



Allied Exploration & Geotechnics Limited

Final Factual Report

TRINITY SOUTH RESIDENTIAL
DEVELOPMENT, SOUTH SHIELDS
GROUND INVESTIGATION

for

South Tyneside Council

Consulting Engineer:

Cundall Johnston and Partners LLP

November 2011

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GROUND INVESTIGATION**

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TRINITY SOUTH RESIDENTIAL DEVELOPMENT, SOUTH SHIELDS – GROUND INVESTIGATION

1. INTRODUCTION

It is proposed to redevelop the site formerly occupied by the Circatex Factory (manufacturer of printed circuit boards) for the purposes of residential housing and associated infrastructure. The site, located within the Laygate region of South Shields, was subject to an extensive programme of demolition works during 2008/2009 which was undertaken by Holystone Demolition Ltd. All above ground structures, foundation elements and hardstanding related to the Circatex factory were cleared during this period. At the time of the investigation the site was vacant and used for public amenity, having subsequently been grassed-over and landscaped.

Allied Exploration & Geotechnics Limited (AEG) were contracted by South Tyneside Council with Cundall Johnston and Partners LLP (Cundall) acting in the capacity of the Consulting Engineer to perform a ground investigation at this site in order to provide information on the subsurface ground and groundwater conditions, as well as to obtain samples for geotechnical and specialist chemical testing. This information will ultimately be used to assist the design of the residential development and to highlight any adverse conditions that could potentially pose a hazard to the intended construction works.

The investigation works consisted of the following main elements:

- Ten cable percussion boreholes, four of which were extended into the underlying solid stratigraphy using rotary coring techniques.
- Eighteen windowless sample holes, utilising a removable liner system, in order to supplement the ground model determined by the cable percussion boring works.
- Seven machine excavated trial trenches, scheduled to identify any latent risk from shallow remnant foundation elements.
- Five machine excavated inspection pits which were positioned on the perimeter bund surrounding the site.
- Sixteen Panda probes to determine various geotechnical parameters (primarily CBR values).
- *In-situ* standard penetration, soakaway infiltration and photo-ionisation detector testing.
- Disturbed, undisturbed and geo-environmental sampling.
- Installation of gas/groundwater monitoring instrumentation.
- Post site works groundwater monitoring.

In-situ testing was carried out in the boreholes and windowless sample holes in accordance with the relevant British Standards.



Site work was carried out between the 19th and 30th September 2011 with subsequent post site work monitoring, laboratory testing and reporting thereafter. A factual report only was requested.

The comments and opinions expressed in this report are based on the ground conditions encountered during the site work and on the results of tests carried out in the field and in the laboratory. There may, however, be special conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report.

2. THE SITE

2.1 Location

The National Grid Reference of the approximate centre of the site is NZ 360 662. This can be found on Ordnance Survey 1:50,000 Sheet Number 88 (Newcastle upon Tyne, Durham and Sunderland). Part of this sheet is reproduced as Figure 1, the Site Location Plan.

The site is located around 1.5 km south-southwest of South Shields town centre and 0.6 km to the east of the River Tyne within the Laygate region of South Shields.

2.2 Site Description and Topography

The site can be characteristically described as broadly rectangular, being around 345m (north-south) by 130m (east-west) in plan. It is bounded by Laygate, Frederick Street, Reed Street and Eldon Street to the north, east, south and west respectively. An earth bund (0.5 to 1.0m high) forms a perimeter structure surrounding the majority of the site in order to prevent vehicular access. Land immediately east, between the perimeter earth bund and the rear of Frederick Street, comprised intervening car parking and vehicular access. A number of scheduled exploratory holes were carried out in the northern part of the car park area during the investigation.

Neighbouring land use includes commercial premises to the east centred on Frederick Street, with light industrial concerns occupying land to the west and in part to the south. Residential areas exist to the north (Trinity Walk) and in part to the south (Drake Close).

At the time of the investigation the former Circatex site was relatively featureless having been entirely landscaped with grass and used principally since restoration as a public amenity area. The surface ground conditions were extremely hard and compact which permitted unfettered access by wheeled plant to all parts of the investigation area without any consequential rutting.

Topography is relatively flat with elevations ranging between c.6.00 and 12.00m AOD, with higher ground in the north and a prevailing subdued slope towards the south.



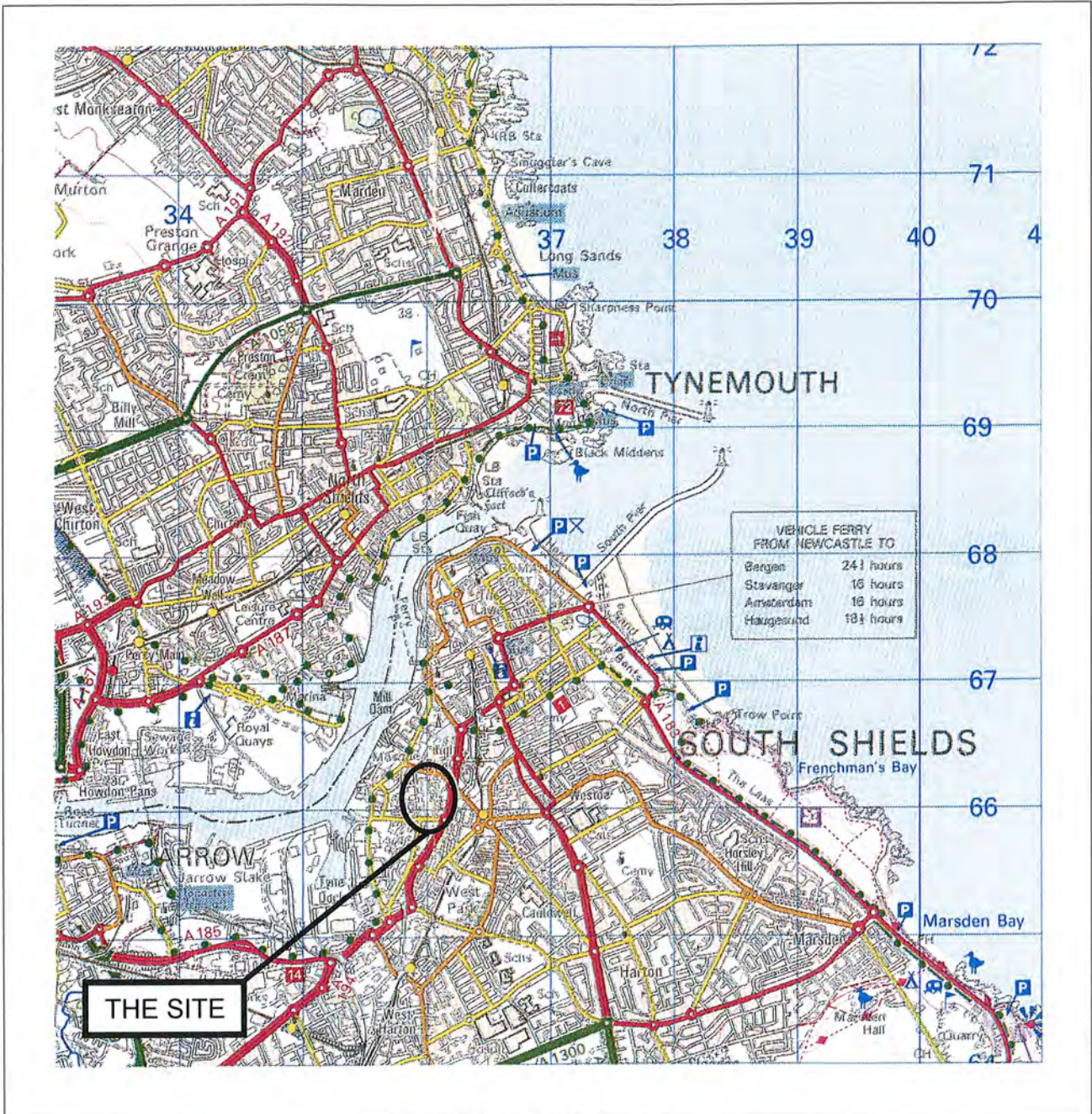


FIGURE 1 – Site Location Plan

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3. SITE OPERATIONS

3.1 General

All exploratory hole work, associated sampling, *in-situ* testing and logging was carried out in accordance with techniques outlined in BS 1377:1990, BS 5930:1999, or BS5930:1999 (Amendment 2: August 2010), incorporating BS EN ISO 14689-1:2003, BS EN ISO 14688-2:2004, and BS EN ISO 14688-1:2002, as appropriate; at positions as near as practicable to those supplied by the Consulting Engineer. These are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

The depths of all exploratory holes, descriptions of the material encountered, details of any groundwater encountered, samples taken and *in-situ* testing carried out together with any other relevant information can be found on the Borehole, Window/Windowless Sample Hole, Trial Trench and Inspection Pit Records, Field Data Enclosures 2, 3, 4 and 5 respectively. A key to all symbols and abbreviations used throughout the report is included in the Key Sheets, Field Data Enclosure 0.

In accordance with the Site Investigation Steering Group publication "Guidelines for the Safe Investigation by Drilling of Landfills and Contaminated Land" the site was classified GREEN. In order to gain vehicular access to the site a small section of the perimeter bund was removed, which was subsequently replaced once the investigation was completed.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of, size, lithological nature and numbers per unit volume of ground cobbles and boulders in soil types such as glacial till (boulder clay).

3.2 Exploratory Holes: Boreholes

Ten boreholes (CBH-01 to CBH-10 inclusive) were sunk using a Dando 2000 drilling rig, utilising light cable percussive (shell and claycutter) techniques, to a maximum depth of 13.50m BGL (CBH-09). All boreholes were originally scheduled to be extended to rockhead level, however, two (CBH-05 and CBH07) were terminated prematurely on boulder obstructions. Boreholes CBH-08 was carried out in the northern part of the car parking area to the rear of Frederick Street, with the remainder located on the main grassed former Circatex site. On completion boreholes were either installed with instrumentation (see Section 3.7) or were backfilled in accordance with the requirements of the Consulting Engineer.

Four boreholes (CBH-01, 03, 09 and 10) were advanced using a Sedidril 210 drilling rig, utilising rotary coring methods, to a maximum depth of 18.50m BGL (CBH-09). Rotary coring employed a '412' (107mm OD) barrel in combination with an Easycut drill bit and air/water (mist) flushing medium. This coring assembly was used to recover 76mm lined cylindrical specimens of rock core. On completion, all rotary continuation boreholes were instrumented (see Section 3.7) in accordance with the requirements of the Consulting Engineer.



3.3 Exploratory Holes: Window/Windowless Sample Holes

Eighteen windowless sample holes were sunk using a Premier Compact 110 Series tracked rig utilising a removable liner system, to depths of between 0.50m (CWS-01A) and 6.00m BGL (CWS-04, 06, 07, 09, 14A and 15). CWS-01, CWS-01A and CWS-14 were terminated prematurely due to obstructions encountered, either during the excavation of the inspection pit, or within the made ground deposits. Furthermore, CWS-14 may have intercepted a former basement slab due to its positioning within the approximate footprint of a former demolished public house situated on the corner of Frederick Street.

Certain windowless samples holes (CWS-09, 14 and 14A) were carried out to the east of the main Circatex site area. CWS-09 was positioned relatively centrally to the rear of Frederick Street on an area of public car park, whilst CWS-14/14A were undertaken in an enclosed compound, formerly a public house, at the junction of Reed and Frederick Street. The remaining windowless sample holes were positioned throughout the main grassed area of the site, formerly occupied by Circatex.

On completion all windowless sample holes were backfilled using bentonite pellets and, from c. 1.00m BGL, compacted arisings or where applicable pavement construction materials, in accordance with the requirements of the Consulting Engineer.

3.4 Exploratory Holes: Mechanically Excavated Trial Trenches

Seven trial trenches (TT-01 to TT-07 inclusive) were mechanically excavated using the back-hoe bucket of a JCB 3CX excavator to depths of between 2.30m (TT-07) and 4.40m BGL (TT-03) in order to establish the presence or otherwise of shallow remnant foundation elements. No remnant foundations were encountered as a consequence of these works in the locations targeted by the Consulting Engineer. In accordance with the Contract Specification there was no requirement for any geotechnical or geo-environmental sampling as part of these excavation works.

Photographs of the resulting trial trench excavation and spoil mound were taken prior to backfilling. Trial trench photographs are presented after the relevant Trial Trench Record. The majority of the excavations were backfilled in layers using a hydraulic "wacker-plate" attachment to the back-hoe boom in order to minimise settlement. All excavations were backfilled flush with the original ground surface on the instructions of the Consulting Engineer.

3.5 Exploratory Holes: Inspection Pits

Five inspection pits (HTP-01 to HTP-05 inclusive) were excavated to 1.20m BGL at selected positions along the perimeter soil bund in order to recover samples for geotechnical and geo-environmental testing. Originally the inspection pits were scheduled to be hand excavated, although due to the hardness/compactness of the near surface deposits, mechanical excavation was subsequently used. Photographs of the resulting inspection pit excavation and spoil mound were taken prior to backfilling. All inspection pits were backfilled with arisings, compacted and reinstated accordingly.



3.6 Samples

Representative samples of soil, water and rock were obtained from the boreholes, windowless sample holes and inspection pit and were taken to the laboratory for selected geotechnical and specialist chemical testing.

Environmental samples were taken in accordance with the contract specification during the investigation using an approved selection of container types in order to suit the encountered material properties and designated laboratory analytical parameters. Full chain of custody procedures were in place post sampling and during the transportation stage to the nominated specialist chemical laboratory. Environmental samples were administered appropriately following the best practice guidance provided in the Contract Specification.

Large bulk samples were obtained for fill suitability assessment from the windowless sample holes, as well as in conjunction with the machine excavated inspection pits (HTP-01 to HTP-05 inclusive) relating to the perimeter earth bund.

3.7 Groundwater

The comments on groundwater conditions are based on the observations made at the time of investigation. It should be noted that groundwater levels may vary due to seasonal and other effects. Furthermore, water was added during advancement of the boreholes in order to facilitate drilling operations. As a consequence there is a possibility that this could have masked the discrete ingress of natural groundwater into the boreholes, which subsequently may have been sealed as a result of progressing the casing.

Groundwater was encountered in a number of the exploratory holes during the site works operation. Where groundwater observations were made details are given on the relevant Borehole, Window/Windowless Sample Hole and Trial Pit Record and in greater detail (collectively in tabulated format) as Field Data Enclosure 6: Groundwater Observations Made at the Time of Siteworks. Standing groundwater levels were recorded in the boreholes at the beginning and end of each drilling shift. The water level information is indicated on the applicable Borehole record as part of the boring progress information.

3.8 Instrumentation & Monitoring

Six boreholes (CBH-01, 02, 04, 07, 09 and 10) were instrumented with single 50mm diameter gas/groundwater monitoring standpipes in accordance with the requirements of the Consulting Engineer. Details of the installations are shown on the relevant Borehole Records.

Groundwater and gas levels in the instruments were monitored daily (where practicable) during the site works period, as well on six occasions after the completion of site works in accordance with the requirements of the Contract Specification. A record of the gas and groundwater readings is presented as Field Data Enclosure 7 (Groundwater Monitoring Results) and Field Data Enclosure 8 (Gas and Groundwater Monitoring Results).



Gas and groundwater monitoring was also undertaken from seven previously installed instruments relating to an earlier investigation (by others) during the site work period and post site work, as part of the specified monitoring visit requirements. A record of the gas and groundwater readings is presented as Field Data Enclosure 9 (Existing Installation Gas and Groundwater Monitoring Results)

3.9 Health & Safety Considerations: Services

Before the commencement of any exploratory hole a search for underground services was conducted as prescribed in HSE publication 'Avoiding Underground Services (HSG47)' and in accordance with in-house internal safety procedure AEG-14.

Service plans provided by the Client are consulted and a cable and pipe-locating device (C.A.T³ V) is used to scan the immediate area. If no services are detected a 'Permit-to-Work' form is issued by the investigation supervisor and, with the exception of trial pits/trenches, the position commenced with a hand excavated inspection pit. The inspection pit is also scanned during the excavation procedure. Where no services are detected the exploratory hole is commenced in accordance with the Contract Specification. Where services are detected or there is a reasonable belief that they are present, the position is typically moved in consultation with the Consulting Engineer.

Details of any services uncovered/located during this investigation are given below:

Exploratory Hole Number	Type of Service	Orientation & Depth (size where indicated)	Status (Damaged/Undamaged)	Additional Remarks
No services were encountered within the inspection pits dug for the purposes of the exploratory hole works. Underground services, however, were suspected as well as shown on service drawings as part of the CAT scan survey carried out within the vicinity of the exploratory hole positions.				

TABLE 1 – Services Encountered

3.10 Health & Safety Considerations: Contamination

For the purposes of determining the condition of the site, with regard to human health and environmental issues, reference should specifically be made to any specialist chemical testing undertaken as part of the investigation scheme, as well as any supporting desk study and risk assessment documentation. The information given herein collates the observations made by the operatives involved in the investigation only and comments that have been indicated on the engineering records.

Exploratory Hole Number	Occurrence (in-situ/surface)	Visual / Olfactory	Depth (mBGL)	Occurrence Type	Additional Remarks
CBH-07	In-Situ	Visual	1.80	Driller notes purple and black staining (possible chemicals)	None
CWS-01B	In-Situ	Olfactory	2.10	Moderate creosote odour	None
CWS-05	In-Situ	Olfactory	1.70	Moderate chemical odour	None

TABLE 2 – Potential Contamination Encountered



Where there was potential evidence of contamination, principally as a consequence of olfactory and visual identification, information is provided in the above table.

It should be stressed that the information provided herein is possibly subjective, as it is based on the perceptions of individuals and not specialists routinely involved in the chemical determination of contaminated residues, liquors, vapours or solid contaminants.

3.11 Surveying

The investigation positions were surveyed after completion of site works using a Leica Smartrover (Model ATX 1230+ GNSS) GPS based instrument which provides corrected ordnance survey co-ordinates in real time to an accuracy of within $\pm 30\text{mm}$ vertical and $\pm 30\text{mm}$ horizontal. These positions have been subsequently plotted in AutoCAD® software and are shown on the Exploratory Hole Location Plan, Field Data Enclosure 1.

4. IN-SITU TESTING

4.1 General

In-situ testing as specified by the Consulting Engineer was carried out in selected boreholes and windowless sample holes in accordance with techniques outlined in the relevant British Standard and/or AEG Quality Procedure. The results are presented in the *In-situ* Testing Enclosures with a number of the test results summarised at the relevant depth on the Borehole and Window/Windowless Sample Hole Records.

4.2 Standard Penetration Test Results

Standard Penetration Testing (SPT) was carried out in the boreholes and windowless sample holes in accordance with techniques outlined in BS EN ISO 22476-3: 2005 in order to determine the relative density and consistency of the strata encountered. The 'N' value (number of blows per 300mm penetration) or the penetration per blow was recorded for each test. Uncorrected 'N' values or penetration per blow data are provided on the applicable Borehole and Window/Windowless Sample Hole Records.

More detailed information concerning the standard penetration testing is given in *In-situ* Testing Enclosure 1 which includes the following;

- Initial exploratory hole conditions prior to the test procedure.
- Calibration and energy ratio (E_m) information for the SPT hammer device used to carry out the test.
- A breakdown of blows for each 75mm penetration interval.
- Rod length (C_R) and energy (C_E) correction ratios.
- Uncorrected 'N' value.
- Corrected 'N₆₀' value that applies the rod (C_R) and energy (C_E) corrections indicated.



- Pertinent remarks corresponding to the test procedure.

In addition to the above, a graph has been prepared for each exploratory hole which plots the uncorrected and corrected 'N' value results against depth or reduced level. Calibration certificates for the SPT apparatus used during the testing procedure are also presented for reference within this *In-situ* Testing Enclosures.

4.3 Photo-ionisation Detector Testing Results

Photo-ionisation detector (PID) screening for semi-volatile and volatile organic compounds was conducted on samples taken during the investigation for specialist chemical testing. The results for the sample based PID tests are recorded, where applicable, on the Borehole, Window/Windowless Sample Hole, Trial Trench and Inspection Pit Records and in tabular format in *In-situ* Testing Enclosure 2.

4.4 Soak Away Testing

Eight soakaway tests were performed in four window sample holes (WS-03, WS-08, WS-10 and WS-13) at 1.00m and at 2.00m BGL in accordance with BRE Digest 365. A modified form of infiltration testing, relevant to boreholes, was used at 2.00m BGL in these exploratory holes following the requirements provided in the Contract Specification. The results from the soakaway testing work are presented in *In-Situ* Testing Enclosure 3.

4.5 Panda Probes

Sixteen Panda Probe Tests were undertaken using a Panda Probe Version 2 to depths of between 0.11m (CBR-11) and 2.19m BGL (CBR4A). Cone resistance values recorded progressively during the course of the testing have been used to determine equivalent CBR, 'N'-value and undrained shear strength (where applicable to the strata conditions) using empirical relationship techniques applicable to the device. Equivalent 'N'-value assessments have also been compared to those yielded in the windowless sample holes where Panda probing was conducted in close proximity. The results are presented in tabular and graphical form in *In-situ* Testing Enclosure 4.

5. LABORATORY TESTING

5.1 General

Laboratory testing as scheduled by the Consulting Engineer was carried out on selected samples in accordance with techniques outlined in BS 1377:1990, AEG Laboratory Quality Procedures or other appropriate standard as quoted.

5.2 Geotechnical Testing

The results are presented in the Laboratory Enclosures with an outline list of the procedures undertaken given in the following tabulated list;



- Moisture content determination.
- Plastic, liquid limit and plasticity index determination.
- Ground aggressiveness analysis (Sulphate and pH).
- Determination of dry density and moisture content relationship.
- One dimensional consolidation properties.
- Undrained shear strength determination in a triaxial cell without pore pressure measurement.
- Determination of point load index.
- Determination of unconfined compression strength.

5.3 Specialist Chemical Testing

Selected samples have been screened for a range of contaminants as specified by the Consulting Engineer. The results of these analyses, conducted under a subcontract arrangement with Derwentside Environmental Testing Services (DETS) are presented as Appendix I.



FIELD DATA ENCLOSURES

ENCLOSURE 0

Key Sheets



Allied Exploration and Geotechnics Limited

Key Sheets



INTRODUCTION

The following explanatory notes define the terminologies, abbreviations and symbols pertaining to each individual column or section of the Exploratory Hole records. 'Exploratory Hole' is used as a general term in this report to comprise borehole, drillhole, and trial pit. All exploratory hole records have been produced using 'gINT®', which is an integrated software environment for the storage and manipulation of subsurface data.

The primary purpose of ground investigation exploratory holes is to probe the stratified sequences of soil and/or rock. From the results of these probings no conclusion should be drawn concerning the presence of size, lithological nature and numbers per unit volume of ground of cobbles and boulders in soil types such as glacial till (boulder clay).

INFORMATION COMMON TO ALL EXPLORATORY HOLE RECORDS

Status Box

The status box in the top right hand corner of each exploratory hole record gives the status of each individual record i.e. PRELIM1, PRELIM2, PRELIM3 FINAL etc. The date shown relates to the last instance the data was revised. This information is for AEG Quality Assurance only.

Exploratory Hole No

The identity number used throughout the report.

Project

The ground investigation project name. Occasionally the project name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Client

Client's name responsible for funding the ground investigation project. The Client's name may be shortened or abbreviated due to string length restraints imposed by the gINT® computer programme.

Location

The exploratory hole position given as either national grid co-ordinates, local grid if specified, or a reference name normally pertaining to the area of investigation.

Method (Equipment)

Represents the drilling, excavation or boring method(s) or equipment used.

Ground Level (m(AOD))

The precise ground level in metres above Ordnance Datum at the exploratory hole location from which the reduced level for each stratigraphic boundary is calculated.

Date

The date relating to the start of the exploratory hole excavation.

Sheet

The sheet number and total number of sheets for the particular record.

Checked By

Printed signature of the person who has carried out the technical quality check on the log.

Logged By

The name of the engineer who has carried out the logging of the exploratory hole.

Contract No.

The Allied Exploration & Geotechnics Limited reference number for the project.



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Key Sheets






INFORMATION RELEVANT TO BOREHOLE AND WINDOW/WINDOWLESS SAMPLE HOLE RECORDS

Sample & Tests Columns

Depth	The depth over which a sample or test is taken is shown in depth column of the exploratory hole record in a "from...to" format.
Type No	Indicates the type of sample/test and number given by the driller.
Test Result	Result of the test given in the applicable units.

