



## **Environmental Services**

### **Factual Report on Ground Investigation**

#### **Stonehaven River Carron & Burn of Glaslaw Flood Alleviation Scheme - Ground Investigation**

#### **Volume 1 of 2**

**Contract No: 018936/5414  
January 2014**

**Client:        Aberdeenshire Council**

**Engineer:    JBA Consulting**



## Environmental Services

### Factual Report on Ground Investigation

## Stonehaven River Carron & Burn of Glaslaw Flood Alleviation Scheme - Ground Investigation

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## 1.0 INTRODUCTION

This report is prepared by Costain Environmental Services (CES) and presents the results of a ground investigation carried out in the town of Stonehaven, Aberdeenshire. CES were instructed by Aberdeenshire Council (the Client) on 12<sup>th</sup> September 2013 and the investigative work was carried out under the technical direction of JBA Consulting (the Engineer).

The services provided comprised a ground investigation to assist with the design of proposed flood defences associated with the River Carron and the Burn of Glaslaw.

The scope of the ground investigation was defined in the Engineer's specification, reference: SH-JBA-00-00-SP-GE-0003-D2\_Specification \_P1.0, date unrecorded, together with all associated schedules and drawings.

The fieldwork was carried out between 16<sup>th</sup> October and 8<sup>th</sup> November 2013 and comprised cable percussion boring, rota-sonic drilling, rotary core drilling and hand dug pits with associated sampling and in situ testing. Post fieldwork groundwater monitoring was carried out weekly between 27<sup>th</sup> November and 13<sup>th</sup> December 2013.

This report details the scope of the works undertaken together with factual results of the fieldwork, in situ testing and laboratory testing. Electronic digital data is provided in AGS 3.1 format and is emailed together with this report.

This report has been prepared, checked and approved by authorised personnel in accordance with our quality system as outlined in our proposal for the work.

Geological formation names have not been applied to the strata encountered. The brief did not require an interpretation of the factual information contained in this report.

## 2.0 SITE SETTING

### 2.1 Site Location

The site is located immediately south of Stonehaven town centre in Aberdeenshire, Scotland as indicated on the Site Location Plan in Appendix 2.1. The approximate National Grid Reference of the site centre is NO 872 857.

### 2.2 Site Description

At the time of undertaking the investigative work, the site typically comprised public highways, parkland, woodland, residential gardens and car parks. The site is bounded to the south and west by the Woods of Dunnotar, to the north by Stonehaven town centre and to the east by residential properties close to the sea front.

The River Carron bisects the site, flowing from west to east and discharging into the sea at the eastern edge of the site. The Burn of Glaslaw runs from the high ground to the south of the site, down to the centre of the site where it flows into the River Carron. The exploratory hole locations and general site layout are shown on the Site Layout Plan and Exploratory Hole Location Plans included in Appendix 2.2.

### 2.3 Review of Published Geology

The published geological map covering the site, (British Geological Survey Sheet 67, Solid and Drift, Stonehaven (1999)), indicates the site to be underlain by Superficial Deposits including the Mill of Forest Till Formation, Alluvium, Drumlithie Sand & Gravel Formation, River Terrace Deposits and Raised Marine deposits. The indicated solid geology is shown to include the Carron & Cowie Sandstone Formations and the Strathlethan Sandstone Member of the Dunnotar Castle Conglomerate Formation

## 3.0 FIELDWORK

The fieldwork was carried out in general accordance with the procedures set out in BS 5930:1999+A2 (2010).

A summary of the fieldwork is given below with detailed method specific procedures provided in Appendix 3.

The exploratory hole positions were set out relative to existing features in general accordance with the provided Site Layout Plan and by agreement with JBA Consulting's representative during the fieldworks.

### 3.1 Exploratory Holes

At the location of each exploratory hole an inspection pit was hand excavated to a depth of 1.20m to confirm the absence of underground services. Details of these are given on the relevant exploratory hole log.

The following exploratory holes were carried out:

Hole Type	No. of Holes	Maximum Depth (m)	Remarks
Rota-sonic drilling	13	12.50	
Rota-sonic drilling with Rotary Cored follow on	13	15.00	
Cable Percussion boring with Rotary Cored follow-on	1	10.00	Modular CP rig used
Cable Percussion boring in restricted access areas	4	8.30	Modular CP rig used
Structural Observation Pits	12	1.70	Hand dug
Trial Pits in restricted access areas	1	1.50	Hand dug
Groundwater monitoring Installations	6	7.50	50mm / 19mm install in BH13. All others 50mm.

Details of the strata encountered, sampling, groundwater encountered and in situ testing are shown on the individual Exploratory Hole Records in Appendix 4.

Photographs of rock core and observation pits are presented in Appendix 5.

### 3.2 In Situ Testing

The following in situ testing was carried out in accordance with the relevant methodology described in Appendix 3:

Test Type	No. of Tests	Remarks
Standard Penetration Test*	181	Calibration certificate in Appendix 6.1
Variable Head Permeability Test	6	Carried out in 50mm standpipes

The test results are presented in Appendix 6 and on the exploratory hole records.

\*Standard Penetration Tests (SPT) were carried out in accordance with the Engineer's specification, the results of which are summarised on the relevant exploratory hole logs.

In accordance with BS EN ISO 22476: Part 3, a graphical presentation of the SPT test results is presented in Appendix 6.1. The energy ratio of the hammer ( $E_r$ ) is presented on the individual borehole record and the SPT Hammer Energy Measurement Reports are presented in Appendix 6.1.

### **3.3 Groundwater Monitoring**

Groundwater strikes encountered in boreholes during drilling operations are recorded on the relevant exploratory hole logs in Appendix 4.

Following completion of the boreholes, 6no. groundwater standpipes were installed in accordance with the Engineer's instructions, details of which are given on the exploratory hole logs. 50mm diameter standpipes were installed in BH6, BH8, BH15, BH18 & BH21B. A combined 19mm piezometer / 50mm standpipe was installed in BH13.

On completion of the fieldwork, groundwater levels were monitored on three occasions as specified by the Engineer. Groundwater sampling was carried out on 27<sup>th</sup> November, 6<sup>th</sup> December & 13<sup>th</sup> December 2013 from the 6no. installations. On the 13<sup>th</sup> December the installation in BH6 in the verge of Carron Terrace was found to have been damaged by vehicular traffic and could not be monitored. The groundwater monitoring results are presented in Appendix 7.1.

### **3.4 Surveying**

On completion of the fieldwork, locations of the exploratory holes were surveyed using Trimble GPS survey equipment. Coordinates and ground levels relative to Ordnance Datum are presented on the Exploratory Hole Records in Appendix 4.

## **4.0 LABORATORY TESTING**

### **4.1 Geotechnical Testing**

The following geotechnical testing was scheduled by JBA Consulting and carried out in accordance with BS1377 (unless otherwise stated) at Costain Environmental Services' UKAS accredited laboratories (No.1489) and K4 Soils UKAS accredited laboratories (No. 2519). Several samples were affected by restrictions, and the list of restrictions (with associated Engineer's instructions) is included with the lab test results in Appendix 8.

Test Type	No. of Tests	Remarks
Natural Moisture Content	69	
Liquid and Plastic Limits	49	
Particle Size Distribution (wet sieving method)	167	
Compaction (2.5kg rammer)	2	
One dimensional consolidation	11	
Unconsolidated undrained triaxial	10	
Organic Matter Content	11	
Point Load Index	15	Up to 10no. individual tests per sample, depending on available sample material.
pH	16	Testing carried out by i2 Analytical Ltd in accordance with BRE Special Digest 1.
SO4	18	
Triaxial cell / Permeameter Constant Head Permeability Testing	0*	Tests cancelled by the Engineer. See restriction in Appendix 8.

The results of the testing are presented in Appendix 8.

## 4.2 Geoenvironmental Testing

The following chemical testing suites were scheduled by JBA and carried out by i2 Analytical Ltd UKAS accredited chemical laboratories (No.4041).

- Suite A (waters): pH & SO4
- Suite F (waters): Arsenic, Boron, Cadmium, Chromium (total), Copper, Lead, Mercury, Nickel, Zinc, pH, SO4, TPH, PAH (USEPA 16), Phenol, total Cyanide.
- Suite E (Soils): Arsenic, Boron, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc, pH, 2:1 SO4, Organic Matter Content, TPH, speciated PAH (GC FID), Phenol, Cyanide, Asbestos Screen.
- pH, SO4 (water soluble), Organic Matter Content.

The results of the testing are presented in Appendix 9.

## 5.0 REFERENCES

Association of Geotechnical and Geoenvironmental specialists, Electronic Transfer of Geotechnical and Geoenvironmental Data. (AGS Edition 3.1 or 4.0).

<http://www.bgs.ac.uk/opengeoscience/home.html?Accordion2=1#maps>

British Geological Survey Sheet 67, Solid and Drift, Stonehaven (1999)

BRE Special Digest 1:2005: Concrete in aggressive ground. Part 1.

BS 5930:(1999) + A2:(2010), Code of Practice for Site Investigations

BS 1377: Parts 1 to 9 (1990), Methods of Tests of Soils for Civil Engineering Purposes

BS EN ISO 14688: Part 1: (2002), Identification and description of soil.

BS EN ISO 14688: Part 2: (2004), Principles for a classification of soil.

BS EN ISO 14689: Part 1: (2003), Identification and description.

BS EN ISO 22475: Part 1: (2006), Technical principles for execution.

BS EN ISO 22476: Part 3: (2005), Standard penetration test.

ISRM RTH 325-89 SR12, Suggested Method for Determining Point Load Strength.

### For and on behalf of Costain Environmental Services:

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**Senior Engineering Geologist**

**Approved By:**

**A. Stevens**  
**Geotechnical Manager (North)**

# Appendix 1

## Appendix 1 - Limitations and Exceptions to the Investigation

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## Limitations and Exceptions to the Investigation

The Client has requested that a ground investigation be performed in order to investigate ground conditions at the site to provide information to assist in design of the proposed development. This report is not a comprehensive site characterisation and should not be construed as such.

This ground investigation was conducted and this report has been prepared for the sole internal use and reliance of the Client. This report shall not be relied upon or transferred to any other parties without the express written authorisation of Costain Environmental Services. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

The report represents the findings of experienced geotechnical contractors. Costain Environmental Services does not provide legal advice and the advice of lawyers may also be required.

The work carried out for this ground investigation can only investigate and monitor a small part of the subsurface conditions. Certain ground conditions may have been outside the very limited portion of the subsurface investigated or monitored, latent at the time of this work or only partially intercepted by the works and thus their full significance could not have been appreciated. Groundwater levels are particularly susceptible to variation. Accordingly, it is possible that Costain Environmental Services work, whilst fully appropriate for this ground investigation, failed to indicate the presence of particular ground conditions.

Costain Environmental Services believes that providing information about limitations is essential to help the Client identify and thereby manage its risks. These risks can be mitigated – but they cannot be limited, through additional research. Costain Environmental Services will on request advise the Client of the additional research opportunities available, their impact on risk, and their cost.

The ground investigation was specifically limited by the following:

- The location and type of exploratory hole was selected by others.
- The laboratory testing was scheduled by others.

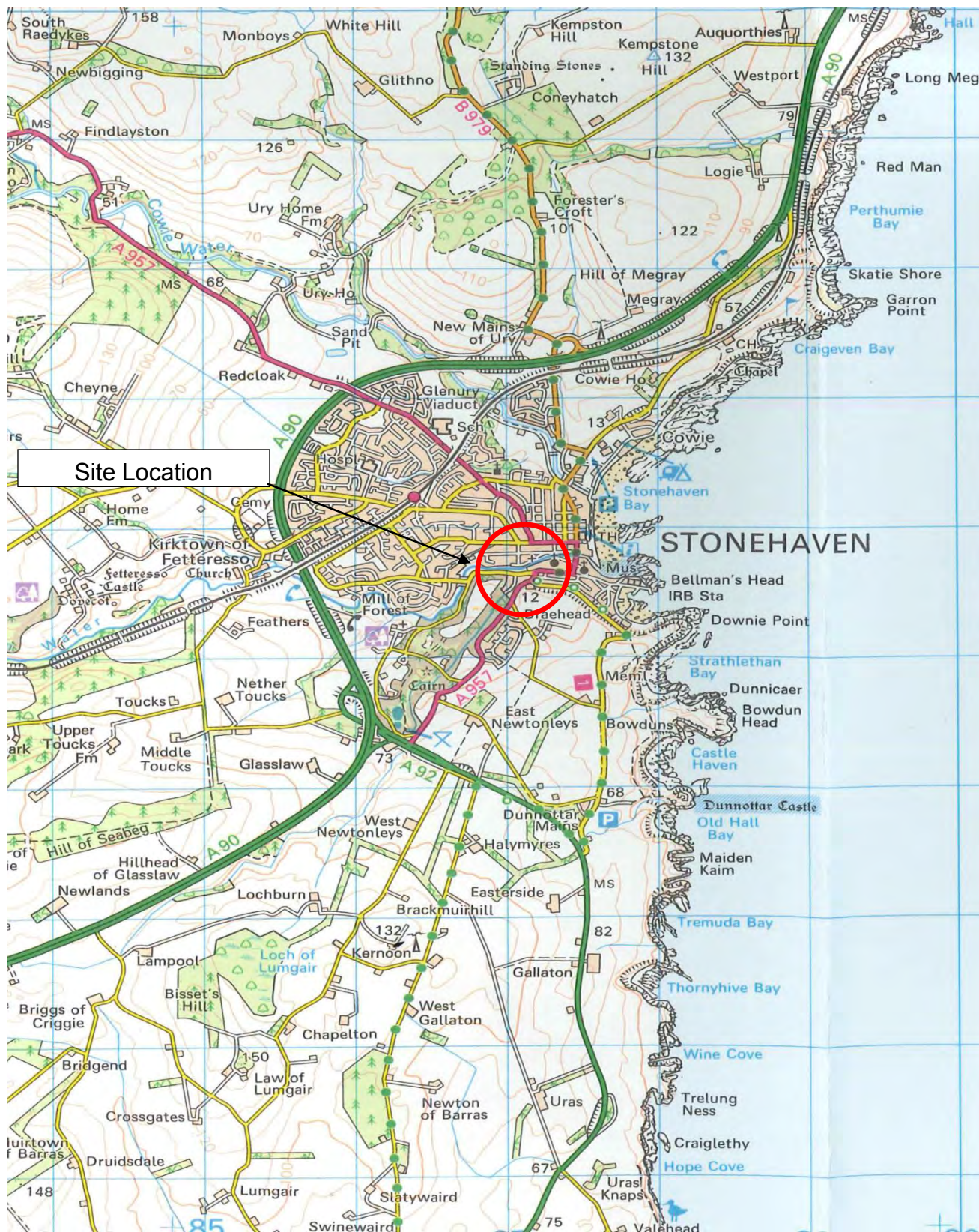


# Appendix 2

## Appendix 2 - Drawings

# Appendix 2.1

## Appendix 2.1 - Site Location Plan



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Environmental Services

Site Location Plan

Stonehaven F.A.S.

Aberdeenshire Council

Appendix 2

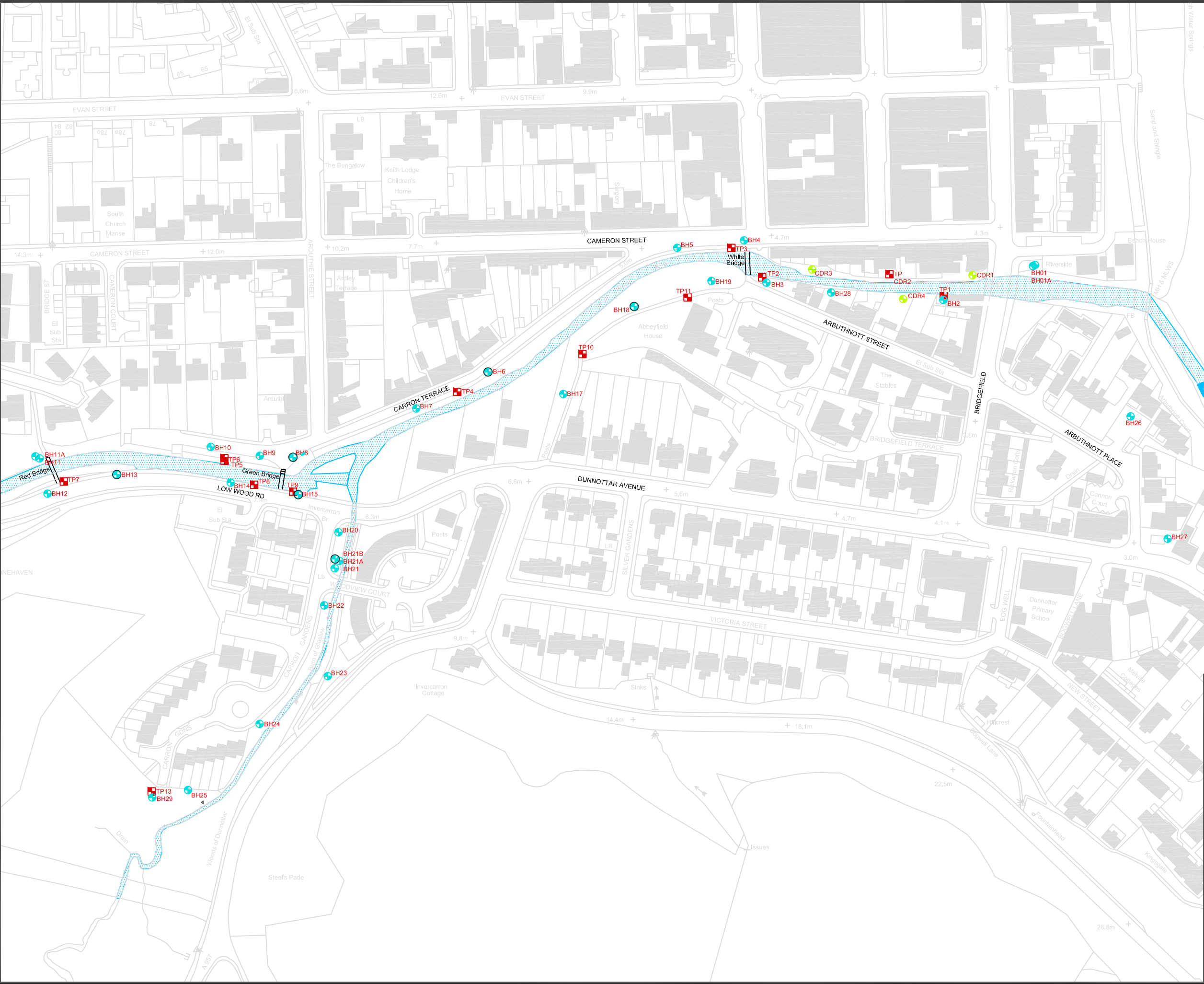
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Contract No. 018936/5414

# Appendix 2.2

## Appendix 2.2 - Site Layout Plan







**Borehole Location**

**Hand Dug Trial Pit Location**

**Borehole with Standpipe**

**COSTAIN LIMITED**

Costain Environmental Services  
Unit 1 Allerton Bywater  
Network Centre, Letchmire Rd  
Allerton Bywater  
West Yorkshire  
WF10 2DB  
Telephone 01977 515 955



**Client**

Aberdeenshire Council

**Project**

Stonehaven FAS

**Title**

Site Layout Plan

<b>Drawing Number</b>	<b>Scale</b>
1 of 1	Original Size A3 Revision No. A





**Borehole Location**

**Hand Dug Trial Pit Location**

**Borehole with Standpipe**

**COSTAIN LIMITED**

Costain Environmental Services  
Unit 1 Allerton Bywater  
Network Centre, Letchmire Rd  
Allerton Bywater  
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WF10 2DB  
Telephone 01977 515 955



**Client**

Aberdeenshire Council

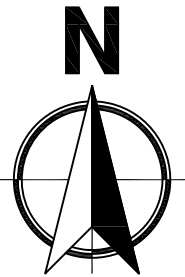
**Project**

Stonehaven FAS

**Title**

Exploratory Hole Location Plan

<b>Drawing Number</b>	<b>Scale</b>
1 of 3	Original Size A3 Revision No. A



Borehole Location



Hand Dug Trial Pit Location



Borehole with Standpipe

COSTAIN LIMITED

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Allerton Bywater  
West Yorkshire  
WF10 2DB  
Telephone 01977 515 955



Client

Aberdeenshire Council

Project

Stonehaven FAS

Title

Exploratory Hole Location Plan

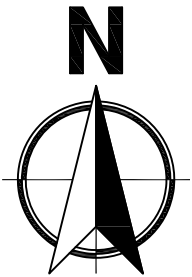
Drawing Number

2 of 3

Scale

Original Size A3  
Revision No. A





Borehole  
Location



Hand Dug  
Trial Pit  
Location



Borehole  
with  
Standpipe

COSTAIN LIMITED

Costain Environmental Services  
Unit 1 Allerton Bywater  
Network Centre, Letchmire Rd  
Allerton Bywater  
West Yorkshire  
WF10 2DB

Telephone 01977 515 955



Client

Aberdeenshire Council

Project

Stonehaven FAS

Title

Exploratory Hole  
Location Plan

Drawing Number

3 of 3

Scale

Original Size A3  
Revision No. A



# Appendix 3

## Appendix 3 - Site Work Methods and BS 5930 Logging Guides

## **A1.0 FIELDWORK METHODS**

### **A1.1 Inspection Pits**

An inspection pit is dug using hand tools at the location of every borehole or dynamic probing position to check for the presence of underground services with the exception of areas where the risk of encountering underground services is deemed sufficiently low as to not warrant an inspection pit.

Inspection pits are scanned with a Cable Avoidance Tool (CAT) and Genny at the surface before digging commences and at 300mm intervals to the base of the pit.

Where services are located in the inspection pit they are recorded on the engineer's log and photographed where necessary. The pit is then backfilled and reinstated at the surface and the borehole/dynamic probe will be moved to a new position.

### **A1.2 Cable Percussion Boring**

Cable percussion boring is commonly used for constructing boreholes through soils and weak rocks where a depth of more than approximately 3.0m is required.

The rig generally consists of a diesel powered winch and tripod frame with running wheels that are permanently attached allowing the rig to be towed behind a suitable vehicle. When the rig has been towed into position it is erected using its own winching system.

Boreholes are advanced through cohesive soil by the percussive action of the cable tool. The force of the cylindrical tool as it is dropped into the borehole cuts a plug of soil that is removed by the tool. In poor consistency soil casing is often used to prevent the sides of the borehole collapsing. Casing may be deemed to be un-necessary in cohesive soils of adequate consistency as the borehole sides will be self supporting.

In non-cohesive soils the borehole is advanced using a shell or bailer. When it is dropped into the borehole, material enters the shell and is retained by use of a clack valve. The water level in the borehole is above that in the surrounding soil to allow for temporary reductions in the head of water as the shell is withdrawn from the borehole.

Water should always flow from the borehole into the surrounding soil at all times to prevent loosening of the soil at the base of the hole. Casing is always advanced with the borehole in granular soil to that material is drawn from the base, rather than the side, of the borehole.

Obstructions to boring are overcome by fitting a heavy chisel with a hardened cutting edge to the base of the percussion tool.

Borehole diameters tend to vary from 6" to 12" however 6" and 8" are most common.

Where suspected contamination is encountered in near surface material the borehole will generally be commenced in a larger diameter until the base of the contaminated layer is reached, the borehole will also be cased to the base of this layer. An impermeable plug, usually bentonite, will then be placed at the bottom of the borehole and left to go off before drilling is recommenced in smaller diameter. This "clean drilling" method reduces the likelihood that a pathway will be created for contamination to migrate down the borehole.

The borehole depth, casing depth and groundwater level is measured at start of every working shift and recorded on the drillers daily record.

Cable percussion boreholes allow soil sampling, groundwater sampling and Standard Penetration Testing (SPT) in addition to installation of groundwater/gas monitoring standpipes or piezometers and other specialised monitoring equipment.

## **A1.4 Rotary Drilling**

Rotary drilling is generally employed for exploratory holes extending into rock strata, although rotary drilling can also be used in both granular and cohesive soils. Rotary drilling utilizes a rotating drill bit at the base of the borehole to advance the borehole. A drilling fluid is used to cool and lubricate the drill bit and in some cases stabilise the borehole sides prior to advancement of casing.

Commonly used drilling fluids are air, mist, water, mud, foam and polymer which are introduced to the borehole via the hollow drilling rods.

Open hole rotary drilling utilises a tricone drill bit or down the hole hammer to rapidly construct a borehole for the installation of monitoring equipment, carrying out of *in situ* tests, probing for voids or reaching a suitable depth where rotary coring can commence.

Rotary coring utilises a double or triple barrelled tungsten or diamond impregnated core bit with a non-rotating inner core barrel fitted with a plastic sample liner. On completion of a core run the liner containing the sample is extracted and stored in a core box where it can be stored before it is photographed, logged and tested.

## A1.5 Rota Sonic Drilling

Rota Sonic drilling is generally employed for all strata types as this technique is able to drill through, and recover samples from, most types of soil and rock strata. This drilling technique employs a combination of high frequency resonance (sonic) and rotation of the drill bit to penetrate the strata. Samples from softer strata are recovered in a hollow sample barrel similar to dynamic sampling techniques, while harder strata are drilled using conventional rotary drilling techniques detailed above. Sonic boreholes allow soil sampling, groundwater sampling, Standard Penetration Testing (SPT) and open tube sampling in addition to installation of groundwater/gas monitoring standpipes or piezometers and other specialised monitoring equipment.

## A1.7 Standard Penetration Testing

The Standard Penetration Test (SPT) can be carried out in most forms of borehole in accordance with the methodology recommended by BS EN ISO 22476: Part 3: (2005).

The SPT determines the in situ resistance of soil to a 50mm diameter split-spoon (S) or solid cone (C) being driven by 63.5kg hammer with a 750mm drop.

The result of an SPT is expressed as an N value which is defined as number of blows needed to obtain 300mm of penetration (the main drive) beneath the initial seating drive of 150mm which is utilized to penetrate any disturbed material at the bottom of the borehole.

The seating drive and main drive are usually recorded in six increments of 75mm, the last four of which are added together to give the N value.

The split spoon sampler is usually used in cohesive soils allowing a sample of the material that was tested to be obtained for observation and testing. The solid cone is usually used where the test is conducted in granular soils or weak rocks.

In granular soils the N value obtained from the SPT is used to assess the relative density of granular soils as shown in the following table:

Term	SPT N-value
Very Loose	0 – 4
Loose	4 – 10
Medium dense	10 – 30

Dense	30 – 50
Very Dense	>50

Where the seating drive has been completed the main drive is terminated if 50 blows have been carried out before the full penetration of 300mm is achieved. The penetration for 50 blows is recorded and an approximate SPT value can be calculated by linear extrapolation of the number of blows for the partial test drive. If the seating drive is not completed at 25 blows, the penetration is recorded and the main drive is started immediately.

For tests in weak rocks the main drive should only be terminated after 100 blows where the penetration of 300mm has not been achieved.

Test results are presented on the logs in the following formats:

**(S)N=24(11,11,6,6,6,6)**

Denotes a split spoon test (S) and a calculated N value of 24 followed by the individual blow counts for each increment in the seating drive and main drive.

**(C)50/89mm(13,11,25,25)**

Denotes a cone test (C) and the maximum blow count in soil of 50 in the main drive followed by the penetration for 50 blows. Individual blow counts for each increment are also shown.

## A1.15 Variable Head Permeability Testing

The determination of in situ permeability by tests in boreholes involves the application of a hydraulic pressure in the borehole different from that in the ground and the measurement of the rate of flow due to this difference.

The pressure in the borehole may be increased by introducing water into it; a falling head test, or decreased by pumping water out of it; a rising head test.

The technique is only applicable to measurement of the permeability of soils below groundwater level.

When carrying out the test the first operation is to add water to the borehole or piezometer (falling head test) or to bail or pump out the water (rising head test). The head in the borehole is then allowed to equalise with that in the ground, the actual head being measured at intervals of time from the commencement of the test.

The permeability can be calculated using the following equation:  $k = A/FT$

Where:

$k$  = the permeability of soil

$A$  = the cross sectional area of the borehole casing or standpipe as appropriate.

$F$  = the intake factor (see below)

$T$  = the basic time factor (see below)

The intake factor is calculated based on the borehole casing/piezometer conditions and the ground conditions when the test is carried out. The calculations for this are given in detail in Figure 6 of BS 5930+A2:1999 (2010).

The basic time factor  $T$  is taken to be the value of elapsed time,  $t$ , corresponding to a value of  $H/H_0$  of 0.37 where  $H_0$  is the head at the start of the test and  $H$  is the head at any time,  $t$ , which has elapsed since the test began.

## A1.20 Groundwater and Gas Monitoring

When groundwater is encountered during drilling work, drilling stops and the depth to groundwater and the casing depth is measured. The groundwater level is then measured at 5 minute intervals for 20 minutes to record rate of inflow. Groundwater levels are also measured at the start and end of every drilling shift.

The symbols on the log to denote the groundwater strike and rise are as follows:



**Depth of groundwater strike**



**Depth of groundwater level after 20 minutes**

On completion of the borehole, it can either be backfilled or installed with a groundwater/gas monitoring piezometer or standpipe.

A groundwater monitoring standpipe usually consists of sections of plain and slotted pipe connected together with the slotted section set in a porous filter medium, known as a response zone, to allow water to flow into the standpipe where it can be monitored. Response zones are normally targeted to monitor groundwater from a particular strata or soil type; as such a bentonite seal is normally placed above and below the response zone. Where the bottom of the slotted section of the standpipe is placed at, or close to, the bottom of the borehole a bentonite seal beneath the response zone is often not required.

A porous groundwater monitoring piezometer is similar to a standpipe but consists of a 300mm porous piezometer tip placed on the end of a plain pipe. They are usually narrower in diameter than standpipes and are often used in narrower response zones and nested installations.

Response zones should never be constructed where they allow transmission of groundwater between contaminated and uncontaminated strata.

Groundwater monitoring is usually carried by lowering a dip meter down the hole until it signals that groundwater has been reached. Alternatively, groundwater can be continually monitored by leaving a pressure transducer, known as a diver, in the borehole which will take a pressure reading at set intervals for a set period of time. The data can then be downloaded at a later date.

Groundwater sampling can be carried out by using a bailer, Waterra tubing, or peristaltic pump. Prior to sampling the volume of groundwater in the well must be calculated and 3 well volumes must be removed to create a cone of depression and causing groundwater to flow into the installation. Where re-charge rates are slow, it may not be possible to remove three well volumes.

Where hydrocarbon contamination is known to be present, an interface meter should be used to measure the thickness of Light Non-Aqueous Phase Liquid (LNAPL) or Dense Non-Aqueous Phase Liquid (DNAPL). LNAPL should be sampled separately.

Gas monitoring can be carried out where a gas tap is present on top of a standpipe or piezometer. Gas monitoring is carried out by connecting either a Flame Ionisation Detector (FID) or Photo Ionisation Detector (PID) to the top of the borehole; numerous gases can be monitored depending on site specific requirements, flow of gases from the borehole can be measured using a flow-pod.

Gas monitoring must be carried out prior to removal of the gas tap for groundwater monitoring or sampling.

Vibrating wire piezometers measure groundwater level by converting water pressure to a frequency signal via a diaphragm, a tensioned steel wire, and an electromagnetic coil. A readout unit is then connected to the vibrating wire at groundwater to measure the frequency. Data-loggers can be connected to vibrating wires for continual monitoring.

## A1.21 Samples

Various samples are taken during site investigation works and post fieldwork core logging to enable further inspection and the completion of laboratory geotechnical and geo-environmental testing.

A bulk disturbed sample (B) comprises a 20 – 30kg bag of material, a disturbed sample (D) comprises a 1 – 2kg plastic tub and environmental sample (ES) comprises a 1 – 2kg plastic tub, a 250ml amber glass jar and 60ml amber glass jar.

A water sample (W) is taken during drilling work in conjunction with a water strike and comprises approximately 1l of water (where obtainable) stored in a plastic bottle; an environmental water sample (EW) is taken during a post site work monitoring visit after development of the monitoring well and comprises a 1000ml plastic bottle, a 1000ml amber glass bottle and a 20ml amber vial.

Core samples (C) are taken during detailed logging of rock cores that are obtained by rotary coring. Core samples will ideally have at least 2:1 length to diameter ratio for uniaxial compressive strength testing. Where this is not possible due to excessive fracturing of the core irregularly shaped samples of 1 – 2kg can be taken for point load testing. Samples are suitably wrapped to maintain natural moisture content.

Block samples (BLK) are usually taken in trial pits and comprise up to 20kg of cohesive soil that is cut, undisturbed, from the base of the pit and stored to maintain natural moisture content and structure. Where trial pits are being dug through weak and very weak rocks boulders of material can be recovered which can be treated as BLK samples and stored appropriately.

Undisturbed samples (U) are taken in boreholes by driving thin walled sampling tube using a down-the hole hammer. When the sample is retrieved, both ends of the sample tube are sealed in wax to maintain the natural moisture content. The number of blows taken to drive the sample and the percentage of sample recovery are shown on the borehole records.

U samples are denoted on the log in the following format:

**\*34/450mm**

Denoting the number of blows and the recovery in millimetres.

Where undisturbed sampling is unsuccessful a disturbed sample is usually taken across the proposed depth of the undisturbed sample.



## A2.0 BS 5930 Logging Guides

The following table taken from BS 5930+A2 (2010) Table 13, outlines the field identification and description of soils.

Soil Group	Principal Soil Type	Particle Size (mm)	Visual Identification	Relative Density/Consistency		Discontinuities	Bedding	Colour	Composite Soil Types (mixtures of basic soil types)	Minor Constituent soil Type	Particle Shape	Principal Soil Type	Minor Constituents	Stratum Name		
				Term	Field Test											
Very Coarse Soils	BOULDERS	Large boulder	Only seen complete in pits or exposures.	None defined	Qualitative description of packing by inspection and ease of excavation.	Describe spacing of features such as fissures, shears, partings, isolated beds or laminae, desiccation cracks, rootlets etc.	Describe the thickness of beds in accordance with geological definition.	Lightness:  Light Dark	For mixtures involving very coarse soils see BS 5930 CH4.4.2		Very angular  Angular Subangular Subrounded	BOULDERS	with rare	Name in accordance with published geological maps, memoirs or sheet explanation		
		Boulder														
	COBBLES	Cobble										200			Often difficult to recover whole from boreholes.	
Coarse Soils (over at least 50% sand and gravel above)	GRAVEL	Coarse	Easily visible to naked eye. Particle shape, grading can be described.	Borehole with SPT N Value		Pea-sized. Soil breaks into blocks along unpolished discontinuities.	Alternating layers of different types	Prequalified by thickness term if in equal proportions	Term before principal soil type	Proportion secondary (see Note A)	Rounded Well rounded  Cubic  Flat Elongated Tabular	GRAVEL	with occasional	For example:  RIVER TERRACE DEPOSITS  GLACIAL SAND AND GRAVEL		
		Medium		Very loose	0 – 4											
		6.3		Loose	4 – 10											
		Fine		Medium coarse	10 – 30											
	SAND	Coarse	2	Visible to naked eye; no cohesion when dry, grading can be described.	Dense	30 – 50	Sheared. Soil breaks into blocks along polished discontinuities.	Inter-bedded or inter-laminated	Pinkish Reddish Yellowish Orangeish Brownish Greenish Bluish Greyish	Term before principal soil type	Proportion secondary (see Note C)	Terms can include glauconitic micaceous shelly	SAND	with numerous, frequent or abundant	BRICKEARTH	
		Medium	0.63													
		0.2	Very dense													>50
	Fine Soils (over at least 20% silt and clay above)	SILT	Coarse	Only coarse silt visible with hand lens; exhibits little plasticity and marked dilatancy; slightly granular or silky to the touch; disintegrates in water; lumps dry quickly, possesses cohesion but can be powdered easily between fingers.	Very soft	Finger easily pushed in up to 25mm; exudes between fingers.	Spacing scale of discontinuities		Spacing scale of bedding thickness		Term before principal soil type	Proportion secondary (see Note A)	slightly (glauconitic)  (glauconitic)  very (glauconitic)	SILT	Terms can include shell fragments, pockets of peat, gypsum crystals, flint gravel, brick fragments, rootlets, plastic bags	
			0.02				Soil	Finger pushed in up to 10mm; moulded by light finger pressure	Term	Mean Spacing (mm)						Term
			Medium		Firm	Thumb makes impression easily; cannot be moulded by fingers; rolls to a thread			Very widely	>2000	Very thickly bedded	>2000				
							0.0063	Fine	Can be indented slightly by thumb; crumbles in rolling thread; remoulds	Widely	2000 – 600	Thickly bedded	2000 – 600			
0.002			CLAY		All soils <0.002mm – Dry lumps can be broken but not powdered between the fingers. They also disintegrate under water but more slowly than silt; smooth to the touch; exhibit plasticity but no dilatancy; stick to the fingers and dry slowly; shrink appreciably on drying usually showing cracks.	Very stiff				Can be indented by thumbnail; cannot be moulded; crumbles	Medium	600 – 200	Medium bedded	600 – 200		
								Hard (or extremely weak)	Can be scratched by thumbnail		Closely	200 – 60	Thinly bedded	200 – 60		
						Very closely				60 – 20	Very thinly bedded	60 – 20				
											Thickly laminated	20 – 6				
									Thinly laminated	<6						

The following table taken from BS 5930+A2:(2010) Table 14/15, is an aid to identification of rocks for engineering purposes and describes the terminology for rock discontinuity description.

Dimension	Rock Material										Rock Mass																						
	Rock Material				Rock Name			General			Discontinuities																						
	Strength	Structure and fabric	Colour	Texture	Grain Size	SEDIMENTARY	IGNEOUS	METAMORPHIC	Minor Constituents	Formation Name	Weathering	Orientation	Spacing	Persistence	Termination	Roughness	Wall Strength	Aperture	Infilling	Seepage	No. of sets												
2000 mm	>250MPa Extremely Strong Rings or hammer blows. Only stripped with geological hammer	Use standard geological terms	LIGHTNESS Light / Dark	Use standard geological terms	Coarse Grained	CONGLOMERATE	GRANITE		Describe using relative terms	Name according to published geological maps and memoirs	Approach 1 Mandatory description of all features associated with weathering	Dip direction and dip eg 245/70	Extremely widely >6m	Very high >20m	Large scale (m) Waveless Curvature Straightness	Use standard strength terms (not 2)	Cannot be described in cores	Clean	Can be summarised in cores where sets of different	Cannot describe in detail in core although data can be used with care for structural analysis and not usually correct													
500 mm	Very Thickly	For example	CONGLOMERATE	GRANITE										Describe state and changes in:							Dip amount only in cores	High 10-20m	Medium 3 to 10m	Field strength tests	Extremely wide >1000 mm	Surface staining (colour)							
	Thickly																					Widely 0.8 to 2m						Low 1 to 2m	Very wide 100-1000 mm	Soil infilling (describe as for soils)	Moisture on rock surface		
200 mm	Medium	phanitic	BRECCIA	GNEISS									rare	COAL MEASURES							Strength	Medium 200-500mm	Medium 3 to 10m	Point load	Wide 10-100mm	Mineral coatings (eg. calcite, chlorite, gypsum etc.)	Dripping water						
	Thinly																											Very low <1m	A outside exposure	Stepped	Schmidt hammer	Moderately wide 2.5-10mm	Visual assessment
80 mm	Very Thickly	CHROMA Pinkish Reddish Yellowish Brownish Greenish Bluish Greyish	porphyritic	LIMESTONE									DIORITE	MIGMATITE							Frequent	WEATHERED WICKERSLEY ROCK	Fracture state	Medium 200-500mm	Medium 3 to 10m	Rough	Other index tests	Open 0.5-2.5mm	Tight 0.1-0.25mm	Other - specify			
30 mm																																	Thinly laminated / Narrowly
6.3 mm	Thinly laminated / Very narrowly	crystalline	DOLOMITE	MARBLE										SHERWOOD SANDSTONE							Presence or absence of weathering products	Extremely closely <20mm	Discontinuous	Cannot normally be described in cores	Undulating	Rough	Take several readings	Continuous in cores	Record size of exposure	Smooth	Report average and maximum	Record width, continuity and relevant characteristics of sets	Small 0.05-5.0mm
0.63 mm	25-50 Mpa Medium Strong Cannot be peeled with knife fractures with single blow of hammer	Thinly laminated / Narrowly	HUE Pink										Medium Grained	Coarse							SANDSTONE HALITE GREYWACKE	MICROGRANITE	SCHIST	vugs	LEWIS CHALK	Approaches 4 or 5 Classify only if useful and unambiguous	Report average and maximum	Continuous in cores	Record size of exposure	Smooth	Report average and maximum	Record width, continuity and relevant characteristics of sets	Small 0.05-5.0mm
0.2 mm	5-25MPa Weak Can be peeled with difficulty Point of hammer makes shallow indents	Thinly laminated / Narrowly	Red	Medium	Medium	QUARTZITE	DOLERITE	PHYLLITE	shells	DISTINCTLY WEATHERED MERCIA MUDSTONE		Report average and maximum		Continuous in cores	Record size of exposure	Smooth	Report average and maximum	Record width, continuity and relevant characteristics of sets	Small 0.05-5.0mm														
					0.063mm	Thinly laminated / Narrowly	Yellow	Fine	TUFF ANHYDRITE	MICROCHLORITE	QUARTZITE	pyrite																					
0.02 mm	1-5MPa Very Weak Crumbles under firm hammer blows. Can be peeled by knife	Thinly laminated / Narrowly	Blue	Fine	Fine Grained	SILTSTONE	RHYOLITE	SLATE	crystals																								
						0.006 mm	Thinly laminated / Narrowly	White	CHALK	ANDESITE	HORNFELS	colours																					
0.002 mm	0.5-1.0MPa Extremely Weak Gravel size lumps crush between finger and thumb, indented by thumbnail	Thinly laminated / Narrowly	Grey	Very Fine	Very Fine Grained	GYPSEUM	BASALT	HORNFELS	colours																								
						0.002 mm	Thinly laminated / Narrowly	Black	FINE GRAINED TUFF	MUDSTONE VERY FINE GRAINED TUFF	CHERT FLINT	OBSSIDIAN VOLCANIC GLASS	colours																				
FRACTURE STATE																																	
Solid Core Solid core is taken as core with at least one full diameter (but not necessarily a full circumference) measured along the core axis or other scan line between two natural fractures																																	
TCR Percentage ratio of core recovered (both solid and non-intact) to the total length of the core run.																																	
SCR Percentage ratio of solid core recovered to the total length of core run.																																	
ROQ Total length of solid core pieces each greater than 100mm between natural fractures expressed as a percentage of total length of core run.																																	
IF Average length of solid core pieces between natural fractures over core lengths of reasonably uniform characteristics, not core runs.																																	
FI Number of fractures per meter over core lengths of reasonably uniform characteristics.																																	

# Appendix 4

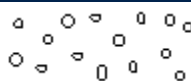
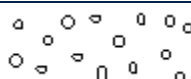



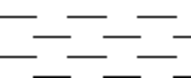
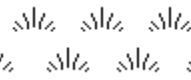



## Appendix 4 - Exploratory Hole Records

# Appendix 4.1

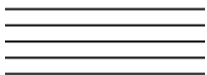




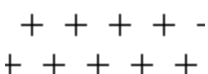
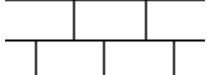



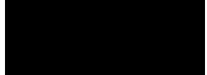

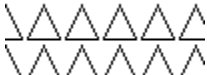
## Appendix 4.1 - Key to Exploratory Hole Records & Soil and Rock Description Terminology

## A4.1 Key to Exploratory Hole Records









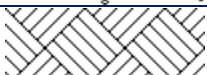
The following table denotes the legend used for principal soil types when presented on geological logs:

Class	Type	Legend	Grain size
Coarse Grained/Non-Cohesive	Boulders		>200mm
	Cobbles		63 – 200mm
	Gravel		Coarse 20 – 63mm Medium 6.3 – 20mm Fine 2 – 6.3mm
	Sand		Coarse 0.63 – 2mm Medium 0.2 – 0.63mm Fine 0.063 – 0.2mm
Fine Grained/Cohesive	Silt		0.002 – 0.063mm
	Clay		>30% of particles finer than 0.002mm
Organic	Peat/Topsoil		N/A
Man Made Material	Made Ground		
	Concrete		
	Blacktop		
Composite soils, such as clayey sands or silty gravels will combine the above legend codes			

The following table denotes the legends used for rock types when presented on geological logs:

Rock Type	Legend	Rock Type	Legend
Mudstone		Conglomerate	
Siltstone		Fine Grained Igneous	
Sandstone		Medium Grained Igneous	
Limestone		Coarse Grained Igneous	
Chalk		Fine Grained Metamorphic	
Coal		Medium/Coarse Grained Metamorphic	
Breccia			

The following table denotes the legends used for borehole backfill and commonly used installation types:

Backfill Type	Legend	Installation Type	Legend
Arisings		Plain Pipe	
Bentonite Pellet Seal		Slotted Pipe	
Sand Filter Medium		Porous Piezometer Tip	
Gravel Filter Medium		Vibrating Wire Piezometer	
Cement/bentonite grout			



## A4.2 Soil and Rock Description Terminology

The following table gives the descriptive consistency term for cohesive soils as described on geological logs based on field observations:

Consistency term for field description	Field test
Very soft	Finger easily pushed in up to 25 mm. Exudes between fingers
Soft	Finger pushed in up to 10mm. Moulds by light finger pressure
Firm	Thumb makes an impression easily. Cannot be moulded by fingers, rolls into a 3 mm thick thread without breaking or crumbling
Stiff	Can be indented slightly by thumb. Crumbles in rolling to a 3 mm thick thread, but can then be remoulded into a lump
Very stiff	Can be indented by thumb nail. Cannot be moulded but crumbles under pressure
Hard	Can be scratched by thumbnail

The term Hard Clay is for transported materials only such as glacial till.

When measurements of undrained shear strength of fine soils are made in the field using a hand vane or in the laboratory by triaxial test the following terms can be given on the logs using the terms described below:

Descriptive term based on measurement	Undrained shear strength classification definition (kPa)
Extremely low	<10
Very low	10 – 20
Low	20 – 40
Medium	40 – 75
High	75 – 150
Very high	150 – 300
Extremely high	300 – 600

The following table gives the descriptive term for strength of rock as it would be described on the geological log relative to field assessments and laboratory tests:

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurements (MPa)
Extremely Weak	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb	0.6 – 1.0
Very Weak	Crumbles under firm blows with the point of a geological hammer. Can be peeled with a pocket knife	1 – 5
Weak	Can be peeled with a pocket knife with difficulty. Shallow indentations made by firm blows with the point of a geological hammer	5 – 25
Medium Strong	Cannot be scraped with a pocket knife. Can be fractured with a single firm blow of a geological hammer	25 – 50
Strong	Requires more than one blow of a geological hammer to fracture	50 – 100
Very Strong	Requires many blows of a geological hammer to fracture	100 – 250
Extremely Strong	Can only be chipped with a geological hammer	>250

The following table gives the descriptive terms for the structure of sedimentary soils and rocks:

Descriptive Term	Thickness
Very thickly	>2 m
Thickly	600 mm – 2 m
Medium	200 mm – 600 mm
Thinly	60 mm – 200 mm
Very Thinly	20 mm – 60 mm
Thickly laminated (sedimentary)	6 – 20 mm
Thinly laminated (sedimentary)	< 6 mm

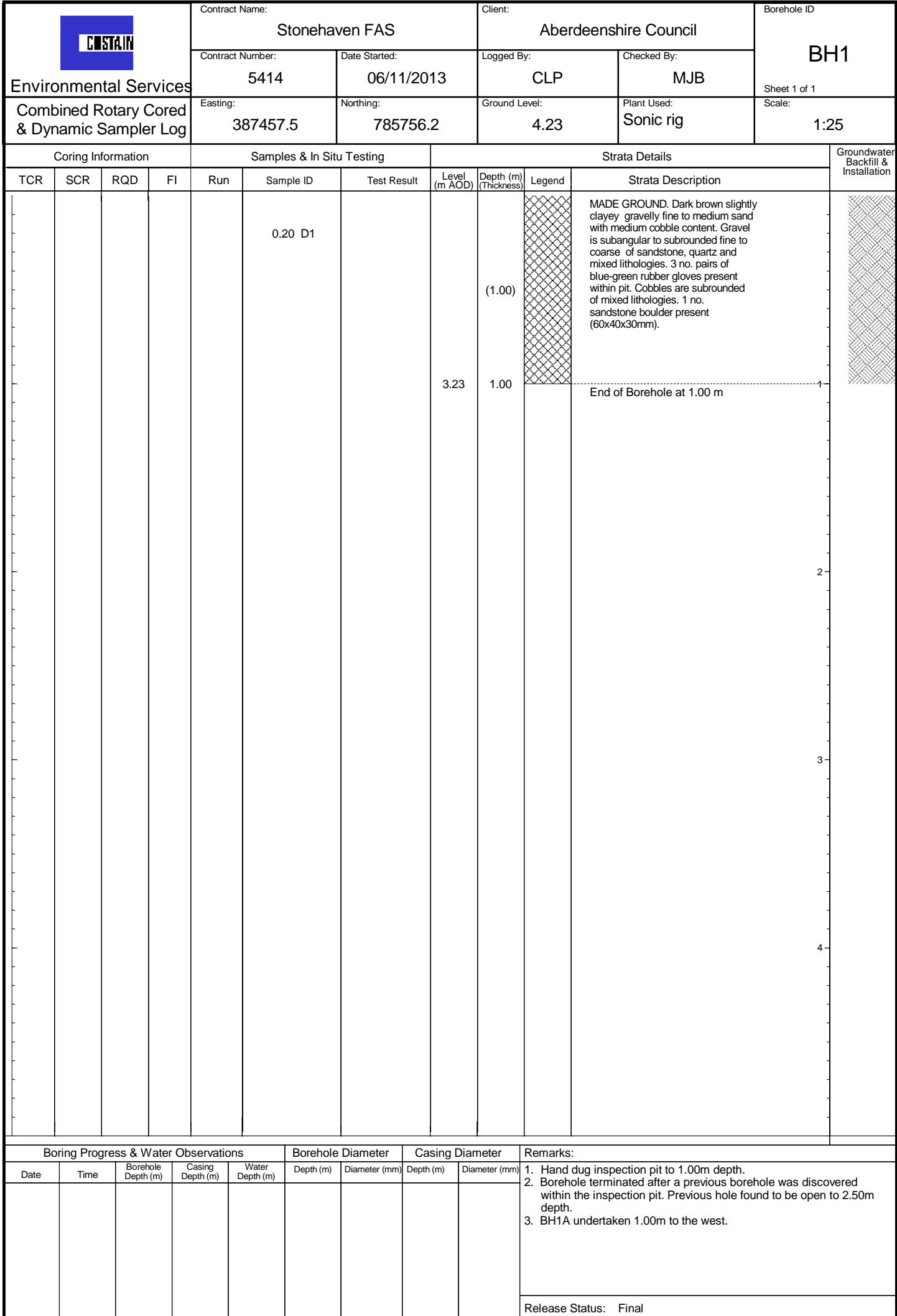


The following table defines the standard indices used for the description of the fractures state in rock cores and is presented on geological logs:

Indices Term	Definition
TCR (%)	Total Core Recovery – Ratio of core recovered (solid and non-intact) to the length of the core run
SCR (%)	Solid Core Recovery – Ratio of solid core recovered to the length of the core run
RQD (%)	Rock Quality Designation – Ratio of solid core pieces longer than 100 mm to the length of the core run
FI	Fracture Index – The number of fractures per metre as calculated from a count of the number of fractures over an arbitrary length of core with similar fracturing intensity.
If (mm)	Fracture Spacing, reported as minimum/mode/maximum spacing of fractures over an arbitrary length of core of similar intensity of fracturing.
NI	Where core is non-intact in the ground, the abbreviation NI may be used.
AZCL	Assessed zone of core loss
CRF	Core recovered from the following run. (length in m)

# Appendix 4.2

## Appendix 4.2 - Cable Percussion / Rotary Core / Rota-Sonic Borehole Logs







Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
					5.00-5.45 D16 5.10-5.60 B17 5.10 ESB17	(S)N=14 (0,1,1,2,3,8)	-0.87	5.10		Remaining Detail : 4.90m - 4.90m : --- from 4.90m depth, with occasional fine to coarse gravel sized pockets of brown amorphous peat.	
								(0.50)		Dark brown amorphous PEAT with occasional fine to coarse gravel sized pockets of grey fine to medium sand.	
					5.70 D18		-1.37	5.60		Dark brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					5.90 D19 6.00-6.50 U20 6.00 U20		-1.57	5.80		Firm reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					6.50 D21 6.50-7.00 B23		-2.27	6.50		Soft reddish brown very sandy SILT.	
					7.00-7.50 B24		-2.77	7.00		Firm becoming stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					7.50-7.95 D25 7.50-8.50 B26	(S)N=42 (4,9,10,10,10,12)		(2.50)		Brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					8.50-9.00 B27						
					9.00-9.45 D28 9.00-10.00 B29	(S)50/203mm (5,8,20,17,13)	-5.27	9.50		Brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	

<div><div><div>COSTAIN</div></div><div>Environmental Services</div></div>		Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID: CDR1	
		Contract Number: 5414	Date Started: 23/10/2013	Logged By: MC	Checked By: MJB	Sheet 1 of 2	
		Easting: 387424.5	Northing: 785750.2	Ground Level: 2.94	Plant Used: Cut down CP	Scale: 1:25	
Cable Percussion Borehole Log							
Samples & In Situ Testing			Strata Details				Groundwater
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)	Backfill/ Installation
0.00 D1  0.20 D2 0.20-0.50 B3	(S)N=50 (11,8,11,10,7,22)	2.84	0.10		MADE GROUND. Grey slightly sandy subangular medium to coarse gravel of granite.	1	
		(0.60)			MADE GROUND. Brown fine to medium sand. --- at 0.10m depth, black geotextile.		
		2.24	0.70		MADE GROUND. Brown angular cobbles and boulders of sandstone with fine to coarse sand infill.		
1.20-1.65 D4 1.20-2.00 B5	(S)N=2 (3,2,1,0,1,0)	1.74	1.20		Very dense brown fine to coarse SAND and very angular to well rounded fine to coarse GRAVEL of sandstone and mixed lithologies.	2	
		(0.80)					
2.00-2.45 D6 2.00 ESD6 2.00-3.00 B7	(S)N=12 (1,1,4,4,1,3)	0.94	2.00		Very loose brown slightly gravelly fine to coarse SAND with low cobble content. Gravel is angular to rounded fine to coarse of sandstone and mixed lithologies. Cobbles are angular of sandstone.	3	
		(1.30)					
		-0.36	3.30				
3.00-3.45 D8 3.00 ESB9 3.00-4.00 B9	*40/0mm	-0.46	3.40		Dark brown amorphous PEAT.	4	
		(0.75)					
		-1.21	4.15				
4.00-4.45 UF 4.00-5.00 B10			(0.85)		Dark brown sandy very angular to well rounded fine to coarse GRAVEL of mixed lithologies.		
					Continued next sheet		
Boring Progress & Water Observations					Depth/Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)	1. Hand dug inspection pit to 1.20m depth. No services encountered. - Difficult excavation 1hr. 2. Cut down rig assembled on position. Cable percussion drilling with cut down rig between 1.20m and 8.30m depth. 3. Groundwater encountered at 1.30m depth, no rise. Groundwater encountered at 8.00m depth, rising to 4.85m after 20 mins. 4. Borehole complete at 8.10m depth on engineer's instruction as casing unable to advance past 6.00m. 5. Borehole backfilled with bentonite upon completion. Release Status: Final
24/10/2013	1800	6.50	6.00	-	6.00	150	
25/10/2013	1100	8.30	6.00	4.85	Depth/Borehole Diameter		
					Depth (m)	Borehole Diameter (mm)	
					8.00	150	

<div><div><div>COSTAIN</div></div><div>Environmental Services</div></div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID: <div>CDR1</div>		
	Contract Number: 5414	Date Started: 23/10/2013	Logged By: MC	Checked By: MJB	Sheet 2 of 2		
Cable Percussion Borehole Log	Easting: 387424.5	Northing: 785750.2	Ground Level: 2.94	Plant Used: Cut down CP	Scale: 1:25		
Samples & In Situ Testing			Strata Details			Groundwater	
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)	Backfill/ Installation
5.00-5.50 B11	(S)N=14 (3,2,2,3,4,5)	-2.06	5.00		Very soft reddish brown sandy gravelly CLAY. Gravel is very angular to well rounded fine to coarse of mixed lithologies.		
6.00 D12 6.00-6.50 B13		-3.06	6.00		Very stiff red slightly gravelly sandy CLAY with low cobble content. Gravel is very angular to well rounded fine to coarse of mixed lithologies. Cobbles are subrounded to well rounded of sandstone and mixed lithologies.	6	
6.50-6.95 D14 6.50-7.00 B15	(S)N=27 (3,4,5,7,7,8)		(2.00)			7	
7.50 D16 7.50-8.00 B17							
8.00-8.30 D18 8.00-8.30 B19	(S)50/150mm (17,8,20,30)	-5.06	8.00		Very dense red slightly clayey very gravelly fine to coarse SAND with low cobble content. Gravel is very angular to well rounded fine to coarse of mixed lithologies. Cobbles are angular to well rounded of mixed lithologies.	8	
		-5.36	8.30		End of Borehole at 8.30 m		
Boring Progress & Water Observations					Depth/Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)	6. SPT hammer id = WB1. Energy ratio =74%
24/10/2013	1800	6.50	6.00	-	6.00	150	
25/10/2013	1100	8.30	6.00	4.85	Depth/Borehole Diameter		
					Depth (m)	Borehole Diameter (mm)	
					8.00	150	Release Status: Final



## Cable Percussion Borehole Log

Contract Number:	5414
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Date Started: 26/10/2013

Aberdeenshire Council

Logged By:	MC
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Checked By:	MJB
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BH2


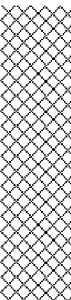








Sheet 1 of 2





Scale:	
1.2	1:25

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









Boring Progress & Water Observations					Depth/Casing Diameter		Remarks:  1. Hand dug inspection pit to 1.20m depth. No services encountered. 2. Cut down rig assembled on position. 3. Breaking out concrete surface and pit - 3 hours. 4. Cable percussion drilling with cut down rig between 1.20m and 6.80m depth. 5. Rotary follow-on attempted at 6.80m depth. 6. Groundwater encountered at 1.65m depth, rising to 1.43m after 5 minutes. 7. SPT hammer Id = WB1. Hammer energy ratio =74% Release Status: Final
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)	
26/10/2013	1800	1.20	-	-	4.70	150	
28/10/2013	1800	6.80	4.70	-	Depth/Borehole Diameter		
					Depth (m)	Borehole Diameter (mm)	
					6.80	150	



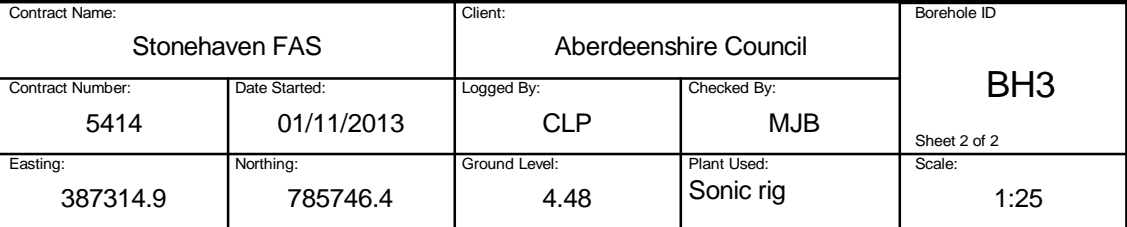
 Environmental Services		Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID:  CDR3	
		Contract Number: 5414	Date Started: 31/10/2013	Logged By: MC	Checked By: 30MJB		
Cable Percussion Borehole Log		Easting: 387337.4	Northing: 785754.9	Ground Level: 3.36	Plant Used: Cut down CP	Sheet 1 of 2 Scale: 1:25	
Samples & In Situ Testing			Strata Details				Groundwater
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)	Backfill/ Installation
0.10 D1 0.10-0.50 B2	(S)N=6 (3,3,4,1,1,0)	2.36	(1.00)		MADE GROUND. Grass over brown slightly silty slightly gravelly fine to coarse predominantly fine sand. Gravel is angular to rounded fine to coarse of slate, quartzite, sandstone, brick and mixed lithologies.  --- from 0.50m depth, gravelly with subangular to well rounded cobbles of sandstone. --- at 0.50m depth, 2cm dia. tree root.	1	
1.00 D3 1.00-1.20 B4			1.00		--- at 0.90m depth, broken ceramic floor tile and dark brown glazed teapot handle.		
1.20-1.65 D5 1.20 ESD5 1.20-2.00 B6			(0.50)		Brown sandy angular to well rounded fine to coarse GRAVEL of sandstone and mixed lithologies.		
2.00 D7 2.00 ESD8 2.00 EWW9 2.00-2.45 D8 2.00 W9 2.00-2.50 B10	(S)N=9 (1,2,2,3,2,2)	1.86	1.50		Plastic dark brown amorphous PEAT with bands of greyish blue fine sand.	2	
3.00-3.45 D11 3.00 ESB12 3.00-3.50 B12	(S)N=33 (6,10,12,9,6,6)	0.16	(1.70)			3	
			3.20		Dense reddish brown very gravelly fine to coarse SAND. Gravel is angular to rounded fine to coarse of mixed lithologies.	4	
4.00-4.45 D13 4.00-4.50 B14	(S)N=11 (2,2,2,2,3,4)	-0.64	4.00		Firm brownish red slightly gravelly sandy SILT. Gravel is angular to well rounded fine to coarse of mixed lithologies.		
Continued next sheet							
Boring Progress & Water Observations					Depth/Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)	1. Hand dug inspection pit to 1.20m depth. Cable encountered in side of pit at 0.80m depth, pit extended 0.5m to north. 2. Cut down rig assembled on position. Cable percussion drilling with cut down rig between 1.20m and 6.80m depth. 3. Groundwater encountered at 1.25m depth, rising to 1.10m after 5 mins. Groundwater encountered at 6.50m depth, rising to 3.50m after 20 mins. 4. Borehole complete at 6.80m depth on engineer's instruction as casing unable to advance past 4.50m. 5. Borehole backfilled with bentonite upon completion. Release Status: Final
31/10/2013	1800	5.00	4.00	-	4.50	150	
01/11/2013	0800	5.00	4.00	4.58	Depth/Borehole Diameter		
01/11/2013	1030	6.80	4.50	2.20	Depth (m)	Borehole Diameter (mm)	
					6.50	150	


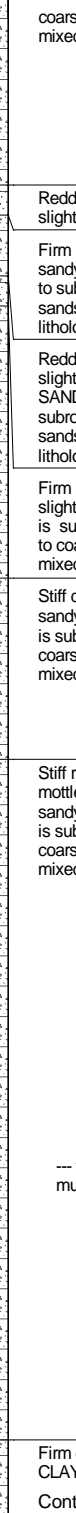
 Environmental Services	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID:  CDR3	
	Contract Number: 5414	Date Started: 31/10/2013	Logged By: MC	Checked By: 30MJB	Sheet 2 of 2	
Cable Percussion Borehole Log	Easting: 387337.4	Northing: 785754.9	Ground Level: 3.36	Plant Used: Cut down CP	Scale: 1:25	
Samples & In Situ Testing			Strata Details			Groundwater
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)
5.00-5.45 D15 5.00 ESD15 5.00-5.50 B16	(S)N=21 (4,5,6,6,4,5)		(2.50)		Firm brownish red slightly gravelly sandy SILT. Gravel is angular to well rounded fine to coarse of mixed lithologies. --- from 5.00m depth, very stiff and low cobble content of rounded sandstone.	
6.00 D17 6.00-6.50 B18						
6.50-6.80 D19 6.50 ESD19						
6.80 W20	(S)50/170mm (3,22,22,20,8)	-3.14	6.50 (0.30)		Very dense brownish red very gravelly fine to coarse SAND. Gravel is angular to rounded fine to medium of mixed lithologies.	
		-3.44	6.80		End of Borehole at 6.80 m	
<div>6</div> <div>7</div> <div>8</div> <div>9</div>						
Boring Progress & Water Observations					Depth/Casing Diameter	Remarks:
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)
31/10/2013	1800	5.00	4.00	-	4.50	150
01/11/2013	0800	5.00	4.00	4.58		
01/11/2013	1030	6.80	4.50	2.20		
					Depth/Borehole Diameter	
					Depth (m)	Borehole Diameter (mm)
					6.50	150
Release Status: Final						

<div><div>COSTAIN</div><div>Environmental Services</div></div>		Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID:  CDR4		
		Contract Number: 5414	Date Started: 29/10/2013	Logged By: MC	Checked By: MJB			
Cable Percussion Borehole Log		Easting: 387387.1	Northing: 785737.7	Ground Level: 3.31	Plant Used: Cut down CP	Sheet 2 of 2 Scale: 1:25		
Samples & In Situ Testing			Strata Details				Groundwater	
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)	Backfill/ Installation	
5.00-5.27 U18 5.00 U18	*55/270mm	-4.54	(4.15)		Stiff brownish red slightly gravelly sandy SILT with low cobble content. Gravel is very angular to rounded fine to coarse of mixed lithologies. Cobbles are subangular to rounded of mixed lithologies. --- from 5.30m depth, very stiff.	6		
5.50 D19								
6.00 D20 6.00-6.50 B21								
6.50-6.95 D22 6.50-7.00 B23	(S)N=49 (6,6,8,13,13,15)							
7.10 D24								
7.50-7.85 D25	(S)50/200mm (10,15,18,18,14)		7.85		End of Borehole at 7.85 m	8		
						9		
Boring Progress & Water Observations					Depth/Casing Diameter		Remarks:	
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)	7. SPT hammer id = WB1. Energy ratio =74%	
					4.50	150		
					Depth/Borehole Diameter			
					Depth (m)	Borehole Diameter (mm)		
					7.50	150	Release Status: Final	

 Environmental Services	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID:  CDR4					
	Contract Number: 5414	Date Started: 29/10/2013	Logged By: MC	Checked By: MJB						
	Cable Percussion Borehole Log	Easting: 387387.1	Northing: 785737.7	Ground Level: 3.31	Plant Used: Cut down CP	Sheet 1 of 2 Scale: 1:25				
Samples & In Situ Testing		Strata Details				Groundwater				
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)	Backfill/ Installation			
0.10 D1 0.10-0.60 B2	(S)N=17 (5,5,4,6,3,4)	2.71	(0.60)		MADE GROUND. Grass over dark brown slightly gravelly silty fine sand with some rootlets. Gravel is angular to well rounded of ceramic and mixed lithologies. (Topsoil).	1 2 3 4				
0.60 D3 0.60 ESB4 0.60 ESD3 0.60-0.80 B4			0.60		MADE GROUND. Reddish brown slightly silty gravelly sand with medium cobble content. Gravel is very angular to well rounded fine to coarse of mixed lithologies. Cobbles are angular to rounded of concrete and mixed lithologies.					
0.90 D5 0.90-1.10 B6		2.41	0.90		Medium-dense brown sandy GRAVEL with high cobble content. Gravel is angular to well rounded fine to coarse of mixed lithologies. Cobbles are angular to rounded of mixed lithologies.					
1.20-1.65 D7 1.20 ESD7 1.20-2.00 B8		1.51	(0.90)							
1.90 D9			1.80		Firm dark brown pseudo-fibrous PEAT.					
2.00-2.45 U10 2.00 U10 2.00-3.00 B12		1.01	(0.50)							
2.50 D11			2.30		Soft bluish grey sandy CLAY with some fibrous plant remains.					
3.00 D13 3.00-3.50 B14		0.51	2.80		Loose brown slightly sandy angular to rounded fine to coarse GRAVEL of mixed lithologies.					
3.70-4.00 B15		-0.39	(0.90)							
4.00-4.45 D16 4.00-5.00 B17			3.70		Stiff brownish red slightly gravelly sandy SILT with low cobble content. Gravel is very angular to rounded fine to coarse of mixed lithologies. Cobbles are subangular to rounded of mixed lithologies.					
Continued next sheet										
Boring Progress & Water Observations					Depth/Casing Diameter			Remarks:  1. Hand dug inspection pit to 1.20m depth. No services encountered. 2. Cut down rig assembled on position. Cable percussion drilling with cut down rig between 1.20m and 7.85m depth. 3. Groundwater encountered at 1.20m depth, rising to 1.10m depth after 20 mins. 4. Chiselling at 7.50m depth - 20 mins. 5. Borehole complete at 7.85m depth on engineer's instruction due to cobbles at 7.50m depth. 6. Borehole backfilled with bentonite upon completion. Release Status: Final		
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)				
					4.50	150				
					Depth/Borehole Diameter					
					Depth (m)	Borehole Diameter (mm)				
					7.50	150				





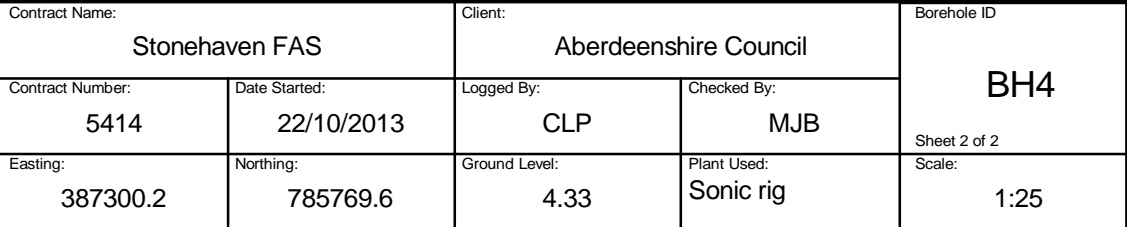
Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation	
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
	5.00-5.50 U16			(0.90)		coarse of sandstone, quartz and mixed lithologies.		
	5.50 D17							
	5.60 D18		-1.12	5.60				
	5.70-5.90 B19		-1.22	5.70		Reddish brown and multicoloured slightly clayey fine to coarse SAND.		
	5.90 D20		-1.42	5.90				
	6.00-6.45 D21	(S)N=46 (4,9,10,11,12,13)	-1.52	6.00		Firm reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		6
	6.00-6.90 B22							
				(0.90)		Reddish brown and multicoloured slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
						Firm becoming stiff reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
	6.90-7.50 B23		-2.42	6.90				
				(0.60)		Stiff dark greyish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		7
	7.50-7.95 D24	(S)50/225mm (2,8,16,16,18)	-3.02	7.50				
	7.50-8.25 B25							Stiff reddish brown occasionally mottled yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.
	8.25-8.80 B26			(2.25)				
	8.80-9.50 B28							
	9.00-9.45 D27	(S)50/145mm (13,12,28,22)				--- from 8.80m depth, mottled multicoloured and very sandy.	9	
	9.50-9.75 B29							
	9.75-10.00 B30		-5.27	9.75				
				(0.25)	Firm dark brown gravelly very sandy CLAY. Gravel is subangular to			
					Continued next sheet			

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					6.00 10.00	140 115	6.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Groundwater encountered at 2.45m rising to 1.97m after 20 mins. 4. Borehole complete at 10.00m upon specified depth. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final

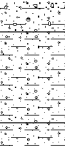
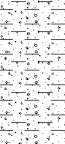
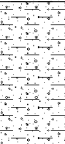
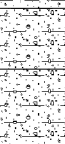
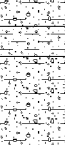







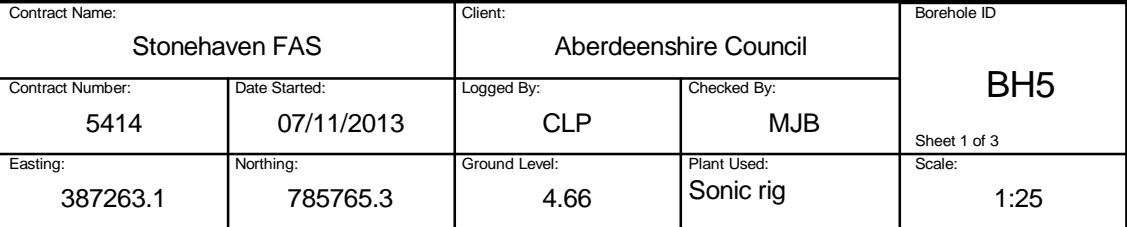











Combined Rotary Cored  
& Dynamic Sampler Log

Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
					5.00-5.45 D11 5.00-5.10 D12 5.10-5.40 B13	(S)N=32 (11,10,7,8,8,9)	-0.77	5.10  (0.30)		Loose dark brown mottled grey slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subrounded of mixed lithologies.	6	
					5.50 D14 5.50-5.90 B15		-1.07	5.40		Firm orangish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
					5.90 D16 6.00-6.45 D17 6.00-6.40 B18	(S)N=23 (2,4,5,7,5,6)		(1.00)		Stiff orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. --- from 5.90m depth, dark brown in colour. --- from 6.10m depth, with occasional fine to coarse gravel sized pockets of orangish brown fine to coarse sand.	7	
					6.40-6.75 B19		-2.07	6.40  (0.35)		Firm dark brown slightly sandy CLAY with occasional thin laminations.		
					6.80 D20 6.80-7.50 B21		-2.42	6.75		Firm and stiff dark orangish brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	8	
					7.50-7.95 D22 7.50-8.30 B23	(S)50/143mm (6,19,22,28)		(1.55)				
					8.40 D24 8.50-8.70 B25		-3.97	8.30		Light yellowish brown gravelly very clayey fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.	9	
					8.70-9.15 D26	(S)50/241mm (2,3,8,8,30,4)	-4.17	8.50  (0.60)		Very dense dark orangish brown becoming dark brown clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of mixed lithologies.		
					9.15 D27 9.20-10.00 B28		-4.77 -4.87	9.10 9.20		Firm orangish brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
								(0.80)		dark yellowish brown and Continued next sheet		

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					6.00 10.00	140 115	6.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Groundwater encountered at 4.00m rising to 1.00m after 20 mins. 4. From 3.00m depth, limited recovery due to water ingress. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final

<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS				Client: Aberdeenshire Council				Borehole ID  BH4	
				Contract Number: 5414		Date Started: 22/10/2013		Logged By: CLP		Checked By: MJB			
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387300.2		Northing: 785769.6		Ground Level: 4.33		Plant Used: Sonic rig		Sheet 2+ of 2  Scale: 1:25	
				Coring Information				Samples & In Situ Testing			Strata Details		
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
							-5.67	10.00		multicoloured slightly clayey very gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. ;;; 9.30m - 9.30m : --- from 9.30m depth, with occasional very thin beds (<50mm) of fine sandy clay.  End of Borehole at 10.00 m			
													11
													12
													13
													14
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Groundwater encountered at 4.00m rising to 1.00m after 20 mins. 4. From 3.00m depth, limited recovery due to water ingress. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
					6.00 10.00	140 115	6.00	140					
Release Status: Final													



Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
	0.20 D1 0.20-1.20 B2		4.56	0.10		MADE GROUND. Asphalt.	
			4.46	0.20		MADE GROUND. Asphalt.	
	1.20-1.65 D2A 1.20-2.00 B3	(S)N=13 (2,3,2,2,5,4)	3.46	1.20		MADE GROUND. Brown sandy angular to rounded fine to coarse gravel of sandstone, quartzite, brick and mixed igneous lithologies with high cobble content. Cobbles are subangular to rounded of sandstone and quartzite.	
						(1.00)	
	2.00-2.70 B4	(S)N=5 (2,1,2,1,1,1)	2.66	2.00		MADE GROUND. Dark brown and multicoloured slightly clayey very gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and brick.	
						(0.80)	
	2.70-3.30 B5		1.96	2.70		Loose dark orangish brown slightly clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
						(0.70)	
	3.00-3.45 D6 3.10 W22 3.10 EWW22	(S)N=12 (0,2,1,2,3,6)	1.36	3.30		Soft brownish yellow gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and quartz.	
						(0.60)	
	3.30-3.45 D7 3.30 ESD7 3.45-3.80 B8		1.21	3.45		Dark brown amorphous PEAT with fine to coarse gravel sized pockets of soft grey slightly sandy clay.	
						(0.35)	
3.80-5.00 B9		0.86	3.80		Greyish brown slightly silty fine to medium SAND with occasional gravel. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
4.00-4.45 D10	(S)N=28 (4,5,6,11,5,6)				Dense brown and multicoloured very sandy subangular to subrounded fine to coarse GRAVEL of sandstone, quartz and mixed lithologies.		
					(1.70)		
						Continued next sheet	

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					2.00 10.50 13.50	229 140 115	2.00 10.50	229 140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Rotary drilling between 10.00m and 13.50m depth. 4. Groundwater encountered at 2.00m rising to 1.84m after 20 mins. 5. Borehole complete at 13.50m upon engineer's instruction. 6. Borehole backfilled with bentonite upon completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final



## Stonehaven FAS

Aberdeenshire Council

BH5

Sheet 2 of 3

## Combined Rotary Cored & Dynamic Sampler Log

387263 1

785765 3

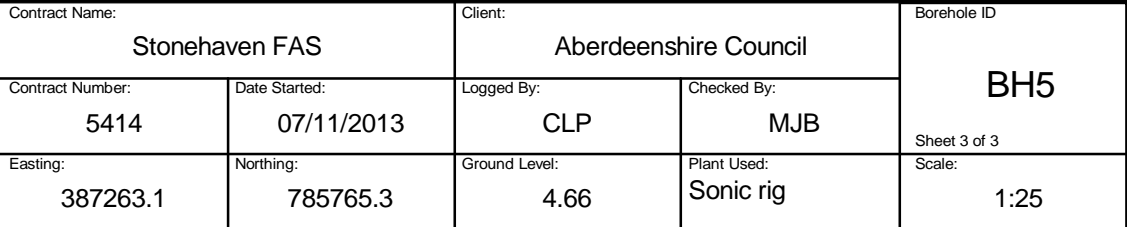
466

Sonic rig



1.25

## Groundwater Backfill & Installation

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					2.00 10.50 13.50	229 140 115	2.00 10.50	229 140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Rotary drilling between 10.00m and 13.50m depth. 4. Groundwater encountered at 2.00m rising to 1.84m after 20 mins. 5. Borehole complete at 13.50m upon engineer's instruction. 6. Borehole backfilled with bentonite upon completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final



Combined Rotary Cored  
& Dynamic Sampler Log


Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
100	100	100	4	10.50	10.00-10.50 B27 10.10 D26	(S)50/75mm (19,6,50)	-5.35	10.00		Reddish brown mottled greenish grey gravelly fine to medium SAND. Gravel is angular of sandstone.	
					(0.50)						
					10.50-10.95 D28		-5.85	10.50		Extremely weak dark greenish grey coarse grained SANDSTONE. Discontinuities are 70 deg medium spaced rough stepped.	
					10.95-11.21 C						
11.70-11.90 C											
100	100	100	4	12.00	12.45-12.58 C		(3.00)			--- from 12.00m depth, very weak.	
					13.08-13.30 C						
							-8.85	13.50		End of Borehole at 13.50 m	

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					2.00 10.50 13.50	229 140 115	2.00 10.50	229 140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Rotary drilling between 10.00m and 13.50m depth. 4. Groundwater encountered at 2.00m rising to 1.84m after 20 mins. 5. Borehole complete at 13.50m upon engineer's instruction. 6. Borehole backfilled with bentonite upon completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final

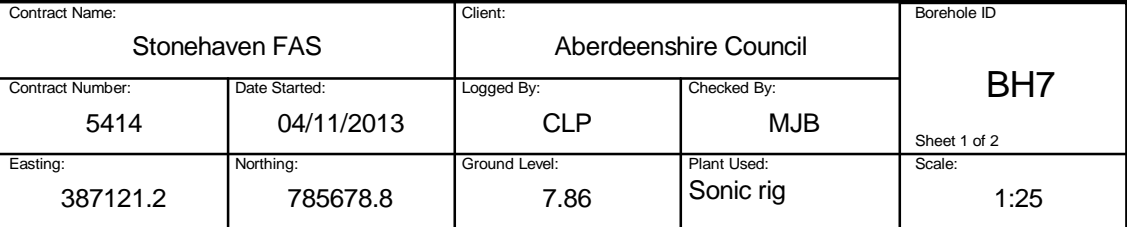


Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
					0.20 D1 0.30-0.50 B2		4.74	(0.60) 0.60		Grass over dark brown clayey gravelly fine to medium SAND with medium cobble content and frequent roots and rootlets. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies. (Possible Made Ground).		
					0.80-1.20 B3					Medium-dense becoming dense light yellowish brown slightly clayey very gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.		
					1.20-1.65 D4 1.20 ESD4 1.20-2.00 B5	(S)N=29 (10,5,7,8,7,7)		(1.75)				
					1.59 EW							
					2.00-2.35 B6	(S)N=32 (10,15,13,10,6,3)				--- at 2.00m depth, dense.		
					2.35-2.70 B7		2.99	2.35		Soft dark greyish brown slightly sandy CLAY with frequent gravel sized pockets of dark brown amorphous peat.		
					2.70-3.10 B8		2.64	2.70				
					3.00-3.45 D9 3.10-3.80 B10	(S)N=40 (7,7,7,7,8,18)		(0.40) 3.10		Dark brown slightly clayey gravelly fine to medium SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of mixed lithologies.		
								(0.70)		Light orangish brown slightly clayey very gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of mixed lithologies.		
					3.90 D11 4.00-4.45 D12 4.00-4.60 B13	(S)N=33 (2,4,7,8,9,9)		1.54 (0.35)		Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
							1.19	4.15		Reddish brown mottled light greenish grey slightly gravelly clayey fine to medium SAND.		
					4.70 D14 4.80-5.00 B15		0.74	4.60		Dense becoming very dense light greenish grey slightly clayey gravelly fine to medium SAND. Gravel is angular to subangular fine		
										Continued next sheet		

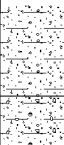

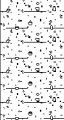
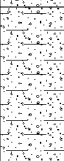
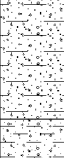
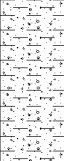
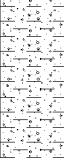
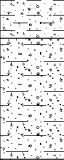

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					2.00 3.00 10.00	229 140 115	2.00 3.00	229 140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 9.00m depth. 3. Rotary drilling between 9.00m and 10.00m depth. 4. Groundwater encountered at 3.00m rising to 2.72m after 20 mins. 5. Borehole complete at 10.00m upon specified depth. 6. 50mm standpipe installed upon completion, slotted between 2.50m and 4.50m depth. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final

<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH6						
	Contract Number: 5414	Date Started: 05/11/2013	Logged By: CLP	Checked By: MJB	Sheet 2 of 2						
	Easting: 387160.4	Northing: 785698.2	Ground Level: 5.34	Plant Used: Sonic rig	Scale: 1:25						
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend		Strata Description
					5.00-5.45 D16 5.00-6.00 B17	(S)N=49 (11,14,10,11,12,16)				to coarse of sandstone. Detail 4.80m - 6.00m : --- below 4.80m depth, light yellowish brown in colour. --- from 5.00m depth, with occasional cobble sized pockets of stiff reddish brown very sandy clay.	
					6.00 D18 6.00-6.75 B19	(S)50/165mm (12,13,18,24,8)				--- from 6.00m depth, very dense.	6
					6.75-7.50 B20			(4.40)		--- between 7.00m and 9.00m depth, gravelly fine to coarse sand.	7
					7.50-7.95 D21 7.50-8.00 B22	(S)50/150mm (13,12,17,33)					
					8.00-9.00 B23						8
				9.00			-3.66	9.00		Very weak dark greenish grey coarse grained SANDSTONE. Discontinuities are 0-10 deg closely to medium spaced rough stepped stained brown.	9
100	100	93	5		9.39-9.67 C			(1.00)		--- from 9.55m depth, discontinuities are 50 deg closely spaced smooth planar open with clay infill.	
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		End of Borehole at 10.00 m		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:		
					2.00 3.00 10.00	229 140 115	2.00 3.00	229 140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 9.00m depth. 3. Rotary drilling between 9.00m and 10.00m depth. 4. Groundwater encountered at 3.00m rising to 2.72m after 20 mins. 5. Borehole complete at 10.00m upon specified depth. 6. 50mm standpipe installed upon completion, slotted between 2.50m and 4.50m depth. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%		
Release Status: Final											
















Combined Rotary Cored  
& Dynamic Sampler Log


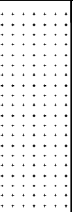


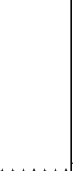


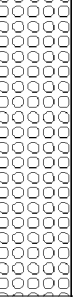
Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation																									
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description																										
57	9	9	AZCL	4.00	0.20 D1 0.30-0.50 B2	(S)N=23 (1,4,2,6,5,10)	7.56	(0.30)		Grass over dark brown clayey gravelly fine to coarse sand with frequent roots and rootlets. Gravel is subangular to subrounded fine to coarse of sandstone and mixed lithologies. (Possible Made Ground). (Topsoil).	1																									
					0.80-1.20 B3			(1.10)				Dark brown clayey gravelly fine to coarse SAND with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.																								
					1.20-1.65 D4 1.30 D5 1.40-2.00 B6							6.46	1.40		--- at 1.20m depth, medium-dense.																					
					2.00-2.45 D7 2.00-2.30 B8										(0.90)		--- at 2.00m depth, dense.																			
					2.30-3.00 B10 2.40 D9													5.56	2.30																	
					3.00-3.45 D11 3.00-3.60 B12																	(1.30)														
					3.60-4.00 B13																				4.26	3.60										
					4.00-4.45 D14																								(0.40)							
																																(0.65)				
																																			3.21	4.65


Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
04/11/2013	1800	3.00	3.00	-	2.00	229	2.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 4.00m depth. 3. Rotary drilling between 4.00m and 9.00m depth. 4. No groundwater encountered during drilling. 5. Borehole complete at 9.00m depth upon engineer's instruction. 6. Borehole backfilled with bentonite upon completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%
05/11/2013	1130	9.00	3.00	1.35	3.00 9.00	140 115	3.00	140	
									Release Status: Final





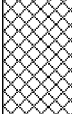
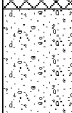
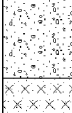




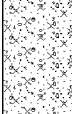
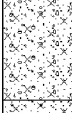
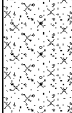
<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH7						
	Contract Number: 5414	Date Started: 04/11/2013	Logged By: CLP	Checked By: MJB	Sheet 2 of 2						
	Easting: 387121.2	Northing: 785678.8	Ground Level: 7.86	Plant Used: Sonic rig	Scale: 1:25						
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend		Strata Description
			1	5.50	5.50-5.94 C					planar and stepped. 2) 75 deg widely spaced rough planar. Detail 4.65m - 4.95m : --- between 4.65m and 4.95m depth, recovered non-intact as reddish and greenish brown gravelly very clayey sand, Gravel is angular fine to coarse of sandstone. --- between 5.13m and 5.50m depth, recovered non-intact as reddish and greenish brown gravelly very clayey sand, Gravel is angular fine to coarse of sandstone. --- between 5.94m and 6.42m depth, recovered non-intact as reddish and greenish brown gravelly sand. Gravel is angular fine to coarse of sandstone.	6
			NI								
100	52	44	1	6.50	6.78-7.06 C					--- between 7.33m and 7.34m depth, 1 no. 20 deg open fracture with red clay infill.	7
			NI								
100	84	75	7	8.00	7.75-8.00 C					--- from 8.00m depth, strong.	8
			NI								
			1								
			NI								
100	86	79	3	8.56-9.00 C							9
			4								
			3				-1.14	9.00		End of Borehole at 9.00 m	
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 4.00m depth. 3. Rotary drilling between 4.00m and 9.00m depth. 4. No groundwater encountered during drilling. 5. Borehole complete at 9.00m depth upon engineer's instruction. 6. Borehole backfilled with bentonite upon completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%		
04/11/2013 05/11/2013	1800 1130	3.00 9.00	3.00 3.00	- 1.35	2.00 3.00 9.00	229 140 115	2.00 3.00	229 140			
Release Status: Final											


<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council				Borehole ID  BH8							
				Contract Number: 5414		Date Started: 02/11/2013		Logged By: CLP		Checked By: MJB								
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387053.3		Northing: 785651.5		Ground Level: 7.24		Plant Used: Sonic rig		Sheet 1 of 3 Scale: 1:25						
				Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation			
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description								
					0.10 D1		7.17	0.07		MADE GROUND. Asphalt.								
					0.30 D2 0.30-0.60 B3		6.94	0.30		MADE GROUND. Reddish brown gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of brick, clinker, limestone and mixed lithologies.								
					0.60 D4 0.60-1.20 B5		6.64	0.60		MADE GROUND. Brown slightly gravelly sandy clay. Gravel is subangular to rounded fine to coarse of brick, sandstone and mixed igneous lithologies.			1					
					1.20-1.65 D6 1.20-2.00 B7	(S)50/269mm (1,4,13,13,14,10)	6.04	1.20		MADE GROUND. Brown sandy subangular to rounded fine to coarse gravel of limestone, clinker, sandstone and mixed igneous lithologies with low cobble content. Cobbles are subangular to rounded of sandstone and mixed igneous lithologies.								
					2.00-2.45 D8 2.00 ESD8 2.00-2.80 B9	(S)50/219mm (25,19,16,15)		(1.60)		Very dense light yellowish brown slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subrounded of sandstone, quartz and mixed lithologies.			2					
					2.79 EW 2.80-3.70 B11 2.90 D10 3.00-3.45 D12	(S)50/200mm (7,8,10,13,27)	4.44	2.80		Stiff reddish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies. --- from 3.20m depth, friable.			3					
					3.70-4.00 B13		3.54	3.70		Very dense dark orangish brown slightly clayey gravelly fine to coarse SAND.			4					
					4.00-4.45 D14 4.00-4.40 B15	(S)50/85mm (8,14,42,8)		(0.70)		--- from 4.20m depth, very clayey.								
					4.50 D16 4.50-5.00 B17		2.84	4.40		Stiff locally hard reddish brown slightly sandy slightly gravelly CLAY with closely spaced thin beds of extremely weak light greenish grey sandstone. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Continued next sheet								
Boring Progress & Water Observations													Borehole Diameter		Casing Diameter		Remarks:	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)										
02/11/2013	1800	1.20	-	-	7.50	140	7.50	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m depth. 3. Rotary drilling between 5.00m and 10.50m depth. 4. Groundwater encountered at 5.00m rising to 4.66m after 20 mins. 5. Borehole complete at 10.50m upon specified depth. 6. 50mm standpipe installed upon completion, slotted between 3.50m and 4.50m depth. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%									
04/11/2013	1530	10.50	7.50	-	10.50	105												
Release Status: Final																		





<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH8			
				Contract Number: 5414		Date Started: 02/11/2013		Logged By: CLP		Checked By: MJB		Sheet 2 of 3	
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387053.3		Northing: 785651.5		Ground Level: 7.24		Plant Used: Sonic rig		Scale: 1:25	
Coring Information				Samples & In Situ Testing				Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
100	28	28	NI	5.00	5.00-5.45 D18	(S)50/150mm (14,11,27,23)	2.24	5.00		Strong reddish brown SANDSTONE recovered as clayey sandy very angular to subangular fine to coarse gravel.			
			10		5.86-6.00 C	1.55	5.69		Very strong reddish brown and grey coarse grained SANDSTONE. Discontinuities are randomly orientated very closely to closely spaced planar stepped straight and rough.				
58	41	18	AZCL	6.00	6.63-6.94 C	1.24	6.00		Assessed Zone of Core Loss.				
			3			0.61	6.63		Very strong reddish brown and grey coarse grained SANDSTONE. Discontinuities are randomly orientated very closely to closely spaced planar stepped straight and rough.				
			NI			0.32	6.92		Very strong reddish brown fine grained CONGLOMERATE. Discontinuities are randomly orientated closely spaced planar stepped and straight, rough infilled (<15mm) with sandy fine to coarse gravel.				
			12			(1.27)	8.19		--- between 6.94m and 7.17m depth, recovered non-intact. --- between 7.50m and 7.60m depth, recovered non-intact.				
2	Very strong grey coarse grained SANDSTONE. Discontinuities are 1) closely spaced subhorizontal stepped planar rough closed. 2) subvertical undulating stepped rough closed.												
100	93	93	15	9.00	9.81-10.03 C								
100	88	0			19								
Continued next sheet													
Boring Progress & Water Observations						Borehole Diameter		Casing Diameter		Remarks:			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m depth. 3. Rotary drilling between 5.00m and 10.50m depth. 4. Groundwater encountered at 5.00m rising to 4.66m after 20 mins. 5. Borehole complete at 10.50m upon specified depth. 6. 50mm standpipe installed upon completion, slotted between 3.50m and 4.50m depth. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
02/11/2013	1800	1.20	-	-	7.50	140	7.50	140					
04/11/2013	1530	10.50	7.50	-	10.50	105			Release Status: Final				

<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH8						
	Contract Number: 5414	Date Started: 02/11/2013	Logged By: CLP	Checked By: MJB	Sheet 3 of 3						
	Easting: 387053.3	Northing: 785651.5	Ground Level: 7.24	Plant Used: Sonic rig	Scale: 1:25						
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend		Strata Description
							-3.26	10.50		Very strong grey coarse grained SANDSTONE. Discontinuities are 1) closely spaced subhorizontal stepped planar rough closed. 2) subvertical undulating stepped rough closed.	
										End of Borehole at 10.50 m	
											11
											12
											13
											14
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m depth. 3. Rotary drilling between 5.00m and 10.50m depth. 4. Groundwater encountered at 5.00m rising to 4.66m after 20 mins. 5. Borehole complete at 10.50m upon specified depth. 6. 50mm standpipe installed upon completion, slotted between 3.50m and 4.50m depth. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%		
02/11/2013 04/11/2013	1800 1530	1.20 10.50	- 7.50	- -	7.50 10.50	140 105	7.50	140			
Release Status: Final											



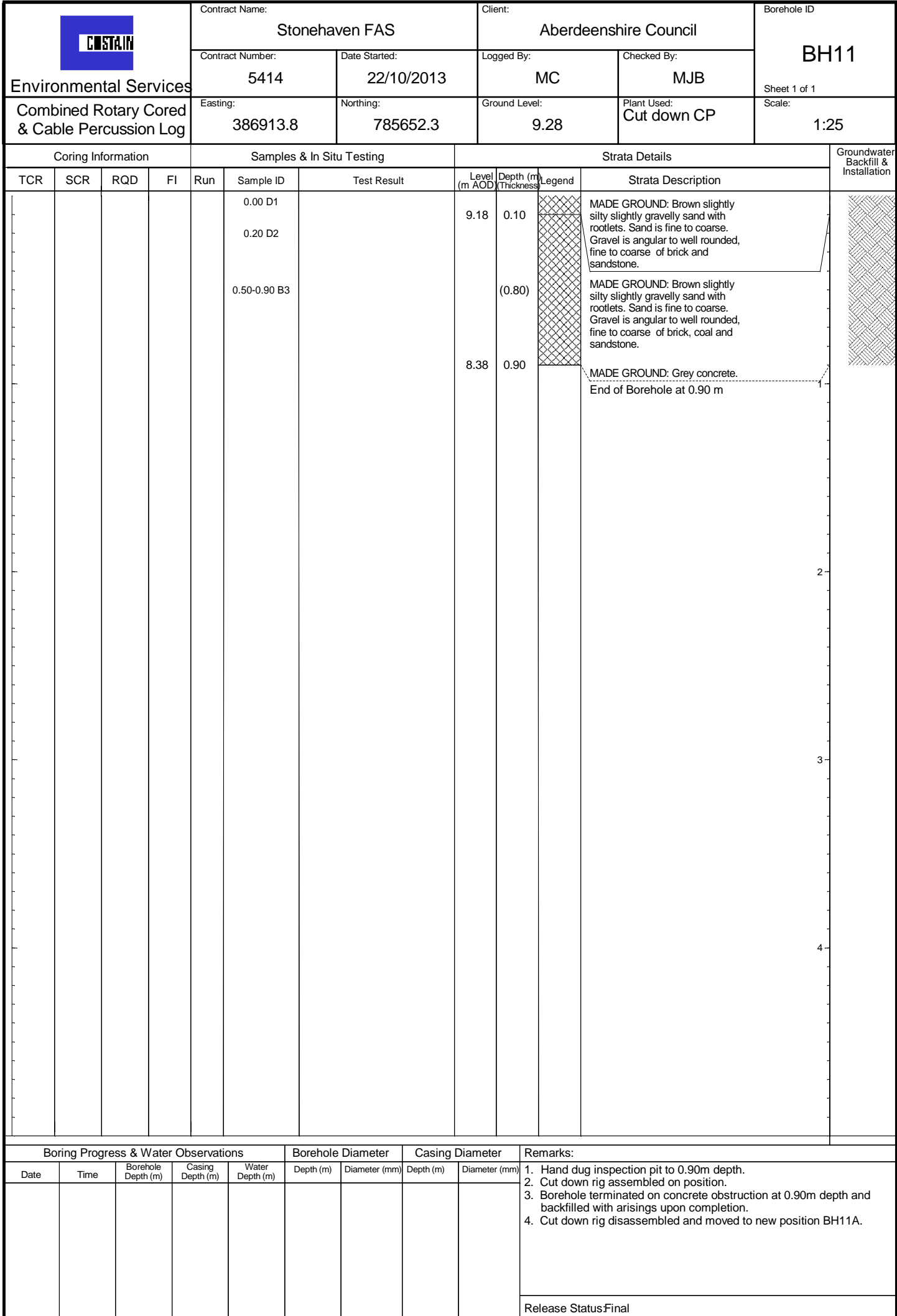
<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID  BH10		
				Contract Number: 5414		Date Started: 28/10/2013	Logged By: CLP		Checked By: MJB			
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387009.6		Northing: 785657.3		Ground Level: 7.96		Plant Used: Sonic rig		Sheet 1 of 1
												Scale: 1:25
Coring Information				Samples & In Situ Testing				Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
					0.30 D1 0.30-0.50 B2		7.86	0.10		MADE GROUND. Asphalt.		
								(0.50)		MADE GROUND. Dark orangish brown slightly clayey gravelly fine to coarse sand with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.		
					0.80-1.20 B3		7.36	0.60		Dark orangish brown gravelly fine to medium SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.		
					1.20-2.00 B4	(S)N=1 (0,0,1,0,0,0)	6.76	1.20		Soft dark orangish brown occasionally mottled light orangish brown very sandy SILT.		
					2.00-2.50 B5 2.00 ESB5	(S)N=10 (3,3,4,3,2,1)		(1.30)		--- from 1.80m depth, becoming gravelly with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.		
					2.50-3.50 B6		5.46	2.50		Loose slightly silty gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.		
					3.00-3.45 D7	(S)N=6 (0,0,0,0,3,3)		(1.00)		--- from 3.00m depth, very silty.		
					3.50-4.30 B8		4.46	3.50		Loose dark orangish brown silty gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		
					4.00-4.45 D9	(S)50/190mm (12,13,12,20,18)		(0.80)				
					4.50-5.00 B10		3.66	4.30		Very dense green grey mottled pinkish brown slightly clayey sandy angular to subangular fine to coarse GRAVEL of sandstone.		
								(0.70)				
Boring Progress & Water Observations				Borehole Diameter		Casing Diameter		End of Borehole at 5.00 m				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:			
					4.00 5.00	140 115	4.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m. 3. Borehole complete at 5.00m upon scheduled depth. 4. Groundwater encountered at 2.00m depth, rising to 1.80m after 20 mins. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%			
									Release Status: Final			

<div> Environmental Services</div>	Contract Name: Stonehaven FAS			Client: Aberdeenshire Council		Borehole ID: BH11	
	Contract Number: 5414		Date Started: 22/10/2013		Logged By: MC	Checked By: MJB	Sheet 1 of 1
	Easting: 386913.8		Northing: 785652.3		Ground Level: 9.28	Plant Used: Cut down CP	Scale: 1:25

Samples & In Situ Testing		Strata Details				Groundwater	
Sample ID	Test Result	Level (m AOD)	Depth (m) (thickness)	Legend	Strata Description	Water Strike(s)	Backfill/ Installation
0.00 D1		9.18	0.10		MADE GROUND: Brown slightly silty slightly gravelly sand with rootlets. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of brick and sandstone.		
0.20 D2			(0.80)		MADE GROUND: Brown slightly silty slightly gravelly sand with rootlets. Sand is fine to coarse. Gravel is angular to well rounded, fine to coarse of brick, coal and sandstone.		
0.50-0.90 B3		8.38	0.90		MADE GROUND: Grey concrete. End of Borehole at 0.90 m	1	
						2	
						3	
						4	





Boring Progress & Water Observations					Depth/Casing Diameter		Remarks:  1. Hand dug inspection pit to 0.90m depth. 2. Cut down rig assembled on position. 3. Borehole terminated on concrete obstruction at 0.90m depth and backfilled with arisings upon completion. 4. Cut down rig disassembled and moved to new position BH11A.  Release Status: Final
Date	Time	Borehole Depth (m)	Depth of Casing (m)	Water Depth (m)	Depth (m)	Casing Diameter (mm)	
					Depth/Borehole Diameter		
					Depth (m)	Borehole Diameter (mm)	




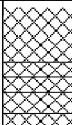






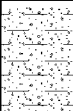
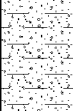
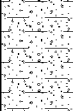



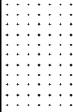
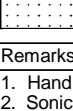


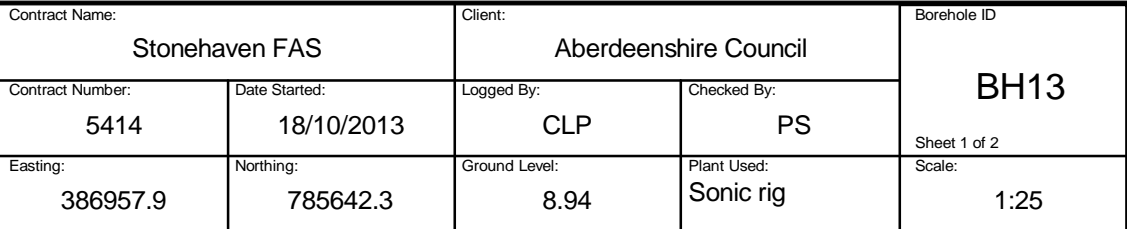



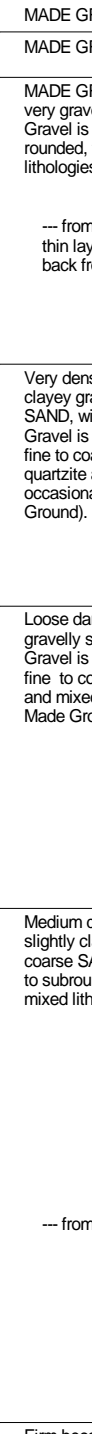


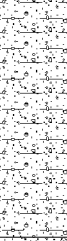
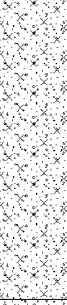
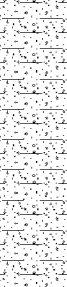
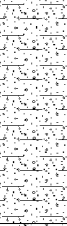

Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m Thickness)	Legend	Strata Description	
97	52	0	NI	5.00	5.45-5.55 C14		4.21	5.00		Very strong grey mottled brown coarse grained SANDSTONE. Discontinuities are: 1) 90-80 deg, very closely spaced planar rough closed stained brown. 2) 0-20 deg, closely spaced curved stepped rough closed stained brown. --- between 5.00m and 5.30m depth, recovered non-intact. --- between 5.50m and 5.78m depth, recovered non-intact.	6
			12								
			NI								
			18								
			NI								
100	43	14	10	6.50	6.47-6.84 C15				--- between 6.20m and 6.50m depth, recovered non-intact.  --- between 6.61m and 6.79m depth, recovered non-intact.  --- between 6.84m and 7.20m depth, recovered non-intact.	7	
			NI								
			10								
			NI								
93	71	0	AZCL	7.20					--- between 7.25m and 7.37m depth, recovered non-intact.		
			NI								
			13								
100	38	0	30	8.00					--- between 8.25m and 8.30m depth, recovered non-intact.  --- between 8.70m and 8.83m depth, recovered non-intact.  --- between 8.90m and 9.00m depth, recovered non-intact. --- below 9.00m depth, discontinuities are medium spaced.	8	
			NI								
			10								
			NI								
			29								
			NI								
100	80	52		9.00	9.25-9.50 C16					9	
100	100	40	4	9.50	9.50-10.00 C17						

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		End of Borehole at 10:00 m
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:
22/10/2013	1600	4.70	4.10	-	4.50	150	4.10	150	1. Hand dug inspection pit to 1.20m depth. No services encountered. 2. Cut down rig assembled on position. 3. Cable percussion drilling with cut down rig between 1.20m and 4.70m depth. 4. Chiselling 3.70m to 4.50m - 1 hour. 5. Rotary follow-on between 4.70m and 10.00m depth. 6. SPT hammer id = WB1. Hammer energy ratio =74%
									Release Status:Final


<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH12											
				Contract Number: 5414		Date Started: 17/10/2013		Logged By: CLP		Checked By: PS		Sheet 1 of 2									
Combined Rotary Cored & Dynamic Sampler Log				Easting: 386920.4		Northing: 785631.7		Ground Level: 9.88		Plant Used: Sonic rig		Scale: 1:25									
Coring Information				Samples & In Situ Testing				Strata Details					Groundwater Backfill & Installation								
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description											
					0.35-1.20 LB2		9.70	0.18		MADE GROUND. Asphalt.											
							9.65	0.23		MADE GROUND. Dark grey angular fine to coarse gravel of mixed igneous lithologies.											
							9.60	0.28		MADE GROUND. Tarmacadam.											
							9.53	0.35		MADE GROUND. Reddish pink slightly sandy angular fine to coarse gravel of mixed igneous lithologies.											
					1.00 D1		9.08	0.80		MADE GROUND. Compacted reddish brown very gravelly fine to medium sand with high cobble content. Gravel is subangular to well rounded fine to coarse of mixed lithologies. Cobbles are subrounded to well rounded of mixed lithologies.											
										1.20-1.45 D3 1.20-1.50 B4	(S)N=31 (5,6,6,6,8,11)	8.68		1.20	MADE GROUND. Reddish brown very gravelly fine to medium SAND, with medium cobble content. Gravel is subrounded to well rounded fine to coarse of mixed lithologies. Cobbles are subrounded to well rounded of mixed lithologies.						
															1.50-1.80 B7 1.60 D6	8.38	1.50	Dense dark brown becoming dark orangish brown gravelly silty fine to coarse SAND. Gravel is angular to subrounded fine to coarse of limestone, quartzite, quartz and mixed lithologies.			
																		1.80-2.00 B8	8.08	1.80	Orangish brown slightly clayey gravelly fine to coarse SAND. Gravel is angular to subrounded fine to coarse of sandstone, quartz, quartzite and mixed lithologies.
					2.00-2.50 B10 2.00-2.45 D9	(S)50/135mm (25,0,37,13)				Firm becoming stiff, orangish brown slightly sandy slightly gravelly CLAY with thick laminations of pinkish brown fine to medium sand. Gravel is subangular to rounded fine to coarse of sandstone, quartz, and mixed lithologies. --- From 2.00m to 2.45m depth, sandy with high cobble content. Cobbles are subangular of mixed lithologies. --- From 2.50m depth, very stiff, friable.											
										2.50-3.00 B11		6.78		3.10	Very dense orangish brown slightly gravelly very clayey fine to medium SAND. Gravel is subangular to subrounded fine to medium of sandstone, quartz, quartzite and mixed lithologies.						
															3.00-3.50 U12 3.00 U12			(0.50)	Very stiff friable orangish brown locally mottled grey, slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to medium of sandstone, quartz and mixed lithologies.		
																			3.50 D13 3.60-4.00 B14		6.28
					4.00-4.45 D15 4.00-5.00 B16	(S)50/233mm (6,11,13,15,18,4)			(1.40)												
Continued next sheet																					
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:												
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 8.00m. 3. Rotary coring from 8.00m to 10.00m. 4. Groundwater encountered overnight . Sitting at 5.37m at start of shift. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%												
17/10/2013	1730	8.00	3.00	-	3.00	140	3.00	140													
18/10/2013	0800	8.00	3.00	5.37	8.00	115															
18/10/2013	1045	10.00	3.00	-	10.00	105															
Release Status: Final																					

<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH12			
				Contract Number: 5414		Date Started: 17/10/2013		Logged By: CLP		Checked By: PS		Sheet 2 of 2	
				Easting: 386920.4		Northing: 785631.7		Ground Level: 9.88		Plant Used: Sonic rig		Scale: 1:25	
Combined Rotary Cored & Dynamic Sampler Log													
Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					5.00-5.45 D17 5.00-6.00 B18	(S)50/129mm (13,12,26,24)	4.88	5.00		Very dense pinkish brown slightly gravelly clayey fine to medium SAND. Gravel is subangular to subrounded fine to medium of sandstone and quartz.			
					6.00-6.45 D19 6.00-7.00 B20	(S)50/75mm (13,12,50)		(3.00)					
					7.00-7.45 D21 7.00-8.00 B22	(S)50/99mm (14,11,35,15)				--- from 6.80m depth, thinly laminated with occasional lenses of stiff clay.			
				8.00			1.88	8.00		Very weak red brown speckled grey and white fine grained SANDSTONE recovered as non intact clayey sandy angular fine to coarse gravel.			
100	0	0	NI					(1.00)		--- between 8.00m and 9.00m depth, recovered non-intact as clayey sandy angular fine to coarse gravel.			
				8.80									
					9.14-9.34 C23		0.88	9.00		Weak red brown speckled grey and white fine grained SANDSTONE. Discontinuities are very closely to closely spaced horizontal stepped closed.			
100	83	50	4		9.65-9.80 C24			(1.00)					
End of Borehole at 10.00 m													
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)					
17/10/2013	1730	8.00	3.00	-	3.00	140	3.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 8.00m. 3. Rotary coring from 8.00m to 10.00m. 4. Groundwater encountered overnight . Sitting at 5.37m at start of shift. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
18/10/2013	0800	8.00	3.00	5.37	8.00	115							
18/10/2013	1045	10.00	3.00	-	10.00	105							
Release Status: Final													

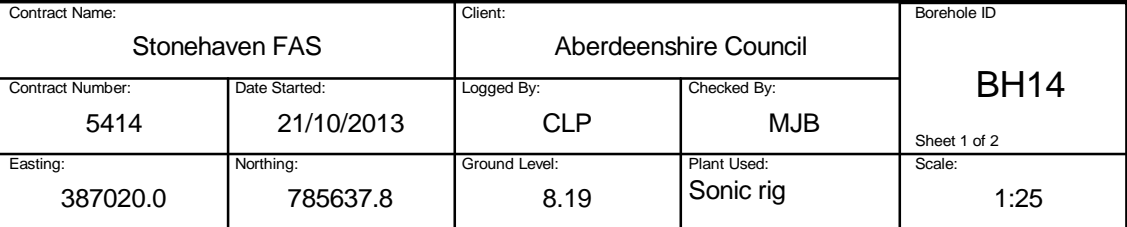


Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
	0.30 D1 0.30-0.70 LB2		8.84	0.10		MADE GROUND. Asphalt.	
			8.69	0.25		MADE GROUND. Concrete.	
			(0.95)		MADE GROUND. Reddish brown very gravelly fine to medium sand. Gravel is subangular to well rounded, fine to coarse of mixed lithologies.		
	---	from 0.70m to 0.74m depth, thin layer of tarmacadam (0.37m back from kerb line).					
	1.20-2.00 B3	(S)50/43mm (0,1,50)	7.74	1.20		Very dense orangish brown slightly clayey gravelly fine to coarse SAND, with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz, quartzite and mixed lithologies. With occasional roots (possible Made Ground).	
	2.00-2.45 D4 2.00-3.00 B5 2.00 ESD4	(S)N=9 (0,0,1,3,3,2)	6.94	2.00		Loose dark orangish brown slightly gravelly silty fine to medium SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies (possible Made Ground).	
			(1.00)				
	3.00-3.45 D6 3.00-4.00 D7 3.04 EW	(S)N=23 (11,7,6,7,6,4)	5.94	3.00		Medium dense dark orangish brown slightly clayey very gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mixed lithologies.	
			(1.70)				
	4.00-4.45 D8 4.00-4.50 B9	(S)50/194mm (8,17,25,16,9)				---	
4.50 D10							
4.70-5.50 B11		4.24	4.70		Firm becoming very stiff thinly laminated light pinkish brown mottled light grey slightly gravelly Continued next sheet		

