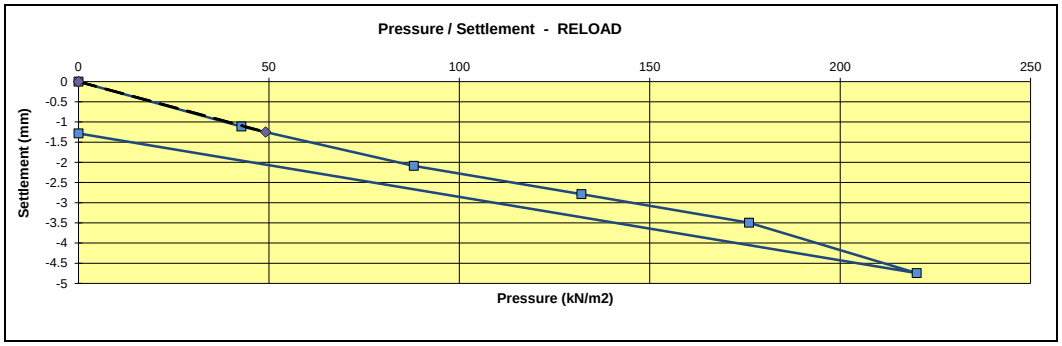
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6500**	**Site / Client Ref. No.**	EW/1/5/7
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Orange Brown Silty Sandy Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 13	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-350mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	220	**Max Deformation (mm)**	9.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
33	-1.23
88	-2.84
132	-4.18
176	-6.05
220	-9.49
0	-5.98



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-1.11
88	-2.09
132	-2.79
176	-3.50
220	-4.74
0	-1.28

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	8	15	MN / m²
Modulus of subgrade reaction (k)	=	17269	25255	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		2.0	
Equivalent CBR % value in accordance with HD25/94	=	**1**	**3**	

Remarks:

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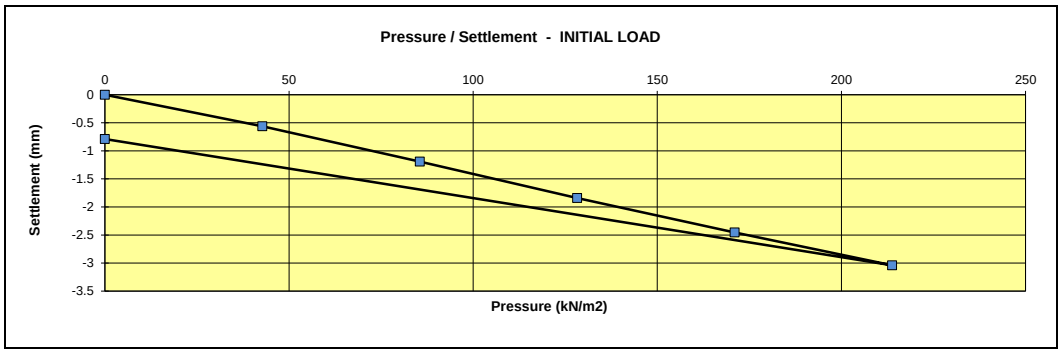
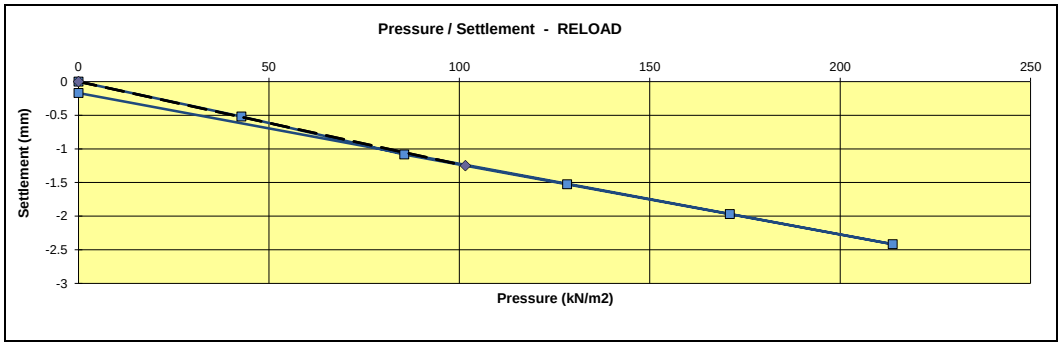
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6501**	**Site / Client Ref. No.**	EW/1/5/8
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Orange Brown Silty Gravelly Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 5	**Offset**	
Date Tested / Operator	01/05/2018 EW	**Level**	-150mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	214	**Max Deformation (mm)**	3.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.56
86	-1.19
128	-1.84
171	-2.45
214	-3.04
0	-0.79



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
43	-0.52
86	-1.08
128	-1.53
171	-1.97
214	-2.42
0	-0.17

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	23	29	MN / m²
Modulus of subgrade reaction (k)	=	45900	52239	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.3	
Equivalent CBR % value in accordance with HD25/94	=	**7**	**9**	

Remarks:

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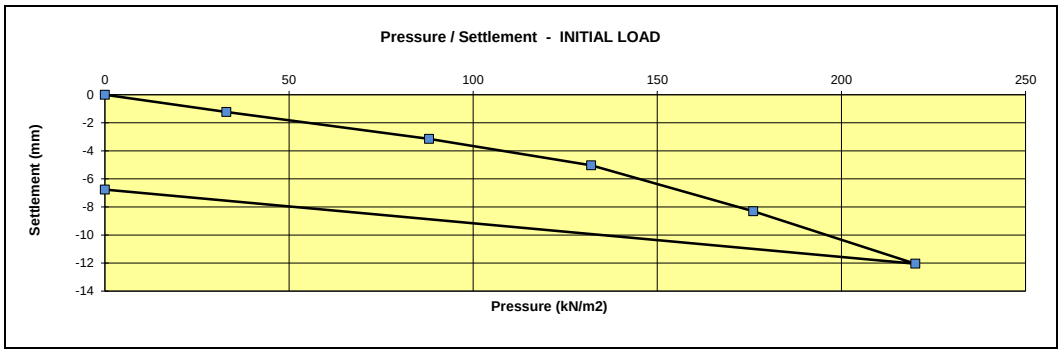
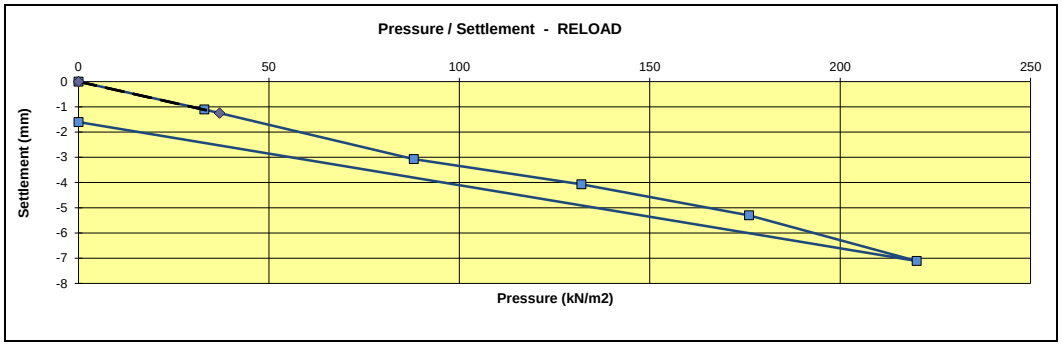
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6519**	**Site / Client Ref. No.**	EW/2/5/1
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Black Gravelly Silty Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 54	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-200mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	220	**Max Deformation (mm)**	12.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
33	-1.23
88	-3.15
132	-5.04
176	-8.31
220	-12.05
0	-6.77



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
33	-1.11
88	-3.07
132	-4.07
176	-5.30
220	-7.11
0	-1.60

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	6	10	MN / m²
Modulus of subgrade reaction (k)	=	17221	19040	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.7	
Equivalent CBR % value in accordance with HD25/94	=	**1**	**2**	

Remarks:

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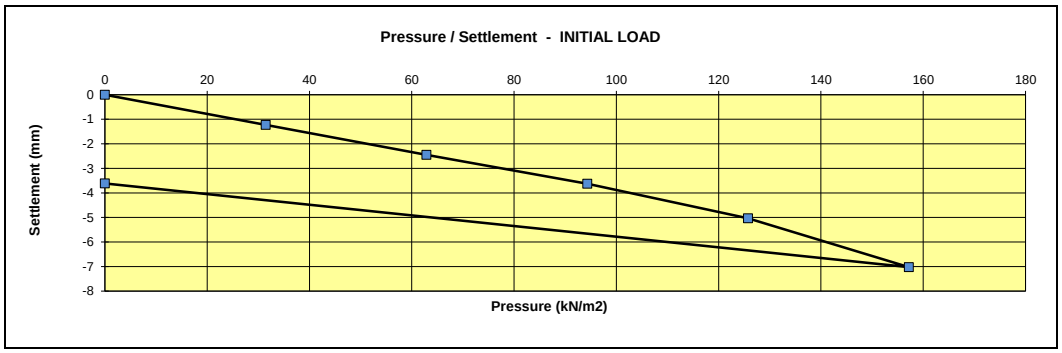
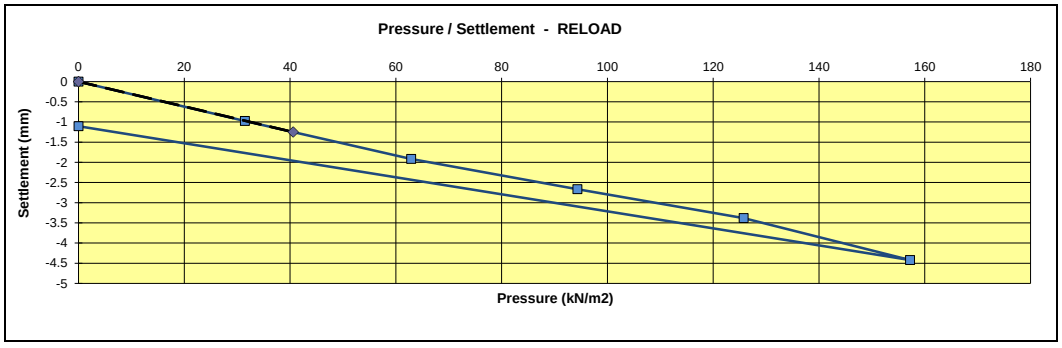
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6520**	**Site / Client Ref. No.**	EW/2/5/2
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Yellow Silty Sandy Clay with Gravel	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 53	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-350mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	157	**Max Deformation (mm)**	7.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-1.23
63	-2.45
94	-3.63
126	-5.03
157	-7.02
0	-3.62



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.98
63	-1.92
94	-2.67
126	-3.38
157	-4.42
0	-1.10

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	7	12	MN / m²
Modulus of subgrade reaction (k)	=	16432	20868	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivalent CBR % value in accordance with HD25/94	=	**1**	**2**	

Remarks:

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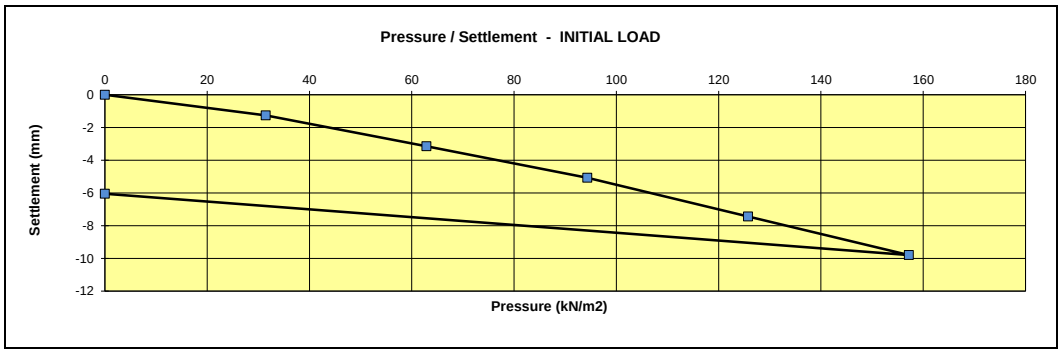
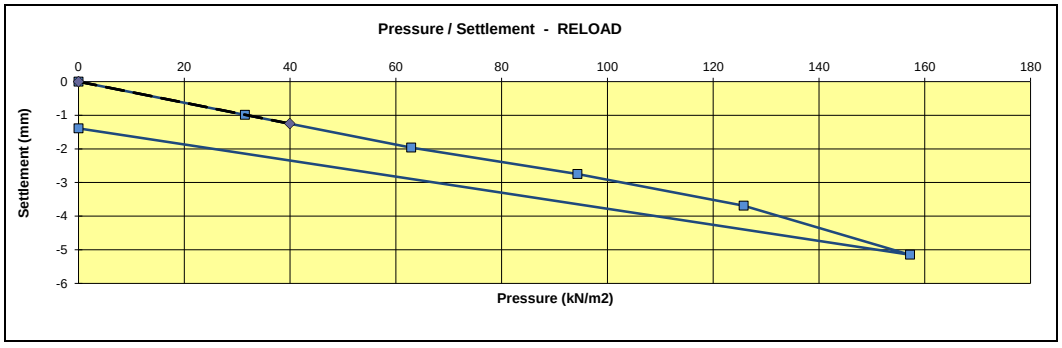
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6521**	**Site / Client Ref. No.**	EW/2/5/3
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Silty Clay with Gravel	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 52	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-400mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	157	**Max Deformation (mm)**	9.8



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-1.26
63	-3.15
94	-5.07
126	-7.44
157	-9.80
0	-6.05



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.99
63	-1.96
94	-2.75
126	-3.69
157	-5.15
0	-1.39

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	5	10	MN / m²
Modulus of subgrade reaction (k)	=	15968	20541	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.9		
Equivalent CBR % value in accordance with HD25/94	=	**1**	**2**	

Remarks:

Signed: for Testall Ltd **Date:** 03/05/2018

Authorised signatories : ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

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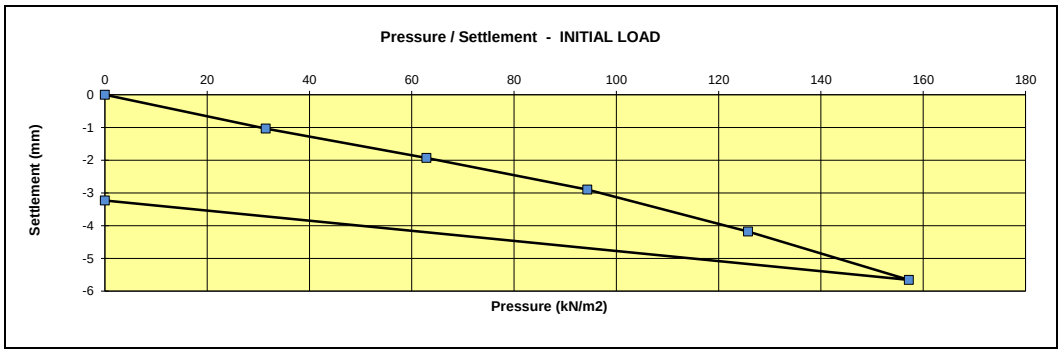
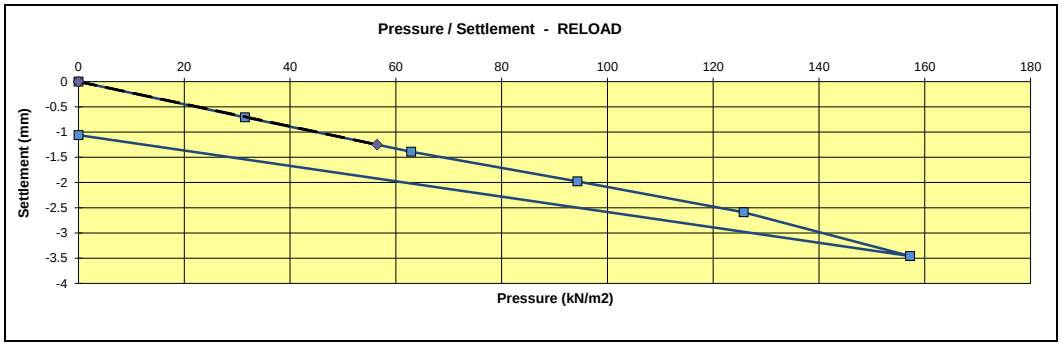
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6522**	**Site / Client Ref. No.**	EW/2/5/4
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Silty Clay with occasional Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 51	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-450mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	157	**Max Deformation (mm)**	5.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-1.03
63	-1.93
94	-2.90
126	-4.18
157	-5.66
0	-3.23



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.71
63	-1.39
94	-1.98
126	-2.59
157	-3.46
0	-1.06

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	9	15	MN / m²
Modulus of subgrade reaction (k)	=	20073	29021	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.6		
Equivalent CBR % value in accordance with HD25/94	=	**2**	**3**	

Remarks:

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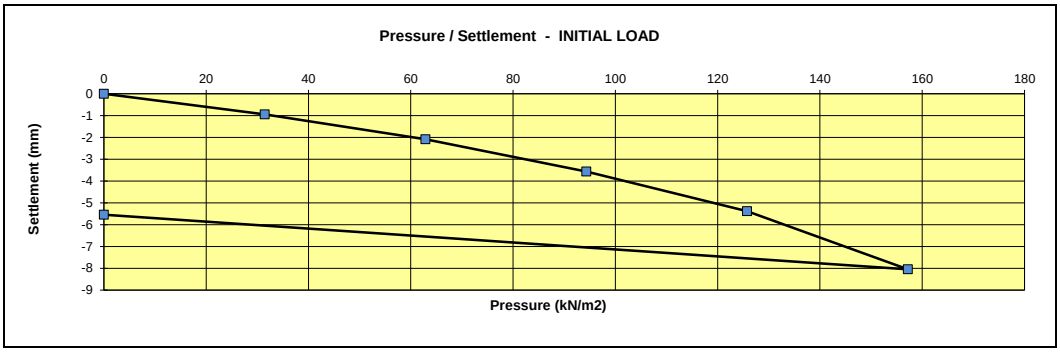
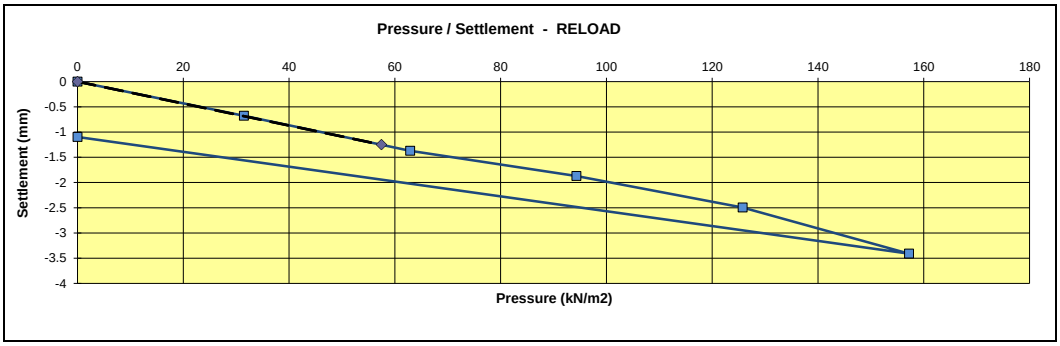
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6523**	**Site / Client Ref. No.**	EW/2/5/5
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Sandy Clay with occasional Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 44	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-450mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	157	**Max Deformation (mm)**	8.0



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.94
63	-2.09
94	-3.56
126	-5.38
157	-8.05
0	-5.54



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.68
63	-1.37
94	-1.87
126	-2.50
157	-3.41
0	-1.10

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	6	15	MN / m²
Modulus of subgrade reaction (k)	=	20503	29535	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	2.4		
Equivalent CBR % value in accordance with HD25/94	=	**2**	**3**	

Remarks:

Signed: D. Jordan **Date:** 03/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

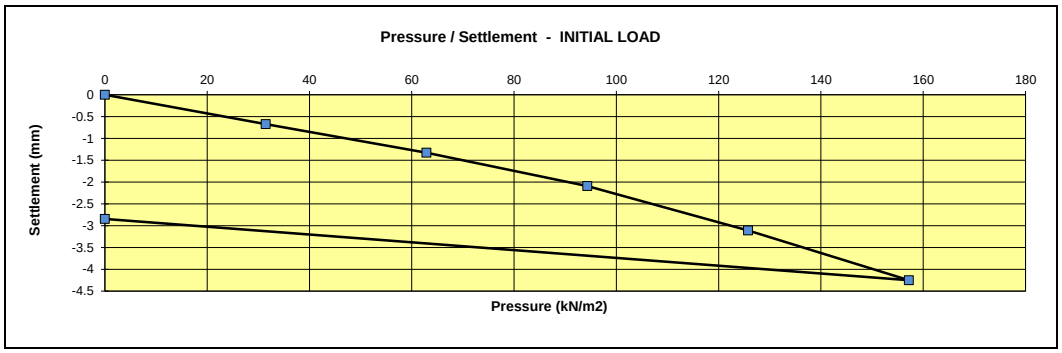
UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

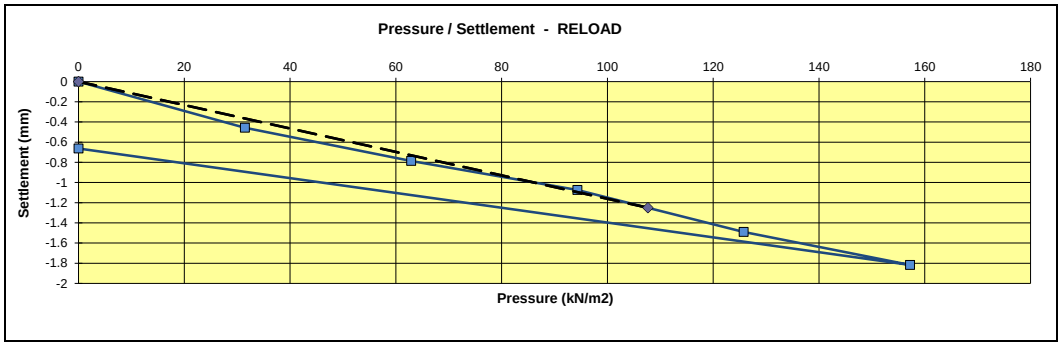
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6524**	**Site / Client Ref. No.**	EW/2/5/6
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Silty Clay with Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 45	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-400mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	157	**Max Deformation (mm)**	4.3



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.67
63	-1.33
94	-2.09
126	-3.11
157	-4.25
0	-2.85



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.46
63	-0.79
94	-1.07
126	-1.49
157	-1.82
0	-0.66

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	28	MN / m²
Modulus of subgrade reaction (k)	=	30364	55355	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		2.3	
Equivalent CBR % value in accordance with HD25/94	=	**4**	**10**	

Remarks:

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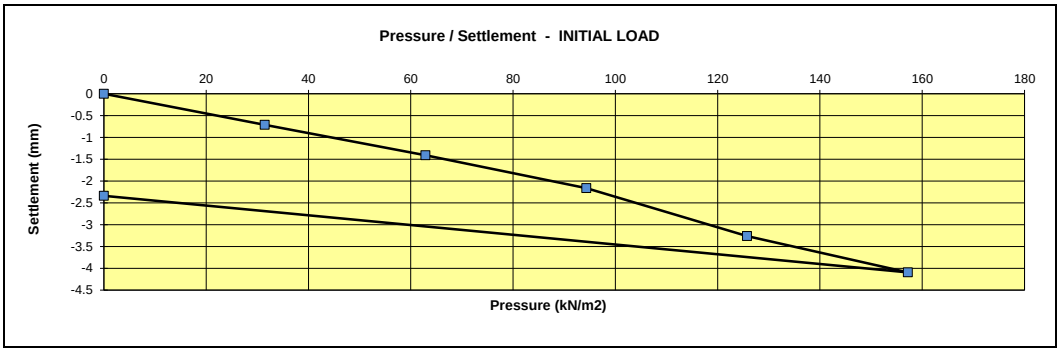
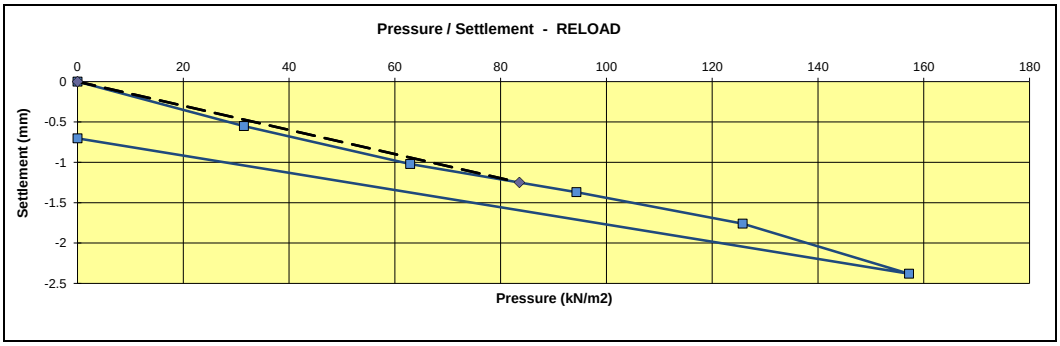
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6525**	**Site / Client Ref. No.**	EW/2/5/7
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Yellow Brown Silty Clay with Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 49	**Offset**	
Date Tested / Operator	02/05/2018 EW	**Level**	-300mm BEGL
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	157	**Max Deformation (mm)**	4.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.71
63	-1.41
94	-2.16
126	-3.26
157	-4.09
0	-2.34



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
31	-0.55
63	-1.02
94	-1.37
126	-1.76
157	-2.38
0	-0.70

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	22	MN / m²
Modulus of subgrade reaction (k)	=	28620	42957	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.7	
Equivalent CBR % value in accordance with HD25/94	=	**3**	**7**	

Remarks:

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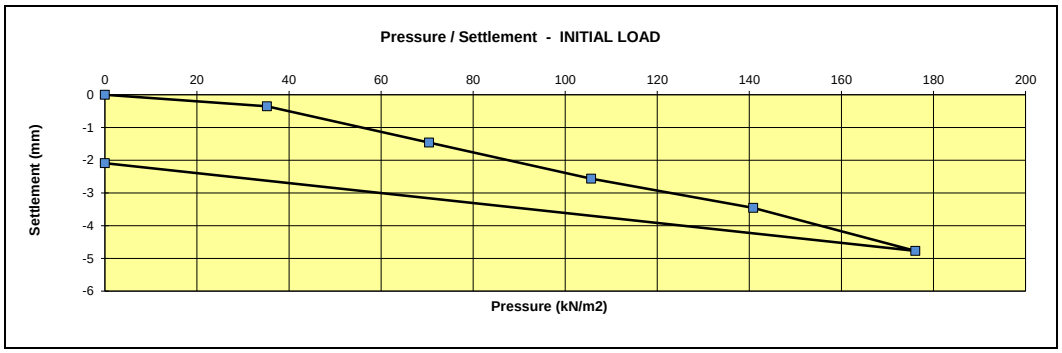
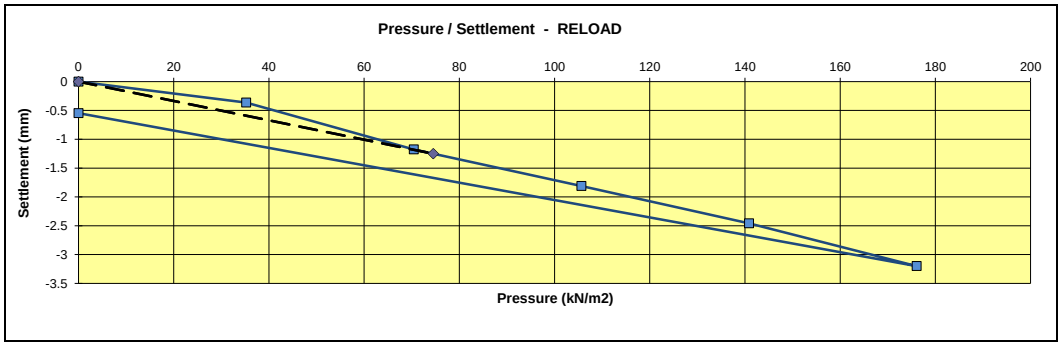
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6568**	**Site / Client Ref. No.**	BMG/4/5/1
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 16	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	200 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	4.8



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.35
70	-1.46
106	-2.57
141	-3.46
176	-4.77
0	-2.09



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.36
70	-1.18
106	-1.81
141	-2.46
176	-3.20
0	-0.55

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	12	18	MN / m²
Modulus of subgrade reaction (k)	=	32733	38310	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**4**	**5**	

Remarks:

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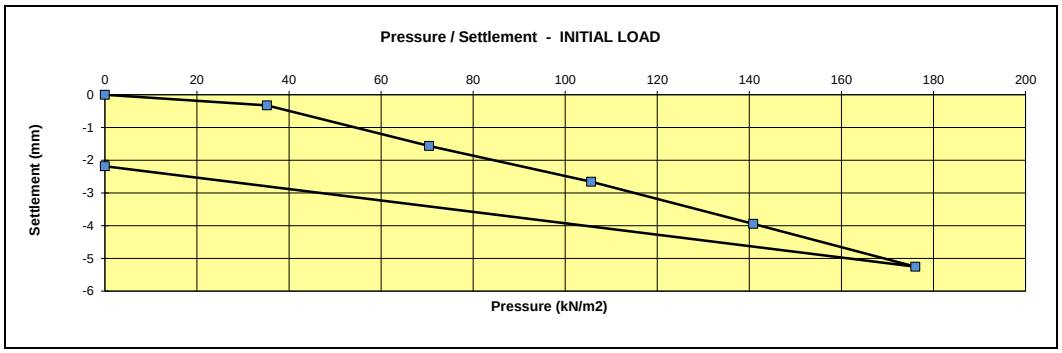
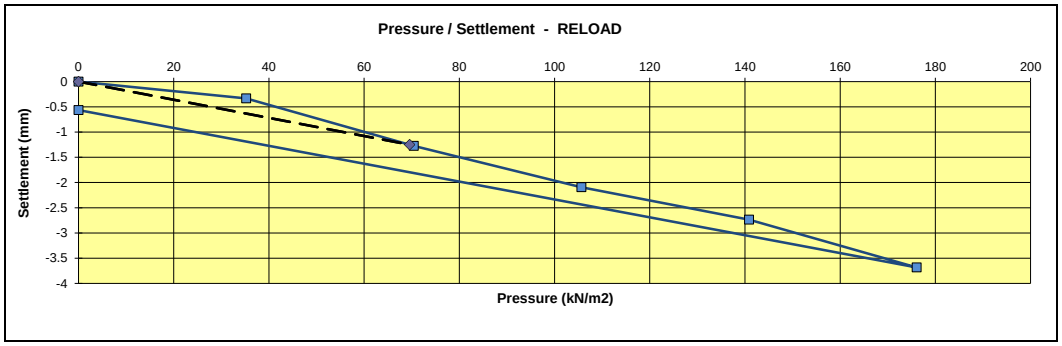
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6569**	**Site / Client Ref. No.**	BMG/4/5/2
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 30	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	220 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	5.3