Water Column

Water Strike	Level of groundwater strike within an exploratory hole. The symbol  denotes a water strike and is suffixed with a number, which indicates the strike order. The corresponding unfilled symbol  is the depth the strike rose to.
Seepage	Groundwater seepage within an exploratory hole is denoted by the  symbol.

Strata Columns

Reduced Level	The corresponding reduced level of each soil or rock boundary in metres Ordnance Datum.
Legend	A graphical representation of the materials encountered using BS 5930:1999 Amendment No.2 (Aug 2010) recommended symbols for soil and rock.
Depth (Thickness)	The depth below ground level of each soil or rock boundary in metres and the thickness of each individual stratigraphic unit (given in brackets).
Description	Engineering description of each individual soil or rock type follows recommendations outlined in Section 6 of BS 5930:1999 Amendment No.2 (Aug 2010) with the following implementation: <ol style="list-style-type: none"> The amendment of section 6 incorporates the guidance indicated in BS EN ISO 14688-1:2002, BS EN ISO 14688-2:2004 and BS EN ISO 14689-1:2003 European Standard with particular emphasis on current UK practice. Supplementary laboratory or in-situ assessed measurements of undrained strength are provided where applicable information is available in parenthesis in accordance with clause 41.3.2 BS 5930:1999 Amendment No.2 (Aug 2010) after the field strength determined consistency. The description based measurement table indicating the quantitative undrained strength classification divisions is provided in Key Sheets Table 1.

Term based on measurement	Undrained strength classification definition cu, in kPa (from BS EN ISO 14688-2:2004, 5.3, Table 5)
Extremely low	<10
Very low	10-20
Low	20-40
Medium	40-75
High	75-150
Very High	150-300
Extremely High	300-600

KEY SHEETS TABLE 1

- Cobble and boulder content is expressed in accordance with the terms provided in EN ISO 14688-2: 2004 where visually identified in trial pit excavations, or inferred/recovered during the drilling operations. The assessment of frequency and spatial occurrence of coarse and very coarse rock material should not be considered as precise, but only an indicator or estimate of the potential conditions. It should be noted that the recovery of coarse or very coarse particles in boreholes is dependent on the limitations imposed by the casing diameter. The terminology used is outlined in Key Sheets Table 2.



Allied Exploration and Geotechnics Limited

Key Sheets



Fraction	Percent by Mass	Term
Boulders	<5	Low boulder content
	5 to 20	Medium boulder content
	>20	High boulder content
Cobbles	<10	Low cobble content
	10 to 20	Medium cobble content
	>20	High cobble content

KEY SHEETS TABLE 2

4 Rock Strength based on assessed field or measured unconfined compressive strength follows the classification scheme given in clause 44.2.1 BS5930:1999 Amendment No.2 (Aug 2010) as outlined in Key Sheets Table 3.

Term for use in field or based on measurement	Definition for field use	Definition on basis of Unconfined Compressive Strength measurement (MPa)	Old Classification of rock strength: Terminology (Strength Range MPa)	Old Classification of rock strength: Determination Method
Extremely weak	Can be indented by thumbnail. Gravel sized lumps crush between finger and thumb.	0.6-1.0	Very Weak (<1.25)	Lumps can be crushed between fingers
Very weak	Crumbles under firm blows with point of geological hammer. Can be peeled by a pocket knife.	1-5	Weak (1.25 – 5)	Lumps can be broken with heavy hand pressure
Weak	Can be peeled by a pocket knife with difficulty. Shallow indentations made by firm blow with the point of geological hammer.	5-25	Moderately Weak (5-12.50)	This slab can be broken with heavy pressure
Medium Strong	Cannot be scraped with pocket knife. Can be fractured with a single firm blow of geological hammer.	25-50	Moderately Strong (12.50-50)	Rock can be broken in the hand with a hammer
Strong	Requires more than one blow of geological hammer to fracture.	50-100	Strong (50-100)	Rock can be broken on a flat surface using a hammer
Very Strong	Requires many blows of geological hammer to fracture.	100-250	Very Strong (100-200)	Rock chipped by blows with a hammer
Extremely strong	Can only be chipped with geological hammer.	>250	Extremely Strong (>200)	Rock rings when hit with a hammer
Based on BS EN ISO 14689-1:2003 4.2.7, Table 5			BS5930: 1999 – Section 6 (Superseded Version)	

KEY SHEETS TABLE 3

5 Where 'rock weathering classification' can be applied it is 'Approach 4' which will be used. If any other approach is used the factual text of the report will provide details of the applicable specific approach. (Ref.: Figure 19, p143, BS 5930:1999 Amendment No.2 (Aug 2010)). An outline of the 'Approach 4' rock weathering classification scheme is provided as Key Sheets Table 4.

APPROACH 4 CLASSIFICATION INCORPORATING MATERIAL AND MASS FEATURES		
Class	Classifier	Typical characteristics
A	Unweathered	Original strength, colour, fracture spacing
B	Partially weathered	Slightly reduced strength, slightly closer fracture spacing, weathering penetrating in from fractures, brown oxidation
C	Distinctly weathered	Further weathered, much closer fracture spacing grey reduction
D	Destructured	Greatly weakened, mottled, ordered lithorelics in matrix becoming weakened and disordered, bedding disturbed.
E	Residual or reworked	Matrix with occasional altered random or 'apparent' lithorelics, bedding destroyed. Classed as reworked when foreign inclusions are present as a result of transportation.

KEY SHEETS TABLE 4



Allied Exploration and Geotechnics Limited

Key Sheets



Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Boring Progress and Water Observations Columns

This section provides information on each day's production as a daily log.

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Casing Dia	Casing's diameter at the start of the shift.
Water Depth	Water level within the borehole at the start and end of shift.

Chiselling Columns

Indicates where hard strata occurred in the borehole and breaking out was carried out to advance the borehole.

From	The depth commenced.
To	The depth finished.
Hours	The time spent for breaking out.

Water Added Columns

Indicates the depth range where water was added to the borehole to facilitate boring or to prevent stress relief disturbance "blowing/boiling" in granular soils.

From	Depth in metres from where water was added.
To	Depth in metres to where water was added.

General Remarks

Any remarks believed to be relevant to the exploratory hole.

INFORMATION RELEVANT TO PIT/TRENCH RECORDS

The pit/trench records follow the same format as the borehole and window/windowless sample hole records for the Samples & Tests, Water and Strata columns. However, in addition to these there are the following:

Plan

A schematic plan view of the pit showing its excavated dimensions together with its orientation, given as a compass bearing to magnetic north.

Groundwater

Notes on water bearing horizons.

Stability

The engineer's comments outlining the stability of the sides during pit excavation.

General Remarks

The engineer's comments of any other information relevant to construction of the pit.

Additional Information

An indication if a sketch and/or photographs accompany the record.



Allied Exploration and Geotechnics Limited

Key Sheets



Underground Services

Depth	Depth service was encountered.
Orientation	Orientation given as a compass bearing to magnetic north.
Type	Type of service encountered.
Diameter	Diameter of service encountered.
Condition	Condition the service encountered was noticed in.

INFORMATION RELEVANT TO DRILLHOLE RECORDS AND ROTARY CONTINUATION

Run Details Columns

Depth	Each drill run is highlighted by a horizontal line with the top and bottom depths shown in metres. Core diameter (C Dia) is presented also within each run.
TCR (SCR) RQD	Information provided on the total core recovery, solid core recovery and rock quality designation. Refer to Abbreviations for further details.
Fracture Index	Information given relating to the fracture index of the rock.

Strata Columns

As the strata columns for borehole and window/windowless sample hole records except for description which is as follows:

Discontinuities Detail	Information on core discontinuities, localised variations in weathering, lithology, strength and structure follows recommendations outlined in Section 6 BS 5930:1999 Amendment No.2 (Aug 2010):Clause 44.
Main	Engineering description of each individual soil or rock type follows recommendations outlined in Section 6 of BS 5930:1999 Amendment No.2 (Aug 2010).

Instrument/Backfill Column

A graphical representation of backfill material or instrumentation detail using graphic legends. Its placement in the column is relative to depth in metres and corresponds to the exploratory hole in scale.

Drilling Progress and Water Observations Columns

Date	Date of shift.
Depth	Depth of hole at the start of the shift.
Casing	Casing's depth at the start of the shift.
Water Strike	Depth at which water was encountered.
Water Standing	Depth at which water in the hole levelled off.
Water Remarks	Any remarks believed to be relevant to the water e.g. Artesian.

Standard Penetration Test

Depth	The depth commenced.
Type	Type of standard penetration test (SPT).
Result	Result of SPT.

Flush

From	The depth commenced.
To	The depth finished.
Type	Details of the type of flush used. A = Air, F = Foam, W = Water and Pol = Polymer.
Returns	An indication of the percentage of the returned flush material.

General Remarks

Any remarks believed to be relevant to the exploratory hole.



Allied Exploration and Geotechnics Limited

Key Sheets



SAMPLES

B	Bulk disturbed sample.
ES	Environmental soil sample.
EW	Environmental water sample.
G	Gas sample.
J	Small disturbed sample.
LB	Large bulk disturbed sample.
P	Piston sample.
P*	An attempted but failed undisturbed piston sample.
U	Undisturbed sample.
U*	An attempted but failed general purpose undisturbed sample.
W	Water sample.

IN-SITU TESTS

CBR	California Bearing Ratio mould sample or test.
HSV	In-situ hand shear vane.
HP	Hand penetrometer test.
K (F)	Falling head permeability test.
K (R)	Rising head permeability test.
K (C)	Constant head permeability test.
K (P)	Packer permeability test.
PT	Pressuremeter test.
PID	Photo ionisation detector test.
FID	Flame ionisation detector test.
HP	Hand penetrometer test.
S	Standard Penetration Test (SPT) using the split barrel sampler (shoe). The corresponding uncorrected 'N' value is given in the test result column with more detailed information provided in the In-Situ Testing Enclosures where applicable. Testing has been conducted in accordance with BS EN ISO 22476-3: 2005.
C	Denotes SPT test using a solid cone in preference to the split barrel sampler (usually in coarse granular soil) with all other reporting requirements as outlined above for the split barrel sampler.
S/C result of e.g. 1/2.94	Denotes where full penetration has not been achieved during the SPT test. In such cases the penetration (mm) per blow is recorded in the test result column e.g. 1/2.94 is 2.94mm of penetration per single blow.
SV	In-situ down-the-hole shear vane test. The remoulded shear strength is given in brackets.

ROCK QUALITY AND CORE RECOVERY

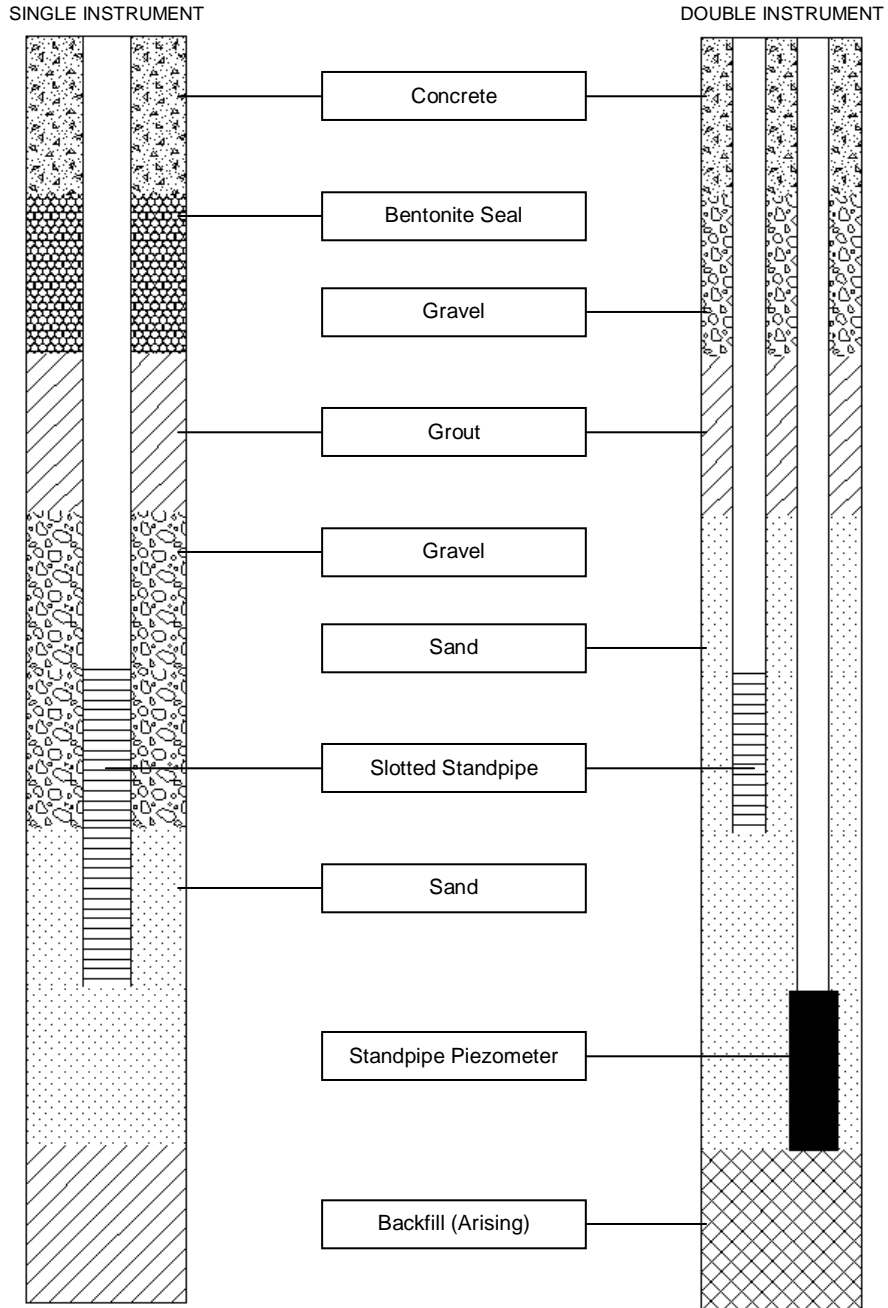
TCR	Total Core Recovery - the length of the recovered core expressed as a percentage of the length of core run.
SCR	Solid Core Recovery - the sum length of all core pieces that are recovered with at least one full diameter, expressed as a percentage of the length of core run.
RQD	Rock Quality Designation - The sum length of all core pieces that are 100mm or longer (measured along the centre of the core), expressed as a percentage of the length of core run.
FI	Fracture Index - The number of fractures per 1000mm length of solid core.
NI	Non-intact - The material recovered in a non-intact state.
NR	No recovery from the core run.



Allied Exploration and Geotechnics Limited Key Sheets



Symbols and Abbreviations: Explanation of Instrumentation Legends Used





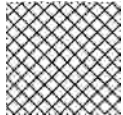
Allied Exploration and Geotechnics Limited

Key Sheets



Symbols and Abbreviations: Explanation of Legends Used

Soils	Rocks		
	<i>Sedimentary</i>	<i>Metamorphic</i>	<i>Igneous</i>



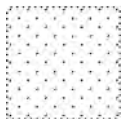
Made Ground



Cobbles and Boulders



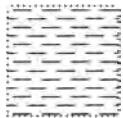
Gravel



Sand



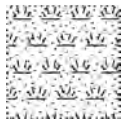
Silt



Clay

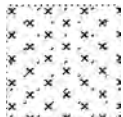


Peat

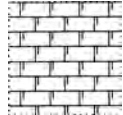


Topsoil

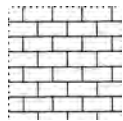
Note: Composite soil types will be signified by combined symbols e.g.



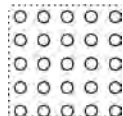
Silty Sand



Chalk



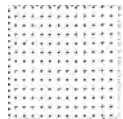
Limestone



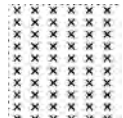
Conglomerate



Breccia



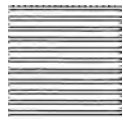
Sandstone



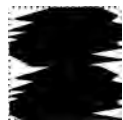
Siltstone



Mudstone



Shale



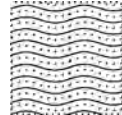
Coal



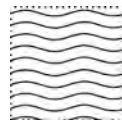
Pyroclastic (Volcanic Ash)



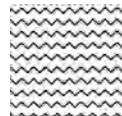
Gypsum



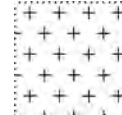
Coarse Grained



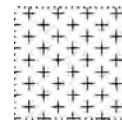
Medium Grained



Fine Grained



Coarse Grained



Medium Grained



Fine Grained





ENCLOSURE 1

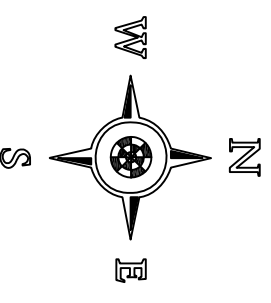
Exploratory Hole Location Plan



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 (Tel: 0191 387 4700
 (Fax): 0191 387 4710
 (Email: enquiries@aeguk.net)

KEY:

-  BOREHOLE LOCATIONS
-  WINDOW SAMPLE HOLE LOCATIONS
-  TRIAL PIT LOCATIONS
-  TRIAL TRENCH LOCATIONS



Base Plan Supplied by Consulting Engineer

Drawing Title:

ENC 1 : Exploratory Hole Location Plan

Drawing No.:

AEG/3842/01

Contract Title:

Trinity South Residential Development, South Shields - GI

Client:

South Tyneside Council

Consultant:

Cundall Johnson and Partners LLP

Contract No.:

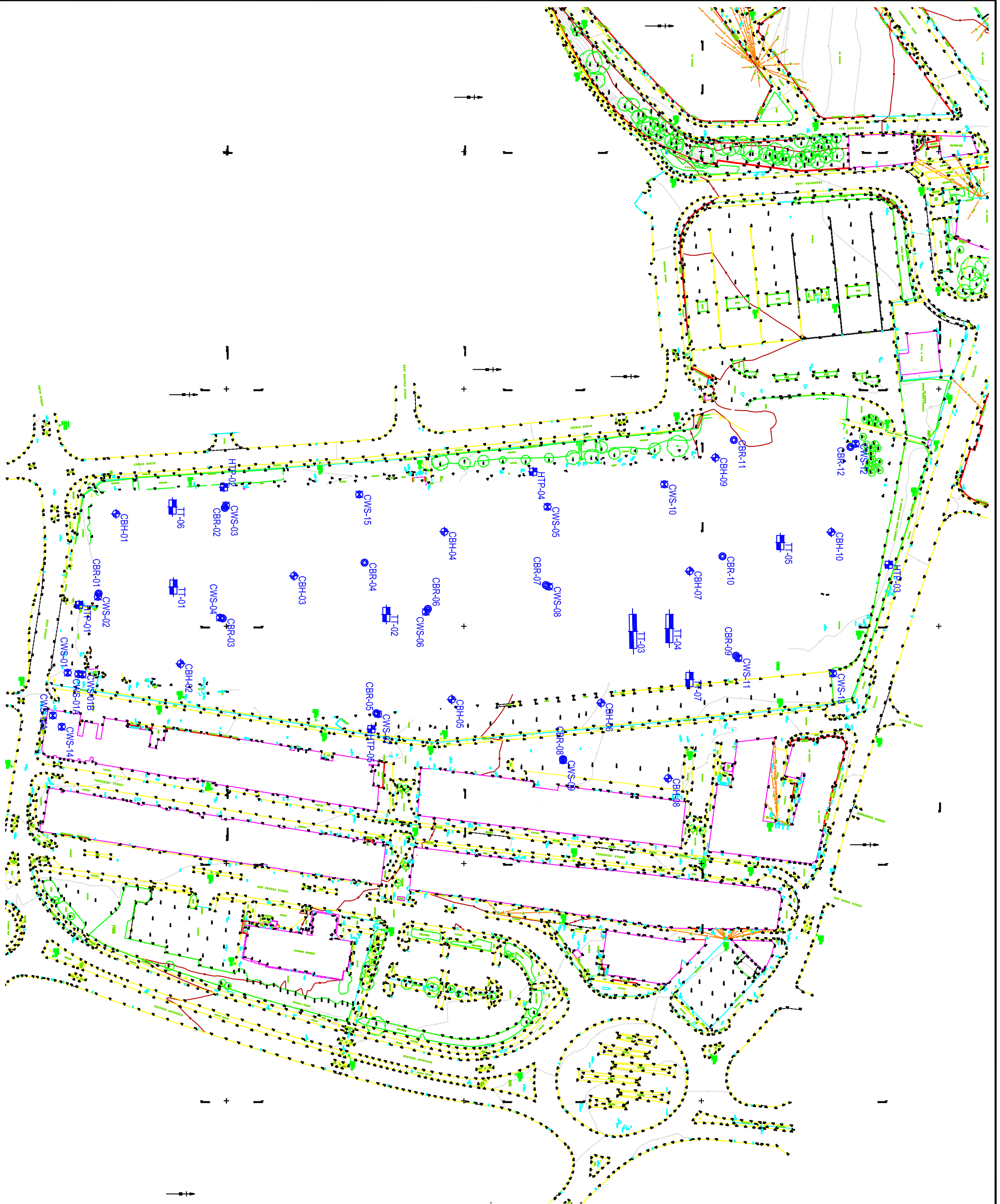
3842

Scale:

1:1500 @ A3

Date:

04/10/2011



ENCLOSURE 2

Borehole Records



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BOREHOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:435952.616 N:565953.502	
Method (Equipment): Percussion/Rotary Coring (Dando 2000/Sedidril 210)		Ground Level (m(AOD)): 7.209	Date: 19/09/2011
		Sheet: 1 of 2	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.15 0.20-0.50	J1 B2		7.159	(0.06)	0.05	MADE GROUND (Grass over topsoil).	
0.50 0.50 0.80 1.00 1.00	PID ES3 J4 PID ES5	0.0 ppm 0.0 ppm				MADE GROUND (Dark brown to grey brown clayey/silty very gravelly sand with low to medium cobble content, pockets of intermixed ash and interbeds/lenses of firm grey brown to brown slightly sandy slightly gravelly clay. Sand includes some ash. Gravel is fine to coarse angular to subangular and includes brick, clinker, concrete, sandstone and pottery. Cobbles are angular to subangular and include brick and concrete).	
1.50-1.95	CB6	N11			(3.15)	at c.1.50m BGL ... loose and medium dense.	
2.20	J7						
2.50-2.95	CB8	N7				at c.2.50m BGL ... loose.	
3.20-3.40	B9		4.009		3.20		
3.50-3.95	SJ10	N4	3.559 3.509		(0.45) (0.05) 3.76	MADE GROUND (Very soft and soft light orange brown and black slightly organic slightly gravelly very sandy clay with some organic material (fibres and other amorphous remains) and orange silty sand lenses/pockets. Slight organic odour noted. Gravel is fine to coarse angular to subrounded and includes flint and sandstone. (Engineer notes intermixed texture to the material)).	
4.00-4.10	B11		3.109		(0.40) 4.10	MADE GROUND (Grey fine sand).	
4.20-4.40	B12						
4.50-5.00	U13	(53)			(1.00)	MADE GROUND (Soft grey to black organic very sandy clay with some organic material (fibres and other amorphous fragments). Sand includes occasional coal/ash. (Possible Relict Topsoil Layer)).	
5.00	J14		2.109		5.10	Soft and firm light orange brown to brown mottled/veined (gleyed) grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium, occasionally coarse, subangular to subrounded and includes sandstone and mudstone.	
5.20 5.20-5.40 5.50-5.95 5.50-5.95	J15 B16 SJ17 B18	N17				at c.4.50m BGL ... high strength clay of low plasticity. Stiff (high strength) brown mottled/veined (gleyed) grey slightly sandy slightly gravelly CLAY with occasional whitish silt pockets (<10mm). Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal. (Engineer notes mottling/veining diminishing with depth).	
6.50	J19				(3.05)		
6.80-7.20	B20						
7.50-8.00	U21	(81)					

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
19/09/2011	0.00							0.00	9.00	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.50m - water level at 3.57m BGL after 20 mins. (4) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-01
Client: South Tyneside Council	Location: South Shields E:435952.616 N:565953.502	
Method (Equipment): Percussion/Rotary Coring (Dando 2000/Sedidrill 210)	Ground Level (m(AOD)): 7.209	Date: 19/09/2011
Sheet: 2 of 2		

SAMPLES & TESTS			STRATA				Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTION
8.00	J22			-0.941		8.15	(As sheet 1 of 2).	
8.00	J23						Extremely weak to very weak red brown to light grey fine to medium grained SANDSTONE distinctly weathered.	
8.30	J24							
8.50-8.70	SJ25	1/0.29				(0.85)	from c.8.50m BGL ... weak and partially weathered.	
8.90-9.00	C26	1/0.18		-1.791		9.00	Boring complete at 9.00m BGL - continued by rotary coring.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
19/09/2011	9.00	6.20	200	Dry	8.40	8.90	01:00			(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.50m - water level at 3.57m BGL after 20 mins. (4) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-01
Client: South Tyneside Council	Location: South Shields E:435952.616 N:565953.502	
Method (Equipment): Percussion/Rotary Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 7.209	Date: 19/09/2011
		Sheet: 1 of 3

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
9.00	100 (48) 32	12	-1.791		9.00	9.00-9.50m ... subhorizontal (0-5 degrees) very closely to closely spaced planar to undulating smooth tight to open clean discontinuities.	Boring complete at 9.00m BGL - continued by rotary coring. Weak to medium strong thinly laminated to thinly bedded light red brown to light whitish brown silty fine to medium grained SANDSTONE partially weathered to unweathered with extremely to very closely spaced micaceous laminations. 9.50m ... very weak to weak and partially weathered. 11.00-11.80m ... very weak and distinctly weathered. 11.15m ... discoloured light greenish brown. 11.90m ... very thin very weak and distinctly weathered interbed.	Hatched pattern
9.50	89 (52) 41	NI			9.50-10.23m ... non-intact.			
		3			10.23-11.00m ... subhorizontal (0-5 degrees) closely to medium spaced planar to undulating smooth tight to open clean discontinuities.			
11.00	73 (10) 0	NI			11.00-11.80m ... non-intact.			
		9			11.80-12.10m ... subhorizontal (0-5 degrees) closely spaced planar to undulating smooth tight to open infilled (sandstone breccia and sand) discontinuities. 12.10-12.50m ... possible zone of no recovery.			
12.50	100 (87) 74	2			12.50-14.00m ... subhorizontal (0-5 degrees) closely to medium spaced planar to undulating smooth tight to open clean and infilled (sandstone breccia and sand) discontinuities.			