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
18/10/2013	1730	8.50	7.00	3.36	7.00	140	7.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 9.00m. 3. Rotary coring from 9.00m to 10.00m. 4. Groundwater encountered at 3.45m rising to 3.13m after 20 mins. 5. 50mm diameter standpipe installed with slotted response zone from 3.00m to 5.00m. 6. 19mm diameter piezometer installed with tip at 7.00m and response zone from 6.50m to 7.50m. 7. SPT hammer id = GS RIG02. Hammer energy ratio ≈39%
19/10/2013	1100	10.00	7.00	-	8.50 10.00	115 105			
									Release Status: Final

<div></div> <div>Environmental Services</div> <div>Combined Rotary Cored &amp; Dynamic Sampler Log</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID  BH13		
				Contract Number: 5414		Date Started: 18/10/2013	Logged By: CLP		Checked By: PS			
				Easting: 386957.9		Northing: 785642.3		Ground Level: 8.94		Plant Used: Sonic rig		Sheet 2 of 2 Scale: 1:25
Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
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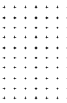
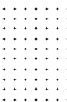



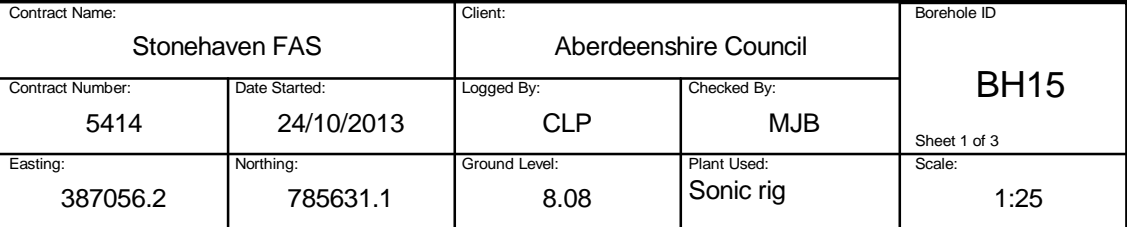
Combined Rotary Cored  
& Dynamic Sampler Log

[illegible]

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					5.00 7.50	140 115	6.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 7.50m. 3. Borehole complete at 7.50m depth, upon engineer's instruction. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final



Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation				
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description					
46	29	21	AZCL	6.00	5.75-5.87 C14		3.19	5.00		Remaining Detail : 4.80m - 4.80m : cobble - possible bedrock. Detail 4.80m - 5.45m : --- between 4.80m and 5.45m depth, assessed zone of core loss.					
			NI							Medium strong to strong light grey coarse grained SANDSTONE. Discontinuities are closely to medium spaced horizontal planar smooth clean. --- between 5.45m and 5.65m depth, recovered non-intact as angular fine to coarse gravel. --- between 5.65m and 6.85m depth, occasional 45 degree inclined discontinuities.					
			7												
100	85	80	NI		7.00-7.50 C16					(2.50)		--- between 6.38m and 6.62m depth, recovered non-intact as angular fine to coarse gravel.			
			NI										--- between 6.72m and 6.82m depth, recovered non-intact as angular fine to coarse gravel.		
			NI												
			3												
												0.69	7.50		End of Borehole at 7.50 m






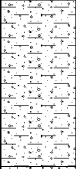
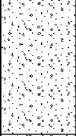
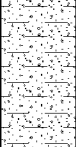
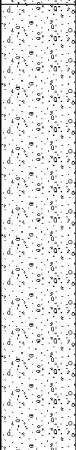

Combined Rotary Cored  
& Dynamic Sampler Log

Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
							7.98	0.10		MADE GROUND. Asphalt.	
					0.80 D1 0.80-1.00 B2			(1.00)		MADE GROUND. Brown and black very gravelly fine to medium sand with low cobble content. Gravel is angular to subrounded fine to coarse of mixed lithologies and tarmacadam. Cobbles are subangular to subrounded of mixed lithologies. --- at 0.10m depth, extending 0.20m from kerbline, concrete step, 500mm thick. --- at 0.47m depth, 0.30m from kerbline, concrete step. Approximately 130mm thick.	1
					1.20-1.65 D3 1.20-1.50 B4	(S)N=16 (1,1,2,5,8)	6.98 6.88	1.10 1.20		Brown slightly gravelly fine to coarse SAND. Gravel is subangular to well rounded fine to coarse of mixed lithologies.	
					1.50 EW 1.50-3.00 B5 1.50 EW		6.58	1.50		Medium-dense orangish red and multicoloured fine to coarse SAND.	
					2.00-2.45 D6 2.00 ESD6	(S)N=14 (2,4,2,3,5,4)		(1.80)		Medium-dense dark brown clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of quartz, sandstone and mixed lithologies. Cobbles are subangular to subrounded of sandstone. --- at 1.50m depth, moisture noted.	2
					3.00-3.45 D7 3.00-3.30 B8	(S)N=31 (1,4,8,9,7,7)					3
					3.40 D9 3.50-4.00 B10		4.78	3.30		Firm becoming stiff orangish brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					4.00-4.45 D11 4.00-4.50 B12	(S)50/257mm (2,7,11,15,16,8 )		(1.40)			4
					4.50-5.00 B13		3.38	4.70		Very dense reddish brown mottled light greenish grey slightly clayey gravelly fine to coarse SAND. Gravel Continued next sheet	

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
23/10/2013	1400	1.20	-	-	5.00	140	5.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m. 3. Rotary coring from 5.00m to 13.60m. 4. Groundwater encountered at 2.00m depth, rising to 1.44m after 20 mins. 5. 50mm diameter standpipe installed with slotted response zone from 2.00m to 3.50m. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%
24/10/2013	1800	5.00	5.00	-	13.60	105			
25/10/2013	1800	13.60	5.00	3.50					
									Release Status: Final

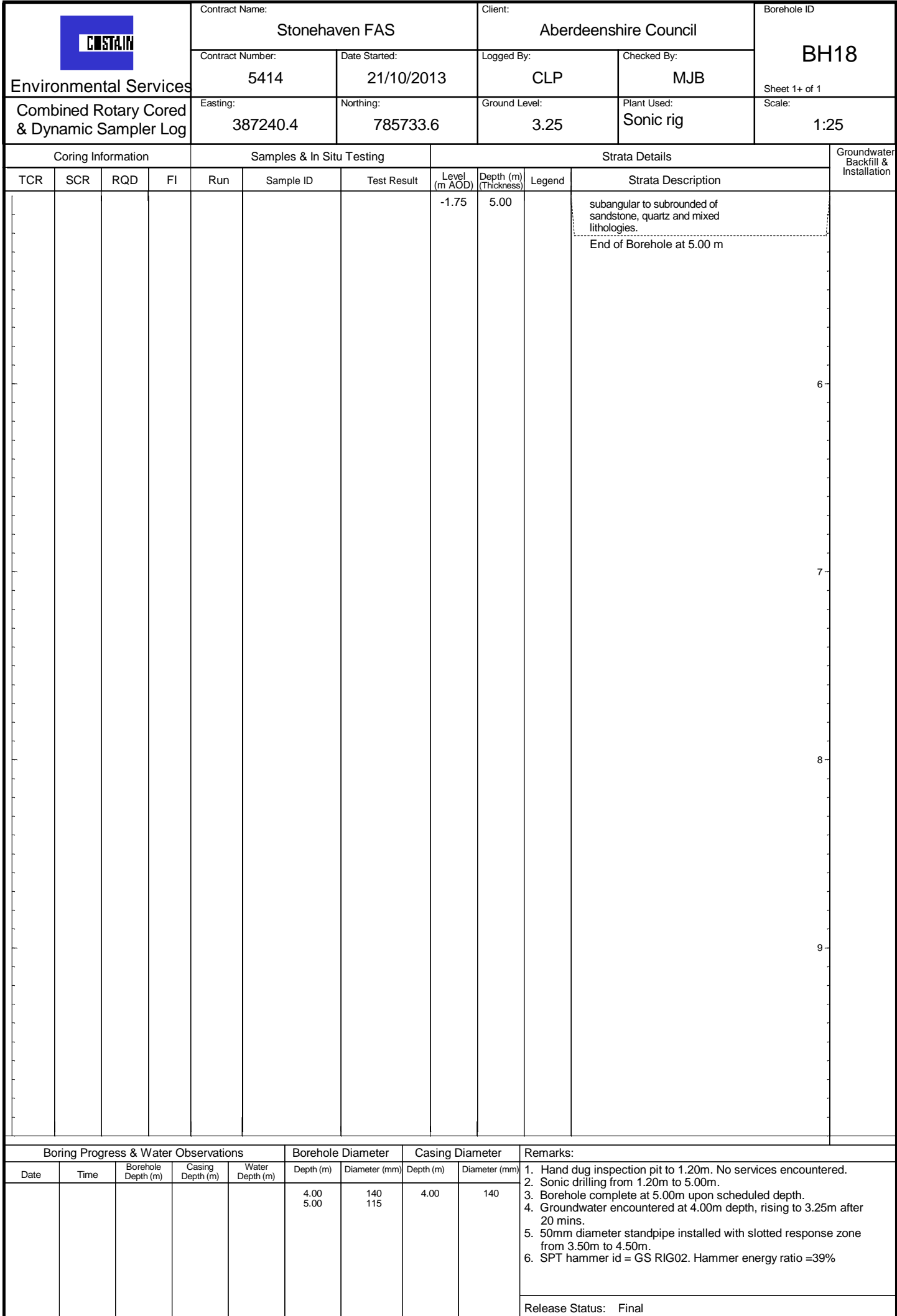


<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH15				
				Contract Number: 5414	Date Started: 24/10/2013	Logged By: CLP	Checked By: MJB	Sheet 3 of 3				
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387056.2	Northing: 785631.1	Ground Level: 8.08	Plant Used: Sonic rig	Scale: 1:25				
Coring Information				Samples & In Situ Testing			Strata Details		Groundwater Backfill & Installation			
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)		Legend	Strata Description	
100	52	18		10.00	10.53-10.63 C					Weak red brown fine grained SANDSTONE. Discontinuities are closely to medium spaced 45 degree inclined open clean. --- between 10.26m and 10.36m depth, recovered non-intact as slightly sandy clayey angular fine to coarse gravel. --- between 10.44m and 10.53m depth, recovered non-intact as slightly sandy clayey angular fine to coarse gravel. --- between 10.78m and 11.10m depth, recovered non-intact as slightly sandy clayey angular fine to coarse gravel.	11	
			NI									
			NI									
			NI									
100	100	89		11.30	11.10-11.30 C		-3.22	11.30		Medium-strong and strong red brown fine grained SANDSTONE. Discontinuities are closely to medium spaced horizontal stepped to undulating closed clean. --- between 11.30m and 11.70m depth, 1 no. vertical fracture smooth closed.	12	
100	83	77		12.40	11.75-11.91 C			(2.30)		--- between 12.80 and 13.00m depth, discontinuities are at 45 degrees.	13	
			NI		12.60-12.81 C					--- between 13.40m and 13.60m depth, recovered non-intact as angular fine to medium gravel.		
					13.00-13.36 C		-5.52	13.60		End of Borehole at 13.60 m	14	
Boring Progress & Water Observations				Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m. 3. Rotary coring from 5.00m to 13.60m. 4. Groundwater encountered at 2.00m depth, rising to 1.44m after 20 mins. 5. 50mm diameter standpipe installed with slotted response zone from 2.00m to 3.50m. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%			
23/10/2013	1400	1.20	-	-	5.00	140	5.00	140				
24/10/2013	1800	5.00	5.00	-	13.60	105						
25/10/2013	1800	13.60	5.00	3.50								
Release Status: Final												



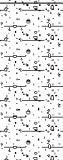










<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH17					
	Contract Number: 5414		Date Started: 21/10/2013		Logged By: CLP					
					Checked By: MJB					
Combined Rotary Cored & Dynamic Sampler Log	Easting: 387201.6		Northing: 785685.9		Ground Level: 6.41					
					Plant Used: Sonic rig					
						Sheet 1 of 1				
						Scale: 1:25				
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	
					0.20 D1 0.30-0.50 B2 0.50-1.00 B3			(1.00)		Probable MADE GROUND: Dark brown clayey gravelly fine to medium sand with frequent rootlets and medium cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone and mixed lithologies. Cobbles are angular to subangular of sandstone (dressed stone)
					1.20-1.65 D4 1.20-1.55 B5	(S)N=22 (2,2,2,1,6,13)	5.41	1.00		(Possible Made Ground). Soft dark orangish brown sandy gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of sandstone and mixed lithologies.
					1.60 D6 1.60-2.00 B7		4.86	1.55		(Possible Made Ground). Light yellowish brown gravelly fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of sandstone and mixed lithologies.
					2.00-2.45 D8 2.00-2.50 B9	(S)N=46 (2,6,10,15,10,11)	4.41	2.00		Dense dark brown clayey gravelly SAND. gravel is subangular to subrounded, fine to coarse of sandstone, quartz and mixed litholiges.
					2.50-4.00 B10		3.91	2.50		Very dense orangish brown mottled light yellowish brown gravelly SAND with low cobble content. Gravel is subangular to subrounded, fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded or sandstone, quartz and mixed lithologies.
					3.00-3.45 D11	(S)50/160mm (16,9,22,23,5)		(1.50)		
					4.00-4.45 D12 4.00-5.00 B13	(S)N=28 (3,4,5,8,7,8)	2.41	4.00		Medium-dense orangish brown very silty fine to medium SAND.
								(1.00)		
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		End of Borehole at 5.00 m	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:	
					4.00 5.00	140 115	4.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m. 3. Borehole complete at 5.00m upon scheduled depth. 4. No groundwater encountered during drilling. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%	
Release Status: Final										





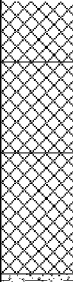
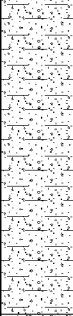
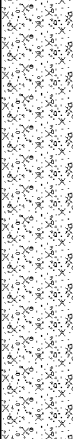
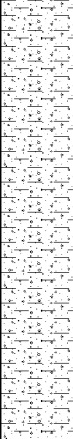





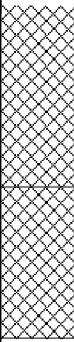





Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
					0.20 D1 0.30-0.50 B2		4.45	(0.30) 0.30		Dark brown slightly clayey gravelly fine to medium SAND with low cobble content and with frequent rootlets and roots.	
					0.80-1.20 B3					Dark orangish brown slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.	
					1.20-1.65 D4 1.20-2.00 B5	(S)N=18 (4,4,4,5,6,3)					
					1.90 W15 1.90 EWW15 2.00-2.45 D6 2.00-2.80 B8	(S)N=12 (4,4,4,4,2,2)		(2.50)			
					2.50 W7						
					2.80-3.00 D9 2.80 ESD9		1.95	2.80		Plastic blackish brown slightly sandy clayey amorphous PEAT.	
					3.00-3.45 D10 3.00-4.00 B11	(S)N=6 (1,2,1,1,1,3)	1.75	3.00		Loose black slightly clayey fine to coarse SAND.	
								(1.00)		--- from 3.30m depth, with occasional fine to coarse gravel sized pockets of dark brown amorphous peat.	
					4.00-4.45 D12 4.00-4.80 B13	(S)N=34 (6,6,7,9,9,9)	0.75	4.00		Dense dark brown mottled multicolours slightly clayey gravelly fine to coarse SAND.	
								(0.80)			
					4.80-5.00 B14		-0.05	4.80		Firm becoming stiff reddish brown	
										Continued next sheet	

<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH19			
				Contract Number: 5414		Date Started: 31/10/2013	Logged By: CLP		Checked By: MJB		Sheet 1+ of 1		
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387282.6		Northing: 785748.0		Ground Level: 4.75		Plant Used: Sonic rig		Scale: 1:25	
Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
							-0.25	5.00		slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. End of Borehole at 5.00 m			
												6	
												7	
												8	
												9	
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 5.00m. 3. Borehole complete at 5.00m upon scheduled depth. 4. Groundwater encountered at 3.00m depth, rising to 2.00m after 20 mins. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
					4.00 5.00	140 115	4.00	140					
Release Status:										Final			

<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH20					
	Contract Number: 5414	Date Started: 23/10/2013	Logged By: CLP	Checked By: MJB	Sheet 1 of 2					
	Combined Rotary Cored & Dynamic Sampler Log	Easting: 387078.9	Northing: 785610.4	Ground Level: 8.39	Plant Used: Sonic rig	Scale: 1:25				
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	
					0.10 D1 0.20-0.50 B2		8.19	0.20		MADE GROUND. Dark brown slightly clayey gravelly fine to coarse sand with frequent roots and rootlets. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. (Topsoil).
					0.50-0.90 B3		7.89	0.50		MADE GROUND. Dark orangish brown gravelly fine to coarse sand with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone.
					0.90-1.20 B4		7.49	0.90		
					1.20-1.65 D5 1.20-1.65 B6	(S)N=28 (5,11,10,7,5,6)				MADE GROUND. Black and reddish brown slightly clayey very sandy gravel with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and quartz. Cobbles are angular to subangular of sandstone.
					1.65 D7 1.80-2.00 B8					Medium-dense orangish brown slightly gravelly clayey fine to medium SAND with occasional roots and rootlets. --- from 1.20m depth, slightly clayey gravelly with no roots/rootlets. --- between 1.65m and 1.80m depth, very clayey.
					2.00-2.45 D9 2.00-3.00 B10	(S)N=8 (9,10,4,2,1,1)	6.39	2.00		Loose orangish brown occasionally mottled dark brown silty gravelly fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are rounded of mixed lithologies. --- at 2.00m depth, moisture noted. --- between 2.00m and 3.00m depth, poor recovery as cobble pushed through sand.  --- at 3.00m depth, dense.
					3.00-3.45 D11 3.00 ESD11 3.00-3.50 B12	(S)N=35 (8,9,8,8,9,10)				
					3.60 D13 3.60-4.00 B14		4.89	3.50		
					4.00-4.50 U15 4.00 U15					Firm and stiff red and orange brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, quartz and mixed lithologies.
					4.50 D16 4.50-5.00 B17					
Continued next sheet										
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 7.50m. 3. Rotary coring from 7.50m to 10.00m. 4. Groundwater encountered at 3.00m depth, rising to 2.56m after 20 mins. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%	
					5.00 10.00	140 115	5.00	140		
Release Status: Final										


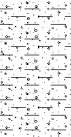












<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH21	
				Contract Number: 5414		Date Started: 30/10/2013		Logged By: CLP		Checked By: MJB	
				Easting: 387076.7		Northing: 785591.3		Ground Level: 8.66		Plant Used: Sonic rig	
Combined Rotary Cored & Dynamic Sampler Log								Scale: 1:25			
Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
					0.20 D1 0.20-0.50 B2  0.50-1.00 B3		8.06	0.60		MADE GROUND. Grass over dark orangish brown slightly clayey slightly gravelly fine to medium sand with low cobble content and frequent roots and rootlets. Gravel is subangular to subrounded fine to coarse of sandstone, quartz, ceramic pipe fragments and mixed lithologies. Cobbles are subrounded of sandstone and mixed lithologies.	
							7.56	1.10		(0.50)	MADE GROUND. Dark brown sandy gravelly clay with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies. --- at 0.70m depth, plastic sheet (possible membrane). --- at 0.90m depth, plastic sheet (possible membrane).  End of Borehole at 1.10 m
											1
											2
											3
											4
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.10m depth. 2. Borehole terminated on boulder obstruction at 1.10m depth and backfilled with arisings upon completion. 3. Borehole BH21A undertaken 2m north to avoid inflow pipe into Burn of Glaslaw.		
Release Status: Final											

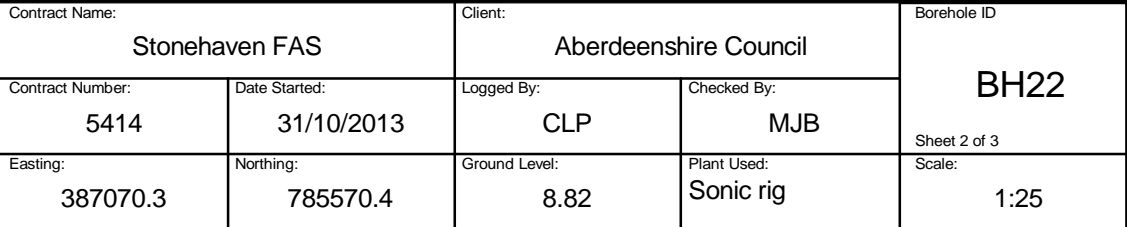
<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS				Client: Aberdeenshire Council				Borehole ID BH21A	
				Contract Number: 5414		Date Started: 30/10/2013		Logged By: CLP		Checked By: MJB		Sheet 1 of 1	
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387079.9		Northing: 785595.6		Ground Level: 8.30		Plant Used: Sonic rig		Scale: 1:25	
Coring Information				Samples & In Situ Testing				Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					0.20 D1 0.30-0.50 B2		8.00	(0.30)  0.30		MADE GROUND. Grass over dark orangish brown slightly clayey slightly gravelly fine to medium sand with frequent roots and rootlets. (Topsoil).			
							7.40	(0.60)  0.90		MADE GROUND. Dark brown slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. --- at 0.30m depth, piece of broken paving slab.			
									End of Borehole at 0.90 m				
												1	
												2	
												3	
												4	
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 0.90m depth. 2. Borehole terminated on concrete obstruction at 0.90m depth and backfilled with arisings upon completion. 3. BH21B undertaken 1.5m north and 0.5m west.				
									Release Status: Final				





<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS				Client: Aberdeenshire Council				Borehole ID: BH21B		
				Contract Number: 5414		Date Started: 30/10/2013		Logged By: CLP		Checked By: MJB		Sheet 2 of 2		
				Easting: 387076.6		Northing: 785596.1		Ground Level: 8.64		Plant Used: Sonic rig		Scale: 1:25		
Combined Rotary Cored & Dynamic Sampler Log														
Coring Information				Samples & In Situ Testing				Strata Details						Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description				
					5.00-5.45 D16 5.00-6.00 B17	(S)N=44 (2,6,11,10,10,13)		(1.95)		Stiff orangish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.				
					6.00-6.45 D18 6.00-6.35 B19	(S)N=44 (2,7,7,10,12,15)							6	
					6.35-7.50 B20		2.29	6.35		Very dense yellowish brown mottled pinkish brown slightly gravelly fine to coarse SAND. Gravel is angular of sandstone.  --- from 7.00m depth, gravelly.			7	
					7.50-7.95 D21 7.50-8.00 B22	(S)50/122mm (13,12,32,18)								
					8.00-9.00 B23			(3.65)					8	
					9.00-9.45 D24 9.00-10.00 B25	(S)50/104mm (14,11,32,18)							9	
Boring Progress & Water Observations													End of Borehole at 10.00 m	
Borehole Diameter					Casing Diameter		Remarks:							
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)						
30/10/2013 31/10/2013	1800 0815	10.00 10.00	5.00 5.00	- 6.97	5.00 10.00	140 115	5.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m depth. 3. Groundwater encountered at 2.00m rising to 1.98m after 20 mins. 4. Borehole complete at 10.00m upon specified depth. 5. 50mm diameter standpipe installed upon completion, slotted between 2.00m and 3.50m depth. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%					
Release Status: Final														

<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH22						
	Contract Number: 5414	Date Started: 31/10/2013	Logged By: CLP	Checked By: MJB	Sheet 1 of 3						
	Combined Rotary Cored & Dynamic Sampler Log	Easting: 387070.3	Northing: 785570.4	Ground Level: 8.82	Plant Used: Sonic rig	Scale: 1:25					
Coring Information				Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	
					0.20 D1 0.30-0.50 B2		8.52	(0.30) 0.30		Dark orangish brown slightly clayey gravelly fine to coarse SAND with low cobble content and occasional rootlets and roots. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subrounded of sandstone and mixed lithologies. (Topsoil). (Possible Made Ground).	
					0.80-1.20 B3			(0.90)		Light orangish brown slightly clayey gravelly fine to coarse SAND with low cobble content and frequent gravel sized pockets of soft clay. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subrounded of mixed lithologies.	
					1.20-2.00 B4	(S)N=13 (0,0,4,4,4,1)	7.62	1.20		Soft orangish brown sandy gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					2.00-2.45 D5 2.00 ESD5 2.00 D6 2.20-2.80 B7	(S)N=7 (1,2,1,1,2,3)	6.72	2.10		Loose orangish brown slightly clayey very sandy subangular to subrounded fine to coarse GRAVEL of sandstone, quartz and mixed lithologies.	
					2.90 D8 3.00-3.45 D9 3.00-3.40 B10	(S)N=28 (7,10,11,11,4,2)	6.02	2.80		Firm reddish brown sandy gravelly CLAY.	
					3.40-4.00 B11		5.72	3.10		Orangish brown slightly clayey very sandy subangular to subrounded fine to coarse GRAVEL of sandstone, quartz and mixed lithologies.	
					4.00-4.50 U12 4.00 U12		5.42	3.40		Firm becoming stiff slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.	
					4.50 D13 4.50-5.00 B14						
Continued next sheet											
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:		
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.45m. 3. Borehole complete at 10.45m upon scheduled depth. 4. Groundwater encountered at 4.00m depth, rising to 3.23m after 20 mins. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%		
					5.00 10.00	140 115	5.00	140			
Release Status: Final											




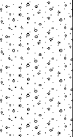

Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	

Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	


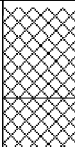
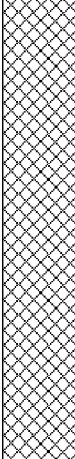
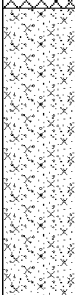

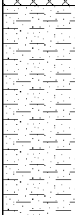
Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description	

5.00-5.45 D15 5.00-6.00 B16	(S)N=43 (9,11,10,12,9,12)				Firm becoming stiff slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.
6.00-6.45 D17 6.00-6.50 B18	(S)50/260mm (8,7,9,15,17,9)		(5.80)		--- from 6.00m depth, gravelly with low cobble content of subangular sandstone.
6.50-7.50 B19					
7.50-7.95 D20 7.50-8.25 B21	(S)50/252mm (4,7,10,15,15,10)				
8.25-8.80 B22					
8.80-9.25 D23 8.80-9.20 B24	(S)50/256mm (10,11,10,12,18,10)				
9.30 D25 9.30-10.00 B26		-0.38	9.20		Very dense light yellowish brown mottled light pinkish brown very sandy angular fine to coarse GRAVEL of sandstone.
			(1.25)		Continued next sheet


Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
					5.00 10.00	140 115	5.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.45m. 3. Borehole complete at 10.45m upon scheduled depth. 4. Groundwater encountered at 4.00m depth, rising to 3.23m after 20 mins. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%
									Release Status: Final

<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS				Client: Aberdeenshire Council				Borehole ID BH22	
				Contract Number: 5414		Date Started: 31/10/2013		Logged By: CLP		Checked By: MJB		Sheet 3 of 3	
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387070.3		Northing: 785570.4		Ground Level: 8.82		Plant Used: Sonic rig		Scale: 1:25	
Coring Information				Samples & In Situ Testing				Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					10.00-10.45 D27	(S)50/79mm (14,11,46,4)	-1.63	10.45		Very dense light yellowish brown mottled light pinkish brown very sandy angular fine to coarse GRAVEL of sandstone.			
										End of Borehole at 10.45 m			
												11	
												12	
												13	
												14	
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.45m. 3. Borehole complete at 10.45m upon scheduled depth. 4. Groundwater encountered at 4.00m depth, rising to 3.23m after 20 mins. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
					5.00 10.00	140 115	5.00	140					
Release Status:										Final			


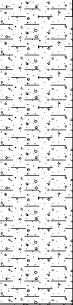










































<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council				Borehole ID  BH24	
				Contract Number: 5414		Date Started: 26/10/2013		Logged By: CLP		Checked By: MJB		
				Easting: 387035.5		Northing: 785506.5		Ground Level: 10.49		Plant Used: Sonic rig		Sheet 1 of 2 Scale: 1:25
Coring Information				Samples & In Situ Testing				Strata Details				Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
					0.20 D1 0.30-0.50 B2 0.50-1.00 B3		10.19	(0.30) 0.30		MADE GROUND. Dark orangish brown slightly clayey slightly gravelly fine to coarse sand with frequent roots and rootlets. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. (Topsoil).		
					1.00-1.20 B4 1.20-1.65 D5 1.20-1.70 B6 1.70-2.00 B7	(S)N=21 (16,9,7,6,5,3)		(1.70)		MADE GROUND. Dark brown slightly clayey gravelly fine to coarse sand with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to rounded of sandstone, quartz and mixed lithologies. --- from 0.60m depth, clayey with medium cobble content and rare wood fragments.  --- from 1.70m depth, very clayey.		
					2.00-2.45 D8 2.00-3.00 B9  3.00 D10 3.20-4.00 B11	(S)N=18 (2,2,3,3,6,6)  (S)N=2 (1,0,0,0,1,1)	8.49  7.49	2.00  3.00	 	Medium-dense dark orangish brown silty gravelly fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse of sandstone, quartz and mixed lithologies.  Soft thinly laminated reddish brown slightly sandy SILT with occasional thin partings of fine sand.		
					4.00-4.50 U12 4.00 U12  4.50 D13 4.50-4.90 B14  4.90 D15		6.19	4.30		--- from 3.60m depth, slightly gravelly. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. --- from 3.90m depth, clayey SILT.  Soft brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone and quartz.		
Continued next sheet												
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)				
26/10/2013	1500	6.00	6.00	-	6.00	140	6.00	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m. 3. Slight seepage noted at 1.00m depth, moisture observed from 2.00m depth. 4. Groundwater encountered overnight . Sitting at 5.60m at start of shift. 5. Borehole complete at 10.00m upon scheduled depth. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%			
28/10/2013	1100	10.00	10.00	-	10.00	115						
Release Status: Final												

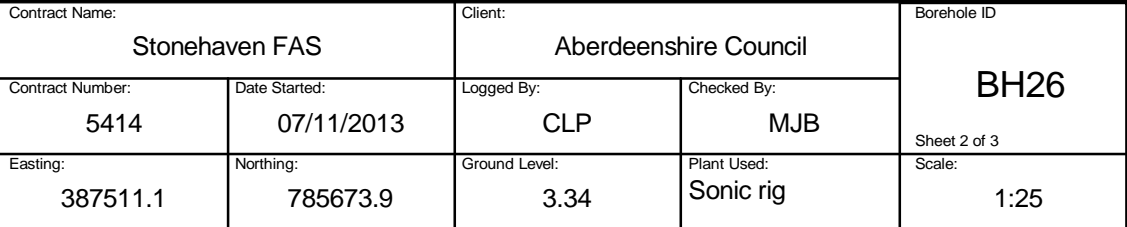


<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH24			
				Contract Number: 5414		Date Started: 26/10/2013	Logged By: CLP		Checked By: MJB		Sheet 2 of 2		
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387035.5		Northing: 785506.5		Ground Level: 10.49		Plant Used: Sonic rig		Scale: 1:25	
Coring Information				Samples & In Situ Testing				Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					5.00-5.45 D16 5.00-5.50 B17	(S)50/258mm (5,7,9,14,18,9)				Remaining Detail : 4.90m - 4.90m : --- from 4.90m depth, very sandy. --- from 5.10m depth, slightly sandy.			
					5.50-6.00 B18					--- from 5.60m depth, becoming stiff and very stiff.			
					6.00-6.45 D19 6.00-6.75 B20	(S)N=46 (7,7,9,9,11,17)				--- bewteeen 6.00m and 6.30m depth, sandy.		6	
					6.75-7.50 B21							7	
					7.50-7.95 D22 7.50-8.25 B23			(5.70)		--- from 7.30m depth, gravelly.			
					8.25-9.00 B24							8	
					9.00-9.45 D25 9.00-10.00 B26							9	
Boring Progress & Water Observations				Borehole Diameter		Casing Diameter		End of Borehole at 10.00 m					
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:				
26/10/2013	1500	6.00	6.00	-	6.00	140	6.00	140	1. Hand dug inspection pit to 1.20m. No services encountered.				
28/10/2013	1100	10.00	10.00	-	10.00	115			2. Sonic drilling from 1.20m to 10.00m.				
									3. Slight seepage noted at 1.00m depth, moisture observed from 2.00m depth.				
									4. Groundwater encountered overnight . Sitting at 5.60m at start of shift.				
									5. Borehole complete at 10.00m upon scheduled depth.				
									6. Borehole backfilled with bentonite on completion.				
									6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
Release Status:									Final				




<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH25					
	Contract Number: 5414	Date Started: 16/10/2013	Logged By: CLP	Checked By: PS	Sheet 2 of 2					
	Combined Rotary Cored & Dynamic Sampler Log	Easting: 386977.5	Northing: 785466.3	Ground Level: 14.03	Plant Used: Sonic rig	Scale: 1:25				
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	
					5.00-5.50 U18 5.00-5.55 U18			(1.45)		lithologies.
					5.50 D19 5.60-6.00 B20					
					6.00-6.45 D21 6.00-6.50 B22	(S)50/188mm (25,28,14,8)	8.03	6.00		Very dense orangish brown slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartzite and mixed lithologies.
					6.50-7.00 B23			(1.00)		
					7.00 D24 7.20-7.50 B25		7.03	7.00		Stiff locally hard dark orangish brown slightly gravelly sandy CLAY with low cobble content. Gravel is angular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of mixed lithologies. --- between 7.00m and 7.50m depth, moisture noted.
					7.50-7.95 D26 7.50-8.00 B27	(S)50/212mm (4,8,12,24,14)				
					8.00 D28 8.00-8.50 B29					
					8.50 D30 8.50-9.00 B31			(3.00)		
					9.00-9.45 D32 9.00-9.50 B33	(S)50/215mm (3,9,9,12,29)				
					9.50-10.00 B34					
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		End of Borehole at 10.00 m	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:	
16/10/2013	1645	10.00	2.00	-	2.00 10.00	229 115	2.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m. 3. Groundwater encountered at 7.50m rising to 7.37m after 20 mins. 4. Borehole complete at 10.00m upon scheduled depth. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%	
Release Status: Final										

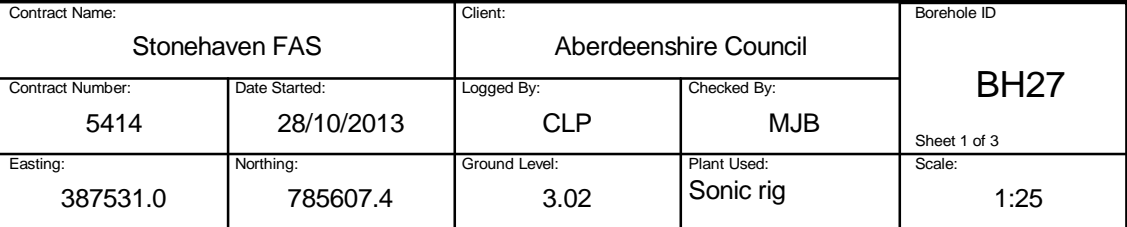
<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID  BH26		
				Contract Number: 5414		Date Started: 07/11/2013		Logged By: CLP		Checked By: MJB		
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387511.1		Northing: 785673.9		Ground Level: 3.34		Plant Used: Sonic rig		
										Scale: 1:25		
Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
					0.10 D1		3.28 3.24	0.06 0.10		MADE GROUND. Red brown brick setts.		
					0.40 D2 0.40-0.80 B3		2.94	0.40		MADE GROUND. Light brown fine to coarse sand.		
					0.80 D4 0.80-1.20 B5		2.54	0.80		MADE GROUND. Brown sandy angular to subangular fine to coarse gravel of limestone.		1
					1.20-1.65 D6 1.20-2.00 B7	(S)50/274mm (4,10,13,17,12,8)	2.14	1.20		MADE GROUND. Grey and brown slightly sandy angular to subangular fine to coarse gravel of slate.		
					2.00-2.45 D8 2.00-2.30 B9 2.00 W13	(S)50/175mm (8,9,11,30,9)				Reddish brown sandy subangular to rounded fine to coarse GRAVEL of sandstone, quartzite and mixed igneous lithologies.		2
					2.30-3.00 B11 2.40 D10 2.40 ESD10		1.04	2.30		Very dense yellowish brown slightly clayey very sandy subangular to rounded fine to coarse GRAVEL of sandstone, quartz, quartzite and mixed lithologies.		
					3.00-3.45 D12 3.00-4.00 B14	(S)N=7 (0,1,1,1,2,3)						3
					4.00-4.50 U15 4.00 U15							
					4.50 D16 4.50-5.00 B17							4
												
										Soft reddish brown slightly sandy SILT.		
												
										--- from 3.80m depth, possibly clayey.		
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
												
Continued next sheet												
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:			
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)				
07/11/2013	1800	7.50	6.00	-	2.00	229	2.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 7.50m. 3. Rotary coring from 7.50m to 13.00m. 4. Groundwater encountered at 2.00m depth, rising to 1.43m after 20 mins. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%			
08/11/2013	0800	7.50	6.00	3.13	7.50	140	7.50	140				
08/11/2013	1200	13.00	7.50	1.80	13.00	115						
										Release Status: Final		



Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation			
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description				
7.50	5.00-5.45 D18 5.00-5.60 B19	(S)N=10 (0,2,2,2,3,3)	-2.26	5.60		Remaining Detail : 4.80m - 5.00m : 1. no sandstone cobble.	6			
	5.60-6.00 B21 5.70 D20	(S)50/261mm (8,9,13,16,15,6)				(1.40)			Firm becoming stiff reddish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular of mixed lithologies. --- from 6.00m depth, sandy.	
	6.00-7.00 B22		-3.66	7.00	(0.50)					Reddish brown mottled greenish grey gravelly fine to medium SAND. Gravel is angular fine to coarse of sandstone.
	7.00-7.50 B24 7.10 D23									-4.16
	7.50-7.95 D25 7.50-7.92 C	(S)50/6mm (25,50)	-4.83	8.17	(0.63)			Assessed Zone of Core Loss.		
8.50	-5.46						8.80		Medium strong brown and greenish grey medium grained SANDSTONE. Discontinuities are 1) subhorizontal medium spaced rough planar. 2) 50 deg widely spaced rough planar. --- between 9.10m and 9.17m depth, recovered non-intact as clayey gravel. --- between 9.68m and 9.92m depth, recovered non-intact as clayey sandy gravel.	
8.80-9.00 C									(1.20)	
9.26-9.68 C										

Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	
07/11/2013	1800	7.50	6.00	-	2.00	229	2.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 7.50m. 3. Rotary coring from 7.50m to 13.00m. 4. Groundwater encountered at 2.00m depth, rising to 1.43m after 20 mins. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%
08/11/2013	0800	7.50	6.00	3.13	7.50	140	7.50	140	
08/11/2013	1200	13.00	7.50	1.80	13.00	115			
Release Status: Final									


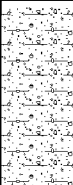
<div></div> <div>Environmental Services</div>	Contract Name: Stonehaven FAS		Client: Aberdeenshire Council		Borehole ID BH26					
	Contract Number: 5414	Date Started: 07/11/2013	Logged By: CLP	Checked By: MJB	Sheet 3 of 3					
	Easting: 387511.1	Northing: 785673.9	Ground Level: 3.34	Plant Used: Sonic rig	Scale: 1:25					
Combined Rotary Cored & Dynamic Sampler Log										
Coring Information				Samples & In Situ Testing			Strata Details			Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	
63	38	33	AZCL	10.00	10.60-10.80 C		-6.66	10.00		Assessed Zone of Core Loss.
				(0.56)						
				10.56						
97	77	67	4	11.16-11.50 C				(2.44)		Medium strong brown and greenish grey medium grained SANDSTONE. Discontinuities are 1) subhorizontal medium spaced rough planar. 2) 50 deg widely spaced rough planar. --- between 10.60m and 10.95m depth, 1 no. discontinuity. 80 deg rough planar. --- between 10.95m and 11.16m depth, recovered non-intact as gravel. --- from 11.16m depth, extremely strong.
			NI							
			1							
			NI							
			2							
			NI							
			2							
			2							
				12.23-12.70 C						--- between 11.50m and 11.60m depth, recovered non-intact as gravel.  --- between 11.83m and 11.88m depth, recovered non-intact as clayey gravel. --- between 11.88m and 12.18m depth, 1 no. fracture. subvertical rough stepped. --- between 12.18m and 12.23m depth, recovered non-intact as clayey gravel.
										End of Borehole at 13.00 m
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:	
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)		
07/11/2013	1800	7.50	6.00	-	2.00	229	2.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 7.50m. 3. Rotary coring from 7.50m to 13.00m. 4. Groundwater encountered at 2.00m depth, rising to 1.43m after 20 mins. 5. Borehole backfilled with bentonite on completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%	
08/11/2013	0800	7.50	6.00	3.13	7.50	140	7.50	140		
08/11/2013	1200	13.00	7.50	1.80	13.00	115				
Release Status: Final										












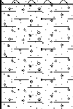
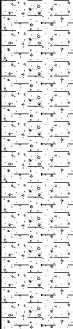

Samples & In Situ Testing			Strata Details				Groundwater Backfill & Installation	
Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
	0.06 D1 0.10 D2 0.10-0.50 B3		2.96	0.06		MADE GROUND. Paving slab.	<div>1</div> <div>2</div> <div>3</div> <div>4</div>	
			2.92	0.10				MADE GROUND. Grey slightly gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone.
				(0.40)				
	0.50 D4 0.50-1.20 B5		2.52	0.50				MADE GROUND. Brown gravelly fine to coarse sand. Gravel is angular to rounded fine to coarse of sandstone and mixed igneous lithologies.
			(0.70)					
	1.20-1.65 D6 1.20-2.00 B7	(S)N=42 (3,8,10,12,10,10)	1.82	1.20		Dense dark orangish brown and multicoloured slightly clayey gravelly fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of mixed lithologies. Cobbles are subrounded to rounded of mixed lithologies.		
				(1.20)				
	2.00-2.45 D8 2.00-2.40 B9	(S)50/105mm (5,9,29,21)						
		0.62	2.40					
	2.60 D10 2.60-3.40 B11	(S)N=10 (0,1,2,2,2,4)				Soft slightly sandy slightly gravelly SILT. Gravel is subangular to subrounded fine to coarse of sandstone and mixed lithologies. --- from 2.60m depth, very thinly laminated with closely spaced thin laminations of fine sand.		
			(1.00)					
3.00-3.45 D12								
3.40-4.00 B13	-0.38		3.40			Firm becoming stiff reddish brown slightly sandy slightly gravelly CLAY with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.		
		(0.90)						
4.00-4.50 U14 4.00 U14								
	-1.28	4.30			Firm reddish brown slightly gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.			
4.50 D15 4.50-5.00 B16		(0.70)						
Continued next sheet								


Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 9.00m. 3. Rotary coring from 9.00m to 11.50m. 4. Sonic drilling from 11.50m to 15.00m depth. 5. Groundwater encountered at 1.20m depth, rising to 1.10m after 20 mins. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%
28/10/2013	1800	1.20	-	-	4.00	229	4.00	229	
29/10/2013	1800	11.50	9.00	1.53	9.00	140	9.00	140	
30/10/2013	1030	15.00	9.00	1.61	15.00	115			
Release Status: Final									




<div></div> <div>Environmental Services</div> <div>Combined Rotary Cored &amp; Dynamic Sampler Log</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH27					
				Contract Number: 5414		Date Started: 28/10/2013		Logged By: CLP		Checked By: MJB		Sheet 2 of 3			
				Easting: 387531.0		Northing: 785607.4		Ground Level: 3.02		Plant Used: Sonic rig		Scale: 1:25			
Coring Information				Samples & In Situ Testing				Strata Details				Groundwater Backfill & Installation			
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description					
				9.00	5.00-5.45 D17 5.00-6.00 B18	(S)50/86mm (25,30,20)	-1.98	5.00		Very dense orangish brown and multicoloured slightly clayey very gravelly fine to coarse SAND with low cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies. Cobbles are subangular to subrounded of sandstone and mixed lithologies.					
					6.00-6.45 D19 6.00-6.20 B20	(S)50/225mm (20,5,18,15,17)	-3.18	6.20		--- from 6.00m depth, becoming clayey.					
					6.30 D21 6.30-7.30 B22					Firm locally stiff and friable dark orangish brown gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.					
					7.30-7.50 B23			(2.30)		--- from 7.30m depth, friable, slightly sandy with fine to coarse gravel sized pockets of sand and sandstone.					
					7.50-7.95 D24 7.50-8.50 B25	(S)50/12mm (25,50)									
					8.50-9.00 B26		-5.48	8.50		(0.50)	Reddish brown and light greenish grey thinly interbedded hard friable sandy CLAY and fine to medium grained SANDSTONE.				
					9.00-9.24 C 9.00-9.45 D27	(S)50/3mm (25,50)	-5.98	9.00			Weak reddish brown coarse grained SANDSTONE. Discontinuities are 1) Closely to medium spaced horizontal planar rough closed stained brown. 2) Random planar rough closed stained brown.				
					9.37-9.60 C										
					100	68	39	10						(1.50)	
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		Remarks:						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)							
28/10/2013	1800	1.20	-	-	4.00	229	4.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 9.00m. 3. Rotary coring from 9.00m to 11.50m. 4. Sonic drilling from 11.50m to 15.00m depth. 5. Groundwater encountered at 1.20m depth, rising to 1.10m after 20 mins. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%						
29/10/2013	1800	11.50	9.00	1.53	9.00	140	9.00	140							
30/10/2013	1030	15.00	9.00	1.61	15.00	115									
Release Status: Final															

<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID  BH27		
				Contract Number: 5414		Date Started: 28/10/2013	Logged By: CLP		Checked By: MJB			
Combined Rotary Cored & Dynamic Sampler Log				Easting: 387531.0		Northing: 785607.4		Ground Level: 3.02		Plant Used: Sonic rig		Sheet 3 of 3
												Scale: 1:25
Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description		
			NI	10.50	10.28-10.38 C		-7.48	10.50		Remaining Detail : 9.99m - 10.10m : --- between 9.99m and 10.10m depth, recovered non-intact. --- below 10.10m depth, moderately strong.		
			17									
98	57	39	NI	11.50	11.30-11.50 C		-7.98	11.00		Weak reddish brown coarse grained SANDSTONE with occasional bands of weak cemented slightly clayey fine to coarse sand. Discontinuities are closely spaced horizontal planar rough infilled with clayey fine to coarse sand. --- between 10.50m and 11.00m depth, recovered non-intact.		
			8									
96	85	51		12.50	12.03-12.15 C							
100	66	12	7	13.50	13.38-13.50 C 13.50-13.78 C			(4.00)		--- between 12.50m and 13.34m depth, 1 no. 85 degree inclined fracture, planar rough stained brown.		
100	31	31	NI	14.40-14.60 C						--- between 13.78m and 14.40m depth, recovered non-intact.		
			5									
			NI							--- between 14.60m and 15.00m depth, recovered non-intact as very gravelly clayey sand.		
Boring Progress & Water Observations				Borehole Diameter		Casing Diameter		End of Borehole at 15.00 m				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:			
28/10/2013	1800	1.20	-	-	4.00	229	4.00	229	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 9.00m. 3. Rotary coring from 9.00m to 11.50m. 4. Sonic drilling from 11.50m to 15.00m depth. 5. Groundwater encountered at 1.20m depth, rising to 1.10m after 20 mins. 6. Borehole backfilled with bentonite on completion. 7. SPT hammer id = GS RIG02. Hammer energy ratio =39%			
29/10/2013	1800	11.50	9.00	1.53	9.00	140	9.00	140				
30/10/2013	1030	15.00	9.00	1.61	15.00	115						
Release Status: Final												

<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH28			
				Contract Number: 5414		Date Started: 01/11/2013		Logged By: CLP		Checked By: MJB		Sheet 1 of 2	
				Easting: 387347.8		Northing: 785741.7		Ground Level: 3.88		Plant Used: Sonic rig		Scale: 1:25	
Combined Rotary Cored & Dynamic Sampler Log													
Coring Information				Samples & In Situ Testing			Strata Details					Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					0.10-0.30 B2 0.20 D1 0.30-0.50 B3		3.78	0.10		MADE GROUND. Red brick setts.			
										MADE GROUND. Orangish brown and multicoloured fine to coarse sand.			
					0.30-0.50 B3 0.50-0.80 B4 0.80-1.20 B5		3.58	0.30		MADE GROUND. Dark brown mottled red and black slightly clayey gravelly fine to coarse sand with medium cobble content. Gravel is subangular to subrounded fine to coarse of sandstone, quartz, brick, concrete and mixed lithologies. --- from 0.80m depth, clayey.			
					1.20-1.65 D6 1.20-2.00 B7	(S)N=45 (3,8,22,12,6,5)		(1.70)					
					2.00-2.45 D8 2.20 D9 2.20 ESD9 2.40-3.00 B10	(S)N=44 (1,10,10,10,12,12)	1.88	2.00		Plastic dark brown slightly clayey amorphous PEAT.			
							1.48	2.40		Dark brown clayey gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.			
					3.00-3.45 D11 3.00-3.50 B12	(S)N=11 (1,1,1,2,7)	0.88	3.00		Soft orangish brown slightly sandy SILT.			
					3.50-4.00 B14 3.60 D13		0.38	3.50		Firm locally stiff slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.  --- at 3.40m depth, 1 no. cobble.			
					4.00-4.45 D15 4.00-5.00 B16	(S)N=25 (3,4,8,4,6,7)				Continued next sheet			
Boring Progress & Water Observations													
Borehole Diameter					Casing Diameter		Remarks:						
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)					
01/11/2013	1800	3.00	3.00	-	7.50	140	7.50	140	1. Hand dug inspection pit to 1.20m. No services encountered. 2. Sonic drilling from 1.20m to 10.00m. 3. Borehole complete at 10.00m upon scheduled depth. 4. Groundwater encountered at 2.50m depth, rising to 2.40m after 20 mins. 5. Borehole backfilled with bentonite upon completion. 6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
02/11/2013	0800	3.00	3.00	1.67	10.00	115							
02/11/2013	1300	10.00	7.50	1.75					Release Status: Final				

 <b>Environmental Services</b>				Contract Name: <b>Stonehaven FAS</b>			Client: <b>Aberdeenshire Council</b>			Borehole ID <b>BH28</b>			
				Contract Number: <b>5414</b>		Date Started: <b>01/11/2013</b>		Logged By: <b>CLP</b>		Checked By: <b>MJB</b>		Sheet 2 of 2	
Combined Rotary Cored & Dynamic Sampler Log				Easting: <b>387347.8</b>		Northing: <b>785741.7</b>		Ground Level: <b>3.88</b>		Plant Used: <b>Sonic rig</b>		Scale: <b>1:25</b>	
Coring Information				Samples & In Situ Testing				Strata Details				Groundwater Backfill & Installation	
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					5.00-5.45 D17 5.00-5.80 B18	(S)50/236mm (4,8,13,18,16,3)		(3.10)		Firm locally stiff slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.			
					5.90 D19 6.00-6.45 D20 6.00-6.60 B21	(S)50/255mm (7,11,12,14,17,7)				--- from 5.80m depth, sandy occasionally very sandy.		6	
					6.60-7.25 B22		-2.72	6.60		Stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		7	
					7.25-8.00 B23		-3.37	7.25		Stiff becoming hard reddish brown and multicoloured slightly gravelly sandy CLAY. Gravel is subangular fine to coarse of sandstone, quartz and mixed lithologies.			
					7.50-7.95 D24	(S)50/95mm (18,7,40,10)							
					8.00-8.60 B25			(1.35)				8	
					8.60-9.00 B26		-4.72	8.60		Light yellowish brown and multicoloured gravelly very sandy CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, quartz and mixed lithologies.		9	
					9.00-9.45 D27 9.00-10.00 B28	(S)50/130mm (2,1,20,30)			(1.40)				
Boring Progress & Water Observations					Borehole Diameter		Casing Diameter		End of Borehole at 10.00 m				
Date	Time	Borehole Depth (m)	Casing Depth (m)	Water Depth (m)	Depth (m)	Diameter (mm)	Depth (m)	Diameter (mm)	Remarks:				
01/11/2013	1800	3.00	3.00	-	7.50	140	7.50	140	1. Hand dug inspection pit to 1.20m. No services encountered.				
02/11/2013	0800	3.00	3.00	1.67	10.00	115			2. Sonic drilling from 1.20m to 10.00m.				
02/11/2013	1300	10.00	7.50	1.75					3. Borehole complete at 10.00m upon scheduled depth.				
									4. Groundwater encountered at 2.50m depth, rising to 2.40m after 20 mins.				
									5. Borehole backfilled with bentonite upon completion.				
									6. SPT hammer id = GS RIG02. Hammer energy ratio =39%				
Release Status: Final													










<div></div> <div>Environmental Services</div>				Contract Name: Stonehaven FAS			Client: Aberdeenshire Council			Borehole ID BH29			
				Contract Number: 5414		Date Started: 17/10/2013	Logged By: CLP		Checked By: PS	Sheet 2 of 2			
Combined Rotary Cored & Dynamic Sampler Log				Easting: 386997.5		Northing: 785470.2		Ground Level: 16.23		Plant Used: Sonic rig		Scale: 1:25	
Coring Information				Samples & In Situ Testing				Strata Details					Groundwater Backfill & Installation
TCR	SCR	RQD	FI	Run	Sample ID	Test Result	Level (m AOD)	Depth (m) (Thickness)	Legend	Strata Description			
					5.00-5.50 U17 5.00 U17						subrounded, fine to medium of sandstone, quartz and mixed lithologies.		
					5.50 D18 5.50-6.00 B19			(1.75)			--- from 5.30m depth, with thin beds of fine to coarse sand.		
					6.00-6.45 D20	(S)50/223mm (6,9,14,15,21)	9.78	6.45			End of Borehole at 6.45 m		

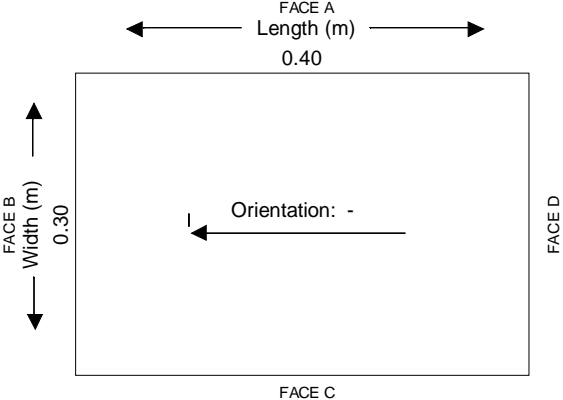
# Appendix 4.3

## Appendix 4.3 - Observation Pit Logs




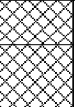



 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>CDR2</b>
	Contract Number: <b>5414</b>	Date Started: <b>04/11/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
Trial Pit Log	Easting: <b>-</b>	Northing: <b>-</b>	Ground Level: <b>-</b>	Plant Used: <b>Hand Tools</b>	Sheet 1 of 1 Scale: <b>1:50</b>

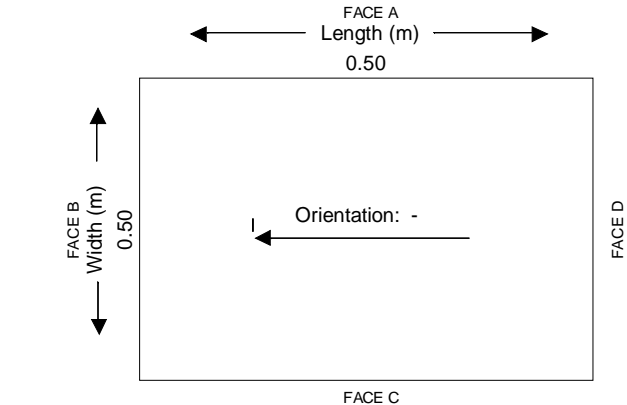
Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.10 D1 0.10-0.60 B2					(0.60)	MADE GROUND. Dark brown slightly gravelly fine to coarse ash sand. Gravel is subangular to rounded fine to coarse of sandstone, brick and mixed lithologies.	
0.60 D3 0.60-1.00 B4					0.60 (0.40)	MADE GROUND. Brown gravelly fine to coarse sand with high cobble content. Gravel is subangular to rounded fine to coarse of sandstone, quartzite and mixed lithologies. Cobbles are subangular to rounded of quartzite.	
1.00 D5 1.00 ESB6 1.00-1.50 B6					1.00 (0.50)	Reddish brown sandy subangular to rounded fine to coarse GRAVEL of sandstone, quartzite and mixed igneous lithologies with high cobble content. Cobbles are subangular to rounded of sandstone and mixed lithologies.	
					1.50	End of Trial Pit at 1.50 m	


<b>Dimensions:</b>	<b>General Remarks:</b>
<p>Final Depth: 1.50m</p> <div></div>	<ol style="list-style-type: none"><li>1. Trial Pit hand excavated from GL to 1.50m. Terminated due to boulder obstruction with engineer's agreement.</li><li>2. No groundwater encountered.</li><li>3. All sides stable.</li><li>4. Photographs taken of side faces and spoil.</li><li>5. Trial pit backfilled on completion.</li></ol>
Inclination: 90	Release Status: Final





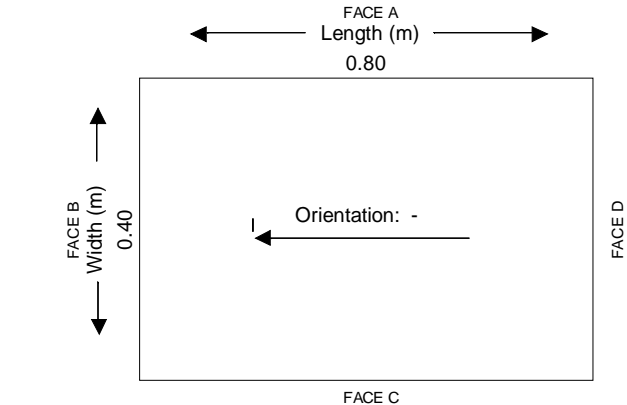
 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP2</b>
	Contract Number: <b>5414</b>	Date Started: <b>05/11/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
Trial Pit Log	Easting: <b>387310.6</b>	Northing: <b>785749.0</b>	Ground Level: <b>4.42</b>	Plant Used: <b>Hand Tools</b>	Sheet 1 of 1 Scale: <b>1:50</b>


Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.30 D1 0.30-0.80 LB2			4.12		(0.30) 0.30	MADE GROUND. Dark brown slightly gravelly fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone. (Topsoil).	
0.80 D3 0.80-1.00 B4			3.62		(0.50) 0.80	MADE GROUND. Brown gravelly fine to coarse sand with medium cobble content. Gravel is angular to subangular fine to coarse of brick, concrete and sandstone. Cobbles are angular to subangular of brick and concrete.	
1.00 D5 1.00-1.60 LB6			3.42		1.00	--- between 0.60m depth, to the northern edge of the pit, to 0.80m depth in the southern edge of the pit, sloping rough concrete footing of 0.30m width.	
					(0.60)		
			2.82		1.60	MADE GROUND. Reddish brown clayey gravelly fine to coarse sand. Gravel is angular to rounded fine to coarse of sandstone, brick, quartzite and mixed lithologies.	
						MADE GROUND. Reddish brown slightly clayey sandy angular to rounded fine to coarse gravel of sandstone, quartzite, brick and mixed lithologies with high cobble content. Cobbles are subangular to rounded of sandstone, brick and mixed lithologies.	
						End of Trial Pit at 1.60 m	



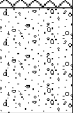
<b>Dimensions:</b>	<b>General Remarks:</b>
<p>Final Depth: 1.60m</p>  <p>Inclination: 90</p>	<ol style="list-style-type: none"><li>1. Trial Pit hand excavated from GL to 1.60m. Terminated due to boulder obstruction with engineer's agreement.</li><li>2. No groundwater encountered.</li><li>3. All sides stable.</li><li>4. Photographs taken of side faces and spoil.</li><li>5. Trial pit backfilled on completion.</li></ol>
Release Status: Final	

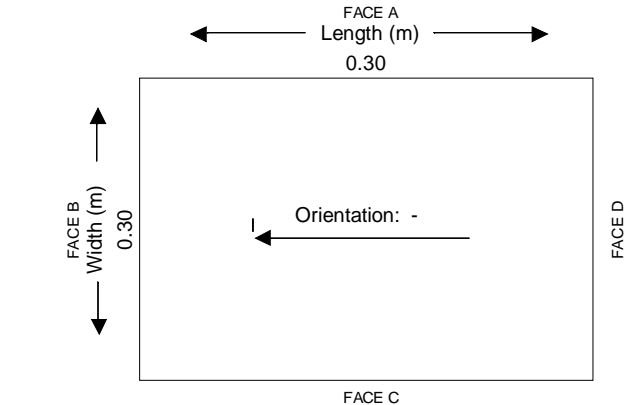
 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP3</b>
	Contract Number: <b>5414</b>	Date Started: <b>24/10/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
Trial Pit Log	Easting: <b>387293.2</b>	Northing: <b>785766.0</b>	Ground Level: <b>4.40</b>	Plant Used: <b>Hand Tools</b>	Sheet 1 of 1 Scale: <b>1:50</b>


Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.10 D1 0.20 D2 0.20-0.80 LB3			4.33 4.30 4.20		0.07 0.10 0.20 (0.60)	MADE GROUND. Paving slabs. MADE GROUND. Orangish brown fine to coarse sand. MADE GROUND. Brown gravelly fine to coarse sand. Gravel is subangular to rounded fine to coarse of mixed lithologies including sandstone and limestone. MADE GROUND. Brown sandy angular to subangular fine to coarse gravel of sandstone, limestone, concrete and mixed lithologies with high cobble and boulder content. Cobbles and boulders are subangular to rounded of sandstone, limestone and mixed lithologies. --- at 0.35m depth, base of river wall exposed. 2 no. boulders from 0.35m to 0.60m depth immediately below base of wall, possibly utilised as a footing. Boulders extend 0.20m out into trial pit from base of wall. End of Trial Pit at 0.80 m	
			3.60		0.80		







<b>Dimensions:</b> Final Depth: 0.80m 	<b>General Remarks:</b> 1. Trial Pit hand excavated from GL to 0.80m. Terminated due to undermining of river wall with engineer's agreement. 2. Difficult excavation 0.00m to 0.80m - 2.5 hours. 3. No groundwater encountered. 4. All sides stable. 5. Photographs taken of side faces and spoil. 6. Trial pit backfilled on completion.
Inclination: 90	Release Status: Final

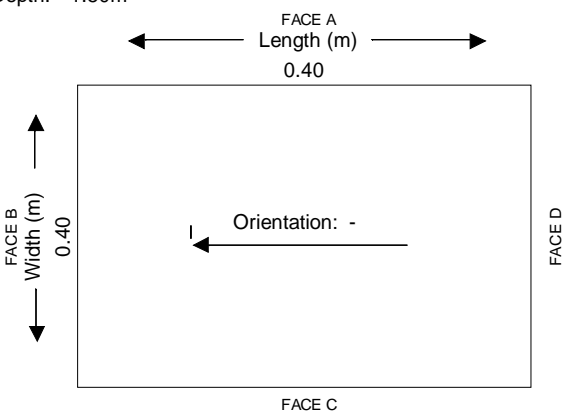
 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP4</b>
	Contract Number: <b>5414</b>	Date Started: <b>05/11/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
	Trial Pit Log	Easting: <b>387143.1</b>	Northing: <b>785687.2</b>	Ground Level: <b>5.57</b>	Plant Used: <b>Hand Tools</b>


Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.20 D1			5.37		0.20	MADE GROUND. Brown clayey fine to coarse sand.	
0.20-0.50 LB2			5.07		(0.30) 0.50	MADE GROUND. Dark brown slightly clayey slightly gravelly fine to coarse sand. Gravel is subangular to rounded fine to coarse of sandstone, limestone and brick.	
0.50 D3			4.37		(0.70) 1.20	Reddish brown gravelly fine to coarse SAND with high cobble content. Gravel is subangular to rounded fine to coarse of sandstone, quartzite and mixed igneous lithologies. Cobbles are subangular to rounded of sandstone, quartzite and mixed igneous lithologies.	
0.50-1.20 LB4						End of Trial Pit at 1.20 m	

<b>Dimensions:</b> Final Depth: 1.20m 	<b>General Remarks:</b> <ul style="list-style-type: none"><li>1. Trial Pit hand excavated from GL to 1.20m.</li><li>2. Trial pit complete upon scheduled depth.</li><li>3. No groundwater encountered.</li><li>4. All sides stable.</li><li>5. Photographs taken of side faces and spoil.</li><li>6. Trial pit backfilled on completion.</li></ul>
Inclination: 90	Release Status: Final

 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP5</b>
	Contract Number: <b>5414</b>	Date Started: <b>29/10/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
	Trial Pit Log	Easting: <b>387016.4</b>	Northing: <b>785651.4</b>	Ground Level: <b>9.68</b>	Plant Used: <b>Hand Tools</b>

Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.10 D1 0.10-0.50 LB2					(0.50)	MADE GROUND. Dark brown slightly gravelly fine to coarse sand. Gravel is angular to subangular fine to coarse of sandstone.	
0.50 D3 0.50-1.30 LB4			9.18		0.50 (0.80)	Brown slightly gravelly clayey fine to coarse SAND with low cobble content. Gravel is subangular to rounded fine to coarse of sandstone and quartzite. Cobbles are subangular to subrounded of quartzite.	
1.30 D5 1.30-1.50 B6			8.38 8.18		1.30 1.50	Brown gravelly fine to coarse SAND with high cobble content. Gravel is subangular to rounded fine to coarse of mixed lithologies. Cobbles are rounded of mixed lithologies. End of Trial Pit at 1.50 m	

<b>Dimensions:</b> Final Depth: 1.50m  Inclination: 90	<b>General Remarks:</b> 1. Trial Pit hand excavated from GL to 1.50m. Terminated due to boulder obstruction with engineer's agreement. 2. No groundwater encountered. 3. All sides stable. 4. Photographs taken of pit and spoil. 5. Trial pit backfilled on completion.  Release Status: Final
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 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP6</b>
	Contract Number: <b>5414</b>	Date Started: <b>19/10/2013</b>	Logged By: <b>MJB</b>	Checked By: <b>PS</b>	
	Trial Pit Log	Easting: <b>387016.9</b>	Northing: <b>785649.4</b>	Ground Level: <b>7.26</b>	Plant Used: <b>Hand Tools</b>

Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.30 D1 0.30-0.70 LB2					(1.40)	MADE GROUND. Brown silty gravelly fine to medium sand, with medium cobble content. Gravel is angular, fine to coarse of mixed lithologies. Cobbles are subangular of mixed lithologies.	
1.40 D3			5.86		1.40		End of Trial Pit at 1.40 m

<b>Dimensions:</b>	<b>General Remarks:</b>
<p>Final Depth: 1.40m</p> <div><div>FACE A Length (m) 0.50</div><div>FACE B Width (m) 0.50</div><div>FACE C</div><div>FACE D</div><div>Orientation: -</div></div> <p>Inclination: 90</p>	<ol style="list-style-type: none"><li>1. Trial Pit hand excavated from GL to 1.40m. Terminated due to tree root obstruction with engineer's agreement.</li><li>2. No groundwater encountered.</li><li>3. All sides stable.</li><li>4. Photographs taken of pit and spoil.</li><li>5. Trial pit backfilled on completion.</li></ol> <p>Release Status: Final</p>





Contract Name:

## Stonehaven FAS

Client:

Aberdeenshire Council

Trial Pit ID:

TP7

Contract Number:

5414

Date Started:

16/10/2013

Logged By:	
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MJB

Checked By:	
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PS

Sheet 1 of 1

Easting:

386928.4

Northing:

785638.6

Ground Level:

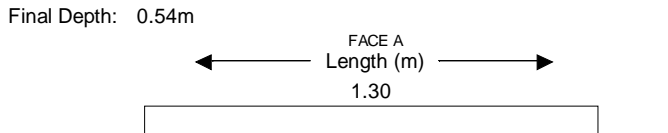
9.94


Plant Used:
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
## Hand Tools

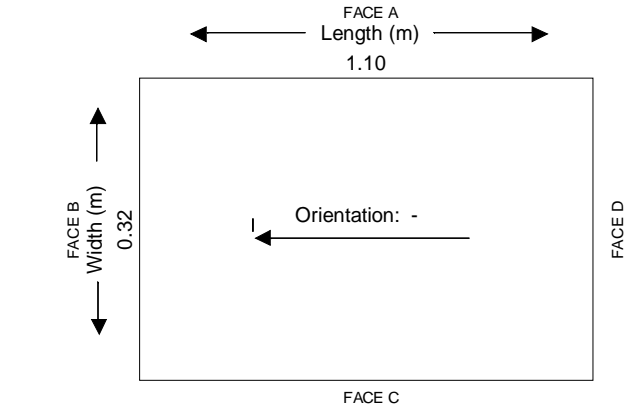
Scale:

1:50

<p><b>Dimensions:</b></p> <p>Final Depth: 0.54m</p>  <p>Inclination: 90</p>	<p><b>General Remarks:</b></p> <ol style="list-style-type: none"> <li>1. Trial Pit hand excavated from GL to 0.54m. Terminated due to obstruction with engineer's agreement.</li> <li>2. No groundwater encountered.</li> <li>3. All sides stable.</li> <li>4. Photographs taken of side faces and spoil.</li> <li>5. Trial pit backfilled on completion.</li> </ol>
	<p><b>Release Status: Final</b></p>

 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP8</b>
	Contract Number: <b>5414</b>	Date Started: <b>22/10/2013</b>	Logged By: <b>MJB</b>	Checked By: <b>MJB</b>	
	Trial Pit Log	Easting: <b>387032.2</b>	Northing: <b>785636.0</b>	Ground Level: <b>8.00</b>	Plant Used: <b>Hand Tools</b>

Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.20 D1 0.20-0.40 B2			7.94		0.06	MADE GROUND. Asphalt.	
			7.60		(0.34) 0.40		

<b>Dimensions:</b> Final Depth: 0.40m  Inclination: 90	<b>General Remarks:</b> 1. Trial Pit hand excavated from GL to 0.40m. Terminated due to concrete obstruction with engineer's agreement. 2. Difficult excavation 0.00-0.40m - 2 hours. 3. No groundwater encountered. 4. All sides stable. 5. Photographs taken of side faces and spoil. 6. Trial pit backfilled on completion.  Release Status: Final
---	---



## Trial Pit Log

Contract Name:

## Stonehaven FAS

Contract Number:

5414

Date Started:

26/10/2013

Client:

Aberdeenshire Council

Logged By:	
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PS

Checked By:	
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MJB



Trial Pit ID:

TP9

Sheet 1 of 1

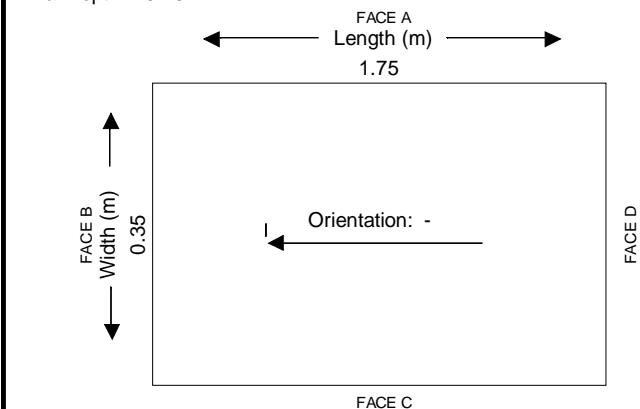
Scale:

1:50


Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.06 D1			8.04		0.06	MADE GROUND. Asphalt.	
0.06-0.40 LB2			7.70		(0.34) 0.40	MADE GROUND. Brown sandy angular to rounded fine to coarse gravel of sandstone, brick and mixed igneous lithologies. --- at 0.15m depth, 0.65m from kerbline, 300mm width concrete step. Extends to base of pit. ---between 0.20m and 0.30m depth, rough concrete extends between kerbline and concrete step. End of Trial Pit at 0.40 m	




Final Depth: 0.40m

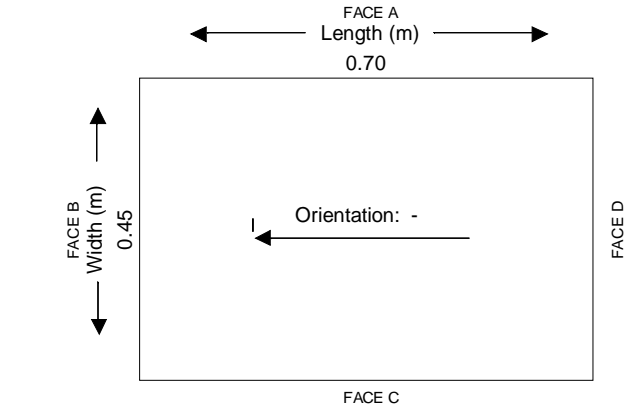
1. Trial Pit hand excavated from GL to 0.40m. Terminated due to concrete obstruction with engineer's agreement.
2. Difficult excavation 0.00m-0.40m depth - 2 hours.
3. No groundwater encountered.
4. All sides stable.
5. Photographs taken of side faces and spoil.
6. Trial pit backfilled on completion.








Release Status: Final

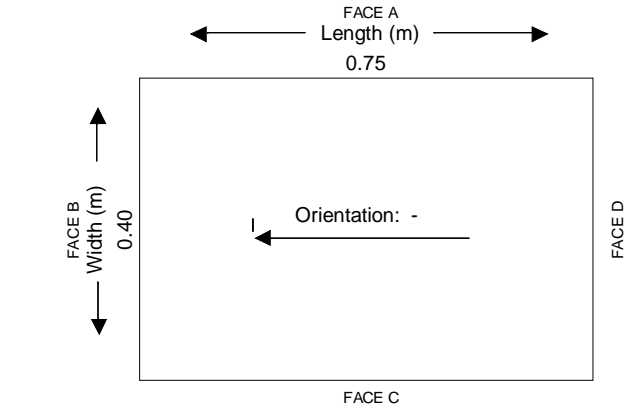
 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP10</b>
	Contract Number: <b>5414</b>	Date Started: <b>31/10/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
Trial Pit Log	Easting: <b>387211.5</b>	Northing: <b>785707.6</b>	Ground Level: <b>5.85</b>	Plant Used: <b>Hand Tools</b>	Sheet 1 of 1 Scale: <b>1:50</b>


Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.10 D1 0.10-0.60 LB2			5.79		0.06 (0.54)	MADE GROUND. Asphalt.	
0.60 D3 0.60-1.40 LB4			5.25		0.60 (0.80)	MADE GROUND. Dark brown gravelly fine to coarse sand with high cobble content. Gravel is angular to subangular fine to coarse of limestone, brick, asphalt, ceramics and pottery. Cobbles are subangular to subrounded of brick and concrete. --- between 0.30m and 0.60m depth, wall footing. Extends 0.05m into trial pit.	
1.40 D5 1.40-1.70 B6			4.45		1.40 (0.30)	Reddish brown gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse of sandstone, quartzite and mixed igneous lithologies. (Possible Made Ground).	
			4.15		1.70	Brown very sandy subangular to rounded fine to coarse GRAVEL of sandstone and quartz with medium cobble content. Cobbles are subangular to rounded of quartz and mixed lithologies. End of Trial Pit at 1.70 m	

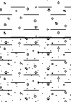



<b>Dimensions:</b> Final Depth: 1.70m  Inclination: 90	<b>General Remarks:</b> 1. Trial Pit hand excavated from GL to 1.70m. Terminated due to boulder obstruction with engineer's agreement. 2. No groundwater encountered. 3. All sides stable. 4. Photographs taken of pit and spoil. 5. Trial pit backfilled on completion.  Release Status: Final
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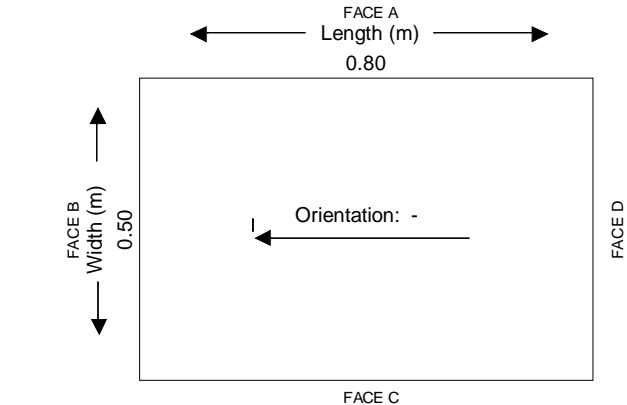
 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP11</b>
	Contract Number: <b>5414</b>	Date Started: <b>29/10/2013</b>	Logged By: <b>PS</b>	Checked By: <b>MJB</b>	
Trial Pit Log	Easting: <b>387269.3</b>	Northing: <b>785739.2</b>	Ground Level: <b>4.94</b>	Plant Used: <b>Hand Tools</b>	Sheet 1 of 1 Scale: <b>1:50</b>

Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.10 D1 0.10-1.00 LB2			4.88		0.06  (0.94)	MADE GROUND. Asphalt.  MADE GROUND. Brown slightly clayey sandy subangular to rounded fine to coarse gravel of sandstone, quartzite and mixed igneous lithologies. --- from 0.20m depth, with low cobble content. Cobbles are subrounded to rounded of quartzite and mixed igneous lithologies. --- between 0.30m and 0.60m depth, wall footing. Extends 0.10m into trial pit. --- from 0.60m depth, with high cobble content. Cobbles are subrounded to rounded of sandstone, quartzite and mixed igneous lithologies.	
1.00 D3 1.00-1.70 LB4			3.94		1.00  (0.70)		
			3.24		1.70	Reddish brown sandy subrounded to rounded fine to coarse GRAVEL of mixed lithologies with high cobble content. Cobbles are subrounded to rounded of mixed lithologies. End of Trial Pit at 1.70 m	

<b>Dimensions:</b> Final Depth: 1.70m 	<b>General Remarks:</b> 1. Trial Pit hand excavated from GL to 1.70m. Terminated with engineer's agreement. 2. No groundwater encountered. 3. All sides stable. 4. Photographs taken of pit and spoil. 5. Trial pit backfilled on completion.
Inclination: 90	Release Status: Final

 Environmental Services	Contract Name: <b>Stonehaven FAS</b>		Client: <b>Aberdeenshire Council</b>		Trial Pit ID: <b>TP13</b>
	Contract Number: <b>5414</b>	Date Started: <b>18/10/2013</b>	Logged By: <b>MJB</b>	Checked By: <b>PS</b>	
	Trial Pit Log	Easting: <b>386976.0</b>	Northing: <b>785469.5</b>	Ground Level: <b>14.29</b>	Plant Used: <b>Hand Tools</b>

Samples & In Situ Testing		Water	Strata Details				Backfill
Sample ID	Test Result		Reduced Level	Legend	Depth (m) (thickness)	Strata Description	
0.40 D1 0.40-0.80 B2  0.90 D3 0.90-1.20 LB4			13.99		(0.30) 0.30	Soft black very gravelly CLAY. Gravel is angular to subrounded, fine to coarse of mixed lithologies (Topsoil).	
			13.49		(0.50) 0.80	Soft reddish brown gravelly very sandy CLAY. Gravel is subangular to well rounded, fine to coarse of mixed lithologies.	
					(0.90) 1.70	Reddish brown very gravelly fine to medium SAND, with high cobble content. Gravel is angular to well rounded fine to coarse of mixed lithologies. Cobbles are subangular to well rounded of mixed lithologies.	
			12.59			End of Trial Pit at 1.70 m	

<b>Dimensions:</b> Final Depth: 1.70m 	<b>General Remarks:</b> 1. Trial Pit hand excavated from GL to 1.70m. Terminated due to boulder obstruction with engineer's agreement. 2. No groundwater encountered. 3. All sides stable. 4. Photographs taken of pit and spoil. 5. Trial pit backfilled on completion.
Inclination: 90	Release Status: Final

# Appendix 5

## Appendix 5 - Photographs



# Appendix 5.1

## Appendix 5.1 – Rotary Core Photographs

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH05

**Contract Name:**

Stonehaven FAS

**Box No:**

1

**Client:**

Aberdeenshire  
Council

**Depth:**

10.50m – 12.00m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH05

**Contract Name:**

Stonehaven FAS

**Box No:**

2

**Client:**

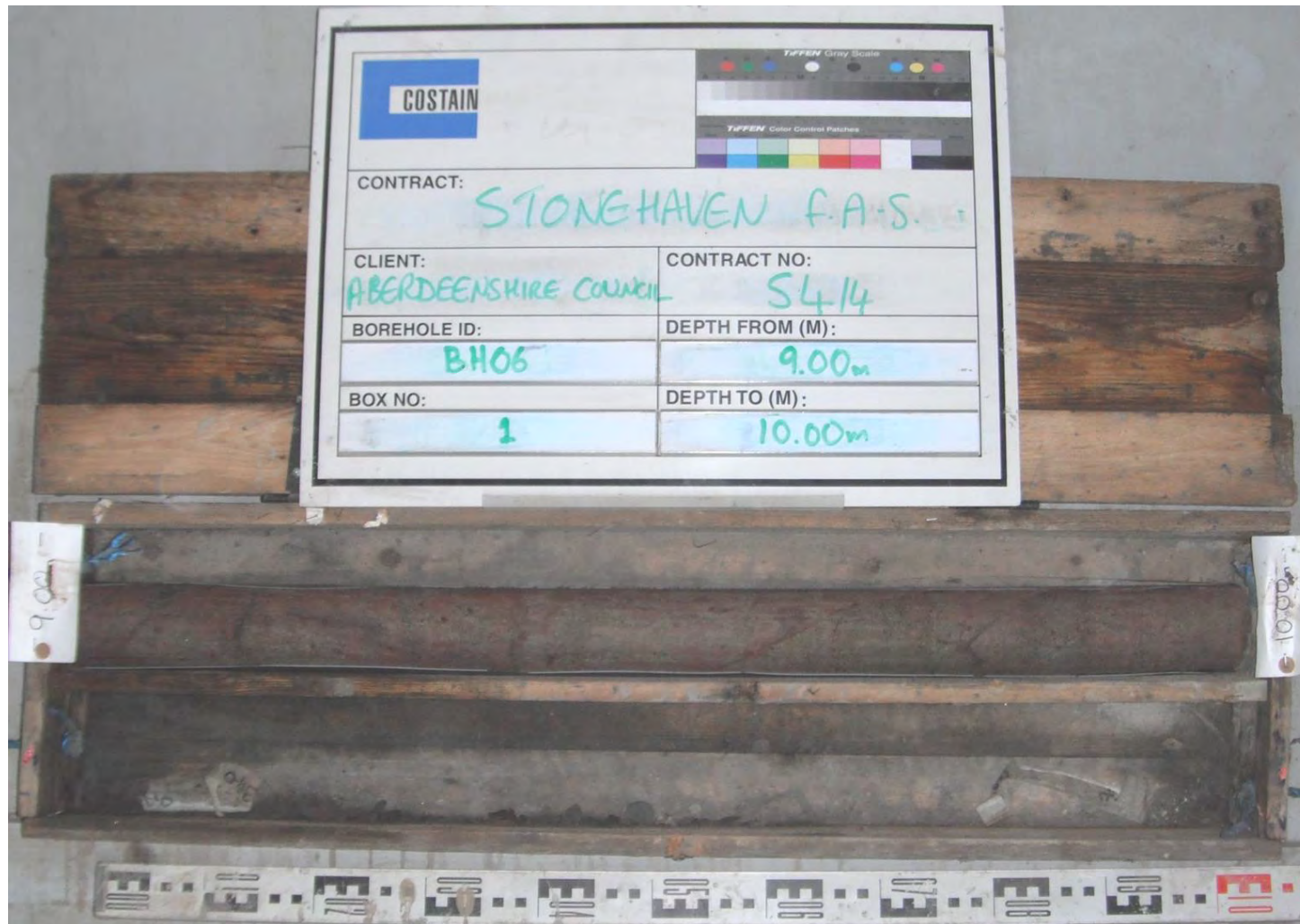
Aberdeenshire  
Council

**Depth:**

12.00m – 13.50m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH06

**Contract Name:**

Stonehaven FAS

**Box No:**

1

**Client:**

Aberdeenshire  
Council

**Depth:**

9.00m – 10.00m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Contract Name:**

Stonehaven FAS

**Client:**

Aberdeenshire  
Council

**Borehole ID:**

BH07

**Box No:**

1

**Depth:**

4.00m – 6.50m



# Core Photograph



Environmental Services

Contract ID:

5414

Borehole ID:

BH07

Contract Name:

Stonehaven FAS

Box No:

2

Client:

Aberdeenshire  
Council

Depth:

6.50m – 8.00m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH07

**Contract Name:**

Stonehaven FAS

**Box No:**

3

**Client:**

Aberdeenshire  
Council

**Depth:**

8.00m –9.00m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH08

**Contract Name:**

Stonehaven FAS

**Box No:**

1

**Client:**

Aberdeenshire  
Council

**Depth:**

5.00m – 7.50m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH08

**Contract Name:**

Stonehaven FAS

**Box No:**

2

**Client:**

Aberdeenshire  
Council

**Depth:**

7.50m – 9.00m

# Core Photograph



Environmental Services

Contract ID:

5414

Borehole ID:

BH08

Contract Name:

Stonehaven FAS

Box No:

3

Client:

Aberdeenshire  
Council

Depth:

9.00m – 10.50m



Core Photograph



Environmental Services

Contract ID:	5414	Borehole ID:	BH11A
Contract Name:	Stonehaven FAS	Box No:	1
Client:	Aberdeenshire Council	Depth:	5.00m – 7.20m

# Core Photograph



Environmental Services

Contract ID:

5414

Borehole ID:

BH11A

Contract Name:

Stonehaven FAS

Box No:

2

Client:

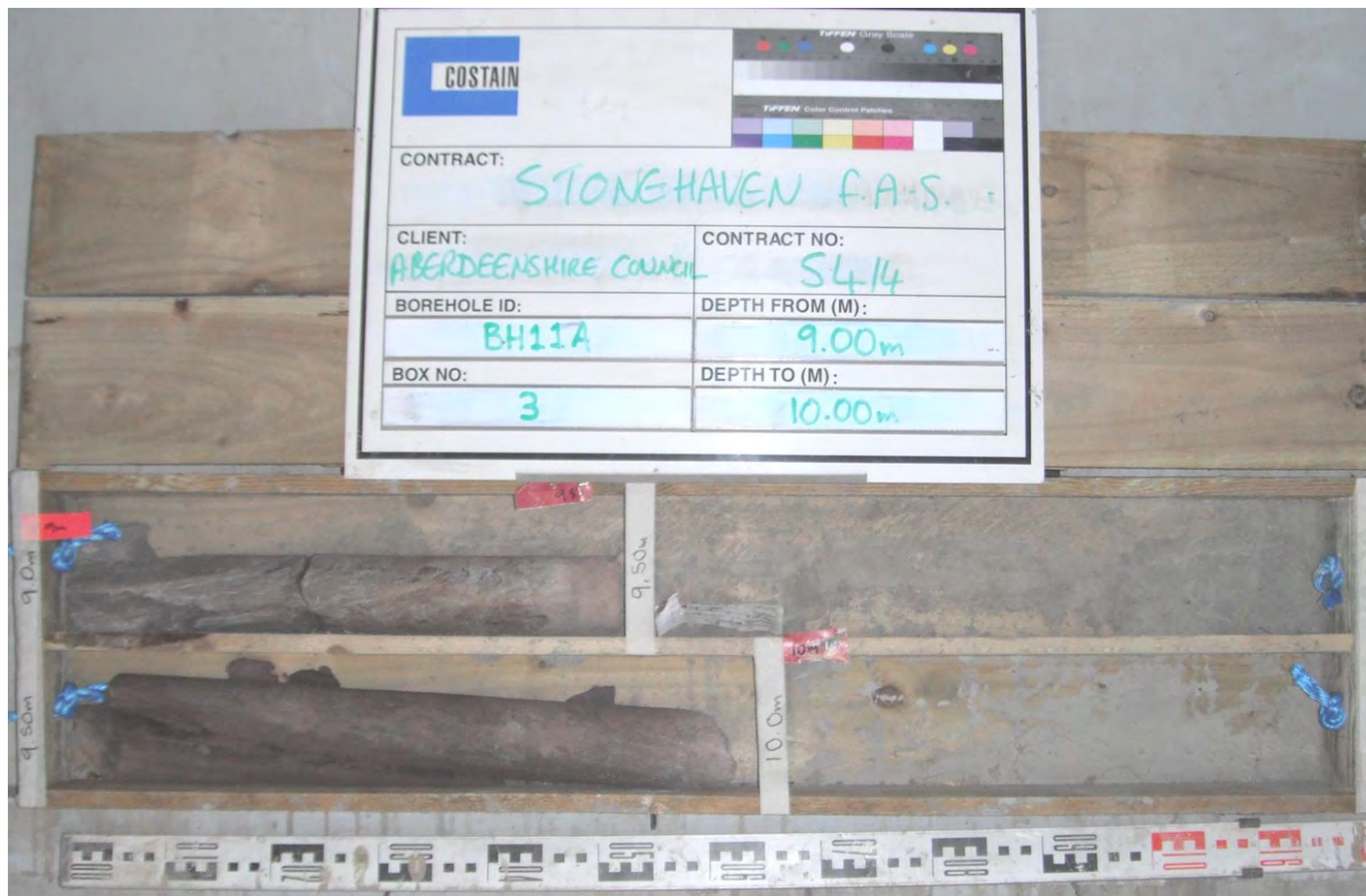
Aberdeenshire  
Council

Depth:

7.20m – 9.00m



# Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH11A

**Contract Name:**

Stonehaven FAS

**Box No:**

3

**Client:**


Aberdeenshire  
Council


**Depth:**

9.00m – 10.00m

Core Photograph





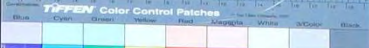
	Costain Limited, Geotechnical Services Division	
	Rotary Cored Borehole	
	Client: <b>ABERDEENSHIRE COUNCIL</b>	Contract: <b>STONEHAVEN FAS</b>
	Contract ID: <b>5414</b>	Depth From (m): <b>8.0</b>
	Borehole ID: <b>BH12</b>	Depth To (m): <b>10.0</b>
Box No.: <b>1</b>		

 <b>Environmental Services</b>	<b>Contract ID:</b>	5414	<b>Borehole ID:</b>	BH12
	<b>Contract Name:</b>	Stonehaven FAS	<b>Box No:</b>	1
	<b>Client:</b>	Aberdeenshire Council	<b>Depth:</b>	8.00m – 10.00m



# Core Photograph



 Costain Limited, Geotechnical Services Division			
Rotary Cored Borehole			
Client: ABERDEENSHIRE COUNCIL		Contract: STONEHAVEN FAS	
Contract ID: 5414		Depth From (m) 9.0	
Borehole ID: BH13		Depth To (m) 10.0	
Box No.: 1			



Environmental Services

Contract ID:

5414

Contract Name:

Stonehaven FAS

Client:

Aberdeenshire  
Council

Borehole ID:

BH13

Box No:

1

Depth:

9.00m – 10.00m



# Core Photograph



Environmental Services

Contract ID:

5414

Contract Name:

Stonehaven FAS

Client:

Aberdeenshire Council

Borehole ID:

BH14

Box No:

1

Depth:

4.80m – 7.50m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH15

**Contract Name:**

Stonehaven FAS

**Box No:**

1

**Client:**

Aberdeenshire  
Council

**Depth:**

5.00m – 7.50m

Core Photograph



Environmental Services

Contract ID:	5414	Borehole ID:	BH15
Contract Name:	Stonehaven FAS	Box No:	2
Client:	Aberdeenshire Council	Depth:	7.50m – 9.80m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH15

**Contract Name:**

Stonehaven FAS

**Box No:**

3

**Client:**

Aberdeenshire  
Council

**Depth:**

9.80m – 11.70m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Contract Name:**

Stonehaven FAS

**Client:**

Aberdeenshire  
Council

**Borehole ID:**

BH15

**Box No:**

4

**Depth:**

11.70m – 13.60m



# Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Contract Name:**

Stonehaven FAS

**Client:**

Aberdeenshire  
Council

**Borehole ID:**

BH20

**Box No:**

1

**Depth:**

7.50m – 10.00m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH26

**Contract Name:**

Stonehaven FAS

**Box No:**

1

**Client:**

Aberdeenshire  
Council

**Depth:**

7.50m – 10.00m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH26

**Contract Name:**

Stonehaven FAS

**Box No:**

2

**Client:**

Aberdeenshire  
Council

**Depth:**

10.00m – 11.50m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH26

**Contract Name:**

Stonehaven FAS

**Box No:**

3

**Client:**

Aberdeenshire  
Council

**Depth:**

11.50m – 13.00m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH27

**Contract Name:**

Stonehaven FAS

**Box No:**

1

**Client:**

Aberdeenshire  
Council

**Depth:**

9.00m – 10.50m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH27

**Contract Name:**

Stonehaven FAS

**Box No:**

2

**Client:**

Aberdeenshire  
Council

**Depth:**

10.50m – 12.50m



## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH27

**Contract Name:**

Stonehaven FAS

**Box No:**

3

**Client:**

Aberdeenshire  
Council

**Depth:**

12.50m – 14.60m

## Core Photograph



**Environmental Services**

**Contract ID:**

5414

**Borehole ID:**

BH27

**Contract Name:**

Stonehaven FAS

**Box No:**

4

**Client:**

Aberdeenshire  
Council

**Depth:**

14.60m – 15.00m

# Appendix 5.2

## Appendix 5.2 – Observation Pit Photographs



Trial Pit Photograph






Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP CDR2. 0m to 1.5m



Trial Pit Photograph



 Costain Limited, Geotechnical Services Division			
Trial Pit			
Client ABERDEENSHIRE COUNCIL	Contract STONEHAVEN FAS		
Contract ID 5414			
Trial Pit ID CDR 2	Depth From (m): 0.00		
	Depth To (m): 1.50		



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP CDR2 0m to 1.5m

Trial Pit Photograph




Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP01 0m to 0.2m



Trial Pit Photograph



<div></div> <div>Environmental Services</div>	Contract Name:	Stonehaven FAS
	Contract ID:	5414
	Client:	Aberdeenshire Council
	Hole ID:	TP01 0m to 0.2m

Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP02 0m to 1.6m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP02 0m to 1.6m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP03 0m to 0.8m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP03 0m to 0.8m



Trial Pit Photograph




Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP04 0m to 1.2m

Trial Pit Photograph



<div></div> <div>Environmental Services</div>	Contract Name:	Stonehaven FAS
	Contract ID:	5414
	Client:	Aberdeenshire Council
	Hole ID:	TP04 0m to 1.2m



Trial Pit Photograph

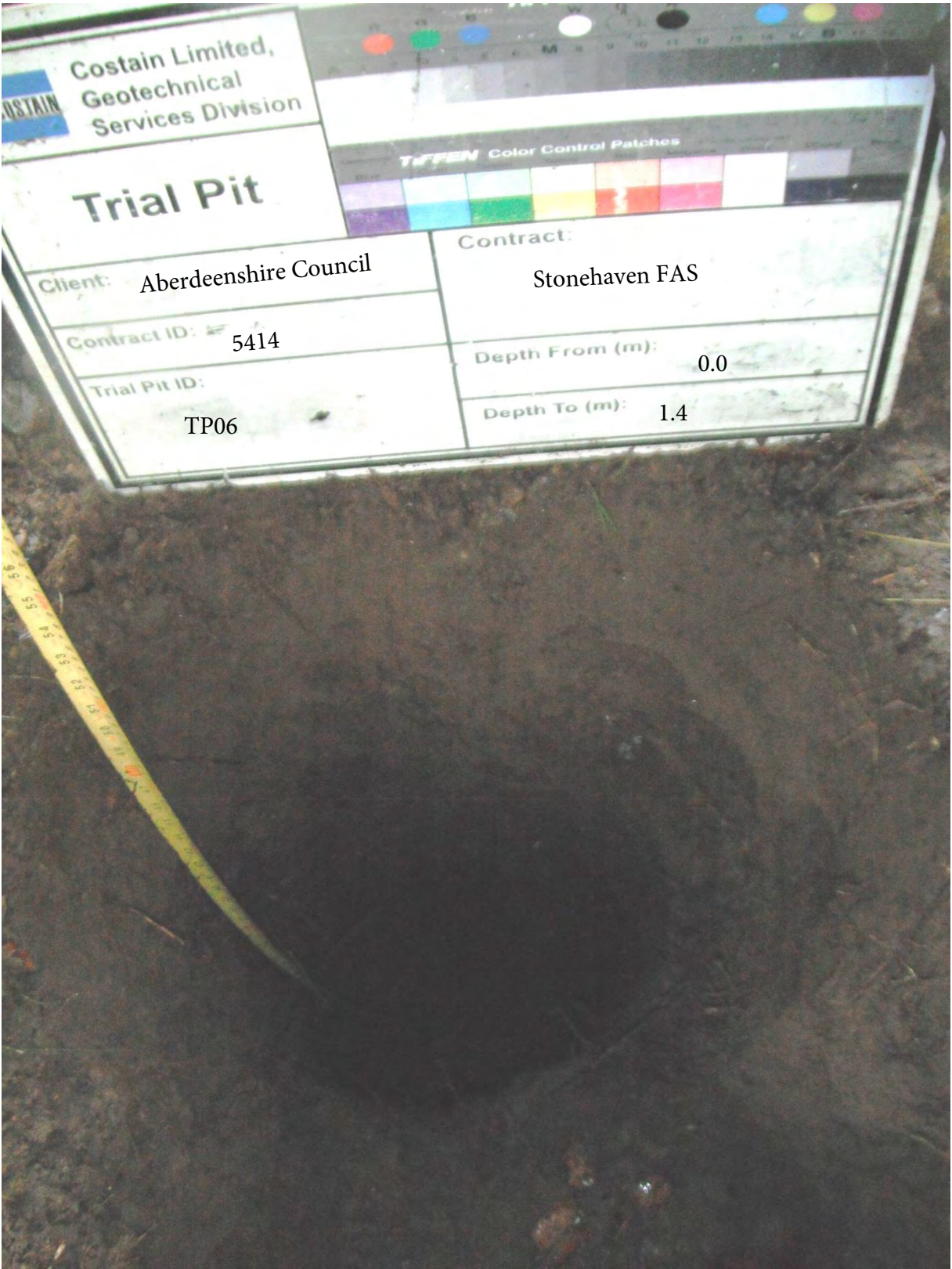


Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP05 0m to 1.5m



Trial Pit Photograph

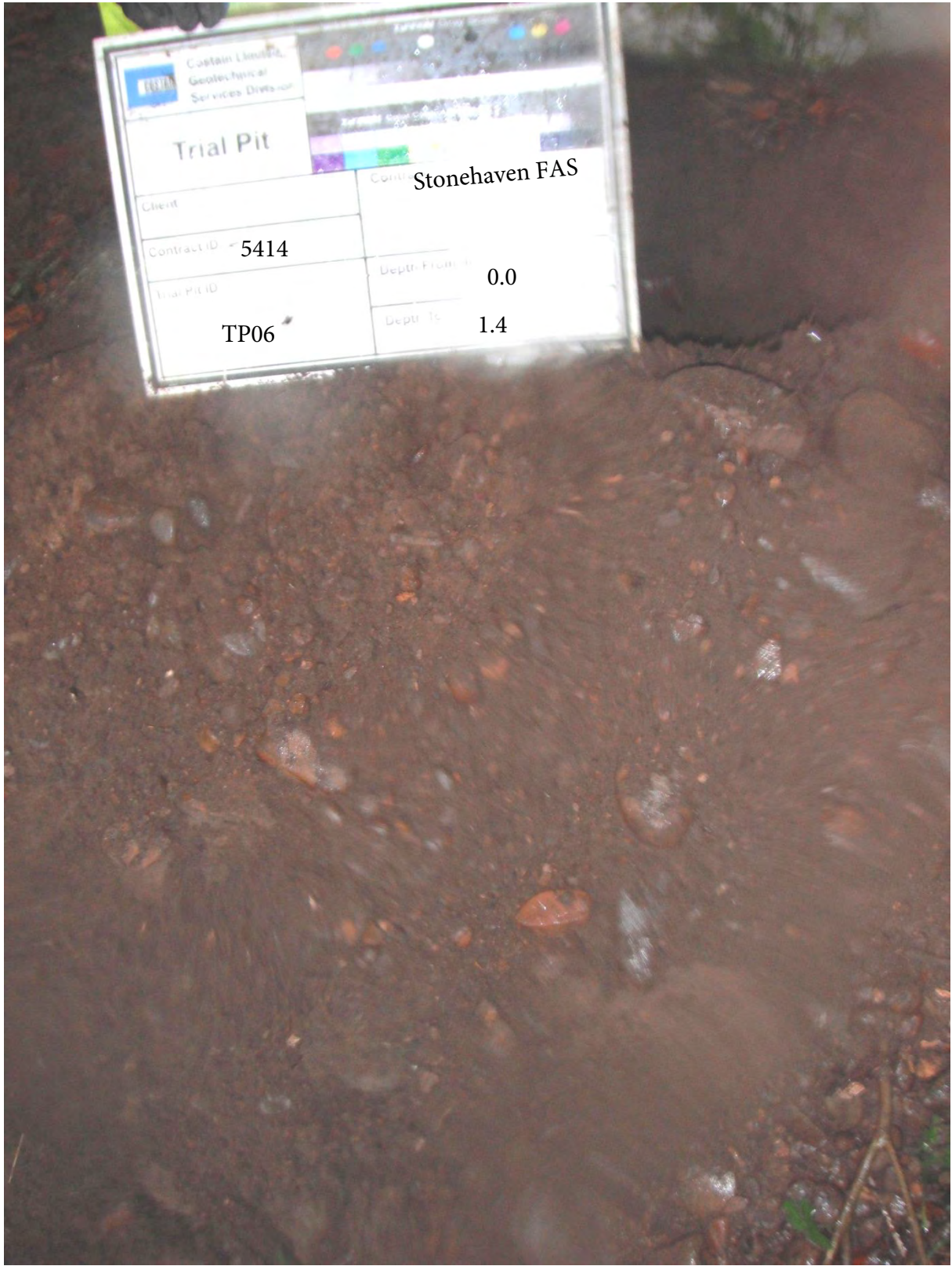


Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP06 0m to 1.4m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP06 0m to 1.4m



Trial Pit Photograph

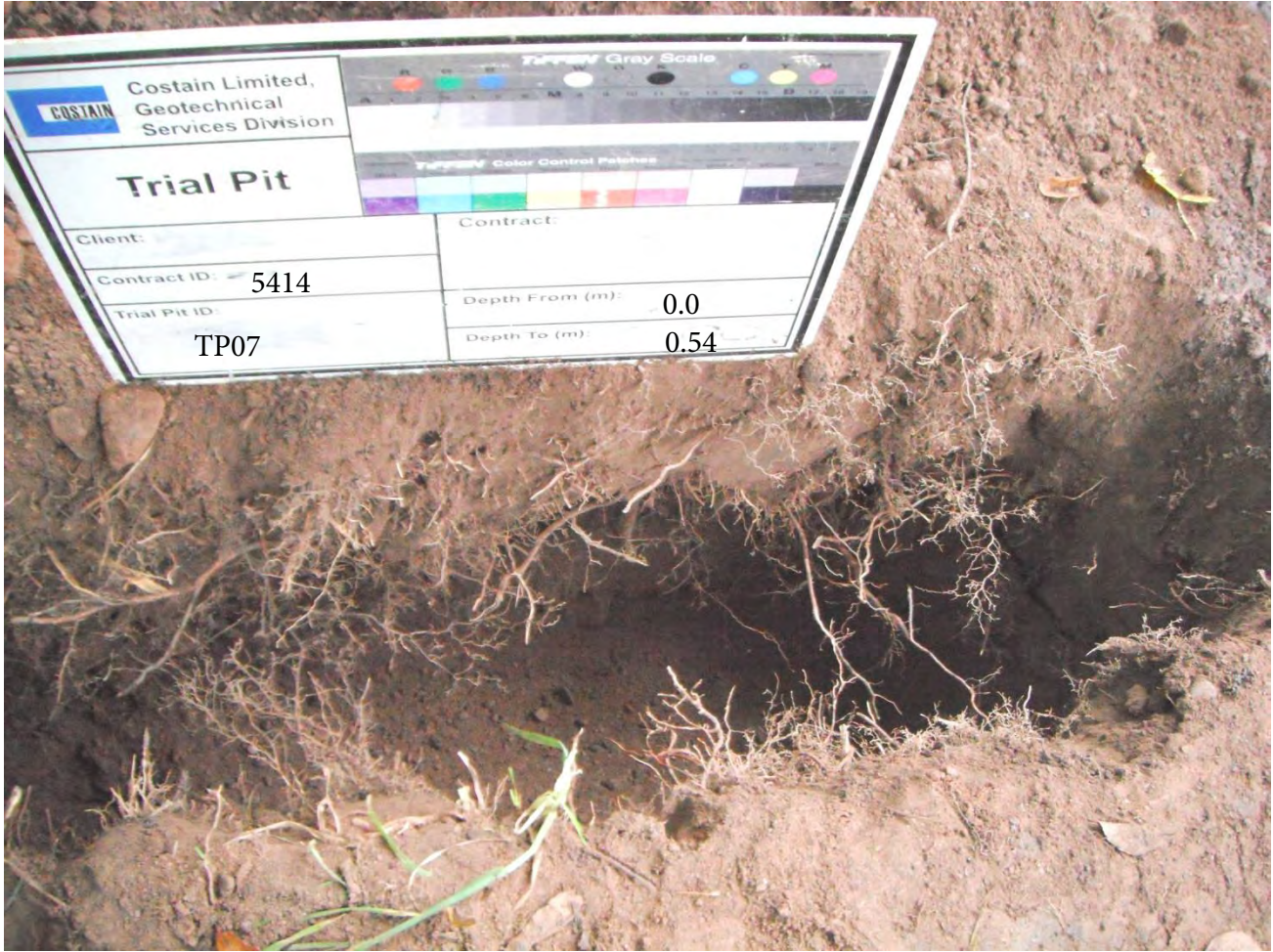


Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP07 0m to 0.54m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP07 0m to 0.54m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP08 0m to 0.40m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP09 0m to 0.40m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP09 0m to 0.40m



Trial Pit Photograph




Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP10 0m to 1.70m



Trial Pit Photograph



<div></div> <div>Environmental Services</div>	Contract Name:	Stonehaven FAS
	Contract ID:	5414
	Client:	Aberdeenshire Council
	Hole ID:	TP10 0m to 1.70m

Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP11 0m to 1.70m



Trial Pit Photograph



Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP11 0m to 1.70m



Trial Pit Photograph




Environmental Services

Contract Name:	Stonehaven FAS
Contract ID:	5414
Client:	Aberdeenshire Council
Hole ID:	TP13 0m to 1.70m



Trial Pit Photograph



<div></div> <div>Environmental Services</div>	Contract Name:	Stonehaven FAS
	Contract ID:	5414
	Client:	Aberdeenshire Council
	Hole ID:	TP13 0m to 1.70m

# Appendix 6

## Appendix 6 - In Situ Test Results

# Appendix 6.1

## Appendix 6.1 - SPT N Value Graphical Presentation & SPT Hammer Energy Measurement Report



SPT Vs Depth						Hole	BH1A
Client      Aberdeenshire Council						Job No.	5414
Site      Stonehaven FAS						Date Drawn	06/01/2014
Easting	387458.5	Northing	785756.2	G.L.	4.228	Energy Ratio	39.00%
						Hammer ID	

Hole

BH1A

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387458.5	Northing	785756.2	G.L.	4.228
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### Energy Ratio

39.00%

Hammer ID

SPT N Value

[illegible]

Remarks

## SPT Vs Depth

Hole

BH2

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387409	Northing	785737.4	G.L.	3.433
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### Energy Ratio

74.00%

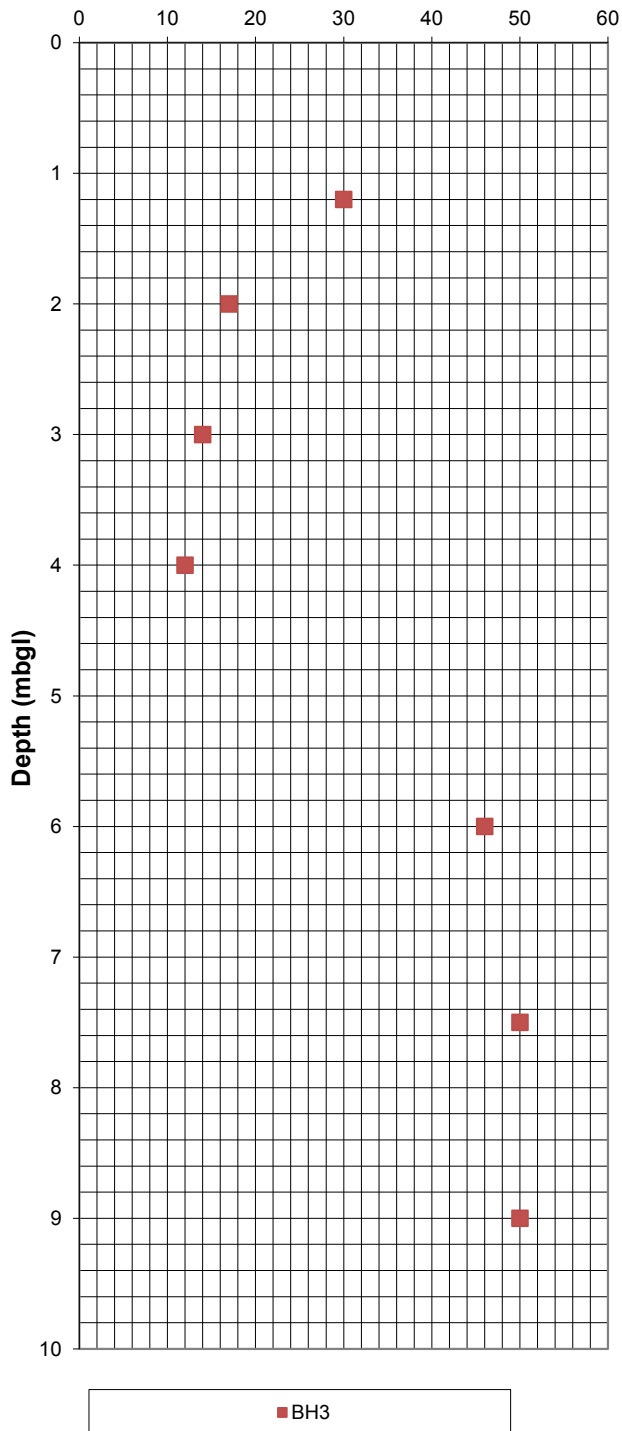
Hammer ID

[illegible]

Remarks

SPT Vs Depth						Hole	BH3
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387314.9	Northing	785746.4	G.L.	4.476	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value

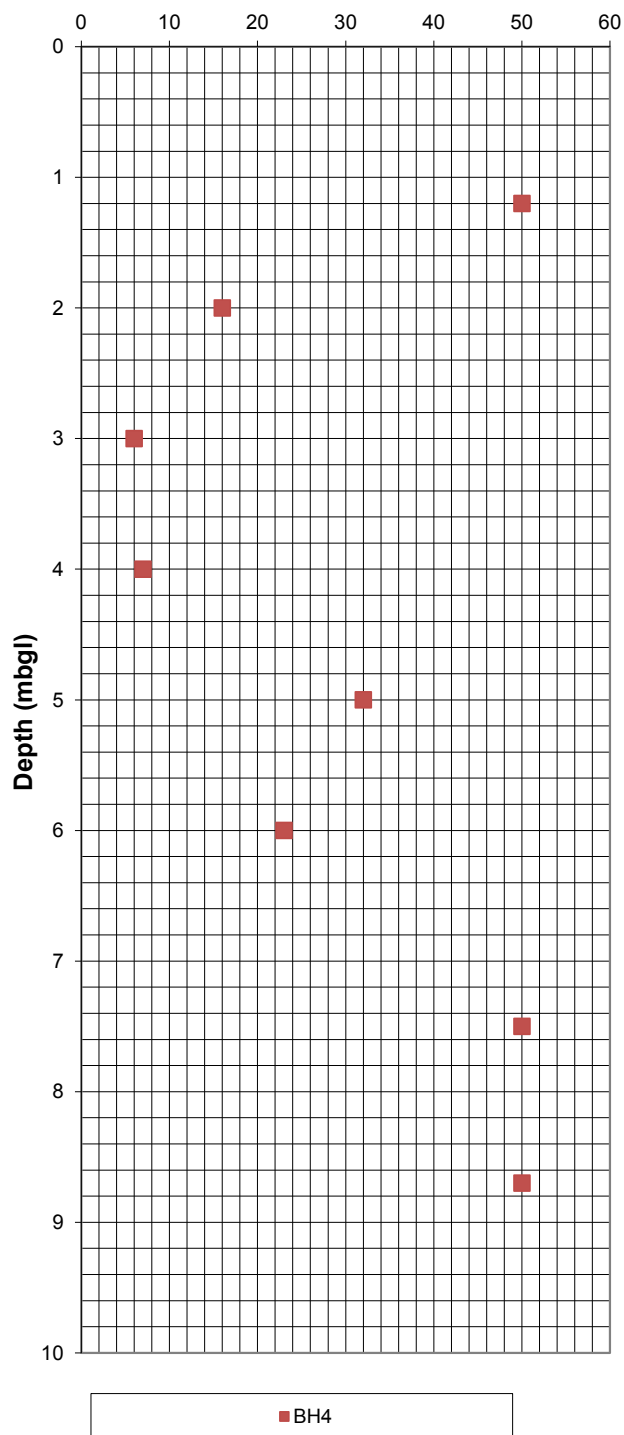


Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=30 (5,5,7,7,7,9)		
2.00	N=17 (4,3,3,4,6,4)		
3.00	N=14 (0,0,1,1,4,8)		
4.00	N=12 (1,3,2,2,5,3)		
6.00	N=46 (4,9,10,11,12,13)		
7.50	50/225mm (2,8,16,16,18)		
9.00	50/145mm (13,12,28,22)		

Remarks
---------

SPT Vs Depth						Hole	BH4
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387300.2	Northing	785769.6	G.L.	4.332	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value



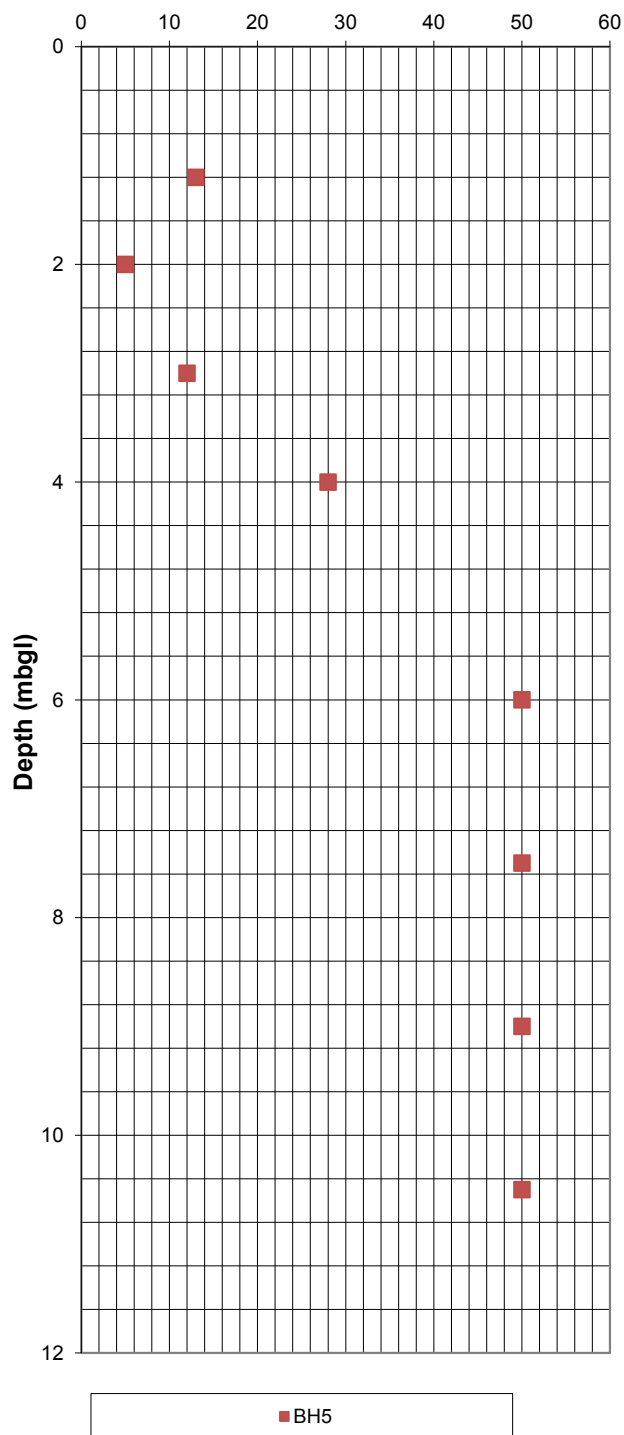
Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=50 (8,9,12,15,13,10)		
2.00	N=16 (16,7,4,5,4,3)		
3.00	N=6 (11,6,2,1,1,2)		
4.00	N=7 (2,1,2,2,1,2)		
5.00	N=32 (11,10,7,8,8,9)		
6.00	N=23 (2,4,5,7,5,6)		
7.50	50/143mm (6,19,22,28)		
8.70	50/241mm (2,3,8,8,30,4)		

Remarks



SPT Vs Depth						Hole	BH5
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387263.1	Northing	785765.3	G.L.	4.655	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value



Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=13 (2,3,2,2,5,4)		
2.00	N=5 (2,1,2,1,1,1)		
3.00	N=12 (0,2,1,2,3,6)		
4.00	N=28 (4,5,6,11,5,6)		
5.00	N=112 (1,3,10,81,11,10)		
6.00	50/277mm (3,8,11,14,15,10)		
7.50	50/194mm (7,15,18,22,10)		
9.00	50/219mm (6,12,9,10,31)		
10.50	50/75mm (19,6,50)		

Remarks
---------

SPT Vs Depth						Hole	BH6
Client	Aberdeenshire Council					Job No.	5414
Site	Stonehaven FAS					Date Drawn	06/01/2014
Easting	387160.4	Northing	785698.2	G.L.	5.341	Energy Ratio	39.00%
						Hammer ID	

Hole

BH6

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387160.4	Northing	785698.2	G.L.	5.341
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### Energy Ratio

39.00%

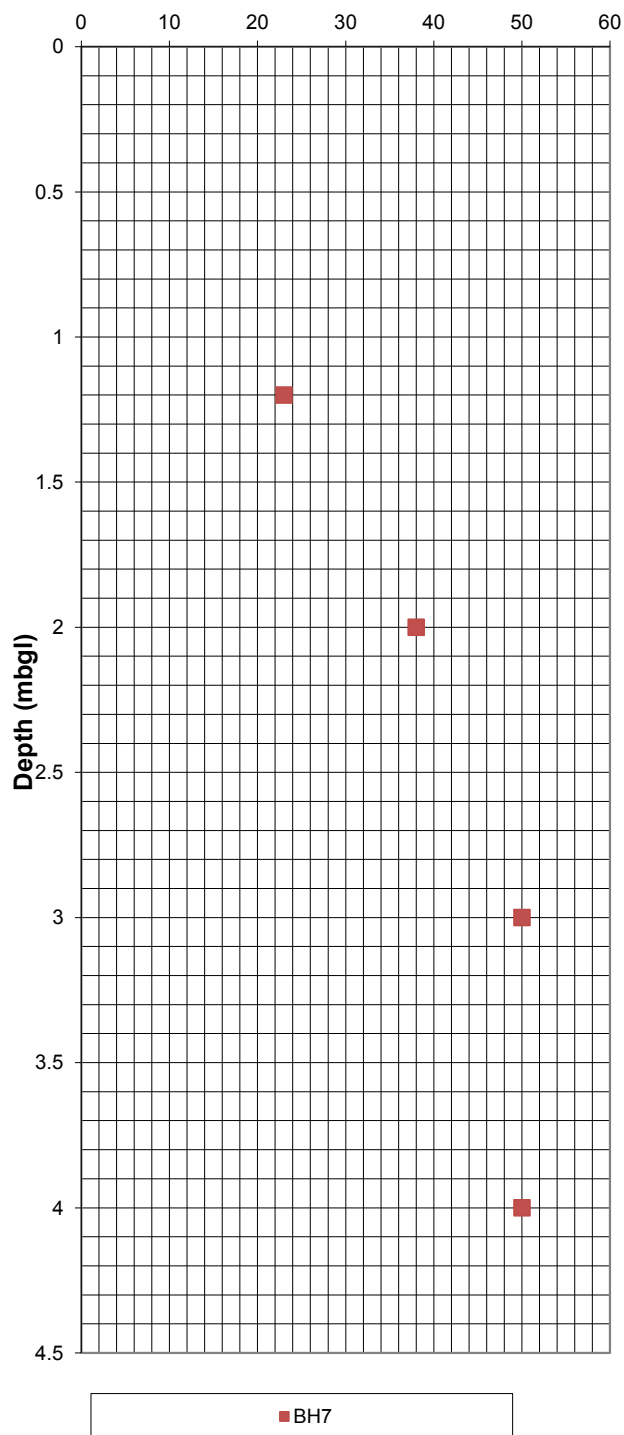
Hammer ID

SPT N Value

[illegible]

SPT Vs Depth						Hole	BH7
Client      Aberdeenshire Council						Job No.	5414
Site      Stonehaven FAS						Date Drawn	06/01/2014
Easting	387121.2	Northing	785678.8	G.L.	7.863	Energy Ratio	39.00%
						Hammer ID	

SPT N Value

[illegible]

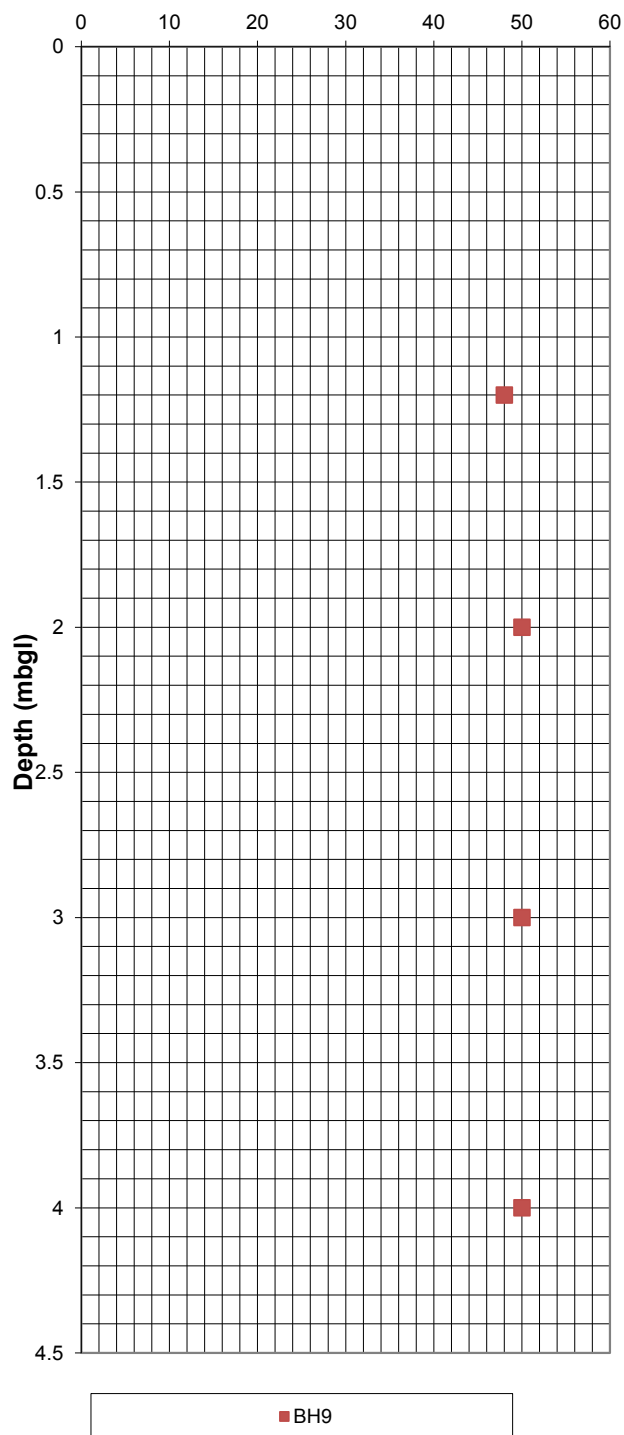
Remarks





SPT Vs Depth						Hole	BH9
Client      Aberdeenshire Council						Job No.	5414
Site      Stonehaven FAS						Date Drawn	06/01/2014
Easting	387035.5	Northing	785652.6	G.L.	7.076	Energy Ratio	39.00%
						Hammer ID	

SPT N Value

[illegible]

Remarks

SPT Vs Depth						Hole	BH10
Client	Aberdeenshire Council					Job No.	5414
Site	Stonehaven FAS					Date Drawn	06/01/2014
Easting	387009.6	Northing	785657.3	G.L.	7.959	Energy Ratio	0.00%
						Hammer ID	

Hole

BH10

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting

387009

## Northing

785657.3

G.L.