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.33
70	-1.56
106	-2.66
141	-3.94
176	-5.25
0	-2.18



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.33
70	-1.27
106	-2.09
141	-2.74
176	-3.68
0	-0.56

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	16	MN / m²
Modulus of subgrade reaction (k)	=	31626	35764	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.4	
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**4**	**5**	

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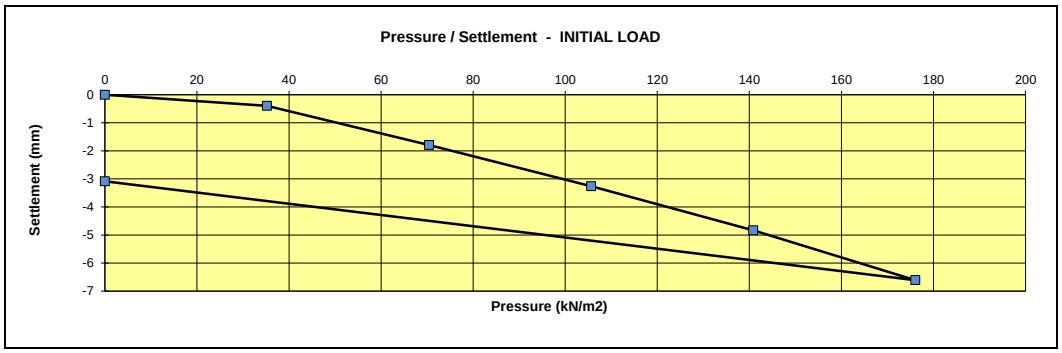
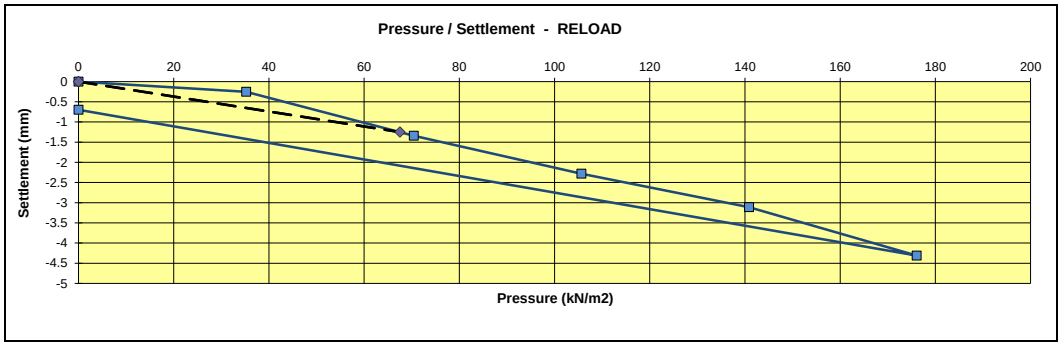
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6570**	**Site / Client Ref. No.**	BMG/4/5/3
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 33	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	150 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	6.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.39
70	-1.79
106	-3.26
141	-4.83
176	-6.61
0	-3.09



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.25
70	-1.34
106	-2.28
141	-3.11
176	-4.31
0	-0.70

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	9	13	MN / m²
Modulus of subgrade reaction (k)	=	29186	34714	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.5		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**3**	**5**	

Remarks:

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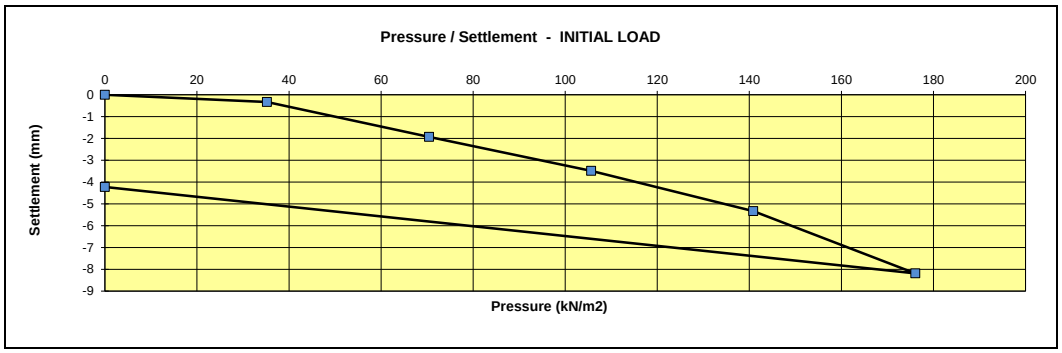
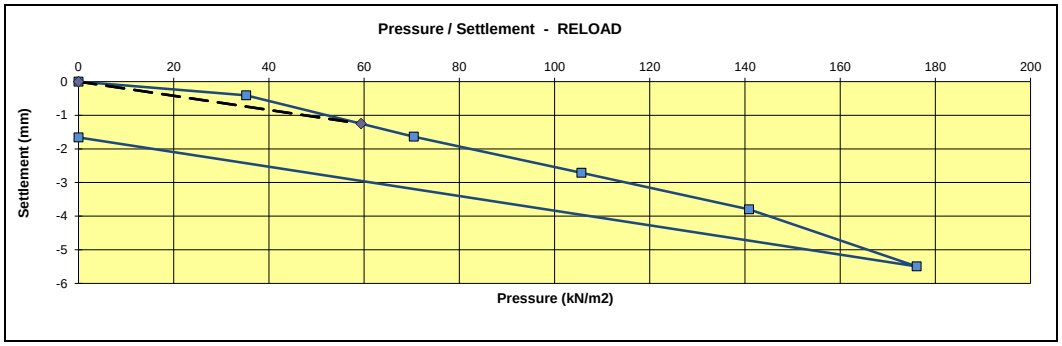
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6571**	**Site / Client Ref. No.**	BMG/4/5/4
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 35	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	8.2



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.33
70	-1.93
106	-3.49
141	-5.33
176	-8.19
0	-4.23



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.41
70	-1.64
106	-2.71
141	-3.80
176	-5.49
0	-1.66

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	7	10	MN / m²
Modulus of subgrade reaction (k)	=	28502	30521	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**3**	**4**	

Remarks:

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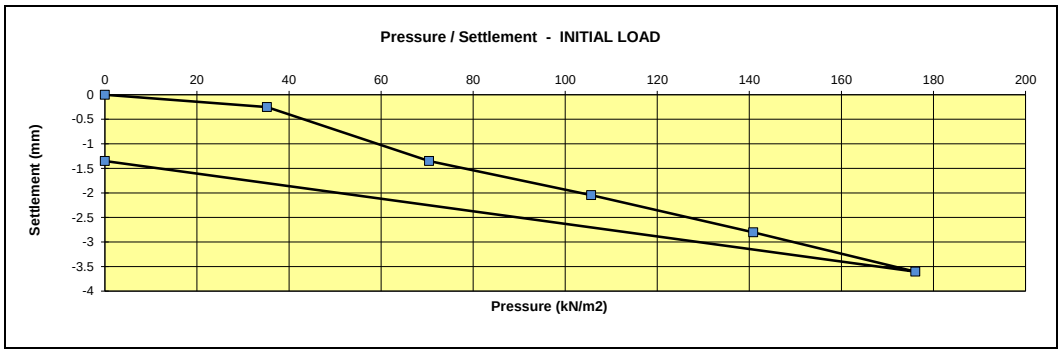
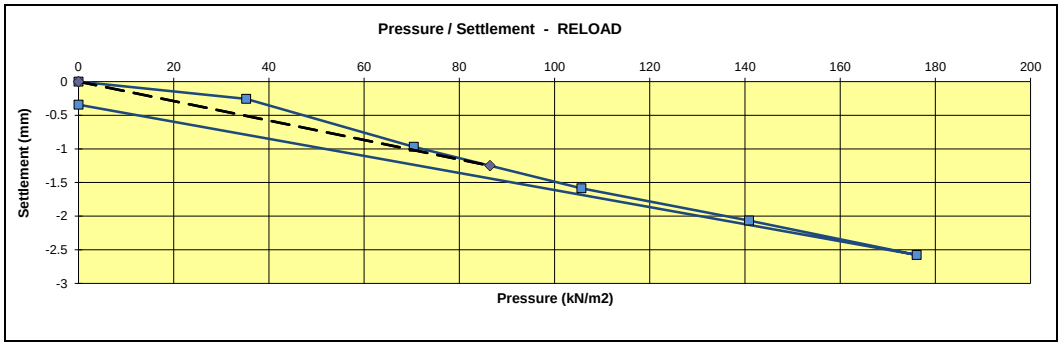
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6572**	**Site / Client Ref. No.**	BMG/4/5/5
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 22	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	3.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.25
70	-1.35
106	-2.04
141	-2.80
176	-3.60
0	-1.35



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.26
70	-0.97
106	-1.59
141	-2.07
176	-2.58
0	-0.34

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	16	22	MN / m²
Modulus of subgrade reaction (k)	=	34567	44435	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.4	
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**4**	**7**	

Remarks:

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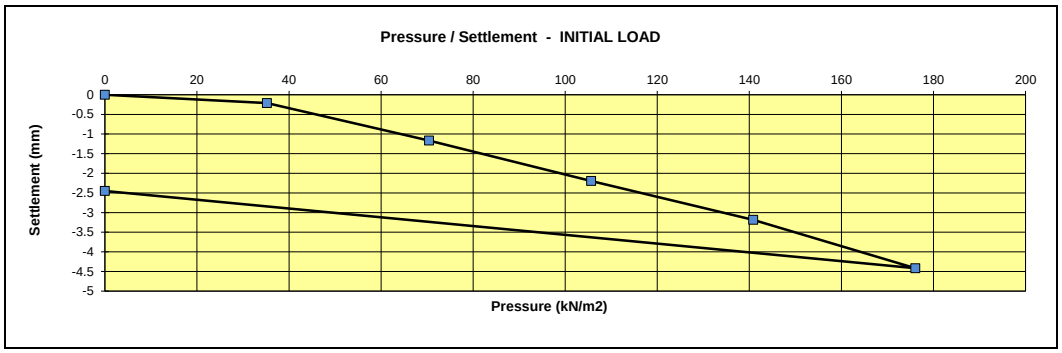
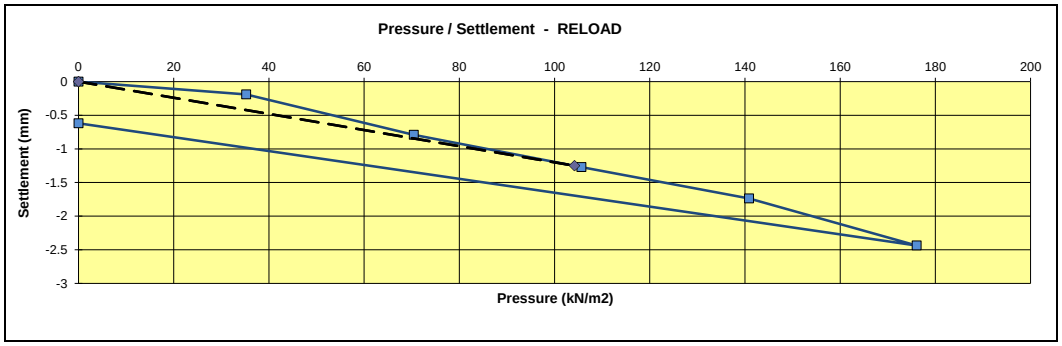
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6573**	**Site / Client Ref. No.**	BMG/4/5/6
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Dark Brown Clay with Cobbles	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 19	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	100 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	4.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.21
70	-1.17
106	-2.20
141	-3.19
176	-4.42
0	-2.45



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.19
70	-0.79
106	-1.27
141	-1.74
176	-2.44
0	-0.62

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	13	24	MN / m²
Modulus of subgrade reaction (k)	=	37678	53566	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.8		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**5**	**10**	

Remarks:

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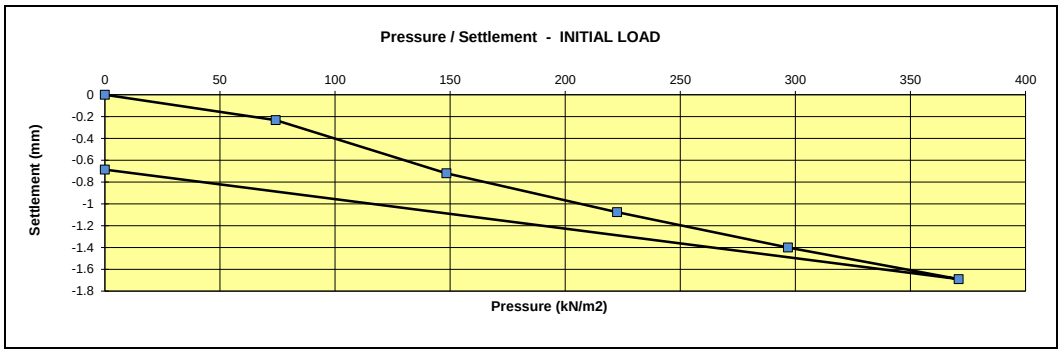
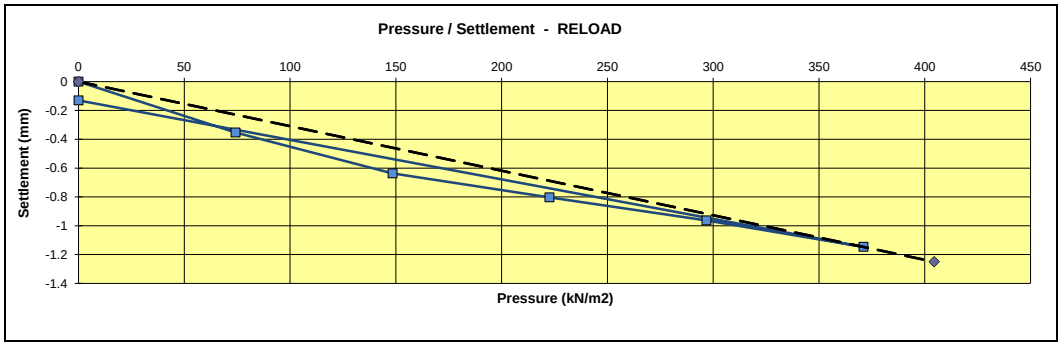
Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6574**	**Site / Client Ref. No.**	BMG/4/5/7
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Mix of Agg + Bituminous Material	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 20	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	100 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	371	**Max Deformation (mm)**	1.7



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
74	-0.23
148	-0.72
223	-1.08
297	-1.40
371	-1.69
0	-0.69



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
74	-0.35
148	-0.64
223	-0.80
297	-0.96
371	-1.15
0	-0.13

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	72	106	MN / m²
Modulus of subgrade reaction (k)	=	134913	207958	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.5	
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**47**	**100**	

Remarks:

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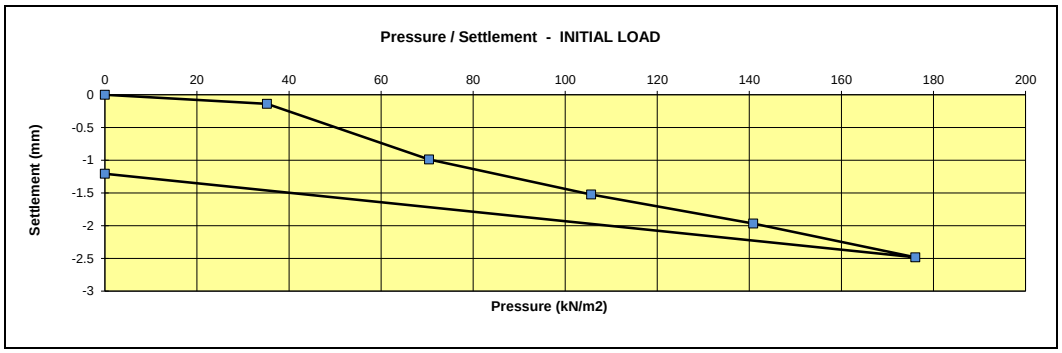
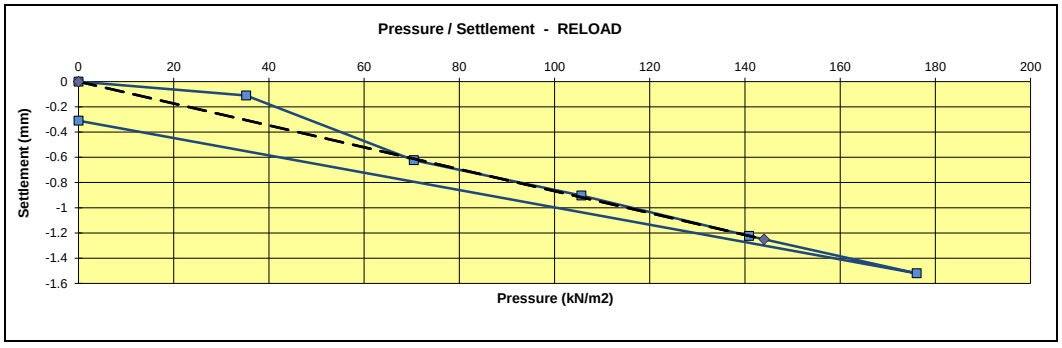
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6575**	**Site / Client Ref. No.**	BMG/4/5/8
Supplier	Insitu Material	**Source**	Insitu Material
Material Description	Dark Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 24	**Offset**	
Date Tested / Operator	04/05/2018 BMG	**Level**	400 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	2.5



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.14
70	-0.99
106	-1.52
141	-1.97
176	-2.48
0	-1.21



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.11
70	-0.62
106	-0.90
141	-1.22
176	-1.52
0	-0.31

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	23	38	MN / m²
Modulus of subgrade reaction (k)	=	45040	74054	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=		1.6	
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**7**	**17**	

Remarks:

Signed: D. Jordan **Date:** 08/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

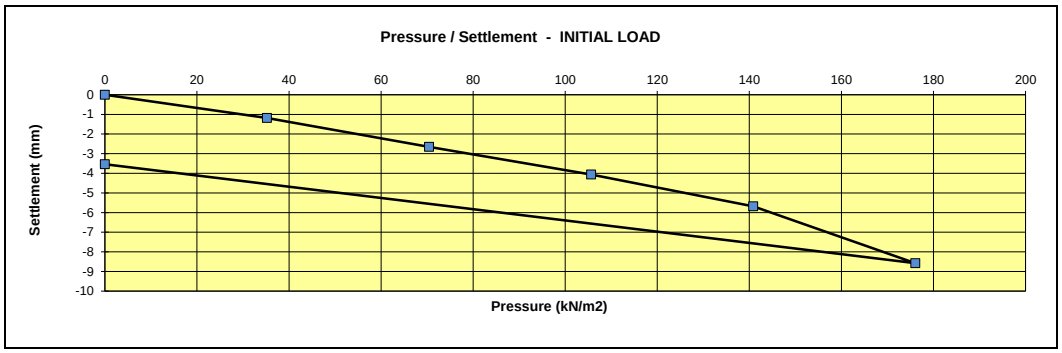
UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

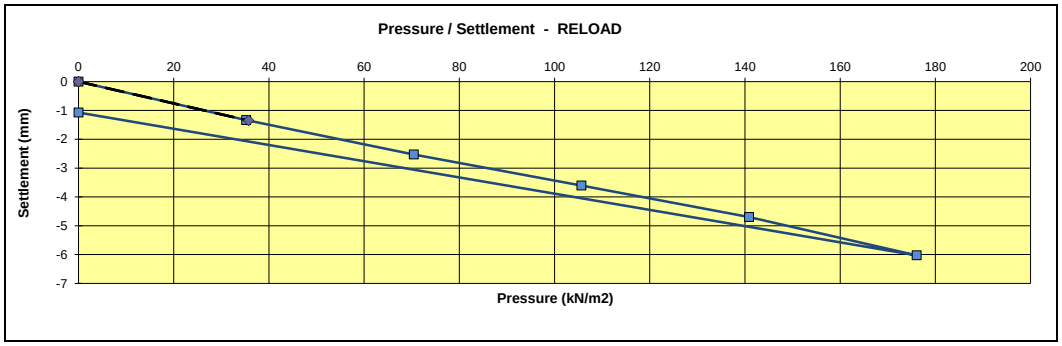
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6646**	**Site / Client Ref. No.**	BMG/11/5/1
Supplier	Insitu	**Source**	Insitu
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 37	**Offset**	PBT 1
Date Tested / Operator	11/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	8.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-1.19
70	-2.66
106	-4.06
141	-5.68
176	-8.58
0	-3.54



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-1.33
70	-2.53
106	-3.61
141	-4.70
176	-6.03
0	-1.07

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	7	10	MN / m²
Modulus of subgrade reaction (k)	=	18887	16999	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**2**	**1**	

Remarks:

Signed: D. Jordan for Testall Ltd **Date:** 14/05/2018

Authorised signatories : ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
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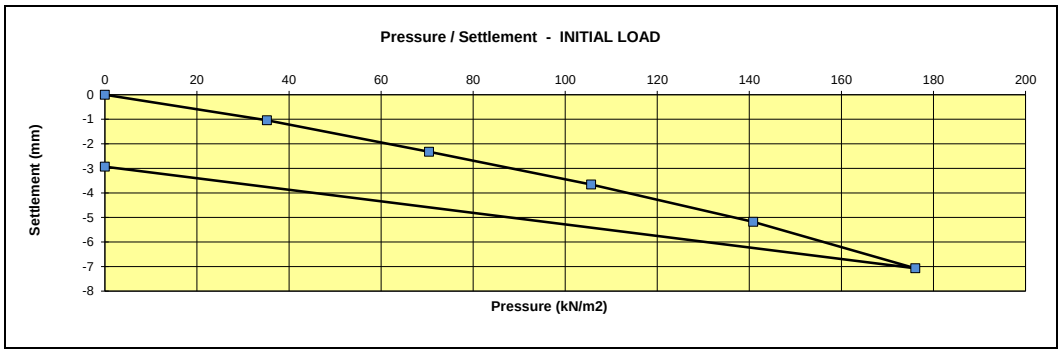
Newtownbutler
Co. Fermanagh
BT92 8BJ

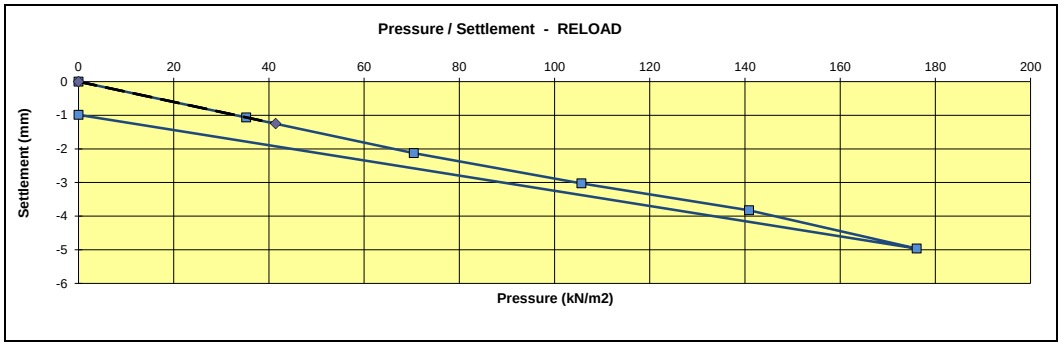
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6647**	**Site / Client Ref. No.**	BMG/11/5/2
Supplier	Insitu	**Source**	Insitu
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 36	**Offset**	PBT 2
Date Tested / Operator	11/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	7.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-1.04
70	-2.32
106	-3.66
141	-5.18
176	-7.07
0	-2.93



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-1.06
70	-2.12
106	-3.03
141	-3.82
176	-4.96
0	-0.99

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	8	12	MN / m²
Modulus of subgrade reaction (k)	=	21030	21295	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**2**	**2**	

Remarks:

Signed: D. Jordan **Date:** 14/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

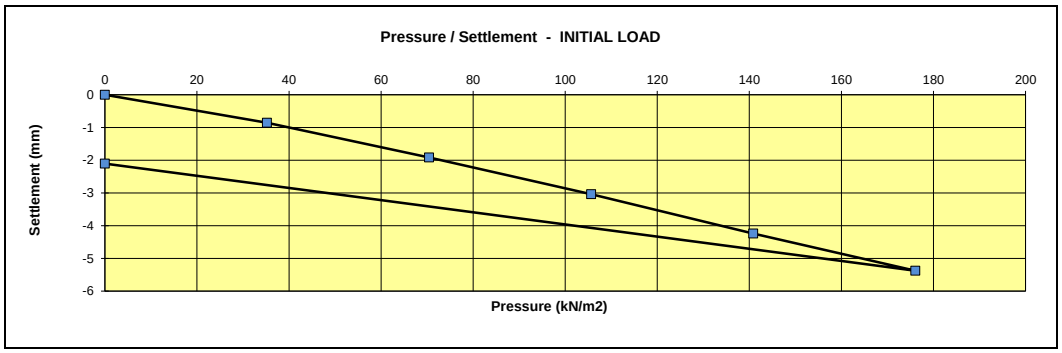
UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

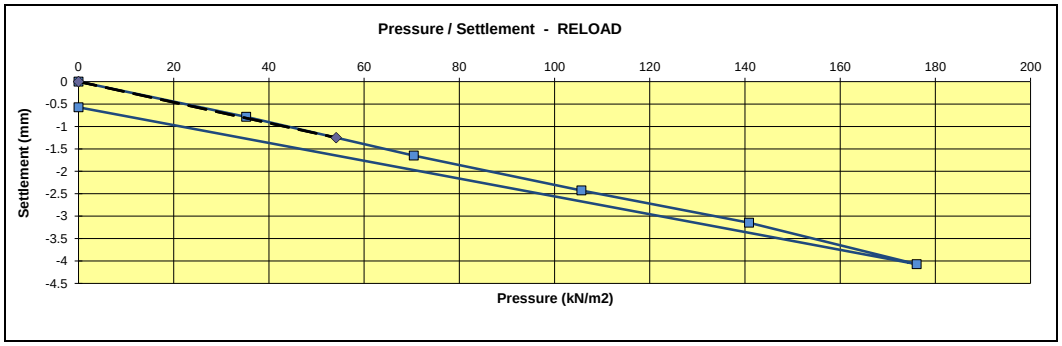
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6648**	**Site / Client Ref. No.**	BMG/11/5/3
Supplier	Insitu	**Source**	Insitu
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 32	**Offset**	PBT 3
Date Tested / Operator	11/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	5.4



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.86
70	-1.92
106	-3.04
141	-4.24
176	-5.38
0	-2.10



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.79
70	-1.65
106	-2.43
141	-3.15
176	-4.07
0	-0.57

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	11	14	MN / m²
Modulus of subgrade reaction (k)	=	24826	27824	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.3		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**3**	**3**	

Remarks:

Signed: D. Jordan **Date:** 14/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

UKAS TESTING 8995

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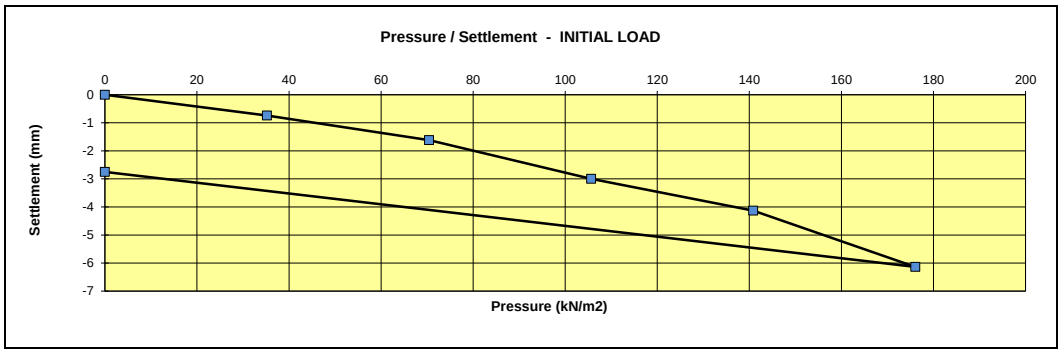
Co. Fermanagh
BT92 8BJ

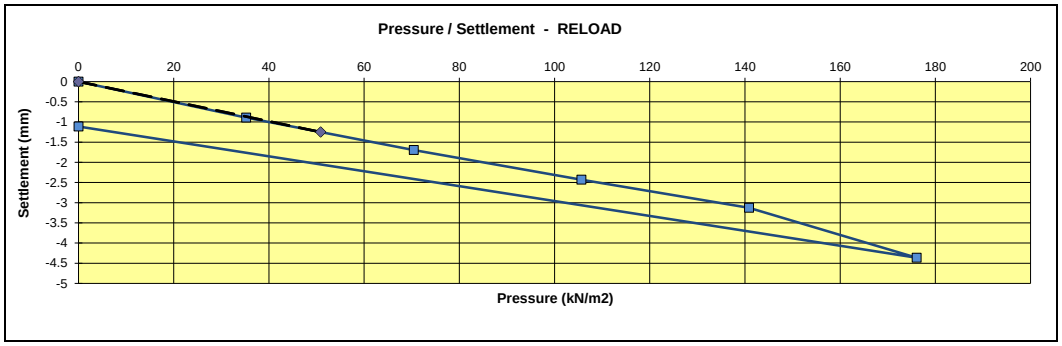
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6649**	**Site / Client Ref. No.**	BMG/11/5/4
Supplier	Insitu	**Source**	Insitu
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 27	**Offset**	PBT 4
Date Tested / Operator	11/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	6.1