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
23/09/2011	9.00	9.00		4.96					9.00	14.00	A/M	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.50m - water level at 3.57m BGL after 20 mins. (4) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-01
Client: South Tyneside Council	Location: South Shields E:435952.616 N:565953.502	
Method (Equipment): Percussion/Rotary Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 7.209	Date: 19/09/2011
Sheet: 2 of 3		

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
C Dia (76mm)			-6.791		14.00	(As sheet 1 of 3). Weak to medium strong thinly laminated to thinly bedded light red brown to light whitish brown silty fine to medium grained SANDSTONE partially weathered to unweathered with extremely to very closely spaced micaceous laminations. 13.50m ... very thick very weak and distinctly weathered interbed. 13.60m ... very thick very weak and distinctly weathered interbed.		
						Borehole complete at 14.00m BGL.		

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
23/09/2011	14.00	9.00		9.14									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.50m - water level at 3.57m BGL after 20 mins. (4) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-01	
Client: South Tyneside Council	Location: South Shields E:435952.616 N:565953.502		Sheet: 3 of 3
Method (Equipment): Percussion/Rotary Coring (Dando 2000/Sedidrill 210)	Ground Level (m(AOD)): 7.209	Date: 19/09/2011	

PHOTOGRAPHS



Figure CBH-01.1
9.00m - 11.00m BGL.



Figure CBH-01.2
11.00m - 14.00m BGL.



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BOREHOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436015.832 N:565980.680	
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m(AOD)): 7.670	Date: 19/09/2011
			Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill	
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		DESCRIPTION
			7.570	(0.10)	0.10	(1) MADE GROUND (Grass over topsoil).		
0.20	J1			[Cross-hatched legend symbol]		MADE GROUND (Dark brown to grey brown silty very gravelly sand with low cobble content and intermixed pockets/interbeds of soft and firm orange brown slightly sandy slightly gravelly clay. Sand includes some ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, tile, sandstone and occasional flint. Cobbles are mainly angular and include concrete and brick).		
0.30-0.50	B2							
0.50	PID	0.4 ppm						
0.50	ES3							
0.80	J4							
1.00	PID	1.9 ppm						
1.00	ES5							
1.50-1.95	CB6	N11	(2.65)				at c.1.50m BGL ... loose to medium dense interbed/pocket of slightly silty gravelly sand. Gravel includes clinker and slag. Sand is mainly ash.	
2.00-2.45	CB7	N11					at c.2.00m BGL ... loose to medium dense slightly clayey gravelly sand.	
2.50-2.95	CB8	N8	4.920				2.75	
3.00-3.50	U9	(36)	4.370	(0.55)	3.30	MADE GROUND (Very soft dark grey to black organic sandy silty clay with some organic material (fibres and amorphous remains) and strong organic odour noted). (Possible Relict Topsoil Layer).		
3.50-3.95	SJ10	N11	3.970	(0.40)	3.70	Soft and firm orange brown mottled/veined (gleyed) grey slightly sandy slightly gravelly CLAY. Gravel is fine to medium, occasionally coarse, subangular to subrounded and includes sandstone).		
3.50-3.95	B11							
4.00-4.50	U12	(66)	3.270	(0.70)	4.40	Firm and stiff (medium to high strength) orange brown mottled grey slightly sandy slightly gravelly CLAY with low cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone and occasional coal. Cobbles are subrounded and includes sandstone. at c.4.00m BGL ... high strength clay of high plasticity.		
4.50	J13	N14				Stiff and very stiff (medium to high strength) brown to dark brown occasionally mottled grey slightly sandy slightly gravelly CLAY with low to medium cobble content and occasional thin interbeds/lenses of silty sand. Gravel is fine to coarse subangular to subrounded and includes sandstone and occasional coal. Cobbles are subrounded and include sandstone. (Engineer notes that grey mottling diminishes with depth)). at c.5.50m BGL ... high strength.		
4.50-4.95	SJ14							
4.50-4.95	B15							
5.10	J16							
5.20-5.50	B17							
5.50-6.00	U18	(76)						
6.00	J19							
6.50-6.95	CB20	N36			(4.80)			
7.20	J21							
7.50-8.00	U22	(120)				at c.7.50m BGL ... high strength.		

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
19/09/2011	0.00				6.30	6.60	00:30	0.00	2.50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Damp at 3.70m BGL. (4) 50mm gas/groundwater standpipe installed to 3.30m BGL.
19/09/2011	2.50	2.50	200	Dry				2.50	9.70	
20/09/2011	2.50	2.50	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-03	
Client: South Tyneside Council	Location: South Shields E:435978.773 N:566028.464		Sheet: 1 of 2
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m(AOD)): 8.112	Date: 20/09/2011	

SAMPLES & TESTS			STRATA				Instrument/ Backfill			
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTION		
0.20	J1			8.012		0.10	(1) MADE GROUND (Grass over topsoil).			
0.30-0.50	B2									
0.50	ES3									
0.70	J4									
1.00	ES5									
1.20-1.65	CB6	N11						(2.10)		MADE GROUND (Loose dark brown to grey brown clayey, in places very clayey, very gravelly sand with low to medium cobble content and intermixed pockets/interbeds of firm orange brown slightly sandy slightly gravelly clay. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, tile, sandstone and occasional flint. Cobbles are mainly angular and include concrete and brick).
1.70-2.15	CB7	N10								at c.0.30m BGL ... interbed/pocket of firm brown slightly sandy slightly gravelly clay.
2.20-2.65	CB8	N9				5.912		2.20		MADE GROUND (Loose black to dark grey silty gravelly sand. Sand is mainly ash. Gravel is fine to coarse angular to subangular and includes clinker, slag and brick with occasional coal).
2.70-3.15	CB9	N5						(1.20)		
3.20-3.65	CB10	N3				4.712		3.40		
3.70-4.15	CB11	N7				4.412		(0.30)		MADE GROUND (Very loose dark grey to black organic slightly gravelly very silty sand with low cobble content, occasional organic material (fibres and other amorphous remains) and slight organic odour. Occasional pockets of brown slightly sandy clay. Gravel is fine to medium angular to subangular and includes brick. Cobbles are angular and include brick).
4.20-4.65	CB12	N5				3.712		(0.70)		
4.70-5.20	U13	(39)				3.612		(0.10) 4.50		MADE GROUND (Very loose and loose dark grey to black clayey slightly sandy gravel and cobbles with some brown slightly sandy clay pockets. Gravel is fine to coarse angular and includes slag, brick and concrete. Cobbles are angular and include brick).
5.20	J14									(1) MADE GROUND (Soft grey black sandy clay).
5.30-5.60	B15							(2.15)		Firm and stiff thinly to thickly laminated and closely fissured dark brown to brown mottled (gleyed) grey slightly sandy CLAY with silt dusting on laminae and occasional inter laminations of silt fine to medium sand.
5.80	J16						at c.4.70m BGL ... high strength clay of high plasticity.			
6.20-6.70	U17	(71)					at c.6.20m BGL ... very high strength.			
6.70	J18			1.462		6.65				
6.80-7.00	B19						Stiff and very stiff (high to very high strength) brown to dark brown slightly sandy slightly gravelly CLAY with low cobble content and occasional lenses of silty sand. Gravel is fine to coarse subangular to subrounded and includes sandstone and occasional coal. Cobbles are subrounded and include sandstone.			
7.10	J20									
7.20-7.65	SJ21	N42								
7.20-7.65	B22									
7.70	B23						at c.7.70m BGL ... sandstone boulder.			

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
20/09/2011	0.00				7.50	7.70	00:30	0.00	5.20	
20/09/2011	5.20	4.70	200	Dry				5.20	9.80	
21/09/2011	5.20	4.70	200	Dry						

(1) Description derived from drillers daily report.
 (2) Inspection pit dug prior to drilling.
 (3) Water strike at 3.70m BGL - water level rose to 3.58m BGL after 20 mins.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-03
Client: South Tyneside Council	Location: South Shields E:435978.773 N:566028.464	
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m(AOD)): 8.112	Date: 20/09/2011
Sheet: 2 of 2		

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
7.90	J24				(2.75)	(As sheet 1 of 2). Stiff and very stiff (high to very high strength) brown to dark brown slightly sandy slightly gravelly CLAY with low cobble content and occasional lenses of silty sand. Gravel is fine to coarse subangular to subrounded and includes sandstone and occasional coal. Cobbles are subrounded and include sandstone.	
8.20-8.35	U*B25	(120)					
8.80	J26					Very weak to weak thinly bedded red brown to light grey brown fine to medium grained SANDSTONE partially to distinctly weathered.	
9.20-9.45	CB27	1/2.04	1.288		9.40		
9.60	J28		1.688		(0.40) 9.80	Borehole complete at 9.80m BGL.	
9.80	C	1/0.26					

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
21/09/2011	9.80	6.20	200	Dry	9.40	9.80	01:00			(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 3.70m BGL - water level rose to 3.58m BGL after 20 mins.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-04	
Client: South Tyneside Council		Location: South Shields E:435960.152 N:566091.772	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)		Ground Level (m(AOD)): 9.247	Date: 23/09/2011
		Sheet: 1 of 2	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.20	J1		9.147		(0.10) 0.10	(1) MADE GROUND (Grass over topsoil).	
0.50 0.50 0.60-0.80	ES2 PID B3	0.0 ppm			(0.95)	MADE GROUND (Firm and stiff (desiccated) orange brown to brown slightly sandy slightly gravelly clay with low cobble content and some interbeds/pockets of sand to fine gravel sized ash. Gravel is fine to coarse angular to subangular and includes sandstone, clinker, flint, brick and occasional slag. Cobbles are mainly angular brick, sandstone and concrete).	
1.00 1.00 1.20-1.65	ES4 PID CB5	0.2 ppm N11	8.197		1.05	MADE GROUND (Soft and firm dark grey to brown grey sandy very gravelly clay with low to medium cobble content and some intermixed pockets/interbeds of silty very gravelly sand. Sand includes some ash. Gravel is fine to coarse angular to subangular and includes sandstone, clinker, flint, brick and occasional slag. Cobbles are mainly angular brick, sandstone and concrete).	
1.70-2.15	CB6	N30			(1.25)	at c.1.70m BGL ... subangular sandstone boulder.	
2.20-2.65	CB7	N8	6.947		2.30	MADE GROUND (Soft and firm (low to medium strength) dark grey to grey slightly organic slightly gravelly sandy silty clay with occasional pockets/lenses of black slightly sandy silt/clay and slight organic odour. Gravel is fine to medium angular to subangular and includes flint, sandstone, clinker and occasional coal). (Possible Relict Topsoil Layer).	
2.70-3.15	CB8	N15	6.447		(0.50)	Firm (medium strength) light brown to orange brown mottled blue grey and orange slightly sandy slightly gravelly CLAY of high plasticity with occasional silt pockets (<20mm). Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal.	
3.20-3.70	U9	(60)			(1.05)	Firm, in places stiff, (medium to high strength) closely fissured and (incipiently) thinly laminated red brown mottled/veined (gleyed) blue grey slightly sandy CLAY with occasional thin interbeds of silty fine to medium sand.	
3.70 3.70-4.15 3.70-4.15	J10 SJ11 B12	N12	5.397		3.85	at c.4.20m BGL ... high strength clay of intermediate to high plasticity.	
4.20-4.70	U13	(73)			(1.20)	Very stiff (very high to extremely high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY of low plasticity with low cobble content and occasional silty sandy pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. Cobbles are subangular and include sandstone and limestone.	
4.70 4.70-5.15 4.70-5.15	J14 SJ15 B16	N18	4.197		5.05	at c.6.20m BGL ... extremely high strength.	
5.30 5.50-5.80	J17 B18						
6.20-6.70	U19	(120)					
6.70 6.90	J20 J21						
7.20-7.65	CB22	1/4.74					

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
23/09/2011	0.00							0.00	3.20	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 6.00m BGL.
23/09/2011	3.20	3.20	200	Dry				3.20	11.60	
26/09/2011	3.20	3.20	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-04	
Client: South Tyneside Council		Location: South Shields E:435960.152 N:566091.772	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)		Ground Level (m(AOD)): 9.247	Date: 23/09/2011
		Sheet: 2 of 2	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
8.00	J23					(5.95)	(As sheet 1 of 2). Very stiff (very high to extremely high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY of low plasticity with low cobble content and occasional silty sandy pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. Cobbles are subangular and include sandstone and limestone. at c.8.20m BGL ... very high strength.
8.20-8.70	U24	(50)					
8.70	J25						
9.00	J26						
9.20-9.65	SJ27	N42					
9.20-9.65	B28						
9.90	J29						
10.20-10.70	U30	(120)					
10.70	J31						
11.10	J32	1/1.12				11.00	
11.20-11.35	CB33					(0.60)	Extremely weak to very weak red brown to light grey brown fine to medium grained SANDSTONE partially to distinctly weathered.
11.60	C34	1/0.17				11.60	Boring complete at 11.60m BGL continued by rotary coring.

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
26/09/2011	11.60	6.20	200	Dry	11.20	11.60	01:00			(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-04
Client: South Tyneside Council	Location: South Shields E:435960.152 N:566091.772	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidrill 210)	Ground Level (m(AOD)): 9.247	Date: 23/09/2011
		Sheet: 1 of 3

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
11.60	100 (60) 0	NI	-2.353		11.60	11.60-11.90m ... non-intact.	Boring complete at 11.60m BGL continued by rotary coring. Weak to medium strong thickly laminated to thinly bedded red brown to white grey brown fine to medium grained micaceous SANDSTONE partially weathered to unweathered with very closely spaced micaceous laminations and occasional iron staining on discontinuity surfaces. 11.60-12.26m ... very weak and weak distinctly weathered.	
		NR				11.90-12.10m ... possible zone of no recovery.		
12.10		NI				12.10-12.26m ... non-intact.		
	100 (59) 45	8				12.26-14.16m ... horizontal to subhorizontal (0-5 degrees) closely spaced to medium spaced planar to undulating, occasionally stepped, smooth tight to moderately open clean, in places coated (sand), discontinuities.		
					(3.36)			
13.60								
	100 (73) 60	3				14.16-14.96m ... horizontal to subhorizontal (0-5 degrees) medium spaced planar to undulating smooth tight to moderately open clean, in places stained (iron), discontinuities.		
			-5.713		14.96			
15.10		NI	-5.853		(0.14) 15.10	14.96-15.10m ... non-intact.		
	80 (43) 29	NR				15.10-15.40m ... possible zone of no recovery.		
		>50				15.40-15.80m ... horizontal to subhorizontal (0-5 degrees) extremely closely to very closely spaced		

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
27/09/2011	11.60	11.60			4.06	11.60	C	1/0.17	11.60	16.60	A/M	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-04
Client: South Tyneside Council	Location: South Shields E:435960.152 N:566091.772	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidrill 210)	Ground Level (m(AOD)): 9.247	Date: 23/09/2011
Sheet: 2 of 3		

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
C Dia (76mm)		7			(1.50)	planar to stepped smooth tight to moderately open clean discontinuities.	Weak to medium strong very thinly to thinly bedded grey brown fine to medium grained micaceous SANDSTONE partially weathered to unweathered with closely spaced micaceous laminations. 15.40-15.80m ... very weak to weak partially to distinctly weathered (core fractured).	
			-7.353		16.60	15.80-16.60m ... horizontal to subhorizontal (0-5 degrees) closely to medium spaced planar smooth tight to moderately open clean discontinuities.		
						Borehole complete at 16.60m BGL.		

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
27/09/2011	16.60	11.60			2.91								(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 6.00m BGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-04	
Client: South Tyneside Council	Location: South Shields E:435960.152 N:566091.772		Sheet: 3 of 3
Method (Equipment): Percussion/Coring (Dando 2000/Sedidrill 210)	Ground Level (m(AOD)): 9.247	Date: 23/09/2011	

PHOTOGRAPHS



Figure CBH-04.1
11.60m - 13.60m BGL.



Figure CBH-04.2
13.60m - 16.60m BGL.



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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation			Exploratory Hole No. CBH-05	
Client: South Tyneside Council		Location: South Shields E:436030.838 N:566094.895		
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m(AOD)): 9.343	Date: 21/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.10 0.20-0.40	J1 B2		9.243		(0.10) 0.10	(1) MADE GROUND (Grass over topsoil).		
0.50 0.50 0.70	ES3 PID J4	0.2 ppm			(1.60)	MADE GROUND (Dark brown to grey brown clayey, in places very clayey, very gravelly sand/very sandy gravel with low to medium cobble content and intermixed pockets/interbeds of firm orange brown slightly sandy slightly gravelly clay. Sand includes occasional ash. Gravel is angular to subangular and includes brick, concrete, slag, tile, sandstone and occasional flint. Cobbles are mainly angular and include concrete and brick).		
1.00 1.00 1.20-1.35	ES5 PID CB6	0.1 ppm	7.643		1.70	MADE GROUND (Medium dense light brown to brown silty very sandy gravel with medium cobble and low boulder content. Gravel is fine to coarse angular to subrounded and includes flint, brick and sandstone. Cobbles are angular and include sandstone).		
1.70-2.15	CB7	N15			(0.70)	at c.1.70m BGL ... sandstone cobble/boulder.		
2.20-2.65	CB8	N4	6.943		2.40	MADE GROUND (Dark grey to black silty gravelly sand with occasional pockets of sandy silt. Gravel is fine to coarse angular to subangular and includes clinker and slag. Sand is mainly ash and coal. Gravel is fine to medium angular to subangular and includes clinker and slag).		
2.70-3.15	CB9	N8	6.443		(0.50) 2.90	Firm (medium strength) very closely fissured (and incipiently thinly to thickly laminated) red brown mottled/veined (gleyed) blue grey slightly sandy CLAY of high plasticity.		
3.20-3.70	U10	(43)			(0.95)	Firm (medium to high strength) thinly to thickly laminated brown mottled orange and grey slightly sandy CLAY with occasional silt dusting on laminae.		
3.70 3.70-4.15 3.70-4.15	J11 SJ12 B13	N15	5.493		3.85	at c.4.20m BGL ... high strength clay of high plasticity.		
4.20-4.70	U14	(62)			(1.60)			
4.70 4.70-5.15 4.70-5.15	J15 SJ16 B17	N19			5.45			
5.40	C	1/0.19	3.893		5.45	Borehole terminated at 5.45m BGL due to an obstruction.		

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
21/09/2011	0.00				1.30	1.50	00:30	0.00	5.45	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
21/09/2011	5.45	5.40	200	Dry	5.40	5.45	00:30			

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436032.308 N:566157.798	
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m(AOD)): 10.761	Date: 22/09/2011
			Sheet: 1 of 1

SAMPLES & TESTS			STRATA					Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.20	J1			10.361		(0.40) 0.40	MADE GROUND (Dark brown to grey brown silty gravelly sand. Gravel is fine to coarse angular to subangular and includes brick, concrete and sandstone).	
0.50 0.50 0.60 0.70-0.90 1.00 1.00 1.20-1.65	ES2 PID J3 B4 ES5 PID CB6	0.0 ppm 0.0 ppm N8				(1.05) 1.45	MADE GROUND (Dark brown to brown slightly silty gravelly, in places very gravelly, sand with low to medium cobble content and intermixed pockets/interbeds of soft and firm orange brown to brown green sandy slightly gravelly clay. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, coal, clinker, sandstone and occasional flint. Cobbles are mainly angular and include sandstone, concrete and brick).	
1.70-2.15	CB7	N7		8.861		(0.45) 1.90	MADE GROUND (Soft and firm dark brown to brown slightly sandy slightly gravelly clay with low cobble content. Gravel is fine to coarse angular to subangular and includes sandstone, flint and brick. Cobbles are mainly angular brick).	
2.20-2.65	CB8	N7				(1.05)	MADE GROUND (Loose dark grey to black silty gravelly sand with occasional pockets of sandy silt. Gravel is fine to coarse angular to subangular and includes clinker and slag).	
2.70-3.15	CB9	N5		7.811		(0.30) 2.95	at c.2.20m BGL ... interbed of dark grey to black sandy clay.	
3.20-3.70	U10	(68)		7.511		(0.70) 3.25	Soft and firm (incipiently) thinly laminated red brown to brown mottled (gleyed) orange and blue grey slightly sandy CLAY with occasional thin orange silty fine sand interlamination.	
3.70 3.70-4.15 3.70-4.15	J11 SJ12 B13	N14		6.811		(0.70) 3.95	Firm orange brown to brown slightly sandy slightly gravelly CLAY with orange brown silty sand pockets/lenses. Gravel is fine to medium subangular to subrounded and includes sandstone.	
4.20-4.70	U14	(80)					Stiff and very stiff (high strength) brown to dark brown slightly sandy slightly gravelly CLAY of low plasticity with low to medium cobble content and occasional thin interbeds/lenses of silty sand. Gravel is fine to coarse subangular to subrounded and includes sandstone and occasional coal. Cobbles are subrounded and include sandstone.	
4.70 4.70-5.15 4.70-5.15	J15 SJ16 B17	N26				(3.10)		
5.40 5.70-5.90	J18 B19							
6.20-6.70	U20	(120)						
6.70	J21							
7.00 7.20 7.30 7.50	J22 C23 J24 C25	1/0.78 1/0.27		3.711 3.261		(0.45) 7.50	Extremely weak to very weak red brown to light grey brown fine to medium grained SANDSTONE partially to distinctly weathered.	
Borehole complete at 7.50m BGL.								