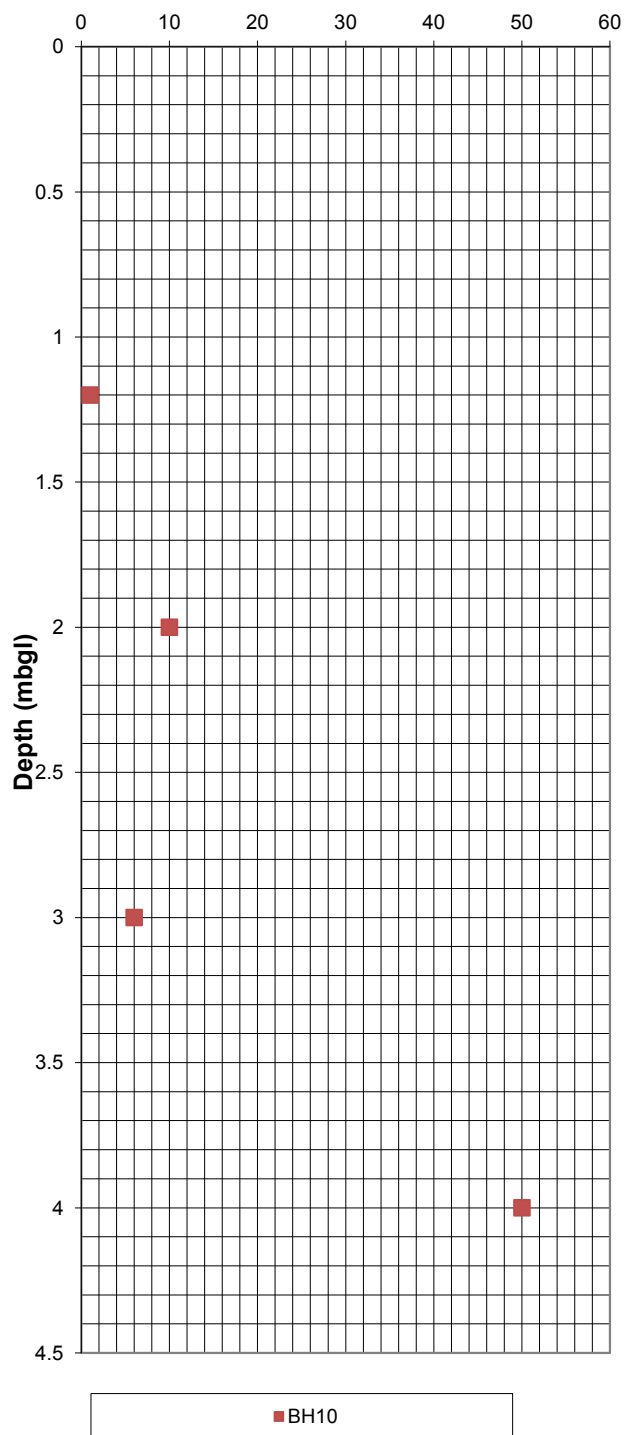
7.959

### Energy Ratio

0.00%

Hammer ID

SPT N Value

[illegible]

Remarks



SPT Vs Depth						Hole	BH12
Client	Aberdeenshire Council					Job No.	5414
Site	Stonehaven FAS					Date Drawn	06/01/2014
Easting	386920.4	Northing	785631.7	G.L.	9.881	Energy Ratio	39.00%
						Hammer ID	

Hole

BH12

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting

386920.4

Northing

785631.7

G.L.

9.881

### Energy Ratio

39.00%

Hammer ID

SPT N Value

[illegible]





## SPT Vs Depth

Hole

BH14

Client      Aberdeenshire Council

Job No.

5414

Site Stonehaven FAS

Date Drawn

06/01/2014

Easting	387020	Northing	785637.8	G.L.	8.194
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## Energy Ratio

39.00%

Hammer ID

[illegible]

Remarks

## SPT Vs Depth

Hole

BH15

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387056.2	Northing	785631.1	G.L.	8.076
---------	----------	----------	----------	------	-------

### Energy Ratio

39.00%

Hammer ID

[illegible]

Remarks





SPT Vs Depth						Hole	BH18
Client      Aberdeenshire Council						Job No.	5414
Site      Stonehaven FAS						Date Drawn	06/01/2014
Easting	387240.4	Northing	785733.6	G.L.	3.247	Energy Ratio	39.00%
						Hammer ID	

Hole

BH18

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387240.4	Northing	785733.6	G.L.	3.247
---------	----------	----------	----------	------	-------

## Energy Ratio

39.00%

Hammer ID

SPT N Value

[illegible]



## SPT Vs Depth

Hole

BH20

Client      Aberdeenshire Council

Job No.

5414

Site Stonehaven FAS

Date Drawn

06/01/2014

Easting

387078

## Northing

785610.4

G.L.

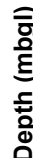
8.393

## Energy Ratio

39.00%

Hammer ID

SPT N Value



## Depth

Uncorrected N value

## Casing Depth

## Water Depth

1.20

N=28 (5,11,10,7,5,6)

2 00

N=8 (9,10,4,2,1,1)

3.00

N=35 (8,9,8,8,9,10)

5.00

50/176mm  
(4, 10, 16, 24, 10)

6.00

50/115mm  
(8,17,31,19)

7.50

50/64mm (25,50)

Remarks

SPT Vs Depth						Hole	BH21B
Client      Aberdeenshire Council						Job No.	5414
Site      Stonehaven FAS						Date Drawn	06/01/2014
Easting	387076.6	Northing	785596.1	G.L.	8.639	Energy Ratio	39.00%
						Hammer ID	

Hole

BH21B

Client

Aberdeenshire Council

Job No.

5414

Site

## Stonehaven FAS

Date Drawn

06/01/2014

Easting

387076.6

## Northing

785596.1

G.L.

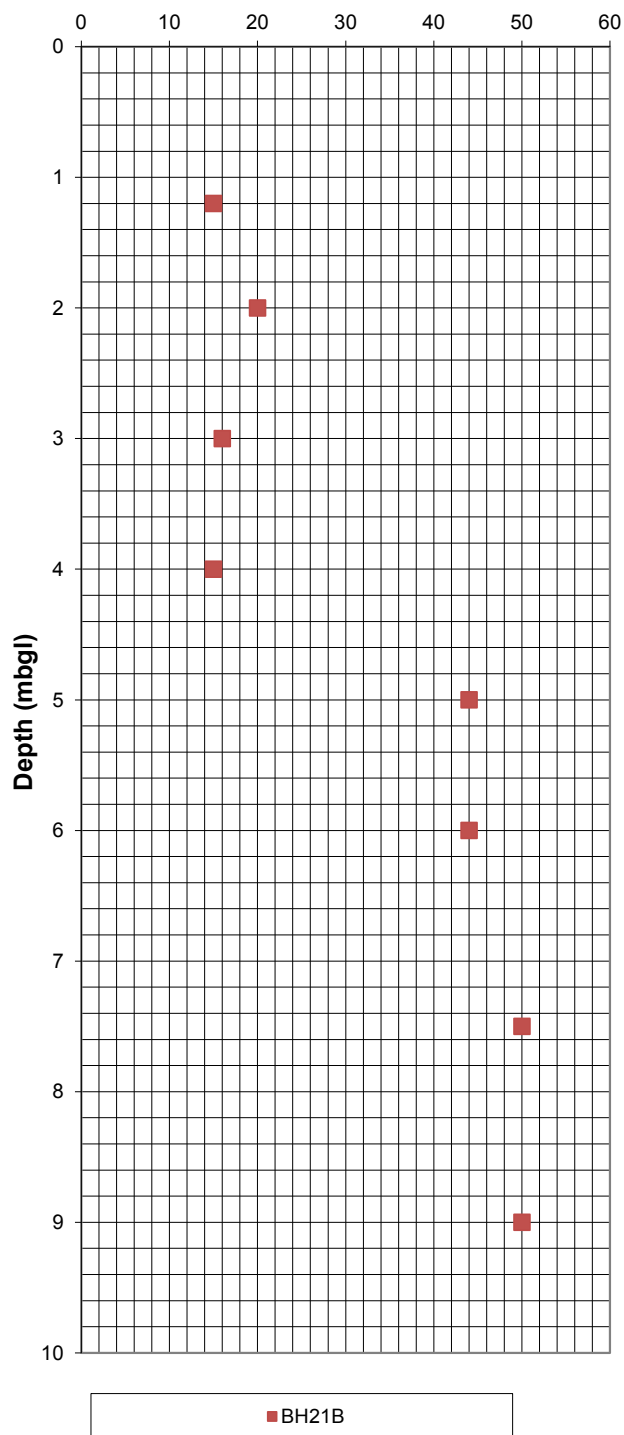
8.639

### Energy Ratio

39.00%

Hammer ID

SPT N Value

[illegible]

Uncorrected N value

## Casing Depth

## Water Depth

1.20

N=15 (4,8,4,2,4,5)

2.00

N=20 (11,9,6,5,4,5)

3.00

N=16 (5,11,4,7,3,2)

4.00

N=15 (1,2,2,3,5,5)

5.00

N=44  
(2,6,11,10,10,13)

6.00

N=44 (2,7,7,10,12,15)

7.50

50/122mm  
(13,12,32,18)

9 00

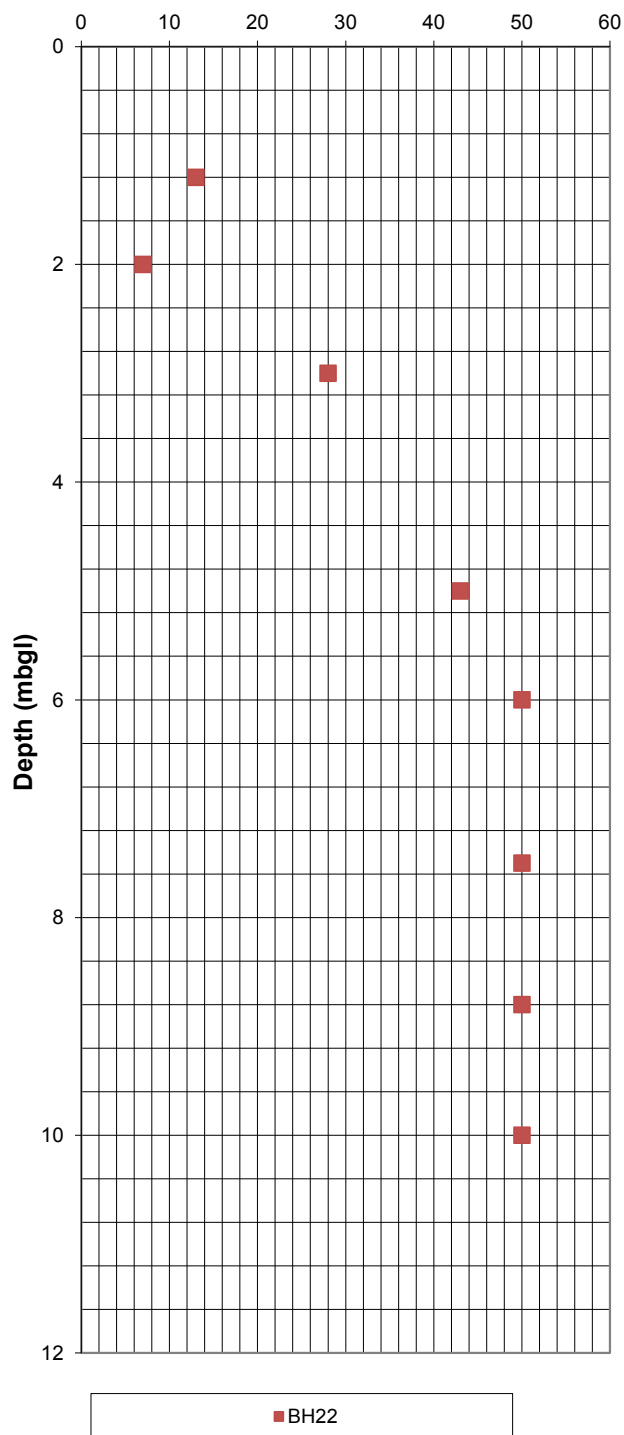
50/104mm  
(14,11,32,18)

Remarks



SPT Vs Depth						Hole	BH22
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387070.3	Northing	785570.4	G.L.	8.818	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value



Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=13 (0,0,4,4,4,1)		
2.00	N=7 (1,2,1,1,2,3)		
3.00	N=28 (7,10,11,11,4,2)		
5.00	N=43 (9,11,10,12,9,12)		
6.00	50/260mm (8,7,9,15,17,9)		
7.50	50/252mm (4,7,10,15,15,10)		
8.80	50/256mm (10,11,10,12,18,10)		
10.00	50/79mm (14,11,46,4)		

Remarks

SPT Vs Depth						Hole	BH23
Client	Aberdeenshire Council					Job No.	5414
Site	Stonehaven FAS					Date Drawn	06/01/2014
Easting	387072.5	Northing	785532.2	G.L.	9.103	Energy Ratio	39.00%
						Hammer ID	

Hole

BH23

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387072.5	Northing	785532.2	G.L.	9.103
---------	----------	----------	----------	------	-------

### Energy Ratio

39.00%

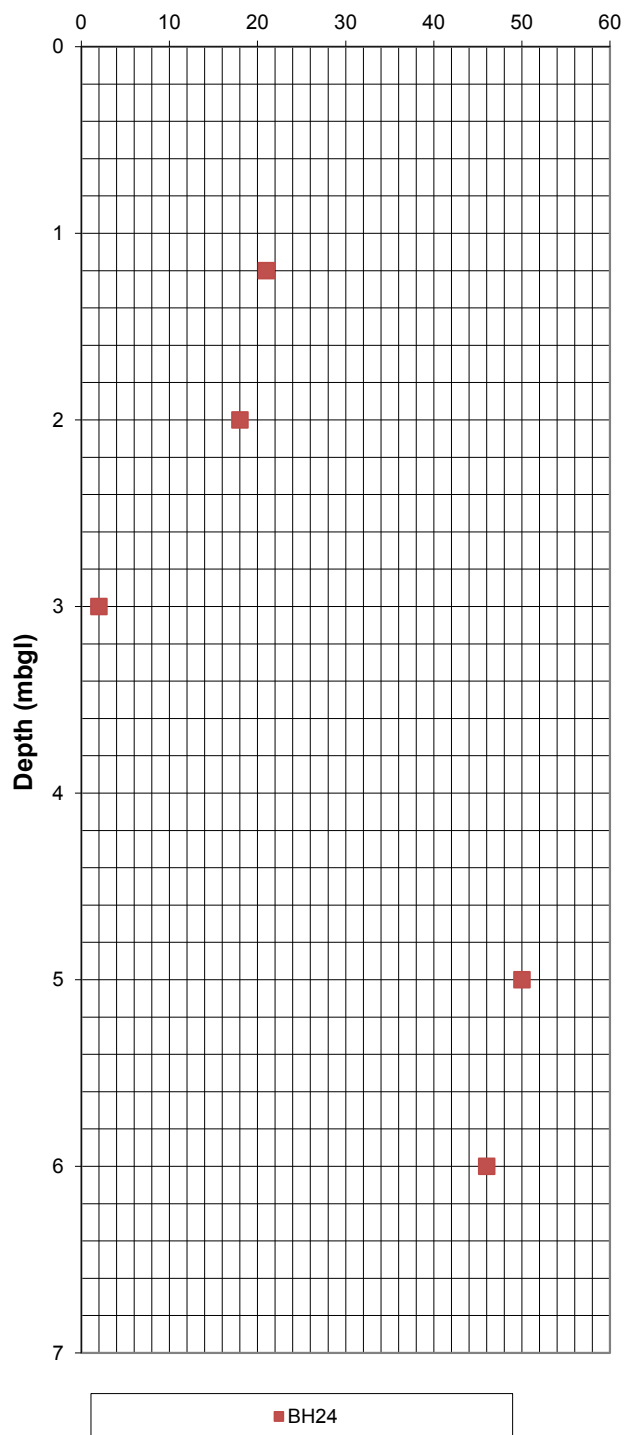
Hammer ID

SPT N Value

[illegible]

SPT Vs Depth						Hole	BH24
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387035.5	Northing	785506.5	G.L.	10.494	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value



Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=21 (16,9,7,6,5,3)		
2.00	N=18 (2,2,3,3,6,6)		
3.00	N=2 (1,0,0,0,1,1)		
5.00	50/258mm (5,7,9,14,18,9)		
6.00	N=46 (7,7,9,9,11,17)		

Remarks



SPT Vs Depth						Hole	BH26
Client      Aberdeenshire Council						Job No.	5414
Site      Stonehaven FAS						Date Drawn	06/01/2014
Easting	387511.1	Northing	785673.9	G.L.	3.339	Energy Ratio	39.00%
						Hammer ID	

Hole

BH26

Client      Aberdeenshire Council

Job No.

5414

Site	Stonehaven FAS
------	----------------

Date Drawn

06/01/2014

Easting	387511.1	Northing	785673.9	G.L.	3.339
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### Energy Ratio

39.00%

Hammer ID

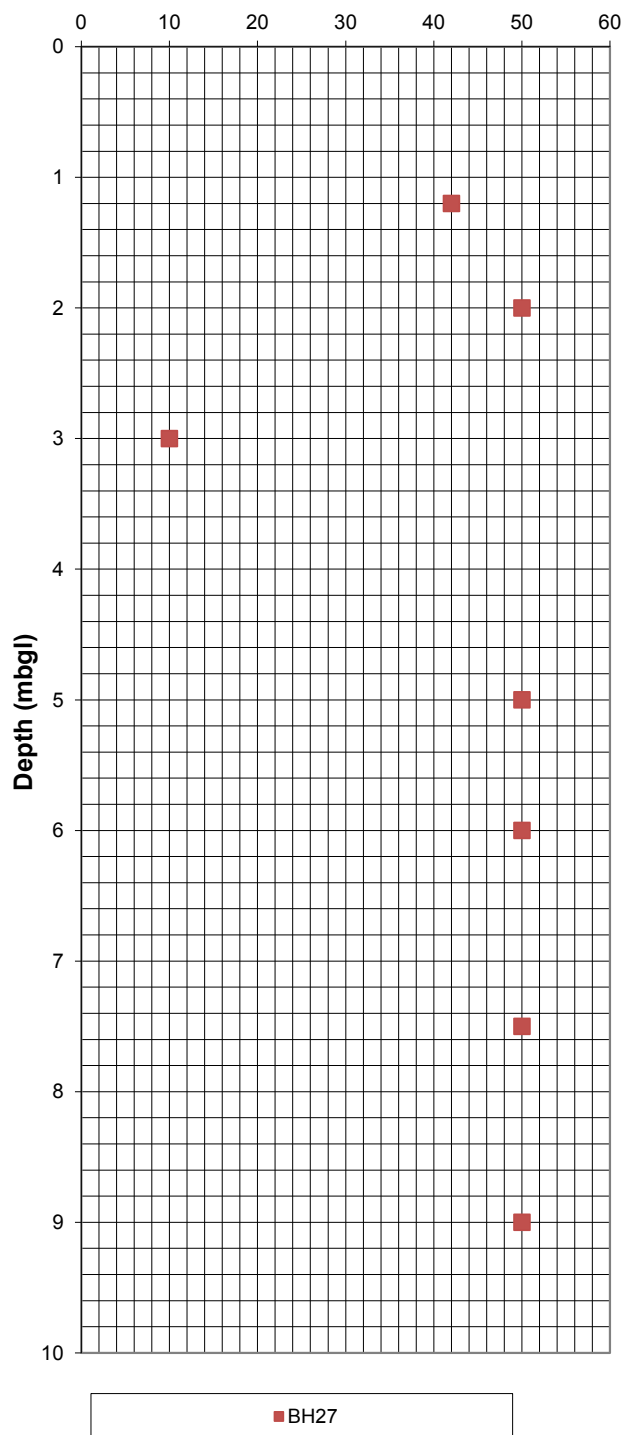
SPT N Value

[illegible]



SPT Vs Depth						Hole	BH27
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387531	Northing	785607.4	G.L.	3.019	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value

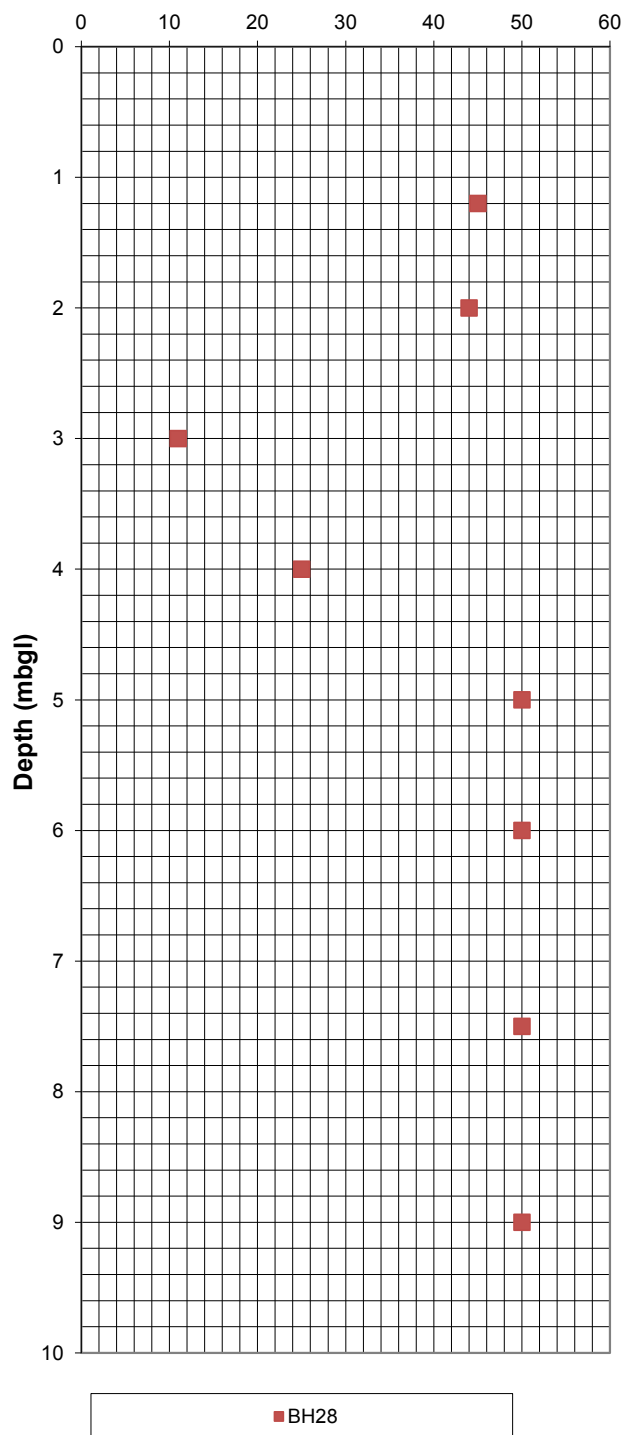


Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=42 (3,8,10,12,10,10)		
2.00	50/105mm (5,9,29,21)		
3.00	N=10 (0,1,2,2,2,4)		
5.00	50/86mm (25,30,20)		
6.00	50/225mm (20,5,18,15,17)		
7.50	50/12mm (25,50)		
9.00	50/3mm (25,50)		

Remarks

SPT Vs Depth						Hole	BH28
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387347.8	Northing	785741.7	G.L.	3.884	Energy Ratio	39.00%
						Hammer ID	

### SPT N Value

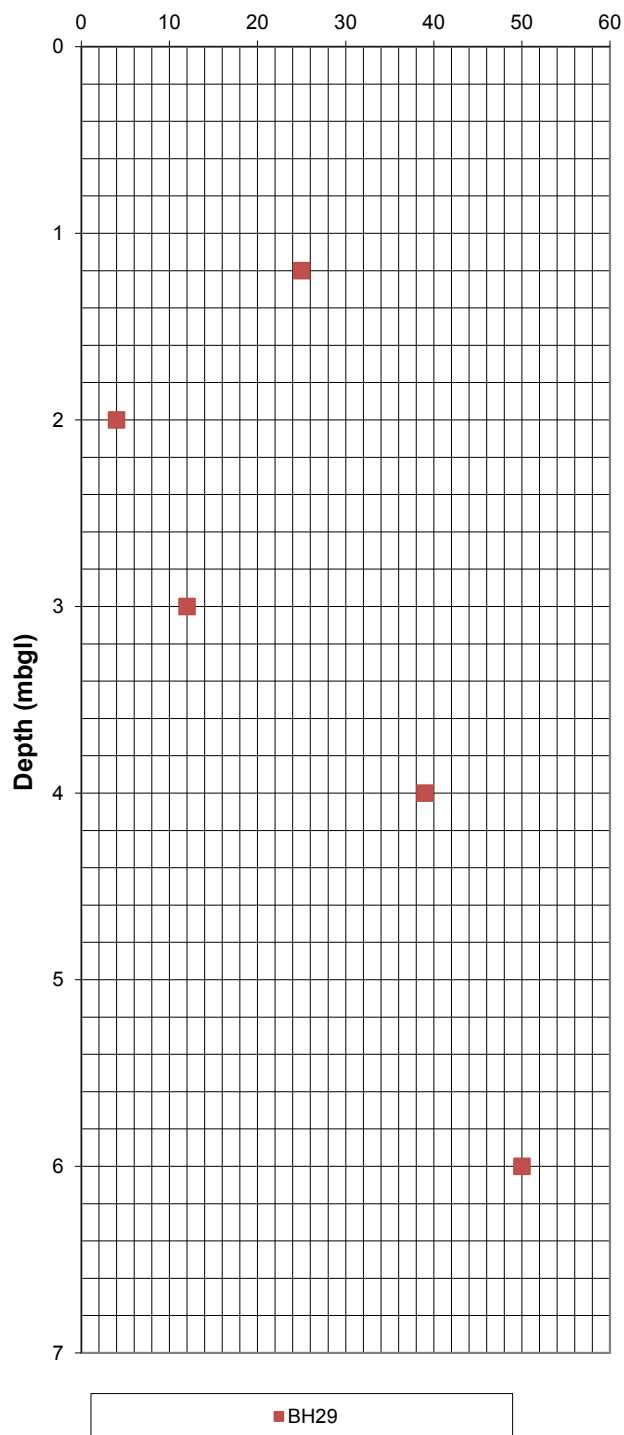


Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=45 (3,8,22,12,6,5)		
2.00	N=44 (1,10,10,10,12,12)		
3.00	N=11 (1,1,1,2,7)		
4.00	N=25 (3,4,8,4,6,7)		
5.00	50/236mm (4,8,13,18,16,3)		
6.00	50/255mm (7,11,12,14,17,7)		
7.50	50/95mm (18,7,40,10)		
9.00	50/130mm (2,1,20,30)		

Remarks
---------

SPT Vs Depth						Hole	BH29
Client	Aberdeenshire Council					Job No.	5414
Site	Stonehaven FAS					Date Drawn	06/01/2014
Easting	386997.5	Northing	785470.2	G.L.	16.228	Energy Ratio	39.00%
						Hammer ID	

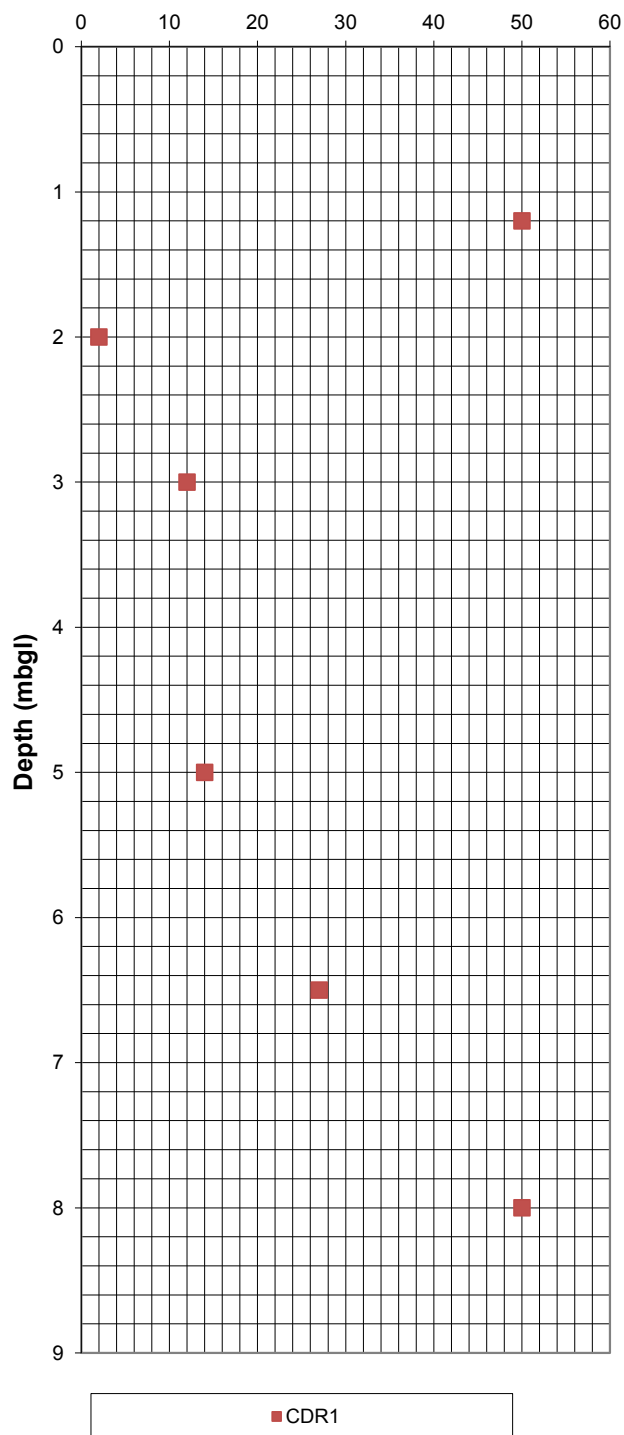
SPT N Value

[illegible]

Remarks

SPT Vs Depth						Hole	CDR1
Client     Aberdeenshire Council						Job No.	5414
Site     Stonehaven FAS						Date Drawn	06/01/2014
Easting	387424.5	Northing	785750.2	G.L.	2.944	Energy Ratio	74.00%
						Hammer ID	

### SPT N Value

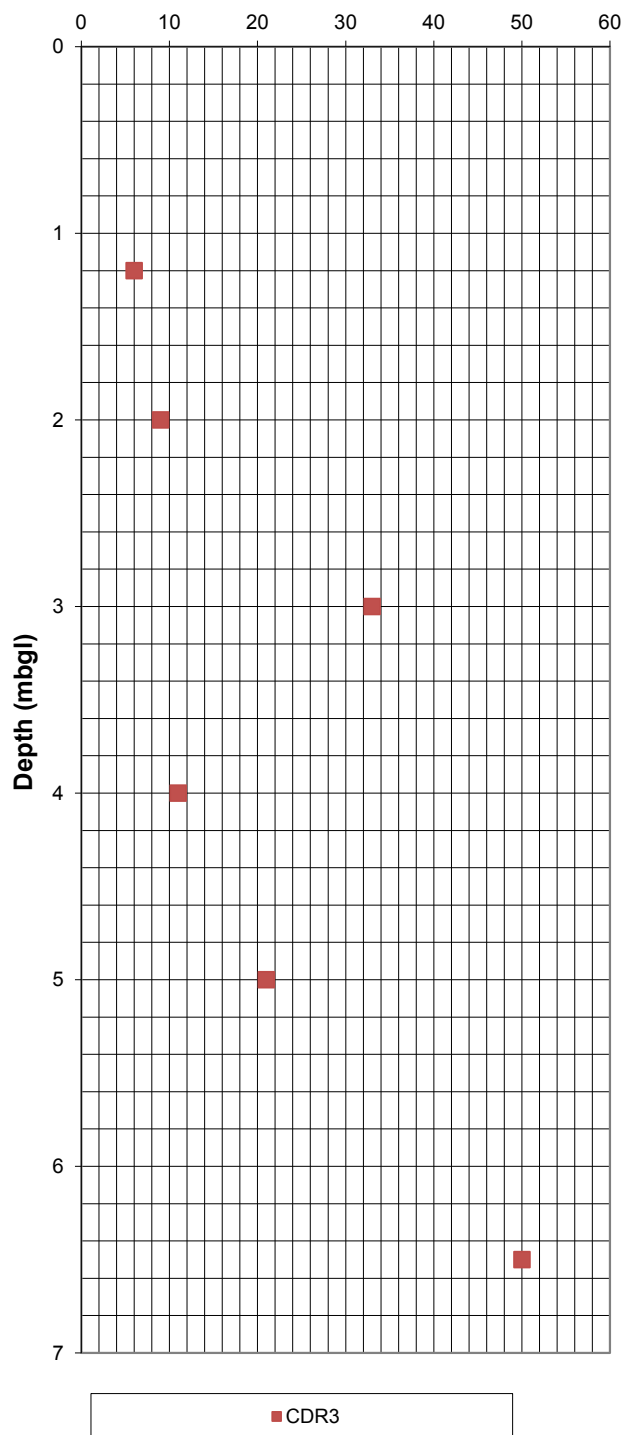


Depth	Uncorrected N value	Casing Depth	Water Depth
1.20	N=50 (11,8,11,10,7,22)		
2.00	N=2 (3,2,1,0,1,0)	1.50	
3.00	N=12 (1,1,4,4,1,3)	3.00	
5.00	N=14 (3,2,2,3,4,5)	4.80	
6.50	N=27 (3,4,5,7,7,8)	6.00	
8.00	50/150mm (17,8,20,30)	6.00	4.85

Remarks
---------

SPT Vs Depth						Hole	CDR3
Client	Aberdeenshire Council					Job No.	5414
Site	Stonehaven FAS					Date Drawn	06/01/2014
Easting	387337.4	Northing	785754.9	G.L.	3.36	Energy Ratio	74.00%
						Hammer ID	

SPT N Value

[illegible]

Remarks





**GeoSonic Drilling Ltd**  
**Unit D, Greenfield Complex**  
**Greenfield Street**  
**Alloa**  
**Clackmannanshire**  
**FK10 2AL**

## SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

SPT Hammer Ref: GS RIG02  
Test Date: 05/06/2013  
Report Date: 05/06/2013  
File Name: GS RIG02.spt  
Test Operator: DC

### Instrumented Rod Data

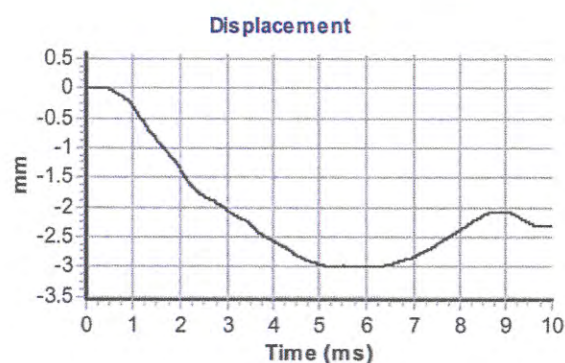
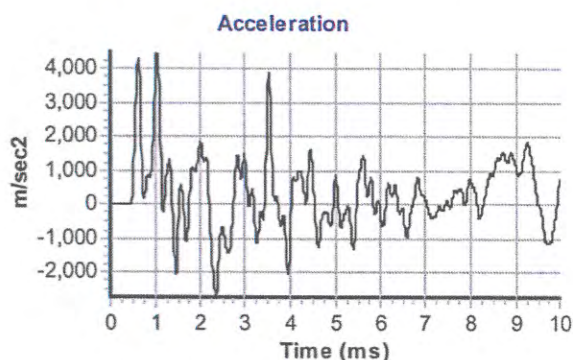
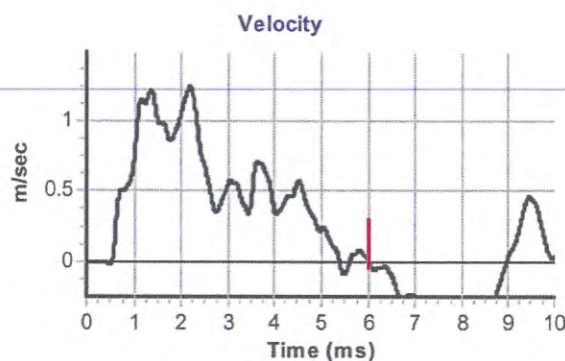
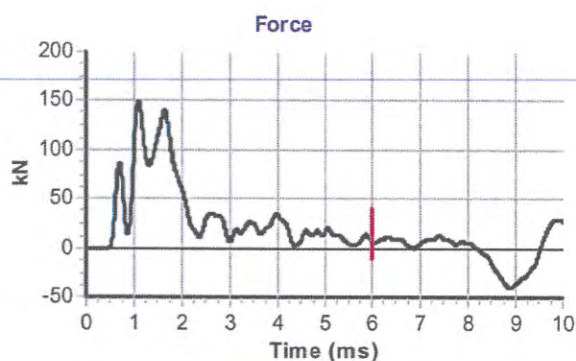
Diameter  $d_r$  (mm): 76  
Wall Thickness  $t_r$  (mm): 3.7  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1:  
Accelerometer No.2:

### SPT Hammer Information

Hammer Mass  $m$  (kg): 63.0  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 18.6

### Comments / Location

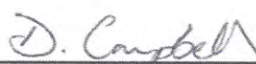
Test undertaken at GeoSonic test facility



### Calculations

Area of Rod  $A$  (mm<sup>2</sup>): 840  
Theoretical Energy  $E_{\text{theor}}$  (J): 473  
Measured Energy  $E_{\text{meas}}$  (J): 185

**Energy Ratio  $E_r$  (%):** **39**

  
Signed: Duncan Campbell  
Title: Operation Coordinator

The recommended calibration interval is 12 months

**Testconsult Limited**  
**40A Hardwick Grange**  
**Warrington**  
**Cheshire**  
**WA1 4RF**

SPT Hammer Ref: WB1  
Test Date: 22/02/2013  
Report Date: 22/02/2013  
File Name: WB1.spt  
Test Operator: TS



## Instrumented Rod Data

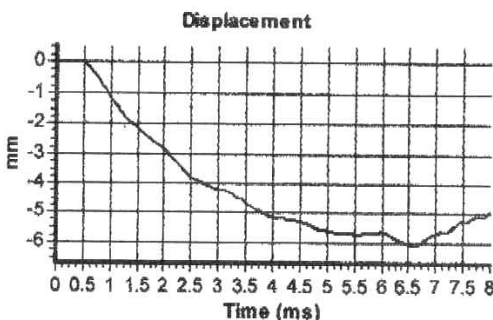
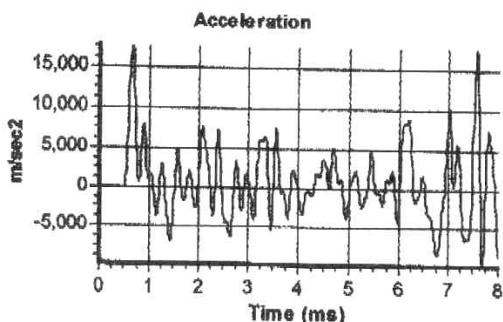
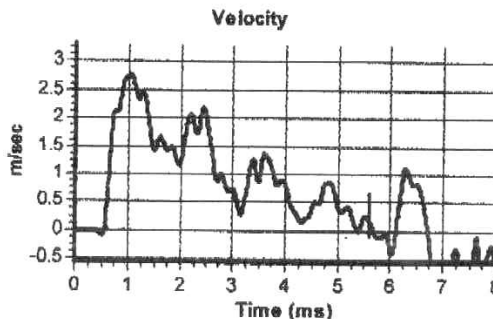
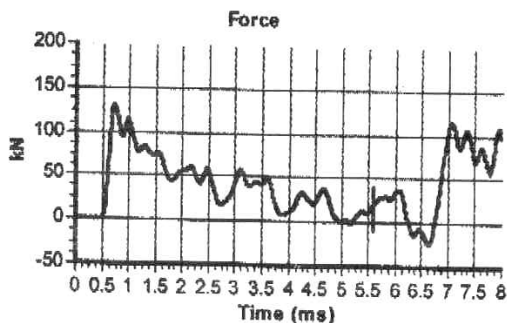
Diameter  $d_r$  (mm): 54  
Wall Thickness  $t_r$  (mm): 6.6  
Assumed Modulus  $E_a$  (GPa): 208  
Accelerometer No.1: 5677  
Accelerometer No.2: 5833

## SPT Hammer Information

Hammer Mass  $m$  (kg): 63.5  
Falling Height  $h$  (mm): 760  
SPT String Length  $L$  (m): 14.0

## Comments / Location

Client: Williams Brothers Drilling Ltd  
Location: Testconsult Laboratory  
Type: Trip Hammer



## Calculations

Area of Rod A ( $\text{mm}^2$ ): 983  
Theoretical Energy  $E_{\text{theor}}$  (J): 473  
Measured Energy  $E_{\text{meas}}$  (J): 349

**Energy Ratio  $E_r$  (%)**

**74**

Signed: Tony S. [Signature]  
Title: Senior Electronics Technician



The recommended calibration interval is 12 months

# Appendix 6.2

## Appendix 6.2 – Variable Head Permeability Testing



# Environmental Services

## Falling Head Permeability Test in a Standpipe

Project Name	Stonehaven	Borehole ID	BH06
Project ID	5414	Operative	PS/CP
Date of Test	08/11/2013	Checked	AP

Calculation of permeability (k) as per BS 5930, Section 25.4.6.1 (1999+A2:2010) - general approach

$$k = \frac{A \times \ln \left( \frac{H_1}{H_2} \right)}{F \times (t_2 - t_1)} \quad A = \pi \times d^2 / 4$$

Where:

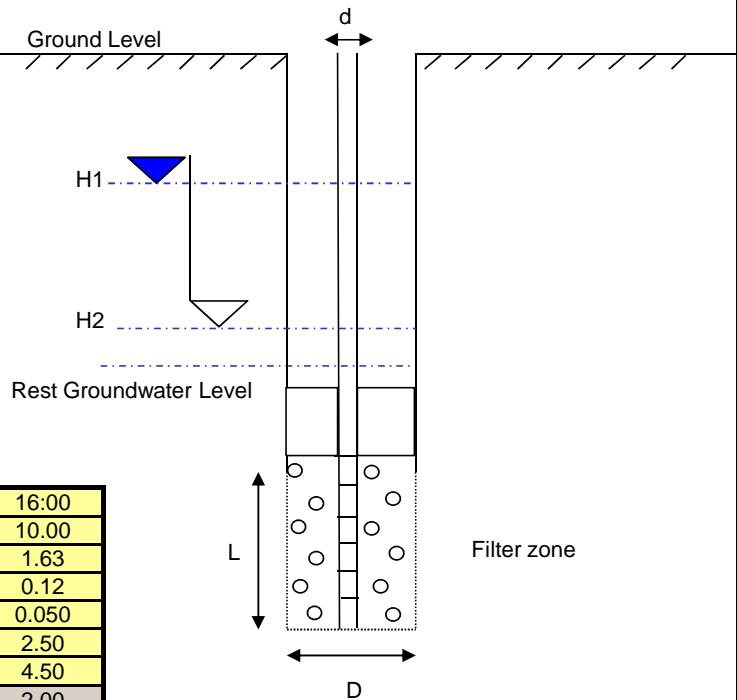
A = cross sectional area of standpipe

H<sub>1</sub> = Head of water at time t<sub>1</sub>

H<sub>2</sub> = Head of water at time t<sub>2</sub>

F = Intake Factor

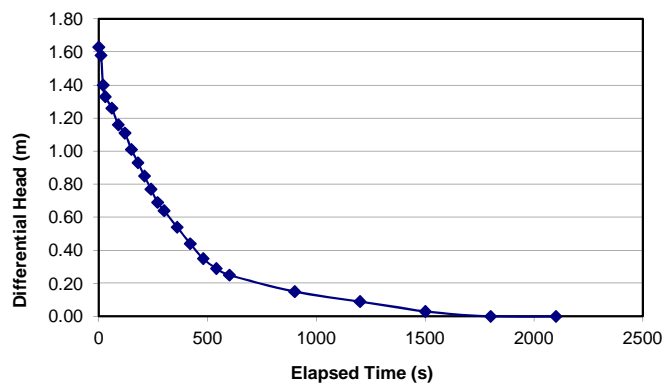
$$F = \frac{2.32 \pi \times L}{\ln \left( 1.1 \left( \frac{L}{D} \right) + \left( 1 + 1.1 \left( \frac{L}{D} \right)^2 \right)^{0.5} \right)}$$



Time at Start of Test	16:00
Depth of Borehole Below Ground Level (m)	10.00
Initial Groundwater Level (m BGL)	1.63
Diameter of borehole, D (m)	0.12
Diameter of standpipe, d (m)	0.050
Top of response zone	2.50
Bottom of response zone	4.50
Length of Filter Zone, L (m)	2.00
Intake Factor, F	4.03

Time	Elapsed Time (s)	Water depth (m BGL)	Differential Head, H (m)
	0	0.000	1.63
	10	0.050	1.58
	20	0.230	1.40
	30	0.300	1.33
	60	0.370	1.26
	90	0.470	1.16
	120	0.520	1.11
	150	0.620	1.01
	180	0.700	0.93
	210	0.780	0.85
	240	0.860	0.77
	270	0.940	0.69
	300	0.990	0.64
	360	1.090	0.54
	420	1.190	0.44
	480	1.280	0.35
	540	1.340	0.29
	600	1.380	0.25
	900	1.480	0.15
	1200	1.540	0.09
	1500	1.60	0.03
	1800	1.63	0.00
	2100	1.63	0.00

Change in Head against Elapsed Time



## Calculation of Permeability (k)

t <sub>1</sub> (s)	t <sub>2</sub> (s)	H <sub>1</sub> (m)	H <sub>2</sub> (m)	k (ms <sup>-1</sup> )
30	270	1.58	0.69	> 1.68E-06
270	1500	0.77	0.03	> 1.29E-06

Remark: 10 Gallons added





# Environmental Services

## Falling Head Permeability Test in a Standpipe

Project Name	Stonehaven	Borehole ID	BH08
Project ID	5414	Operative	PS/CP
Date of Test	08/11/2013	Checked	AP

Calculation of permeability (k) as per BS 5930, Section 25.4.6.1 (1999+A2:2010) - general approach

$$k = \frac{A \times \ln \left( \frac{H_1}{H_2} \right)}{F \times (t_2 - t_1)} \quad A = \pi \times d^2 / 4$$

Where:

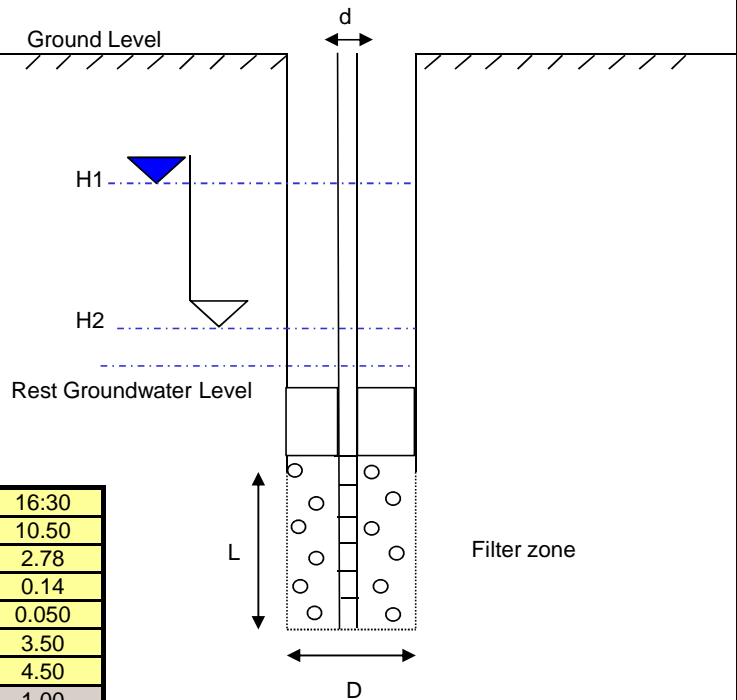
A = cross sectional area of standpipe

H<sub>1</sub> = Head of water at time t<sub>1</sub>

H<sub>2</sub> = Head of water at time t<sub>2</sub>

F = Intake Factor

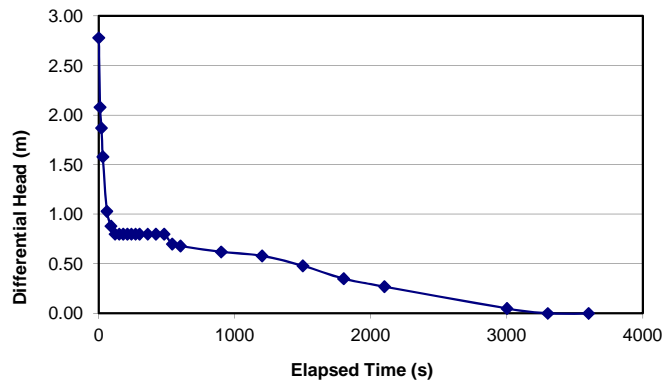
$$F = \frac{2.32 \pi \times L}{\ln \left( 1.1 \left( \frac{L}{D} \right) + \left( 1 + 1.1 \left( \frac{L}{D} \right)^2 \right)^{0.5} \right)}$$



Time at Start of Test	16:30
Depth of Borehole Below Ground Level (m)	10.50
Initial Groundwater Level (m BGL)	2.78
Diameter of borehole, D (m)	0.14
Diameter of standpipe, d (m)	0.050
Top of response zone	3.50
Bottom of response zone	4.50
Length of Filter Zone, L (m)	1.00
Intake Factor, F	2.66

Time	Elapsed Time (s)	Water depth (m BGL)	Differential Head, H (m)
	0	0.000	2.78
	10	0.700	2.08
	20	0.910	1.87
	30	1.200	1.58
	60	1.750	1.03
	90	1.900	0.88
	120	1.980	0.80
	150	1.980	0.80
	180	1.980	0.80
	210	1.980	0.80
	240	1.980	0.80
	270	1.980	0.80
	300	1.980	0.80
	360	1.980	0.80
	420	1.980	0.80
	480	1.980	0.80
	540	2.080	0.70
	600	2.100	0.68
	900	2.160	0.62
	1200	2.200	0.58
	1500	2.30	0.48
	1800	2.43	0.35
	2100	2.51	0.27
	3000	2.73	0.05
	3300	2.78	0.00
	3600	2.78	0.00

Change in Head against Elapsed Time



## Calculation of Permeability (k)

t <sub>1</sub> (s)	t <sub>2</sub> (s)	H <sub>1</sub> (m)	H <sub>2</sub> (m)	k (ms <sup>-1</sup> )
90	540	0.88	0.62	> 5.73E-07
900	3000	0.62	0.05	> 8.83E-07

Remark: 10 Gallons added

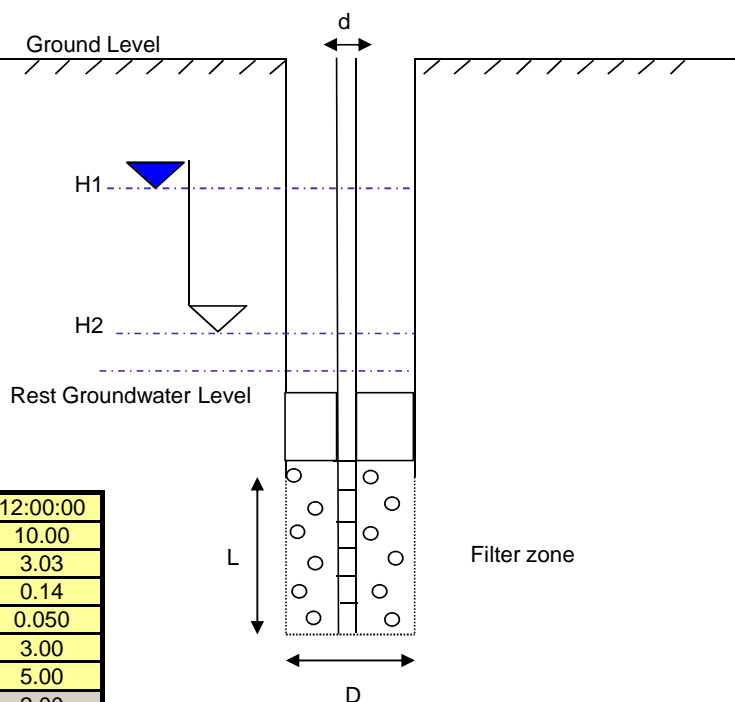


Project Name	Stonehaven	Borehole ID	BH13
Project ID	5414	Operative	CP/PS
Date of Test	08/11/2013	Checked	AP

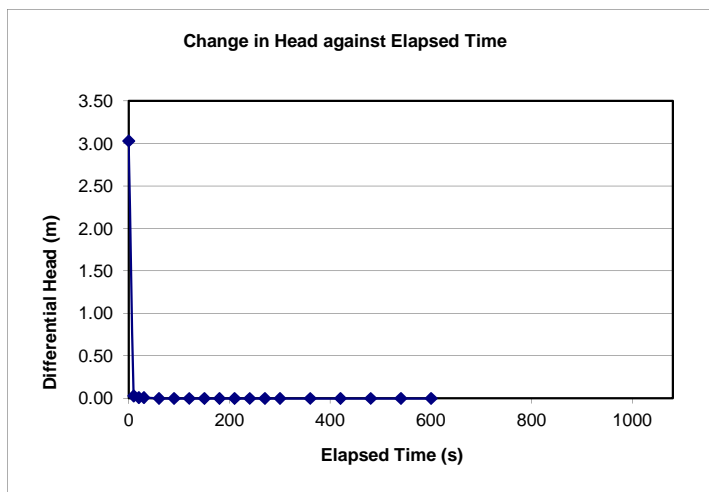
$$k = \frac{A \times \ln \left( \frac{H_1}{H_2} \right)}{F \times (t_2 - t_1)} \quad A = \pi \times d^2 / 4$$

F = Intake Factor

$$F = \frac{2.32 \pi i \times L}{\ln \left( 1.1 \left( \frac{L}{D} \right) + \left( 1 + 1.1 \left( \frac{L}{D} \right)^2 \right)^{0.5} \right)}$$



Time at Start of Test	12:00:00
Depth of Borehole Below Ground Level (m)	10.00
Initial Groundwater Level (m BGL)	3.03
Diameter of borehole, D (m)	0.14
Diameter of standpipe, d (m)	0.050
Top of response zone	3.00
Bottom of response zone	5.00
Length of Filter Zone, L (m)	2.00
Intake Factor, F	4.26

[illegible]

Calculation of Permeability (k)				
t <sub>1</sub> (s)	t <sub>2</sub> (s)	H <sub>1</sub> (m)	H <sub>2</sub> (m)	k (ms <sup>-1</sup> )
0	30	3.03	0.01	> 8.79E-05

Remark:	
10 Gallons added.	

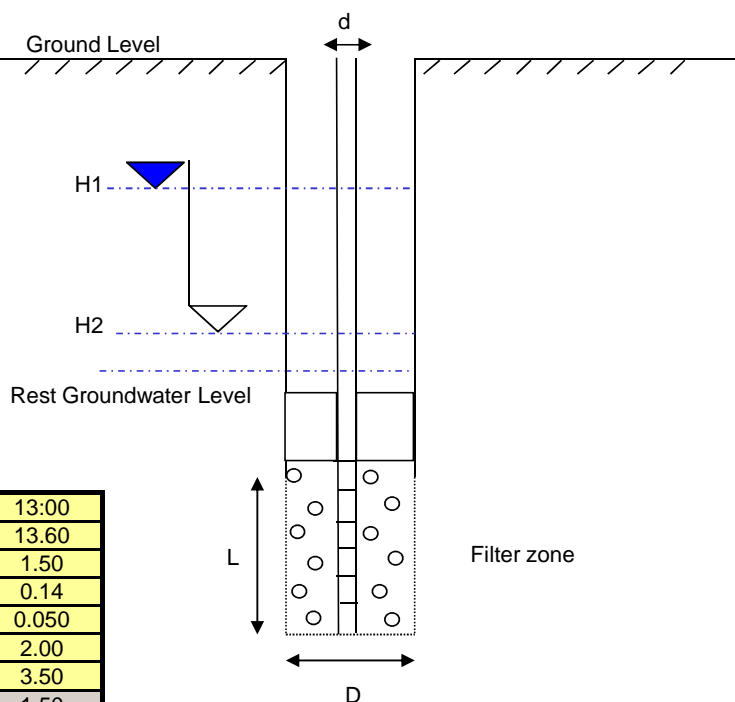


Project Name	Stonehaven	Borehole ID	BH15
Project ID	5414	Operative	PS/CP
Date of Test	08/11/2013	Checked	AP

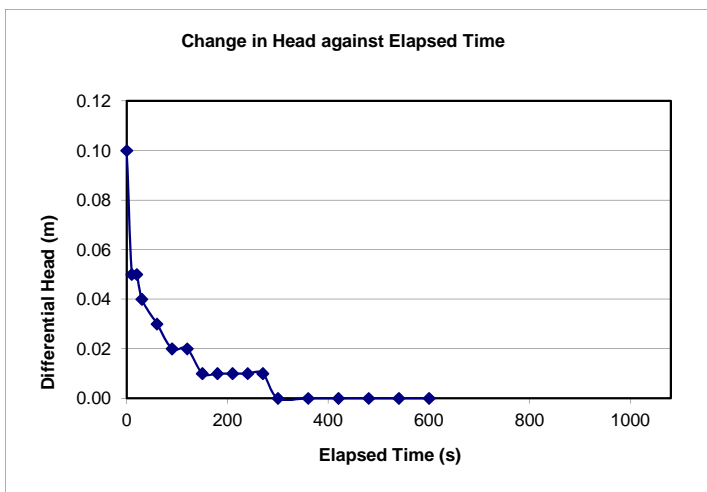
$$k = \frac{A \times \ln\left(\frac{H_1}{H_2}\right)}{F \times (t_2 - t_1)} \quad A = \pi \times d^2 / 4$$

F = Intake Factor

$$F = \frac{2.32 \pi i \times L}{\ln \left( 1.1 \left( \frac{L}{D} \right) + \left( 1 + 1.1 \left( \frac{L}{D} \right)^2 \right)^{0.5} \right)}$$



Time at Start of Test	13:00
Depth of Borehole Below Ground Level (m)	13.60
Initial Groundwater Level (m BGL)	1.50
Diameter of borehole, D (m)	0.14
Diameter of standpipe, d (m)	0.050
Top of response zone	2.00
Bottom of response zone	3.50
Length of Filter Zone, L (m)	1.50
Intake Factor, F	3.48

[illegible]

Calculation of Permeability (k)				
t <sub>1</sub> (s)	t <sub>2</sub> (s)	H <sub>1</sub> (m)	H <sub>2</sub> (m)	k (ms <sup>-1</sup> )
0	270	0.10	0.01	> 4.81E-06

Remark:	
10 Gallons added.	

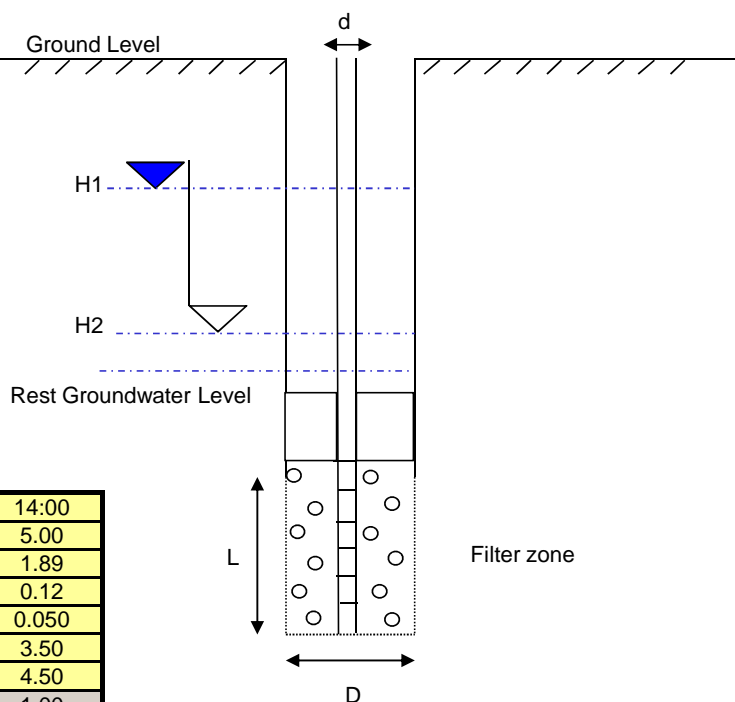


Project Name	Stonehaven	Borehole ID	BH18
Project ID	5414	Operative	PS/CP
Date of Test	08/11/2013	Checked	AP

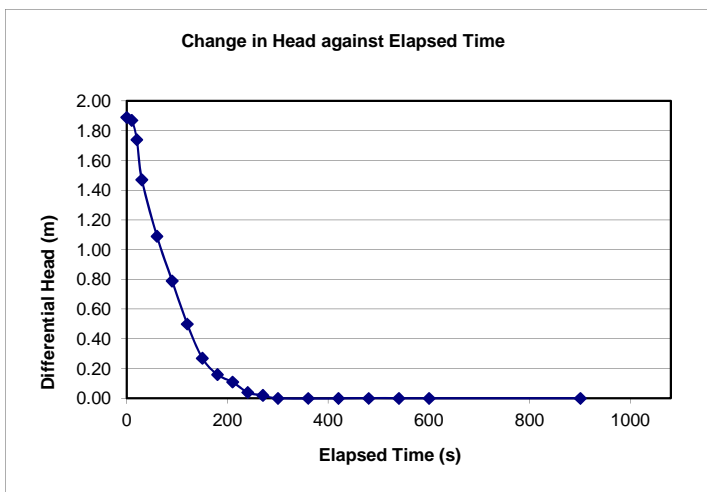
$$k = \frac{A \times \ln \left( \frac{H_1}{H_2} \right)}{F \times (t_2 - t_1)} \quad A = \pi \times d^2 / 4$$

F = Intake Factor

$$F = \frac{2.32 \pi i \times L}{\ln \left( 1.1 \left( \frac{L}{D} \right) + \left( 1 + 1.1 \left( \frac{L}{D} \right)^2 \right)^{0.5} \right)}$$



Time at Start of Test	14:00
Depth of Borehole Below Ground Level (m)	5.00
Initial Groundwater Level (m BGL)	1.89
Diameter of borehole, D (m)	0.12
Diameter of standpipe, d (m)	0.050
Top of response zone	3.50
Bottom of response zone	4.50
Length of Filter Zone, L (m)	1.00
Intake Factor, F	2.49

[illegible]

Calculation of Permeability (k)				
t <sub>1</sub> (s)	t <sub>2</sub> (s)	H <sub>1</sub> (m)	H <sub>2</sub> (m)	k (ms <sup>-1</sup> )
0	120	1.89	0.50	> 8.75E-06
120	270	0.50	0.02	> 1.69E-05

Remark:	
10 Gallons added.	





# Appendix 7

## Appendix 7 - Groundwater Monitoring

# Appendix 7.1

## Appendix 7.1 – Groundwater Monitoring Result Sheets



# RECORD OF MEASUREMENTS FOR MONITORING BOREHOLES

## Environmental Services

Client Name	Aberdeenshire Council
Site Name	Stonehaven River Carron and Burn of Glaslaw FAS

Date of Monitoring	27/11/2013 10:30 - 12:30
Job Number	5414

Sample Point Reference	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	BAL (%)		CO (ppm)	H <sub>2</sub> S (ppm)	L.CH <sub>4</sub> (%)	P.CH <sub>4</sub> (%)		Rel Pressure (mb)	Flow (l/hr)	Water level (mbgl)	Base (mbgl)
BH21B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.93	3.48
BH15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.51	3.46
BH13PIEZO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.04	6.74
BH13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.08	5.00
BH6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.65	4.46
BH8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.81	4.45
BH18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.91	4.47
Accuracy of Instrument														

Instrument Used	GW Dip tape
Atmospheric Pressure (mb)	1028
Weather / Temperature	Cold/calm 12 <sup>0</sup> C

Date Last Calibrated	24.11.13
Date Next Calibration Due	28.02.14
Date Last Calibration Gas Check	NR

Serial Number	T62
Operator	A Grierson
Pressure Trend	Rising

### Notes/Comments



# RECORD OF MEASUREMENTS FOR GAS MONITORING BOREHOLES

## Environmental Services

Client Name	Aberdeenshire Council
Site Name	Stonehaven River Carron and Burn of Glaslaw FAS

Date of Monitoring	06/12/2013
Job Number	5414

Sample Point Reference	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	BAL (%)		CO (ppm)	H <sub>2</sub> S (ppm)	L.CH <sub>4</sub> (%)	P.CH <sub>4</sub> (%)		Rel Pressure (mb)	Time	Water level (mbgl)	Base (mbgl)
BH21B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11:01	1.9	3.47
BH15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:14	1.49	3.46
BH13PIEZO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11:06	3.03	6.88
BH13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11:07	3.06	5.01
BH6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11:10	1.60	4.46
BH8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:55	2.78	4.45
BH18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:07	1.90	4.47
Accuracy of Instrument														

Instrument Used	GW Dip tape
Atmospheric Pressure (mb)	1019
Weather / Temperature	Cold/calm 0°C

Date Last Calibrated	24.11.13
Date Next Calibration Due	28.02.14
Date Last Calibration Gas Check	NR

Serial Number	T62
Operator	A.Grierson
Pressure Trend	Raising

### Notes/Comments



# RECORD OF MEASUREMENTS FOR MONITORING BOREHOLES

## Environmental Services

Client Name	Aberdeenshire Council
Site Name	Stonehaven River Carron and Burn of Glaslaw FAS

Date of Monitoring	13/12/2013
Job Number	5414

Sample Point Reference	CH <sub>4</sub> (%)	CO <sub>2</sub> (%)	O <sub>2</sub> (%)	BAL (%)		CO (ppm)	H <sub>2</sub> S (ppm)	L.CH <sub>4</sub> (%)	P.CH <sub>4</sub> (%)		Rel Pressure (mb)	Time	Water level (mbgl)	Base (mbgl)
BH21B	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:34	1.9	3.47
BH15	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:38	1.50	3.46
BH13PIEZO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:40	3.00	6.88
BH13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:40	3.02	4.99
BH6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Damaged, cannot monitor	
BH8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:46	2.78	4.45
BH18	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10:29	1.92	4.47
Accuracy of Instrument														

Instrument Used	GW Dip tape
Atmospheric Pressure (mb)	1004
Weather / Temperature	Cold/calm 10 <sup>0</sup> C

Date Last Calibrated	24.11.13
Date Next Calibration Due	28.02.14
Date Last Calibration Gas Check	NR

Serial Number	T62
Operator	A.Grierson
Pressure Trend	Raising

### Notes/Comments





## **Environmental Services**

### **Factual Report on Ground Investigation**

#### **Stonehaven River Carron & Burn of Glaslaw Flood Alleviation Scheme - Ground Investigation**

#### **Volume 2 of 2**

**Contract No: 018936/5414  
January 2014**

**Client: Aberdeenshire Council**

**Engineer: JBA Consulting**

# Appendix 8

## Appendix 8 - Geotechnical Test Results



## Environmental Services

### SUMMARY OF INDEX PROPERTIES

BS1377 : Part 2 : 1990 : Clause 3.0, 4.0 & 5.0

**Client:** Aberdeenshire Council

**Contract No:** 5414

**Contract Name:** Stonehaven FAS

Lab Sample No	Hole Id	Sample Type	Sample No	Depth (m)		Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 mic (%)	Remarks
				From	To							
S8790	BH10	B	5.0	2.00	2.50	Brown slightly silty gravelly SAND with PEAT	90					
S8800	BH12	D	13.0	3.50		Pinkish brown clayey sandy SILT	17	32	19	13	100	Natural Specimen, 4-point.
S8801	BH12	D	15.0	4.00	4.45	Brown very sandy CLAY	17	36	21	15	100	Natural Specimen, 4-point.
S8808	BH13	B	11.0	4.70	5.50	Light pinkish brown slightly gravelly silty sandy CLAY	9	30	16	14	78	Sieved Specimen, 4-point.
S8814	BH14	B	6.0	2.40	3.00	Reddish brown gravelly sandy silty CLAY	14	28	14	14	52	Sieved Specimen, 4-point.
S8816	BH14	D	10.0	3.50	3.75	Brown slightly gravelly very sandy silty CLAY	14	27	17	10	81	Sieved Specimen, 1-point.
S8823	BH15	B	8.0	3.00	3.30	Orange brown slightly sandy gravelly silty CLAY	18	36	17	19	29	Sieved Specimen, 4-point.
S8827	BH17	D	4.0	1.20	1.65	Brown clayey very gravelly SAND	8				29	Non-plastic
S8832	BH18	D	6.0	2.00	2.45	Black slightly sandy slightly gravelly organic SILT	85	69	48	21	93	Sieved Specimen, 4-point.
S8839	BH19	D	9.0	2.80	3.00	Black slightly sandy organic SILT	98					
S8841	BH19	D	12.0	4.00	4.45	Brownish grey slightly clayey sandy GRAVEL	13					
S8842	BH19	B	14.0	4.80	5.00	Reddish brown gravelly sandy CLAY	13	33	14	19	58	Sieved Specimen, 4-point.

#### General notes:

MC-Moisture content

LL-Liquid limit

PL-Plastic limit

PI-Plasticity Index

**Checked and Approved** *Agata K-Roche*  
Senior Technician

Date: 09/12/2013



Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

**1489**



## Environmental Services

### SUMMARY OF INDEX PROPERTIES

BS1377 : Part 2 : 1990 : Clause 3.0, 4.0 & 5.0

**Client:** Aberdeenshire Council

**Contract No:** 5414

**Contract Name:** Stonehaven FAS

Lab Sample No	Hole Id	Sample Type	Sample No	Depth (m)		Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 mic (%)	Remarks
				From	To							
S8716	BH1A	D	11.0	3.30		Dark brown and greyish brown slightly sandy organic SILT	74	107	57	50	100	Natural Specimen, 4-point.
S8718	BH1A	B	17.0	5.10	5.60	Dark grey silty organic SAND	72					
S8719	BH1A	D	19.0	5.90		Reddish brown slightly gravelly sandy CLAY	20	31	19	12	69	Sieved Specimen, 4-point.
S8721	BH1A	B	24.0	7.00	7.50	Reddish brown slightly gravelly sandy CLAY	13	32	16	16	72	Sieved Specimen, 4-point.
S8724	BH2	D	10.0	2.00	2.45	Dark grey slightly sandy slightly gravelly organic SILT and brown slightly sandy GRAVEL	57	74	44	30	22	Sieved Specimen, 1-point.
S8845	BH20	D	11.0	3.00	3.45	Orange brown slightly clayey sandy GRAVEL	8.4					
S8849	BH20	D	21.0	6.00	6.45	Pinkish brown slightly sandy CLAY and greenish grey slightly gravelly SAND	14	33	17	16	66	Sieved Specimen, 4-point.
S8853	BH21B	B	5.0	1.20	1.80	Brown gravelly clayey SAND	7.3					
S8860	BH21B	D	16.0	5.00	5.45	Reddish brown slightly sandy slightly gravelly silty CLAY	13	37	19	18	70	Sieved Specimen, 4-point.
S8867	BH22	D	13.0	4.50		Reddish brown slightly sandy gravelly silty CLAY	10	33	15	18	46	Sieved Specimen, 4-point.
S8873	BH23	B	9.0	3.00	3.35	Reddish brown gravelly very sandy silty CLAY	16	25	17	8	42	Sieved Specimen, 4-point.
S8876	BH23	B	15.0	4.00	5.00	Reddish brown slightly sandy slightly gravelly CLAY	14	34	15	19	59	Sieved Specimen, 4-point.

#### General notes:

MC-Moisture content

LL-Liquid limit

PL-Plastic limit

PI-Plasticity Index

**Checked and Approved** *Agata K-Roche*  
Senior Technician

Date: 09/12/2013



Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

**1489**



## Environmental Services

### SUMMARY OF INDEX PROPERTIES

BS1377 : Part 2 : 1990 : Clause 3.0, 4.0 & 5.0

Client: Aberdeenshire Council

Contract No: 5414

Contract Name: Stonehaven FAS

Lab Sample No	Hole Id	Sample Type	Sample No	Depth (m)		Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 mic (%)	Remarks
				From	To							
S8882	BH24	D	13.0	4.50		Reddish brown sandy gravelly silty CLAY	14	29	18	11	56	Sieved Specimen, 4-point.
S8883	BH24	D	15.0	4.90		Reddish brown slightly gravelly very sandy silty CLAY	13	27	15	12	61	Sieved Specimen, 4-point.
S8885	BH24	D	19.0	6.00	6.45	Reddish brown sandy gravelly CLAY	12	35	14	21	54	Sieved Specimen, 1-point.
S8887	BH25	B	3.0	0.50	1.00	Brown clayey very sandy GRAVEL with cobbles	15	37	23	14	23	Sieved Specimen, 4-point.
S8889	BH25	B	10.0	2.60	3.00	Reddish brown slightly sandy slightly gravelly silty CLAY	19	31	20	11	60	Sieved Specimen, 4-point.
S8892	BH25	D	19.0	5.50		Reddish brown gravelly sandy CLAY	10	33	14	19	50	Sieved Specimen, 4-point.
S8894	BH25	B	27.0	7.50	8.00	Reddish brown sandy gravelly silty CLAY	17	40	16	24	58	Sieved Specimen, 4-point.
S8900	BH26	D	10.0	2.40		Reddish brown slightly sandy slightly gravelly clayey SILT	23	38	24	14	73	Sieved Specimen, 4-point.
S8904	BH26	D	20.0	5.70		Reddish brown slightly gravelly slightly sandy clayey SILT	24	37	23	14	84	Sieved Specimen, 4-point.
S8911	BH27	B	11.0	2.60	3.40	Reddish brown slightly sandy slightly gravelly clayey SILT	33	41	26	15	84	Sieved Specimen, 4-point.
S8912	BH27	B	13.0	3.40	4.00	Reddish brown slightly gravelly slightly sandy silty CLAY with frequent cobbles	23	38	20	18	58	Sieved Specimen, 4-point.
S8915	BH27	B	20.0	6.00	6.20	Reddish brown clayey very sandy GRAVEL	15	26	15	11	28	Sieved Specimen, 4-point.

#### General notes:

MC-Moisture content

LL-Liquid limit

PL-Plastic limit

PI-Plasticity Index

Checked and Approved **Agata K-Roche**  
Senior Technician

Date: 09/12/2013



Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

1489





## Environmental Services

### SUMMARY OF INDEX PROPERTIES

BS1377 : Part 2 : 1990 : Clause 3.0, 4.0 & 5.0

**Client:** Aberdeenshire Council

**Contract No:** 5414

**Contract Name:** Stonehaven FAS

Lab Sample No	Hole Id	Sample Type	Sample No	Depth (m)		Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 mic (%)	Remarks
				From	To							
S8917	BH28	D	9.0	2.20		Black slightly sandy slightly gravelly organic SILT	55					
S8919	BH28	B	12.0	3.00	3.50	Brown slightly sandy slightly gravelly clayey SILT with cobbles	26	39	23	16	43	Sieved Specimen, 4-point.
S8921	BH28	D	15.0	4.00	4.45	Reddish brown gravelly sandy silty CLAY	14	27	16	11	57	Sieved Specimen, 4-point.
S8922	BH28	B	22.0	6.60	7.25	Reddish brown slightly gravelly sandy CLAY	11	31	14	17	62	Sieved Specimen, 4-point.
S8923	BH28	B	26.0	8.60	9.00	Light brown sandy gravelly CLAY	11	26	18	8	27	Sieved Specimen, 4-point.
S8926	BH29	D	6.0	2.00	2.45	Orange brown slightly gravelly very sandy CLAY	25					
S8730	BH3	D	6.0	2.00	2.45	Brown clayey gravelly SAND	15					
S8732	BH3	D	11.0	3.00	3.45	Black organic SILT	83					
S8734	BH3	D	14.0	4.80		Reddish brown slightly sandy slightly gravelly CLAY	14	34	14	20	70	Sieved Specimen, 4-point.
S8737	BH3	D	24.0	7.50	7.95	Reddish brown and greenish brown slightly sandy gravelly CLAY	11	27	18	9	57	Sieved Specimen, 4-point.
S8741	BH4	D	8.0	3.00	3.20	Dark grey and brown slightly sandy organic CLAY	56					
S8743	BH4	B	13.0	5.10	5.40	Dark brown sandy gravelly silty CLAY	14	28	13	15	45	Sieved Specimen, 4-point.

#### General notes:

MC-Moisture content

LL-Liquid limit

PL-Plastic limit

PI-Plasticity Index

**Checked and Approved** *Agata K-Roche*  
Senior Technician

Date: 09/12/2013



Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

**1489**



## Environmental Services

### SUMMARY OF INDEX PROPERTIES

BS1377 : Part 2 : 1990 : Clause 3.0, 4.0 & 5.0

**Client:** Aberdeenshire Council

**Contract No:** 5414

**Contract Name:** Stonehaven FAS

Lab Sample No	Hole Id	Sample Type	Sample No	Depth (m)		Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 mic (%)	Remarks
				From	To							
S8745	BH4	D	16.0	5.90		Pinkish brown and greyish brown slightly sandy slightly gravelly CLAY	14	38	15	23	72	Sieved Specimen, 4-point.
S8751	BH5	B	4.0	2.00	2.70	Brownish grey slightly silty very gravelly SAND	20				25	
S8752	BH5	B	5.0	2.70	3.30	Grey and yellowish brown clayey very sandy GRAVEL	15				30	Non-plastic
S8753	BH5	D	7.0	3.30	3.45	Black and brown slightly sandy slightly gravelly organic SILT	53					
S8756	BH5	B	15.0	5.60	6.00	Grey slightly gravelly slightly sandy SILT	12	27	22	5	69	Sieved Specimen, 4-point.
S8758	BH5	D	24.0	9.40		Greyish brown and light brown sandy very gravelly CLAY	10	30	20	10	21	Sieved Specimen, 4-point.
S8761	BH6	B	7.0	2.35	2.70	Black slightly gravelly sandy organic SILT	66	55	34	21	69	Sieved Specimen, 4-point.
S8763	BH6	D	11.0	3.90		Reddish brown occasional mottled greenish brown slightly sandy gravelly silty CLAY	16	30	15	15	63	Sieved Specimen, 4-point.
S8771	BH7	D	9.0	2.40		Reddish brown slightly sandy slightly gravelly silty CLAY	18	33	17	16	76	Sieved Specimen, 4-point.
S8776	BH8	B	11.0	2.80	3.70	Brown slightly sandy gravelly CLAY with cobbles	6	32	15	17	44	Sieved Specimen, 4-point.
S8778	BH8	B	15.0	4.00	4.40	Brown gravelly very clayey SAND	14				72	
S8779	BH8	D	16.0	4.50		Brown gravelly sandy CLAY	7	29	14	15	51	Sieved Specimen, 4-point.

#### General notes:

MC-Moisture content

LL-Liquid limit

PL-Plastic limit

PI-Plasticity Index

**Checked and Approved** *Agata K-Roche*  
Senior Technician

Date: 09/12/2013



Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

**1489**



## Environmental Services

### SUMMARY OF INDEX PROPERTIES

BS1377 : Part 2 : 1990 : Clause 3.0, 4.0 & 5.0

**Client:** Aberdeenshire Council

**Contract No:** 5414

**Contract Name:** Stonehaven FAS

Lab Sample No	Hole Id	Sample Type	Sample No	Depth (m)		Description	MC (%)	LL (%)	PL (%)	PI (%)	<425 mic (%)	Remarks
				From	To							
S8783	BH9	D	6.0	2.00	2.45	Brown very sandy GRAVEL	7.1					
S8785	BH9	D	8.0	2.50		Brown sandy very gravelly CLAY	11	30	15	15	29	Sieved Specimen, 4-point.
S8691	CDR1	B	9.0	3.00	4.00	Black gravelly sandy PEAT	43				44	
S8692	CDR1	B	11.0	5.00	5.50	Reddish brown slightly sandy slightly gravelly silty CLAY	18	33	16	17	60	Sieved Specimen, 4-point.
S8694	CDR1	B	17.0	7.50	8.00	Orange brown slightly gravelly sandy CLAY	18	31	15	16	65	Sieved Specimen, 4-point.
S8699	CDR3	D	7.0	2.00		Dark grey very sandy organic SILT	54					
S8708	CDR4	D	9.0	1.90		Black slightly sandy organic SILT	90					
S8709	CDR4	D	11.0	2.50		Grey sandy silty CLAY	28	40	16	24	100	Natural Specimen, 4-point.

#### General notes:

MC-Moisture content

LL-Liquid limit

PL-Plastic limit

PI-Plasticity Index


**Checked and Approved** *Agata K-Roche*  
Senior Technician

Date: 09/12/2013




Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

**1489**

<b>Project Name:</b> Stonehaven FAS						<b>Samples Received:</b> 02/12/2013		
						<b>Project Started:</b> 02/12/2013		
<b>Client:</b> Costain Environmental Services						<b>Testing Started:</b> 10/12/2013		
<b>Project No:</b> 5414			<b>Our job/report no:</b> 15754			<b>Date Reported:</b> 04/01/2014		

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
BH20	U15	4.00	Very high strength reddish brown gravelly sandy silty CLAY (gravel is fmc and sub-angular to sub-rounded)	13	30	16	14	70	

	<b>Summary of Test Results</b>								<b>Checked and Approved</b> Initials: K.P Date: 04/01/2014
	BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.								
	BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.								
	BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.								

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford Herts WD18 9RU

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acoppy of this policy is available on request.