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.74
70	-1.62
106	-3.00
141	-4.13
176	-6.14
0	-2.75



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.89
70	-1.70
106	-2.43
141	-3.13
176	-4.36
0	-1.11

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	9	13	MN / m²
Modulus of subgrade reaction (k)	=	28571	26146	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.4		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**3**	**3**	

Remarks:

Signed: D. Jordan **Date:** 14/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

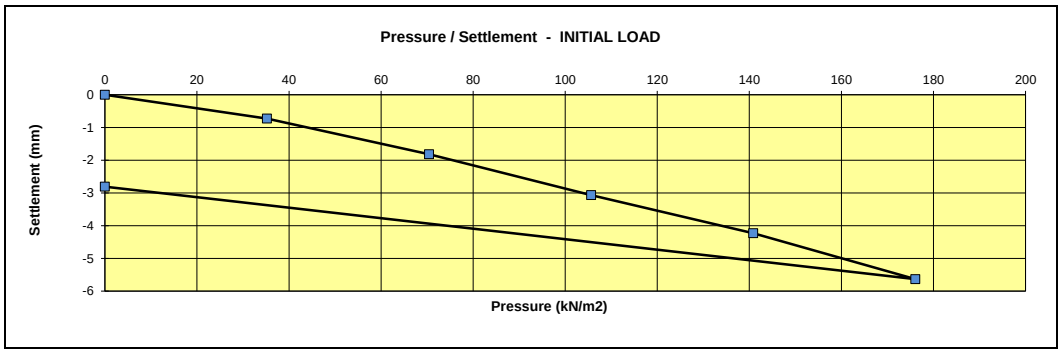
UKAS TESTING 8995

Testall Ltd
295A Moorlough Rd
Drumclay
Newtownbutler
Co. Fermanagh
BT92 8BJ

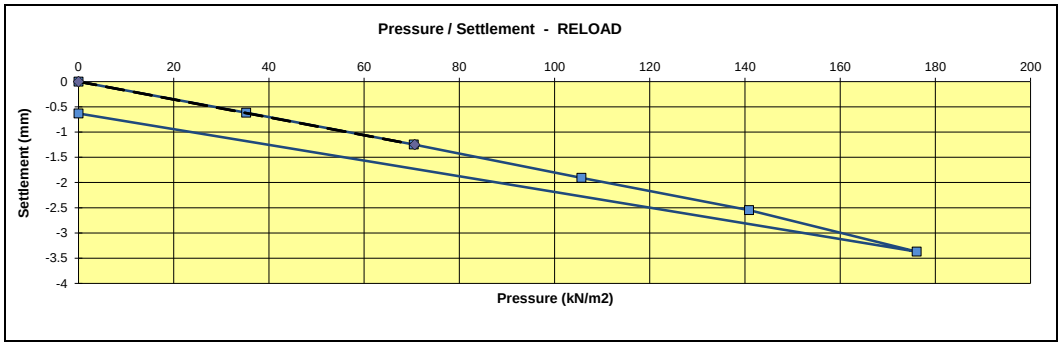
INSITU PLATE LOAD TEST REPORT - BS 1377 - 9 : 1990

Client : Ground Investigations Ireland Ltd (Cairn Homes PLC) **Contract :** Newcastle Lands, Dublin **Job No :** J00547

ERN Sample No.	**SA6650**	**Site / Client Ref. No.**	BMG/11/5/5
Supplier	Insitu	**Source**	Insitu
Material Description	Light Brown Sandy Clay	**Deposition**	Newcastle Lands, Dublin
Chainage	CBR 31	**Offset**	PB5 1
Date Tested / Operator	11/05/2018 BMG	**Level**	300 Below top of ground
Plate Size (mm)	450	**Plate Correction factor**	0.64
Max Applied Pressure (KN/m²)	176	**Max Deformation (mm)**	5.6



Initial Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.73
70	-1.82
106	-3.07
141	-4.23
176	-5.63
0	-2.81



Re-Load Cycle	
Applied Pressure (kN/m2)	Average settlement (mm)
0	0
35	-0.62
70	-1.25
106	-1.91
141	-2.55
176	-3.37
0	-0.63

		INITIAL LOAD	RELOAD	
Elastic Modulus (Ev_1 / Ev_2)	=	10	17	MN / m²
Modulus of subgrade reaction (k)	=	26771	36305	KN / m² / m
Compaction Elastic Modulus Ratio (Ev_2 / Ev_1)	=	1.7		
Equivalent CBR % value in accordance with IAN 73/06 rev 1	=	**3**	**5**	

Remarks:

Signed: D. Jordan **Date:** 14/05/2018

for Testall Ltd **Authorised signatories :** ☑ D. Jordan - Laboratory Manager ☐ G.McHugh - Senior Technician

UKAS TESTING 8995

APPENDIX 8 – Laboratory Test Results

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

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

Attention :	Conor Finnerty
Date :	8th June, 2018
Your reference :	7612-04-18
Our reference :	Test Report 18/7951 Batch 1
Location :	Newcastle Lands
Date samples received :	24th May, 2018
Status :	Final report
Issue :	1

Eight samples were received for analysis on 24th May, 2018 of which eight 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.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7951

Report : Solid

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	TP02	TP05	TP20	TP21	TP27	TP36	TP47	TP54					
Depth	0.60	2.50	1.20	2.00	1.50	2.00	1.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
Antimony	2	2	<1	2	23	1	2	1			<1	mg/kg	TM30/PM15
Arsenic #	17.3	11.9	5.5	19.6	117.6	8.7	15.4	9.7			<0.5	mg/kg	TM30/PM15
Barium #	76	78	13	228	189	582	100	141			<1	mg/kg	TM30/PM15
Cadmium #	2.1	1.6	0.2	1.8	0.4	4.3	2.4	2.2			<0.1	mg/kg	TM30/PM15
Chromium #	64.9	79.7	63.1	47.3	120.0	17.1	44.8	23.3			<0.5	mg/kg	TM30/PM15
Copper #	26	19	5	22	196	13	20	30			<1	mg/kg	TM30/PM15
Lead #	33	64	14	41	16290_{AA}	224	26	24			<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Molybdenum #	2.4	2.8	2.1	1.9	4.9	1.0	1.8	1.3			<0.1	mg/kg	TM30/PM15
Nickel #	50.4	35.8	3.8	46.9	56.0	16.2	36.0	34.7			<0.7	mg/kg	TM30/PM15
Selenium #	1	1	<1	1	2	1	1	2			<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	112	149	<50	187	607	364	166	544			<50	mg/kg	TM50/PM29
Water Soluble Boron #	0.3	0.4	<0.1	0.2	0.3	0.2	0.3	1.1			<0.1	mg/kg	TM74/PM32
Zinc #	139	95	25	130	900	246	100	130			<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	mg/kg	TM4/PM8
Acenaphthylene	<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	mg/kg	TM4/PM8
Fluorene #	<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	mg/kg	TM4/PM8
Anthracene #	<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	mg/kg	TM4/PM8
Pyrene #	<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	mg/kg	TM4/PM8
Chrysene #	<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	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	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	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	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	mg/kg	TM4/PM8
Coronene	<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	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	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	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	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	98	87	89	84	87	90	83	88			<0	%	TM4/PM8
Mineral Oil (C10-C40)	<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: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7951

Report : Solid

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	TP02	TP05	TP20	TP21	TP27	TP36	TP47	TP54					
Depth	0.60	2.50	1.20	2.00	1.50	2.00	1.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV			<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV			<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV			<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<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	mg/kg	TM5/PM8/PM16
>C21-C35 #	<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	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<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 SV			<0.1	mg/kg	TM36/PM12
>C10-C25	<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	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV			<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV			<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1 SV			<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<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	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<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	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<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	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 SV			<0.1	mg/kg	TM36/PM12
>EC10-EC25	<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	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5 SV			<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5 SV			<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5 SV			<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5 SV			<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5 SV			<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5 SV			<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 180 #	<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	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7951

Report : Solid

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	TP02	TP05	TP20	TP21	TP27	TP36	TP47	TP54					
Depth	0.60	2.50	1.20	2.00	1.50	2.00	1.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
Phenol #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	mg/kg	TM26/PM21
Natural Moisture Content	15.4	14.6	7.6	13.3	19.7	<0.1	11.7	73.1			<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	13.4	12.8	7.1	11.7	16.5	<0.1	10.5	42.2			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Chromium III	64.9	79.7	63.1	47.3	120.0	17.1	44.8	23.3			<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	0.14	0.11	<0.02	0.09	0.15	0.05	0.16	3.86			<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10			<10	mg/kg	TM106/PM119
Elemental Sulphur	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM108/PM114
pH #	8.52	8.65	9.04	8.86	7.38	9.00	8.78	8.04			<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1054	0.1053	0.1002	0.1051	0.1115	0.0999	0.1024	0.1527				kg	NONE/PM17
Mass of dried test portion	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: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7951

Report : CEN 10:1 1 Batch

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	TP02	TP05	TP20	TP21	TP27	TP36	TP47	TP54					
Depth	0.60	2.50	1.20	2.00	1.50	2.00	1.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
Dissolved Antimony #	<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	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	0.0047	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025			<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	0.047	<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	0.019	0.148	0.011	0.006			<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	<0.03	<0.03	0.19	1.48	0.11	0.06			<0.03	mg/kg	TM30/PM17
Dissolved Boron #	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012			<0.012	mg/l	TM30/PM17
Dissolved Boron (A10) #	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12			<0.12	mg/kg	TM30/PM17
Dissolved Cadmium #	<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	mg/kg	TM30/PM17
Dissolved Chromium #	<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	mg/kg	TM30/PM17
Dissolved Copper #	<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	mg/kg	TM30/PM17
Dissolved Lead #	<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	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	0.004	0.007	0.009	<0.002	0.005	0.004	0.014			<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	0.04	0.07	0.09	<0.02	0.05	0.04	0.14			<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005			<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.05			<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.012			<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.12			<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003			<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.04	<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	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			<0.0001	mg/kg	TM61/PM38
Phenol	<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	mg/kg	TM26/PM0
Fluoride	0.8	0.4	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/l	TM173/PM0
Fluoride	8	4	<3	<3	<3	<3	<3	<3			<3	mg/kg	TM173/PM0
Sulphate as SO4 #	1.78	1.52	0.49	0.36	1.75	4.42	0.11	0.63			<0.05	mg/l	TM38/PM0
Sulphate as SO4 #	17.8	15.2	4.9	3.6	17.5	44.2	1.1	6.3			<0.5	mg/kg	TM38/PM0
Chloride #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	1.0			<0.3	mg/l	TM38/PM0
Chloride #	<3	<3	<3	<3	<3	<3	<3	10			<3	mg/kg	TM38/PM0
Ammoniacal Nitrogen as N #	<0.03	<0.03	0.03	<0.03	<0.03	0.03	0.03	0.05			<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	<0.3	0.5			<0.3	mg/kg	TM38/PM0
Dissolved Organic Carbon	3	<2	<2	<2	<2	<2	<2	8			<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	<20	<20	<20	<20	<20	<20	80			<20	mg/kg	TM60/PM0
Total Dissolved Solids #	<35	<35	<35	35	<35	83	62	141			<35	mg/l	TM20/PM0
Total Dissolved Solids #	<350	<350	<350	<350	<350	830	620	1410			<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7951

Report : EN12457_2

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24								
Sample ID	TP02	TP05	TP20	TP21	TP27	TP36	TP47	TP54								
Depth	0.60	2.50	1.20	2.00	1.50	2.00	1.50	1.00								
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T								
Sample Date	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018	22/05/2018								
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1	1	1	1								
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018			Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis																
Total Organic Carbon #	0.14	0.11	<0.02	0.09	0.15	0.05	0.16	3.86			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 [SV]			6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<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			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	mg/kg	TM4/PM8
PAH Sum of 17	<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	0.047	<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	0.19	1.48	0.11	0.06			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			0.04	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			0.5	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			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			0.01	0.2	2	<0.0001	mg/kg	TM61/PM38
Molybdenum #	<0.02	0.04	0.07	0.09	<0.02	0.05	0.04	0.14			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	0.05			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			0.5	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			0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.12			0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	0.04	<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 #	<350	<350	<350	<350	<350	830	620	1410			4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	<20	<20	<20	<20	<20	<20	80			500	800	1000	<20	mg/kg	TM60/PM0
Dry Matter Content Ratio	85.5	85.9	90.3	85.8	80.7	90.5	87.6	58.8			-	-	-	<0.1	%	NONE/PM4
Eluate Volume	0.76	0.77	0.82	0.75	0.76	0.791	0.787	0.785			-	-	-		l	NONE/PM17
pH #	8.52	8.65	9.04	8.86	7.38	9.00	8.78	8.04			-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	8	4	<3	<3	<3	<3	<3	<3			-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	17.8	15.2	4.9	3.6	17.5	44.2	1.1	6.3			1000	20000	50000	<0.5	mg/kg	TM38/PM0
Chloride #	<3	<3	<3	<3	<3	<3	<3	10			800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
18/7951	1	TP02	0.60	1-3	No interpretation possible
18/7951	1	TP05	2.50	4-6	No interpretation possible
18/7951	1	TP20	1.20	7-9	No interpretation possible
18/7951	1	TP21	2.00	10-12	No interpretation possible
18/7951	1	TP27	1.50	13-15	No interpretation possible
18/7951	1	TP36	2.00	16-18	No interpretation possible
18/7951	1	TP47	1.50	19-21	No interpretation possible
18/7951	1	TP54	1.00	22-24	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 18/04/7612
Location: Newcastle Lands
Contact: Conor Finnerty

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, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/7951	1	TP02	0.60	2	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP05	2.50	5	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP20	1.20	8	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP21	2.00	11	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP27	1.50	14	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD

Client Name: Ground Investigations Ireland
Reference: 18/04/7612
Location: Newcastle Lands
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/7951	1	TP27	1.50	14	05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP36	2.00	17	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP47	1.50	20	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7951	1	TP54	1.00	23	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland

Reference: 7612-04-18

Location: Newcastle Lands

Contact: Conor Finnerty

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/7951	1	TP02	0.60	1-3	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP05	2.50	4-6	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP20	1.20	7-9	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP21	2.00	10-12	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP27	1.50	13-15	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP36	2.00	16-18	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP47	1.50	19-21	GRO	Solid Samples were received at a temperature above 9°C.
18/7951	1	TP54	1.00	22-24	GRO	Solid Samples were received at a temperature above 9°C.

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

JE Job No.: 18/7951

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. 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.

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

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

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.

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.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental 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
AA	x10 Dilution

JE Job No: 18/7951

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 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 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 8270 method for the solvent extraction and determination of 16 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 USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	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 USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	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 8270. 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 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. 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

JE Job No: 18/7951

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
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	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 Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	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 Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 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
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes

JE Job No: 18/7951

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 the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	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
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	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 and 9045D and BS1377:1990. 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
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM108	Determination of Elemental Sulphur by Reversed Phase High Performance Liquid Chromatography with Ultra Violet spectroscopy.	PM114	End over end extraction of dried and crushed soil samples for organic analysis. The solvent mix varies depending on analysis required			AD	Yes

JE Job No: 18/7951

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
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 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 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 μm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.

Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

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

Attention :	Conor Finnerty
Date :	8th June, 2018
Your reference :	7612-04-18
Our reference :	Test Report 18/7953 Batch 1
Location :	Newcastle Lands
Date samples received :	24th May, 2018
Status :	Final report
Issue :	1

Eight samples were received for analysis on 24th May, 2018 of which eight 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.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7953

Report : Solid

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	BH02	BH04	BH06	BH08	BH10	BH12	BH14	BH15					
Depth	1.00	0.50	0.50	0.50	0.50	0.50	0.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
Antimony	3	3	3	3	37_{AA}	2	3	2			<1	mg/kg	TM30/PM15
Arsenic #	26.9	16.3	19.2	19.1	78.7	18.6	18.0	19.4			<0.5	mg/kg	TM30/PM15
Barium #	413	104	109	132	459	187	311	98			<1	mg/kg	TM30/PM15
Cadmium #	3.3	4.2	4.4	4.1	0.9	3.7	4.2	1.5			<0.1	mg/kg	TM30/PM15
Chromium #	45.5	47.1	37.8	39.7	55.7	36.2	42.3	33.8			<0.5	mg/kg	TM30/PM15
Copper #	39	30	54	41	108	26	32	23			<1	mg/kg	TM30/PM15
Lead #	280	38	41	51	16710_{AA}	209	36	26			<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Molybdenum #	3.3	3.1	4.3	5.7	8.7	1.5	6.5	1.4			<0.1	mg/kg	TM30/PM15
Nickel #	65.1	71.3	89.3	67.7	35.5	53.4	66.0	43.4			<0.7	mg/kg	TM30/PM15
Selenium #	3	2	3	3	6	2	3	1			<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	363	252	284	191	601	198	402	233			<50	mg/kg	TM50/PM29
Water Soluble Boron #	0.5	0.4	0.4	0.4	0.1	0.1	0.5	0.2			<0.1	mg/kg	TM74/PM32
Zinc #	223	159	160	138	541	521	151	105			<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	mg/kg	TM4/PM8
Acenaphthylene	<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	mg/kg	TM4/PM8
Fluorene #	<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	mg/kg	TM4/PM8
Anthracene #	<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	mg/kg	TM4/PM8
Pyrene #	<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	mg/kg	TM4/PM8
Chrysene #	<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	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	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	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	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	mg/kg	TM4/PM8
Coronene	<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	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	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	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	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	87	88	88	85	86	88	88	85			<0	%	TM4/PM8
Mineral Oil (C10-C40)	<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: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7953

Report : Solid

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	BH02	BH04	BH06	BH08	BH10	BH12	BH14	BH15					
Depth	1.00	0.50	0.50	0.50	0.50	0.50	0.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
TPH CWG													
Aliphatics													
>C5-C6 #	<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	mg/kg	TM36/PM12
>C8-C10	<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	mg/kg	TM5/PM8/PM16
>C12-C16 #	<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	mg/kg	TM5/PM8/PM16
>C21-C35 #	<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	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<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	mg/kg	TM36/PM12
>C10-C25	<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	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	mg/kg	TM36/PM12
>EC7-EC8 #	<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	mg/kg	TM36/PM12
>EC10-EC12 #	<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	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<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	mg/kg	TM5/PM8/PM16
>EC35-EC40	<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	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<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	mg/kg	TM36/PM12
>EC10-EC25	<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	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM17/PM8
PCB 180 #	<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	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7953

Report : Solid

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	BH02	BH04	BH06	BH08	BH10	BH12	BH14	BH15					
Depth	1.00	0.50	0.50	0.50	0.50	0.50	0.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
Phenol #	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			<0.01	mg/kg	TM26/PM21
Natural Moisture Content	22.9	17.9	22.6	19.5	16.7	37.2	25.9	12.1			<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	18.6	15.2	18.4	16.3	14.3	27.1	20.6	10.8			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Chromium III	45.5	47.1	37.8	39.7	55.7	36.2	42.3	33.8			<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	0.15	0.41	0.65	0.47	0.13	0.52	1.09	0.13			<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10			<10	mg/kg	TM106/PM119
Elemental Sulphur	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM108/PM114
pH #	7.58	8.26	7.70	8.35	8.04	8.73	8.27	8.50			<0.01	pH units	TM73/PM11
Mass of raw test portion	0.113	0.103	0.1133	0.11	0.1072	0.1065	0.1137	0.1046				kg	NONE/PM17
Mass of dried test portion	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: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7953

Report : CEN 10:1 1 Batch

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

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24			LOD/LOR	Units	Method No.
Sample ID	BH02	BH04	BH06	BH08	BH10	BH12	BH14	BH15					
Depth	1.00	0.50	0.50	0.50	0.50	0.50	0.50	1.00					
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T					
Sample Date	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018					
Dissolved Antimony #	<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	mg/kg	TM30/PM17
Dissolved Arsenic #	<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	mg/kg	TM30/PM17
Dissolved Barium #	0.213	<0.003	<0.003	<0.003	0.075	0.026	0.024	0.014			<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	2.13	<0.03	<0.03	<0.03	0.75	0.26	0.24	0.14			<0.03	mg/kg	TM30/PM17
Dissolved Boron #	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012			<0.012	mg/l	TM30/PM17
Dissolved Boron (A10) #	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12			<0.12	mg/kg	TM30/PM17
Dissolved Cadmium #	<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	mg/kg	TM30/PM17
Dissolved Chromium #	<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	mg/kg	TM30/PM17
Dissolved Copper #	<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	mg/kg	TM30/PM17
Dissolved Lead #	<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	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.006	0.005	<0.002	0.003	<0.002	0.003	<0.002	0.009			<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.05	<0.02	0.03	<0.02	0.03	<0.02	0.09			<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	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	mg/kg	TM30/PM17
Dissolved Selenium #	<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	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	0.004	0.004	<0.003	<0.003	<0.003	<0.003	<0.003			<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	0.04	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	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			<0.0001	mg/kg	TM61/PM38
Phenol	<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	mg/kg	TM26/PM0
Fluoride	0.4	<0.3	<0.3	0.4	1.2	0.3	1.5	<0.3			<0.3	mg/l	TM173/PM0
Fluoride	4	<3	<3	4	12	3	15	<3			<3	mg/kg	TM173/PM0
Sulphate as SO4 #	7.58	0.39	0.62	0.24	2.70	0.25	0.30	7.25			<0.05	mg/l	TM38/PM0
Sulphate as SO4 #	75.8	3.9	6.2	2.4	27.0	2.5	3.0	72.5			<0.5	mg/kg	TM38/PM0
Chloride #	0.7	0.3	0.6	0.6	0.5	0.5	0.5	<0.3			<0.3	mg/l	TM38/PM0
Chloride #	7	3	6	6	5	5	5	<3			<3	mg/kg	TM38/PM0
Ammoniacal Nitrogen as N #	1.23	0.03	0.07	0.03	0.03	0.03	0.05	0.04			<0.03	mg/l	TM38/PM0
Ammoniacal Nitrogen as N #	12.3	0.3	0.7	<0.3	0.3	0.3	0.5	0.4			<0.3	mg/kg	TM38/PM0
Dissolved Organic Carbon	5	4	9	2	<2	<2	5	<2			<2	mg/l	TM60/PM0
Dissolved Organic Carbon	50	40	90	<20	<20	<20	50	<20			<20	mg/kg	TM60/PM0
Total Dissolved Solids #	147	76	39	66	93	92	73	163			<35	mg/l	TM20/PM0
Total Dissolved Solids #	1471	760	390	660	930	920	730	1629			<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty
JE Job No.: 18/7953

Report : EN12457_2

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

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24								
Sample ID	BH02	BH04	BH06	BH08	BH10	BH12	BH14	BH15								
Depth	1.00	0.50	0.50	0.50	0.50	0.50	0.50	1.00								
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T								
Sample Date	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018	21/05/2018								
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1	1	1	1			Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Date of Receipt	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018	24/05/2018								
Solid Waste Analysis																
Total Organic Carbon #	0.15	0.41	0.65	0.47	0.13	0.52	1.09	0.13			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			6	-	-	<0.025	mg/kg	TM31/PM12
Sum of 7 PCBs #	<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			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	mg/kg	TM4/PM8
PAH Sum of 17	<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			0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	2.13	<0.03	<0.03	<0.03	0.75	0.26	0.24	0.14			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			0.04	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			0.5	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			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			0.01	0.2	2	<0.0001	mg/kg	TM61/PM38
Molybdenum #	0.06	0.05	<0.02	0.03	<0.02	0.03	<0.02	0.09			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			0.4	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			0.5	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			0.06	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			0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	<0.03	0.04	0.04	<0.03	<0.03	<0.03	<0.03	<0.03			4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1471	760	390	660	930	920	730	1629			4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	50	40	90	<20	<20	<20	50	<20			500	800	1000	<20	mg/kg	TM60/PM0
Dry Matter Content Ratio	79.3	87.3	79.7	82.0	84.0	84.6	78.9	86.0			-	-	-	<0.1	%	NONE/PM4
Eluate Volume	0.777	0.787	0.777	0.79	0.783	0.784	0.776	0.737			-	-	-		l	NONE/PM17
pH #	7.58	8.26	7.70	8.35	8.04	8.73	8.27	8.50			-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	4	<3	<3	4	12	3	15	<3			-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	75.8	3.9	6.2	2.4	27.0	2.5	3.0	72.5			1000	20000	50000	<0.5	mg/kg	TM38/PM0
Chloride #	7	3	6	6	5	5	5	<3			800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland **Matrix : Solid**
Reference: 7612-04-18
Location: Newcastle Lands
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
18/7953	1	BH02	1.00	1-3	No interpretation possible
18/7953	1	BH04	0.50	4-6	No interpretation possible
18/7953	1	BH06	0.50	7-9	No interpretation possible
18/7953	1	BH08	0.50	10-12	No interpretation possible
18/7953	1	BH10	0.50	13-15	No interpretation possible
18/7953	1	BH12	0.50	16-18	No interpretation possible
18/7953	1	BH14	0.50	19-21	No interpretation possible
18/7953	1	BH15	1.00	22-24	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 18/04/7612
Location: Newcastle Lands
Contact: Conor Finnerty

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, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/7953	1	BH02	1.00	2	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH04	0.50	5	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH06	0.50	8	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH08	0.50	11	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH10	0.50	14	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD

Client Name: Ground Investigations Ireland
Reference: 18/04/7612
Location: Newcastle Lands
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/7953	1	BH10	0.50	14	05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH12	0.50	17	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH14	0.50	20	05/06/2018	**General Description (Bulk Analysis)**	Soil/Stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD
18/7953	1	BH15	1.00	23	05/06/2018	**General Description (Bulk Analysis)**	soil-stones
					05/06/2018	**Asbestos Fibres**	NAD
					05/06/2018	**Asbestos Fibres (2)**	NAD
					05/06/2018	**Asbestos ACM**	NAD
					05/06/2018	**Asbestos ACM (2)**	NAD
					05/06/2018	**Asbestos Type**	NAD
					05/06/2018	**Asbestos Type (2)**	NAD
					05/06/2018	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland

Reference: 7612-04-18

Location: Newcastle Lands

Contact: Conor Finnerty

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/7953	1	BH02	1.00	1-3	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH04	0.50	4-6	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH06	0.50	7-9	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH08	0.50	10-12	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH10	0.50	13-15	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH12	0.50	16-18	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH14	0.50	19-21	GRO	Solid Samples were received at a temperature above 9°C.
18/7953	1	BH15	1.00	22-24	GRO	Solid Samples were received at a temperature above 9°C.

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.

Client Name: Ground Investigations Ireland

Reference: 7612-04-18

Location: Newcastle Lands

Contact: Conor Finnerty

Matrix : CEN 10:1 1 Batch

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/7953	1	BH14	0.50	19-21	TDS	Sample holding time exceeded
18/7953	1	BH15	1.00	22-24	TDS	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

JE Job No.: 18/7953

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. 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.

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

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

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.

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.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental 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
AA	x10 Dilution

JE Job No: 18/7953

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 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 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 8270 method for the solvent extraction and determination of 16 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 USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	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 USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	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 8270. 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 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. 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

JE Job No: 18/7953

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
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	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 Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	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 Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 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
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes

JE Job No: 18/7953

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 the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	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
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	Dried and ground solid sample is boiled with dilute hydrochloric acid, the resulting liquor is then analysed.	Yes		AD	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	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 and 9045D and BS1377:1990. 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
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes
TM108	Determination of Elemental Sulphur by Reversed Phase High Performance Liquid Chromatography with Ultra Violet spectroscopy.	PM114	End over end extraction of dried and crushed soil samples for organic analysis. The solvent mix varies depending on analysis required			AD	Yes

JE Job No: 18/7953

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
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 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 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.