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
22/09/2011	0.00				7.10	7.50	01:00	0.00	7.50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
22/09/2011	7.50	4.70	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:435976.740 N:566195.123	
Method (Equipment): Cable Percussion (Dando 2000)		Ground Level (m(AOD)): 10.992	Date: 22/09/2011
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.10 0.20-0.40	J1 B2		10.942		(0.05) 0.05	(1) MADE GROUND (Grass over topsoil).	
0.50 0.50	ES3 PID	0.3 ppm				MADE GROUND (Firm orange brown to brown slightly sandy slightly gravelly clay with low cobble content and some interbeds/pockets of grey brown silty/clayey gravelly sand. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes sandstone, clinker, flint brick and occasional slag. Cobbles are mainly angular brick and concrete).	
1.00 1.00 1.20-1.65	ES4 PID CB5	0.2 ppm N10			(2.80)		
1.70-2.15	CB6	N7				between 1.80m and 2.70m BGL ... driller notes purple and black staining (possible chemicals).	
2.20-2.70	CB7	N7				at c.2.20m BGL ... interbed of slightly sandy slightly gravelly clay.	
2.70-3.15	CB8	N9	8.142		2.85		
3.20-3.70	U9	(63)	7.742		(0.40) 3.25	MADE GROUND (Firm (low to medium strength) closely fissured and thinly laminated red brown slightly sandy clay with occasional thin interbeds of brown silty sand. (Driller notes sand lenses)). (Possible Natural Ground).	
3.70 3.70-4.15	J10 CB11	N6	7.292		(0.45) 3.70	at c.3.20m BGL ... thin interbed of silty fine gravelly sand. Firm red brown sandy slightly gravelly CLAY with thin interbeds of fine gravelly medium to coarse sand. Gravel is fine, occasionally medium, subangular to rounded and includes quartz and sandstone. (Driller notes reinforcement bar).	
4.20-4.65	CB12	N11				(Possible Made Ground). between c.3.25m and 5.60m BGL ... driller notes pushing reinforcement bar in front of sampling tools.	
4.70-5.15	CB13	N20			(2.30)	Stiff (medium to high strength) dark brown to red brown slightly sandy slightly gravelly CLAY with low cobble content and occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. Cobbles are subrounded and include sandstone.	
5.30	J14					at c.4.20m BGL ... interbed of brown silty fine to medium sand.	
5.70-5.90	B15		4.992		6.00		
6.20-6.70	U16	(120)			(0.70)	Very stiff dark brown to grey brown slightly sandy slightly gravelly CLAY with occasional silty sand pocket/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. Cobbles are subrounded and include sandstone and limestone.	
6.60 6.70 6.70	J17 B18 C19	1/0.12	4.292		6.70	at c.6.60m BGL ... subangular limestone cobble/boulder. Borehole terminated at 6.70m BGL due to limestone boulder obstruction (no progress).	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
22/09/2011	0.00				6.60	6.70	01:15	0.00	2.70	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 3.70m BGL.
22/09/2011	2.70	2.70	200	Dry				2.70	6.70	
23/09/2011	2.70	2.70	200	Dry						
23/09/2011	6.70	6.60	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-08	
Client: South Tyneside Council	Location: South Shields E:436064.090 N:566186.038		
Method (Equipment): Cable Percussion (Dando 2000)	Ground Level (m(AOD)): 11.835	Date: 28/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill	
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		DESCRIPTION
0.30	J1		11.785		(0.05) 0.05	MADE GROUND (Macadam).		
0.50	ES2	0.0 ppm	11.635		(0.15) 0.20	MADE GROUND (Magnesian limestone sub-base).		
0.50	PID		11.235		(0.40) 0.60	MADE GROUND (Black sand with cobbles. Sand includes ash).		
0.60-0.80	B3					MADE GROUND (Light grey brown slightly silty gravelly fine to coarse sand with low to medium cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, brick, clinker, flint and occasional concrete. Cobbles are subangular and include sandstone).		
1.00	ES4	0.0 ppm			(1.10)			
1.00	PID							
1.30	J5							
1.50-1.95	CB6	N8	10.135			1.70		MADE GROUND (Loose light brown to brown, in places black, silty gravelly sand with low cobble content. Sand includes some ash. Gravel is fine to coarse subangular to subrounded and includes brick, flint, clinker and occasional slag. Cobbles are angular to subangular and include slag and clinker).
2.00-2.45	CB7	N5			(1.60)			at c.2.50m BGL ... with coarse gravel to cobble sized refractory brick.
2.50-2.95	CB8	N6						between c.3.00 - 3.45m BGL ... medium dense dark brown to black slightly clayey very gravelly sand with low to medium cobble content. Gravel is fine to coarse angular to subangular and includes magnesian limestone, slag, clinker, brick and sandstone. Cobbles are angular and include slag.
3.00-3.45	CB9	N14	8.535		3.30	Stiff and very stiff (medium to high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with low to medium cobble/boulder content and occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional limestone. Cobble/boulders are subangular and include sandstone and limestone.		
3.50-4.00	U10	(32)		(1.25)		between c.3.30 - 4.40m BGL ... incipiently thinly laminated.		
4.00	J11	N14	7.285		4.55	Very weak to weak thickly laminated to thinly bedded red brown to light red grey fine to medium grained SANDSTONE partially to distinctly weathered.		
4.00-4.45	SJ12			(0.45)		Borehole complete at 5.00m BGL.		
4.00-4.45	B13							
4.50-4.60	U14	(120)	6.835		5.00			
4.60	J15							
4.80	CB16	1/0.56						
5.00	C17	1/0.26						

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
28/09/2011	0.00	0.00			4.60	4.80	00:30	0.00	2.50	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Borehole undertaken in car park area to the east of the main site.
28/09/2011	2.50	2.50	200	Dry	4.80	5.00	00:30	2.50	5.00	
29/09/2011	2.50	2.50	200	Dry						
29/09/2011	5.00	4.60	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-09	
Client: South Tyneside Council	Location: South Shields E:435928.950 N:566205.930		
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 10.548	Date: 27/09/2011	Sheet: 1 of 2

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.15	J1		10.498		(0.05) 0.05	(1) MADE GROUND (Grass over topsoil).	
0.50	ES2	1.5 ppm	9.948		(0.55) 0.60	MADE GROUND (Firm and stiff (desiccated) orange brown to brown slightly sandy slightly gravelly clay with low cobble content and some interbeds/pockets of sand to fine gravel sized ash. Gravel is fine to coarse angular to subangular and includes sandstone, clinker, flint, brick and occasional slag. Cobbles are mainly angular and include brick, sandstone and concrete).	
0.50	PID						
0.70-0.90	B3						
1.00	ES4	1.6 ppm	9.148		(0.80) 1.40	MADE GROUND (Soft dark brown sandy gravelly clay with low cobble content, occasional silty gravelly sandy pockets/lenses and some organic material (grass, fibres, stems). Gravel is fine to coarse angular to subangular and includes flint, sandstone, limestone, brick and concrete. Cobbles are angular and include brick).	
1.00	PID	N23					
1.20-1.65	CB5						
1.70-2.15	CB6	N11					
2.20-2.65	CB7	N11			(1.60)	MADE GROUND (Loose and medium dense dark brown to grey brown silty/clayey very gravelly sand with low cobble content. Gravel is fine to coarse angular to subrounded and includes flint, brick and concrete. Cobbles are angular and include brick).	
2.70-3.15	CB8	N9	7.548		3.00		
3.20-3.70	U9	(41)			(1.10)	Firm (medium strength) (incipiently) thinly to thickly laminated and very closely fissured red brown occasionally mottled/veined (gleyed) blue grey slightly sandy CLAY with occasionally thin silt/fine sand interlaminae and silt dusting on laminae surfaces.	
3.70	J10	N10	6.448		4.10		
3.70-4.15	SJ11						
3.70-4.15	B12						
4.20-4.70	U13	(73)				Stiff and very stiff (high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with low to medium cobble/boulder content and occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional limestone. Cobble/boulders are subangular and include sandstone and limestone.	
4.70	J14	N26					
4.70-5.15	SJ15						
4.70-5.15	B16						
5.70	J17						
5.80-6.20	B18						
6.20-6.70	U19	(120)					
6.70	J20						
6.90	J21						
7.20-7.65	SJ22	1/5.04				from c.7.20m BGL ... very high strength.	
7.20-7.65	B23						

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
27/09/2011	0.00							0.00	5.20	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 18.50m BGL.
27/09/2011	5.20	4.70	200	Dry				5.20	13.50	
28/09/2011	5.20	4.70	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-09
Client: South Tyneside Council	Location: South Shields E:435928.950 N:566205.930	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 10.548	Date: 27/09/2011
		Sheet: 2 of 2

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
8.00	J24					(As sheet 1 of 2). Stiff and very stiff (high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with low to medium cobble/boulder content and occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional limestone. Cobble/boulders are subangular and include sandstone and limestone.	
8.20-8.45	U25	(120)			(8.80)		
9.00	J26						
9.20-9.60	SJ27	1/4.32					
9.20-9.60	B28						
9.90	J29						
10.20-10.70	U30	(120)					
10.70	J31						
11.00	J32						
11.20-11.40	B33	1/1.92					
11.70	J34						
12.20-12.70	U35	(120)					
12.70	J36		2.352		12.90		
13.00	J37				(0.60)	Very weak to weak thickly laminated to thinly bedded red brown to light red grey fine to medium grained SANDSTONE partially to distinctly weathered.	
13.20	C38	1/0.46	2.952		13.50		
13.50	C39	1/0.22				Boring complete at 13.50m BGL continued by rotary coring.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
28/09/2011	13.50	4.70	200	Dry	8.45	8.55	00:15			(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 18.50m BGL.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-09	
Client: South Tyneside Council	Location: South Shields E:435928.950 N:566205.930		
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 10.548	Date: 27/09/2011	Sheet: 1 of 3

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
13.50	100 (53) 51	NI	-2.952	[Symbol]	13.50	13.50-14.03m ... non-intact.	Boring complete at 13.50m BGL continued by rotary coring. Very weak to weak thickly laminated to thinly bedded light brown grey, discoloured red brown, fine to medium grained micaceous SANDSTONE partially to distinctly weathered with very closely spaced micaceous laminations and occasional iron staining on discontinuity surfaces. Weak to medium strong very thinly to thinly bedded light brown to white grey, occasionally discoloured red brown, fine to medium grained SANDSTONE partially weathered to unweathered. at 14.25m ... very weak (brecciated) distinctly weathered with sand infill. at 14.30m ... discoloured dark brown/black.	[Symbol]
			-3.482		14.03	14.03-15.30m ... horizontal to subhorizontal (0 - 5 degs) very closely to medium spaced planar, occasionally undulating, smooth tight to moderately open clean and occasionally coated (red sandy clay) discontinuities		
15.00	100 (31) 0	5	-5.052	[Symbol]	15.60	15.30-15.45m ... non-intact.	at 15.45 to 15.60m ... very weak (brecciated) distinctly weathered with a red brown clay coating. Extremely weak to very weak thinly laminated dark grey MUDSTONE distinctly weathered. (Engineer notes weathering and fracture state could be drilling induced). from 15.60 to 16.00m ... with closely spaced thin interbeds of weak micaceous sandstone distinctly weathered.	[Symbol]
		NI				15.45-15.60m ... horizontal to subhorizontal (0 - 5 degs) extremely to very closely spaced planar, occasionally undulating, smooth tight to moderately open clean discontinuities.		
		20				15.60-16.40m ... non-intact.		
16.00	100 (13) 0	22		[Symbol]		16.40-16.49m ... horizontal (0 degs) extremely to very closely spaced planar smooth tight discontinuities. (Engineer notes small section of intact core only).	at 16.45m ... closely spaced thin interbeds of weak mudstone unweathered.	[Symbol]
		NI				16.49-17.50m ... non-intact.		
17.50								

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
29/09/2011	13.50	0.00			Dry	13.50	C	1/0.22	13.50	18.50	A/M	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 18.50m BGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-09
Client: South Tyneside Council	Location: South Shields E:435928.950 N:566205.930	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 10.548	Date: 27/09/2011
Sheet: 2 of 3		

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
C Dia (92mm)	100 (30) 12	50	- 7.952		18.50	17.50-18.50m ... non-intact core (fractured) with much grey clay coating (and infill) and medium spaced intact sections; at c.17.80m to 17.90m and 17.95 to 18.50m BGL.	(As sheet 1 of 3). at 17.80m ... closely spaced thin interbeds of weak mudstone unweathered. at 18.20m ... closely spaced thin interbeds of weak mudstone unweathered.	
							Borehole complete at 18.50m BGL.	

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
29/09/2011	18.50	13.50		14.09									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater standpipe installed to 18.50m BGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-09	
Client: South Tyneside Council	Location: South Shields E:435928.950 N:566205.930		Sheet: 3 of 3
Method (Equipment): Percussion/Coring (Dando 2000/Sedidrill 210)	Ground Level (m(AOD)): 10.548	Date: 27/09/2011	

PHOTOGRAPHS



Figure CBH-09.1
13.50m - 16.00m BGL.



Figure CBH-09.2
16.00m - 18.50m BGL.



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BOREHOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-10	
Client: South Tyneside Council		Location: South Shields E:435960.339 N:566254.748	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)		Ground Level (m(AOD)): 11.018	Date: 26/09/2011 Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill	
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)		DESCRIPTION
0.20	J1		10.968		(0.06) 0.05	(1) MADE GROUND (Grass over topsoil). MADE GROUND (Firm, in places soft and stiff (desiccated), dark brown grey to orange brown sandy gravelly clay with low cobble content and occasional pockets/interbeds of silty very gravelly sand. Sand includes some ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, flint and occasional slag. Cobbles are angular to subangular and include brick and concrete).		
0.50	ES2							
0.60-0.80	B3							
1.00	ES4					(2.20)		
1.20-1.65	CB5	N11						
1.70-2.15	CB6	N8						
2.20-2.65	CB7	N9	8.768			2.25		Soft and firm (medium strength) light brown to grey brown mottled grey and orange slightly sandy slightly gravelly CLAY. Gravel is fine to coarse angular to subangular and includes mudstone and sandstone. (Engineer notes stratum as probably water softened).
2.70-3.20	U8	(43)	8.318			(0.45) 2.70		Firm (medium strength) (incipiently) thinly to thickly laminated and very closely fissured red brown occasionally mottled/veined (gleyed) blue grey slightly sandy CLAY with occasional thin silt/fine sand interlaminations and silt dusting on laminae surfaces.
3.20	J9	N12				(1.80)		
3.20-3.65	SJ10							
3.20-3.65	B11							
3.70-4.20	U12	(70)						
4.20	J13	N18						
4.20-4.65	SJ14		6.518		4.50	Stiff and very stiff (high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with low to medium cobble/boulder content and occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional limestone. Cobbles/boulders are subangular and include sandstone and limestone. at c.5.10m BGL ... sandstone boulder.		
4.20-4.65	B15							
4.70-5.10	U16	(120)						
5.20-5.45	CB17	1/0.36						
5.70	J18				(2.60)			
5.90-6.10	B19							
6.20-6.40	SJ20	1/1.70						
6.20-6.40	B21							
7.20-7.40	CB22	1/1.82	3.918		7.10	Very weak to weak thickly laminated to thinly bedded red brown to light red grey fine to medium grained SANDSTONE partially to distinctly weathered.		
7.50	J23		3.418		7.60	Boring complete at 7.60m BGL continued by rotary coring.		
7.60	C24	1/0.21						

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
26/09/2011	0.00				5.10	5.50	01:00	0.00	3.20	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater installation installed to 6.00mBGL.
26/09/2011	3.20	3.20	200	Dry	6.60	6.80	00:30	3.20	7.60	
27/09/2011	3.20	3.20	200	Dry	7.20	7.60	01:00			
27/09/2011	7.60	6.20	200	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-10	
Client: South Tyneside Council	Location: South Shields E:435960.339 N:566254.748		
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 11.018	Date: 26/09/2011	Sheet: 1 of 3

RUN DETAILS				STRATA				Instrument/ Backfill
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail	Main	
7.60	0 (0) 0	NR	3.418		7.60	7.60-8.10m ... no recovery.	Boring complete at 7.60m BGL continued by rotary coring. (1) SANDSTONE.	(Hatched area)
8.10			2.918		8.10	8.10-9.45m ... moderately open clean and coated (iron oxidation residue) discontinuities.	Weak to medium strong thickly laminated to thinly bedded light grey brown, in places discoloured red, fine to medium grained SANDSTONE partially weathered to unweathered with occasional iron staining on discontinuity surfaces and closely spaced thin micaceous/carbonaceous interlaminae.	
9.60	100 (75) 61	4	1.568		9.45	9.45-10.45m ... horizontal to vertical (0 - 90 degs) extremely closely spaced stepped (irregular) smooth to rough tight to moderately open infilled (sandstone breccia and sand) discontinuities.	Very weak to weak thickly laminated to thinly bedded light brown, discoloured red, fine to medium grained micaceous SANDSTONE partially to distinctly weathered with irregular thin carbonaceous/micaceous interlaminae and stained (iron) discontinuities. (Engineer notes core distinctly fractured and brecciated). 9.48-9.52m ... extremely weak and destructured to gravelly sand. 9.90m ... thin interbed of brecciated sandstone (non-intact) 10.10m ... thin interbed of brecciated sandstone (non-intact).	
	100 (49) 35	>50	0.568		10.45	10.45-11.10m ... horizontal (0 degs) closely spaced planar to undulating smooth tight clean discontinuities.	Very weak to weak thinly laminated dark red brown fine sandy SILTSTONE partially weathered. (Engineer notes core coated in sandy clay.)	
11.10		5	-0.082		11.10	11.10-11.97m ... horizontal to subhorizontal (0 - 5 degs) closely to medium spaced planar, occasionally undulating, smooth tight to moderately open clean and occasionally coated (iron oxidation residue) discontinuities.	(As sheet 2 of 3).	
	100 (74) 62	4						

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
28/09/2011	7.60	7.60		6.91		7.60	C	1/0.21	7.60	12.60	A/M	100	(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater installation installed to 6.00mBGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CBH-10
Client: South Tyneside Council	Location: South Shields E:435960.339 N:566254.748	
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 11.018	Date: 26/09/2011
		Sheet: 2 of 3

RUN DETAILS			STRATA				Instrument/ Backfill	
Depth	TCR (SCR) RQD	Fracture Index	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION		
						Discontinuities Detail		Main
C Dia (76mm)		NI			(1.50)	11.97-12.26m ... non-intact.	Weak to medium strong thickly laminated to thinly bedded light grey brown, in places discoloured red, fine to medium grained SANDSTONE partially weathered to unweathered with occasional iron standing on discontinuity surfaces and closely spaced thin micaceous/carbonaceous interlamination. 1.97-12.26m ... very weak brecciated sandstone (with sand infill) partially to distinctly weathered.	
		5			12.26-12.60m ... horizontal to subhorizontal (0 - 5 degs) closely to medium spaced planar, occasionally undulating, smooth tight to moderately open clean and occasionally coated (iron oxidation residue) discontinuities.	Borehole complete at 12.60m BGL.		
			- 1.582		12.60			

Drilling Progress and Water Observations						Standard Penetration Test			Flush				General Remarks
Date	Depth	Casing	Water Strike	Water Standing	Water Remarks	Depth	Type	Result	From	To	Type	Returns (%)	
28/09/2011	12.60	7.60		7.14									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) 50mm gas/groundwater installation installed to 6.00mBGL.

All dimensions in metres Scale 1:25	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ROTARY CONTINUATION

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435960.339 N:566254.748		CBH-10
Method (Equipment): Percussion/Coring (Dando 2000/Sedidril 210)	Ground Level (m(AOD)): 11.018	Date: 26/09/2011	Sheet: 3 of 3

PHOTOGRAPHS

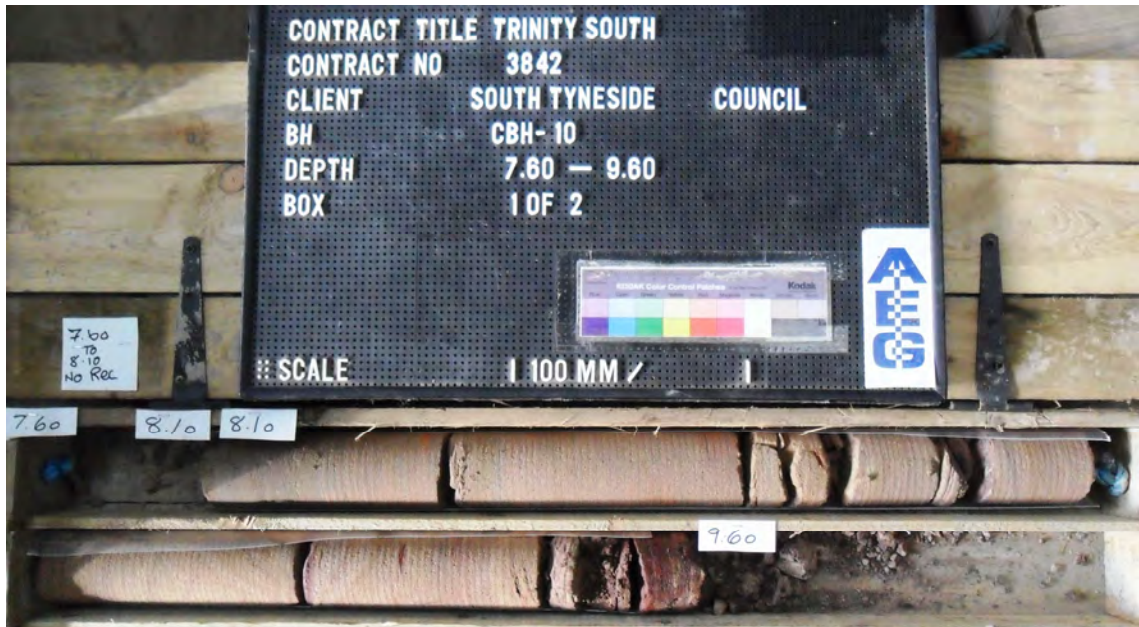


Figure CBH-10.1
7.60m - 9.60m BGL.



Figure CBH-10.2
9.60m - 12.60m BGL.

ENCLOSURE 3

Window/Windowless Sample Hole Records



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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436019.588 N:565933.147	CWS-01	
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 7.600	Date: 21/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.30-0.50 0.50 0.50	B1 ES2 PID	0.0 ppm	7.550 6.900		(0.05) 0.05 (0.65) 0.70	<p>(1) MADE GROUND (Grass over topsoil).</p> <p>MADE GROUND (Firm and stiff (desiccated) brown to grey brown sandy gravelly clay with some intermixed pockets/interbeds of silty/clayey very gravelly sand. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include concrete and brick).</p> <p>at c.0.70m BGL ... concrete obstruction.</p> <p>Windowless sample hole terminated in inspection pit at 0.70m BGL.</p>	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
21/09/2011 21/09/2011	0.00 0.70			Dry						(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Re-drilled as CWS-01A.

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436020.110 N:565937.671	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 6.930	Date: 23/09/2011
		Sheet: 1 of 1	

SAMPLES & TESTS			STRATA				Instrument/ Backfill	
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTION
				6.430		0.50	(1) MADE GROUND (Gravelly soil with concrete). at c.0.50m BGL ... concrete obstruction. Windowless sample hole terminated in inspection pit at 0.50m BGL due to encountering concrete obstruction.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
23/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Redrill of CWS-01. (4) Redrilled as CWS-01B.
23/09/2011	0.50									

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: N/A	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436020.360 N:565939.349	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 7.086	Date: 23/09/2011
			Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
1.00	ES1 PID SJ2 U3	0.4 ppm N7 (122)	↓	7.036		(0.05) 0.05	(1) MADE GROUND (Grass over topsoil).
1.00				5.886		1.20	MADE GROUND (Brown to grey brown silty/clayey very gravelly sand with intermixed pockets/interbeds of firm brown slightly sandy slightly gravelly clay with low to medium cobble content. Sand includes occasional ash. Gravel is angular to subangular fine to coarse and includes brick, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include concrete and brick).
1.20-1.65				4.686		2.40	MADE GROUND (Very loose and loose grey brown to brown clayey very gravelly sand with low to medium cobble content and occasional interbeds/pockets of soft and firm sandy clay. Sand includes some ash and mortar fines. Gravel is fine to coarse angular to subangular and includes brick, flint, sandstone, slag, and concrete. Cobbles are mainly angular and includes concrete and brick).
1.20-2.10				4.286		2.80	at c.1.20m BGL ... medium interbed of firm orange brown slightly sandy clay. at c.1.90m BGL ... thin interbed of light brown silty sand. at c.2.10m BGL ... pockets/lenses of light brown clayey sand with gravel sized brick and black timber fragments (moderate odour of creosote).
2.10-2.55	SJ4 U5 ES _(SS1)	N1 (22)	↓	4.686		2.40	MADE GROUND (Soft grey to dark grey slightly organic very sandy clay/silt with occasional organic material (wood and amorphous remains) and slight organic odour). (Possible Relict Topsoil).
2.10-3.10				4.286		2.80	Soft and firm (medium strength) light brown to grey brown mottled orange and blue grey slightly sandy slightly gravelly CLAY. Gravel is fine subangular to subrounded and includes sandstone and occasional coal.
2.40-2.80	SJ6 U7	N8 (74)	↓	4.286		(1.30)	at c.2.80m BGL ... water softened at contact with made ground above.
3.10-3.55				2.986		4.10	Firm (medium to high strength) dark red brown slightly sandy slightly gravelly CLAY with occasional brown sand lenses/pockets. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal.
3.10-4.10				1.986		5.10	Stiff (high strength) dark brown to brown slightly sandy slightly gravelly CLAY with low cobble content and occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal. Cobbles are subangular to subrounded and include sandstone.
4.10-4.55	SJ8 U9	N15 (65)	↓	2.986		(1.00)	Windowless sample hole terminated at 5.55m BGL due to water ingress affecting sampling.
4.10-5.10				1.986		5.10	
5.10-5.55	SJ10	N21	↓	1.986		(0.45) 0.45	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
23/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Redrill of CWS-01A. (4) Water strike at 3.10m BGL - water level rose to 3.00m BGL after 20 mins.
23/09/2011	5.55	2.00	116	3.93						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-02	
Client: South Tyneside Council		Location: South Shields E:435987.584 N:565945.867	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 6.969	Date: 21/09/2011 Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.35 0.35 0.50-1.00	ES1 PID B2	0.0 ppm	6.569		(0.40) 0.40	(1) MADE GROUND (Firm brown clay).	
1.00 1.00 1.20-1.65 1.20-2.10	ES3 PID SJ4 U5	0.0 ppm N11 (154)			(2.00)	MADE GROUND (Dark brown to brown clayey/silty very gravelly sand with low to medium cobble content and occasional pockets/interbeds of soft to stiff (desiccated) brown slightly sandy gravelly clay. Sand includes occasional ash. Gravel is angular to subangular fine to coarse and includes brick, concrete, slag, tile, sandstone and occasional flint. Cobbles are mainly angular and include concrete and brick). from c. 1.20m BGL ... loose and medium dense.	
2.10-2.55 2.10-3.10	SJ6 U7	N10 (65)	4.569		2.40		
3.10-3.55 3.10-4.10	SJ8 U9	N18 (115)	4.069		(0.50) 2.90	MADE GROUND (Soft and firm brown grey slightly organic sandy slightly gravelly silty clay with occasional organic material (amorphous remains) and slight organic odour. Gravel is fine to medium angular to subangular and includes sandstone). (Possible Relict Topsoil). from 2.80m BGL ... thin to medium interbed of brown slightly silty sand.	
4.10-4.55 4.10-5.10	SJ10 U11	N32 (132)			(2.65)	Firm and stiff (high strength) red brown mottled/veined blue grey and orange slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. from 2.90m to 3.10m BGL ... soft and firm (water softened).	
5.10-5.55	SJ12	N22	1.419		5.55	at c.5.10m BGL ... with occasional brown silty sand lenses/pockets.	
Windowless sample hole terminated at 5.55m BGL due to refusal.							