MSF-11/R2

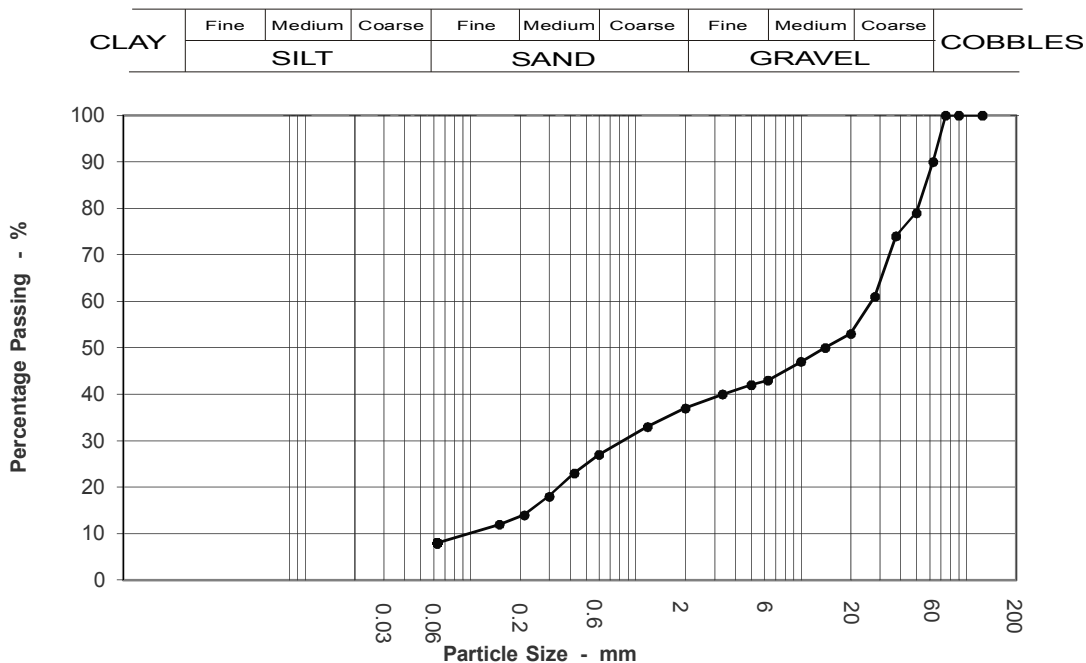


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8713
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH1A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greyish brown slightly clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	90		
50	79		
37.5	74		
28	61		
20	53		
14	50		
10	47		
6.3	43		
5	42		
3.35	40		
2	37		
1.18	33		
0.6	27		
0.425	23		
0.3	18		
0.212	14		
0.15	12		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	10.0
Gravel	53.0
Sand	29.0
Silt & Clay	8.0

Grading Analysis	
D60	27.00
D10	0.11
Uniformity Coefficient	253.52

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





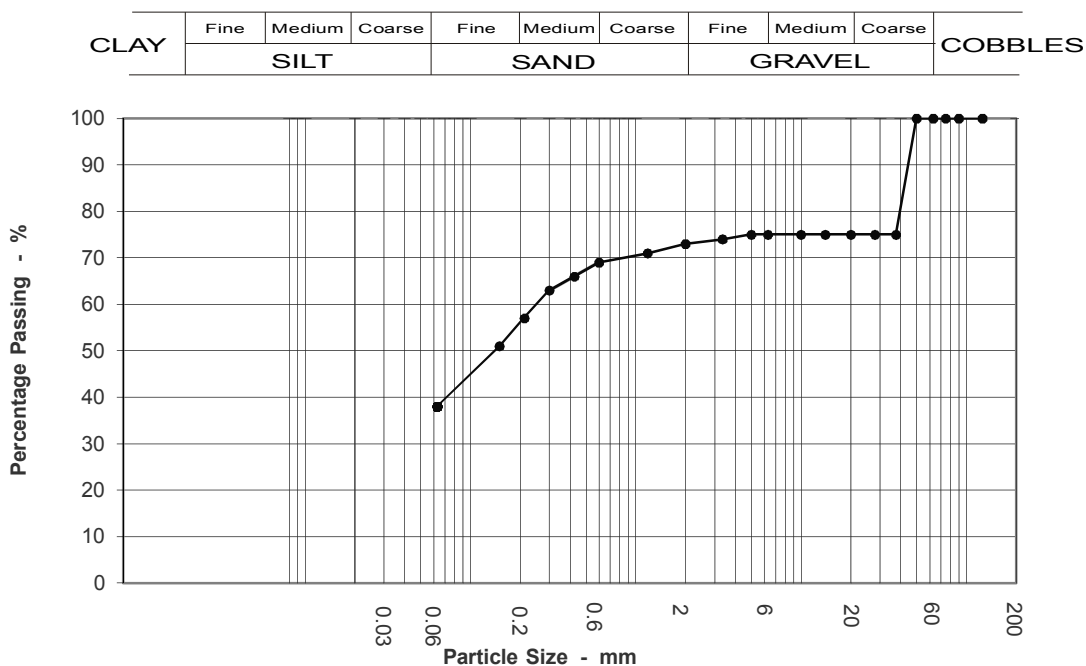


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8715
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH1A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark grey slightly gravelly silty SAND and brown mottled grey slightly gravelly sandy CLAY	<b>Sample No:</b>	12
		<b>Depth (m):</b>	3.20 - 4.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	75		
28	75		
20	75		
14	75		
10	75		
6.3	75		
5	75		
3.35	74		
2	73		
1.18	71		
0.6	69		
0.425	66		
0.3	63		
0.212	57		
0.15	51		
0.063	38		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	27.0
Sand	35.0
Silt & Clay	38.0

Grading Analysis	
D60	0.26
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



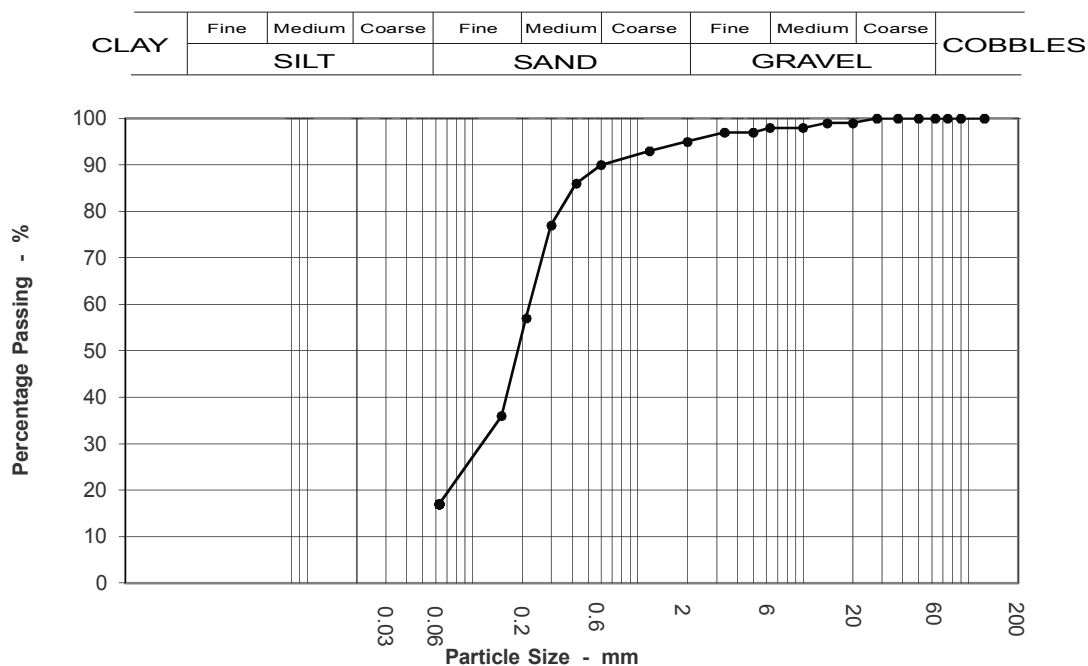


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8717
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH1A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Grey slightly gravelly clayey SAND	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.60 - 5.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	99		
10	98		
6.3	98		
5	97		
3.35	97		
2	95		
1.18	93		
0.6	90		
0.425	86		
0.3	77		
0.212	57		
0.15	36		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	5.0
Sand	78.0
Silt & Clay	17.0

Grading Analysis	
D60	0.23
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



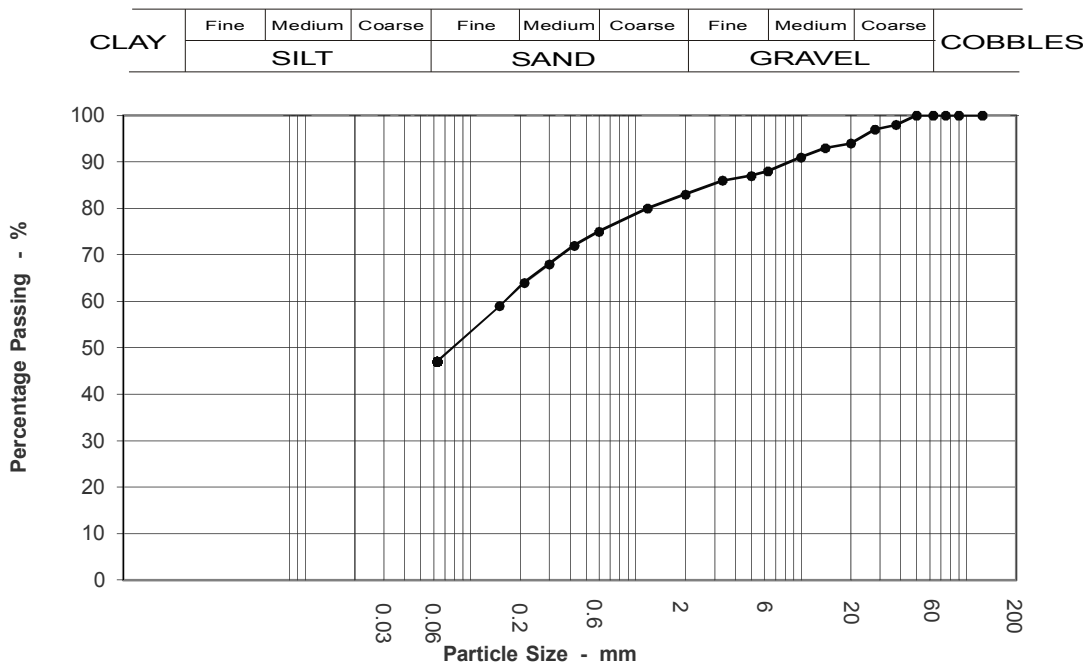


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8721
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH1A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy CLAY	<b>Sample No:</b>	24
		<b>Depth (m):</b>	7.00 - 7.50
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	97		
20	94		
14	93		
10	91		
6.3	88		
5	87		
3.35	86		
2	83		
1.18	80		
0.6	75		
0.425	72		
0.3	68		
0.212	64		
0.15	59		
0.063	47		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	17.0
Sand	36.0
Silt & Clay	47.0

Grading Analysis	
D60	0.16
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



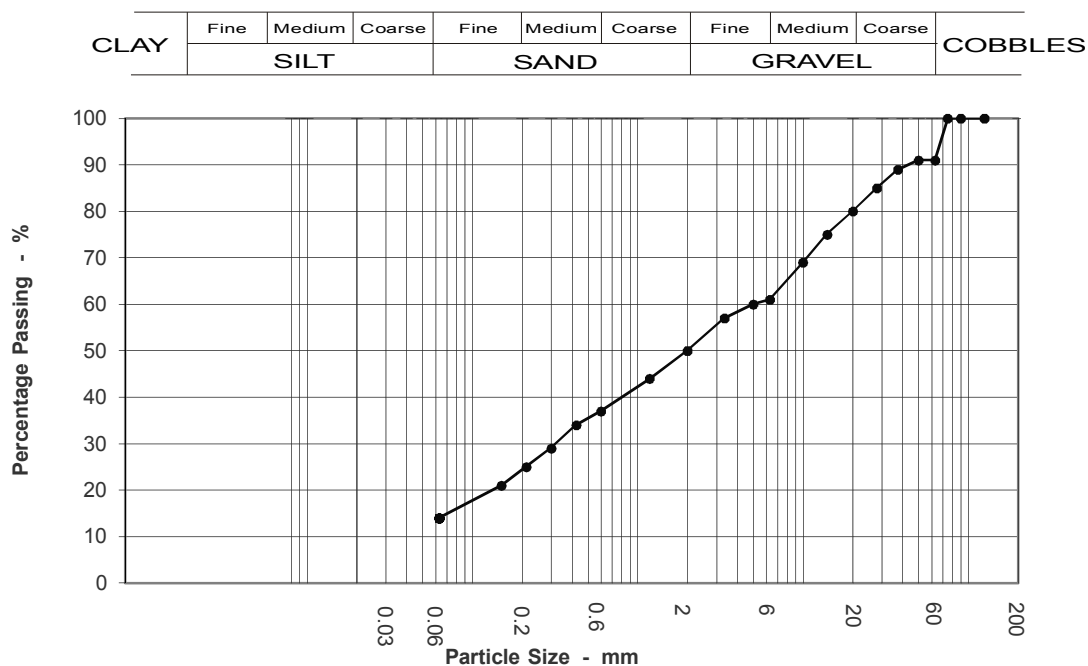


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8722
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH1A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greyish brown clayey very sandy GRAVEL	<b>Sample No:</b>	29
		<b>Depth (m):</b>	9.00 - 10.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	91		
50	91		
37.5	89		
28	85		
20	80		
14	75		
10	69		
6.3	61		
5	60		
3.35	57		
2	50		
1.18	44		
0.6	37		
0.425	34		
0.3	29		
0.212	25		
0.15	21		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	9.0
Gravel	41.0
Sand	36.0
Silt & Clay	14.0

Grading Analysis	
D60	5.00
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



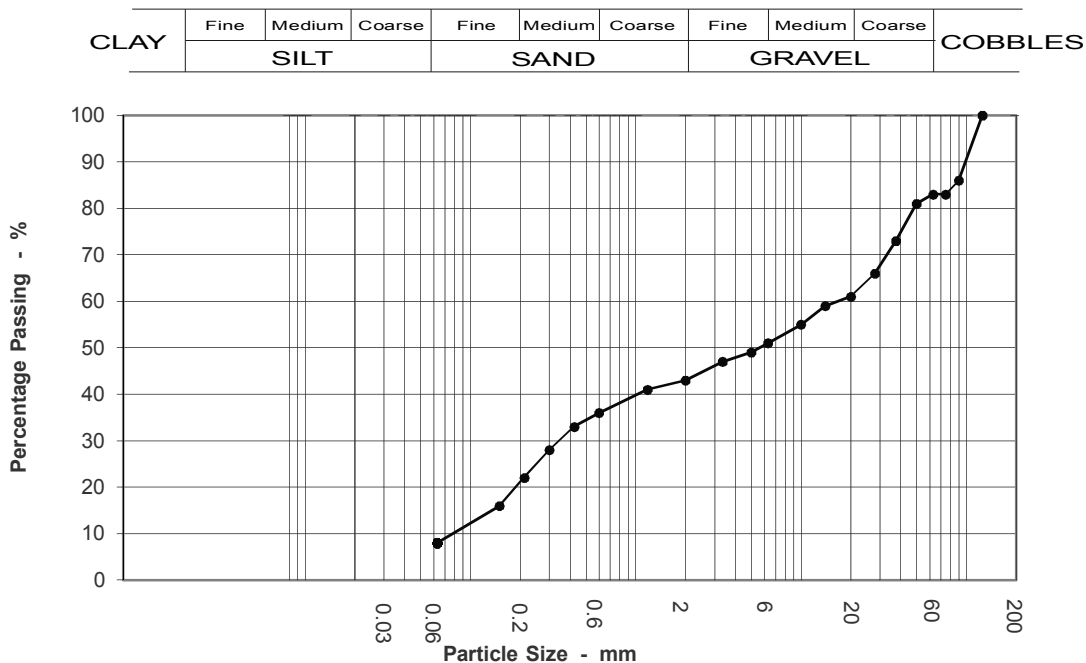


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8723
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH2
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL with cobbles	<b>Sample No:</b>	6
		<b>Depth (m):</b>	0.80 - 1.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	86		
75	83		
63	83		
50	81		
37.5	73		
28	66		
20	61		
14	59		
10	55		
6.3	51		
5	49		
3.35	47		
2	43		
1.18	41		
0.6	36		
0.425	33		
0.3	28		
0.212	22		
0.15	16		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	17.0
Gravel	40.0
Sand	35.0
Silt & Clay	8.0

Grading Analysis	
D60	17.00
D10	0.08
Uniformity Coefficient	200.59

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





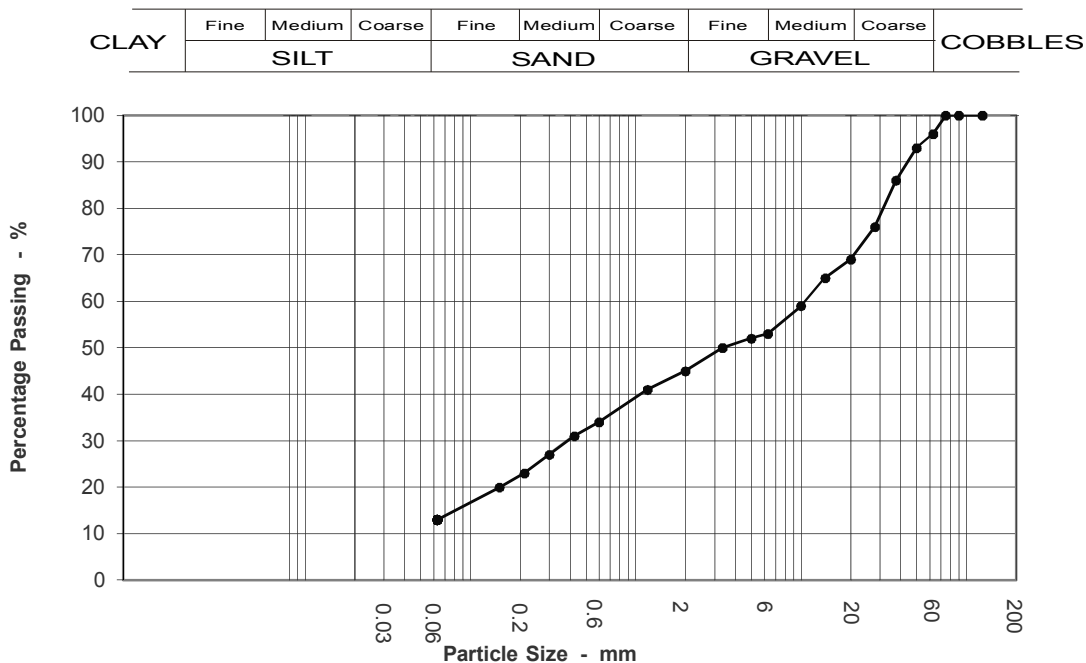


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8725
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH2
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very sandy GRAVEL with occasional cobbles	<b>Sample No:</b>	12
		<b>Depth (m):</b>	3.00 - 4.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	96		
50	93		
37.5	86		
28	76		
20	69		
14	65		
10	59		
6.3	53		
5	52		
3.35	50		
2	45		
1.18	41		
0.6	34		
0.425	31		
0.3	27		
0.212	23		
0.15	20		
0.063	13		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	4.0
Gravel	51.0
Sand	32.0
Silt & Clay	13.0

Grading Analysis	
D60	10.67
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



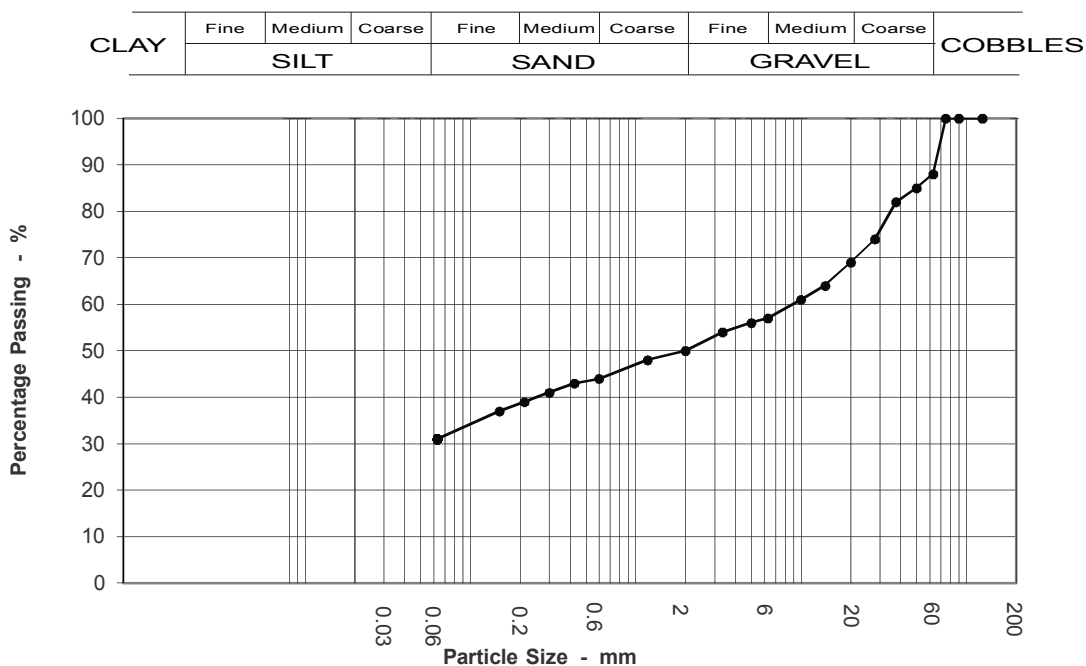


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8726
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH2
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly sandy clayey gravelly SILT with cobbles	<b>Sample No:</b>	14
		<b>Depth (m):</b>	4.00 - 5.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	85		
37.5	82		
28	74		
20	69		
14	64		
10	61		
6.3	57		
5	56		
3.35	54		
2	50		
1.18	48		
0.6	44		
0.425	43		
0.3	41		
0.212	39		
0.15	37		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	12.0
Gravel	38.0
Sand	19.0
Silt & Clay	31.0

Grading Analysis	
D60	9.08
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



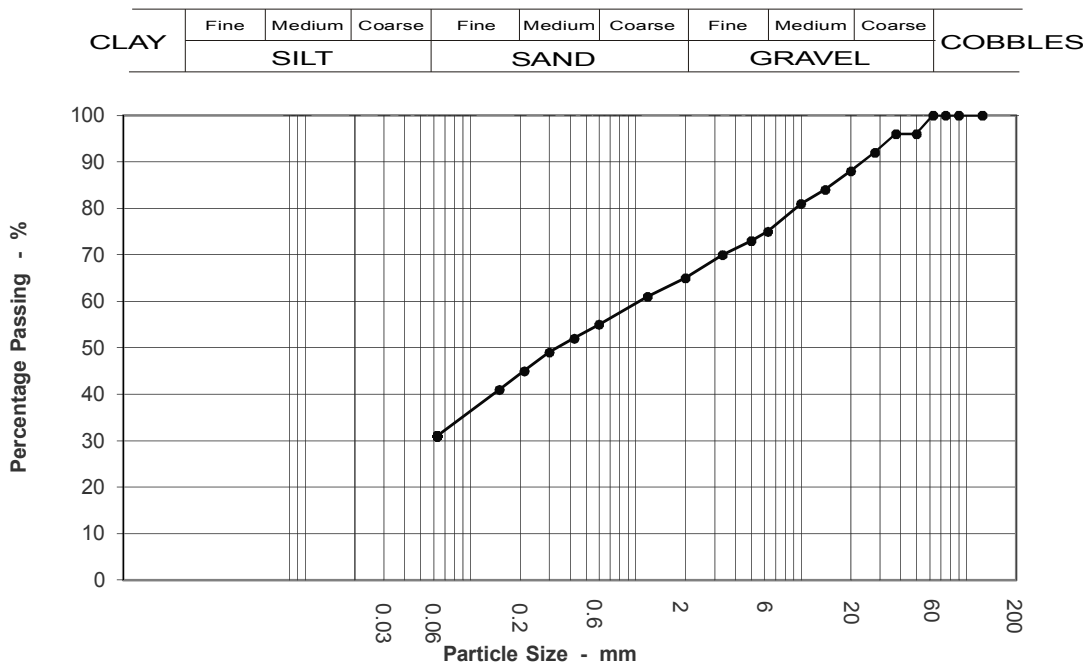


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8727
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH2
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown very silty SAND and GRAVEL	<b>Sample No:</b>	18
		<b>Depth (m):</b>	6.00 - 6.50
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	96		
28	92		
20	88		
14	84		
10	81		
6.3	75		
5	73		
3.35	70		
2	65		
1.18	61		
0.6	55		
0.425	52		
0.3	49		
0.212	45		
0.15	41		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	35.0
Sand	34.0
Silt & Clay	31.0

Grading Analysis	
D60	1.08
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



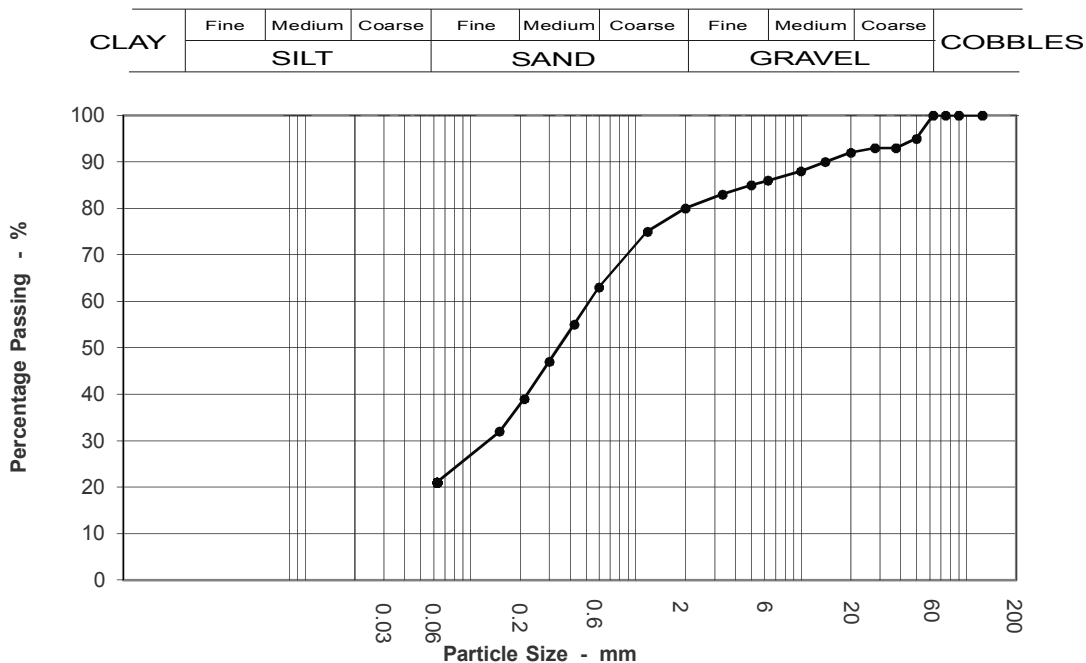


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8728
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Grey clayey gravelly SAND	<b>Sample No:</b>	2
		<b>Depth (m):</b>	0.30 - 0.50
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	93		
28	93		
20	92		
14	90		
10	88		
6.3	86		
5	85		
3.35	83		
2	80		
1.18	75		
0.6	63		
0.425	55		
0.3	47		
0.212	39		
0.15	32		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	20.0
Sand	59.0
Silt & Clay	21.0

Grading Analysis	
D60	0.53
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



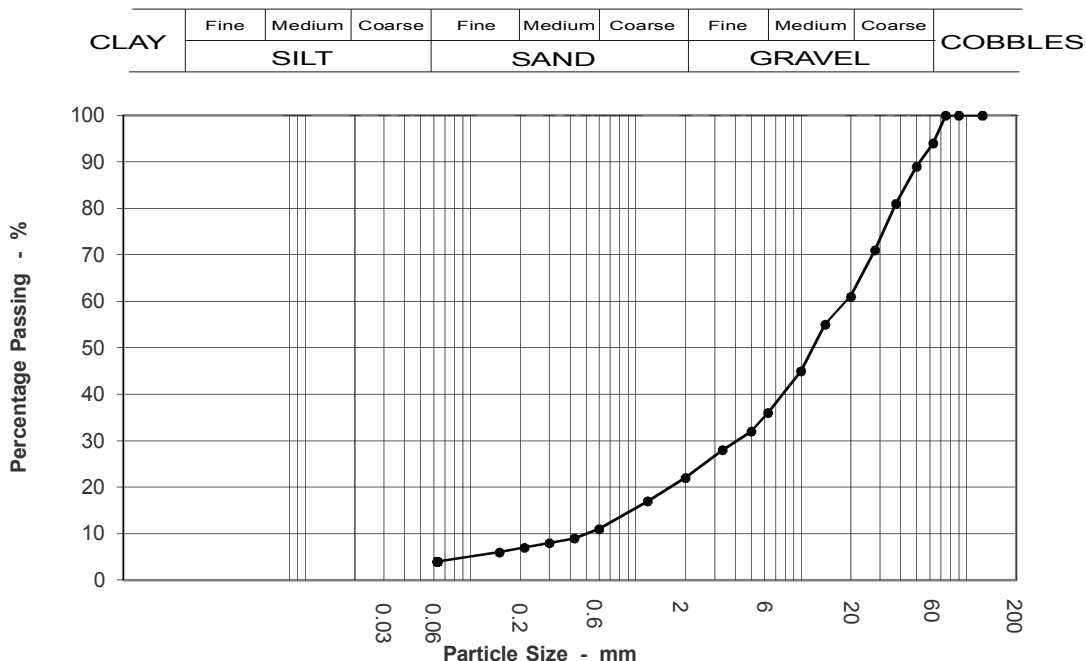


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8729
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	89		
37.5	81		
28	71		
20	61		
14	55		
10	45		
6.3	36		
5	32		
3.35	28		
2	22		
1.18	17		
0.6	11		
0.425	9		
0.3	8		
0.212	7		
0.15	6		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	6.0
Gravel	72.0
Sand	18.0
Silt & Clay	4.0

Grading Analysis	
D60	19.00
D10	0.51
Uniformity Coefficient	37.07

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





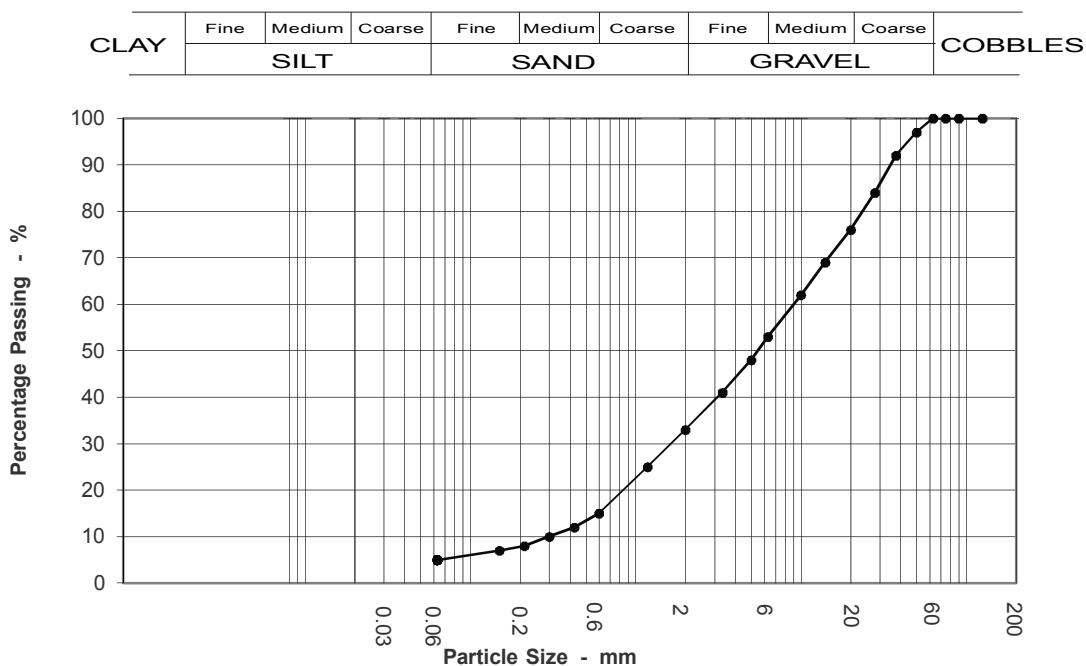


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8731
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey very sandy GRAVEL	<b>Sample No:</b>	7
		<b>Depth (m):</b>	2.00 - 2.60
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	92		
28	84		
20	76		
14	69		
10	62		
6.3	53		
5	48		
3.35	41		
2	33		
1.18	25		
0.6	15		
0.425	12		
0.3	10		
0.212	8		
0.15	7		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	67.0
Sand	28.0
Silt & Clay	5.0

Grading Analysis	
D60	9.18
D10	0.30
Uniformity Coefficient	30.59

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



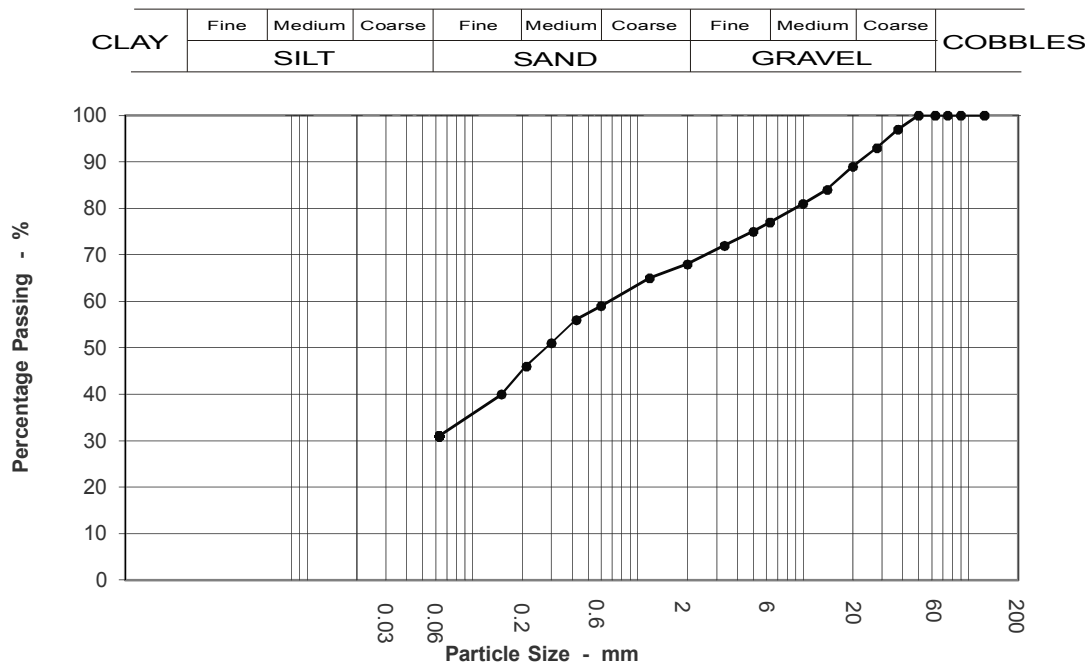


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8735
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly gravelly sandy CLAY	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.80 - 5.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	93		
20	89		
14	84		
10	81		
6.3	77		
5	75		
3.35	72		
2	68		
1.18	65		
0.6	59		
0.425	56		
0.3	51		
0.212	46		
0.15	40		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	37.0
Silt & Clay	31.0

Grading Analysis	
D60	0.70
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



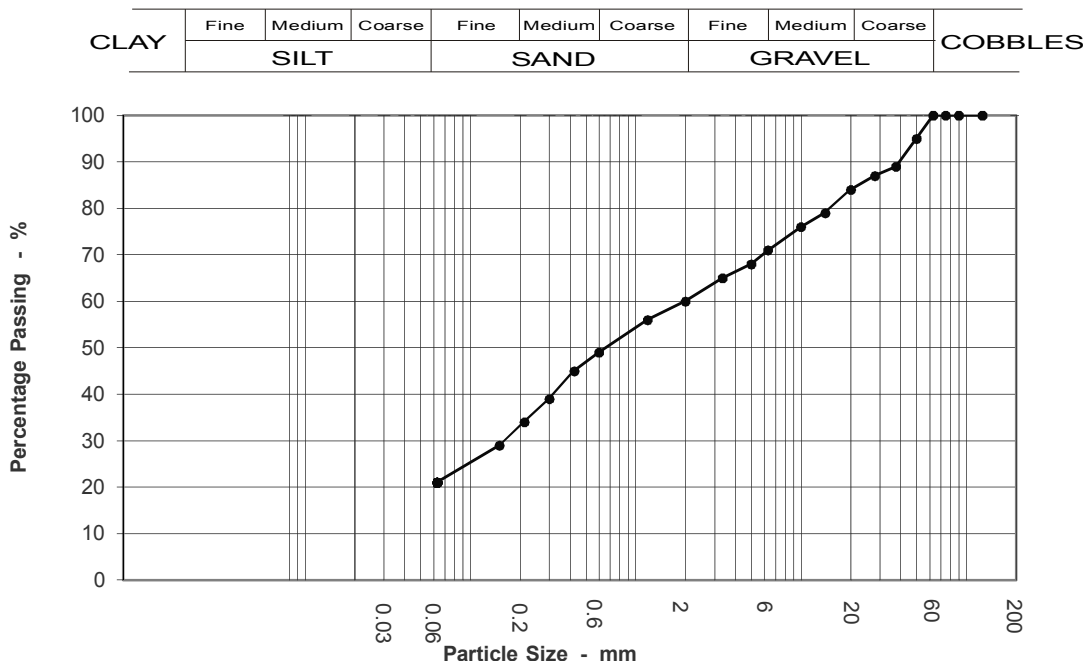


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8733
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very clayey SAND and GRAVEL	<b>Sample No:</b>	13
		<b>Depth (m):</b>	4.00 - 4.70
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	89		
28	87		
20	84		
14	79		
10	76		
6.3	71		
5	68		
3.35	65		
2	60		
1.18	56		
0.6	49		
0.425	45		
0.3	39		
0.212	34		
0.15	29		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	40.0
Sand	39.0
Silt & Clay	21.0

Grading Analysis	
D60	2.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



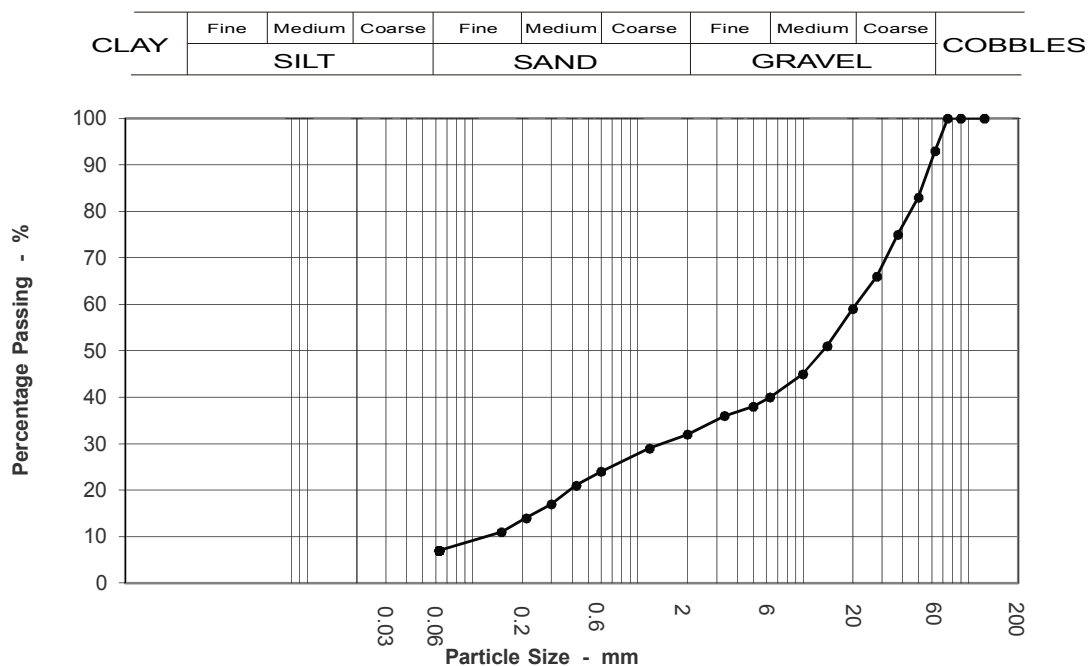


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8739
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Purplish brown clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	4
		<b>Depth (m):</b>	1.20 - 1.90
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	83		
37.5	75		
28	66		
20	59		
14	51		
10	45		
6.3	40		
5	38		
3.35	36		
2	32		
1.18	29		
0.6	24		
0.425	21		
0.3	17		
0.212	14		
0.15	11		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	7.0
Gravel	61.0
Sand	25.0
Silt & Clay	7.0

Grading Analysis	
D60	21.14
D10	0.13
Uniformity Coefficient	164.86

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



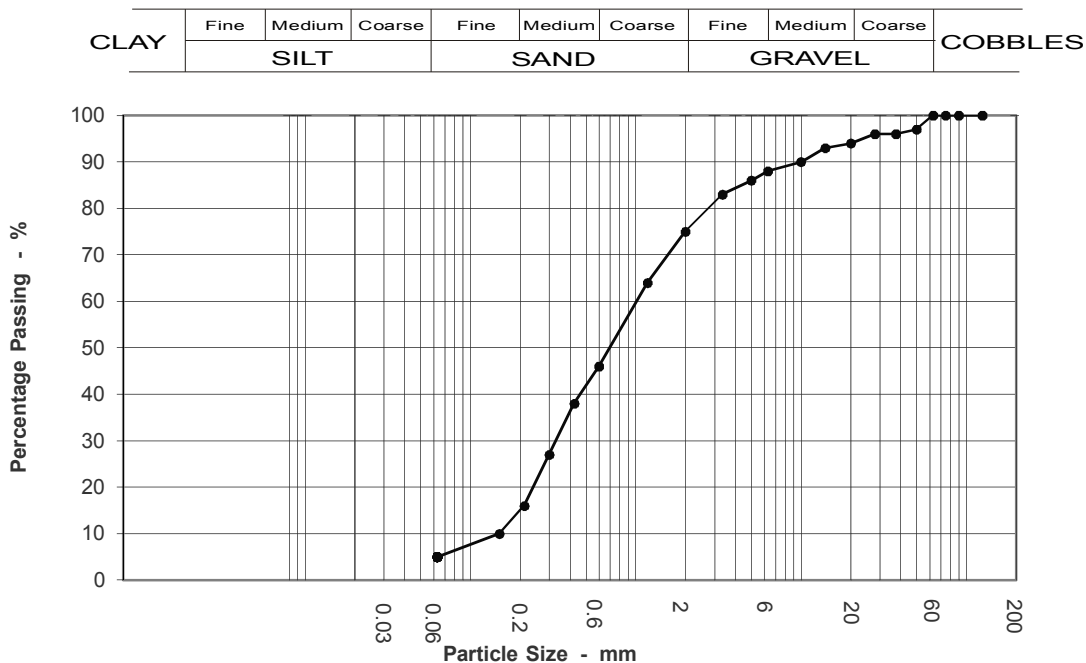


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8742
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greyish brown slightly clayey very gravelly SAND	<b>Sample No:</b>	9
		<b>Depth (m):</b>	3.20 - 5.00
		<b>Date Tested:</b>	25/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	96		
28	96		
20	94		
14	93		
10	90		
6.3	88		
5	86		
3.35	83		
2	75		
1.18	64		
0.6	46		
0.425	38		
0.3	27		
0.212	16		
0.15	10		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	25.0
Sand	70.0
Silt & Clay	5.0

Grading Analysis	
D60	1.05
D10	0.15
Uniformity Coefficient	7.01

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





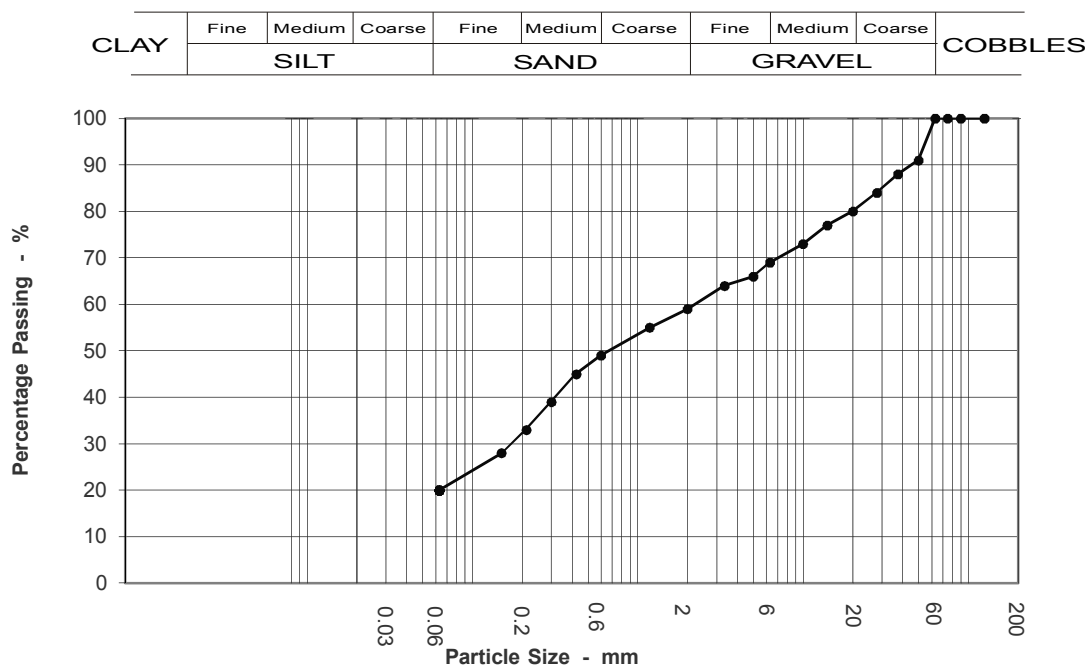


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8743
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark brown sandy gravelly silty CLAY	<b>Sample No:</b>	13
		<b>Depth (m):</b>	5.10 - 5.40
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	88		
28	84		
20	80		
14	77		
10	73		
6.3	69		
5	66		
3.35	64		
2	59		
1.18	55		
0.6	49		
0.425	45		
0.3	39		
0.212	33		
0.15	28		
0.063	20		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	41.0
Sand	39.0
Silt & Clay	20.0

Grading Analysis	
D60	2.27
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



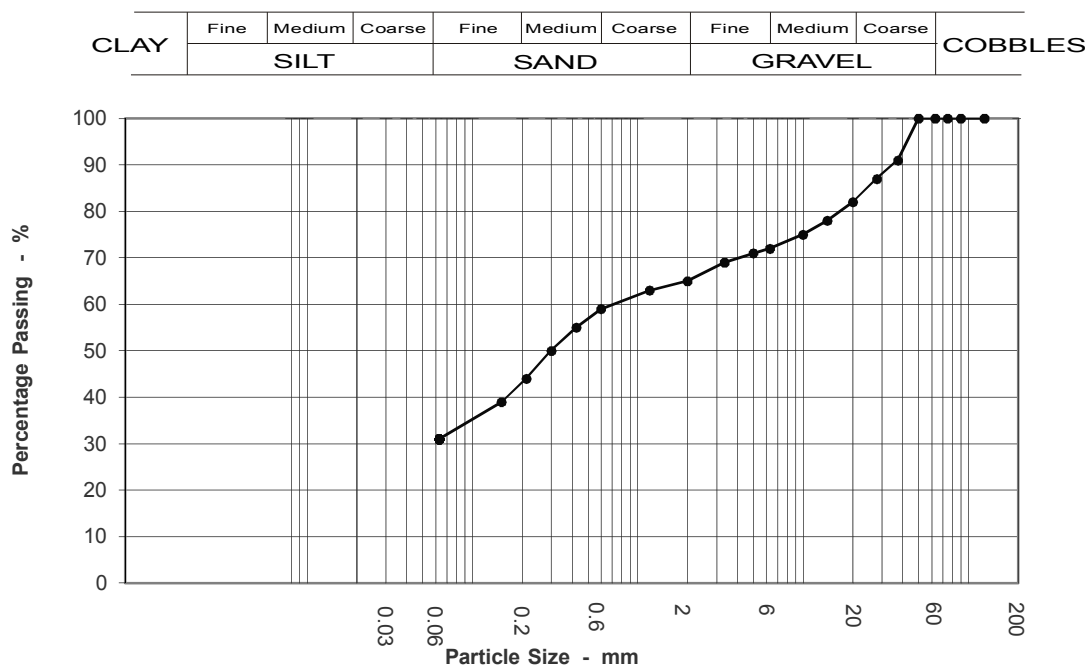


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8744
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown sandy gravelly CLAY	<b>Sample No:</b>	15
		<b>Depth (m):</b>	5.50 - 5.90
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	91		
28	87		
20	82		
14	78		
10	75		
6.3	72		
5	71		
3.35	69		
2	65		
1.18	63		
0.6	59		
0.425	55		
0.3	50		
0.212	44		
0.15	39		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	35.0
Sand	34.0
Silt & Clay	31.0

Grading Analysis	
D60	0.75
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



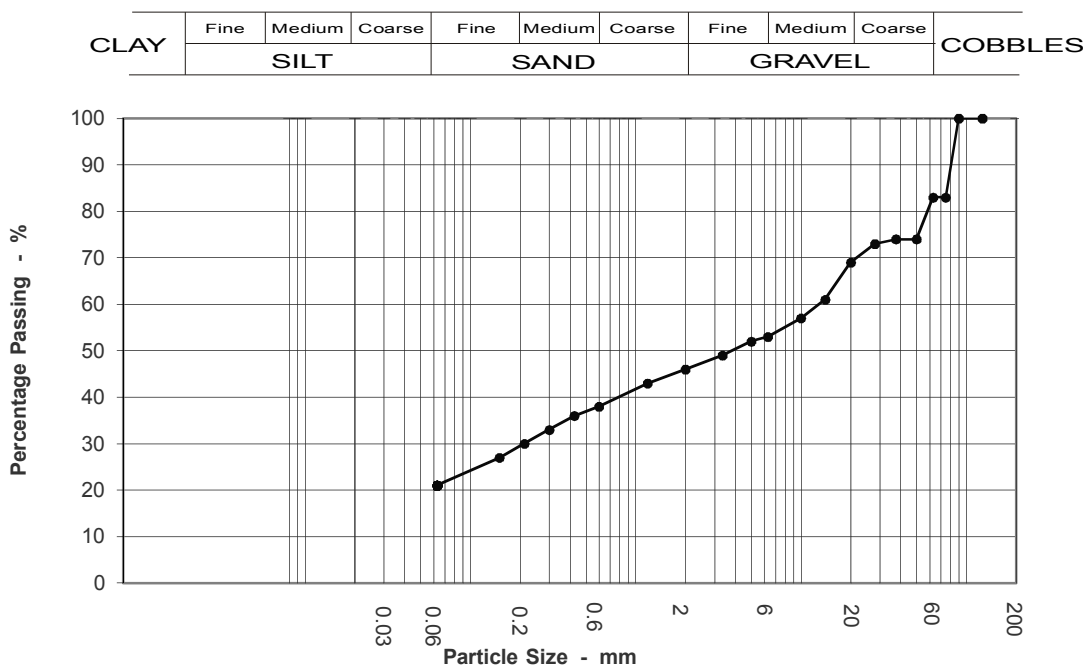


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8746
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	25
		<b>Depth (m):</b>	8.50 - 8.70
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	83		
63	83		
50	74		
37.5	74		
28	73		
20	69		
14	61		
10	57		
6.3	53		
5	52		
3.35	49		
2	46		
1.18	43		
0.6	38		
0.425	36		
0.3	33		
0.212	30		
0.15	27		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	17.0
Gravel	37.0
Sand	25.0
Silt & Clay	21.0

Grading Analysis	
D60	13.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



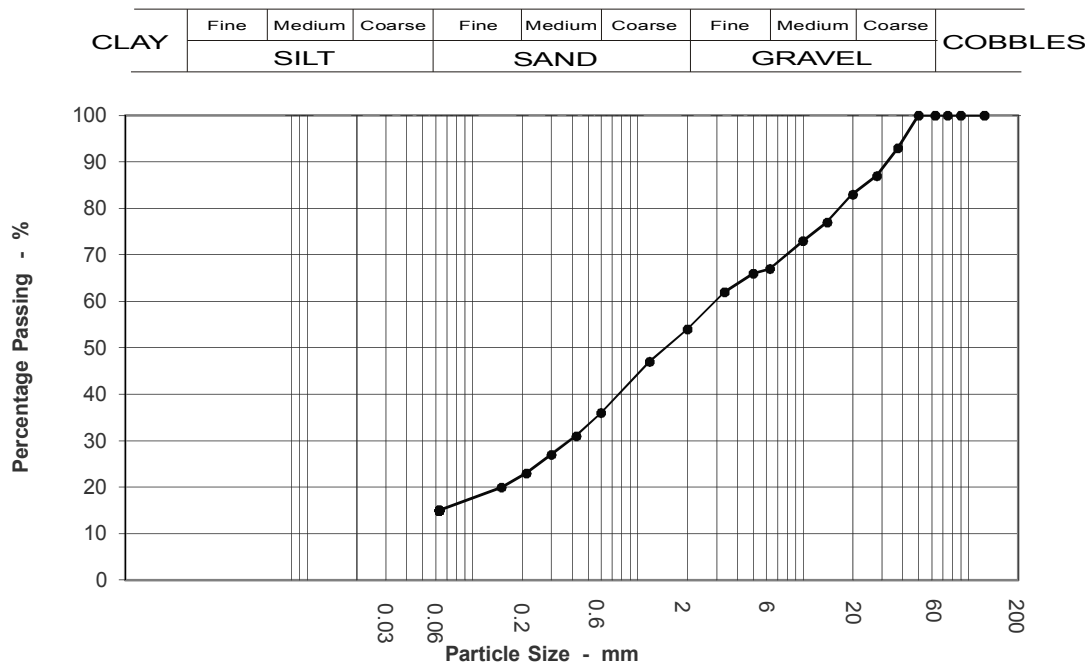


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8747
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greyish brown and brown clayey sandy GRAVEL	<b>Sample No:</b>	28
		<b>Depth (m):</b>	9.20 - 10.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	87		
20	83		
14	77		
10	73		
6.3	67		
5	66		
3.35	62		
2	54		
1.18	47		
0.6	36		
0.425	31		
0.3	27		
0.212	23		
0.15	20		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	46.0
Sand	39.0
Silt & Clay	15.0

Grading Analysis	
D60	3.01
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



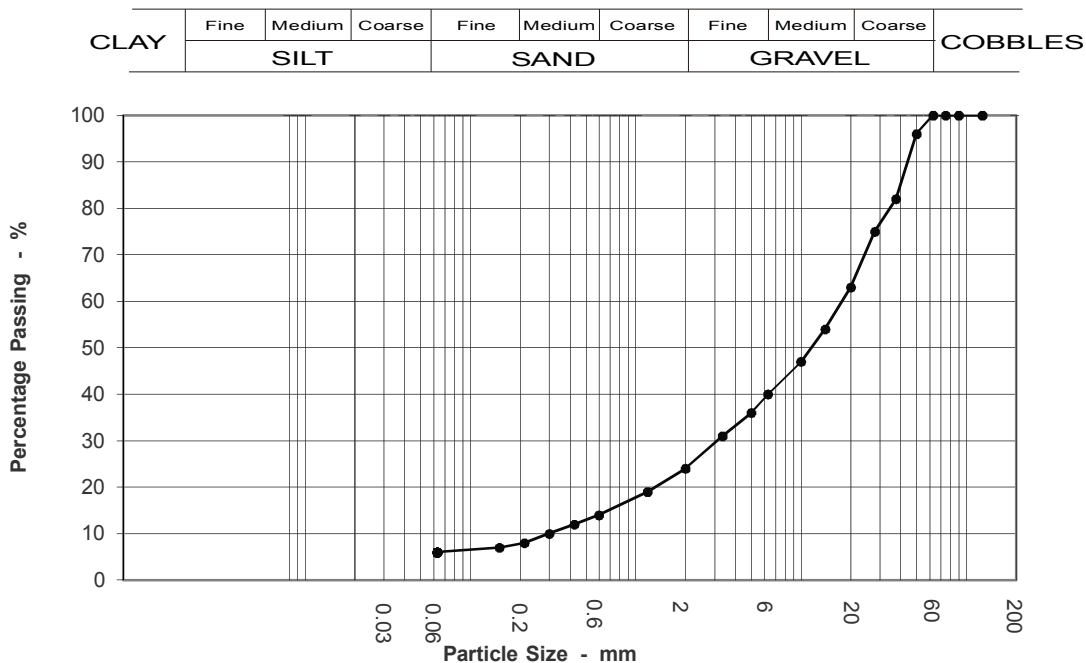


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8748
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey sandy GRAVEL	<b>Sample No:</b>	3
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	82		
28	75		
20	63		
14	54		
10	47		
6.3	40		
5	36		
3.35	31		
2	24		
1.18	19		
0.6	14		
0.425	12		
0.3	10		
0.212	8		
0.15	7		
0.063	6		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	76.0
Sand	18.0
Silt & Clay	6.0

Grading Analysis	
D60	18.00
D10	0.30
Uniformity Coefficient	60.00

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





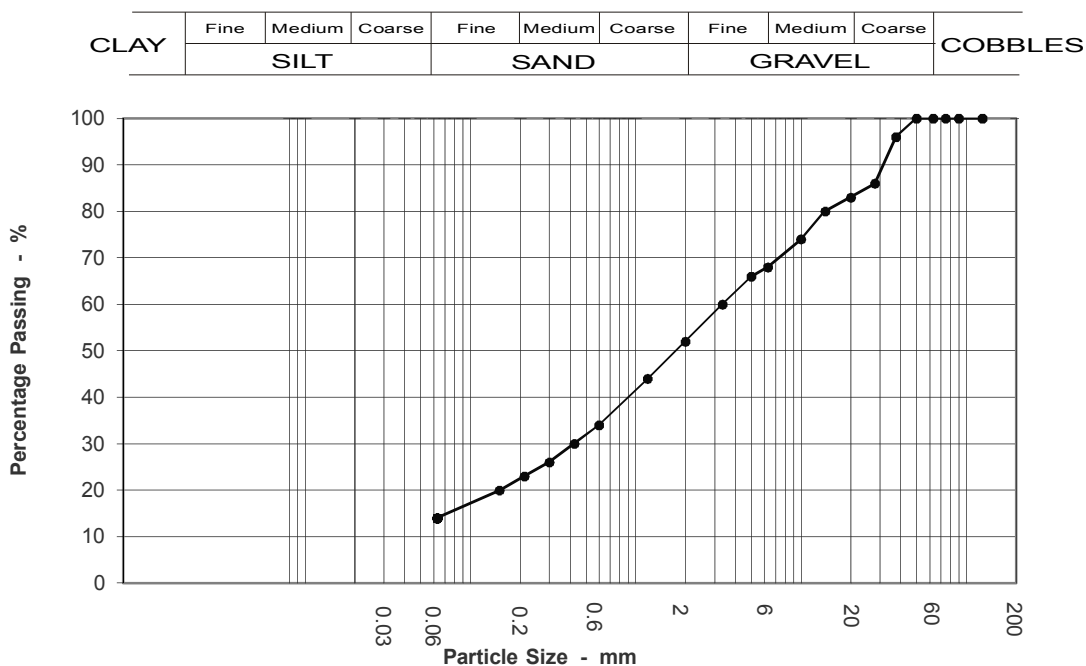


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8752
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Grey and yellowish brown clayey very sandy GRAVEL	<b>Sample No:</b>	5
		<b>Depth (m):</b>	2.70 - 3.30
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	86		
20	83		
14	80		
10	74		
6.3	68		
5	66		
3.35	60		
2	52		
1.18	44		
0.6	34		
0.425	30		
0.3	26		
0.212	23		
0.15	20		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	48.0
Sand	38.0
Silt & Clay	14.0

Grading Analysis	
D60	3.35
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



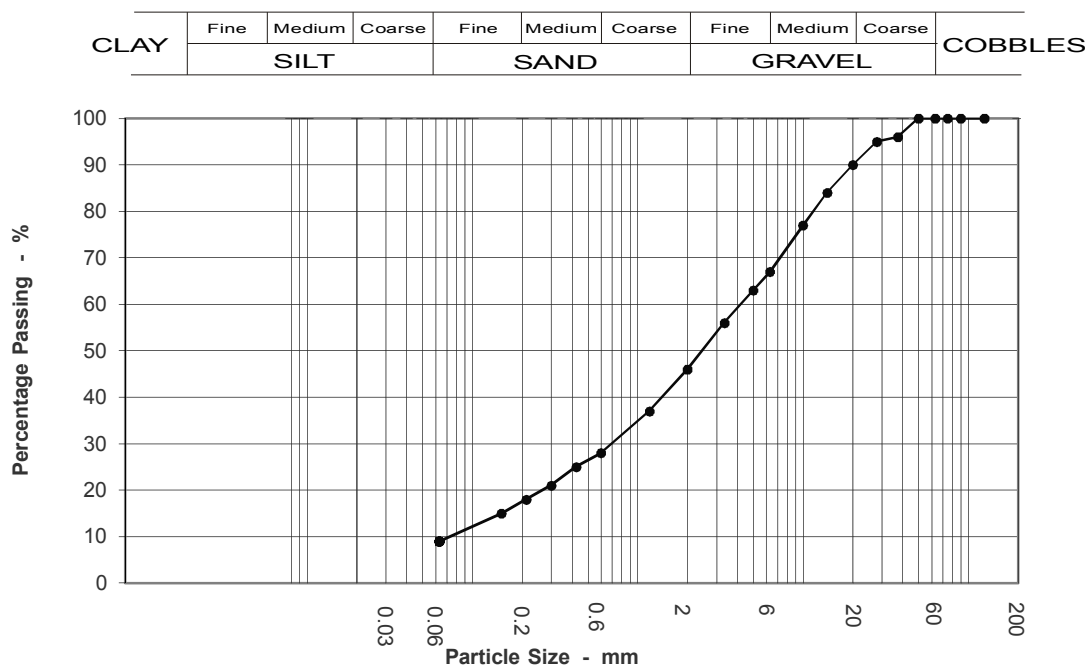


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8751
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey slightly silty very gravelly SAND	<b>Sample No:</b>	4
		<b>Depth (m):</b>	2.00 - 2.70
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	95		
20	90		
14	84		
10	77		
6.3	67		
5	63		
3.35	56		
2	46		
1.18	37		
0.6	28		
0.425	25		
0.3	21		
0.212	18		
0.15	15		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	54.0
Sand	37.0
Silt & Clay	9.0

Grading Analysis	
D60	4.29
D10	0.08
Uniformity Coefficient	55.39

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



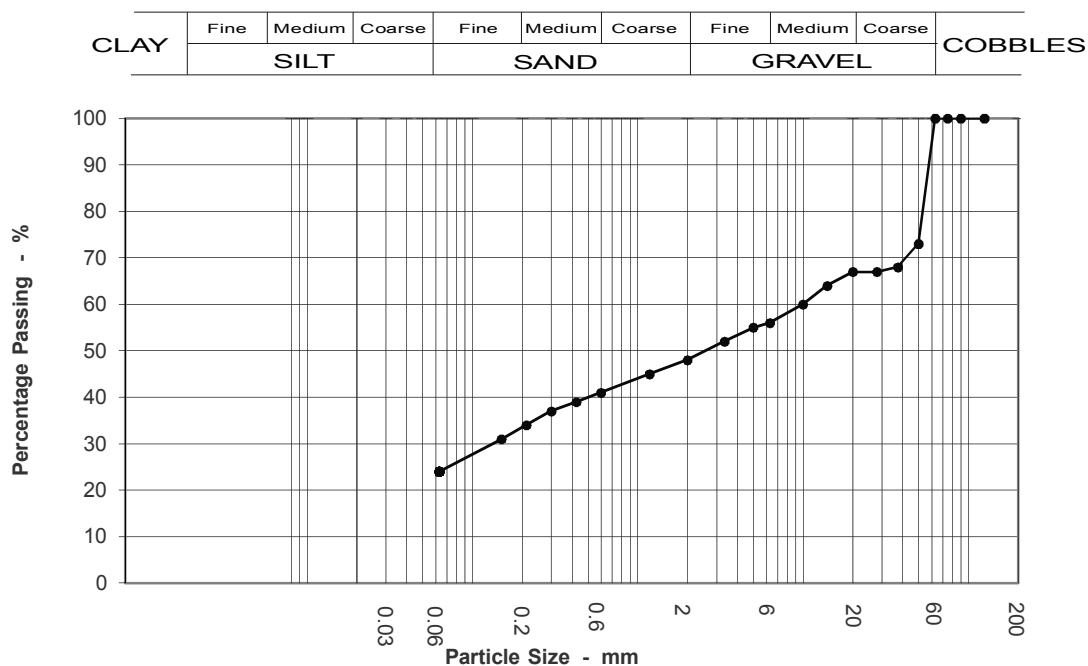


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8738
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown and greyish brown slightly sandy gravelly CLAY	<b>Sample No:</b>	29
		<b>Depth (m):</b>	9.50 - 9.75
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	73		
37.5	68		
28	67		
20	67		
14	64		
10	60		
6.3	56		
5	55		
3.35	52		
2	48		
1.18	45		
0.6	41		
0.425	39		
0.3	37		
0.212	34		
0.15	31		
0.063	24		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	52.0
Sand	24.0
Silt & Clay	24.0

Grading Analysis	
D60	10.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



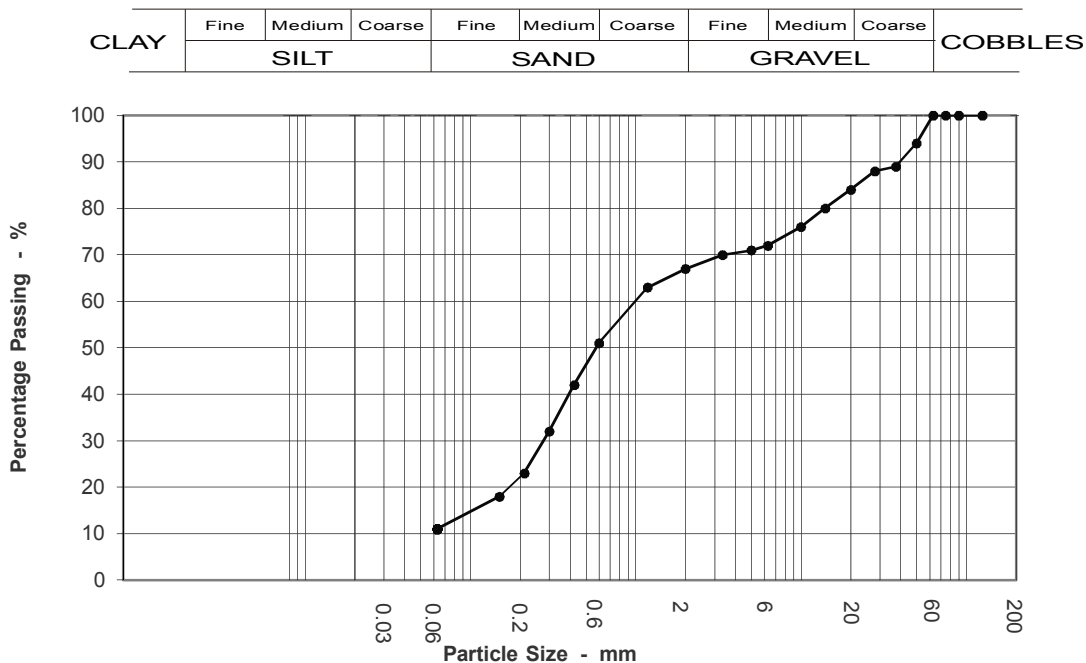


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8754
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Grey silty gravelly SAND	<b>Sample No:</b>	8
		<b>Depth (m):</b>	3.45 - 3.80
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	89		
28	88		
20	84		
14	80		
10	76		
6.3	72		
5	71		
3.35	70		
2	67		
1.18	63		
0.6	51		
0.425	42		
0.3	32		
0.212	23		
0.15	18		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	33.0
Sand	56.0
Silt & Clay	11.0

Grading Analysis	
D60	1.04
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



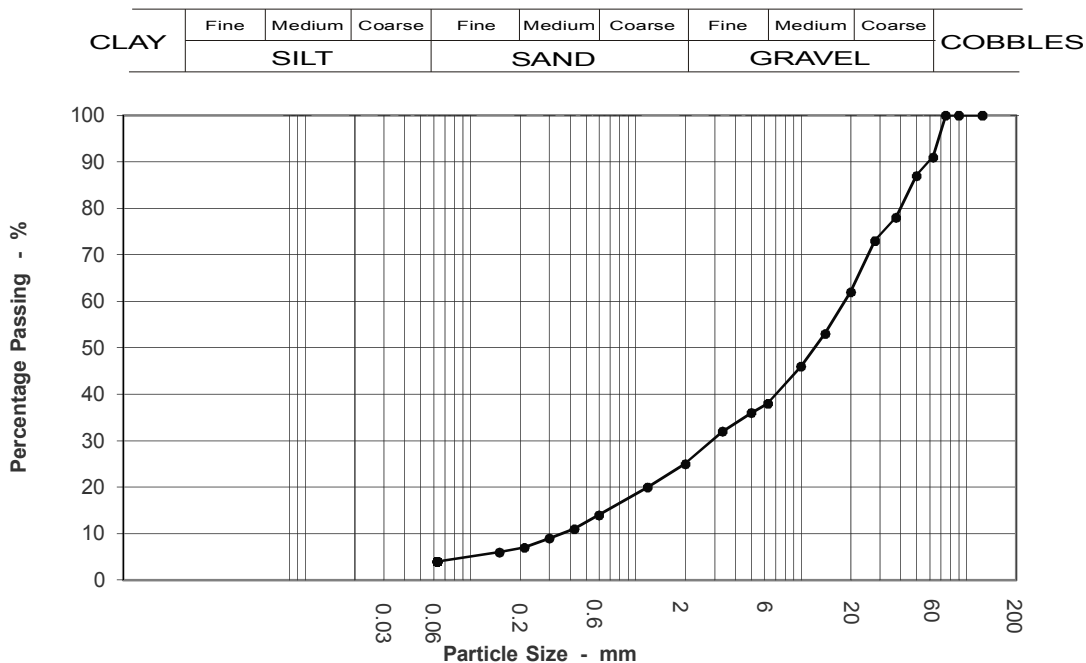


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8755
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown sandy GRAVEL with cobbles	<b>Sample No:</b>	12
		<b>Depth (m):</b>	5.00 - 5.50
		<b>Date Tested:</b>	25/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	91		
50	87		
37.5	78		
28	73		
20	62		
14	53		
10	46		
6.3	38		
5	36		
3.35	32		
2	25		
1.18	20		
0.6	14		
0.425	11		
0.3	9		
0.212	7		
0.15	6		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	9.0
Gravel	66.0
Sand	21.0
Silt & Clay	4.0

Grading Analysis	
D60	18.67
D10	0.36
Uniformity Coefficient	51.49

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





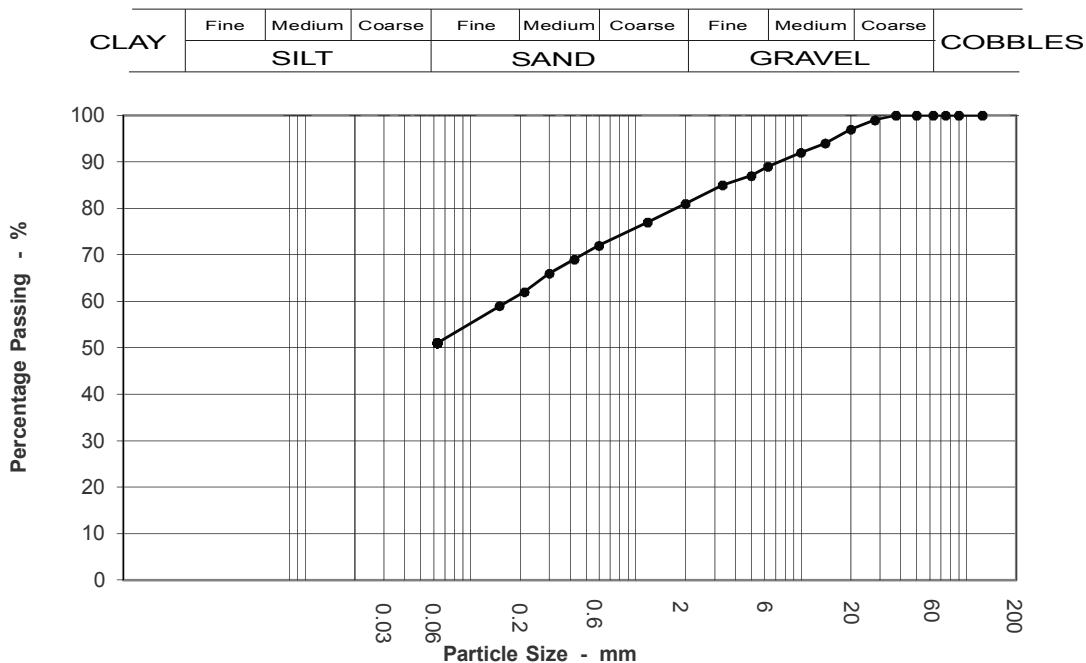


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8756
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Grey slightly gravelly slightly sandy SILT	<b>Sample No:</b>	15
		<b>Depth (m):</b>	5.60 - 6.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	97		
14	94		
10	92		
6.3	89		
5	87		
3.35	85		
2	81		
1.18	77		
0.6	72		
0.425	69		
0.3	66		
0.212	62		
0.15	59		
0.063	51		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	19.0
Sand	30.0
Silt & Clay	51.0

Grading Analysis	
D60	0.17
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



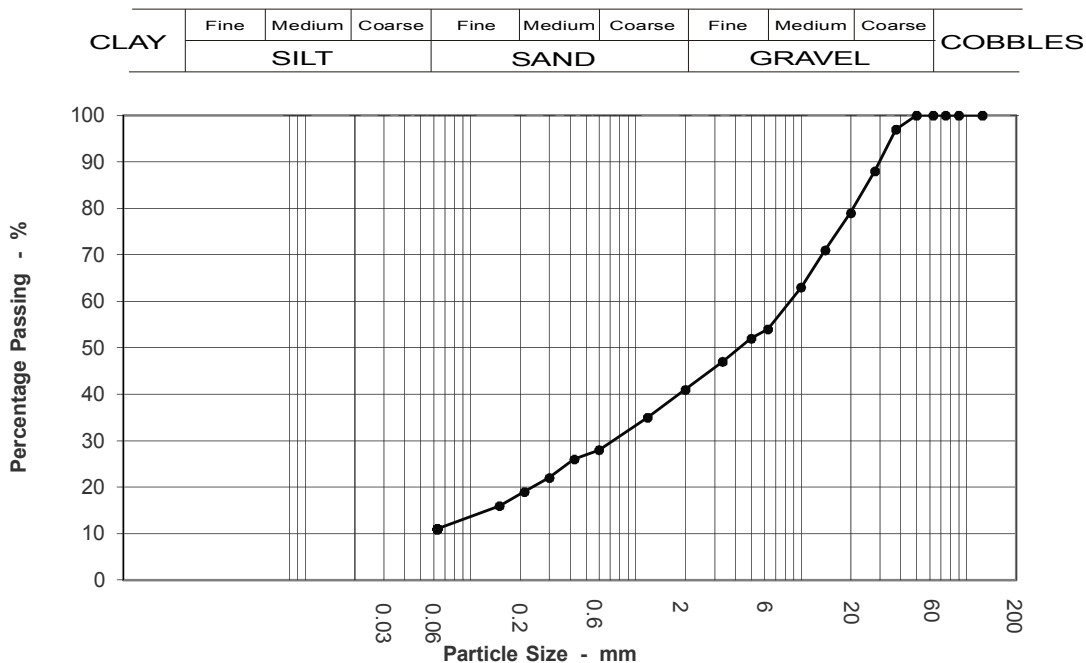


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8757
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light brown silty very sandy GRAVEL	<b>Sample No:</b>	21
		<b>Depth (m):</b>	8.25 - 9.30
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	88		
20	79		
14	71		
10	63		
6.3	54		
5	52		
3.35	47		
2	41		
1.18	35		
0.6	28		
0.425	26		
0.3	22		
0.212	19		
0.15	16		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	59.0
Sand	30.0
Silt & Clay	11.0

Grading Analysis	
D60	8.77
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



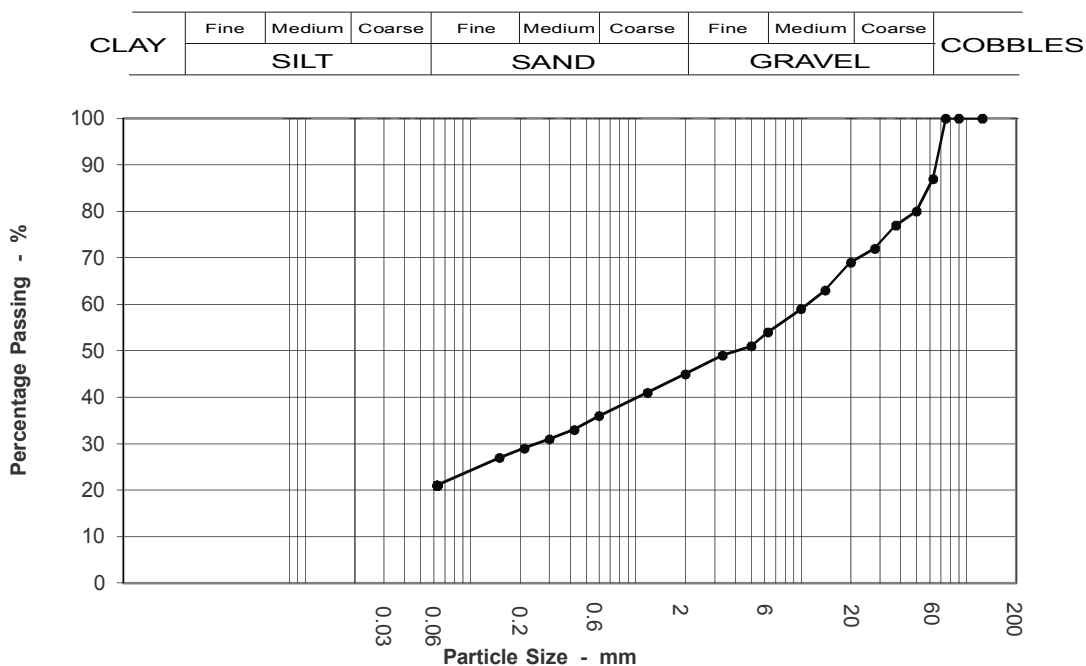


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8759
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greenish grey very clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	25
		<b>Depth (m):</b>	9.40 - 10.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	87		
50	80		
37.5	77		
28	72		
20	69		
14	63		
10	59		
6.3	54		
5	51		
3.35	49		
2	45		
1.18	41		
0.6	36		
0.425	33		
0.3	31		
0.212	29		
0.15	27		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	13.0
Gravel	42.0
Sand	24.0
Silt & Clay	21.0

Grading Analysis	
D60	11.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



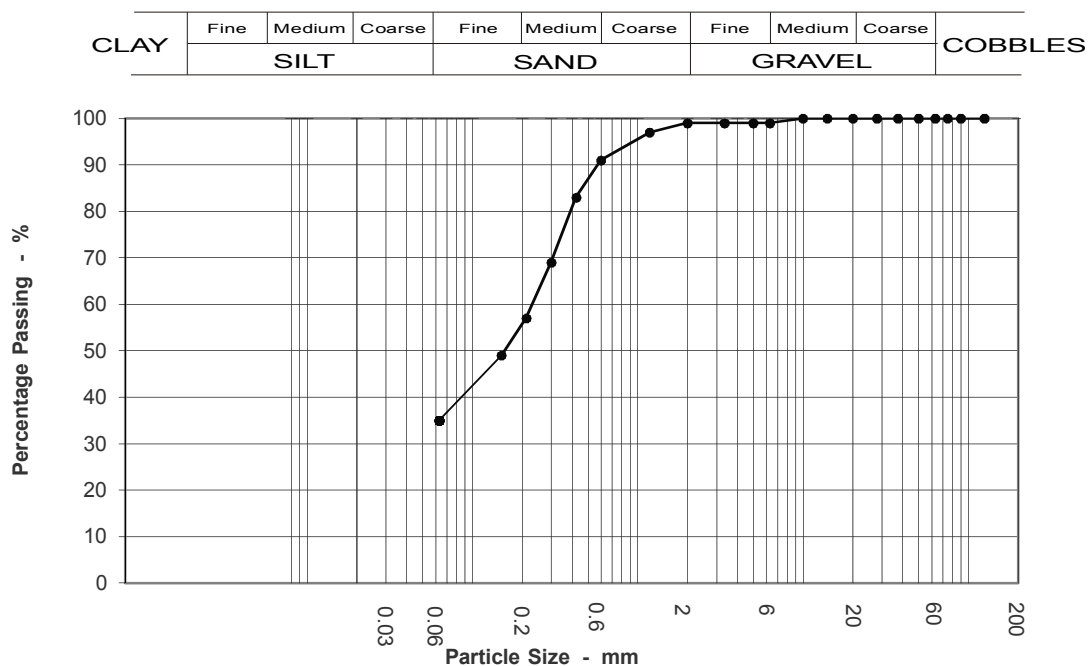


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8749
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Purplish grey sandy clayey SILT	<b>Sample No:</b>	27
		<b>Depth (m):</b>	10.00 - 10.50
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	99		
1.18	97		
0.6	91		
0.425	83		
0.3	69		
0.212	57		
0.15	49		
0.063	35		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	1.0
Sand	64.0
Silt & Clay	35.0

Grading Analysis	
D60	0.23
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



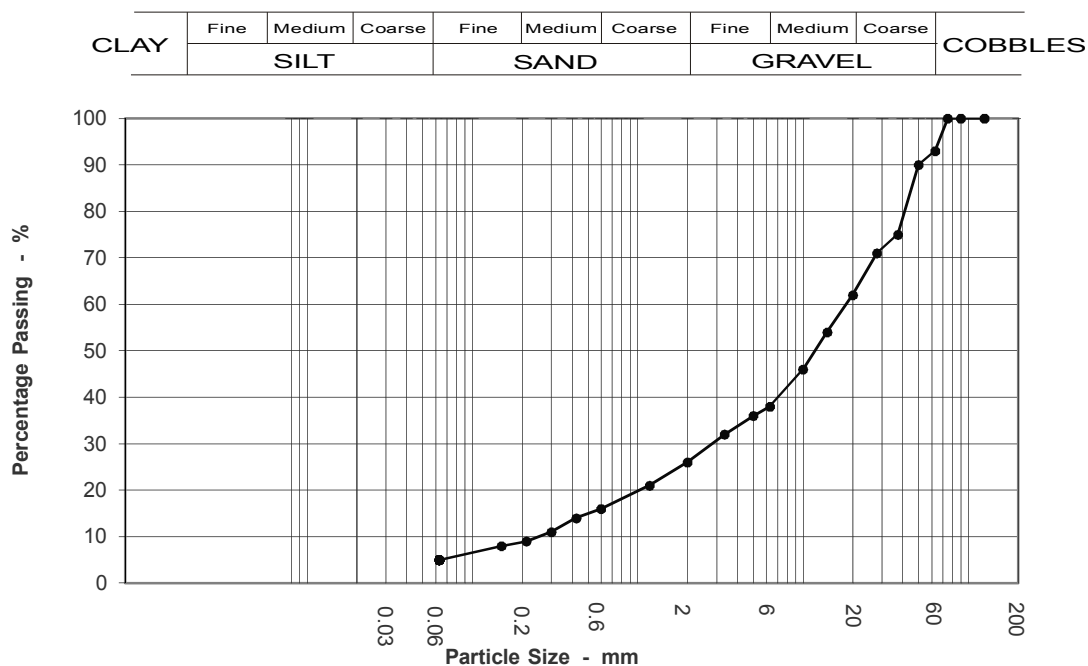


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8760
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	90		
37.5	75		
28	71		
20	62		
14	54		
10	46		
6.3	38		
5	36		
3.35	32		
2	26		
1.18	21		
0.6	16		
0.425	14		
0.3	11		
0.212	9		
0.15	8		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	7.0
Gravel	67.0
Sand	21.0
Silt & Clay	5.0

Grading Analysis	
D60	18.50
D10	0.26
Uniformity Coefficient	72.27

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





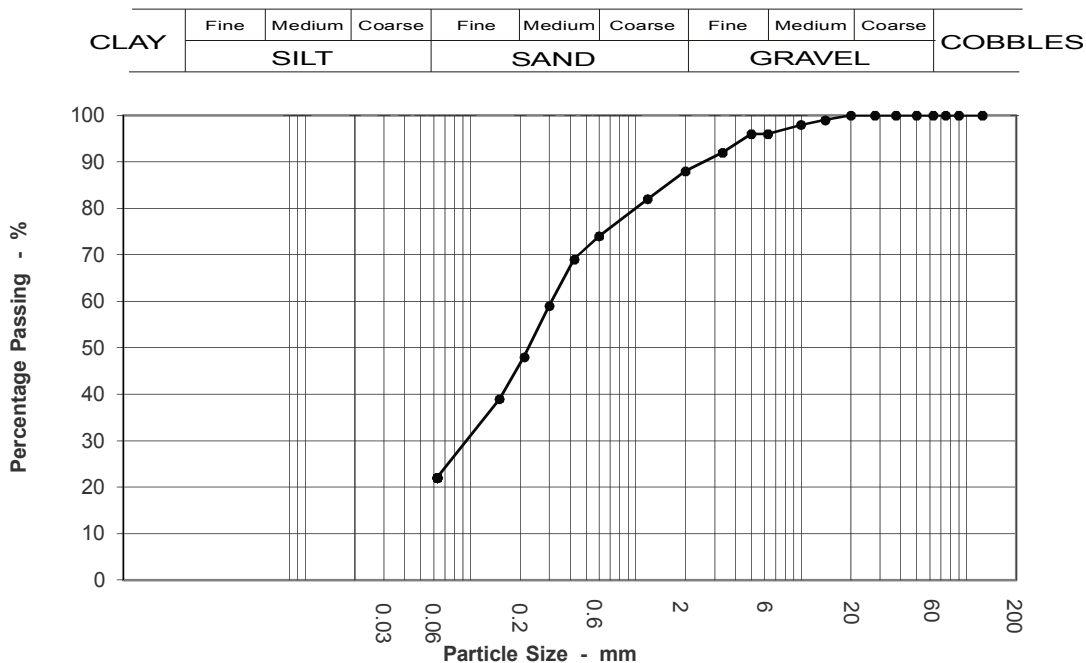


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8761
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Black slightly gravelly sandy organic SILT	<b>Sample No:</b>	7
		<b>Depth (m):</b>	2.35 - 2.70
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	96		
5	96		
3.35	92		
2	88		
1.18	82		
0.6	74		
0.425	69		
0.3	59		
0.212	48		
0.15	39		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	12.0
Sand	66.0
Silt & Clay	22.0

Grading Analysis	
D60	0.31
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



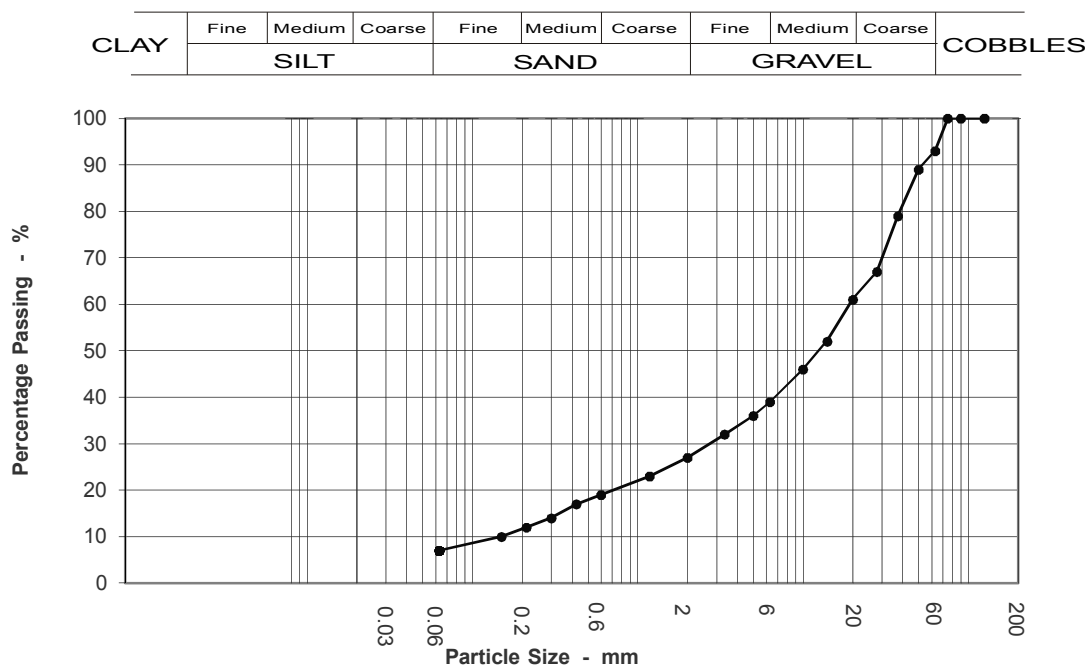


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8762
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light brown and grey clayey sandy GRAVEL with cobbles	<b>Sample No:</b>	10
		<b>Depth (m):</b>	3.10 - 3.80
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	89		
37.5	79		
28	67		
20	61		
14	52		
10	46		
6.3	39		
5	36		
3.35	32		
2	27		
1.18	23		
0.6	19		
0.425	17		
0.3	14		
0.212	12		
0.15	10		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	7.0
Gravel	66.0
Sand	20.0
Silt & Clay	7.0

Grading Analysis	
D60	19.33
D10	0.15
Uniformity Coefficient	128.89

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



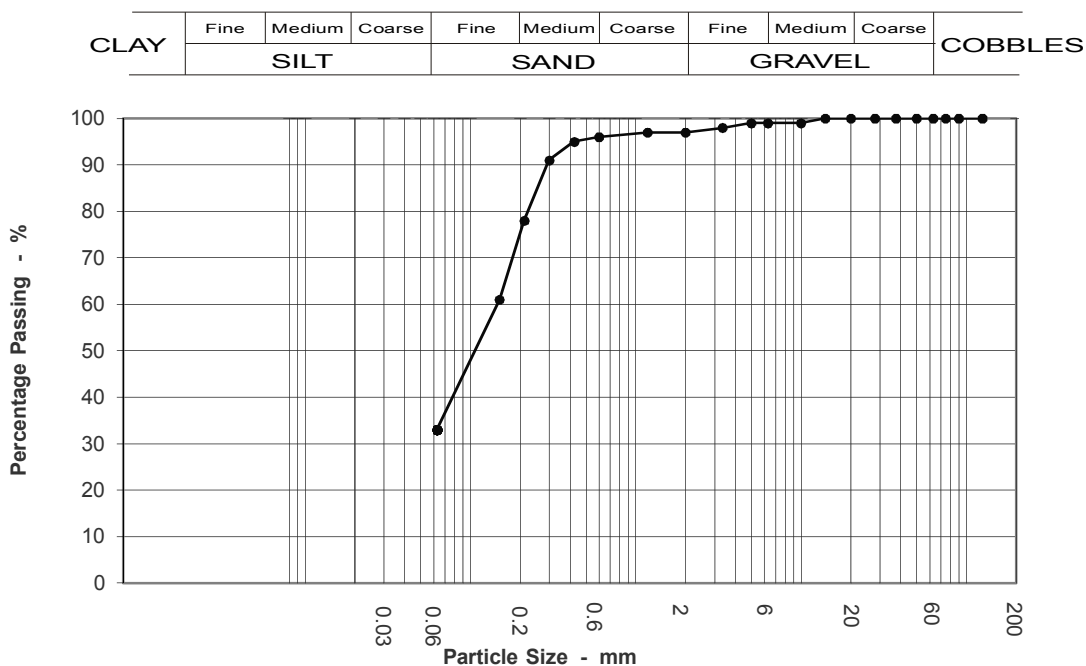


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8764
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greenish grey slightly gravelly clayey SAND	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.80 - 5.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	98		
2	97		
1.18	97		
0.6	96		
0.425	95		
0.3	91		
0.212	78		
0.15	61		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	3.0
Sand	64.0
Silt & Clay	33.0

Grading Analysis	
D60	0.15
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



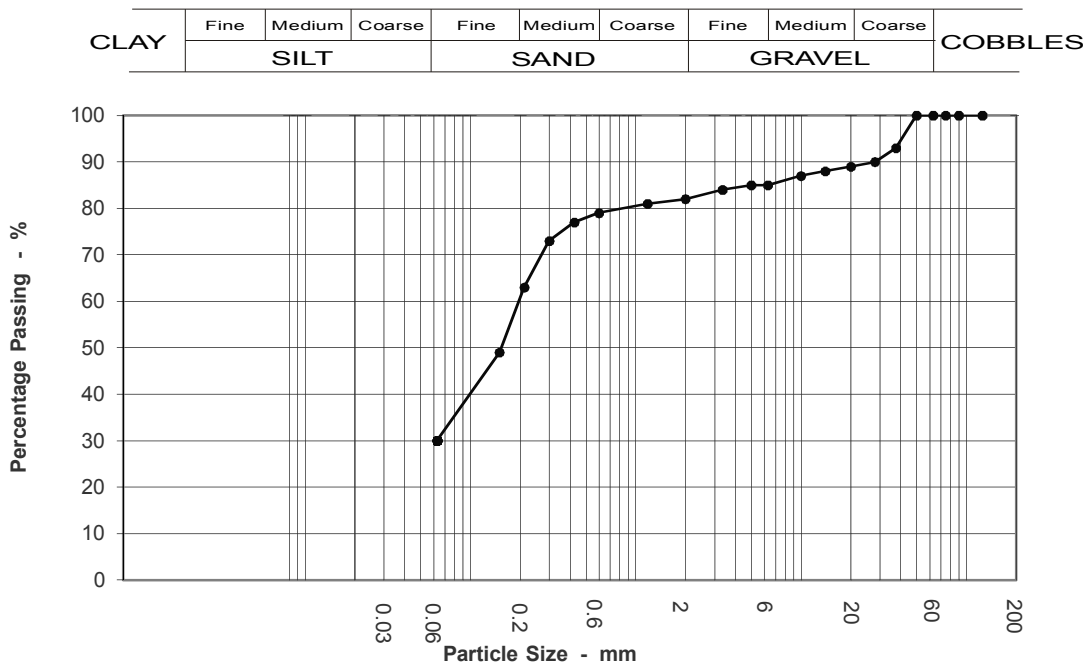


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8766
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greenish grey and purplish brown slightly gravelly sandy silty CLAY	<b>Sample No:</b>	20
		<b>Depth (m):</b>	6.75 - 7.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	90		
20	89		
14	88		
10	87		
6.3	85		
5	85		
3.35	84		
2	82		
1.18	81		
0.6	79		
0.425	77		
0.3	73		
0.212	63		
0.15	49		
0.063	30		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	18.0
Sand	52.0
Silt & Clay	30.0

Grading Analysis	
D60	0.20
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



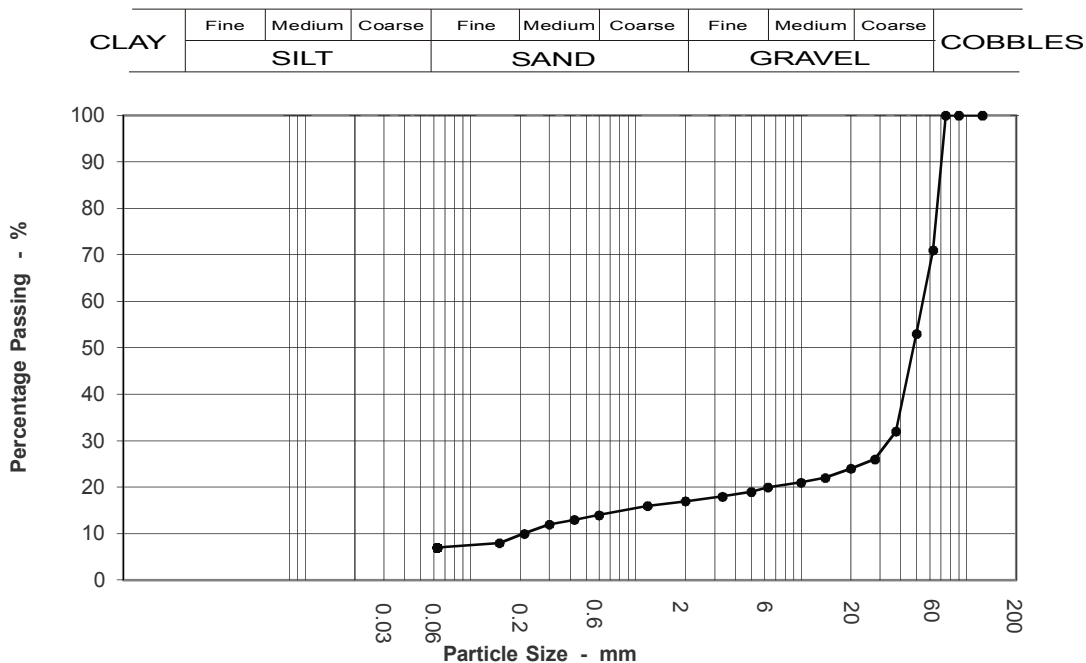


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8768
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH7
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark brown clayey sandy GRAVEL with frequent cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	71		
50	53		
37.5	32		
28	26		
20	24		
14	22		
10	21		
6.3	20		
5	19		
3.35	18		
2	17		
1.18	16		
0.6	14		
0.425	13		
0.3	12		
0.212	10		
0.15	8		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	29.0
Gravel	54.0
Sand	10.0
Silt & Clay	7.0

Grading Analysis	
D60	55.06
D10	0.21
Uniformity Coefficient	259.70

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





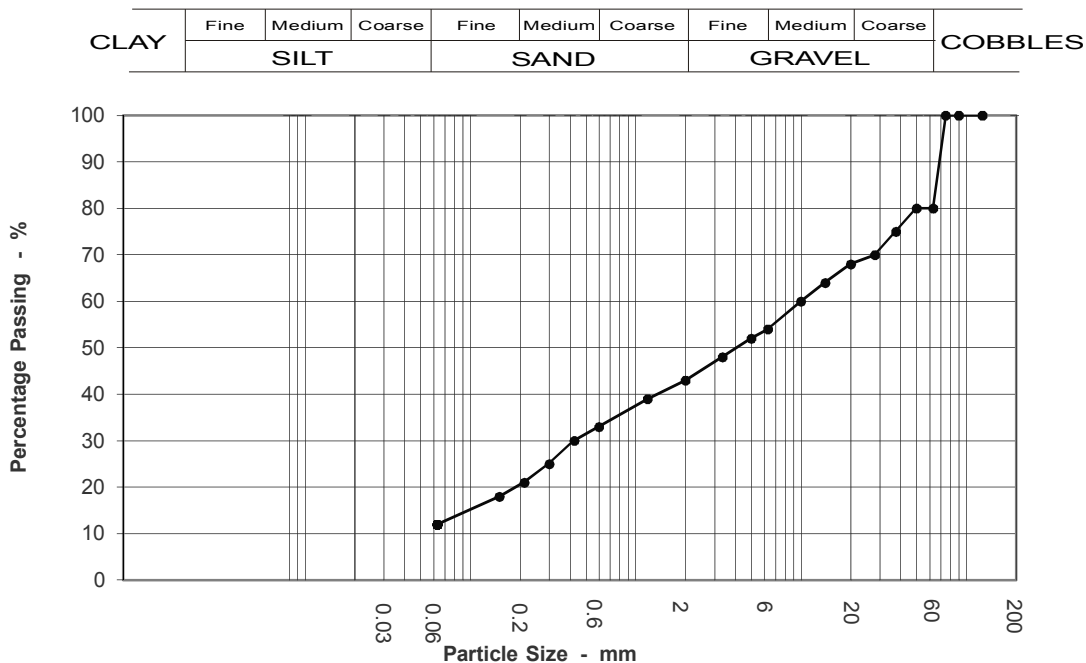


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8769
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH7
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very sandy GRAVEL with frequent cobbles	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.40 - 2.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	80		
50	80		
37.5	75		
28	70		
20	68		
14	64		
10	60		
6.3	54		
5	52		
3.35	48		
2	43		
1.18	39		
0.6	33		
0.425	30		
0.3	25		
0.212	21		
0.15	18		
0.063	12		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	20.0
Gravel	37.0
Sand	31.0
Silt & Clay	12.0

Grading Analysis	
D60	10.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



1489

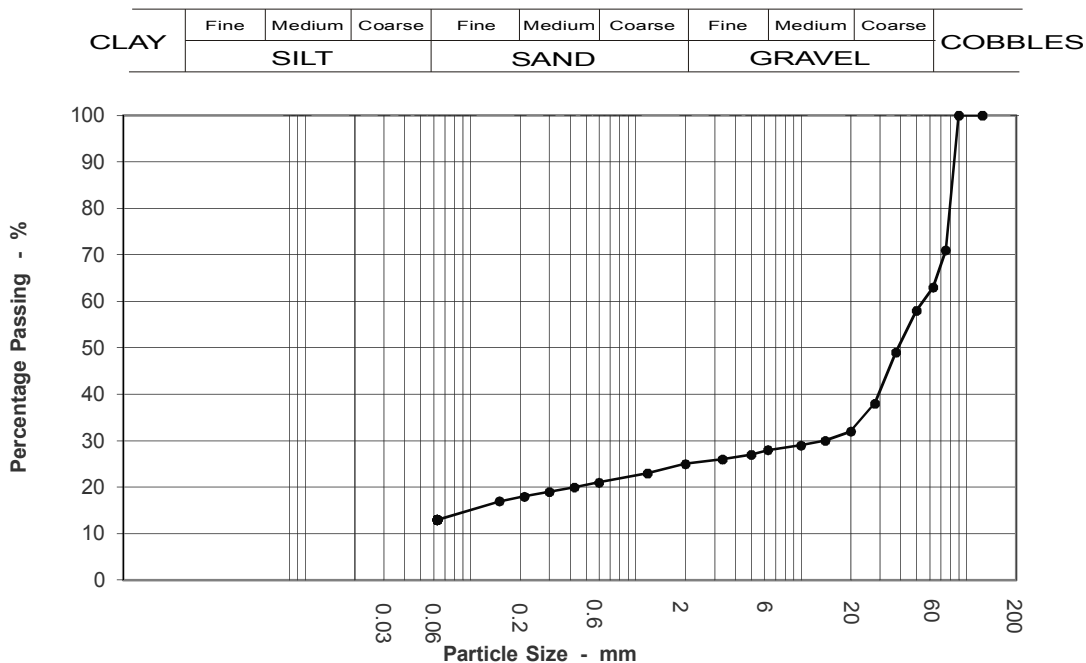


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8770
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH7
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown clayey sandy GRAVEL with frequent cobbles	<b>Sample No:</b>	10
		<b>Depth (m):</b>	2.30 - 3.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	71		
63	63		
50	58		
37.5	49		
28	38		
20	32		
14	30		
10	29		
6.3	28		
5	27		
3.35	26		
2	25		
1.18	23		
0.6	21		
0.425	20		
0.3	19		
0.212	18		
0.15	17		
0.063	13		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	37.0
Gravel	38.0
Sand	12.0
Silt & Clay	13.0

Grading Analysis	
D60	55.20
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



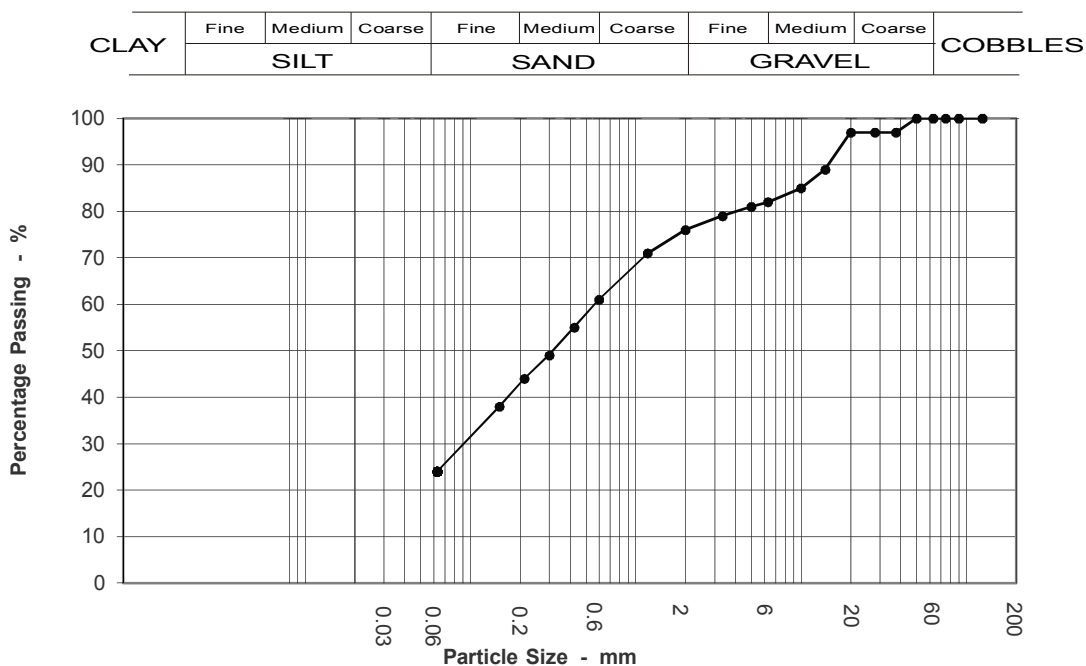


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8772
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH7
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey very silty very gravelly SAND	<b>Sample No:</b>	13
		<b>Depth (m):</b>	3.60 - 4.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	97		
20	97		
14	89		
10	85		
6.3	82		
5	81		
3.35	79		
2	76		
1.18	71		
0.6	61		
0.425	55		
0.3	49		
0.212	44		
0.15	38		
0.063	24		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	52.0
Silt & Clay	24.0

Grading Analysis	
D60	0.57
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



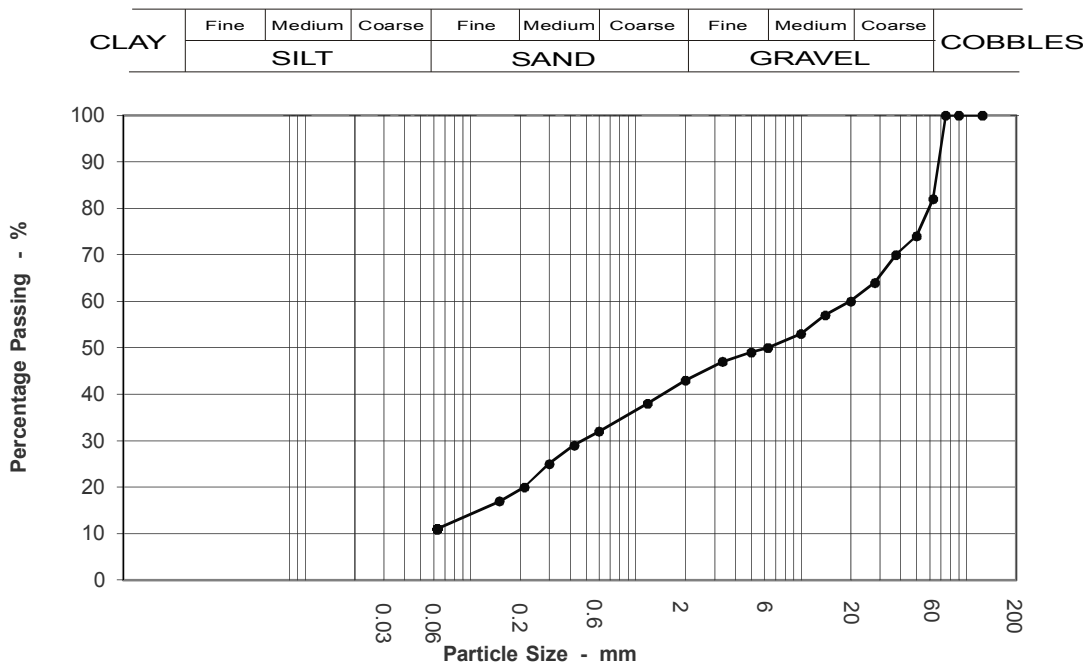


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8774
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL with rootlets and cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	0.60 - 1.20
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	82		
50	74		
37.5	70		
28	64		
20	60		
14	57		
10	53		
6.3	50		
5	49		
3.35	47		
2	43		
1.18	38		
0.6	32		
0.425	29		
0.3	25		
0.212	20		
0.15	17		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	18.0
Gravel	39.0
Sand	32.0
Silt & Clay	11.0

Grading Analysis	
D60	20.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



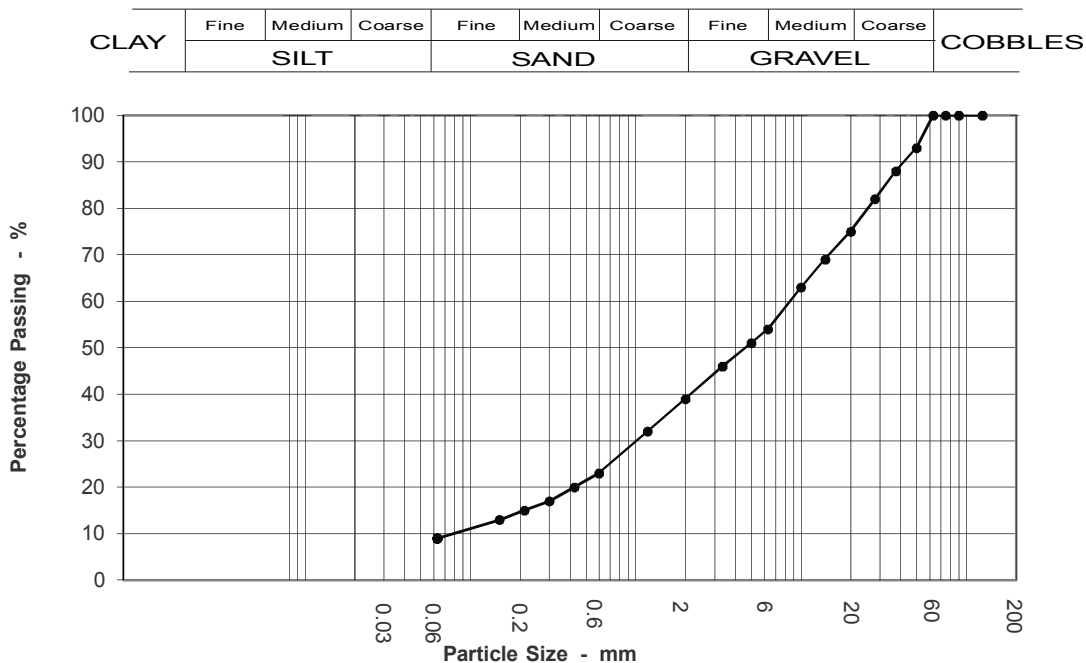


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8775
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL	<b>Sample No:</b>	7
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	88		
28	82		
20	75		
14	69		
10	63		
6.3	54		
5	51		
3.35	46		
2	39		
1.18	32		
0.6	23		
0.425	20		
0.3	17		
0.212	15		
0.15	13		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	61.0
Sand	30.0
Silt & Clay	9.0

Grading Analysis	
D60	8.77
D10	0.08
Uniformity Coefficient	103.44

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



1489



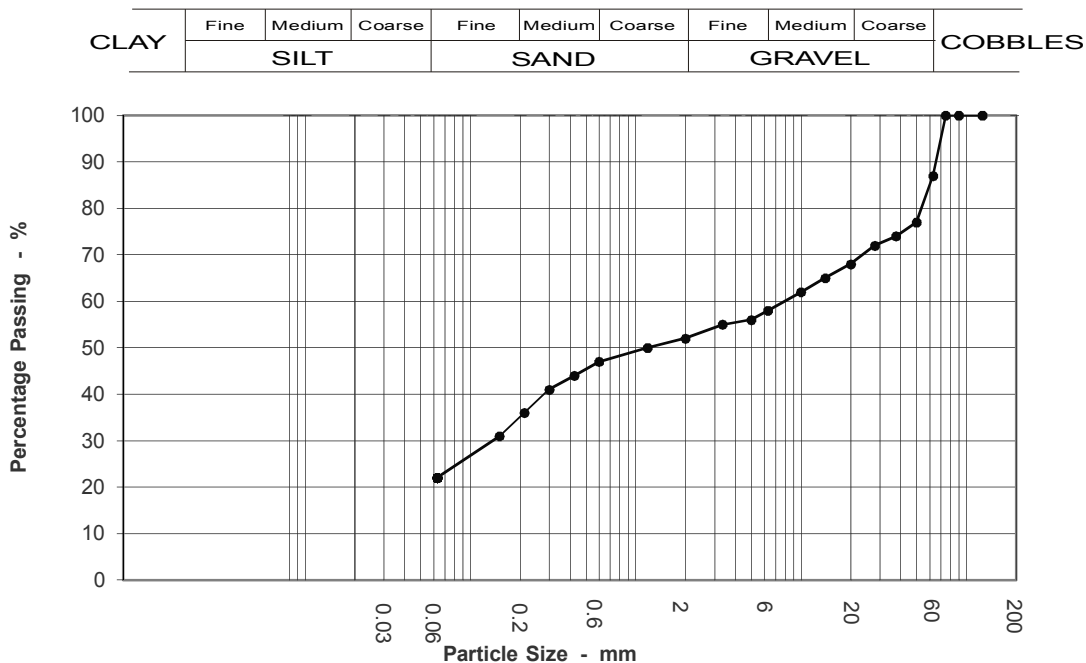


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8776
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly sandy gravelly CLAY with cobbles	<b>Sample No:</b>	11
		<b>Depth (m):</b>	2.80 - 3.70
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	87		
50	77		
37.5	74		
28	72		
20	68		
14	65		
10	62		
6.3	58		
5	56		
3.35	55		
2	52		
1.18	50		
0.6	47		
0.425	44		
0.3	41		
0.212	36		
0.15	31		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	13.0
Gravel	35.0
Sand	30.0
Silt & Clay	22.0

Grading Analysis	
D60	8.15
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



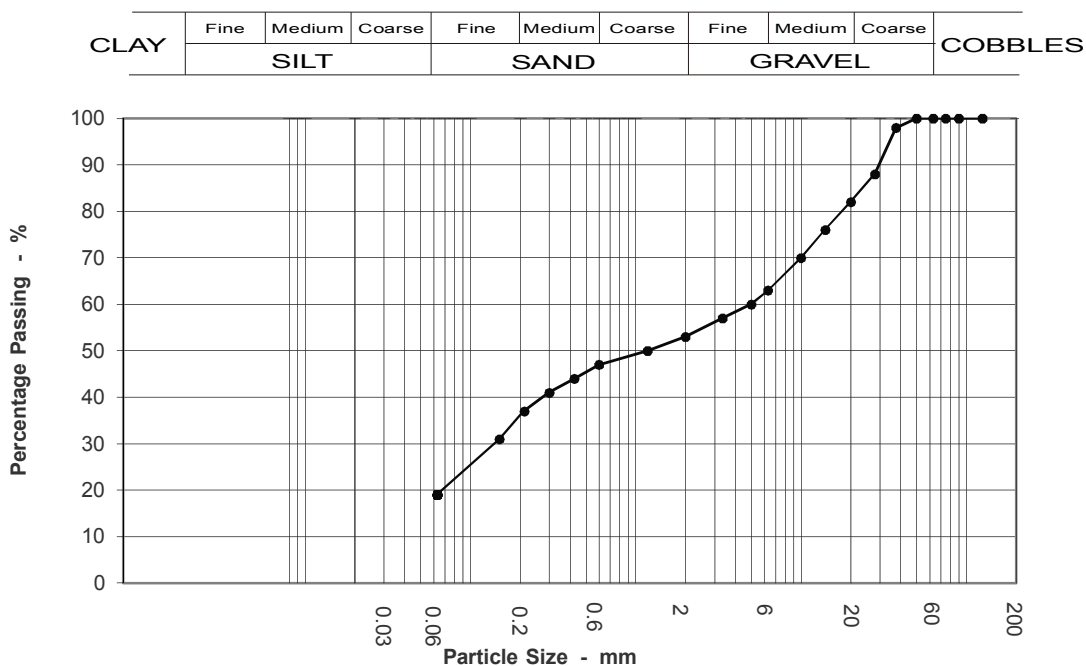


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8777
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL	<b>Sample No:</b>	13
		<b>Depth (m):</b>	3.70 - 4.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	88		
20	82		
14	76		
10	70		
6.3	63		
5	60		
3.35	57		
2	53		
1.18	50		
0.6	47		
0.425	44		
0.3	41		
0.212	37		
0.15	31		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	47.0
Sand	34.0
Silt & Clay	19.0

Grading Analysis	
D60	5.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



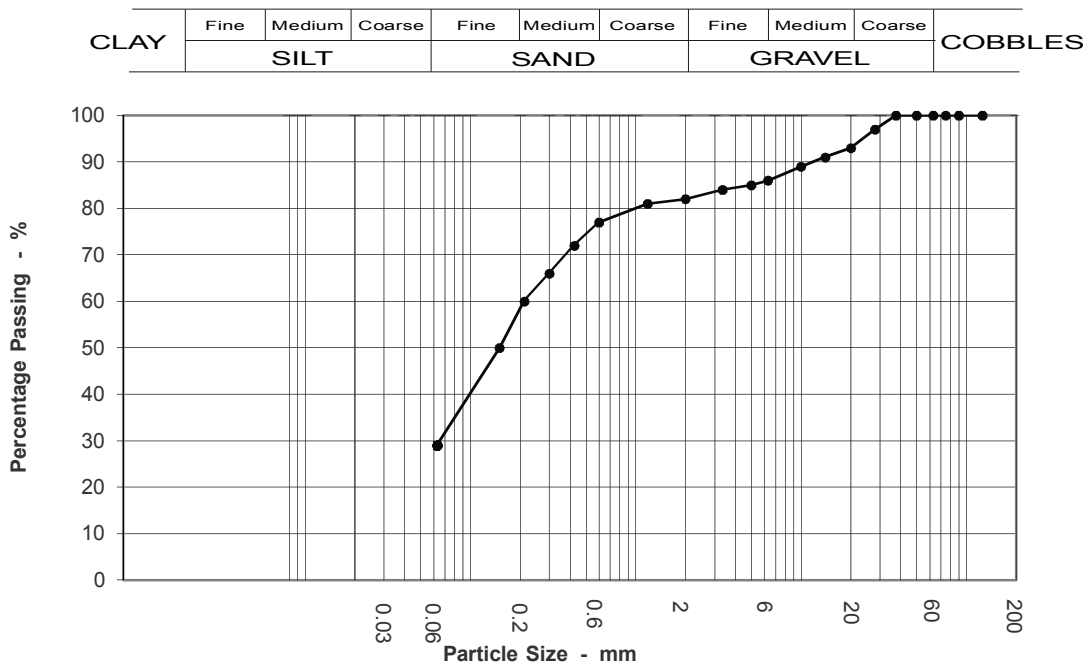


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8778
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown gravelly very clayey SAND	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.00 - 4.40
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	93		
14	91		
10	89		
6.3	86		
5	85		
3.35	84		
2	82		
1.18	81		
0.6	77		
0.425	72		
0.3	66		
0.212	60		
0.15	50		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	18.0
Sand	53.0
Silt & Clay	29.0

Grading Analysis	
D60	0.21
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



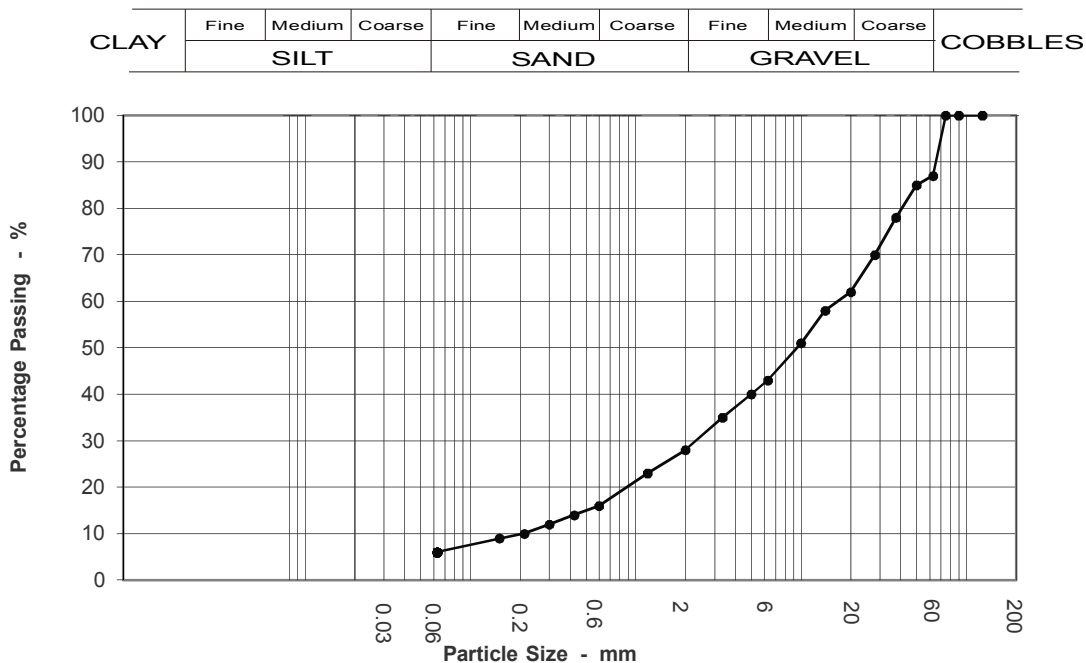


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8782
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH9
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	87		
50	85		
37.5	78		
28	70		
20	62		
14	58		
10	51		
6.3	43		
5	40		
3.35	35		
2	28		
1.18	23		
0.6	16		
0.425	14		
0.3	12		
0.212	10		
0.15	9		
0.063	6		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	13.0
Gravel	59.0
Sand	22.0
Silt & Clay	6.0

Grading Analysis	
D60	17.00
D10	0.21
Uniformity Coefficient	80.19

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



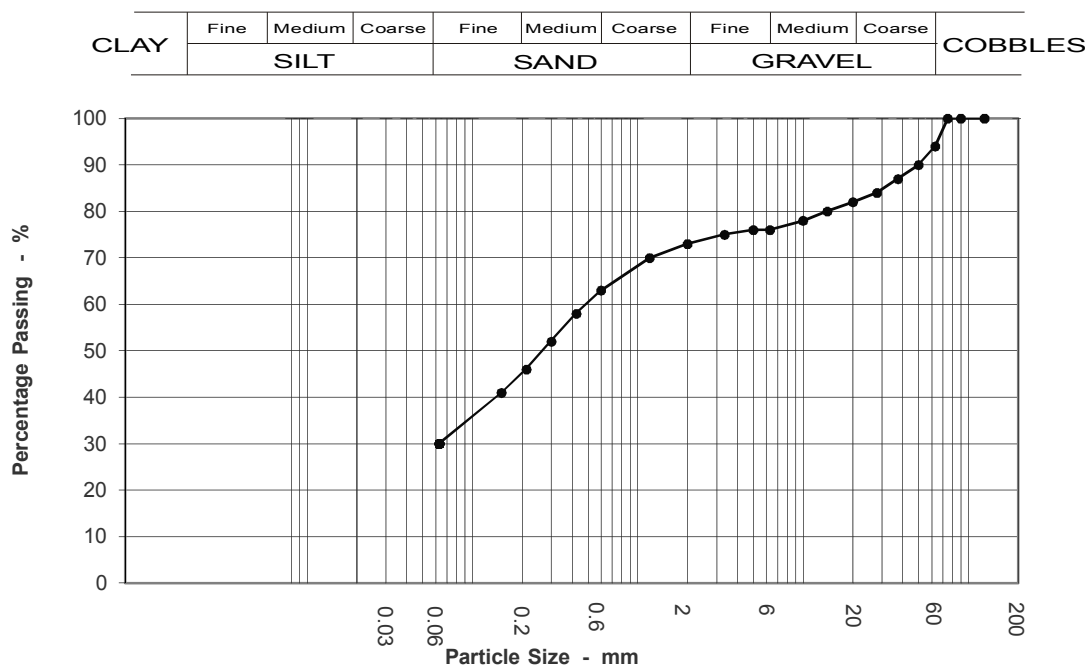


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8786
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH9
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy CLAY with cobbles	<b>Sample No:</b>	9
		<b>Depth (m):</b>	2.50 - 3.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	90		
37.5	87		
28	84		
20	82		
14	80		
10	78		
6.3	76		
5	76		
3.35	75		
2	73		
1.18	70		
0.6	63		
0.425	58		
0.3	52		
0.212	46		
0.15	41		
0.063	30		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	6.0
Gravel	21.0
Sand	43.0
Silt & Clay	30.0