Laboratory Report

2788

GEO Site & Testing Services Ltd

Contract Number: 39415

Client Ref:

Client PO: **7612-04-18**

Report Date: **18-06-2018**

Client **Ground Investigation Ireland**
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin

Contract Title: **Newcastle Lands**

For the attention of: **Sara Worth**

Date Received: **25-05-2018**

Date Commenced: **25-05-2018**

Date Completed: **18-06-2018**

Test Description	Qty
Moisture Content BS 1377 : Part 2 : 3.2 - * UKAS	35
4 Point Liquid & Plastic Limit (LL/PL) BS 1377 Part 2 : 4.3 & 5.3 - * UKAS	35
PSD Wet Sieve method BS 1377 : 1990 Part 2 : 9.2 - * UKAS	35
Organic Matter Content-dichromate method 1377 : 1990 Part 3 : 3 - @ Non Accredited Test	33
Acid Soluble Sulphate 1377 : 1990 Part 3 : 5 - @ Non Accredited Test	33
Water Soluble Sulphate 2:1 extract 1377 : 1990 Part 3 : 5 - @ Non Accredited Test	33
pH Value of Soil. BS1377-3:1990 Cl9 - @ Non Accredited Test	15

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative/Accounts Assistant)
Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

Laboratory Report

2788

GEO Site & Testing Services Ltd

Contract Number: 39415

Test Description	Qty
Determination of the Total Sulphur content of Soil 1377 : 1990 BRE Dependant Options - @ Non Accredited Test	33
CBR: Remoulded Specimen and tested at top only BS1377 : 1990 Part 4 : 7 - * UKAS	7
Disposal of Samples on Project	1

Notes: **Observations and Interpretations are outside the UKAS Accreditation**
*** - denotes test included in laboratory scope of accreditation**
 # - denotes test carried out by approved contractor
@ - denotes non accredited tests

Approved Signatories:
Alex Wynn (Associate Director) - Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager)
Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) - Sean Penn (Administrative/Accounts Assistant)
Wayne Honey (Administrative/Quality Assistant)

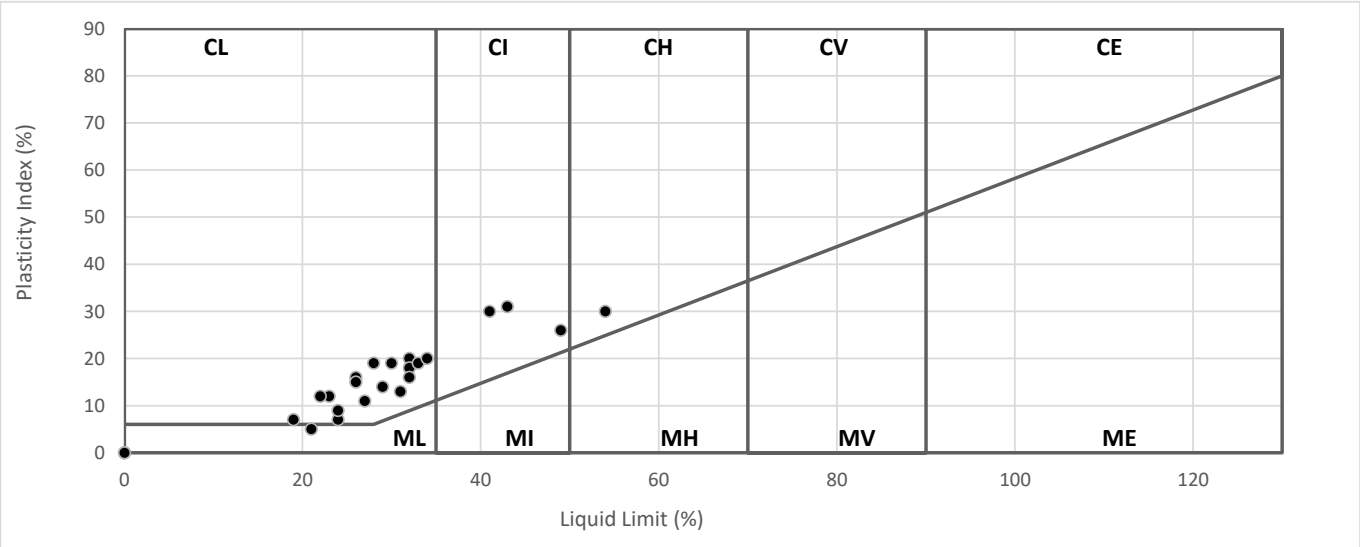
GEO Site & Testing Services Ltd
Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN
Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)	
Contract Number	**39415**	
Site Name	**Newcastle Lands**	

Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
BH01		B	0.50	-		27	54	24	30	64	CH High Plasticity
BH01		B	3.00	-		7.1	21	16	5	42	ML Low Plasticity
BH03		B	1.00	-		14	43	12	31	50	CI Intermediate Plasticity
BH03		B	4.00	-		13	23	11	12	62	CL Low Plasticity
BH04		B	3.00	-		8.9	19	12	7	32	CL Low Plasticity
BH05		B	1.50	-		12	29	15	14	25	CL Low Plasticity
BH06		B	1.00	-		14	32	12	20	53	CL Low Plasticity
BH06		B	4.00	-		14	41	11	30	42	CI Intermediate Plasticity
BH07		B	1.00	-		15	32	14	18	33	CL Low Plasticity
BH07		B	3.00	-		12	26	10	16	33	CL Low Plasticity
BH08		B	1.50	-		17	33	14	19	67	CL Low Plasticity
BH08		B	4.00	-		12	32	16	16	63	CL Low Plasticity
BH09		B	2.00	-		18	34	14	20	50	CL Low Plasticity
BH10		B	1.50	-		13	24	17	7	56	CL Low Plasticity
BH10		B	5.00	-		16	31	18	13	78	CL Low Plasticity
BH11		B	2.00	-		12	27	16	11	50	CL Low Plasticity
BH12		B	2.00	-		11	28	9	19	22	CL Low Plasticity
BH13		B	1.50	-		11	24	15	9	36	CL Low Plasticity
BH14		B	1.00	-		25	49	23	26	76	CI Intermediate Plasticity
BH14		B	3.00	-		11	22	10	12	27	CL Low Plasticity
BH15		B	0.50	-		13	30	11	19	15	CL Low Plasticity
BH15		B	3.00	-		13	26	11	15	60	CL Low Plasticity
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Operators	Checked	17-06-18	Emma Sharp	
DB	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL

LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX
(BS 1377 : Part 2 : 1990 Method 5)

Contract Number	**39415**
Site Name	**Newcastle Lands**

Hole Reference	Sample Number	Sample Type	Depth (m)			Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing .425mm %	Remarks
TP01		B	3.40	-		13	28	11	17	56	CL Low Plasticity
TP06		B	3.00	-		8.8	23	13	10	67	CL Low Plasticity
TP09		B	0.00	-	1.80	8.9	26	15	11	25	CL Low Plasticity
TP10		B	3.50	-		8.9	19	1	18	26	CL Low Plasticity
TP13		B	3.40	-		10	24	12	12	50	CL Low Plasticity
TP15		B	2.50	-		12	25	14	11	54	CL Low Plasticity
TP19		B	2.80	-		10	26	14	12	65	CL Low Plasticity
TP26		B	1.50	-		30	46	26	20	75	CI Intermediate Plasticity
TP32		B	3.00	-		21	34	27	7	89	ML Low Plasticity
TP38		B	2.80	-		12	29	15	14	47	CL Low Plasticity
TP43		B	2.50	-		12	28	16	12	62	CL Low Plasticity
TP49		B	2.50	-		13	34	11	23	77	CL Low Plasticity
TP54		B	1.00	-		73	95	43	52	82	ME Extremely High Plasticity
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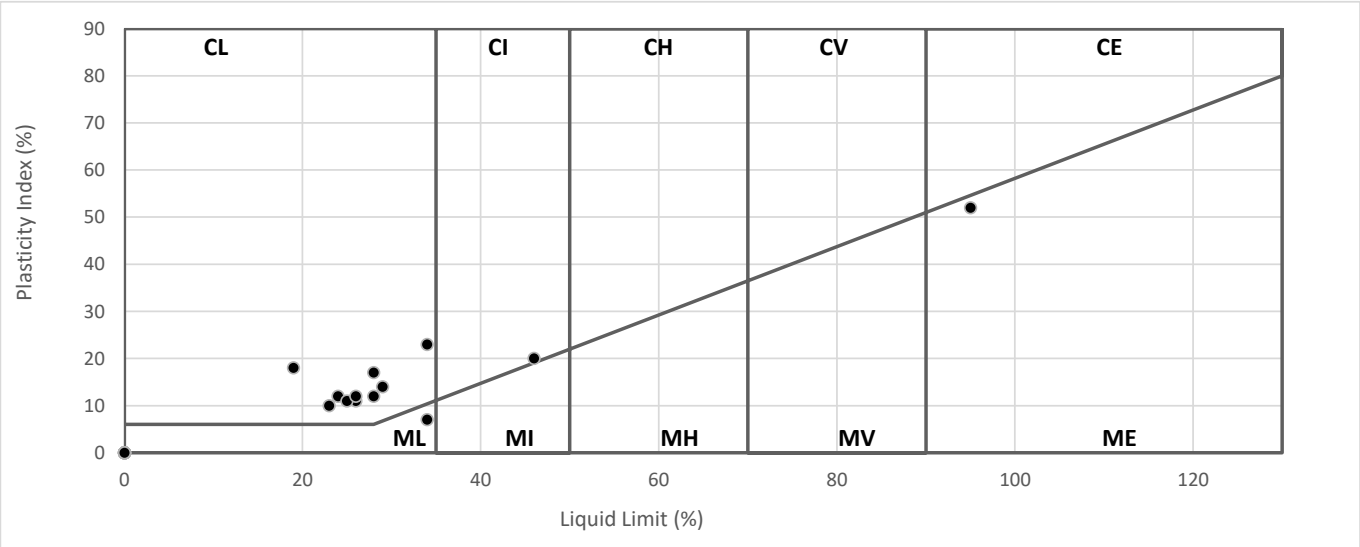
Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION
BS 5930:1999+A2:2010



Operators	Checked	17-06-18	Emma Sharp	
DB	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	Certificate of Chemical Analysis (BRE BR 279)	Contract Number	39415
		Client Reference	7612-04-18
Client	Ground Investigation Ireland	Date Received	
Site Name	Newcastle Lands	Date Started	04-06-18
		Date Completed	18-06-18
		No. of Samples	30

Hole Number	Sample Number	Sample Type	Depth (m)			Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	Ph Value	Total Sulphur	Magnesium	Nitrate
BH01		SB	1.50	-					7.89			
BH02		SB	1.00	-		0.29	0.02			0.12		
BH03		SB	0.50	-		0.31	0.03			0.13		
BH03		SB	3.00	-		0.27	0.05		7.94	0.11		
BH04		SB	0.50	-		0.21	0.04			0.09		
BH05		SB	0.50	-		0.56	0.03		8.02	0.21		
BH06		SB	0.50	-		0.39	0.06			0.15		
BH07		SB	1.50	-		0.27	0.05		8.11	0.11		
BH08		SB	0.50	-		0.21	0.04			0.09		
BH09		SB	0.50	-		0.27	0.03		7.64	0.11		
BH10		SB	0.50	-		0.33	0.04			0.13		
BH11		SB	1.00	-		0.23	0.05		7.80	0.10		
BH12		SB	0.50	-		0.27	0.03			0.11		
BH13		SB	0.50	-		0.21	0.04		7.50	0.09		
BH14		SB	0.50	-		0.23	0.02			0.10		
BH15		SB	1.00	-		0.29	0.03			0.12		
BH15		SB	2.00	-					7.77			
TP01		SB	0.50	-		0.29	0.02		7.49	0.12		
TP02		SB	0.60	-		0.25	0.03			0.10		
TP03		SB	0.50	-		0.33	0.03			0.14		
TP04		SB	0.90	-		0.23	0.02		7.63	0.10		
TP05		SB	2.50	-		0.31	0.04			0.12		
TP06		SB	0.80	-		0.25	0.02			0.10		
TP13		SB	3.40	-		0.21	0.03		7.44	0.09		
TP19		SB	0.80	-		0.35	0.04		7.75	0.15		
TP20		SB	1.20	-		0.29	0.03			0.12		
TP21		SB	2.00	-		0.29	0.03			0.12		
TP22		SB	0.80	-		0.19	0.03			0.08		
TP26		SB	1.50	-		0.27	0.02		7.26	0.11		
TP27		SB	1.50	-		0.33	0.04			0.13		

Key	Reported As
Acid Soluble Sulphate	% SO_4
Aqueous Extract Sulphate	g/l SO_4
Chloride Content (Semi)	mg Cl/l
PH Value	@ 25°
Total Sulphur	% S
Magnesium	g/l SO_4
Nitrate	NO_3 mg/l

Remarks

NCP = No Chloride Present

Test Operator	Checked and Authorised by		Ben Sharp	
Darren Bourne	Date	18-06-18		

GSTL	Certificate of Chemical Analysis (BRE BR 279)	Contract Number	39415
		Client Reference	7612-04-18
Client	Ground Investigation Ireland	**Date Received**	
Site Name	Newcastle Lands	**Date Started**	04-06-18
		Date Completed	18-06-18
		No. of Samples	5

Hole Number	Sample Number	Sample Type	Depth (m)			Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	Ph Value	Total Sulphur	Magnesium	Nitrate
TP33		SB	2.50	-		0.35	0.03		7.60	0.14		
TP36		SB	2.00	-		0.27	0.03			0.11		
TP47		SB	1.50	-		0.21	0.02			0.09		
TP49		SB	2.50	-		0.29	0.03		7.39	0.12		
TP54		SB	1.00	-		0.29	0.04			0.12		
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Key	Reported As
Acid Soluble Sulphate	% SO_4
Aqueous Extract Sulphate	g/l SO_4
Chloride Content (Semi)	mg Cl/l
PH Value	@ 25°
Total Sulphur	% S
Magnesium	g/l SO_4
Nitrate	NO_3 mg/l

Remarks

NCP = No Chloride Present

Test Operator	Checked and Authorised by		Ben Sharp	
Darren Bourne	Date	18-06-18		

GSTL	Certificate of Chemical Analysis onsuling	Contract Number	39415
		Client Reference	7612-04-18
Client	Ground Investigation Ireland	**Date Received**	
Site Name	Newcastle Lands	**Date Started**	04-06-18
		Date Completed	18-06-18
		No. of Samples	30

Hole Number	Sample Number	Sample Type	Depth (m)			Acid Soluble Sulphate	Aqueous Extract Sulphate	Water Soluble Chloride	PH Value	Organic Matter Content	Acid Soluble Chloride	Loss On Ignition
BH02		SB	1.00	-						1.4		
BH03		SB	0.50	-						1.6		
BH03		SB	3.00	-						1.5		
BH04		SB	0.50	-						1		
BH05		SB	0.50	-						1.2		
BH06		SB	0.50	-						1.3		
BH07		SB	1.50	-						1.7		
BH08		SB	0.50	-						1.4		
BH09		SB	0.50	-						0.9		
BH10		SB	0.50	-						2		
BH11		SB	1.00	-						2.2		
BH12		SB	0.50	-						2		
BH13		SB	0.50	-						1.6		
BH14		SB	0.50	-						1.7		
BH15		SB	1.00	-						2.1		
TP01		SB	0.50	-						1.3		
TP02		SB	0.60	-						1.9		
TP03		SB	0.50	-						1.7		
TP04		SB	0.90	-						2		
TP05		SB	2.50	-						1.4		
TP06		SB	0.80	-						1.6		
TP13		SB	3.40	-						1.8		
TP19		SB	2.80	-						1		
TP20		SB	1.20	-						1.9		
TP21		SB	2.00	-						1.4		
TP22		SB	0.80	-						2		
TP26		SB	1.50	-						2.8		
TP27		SB	1.50	-						1.9		
TP33		SB	2.50	-						1.3		
TP36		SB	2.00	-						0.4		

Key	**Reported As**	**Clause**
Acid Soluble Sulphate	% SO_3	Clause 5.2 & 5.5
Aqueous Extract Sulphate	g/l SO_3	Clause 5.3 & 5.5
2/1 Chloride	%	Clause 7.2
PH Value	@ 25°	Clause 9.5
Organic	%	Clause 3
Redox Mv	Mv	Clause 4
LOI	%	Clause 4

Remarks

NCP = No Chloride Present

Test Operator	Checked and Authorised by		Ben Sharp	
Darren Bourne	Date	18-06-18		

GSTL	Certificate of Chemical Analysis onsuling	Contract Number	39415
		Client Reference	7612-04-18
Client	Ground Investigation Ireland	**Date Received**	
Site Name	Newcastle Lands	**Date Started**	04-06-18
		Date Completed	18-06-18
		No. of Samples	3

Hole Number	Sample Number	Sample Type	Depth (m)			Acid Soluble Sulphate	Aqueous Extract Sulphate	Water Soluble Chloride	PH Value	Organic Matter Content	Acid Soluble Chloride	Loss On Ignition
TP47		SB	1.50	-						1.4		
TP49		SB	2.50	-						3		
TP54		SB	1.00	-						8.6		
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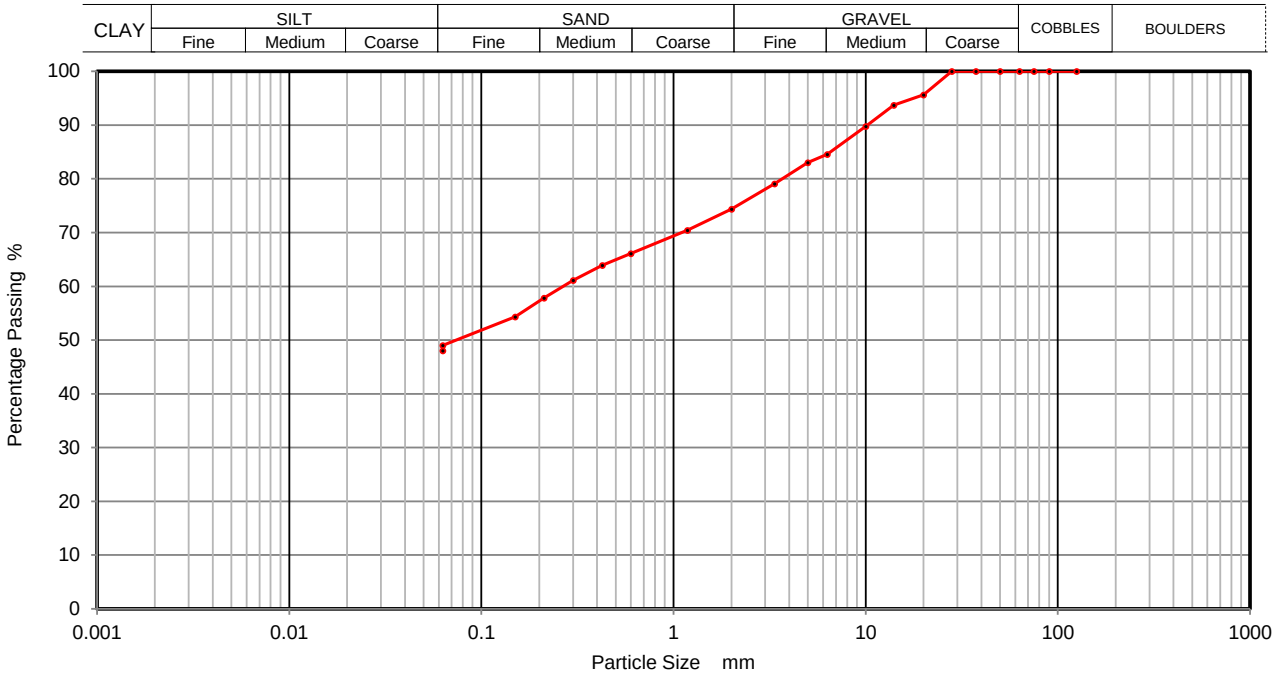
Key	**Reported As**	**Clause**
Acid Soluble Sulphate	% SO_3	Clause 5.2 & 5.5
Aqueous Extract Sulphate	g/l SO_3	Clause 5.3 & 5.5
2/1 Chloride	%	Clause 7.2
PH Value	@ 25°	Clause 9.5
Organic	%	Clause 3
Redox Mv	Mv	Clause 4
LOI	%	Clause 4

Remarks

NCP = No Chloride Present

Test Operator	Checked and Authorised by		Ben Sharp	
Darren Bourne	Date	18-06-18		

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH01
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	0.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	94		
10	90		
6.3	85		
5	83		
3.35	79		
2	74		
1.18	70		
0.6	66		
0.425	64		
0.3	61		
0.212	58		
0.15	54		
0.063	49		

Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	25
Silt and Clay	49

Grading Analysis	
Uniformity Coefficient	

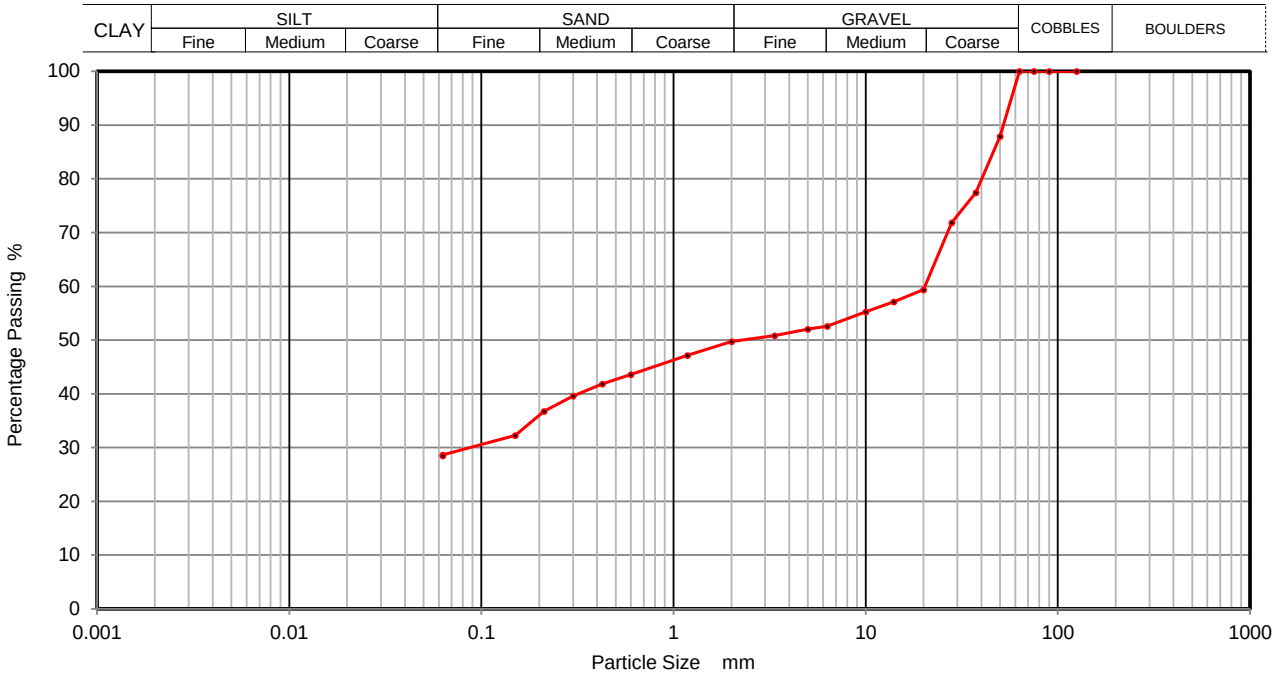
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH01
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	88		
37.5	77		
28	72		
20	59		
14	57		
10	55		
6.3	53		
5	52		
3.35	51		
2	50		
1.18	47		
0.6	44		
0.425	42		
0.3	40		
0.212	37		
0.15	32		
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	50
Sand	21
Silt and Clay	29

Grading Analysis	
Uniformity Coefficient	

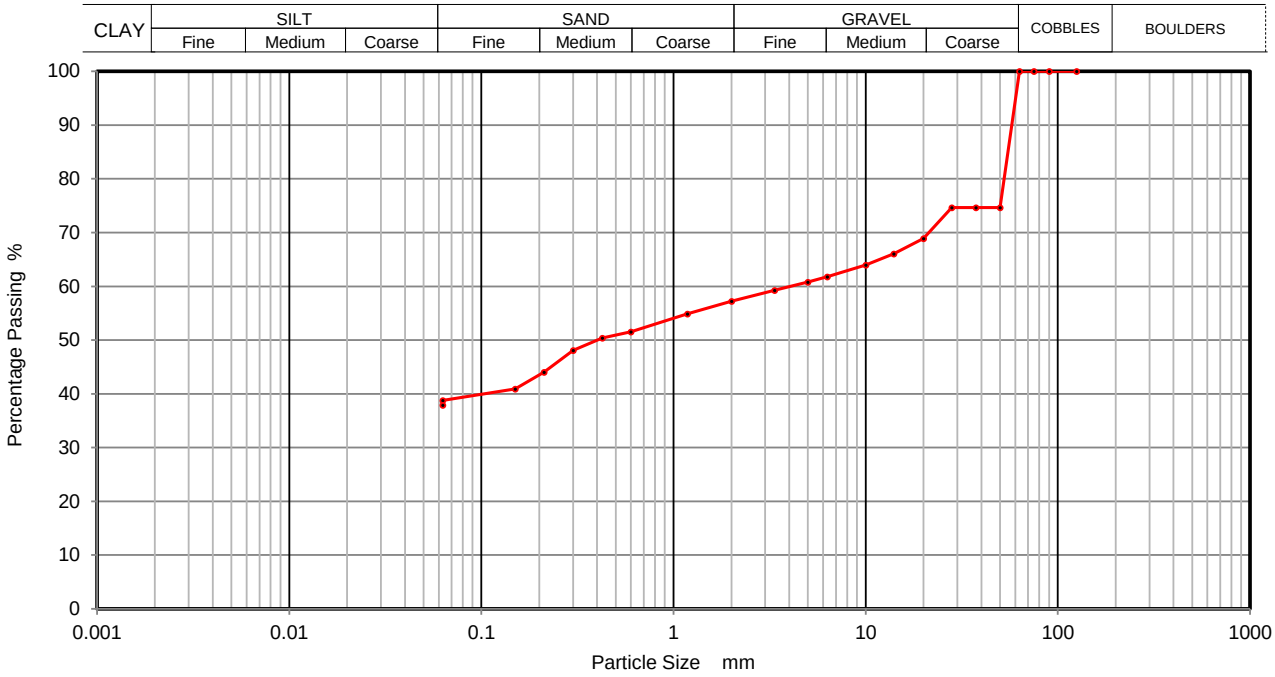
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH03
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	1.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	75		
37.5	75		
28	75		
20	69		
14	66		
10	64		
6.3	62		
5	61		
3.35	59		
2	57		
1.18	55		
0.6	52		
0.425	50		
0.3	48		
0.212	44		
0.15	41		
0.063	39		

Sample Proportions	% dry mass
Cobbles	0
Gravel	43
Sand	18
Silt and Clay	39

Grading Analysis	
Uniformity Coefficient	

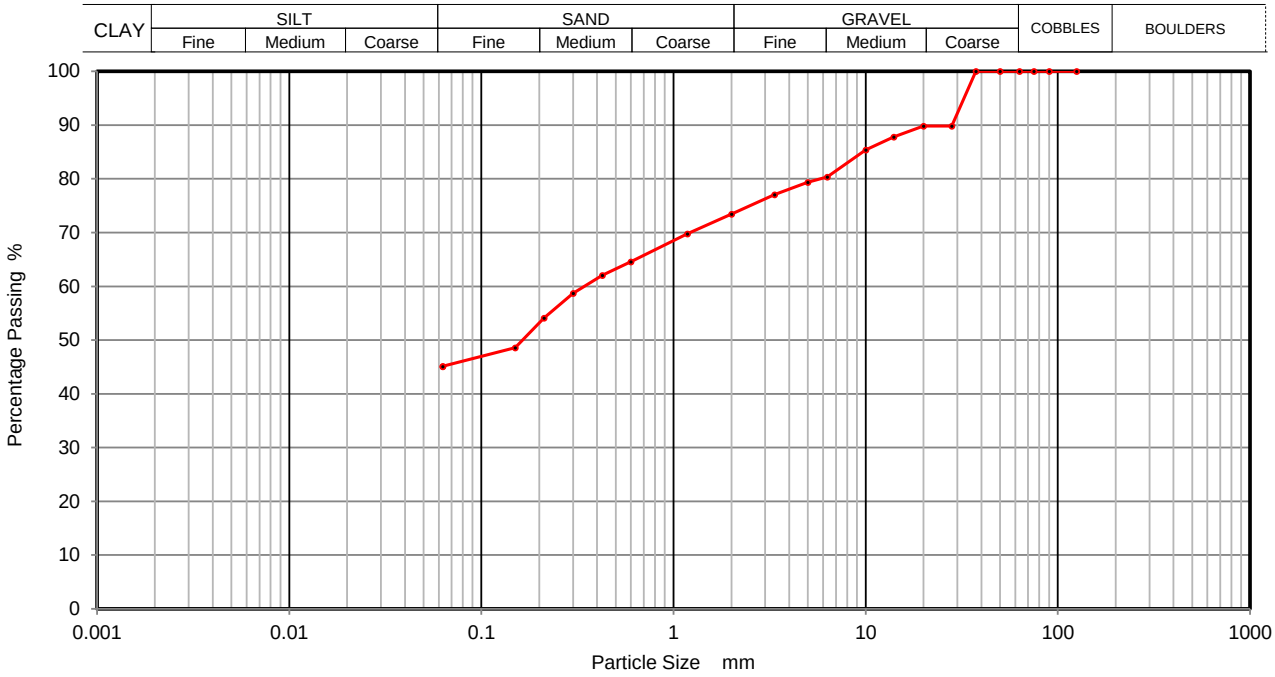
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH03
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	4.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	90		
20	90		
14	88		
10	85		
6.3	80		
5	79		
3.35	77		
2	73		
1.18	70		
0.6	65		
0.425	62		
0.3	59		
0.212	54		
0.15	49		
0.063	45		