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
21/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
21/09/2011	5.55	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-03	
Client: South Tyneside Council	Location: South Shields E:435949.072 N:565999.855		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 7.775	Date: 26/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.50 0.50 0.60	ES1 PID LB2	0.3 ppm		7.725		(0.05) 0.05 (1.15)	(1) MADE GROUND (Grass over topsoil). MADE GROUND (Firm, in places stiff (desiccated) dark brown to grey brown sandy gravelly clay with low cobble content, occasional intermixed pockets/interbeds of silty/clayey very gravelly sand and organic material (rootlets). Gravel is fine to coarse angular to subangular and includes brick, magnesian limestone, concrete and occasional flint. Cobbles are mainly angular and include concrete and brick).
1.00 1.00 1.20-1.65 1.20-2.10	ES3 PID SJ4 U*B5	0.3 ppm N21 (67)		6.575		(0.90) 1.20	MADE GROUND (Medium dense light yellow brown very clayey slightly gravelly sand with low cobble content, some intermixed pockets/interbeds of soft and firm light grey brown sandy gravelly clay and black organic clayey silt. Gravel is fine to coarse angular to subangular and includes sandstone, concrete and brick. Cobbles are angular and include brick and concrete. at c.1.20m BGL ... ash and clinker pocket.
2.10-2.55 2.10-3.10	SJ6 U7	N5 (30)		5.675		(1.90) 2.10	MADE GROUND (Brown to grey brown clayey/silty very sandy gravel with occasional interbeds of soft grey clay. Gravel is fine to coarse angular to subrounded and includes flint, sandstone, brick and occasional clinker). (Driller notes cobbles). at c.2.10m BGL ... loose. between 2.40m to 2.70m BGL ... light brown silty fine to medium sand. at c.2.80m BGL ... coarse clinker gravel. between c.2.90m and 3.10m BGL ... medium interbed of brown silty medium to coarse sand with occasional shell. at c.3.10m BGL ... medium dense thin interbed of black organic silt.
3.10-3.55 3.10-4.10	SJ8 U9	N29 (86)		3.775		(0.90) 4.00	Soft and firm (low strength) light brown mottled orange and grey slightly sandy CLAY.
4.10-4.55 4.10-5.10	SJ10 U11	N7 (38)		2.875		(0.65) 4.90	Firm (low to medium strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. (Engineer notes poor sample recovery; description based on SPT sample).
5.10-5.55 5.10-6.00	SJ12 U13	N8 (93)		2.225		(0.65) 5.55	Windowless sample hole complete at 5.55m BGL.

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
27/09/2011	1.20									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Soakaway test carried out at 1.00m and 2.00m BGL - refer to In-situ Enclosures for further details. (4) Drilling difficulties due to water in windowless sample hole from soakaway test.
27/09/2011	5.55	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-04	
Client: South Tyneside Council	Location: South Shields E:435996.379 N:565997.265		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 7.703	Date: 21/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50	ES1 B2 PID	0.0 ppm	7.653		(0.05) 0.05	(1) MADE GROUND (Grass over topsoil).		
0.50-1.00			7.303		(0.35) 0.40	(1) MADE GROUND (Brown gravelly clay with bricks and cobbles).		
0.50								MADE GROUND (Brown to grey brown silty, in places very clayey, very gravelly sand with low to medium cobble content and intermixed pockets/interbeds of soft and firm orange brown slightly sandy slightly gravelly clay. Sand includes occasional ash. Gravel is angular to subangular fine to coarse and includes brick, concrete, slag, tile, sandstone and occasional flint. Cobbles are mainly angular and include concrete and brick). between 1.20 and 1.60m BGL ... interbed of soft (low strength) orange brown slightly sandy clay.
1.00	ES3 PID SJ4 U5	0.1 ppm			(1.70)			
1.00								
1.20-1.65								
1.20-2.10								
2.10-2.55	SJ6 U7	N5 (62)	5.603		2.10	MADE GROUND (Loose black to dark grey slightly organic very silty fine sand with occasional organic material (amorphous remains) and slight organic odour). (Possible Relict Topsoil). between 2.40 and 2.50m BGL ... intermixed with stratum below.		
2.10-3.10			5.203		(0.40) 2.50	Firm and stiff (high strength) red brown mottled/veined (gleyed) blue grey and orange slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. between 2.50m and 2.70m BGL ... soft and firm (water softened).		
3.10-3.55	SJ8 U9	N26 (130)			(1.60)			
3.10-4.10								
4.10-4.55	SJ10 U11	N31 (97)	3.603		4.10	Stiff and very stiff (high to very high strength) dark brown slightly sandy slightly gravelly CLAY with occasional silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal.		
4.10-5.10								
5.10-5.55	SJ12 U13	N41 (71)			(1.90)			
5.10-6.00								
			1.703		6.00	Windowless sample hole complete at 6.00m BGL.		

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
21/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
21/09/2011	6.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-05
Client: South Tyneside Council	Location: South Shields E:435949.653 N:566135.214	
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 9.783	Date: 23/09/2011
Sheet: 1 of 1		

SAMPLES & TESTS			STRATA				Instrument/ Backfill
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	
0.50	ES1 B2 PID	0.0 ppm	↓	9.733		(0.05) 0.05	(1) MADE GROUND (Grass over topsoil).
0.50-1.00				9.083		(0.65) 0.70	MADE GROUND (Brown to orange brown sandy gravelly clay with low to medium cobble content and intermixed interbeds/pockets of silty/clayey very gravelly sand. Occasional organic material (rootlets) and plastic fragments. Sand includes occasional ash. Gravel is angular to subangular fine to coarse and includes brick, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include concrete).
0.50							
1.00	ES3 PID SJ4 U5	0.2 ppm N7 (98)	↓	7.983		(1.10) 1.80	MADE GROUND (Loose grey brown to brown clayey very gravelly sand with low to medium cobble content and occasional interbeds/pockets of soft and firm sandy clay. Sand includes some ash and mortar fines. Gravel is fine to coarse angular to subangular and includes flint, brick, sandstone and concrete. Cobbles are mainly angular and include concrete and brick).
1.00				7.883		(1.10) 1.90	at c.1.20m BGL ... gravel sized clinker fragments.
1.20-1.65							
1.20-2.10							at c.1.70m BGL ... thin interbeds of light brown and green gravelly silty sand with a moderate chemical odour.
1.70	ES _(SS1)		↓	6.883		(1.20) 2.90	MADE GROUND (Soft grey to dark grey brown slightly organic sandy slightly gravelly clay with occasional organic material (amorphous remains) and slight organic odour). (Possible Relict Topsoil).
2.10-2.55							
2.10-3.10	SJ6 U7	N11 (106)	↓	5.683		(1.20) 4.10	Firm (medium strength) red mottled (gleyed) orange and blue grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal.
2.10-3.10							
3.10-3.55	SJ8 U9	N24 (157)	↓	5.233		(0.45) 4.55	Firm and stiff (high strength) dark red brown to brown occasionally veined (gleyed) blue grey slightly sandy slightly gravelly CLAY with occasional brown silty sand lenses/pockets. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal.
3.10-4.10							
4.10-4.55	SJ10	N32	↓				Stiff (high to very high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with low cobble content and occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal. Cobbles are subangular to subrounded and include sandstone. Windowless sample hole terminated at 4.55m BGL due to refusal.

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
23/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Water strike at 4.04m - no rise in water level after 20 mins.
23/09/2011	4.55	2.00	116	4.04						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:435993.935 N:566084.006	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 9.188	Date: 22/09/2011
			Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50	ES1 B2 PID	0.1 ppm	9.138		(0.05) 0.05	MADE GROUND (Grass over topsoil).		
0.50-1.00			8.488		(0.65) 0.70	MADE GROUND (Brown to grey brown very silty/clayey very gravelly sand with intermixed pockets/interbeds of firm brown slightly sandy slightly gravelly clay with low to medium cobble content. Sand includes occasional ash. Gravel is angular to subangular fine to coarse and includes brick, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include concrete and brick).		
0.50								
1.00	ES3 PID SJ4 U5	0.0 ppm N19 (248)			(1.60)	MADE GROUND (Medium dense grey brown to brown clayey very gravelly sand with low to medium cobble content and occasional interbeds/pockets of soft and firm sandy clay. Sand includes ash and mortar fines. Gravel is fine to coarse angular to subangular and includes brick, flint, sandstone, slag and concrete. Cobbles are mainly angular and include concrete and brick).		
1.00-1.65			6.888		2.30	at c.1.60m BGL ... brick cobble and brick fragments.		
1.20-2.10			6.688		(0.20) 2.50	between c.1.60 and 1.75m BGL ... interbed of soft brown grey sandy clay. from c.2.10m BGL ... interbed of gravelly slightly sandy silty clay. Gravel is fine to coarse angular and includes brick and refractory brick.		
2.10-2.55	SJ6 U7	N7 (31)			(1.30)	MADE GROUND (Black to dark grey slightly organic very clayey/silty fine sand with occasional organic material (amorphous remains) and slight organic odour). (Possible Relict Topsoil).		
2.10-3.10			5.388		3.80	Soft and firm (medium strength) fissured (incipiently thinly laminated) light orange brown mottled orange and blue grey slightly sandy CLAY.		
3.10-3.55	SJ8 U9	N11 (85)			(1.30)	Firm (medium strength) thinly laminated (incipiently in places) orange brown to red brown veined (gleyed) blue grey slightly sandy CLAY with occasional silt dusting on laminae.		
3.10-4.10			4.088		5.10			
4.10-4.55	SJ10 U11	N12 (59)			(0.90)	Stiff (high strength) dark red brown to brown mottled/veined (gleyed) blue grey slightly sandy slightly gravelly CLAY with low cobble content and occasional brown silty sandy pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal. Cobbles are subangular to subrounded and include sandstone.		
4.10-5.10			3.188		6.00			
5.10-5.55	SJ12 U13	N22 (125)				Windowless sample hole complete at 6.00m BGL.		
5.10-6.00								

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
22/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
22/09/2011	6.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-07	
Client: South Tyneside Council	Location: South Shields E:436037.017 N:566063.871		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 8.555	Date: 22/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50 0.50-1.00 0.50	ES1 B2 PID	0.0 ppm	8.505		(0.05) 0.05 (1.15)	(1) MADE GROUND. MADE GROUND (Brown to dark brown clayey, in places very clayey, very sandy gravel with low to medium cobble content and intermixed pockets/interbeds of firm to stiff (desiccated) orange brown slightly sandy slightly gravelly clay. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, refractory brick, sandstone, flint and occasional slag. Cobbles are mainly angular and include concrete and brick).		
1.00 1.00 1.20-1.65 1.20-2.10	ES3 PID SJ4 U5	0.0 ppm N4 (118)	7.355		(0.90) 2.10	MADE GROUND (Loose dark brown to black slightly gravelly very silty sand. Sand includes ash and occasional coal. Gravel is fine to coarse angular to subangular and includes clinker, coal and brick). at c.1.40m BGL ... medium interbed of grey slightly silty slightly gravelly sand. Gravel is mainly angular clinker. at c.1.60m BGL ... thin to medium interbed of light brown silty sand.		
2.10-2.55 2.10-3.10	SJ6 U7	N4 (46)	6.455 6.155		(0.30) 2.40	MADE GROUND (Dark grey to black slightly silty sandy gravel. Sand includes ash. Gravel is fine to coarse angular to subangular and includes clinker and slag).		
3.10-3.55 3.10-4.10	SJ8 U9	N15 (71)	5.855		(0.30) 2.70	MADE GROUND (Black to dark grey slightly organic slightly gravelly sandy silty clay with occasional organic material (amorphous remains) and slight organic odour). from 2.40m BGL ... intermixed with stratum above.		
4.10-4.55 4.10-5.10	SJ10 U11	N18 (56)	4.755		(1.10) 3.80	Firm (medium to high strength) light brown to orange brown mottled blue grey and orange slightly sandy slightly gravelly CLAY with occasional silt pockets (<20mm). Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal.		
5.10-5.55 5.10-6.00	SJ12 U13	N21 (152)	3.855		(0.90) 4.70	Firm and stiff (high strength) red brown mottled grey (gleying) slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal.		
			2.555		(1.30) 6.00	Stiff and very stiff (high strength) dark brown slightly sandy slightly gravelly CLAY with low cobble content and occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal. Cobbles are subangular to subrounded and include sandstone.		
Windowless sample hole complete at 6.00m BGL.								

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
22/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
22/09/2011	6.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-08	
Client: South Tyneside Council		Location: South Shields E:435983.261 N:566135.867	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 10.122	Date: 28/09/2011
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50 0.50 0.60	ES1 PID B2	0.0 ppm	10.072		(0.05) 0.05 (1.15)	(1) MADE GROUND (Grass over topsoil). MADE GROUND (Firm, in places stiff (desiccated) dark brown to grey brown sandy gravelly clay with low cobble content, occasional intermixed pockets/interbeds of silty/clayey very gravelly sand and organic material (rootlets). Gravel is fine to coarse angular to subangular and includes brick, magnesian limestone, concrete and occasional flint. Cobbles are mainly angular and include concrete and brick).		
1.00 1.20-1.65 1.20-2.10 1.20	ES3 SJ4 U5 PID	N16 (33) 0.1 ppm	8.922		(0.50) 1.20 1.70	MADE GROUND (Medium dense dark brown, black in places, silty/clayey gravelly sand with some intermixed interbeds/pockets of soft grey sandy clay and organic silt. Sand includes occasional ash. Gravel is fine to medium, occasionally coarse, and includes brick, sandstone, refractory brick and concrete).		
2.10-2.55 2.10-3.10	SJ6 U7	N2 (41)	8.422		(1.40) 3.10	MADE GROUND (Very soft grey brown slightly sandy slightly gravelly clay. Gravel is fine to coarse angular to subangular and includes sandstone, clinker, brick and concrete).		
3.10-3.55 3.10-4.10	SJ8 U9	N2 (39)	7.022		(2.05) 5.15	Firm (incipiently thinly laminated in places) red brown mottled/veined (gleyed) blue grey slightly sandy slightly gravelly CLAY with occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal. (Engineer notes veining diminishing with depth). at c.4.10m BGL ... poor liner sample recovery.		
4.10-4.55 4.10-5.10	SJ10 U11	N16 (106)	4.972		(0.40) 5.55	Firm (high strength) dark brown slightly sandy slightly gravelly CLAY with occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. (Engineer notes stratum assessment determined from SPT sample only.) Windowless sample hole complete at 5.55m BGL.		

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
28/09/2011	0.00	0.00								(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Soakaway test carried out at 1.00m and 2.00m BGL - refer to In-situ Enclosures for further details.
28/09/2011	5.50	2.00	116							

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436056.492 N:566141.798	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 10.675	Date: 26/09/2011
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
			10.625		(0.06)	(1) MADE GROUND (Macadam).	
			10.445		(0.18)	(1) MADE GROUND (Magnesian limestone sub-base).	
0.50 0.50-1.00 0.50	ES1 B2 PID	0.0 ppm			(0.77)	MADE GROUND (Brown to grey brown gravelly very silty fine to medium sand with low to medium cobble content. Sand includes occasional ash. Gravel is fine to coarse subangular to rounded and includes sandstone, flint, slag, quartz and occasional clinker. Cobble are angular and include slag).	
1.00	ES3		9.675		1.00	MADE GROUND (Loose reddish brown to brown silty very gravelly sand with some intermixed pockets of soft orange brown sandy clay. Sand includes clinker, slag and burnt red shale fines. Gravel is fine to coarse angular to subangular and includes clinker, slag, brick and occasional burnt red shale).	
1.20-1.65 1.20-2.10 1.20	SJ4 U5 PID	N6 (70) 0.2 ppm	9.275		(0.40)	MADE GROUND (Soft dark brown to brown grey sandy slightly gravelly clay with thin interbeds of clayey fine to medium gravel sized burnt shale and mudstone. Gravel is fine to medium angular and includes mudstone and burnt red shale).	
			9.075		(0.20)	MADE GROUND (Light brown silty slightly gravelly fine to medium sand with occasional clay pockets (<10mm). Gravel is fine to medium angular and includes mudstone and burnt red shale).	
2.10-2.55 2.10-3.10	SJ6 U7	N1 (75)	8.375		(0.70)	MADE GROUND (Soft and firm (very low strength) grey to brown grey slightly sandy slightly gravelly clay with some intermixed pockets/interbeds of clayey very gravelly sand and black organic silt. Sand includes ash and mortar fines. Gravel is fine to coarse angular to subangular and includes brick, chalk, concrete. at c.1.35m BGL thin interbeds of soft and firm brown grey slightly sandy clay.	
			7.875		(0.50)	MADE GROUND (Soft dark brown to brown grey sandy slightly gravelly clay with thin interbeds of clayey fine to medium gravel sized burnt shale and mudstone. Gravel is fine to medium angular and includes mudstone and burnt red shale).	
3.10-3.55 3.10-4.10	SJ8 U9	N2 (17)			(1.30)	MADE GROUND (Light brown silty slightly gravelly fine to medium sand with occasional clay pockets (<10mm). Gravel is fine to medium angular and includes mudstone and burnt red shale).	
			6.575		(1.90)	MADE GROUND (Soft and firm (very low strength) grey to brown grey slightly sandy slightly gravelly clay with some intermixed pockets/interbeds of clayey very gravelly sand and black organic silt. Sand includes ash and mortar fines. Gravel is fine to coarse angular to subangular and includes brick, chalk, concrete. at c.3.90m BGL ... chalk fragments. at c.4.10m BGL ... thin medium interbed of grey to black organic clayey sand.	
4.10-4.55 4.10-5.10	SJ10 U11	N5 (74)			(1.90)	Firm and stiff (medium to high strength) dark red brown mottled/veined (gleyed) blue grey and orange slightly sandy slightly gravelly CLAY with occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal. (Engineer notes mottling/veining diminishing with depth). between 4.10m and 4.40m BGL ... water softened at contact with made ground above.	
5.10-5.55 5.10-6.00	SJ12 U13	N26 (175)	4.675		6.00	Windowless sample hole complete at 6.00m BGL.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
26/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
26/09/2011	6.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-10	
Client: South Tyneside Council		Location: South Shields E:435940.175 N:566184.446	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 10.249	Date: 28/09/2011
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.50 0.60	ES1 B2		10.199		(0.05) 0.05 (1.15)	(1) MADE GROUND (Grass over topsoil). MADE GROUND (Firm, in places stiff (desiccated), dark brown to grey brown sandy gravelly clay with low cobble content, occasional intermixed pockets/interbeds of silty/clayey very gravelly sand and organic material (rootlets). Gravel is fine to coarse angular to subangular and includes brick, magnesian limestone, concrete and occasional flint. Cobbles are mainly angular and include concrete and brick).	
1.00 1.20-1.65 1.20-2.10	ES3 SJ4 U5	N5 (72)	9.049		1.20	MADE GROUND (Soft and firm (extremely low to very low strength) dark brown to brown sandy gravelly clay with low to medium cobble content and occasional pockets of silty sandy gravel. Gravel is fine to coarse angular to subangular and includes sandstone, clinker, brick, flint, magnesian limestone and concrete. Cobbles are angular and include brick and concrete). at c.1.20m BGL ... interbed of sand to gravel sized magnesian limestone. at c.2.10m BGL ... interbed of very clayey gravelly sand.	
2.10-2.55 2.10-3.10	SJ6 U*B7	N2 (37)			(2.10)		
3.10-3.55 3.10-3.10	SJ8 U9	N42 (183)	6.949		3.30		
4.10-4.55 4.10-5.10	SJ10 U11	N19 (119)			(2.25)	Firm and stiff (high strength) dark brown slightly sandy slightly gravelly CLAY with occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. at c.4.10m BGL ... incipiently thinly laminated.	
5.10-5.55	SJ12	N39	4.699		5.55	Windowless sample hole complete at 5.55m BGL.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
28/09/2011	0.00	0.00								(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Soakaway test carried out at 1.00m and 2.00m BGL - refer to In-situ Enclosures for further details.
28/09/2011	5.55	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-11	
Client: South Tyneside Council	Location: South Shields E:436013.454 N:566215.647		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 11.577	Date: 23/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.50	ES1	0.0 ppm	11.527		0.05	(1) MADE GROUND (Grass over topsoil).	
0.50-1.00	B2 PID		10.877		0.70	MADE GROUND (Firm, in places stiff (desiccated), brown to orange brown sandy gravelly clay with low to medium cobble content and intermixed pockets /interbeds of silty/clayey very gravelly sand. Occasional organic material (rootlets) and timber fragments. Sand includes occasional ash. Gravel is angular to subangular fine to coarse an includes, brick, magnesian limestone, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include brick and concrete).	
1.00	ES3	0.0 ppm	9.977		1.60	MADE GROUND (Soft and firm (very low strength) orange brown to brown sandy gravelly clay with low to medium cobble content and some intermixed pockets/lenses of very gravelly sand/very sandy gravel. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include brick and concrete).	
1.00-1.20	PID				1.60	1.60	
1.20-1.65	SJ4	N4 (32)	8.477		3.10	Firm and stiff (medium to high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal.	
1.20-2.10	U5				3.10	3.10	
2.10-2.55	SJ6	N7 (61)	7.927		3.65	Windowless sample hole terminated at 3.78m BGL - due to sample refusal.	
2.10-3.10	U7				3.65	3.65	
3.10-3.55	SJ8	N18 (143)	7.797		3.78		
3.10-3.78	U9				3.78	3.78	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
23/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
23/09/2011	3.78	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:435923.108 N:566264.983	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 10.847	Date: 26/09/2011
			Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.50 0.50-1.00 0.50	ES1 B2 PID	0.4 ppm	10.797		(0.05) 0.05 (0.45) 0.50	<p>(1) MADE GROUND (Grass over topsoil).</p> <p>MADE GROUND (Firm, in places stiff (desiccated), dark brown to grey brown sandy gravelly clay with low cobble content, occasional intermixed pockets/interbeds of silty/clayey very gravelly sand and organic material (rootlets). Gravel is fine to coarse angular to subangular and includes brick, magnesian limestone, concrete and occasional flint. Cobble are mainly angular and include concrete and brick).</p>	
1.00 1.00-1.65 1.20-2.10	ES3 PID SJ4 U5	0.6 ppm N4 (46)	9.747 9.447		(0.60) 1.10 (0.30) 1.40	<p>MADE GROUND (Brown to light brown silty gravelly fine to medium sand with occasional organic material (rootlets) and occasional firm brown clay pockets (<150mm). Sand includes occasional ash. Gravel is fine to medium, occasionally coarse, and includes brick, sandstone, and concrete).</p>	
2.10-2.55 2.10-3.10	SJ6 U7	N2 (54)	8.747		(0.70) 2.10	<p>MADE GROUND (Black and red brown silty gravelly sand. Sand includes burnt red shale, ash and clinker fines. Gravel is mainly fine to medium angular and includes red mudstone, slag and clinker).</p>	
3.10-3.55 3.10-4.10	SJ8 U9	N20 (126)			(3.45)	<p>MADE GROUND (Very soft and soft grey brown to brown mottled black slightly organic slightly gravelly sandy clay/silt with some organic material (amorphous remains) and slight organic odour. Gravel is mainly fine to medium and includes sandstone). (Engineer notes black mottling represents organic constituent of material - Possible Relict Topsoil).</p>	
4.10-4.55 4.10-5.10	SJ10 U11	N24 (120)				<p>Firm and stiff dark red brown mottled/veined (gleyed) blue grey and orange slightly sandy slightly gravelly CLAY with occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone and occasional coal. (Engineer notes mottling veining diminishing with depth).</p>	
5.10-5.55	SJ12	N28	5.297		5.55	<p>Windowless sample hole complete at 5.55m BGL.</p>	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
26/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
26/09/2011	5.55	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. CWS-13	
Client: South Tyneside Council	Location: South Shields E:436019.910 N:566255.439		
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 11.221	Date: 29/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50 0.50-1.00 0.50	ES1 B2 PID	0.0 ppm	11.171		(0.05) 0.05 (0.95)	(1) MADE GROUND (Grass over topsoil). MADE GROUND (Firm, in places stiff (desiccated) dark brown to grey brown sandy gravelly clay with low cobble content, occasional intermixed pockets/interbeds of silty/clayey very gravelly sand and organic material (rootlets). Gravel is fine to coarse angular to subangular and includes brick, magnesian limestone, concrete and occasional flint. Cobbles are mainly angular and include concrete and brick).		
1.00 1.00 1.20-1.65 1.20-2.10	ES3 PID SJ4 U5	0.0 ppm N9 (139)	10.221		(0.90)	Soft and firm (medium strength) closely fissured light grey brown mottled grey and orange slightly sandy CLAY.		
2.10-2.55 2.10-3.10	SJ6 U7	N16 (193)	9.321		(1.90)	Firm (medium to high strength) brown mottled grey and orange slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded and includes sandstone and occasional coal. (Engineer notes mottling diminishing with depth).		
3.10-3.55 3.10-4.10	SJ8 U9	N21 (126)			(2.20)	from c.3.10m BGL ... brown/dark brown.		
4.10-4.55 4.10-5.10	SJ10 U11	N39 (121)	7.121		4.10	Dense brown silty fine to medium SAND.		
			6.621		(0.50) 4.60			
5.10-5.55	SJ12	N48			(0.85)	Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to medium subangular to subrounded and includes sandstone and occasional coal.		
			5.771		5.45			
			5.671		(0.10) 5.55	Very weak to weak light red brown fine to medium grained SANDSTONE partially to distinctly weathered. (Possible Bedrock) Windowless sample hole complete at 5.55m BGL.		