Grading Analysis	
D60	0.50
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



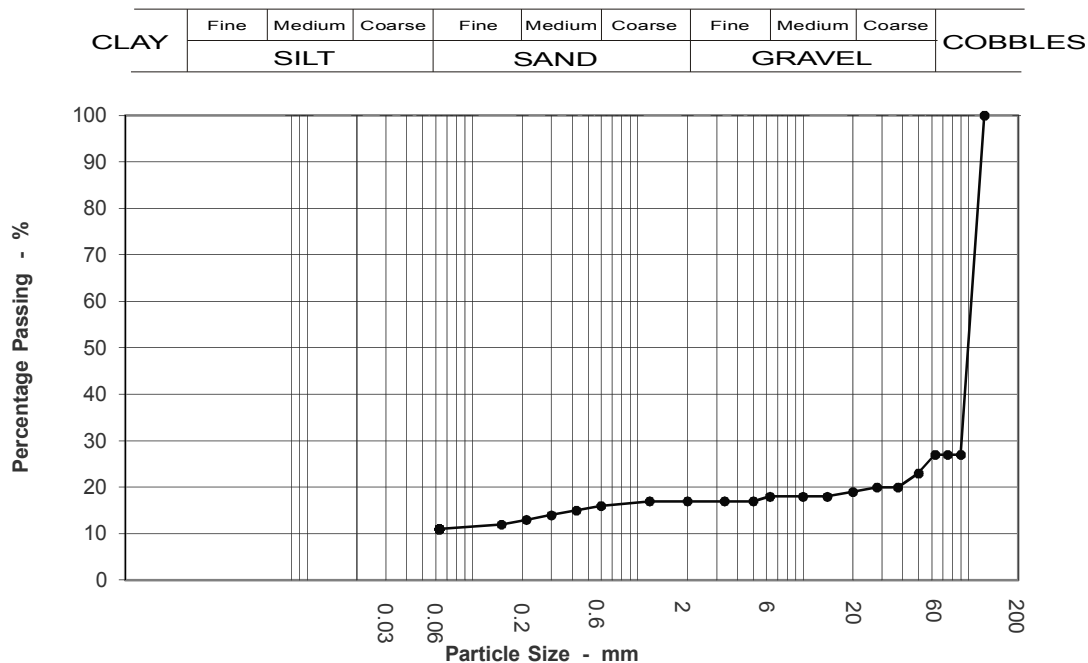


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8787
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH9
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly gravelly slightly sandy CLAY and 1 core of grey SANDSTONE	<b>Sample No:</b>	14
		<b>Depth (m):</b>	4.20 - 5.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	27		
75	27		
63	27		
50	23		
37.5	20		
28	20		
20	19		
14	18		
10	18		
6.3	18		
5	17		
3.35	17		
2	17		
1.18	17		
0.6	16		
0.425	15		
0.3	14		
0.212	13		
0.15	12		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	73.0
Gravel	10.0
Sand	6.0
Silt & Clay	11.0

Grading Analysis	
D60	105.82
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





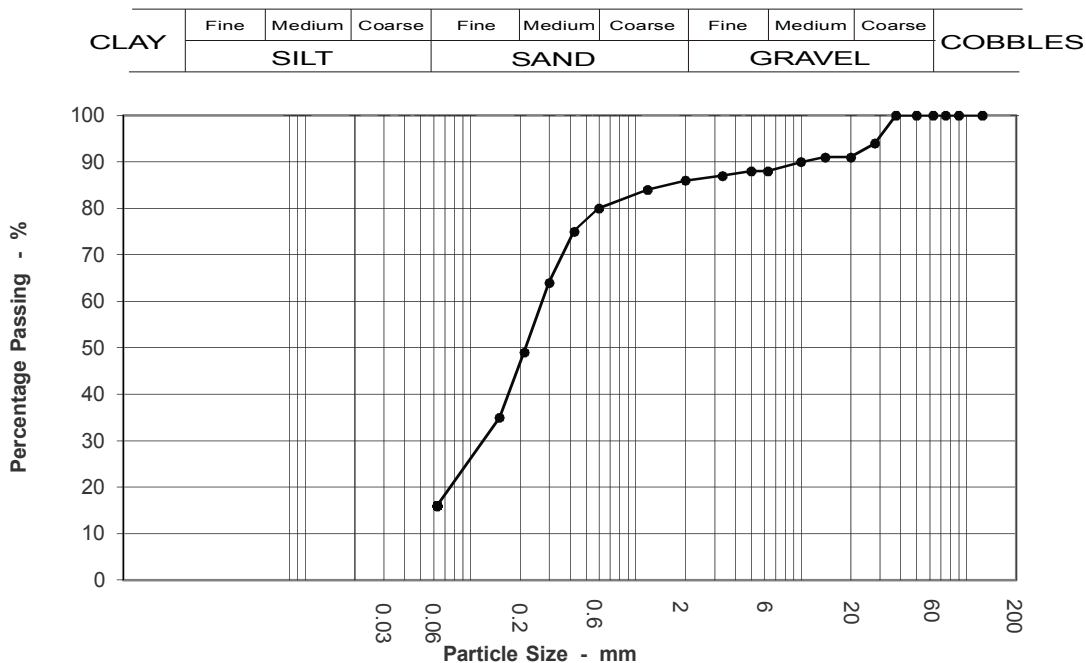


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8788
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH10
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty gravelly SAND	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	94		
20	91		
14	91		
10	90		
6.3	88		
5	88		
3.35	87		
2	86		
1.18	84		
0.6	80		
0.425	75		
0.3	64		
0.212	49		
0.15	35		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	14.0
Sand	70.0
Silt & Clay	16.0

Grading Analysis	
D60	0.28
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



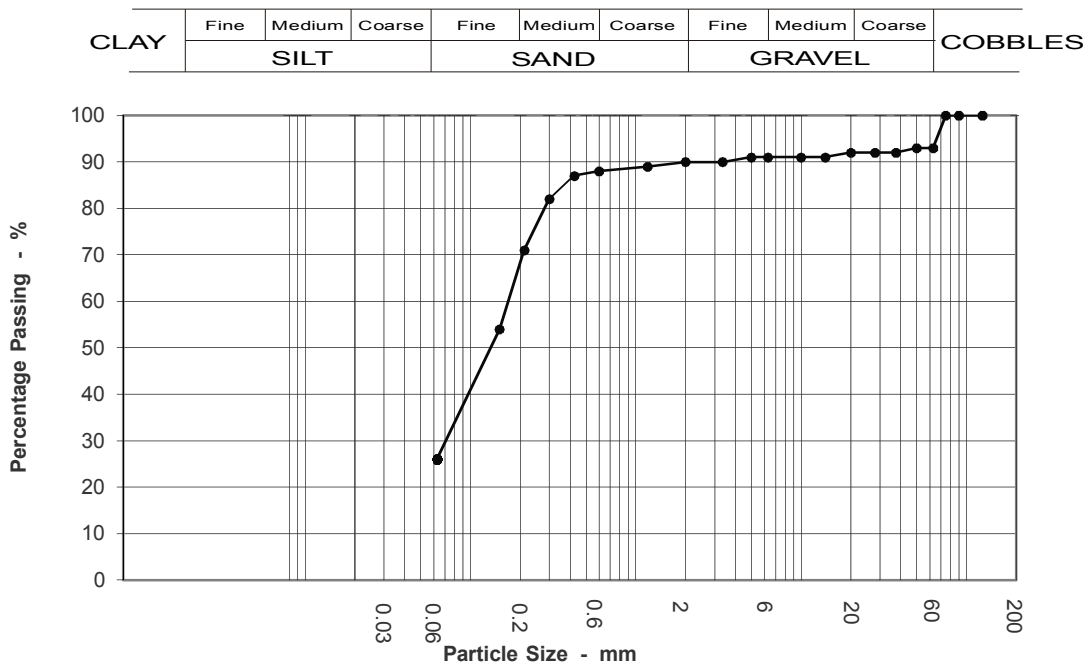


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8789
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH10
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly gravelly silty SAND with cobbles	<b>Sample No:</b>	4
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	93		
50	93		
37.5	92		
28	92		
20	92		
14	91		
10	91		
6.3	91		
5	91		
3.35	90		
2	90		
1.18	89		
0.6	88		
0.425	87		
0.3	82		
0.212	71		
0.15	54		
0.063	26		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	7.0
Gravel	3.0
Sand	64.0
Silt & Clay	26.0

Grading Analysis	
D60	0.17
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



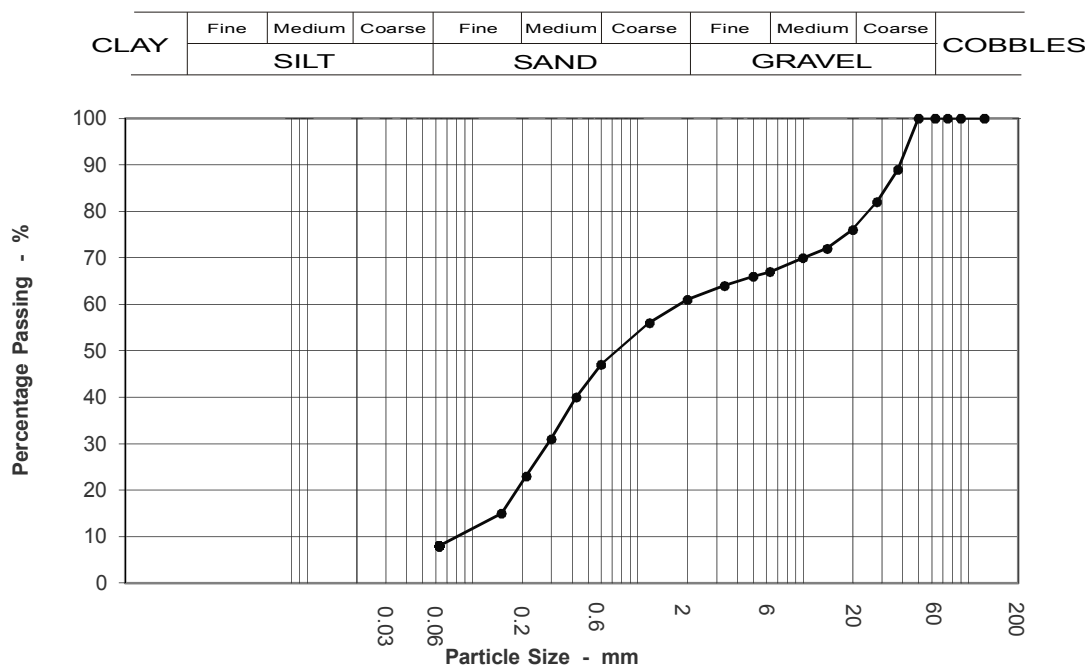


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8791
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH10
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey slightly silty very gravelly SAND	<b>Sample No:</b>	6
		<b>Depth (m):</b>	2.50 - 3.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	82		
20	76		
14	72		
10	70		
6.3	67		
5	66		
3.35	64		
2	61		
1.18	56		
0.6	47		
0.425	40		
0.3	31		
0.212	23		
0.15	15		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	39.0
Sand	53.0
Silt & Clay	8.0

Grading Analysis	
D60	1.84
D10	0.09
Uniformity Coefficient	20.90

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



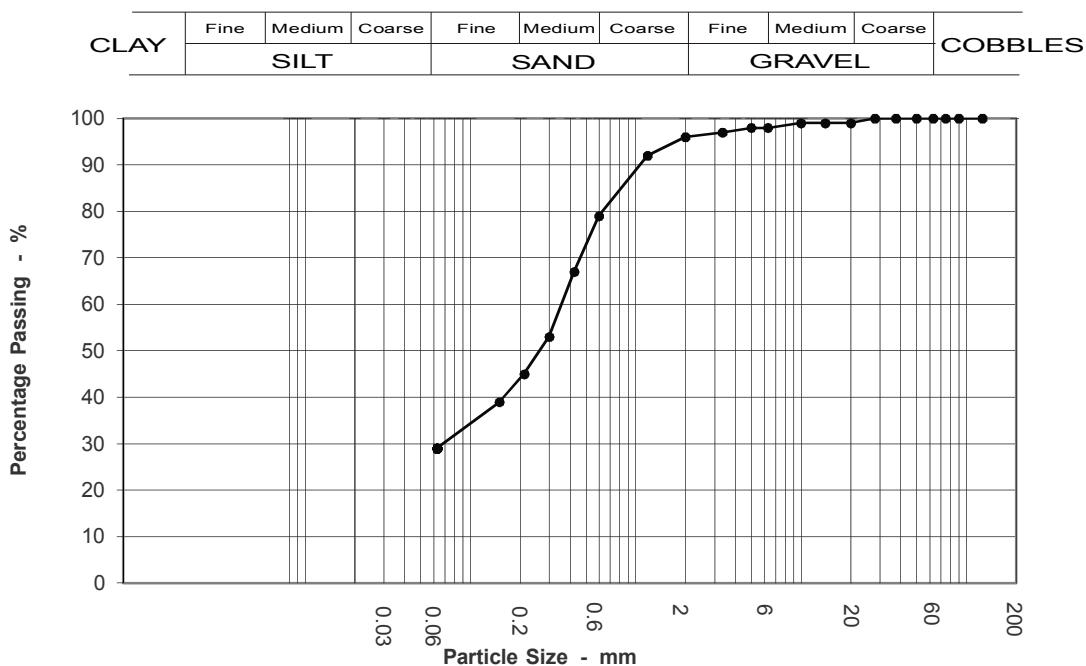


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8792
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH10
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey slightly gravelly clayey SAND	<b>Sample No:</b>	10
		<b>Depth (m):</b>	4.50 - 5.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	99		
10	99		
6.3	98		
5	98		
3.35	97		
2	96		
1.18	92		
0.6	79		
0.425	67		
0.3	53		
0.212	45		
0.15	39		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	4.0
Sand	67.0
Silt & Clay	29.0

Grading Analysis	
D60	0.36
D10	
Uniformity Coefficient	N/A

**Remarks:**

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



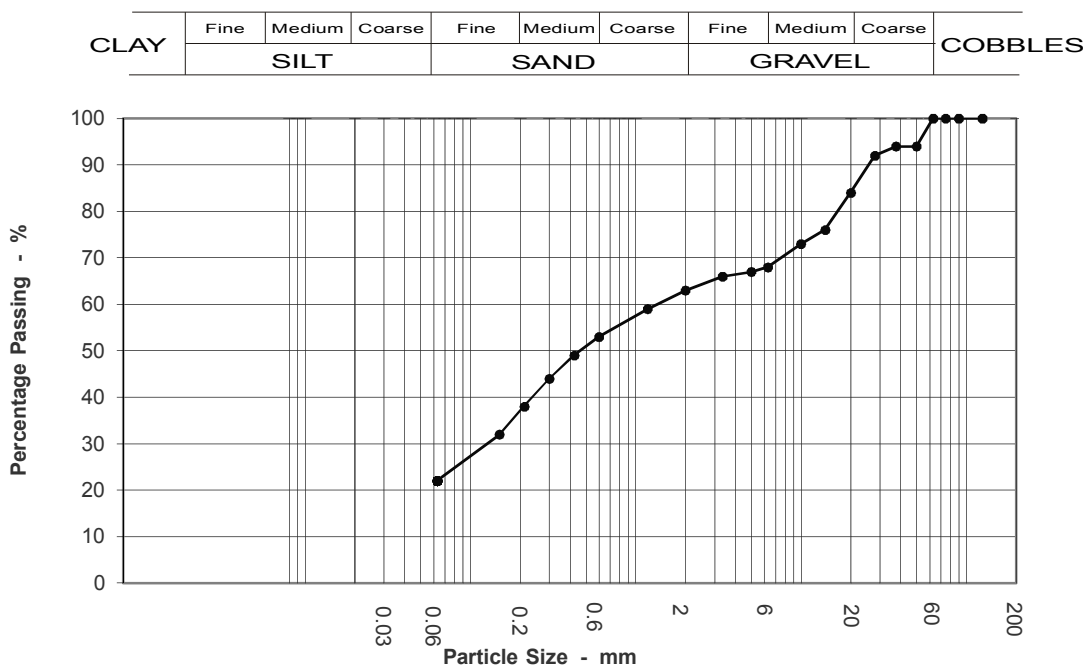


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8793
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH11A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown and grey clayey very gravelly SAND with rootlets	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	94		
28	92		
20	84		
14	76		
10	73		
6.3	68		
5	67		
3.35	66		
2	63		
1.18	59		
0.6	53		
0.425	49		
0.3	44		
0.212	38		
0.15	32		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	37.0
Sand	41.0
Silt & Clay	22.0

Grading Analysis	
D60	1.39
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



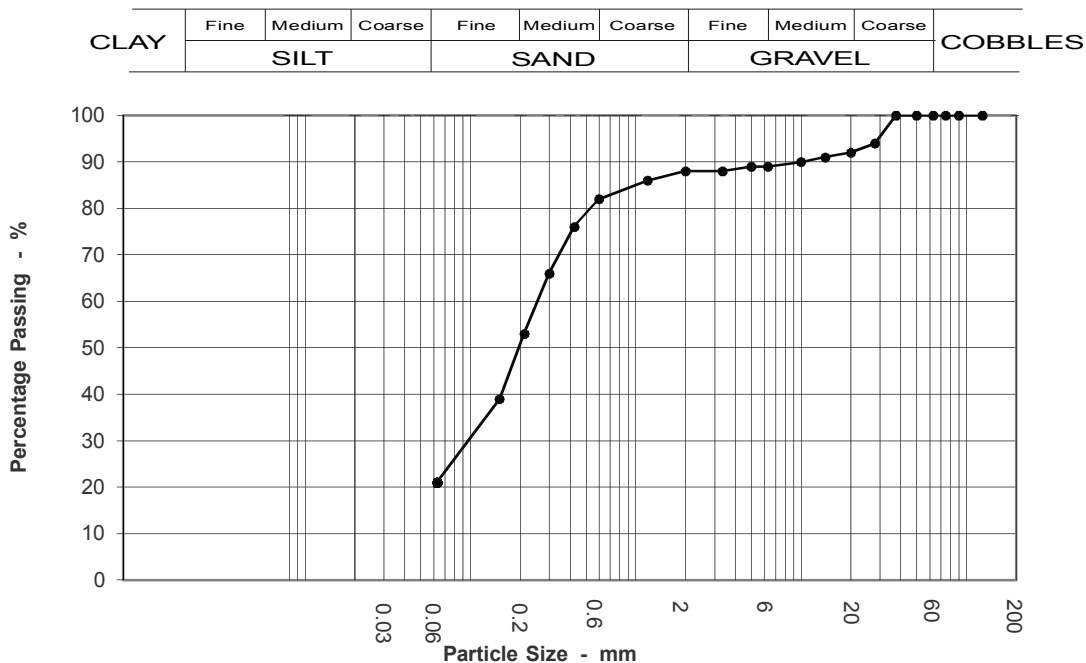


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8794
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH11A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown gravelly silty SAND	<b>Sample No:</b>	8
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	94		
20	92		
14	91		
10	90		
6.3	89		
5	89		
3.35	88		
2	88		
1.18	86		
0.6	82		
0.425	76		
0.3	66		
0.212	53		
0.15	39		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	12.0
Sand	67.0
Silt & Clay	21.0

Grading Analysis	
D60	0.26
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





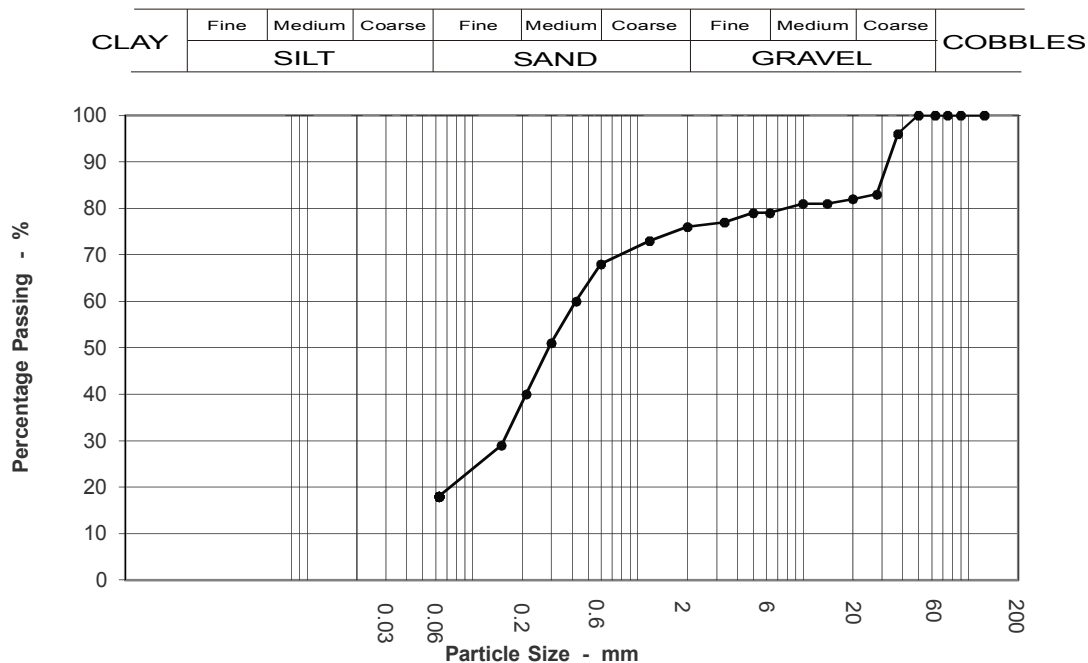


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8795
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH11A
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey silty very gravelly SAND	<b>Sample No:</b>	12
		<b>Depth (m):</b>	3.50 - 4.50
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	83		
20	82		
14	81		
10	81		
6.3	79		
5	79		
3.35	77		
2	76		
1.18	73		
0.6	68		
0.425	60		
0.3	51		
0.212	40		
0.15	29		
0.063	18		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	58.0
Silt & Clay	18.0

Grading Analysis	
D60	0.43
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



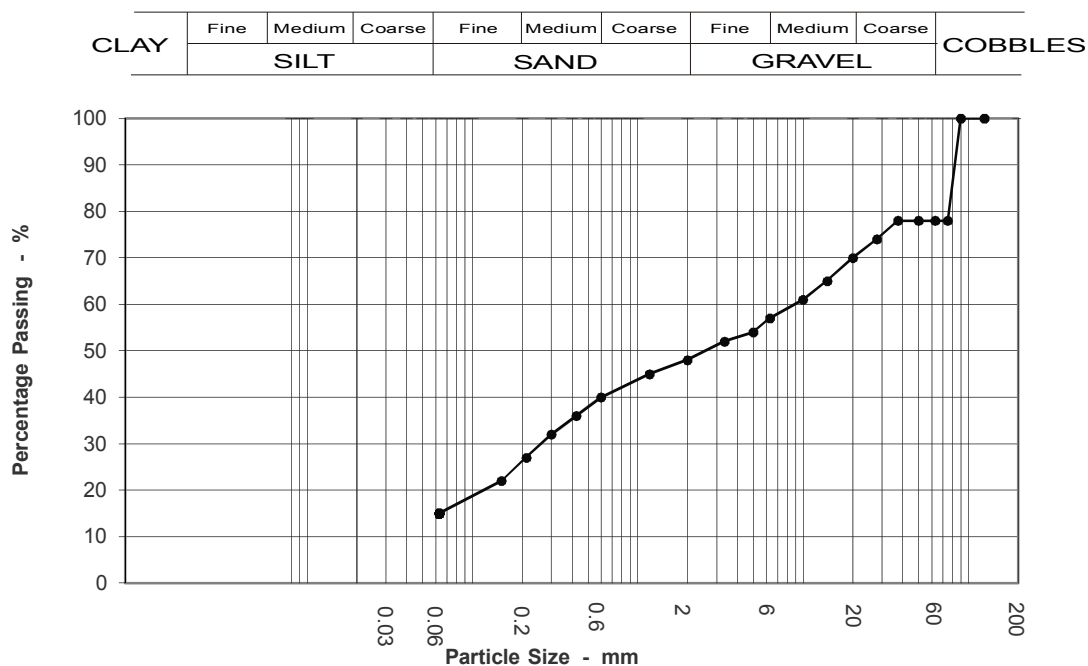


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8796
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH12
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey SAND and GRAVEL with frequent cobbles	<b>Sample No:</b>	4
		<b>Depth (m):</b>	1.20 - 1.50
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	78		
63	78		
50	78		
37.5	78		
28	74		
20	70		
14	65		
10	61		
6.3	57		
5	54		
3.35	52		
2	48		
1.18	45		
0.6	40		
0.425	36		
0.3	32		
0.212	27		
0.15	22		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	22.0
Gravel	30.0
Sand	33.0
Silt & Clay	15.0

Grading Analysis	
D60	9.08
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



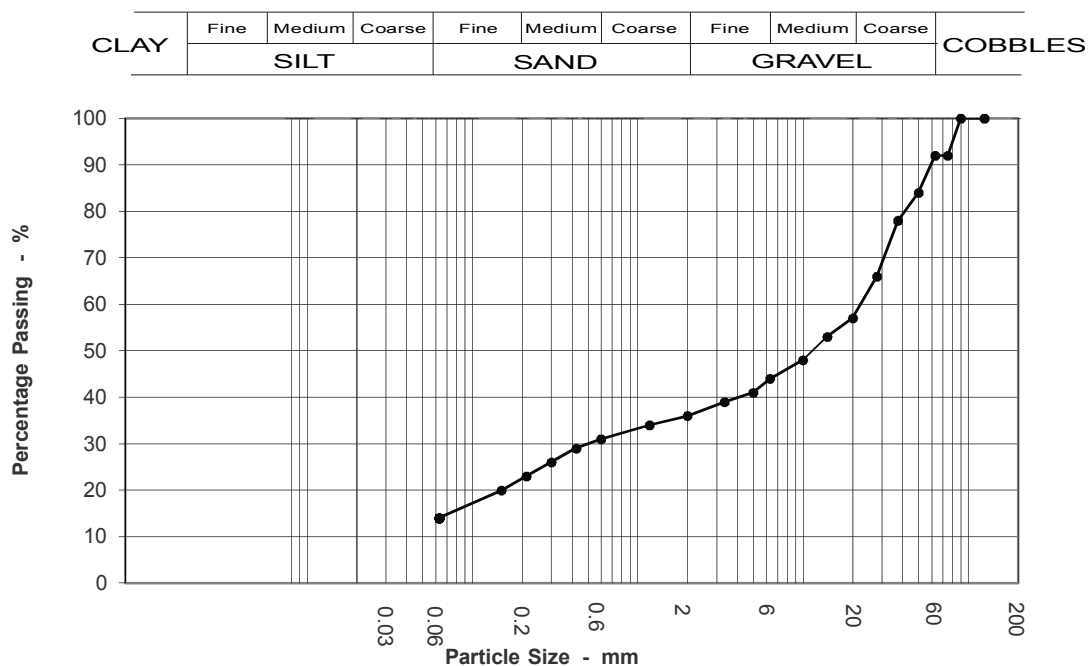


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8798
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH12
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Pinkish brown slightly sandy gravelly silty CLAY with cobbles	<b>Sample No:</b>	10
		<b>Depth (m):</b>	2.00 - 2.50
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	92		
63	92		
50	84		
37.5	78		
28	66		
20	57		
14	53		
10	48		
6.3	44		
5	41		
3.35	39		
2	36		
1.18	34		
0.6	31		
0.425	29		
0.3	26		
0.212	23		
0.15	20		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	8.0
Gravel	56.0
Sand	22.0
Silt & Clay	14.0

Grading Analysis	
D60	22.67
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



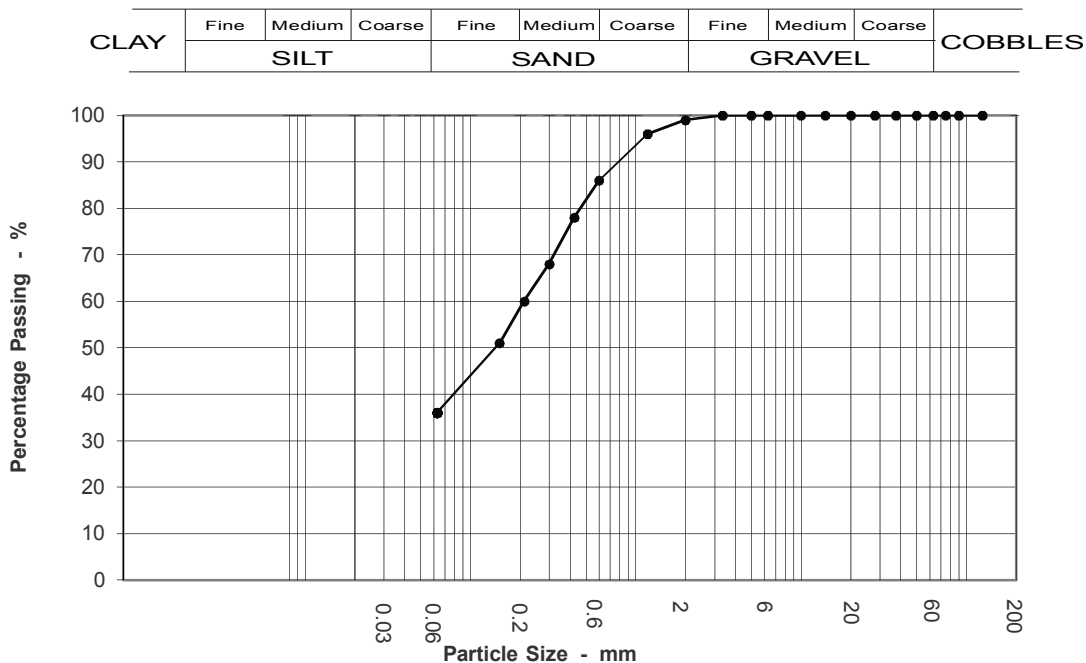


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8802
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH12
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Purplish brown slightly gravelly clayey SAND	<b>Sample No:</b>	18
		<b>Depth (m):</b>	5.00 - 6.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	99		
1.18	96		
0.6	86		
0.425	78		
0.3	68		
0.212	60		
0.15	51		
0.063	36		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	1.0
Sand	63.0
Silt & Clay	36.0

Grading Analysis	
D60	0.21
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



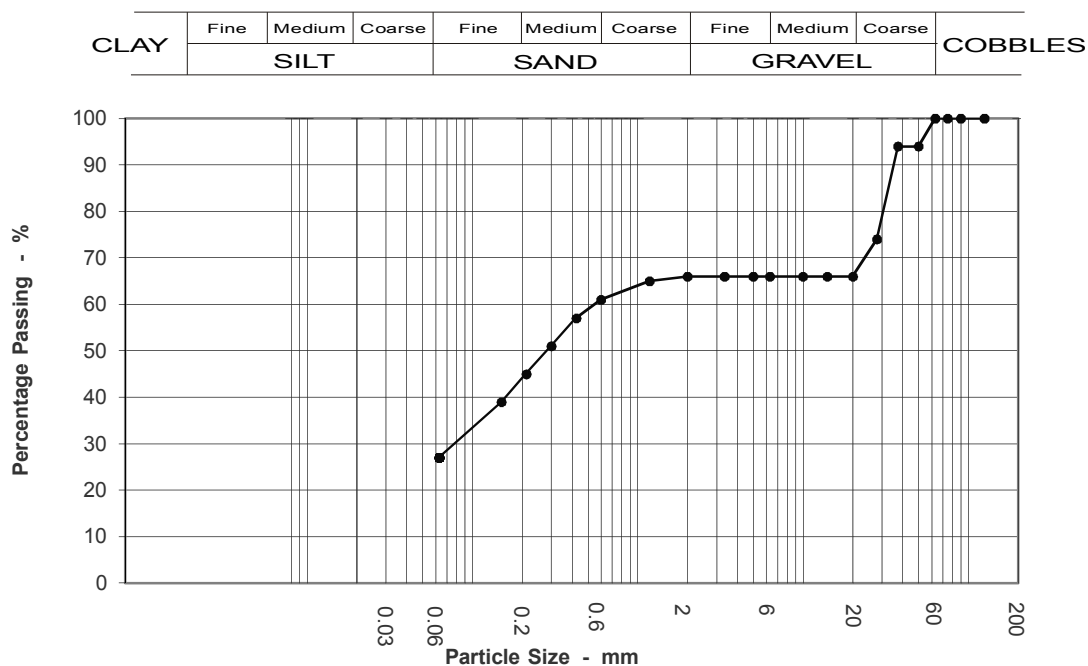


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8803
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH12
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Purplish brown clayey SAND and GRAVEL	<b>Sample No:</b>	22
		<b>Depth (m):</b>	7.00 - 8.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	94		
28	74		
20	66		
14	66		
10	66		
6.3	66		
5	66		
3.35	66		
2	66		
1.18	65		
0.6	61		
0.425	57		
0.3	51		
0.212	45		
0.15	39		
0.063	27		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	34.0
Sand	39.0
Silt & Clay	27.0

Grading Analysis	
D60	0.56
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



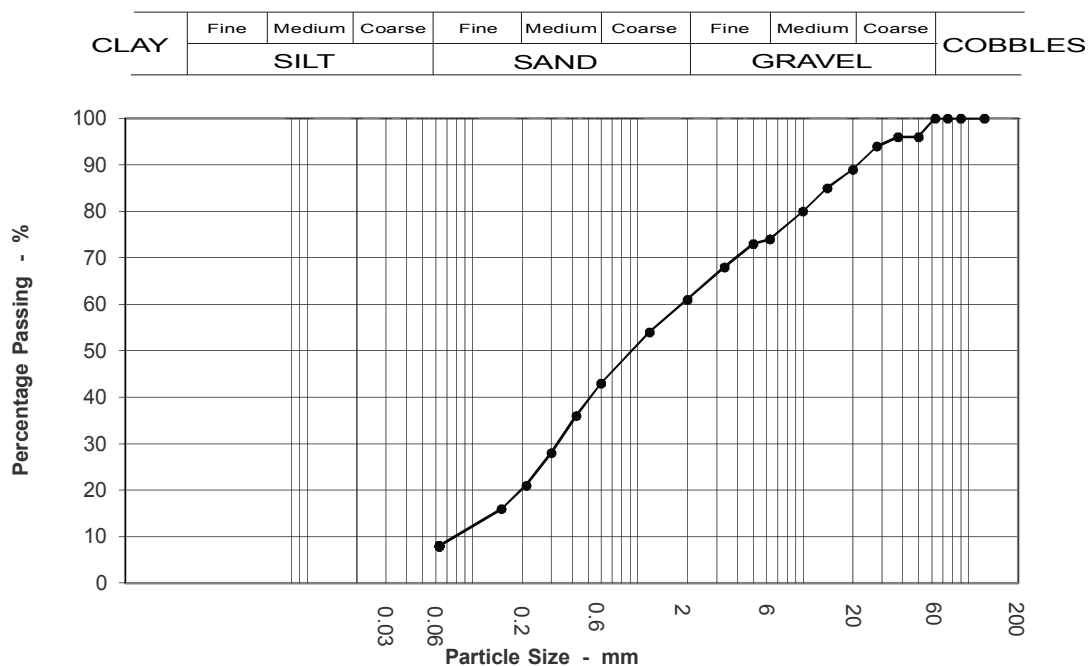


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8805
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very gravelly SAND	<b>Sample No:</b>	3
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	96		
28	94		
20	89		
14	85		
10	80		
6.3	74		
5	73		
3.35	68		
2	61		
1.18	54		
0.6	43		
0.425	36		
0.3	28		
0.212	21		
0.15	16		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	39.0
Sand	53.0
Silt & Clay	8.0

Grading Analysis	
D60	1.88
D10	0.08
Uniformity Coefficient	22.22

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





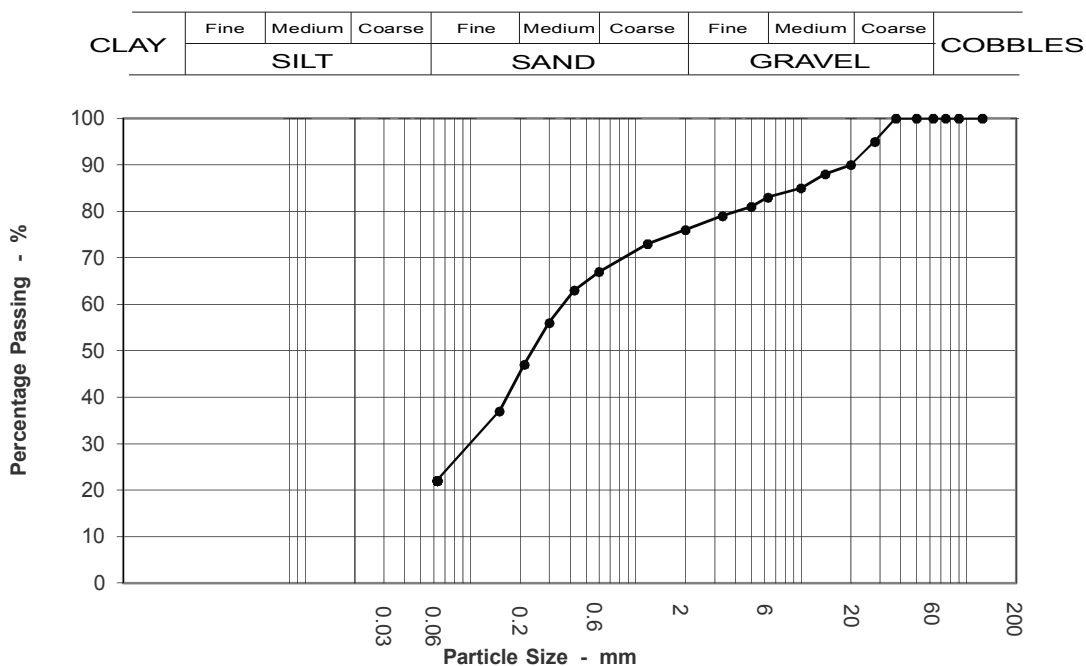


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8806
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty gravelly SAND	<b>Sample No:</b>	5
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	90		
14	88		
10	85		
6.3	83		
5	81		
3.35	79		
2	76		
1.18	73		
0.6	67		
0.425	63		
0.3	56		
0.212	47		
0.15	37		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	54.0
Silt & Clay	22.0

Grading Analysis	
D60	0.37
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



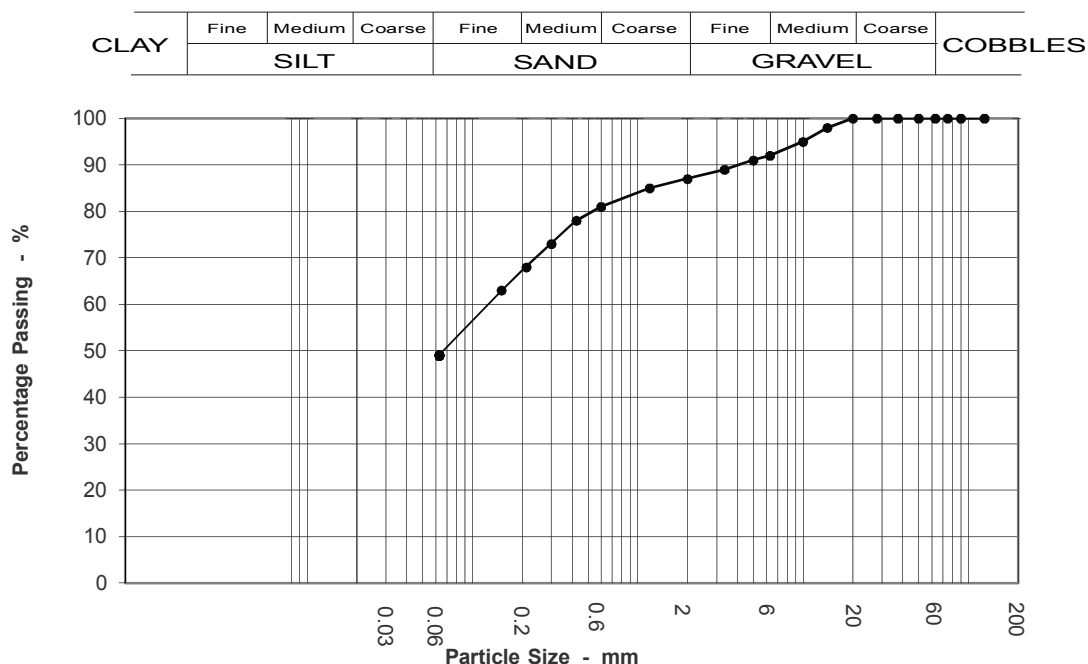


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8808
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light pinkish brown slightly gravelly silty sandy CLAY	<b>Sample No:</b>	11
		<b>Depth (m):</b>	4.70 - 5.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	95		
6.3	92		
5	91		
3.35	89		
2	87		
1.18	85		
0.6	81		
0.425	78		
0.3	73		
0.212	68		
0.15	63		
0.063	49		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	13.0
Sand	38.0
Silt & Clay	49.0

Grading Analysis	
D60	0.13
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



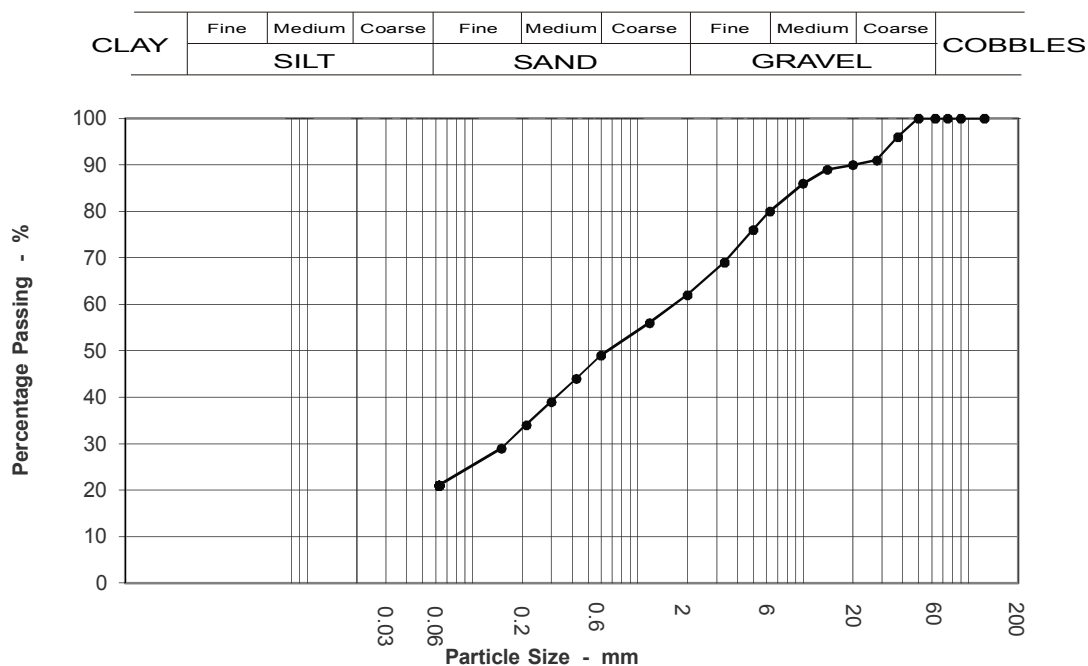


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8807
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty SAND and GRAVEL	<b>Sample No:</b>	9
		<b>Depth (m):</b>	4.00 - 4.50
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	91		
20	90		
14	89		
10	86		
6.3	80		
5	76		
3.35	69		
2	62		
1.18	56		
0.6	49		
0.425	44		
0.3	39		
0.212	34		
0.15	29		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	38.0
Sand	41.0
Silt & Clay	21.0

Grading Analysis	
D60	1.73
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



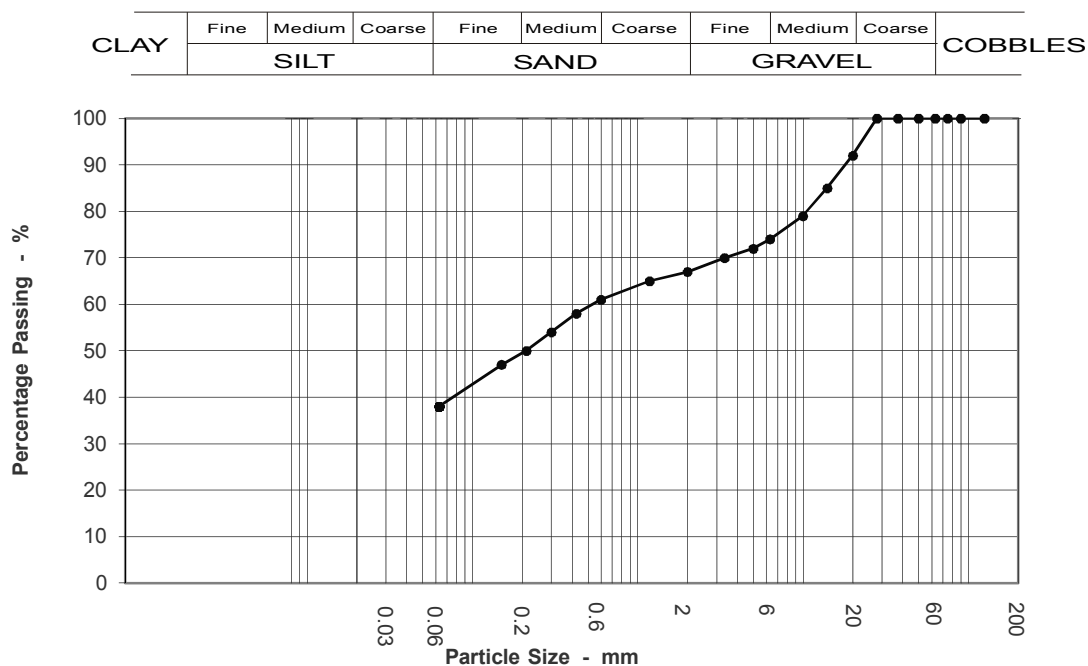


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8809
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Pinkish brown clayey SAND and GRAVEL	<b>Sample No:</b>	13
		<b>Depth (m):</b>	5.50 - 6.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	92		
14	85		
10	79		
6.3	74		
5	72		
3.35	70		
2	67		
1.18	65		
0.6	61		
0.425	58		
0.3	54		
0.212	50		
0.15	47		
0.063	38		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	33.0
Sand	29.0
Silt & Clay	38.0

Grading Analysis	
D60	0.54
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



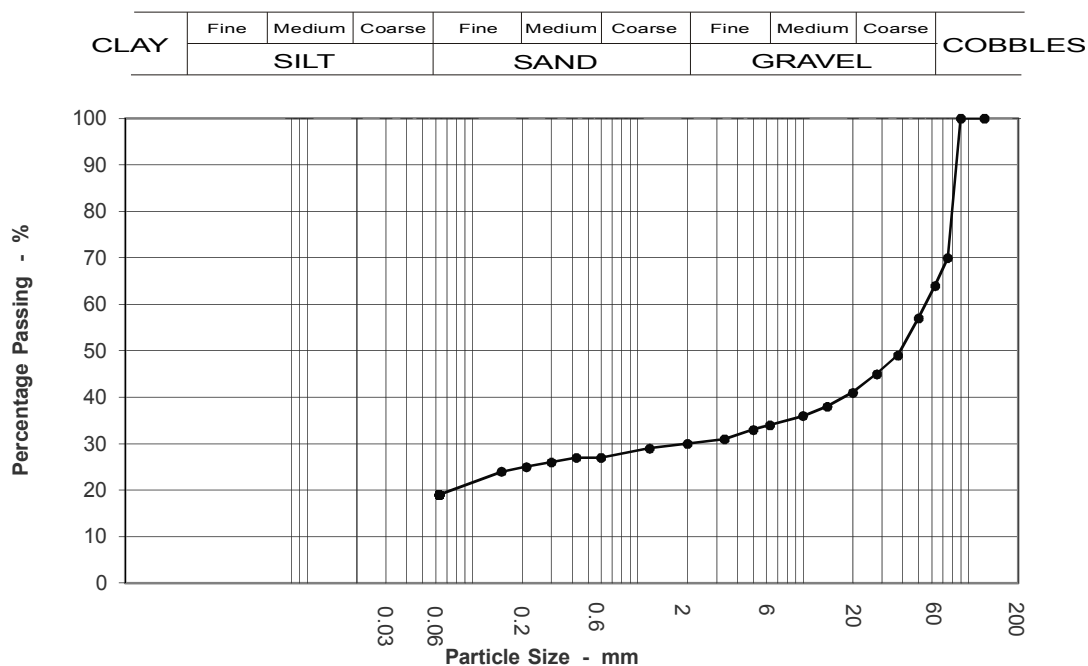


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8810
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown sandy clayey GRAVEL with frequent cobbles	<b>Sample No:</b>	16
		<b>Depth (m):</b>	6.75 - 7.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	70		
63	64		
50	57		
37.5	49		
28	45		
20	41		
14	38		
10	36		
6.3	34		
5	33		
3.35	31		
2	30		
1.18	29		
0.6	27		
0.425	27		
0.3	26		
0.212	25		
0.15	24		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	36.0
Gravel	34.0
Sand	11.0
Silt & Clay	19.0

Grading Analysis	
D60	55.57
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



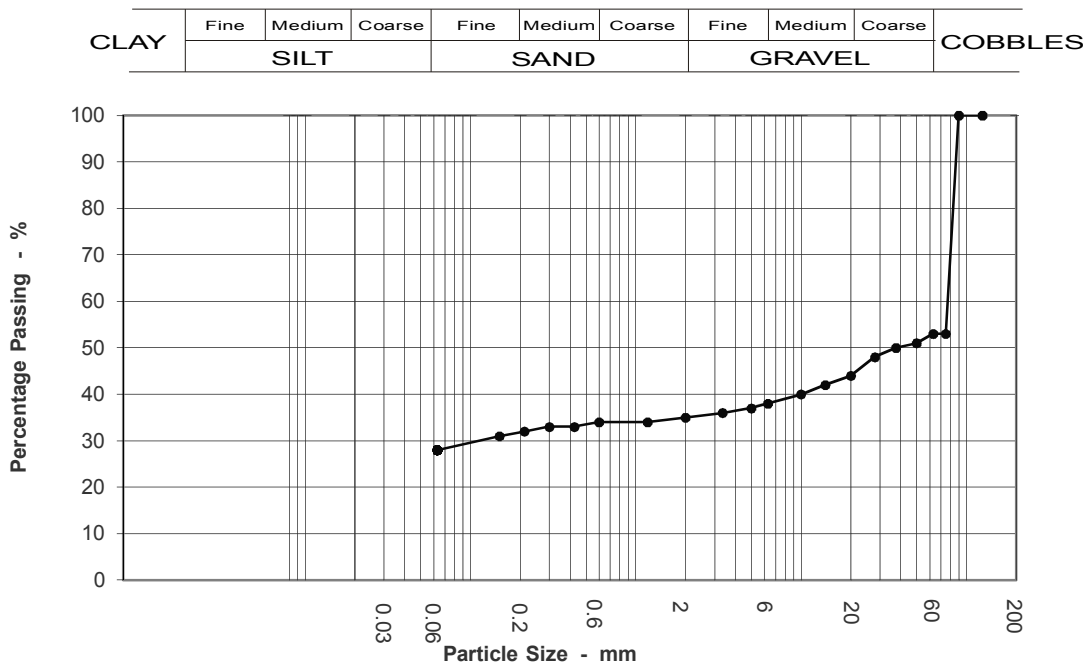


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8811
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Pinkish brown slightly sandy slightly gravelly CLAY with 2 intact SANDSTONE cores	<b>Sample No:</b>	18
		<b>Depth (m):</b>	7.50 - 8.50
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	53		
63	53		
50	51		
37.5	50		
28	48		
20	44		
14	42		
10	40		
6.3	38		
5	37		
3.35	36		
2	35		
1.18	34		
0.6	34		
0.425	33		
0.3	33		
0.212	32		
0.15	31		
0.063	28		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	47.0
Gravel	18.0
Sand	7.0
Silt & Clay	28.0

Grading Analysis	
D60	77.23
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





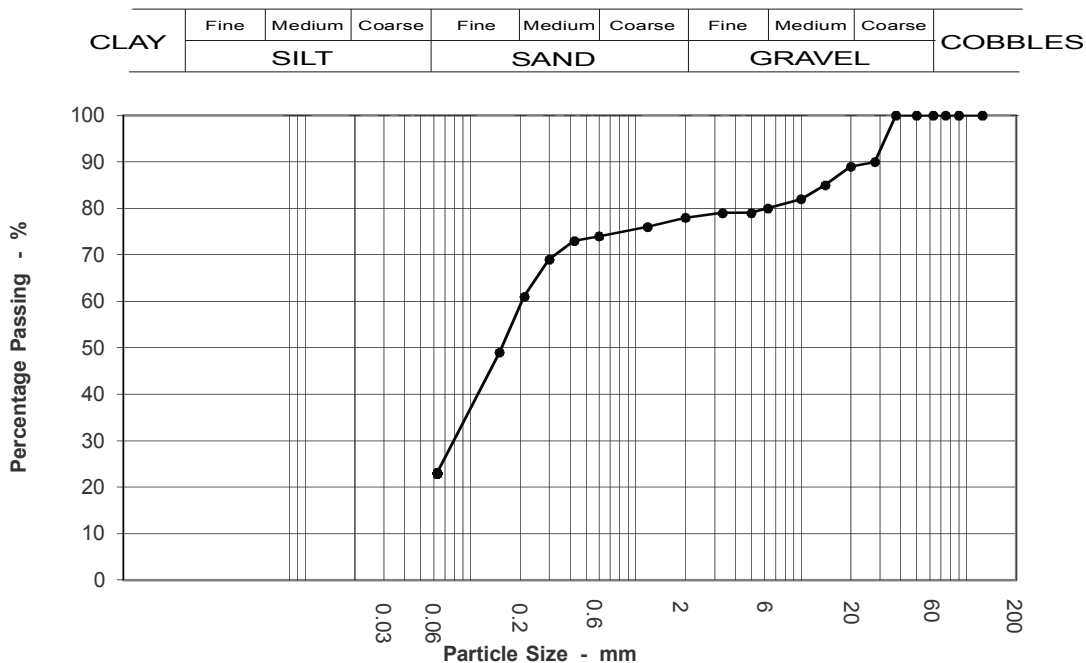


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8813
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown gravelly silty SAND	<b>Sample No:</b>	2
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	90		
20	89		
14	85		
10	82		
6.3	80		
5	79		
3.35	79		
2	78		
1.18	76		
0.6	74		
0.425	73		
0.3	69		
0.212	61		
0.15	49		
0.063	23		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	22.0
Sand	55.0
Silt & Clay	23.0

Grading Analysis	
D60	0.21
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



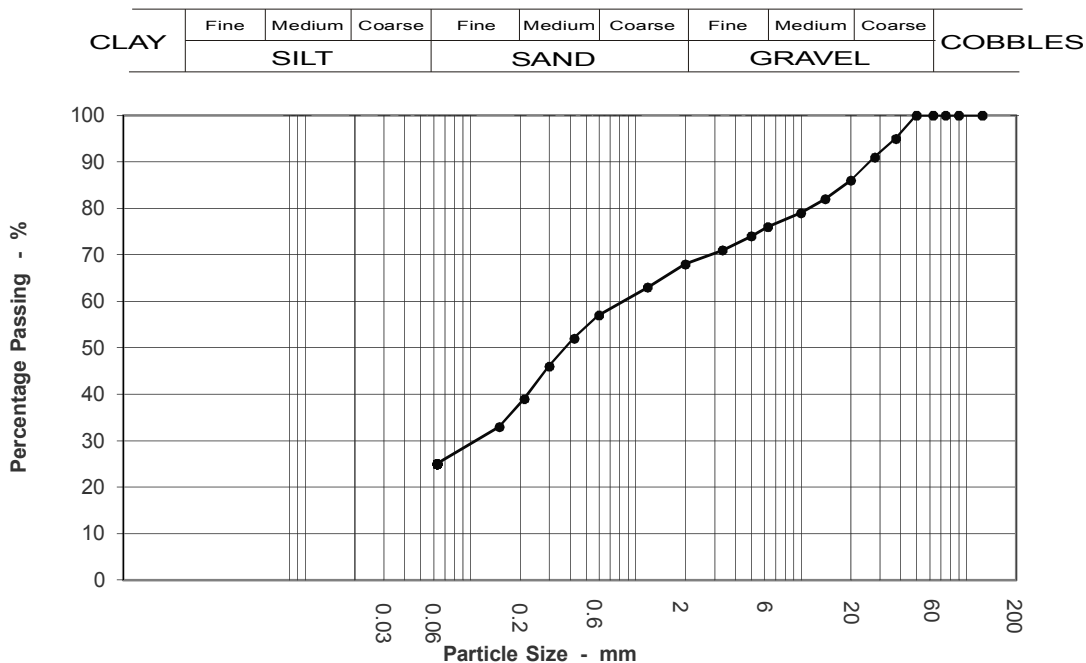


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8814
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown gravelly sandy silty CLAY	<b>Sample No:</b>	6
		<b>Depth (m):</b>	2.40 - 3.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	91		
20	86		
14	82		
10	79		
6.3	76		
5	74		
3.35	71		
2	68		
1.18	63		
0.6	57		
0.425	52		
0.3	46		
0.212	39		
0.15	33		
0.063	25		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	43.0
Silt & Clay	25.0

Grading Analysis	
D60	0.89
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



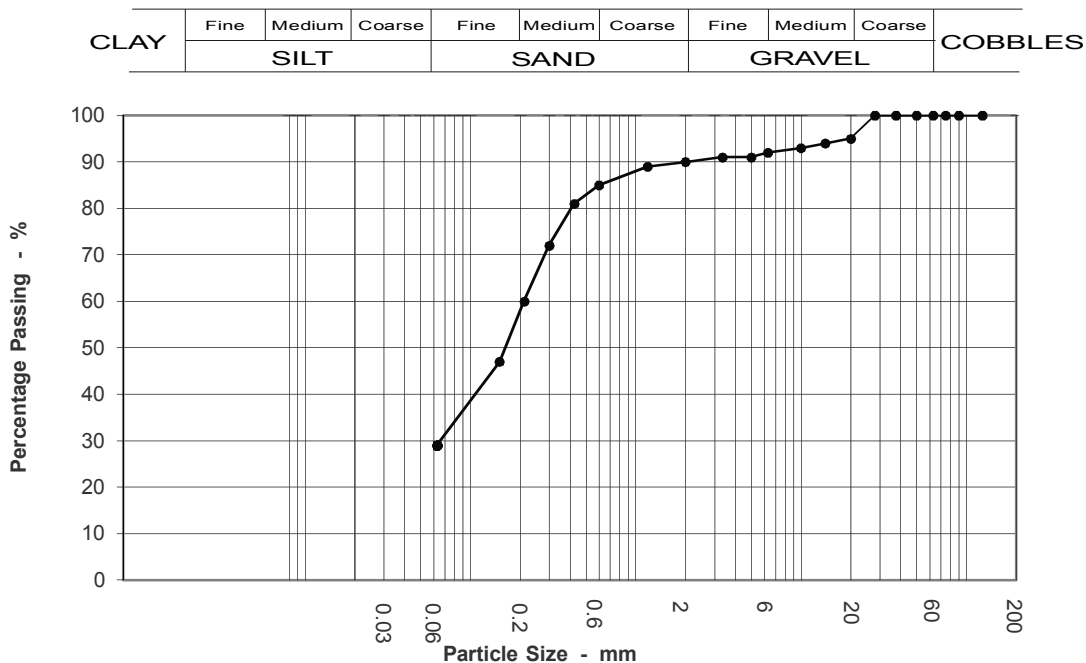


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8816
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	D
<b>Sample Description:</b>	Brown slightly gravelly very sandy silty CLAY	<b>Sample No:</b>	10
		<b>Depth (m):</b>	3.50 - 3.75
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	94		
10	93		
6.3	92		
5	91		
3.35	91		
2	90		
1.18	89		
0.6	85		
0.425	81		
0.3	72		
0.212	60		
0.15	47		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	10.0
Sand	61.0
Silt & Clay	29.0

Grading Analysis	
D60	0.21
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



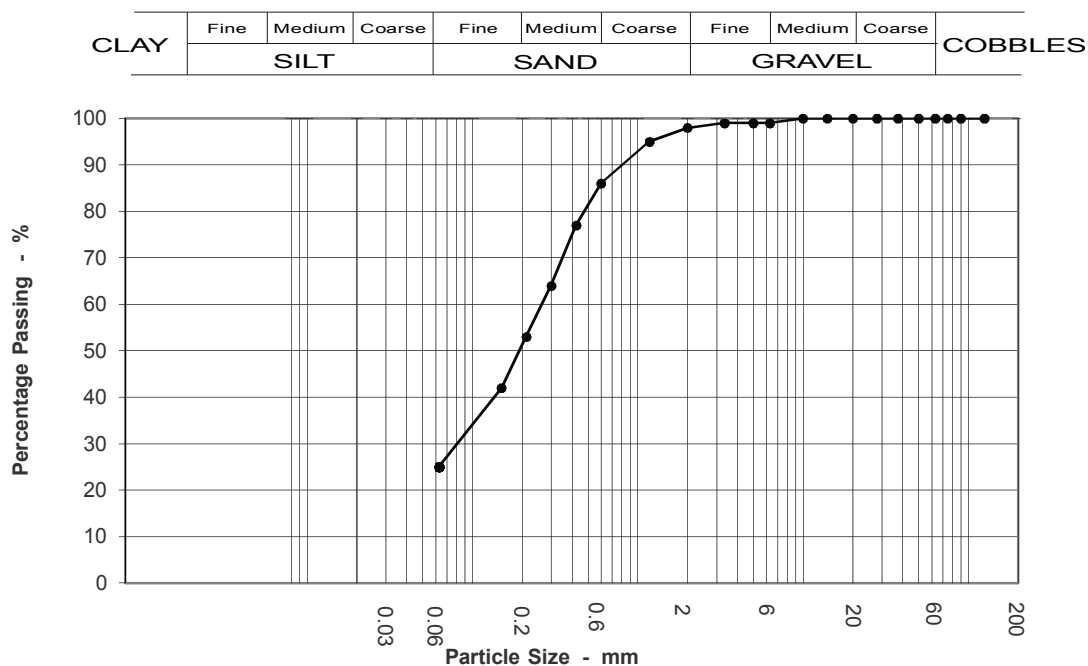


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8815
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey slightly gravelly clayey SAND	<b>Sample No:</b>	8
		<b>Depth (m):</b>	3.00 - 3.40
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	98		
1.18	95		
0.6	86		
0.425	77		
0.3	64		
0.212	53		
0.15	42		
0.063	25		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	2.0
Sand	73.0
Silt & Clay	25.0

Grading Analysis	
D60	0.27
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



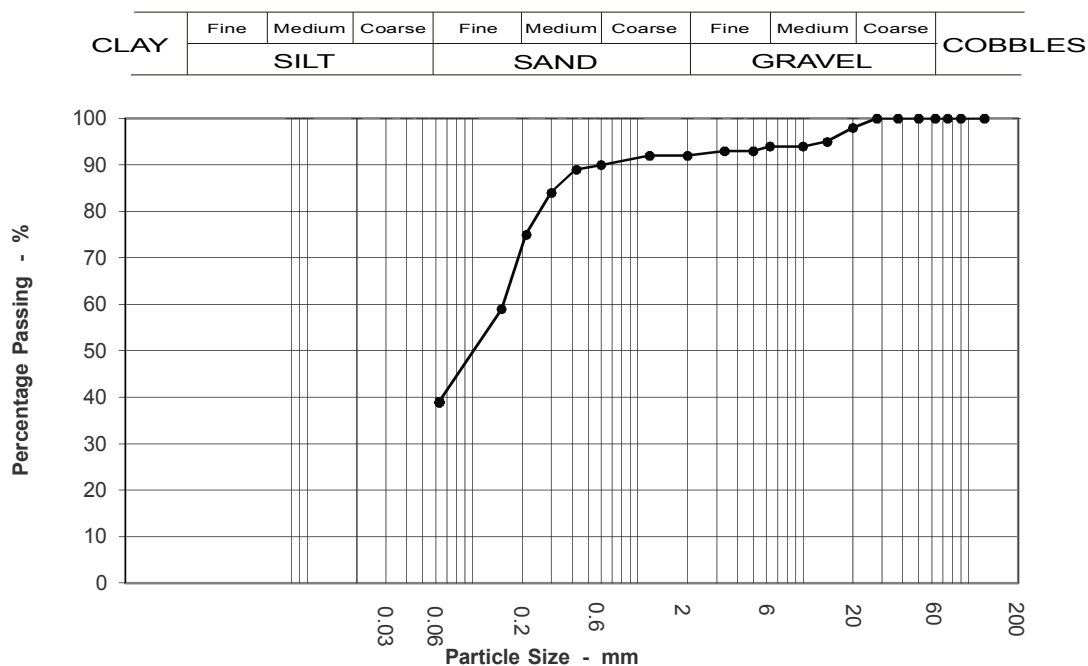


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8817
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	D
<b>Sample Description:</b>	Brown gravelly clayey SAND	<b>Sample No:</b>	12
		<b>Depth (m):</b>	4.3
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	95		
10	94		
6.3	94		
5	93		
3.35	93		
2	92		
1.18	92		
0.6	90		
0.425	89		
0.3	84		
0.212	75		
0.15	59		
0.063	39		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	8.0
Sand	53.0
Silt & Clay	39.0

Grading Analysis	
D60	0.15
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



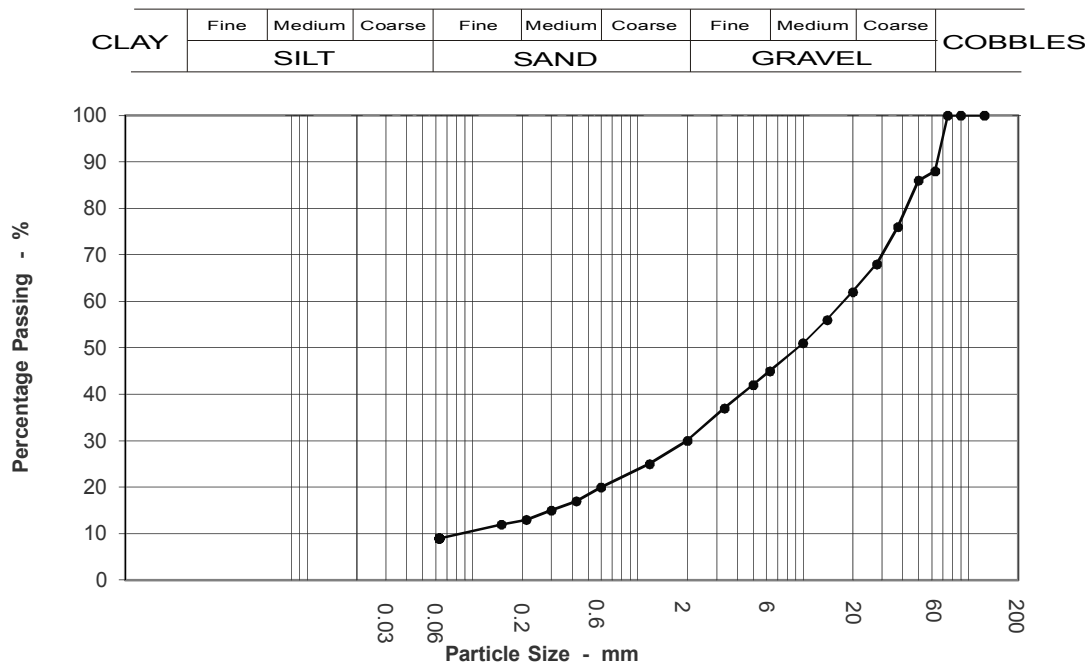


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8820
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH15
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.50 - 3.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	86		
37.5	76		
28	68		
20	62		
14	56		
10	51		
6.3	45		
5	42		
3.35	37		
2	30		
1.18	25		
0.6	20		
0.425	17		
0.3	15		
0.212	13		
0.15	12		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	12.0
Gravel	58.0
Sand	21.0
Silt & Clay	9.0

Grading Analysis	
D60	18.00
D10	0.09
Uniformity Coefficient	195.65

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





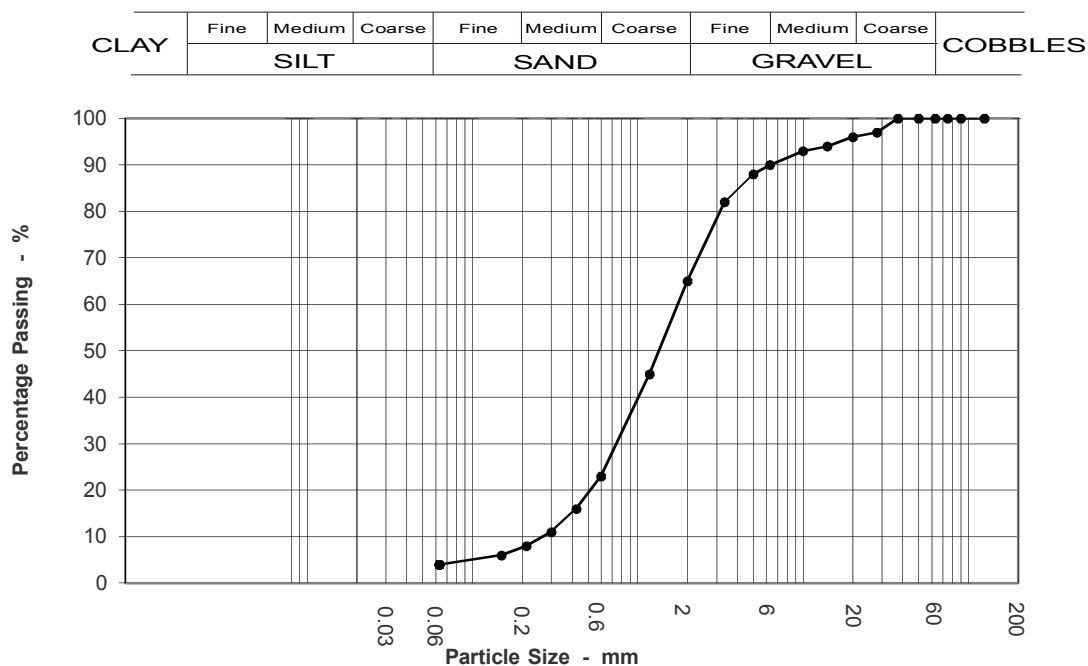


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8819
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH15
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very gravelly SAND	<b>Sample No:</b>	4
		<b>Depth (m):</b>	1.20 - 1.50
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	96		
14	94		
10	93		
6.3	90		
5	88		
3.35	82		
2	65		
1.18	45		
0.6	23		
0.425	16		
0.3	11		
0.212	8		
0.15	6		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	35.0
Sand	61.0
Silt & Clay	4.0

Grading Analysis	
D60	1.80
D10	0.27
Uniformity Coefficient	6.63

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



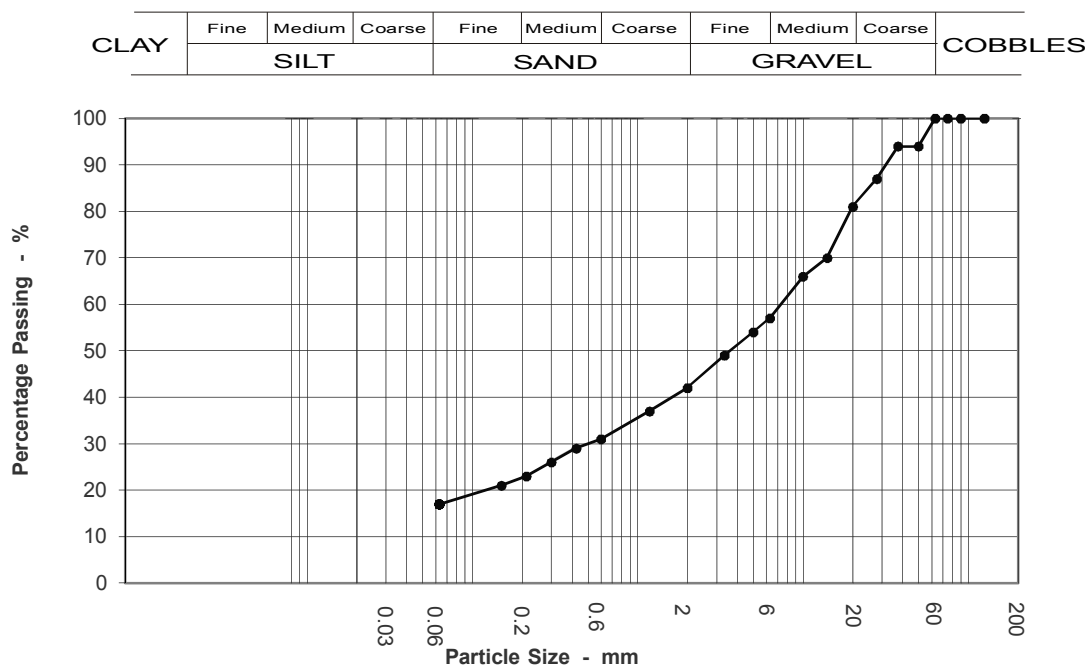


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8823
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH15
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Orange brown slightly sandy gravelly silty CLAY	<b>Sample No:</b>	8
		<b>Depth (m):</b>	3.00 - 3.30
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	94		
28	87		
20	81		
14	70		
10	66		
6.3	57		
5	54		
3.35	49		
2	42		
1.18	37		
0.6	31		
0.425	29		
0.3	26		
0.212	23		
0.15	21		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	58.0
Sand	25.0
Silt & Clay	17.0

Grading Analysis	
D60	7.53
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



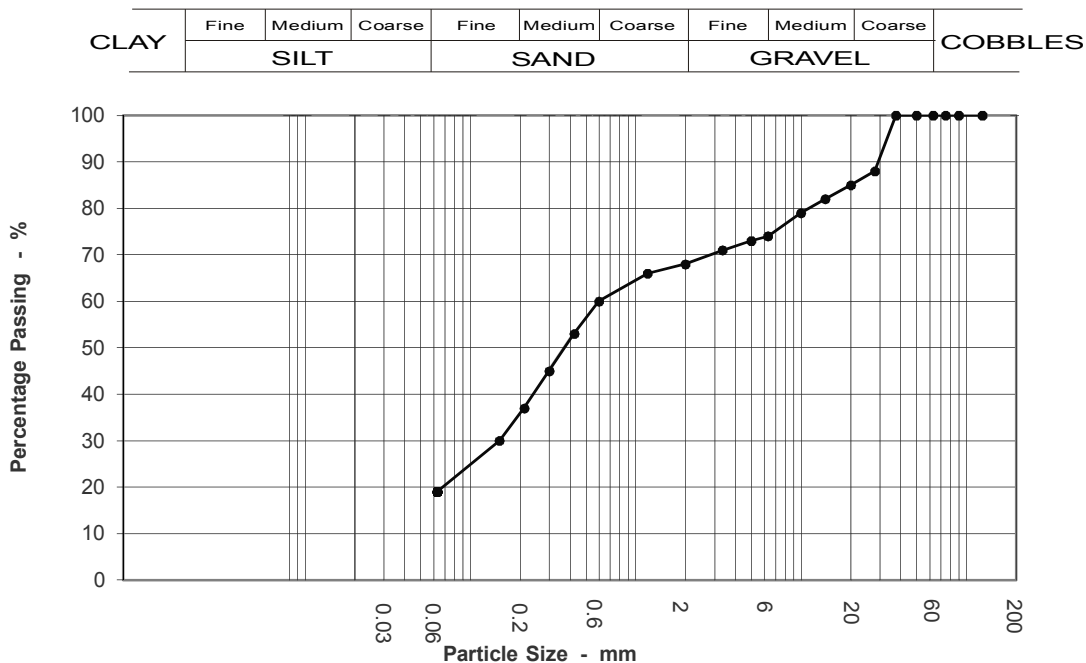


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8824
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH15
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey clayey very gravelly SAND	<b>Sample No:</b>	13
		<b>Depth (m):</b>	4.50 - 5.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	88		
20	85		
14	82		
10	79		
6.3	74		
5	73		
3.35	71		
2	68		
1.18	66		
0.6	60		
0.425	53		
0.3	45		
0.212	37		
0.15	30		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	49.0
Silt & Clay	19.0

Grading Analysis	
D60	0.60
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



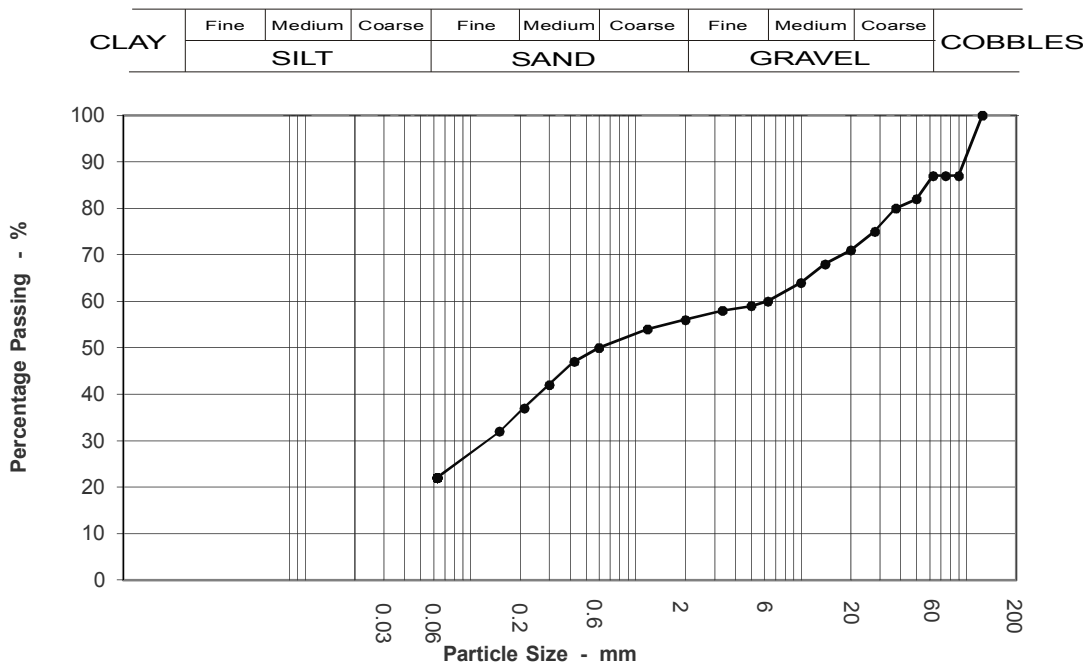


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8825
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH17
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very gravelly SAND with cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.50 - 1.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	87		
75	87		
63	87		
50	82		
37.5	80		
28	75		
20	71		
14	68		
10	64		
6.3	60		
5	59		
3.35	58		
2	56		
1.18	54		
0.6	50		
0.425	47		
0.3	42		
0.212	37		
0.15	32		
0.063	22		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	13.0
Gravel	31.0
Sand	34.0
Silt & Clay	22.0

Grading Analysis	
D60	6.30
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



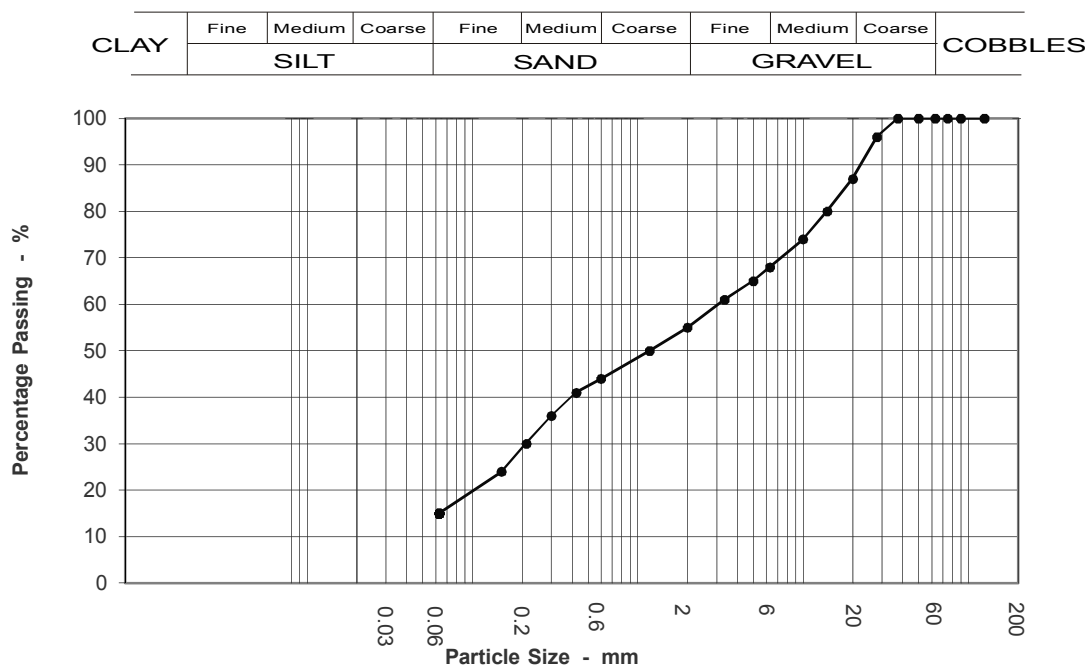


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8826
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH17
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey SAND and GRAVEL	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 1.55
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	87		
14	80		
10	74		
6.3	68		
5	65		
3.35	61		
2	55		
1.18	50		
0.6	44		
0.425	41		
0.3	36		
0.212	30		
0.15	24		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	45.0
Sand	40.0
Silt & Clay	15.0

Grading Analysis	
D60	3.13
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



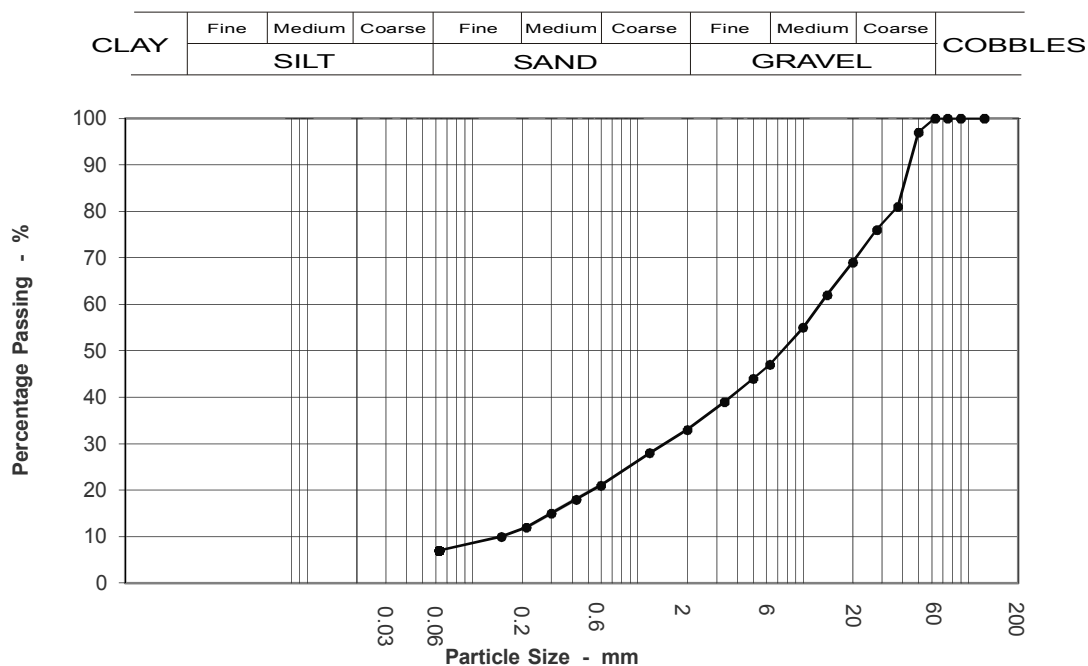


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8828
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH17
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey very sandy GRAVEL	<b>Sample No:</b>	9
		<b>Depth (m):</b>	2.00 - 2.50
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	81		
28	76		
20	69		
14	62		
10	55		
6.3	47		
5	44		
3.35	39		
2	33		
1.18	28		
0.6	21		
0.425	18		
0.3	15		
0.212	12		
0.15	10		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	67.0
Sand	26.0
Silt & Clay	7.0

Grading Analysis	
D60	12.86
D10	0.15
Uniformity Coefficient	85.71

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





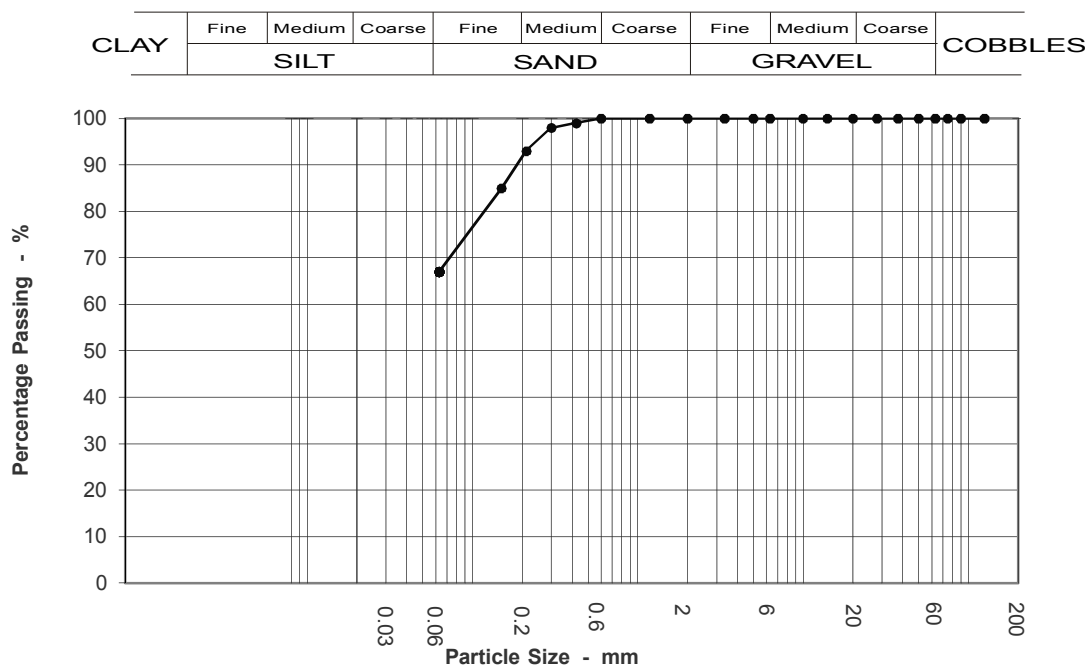


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8829
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH17
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown sandy SILT	<b>Sample No:</b>	13
		<b>Depth (m):</b>	4.00 - 5.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	99		
0.3	98		
0.212	93		
0.15	85		
0.063	67		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	33.0
Silt & Clay	67.0

Grading Analysis	
D60	
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



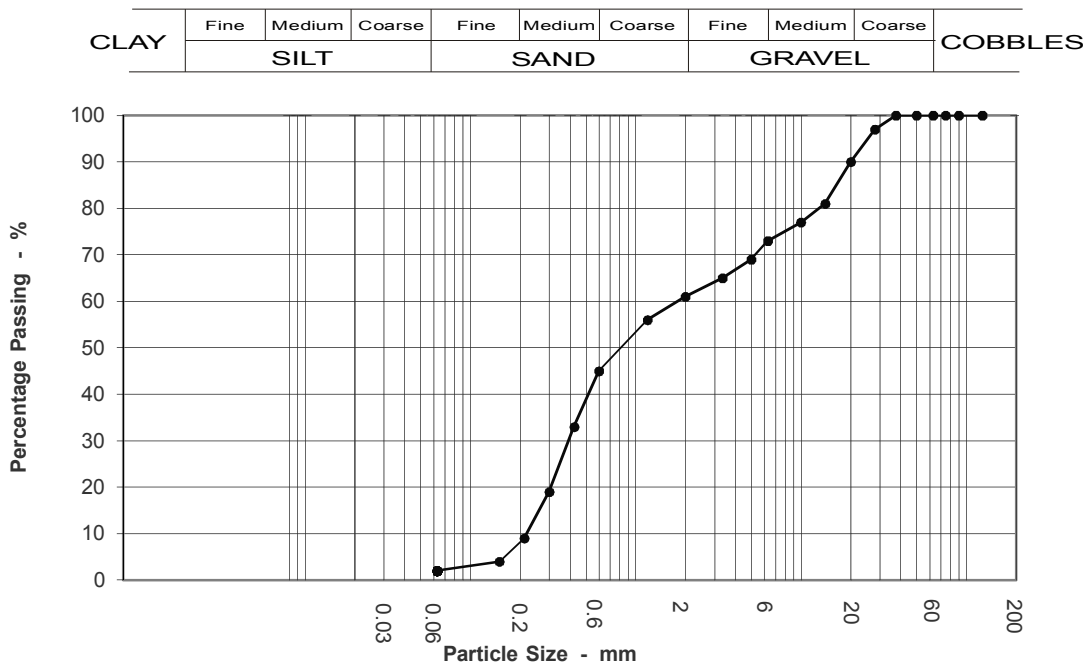


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8830
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH18
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very gravelly SAND	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.50 - 1.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	90		
14	81		
10	77		
6.3	73		
5	69		
3.35	65		
2	61		
1.18	56		
0.6	45		
0.425	33		
0.3	19		
0.212	9		
0.15	4		
0.063	2		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	39.0
Sand	59.0
Silt & Clay	2.0

Grading Analysis	
D60	1.84
D10	0.22
Uniformity Coefficient	8.32

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



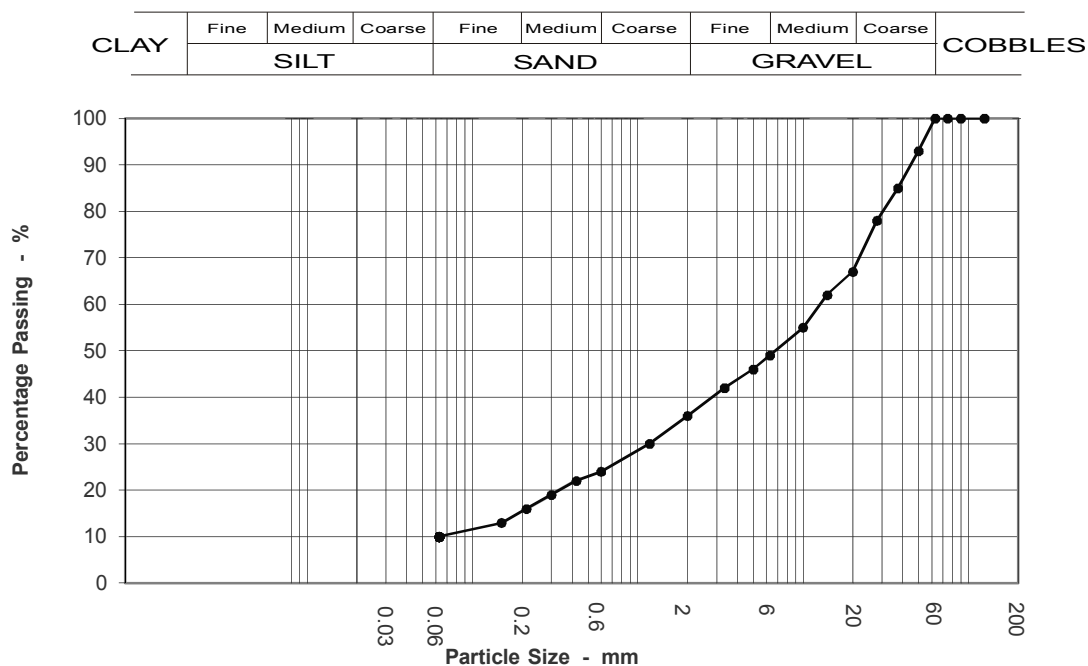


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8831
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH18
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly silty very sandy GRAVEL	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	85		
28	78		
20	67		
14	62		
10	55		
6.3	49		
5	46		
3.35	42		
2	36		
1.18	30		
0.6	24		
0.425	22		
0.3	19		
0.212	16		
0.15	13		
0.063	10		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	64.0
Sand	26.0
Silt & Clay	10.0

Grading Analysis	
D60	12.86
D10	0.06
Uniformity Coefficient	204.08

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



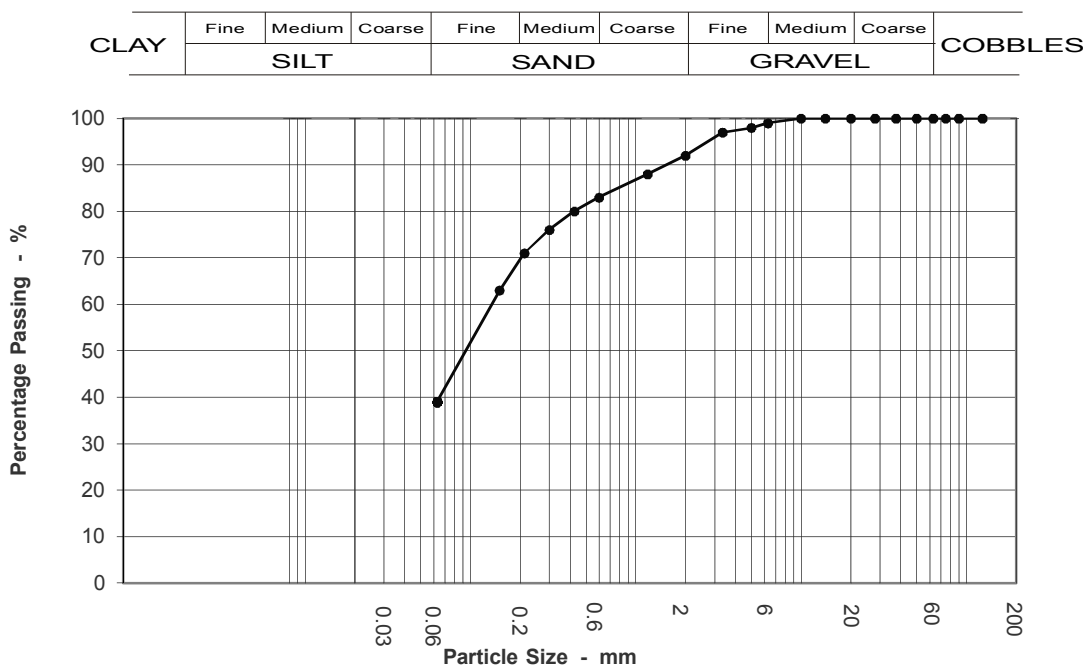


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8833
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH18
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark grey slightly gravelly sandy SILT	<b>Sample No:</b>	7
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	98		
3.35	97		
2	92		
1.18	88		
0.6	83		
0.425	80		
0.3	76		
0.212	71		
0.15	63		
0.063	39		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	8.0
Sand	53.0
Silt & Clay	39.0

Grading Analysis	
D60	0.14
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agat K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



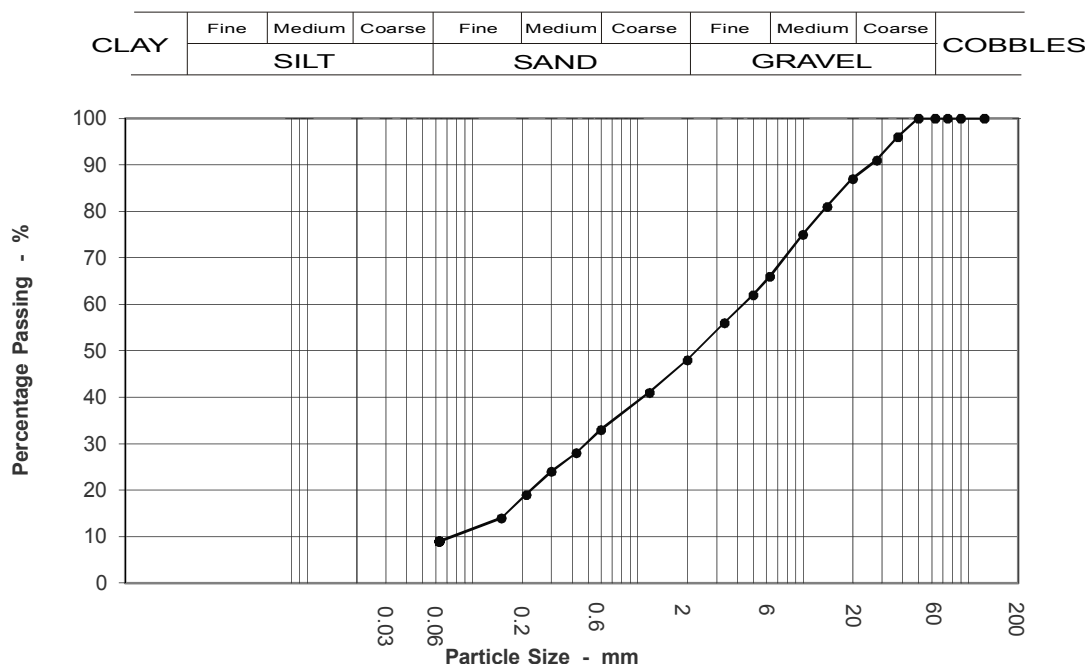


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8834
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH18
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark greyish brown slightly clayey very sandy GRAVEL	<b>Sample No:</b>	10
		<b>Depth (m):</b>	3.30 - 4.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	91		
20	87		
14	81		
10	75		
6.3	66		
5	62		
3.35	56		
2	48		
1.18	41		
0.6	33		
0.425	28		
0.3	24		
0.212	19		
0.15	14		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	52.0
Sand	39.0
Silt & Clay	9.0

Grading Analysis	
D60	4.45
D10	0.08
Uniformity Coefficient	55.35

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



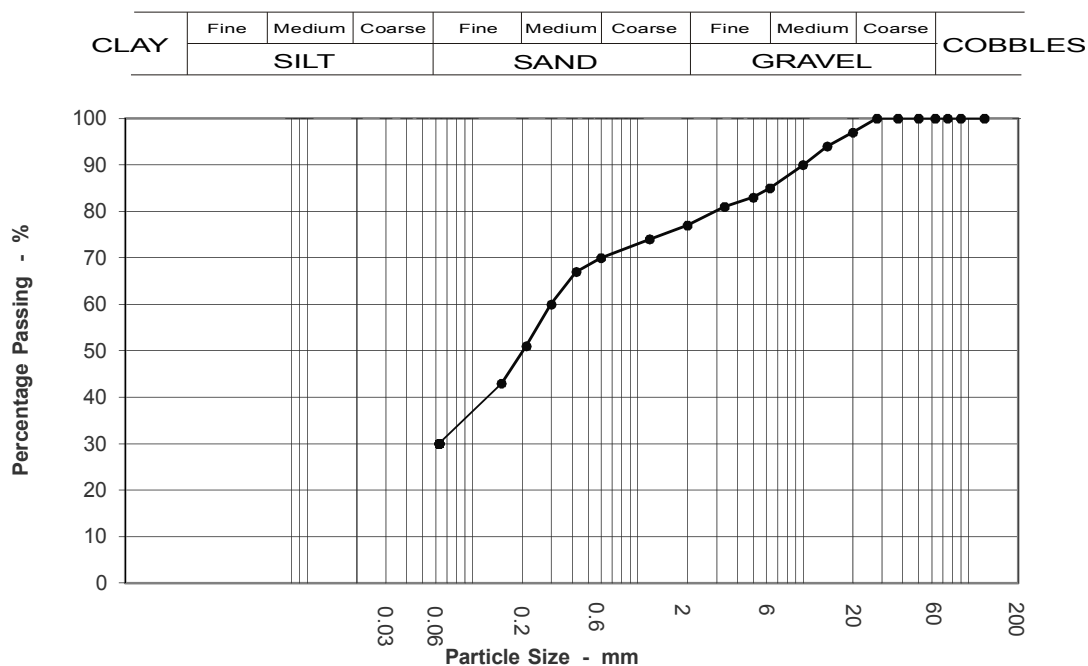


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8835
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH18
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Orange brown sandy gravelly silty CLAY	<b>Sample No:</b>	13
		<b>Depth (m):</b>	4.50 - 5.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	94		
10	90		
6.3	85		
5	83		
3.35	81		
2	77		
1.18	74		
0.6	70		
0.425	67		
0.3	60		
0.212	51		
0.15	43		
0.063	30		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	23.0
Sand	47.0
Silt & Clay	30.0

Grading Analysis	
D60	0.30
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





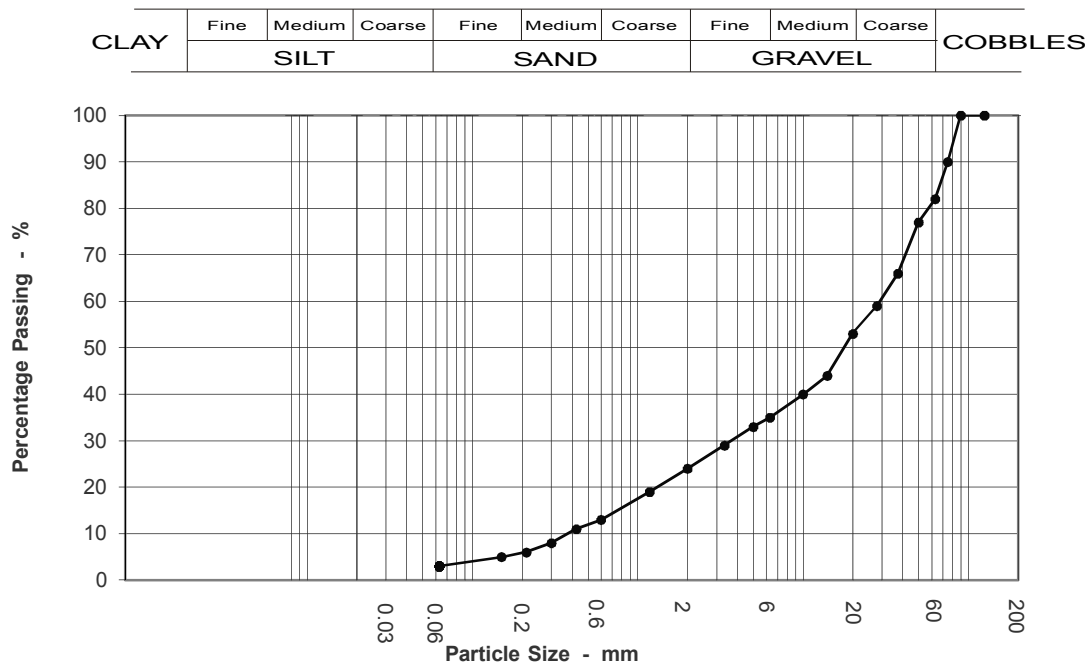


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8836
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH19
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL with cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	90		
63	82		
50	77		
37.5	66		
28	59		
20	53		
14	44		
10	40		
6.3	35		
5	33		
3.35	29		
2	24		
1.18	19		
0.6	13		
0.425	11		
0.3	8		
0.212	6		
0.15	5		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	18.0
Gravel	58.0
Sand	21.0
Silt & Clay	3.0

Grading Analysis	
D60	29.36
D10	0.38
Uniformity Coefficient	76.58

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



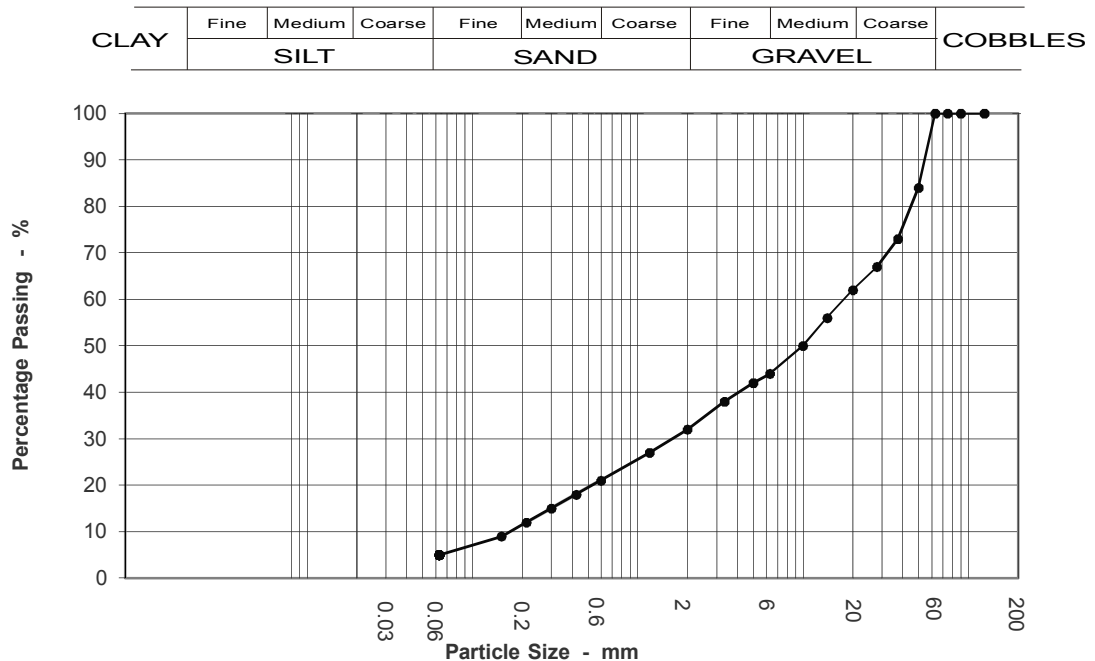


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8837
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH19
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	84		
37.5	73		
28	67		
20	62		
14	56		
10	50		
6.3	44		
5	42		
3.35	38		
2	32		
1.18	27		
0.6	21		
0.425	18		
0.3	15		
0.212	12		
0.15	9		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	68.0
Sand	27.0
Silt & Clay	5.0

Grading Analysis	
D60	18.00
D10	0.17
Uniformity Coefficient	105.47

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



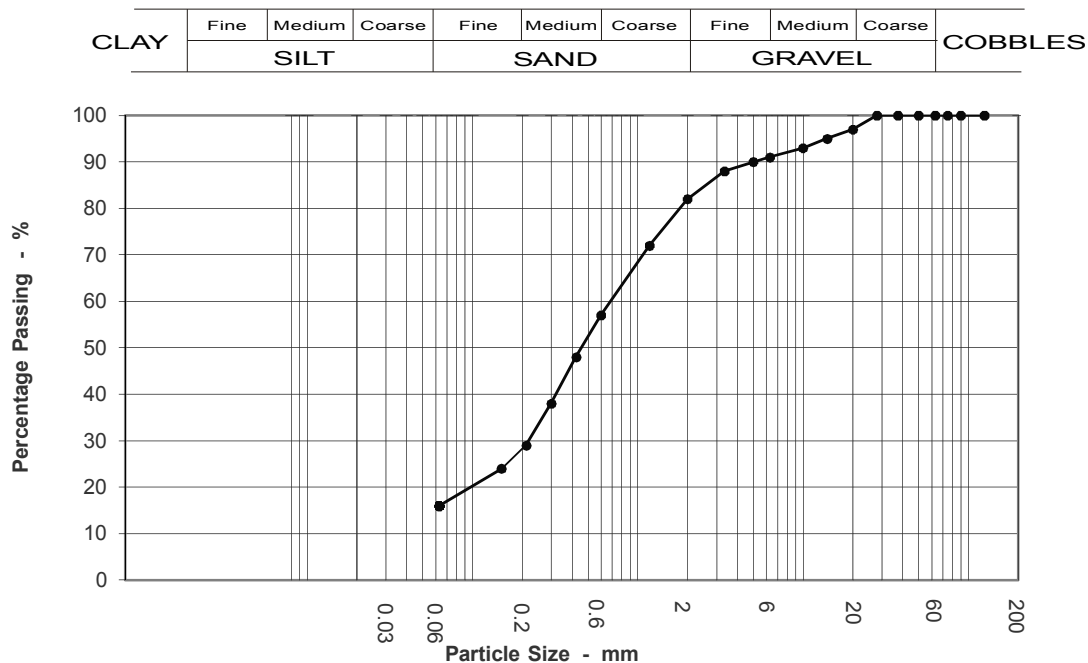


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8840
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH19
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Grey clayey gravelly SAND	<b>Sample No:</b>	11
		<b>Depth (m):</b>	3.00 - 4.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	95		
10	93		
6.3	91		
5	90		
3.35	88		
2	82		
1.18	72		
0.6	57		
0.425	48		
0.3	38		
0.212	29		
0.15	24		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	18.0
Sand	66.0
Silt & Clay	16.0

Grading Analysis	
D60	0.72
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



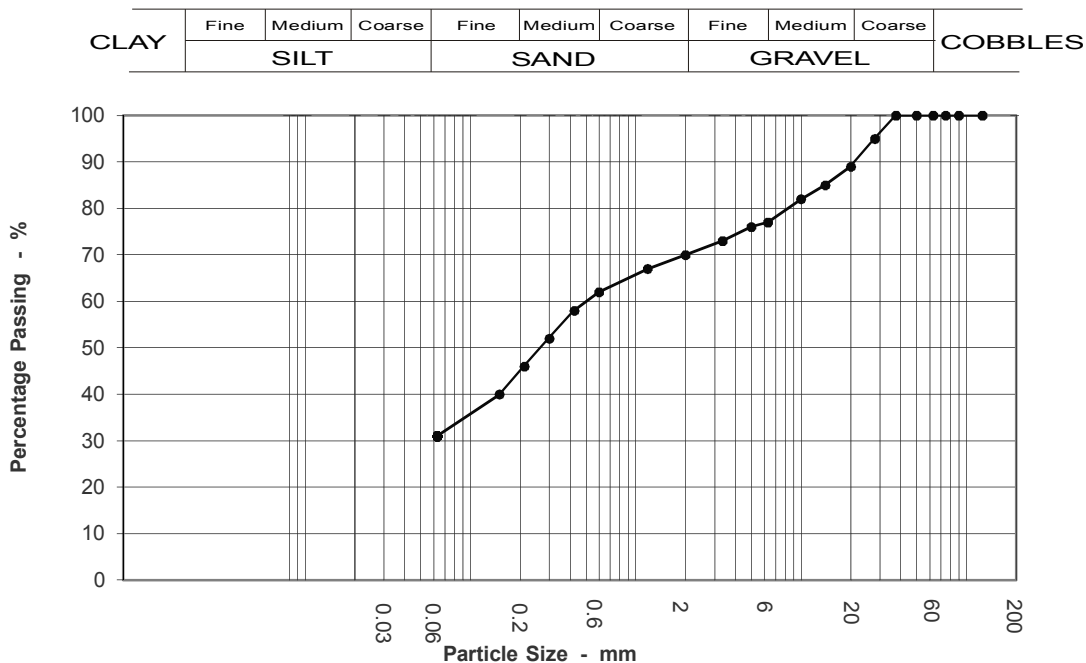


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8842
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH19
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown gravelly sandy CLAY	<b>Sample No:</b>	14
		<b>Depth (m):</b>	4.80 - 5.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	89		
14	85		
10	82		
6.3	77		
5	76		
3.35	73		
2	70		
1.18	67		
0.6	62		
0.425	58		
0.3	52		
0.212	46		
0.15	40		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	30.0
Sand	39.0
Silt & Clay	31.0