Sample Proportions	% dry mass
Cobbles	0
Gravel	27
Sand	28
Silt and Clay	45

Grading Analysis	
Uniformity Coefficient	

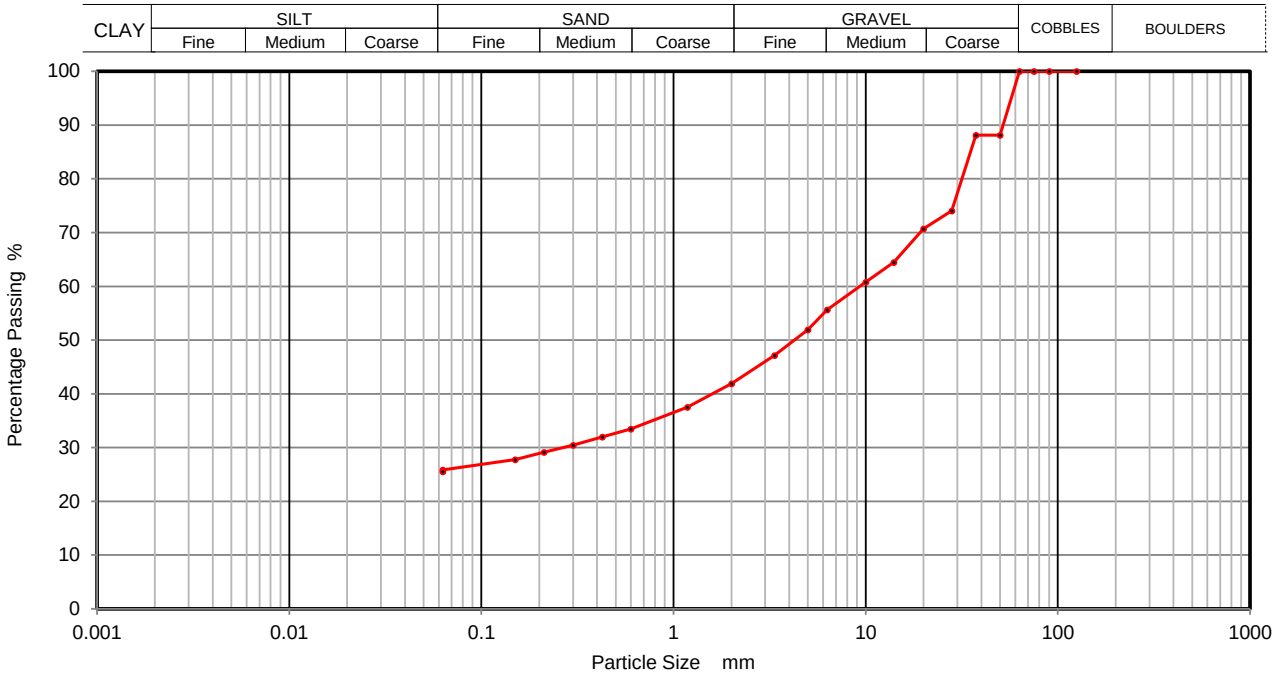
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH04
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	88		
37.5	88		
28	74		
20	71		
14	64		
10	61		
6.3	56		
5	52		
3.35	47		
2	42		
1.18	38		
0.6	33		
0.425	32		
0.3	30		
0.212	29		
0.15	28		
0.063	26		

Sample Proportions	% dry mass
Cobbles	0
Gravel	58
Sand	16
Silt and Clay	26

Grading Analysis	
Uniformity Coefficient	

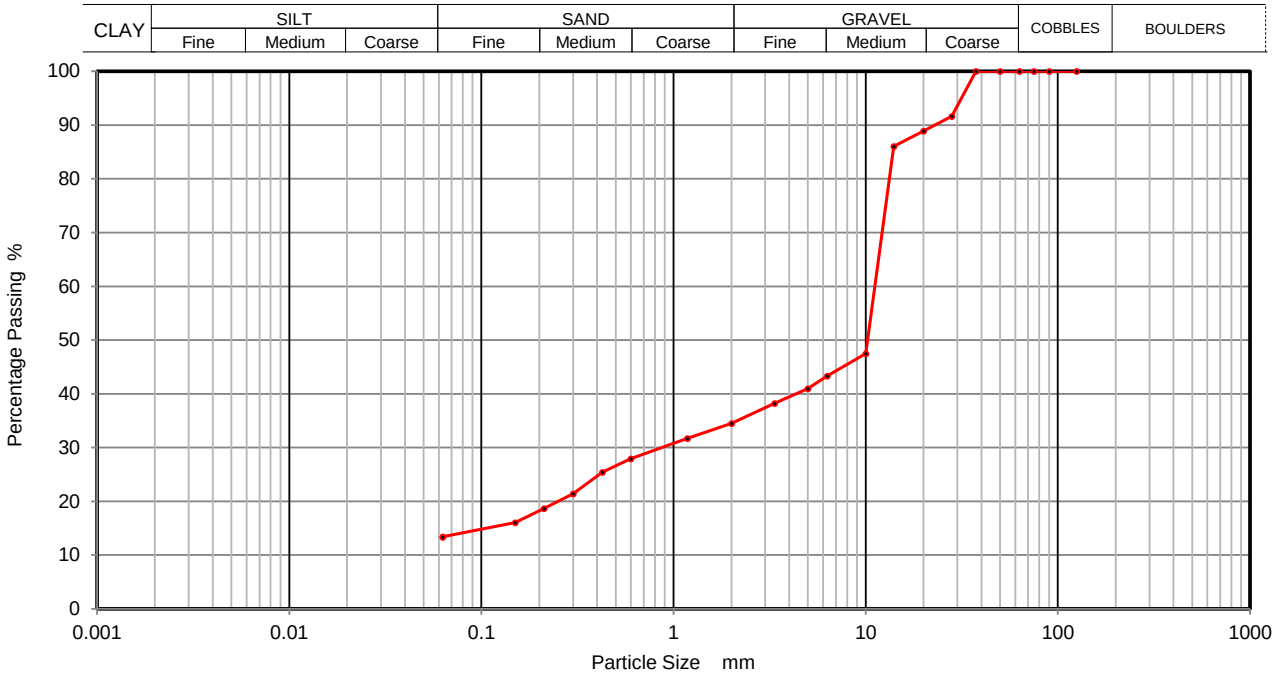
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH05
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL.	Depth Top	1.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	92		
20	89		
14	86		
10	48		
6.3	43		
5	41		
3.35	38		
2	35		
1.18	32		
0.6	28		
0.425	25		
0.3	21		
0.212	19		
0.15	16		
0.063	13		

Sample Proportions	% dry mass
Cobbles	0
Gravel	65
Sand	22
Silt and Clay	13

Grading Analysis	
Uniformity Coefficient	

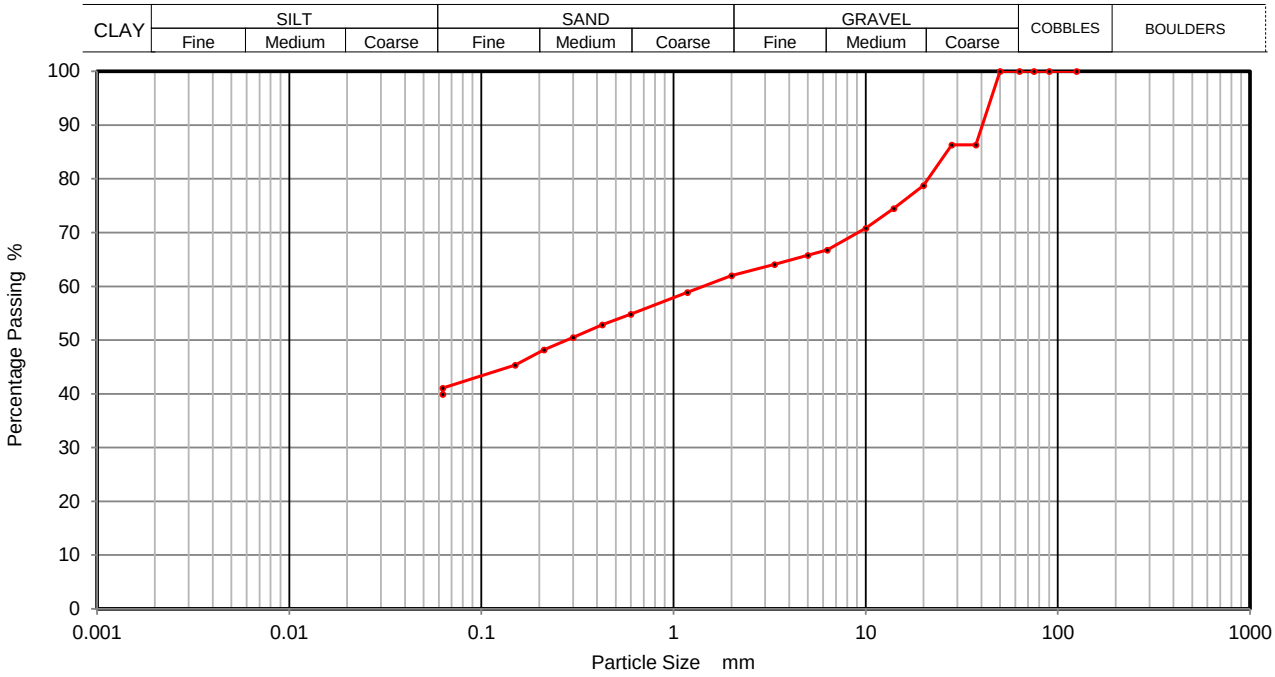
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH06
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	1.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	86		
28	86		
20	79		
14	74		
10	71		
6.3	67		
5	66		
3.35	64		
2	62		
1.18	59		
0.6	55		
0.425	53		
0.3	51		
0.212	48		
0.15	45		
0.063	41		

Sample Proportions	% dry mass
Cobbles	0
Gravel	38
Sand	21
Silt and Clay	41

Grading Analysis	
Uniformity Coefficient	

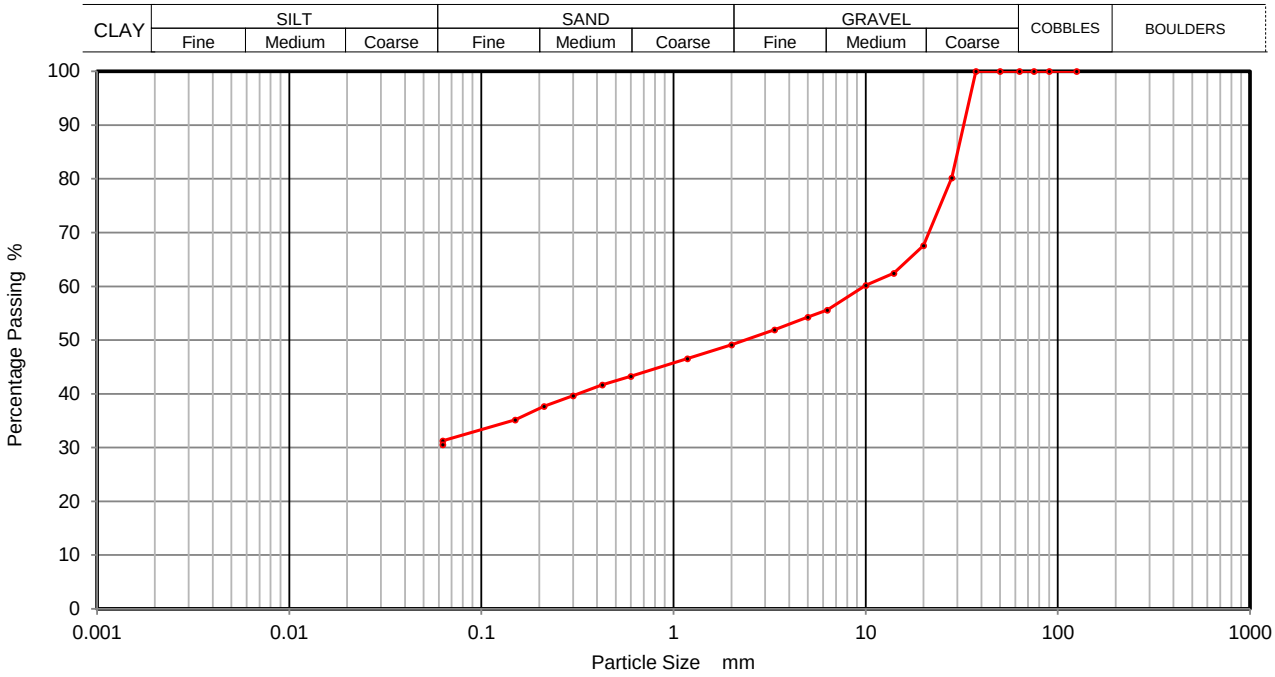
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH06
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	4.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	80		
20	68		
14	62		
10	60		
6.3	56		
5	54		
3.35	52		
2	49		
1.18	47		
0.6	43		
0.425	42		
0.3	40		
0.212	38		
0.15	35		
0.063	31		

Sample Proportions	% dry mass
Cobbles	0
Gravel	51
Sand	18
Silt and Clay	31

Grading Analysis	
Uniformity Coefficient	

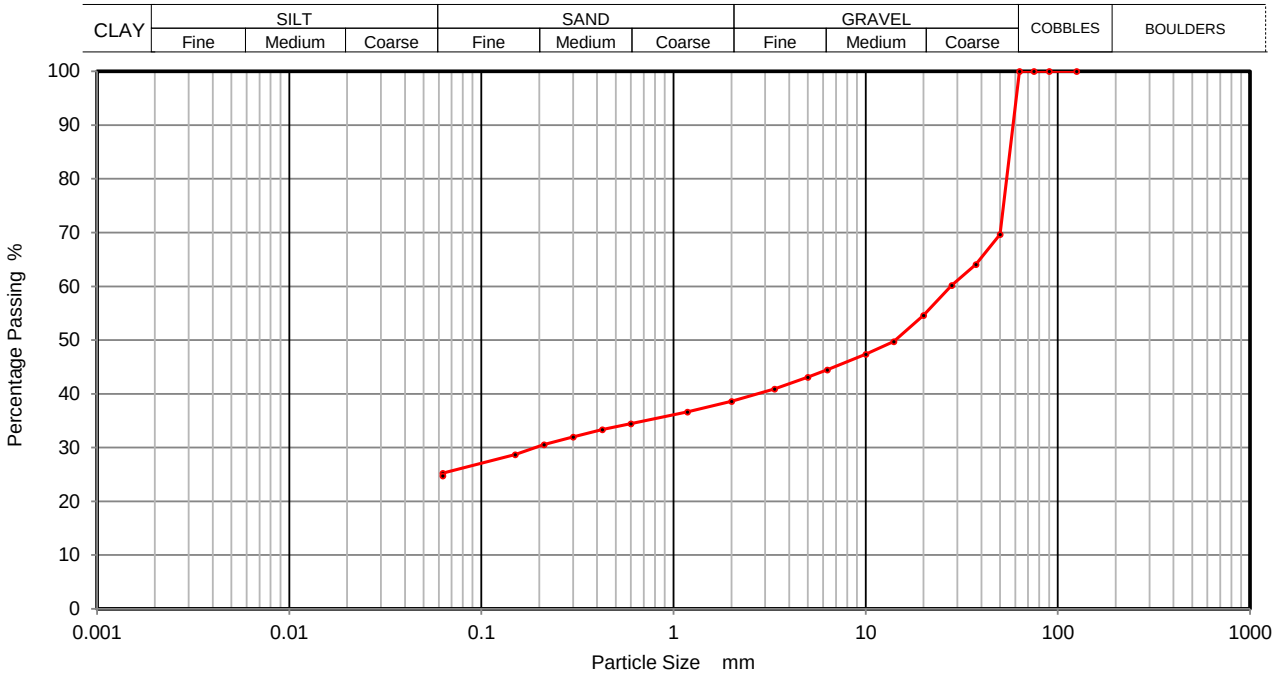
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH07
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	1.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	70		
37.5	64		
28	60		
20	55		
14	50		
10	47		
6.3	44		
5	43		
3.35	41		
2	39		
1.18	37		
0.6	34		
0.425	33		
0.3	32		
0.212	31		
0.15	29		
0.063	25		

Sample Proportions	% dry mass
Cobbles	0
Gravel	61
Sand	14
Silt and Clay	25

Grading Analysis	
Uniformity Coefficient	

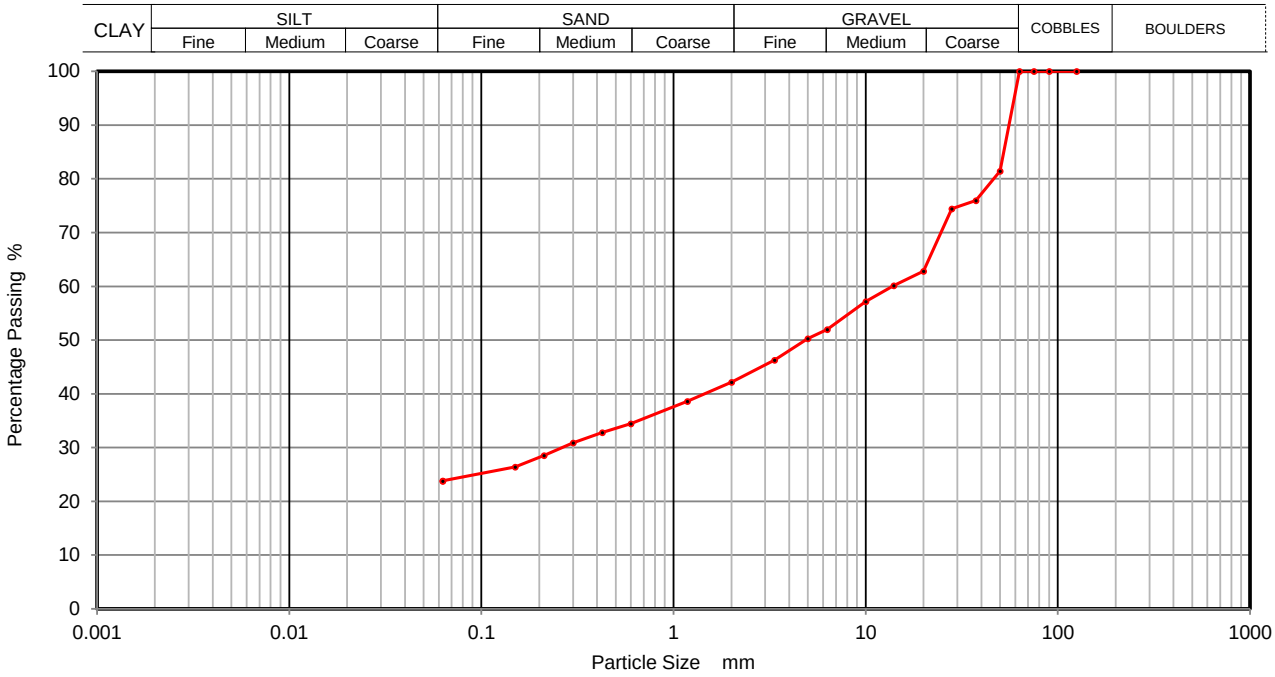
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH07
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	81		
37.5	76		
28	74		
20	63		
14	60		
10	57		
6.3	52		
5	50		
3.35	46		
2	42		
1.18	39		
0.6	34		
0.425	33		
0.3	31		
0.212	29		
0.15	26		
0.063	24		

Sample Proportions	% dry mass
Cobbles	0
Gravel	58
Sand	18
Silt and Clay	24

Grading Analysis	
Uniformity Coefficient	

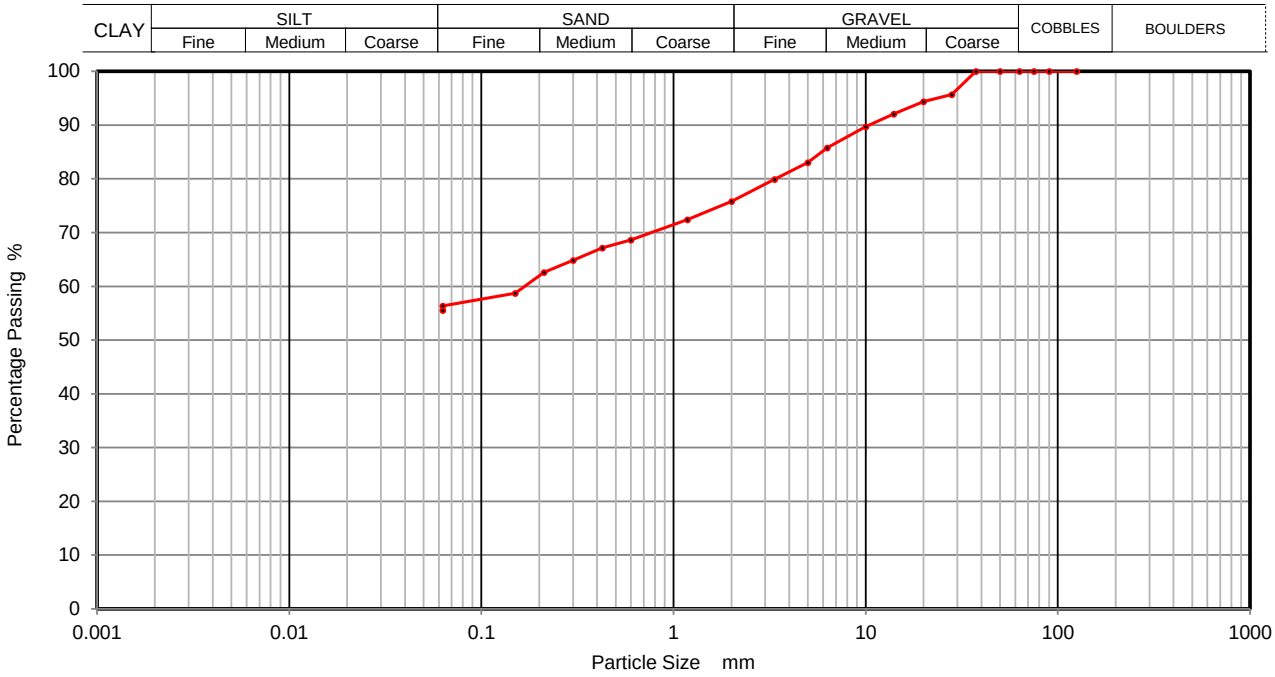
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH08
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	1.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	96		
20	94		
14	92		
10	90		
6.3	86		
5	83		
3.35	80		
2	76		
1.18	72		
0.6	69		
0.425	67		
0.3	65		
0.212	63		
0.15	59		
0.063	56		

Sample Proportions	% dry mass
Cobbles	0
Gravel	24
Sand	20
Silt and Clay	56

Grading Analysis	
Uniformity Coefficient	

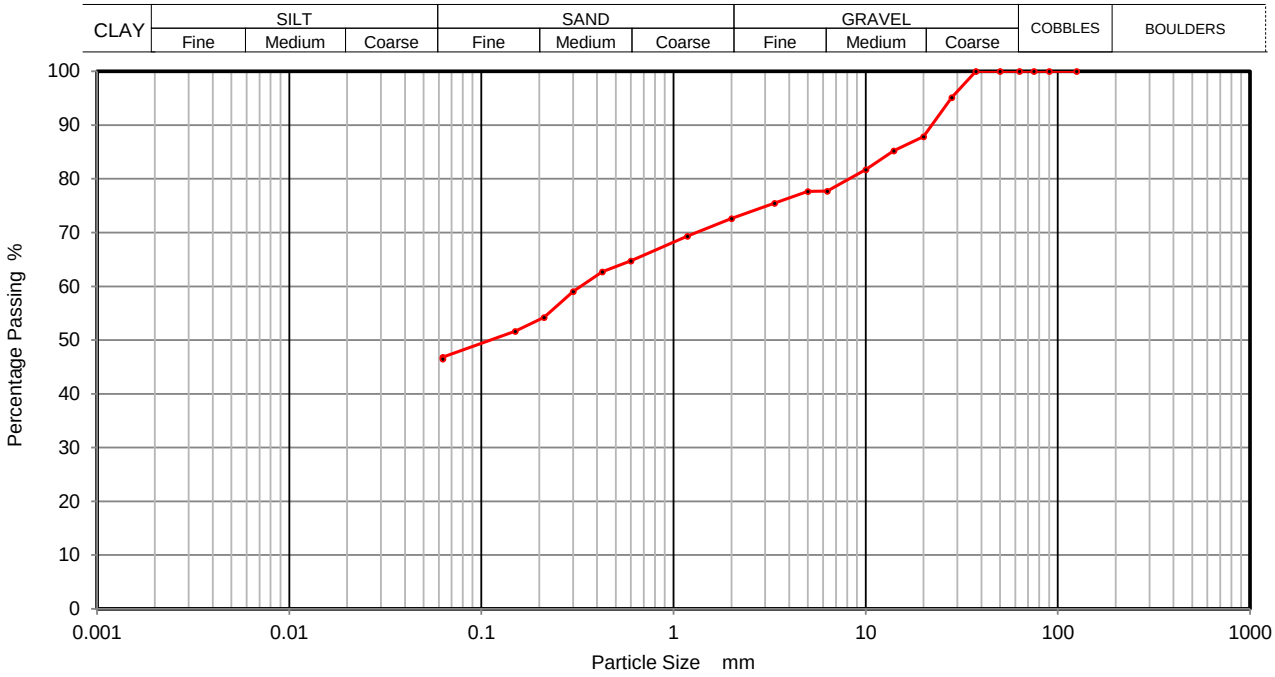
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH08
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	4.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	95		
20	88		
14	85		
10	82		
6.3	78		
5	78		
3.35	75		
2	73		
1.18	69		
0.6	65		
0.425	63		
0.3	59		
0.212	54		
0.15	52		
0.063	47		

Sample Proportions	% dry mass
Cobbles	0
Gravel	27
Sand	26
Silt and Clay	47

Grading Analysis	
Uniformity Coefficient	

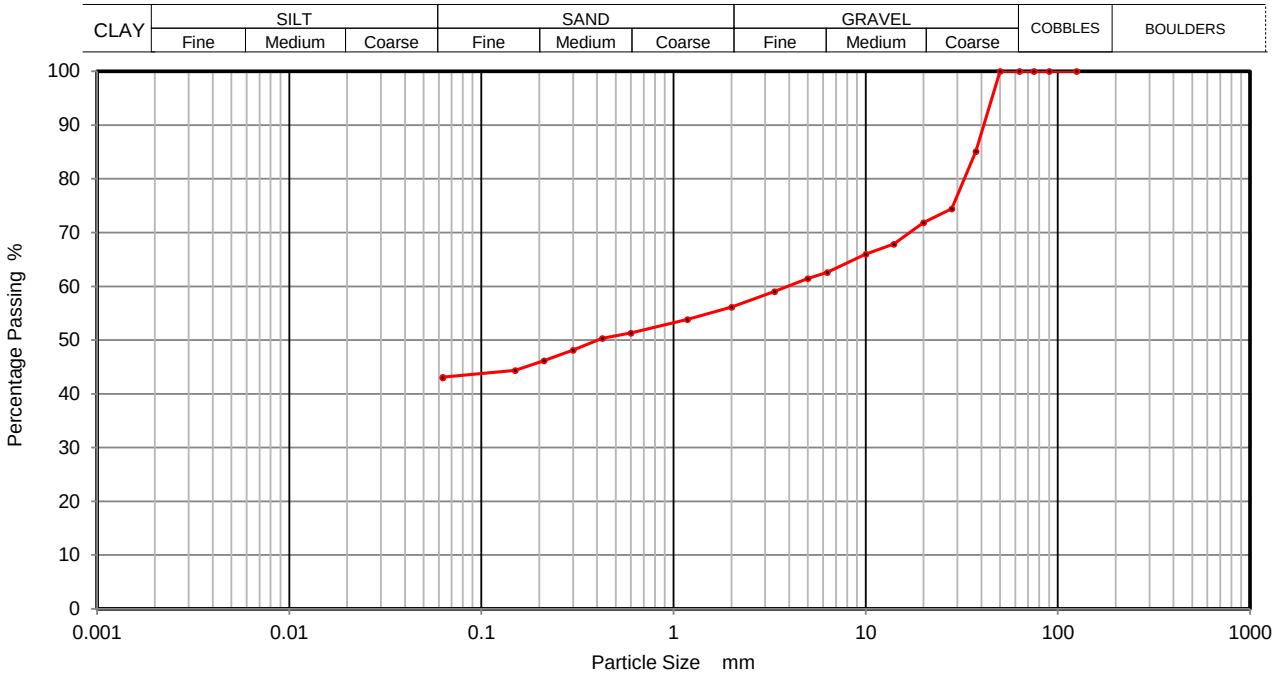
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH09
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	2.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	85		
28	74		
20	72		
14	68		
10	66		
6.3	63		
5	61		
3.35	59		
2	56		
1.18	54		
0.6	51		
0.425	50		
0.3	48		
0.212	46		
0.15	44		
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	44
Sand	13
Silt and Clay	43

Grading Analysis	
Uniformity Coefficient	

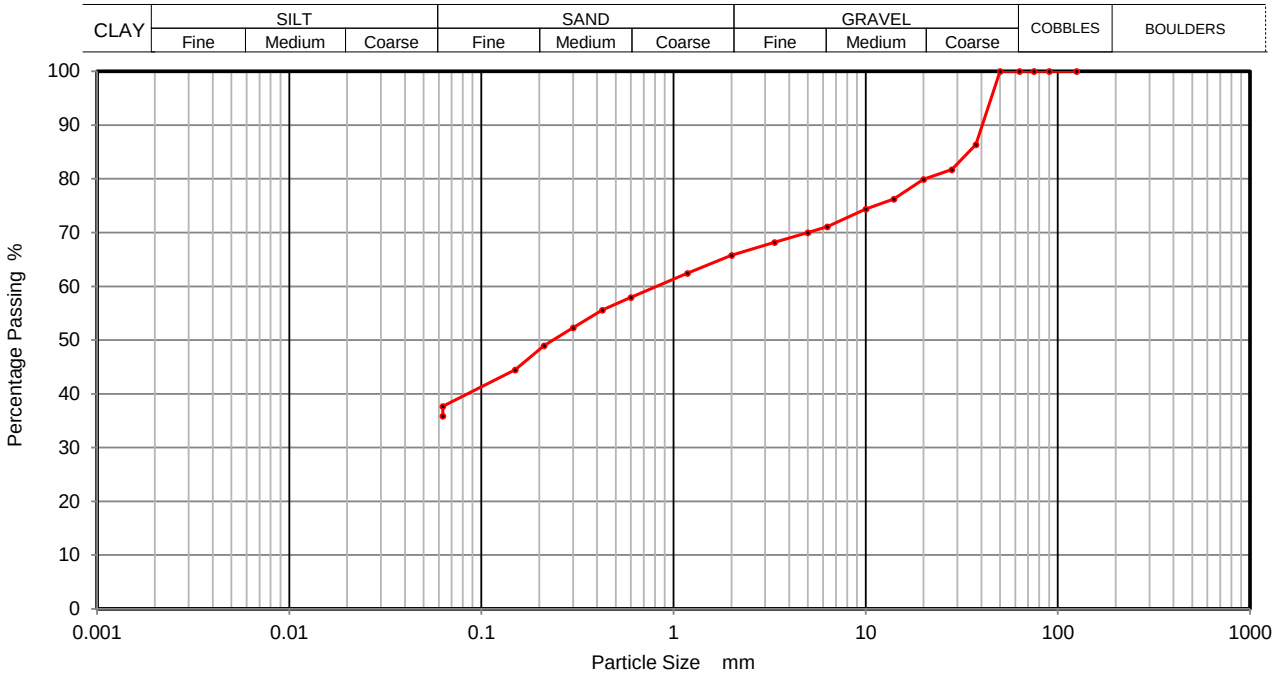
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH10
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	1.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	86		
28	82		
20	80		
14	76		
10	74		
6.3	71		
5	70		
3.35	68		
2	66		
1.18	62		
0.6	58		
0.425	56		
0.3	52		
0.212	49		
0.15	44		
0.063	38		