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
29/09/2011	0.00	0.00								(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Soakaway test carried out at 1.00m and 2.00m BGL - refer to In-situ Enclosures for further details.
29/09/2011	5.55	2.00	116	2.00						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436042.370 N:565930.642	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 7.310	Date: 27/09/2011
		Sheet: 1 of 1	

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
0.50 0.50-1.00 0.50	ES1 B2 PID	0.5 ppm			(2.00)	MADE GROUND (Dark brown to brown silty very sandy gravel with medium cobble/boulder content. Sand is mainly crushed mortar. Gravel is fine to coarse angular to subangular and includes brick and concrete. Cobbles/boulders are angular and include concrete and brick).	
1.00 1.00 1.20-1.65 1.20-2.00	ES3 PID SJ4 U*J5	1.5 ppm N6 (110)			2.00	at c.1.20m BGL ... loose.	
			5.310			at c.2.00m BGL ... concrete (possible basement structure). Windowless sample hole terminated at 2.00m BGL due to encountering a concrete obstruction.	

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
27/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Windowless sample hole undertaken in a compound previously occupied by a public house which has recently been demolished. (4) Re-drilled as CWS-14A.
27/09/2011	2.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:436037.601 N:565926.903	
Method (Equipment): Windowless Sampling (PC Tracker S110)		Ground Level (m(AOD)): 7.230	Date: 27/09/2011
			Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA			Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	
1.20-1.65 1.20-2.10	SJ1 U2	N10 (96)		[Cross-hatch pattern]	(2.45)	MADE GROUND (Dark brown to brown silty very sandy gravel with medium cobble/boulder content. Sand is mainly crushed mortar. Gravel is fine to coarse angular to subangular and includes brick and concrete. Cobbles and boulders are angular and include concrete and brick). at c.1.20m BGL ... loose to medium dense.	[Cross-hatch pattern]
2.10-2.55 2.10-3.10	SJ3 U4	N2 (46)	4.780	[Cross-hatch pattern]	2.45	at c.2.10m BGL ... very loose.	[Cross-hatch pattern]
3.10-3.55 3.10-4.10	SJ5 U6	N8 (100)	4.580	[Wavy pattern]	(0.20) 2.65	Soft grey mottled black slightly organic slightly sandy CLAY with some organic material (amorphous remains) and slight organic odour. (Engineer notes black mottling represents organic constituent).	[Wavy pattern]
3.10-3.55 3.10-4.10	SJ5 U6	N8 (100)	4.230	[Wavy pattern]	(0.35) 3.00	Soft and firm light brown mottled orange and grey slightly sandy CLAY.	[Wavy pattern]
4.10-4.55 4.10-5.10	SJ7 U8	N10 (49)	[Wavy pattern]	[Wavy pattern]	(1.90)	Firm (low to medium strength) closely fissured dark red brown mottled/veined (gleyed) blue grey slightly sandy CLAY with occasional white grey silt pockets (<30mm).	[Wavy pattern]
5.10-5.55 5.10-6.00	SJ9 U10	N26 (120)	2.330	[Wavy pattern]	4.90	Firm (high strength) dark brown to grey brown slightly sandy slightly gravelly CLAY with occasional pockets of silty brown sand. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone, siltstone and occasional coal. (Engineer notes poor sample recovery).	[Wavy pattern]
5.10-5.55 5.10-6.00	SJ9 U10	N26 (120)	1.230	[Wavy pattern]	(1.10) 6.00	Windowless sample hole complete at 6.00m BGL.	[Wavy pattern]

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
27/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling. (3) Windowless sample hole undertaken in a compound previously occupied by a public house which has recently been demolished. (4) Re-drill of CWS-14.
27/09/2011	6.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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WINDOW/WINDOWLESS SAMPLE HOLE RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation	Exploratory Hole No.
Client: South Tyneside Council	South Shields E:435944.445 N:566055.963
Method (Equipment): Windowless Sampling (PC Tracker S110)	Ground Level (m(AOD)): 8.229
Date: 22/09/2011	Sheet: 1 of 1

SAMPLES & TESTS			Water	STRATA				Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	
0.50 0.50-1.00 0.50	ES1 B2 PID	0.0 ppm	8.179	[Cross-hatch pattern]	(0.05) 0.05	(1) MADE GROUND (Grass over topsoil).	[Cross-hatch pattern]	
1.00 1.00 1.20-1.65 1.20-2.10	ES3 PID SJ4 U5	0.0 ppm N11 (100)	7.379		(0.80) 0.85	MADE GROUND (Brown to grey brown silty/clayey very gravelly sand with intermixed pockets/interbeds of firm brown slightly sandy slightly gravelly clay with occasional plastic fragments. Sand includes occasional ash. Gravel is fine to coarse angular to subangular and includes brick, concrete, flint, sandstone and occasional slag. Cobbles are mainly angular and include concrete and brick).		
2.10-2.55 2.10-3.10	SJ6 U7	N5 (65)	6.179 6.029	[Cross-hatch pattern]	(1.20) 2.05	MADE GROUND (Loose to medium dense light brown to grey brown silty gravelly sand. Gravel is fine to coarse subangular to rounded and includes flint, chert and brick).	[Cross-hatch pattern]	
3.10-3.55 3.10-4.10	SJ8 U9	N22 (117)	5.429		(0.15) 2.20 (0.60) 2.80	MADE GROUND (Black to dark grey slightly organic very clayey/silty fine sand with occasional organic material (amorphous remains) and slight organic odour). MADE GROUND (Soft grey brown mottled black slightly organic slightly sandy clay with some organic material (amorphous remains) and moderate organic odour). (Possible Relict Topsoil).		
4.10-4.55 4.10-5.10	SJ10 U11	N23 (87)	4.429	[Horizontal lines pattern]	(1.00) 3.80	Stiff (high strength) red brown mottled/veined (gleyed) blue grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal.	[Horizontal lines pattern]	
5.10-5.55 5.10-6.00	SJ12 U13	N25 (154)	2.229		(2.20) 6.00	Stiff and very stiff (high strength) dark brown slightly sandy slightly gravelly CLAY with low cobble content and occasional brown silty sand pockets/lenses. Gravel is fine to coarse subangular to subrounded and includes sandstone, siltstone, mudstone and occasional coal. Cobbles are subangular to subrounded and include sandstone.		
Windowless sample hole complete at 6.00m BGL.								

Boring Progress and Water Observations					Chiselling			Water Added		General Remarks
Date	Depth	Casing	Casing Dia (mm)	Water Depth	From	To	Hours (hh:mm)	From	To	
22/09/2011	0.00									(1) Description derived from drillers daily report. (2) Inspection pit dug prior to drilling.
22/09/2011	6.00	2.00	116	Dry						

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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ENCLOSURE 4

Trial Trench Records



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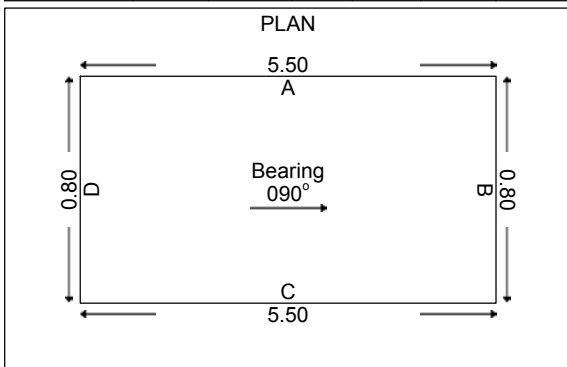
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TRIAL TRENCH RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-01	
Client: South Tyneside Council		Location: South Shields E:435983.463 N:565977.671	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 7.564	Date: 20/09/2011 Sheet: 1 of 3

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
				7.364	[Cross-hatched pattern]	(0.20) 0.20	MADE GROUND (Grass over topsoil).
				7.064		(0.30) 0.50	MADE GROUND (Soft and firm light brown to brown sandy clay).
				6.564	[Cross-hatched pattern]	(0.50) 1.00	MADE GROUND (Firm and stiff (desiccated) light brown to brown slightly sandy slightly gravelly clay with low cobble content. Gravel is fine to coarse angular to subrounded and includes brick, concrete and sandstone. Cobbles are mainly angular brick and concrete).
				5.564		(1.00) 2.00	MADE GROUND (Dark grey to brown grey clayey/silty very gravelly sand with low cobble content. Sand includes some ash. Gravel is fine to coarse angular to subrounded and includes sandstone, brick, chalk, flint and concrete. Cobbles are mainly angular and include flint, concrete and sandstone). between c.1.20 and 1.50m BGL ... pocket (<300mm) of organic clayey sand.
				5.464	[Cross-hatched pattern]	(0.10) 2.10	MADE GROUND (Firm black organic slightly sandy clay/silt with some organic material (fibres, grass and other amorphous remains) and moderate organic odour. (Possible Relict Topsoil Layer).
				4.364	[Horizontal line pattern]	(1.10) 3.20	Firm thinly to thickly laminated brown slightly sandy CLAY with silt dusting on the laminae surfaces and occasional thin interbeds (non-continuous) of brown silty fine to medium sand. between c.2.10 and 2.50m BGL ...soft and firm (water softened at contact with made ground). Trial trench complete at 3.20m BGL.



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides stable throughout excavation.

GENERAL REMARKS
 (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
 (2) No geotechnical or geoenvironmental samples were taken.
 (3) No foundation structures encountered.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-01	
Client: South Tyneside Council	Location: South Shields E:435983.463 N:565977.671		Sheet: 2 of 3
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.564	Date: 20/09/2011	

PHOTOGRAPHS



Figure TT-01.1
TT-01



Figure TT-01.2
TT-01



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-01	
Client: South Tyneside Council	Location: South Shields E:435983.463 N:565977.671		Sheet: 3 of 3
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.564	Date: 20/09/2011	

PHOTOGRAPHS



Figure TT-01.3
TT-01 Spoil



Figure TT-01.4
TT-01 Spoil



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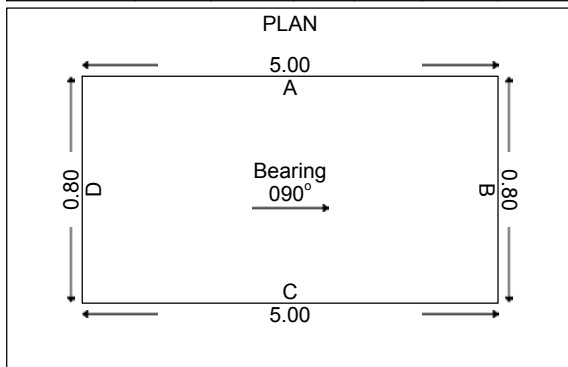
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TRIAL TRENCH RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-02	
Client: South Tyneside Council		Location: South Shields E:435995.046 N:566067.334	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 8.769	Date: 20/09/2011
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
			↓ Water	8.619		0.15	MADE GROUND (Grass over topsoil).
				8.369		0.40	MADE GROUND (Grey to black clayey very gravelly sand/very sandy gravel with low cobble content and occasional glass and reinforcement bar fragments. Sand includes occasional ash. Gravel is fine to coarse angular to subrounded and includes brick, concrete, limestone, sandstone and occasional flint. Cobbles are mainly angular and include concrete and brick).
				7.869		0.90	MADE GROUND (Firm brown to grey brown slightly sandy slightly gravelly clay with medium cobble content. Gravel is fine to coarse angular to subrounded and includes brick, concrete and sandstone. Cobbles are mainly angular brick and concrete).
				7.469		1.30	MADE GROUND (Brown slightly silty sand).
				7.369		1.40	MADE GROUND (Grey slightly silty gravelly sand with low to medium cobble content. Gravel is fine to coarse angular and includes brick and concrete. Cobbles are angular and include brick and concrete).
				6.469		2.30	at c.1.35m BGL ... medium boulder (<500mm) content. Boulders are mainly angular concrete.
				5.969		2.80	MADE GROUND (Dark grey to black grey slightly silty very gravelly sand with low cobble content. Sand includes mainly ash. Gravel is fine to coarse angular to subrounded and includes sandstone, clinker, brick, chalk, flint and concrete. Cobbles are mainly angular and include concrete and sandstone).
							Firm thinly to thickly laminated brown slightly sandy CLAY with silt dusting on laminae surfaces and occasional slightly gravelly interbeds. Gravel is mainly fine to medium subangular to subrounded and includes sandstone. Trial trench complete at 2.80m BGL.



GROUNDWATER
 Water strike (slight inflow) at 2.80m BGL.

STABILITY
 Pit sides slightly unstable.

GENERAL REMARKS
 (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
 (2) No geotechnical or geoenvironmental samples were taken.
 (3) No foundation structures encountered.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-02	
Client: South Tyneside Council	Location: South Shields E:435995.046 N:566067.334		
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 8.769	Date: 20/09/2011	Sheet: 2 of 4

PHOTOGRAPHS



Figure TT-02.1
TT-02



Figure TT-02.2
TT-02



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435995.046 N:566067.334	TT-02	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 8.769	Date: 20/09/2011	Sheet: 3 of 4

PHOTOGRAPHS



Figure TT-02.3
TT-02



Figure TT-02.4
TT-02



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-02	
Client: South Tyneside Council	Location: South Shields E:435995.046 N:566067.334		
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 8.769	Date: 20/09/2011	Sheet: 4 of 4

PHOTOGRAPHS



Figure TT-02.5
TT-02 Spoil



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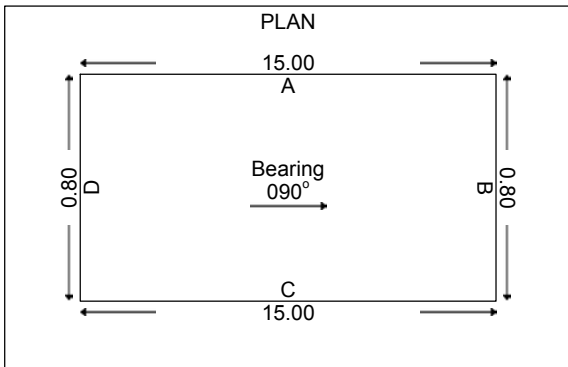
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TRIAL TRENCH RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-03	
Client: South Tyneside Council		Location: South Shields E:436002.170 N:566171.240	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 10.818	Date: 19/09/2011 Sheet: 1 of 5

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
0.00	PID	0.0 ppm		10.618	(0.20)	0.20	MADE GROUND (Grass over topsoil).
3.00	EW					(3.80)	MADE GROUND (Firm and stiff (desiccated) light brown to brown slightly sandy gravelly clay with high cobble and medium boulder content and pockets/interbeds of sandy very clayey gravel. Occasional glass, reinforcement bar, wood, plastic, wire cable and plastic pipe. Gravel is fine to coarse angular to subrounded and includes brick, concrete, flint and sandstone. Cobbles and boulders (<800mm) are mainly angular brick and concrete (including paving slab fragments) and occasional tarmac).
							at c.3.00m BGL .. water sample taken as groundwater appeared slightly oily with a strong stagnant odour.
				6.818		4.00	at c.3.90m BGL ... intermixed with some soft black organic slightly sandy clay/silt.
				6.768	(0.05)	4.05	MADE GROUND (Soft black organic slightly sandy clay/silt with some organic material (fibres, grass and other amorphous remains) and moderate organic odour. (Possible Relict Topsoil Layer).
				6.418	(0.35)	4.40	Firm and stiff brown slightly sandy gravelly CLAY with low cobble content. Gravel is fine to coarse subangular to subrounded and includes sandstone, mudstone and siltstone. Cobbles are subangular to subrounded and include sandstone. Trial trench complete at 4.40m BGL.



GROUNDWATER
 Water strike (moderate inflow) at 3.00m BGL.
 Water seepage (slow inflow) at 4.40m BGL.

STABILITY
 Pit sides stable throughout excavation.

GENERAL REMARKS
 (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
 (2) No geotechnical samples were taken.
 (3) No foundation structures encountered.
 (4) Trial trench backfilled using vibrating plate attachment to JCB rear bucket.

ADDITIONAL INFORMATION		
Sketch Diagram:	Sketch Taken	
Photographs:	Yes	See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436002.170 N:566171.240	TT-03	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 10.818	Date: 19/09/2011	Sheet: 2 of 5

PHOTOGRAPHS



Figure TT-03.1
TT-03



Figure TT-03.2
TT-03



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436002.170 N:566171.240	TT-03	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 10.818	Date: 19/09/2011	Sheet: 3 of 5

PHOTOGRAPHS



Figure TT-03.3
TT-03



Figure TT-03.4
TT-03



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Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436002.170 N:566171.240	TT-03	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 10.818	Date: 19/09/2011	Sheet: 4 of 5

PHOTOGRAPHS



Figure TT-03.5
TT-03



Figure TT-03.6
TT-03



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-03	
Client: South Tyneside Council	Location: South Shields E:436002.170 N:566171.240		
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 10.818	Date: 19/09/2011	Sheet: 5 of 5

PHOTOGRAPHS

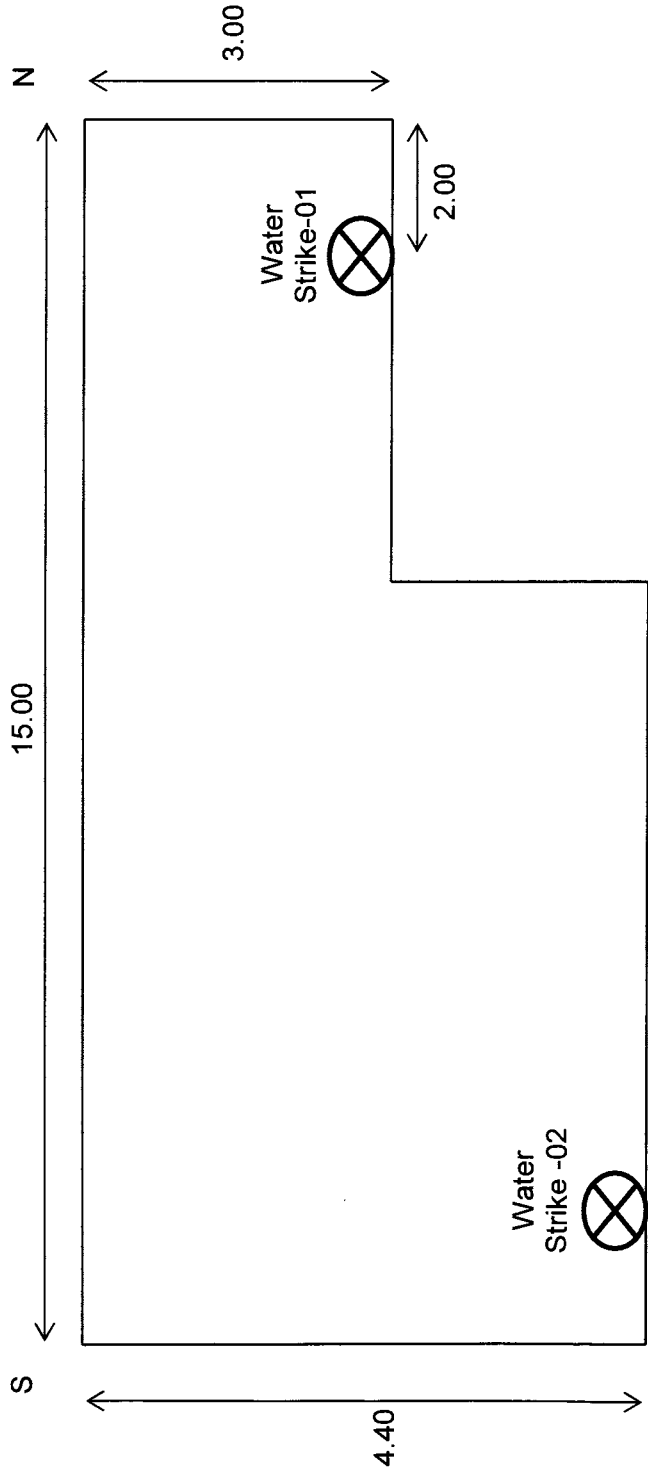


Figure TT-03.7
TT-03



Figure TT-03.8
TT-03 Spoil

Trial Pit Sketch TT-03



NOT TO SCALE

ALL MEASUREMENTS ARE IN METRES



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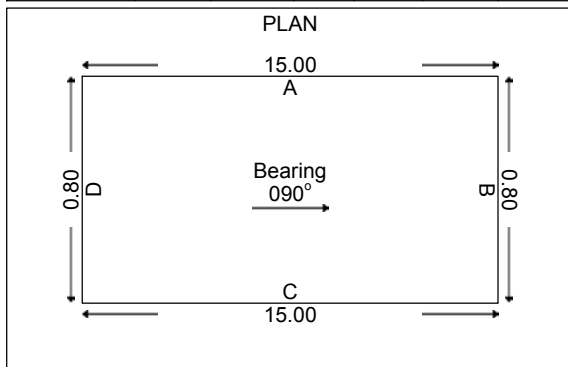
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TRIAL TRENCH RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-04	
Client: South Tyneside Council		Location: South Shields E:436000.960 N:566186.546	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 11.119	Date: 19/09/2011
		Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
0.00	PID	0.0 ppm		10.919		(0.20) 0.20	MADE GROUND (Grass over topsoil).
						(2.80)	MADE GROUND (Firm and stiff (desiccated) light brown to brown, in places black, slightly sandy slightly gravelly clay with high cobble and medium boulder content and pockets/interbeds of sandy very clayey gravel. Occasional glass, reinforcement bar and plastic. Gravel is fine to coarse angular to subrounded and includes brick, concrete, flint and sandstone. Cobbles and boulders (<800mm) are mainly angular brick and concrete (including paving slab fragments) and occasional tarmac).
				8.119		3.00	Trial trench complete at 3.00m BGL.