Grading Analysis	
D60	0.51
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



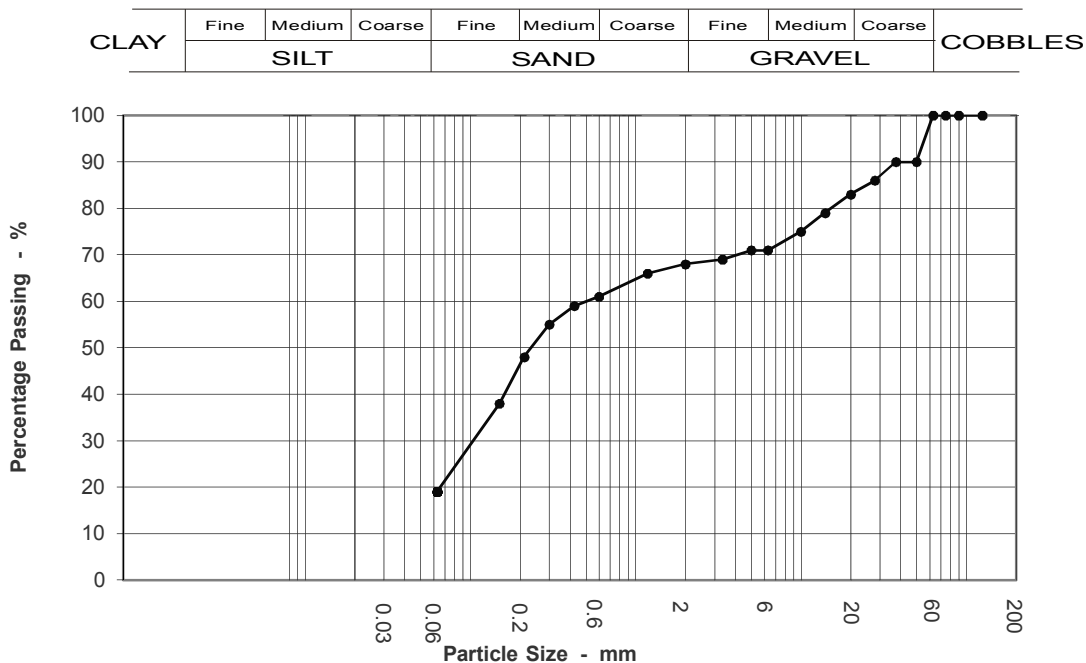


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8843
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very gravelly SAND	<b>Sample No:</b>	4
		<b>Depth (m):</b>	0.90 - 1.20
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	90		
37.5	90		
28	86		
20	83		
14	79		
10	75		
6.3	71		
5	71		
3.35	69		
2	68		
1.18	66		
0.6	61		
0.425	59		
0.3	55		
0.212	48		
0.15	38		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	32.0
Sand	49.0
Silt & Clay	19.0

Grading Analysis	
D60	0.51
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



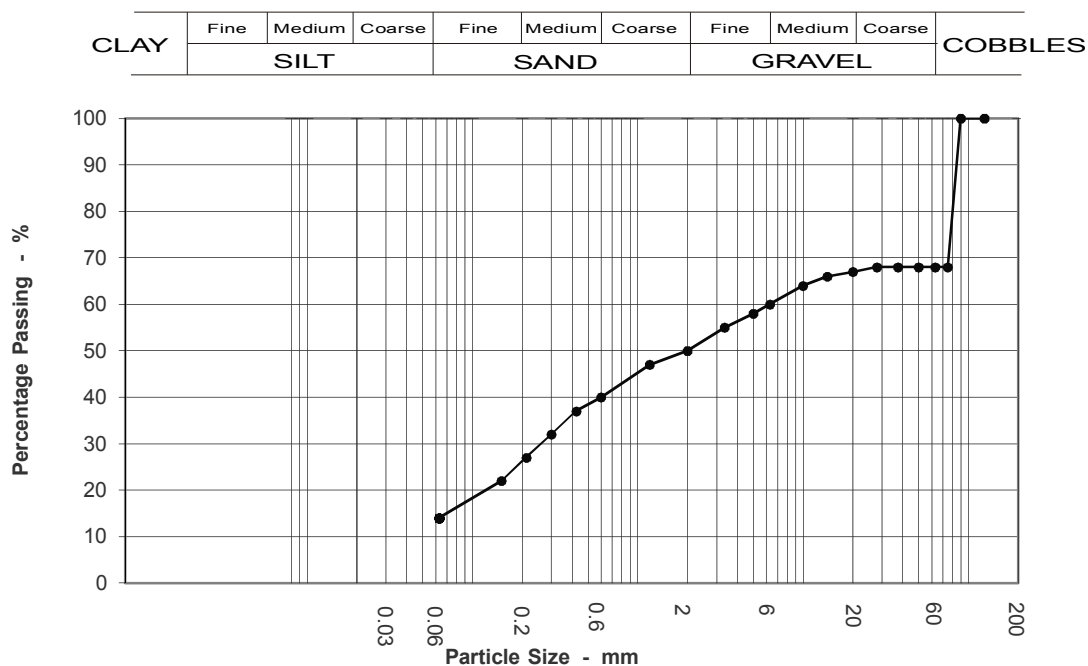


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8844
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty gravelly SAND with frequent cobbles	<b>Sample No:</b>	10
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	68		
63	68		
50	68		
37.5	68		
28	68		
20	67		
14	66		
10	64		
6.3	60		
5	58		
3.35	55		
2	50		
1.18	47		
0.6	40		
0.425	37		
0.3	32		
0.212	27		
0.15	22		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	32.0
Gravel	18.0
Sand	36.0
Silt & Clay	14.0

Grading Analysis	
D60	6.30
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





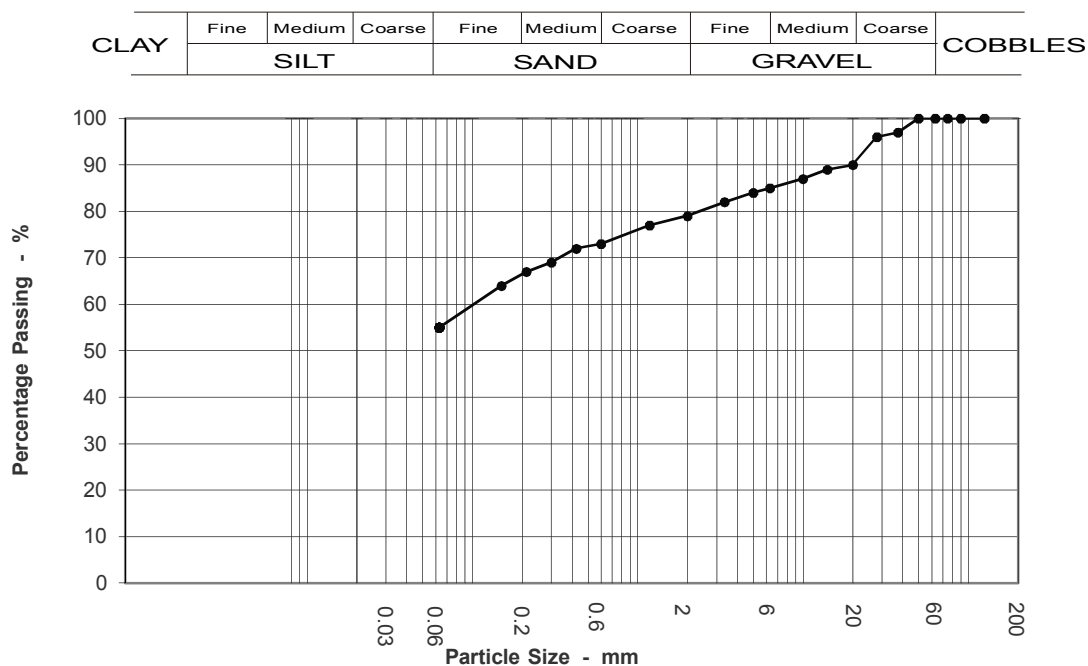


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8846
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly slightly sandy silty CLAY	<b>Sample No:</b>	14
		<b>Depth (m):</b>	3.60 - 4.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	97		
28	96		
20	90		
14	89		
10	87		
6.3	85		
5	84		
3.35	82		
2	79		
1.18	77		
0.6	73		
0.425	72		
0.3	69		
0.212	67		
0.15	64		
0.063	55		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	21.0
Sand	24.0
Silt & Clay	55.0

Grading Analysis	
D60	0.11
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



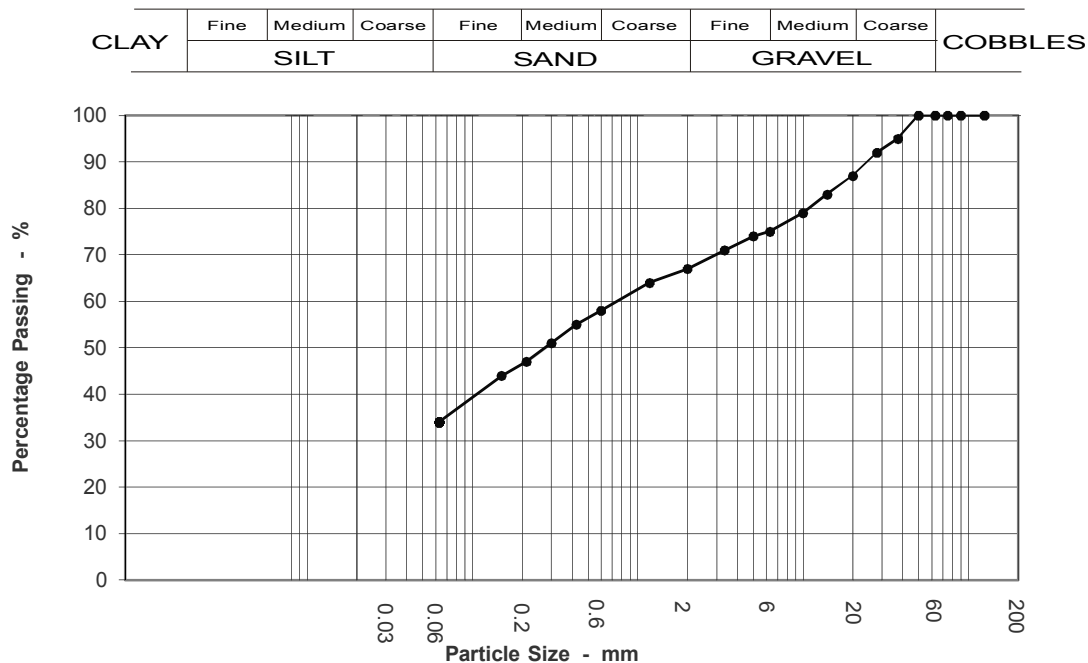


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8848
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly CLAY	<b>Sample No:</b>	17
		<b>Depth (m):</b>	4.50 - 5.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	92		
20	87		
14	83		
10	79		
6.3	75		
5	74		
3.35	71		
2	67		
1.18	64		
0.6	58		
0.425	55		
0.3	51		
0.212	47		
0.15	44		
0.063	34		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	33.0
Sand	33.0
Silt & Clay	34.0

Grading Analysis	
D60	0.79
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



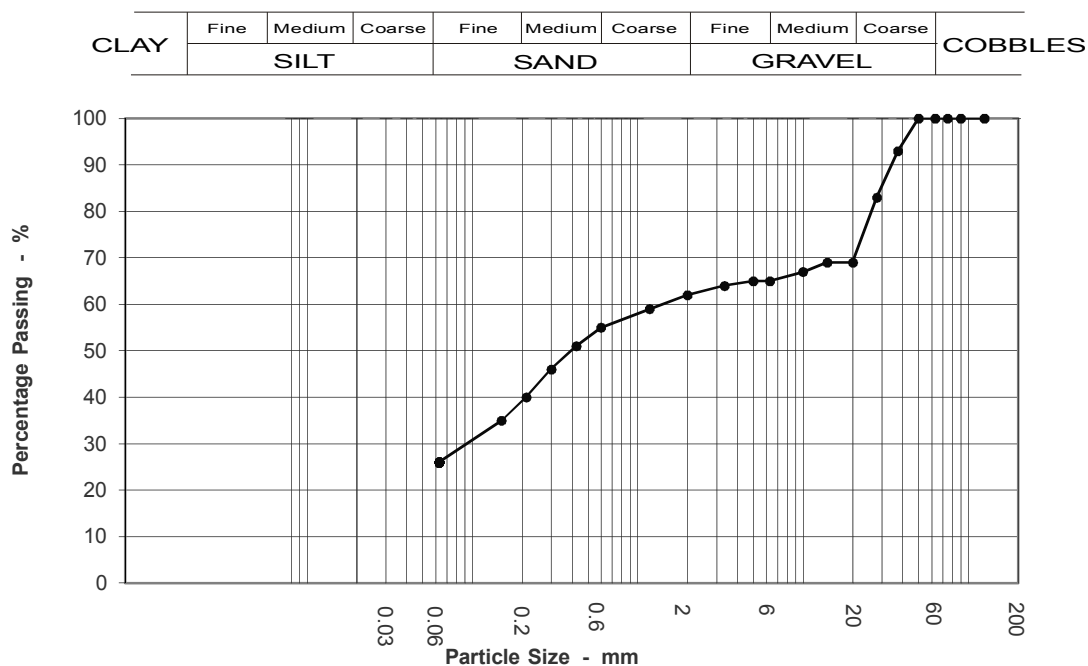


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8850
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Pinkish brown very clayey very sandy GRAVEL	<b>Sample No:</b>	23
		<b>Depth (m):</b>	6.20 - 6.75
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	93		
28	83		
20	69		
14	69		
10	67		
6.3	65		
5	65		
3.35	64		
2	62		
1.18	59		
0.6	55		
0.425	51		
0.3	46		
0.212	40		
0.15	35		
0.063	26		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	38.0
Sand	36.0
Silt & Clay	26.0

Grading Analysis	
D60	1.45
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



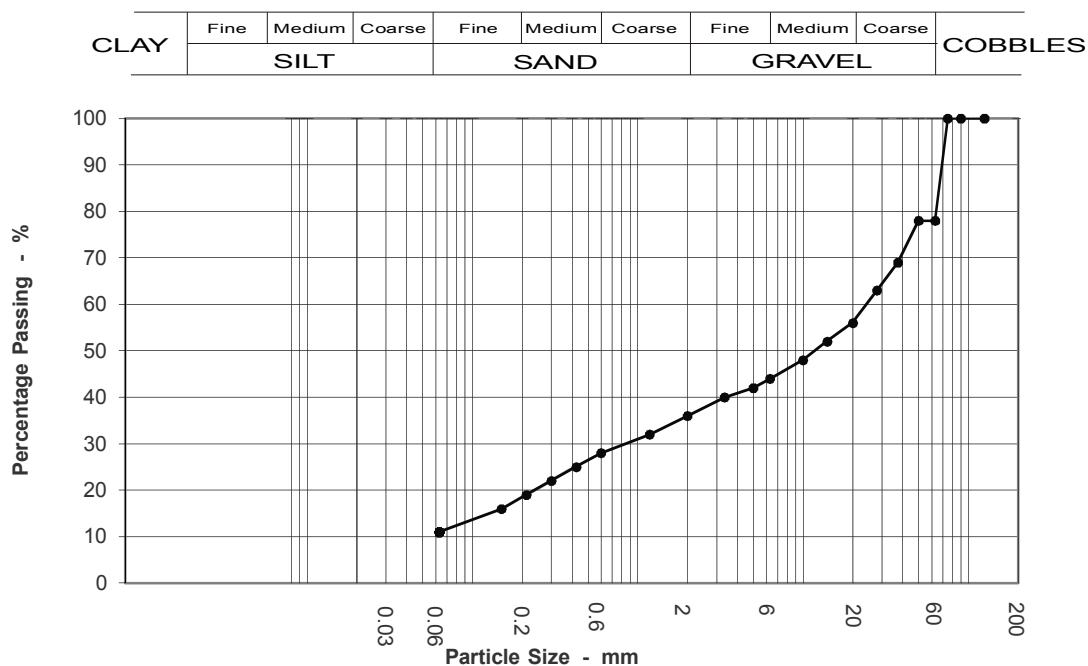


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8854
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL with frequent cobbles	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.80 - 2.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	78		
50	78		
37.5	69		
28	63		
20	56		
14	52		
10	48		
6.3	44		
5	42		
3.35	40		
2	36		
1.18	32		
0.6	28		
0.425	25		
0.3	22		
0.212	19		
0.15	16		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	22.0
Gravel	42.0
Sand	25.0
Silt & Clay	11.0

Grading Analysis	
D60	24.57
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



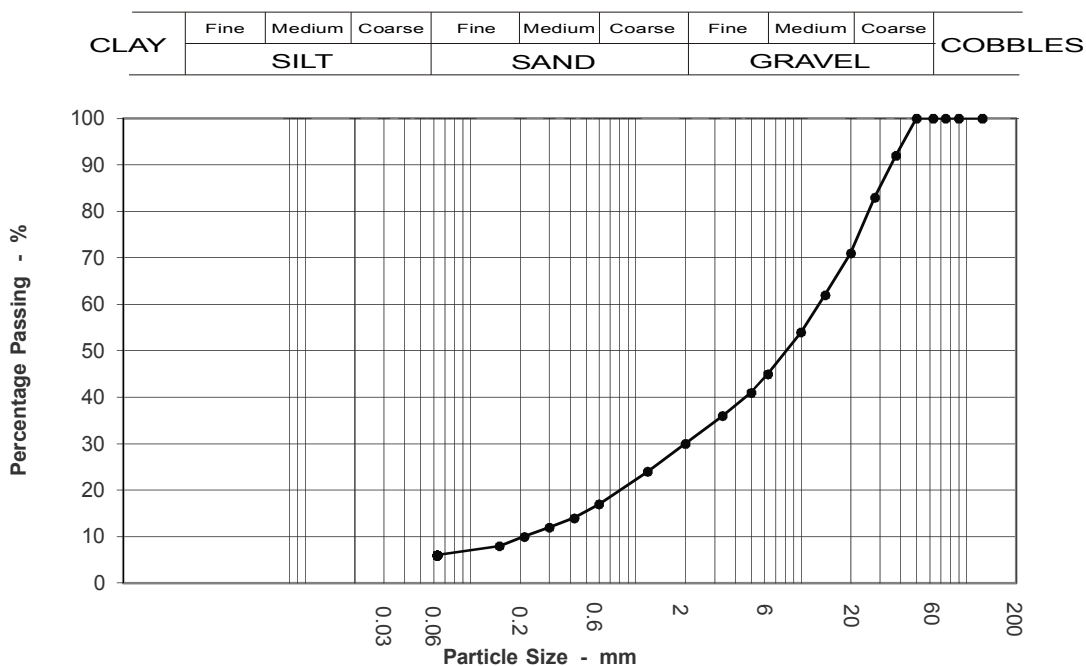


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8855
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly calyey very sandy GRAVEL	<b>Sample No:</b>	8
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	92		
28	83		
20	71		
14	62		
10	54		
6.3	45		
5	41		
3.35	36		
2	30		
1.18	24		
0.6	17		
0.425	14		
0.3	12		
0.212	10		
0.15	8		
0.063	6		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	70.0
Sand	24.0
Silt & Clay	6.0

Grading Analysis	
D60	13.00
D10	0.21
Uniformity Coefficient	61.32

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



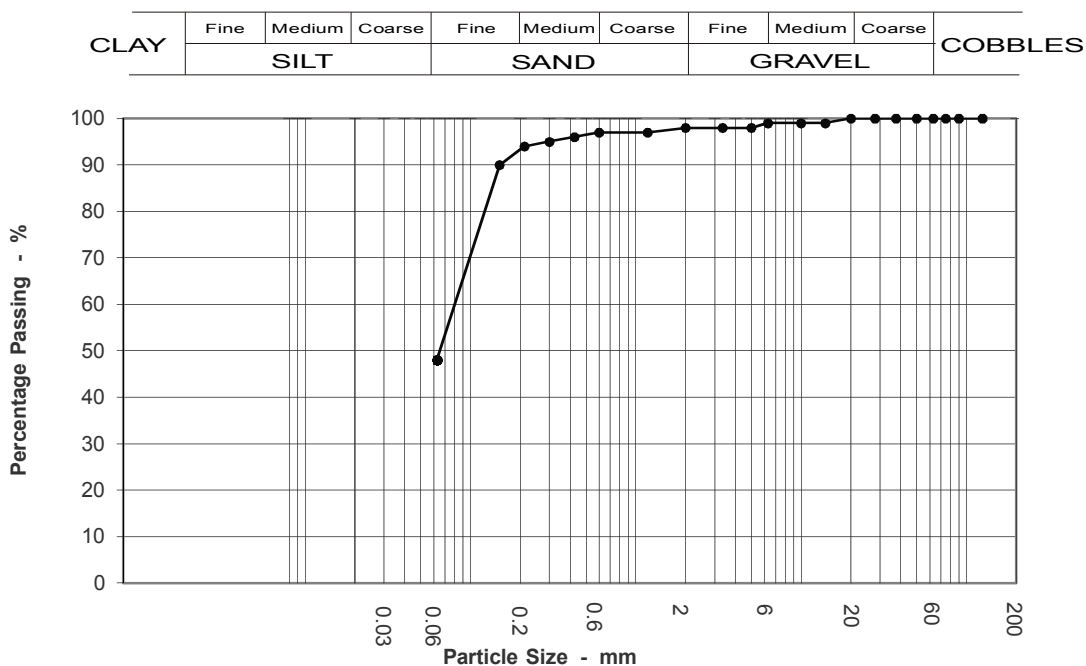


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8857
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly gravelly very silty SAND	<b>Sample No:</b>	11
		<b>Depth (m):</b>	3.30 - 4.00
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	99		
6.3	99		
5	98		
3.35	98		
2	98		
1.18	97		
0.6	97		
0.425	96		
0.3	95		
0.212	94		
0.15	90		
0.063	48		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	2.0
Sand	50.0
Silt & Clay	48.0

Grading Analysis	
D60	0.09
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





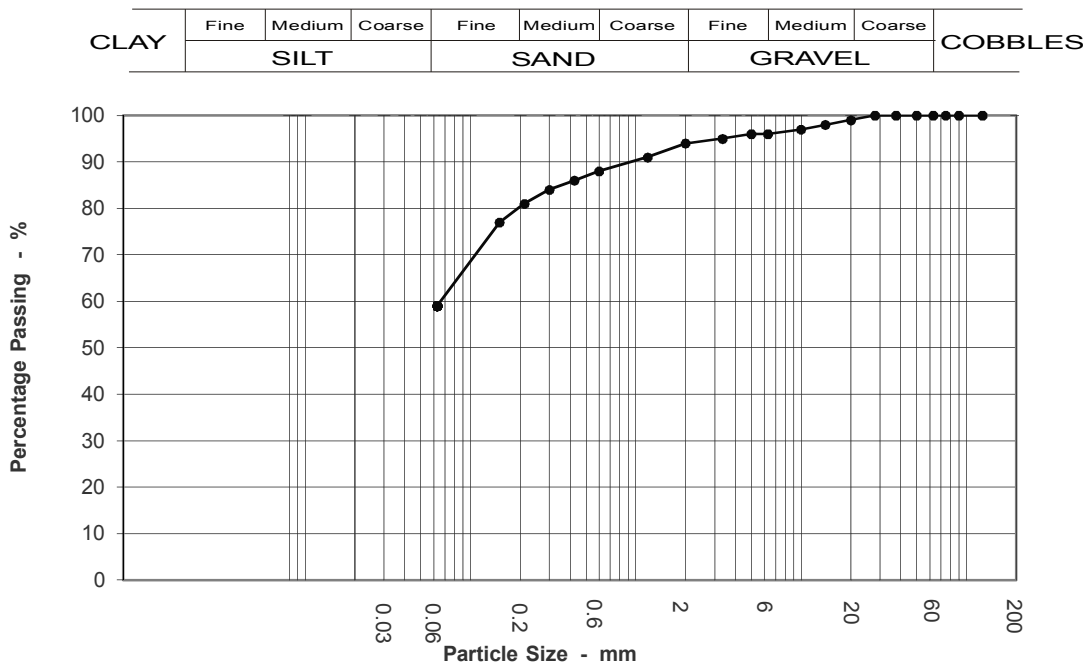


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8858
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy silty CLAY	<b>Sample No:</b>	13
		<b>Depth (m):</b>	4.00 - 4.40
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	99		
14	98		
10	97		
6.3	96		
5	96		
3.35	95		
2	94		
1.18	91		
0.6	88		
0.425	86		
0.3	84		
0.212	81		
0.15	77		
0.063	59		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	6.0
Sand	35.0
Silt & Clay	59.0

Grading Analysis	
D60	0.07
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



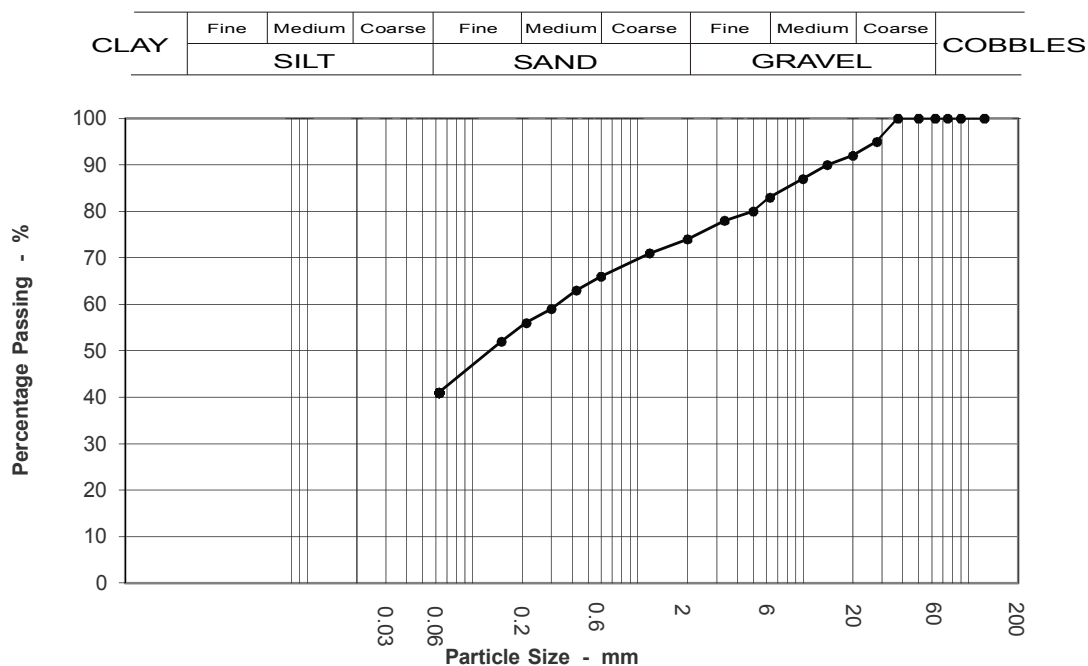


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8859
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly slightly sandy CLAY	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.50 - 5.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	92		
14	90		
10	87		
6.3	83		
5	80		
3.35	78		
2	74		
1.18	71		
0.6	66		
0.425	63		
0.3	59		
0.212	56		
0.15	52		
0.063	41		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	26.0
Sand	33.0
Silt & Clay	41.0

Grading Analysis	
D60	0.33
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



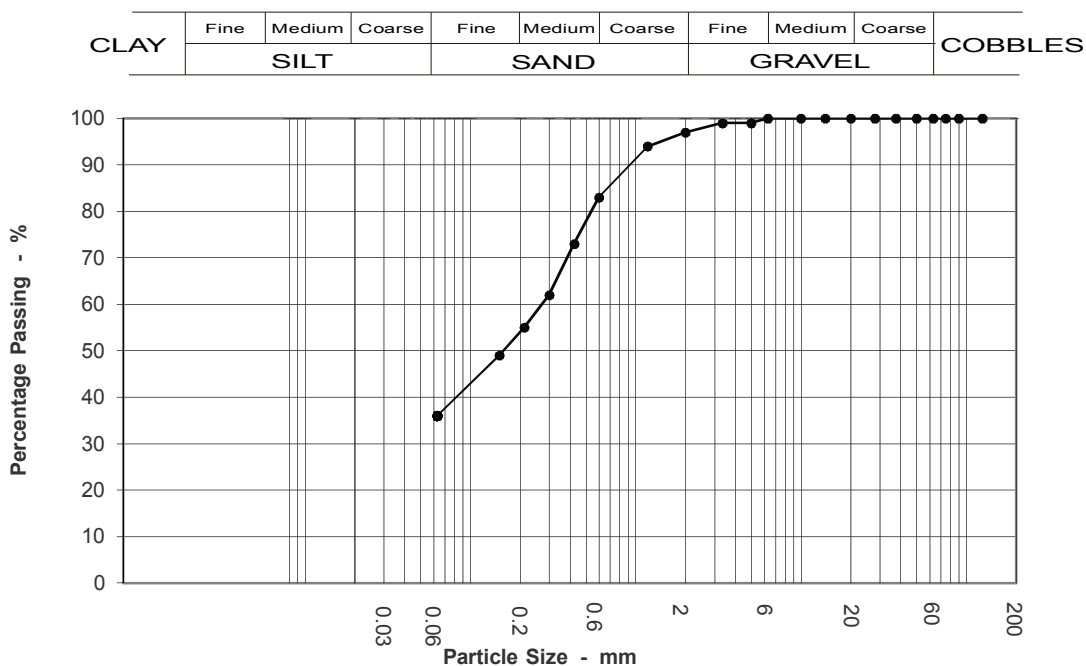


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8861
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light brown slightly gravelly very silty SAND	<b>Sample No:</b>	20
		<b>Depth (m):</b>	6.35 - 7.50
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	97		
1.18	94		
0.6	83		
0.425	73		
0.3	62		
0.212	55		
0.15	49		
0.063	36		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	3.0
Sand	61.0
Silt & Clay	36.0

Grading Analysis	
D60	0.27
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



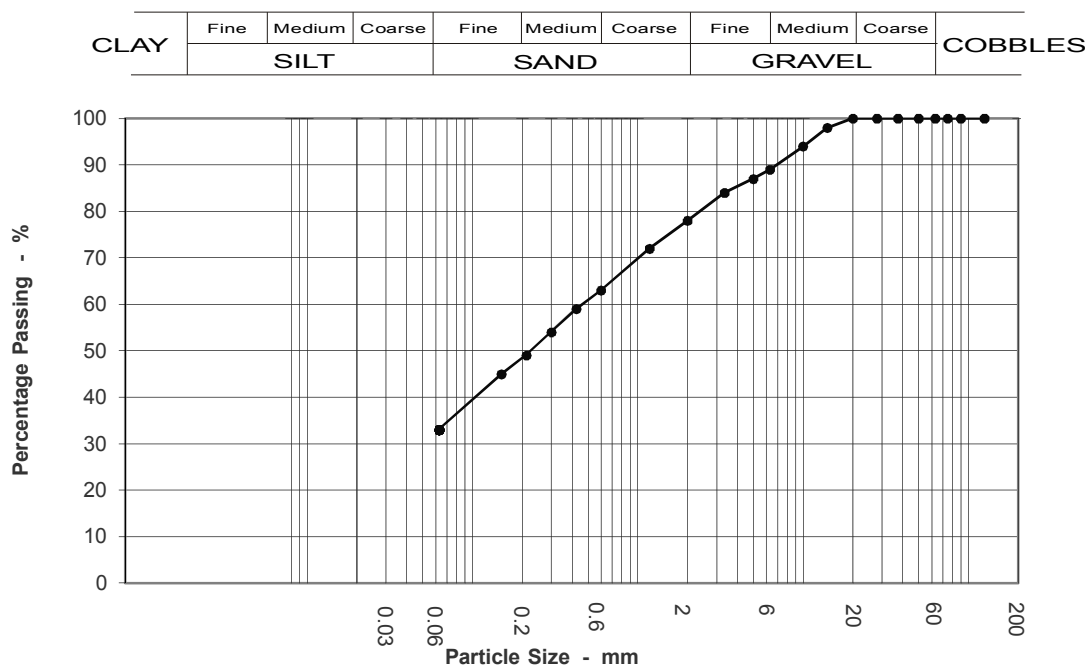


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8862
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH21B
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light brown slightly gravelly very silty SAND	<b>Sample No:</b>	23
		<b>Depth (m):</b>	8.00 - 9.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	94		
6.3	89		
5	87		
3.35	84		
2	78		
1.18	72		
0.6	63		
0.425	59		
0.3	54		
0.212	49		
0.15	45		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	22.0
Sand	45.0
Silt & Clay	33.0

Grading Analysis	
D60	0.47
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



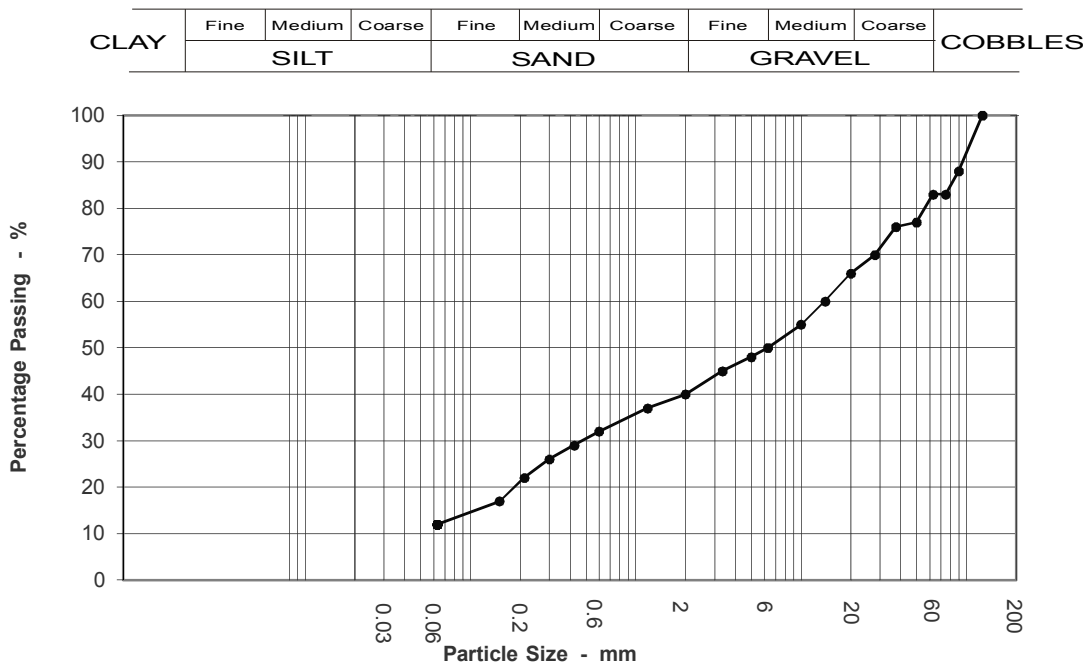


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8863
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH22
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	88		
75	83		
63	83		
50	77		
37.5	76		
28	70		
20	66		
14	60		
10	55		
6.3	50		
5	48		
3.35	45		
2	40		
1.18	37		
0.6	32		
0.425	29		
0.3	26		
0.212	22		
0.15	17		
0.063	12		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	17.0
Gravel	43.0
Sand	28.0
Silt & Clay	12.0

Grading Analysis	
D60	14.00
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



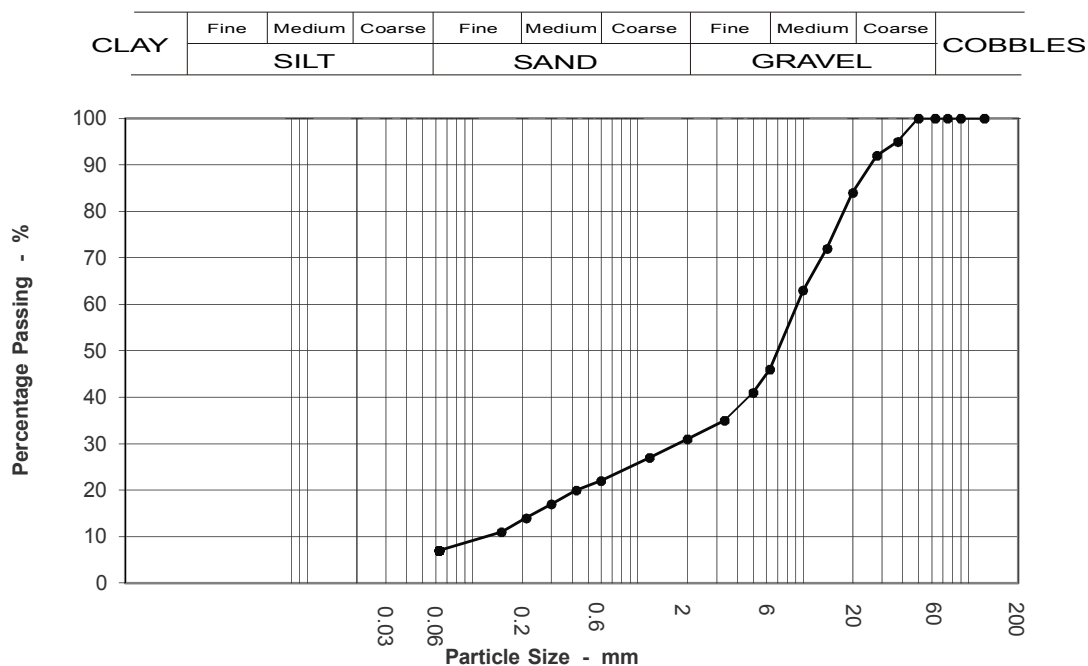


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8864
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH22
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly silty very sandy GRAVEL	<b>Sample No:</b>	7
		<b>Depth (m):</b>	2.20 - 2.80
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	95		
28	92		
20	84		
14	72		
10	63		
6.3	46		
5	41		
3.35	35		
2	31		
1.18	27		
0.6	22		
0.425	20		
0.3	17		
0.212	14		
0.15	11		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	69.0
Sand	24.0
Silt & Clay	7.0

Grading Analysis	
D60	9.35
D10	0.13
Uniformity Coefficient	72.88

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





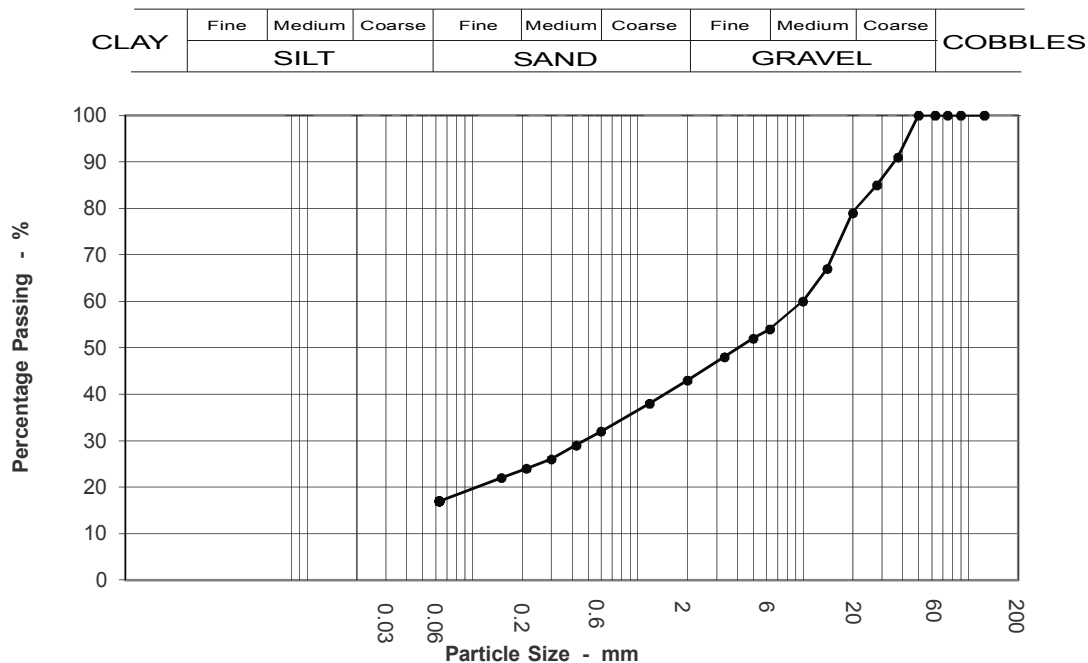


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8865
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH22
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown clayey very sandy GRAVEL	<b>Sample No:</b>	10
		<b>Depth (m):</b>	3.00 - 3.40
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	91		
28	85		
20	79		
14	67		
10	60		
6.3	54		
5	52		
3.35	48		
2	43		
1.18	38		
0.6	32		
0.425	29		
0.3	26		
0.212	24		
0.15	22		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	57.0
Sand	26.0
Silt & Clay	17.0

Grading Analysis	
D60	10.00
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



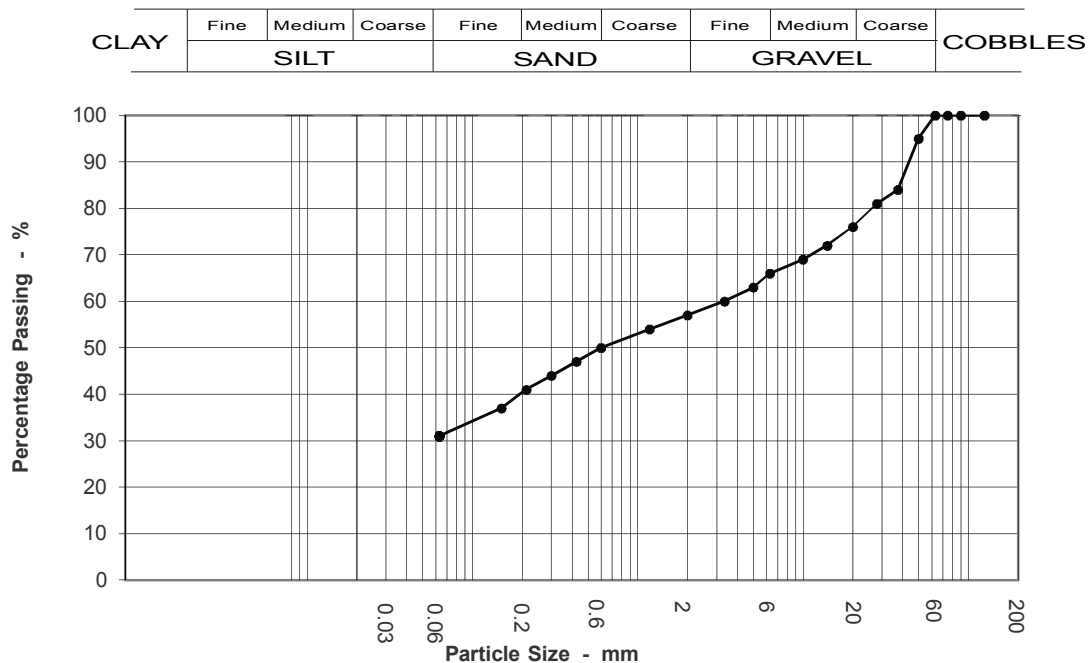


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8868
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH22
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy gravelly CLAY	<b>Sample No:</b>	19
		<b>Depth (m):</b>	6.50 - 7.50
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	84		
28	81		
20	76		
14	72		
10	69		
6.3	66		
5	63		
3.35	60		
2	57		
1.18	54		
0.6	50		
0.425	47		
0.3	44		
0.212	41		
0.15	37		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	43.0
Sand	26.0
Silt & Clay	31.0

Grading Analysis	
D60	3.35
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



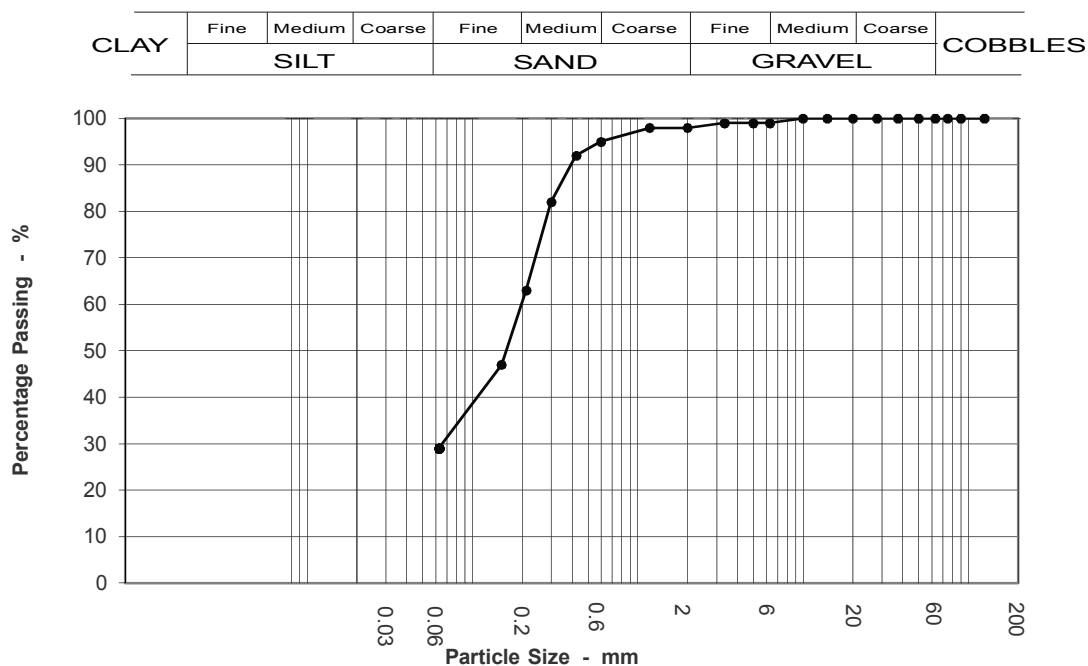


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8869
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH22
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light yellowish brown slightly gravelly very silty SAND	<b>Sample No:</b>	26
		<b>Depth (m):</b>	9.30 - 10.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	95		
0.425	92		
0.3	82		
0.212	63		
0.15	47		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	2.0
Sand	69.0
Silt & Clay	29.0

Grading Analysis	
D60	0.20
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



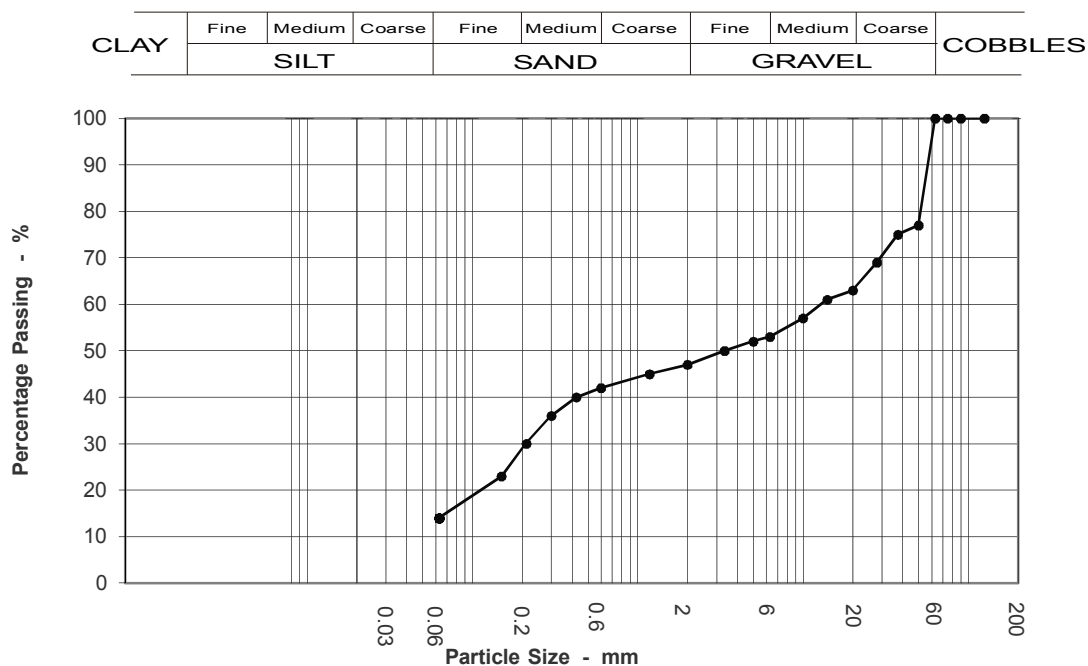


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8870
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH23
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very sandy GRAVEL	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.50 - 1.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	77		
37.5	75		
28	69		
20	63		
14	61		
10	57		
6.3	53		
5	52		
3.35	50		
2	47		
1.18	45		
0.6	42		
0.425	40		
0.3	36		
0.212	30		
0.15	23		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	53.0
Sand	33.0
Silt & Clay	14.0

Grading Analysis	
D60	13.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** Agata K-Roche

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



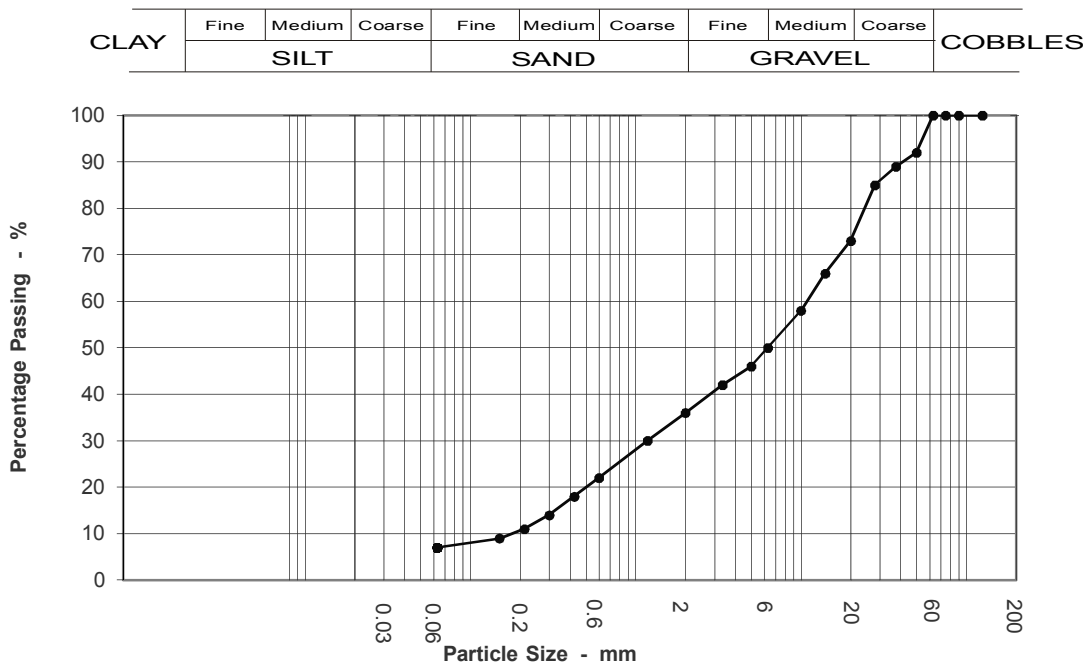


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8871
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH23
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very sandy GRAVEL	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.40
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	89		
28	85		
20	73		
14	66		
10	58		
6.3	50		
5	46		
3.35	42		
2	36		
1.18	30		
0.6	22		
0.425	18		
0.3	14		
0.212	11		
0.15	9		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	64.0
Sand	29.0
Silt & Clay	7.0

Grading Analysis	
D60	11.00
D10	0.18
Uniformity Coefficient	60.77

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



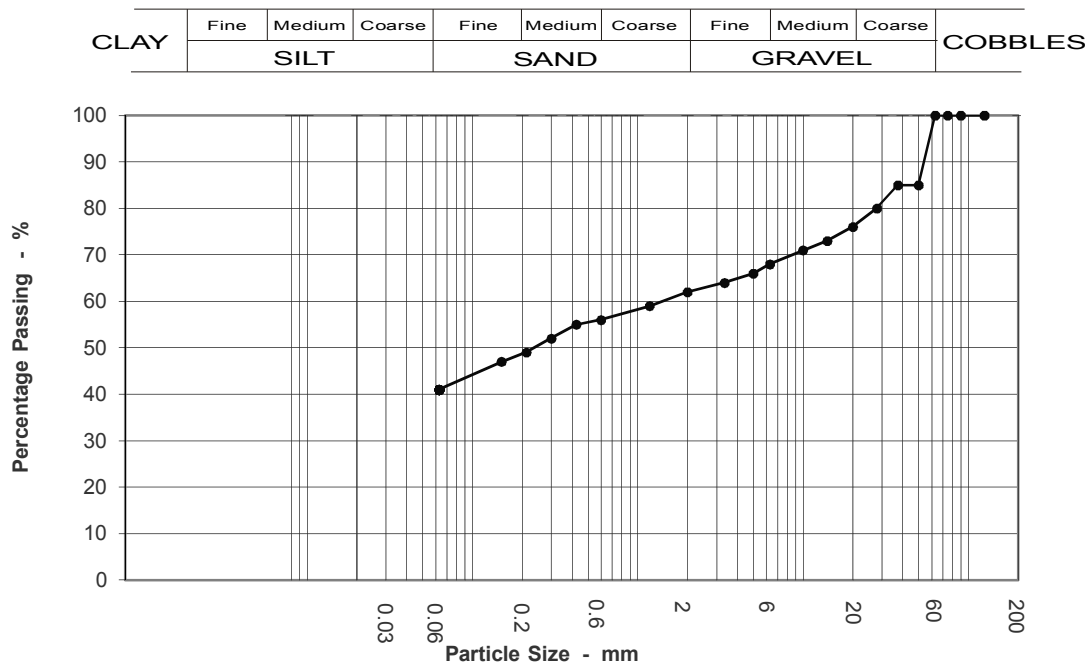


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8872
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH23
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy gravelly silty CLAY	<b>Sample No:</b>	8
		<b>Depth (m):</b>	2.50 - 3.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	85		
37.5	85		
28	80		
20	76		
14	73		
10	71		
6.3	68		
5	66		
3.35	64		
2	62		
1.18	59		
0.6	56		
0.425	55		
0.3	52		
0.212	49		
0.15	47		
0.063	41		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	38.0
Sand	21.0
Silt & Clay	41.0

Grading Analysis	
D60	1.45
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





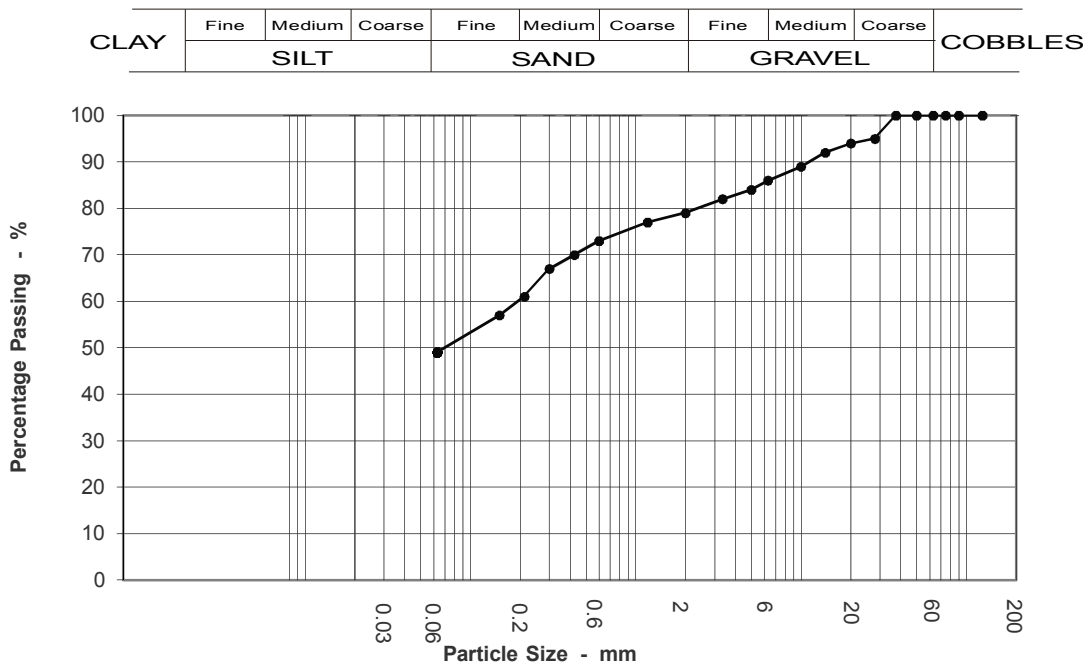


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8874
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH23
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly garvelly slightly sandy silty CLAY	<b>Sample No:</b>	12
		<b>Depth (m):</b>	3.50 - 3.75
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	94		
14	92		
10	89		
6.3	86		
5	84		
3.35	82		
2	79		
1.18	77		
0.6	73		
0.425	70		
0.3	67		
0.212	61		
0.15	57		
0.063	49		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	21.0
Sand	30.0
Silt & Clay	49.0

Grading Analysis	
D60	0.20
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



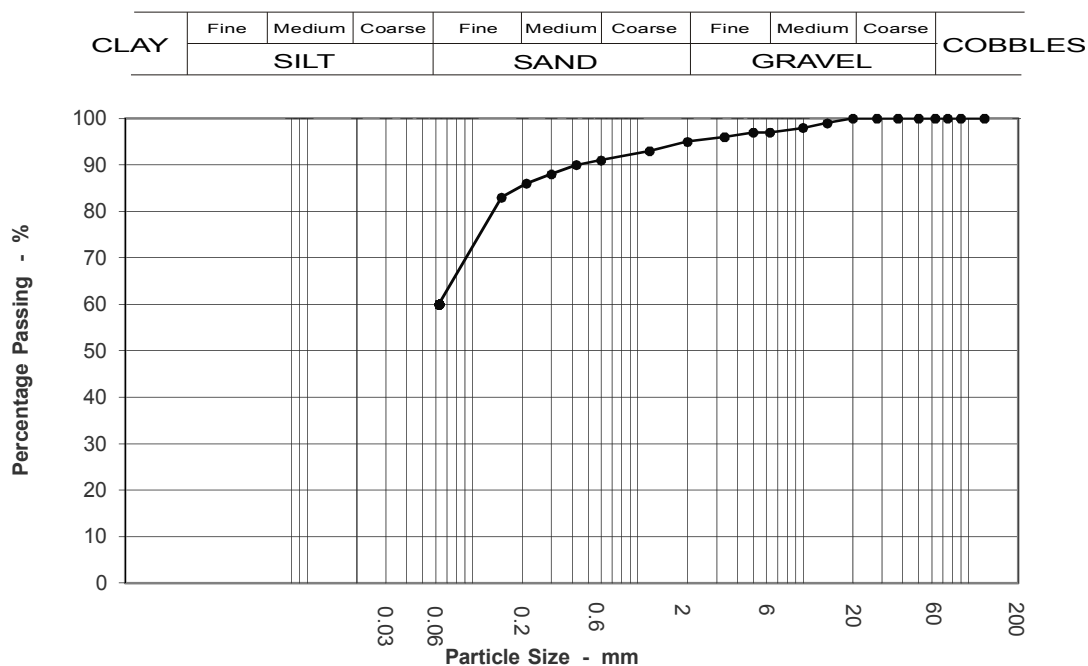


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8875
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH23
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy SILT	<b>Sample No:</b>	13
		<b>Depth (m):</b>	3.75 - 4.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	99		
10	98		
6.3	97		
5	97		
3.35	96		
2	95		
1.18	93		
0.6	91		
0.425	90		
0.3	88		
0.212	86		
0.15	83		
0.063	60		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	5.0
Sand	35.0
Silt & Clay	60.0

Grading Analysis	
D60	0.06
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



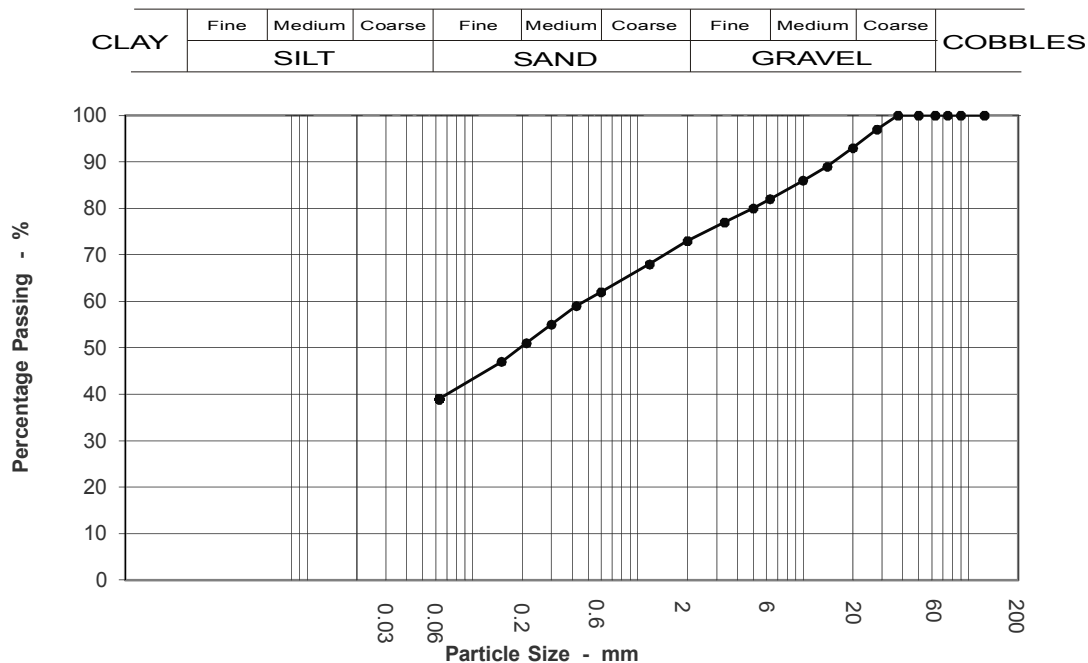


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8876
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH23
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly CLAY	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.00 - 5.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	97		
20	93		
14	89		
10	86		
6.3	82		
5	80		
3.35	77		
2	73		
1.18	68		
0.6	62		
0.425	59		
0.3	55		
0.212	51		
0.15	47		
0.063	39		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	27.0
Sand	34.0
Silt & Clay	39.0

Grading Analysis	
D60	0.48
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



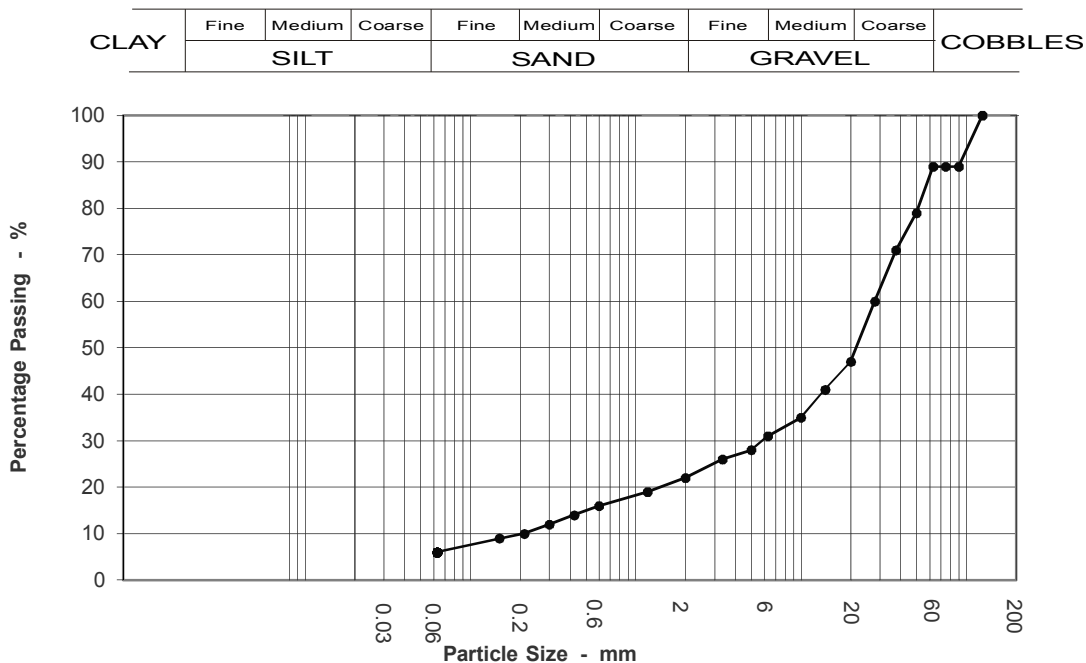


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8877
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH24
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey sandy GRAVEL with cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.50 - 1.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	89		
75	89		
63	89		
50	79		
37.5	71		
28	60		
20	47		
14	41		
10	35		
6.3	31		
5	28		
3.35	26		
2	22		
1.18	19		
0.6	16		
0.425	14		
0.3	12		
0.212	10		
0.15	9		
0.063	6		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	11.0
Gravel	67.0
Sand	16.0
Silt & Clay	6.0

Grading Analysis	
D60	28.00
D10	0.21
Uniformity Coefficient	132.08

**Remarks:** Whole sample used. 3.5 kg, 150mm diameter cobble recovered from test sample.

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



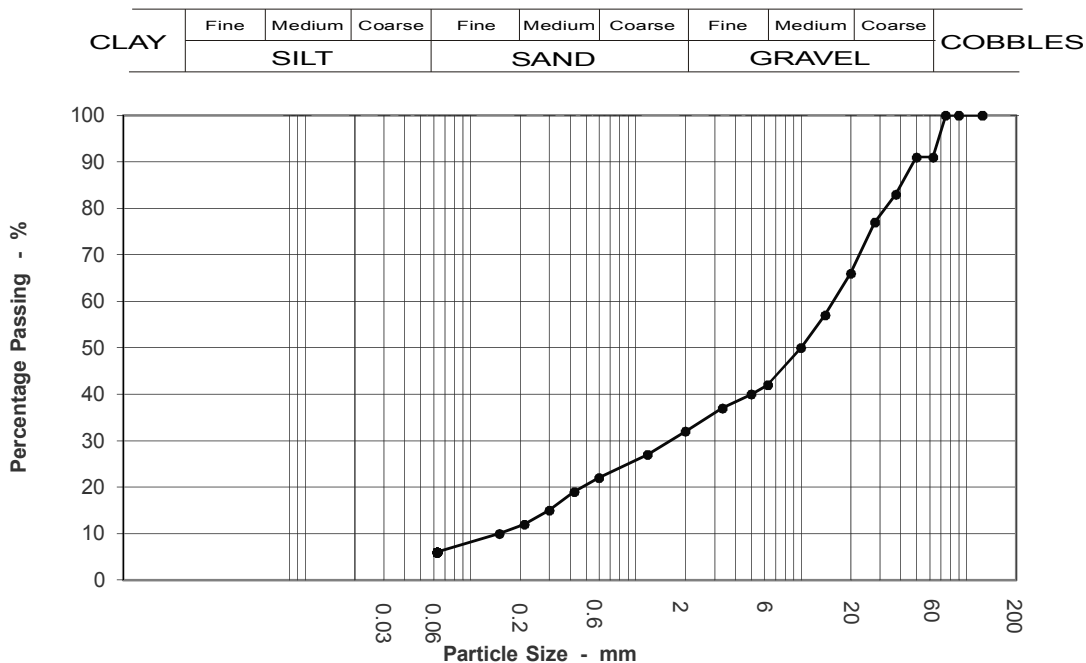


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8878
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH24
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.20 - 1.70
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	91		
50	91		
37.5	83		
28	77		
20	66		
14	57		
10	50		
6.3	42		
5	40		
3.35	37		
2	32		
1.18	27		
0.6	22		
0.425	19		
0.3	15		
0.212	12		
0.15	10		
0.063	6		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	9.0
Gravel	59.0
Sand	26.0
Silt & Clay	6.0

Grading Analysis	
D60	16.00
D10	0.15
Uniformity Coefficient	106.67

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



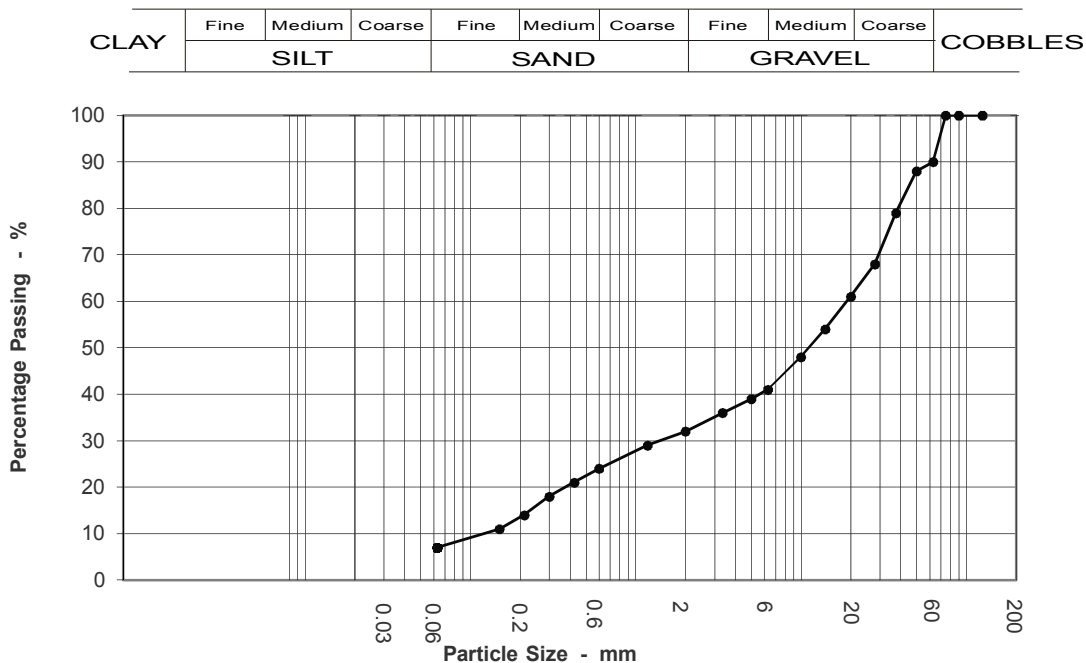


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8879
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH24
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly silty very sandy GRAVEL with cobbles	<b>Sample No:</b>	9
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	90		
50	88		
37.5	79		
28	68		
20	61		
14	54		
10	48		
6.3	41		
5	39		
3.35	36		
2	32		
1.18	29		
0.6	24		
0.425	21		
0.3	18		
0.212	14		
0.15	11		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	10.0
Gravel	58.0
Sand	25.0
Silt & Clay	7.0

Grading Analysis	
D60	19.14
D10	0.13
Uniformity Coefficient	149.26

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





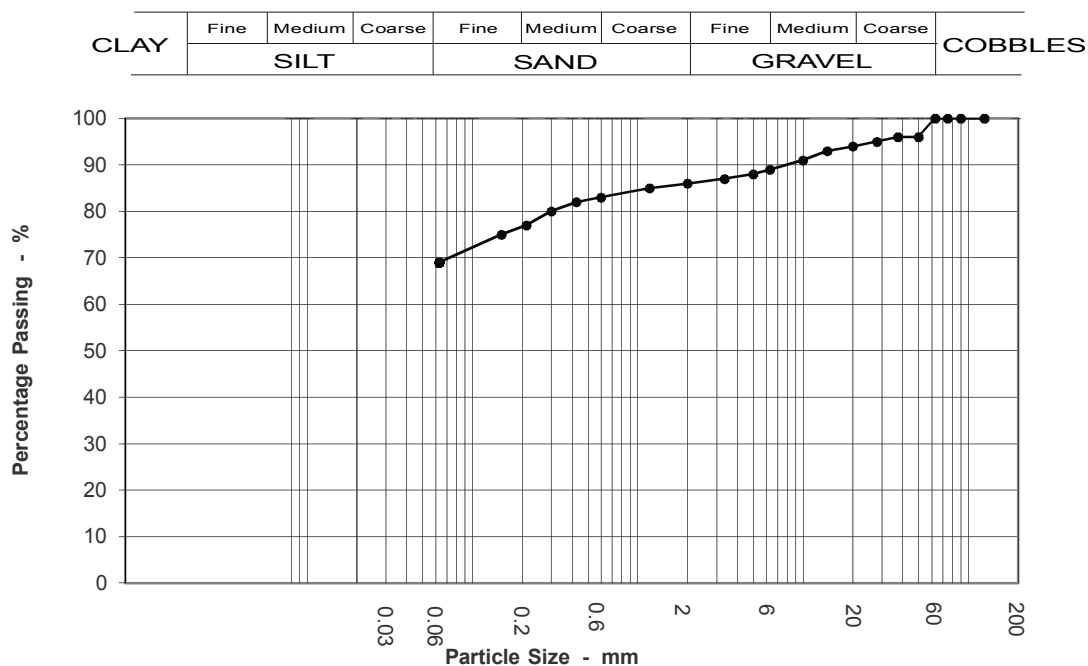


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8880
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH24
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey slightly garvelly slightly sandy SILT	<b>Sample No:</b>	11
		<b>Depth (m):</b>	3.20 - 4.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	96		
28	95		
20	94		
14	93		
10	91		
6.3	89		
5	88		
3.35	87		
2	86		
1.18	85		
0.6	83		
0.425	82		
0.3	80		
0.212	77		
0.15	75		
0.063	69		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	14.0
Sand	17.0
Silt & Clay	69.0

Grading Analysis	
D60	
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



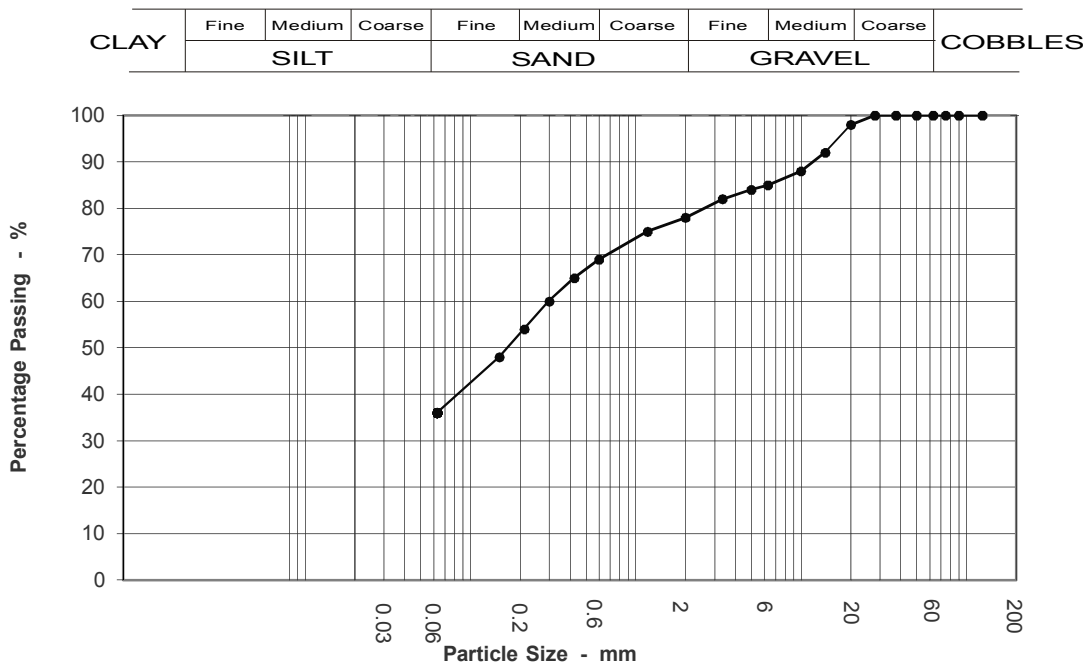


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8884
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH24
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy silty CLAY	<b>Sample No:</b>	17
		<b>Depth (m):</b>	5.00 - 5.50
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	92		
10	88		
6.3	85		
5	84		
3.35	82		
2	78		
1.18	75		
0.6	69		
0.425	65		
0.3	60		
0.212	54		
0.15	48		
0.063	36		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	22.0
Sand	42.0
Silt & Clay	36.0

Grading Analysis	
D60	0.30
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



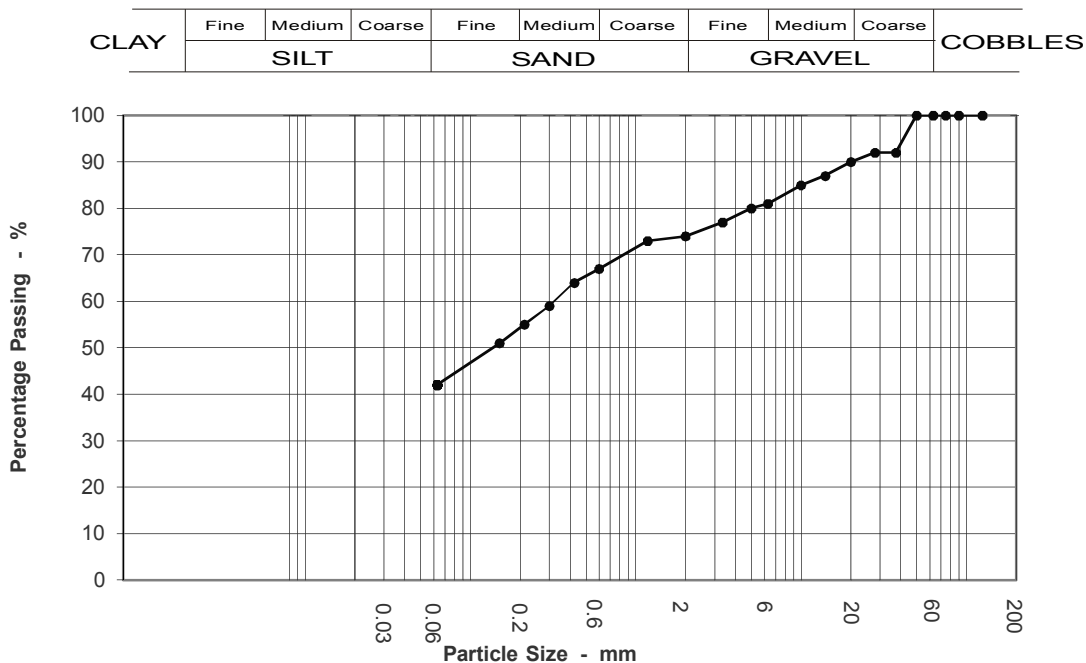


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8886
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH24
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Redish brown slightly gravelly slightly sandy silty CLAY	<b>Sample No:</b>	20
		<b>Depth (m):</b>	6.00 - 6.75
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	92		
28	92		
20	90		
14	87		
10	85		
6.3	81		
5	80		
3.35	77		
2	74		
1.18	73		
0.6	67		
0.425	64		
0.3	59		
0.212	55		
0.15	51		
0.063	42		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	26.0
Sand	32.0
Silt & Clay	42.0

Grading Analysis	
D60	0.33
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



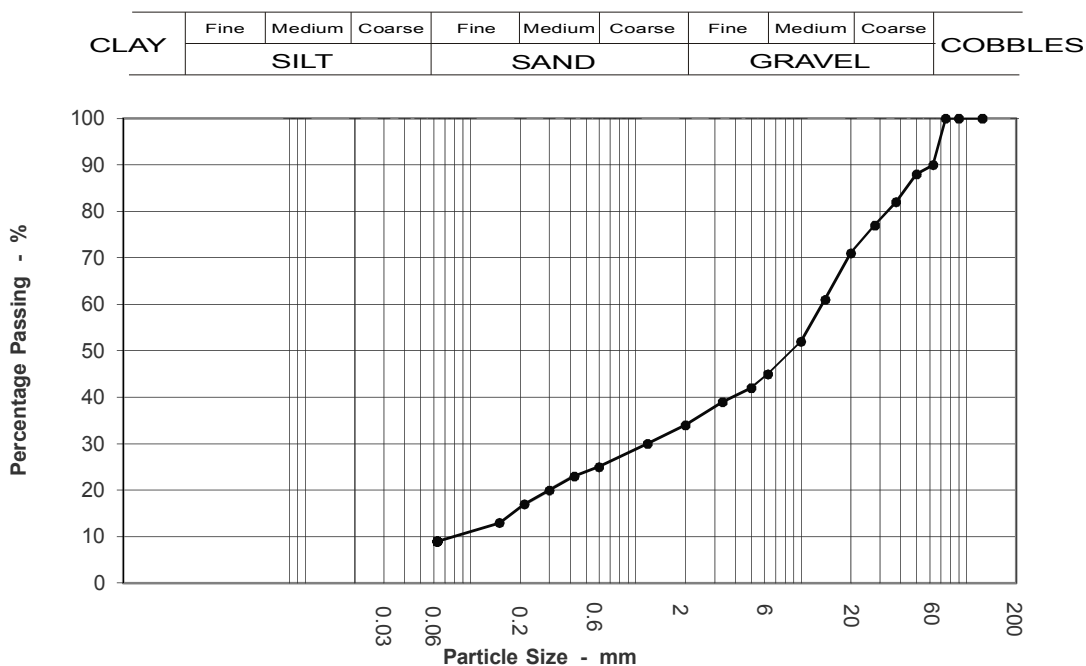


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8887
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH25
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.50 - 1.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	90		
50	88		
37.5	82		
28	77		
20	71		
14	61		
10	52		
6.3	45		
5	42		
3.35	39		
2	34		
1.18	30		
0.6	25		
0.425	23		
0.3	20		
0.212	17		
0.15	13		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	10.0
Gravel	56.0
Sand	25.0
Silt & Clay	9.0

Grading Analysis	
D60	13.56
D10	0.08
Uniformity Coefficient	159.95

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



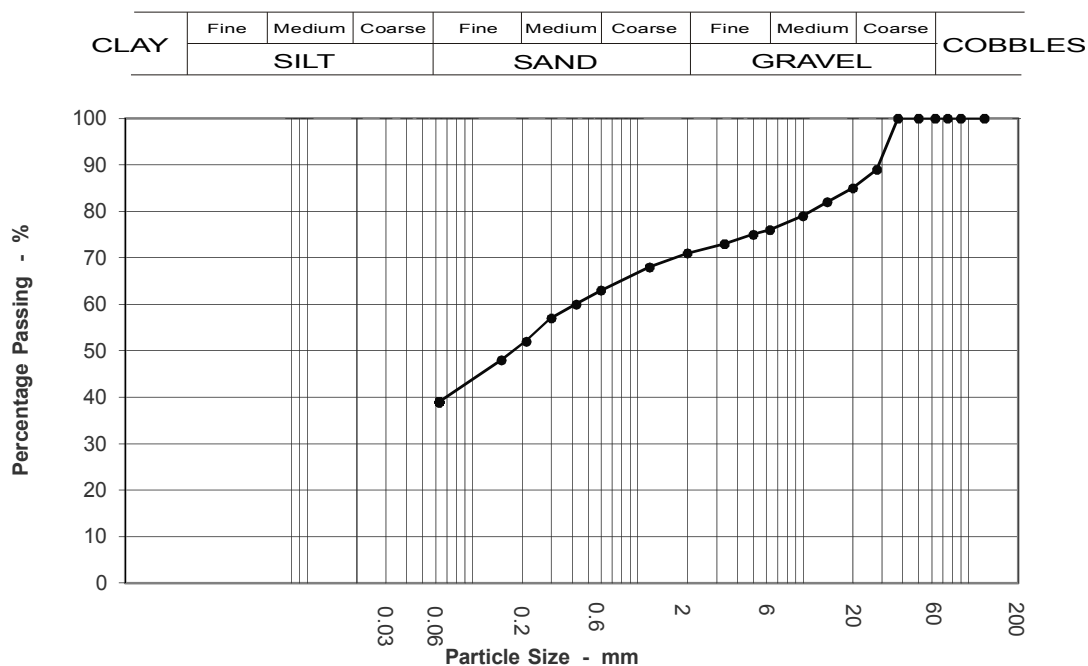


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8889
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH25
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly silty CLAY	<b>Sample No:</b>	10
		<b>Depth (m):</b>	2.60 - 3.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	89		
20	85		
14	82		
10	79		
6.3	76		
5	75		
3.35	73		
2	71		
1.18	68		
0.6	63		
0.425	60		
0.3	57		
0.212	52		
0.15	48		
0.063	39		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	29.0
Sand	32.0
Silt & Clay	39.0

Grading Analysis	
D60	0.43
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



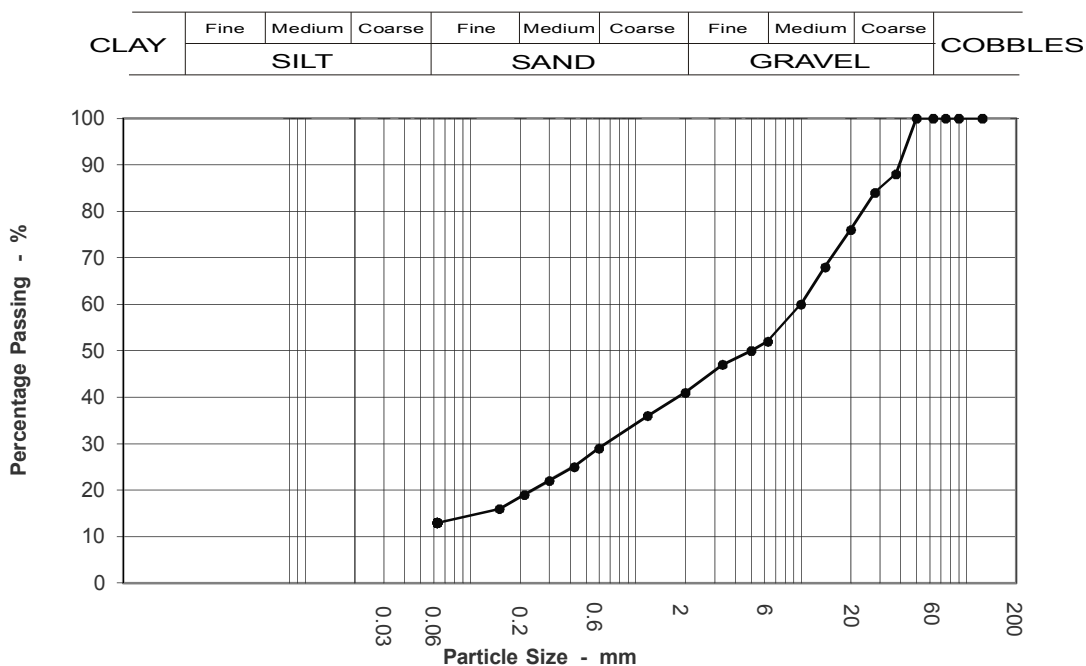


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8888
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH25
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	D
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL	<b>Sample No:</b>	7
		<b>Depth (m):</b>	2.00 - 2.45
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	84		
20	76		
14	68		
10	60		
6.3	52		
5	50		
3.35	47		
2	41		
1.18	36		
0.6	29		
0.425	25		
0.3	22		
0.212	19		
0.15	16		
0.063	13		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	59.0
Sand	28.0
Silt & Clay	13.0

Grading Analysis	
D60	10.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Sample combined with B8 @ 2.0-2.5m

**Checked and** Agata K-Roche

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





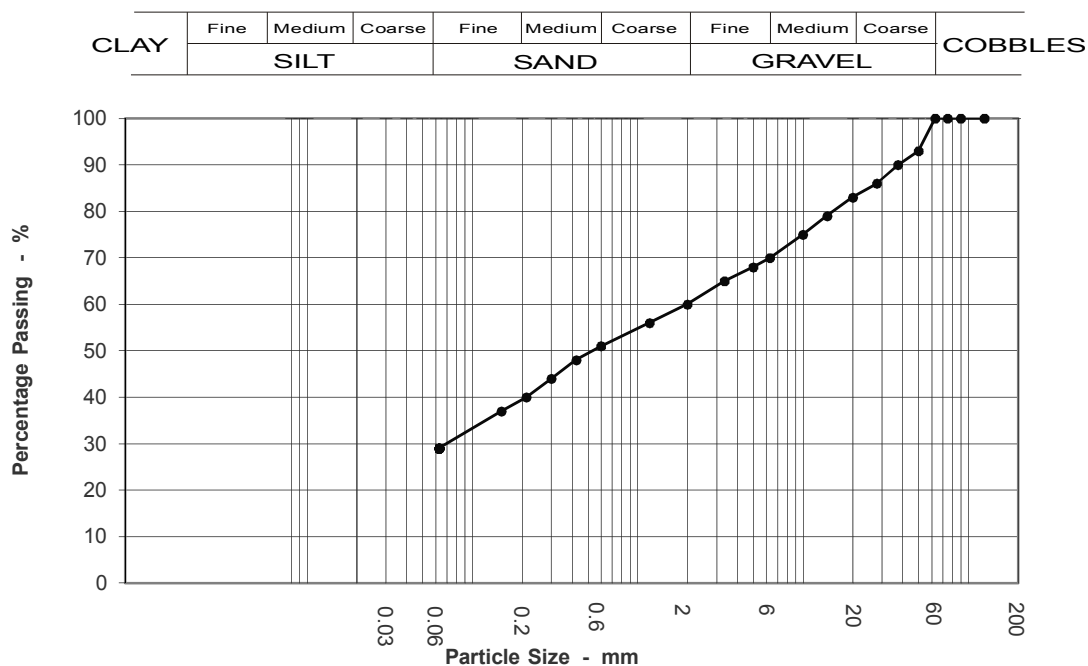


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8891
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH25
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy gravelly CLAY	<b>Sample No:</b>	17
		<b>Depth (m):</b>	4.60 - 5.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	90		
28	86		
20	83		
14	79		
10	75		
6.3	70		
5	68		
3.35	65		
2	60		
1.18	56		
0.6	51		
0.425	48		
0.3	44		
0.212	40		
0.15	37		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	40.0
Sand	31.0
Silt & Clay	29.0

Grading Analysis	
D60	2.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



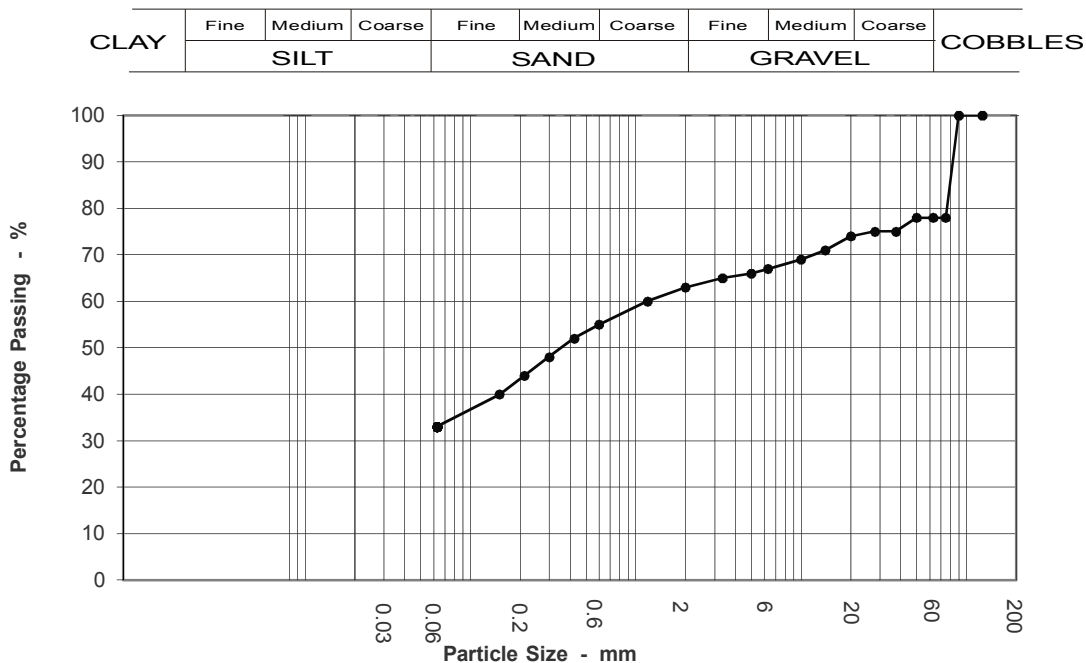


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8893
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH25
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown gravelly very clayey SAND with frequent cobbles	<b>Sample No:</b>	22
		<b>Depth (m):</b>	6.00 - 6.50
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	78		
63	78		
50	78		
37.5	75		
28	75		
20	74		
14	71		
10	69		
6.3	67		
5	66		
3.35	65		
2	63		
1.18	60		
0.6	55		
0.425	52		
0.3	48		
0.212	44		
0.15	40		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	22.0
Gravel	15.0
Sand	30.0
Silt & Clay	33.0

Grading Analysis	
D60	1.18
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



1489

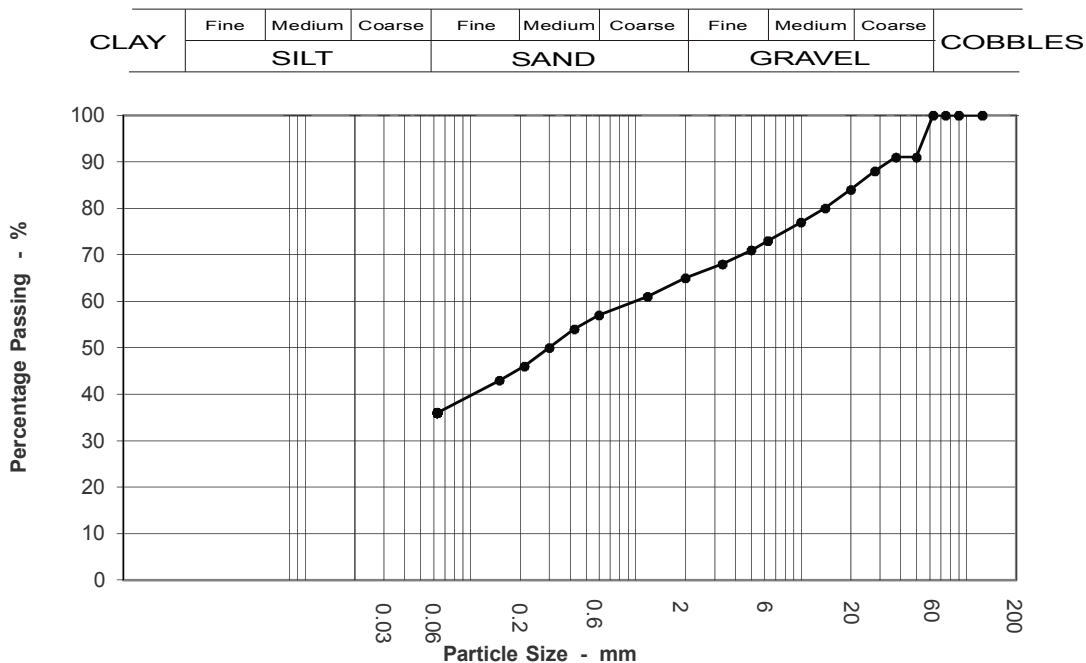


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8895
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH25
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy gravelly CLAY	<b>Sample No:</b>	29
		<b>Depth (m):</b>	8.00 - 8.50
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	91		
37.5	91		
28	88		
20	84		
14	80		
10	77		
6.3	73		
5	71		
3.35	68		
2	65		
1.18	61		
0.6	57		
0.425	54		
0.3	50		
0.212	46		
0.15	43		
0.063	36		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	35.0
Sand	29.0
Silt & Clay	36.0

Grading Analysis	
D60	1.04
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



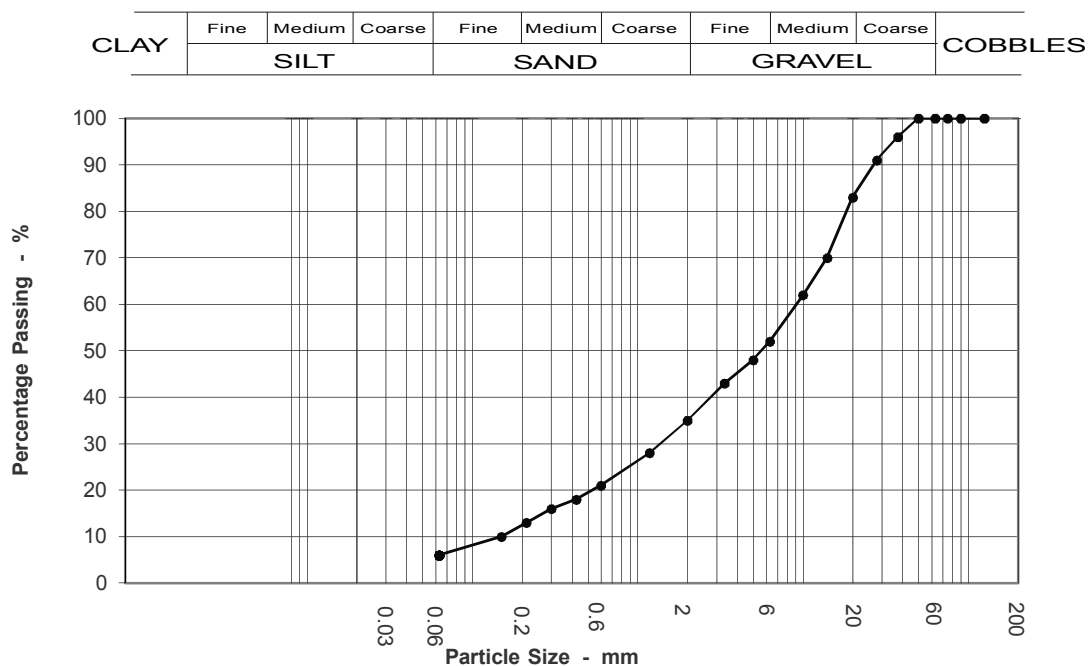


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8896
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL	<b>Sample No:</b>	5
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	96		
28	91		
20	83		
14	70		
10	62		
6.3	52		
5	48		
3.35	43		
2	35		
1.18	28		
0.6	21		
0.425	18		
0.3	16		
0.212	13		
0.15	10		
0.063	6		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	65.0
Sand	29.0
Silt & Clay	6.0

Grading Analysis	
D60	9.26
D10	0.15
Uniformity Coefficient	61.73

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



1489

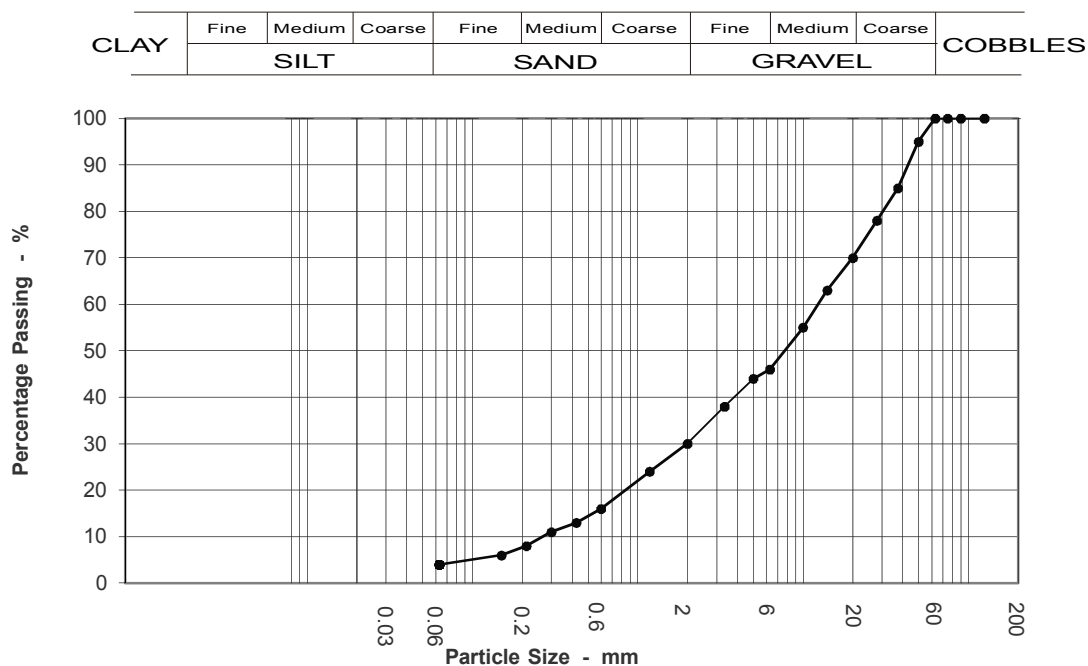


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8897
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown very sandy GRAVEL	<b>Sample No:</b>	7
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	85		
28	78		
20	70		
14	63		
10	55		
6.3	46		
5	44		
3.35	38		
2	30		
1.18	24		
0.6	16		
0.425	13		
0.3	11		
0.212	8		
0.15	6		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	70.0
Sand	26.0
Silt & Clay	4.0

Grading Analysis	
D60	12.50
D10	0.27
Uniformity Coefficient	46.18

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



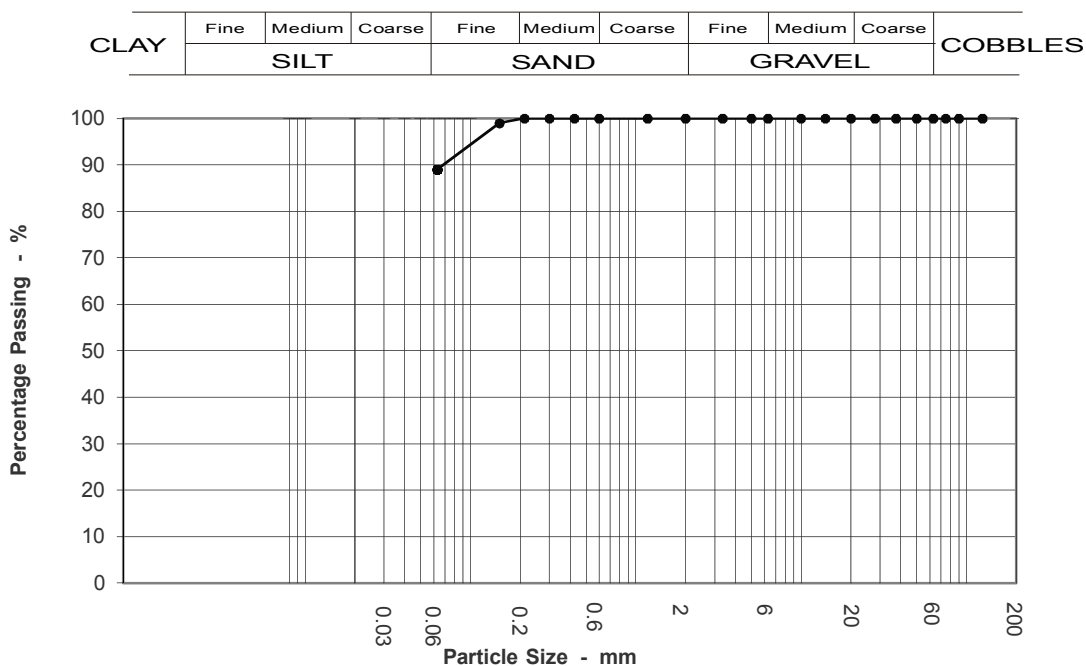


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8899
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly sandy SILT	<b>Sample No:</b>	11
		<b>Depth (m):</b>	2.30 - 3.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	100		
0.3	100		
0.212	100		
0.15	99		
0.063	89		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	11.0
Silt & Clay	89.0

Grading Analysis	
D60	
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



1489



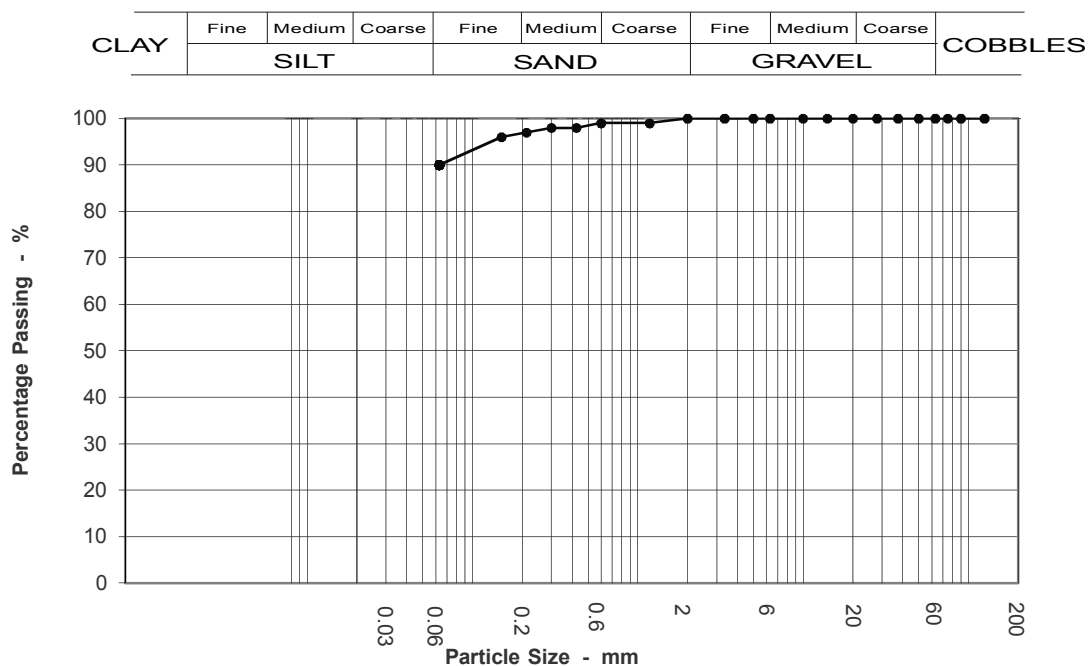


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8901
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy SILT	<b>Sample No:</b>	14
		<b>Depth (m):</b>	3.00 - 4.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	98		
0.3	98		
0.212	97		
0.15	96		
0.063	90		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	0.0
Sand	10.0
Silt & Clay	90.0

Grading Analysis	
D60	
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



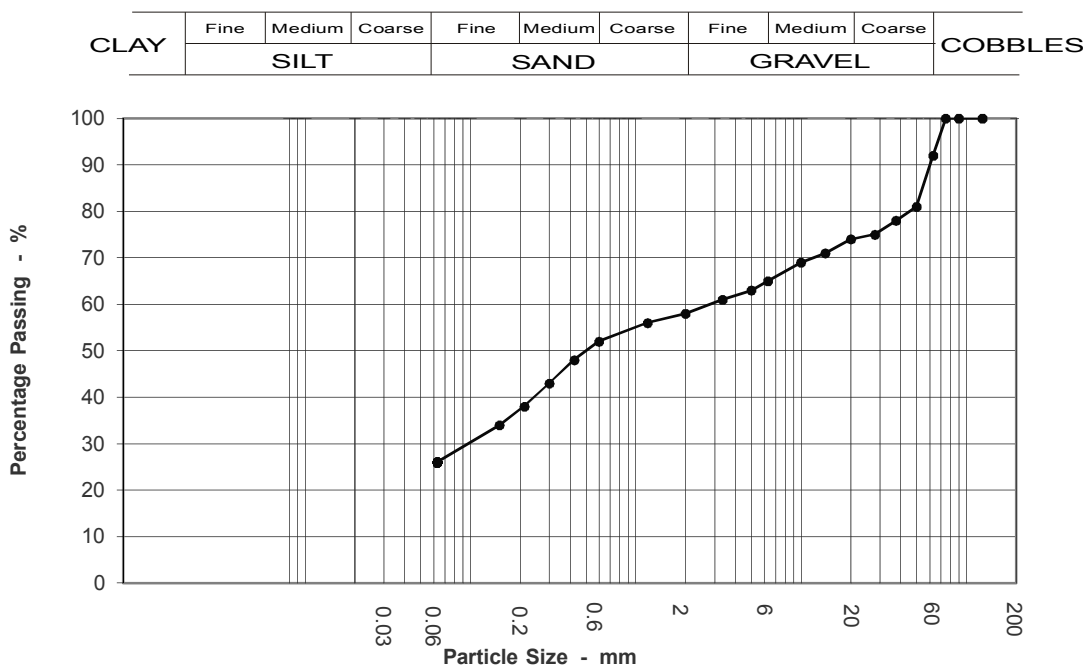


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8903
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly CLAY with cobbles	<b>Sample No:</b>	21
		<b>Depth (m):</b>	5.60 - 6.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	92		
50	81		
37.5	78		
28	75		
20	74		
14	71		
10	69		
6.3	65		
5	63		
3.35	61		
2	58		
1.18	56		
0.6	52		
0.425	48		
0.3	43		
0.212	38		
0.15	34		
0.063	26		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	8.0
Gravel	34.0
Sand	32.0
Silt & Clay	26.0

Grading Analysis	
D60	2.90
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



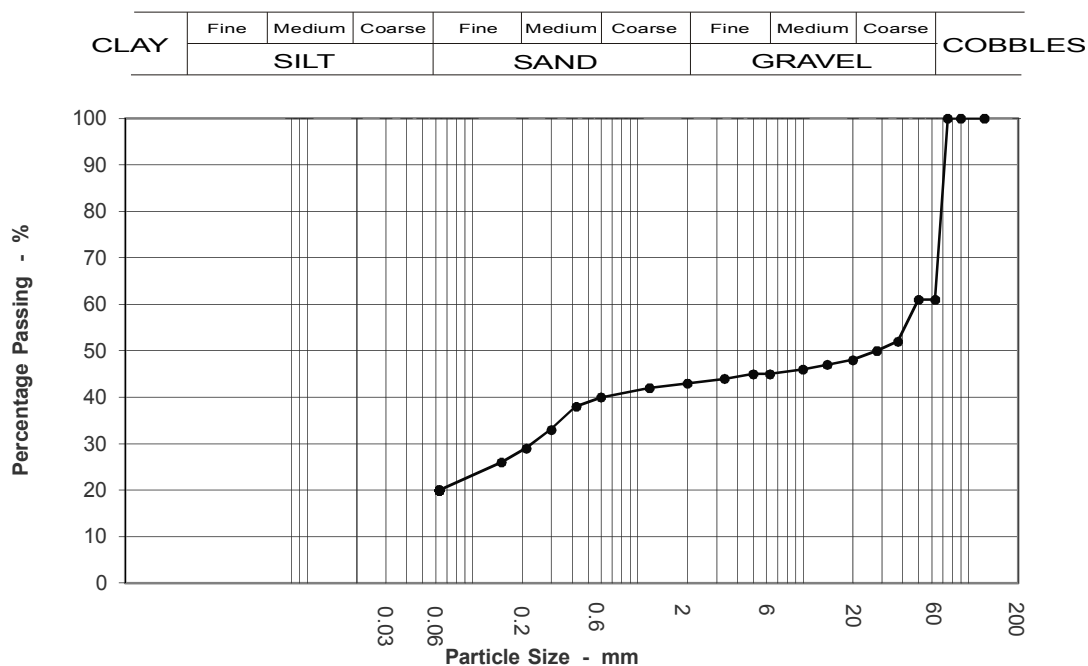


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8905
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light brown gravelly very silty SAND with frequent cobbles	<b>Sample No:</b>	24
		<b>Depth (m):</b>	7.00 - 7.50
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	61		
50	61		
37.5	52		
28	50		
20	48		
14	47		
10	46		
6.3	45		
5	45		
3.35	44		
2	43		
1.18	42		
0.6	40		
0.425	38		
0.3	33		
0.212	29		
0.15	26		
0.063	20		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	39.0
Gravel	18.0
Sand	23.0
Silt & Clay	20.0

Grading Analysis	
D60	48.61
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



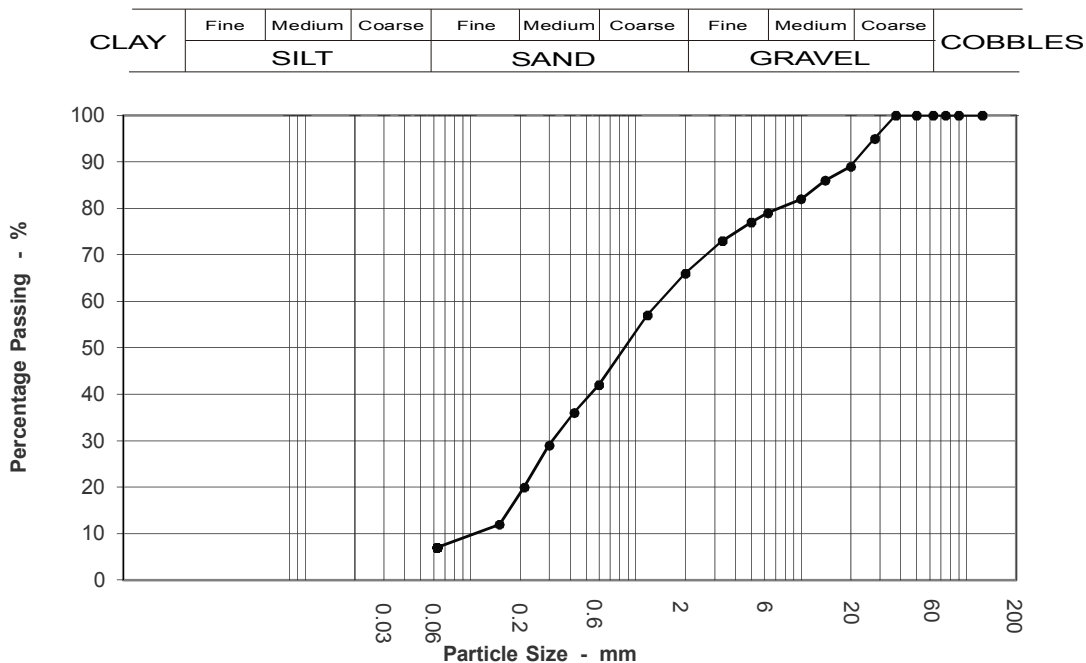


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8907
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very gravelly SAND	<b>Sample No:</b>	5
		<b>Depth (m):</b>	0.50 - 1.20
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	89		
14	86		
10	82		
6.3	79		
5	77		
3.35	73		
2	66		
1.18	57		
0.6	42		
0.425	36		
0.3	29		
0.212	20		
0.15	12		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	34.0
Sand	59.0
Silt & Clay	7.0