Sample Proportions	% dry mass
Cobbles	0
Gravel	34
Sand	28
Silt and Clay	38

Grading Analysis	
Uniformity Coefficient	

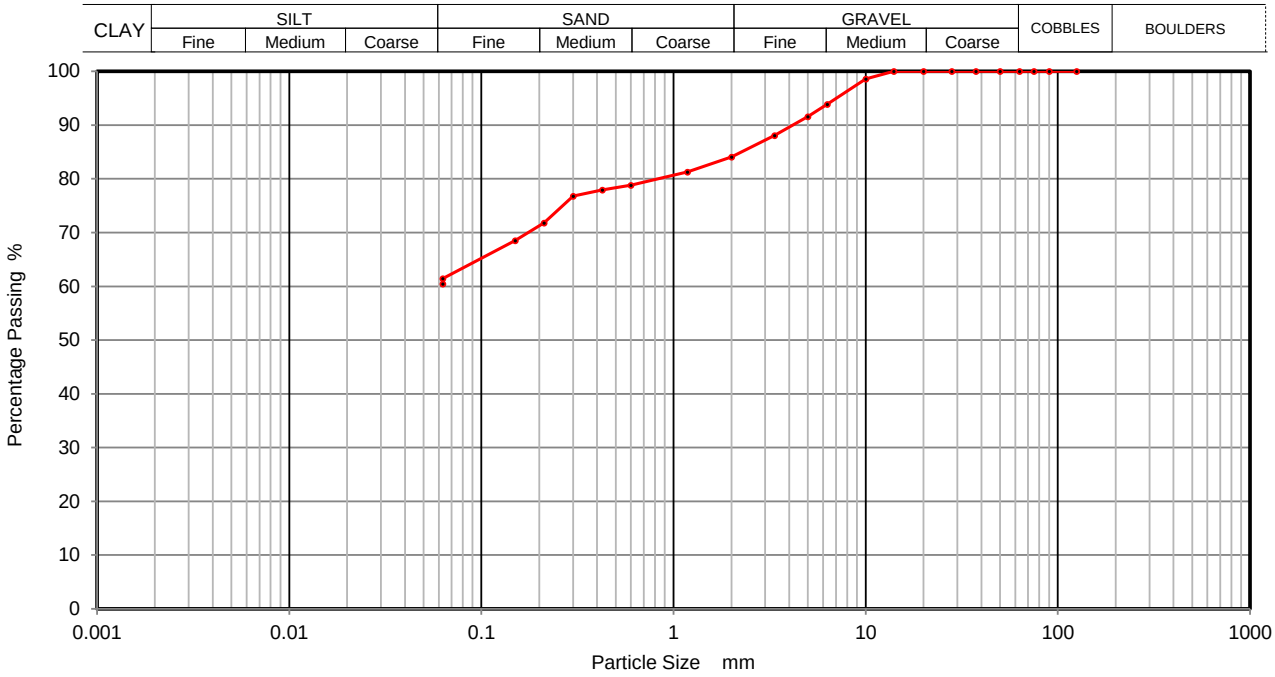
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH10
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	5.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	94		
5	92		
3.35	88		
2	84		
1.18	81		
0.6	79		
0.425	78		
0.3	77		
0.212	72		
0.15	69		
0.063	61		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	23
Silt and Clay	61

Grading Analysis	
Uniformity Coefficient	

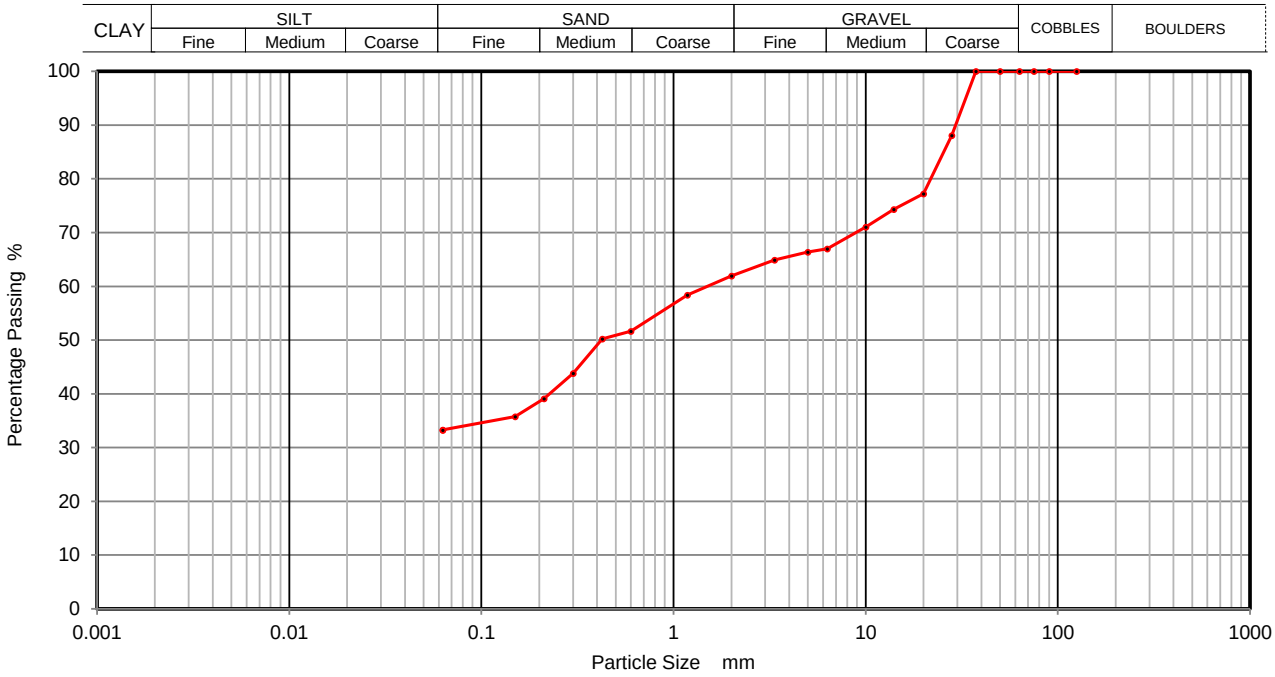
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH11
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	2.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	88		
20	77		
14	74		
10	71		
6.3	67		
5	66		
3.35	65		
2	62		
1.18	58		
0.6	52		
0.425	50		
0.3	44		
0.212	39		
0.15	36		
0.063	33		

Sample Proportions	% dry mass
Cobbles	0
Gravel	38
Sand	29
Silt and Clay	33

Grading Analysis	
Uniformity Coefficient	

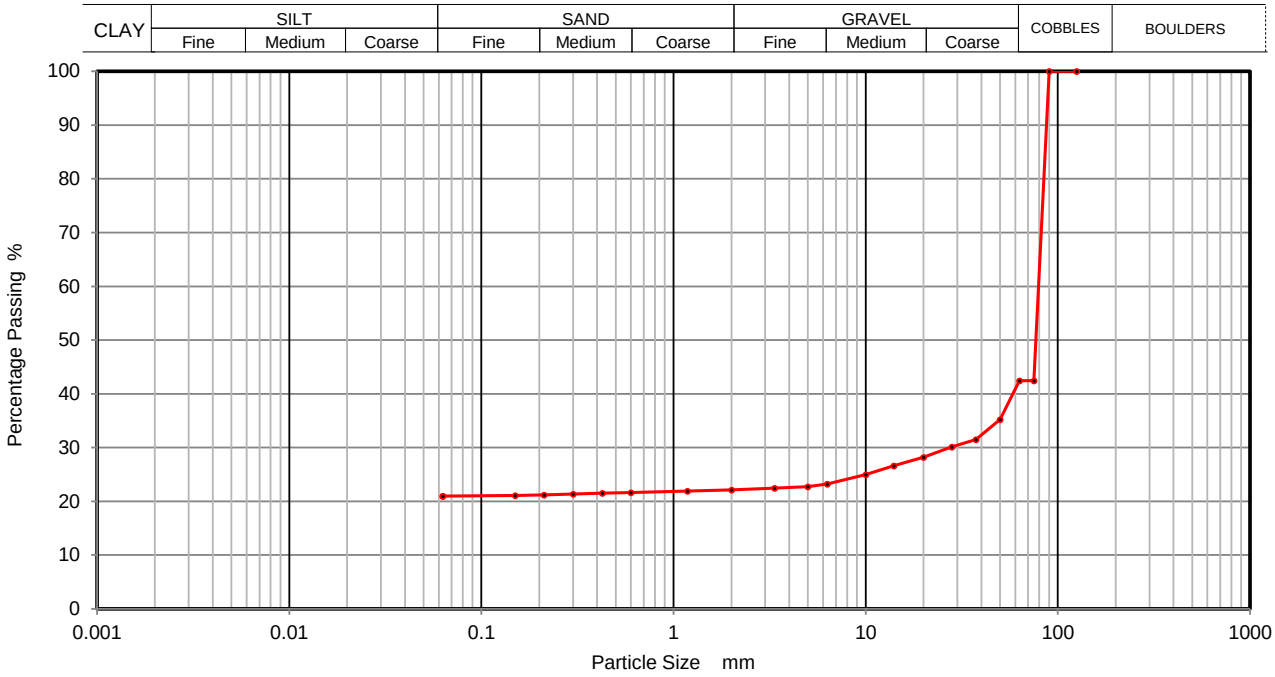
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH12
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY with many cobbles.	Depth Top	2.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	42	0.0019	
63	42		
50	35		
37.5	32		
28	30		
20	28		
14	27		
10	25		
6.3	23		
5	23		
3.35	22		
2	22		
1.18	22		
0.6	22		
0.425	22		
0.3	21		
0.212	21		
0.15	21		
0.063	21		

Sample Proportions	% dry mass
Cobbles	58
Gravel	20
Sand	1
Silt and Clay	21

Grading Analysis	
Uniformity Coefficient	

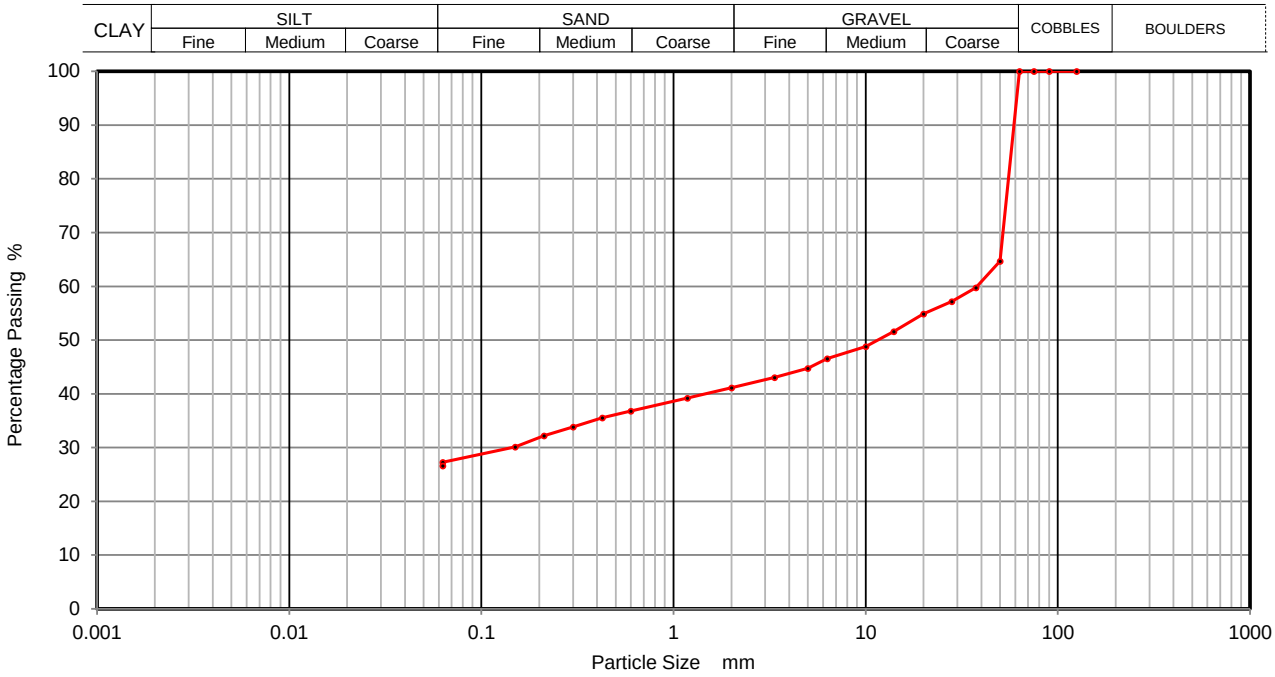
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH13
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	1.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	65		
37.5	60		
28	57		
20	55		
14	52		
10	49		
6.3	47		
5	45		
3.35	43		
2	41		
1.18	39		
0.6	37		
0.425	36		
0.3	34		
0.212	32		
0.15	30		
0.063	27		

Sample Proportions	% dry mass
Cobbles	0
Gravel	59
Sand	14
Silt and Clay	27

Grading Analysis	
Uniformity Coefficient	

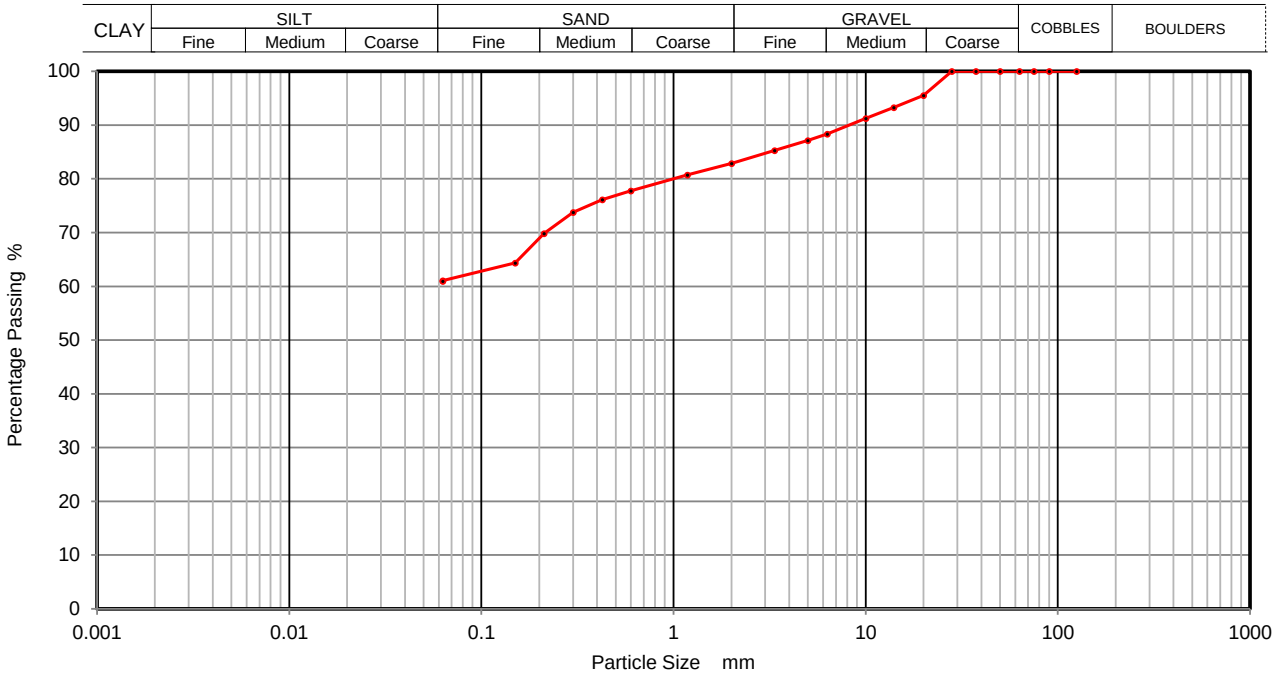
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH14
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	1.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	93		
10	91		
6.3	88		
5	87		
3.35	85		
2	83		
1.18	81		
0.6	78		
0.425	76		
0.3	74		
0.212	70		
0.15	64		
0.063	61		

Sample Proportions	% dry mass
Cobbles	0
Gravel	17
Sand	22
Silt and Clay	61

Grading Analysis	
Uniformity Coefficient	

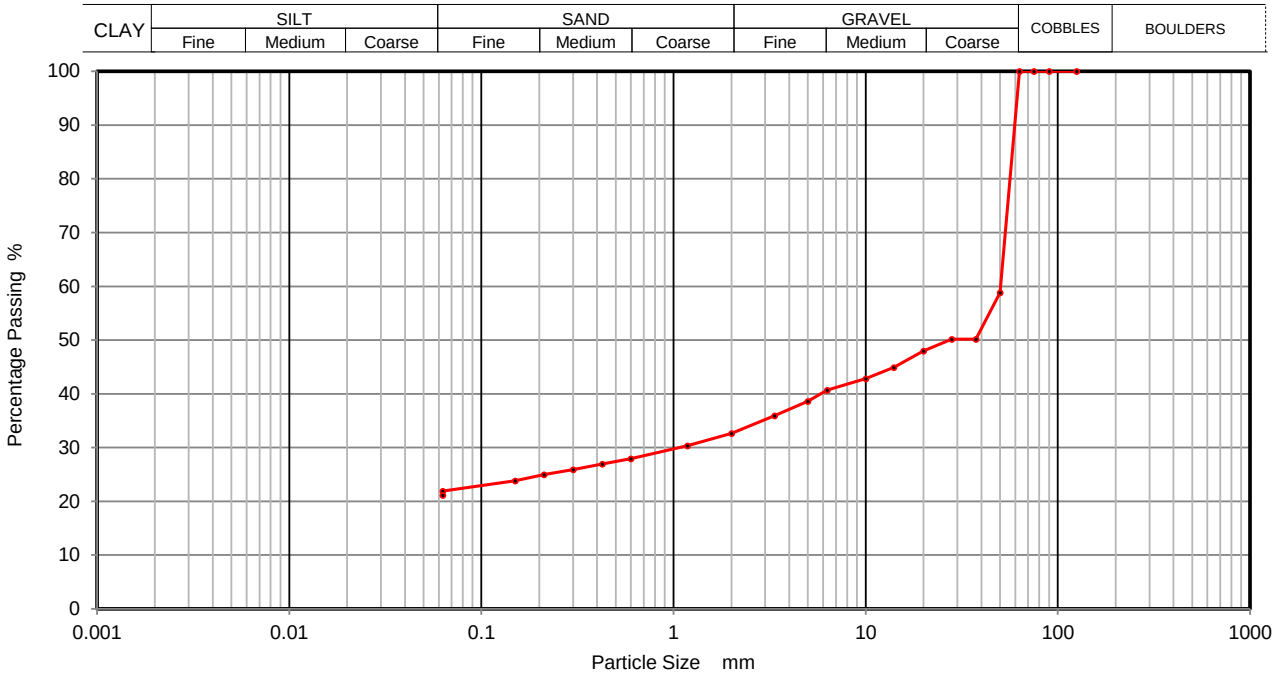
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH14
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	59		
37.5	50		
28	50		
20	48		
14	45		
10	43		
6.3	41		
5	39		
3.35	36		
2	33		
1.18	30		
0.6	28		
0.425	27		
0.3	26		
0.212	25		
0.15	24		
0.063	22		

Sample Proportions	% dry mass
Cobbles	0
Gravel	67
Sand	11
Silt and Clay	22

Grading Analysis	
Uniformity Coefficient	

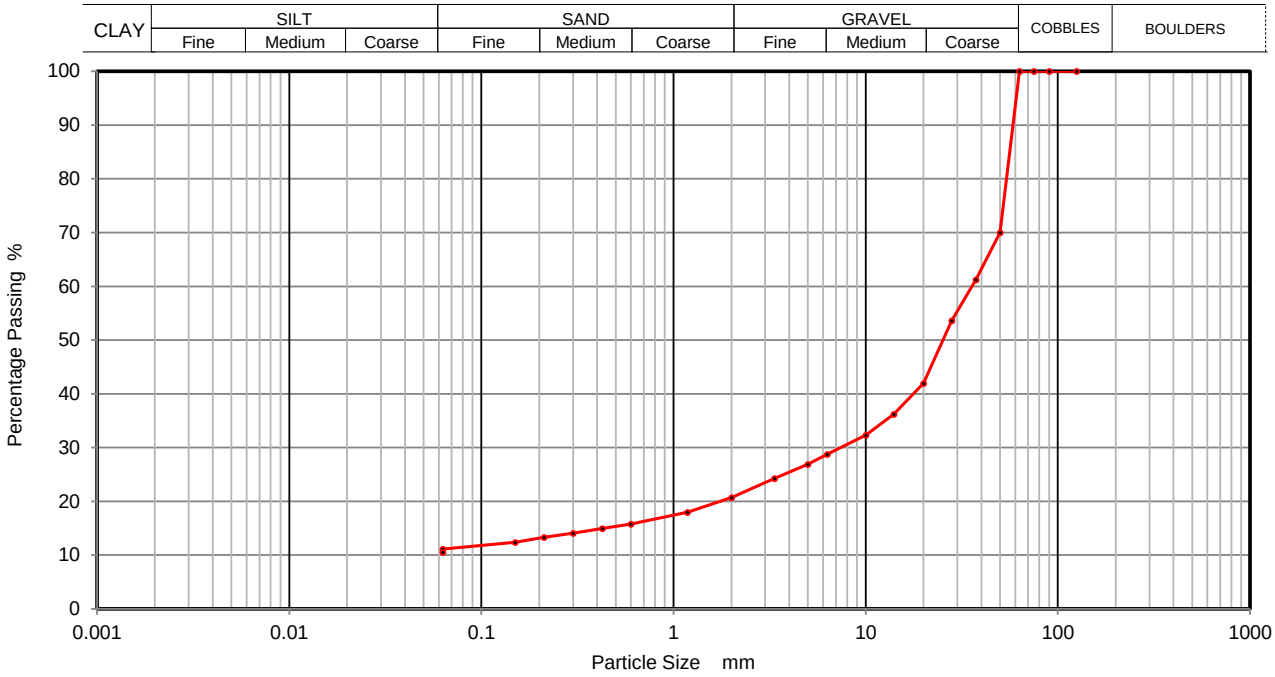
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH15
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	0.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	70		
37.5	61		
28	54		
20	42		
14	36		
10	32		
6.3	29		
5	27		
3.35	24		
2	21		
1.18	18		
0.6	16		
0.425	15		
0.3	14		
0.212	13		
0.15	12		
0.063	11		

Sample Proportions	% dry mass
Cobbles	0
Gravel	79
Sand	10
Silt and Clay	11

Grading Analysis	
Uniformity Coefficient	

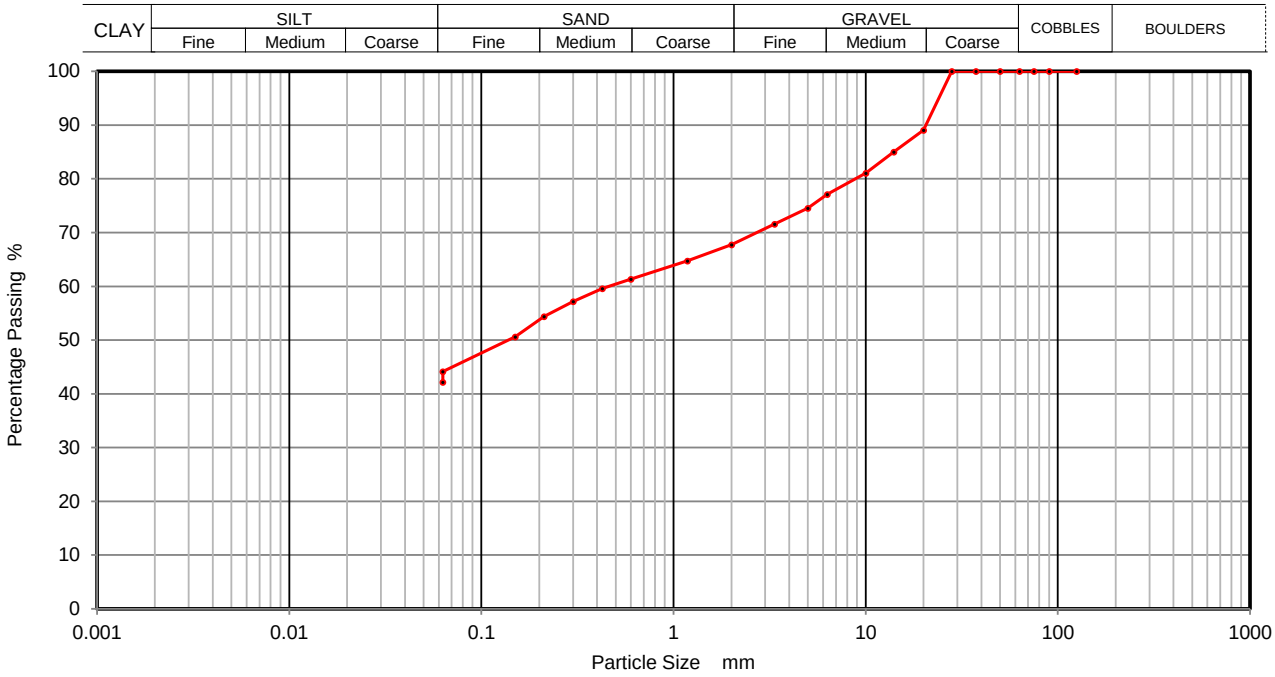
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	BH15
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	89		
14	85		
10	81		
6.3	77		
5	75		
3.35	72		
2	68		
1.18	65		
0.6	61		
0.425	60		
0.3	57		
0.212	54		
0.15	51		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	32
Sand	24
Silt and Clay	44

Grading Analysis	
Uniformity Coefficient	

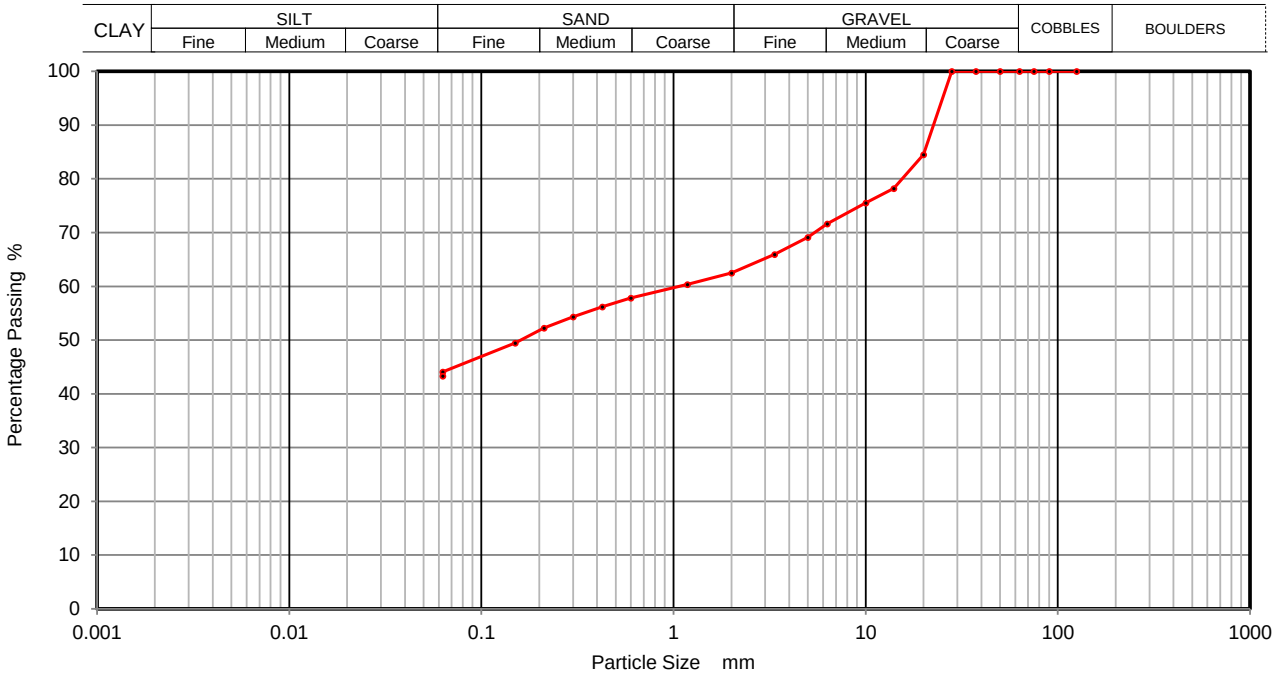
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP01
Site Name	**Newcastle Lands**	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	3.40
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	85		
14	78		
10	76		
6.3	72		
5	69		
3.35	66		
2	62		
1.18	60		
0.6	58		
0.425	56		
0.3	54		
0.212	52		
0.15	49		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	38
Sand	18
Silt and Clay	44