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides stable throughout excavation.

GENERAL REMARKS
 (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
 (2) No geotechnical or geoenvironmental samples were taken.
 (3) No foundation structures encountered.
 (4) Trial trench backfilled using vibrating plate attachment to JCB rear bucket.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436000.960 N:566186.546		TT-04
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.119	Date: 19/09/2011	Sheet: 2 of 4

PHOTOGRAPHS



Figure TT-04.1
TT-04



Figure TT-04.2
TT-04



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436000.960 N:566186.546		TT-04
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.119	Date: 19/09/2011	Sheet: 3 of 4

PHOTOGRAPHS



Figure TT-04.3
TT-04



Figure TT-04.4
TT-04



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436000.960 N:566186.546		TT-04
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.119	Date: 19/09/2011	Sheet: 4 of 4

PHOTOGRAPHS



Figure TT-04.5
TT-04



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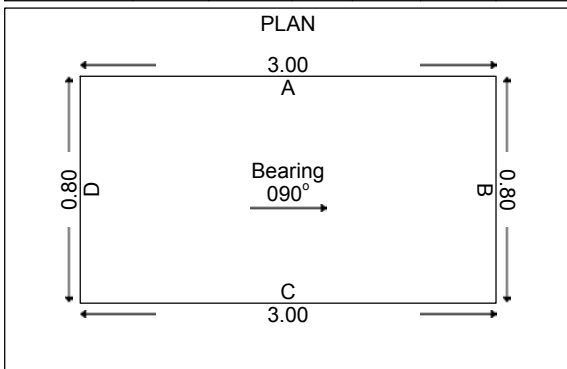
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TRIAL TRENCH RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation	Exploratory Hole No.
Client: South Tyneside Council	TT-05
Location: South Shields E:435964.732 N:566233.275	Sheet: 1 of 3
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.235 Date: 20/09/2011

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
				11.035		(0.20) 0.20	MADE GROUND (Grass over topsoil).
						(1.30)	MADE GROUND (Firm and stiff (desiccated) dark brown to grey brown slightly sandy gravelly clay with high cobble and medium boulder content and pockets/interbeds of sandy very clayey gravel/very gravelly sand. Occasional reinforcement bar, footwear and plastic. Gravel is fine to coarse angular to subrounded and includes brick, concrete, flint and sandstone. Cobbles and boulders (<800mm) are mainly angular brick and concrete (including paving slab fragments)).
				9.735		1.50	
				9.235		(0.50) 2.00	MADE GROUND (Firm thinly laminated grey brown to brown slightly sandy slightly gravelly clay with low cobble content. Gravel is fine to coarse angular to subangular and includes brick. (Engineer notes reworked laminated clay)).
						(1.00)	Firm thinly to thickly laminated grey brown to brown slightly sandy clay with occasional silt dusting on laminae and interlaminations/very thin interbeds of silty fine to medium sand. (Engineer notes slightly gravelly interbeds; gravel includes sandstone).
				8.235		3.00	Trial trench complete at 3.00m BGL.



GROUNDWATER
Water seepage (slight inflow) at 3.00m BGL.

STABILITY
Pit sides stable throughout excavation.

GENERAL REMARKS

- (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
- (2) No geotechnical or geoenvironmental samples were taken.
- (3) No foundation structures encountered.

ADDITIONAL INFORMATION		
Sketch Diagram:	No Sketch Taken	
Photographs:	Yes	See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435964.732 N:566233.275		TT-05
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.235	Date: 20/09/2011	Sheet: 2 of 3

PHOTOGRAPHS



Figure TT-05.1
TT-05



Figure TT-05.2
TT-05



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TRIAL TRENCH RECORD

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435964.732 N:566233.275		TT-05
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.235	Date: 20/09/2011	Sheet: 3 of 3

PHOTOGRAPHS



Figure TT-05.3
TT-05



Figure TT-05.4
TT-05 Spoil



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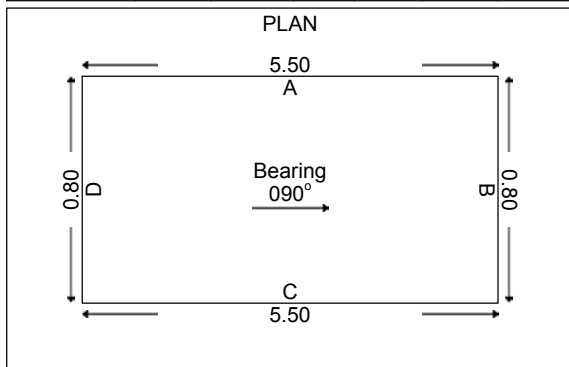
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TRIAL TRENCH RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation	Exploratory Hole No.
Client: South Tyneside Council	TT-06
Location: South Shields E:435949.745 N:565977.308	Method (Equipment): Machine Excavated (JCB 3CX)
Ground Level (m(AOD)): 7.514	Date: 20/09/2011
Sheet: 1 of 4	

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
				7.314	(0.20)	0.20	MADE GROUND (Grass over topsoil).
				6.814	(0.50)	0.70	MADE GROUND (Stiff (desiccated) brown slightly sandy gravelly clay. Gravel is fine to coarse angular to subrounded and includes brick and sandstone).
				5.214	(1.60)	2.30	MADE GROUND (Dark grey to grey clayey very gravelly sand/very sandy gravel with medium cobble and low boulder content. Occasional glass, plastic and rubber fragments. Sand includes some ash. Gravel is fine to coarse angular to subrounded and includes brick and concrete with occasional flint, slag and clinker. Cobbles and boulders (<500mm) are angular to subangular and include brick and concrete).
				4.414	(0.80)	3.10	MADE GROUND (Brown slightly silty gravelly sand with low cobble content. Gravel is fine to coarse angular to rounded and includes brick, concrete, sandstone and flint. Cobbles are angular to subrounded and include brick, concrete, sandstone and flint).
							Trial trench complete at 3.10m BGL.



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides slightly unstable.

GENERAL REMARKS

- (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
- (2) No geotechnical or geoenvironmental samples were taken.
- (3) No foundation structures encountered.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435949.745 N:565977.308		TT-06
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.514	Date: 20/09/2011	Sheet: 2 of 4

PHOTOGRAPHS



Figure TT-06.1
TT-06



Figure TT-06.2
TT-06



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TRIAL TRENCH RECORD

Status:-
FINAL
Date:-
09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435949.745 N:565977.308		TT-06
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.514	Date: 20/09/2011	Sheet: 3 of 4

PHOTOGRAPHS



Figure TT-06.3
TT-06



Figure TT-06.4
TT-06



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435949.745 N:565977.308		TT-06
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.514	Date: 20/09/2011	Sheet: 4 of 4

PHOTOGRAPHS



Figure TT-06.5
TT-06 Spoil



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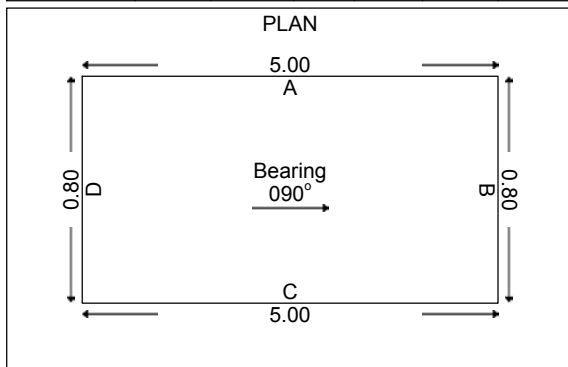
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TRIAL TRENCH RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-07	
Client: South Tyneside Council		Location: South Shields E:436022.462 N:566195.020	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 11.470	Date: 20/09/2011 Sheet: 1 of 4

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
				11.370	(0.10)	0.10	MADE GROUND (Grass over topsoil).
				10.970	(0.40)	0.50	MADE GROUND (Dark grey to black clayey/silty very gravelly sandy/very sandy gravel and some cast iron pipes (scrap). Sand includes some ash. Gravel is fine to coarse angular to subrounded and includes clinker, concrete, limestone and brick).
				10.070	(0.90)	1.40	MADE GROUND (Firm grey brown to brown slightly sandy gravelly clay with low cobble content. Gravel is fine to coarse angular to subrounded and includes brick, concrete, coal, sandstone and limestone. Cobbles are angular to subangular and include brick and concrete).
				9.670	(0.40)	1.80	MADE GROUND (Firm dark grey slightly sandy slightly gravelly clay. Sand includes ash. Gravel is fine to coarse angular to subrounded and includes clinker).
				9.470	(0.20)	2.00	MADE GROUND (Soft and firm thinly laminated grey brown to brown slightly sandy slightly gravelly clay with low cobble content. Gravel is fine to coarse angular to subangular and includes brick and sandstone. Cobbles are angular and include brick. (Engineer notes reworked laminated clay)).
				9.170	(0.30)	2.30	Firm thinly to thickly laminated grey brown to brown slightly sandy CLAY with occasional silt dusting on laminae and interlaminae/very thin interbeds of silty fine to medium sand. (Engineer notes slightly gravelly interbeds; gravel includes sandstone). Trial Trench complete at 2.30m BGL.



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides relatively stable.

GENERAL REMARKS
 (1) Trial Trench excavated to determine the presence/absence of relict concrete foundations.
 (2) No geotechnical or geoenvironmental samples were taken.
 (3) No foundation structures encountered.
 (4) Service marker bricks encountered in eastern end of the pit - pit moved to avoid.
 (5) Refer to following sketch for further detail.

ADDITIONAL INFORMATION		
Sketch Diagram:	Sketch Taken	
Photographs:	Yes	See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: GT	Contract No. 3842
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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-07	
Client: South Tyneside Council	Location: South Shields E:436022.462 N:566195.020		
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.470	Date: 20/09/2011	Sheet: 2 of 4

PHOTOGRAPHS



Figure TT-07.1
TT-07



Figure TT-07.2
TT-07



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-07	
Client: South Tyneside Council	Location: South Shields E:436022.462 N:566195.020		
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.470	Date: 20/09/2011	Sheet: 3 of 4

PHOTOGRAPHS



Figure TT-07.3
TT-07



Figure TT-07.4
TT-07



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TRIAL TRENCH RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. TT-07	
Client: South Tyneside Council	Location: South Shields E:436022.462 N:566195.020		
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.470	Date: 20/09/2011	Sheet: 4 of 4

PHOTOGRAPHS

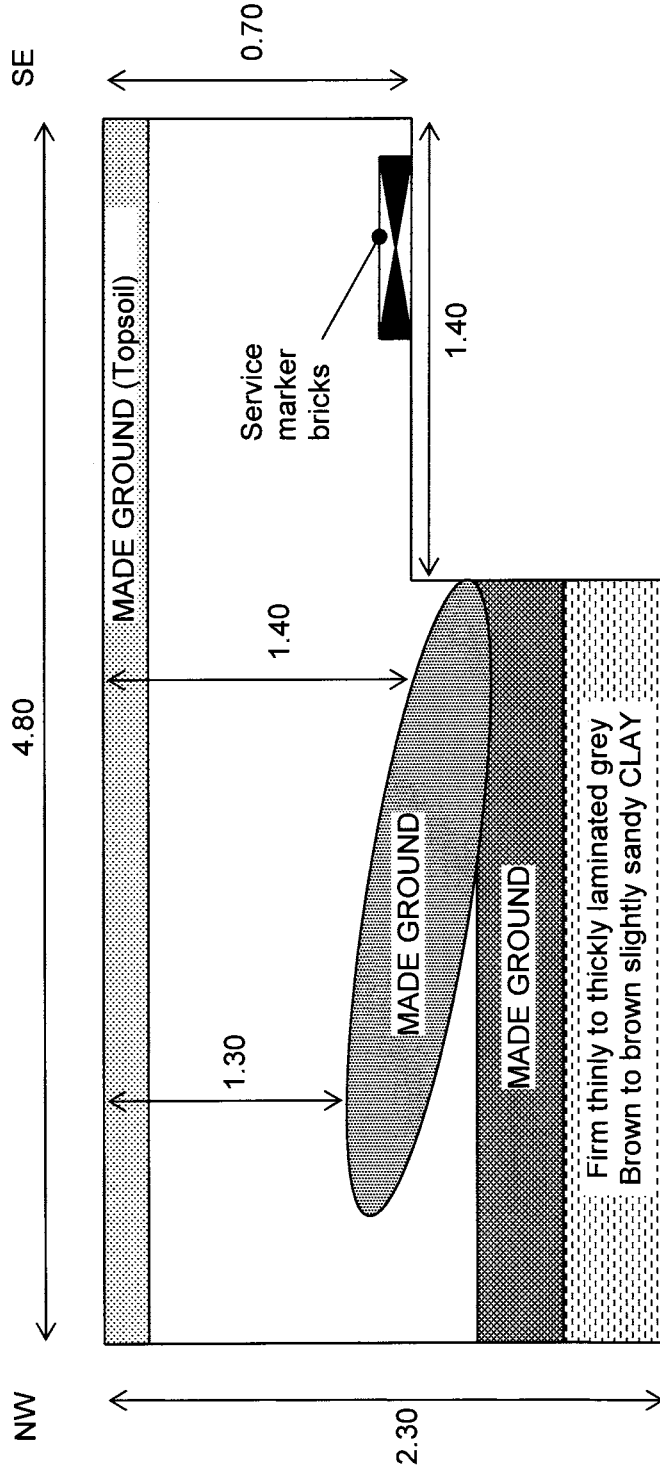


Figure TT-07.5
TT-07



Figure TT-07.6
TT-07 Spoil

Trial Pit Sketch TT-07



NOT TO SCALE

ALL MEASUREMENTS ARE IN METRES

ENCLOSURE 5

Inspection Pit Records



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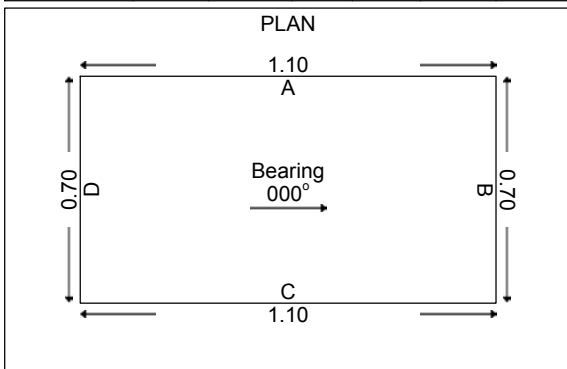
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INSPECTION PIT RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. HTP-01
Client: South Tyneside Council	Location: South Shields E:435991.012 N:565937.934	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.400	Date: 20/09/2011
		Sheet: 1 of 3

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
0.20-0.50	LB			7.350		0.05	MADE GROUND (Grass over topsoil).
0.50	PID	0.0		6.850		0.55	MADE GROUND (Stiff and very stiff (desiccated) light brown to brown sandy gravelly clay with low cobble content and intermixed pockets (<100mm) of sandy gravel. Gravel is fine to coarse angular to subrounded and includes sandstone, brick, concrete and occasional flint. Cobbles are mainly angular and include concrete, brick and refractory brick and sandstone).
0.50	ES						
0.70-0.90	LB					0.65	MADE GROUND (Dark grey to brown grey very clayey/silty very gravelly sand with low cobble content. Occasional plywood and plastic fragments. Sand includes occasional ash. Gravel is fine to coarse angular to subrounded and includes sandstone, brick, flint and concrete. Cobbles are mainly angular and include concrete and sandstone). Trial pit complete at 1.20m BGL.
1.00	PID	0.1		6.200		1.20	
1.00	ES						



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides stable throughout excavation.

GENERAL REMARKS
 (1) Trial pit excavated at specified position along perimeter soil bund.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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INSPECTION PIT RECORD

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435991.012 N:565937.934		HTP-01
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.400	Date: 20/09/2011	Sheet: 2 of 3

PHOTOGRAPHS



Figure HTP-01.1
HTP-01



Figure HTP-01.2
HTP-01



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INSPECTION PIT RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. HTP-01	
Client: South Tyneside Council	Location: South Shields E:435991.012 N:565937.934		Sheet: 3 of 3
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 7.400	Date: 20/09/2011	

PHOTOGRAPHS



Figure HTP-01.3
HTP-01 Spoil



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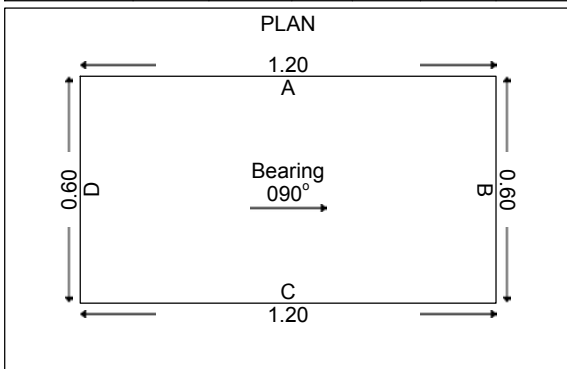
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INSPECTION PIT RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:435941.422 N:565998.950	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 8.232	Date: 20/09/2011
			Sheet: 1 of 3

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
0.50 0.50 0.50-0.80	PID ES LB	0.0		8.182	(0.05)	0.05	MADE GROUND (Grass over topsoil). MADE GROUND (Stiff and very stiff (desiccated) light brown to brown sandy gravelly clay with low cobble content and intermixed pockets (<200mm) of clayey gravelly sand. Occasional rope and metal fragments. Gravel is fine to coarse angular to subrounded and includes sandstone, brick, concrete and occasional flint. Cobbles are mainly angular and include concrete, brick and sandstone).
1.00 1.00	PID ES	0.0		7.032	(1.15)	1.20	Trial pit complete at 1.20m BGL.



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides stable throughout excavation.

GENERAL REMARKS
(1) Trial pit excavated at specified position along perimeter soil bund.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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INSPECTION PIT RECORD

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435941.422 N:565998.950		HTP-02
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 8.232	Date: 20/09/2011	Sheet: 2 of 3

PHOTOGRAPHS



Figure HTP-02.1
HTP-02



Figure HTP-02.2
HTP-02



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INSPECTION PIT RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435941.422 N:565998.950		HTP-02
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 8.232	Date: 20/09/2011	

PHOTOGRAPHS



Figure HTP-02.3
HTP-02 Spoil



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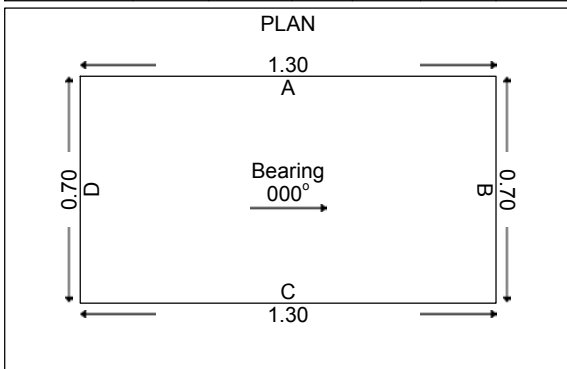
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INSPECTION PIT RECORD

Status:-	FINAL
Date:-	09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council		Location: South Shields E:435974.076 N:566278.949	
Method (Equipment): Machine Excavated (JCB 3CX)		Ground Level (m(AOD)): 11.788	Date: 20/09/2011
			Sheet: 1 of 3

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
				11.738	(0.06)	0.05	MADE GROUND (Grass over topsoil).
0.50 0.50 0.50-1.00	PID ES LB	0.0			(1.15)		MADE GROUND (Stiff and very stiff (desiccated) light brown to brown sandy gravelly clay with low cobble content and some intermixed pockets (<150mm) of clayey gravelly sand. Occasional plastic mesh fragments. Gravel is fine to coarse angular to subrounded and includes sandstone, brick, concrete and occasional flint. Cobbles are mainly angular and include concrete, brick and sandstone).
1.00 1.00	PID ES	0.0		10.588		1.20	Trial pit complete at 1.20m BGL.



GROUNDWATER
No groundwater inflow observed.

STABILITY
Pit sides stable throughout excavation.

GENERAL REMARKS
(1) Trial pit excavated at specified position along perimeter soil bund.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: <i>N.V.</i>	Logged by: NV	Contract No. 3842
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INSPECTION PIT RECORD

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435974.076 N:566278.949		HTP-03
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.788	Date: 20/09/2011	Sheet: 2 of 3

PHOTOGRAPHS



Figure HTP-03.1
HTP-03



Figure HTP-03.2
HTP-03



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INSPECTION PIT RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435974.076 N:566278.949		HTP-03
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 11.788	Date: 20/09/2011	

PHOTOGRAPHS



Figure HTP-03.3
HTP-03 Spoil



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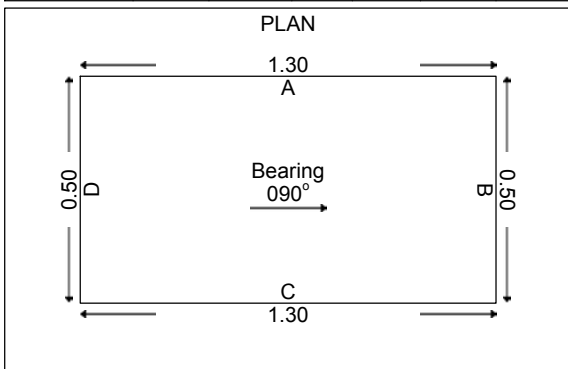
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INSPECTION PIT RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. HTP-04
Client: South Tyneside Council	Location: South Shields E:435934.901 N:566129.160	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 9.915	Date: 20/09/2011
		Sheet: 1 of 3

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
0.35	PID ES LB	0.0		9.865		(0.06) 0.05	MADE GROUND (Grass over topsoil).
0.35				9.565		(0.30) 0.35	MADE GROUND (Light brown to brown slightly clayey very gravelly sand/very sandy gravel with some (desiccated) slightly sandy clay pockets (<100mm) and low cobble content. Occasional glass and plastic fragments. Gravel is fine to coarse angular to subangular and includes brick, sandstone and concrete. Cobbles are mainly angular and include concrete, sandstone and brick).
1.00	PID ES	0.0		8.715		(0.85) 1.20	MADE GROUND (Firm dark brown to brown slightly sandy slightly gravelly clay with low cobble content. Gravel is fine to coarse angular to subrounded and includes sandstone, brick and concrete. Cobbles are angular and include brick). Trial pit complete at 1.20m BGL.
1.00							



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides stable throughout excavation.

GENERAL REMARKS
 (1) Trial pit excavated at specified position along perimeter soil bund.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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INSPECTION PIT RECORD

Status:-

FINAL

Date:-

09/11/2011

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:435934.901 N:566129.160		HTP-04
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 9.915	Date: 20/09/2011	Sheet: 2 of 3

PHOTOGRAPHS



Figure HTP-04.1
HDP-04



Figure HTP-04.2
HDP-04



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INSPECTION PIT RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. HTP-04	
Client: South Tyneside Council	Location: South Shields E:435934.901 N:566129.160		Sheet: 3 of 3
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 9.915	Date: 20/09/2011	

PHOTOGRAPHS



Figure HTP-04.3
HDP-04 Spoil



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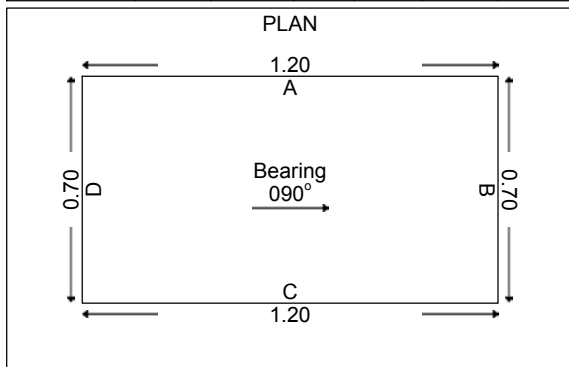
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INSPECTION PIT RECORD

Status:- **FINAL**
 Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. HTP-05
Client: South Tyneside Council	Location: South Shields E:436043.374 N:566061.046	
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 9.130	Date: 20/09/2011
		Sheet: 1 of 3

SAMPLES & TESTS			STRATA				
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)	DESCRIPTION
0.50	PID ES LB	0.0		9.080		0.05	MADE GROUND (Grass over topsoil).
0.50				(1.15)		MADE GROUND (Firm and very stiff (desiccated) light brown to brown slightly sandy slightly gravelly clay with much intermixed brown grey slightly clayey very gravelly sand with low cobble content and occasional plastic, metal and pottery fragments. Gravel is fine to coarse angular to subrounded and includes concrete, brick, sandstone, flint and occasional slag. Cobbles are mainly angular and include brick and concrete).	
0.50-1.00				1.20		at c.0.90m BGL ... pocket (c.200mm) of brown red burnt shale.	
1.00	PID ES	0.0		7.930			Trial pit complete at 1.20m BGL.
1.00							



GROUNDWATER
 No groundwater inflow observed.