Grading Analysis	
D60	1.45
D10	0.12
Uniformity Coefficient	12.62

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



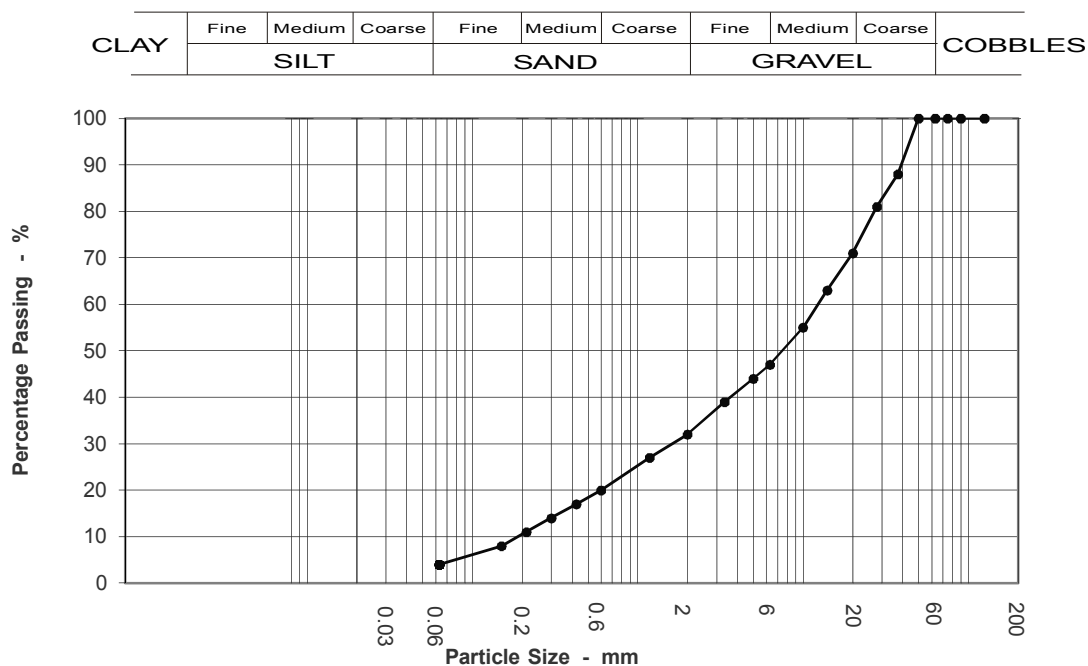


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8908
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey very sandy GRAVEL	<b>Sample No:</b>	7
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	81		
20	71		
14	63		
10	55		
6.3	47		
5	44		
3.35	39		
2	32		
1.18	27		
0.6	20		
0.425	17		
0.3	14		
0.212	11		
0.15	8		
0.063	4		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	68.0
Sand	28.0
Silt & Clay	4.0

Grading Analysis	
D60	12.50
D10	0.19
Uniformity Coefficient	65.33

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



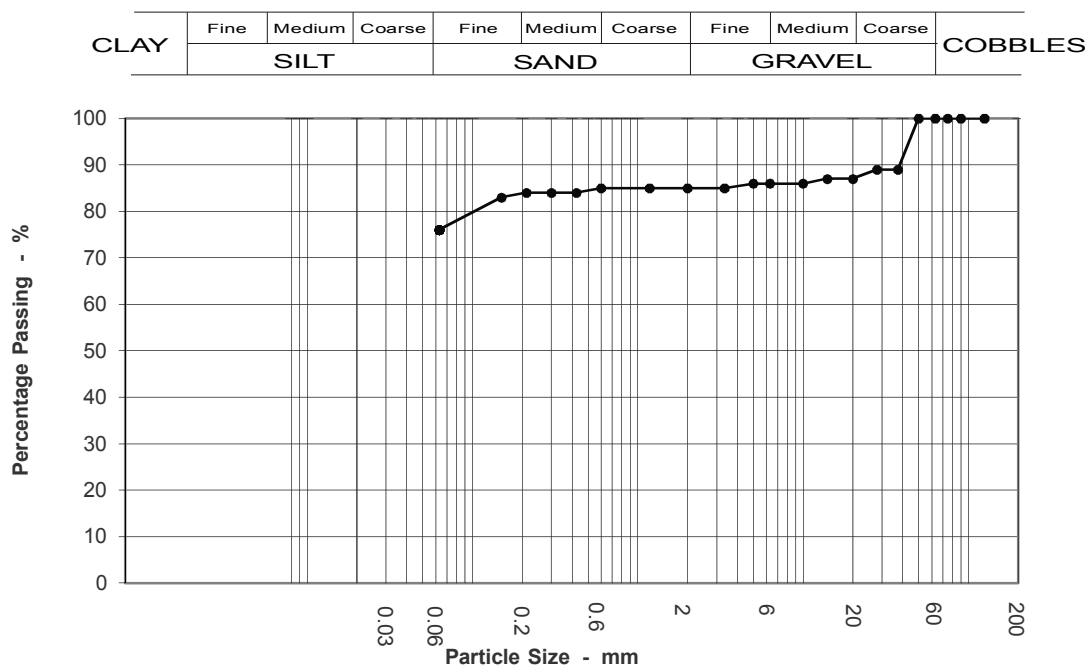


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8911
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly clayey SILT	<b>Sample No:</b>	11
		<b>Depth (m):</b>	2.60 - 3.40
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	89		
28	89		
20	87		
14	87		
10	86		
6.3	86		
5	86		
3.35	85		
2	85		
1.18	85		
0.6	85		
0.425	84		
0.3	84		
0.212	84		
0.15	83		
0.063	76		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	15.0
Sand	9.0
Silt & Clay	76.0

Grading Analysis	
D60	
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





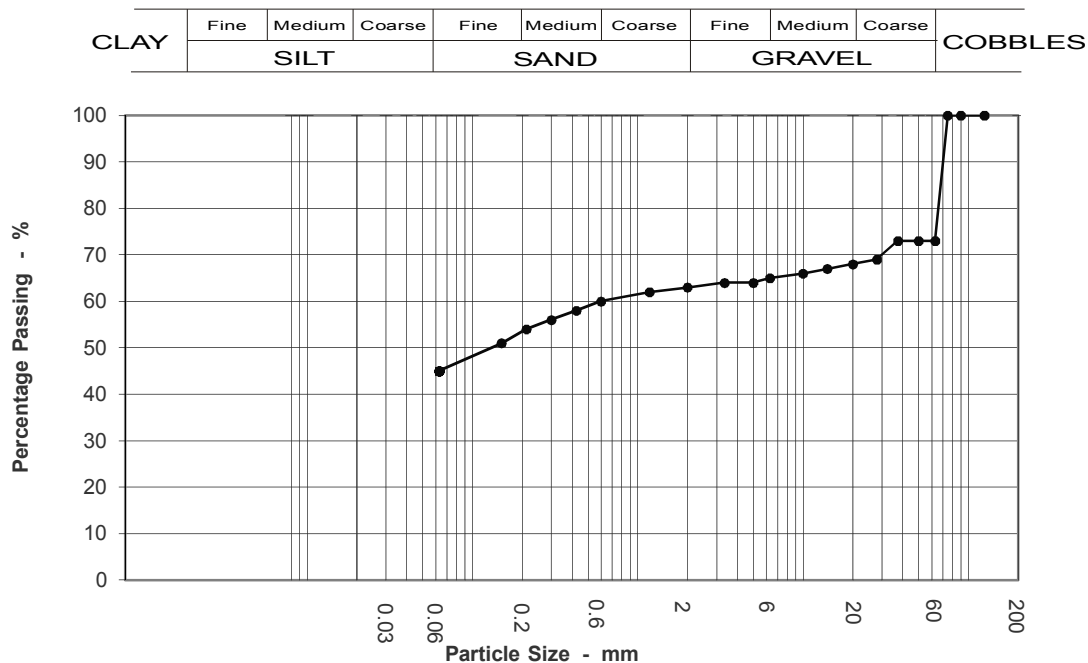


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8912
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly slightly sandy silty CLAY with frequent cobbles	<b>Sample No:</b>	13
		<b>Depth (m):</b>	3.40 - 4.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	73		
50	73		
37.5	73		
28	69		
20	68		
14	67		
10	66		
6.3	65		
5	64		
3.35	64		
2	63		
1.18	62		
0.6	60		
0.425	58		
0.3	56		
0.212	54		
0.15	51		
0.063	45		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	27.0
Gravel	10.0
Sand	18.0
Silt & Clay	45.0

Grading Analysis	
D60	0.60
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



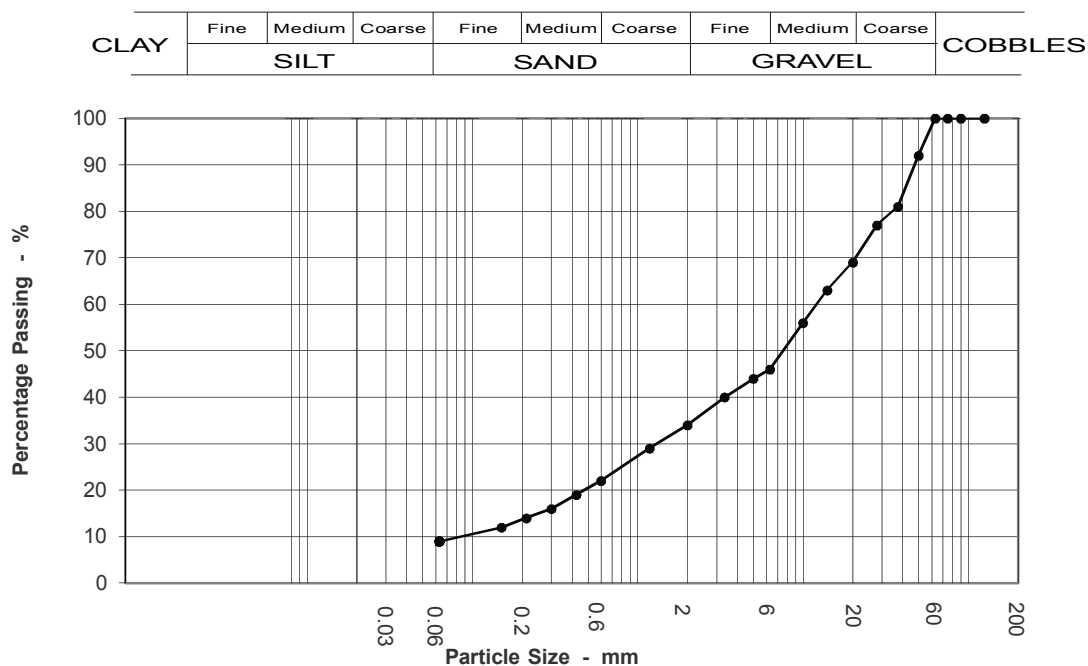


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8914
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	D
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL	<b>Sample No:</b>	17
		<b>Depth (m):</b>	5.00 - 5.45
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	92		
37.5	81		
28	77		
20	69		
14	63		
10	56		
6.3	46		
5	44		
3.35	40		
2	34		
1.18	29		
0.6	22		
0.425	19		
0.3	16		
0.212	14		
0.15	12		
0.063	9		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	66.0
Sand	25.0
Silt & Clay	9.0

Grading Analysis	
D60	12.29
D10	0.09
Uniformity Coefficient	133.54

**Remarks:** Sample combine with B18 @ 5.0-6.0m.

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



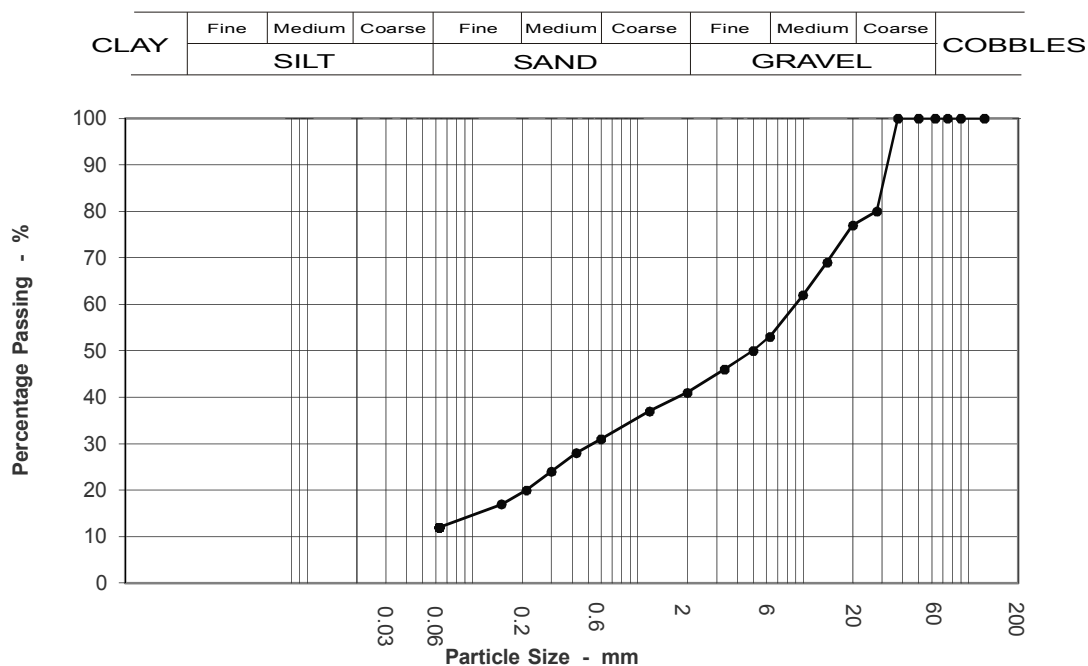


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8915
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown clayey very sandy GRAVEL	<b>Sample No:</b>	20
		<b>Depth (m):</b>	6.00 - 6.20
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	80		
20	77		
14	69		
10	62		
6.3	53		
5	50		
3.35	46		
2	41		
1.18	37		
0.6	31		
0.425	28		
0.3	24		
0.212	20		
0.15	17		
0.063	12		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	59.0
Sand	29.0
Silt & Clay	12.0

Grading Analysis	
D60	9.18
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



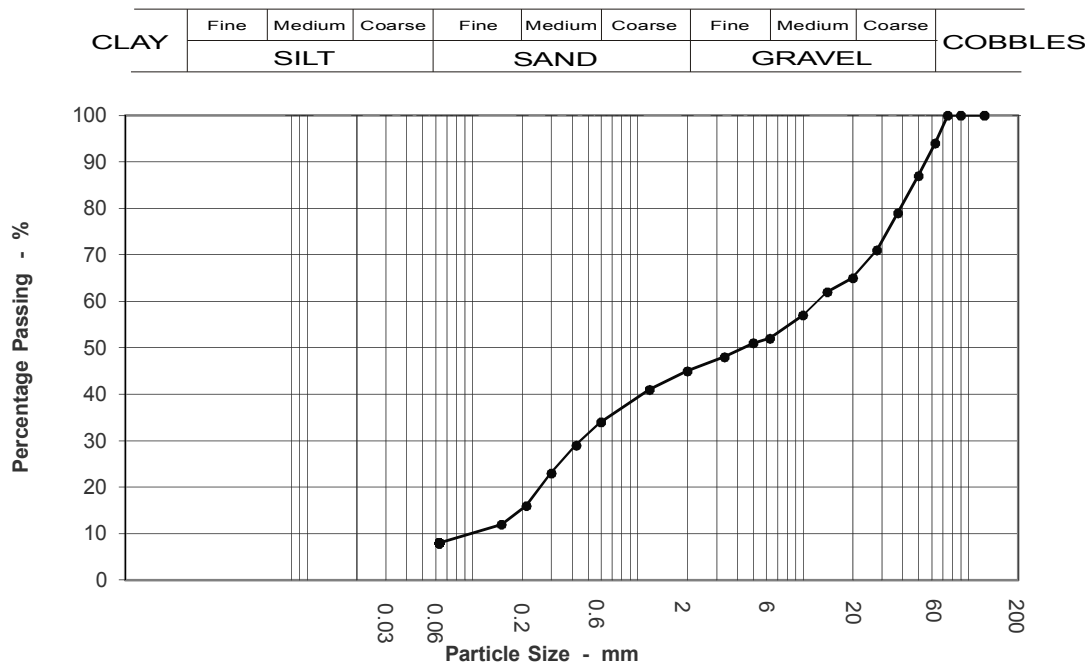


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8916
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH28
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown clayey very sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	0.80 - 1.20
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	87		
37.5	79		
28	71		
20	65		
14	62		
10	57		
6.3	52		
5	51		
3.35	48		
2	45		
1.18	41		
0.6	34		
0.425	29		
0.3	23		
0.212	16		
0.15	12		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	6.0
Gravel	49.0
Sand	37.0
Silt & Clay	8.0

Grading Analysis	
D60	12.40
D10	0.11
Uniformity Coefficient	116.43

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



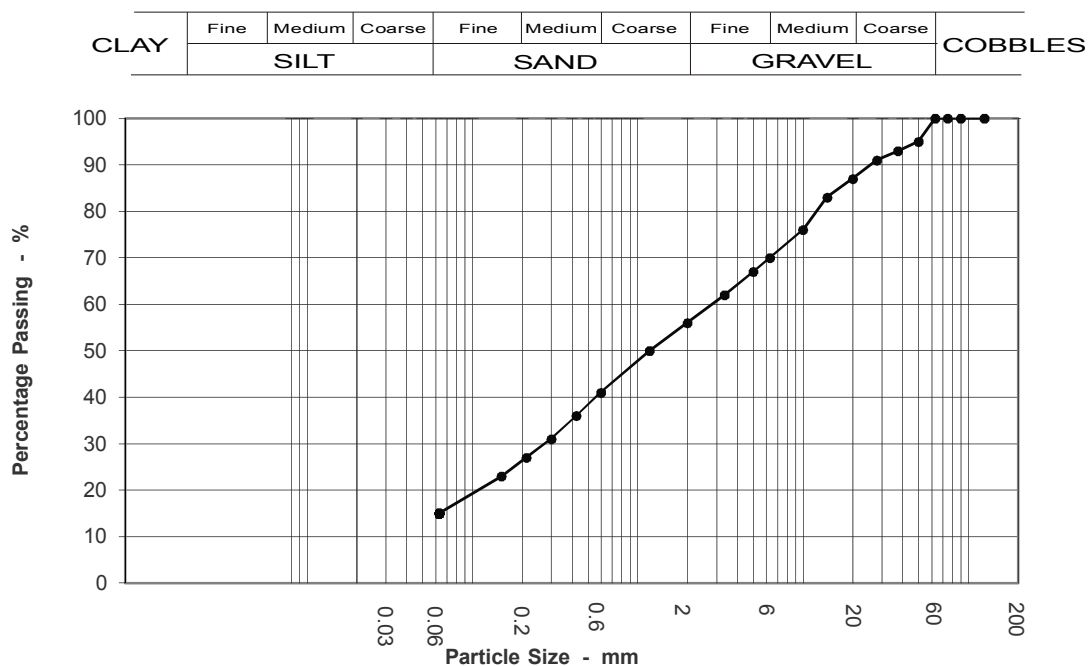


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8918
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH28
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Black clayey SAND and GRAVEL	<b>Sample No:</b>	10
		<b>Depth (m):</b>	2.40 - 3.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	93		
28	91		
20	87		
14	83		
10	76		
6.3	70		
5	67		
3.35	62		
2	56		
1.18	50		
0.6	41		
0.425	36		
0.3	31		
0.212	27		
0.15	23		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	44.0
Sand	41.0
Silt & Clay	15.0

Grading Analysis	
D60	2.90
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



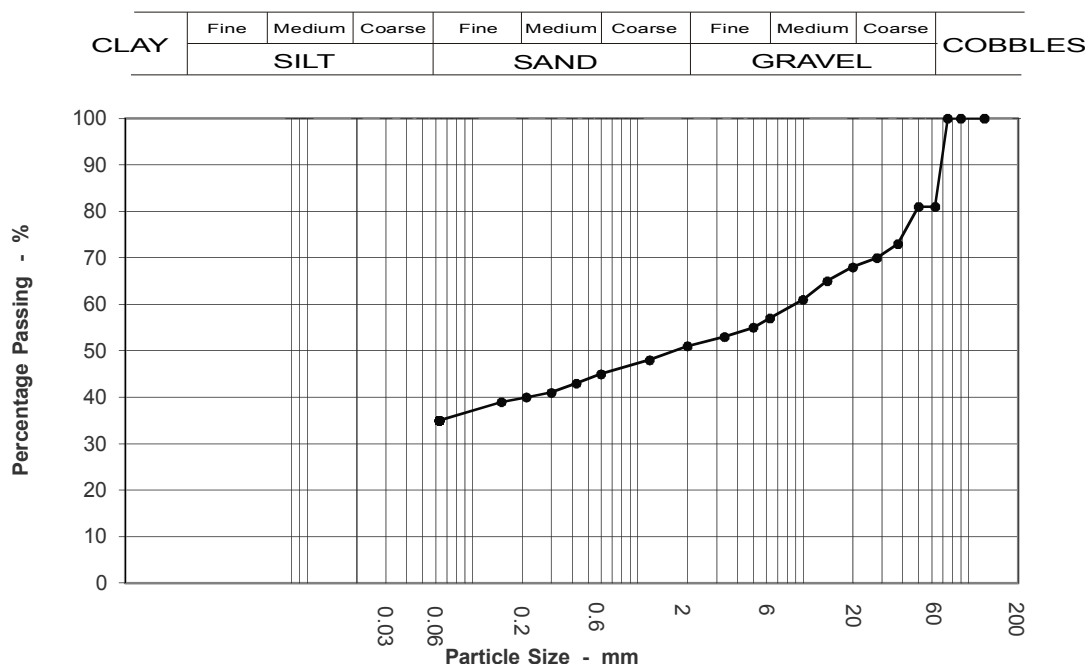


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8919
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH28
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly sandy slightly gravelly clayey SILT with cobbles	<b>Sample No:</b>	12
		<b>Depth (m):</b>	3.00 - 3.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	81		
37.5	73		
28	70		
20	68		
14	65		
10	61		
6.3	57		
5	55		
3.35	53		
2	51		
1.18	48		
0.6	45		
0.425	43		
0.3	41		
0.212	40		
0.15	39		
0.063	35		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	19.0
Gravel	30.0
Sand	16.0
Silt & Clay	35.0

Grading Analysis	
D60	9.08
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





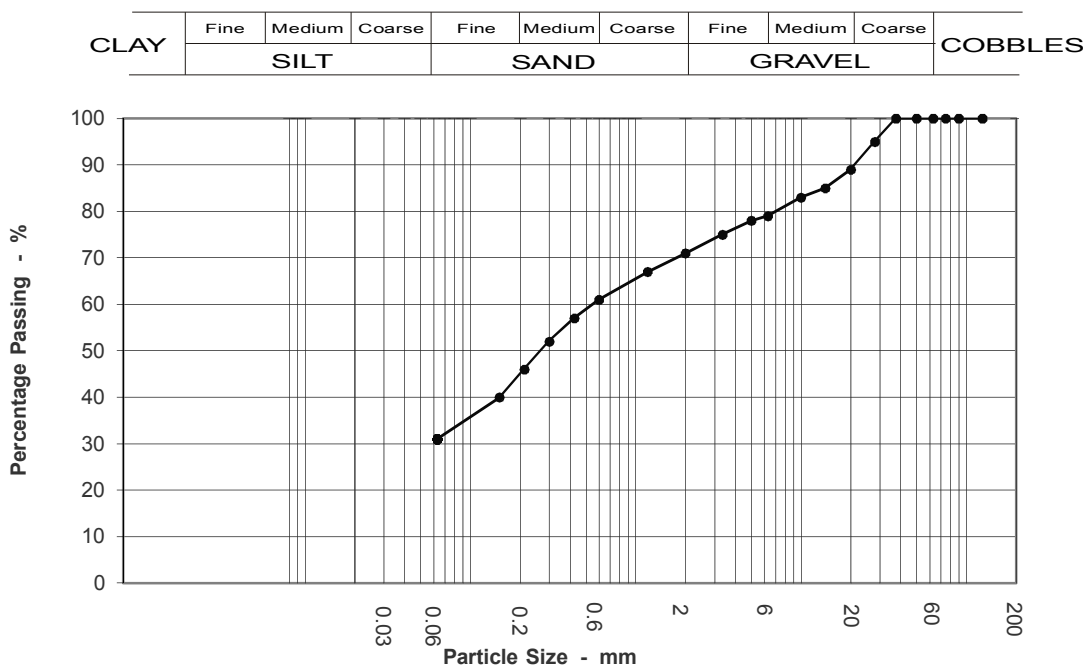


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8920
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH28
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly gravelly sandy CLAY	<b>Sample No:</b>	14
		<b>Depth (m):</b>	3.50 - 4.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	95		
20	89		
14	85		
10	83		
6.3	79		
5	78		
3.35	75		
2	71		
1.18	67		
0.6	61		
0.425	57		
0.3	52		
0.212	46		
0.15	40		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	29.0
Sand	40.0
Silt & Clay	31.0

Grading Analysis	
D60	0.56
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



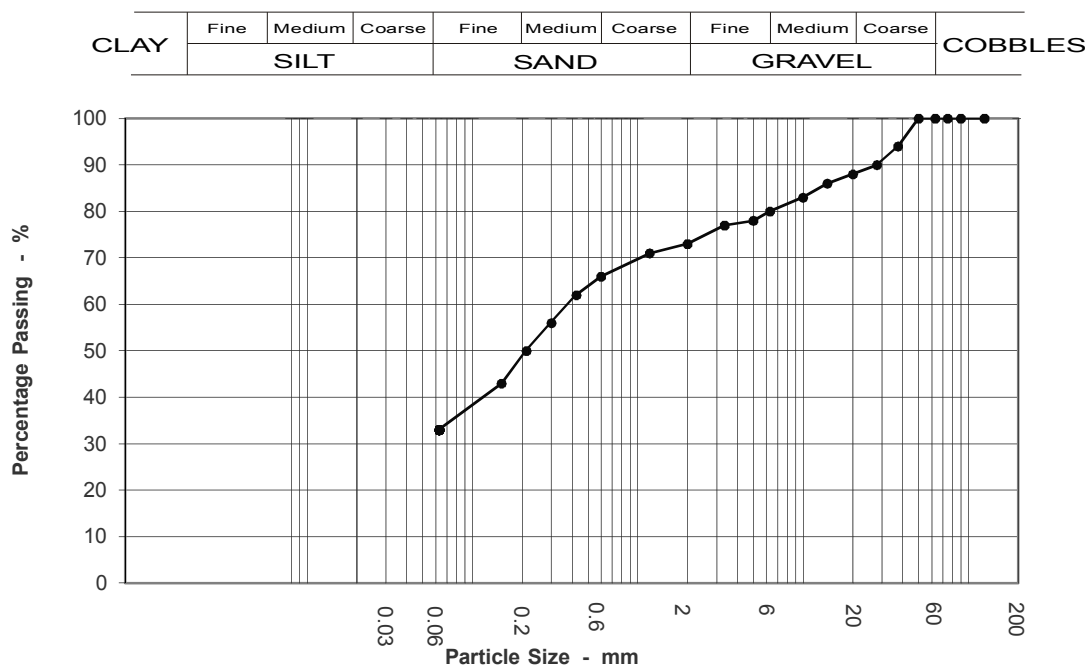


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8922
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH28
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy CLAY	<b>Sample No:</b>	22
		<b>Depth (m):</b>	6.60 - 7.25
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	90		
20	88		
14	86		
10	83		
6.3	80		
5	78		
3.35	77		
2	73		
1.18	71		
0.6	66		
0.425	62		
0.3	56		
0.212	50		
0.15	43		
0.063	33		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	27.0
Sand	40.0
Silt & Clay	33.0

Grading Analysis	
D60	0.38
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



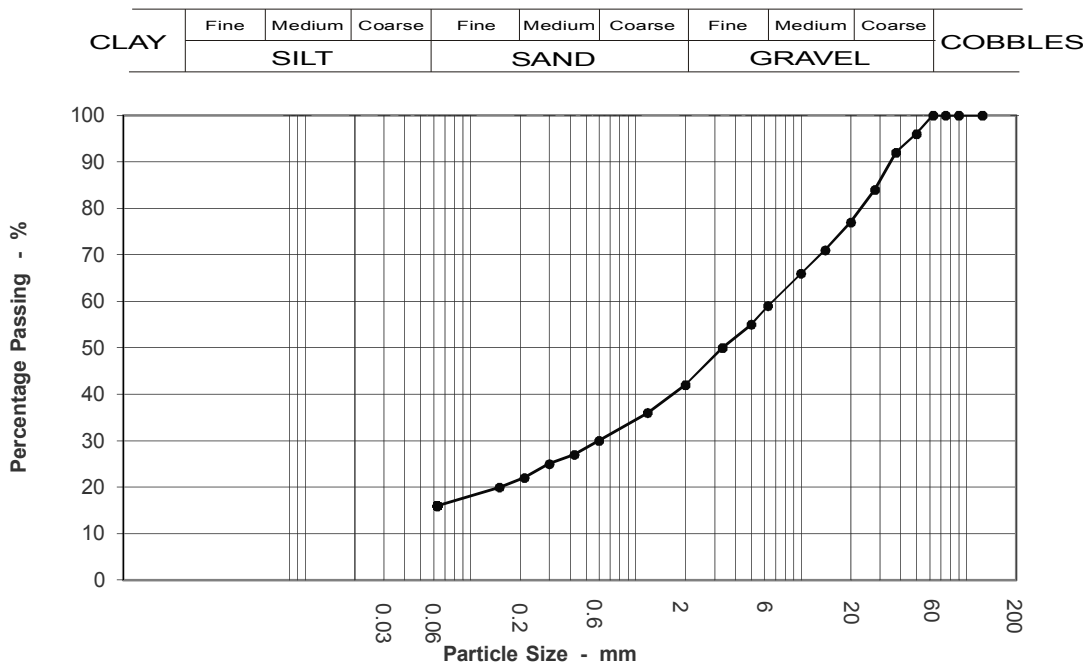


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8923
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH28
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Light brown sandy gravelly CLAY	<b>Sample No:</b>	26
		<b>Depth (m):</b>	8.60 - 9.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	92		
28	84		
20	77		
14	71		
10	66		
6.3	59		
5	55		
3.35	50		
2	42		
1.18	36		
0.6	30		
0.425	27		
0.3	25		
0.212	22		
0.15	20		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	58.0
Sand	26.0
Silt & Clay	16.0

Grading Analysis	
D60	6.83
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



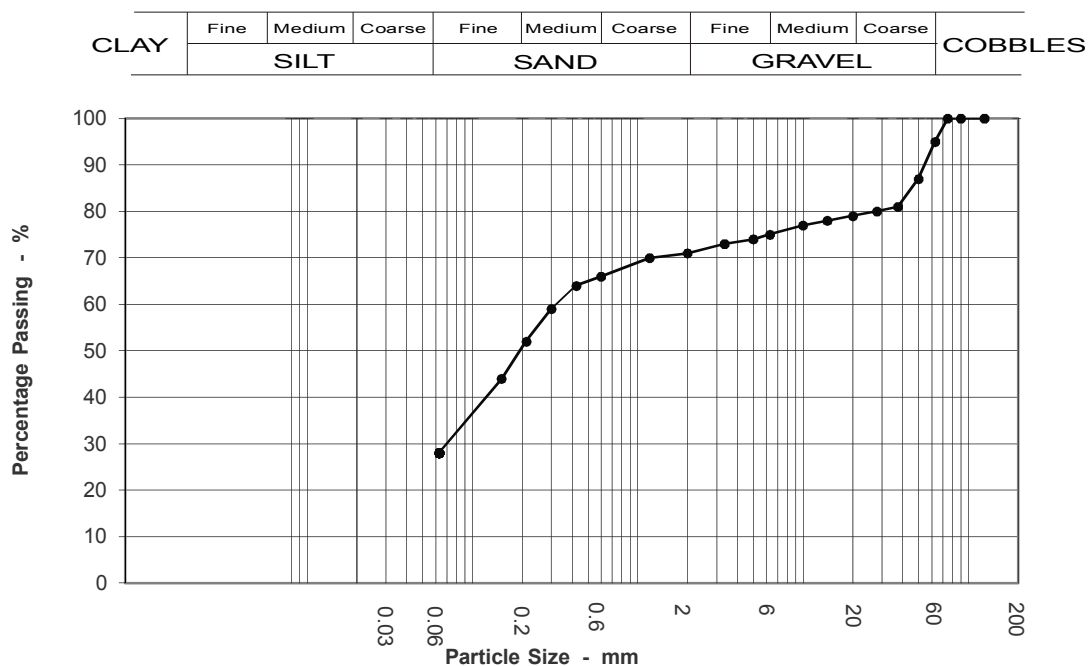


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8924
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH29
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly very clayey SAND with occasional cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.50 - 1.00
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	95		
50	87		
37.5	81		
28	80		
20	79		
14	78		
10	77		
6.3	75		
5	74		
3.35	73		
2	71		
1.18	70		
0.6	66		
0.425	64		
0.3	59		
0.212	52		
0.15	44		
0.063	28		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	5.0
Gravel	24.0
Sand	43.0
Silt & Clay	28.0

Grading Analysis	
D60	0.33
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



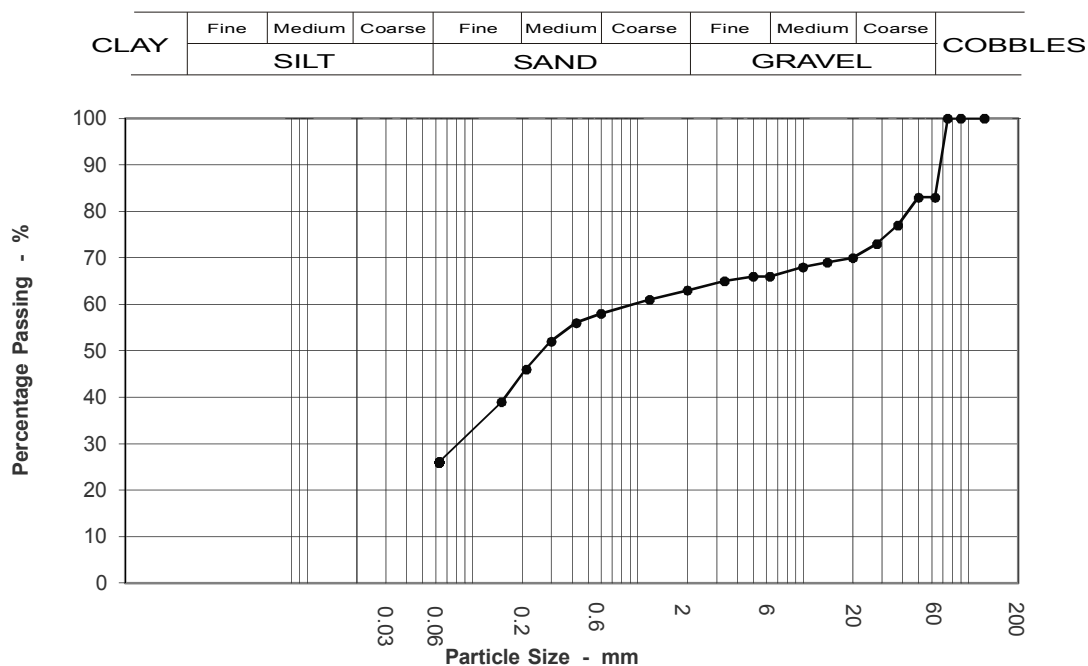


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8925
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH29
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown gravelly very clayey SAND with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	03/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	83		
50	83		
37.5	77		
28	73		
20	70		
14	69		
10	68		
6.3	66		
5	66		
3.35	65		
2	63		
1.18	61		
0.6	58		
0.425	56		
0.3	52		
0.212	46		
0.15	39		
0.063	26		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	17.0
Gravel	20.0
Sand	37.0
Silt & Clay	26.0

Grading Analysis	
D60	0.99
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



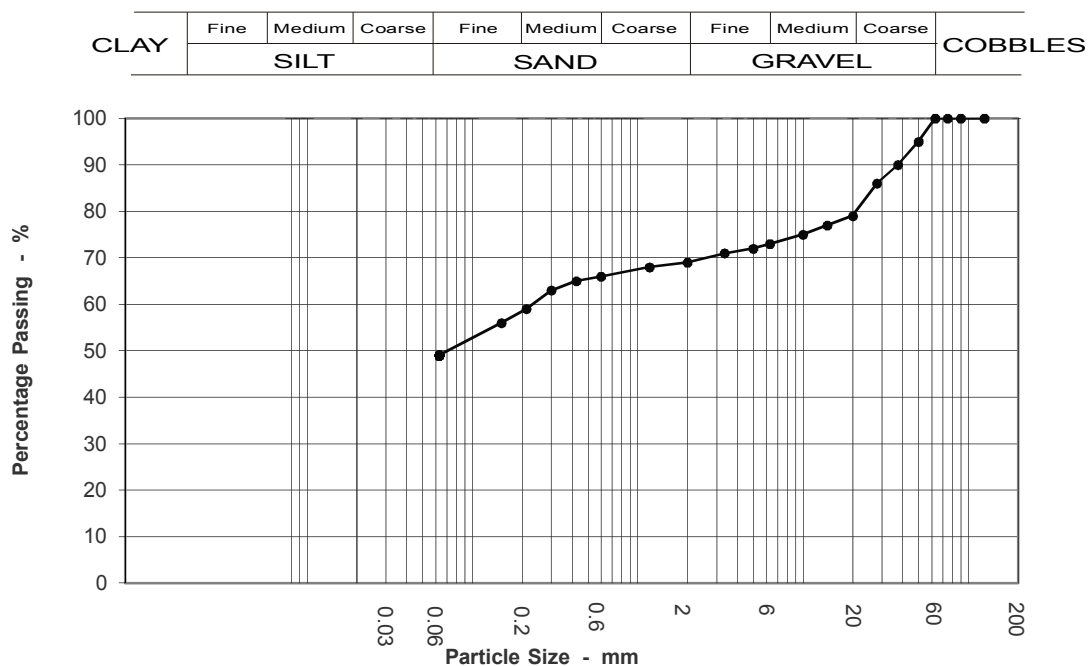


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8928
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH29
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly silty CLAY	<b>Sample No:</b>	9
		<b>Depth (m):</b>	2.60 - 3.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	95		
37.5	90		
28	86		
20	79		
14	77		
10	75		
6.3	73		
5	72		
3.35	71		
2	69		
1.18	68		
0.6	66		
0.425	65		
0.3	63		
0.212	59		
0.15	56		
0.063	49		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	31.0
Sand	20.0
Silt & Clay	49.0

Grading Analysis	
D60	0.23
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** Agata K-Roche

**Approved:** Senior Technician

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



1489



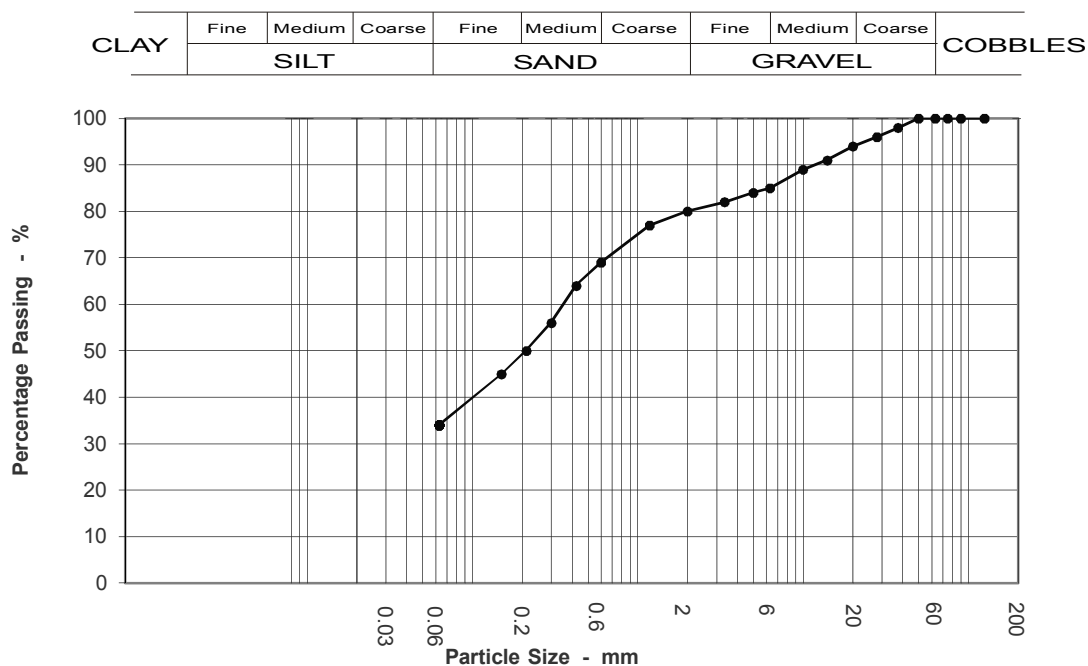


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8930
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH29
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy CLAY	<b>Sample No:</b>	16
		<b>Depth (m):</b>	4.70 - 5.00
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	98		
28	96		
20	94		
14	91		
10	89		
6.3	85		
5	84		
3.35	82		
2	80		
1.18	77		
0.6	69		
0.425	64		
0.3	56		
0.212	50		
0.15	45		
0.063	34		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	20.0
Sand	46.0
Silt & Clay	34.0

Grading Analysis	
D60	0.36
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



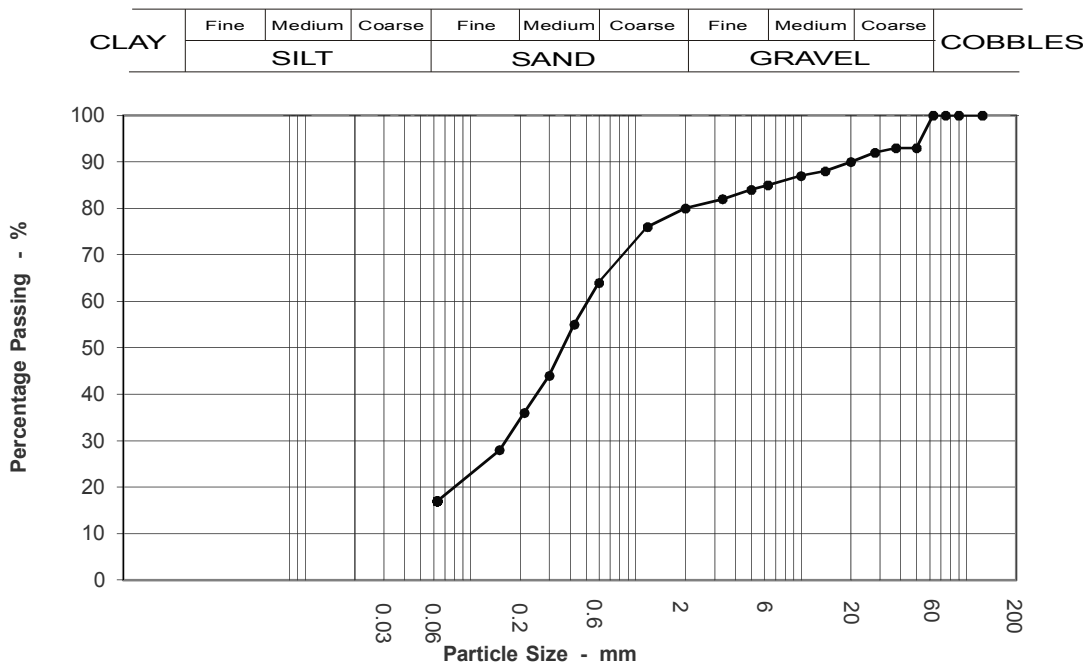


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8929
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH29
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown clayey gravelly SAND	<b>Sample No:</b>	15
		<b>Depth (m):</b>	4.00 - 4.70
		<b>Date Tested:</b>	02/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	93		
28	92		
20	90		
14	88		
10	87		
6.3	85		
5	84		
3.35	82		
2	80		
1.18	76		
0.6	64		
0.425	55		
0.3	44		
0.212	36		
0.15	28		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	20.0
Sand	63.0
Silt & Clay	17.0

Grading Analysis	
D60	0.52
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



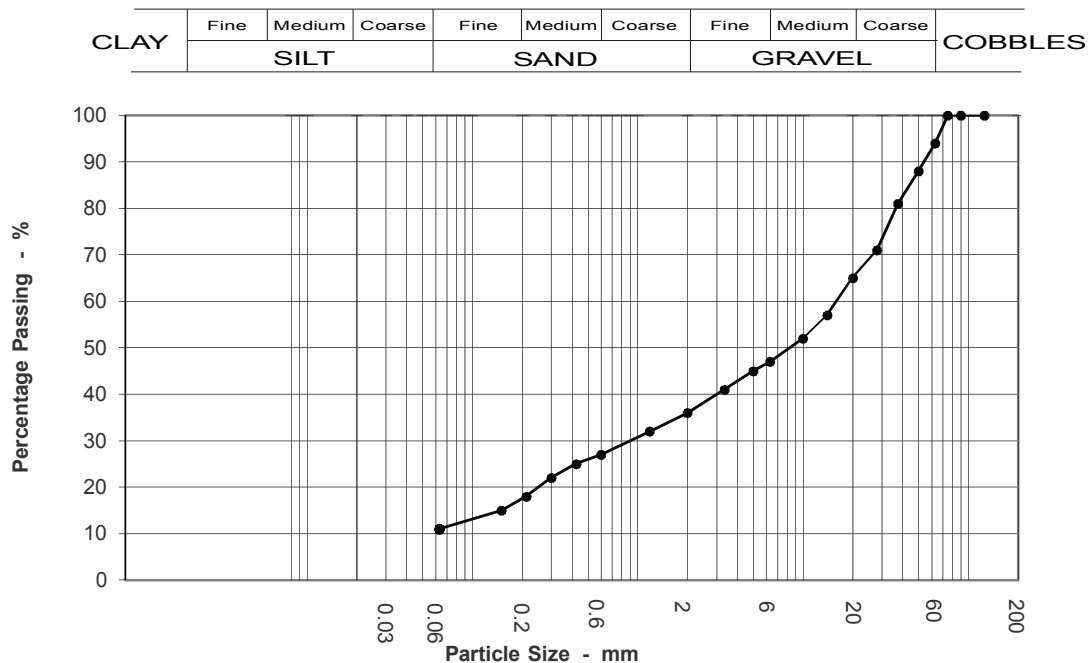


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8689
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR1
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very sandy GRAVEL with cobbles	<b>Sample No:</b>	5
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	88		
37.5	81		
28	71		
20	65		
14	57		
10	52		
6.3	47		
5	45		
3.35	41		
2	36		
1.18	32		
0.6	27		
0.425	25		
0.3	22		
0.212	18		
0.15	15		
0.063	11		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	6.0
Gravel	58.0
Sand	25.0
Silt & Clay	11.0

Grading Analysis	
D60	16.25
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



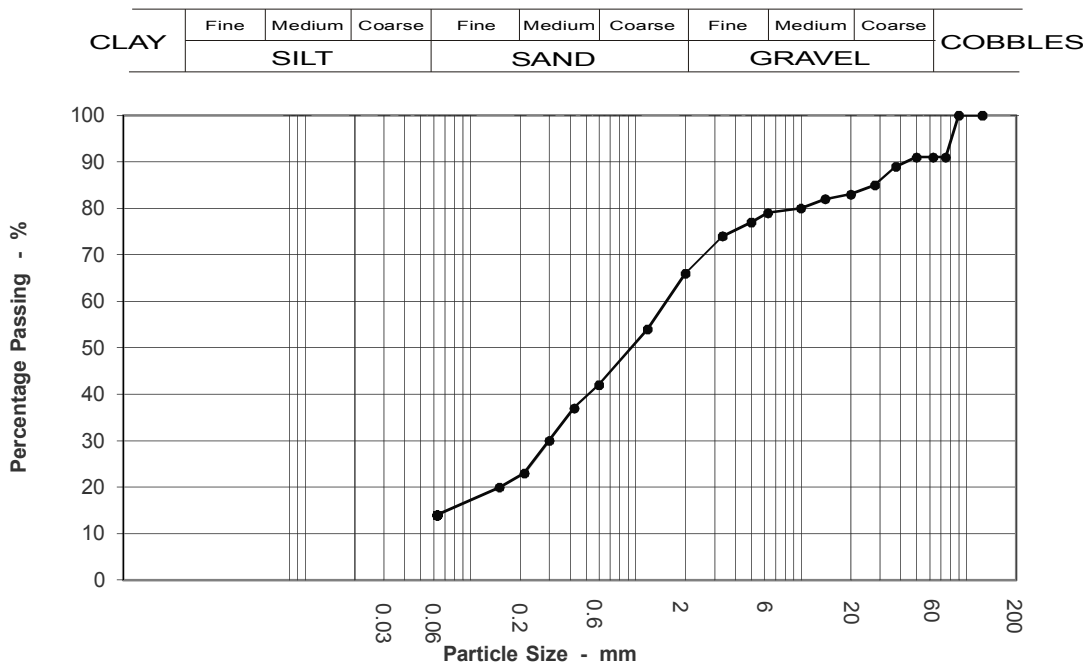


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8690
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR1
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty very gravelly SAND with cobbles	<b>Sample No:</b>	7
		<b>Depth (m):</b>	2.00 - 3.00
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	91		
63	91		
50	91		
37.5	89		
28	85		
20	83		
14	82		
10	80		
6.3	79		
5	77		
3.35	74		
2	66		
1.18	54		
0.6	42		
0.425	37		
0.3	30		
0.212	23		
0.15	20		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	9.0
Gravel	25.0
Sand	52.0
Silt & Clay	14.0

Grading Analysis	
D60	1.59
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



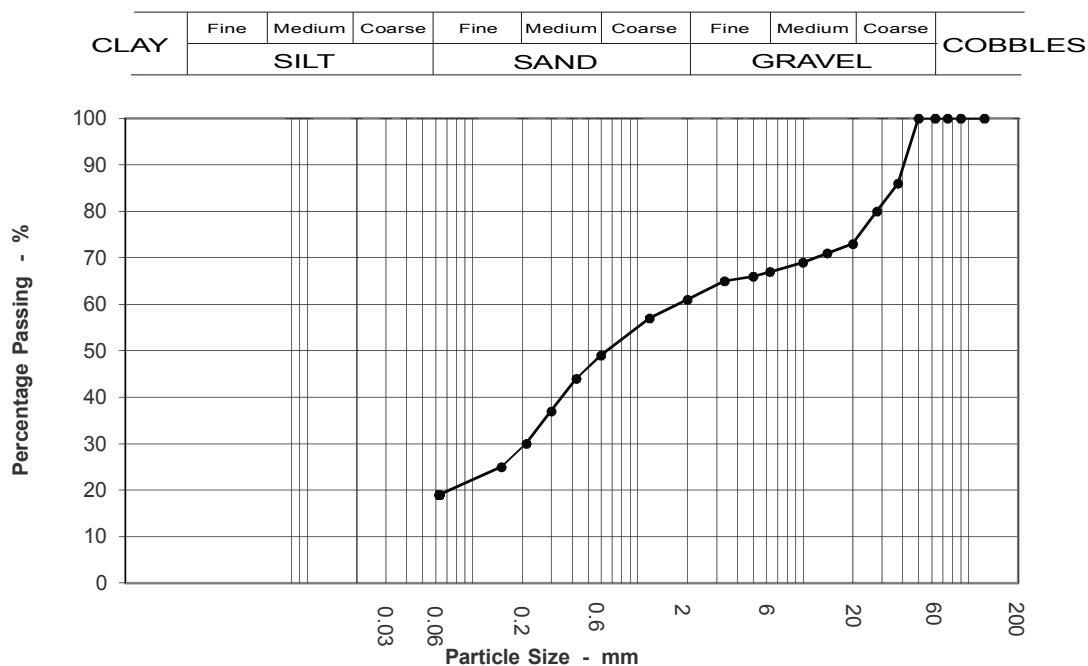


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8691
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR1
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Black gravelly sandy PEAT	<b>Sample No:</b>	9
		<b>Depth (m):</b>	3.00 - 4.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	86		
28	80		
20	73		
14	71		
10	69		
6.3	67		
5	66		
3.35	65		
2	61		
1.18	57		
0.6	49		
0.425	44		
0.3	37		
0.212	30		
0.15	25		
0.063	19		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	39.0
Sand	42.0
Silt & Clay	19.0

Grading Analysis	
D60	1.80
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



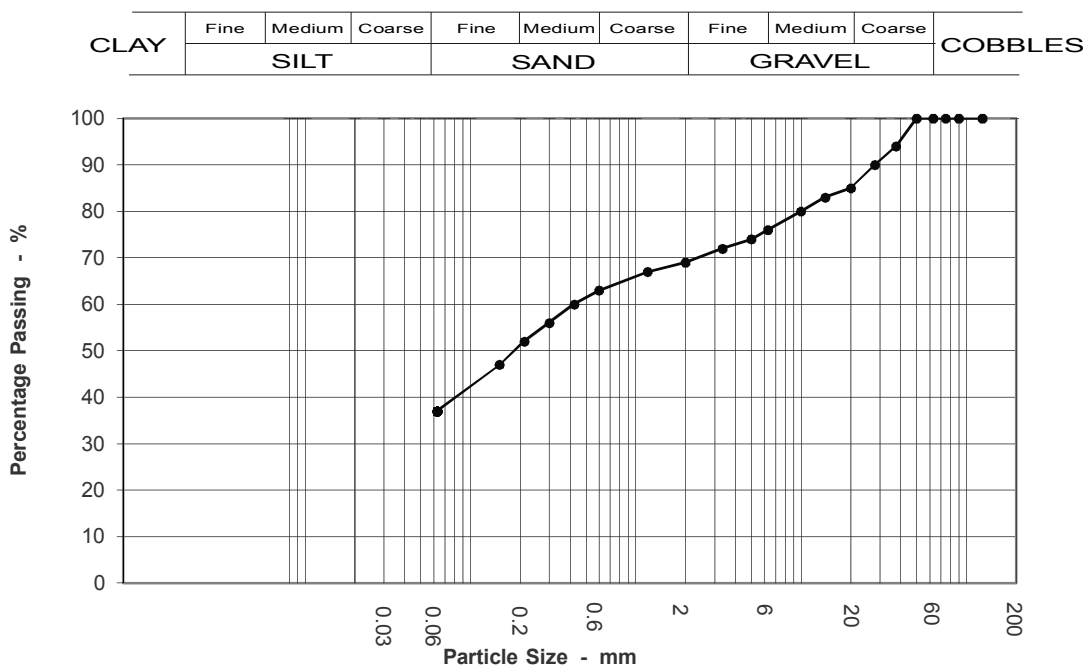


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8692
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR1
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly sandy slightly gravelly silty CLAY	<b>Sample No:</b>	11
		<b>Depth (m):</b>	5.00 - 5.50
		<b>Date Tested:</b>	04/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	90		
20	85		
14	83		
10	80		
6.3	76		
5	74		
3.35	72		
2	69		
1.18	67		
0.6	63		
0.425	60		
0.3	56		
0.212	52		
0.15	47		
0.063	37		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	31.0
Sand	32.0
Silt & Clay	37.0

Grading Analysis	
D60	0.43
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



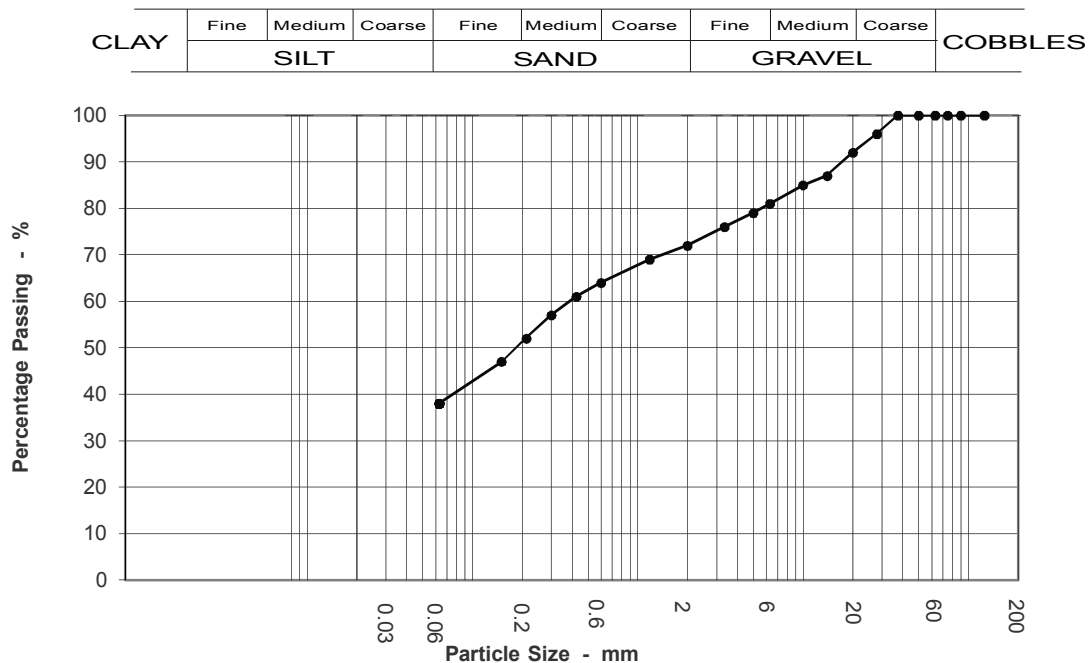


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8693
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR1
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly slightly sandy CLAY	<b>Sample No:</b>	15
		<b>Depth (m):</b>	6.50 - 7.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	96		
20	92		
14	87		
10	85		
6.3	81		
5	79		
3.35	76		
2	72		
1.18	69		
0.6	64		
0.425	61		
0.3	57		
0.212	52		
0.15	47		
0.063	38		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	28.0
Sand	34.0
Silt & Clay	38.0

Grading Analysis	
D60	0.39
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





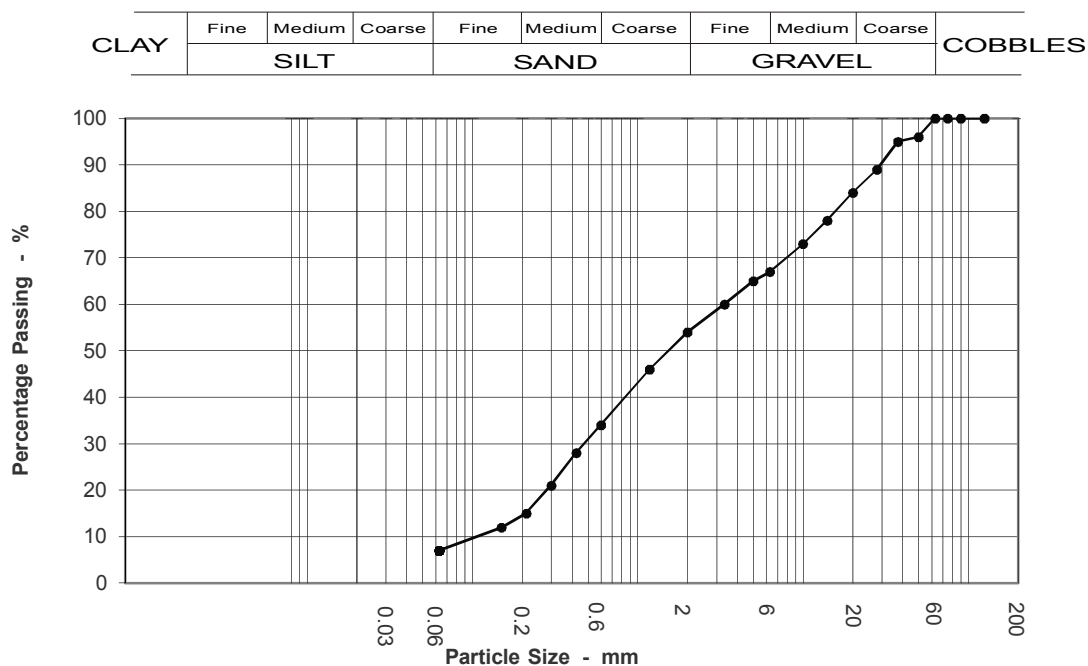


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8695
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR1
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown very gravelly SAND	<b>Sample No:</b>	19
		<b>Depth (m):</b>	8.00 - 8.30
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	96		
37.5	95		
28	89		
20	84		
14	78		
10	73		
6.3	67		
5	65		
3.35	60		
2	54		
1.18	46		
0.6	34		
0.425	28		
0.3	21		
0.212	15		
0.15	12		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	46.0
Sand	47.0
Silt & Clay	7.0

Grading Analysis	
D60	3.35
D10	0.12
Uniformity Coefficient	29.08

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



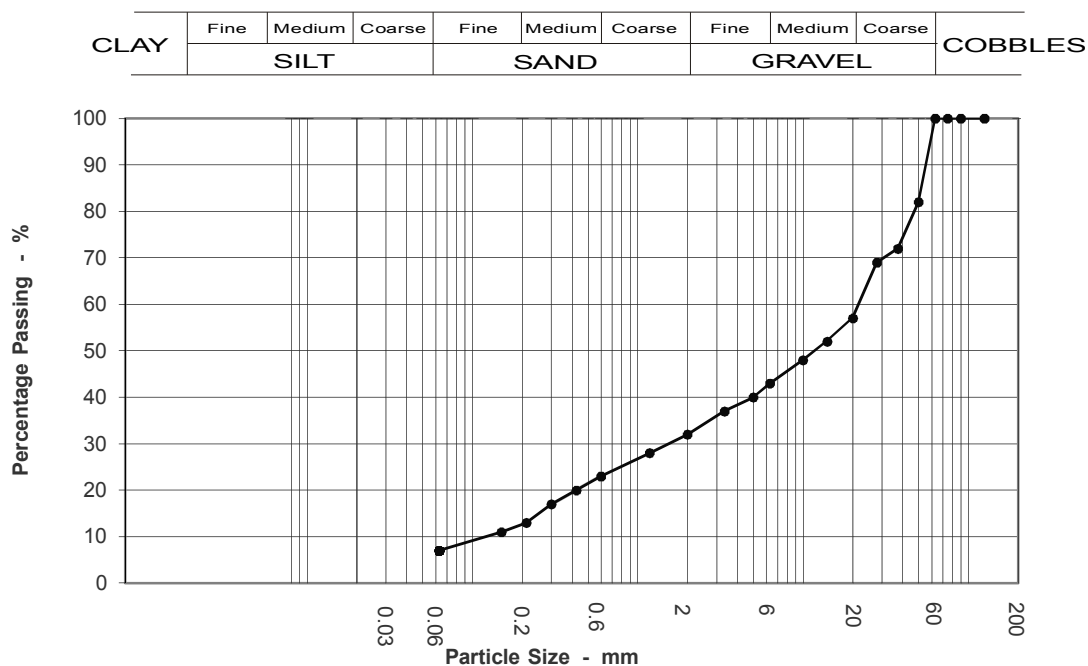


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8696
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR2
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly silty sandy GRAVEL	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.00 - 1.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	82		
37.5	72		
28	69		
20	57		
14	52		
10	48		
6.3	43		
5	40		
3.35	37		
2	32		
1.18	28		
0.6	23		
0.425	20		
0.3	17		
0.212	13		
0.15	11		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	68.0
Sand	25.0
Silt & Clay	7.0

Grading Analysis	
D60	22.00
D10	0.13
Uniformity Coefficient	171.54

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



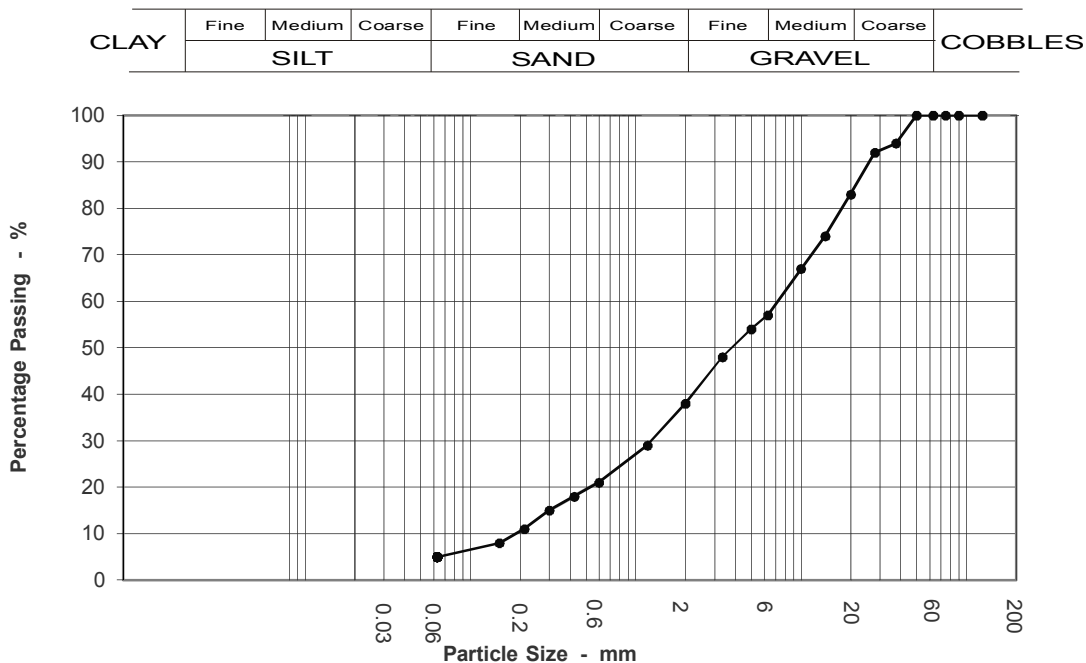


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8697
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey very sandy GRAVEL	<b>Sample No:</b>	4
		<b>Depth (m):</b>	1.00 - 1.20
		<b>Date Tested:</b>	26/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	94		
28	92		
20	83		
14	74		
10	67		
6.3	57		
5	54		
3.35	48		
2	38		
1.18	29		
0.6	21		
0.425	18		
0.3	15		
0.212	11		
0.15	8		
0.063	5		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	62.0
Sand	33.0
Silt & Clay	5.0

Grading Analysis	
D60	7.41
D10	0.19
Uniformity Coefficient	38.73

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



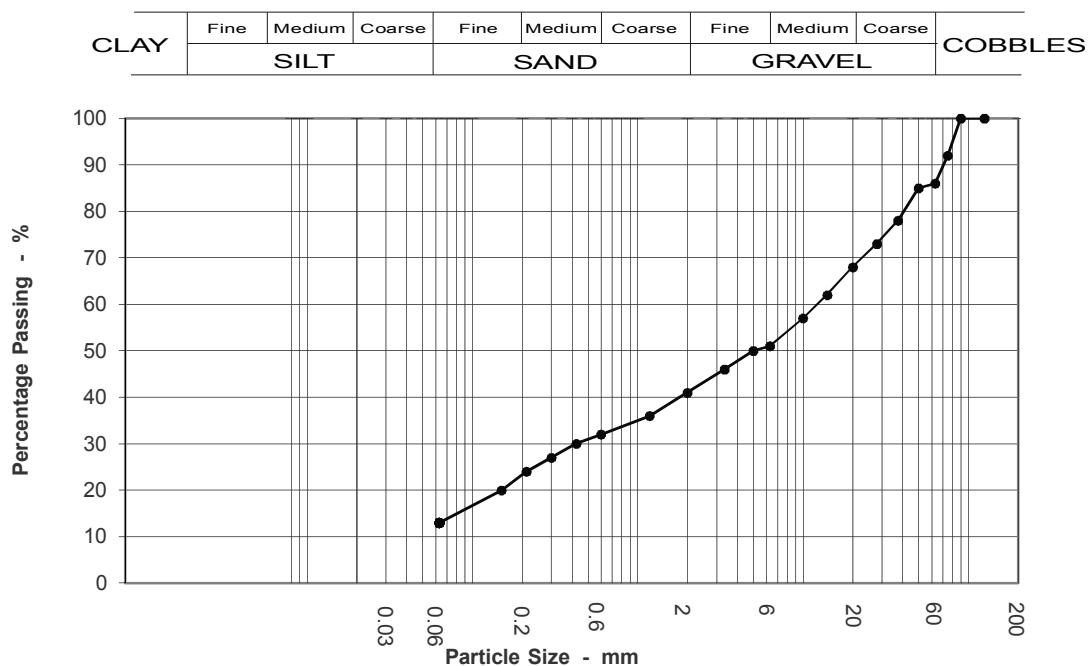


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8698
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark grey and brown sandy silty GRAVEL	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	92		
63	86		
50	85		
37.5	78		
28	73		
20	68		
14	62		
10	57		
6.3	51		
5	50		
3.35	46		
2	41		
1.18	36		
0.6	32		
0.425	30		
0.3	27		
0.212	24		
0.15	20		
0.063	13		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	14.0
Gravel	45.0
Sand	28.0
Silt & Clay	13.0

Grading Analysis	
D60	12.40
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



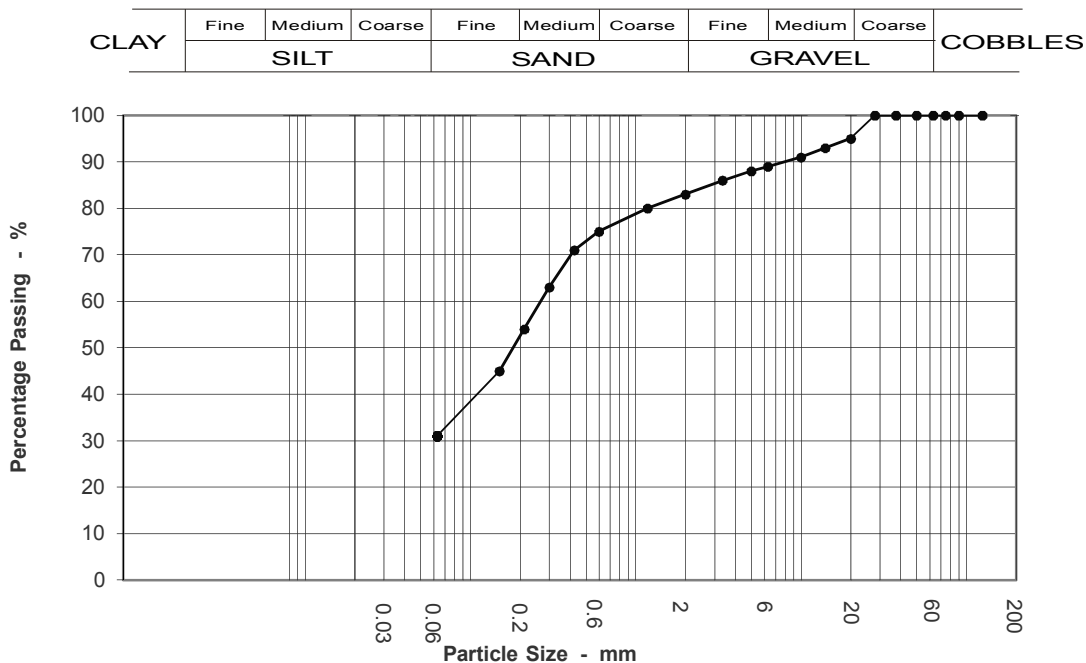


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8700
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark brown slightly gravelly sandy PEAT	<b>Sample No:</b>	10
		<b>Depth (m):</b>	2.00 - 2.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	95		
14	93		
10	91		
6.3	89		
5	88		
3.35	86		
2	83		
1.18	80		
0.6	75		
0.425	71		
0.3	63		
0.212	54		
0.15	45		
0.063	31		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	17.0
Sand	52.0
Silt & Clay	31.0

Grading Analysis	
D60	0.27
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



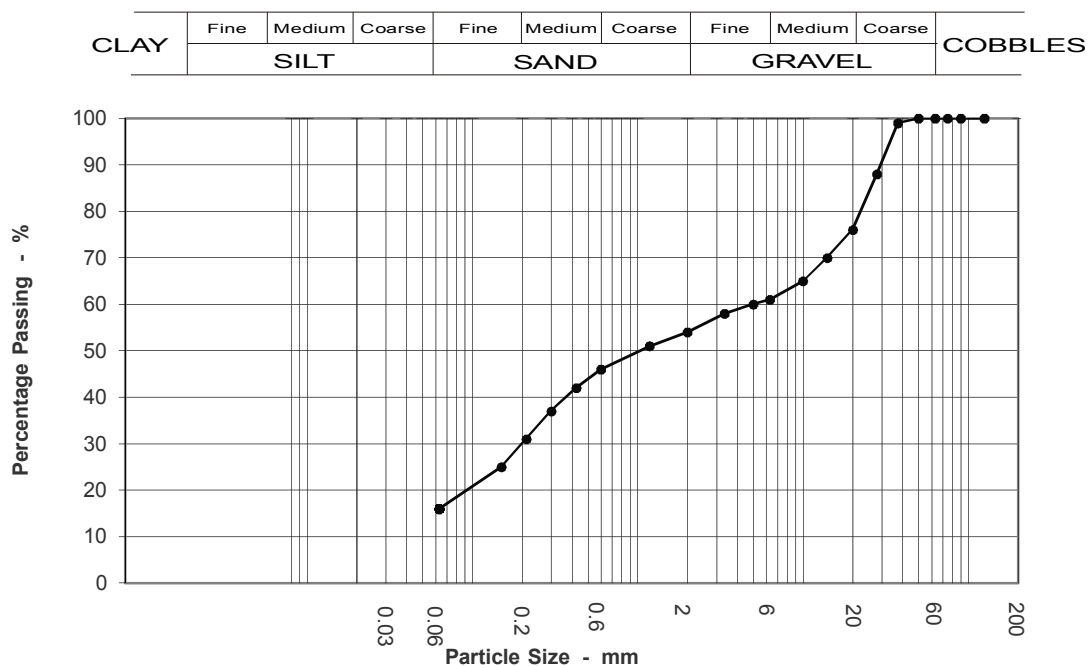


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8701
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Dark grey very gravelly silty SAND	<b>Sample No:</b>	12
		<b>Depth (m):</b>	3.00 - 3.50
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	99		
28	88		
20	76		
14	70		
10	65		
6.3	61		
5	60		
3.35	58		
2	54		
1.18	51		
0.6	46		
0.425	42		
0.3	37		
0.212	31		
0.15	25		
0.063	16		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	46.0
Sand	38.0
Silt & Clay	16.0

Grading Analysis	
D60	5.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



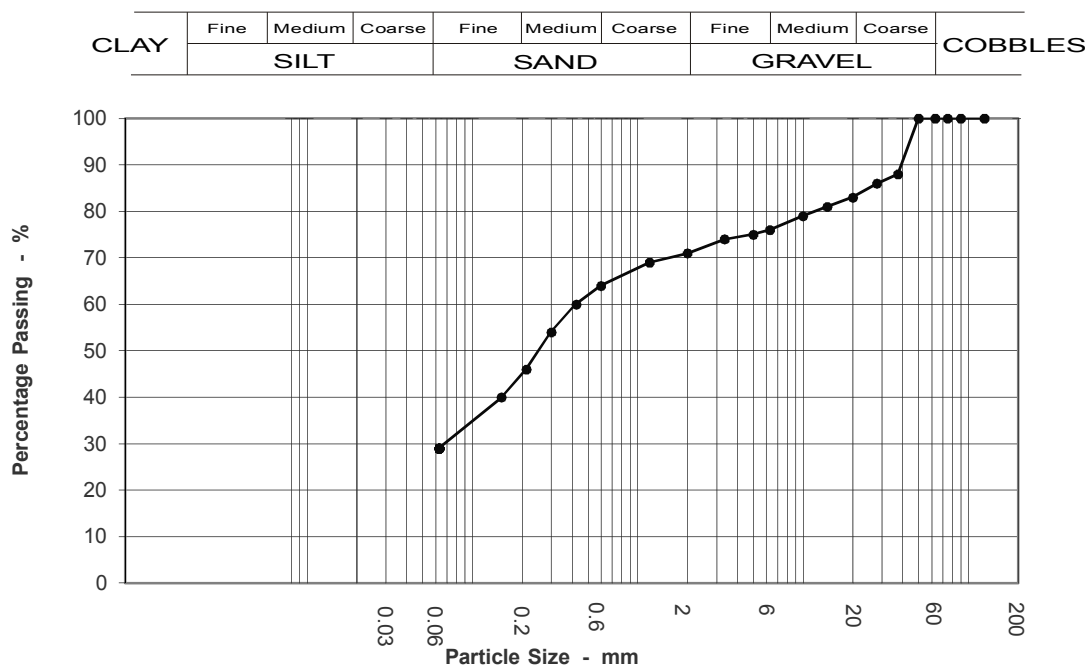


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8703
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Reddish brown slightly gravelly sandy clayey SILT	<b>Sample No:</b>	16
		<b>Depth (m):</b>	5.00 - 5.50
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	88		
28	86		
20	83		
14	81		
10	79		
6.3	76		
5	75		
3.35	74		
2	71		
1.18	69		
0.6	64		
0.425	60		
0.3	54		
0.212	46		
0.15	40		
0.063	29		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	29.0
Sand	42.0
Silt & Clay	29.0

Grading Analysis	
D60	0.43
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





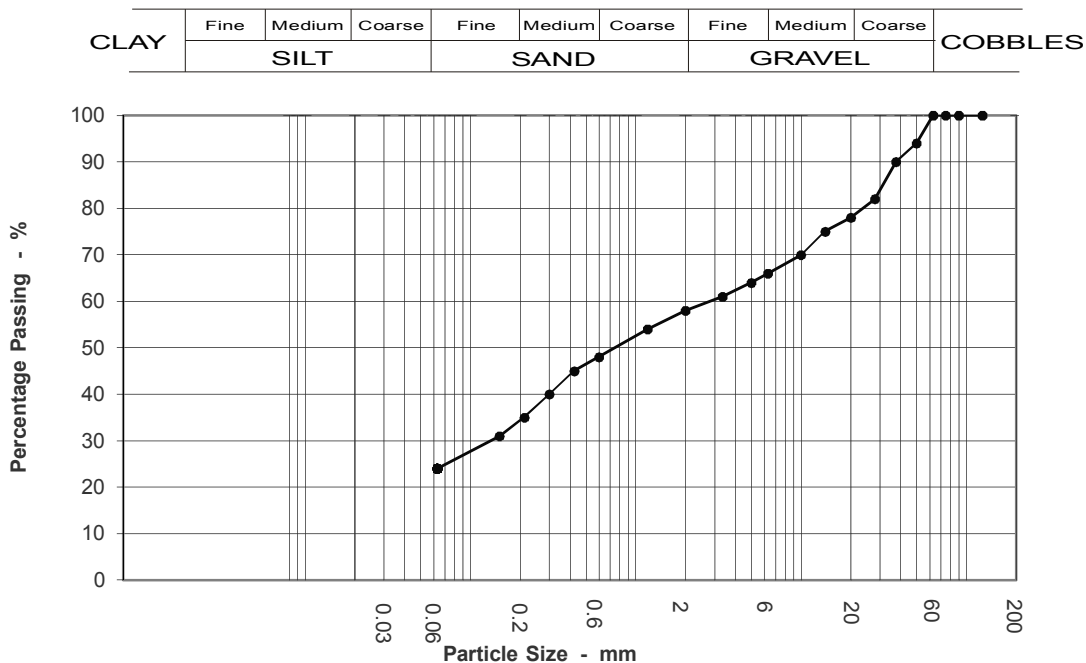


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8704
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly sandy gravelly SILT	<b>Sample No:</b>	18
		<b>Depth (m):</b>	6.00 - 6.50
		<b>Date Tested:</b>	03/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	94		
37.5	90		
28	82		
20	78		
14	75		
10	70		
6.3	66		
5	64		
3.35	61		
2	58		
1.18	54		
0.6	48		
0.425	45		
0.3	40		
0.212	35		
0.15	31		
0.063	24		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	42.0
Sand	34.0
Silt & Clay	24.0

Grading Analysis	
D60	2.90
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



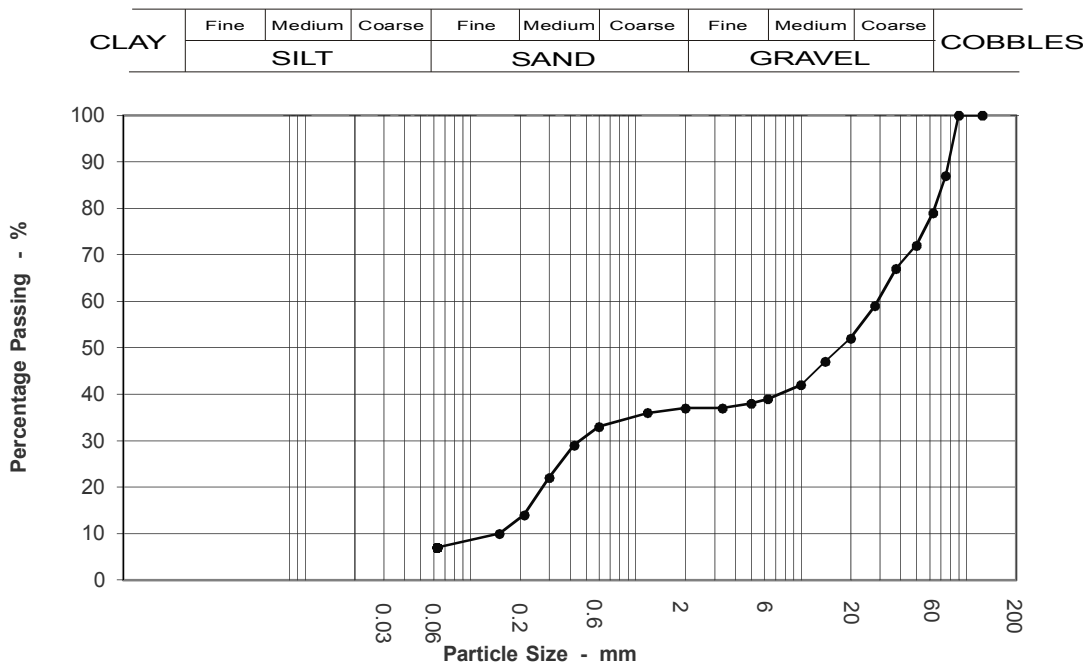


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8705
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brownish grey slightly silty sandy GRAVEL with frequent cobbles	<b>Sample No:</b>	4
		<b>Depth (m):</b>	0.60 - 0.80
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	87		
63	79		
50	72		
37.5	67		
28	59		
20	52		
14	47		
10	42		
6.3	39		
5	38		
3.35	37		
2	37		
1.18	36		
0.6	33		
0.425	29		
0.3	22		
0.212	14		
0.15	10		
0.063	7		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	21.0
Gravel	42.0
Sand	30.0
Silt & Clay	7.0

Grading Analysis	
D60	29.19
D10	0.15
Uniformity Coefficient	194.58

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



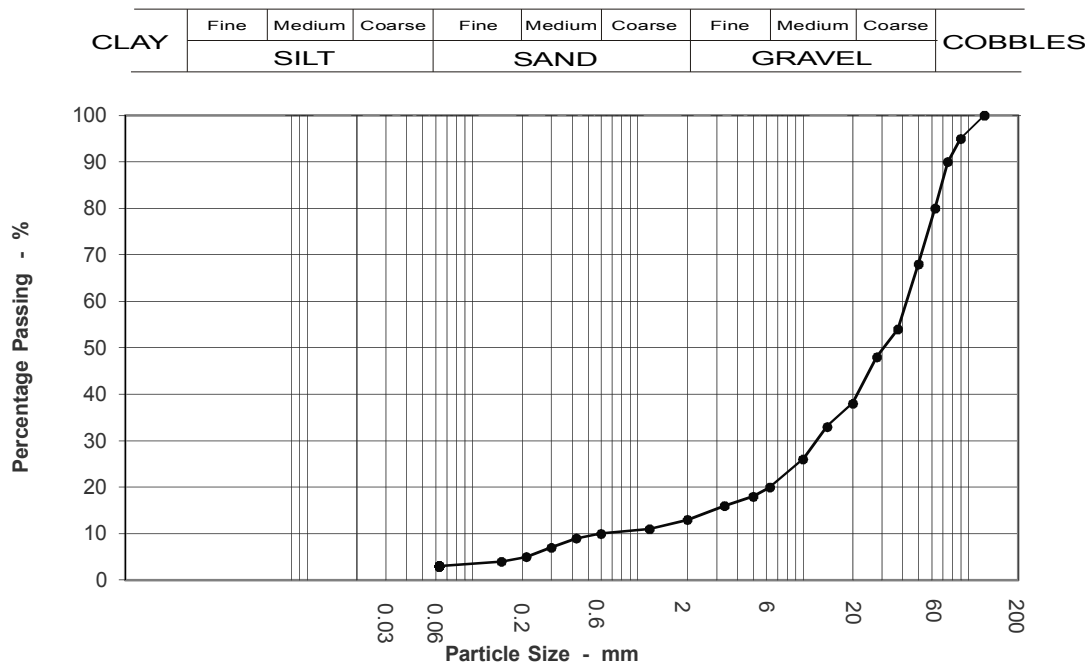


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8706
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown sandy GRAVEL with frequent cobbles	<b>Sample No:</b>	6
		<b>Depth (m):</b>	0.90 - 1.10
		<b>Date Tested:</b>	29/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	95		
75	90		
63	80		
50	68		
37.5	54		
28	48		
20	38		
14	33		
10	26		
6.3	20		
5	18		
3.35	16		
2	13		
1.18	11		
0.6	10		
0.425	9		
0.3	7		
0.212	5		
0.15	4		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	20.0
Gravel	67.0
Sand	10.0
Silt & Clay	3.0

Grading Analysis	
D60	42.86
D10	0.60
Uniformity Coefficient	71.43

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



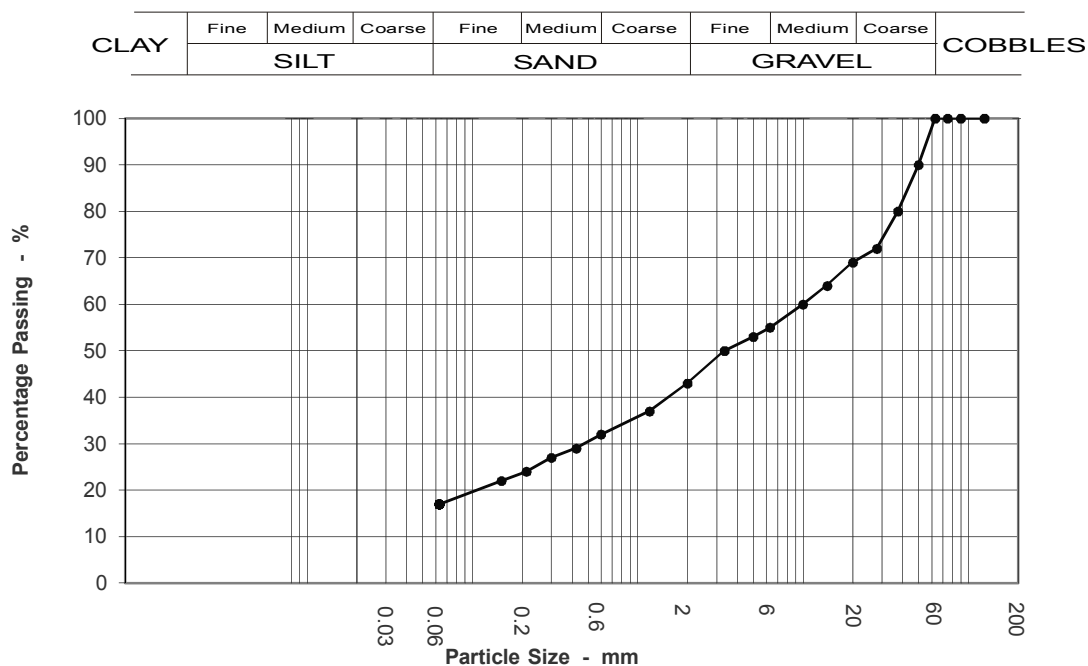


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8707
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Black and light brown silty very sandy GRAVEL	<b>Sample No:</b>	8
		<b>Depth (m):</b>	1.20 - 2.00
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	90		
37.5	80		
28	72		
20	69		
14	64		
10	60		
6.3	55		
5	53		
3.35	50		
2	43		
1.18	37		
0.6	32		
0.425	29		
0.3	27		
0.212	24		
0.15	22		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	57.0
Sand	26.0
Silt & Clay	17.0

Grading Analysis	
D60	10.00
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



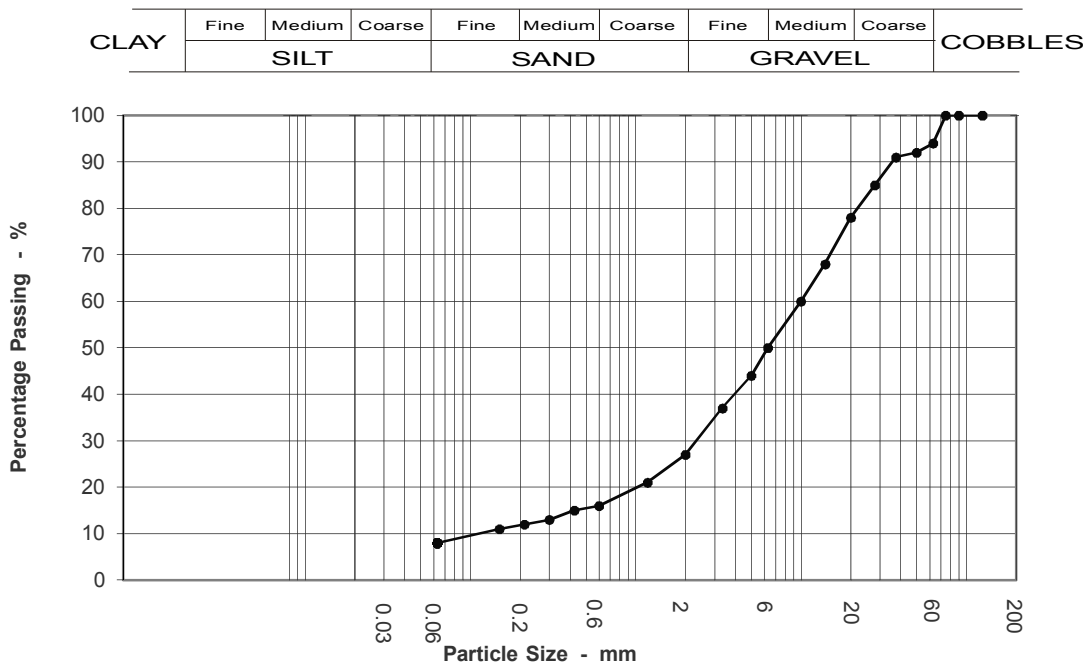


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8710
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown silty sandy GRAVEL with cobbles and pockets of grey CLAY	<b>Sample No:</b>	14
		<b>Depth (m):</b>	3.00 - 3.50
		<b>Date Tested:</b>	05/12/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	94		
50	92		
37.5	91		
28	85		
20	78		
14	68		
10	60		
6.3	50		
5	44		
3.35	37		
2	27		
1.18	21		
0.6	16		
0.425	15		
0.3	13		
0.212	12		
0.15	11		
0.063	8		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	6.0
Gravel	67.0
Sand	19.0
Silt & Clay	8.0

Grading Analysis	
D60	10.00
D10	0.12
Uniformity Coefficient	82.64

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



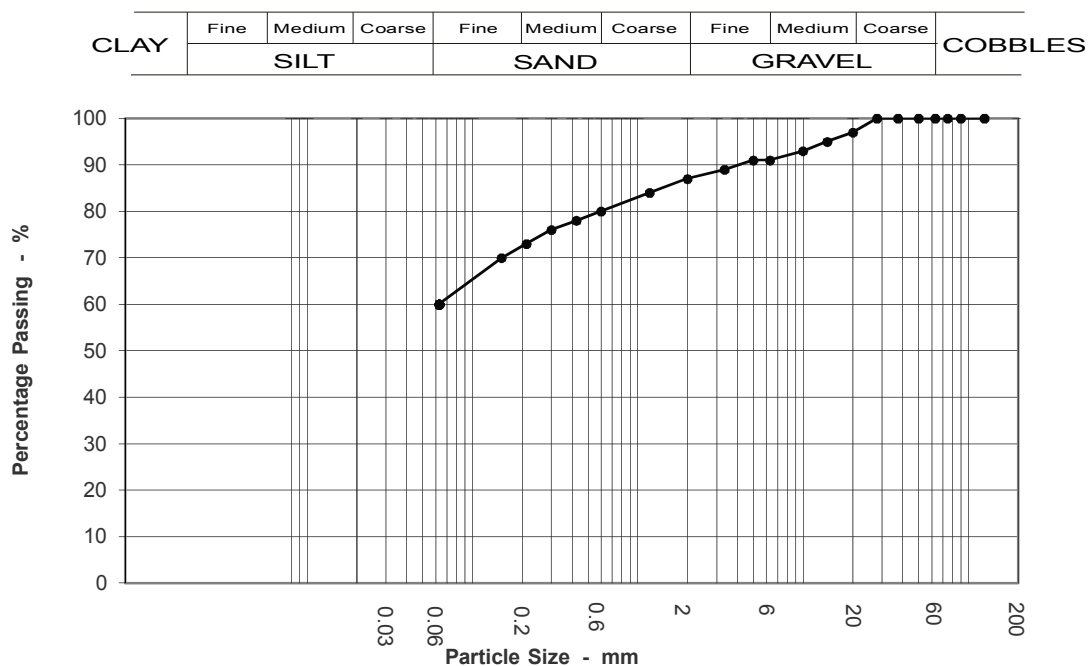


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8711
<b>Contract No:</b>	5414	<b>Hole ID:</b>	CDR4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly gravelly slightly sandy clayey SILT	<b>Sample No:</b>	17
		<b>Depth (m):</b>	4.00 - 5.00
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	97		
14	95		
10	93		
6.3	91		
5	91		
3.35	89		
2	87		
1.18	84		
0.6	80		
0.425	78		
0.3	76		
0.212	73		
0.15	70		
0.063	60		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	13.0
Sand	27.0
Silt & Clay	60.0

Grading Analysis	
D60	0.06
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



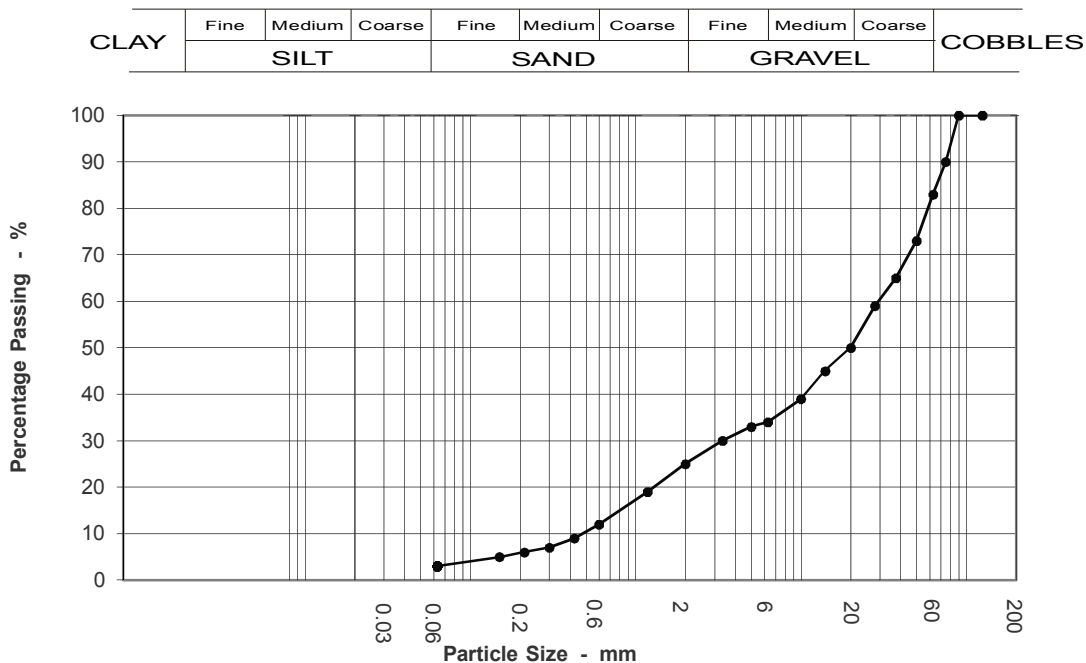


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8931
<b>Contract No:</b>	5414	<b>Hole ID:</b>	TP3
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	LB
<b>Sample Description:</b>	Brown sandy GRAVEL with cobbles	<b>Sample No:</b>	3
		<b>Depth (m):</b>	0.20 - 0.80
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	90		
63	83		
50	73		
37.5	65		
28	59		
20	50		
14	45		
10	39		
6.3	34		
5	33		
3.35	30		
2	25		
1.18	19		
0.6	12		
0.425	9		
0.3	7		
0.212	6		
0.15	5		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	17.0
Gravel	58.0
Sand	22.0
Silt & Clay	3.0

Grading Analysis	
D60	29.58
D10	0.48
Uniformity Coefficient	61.21

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





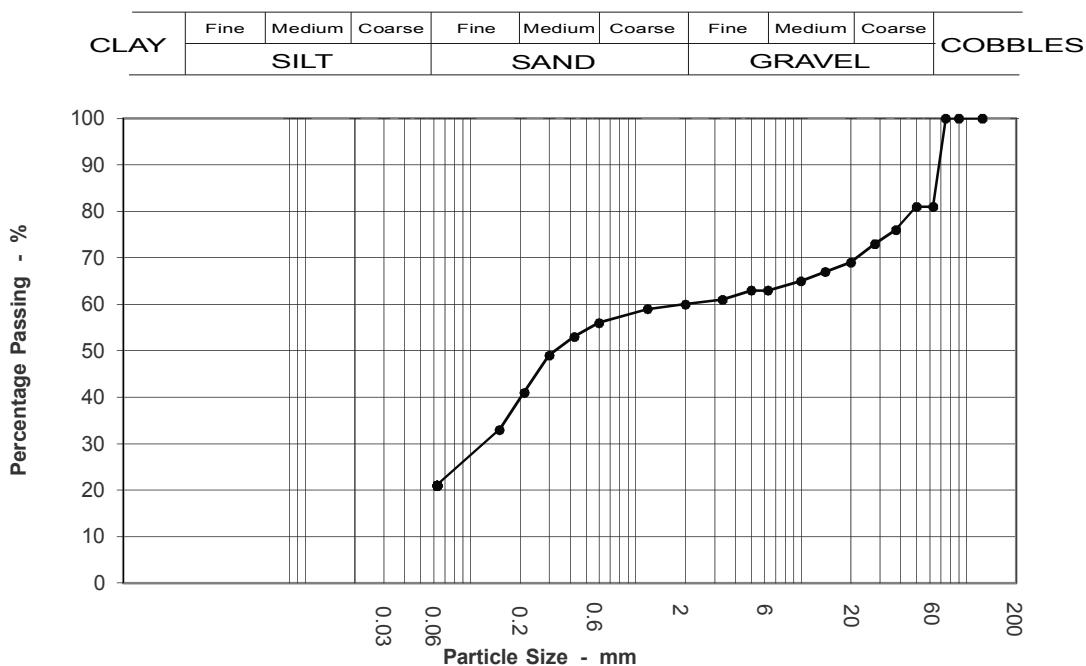


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8932
<b>Contract No:</b>	5414	<b>Hole ID:</b>	TP5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	LB
<b>Sample Description:</b>	Brownish grey slightly gravelly silty SAND	<b>Sample No:</b>	4
		<b>Depth (m):</b>	0.50 - 1.30
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	81		
50	81		
37.5	76		
28	73		
20	69		
14	67		
10	65		
6.3	63		
5	63		
3.35	61		
2	60		
1.18	59		
0.6	56		
0.425	53		
0.3	49		
0.212	41		
0.15	33		
0.063	21		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	19.0
Gravel	21.0
Sand	39.0
Silt & Clay	21.0

Grading Analysis	
D60	2.00
D10	
Uniformity Coefficient	N/A

**Remarks:** Whole sample used

**Checked and** *Agata K-Roche*

**Approved:** Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



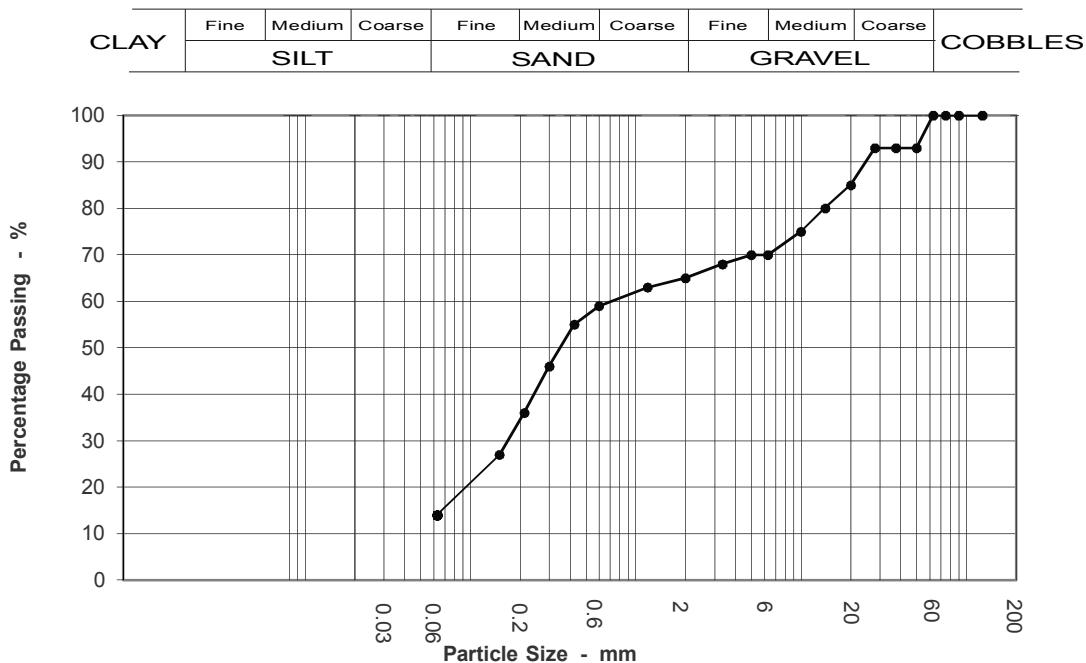


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8933
<b>Contract No:</b>	5414	<b>Hole ID:</b>	TP5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly slightly gravelly SAND	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.30 - 1.50
		<b>Date Tested:</b>	28/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	93		
37.5	93		
28	93		
20	85		
14	80		
10	75		
6.3	70		
5	70		
3.35	68		
2	65		
1.18	63		
0.6	59		
0.425	55		
0.3	46		
0.212	36		
0.15	27		
0.063	14		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	35.0
Sand	51.0
Silt & Clay	14.0

Grading Analysis	
D60	0.75
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



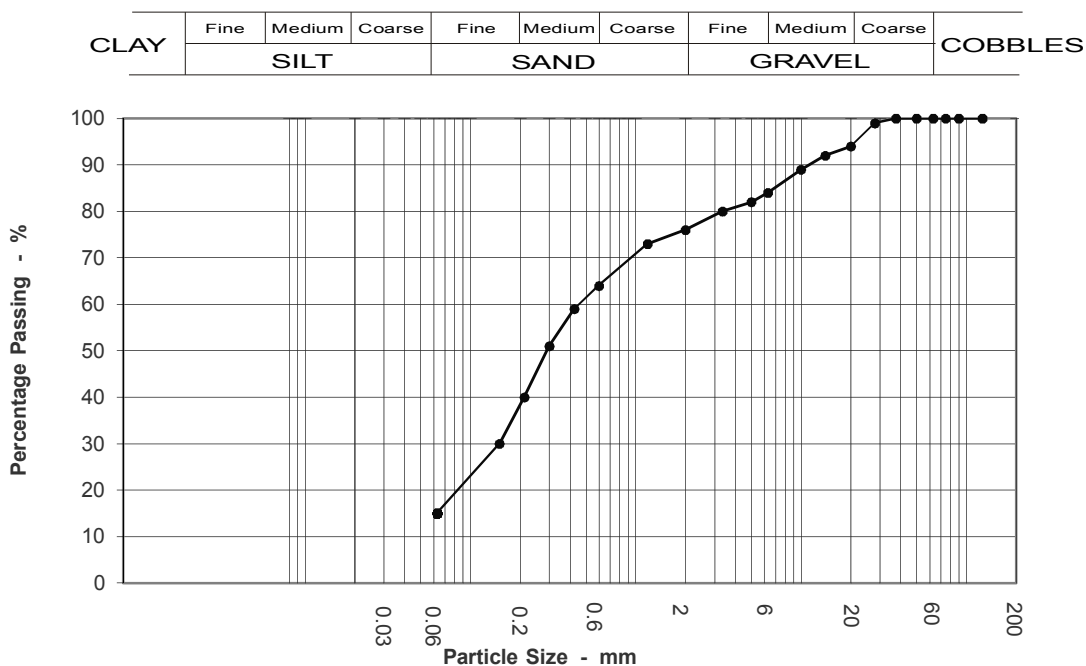


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8934
<b>Contract No:</b>	5414	<b>Hole ID:</b>	TP6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	LB
<b>Sample Description:</b>	Dark brown slightly silty slightly gravelly SAND	<b>Sample No:</b>	2
		<b>Depth (m):</b>	0.30 - 0.70
		<b>Date Tested:</b>	27/11/2013



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	99		
20	94		
14	92		
10	89		
6.3	84		
5	82		
3.35	80		
2	76		
1.18	73		
0.6	64		
0.425	59		
0.3	51		
0.212	40		
0.15	30		
0.063	15		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	24.0
Sand	61.0
Silt & Clay	15.0

Grading Analysis	
D60	0.46
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **Agata K-Roche**

Approved: Senior Technician

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



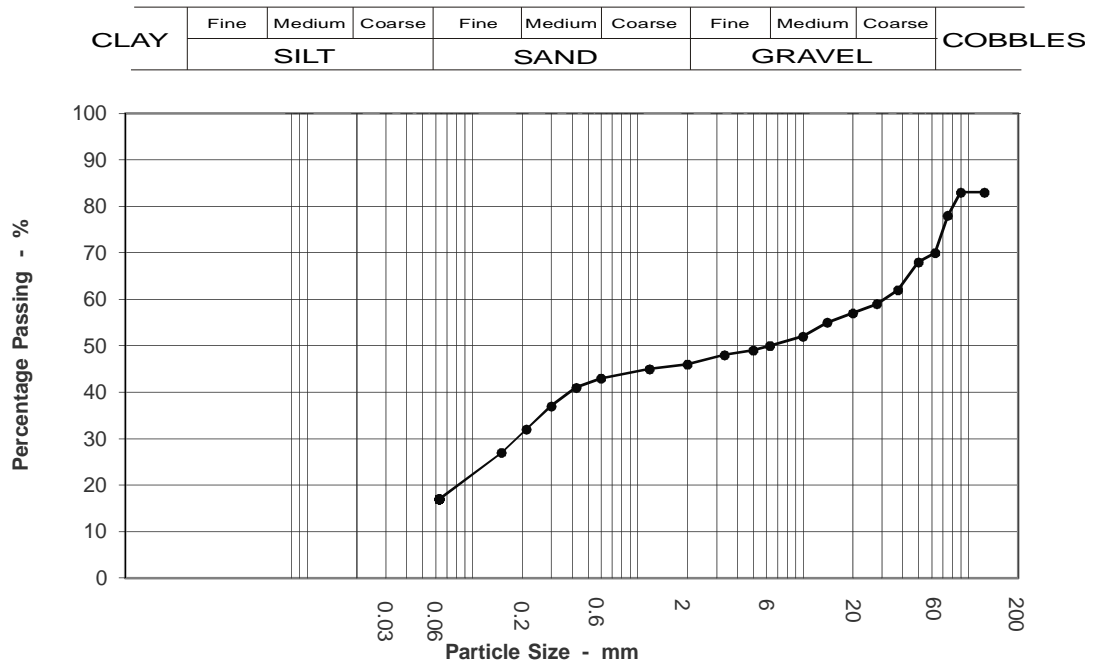


## Environmental Services

### DETERMINATION OF PARTICLE SIZE DISTRIBUTION WET SIEVING METHOD

BS1377 : Part 2 : 1990 Clause 9.2

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S9226
<b>Contract No:</b>	5414	<b>Hole ID:</b>	TP13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	LB
<b>Sample Description:</b>	0	<b>Sample No:</b>	4
		<b>Depth (m):</b>	0.90 - 1.20
		<b>Date Tested:</b>	16/01/2014



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	83		
90	83		
75	78		
63	70		
50	68		
37.5	62		
28	59		
20	57		
14	55		
10	52		
6.3	50		
5	49		
3.35	48		
2	46		
1.18	45		
0.6	43		
0.425	41		
0.3	37		
0.212	32		
0.15	27		
0.063	17		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause Depth (m):
Sedimentation	N/A

Sample Proportions	
Cobbles	30.0
Gravel	24.0
Sand	29.0
Silt & Clay	17.0

Grading Analysis	
D60	31.17
D10	
Uniformity Coefficient	N/A

Remarks:

Checked and **D Oates**

Approved: Quality Co-ordinator

Date: 16/01/2014

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

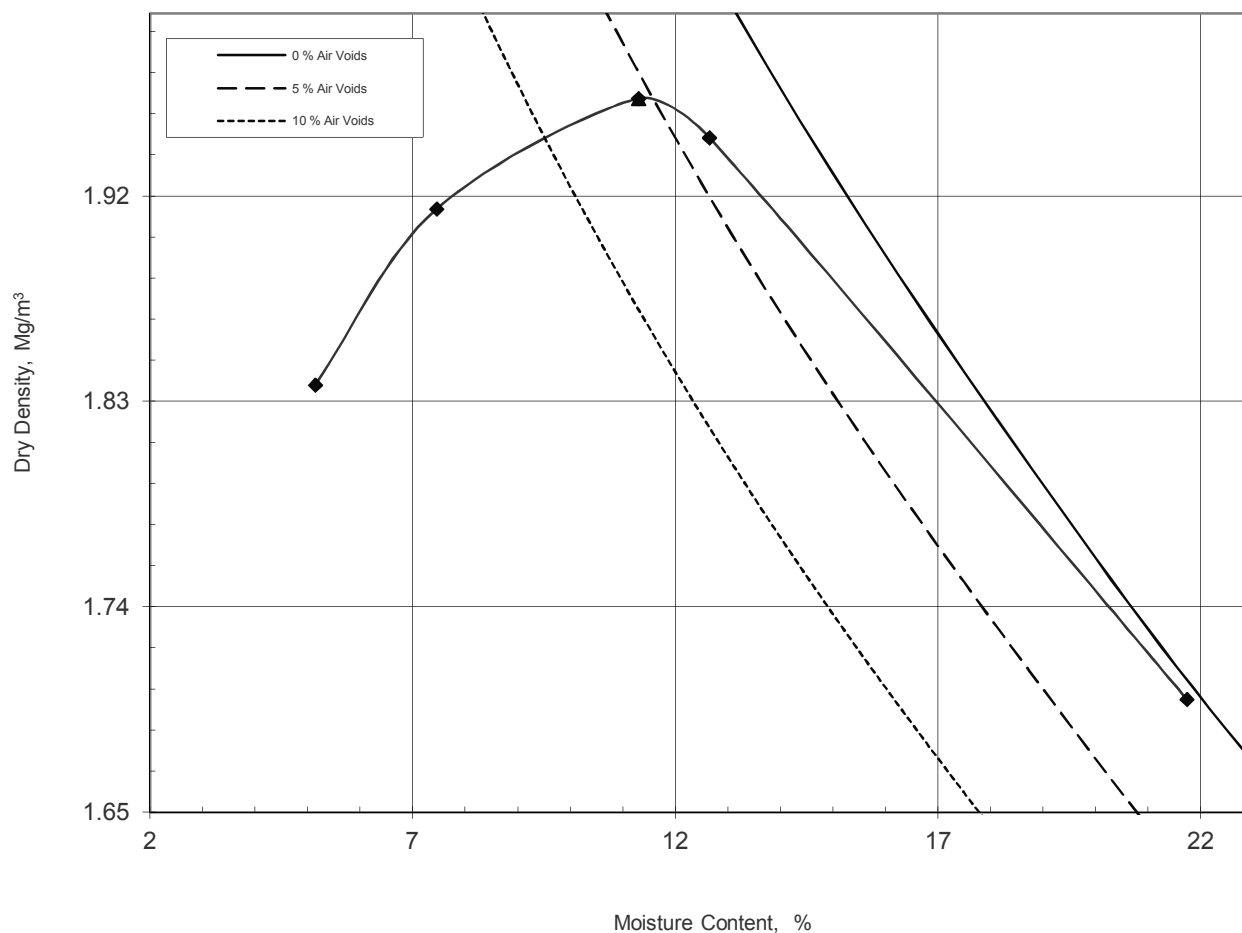


## Environmental Services

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS1377 : Part 4 : 1990

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8740
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH4
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Brown slightly clayey slightly gravelly SAND	<b>Sample No:</b>	6
		<b>Depth (m):</b>	1.90 - 3.00
		<b>Date Tested:</b>	25/11/2013



Preparation		AIR DRIED
Test Method		2.5 kg Rammer
Mould Type		STANDARD
Samples Used		SINGLE SAMPLE
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	2
Particle Density - ASSUMED	Mg/m³	2.72
Maximum Dry Density	Mg/m³	1.96
Optimum Moisture Content	%	11

## Remarks:

Checked and  
Approved **Agata K-  
Roche**

Date: 09/12/2013



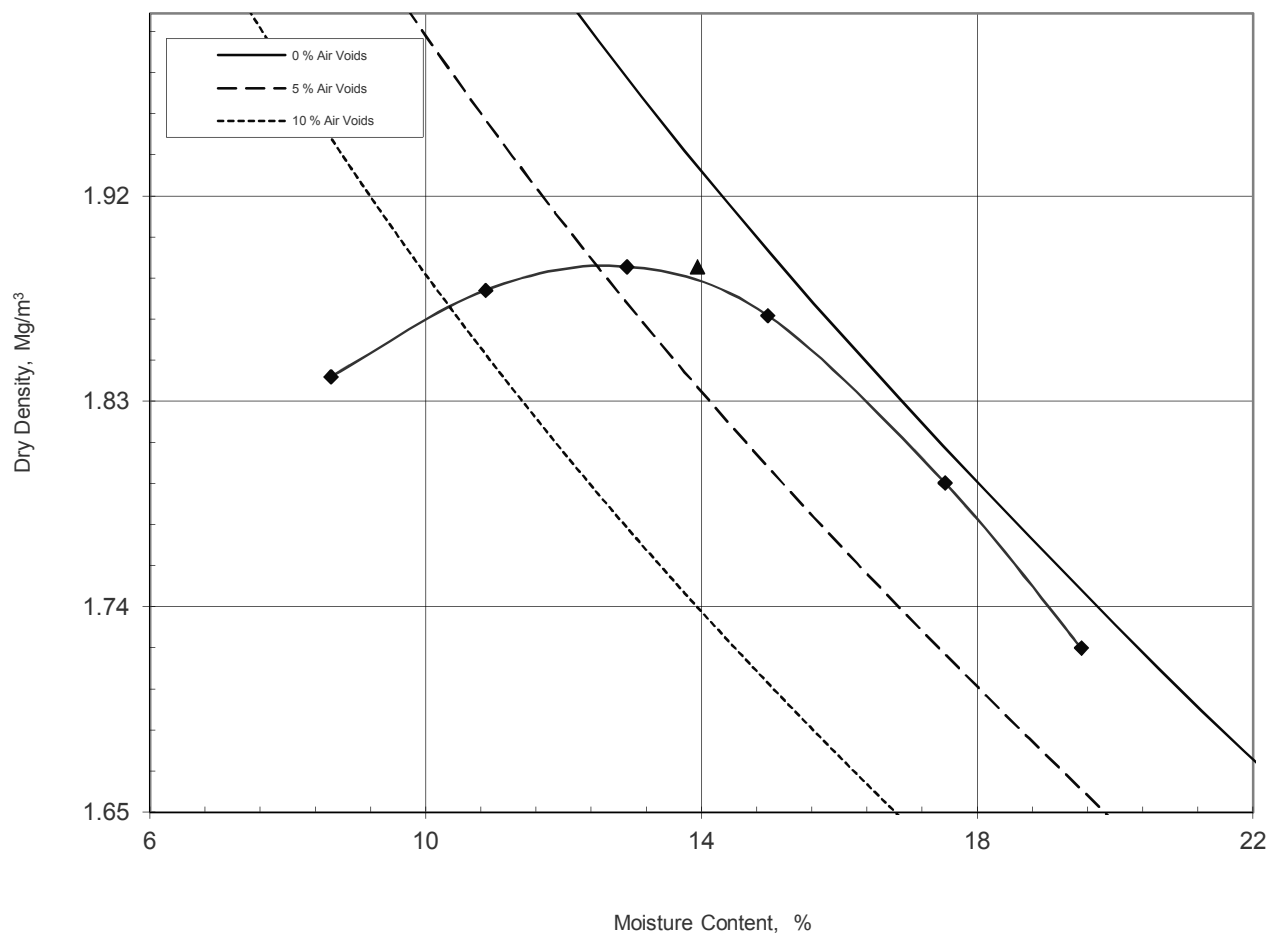
Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

## Environmental Services

## MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS1377 : Part 4 : 1990

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8765
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	B
<b>Sample Description:</b>	Greyish brown slightly gravelly very clayey SAND	<b>Sample No:</b>	17
		<b>Depth (m):</b>	5.00 - 6.00
		<b>Date Tested:</b>	28/11/2013



Preparation		AIR DRIED
Test Method		2.5 kg Rammer
Mould Type		STANDARD
Samples Used		SEPARATE SAMPLES
Mass Retained on 37.5 mm Sieve	%	0
Mass Retained on 20.0 mm Sieve	%	0
Particle Density - ASSUMED	Mg/m³	2.65
Maximum Dry Density	Mg/m³	1.89
Optimum Moisture Content	%	14

## Remarks:

Checked and  
Approved **Agata K-  
Roche**

Date: 09/12/2013



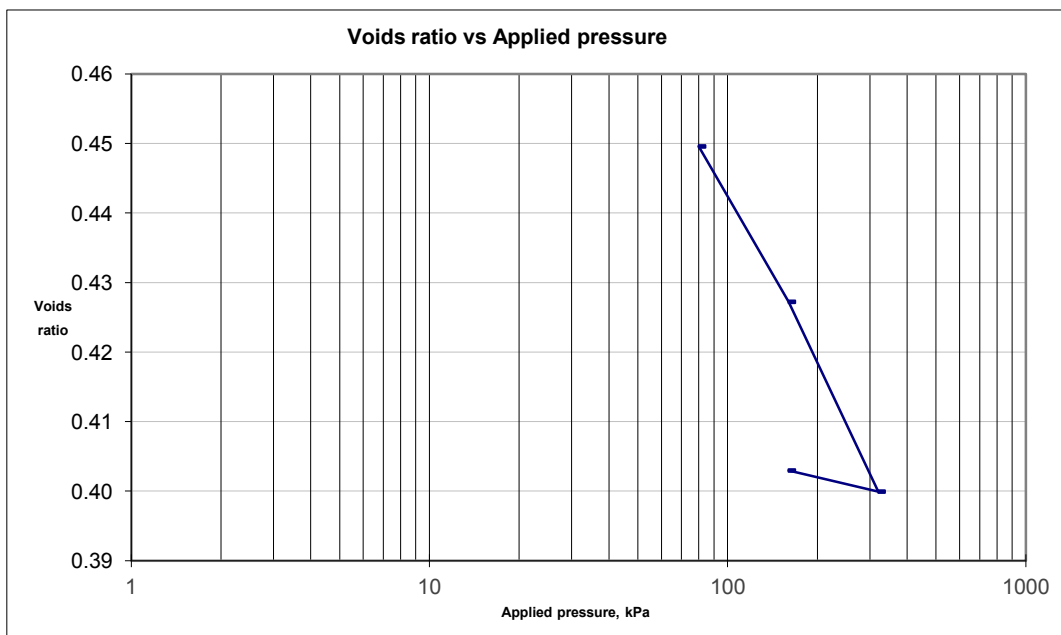
Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT

The logo for K4 SOILS, featuring a stylized 'K4' inside an oval with the word 'SOILS' below it.