Grading Analysis	
Uniformity Coefficient	

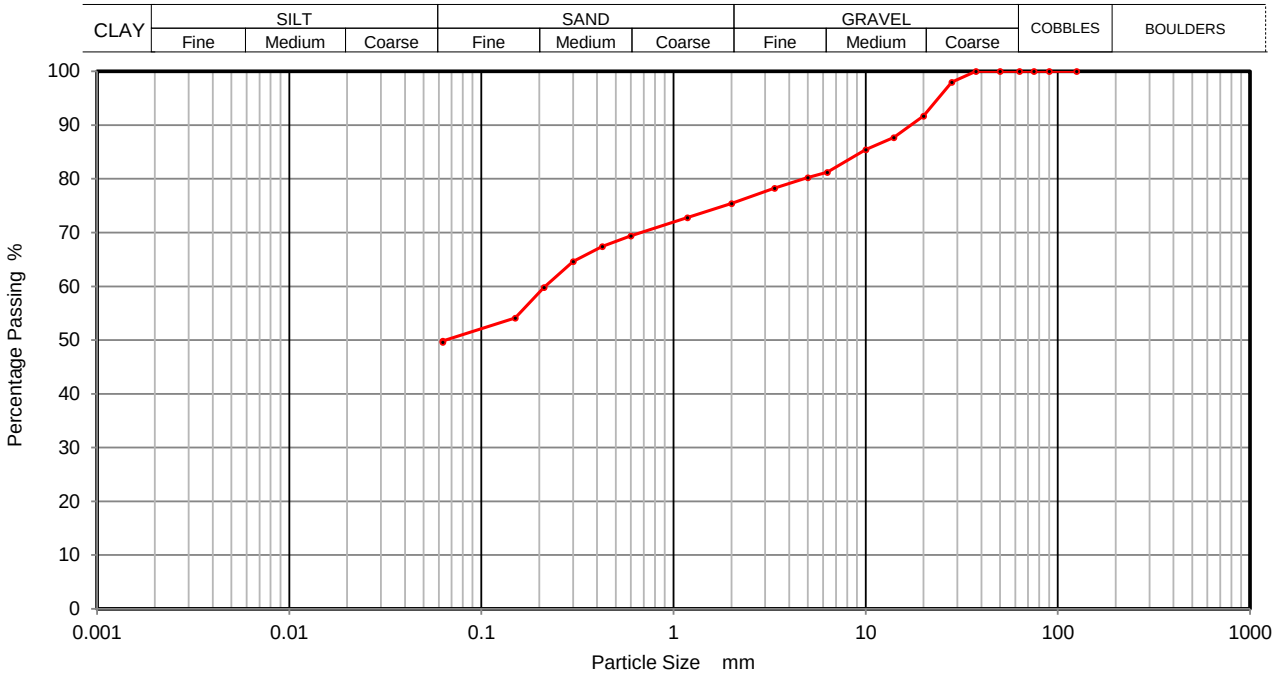
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP06
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	98		
20	92		
14	88		
10	85		
6.3	81		
5	80		
3.35	78		
2	75		
1.18	73		
0.6	69		
0.425	67		
0.3	65		
0.212	60		
0.15	54		
0.063	50		

Sample Proportions	% dry mass
Cobbles	0
Gravel	25
Sand	25
Silt and Clay	50

Grading Analysis	
Uniformity Coefficient	

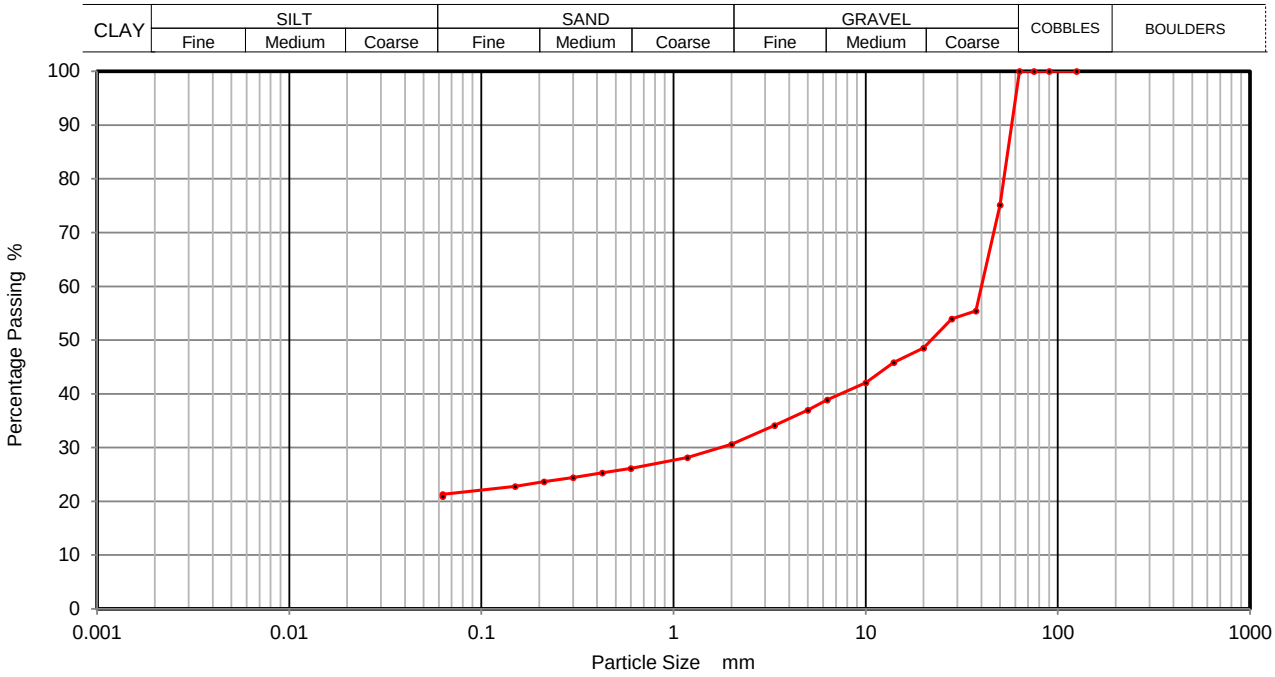
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP09
Site Name	**Newcastle Lands**	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	0.00
		Depth Base	1.80
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	75		
37.5	55		
28	54		
20	49		
14	46		
10	42		
6.3	39		
5	37		
3.35	34		
2	31		
1.18	28		
0.6	26		
0.425	25		
0.3	24		
0.212	24		
0.15	23		
0.063	21		

Sample Proportions	% dry mass
Cobbles	0
Gravel	69
Sand	10
Silt and Clay	21

Grading Analysis	
Uniformity Coefficient	

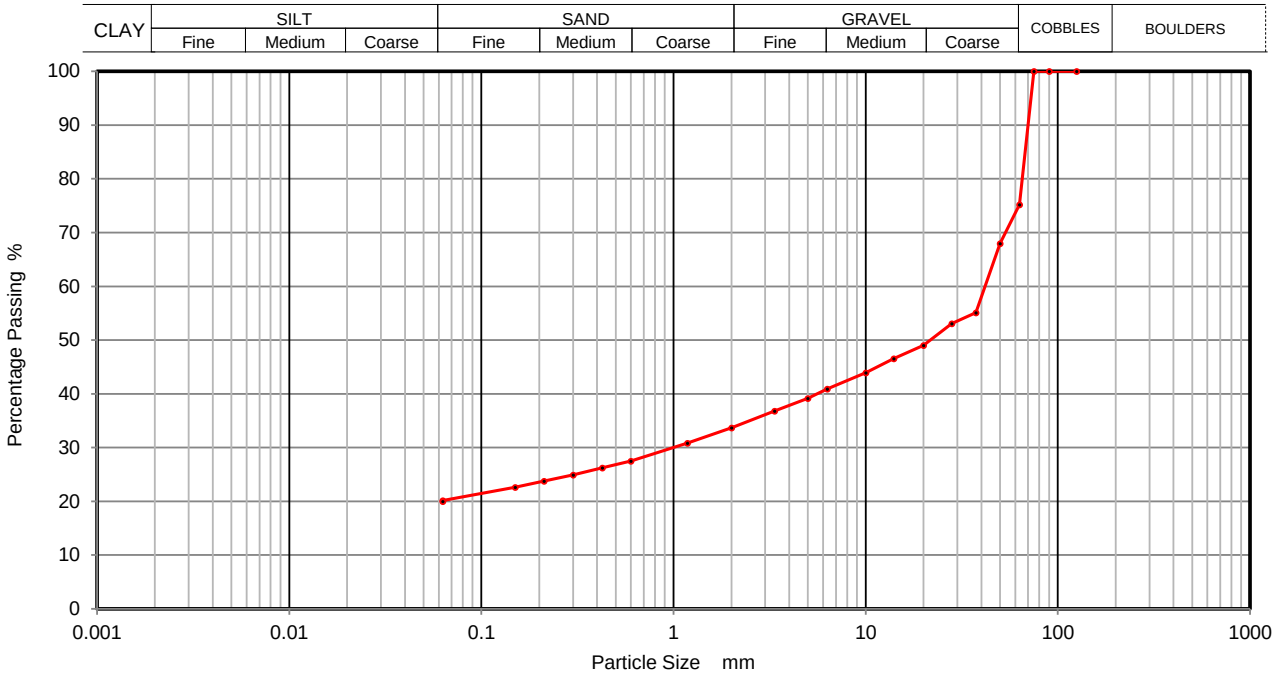
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP10
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL with many cobbles.	Depth Top	3.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	75		
50	68		
37.5	55		
28	53		
20	49		
14	47		
10	44		
6.3	41		
5	39		
3.35	37		
2	34		
1.18	31		
0.6	27		
0.425	26		
0.3	25		
0.212	24		
0.15	23		
0.063	20		

Sample Proportions	% dry mass
Cobbles	25
Gravel	41
Sand	14
Silt and Clay	20

Grading Analysis	
Uniformity Coefficient	

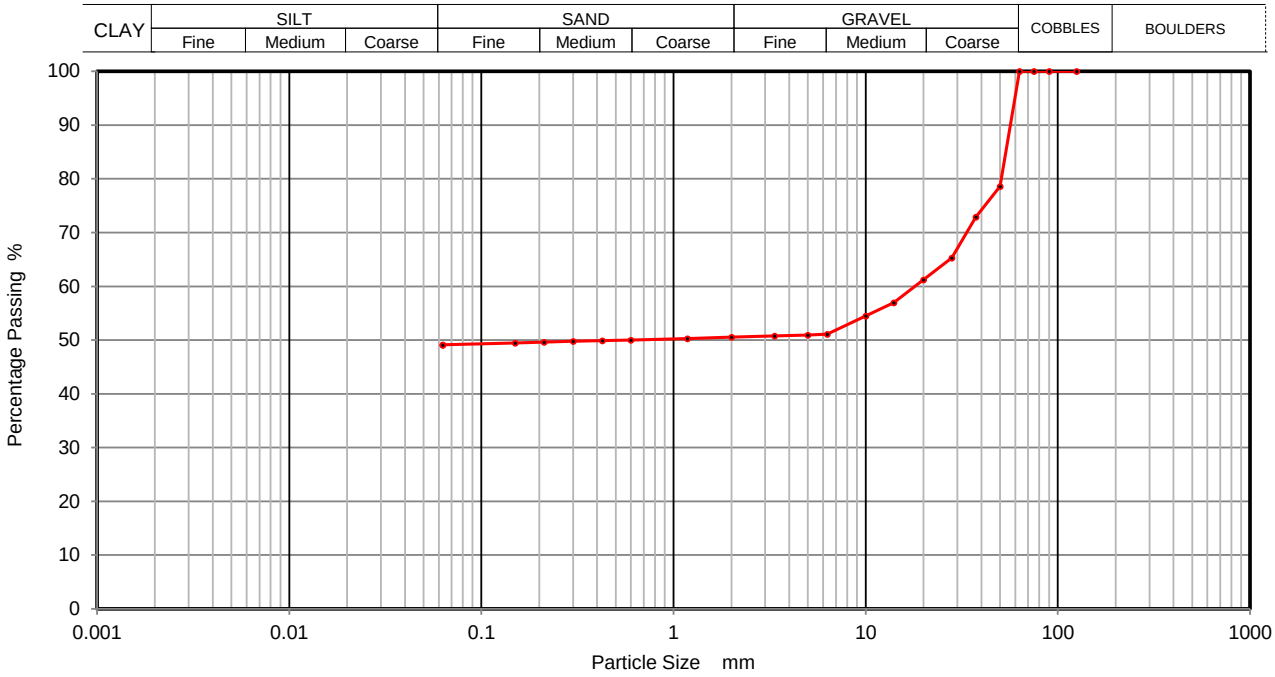
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP13
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	3.40
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	79		
37.5	73		
28	65		
20	61		
14	57		
10	55		
6.3	51		
5	51		
3.35	51		
2	51		
1.18	50		
0.6	50		
0.425	50		
0.3	50		
0.212	50		
0.15	49		
0.063	49		

Sample Proportions	% dry mass
Cobbles	0
Gravel	49
Sand	2
Silt and Clay	49

Grading Analysis	
Uniformity Coefficient	

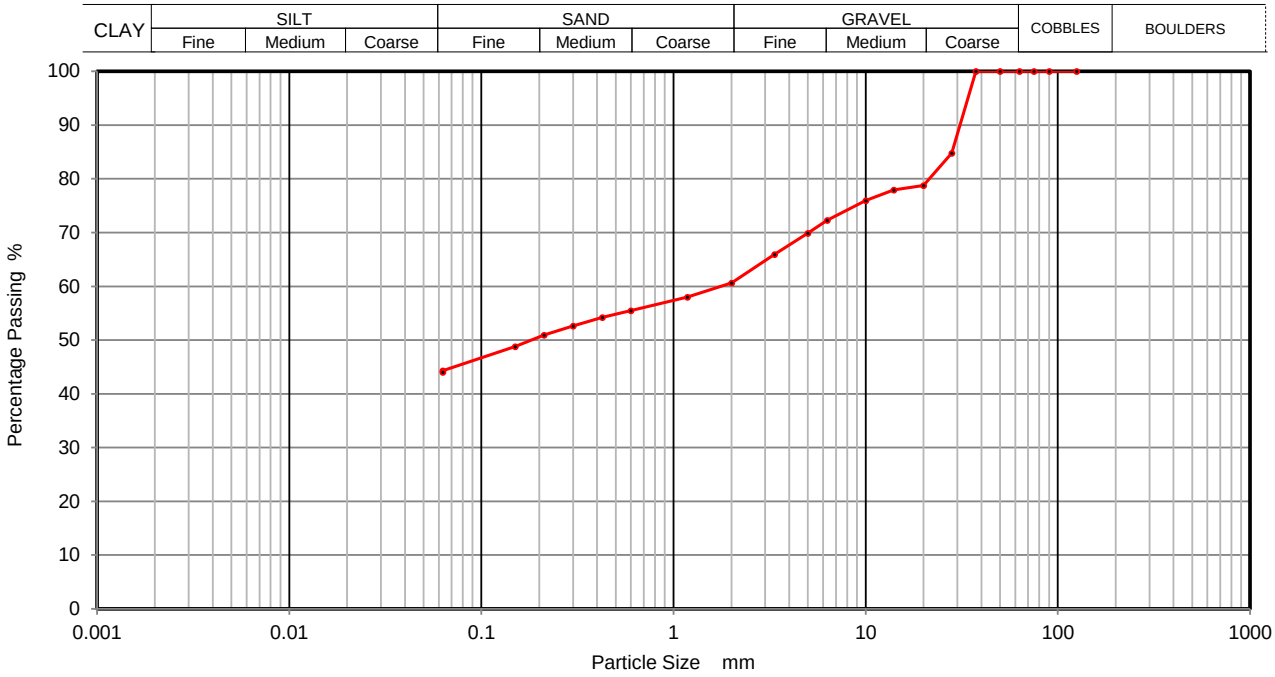
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP15
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	2.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	85		
20	79		
14	78		
10	76		
6.3	72		
5	70		
3.35	66		
2	61		
1.18	58		
0.6	55		
0.425	54		
0.3	53		
0.212	51		
0.15	49		
0.063	44		

Sample Proportions	% dry mass
Cobbles	0
Gravel	39
Sand	17
Silt and Clay	44

Grading Analysis	
Uniformity Coefficient	

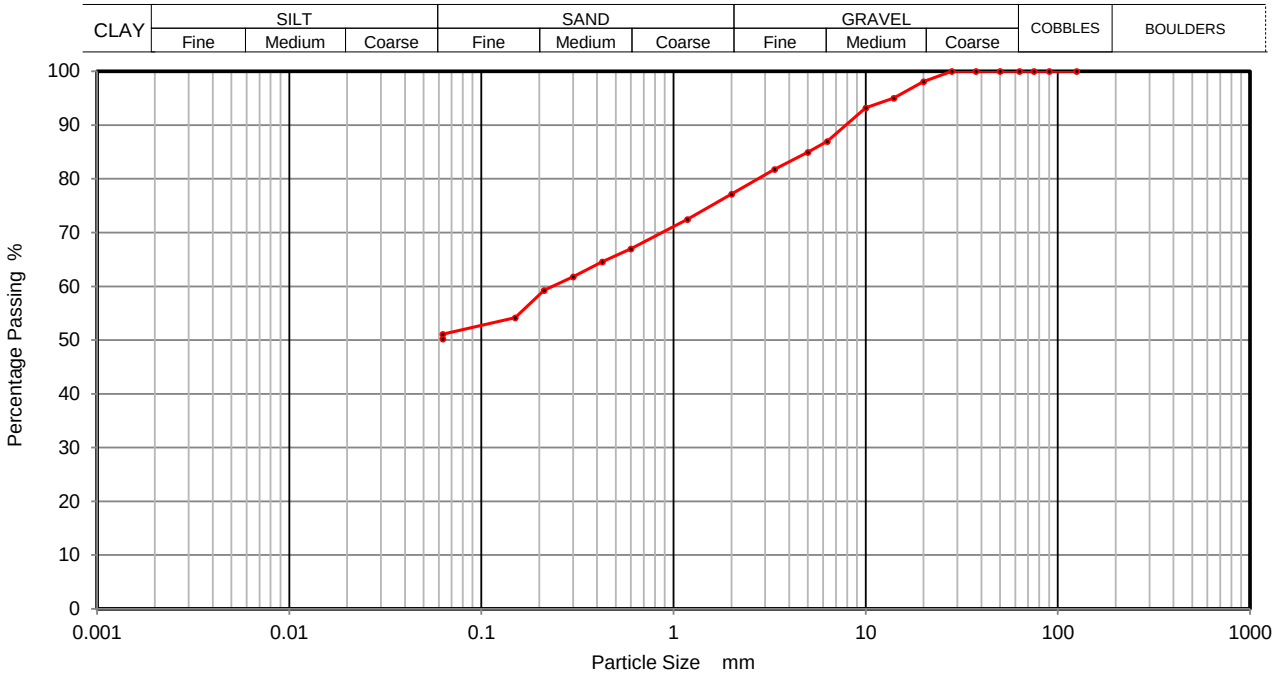
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP19
Site Name	**Newcastle Lands**	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	2.80
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	95		
10	93		
6.3	87		
5	85		
3.35	82		
2	77		
1.18	72		
0.6	67		
0.425	65		
0.3	62		
0.212	59		
0.15	54		
0.063	51		

Sample Proportions	% dry mass
Cobbles	0
Gravel	23
Sand	26
Silt and Clay	51

Grading Analysis	
Uniformity Coefficient	

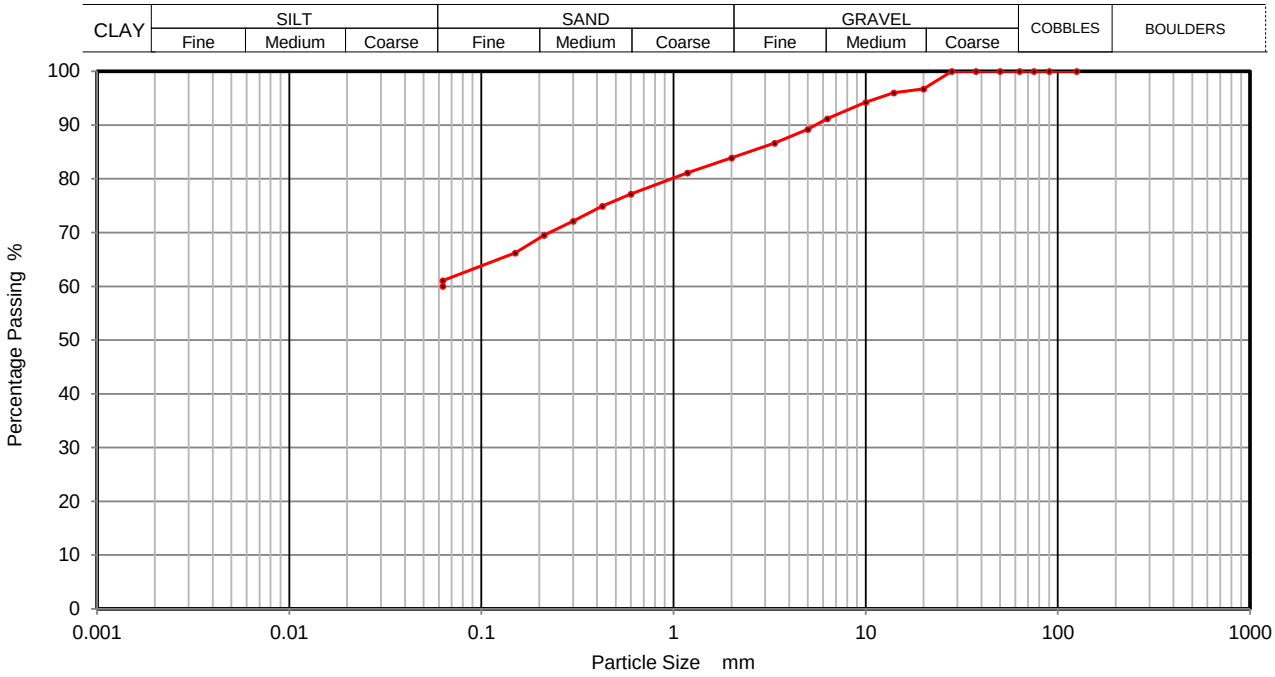
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP26
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	1.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	96		
10	94		
6.3	91		
5	89		
3.35	87		
2	84		
1.18	81		
0.6	77		
0.425	75		
0.3	72		
0.212	69		
0.15	66		
0.063	61		

Sample Proportions	% dry mass
Cobbles	0
Gravel	16
Sand	23
Silt and Clay	61

Grading Analysis	
Uniformity Coefficient	

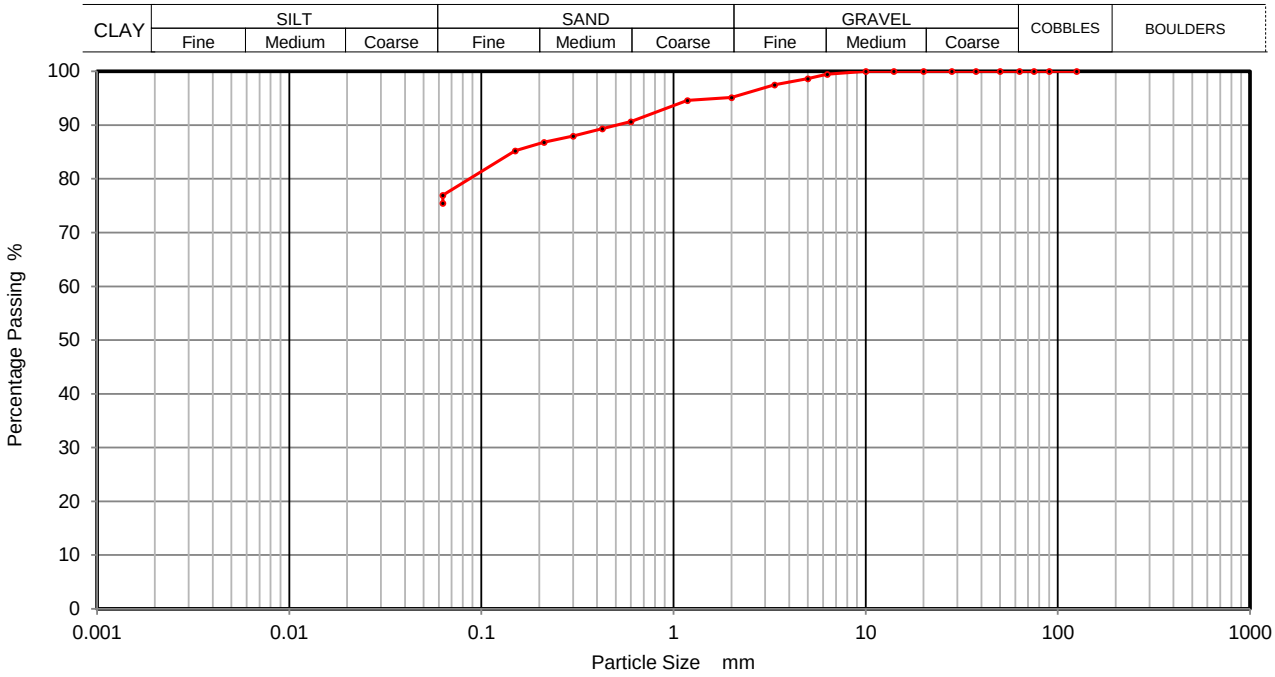
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP32
Site Name	**Newcastle Lands**	Sample No.	
Soil Description	Brown fine to medium slightly gravelly fine to coarse sandy silty CLAY.	Depth Top	3.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	95		
1.18	95		
0.6	91		
0.425	89		
0.3	88		
0.212	87		
0.15	85		
0.063	77		

Sample Proportions	% dry mass
Cobbles	0
Gravel	5
Sand	18
Silt and Clay	77

Grading Analysis	
Uniformity Coefficient	

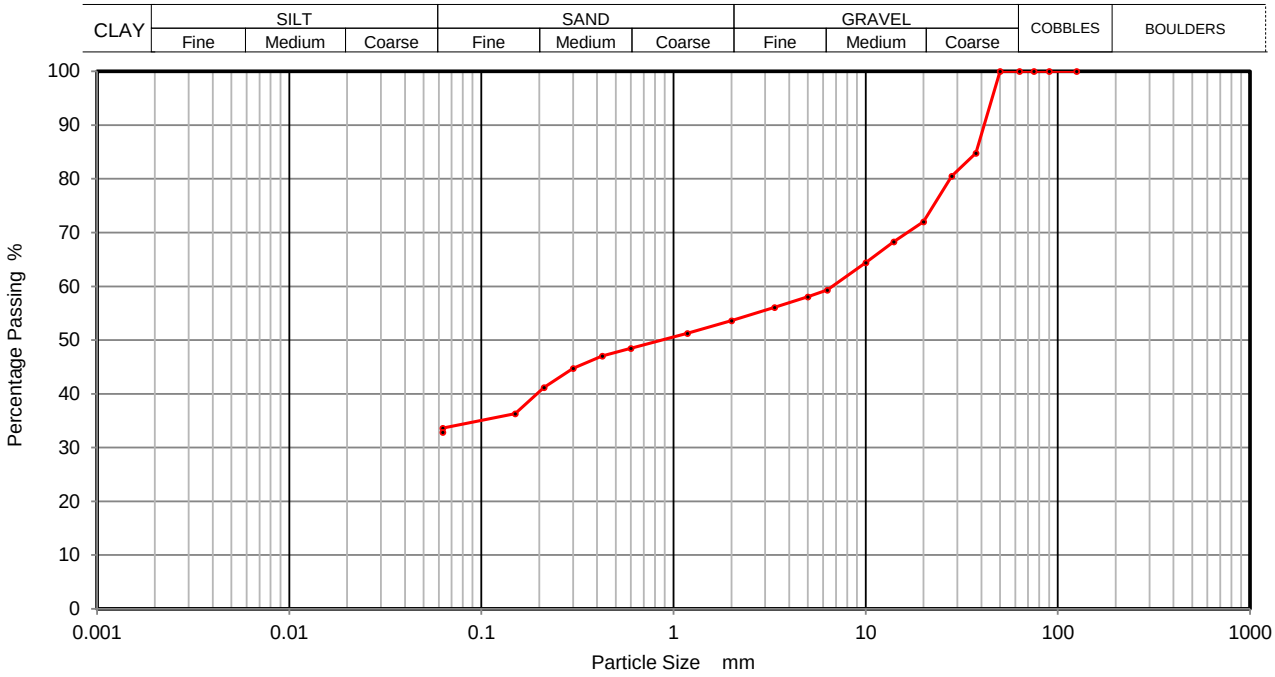
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP38
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL.	Depth Top	2.80
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	85		
28	81		
20	72		
14	68		
10	64		
6.3	59		
5	58		
3.35	56		
2	54		
1.18	51		
0.6	48		
0.425	47		
0.3	45		
0.212	41		
0.15	36		
0.063	34		

Sample Proportions	% dry mass
Cobbles	0
Gravel	46
Sand	20
Silt and Clay	34

Grading Analysis	
Uniformity Coefficient	

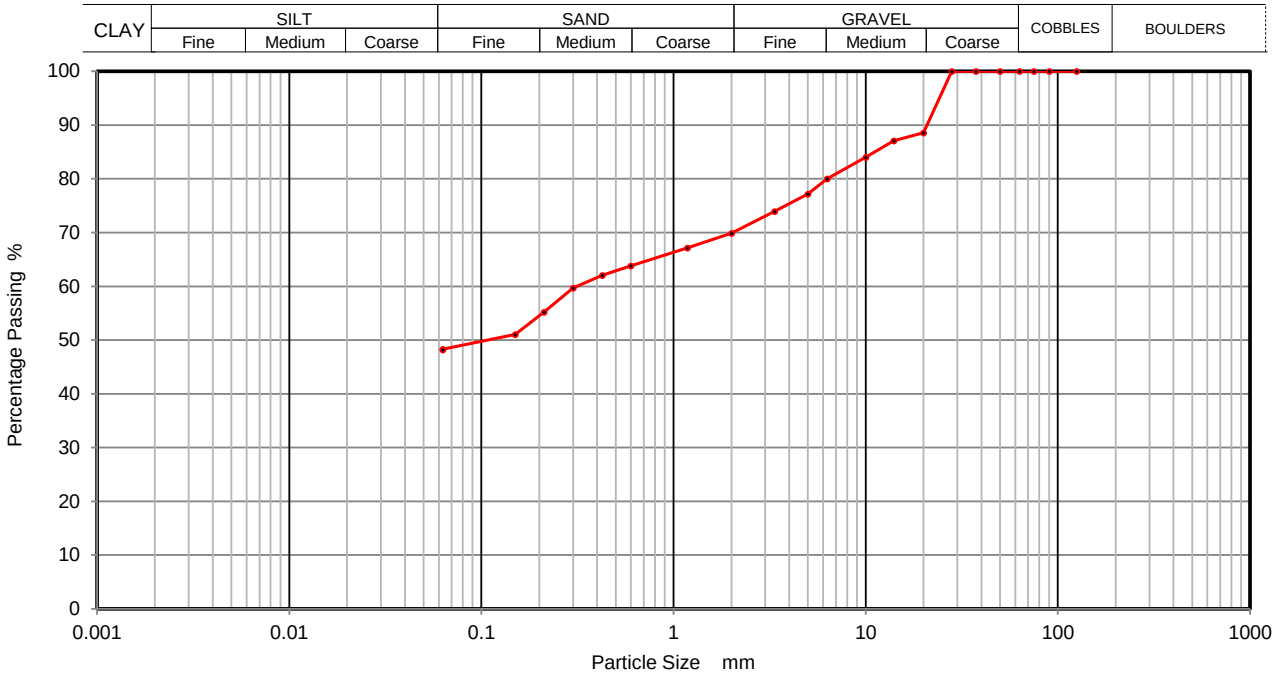
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP43
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse sandy fine to coarse gravelly silty CLAY.	Depth Top	2.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	89		
14	87		
10	84		
6.3	80		
5	77		
3.35	74		
2	70		
1.18	67		
0.6	64		
0.425	62		
0.3	60		
0.212	55		
0.15	51		
0.063	48		