Depth within original sample	m :	6.10	Orientation within original sample	:	Vertical
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<u>Specimen details</u>		<u>Initial</u>	<u>Final</u>
Height	mm :	19.03	17.58
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.12	2.24
Moisture content	% :	19	16
Dry density	Mg/m3 :	1.78	1.92
Voids Ratio	:	0.52	0.40
Degree of saturation	% :	101.2	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	80	0.4496	4.57	0.570	11				
2	160	0.4272	2.63	0.193	12				
3	320	0.3999	2.83	0.120	13				
4	160	0.4030	20.13	0.014	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				




### Determination of the one-dimensional consolidation properties

Initials : kp  
Date : 20/12/2013

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.



<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 
Costain Environmental Services		<b>Project Started</b>	02/12/2013	
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	10/12/2013	
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013	
<b>Sample description:</b> sub-angular		<b>Sample no/ type:</b> U12	<b>BH no:</b>	BH12
			<b>Depth (m):</b>	3.00

Test details

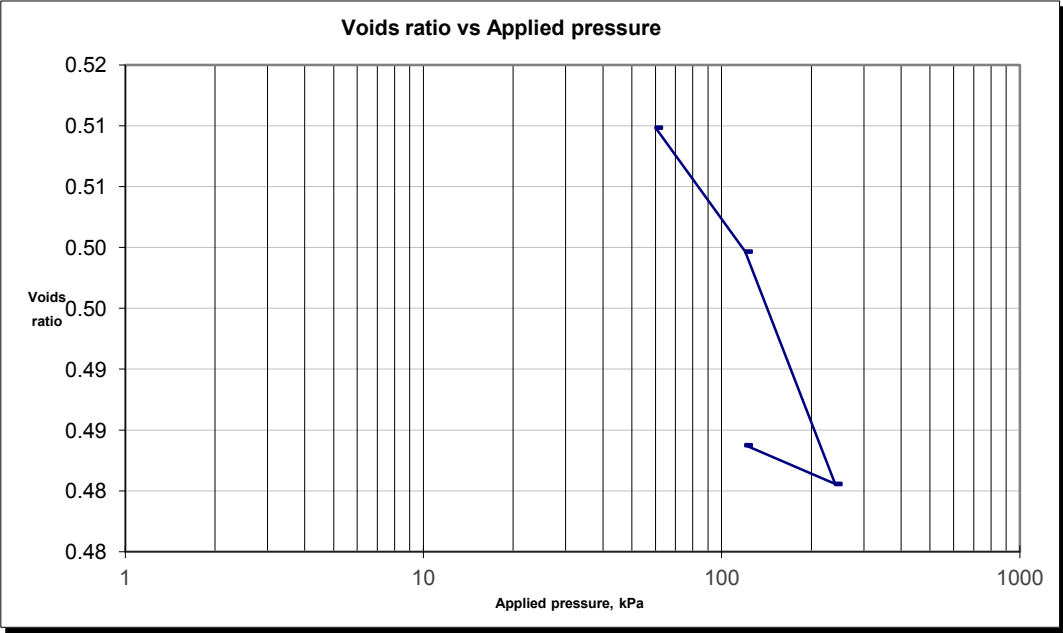
Depth within original sample m : 3.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.18	18.65
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.04	2.14
Moisture content	% :	16	17
Dry density	Mg/m3 :	1.77	1.82
Voids Ratio	:	0.53	0.48
Degree of saturation	% :	79.6	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	60	0.5098	40.40	0.179	11				
2	120	0.4997	3.23	0.112	12				
3	240	0.4806	2.21	0.106	13				
4	120	0.4837	4.28	0.018	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by


Initials : kp  
Date : 20/12/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 	
Costain Environmental Services		<b>Project Started</b>	02/12/2013		
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	11/12/2013		
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013		
<b>Sample description:</b>		<b>Sample no/ type:</b>	U	<b>BH no:</b>	BH20
Very high strength reddish brown gravelly sandy silty CLAY (gravel is fmc and sub-angular to sub-rounded)			<b>Depth (m):</b>		4.00

### Test details

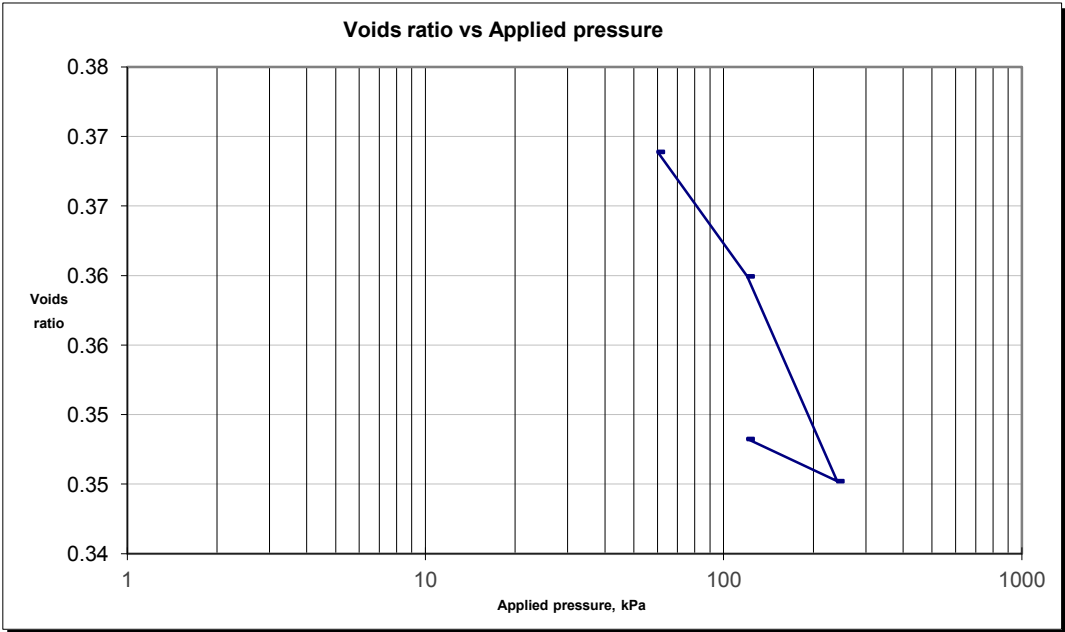
Depth within original sample m : 4.10 Orientation within original sample : Vertical


### Specimen details

		Initial	Final
Height	mm :	19.12	18.68
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.20	2.26
Moisture content	% :	12	13
Dry density	Mg/m3 :	1.96	2.00
Voids Ratio	:	0.38	0.35
Degree of saturation	% :	88.5	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

### Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	60	0.3689	17.50	0.138	11				
2	120	0.3599	2.48	0.109	12				
3	240	0.3452	3.57	0.090	13				
4	120	0.3482	4.02	0.019	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



	<h2>One-Dimensional Consolidation Test</h2>	<b>Approved by</b>
	BS 1377 : Part 5 : Clause 3 & 4 : 1990	Initials : <b>kp</b>
	Determination of the one-dimensional consolidation properties	Date : <b>20/12/2013</b>

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

The logo for K4 SOILS, featuring a stylized 'K4' inside an oval with the word 'SOILS' below it.

Test details
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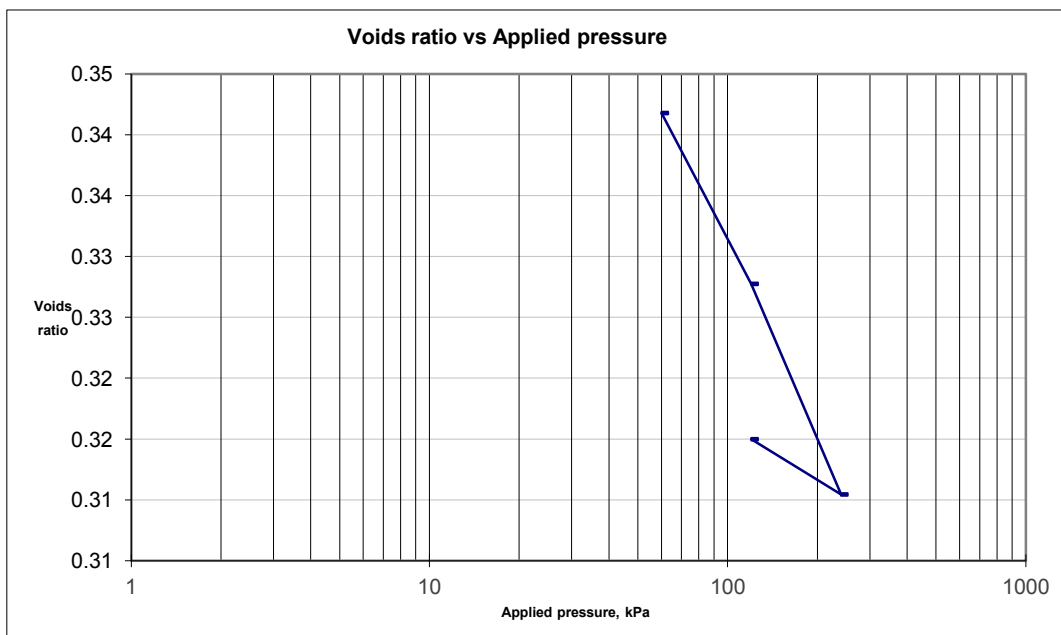
Depth within original sample	m :	4.10	Orientation within original sample	:	Vertical
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## Specimen details

Specimen details		Initial	Final
Height	mm :	19.08	18.54
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.25	2.34
Moisture content	% :	13	14
Dry density	Mg/m3 :	2.00	2.05
Voids Ratio	:	0.35	0.31
Degree of saturation	% :	98.8	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

## Consolidation Stage

Stage number	Applied Pressure	Voids Ratio	Coefficient of Consolidation	Coefficient of Compressibility	Stage number	Applied Pressure	Voids Ratio	Coefficient of Consolidation	Coefficient of Compressibility
	kPa		m2/year	m2/MN		kPa		m2/year	m2/MN
1	60	0.3418	15.65	0.140	11				
2	120	0.3277	17.10	0.174	12				
3	240	0.3104	3.12	0.109	13				
4	120	0.3150	3.49	0.029	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



## One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 &amp; 4 : 1990

### Determination of the one-dimensional consolidation properties

**Approved by**

Initials : kp


Date : 20/12/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report, incl any on 'hold' will be stored and disposed off according to Company policy. A copy of this policy is available on request.

<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 	
Costain Environmental Services		<b>Project Started</b>	02/12/2013		
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	06/12/2013		
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013		
<b>Sample description:</b>		<b>Sample no/ type:</b>	U	<b>BH no:</b>	BH24
High strength reddish brown gravelly silty sandy CLAY (gravel is fmc and rounded to sub-angular)		<b>Depth (m):</b>	4.00		

### Test details

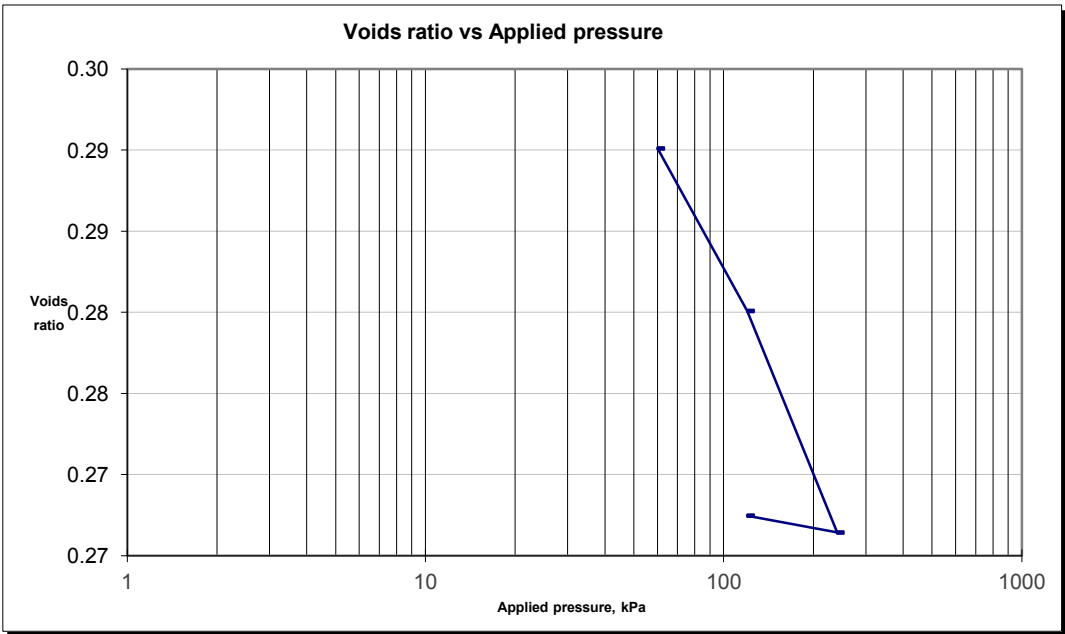
Depth within original sample m : 4.10 Orientation within original sample : Vertical

### Specimen details

		Initial	Final
Height	mm :	20.21	19.49
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.33	2.39
Moisture content	% :	13	12
Dry density	Mg/m3 :	2.05	2.13
Voids Ratio	:	0.31	0.27
Degree of saturation	% :	114.9	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

### Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	60	0.2901	4.36	0.308	11				
2	120	0.2801	3.01	0.129	12				
3	240	0.2664	3.11	0.089	13				
4	120	0.2675	13.16	0.007	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



## One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by


Initials : kp  
Date : 20/12/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 	
Costain Environmental Services		<b>Project Started</b>	02/12/2013		
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	07/12/2013		
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013		
<b>Sample description:</b>		<b>Sample no/ type:</b>	U	<b>BH no:</b>	BH25
Medium strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)			<b>Depth (m):</b>	3.00	

### Test details

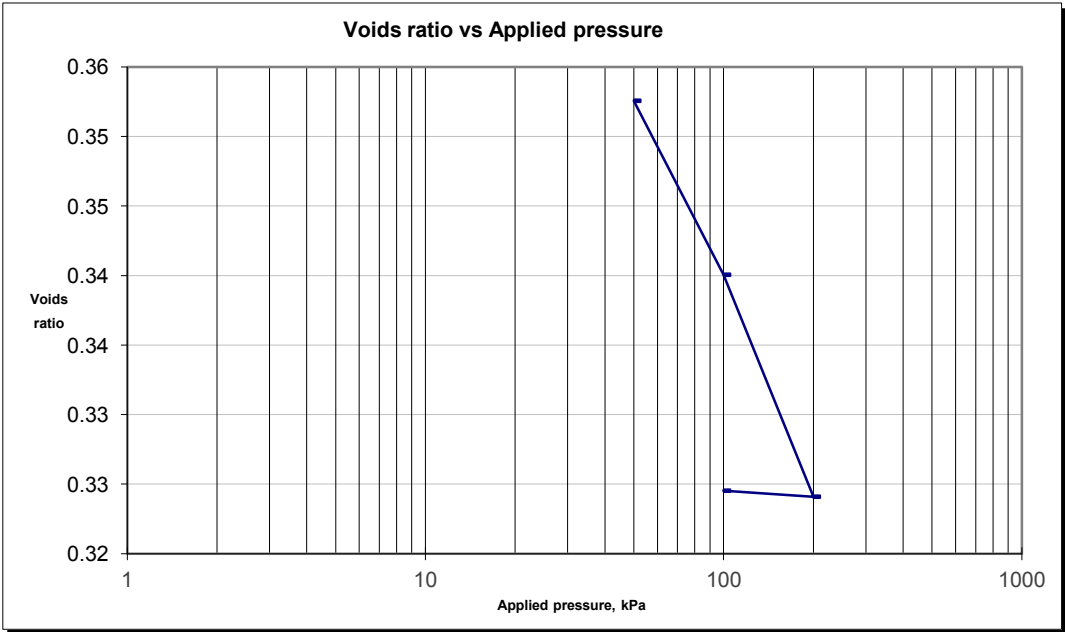
Depth within original sample m : 3.10 Orientation within original sample : Vertical


### Specimen details

		Initial	Final
Height	mm :	19.34	18.42
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.26	2.33
Moisture content	% :	16	14
Dry density	Mg/m3 :	1.94	2.04
Voids Ratio	:	0.39	0.32
Degree of saturation	% :	113.3	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

### Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	50	0.3526	3.28	0.548	11				
2	100	0.3401	1.92	0.185	12				
3	200	0.3241	4.23	0.119	13				
4	100	0.3245	0.73	0.003	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				




	<h2>One-Dimensional Consolidation Test</h2>	<b>Approved by</b>
	BS 1377 : Part 5 : Clause 3 & 4 : 1990	Initials : <b>kp</b>
	Determination of the one-dimensional consolidation properties	Date : <b>20/12/2013</b>

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 	
Costain Environmental Services		<b>Project Started</b>	02/12/2013		
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	07/12/2013		
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013		
<b>Sample description:</b>		<b>Sample no/ type:</b>	U	<b>BH no:</b>	BH25
Medium strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-angular to sub-rounded)			<b>Depth (m):</b>	5.00	

### Test details

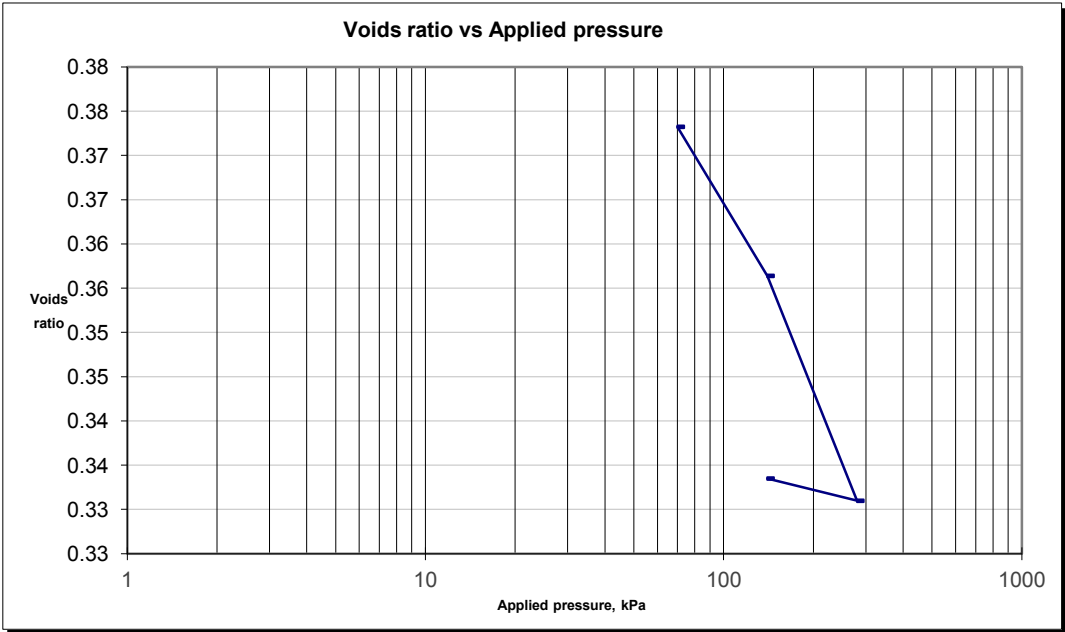
Depth within original sample m : 5.10 Orientation within original sample : Vertical

### Specimen details

		Initial	Final
Height	mm :	18.90	18.05
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.19	1.04
Moisture content	% :	13	-48
Dry density	Mg/m3 :	1.93	2.02
Voids Ratio	:	0.40	0.33
Degree of saturation	% :	89.0	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

### Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	70	0.3732	6.19	0.236	11				
2	140	0.3564	2.63	0.175	12				
3	280	0.3310	1.81	0.134	13				
4	140	0.3335	1.34	0.013	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



## One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by


Initials : kp  
Date : 20/12/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

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<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 	
Costain Environmental Services		<b>Project Started</b>	02/12/2013		
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	11/12/2013		
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013		
<b>Sample description:</b>		<b>Sample no/ type:</b>	U	<b>BH no:</b>	BH26
High strength reddish brown slightly gravelly silty CLAY (gravel is fm and sub-angular)				<b>Depth (m):</b>	4.00

### Test details

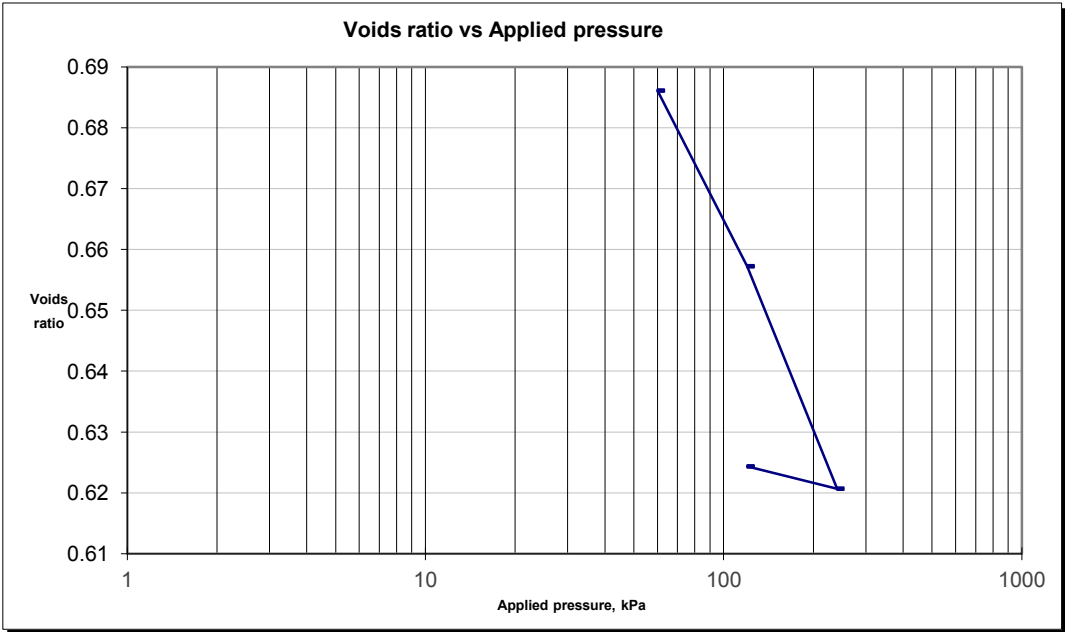
Depth within original sample m : 4.10 Orientation within original sample : Vertical

### Specimen details

		Initial	Final
Height	mm :	19.01	17.77
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.02	2.08
Moisture content	% :	30	25
Dry density	Mg/m3 :	1.55	1.66
Voids Ratio	:	0.74	0.62
Degree of saturation	% :	109.4	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

### Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	60	0.6861	1.84	0.491	11				
2	120	0.6572	2.32	0.285	12				
3	240	0.6207	2.61	0.184	13				
4	120	0.6243	1.80	0.019	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



## One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp  
Date : 20/12/2013


Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acoply of this policy is available on request.



<b>Client name &amp; address:</b>		<b>Samples Received</b>	02/12/2013	<b>K4 SOILS</b> 	
Costain Environmental Services		<b>Project Started</b>	02/02/2013		
<b>Project Name:</b> Stonehaven FAS		<b>Testing Started</b>	06/12/2013		
<b>Project No:</b> 5414	<b>Our Job / report no:</b> 15754	<b>Date Reported:</b>	20/12/2013		
<b>Sample description:</b>		<b>Sample no/ type:</b>	U	<b>BH no:</b>	BH27
High strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)			<b>Depth (m):</b>	4.00	

Test details

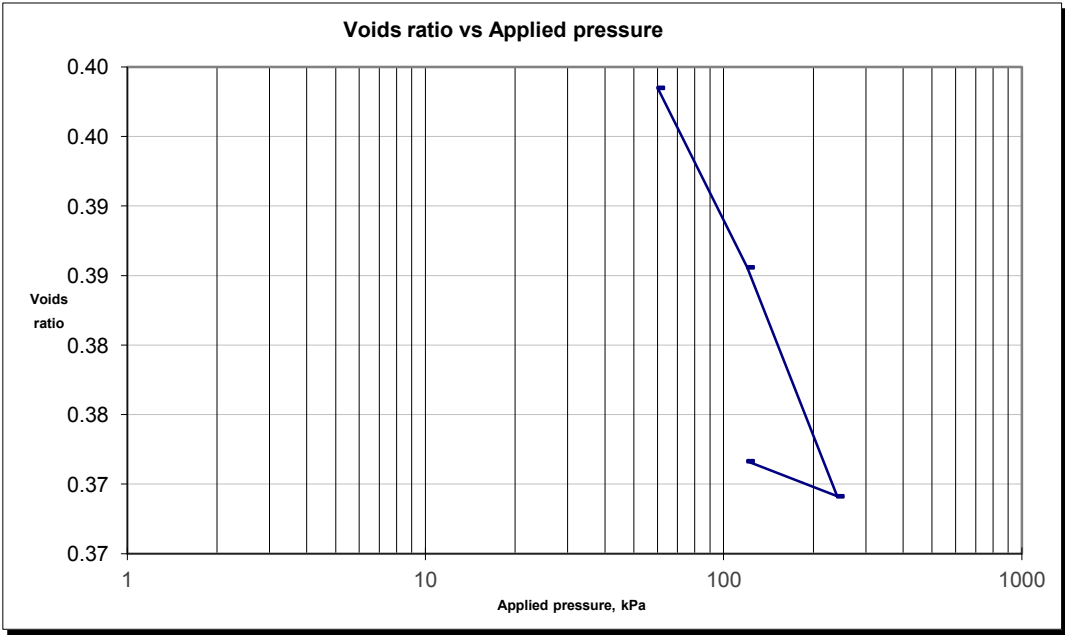
Depth within original sample m : 4.10 Orientation within original sample : Vertical

Specimen details

		Initial	Final
Height	mm :	19.23	18.49
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.20	2.26
Moisture content	% :	16	15
Dry density	Mg/m3 :	1.89	1.97
Voids Ratio	:	0.43	0.37
Degree of saturation	% :	103.7	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	60	0.3985	2.94	0.324	11				
2	120	0.3856	2.72	0.154	12				
3	240	0.3691	3.51	0.099	13				
4	120	0.3716	11.84	0.015	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 & 4 : 1990

Determination of the one-dimensional consolidation properties

Approved by

Initials : kp  
Date : 20/12/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

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The logo for K4 SOILS, featuring a stylized 'K4' inside an oval with the word 'SOILS' below it.

Test details
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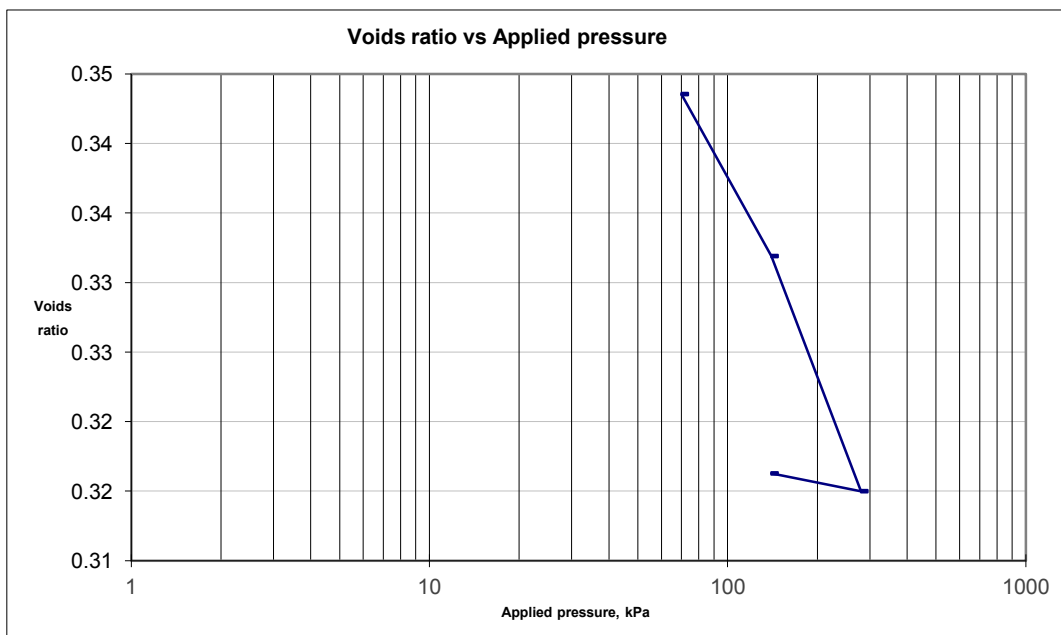
Depth within original sample	m :	5.10	Orientation within original sample	:	Vertical
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## Specimen details

Specimen details		Initial	Final
Height	mm :	19.16	18.53
Diameter	mm :	75	-
Bulk density	Mg/m3 :	2.19	2.29
Moisture content	% :	11	12
Dry density	Mg/m3 :	1.98	2.05
Voids Ratio	:	0.36	0.32
Degree of saturation	% :	79.5	-
Particle density	Mg/m3 :	2.70	-
Swelling pressure	kPa :	0	-

## Consolidation Stage

Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure kPa	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
1	70	0.3436	17.88	0.185	11				
2	140	0.3319	3.39	0.124	12				
3	280	0.3150	3.13	0.091	13				
4	140	0.3163	9.52	0.007	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				



## One-Dimensional Consolidation Test

BS 1377 : Part 5 : Clause 3 &amp; 4 : 1990

### Determination of the one-dimensional consolidation properties

**Approved by**

Initials : kp

Date : 20/12/2013

Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU

Sheet 2/2

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

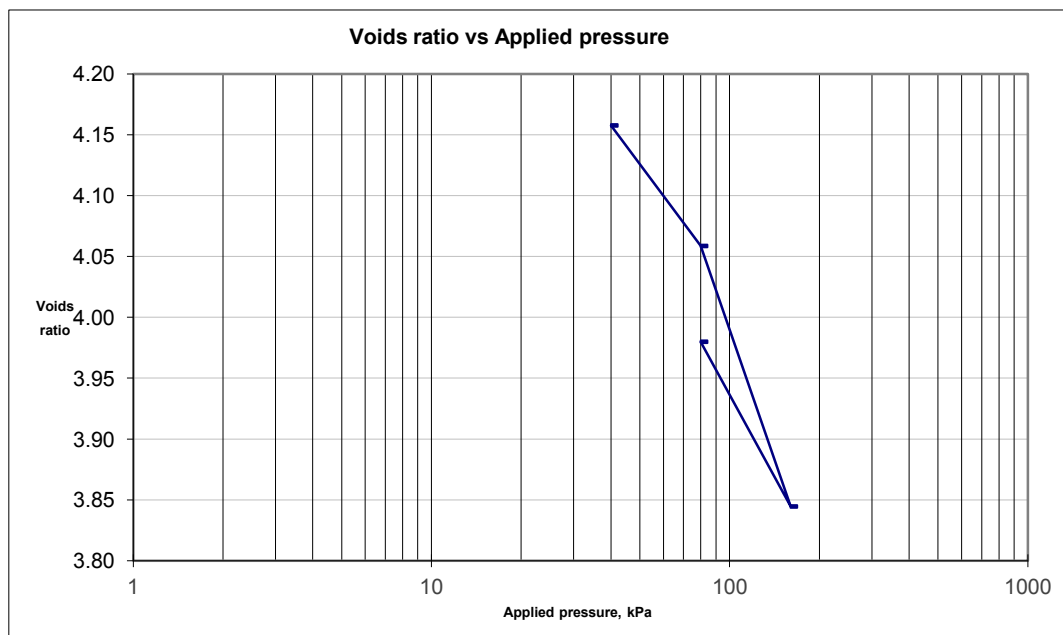
All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

The logo for K4 SOILS, featuring a stylized 'K4' inside an oval with the word 'SOILS' below it.

Depth within original sample	m :	2.10	Orientation within original sample	:	Vertical
------------------------------	-----	------	------------------------------------	---	----------

Specimen details		Initial	Final
Height	mm :	19.11	18.10
Diameter	mm :	75	-
Bulk density	Mg/m3 :	1.09	1.14
Moisture content	% :	271	266
Dry density	Mg/m3 :	0.29	0.31
Voids Ratio	:	4.26	3.98
Degree of saturation	% :	98.7	-
Particle density	Mg/m3 :	1.55	-
Swelling pressure	kPa :	0	-

Stage number	Applied Pressure	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN	Stage number	Applied Pressure	Voids Ratio	Coefficient of Consolidation m2/year	Coefficient of Compressibility m2/MN
	kPa					kPa			
1	40	4.1577	2.90	0.481	11				
2	80	4.0586	0.88	0.480	12				
3	160	3.8445	0.49	0.529	13				
4	80	3.9799	0.47	0.349	14				
5					15				
6					16				
7					17				
8					18				
9					19				
10					20				





### Determination of the one-dimensional consolidation properties

Date : 20/12/2013

Test Results relate only to the sample numbers shown above. Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)

All samples connected with this report ,incl any on 'hold' will be stored and disposed off according to Company policy.Acopy of this policy is available on request.

Client : Costain Environmental Services					Our Job/report no: 15754			Samples Rec : 02/12/2013		Testing Started: 07/12/2013		
Project name: Stonehaven FAS					Project No: 5414			Project Started: -		Date reported: 20/12/2013		
BH / TP No	Sample no / ref	Sample depth (m)	Description	Moisture content (%)	Bulk Density (Mg/m3)	Dry density (Mg/m3)	Cell Pressure (kPa)	Strain at failure (%)	Max Deviator Stress (kPa)	Mode of failure	Shear Strength (kPa)	Phi (deg)
CDR4	U18	5.00	Very high strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-angular to sub-rounded)	10	2.34	2.13	150	13.9	556	Brittle	278	NA
BH1A	U20	6.00	High strength reddish brown gravelly sandy silty CLAY (gravel is fmc and rounded to sub-angular)	11	2.45	2.21	150	18.7	257	Brittle	129	NA
BH03	U16	5.00	Medium strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)	11	2.24	2.03	150	18.6	87	Brittle	44	NA
BH12	U12	3.00	Very high strength reddish brown slightly gravelly silty sandy CLAY with occasional pockets of red sand (gravel is fm and sub-angular)	16	2.16	1.86	100	11.6	579	Brittle	290	NA
BH20	U15	4.00	Very high strength reddish brown gravelly sandy silty CLAY (gravel is fmc and sub-angular to sub-rounded)	11	2.30	2.07	150	11.6	541	Brittle	271	NA
BH22	U12	4.00	Very high strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-angular)	10	2.29	2.09	150	16.2	540	Brittle	270	NA
BH24	U12	4.00	High strength reddish brown gravelly silty sandy CLAY (gravel is fmc and rounded to sub-angular)	9.2	2.43	2.22	150	19.2	213	Brittle	107	NA
BH25	U11	3.00	Medium strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)	17	2.38	2.02	100	20.2	89	Plastic	45	NA
BH26	U15	4.00	High strength reddish brown slightly gravelly silty CLAY (gravel is fm and sub-angular)	27	2.11	1.67	150	20.2	212	Brittle	106	NA
BH27	U14	4.00	High strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)	16	2.31	2.00	150	20.2	168	Brittle	84	NA

<div>K4 SOILS</div> <div></div>	Summary of Undrained Triaxial Compression Testing					<div></div>	Checked and approved	
	BS 1377 : Part 7 : Clause 8 : 1990						Initials	kp
	Test Results relate only to the sample numbers shown above. All samples connected with this report, incl any on 'hold' will be stored and disposed off according to company policy. A copy of this policy is available on request.							
Test Report by K4 SOILS LABORATORY Unit 8 Olds Close Olds Approach Watford WD18 9RU					Approved Signatories: K.Phaure (Tech.Mgr) J.Phaure (Lab.Mgr)		2519	



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH1A

Sample no: U20

Depth (m): 6.00

Soil Description: High strength reddish brown gravelly sandy silty CLAY (gravel is fmc and rounded to sub-angular)

## Sample Details

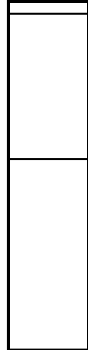
## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	11
Bulk Density	Mg/m <sup>3</sup>	2.45
Dry Density	Mg/m <sup>3</sup>	2.21

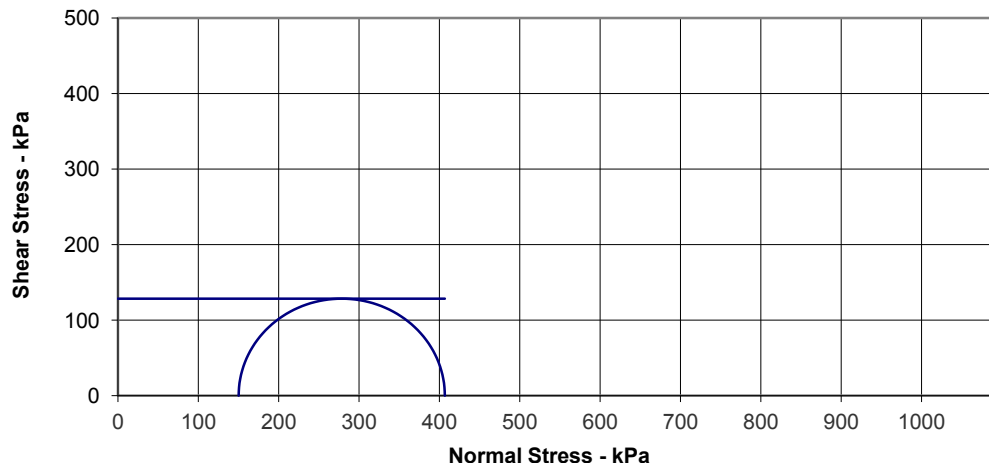
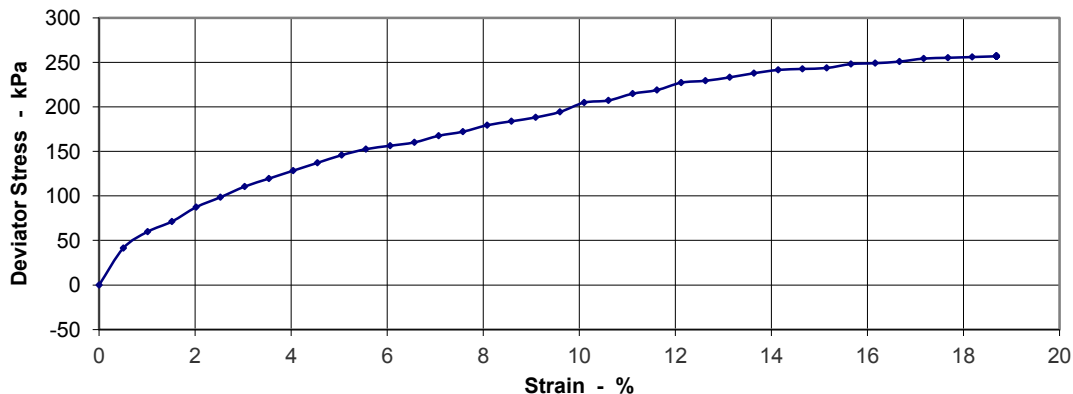
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.73
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	150
Strain at Failure	%	18.7
Maximum Deviator Stress	kPa	257
Shear Strength	kPa	128
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 128 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.  
Tel: 01923 711288 Fax: 01923 711311  
E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH03

Sample no: U16

Depth (m): 5.00

Soil Description: Medium strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)

## Sample Details

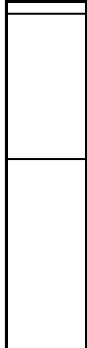
## Specimen

1

Sample Condition		Undisturbed
Height	mm	199.0
Diameter	mm	100.0
Moisture Content	%	10
Bulk Density	Mg/m <sup>3</sup>	2.24
Dry Density	Mg/m <sup>3</sup>	2.03

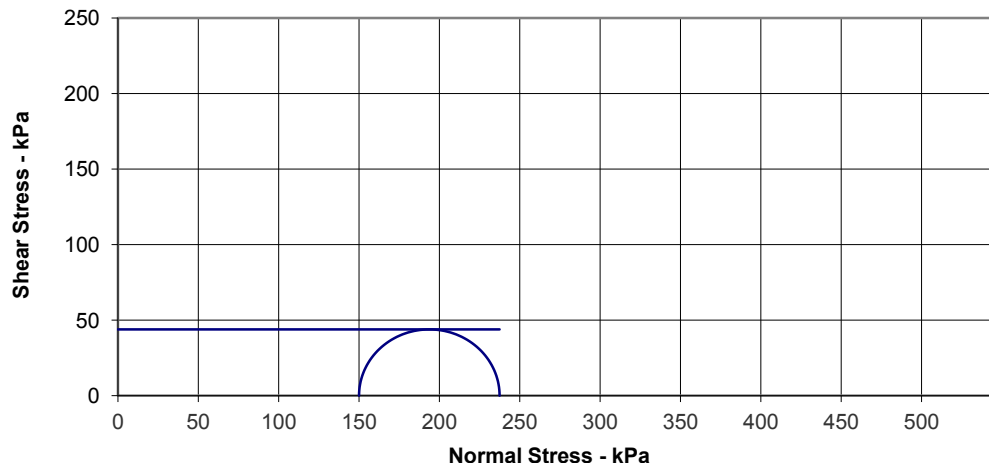
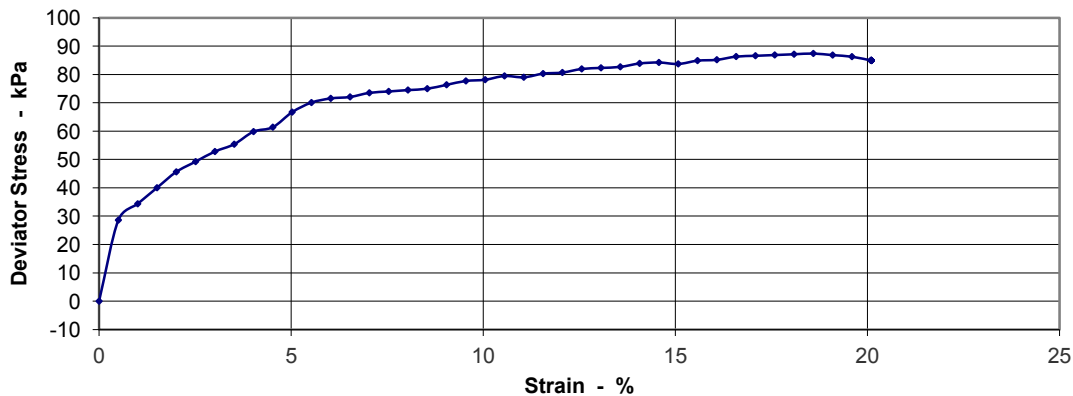
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.72
Rate of Axial Displacement	%/min	2.01
Cell Pressure	kPa	150
Strain at Failure	%	18.6
Maximum Deviator Stress	kPa	87
Shear Strength	kPa	44
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 44 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.  
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E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure (Tech.Mgr)

J.Phaure (Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH12

Sample no: U12

Depth (m): 3.00

**Soil Description:** Very high strength reddish brown slightly gravelly silty sandy CLAY with occasional pockets of red sand (gravel is fm and sub-angular)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	16
Bulk Density	Mg/m <sup>3</sup>	2.16
Dry Density	Mg/m <sup>3</sup>	1.86

Position and orientation within the original sample

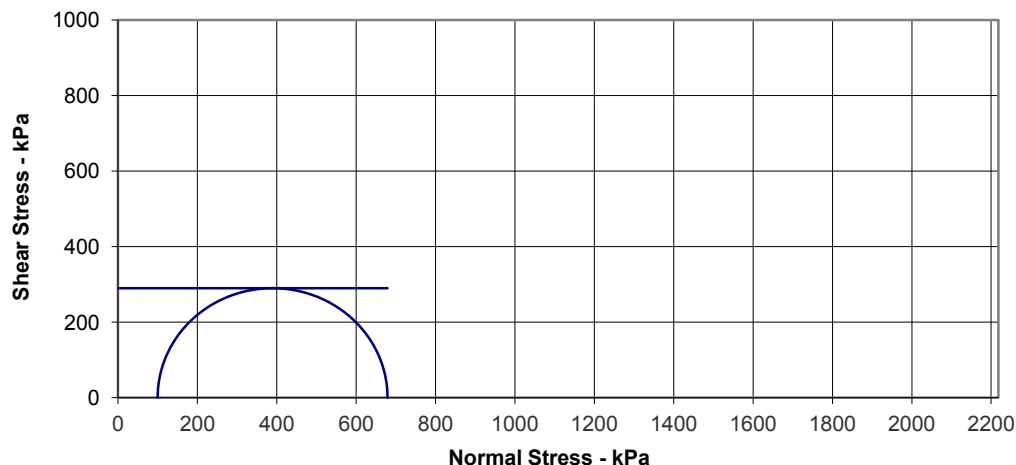
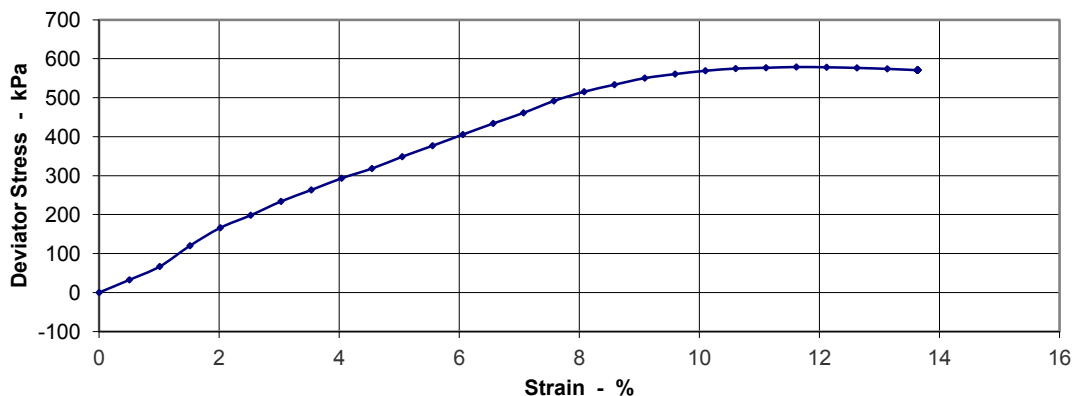
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.51
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	100
Strain at Failure	%	11.6
Maximum Deviator Stress	kPa	579
Shear Strength	kPa	289
Mode of Failure		Brittle

## Shear Strength Parameters

C 289 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

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E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519





## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH20

Sample no: U15

Depth (m): 4.00

Soil Description: Very high strength reddish brown gravelly sandy silty CLAY (gravel is fmc and sub-angular to sub-rounded)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	11
Bulk Density	Mg/m <sup>3</sup>	2.30
Dry Density	Mg/m <sup>3</sup>	2.07

Position and orientation within  
the original sample

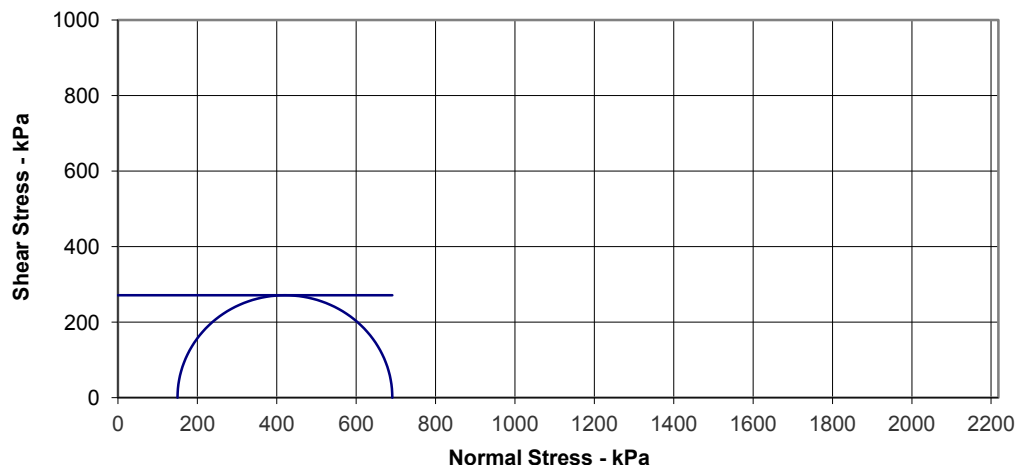
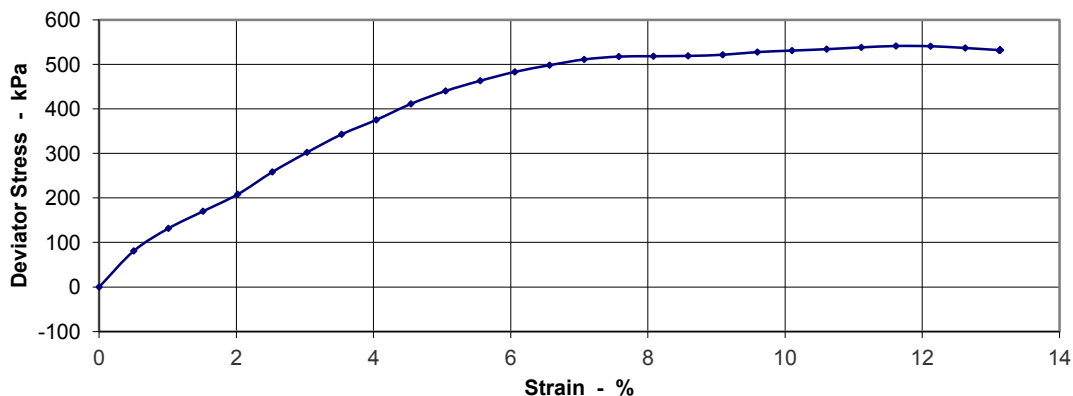
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.51
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	150
Strain at Failure	%	11.6
Maximum Deviator Stress	kPa	541
Shear Strength	kPa	271
Mode of Failure		Brittle

Shear Strength  
Parameters

C 271 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.  
Tel: 01923 711288 Fax: 01923 711311  
E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure (Tech.Mgr)

J.Phaure (Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH22

Sample no: U12

Depth (m): 4.00

Soil Description: Very high strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-angular)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	9.7
Bulk Density	Mg/m <sup>3</sup>	2.29
Dry Density	Mg/m <sup>3</sup>	2.09

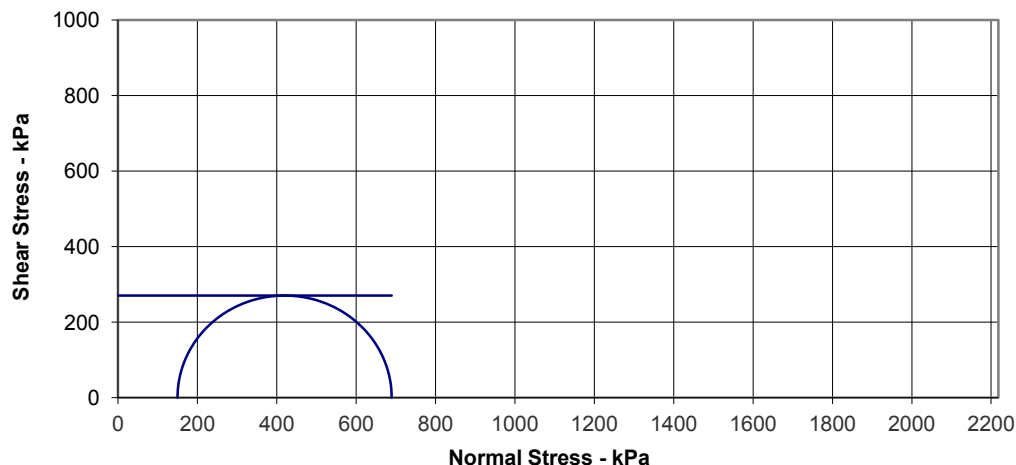
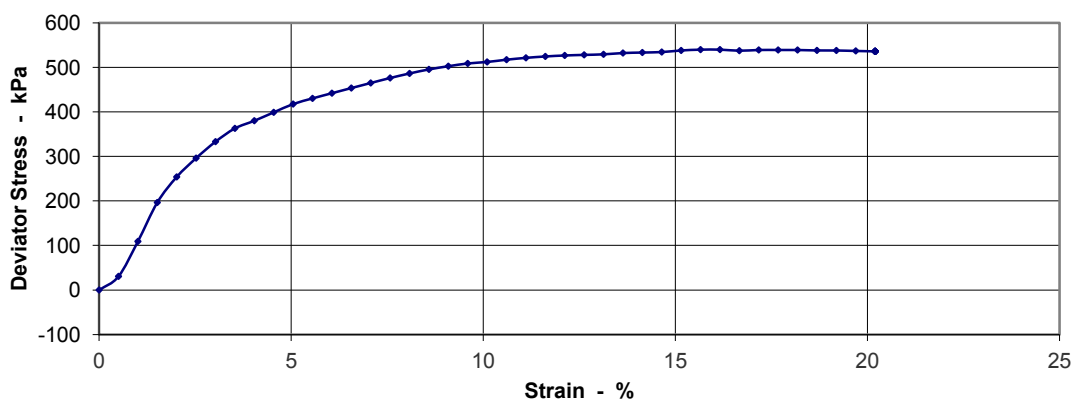
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.65
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	150
Strain at Failure	%	16.2
Maximum Deviator Stress	kPa	540
Shear Strength	kPa	270
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 270 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.  
Tel: 01923 711288 Fax: 01923 711311  
E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH24

Sample no: U12

Depth (m): 4.00

Soil Description: High strength reddish brown gravelly silty sandy CLAY (gravel is fmc and rounded to sub-angular)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	9.2
Bulk Density	Mg/m <sup>3</sup>	2.43
Dry Density	Mg/m <sup>3</sup>	2.22

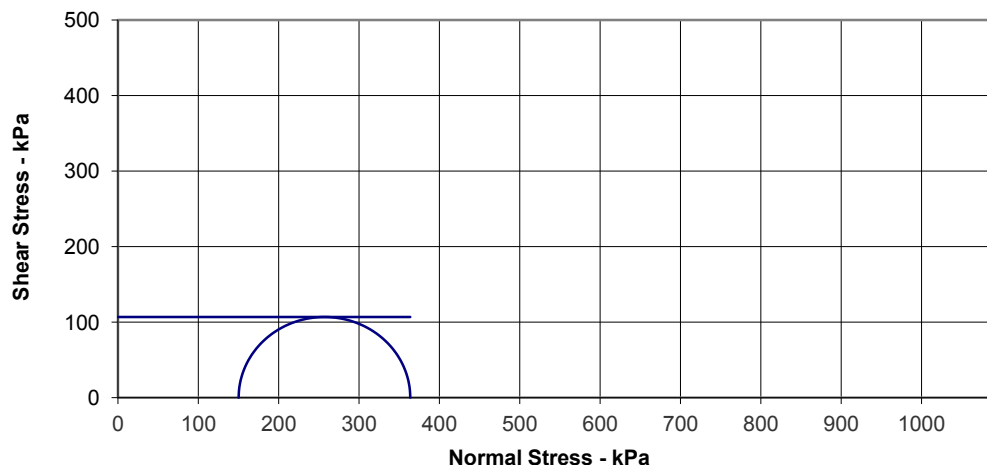
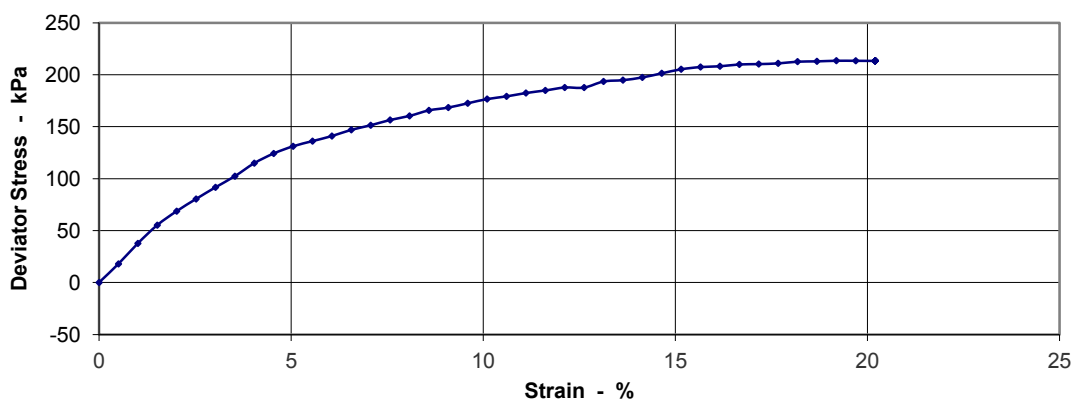
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.74
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	150
Strain at Failure	%	19.2
Maximum Deviator Stress	kPa	213
Shear Strength	kPa	107
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 107 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

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E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH25

Sample no: U11

Depth (m): 3.00

Soil Description: Medium strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	17
Bulk Density	Mg/m <sup>3</sup>	2.38
Dry Density	Mg/m <sup>3</sup>	2.02

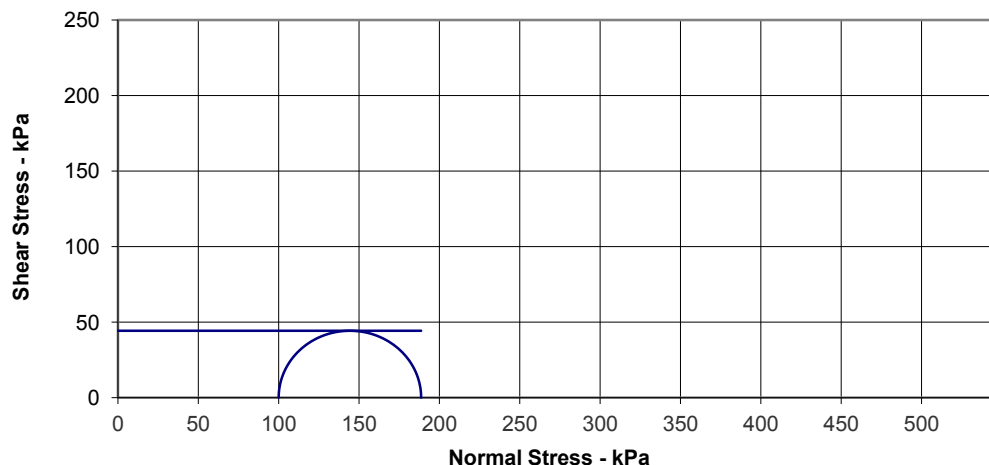
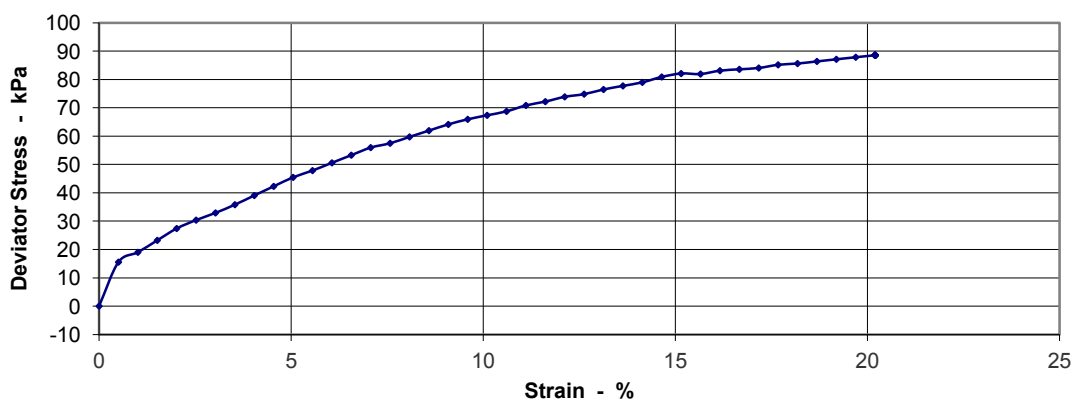
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.76
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	100
Strain at Failure	%	20.2
Maximum Deviator Stress	kPa	89
Shear Strength	kPa	44
Mode of Failure		Plastic

Position and orientation within  
the original sampleShear Strength  
Parameters

C 44 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.

Tel: 01923 711288 Fax: 01923 711311

E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure (Tech.Mgr)

J.Phaure (Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH26

Sample no: U15

Depth (m): 4.00

Soil Description: High strength reddish brown slightly gravelly silty CLAY (gravel is fm and sub-angular)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	27
Bulk Density	Mg/m <sup>3</sup>	2.11
Dry Density	Mg/m <sup>3</sup>	1.67

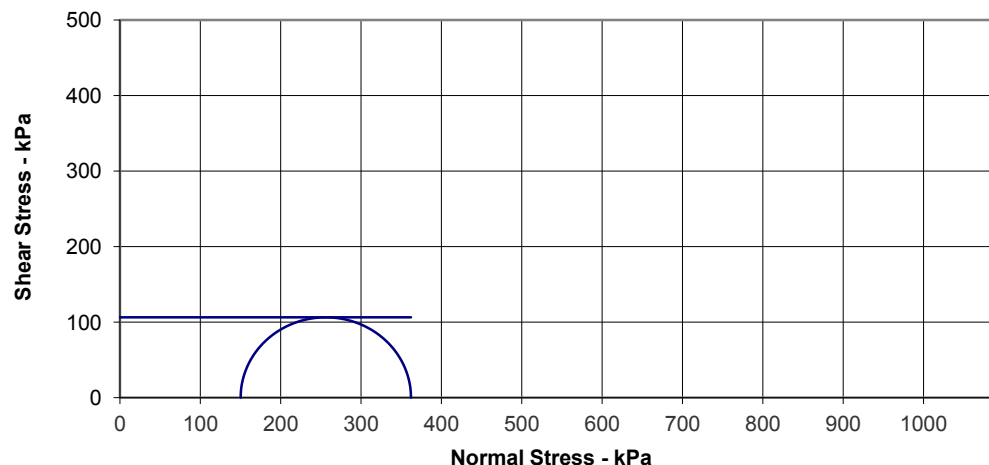
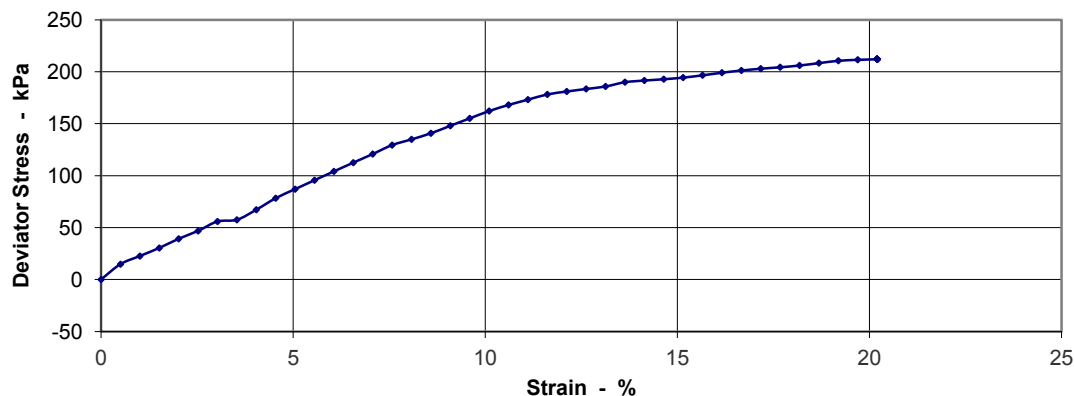
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.76
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	150
Strain at Failure	%	20.2
Maximum Deviator Stress	kPa	212
Shear Strength	kPa	106
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 106 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.  
Tel: 01923 711288 Fax: 01923 711311  
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## Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



## Report of Undrained Triaxial Compression Test

BS 1377 : Part 7 : 1990 Clause 8.0

Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: BH27

Sample no: U14

Depth (m): 4.00

Soil Description: High strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-rounded to sub-angular)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	198.0
Diameter	mm	100.0
Moisture Content	%	15
Bulk Density	Mg/m <sup>3</sup>	2.31
Dry Density	Mg/m <sup>3</sup>	2.00

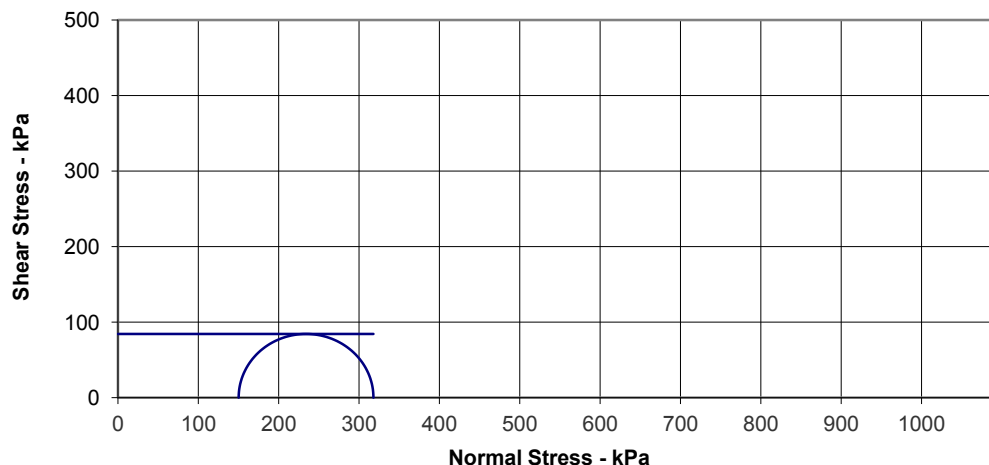
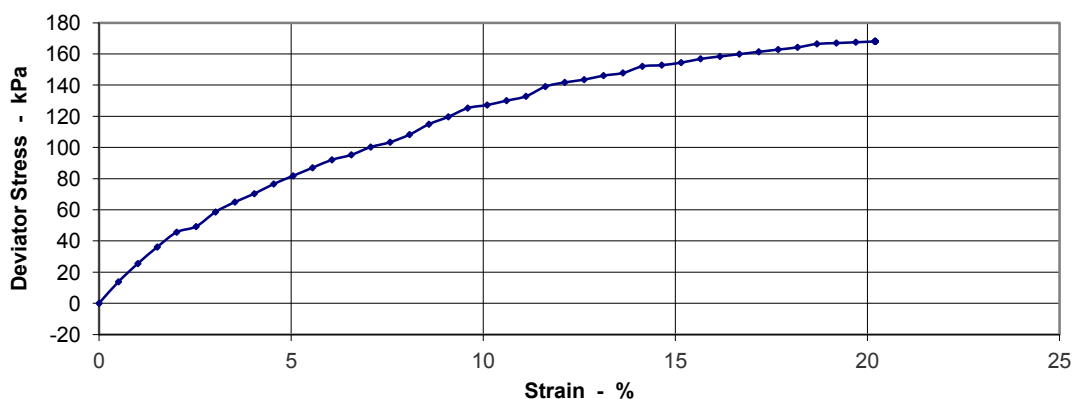
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.76
Rate of Axial Displacement	%/min	2.02
Cell Pressure	kPa	150
Strain at Failure	%	20.2
Maximum Deviator Stress	kPa	168
Shear Strength	kPa	84
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 84 kPa  
Phi 0.0 °

Specimen 1



## K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Herts, WD18 9RU.  
Tel: 01923 711288 Fax: 01923 711311  
E-mail: k4soils@aol.com

## Approved Signatories: K.Phaure(Tech.Mgr)

J.Phaure(Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519



Project name: Stonehaven FAS

Samples Received: 02/12/2013

Project Started: 02/12/2013

Client: Costain Environmental Services

Testing Started: 07/12/2013

Project no: 5414

Our job /report no: 15754

Date Reported: 20/12/2013

BH / TP no: CDR4

Sample no: U18

Depth (m): 5.00

Soil Description: Very high strength reddish brown gravelly silty sandy CLAY (gravel is fmc and sub-angular to sub-rounded)

## Sample Details

## Specimen

1

Sample Condition		Undisturbed
Height	mm	180.0
Diameter	mm	100.0
Moisture Content	%	10
Bulk Density	Mg/m <sup>3</sup>	2.34
Dry Density	Mg/m <sup>3</sup>	2.13

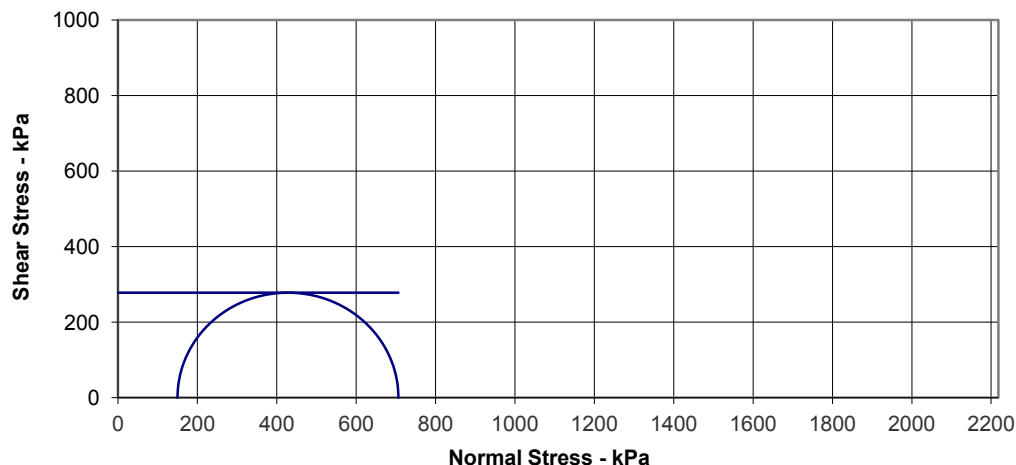
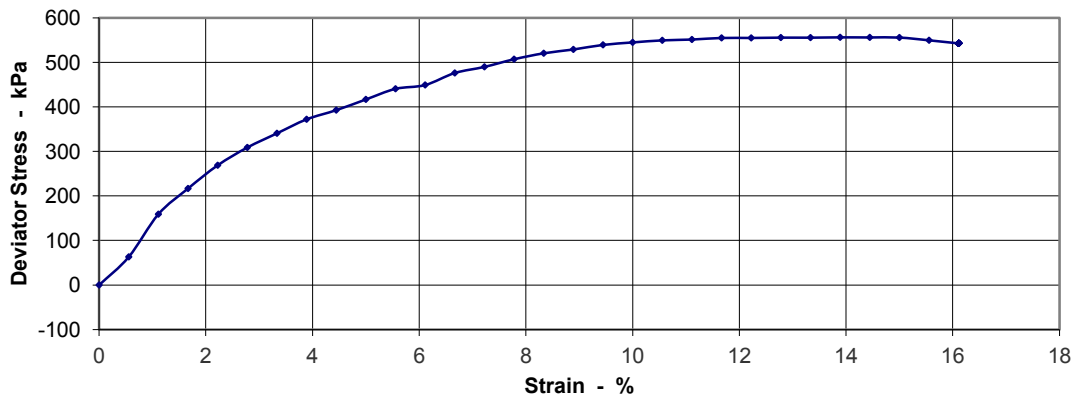
## Test Details

Membrane Thickness	mm	0.2
Membrane Correction	kPa	0.58
Rate of Axial Displacement	%/min	2.22
Cell Pressure	kPa	150
Strain at Failure	%	13.9
Maximum Deviator Stress	kPa	556
Shear Strength	kPa	278
Mode of Failure		Brittle

Position and orientation within  
the original sampleShear Strength  
Parameters

C 278 kPa  
Phi 0.0 °

Specimen 1



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## Approved Signatories: K.Phaure (Tech.Mgr)

J.Phaure (Lab.Mgr)

Test results relate only to the sample numbers shown above

## Checked and Approved

Initials: kp

Date: 20/12/2013



2519





## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8804
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH12
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	24
		<b>Depth (m):</b>	9.65 - 9.80
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		73.87	0.14	5457	73.87	0.03	1.192	0.03058
AXIAL	73.91	64.54	0.11	6071	77.92	0.02	1.221	0.02112
AXIAL	73.74	66.37	0.16	6229	78.92	0.03	1.228	0.03154
AXIAL	73.84	43.83	0.12	4119	64.18	0.03	1.119	0.03124

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8812
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	9.00 - 9.53
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		69.49	11.05	4829	69.49	2.29	1.160	2.65367
DIA		69.14	12.80	4780	69.14	2.68	1.157	3.09808
DIA		69.32	11.24	4805	69.32	2.34	1.158	2.70836
DIA		69.21	12.95	4790	69.21	2.70	1.158	3.12948
DIA		69.19	14.70	4787	69.19	3.07	1.157	3.55397
AXIAL	69.42	65.06	3.23	5748	75.82	0.56	1.206	0.67663

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only two Axials possible.

**Checked and Approved** *Agata K-Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8812
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH13
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	9.00 - 9.53
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
AXIAL	69.48	53.59	7.20	4739	68.84	1.52	1.155	1.75447

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only two Axials possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8818
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Grey SANDSTONE	<b>Sample No:</b>	16
		<b>Depth (m):</b>	7.00 - 7.50
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		83.17	11.55	6917	83.17	1.67	1.257	2.09850
DIA		83.18	12.74	6919	83.18	1.84	1.257	2.31437
DIA		83.48	16.88	6969	83.48	2.42	1.259	3.04968
DIA		83.45	14.70	6964	83.45	2.11	1.259	2.65719
DIA		83.9	14.61	7039	83.90	2.08	1.262	2.61989
AXIAL	83.84	81.2	9.35	8664	93.08	1.08	1.323	1.42657

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8818
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH14
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Grey SANDSTONE	<b>Sample No:</b>	16
		<b>Depth (m):</b>	7.00 - 7.50
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
AXIAL	83.45	75.85	14.36	8056	89.75	1.78	1.301	2.31941
AXIAL	83.35	67.42	6.50	7152	84.57	0.91	1.267	1.15043
AXIAL	83.24	57.21	11.00	6061	77.85	1.81	1.220	2.21507

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8821
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH15
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	12.15 - 12.40
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.54	4.49	5262	72.54	0.85	1.182	1.00882
DIA		72.47	5.77	5252	72.47	1.10	1.182	1.29723
DIA		72.69	0.90	5284	72.69	0.17	1.183	0.20157
AXIAL	72.62	64.6	2.00	5971	77.27	0.33	1.216	0.40643
AXIAL	72.54	61.07	1.44	5638	75.09	0.26	1.201	0.30668

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8851
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	27
		<b>Depth (m):</b>	7.76 - 7.93
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.21	1.20	5214	72.21	0.23	1.180	0.27040
DIA		72.35	2.26	5235	72.35	0.43	1.181	0.50872
DIA		72.41	0.55	5243	72.41	0.10	1.181	0.12279
AXIAL	72.25	54.75	0.96	5035	70.95	0.19	1.171	0.22205

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only one Axial possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8852
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH20
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown and greyish brown SANDSTONE	<b>Sample No:</b>	29
		<b>Depth (m):</b>	9.14 - 9.55
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.58	2.99	5268	72.58	0.57	1.183	0.67010
DIA		72.67	3.20	5281	72.67	0.61	1.183	0.71699
DIA		72.74	2.98	5291	72.74	0.56	1.184	0.66670
DIA		72.55	5.75	5264	72.55	1.09	1.182	1.29052
DIA		72.82	2.03	5303	72.82	0.38	1.184	0.45339
AXIAL	72.49	71.85	3.32	6629	81.42	0.50	1.245	0.62277

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only one Axial possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8906
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Greyish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	7.50 - 7.92
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.77	17.18	5295	72.77	3.24	1.184	3.84003
DIA		72.62	20.90	5274	72.62	3.96	1.183	4.68672
DIA		72.49	23.01	5255	72.49	4.38	1.182	5.17434
DIA		72.73	19.74	5290	72.73	3.73	1.184	4.41728
DIA		72.95	23.72	5322	72.95	4.46	1.185	5.28199
DIA		72.84	23.39	5306	72.84	4.41	1.184	5.22180

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only three Axials possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8906
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Greyish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	7.50 - 7.92
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
AXIAL	72.01	58.07	11.70	5322	72.95	2.20	1.185	2.60466
AXIAL	72.61	57.71	12.53	5333	73.03	2.35	1.186	2.78614
AXIAL	72.5	46.8	10.17	4318	65.71	2.36	1.131	2.66325

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only three Axials possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8898
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH26
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	11.16 - 11.50
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		73	24.45	5329	73.00	4.59	1.186	5.43880
DIA		73.05	27.13	5336	73.05	5.08	1.186	6.02979
DIA		72.69	19.74	5284	72.69	3.74	1.183	4.42104
DIA		72.94	22.07	5320	72.94	4.15	1.185	4.91553
AXIAL	72.47	52.14	18.15	4809	69.35	3.77	1.159	4.37140
AXIAL	72.72	63.44	19.18	5872	76.63	3.27	1.212	3.95745

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only two Axials possible.

**Checked and Approved** *Agata K-Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8909
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	10.28 - 10.38
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		71.86	4.97	5164	71.86	0.96	1.177	1.13309
AXIAL	71.39	45.9	1.32	4170	64.58	0.32	1.122	0.35514

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8910
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH27
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	11.30 - 11.50
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.28	9.00	5224	72.28	1.72	1.180	2.03229
DIA		72.35	15.59	5235	72.35	2.98	1.181	3.51706
DIA		72.55	17.03	5264	72.55	3.23	1.182	3.82439
AXIAL	72.09	54.64	6.15	5013	70.80	1.23	1.169	1.43465
AXIAL	72.19	53.28	10.91	4895	69.97	2.23	1.163	2.59246

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only two Axials possible.

**Checked and Approved** *Agata K-Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8750
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH5
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Greyish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	13.08 - 13.30
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		73.63	0.36	5421	73.63	0.07	1.190	0.07904
DIA		73.82	0.31	5449	73.82	0.06	1.192	0.06779
DIA		73.71	0.37	5433	73.71	0.07	1.191	0.08110
AXIAL	73.61	64.69	0.30	6061	77.85	0.05	1.220	0.05941
AXIAL	73.84	48.27	0.12	4536	67.35	0.03	1.143	0.03025
AXIAL	73.67	52.98	0.17	4968	70.48	0.03	1.167	0.03994

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





## Environmental Services

### POINT LOAD

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<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8767
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH6
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Greyish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	9.39 - 9.67
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		73.19	0.12	5357	73.19	0.02	1.187	0.02659
AXIAL	73.09	62.8	0.07	5842	76.43	0.01	1.210	0.01347
AXIAL	73.21	63.1	0.11	5879	76.68	0.02	1.212	0.02165

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

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<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8773
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH7
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Dark brown and yellowish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	7.75 - 8.00
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.23	1.12	5217	72.23	0.21	1.180	0.25332
DIA		72.24	1.91	5219	72.24	0.37	1.180	0.43078
DIA		72.48	1.68	5253	72.48	0.32	1.182	0.37795
DIA		72.39	1.40	5240	72.39	0.27	1.181	0.31444
AXIAL	72.36	54.82	1.05	5049	71.05	0.21	1.171	0.24245
AXIAL	72.14	55.44	1.16	5090	71.35	0.23	1.173	0.26743

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8773
<b>Contract No:</b>	5414	<b>Hole ID:</b>	BH7
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Dark brown and yellowish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	7.75 - 8.00
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
AXIAL	71.75	56.55	0.96	5164	71.86	0.19	1.177	0.21886
AXIAL	72.51	44.62	0.96	4118	64.17	0.23	1.119	0.26084

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8780
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Reddish brown SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	5.86 - 6.00
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		71.64	7.30	5132	71.64	1.42	1.176	1.67108
AXIAL	71.59	58.08	6.79	5292	72.75	1.28	1.184	1.51891
AXIAL	71.5	67.9	7.50	6179	78.61	1.21	1.226	1.48689

Test results relate only to the sample number shown above.

#### Remarks:

Checked and  
Approved *Agata K-  
Roche*

Date: 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8781
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Grey SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	8.19 - 8.65
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
DIA		72.77	11.34	5295	72.77	2.14	1.184	2.53542
DIA		72.63	11.67	5275	72.63	2.21	1.183	2.61700
DIA		72.85	15.86	5307	72.85	2.99	1.185	3.53953
DIA		72.74	21.38	5291	72.74	4.04	1.184	4.78324
DIA		72.81	17.06	5301	72.81	3.22	1.184	3.80995
DIA		72.67	10.83	5281	72.67	2.05	1.183	2.42544

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only two Axials possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT



## Environmental Services

### POINT LOAD

ISRM SUGGESTED METHODS ON TESTING METHODS - 1985

<b>Client:</b>	Aberdeenshire Council	<b>Lab Sample No:</b>	S8781
<b>Contract No:</b>	5414	<b>Hole ID:</b>	Bh8
<b>Contract Name:</b>	Stonehaven FAS	<b>Sample Type:</b>	C
<b>Sample Description:</b>	Grey SANDSTONE	<b>Sample No:</b>	-
		<b>Depth (m):</b>	8.19 - 8.65
		<b>Date Tested:</b>	25/11/2013

Test Type	W (mm)	D(mm)	P(kN)	De <sup>2</sup> (mm <sup>2</sup> )	De (mm)	Is (Mpa)	F	Is50 (Mpa)
AXIAL	72.69	56.6	9.37	5236	72.36	1.79	1.181	2.11215
AXIAL	72.74	68.48	12.56	6340	79.62	1.98	1.233	2.44160

Test results relate only to the sample number shown above.

**Remarks:** Sample broke predominantly longitudinally. Only two Axials possible.

**Checked and Approved** *Agata K-Roche*

**Date:** 09/12/2013

Unit 10 Wessex Road Bourne end Buckinghamshire SL8 5DT





**Agata Krzak-Roche**

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## **Analytical Report Number : 13-48637**

**Project / Site name:** Stonehaven FAS

**Samples received on:** 28/11/2013

**Your job number:** 5414

**Samples instructed on:** 28/11/2013

**Your order number:** T2347A

**Analysis completed by:** 04/12/2013

**Report Issue Number:** 1

**Report issued on:** 04/12/2013

**Samples Analysed:** 35 soil samples

**Signed:**

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number				300848	300849	300850	300851	300852
Sample Reference				CDR1	CDR1	CDR2	CDR3	CDR3
Sample Number				D6	B9	B6	D5	D8
Depth (m)				2.00-2.45	3.00-4.00	1.00-1.50	1.20-1.65	2.00-2.45
Date Sampled				23/10/2013	23/10/2013	04/11/2013	31/10/2013	31/10/2013
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	N/A	NONE	16	43
Total mass of sample received				kg	0.001	NONE	0.30	0.36

#### General Inorganics

pH	pH Units	N/A	MCERTS	-	-	8.3	6.0	-
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.10	-	-	-	-
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	100	-	-	-	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.050	-	-	-	-
Organic Matter	%	0.1	MCERTS	-	7.9	-	-	8.9

Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number				300853	300854	300855	300856	300857
Sample Reference				CDR3	CDR3	CDR3	CDR4	CDR4
Sample Number				B12	D15	D19	D3	B4
Depth (m)				3.00-3.50	5.00-5.45	6.50-6.80	0.60	0.60-0.80
Date Sampled				31/10/2013	31/10/2013	31/10/2013	29/10/2013	29/10/2013
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	N/A	NONE	40	12
Total mass of sample received				kg	0.001	NONE	0.45	0.56

#### General Inorganics

pH	pH Units	N/A	MCERTS	-	7.0	-	7.2	-
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	-	-	0.027	-	0.034
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	-	-	27	-	34
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-	0.014	-	0.017
Organic Matter	%	0.1	MCERTS	5.5	-	-	-	-

Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number	300858	300859	300860	300861	300862
Sample Reference	CDR4	BH1A	BH1A	BH1A	BH2
Sample Number	D7	B5	D11	B17	B6
Depth (m)	1.20-1.65	1.20-2.00	3.30	5.10-5.60	0.80-1.00
Date Sampled	29/10/2013	06/11/2013	06/11/2013	06/11/2013	26/10/2013
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Unit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	9.7
Total mass of sample received	kg	0.001	NONE	0.35	0.49

#### General Inorganics

pH	pH Units	N/A	MCERTS	-	7.0	-	-	7.4
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.043	-	-	-	0.076
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	43	-	-	-	76
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.022	-	-	-	0.038
Organic Matter	%	0.1	MCERTS	-	-	15	6.7	-

Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number				300863	300864	300865	300866	300867
Sample Reference				BH3	BH4	BH4	BH5	BH6
Sample Number				D9	D5	D8	D7	D4
Depth (m)				2.70	2.00-2.45	3.00-3.20	3.30-3.45	1.20-1.65
Date Sampled				01/11/2013	22/10/2013	22/10/2013	07/11/2013	05/11/2013
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	57	16	55	39	4.5
Total mass of sample received	kg	0.001	NONE	0.95	0.44	0.41	0.86	0.53

#### General Inorganics

pH	pH Units	N/A	MCERTS	-	3.9	-	-	6.3
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	-	2.2	-	-	0.024
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	-	2200	-	-	24
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	1.1	-	-	0.012
Organic Matter	%	0.1	MCERTS	12	-	17	8.1	-

Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number				300868	300869	300870	300871	300872
Sample Reference				BH8	BH9	BH10	BH11A	BH13
Sample Number				D8	D6	B5	D5	D4
Depth (m)				2.00-2.45	2.00-2.45	2.00-2.50	1.20-1.65	2.00-2.45
Date Sampled				02/11/2013	28/10/2013	28/10/2013	22/10/2013	18/10/2013
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	< 0.1
Moisture Content				%	N/A	NONE	5.5	8.0
Total mass of sample received				kg	0.001	NONE	0.52	0.56

#### General Inorganics

pH	pH Units	N/A	MCERTS	6.5	-	6.4	6.5	6.9
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.016	0.016	0.037	0.028	0.076
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	16	16	37	28	76
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0078	0.0081	0.018	0.014	0.038
Organic Matter	%	0.1	MCERTS	-	-	-	-	-

Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number				300873	300874	300875	300876	300877
Sample Reference				BH14	BH15	BH18	BH18	BH19
Sample Number				B3	D6	D6	B5	D9
Depth (m)				1.20-2.30	2.00-2.45	2.00-2.45	1.20-2.00	2.80-3.00
Date Sampled				21/10/2013	24/10/2013	21/10/2013	21/10/2013	31/10/2013
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	14	43	7.4	58
Total mass of sample received	kg	0.001	NONE	0.66	0.41	0.65	0.54	0.43

#### General Inorganics

pH	pH Units	N/A	MCERTS	7.3	7.5	-	-	-
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.10	0.10	-	0.099	-
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	100	100	-	99	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.051	0.050	-	0.049	-
Organic Matter	%	0.1	MCERTS	-	-	8.9	-	13



Analytical Report Number: 13-48637

Project / Site name: Stonehaven FAS

Your Order No: T2347A

Lab Sample Number	300878	300879	300880	300881	300882
Sample Reference	BH20	BH22	BH23	BH26	BH28
Sample Number	D11	D5	D4	D10	D9
Depth (m)	3.00-3.45	2.00-2.45	1.20-1.65	2.40	2.20
Date Sampled	23/10/2013	31/10/2013	21/10/2013	07/11/2013	01/11/2013
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Unit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.8	11
Total mass of sample received	kg	0.001	NONE	0.50	0.43

#### General Inorganics

pH	pH Units	N/A	MCERTS	7.6	-	-	7.3	-
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	0.023	0.017	0.038	-	-
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	23	17	38	-	-
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.011	0.0083	0.019	-	-
Organic Matter	%	0.1	MCERTS	-	-	-	-	5.9

**Analytical Report Number : 13-48637**

**Project / Site name: Stonehaven FAS**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content

of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
300848	CDR1	D6	2.00-2.45	Light brown sandy topsoil.
300849	CDR1	B9	3.00-4.00	Black topsoil with peat.
300850	CDR2	B6	1.00-1.50	Light brown sandy topsoil with gravel.
300851	CDR3	D5	1.20-1.65	Brown sandy topsoil with peat and gravel.
300852	CDR3	D8	2.00-2.45	Black clay and topsoil with peat.
300853	CDR3	B12	3.00-3.50	Black topsoil and sand with gravel.
300854	CDR3	D15	5.00-5.45	Light brown clay and sand.
300855	CDR3	D19	6.50-6.80	Light brown sandy clay with gravel.
300856	CDR4	D3	0.60	Brown sandy topsoil with gravel.
300857	CDR4	B4	0.60-0.80	Brown sandy topsoil with gravel.
300858	CDR4	D7	1.20-1.65	Light brown gravelly sand.
300859	BH1A	B5	1.20-2.00	Light brown gravelly sand.
300860	BH1A	D11	3.30	Black clay and topsoil with peat.
300861	BH1A	B17	5.10-5.60	Black topsoil with peat.
300862	BH2	B6	0.80-1.00	Light brown gravelly sand.
300863	BH3	D9	2.70	Black topsoil with peat.
300864	BH4	D5	2.00-2.45	Green sandy clay.
300865	BH4	D8	3.00-3.20	Black clay and topsoil with peat.
300866	BH5	D7	3.30-3.45	Black topsoil with peat.
300867	BH6	D4	1.20-1.65	Light brown gravelly sand with rubble.
300868	BH8	D8	2.00-2.45	Light brown gravelly sand with rubble.
300869	BH9	D6	2.00-2.45	Light brown gravelly sand.
300870	BH10	B5	2.00-2.50	Light brown gravelly sand.
300871	BH11A	D5	1.20-1.65	Light brown clay and sand with gravel.
300872	BH13	D4	2.00-2.45	Light brown clay and sand with gravel.
300873	BH14	B3	1.20-2.30	Light brown gravelly sand.
300874	BH15	D6	2.00-2.45	Light brown gravelly sand.
300875	BH18	D6	2.00-2.45	Grey topsoil with peat.
300876	BH18	B5	1.20-2.00	Light brown gravelly sand.
300877	BH19	D9	2.80-3.00	Black clay and topsoil with peat.
300878	BH20	D11	3.00-3.45	Light brown gravelly sand.
300879	BH22	D5	2.00-2.45	Light brown gravelly sand.
300880	BH23	D4	1.20-1.65	Light brown gravelly sand.
300881	BH26	D10	2.40	Light brown clay.
300882	BH28	D9	2.20	Black clay and topsoil with peat.

**Analytical Report Number : 13-48637**

**Project / Site name: Stonehaven FAS**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Stones not passing through a 10 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES. Results reported corrected for extraction ratio (soil equivalent) as g/l and mg/kg; and upon the 2:1	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.**

# Appendix 9

## Appendix 9 - Geoenvironmental Test Results

I2 Analytical Ltd UKAS No.4041
Report Numbers
48032
48469
48470
48474
48475
48476
48637



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## **Analytical Report Number : 13-48032**

Replaces Analytical Report Number : 13-48032, issue no. 1

<b>Project / Site name:</b>	Stonehaven F.A.S.	<b>Samples received on:</b>	12/11/2013
<b>Your job number:</b>	5414	<b>Samples instructed on:</b>	12/11/2013
<b>Your order number:</b>		<b>Analysis completed by:</b>	25/11/2013
<b>Report Issue Number:</b>	2	<b>Report issued on:</b>	25/11/2013
<b>Samples Analysed:</b>	6 water samples		

**Signed:** 

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:** 

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 13-48032  
Project / Site name: Stonehaven F.A.S.

Lab Sample Number				297359	297360	297361	297362	297363
Sample Reference				BH6	BH8	BH13	BH15	BH18
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.59	2.79	3.04	1.50	1.85
Date Sampled				07/11/2013	07/11/2013	07/11/2013	07/11/2013	07/11/2013
Time Taken				1200	1215	1242	1230	1300
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

#### General Inorganics

pH	pH Units	N/A	ISO 17025	7.9	7.9	7.5	7.3	7.4
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO <sub>4</sub>	ug/l	45	ISO 17025	4160	38600	26500	24000	44200

#### Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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#### Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

#### Total PAH

Total EPA-16 PAHs	µg/l	0.2	ISO 17025	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
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#### Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	3.1	1.6	2.5	2.3	3.6
Boron (dissolved)	µg/l	10	ISO 17025	100	32	12	26	21
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (dissolved)	µg/l	0.4	ISO 17025	1.7	6.7	7.8	6.4	6.6
Copper (dissolved)	µg/l	0.7	ISO 17025	2.4	3.1	21	2.9	4.4
Lead (dissolved)	µg/l	1	ISO 17025	1.1	3.3	3.2	3.5	4.4
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.3	5.8	5.0	2.7	3.9
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.7	3.2	3.6	3.2	4.8

#### Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
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U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number: 13-48032  
Project / Site name: Stonehaven F.A.S.

Lab Sample Number				297364				
Sample Reference				BH21B				
Sample Number				None Supplied				
Depth (m)				1.92				
Date Sampled				07/11/2013				
Time Taken				1315				
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

#### General Inorganics

pH	pH Units	N/A	ISO 17025	7.3				
Total Cyanide	µg/l	10	ISO 17025	< 10				
Sulphate as SO <sub>4</sub>	ug/l	45	ISO 17025	15300				

#### Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
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#### Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				

#### Total PAH

Total EPA-16 PAHs	µg/l	0.2	ISO 17025	< 0.20				
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#### Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	1	ISO 17025	< 1.0				
Boron (dissolved)	µg/l	10	ISO 17025	21				
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (dissolved)	µg/l	0.4	ISO 17025	6.6				
Copper (dissolved)	µg/l	0.7	ISO 17025	10				
Lead (dissolved)	µg/l	1	ISO 17025	4.1				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	µg/l	0.3	ISO 17025	4.8				
Zinc (dissolved)	µg/l	0.4	ISO 17025	5.7				

#### Petroleum Hydrocarbons

TPH1 (C10 - C40)	µg/l	10	NONE	< 10				
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U/S = Unsuitable Sample I/S = Insufficient Sample





**Analytical Report Number : 13-48032**

**Project / Site name: Stonehaven F.A.S.**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in water	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L070-UK	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
TPH1 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

**Andy Paice**

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## **Analytical Report Number : 13-48469**

**Project / Site name:** Stonehaven FAS

**Samples received on:** 22/11/2013

**Your job number:** 5414

**Samples instructed on:** 25/11/2013

**Your order number:**

**Analysis completed by:** 29/11/2013

**Report Issue Number:** 1

**Report issued on:** 29/11/2013

**Samples Analysed:** 2 soil samples

**Signed:**

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

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Analytical Report Number: 13-48469

Project / Site name: Stonehaven FAS

Lab Sample Number				299926	299927			
Sample Reference				BH1A	BH2			
Sample Number				ES8	ES9			
Depth (m)				2.60	1.20-2.00			
Date Sampled				06/11/2013	06/11/2013			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Unit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	45	16			
Total mass of sample received	kg	0.001	NONE	1.6	2.0			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			

#### General Inorganics

pH	pH Units	N/A	MCERTS	7.7	8.2			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Water Soluble Sulphate (Soil Equivalent)	g/l	0.0025	MCERTS	1.6	0.048			
Water Soluble Sulphate as SO <sub>4</sub> (2:1)	mg/kg	2.5	MCERTS	1600	48			
Water Soluble Sulphate (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.81	0.024			
Organic Matter	%	0.1	MCERTS	6.4	< 0.1			

#### Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	< 2.0			
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#### Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	< 0.20			
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Fluorene	mg/kg	0.2	MCERTS	< 0.20	< 0.20			
Phenanthrene	mg/kg	0.2	MCERTS	< 0.20	0.78			
Anthracene	mg/kg	0.1	MCERTS	< 0.10	0.20			
Fluoranthene	mg/kg	0.2	MCERTS	< 0.20	1.3			
Pyrene	mg/kg	0.2	MCERTS	< 0.20	0.74			
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	< 0.20	< 0.20			
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10			
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20			
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			

#### Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.6	3.0			
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#### Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.2	8.4			
Boron (water soluble)	mg/kg	0.2	MCERTS	19	< 0.2			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.0	< 0.2			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	42	24			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	56	12			
Lead (aqua regia extractable)	mg/kg	2	MCERTS	420	9.9			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	25	23			
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	250	39			

#### Petroleum Hydrocarbons

TPH1 (C10 - C40)	mg/kg	10	MCERTS	610	50			
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**Analytical Report Number : 13-48469**

**Project / Site name: Stonehaven FAS**

\* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Stone content

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
299926	BH1A	ES8	2.60	Black topsoil with vegetation.
299927	BH2	ES9	1.20-2.00	Brown gravelly sand.

**Analytical Report Number : 13-48469**

**Project / Site name: Stonehaven FAS**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Stones not passing through a 10 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES. Results reported corrected for extraction ratio (soil equivalent) as g/l and mg/kg; and upon the 2:1	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH1 (Soil)	Determination of dichloromethane/hexane extractable hydrocarbons in soil by GC-MS.	In-house method	L064-PL	D	MCERTS

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

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## **Analytical Report Number : 13-48470**

**Project / Site name:** Stonehaven FAS

**Samples received on:** 22/11/2013

**Your job number:** 5414

**Samples instructed on:** 22/11/2013

**Your order number:**

**Analysis completed by:** 28/11/2013

**Report Issue Number:** 1

**Report issued on:** 28/11/2013

**Samples Analysed:** 1 water sample

**Signed:**

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

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Sampling date indicates that recommended time for holding samples prior to analysis for sulphate has been exceeded. The results for these parameters may be invalid and should be interpreted with care.



Analytical Report Number: 13-48470

Project / Site name: Stonehaven FAS

Lab Sample Number				299928				
Sample Reference				CDR3				
Sample Number				W9				
Depth (m)				2.00				
Date Sampled				31/10/2013				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

#### General Inorganics

Sulphate as SO <sub>4</sub>	ug/l	45	ISO 17025	17900				
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U/S = Unsuitable Sample I/S = Insufficient Sample





**Analytical Report Number : 13-48470**

**Project / Site name: Stonehaven FAS**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

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## **Analytical Report Number : 13-48474**

**Project / Site name:** Stonehaven FAS

**Samples received on:** 22/11/2013

**Your job number:** 5414

**Samples instructed on:** 22/11/2013

**Your order number:**

**Analysis completed by:** 28/11/2013

**Report Issue Number:** 1

**Report issued on:** 28/11/2013

**Samples Analysed:** 1 water sample

**Signed:**

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

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Sampling date indicates that recommended time for holding samples prior to analysis for pH and sulphate has been exceeded. The results for these parameters may be invalid and should be interpreted with care.



**Analytical Report Number: 13-48474**

**Project / Site name: Stonehaven FAS**

<b>Lab Sample Number</b>				299948				
<b>Sample Reference</b>				BH5				
<b>Sample Number</b>				W22				
<b>Depth (m)</b>				3.10				
<b>Date Sampled</b>				01/11/2013				
<b>Time Taken</b>				None Supplied				
<b>Analytical Parameter (Water Analysis)</b>	<b>Units</b>	<b>Limit of detection</b>	<b>Accreditation Status</b>					

#### General Inorganics

pH	pH Units	N/A	ISO 17025	8.5				
Sulphate as SO <sub>4</sub>	ug/l	45	ISO 17025	23200				

U/S = Unsuitable Sample    I/S = Insufficient Sample



**Analytical Report Number : 13-48474**

**Project / Site name: Stonehaven FAS**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

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## **Analytical Report Number : 13-48475**

**Project / Site name:** Stonehaven FAS

**Samples received on:** 22/11/2013

**Your job number:** 5414

**Samples instructed on:** 22/11/2013

**Your order number:**

**Analysis completed by:** 28/11/2013

**Report Issue Number:** 1

**Report issued on:** 28/11/2013

**Samples Analysed:** 1 water sample

**Signed:**

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

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Sampling date indicates that recommended time for holding samples prior to analysis for pH and sulphate has been exceeded. The results for these parameters may be invalid and should be interpreted with care.



**Analytical Report Number: 13-48475**

**Project / Site name: Stonehaven FAS**

<b>Lab Sample Number</b>				299949				
<b>Sample Reference</b>				BH19				
<b>Sample Number</b>				W15				
<b>Depth (m)</b>				1.90				
<b>Date Sampled</b>				01/11/2013				
<b>Time Taken</b>				None Supplied				
<b>Analytical Parameter (Water Analysis)</b>	<b>Units</b>	<b>Limit of detection</b>	<b>Accreditation Status</b>					

**General Inorganics**

pH	pH Units	N/A	ISO 17025	8.1				
Sulphate as SO <sub>4</sub>	ug/l	45	ISO 17025	24500				

U/S = Unsuitable Sample    I/S = Insufficient Sample



**Analytical Report Number : 13-48475**

**Project / Site name: Stonehaven FAS**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



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## **Analytical Report Number : 13-48476**

**Project / Site name:** Stonehaven FAS

**Samples received on:** 22/11/2013

**Your job number:** 5414

**Samples instructed on:** 22/11/2013

**Your order number:**

**Analysis completed by:** 28/11/2013

**Report Issue Number:** 1

**Report issued on:** 28/11/2013

**Samples Analysed:** 1 water sample

**Signed:**

Dr Claire Stone  
Quality Manager  
**For & on behalf of i2 Analytical Ltd.**

**Signed:**

Rexona Rahman  
Customer Services Manager  
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting  
leachates - 2 weeks from reporting  
waters - 2 weeks from reporting  
asbestos - 6 months from reporting

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Samples were received with no indication of date sampled. The recommended holding time prior to analysis may have been exceeded. Results may not be valid should be interpreted with care.



Analytical Report Number: 13-48476

Project / Site name: Stonehaven FAS

Lab Sample Number				299950				
Sample Reference				BH3				
Sample Number				W8				
Depth (m)				2.00				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

#### General Inorganics

pH	pH Units	N/A	ISO 17025	7.9				
Sulphate as SO <sub>4</sub>	ug/l	45	ISO 17025	27700				

U/S = Unsuitable Sample I/S = Insufficient Sample



**Analytical Report Number : 13-48476**

**Project / Site name: Stonehaven FAS**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**

**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**

**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



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