Sample Proportions	% dry mass
Cobbles	0
Gravel	30
Sand	22
Silt and Clay	48

Grading Analysis	
Uniformity Coefficient	

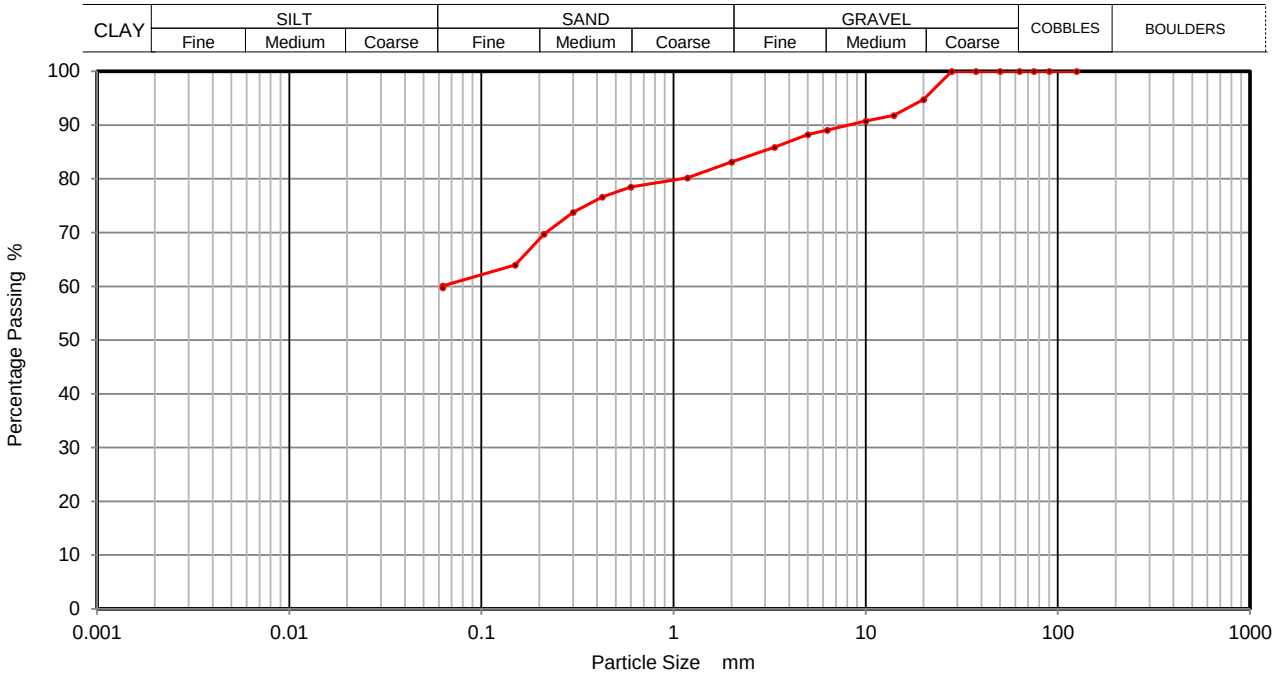
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP49
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	2.50
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	92		
10	91		
6.3	89		
5	88		
3.35	86		
2	83		
1.18	80		
0.6	78		
0.425	77		
0.3	74		
0.212	70		
0.15	64		
0.063	60		

Sample Proportions	% dry mass
Cobbles	0
Gravel	17
Sand	23
Silt and Clay	60

Grading Analysis	
Uniformity Coefficient	

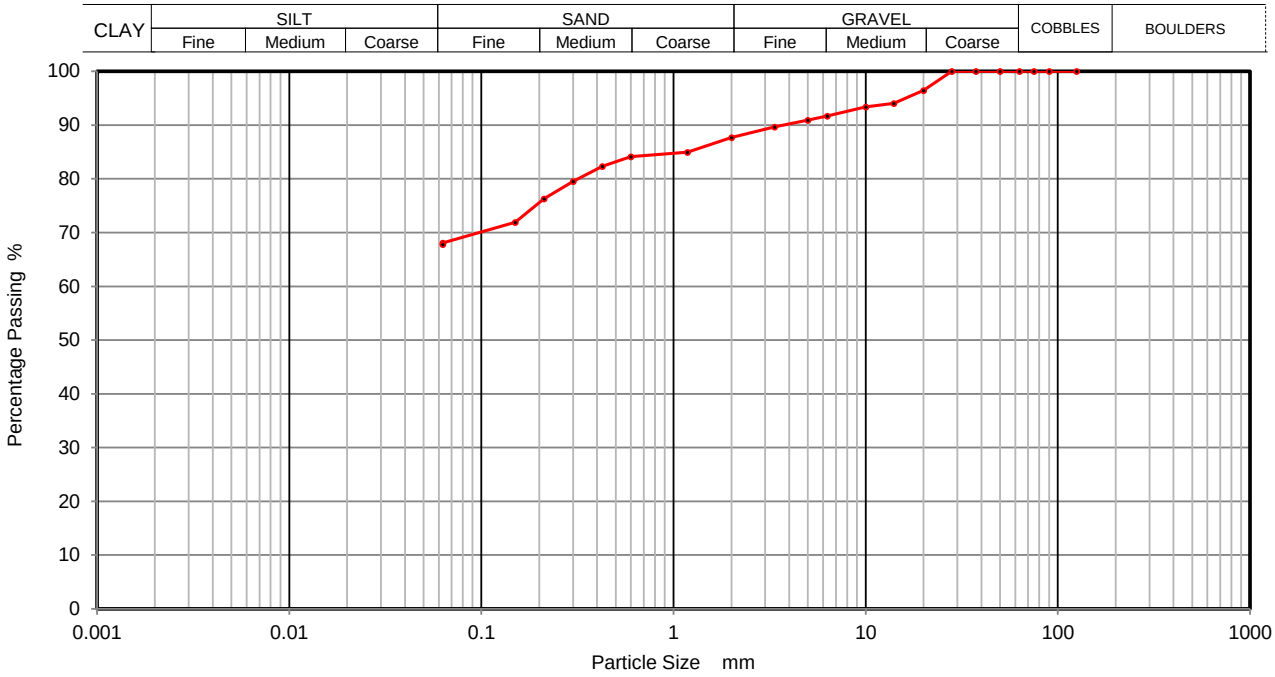
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	39415
		Borehole/Pit No.	TP54
Site Name	Newcastle Lands	Sample No.	
Soil Description	Brown fine to coarse gravelly fine to coarse sandy silty CLAY.	Depth Top	1.00
		Depth Base	
		Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	
90	100	0.0060	
75	100	0.0019	
63	100		
50	100		
37.5	100		
28	100		
20	96		
14	94		
10	93		
6.3	92		
5	91		
3.35	90		
2	88		
1.18	85		
0.6	84		
0.425	82		
0.3	80		
0.212	76		
0.15	72		
0.063	68		

Sample Proportions	% dry mass
Cobbles	0
Gravel	12
Sand	20
Silt and Clay	68

Grading Analysis	
Uniformity Coefficient	

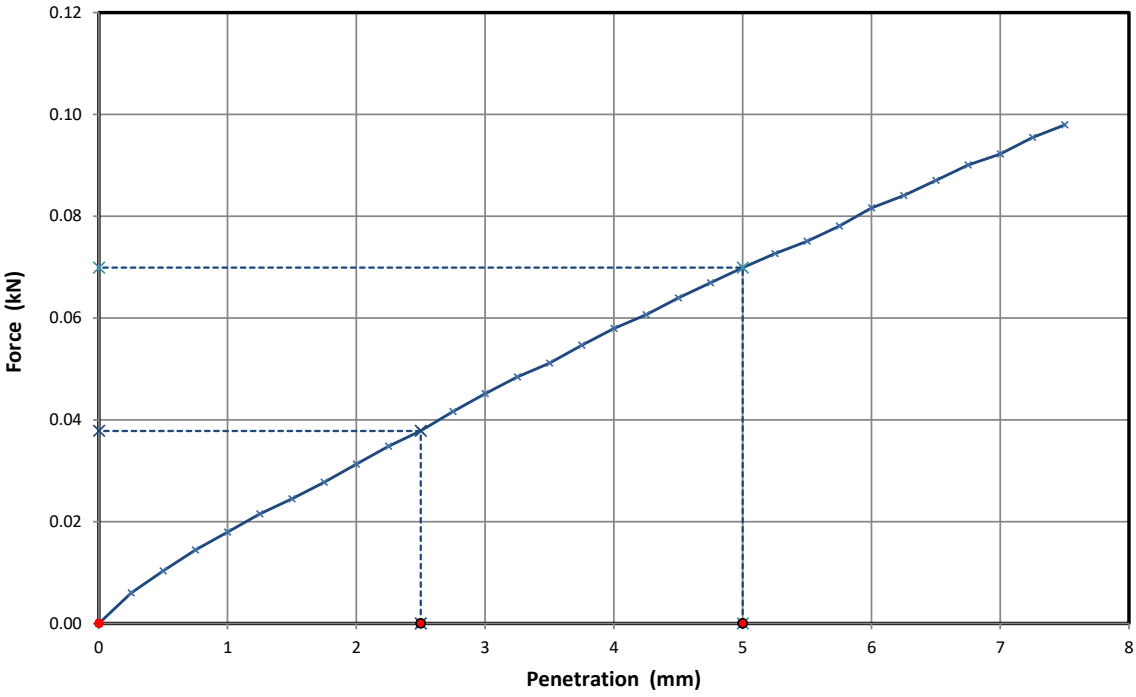
Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operators	Checked	17-06-18	Emma Sharp	
RO/MH	Approved	18-06-18	Paul Evans	

UKAS TESTING 2788

GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP01
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	0.50
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	0%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	27
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	1.97
Dry Density (Mg/m3)	1.55

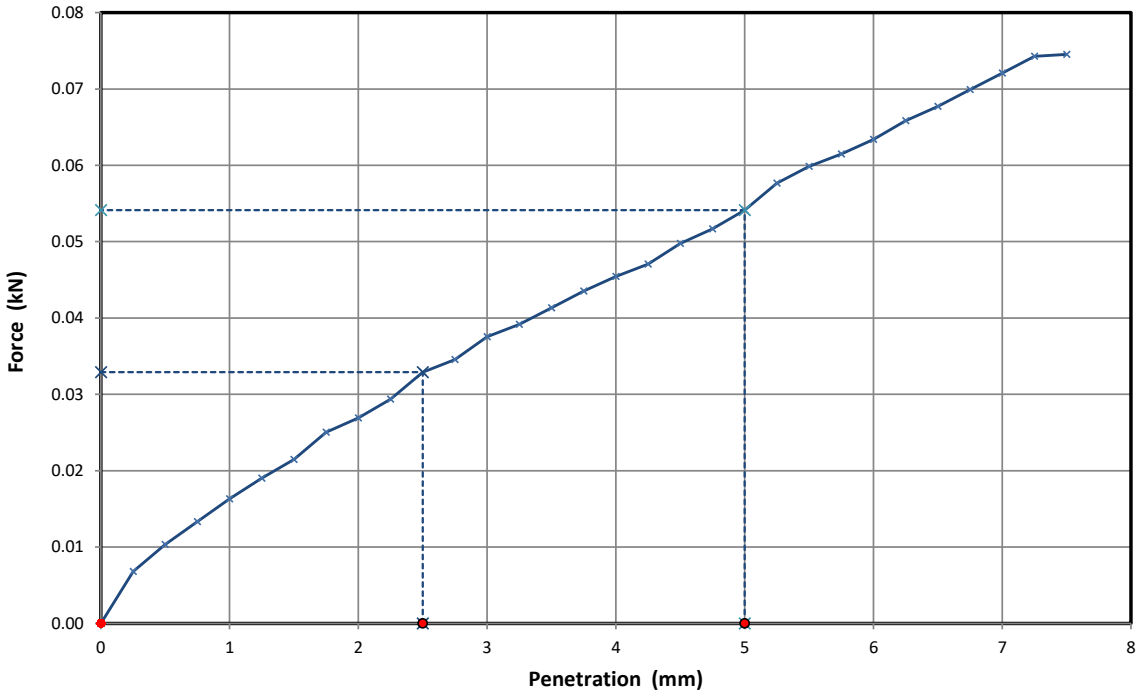
Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.3	2.5mm Bottom	
5mm Top	0.3	5mm Bottom	
CBR Value %	**0.3**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

UKAS TESTING 2788

GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP02
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	0.60
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	12.6%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	17
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.13
Dry Density (Mg/m3)	1.82

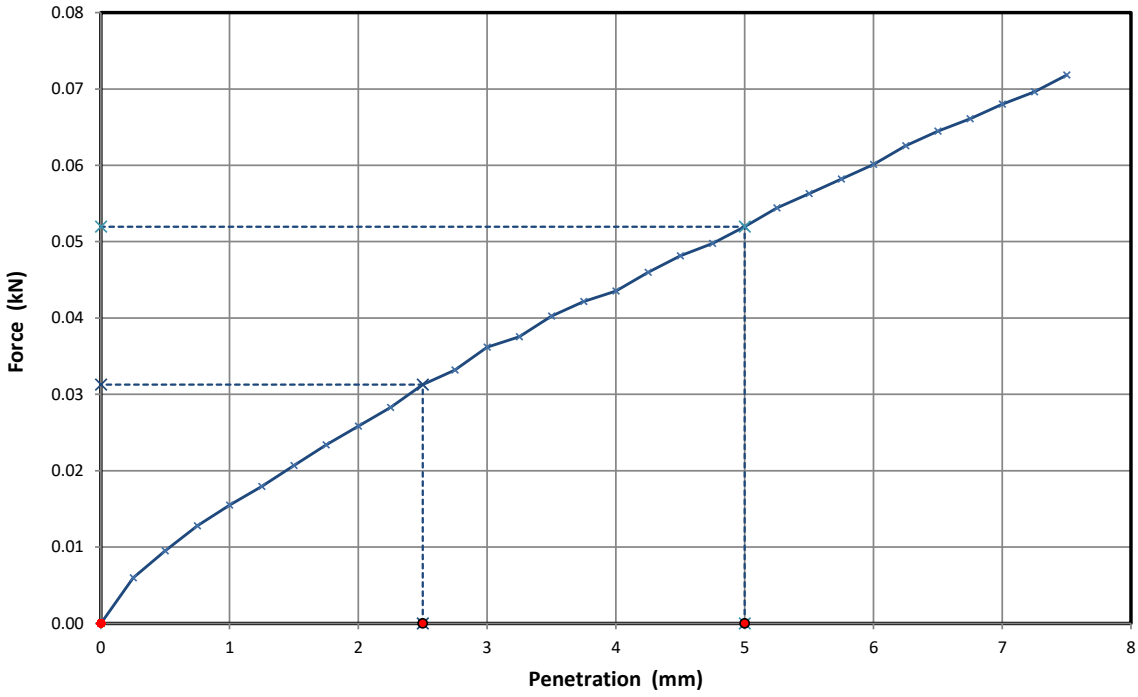
Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.2	2.5mm Bottom	
5mm Top	0.3	5mm Bottom	
CBR Value %	**0.3**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

UKAS TESTING
2788

GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP03
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	0.50
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	14.2%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	18
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	42.54
Dry Density (Mg/m3)	36.17

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.2	2.5mm Bottom	
5mm Top	0.3	5mm Bottom	
CBR Value %	**0.3**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

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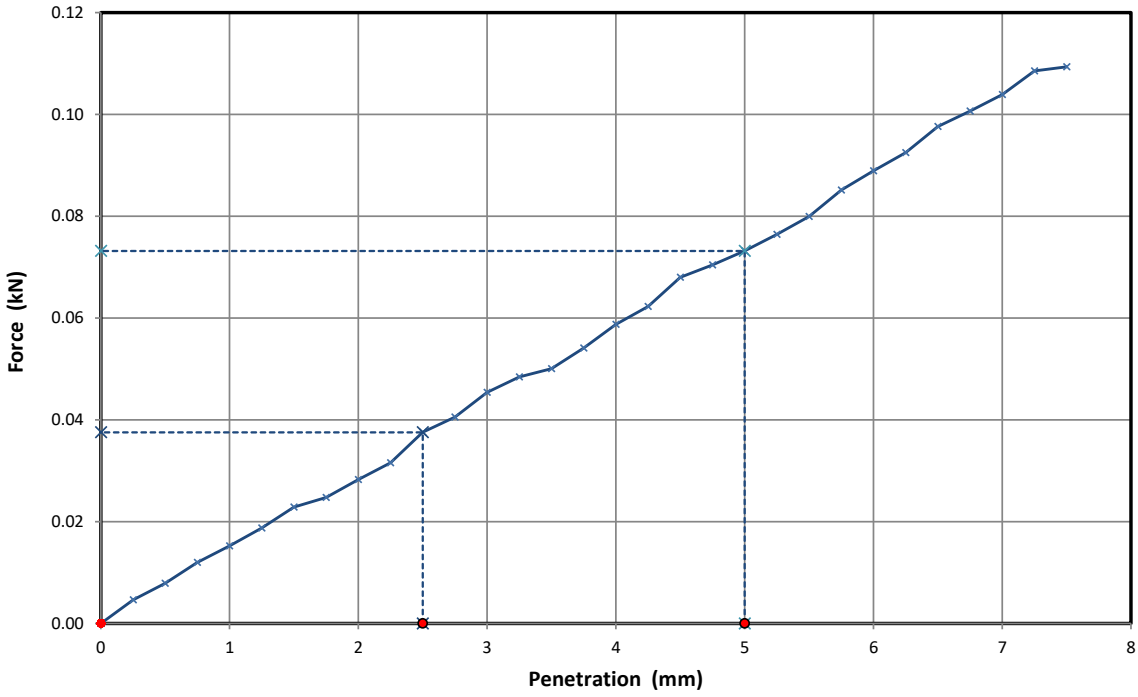
GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP04
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	0.90
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	1.8%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	13
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.20
Dry Density (Mg/m3)	1.95

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.3	2.5mm Bottom	
5mm Top	0.4	5mm Bottom	
CBR Value %	**0.4**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

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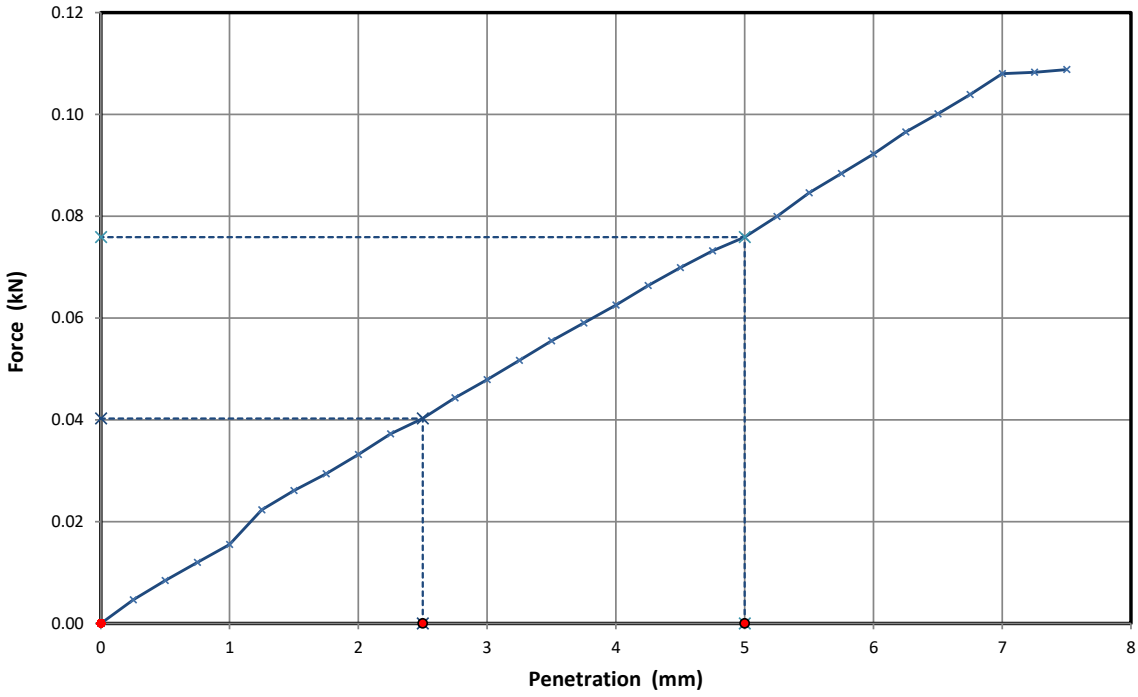
GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP05
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	2.50
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	1.8%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	12
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.21
Dry Density (Mg/m3)	1.97

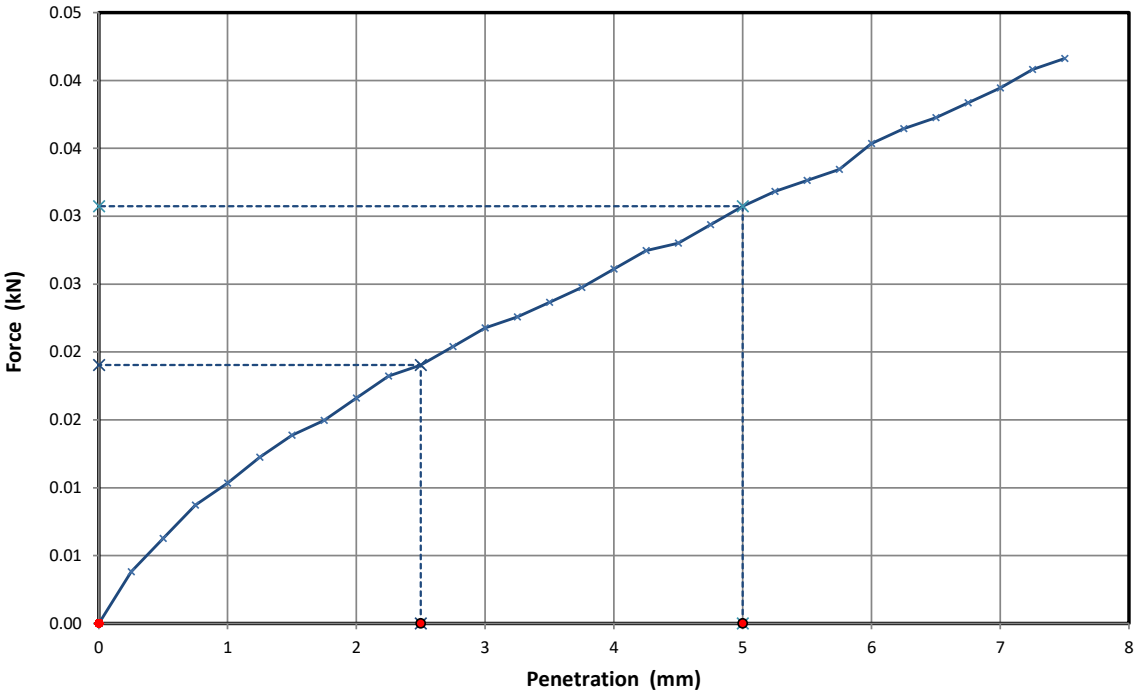
Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.3	2.5mm Bottom	
5mm Top	0.4	5mm Bottom	
CBR Value %	**0.4**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

UKAS TESTING
2788

GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP06
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	0.80
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	1.8%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	17
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.11
Dry Density (Mg/m3)	1.81

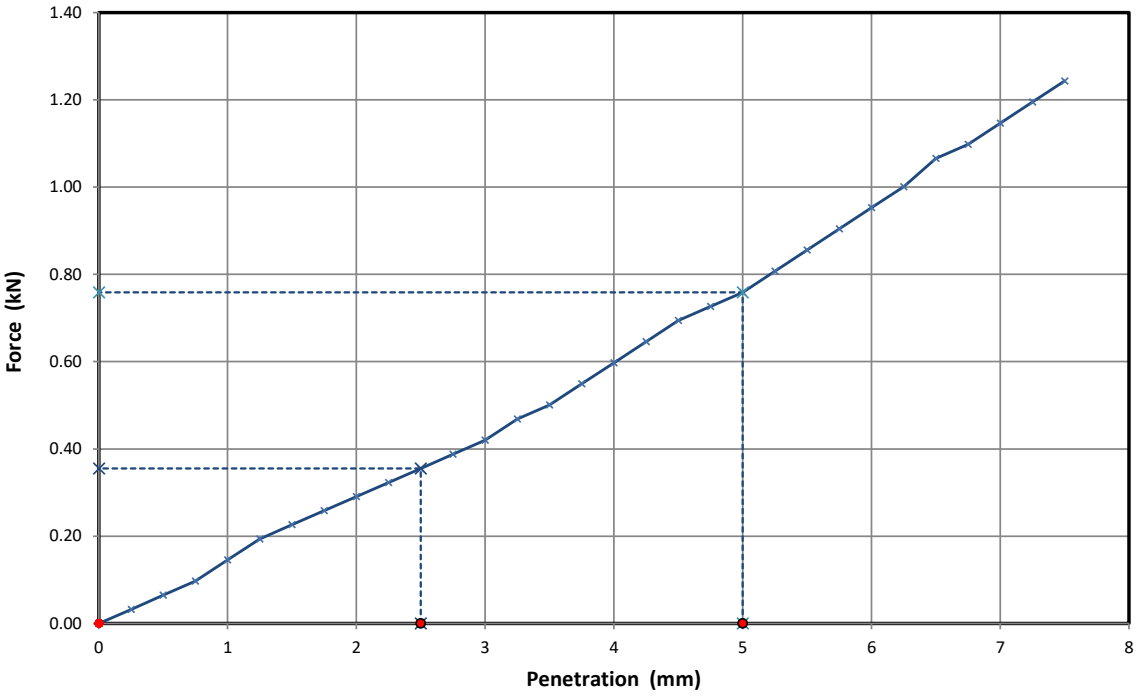
Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	0.1	2.5mm Bottom	
5mm Top	0.2	5mm Bottom	
CBR Value %	**0.2**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

UKAS TESTING 2788

GSTL	California Bearing Ratio BS 1377: Part 4: 1990 Clause 7	Contract Number	39415
		Borehole/Pit No.	TP22
Site Name	Newcastle Lands	Sample No.	
Soil Description		Depth Top	0.80
Compaction Method	2.5 Kg Rammer	Depth Base	
Retained 20mm	11.4%	Sample Type	B



Initial Sample Conditions	
Moisture Content (%)	16
Moisture Top (%)	
Moisture Bottom (%)	
Bulk Density (Mg/m3)	2.15
Dry Density (Mg/m3)	1.85

Specified Testing Parameters	
Surcharge (Kg)	2
Soaking Time (hours)	N/A
Swelling (mm)	N/A
Remarks	

CBR Test Values			
2.5mm Top	2.7	2.5mm Bottom	
5mm Top	3.8	5mm Bottom	
CBR Value %	**3.8**	**CBR Value %**	

Operators	Checked	17-06-18	Sean Penn	
RO/MH	Approved	18-06-18	Ben Sharp	

UKAS TESTING
2788

Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Geotechnical Laboratory,
Civil, Structural & Environmental Engineering
& Environmental Engineering
Trinity College,
Dublin.2.

+353 1 8961009
edunne@tcd.ie

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

Point Load Index Tests (single diametral determination)

Project: Newcastle Lands

Project No: 7612 - 04 - 18

Delivery date: 20.06.2018

Test Date: 21.06.2018

Diametric samples

Borehole No.	Depth (m)	$I_{s(50)}$ (Mpa)
BH - 02	2.60 - 2.76	3.34
BH - 05	3.90 - 4.00	3.93
BH - 11	5.40 - 5.55	4.47
BH - 12	5.48 - 5.61	2.96
BH - 13	7.60 - 7.70	0.67
BH - 14	5.90 - 6.07	4.76

Prof. Brendan O'Kelly

Specimens prepared and tested in accordance with suggested method from International Society for Rock Mechanics (ISRM), 1985

APPENDIX 9 – Groundwater Monitoring

Ground Investigations Ireland Ltd.,
Catherinestown House,
Hazelhatch Road,
Newcastle, Co Dublin.
Tel: 01 601 5175 / 5176 | Fax: 01 601 5173
Email: info@gii.ie | Web: gii.ie

GROUNDWATER MONITORING

Newcastle Lands, Newcastle

BOREHOLE	DATE	TIME	GROUNDWATER (mBGL)	Comments
BH03	22/06/2018	9.30	1.93m	
BH05	22/06/2018	10.05	1.80m	
BH10	22/06/2018	10.30	4.32m	
BH13	22/06/2018	11.15	2.35m	