STABILITY
 Pit sides stable throughout excavation.

GENERAL REMARKS
 (1) Trial pit excavated at specified position along perimeter soil bund.

ADDITIONAL INFORMATION	
Sketch Diagram:	No Sketch Taken
Photographs:	Yes See additional sheets.

UNDERGROUND SERVICES				
Depth	Orientation	Type	Diameter (mm)	Condition

All dimensions in metres Scale 1:50	For explanation of symbols and abbreviations see Key Sheets	Checked by: N.V.	Logged by: NV	Contract No. 3842
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INSPECTION PIT RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No. HTP-05	
Client: South Tyneside Council	Location: South Shields E:436043.374 N:566061.046		Sheet: 2 of 3
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 9.130	Date: 20/09/2011	

PHOTOGRAPHS



Figure HTP-05.1
HDP-05



Figure HTP-05.2
HDP-05



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INSPECTION PIT RECORD

Status:- **FINAL**
Date:- **09/11/2011**

Project: Trinity South Residential Development, South Shields - Ground Investigation		Exploratory Hole No.	
Client: South Tyneside Council	Location: South Shields E:436043.374 N:566061.046		HTP-05
Method (Equipment): Machine Excavated (JCB 3CX)	Ground Level (m(AOD)): 9.130	Date: 20/09/2011	Sheet: 3 of 3

PHOTOGRAPHS



Figure HTP-05.3
HDP-05 Spoil

ENCLOSURE 6

Groundwater Observation Made at the
Time of Siteworks



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GROUNDWATER OBSERVATIONS MADE AT THE TIME OF SITEWORKS

Exploratory Hole No.	Date	Time (hh:mm)	Depth of Water (m)	Depth of Casing (m)	Depth of Sealed (m)	Final Depth (m)	Total Time (mins)	Depth After 5 mins	Depth After 10 mins	Depth After 15 mins	Depth After 20 mins	Remarks
CBH-01	19/09/2011	11:25	3.50	3.50	3.70	3.57	20	3.57	3.57	3.57	3.57	Water strike (Slight inflow).
CBH-02	20/09/2011		3.70									Damp.
CBH-03	20/09/2011		3.70	3.70	4.00	3.58	20	3.61	3.61	3.61	3.58	Water strike (Slow inflow).
CWS-01B	23/09/2011		3.10	2.00		3.00	20	3.10	3.08	3.05	3.00	Water strike (Slight inflow).
CWS-05	23/09/2011		4.04	2.00		4.04	20	4.04	4.04	4.04	4.04	Water strike (Slight inflow).
TT-02	20/09/2011	10:20	2.80									Water strike (Slight inflow).
TT-03	19/09/2011	12:00	3.00									Water strike (Moderate inflow).
TT-03	19/09/2011	12:30	4.40									Water seepage (Slow inflow).
TT-05	20/09/2011	08:45	3.00									Water seepage (Slight inflow).

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	Date of Issue :- 09/11/2011	Page No. :- 1 of 1	Checked By :- LC	Approved By :-
			Certificate No. :- GWO/3842/1	

ENCLOSURE 7

Groundwater Monitoring Results

ALLIED EXPLORATION & GEOTECHNICS LIMITED



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GROUNDWATER MONITORING RESULTS

Exploratory Hole No.	Date	Time	Water Reading (Reduced Level) (m)	Tip Depth (m) (Type)	Remarks
CBH-01	27/09/2011	14:00	3.23 (3.98)	6.00 (50mm SP)	
CBH-01	28/09/2011	12:30	3.26 (3.95)	6.00 (50mm SP)	
CBH-01	03/10/2011	13:50	3.24 (3.97)	6.00 (50mm SP)	
CBH-01	13/10/2011	13:30	3.31 (3.90)	6.00 (50mm SP)	
CBH-01	19/10/2011	10:20	3.31 (3.90)	6.00 (50mm SP)	
CBH-01	25/10/2011	09:45	3.31 (3.90)	6.00 (50mm SP)	
CBH-01	08/11/2011	14:00	3.32 (3.89)	6.00 (50mm SP)	
CBH-01	24/11/2011	10:05	3.35 (3.86)	6.00 (50mm SP)	

SPIE = Standpipe Piezometer, SP = Gas/Water Standpipe

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
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	Certificate No :- 3842\CBH-0111	Date of Issue :- 24/11/2011	Page No. :- 1 of 6	
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GROUNDWATER MONITORING RESULTS

Exploratory Hole No.	Date	Time	Water Reading (Reduced Level) (m)	Tip Depth (m) (Type)	Remarks
CBH-02	22/09/2011	14:15	2.52 (5.15)	3.30 (50mm SP)	
CBH-02	23/09/2011	14:25	2.52 (5.15)	3.30 (50mm SP)	
CBH-02	26/09/2011	14:30	2.52 (5.15)	3.30 (50mm SP)	
CBH-02	27/09/2011	14:15	2.52 (5.15)	3.30 (50mm SP)	
CBH-02	28/09/2011	12:40	2.52 (5.15)	3.30 (50mm SP)	
CBH-02	03/10/2011	14:00	2.52 (5.15)	3.30 (50mm SP)	
CBH-02	13/10/2011	14:40	2.55 (5.12)	3.30 (50mm SP)	
CBH-02	19/10/2011	10:15	2.54 (5.13)	3.30 (50mm SP)	
CBH-02	25/10/2011	09:40	2.55 (5.12)	3.30 (50mm SP)	
CBH-02	08/11/2011	13:55	2.58 (5.09)	3.30 (50mm SP)	
CBH-02	24/11/2011	10:00	2.55 (5.12)	3.30 (50mm SP)	

SPIE = Standpipe Piezometer, SP = Gas/Water Standpipe

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
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	Certificate No :- 3842\CBH-02\2	Date of Issue :- 24/11/2011	Page No. :- 2 of 6	
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GROUNDWATER MONITORING RESULTS

Exploratory Hole No.	Date	Time	Water Reading (Reduced Level) (m)	Tip Depth (m) (Type)	Remarks
CBH-04	28/09/2011	12:00	2.62 (6.63)	6.00 (50mm SP)	
CBH-04	03/10/2011	14:10	2.61 (6.64)	6.00 (50mm SP)	
CBH-04	13/10/2011	13:55	2.00 (7.25)	6.00 (50mm SP)	
CBH-04	19/10/2011	10:25	1.97 (7.28)	6.00 (50mm SP)	
CBH-04	25/10/2011	09:50	1.98 (7.27)	6.00 (50mm SP)	
CBH-04	08/11/2011	14:05	2.04 (7.21)	6.00 (50mm SP)	
CBH-04	24/11/2011	10:10	2.04 (7.21)	6.00 (50mm SP)	

SPIE = Standpipe Piezometer, SP = Gas/Water Standpipe

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
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	Certificate No :- 3842/CBH-04/3	Date of Issue :- 24/11/2011	Page No. :- 3 of 6	
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GROUNDWATER MONITORING RESULTS

Exploratory Hole No.	Date	Time	Water Reading (Reduced Level) (m)	Tip Depth (m) (Type)	Remarks
CBH-07	26/09/2011	14:40	3.34 (7.65)	3.70 (50mm SP)	
CBH-07	27/09/2011	14:30	3.34 (7.65)	3.70 (50mm SP)	
CBH-07	28/09/2011	12:50	3.32 (7.67)	3.70 (50mm SP)	
CBH-07	03/10/2011	14:20	3.33 (7.66)	3.70 (50mm SP)	
CBH-07	13/10/2011	14:30	3.42 (7.57)	3.70 (50mm SP)	
CBH-07	19/10/2011	10:30	3.41 (7.58)	3.70 (50mm SP)	
CBH-07	25/10/2011	09:55	3.37 (7.62)	3.70 (50mm SP)	
CBH-07	08/11/2011	14:10	3.44 (7.55)	3.70 (50mm SP)	
CBH-07	24/11/2011	10:15	3.49 (7.50)	3.70 (50mm SP)	

SPIE = Standpipe Piezometer, SP = Gas/Water Standpipe

Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Certificate No :-
3842\CBH-07\4

Date of Issue :-
24/11/2011

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GROUNDWATER MONITORING RESULTS

Exploratory Hole No.	Date	Time	Water Reading (Reduced Level) (m)	Tip Depth (m) (Type)	Remarks
CBH-09	03/10/2011	14:30	4.05 (6.50)	18.50 (50mm SP)	
CBH-09	13/10/2011	14:10	4.06 (6.49)	18.50 (50mm SP)	
CBH-09	19/10/2011	10:35	4.00 (6.55)	18.50 (50mm SP)	
CBH-09	25/10/2011	10:00	3.97 (6.58)	18.50 (50mm SP)	
CBH-09	08/11/2011	14:15	3.90 (6.65)	18.50 (50mm SP)	
CBH-09	24/11/2011	10:20	3.93 (6.62)	18.50 (50mm SP)	

SPIE = Standpipe Piezometer, SP = Gas/Water Standpipe

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
---	--

	Certificate No :- 3842\CBH-09\5	Date of Issue :- 24/11/2011	Page No. :- 5 of 6	
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GROUNDWATER MONITORING RESULTS

Exploratory Hole No.	Date	Time	Water Reading (Reduced Level) (m)	Tip Depth (m) (Type)	Remarks
CBH-10	03/10/2011	14:40	3.24 (7.78)	6.00 (50mm SP)	
CBH-10	13/10/2011	14:20	2.79 (8.23)	6.00 (50mm SP)	
CBH-10	19/10/2011	10:40	2.60 (8.42)	6.00 (50mm SP)	
CBH-10	25/10/2011	10:05	2.48 (8.54)	6.00 (50mm SP)	
CBH-10	08/11/2011	14:20	2.33 (8.69)	6.00 (50mm SP)	
CBH-10	24/11/2011	10:25	2.25 (8.77)	6.00 (50mm SP)	

SPIE = Standpipe Piezometer, SP = Gas/Water Standpipe

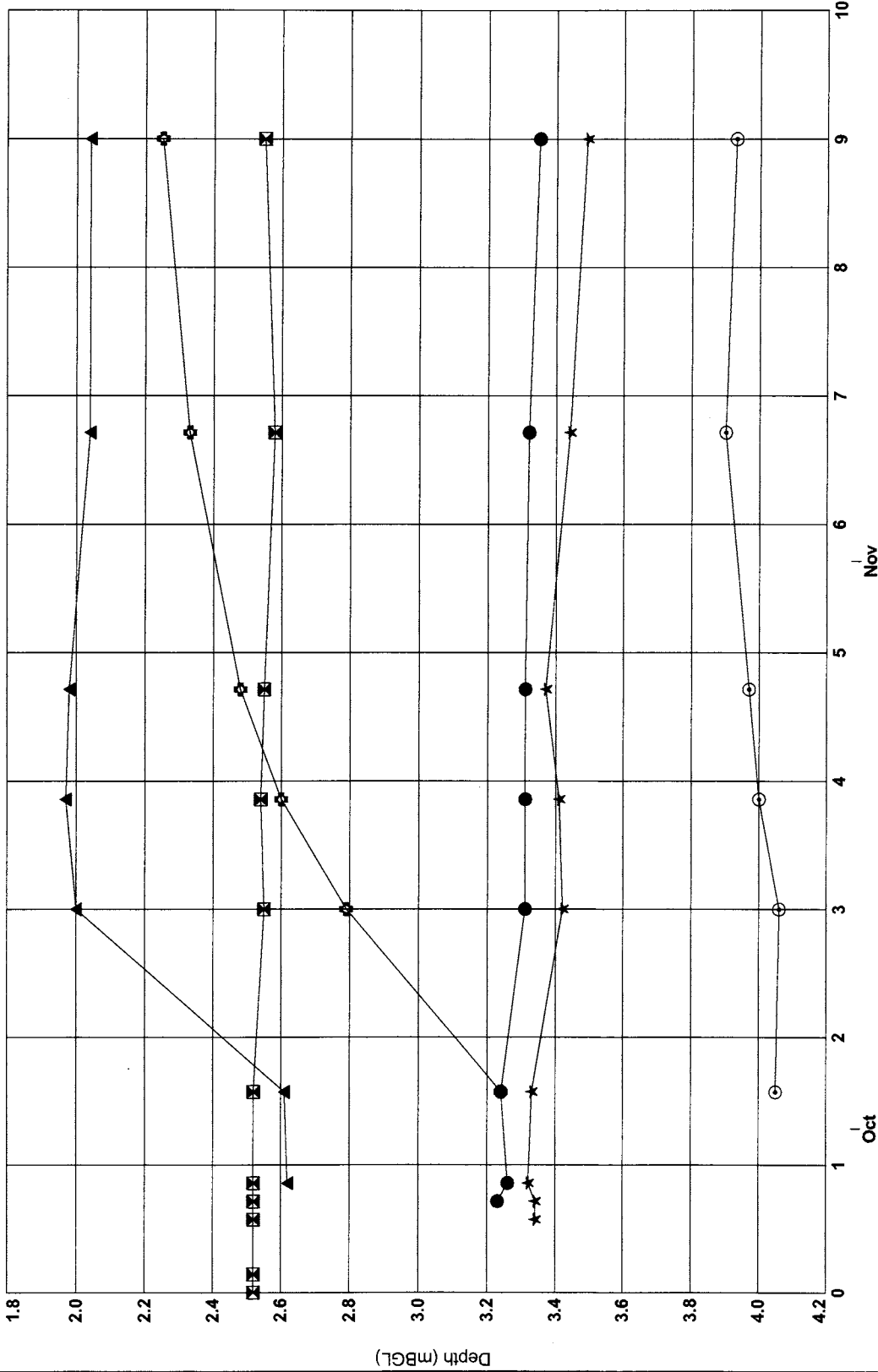
Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
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	Certificate No :- 3842/CBH-10\6	Date of Issue :- 24/11/2011	Page No. :- 6 of 6	
	Checked by :- <i>Jf</i>	Approved by :- <i>LC</i>	AEG Contract No. :- 3842	

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GROUNDWATER MONITORING RESULTS



		Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation		Client :- South Tyneside Council		AEG Contract No :- 3842	
Date of Issue :- 24/11/2011		Page No. :- 1 of 1		Checked By :- J-f		Certificate No. :- GWMR/3842/1	
				Approved By :- LC			

ENCLOSURE 8

Gas and Groundwater Monitoring Results

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit B2 Anchorage Business Park, Chain Caut Way, Riverside Docklands, Preston, PR2 2TL. Tel: 01772 735 300 Fax: 01772 735 989

GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth of Well (m)	Ground Level (m(AD))	Water Level (m(BGL))	Reduced Water Level (m(AD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure Range (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-01	27/09/2011 14:00	OC (17°C)	6.00 0.050	7.21	3.23	3.98	0.0063	0.0	-0.3	1022	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.5 (S) 0.5	(D) 19.1 (S) 19.1	<1.0	4.0	
CBH-01	28/09/2011 12:30	FR (19°C)	6.00 0.050	7.21	3.26	3.95	0.0064	0.0	0.2	1020	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.1 (S) 0.1	(D) 19.0 (S) 19.0	<1.0	<1.0	
CBH-01	03/10/2011 13:50	OC (14°C)	6.00 0.050	7.21	3.24	3.97	0.0064	0.0	-0.3	1004	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.3 (S) 0.3	(D) 19.0 (S) 19.0	<1.0	<1.0	
CBH-01	13/10/2011 13:30	OC (12°C)	6.00 0.005	7.21	3.31	3.90	0.0001	0.0	17.6	1028	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.1 (S) 0.1	(D) 5.6 (S) 5.9	<1.0	<1.0	
CBH-01	19/10/2011 10:20	SU, CD (12°C)	6.00 0.050	7.21	3.31	3.90	0.0065	0.0	-15.7	1011	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 4.3 (S) 4.3	(D) 12.8 (S) 12.8	<1.0	<1.0	
CBH-01	25/10/2011 09:45	OC, SH (12°C)	6.00 0.050	7.21	3.31	3.90	0.0065	0.2	0.3	993	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 5.3 (S) 5.3	(D) 7.1 (S) 7.1	<1.0	<1.0	
CBH-01	08/11/2011 14:00	OC, DZ (11°C)	6.00 0.050	7.21	3.32	3.89	0.0065	0.0	0.3	1013	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 5.7 (S) 5.7	(D) 2.0 (S) 2.0	<1.0	<1.0	
CBH-01	24/11/2011 10:05	SW, CD (13°C)	6.00 0.050	7.21	3.35	3.86	0.0066	0.0	1.0	1019	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 5.4 (S) 5.4	(D) 0.6 (S) 0.6	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council		AEG Contract No. :- 3842	Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU Showers - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FG Snowing - SN
	Checked By :- S.F.	Approved By :- LC	Date of Issue :- 24/11/2011	
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Regional Office: Unit B2 Anstrange Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 989

GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth and Dia of Well (m)	Ground Level (m(AOD))	Water Level (mBGL)	Reduced Water Level (m(AOD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure Range (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-02	22/09/2011 14:15	FR (14°C)	3.30 0.050	7.67	2.52	5.15	0.0049	0.0	-0.4	1010	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.8 (S) 0.7	(D) 20.5 (S) 20.5	<1.0	<1.0	
CBH-02	23/09/2011 14:25	FR (15°C)	3.30 0.050	7.67	2.52	5.15	0.0049	0.0	-0.3	1009	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 3.6 (S) 3.5	(D) 16.8 (S) 17.6	<1.0	<1.0	
CBH-02	26/09/2011 14:30	OC (16°C)	3.30 0.050	7.67	2.52	5.15	0.0049	0.0	-0.2	1016	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 4.2 (S) 4.2	(D) 16.6 (S) 16.7	<1.0	<1.0	
CBH-02	27/09/2011 14:15	OC (17°C)	3.30 0.050	7.67	2.52	5.15	0.0049	0.0	-7.4	1022	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 2.3 (S) 2.3	(D) 18.3 (S) 18.3	<1.0	<1.0	
CBH-02	28/09/2011 12:40	FR (19°C)	3.30 0.050	7.67	2.52	5.15	0.0049	0.0	0.4	1020	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 3.8 (S) 3.8	(D) 16.0 (S) 16.0	<1.0	<1.0	
CBH-02	03/10/2011 14:00	OC (14°C)	3.30 0.050	7.67	2.52	5.15	0.0049	0.0	-0.2	1004	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 3.0 (S) 3.0	(D) 18.1 (S) 18.1	<1.0	<1.0	
CBH-02	13/10/2011 14:40	OC (12°C)	3.30 0.050	7.67	2.55	5.12	0.0050	0.0	0.0	1028	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 4.0 (S) 3.9	(D) 16.6 (S) 16.9	<1.0	<1.0	
CBH-02	19/10/2011 10:15	SU, CD (12°C)	3.30 0.050	7.67	2.54	5.13	0.0050	0.0	0.1	1011	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 3.6 (S) 3.6	(D) 16.9 (S) 16.9	<1.0	<1.0	
CBH-02	25/10/2011 09:40	OC, SH (12°C)	3.30 0.050	7.67	2.55	5.12	0.0050	0.0	0.0	993	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 5.0 (S) 5.0	(D) 15.1 (S) 15.1	<1.0	<1.0	
CBH-02	08/11/2011 13:55	OC, DZ (11°C)	3.30 0.050	7.67	2.58	5.09	0.0051	0.0	0.4	1013	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 5.5 (S) 5.5	(D) 13.5 (S) 13.5	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No. :- 3842	
		Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU Showers - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FG Snowing - SN	
Date of Issue :- 24/11/2011	Page No. :- 2 of 7	Checked By :- S.F.	Approved By :- LC




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 Regional Office: Unit 62 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL. Tel: 01772 736 900 Fax: 01772 736 999

GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth and Dia of Well (m)	Ground Level (m(AD))	Water Level (m(BGL))	Reduced Water Level (m(AD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure Range (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-02	24/11/2011 10:00	SW, CD (13°C)	3.30 0.050	7.67	2.55	5.12	0.0050	0.0	1.1	1019	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 4.7 (S) 0.2	(D) 13.9 (S) 20.4	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No :- 3842	Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU Showers - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FG Snowing - SN
	Date of Issue :- 24/11/2011	Page No. :- 3 of 7	Checked By :- J.F.	Approved By :- LC


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Regional Office: Unit B2, Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2TL - Tel: 01772 735 300 Fax: 01772 735 999

GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth and Dia of Well (m)	Ground Level (m(AD))	Water Level (MBGL)	Reduced Water Level (m(AD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure Range (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-04	28/09/2011 12:00	FR (19°C)	6.00 0.050	9.25	2.62	6.63	0.0051	0.0	-4.9	1020	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.1 (S) 0.1	(D) 18.7 (S) 18.7	<1.0	7.0	
CBH-04	03/10/2011 14:10	OC (14°C)	6.00 0.050	9.25	2.61	6.64	0.0051	0.0	-0.2	1004	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.1 (S) 0.1	(D) 21.0 (S) 21.0	<1.0	<1.0	
CBH-04	13/10/2011 13:55	OC (12°C)	6.00 0.050	9.25	2.00	7.25	0.0039	0.1	17.6	1028	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.5 (S) 0.5	(D) 13.8 (S) 13.8	<1.0	<1.0	
CBH-04	19/10/2011 10:25	SU, CD (12°C)	6.00 0.050	9.25	1.97	7.28	0.0039	0.0	0.0	1011	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.7 (S) 0.7	(D) 12.8 (S) 12.8	<1.0	<1.0	
CBH-04	25/10/2011 09:50	OC, SH (12°C)	6.00 0.050	9.25	1.98	7.27	0.0039	0.0	0.3	992	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.9 (S) 0.9	(D) 12.4 (S) 12.4	<1.0	<1.0	
CBH-04	08/11/2011 14:05	OC, DZ (11°C)	6.00 0.050	9.25	2.04	7.21	0.0040	0.0	0.2	1013	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 1.4 (S) 1.4	(D) 9.5 (S) 9.5	<1.0	<1.0	
CBH-04	24/11/2011 10:10	SW, CD (13°C)	6.00 0.050	9.25	2.04	7.21	0.0040	0.0	0.4	1019	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 2.0 (S) 2.0	(D) 7.8 (S) 7.8	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No :- 3842	Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU Showers - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FG Snowing - SN
	Date of Issue :- 24/11/2011	Page No :- 4 of 7	Checked By :- J.F.	

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Regional Office: Unit 52, Anchorage Business Park, Chain Gate Way, Riverside Docklands, Preston, PR2 2TL - Tel: 01772 735 300 Fax: 01772 735 999

GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth and Dia of Well (m)	Ground Level (m(AD))	Water Level (m(BGL))	Reduced Water Level (m(AD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure Range (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-07	26/09/2011 14:40	OC (16°C)	3.70 0.050	10.99	3.34	7.65	0.0066	0.0	-0.2	1016	(P) 0.4 (S) 0.4	(P) 8.0 (S) 8.0	(P) 0.3 (S) 0.3	(D) 17.1 (S) 17.1	<1.0	<1.0	
CBH-07	27/09/2011 14:30	OC (17°C)	3.70 0.050	10.99	3.34	7.65	0.0066	0.0	-3.4	1022	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.4 (S) 0.4	(D) 19.2 (S) 19.2	<1.0	<1.0	
CBH-07	28/09/2011 12:50	FR (19°C)	3.70 0.050	10.99	3.32	7.67	0.0065	0.0	0.1	1020	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.4 (S) 0.4	(D) 16.8 (S) 16.8	<1.0	<1.0	
CBH-07	03/10/2011 12:20	OC (14°C)	3.70 0.050	10.99	3.33	7.66	0.0065	0.0	-0.2	1004	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.2 (S) 0.2	(D) 21.0 (S) 21.0	<1.0	<1.0	
CBH-07	13/10/2011 14:30	OC (12°C)	3.70 0.050	10.99	3.42	7.57	0.0067	0.1	0.8	1028	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 1.2 (S) 1.2	(D) 18.0 (S) 18.0	<1.0	<1.0	
CBH-07	19/10/2011 10:30	SU, CD (12°C)	3.70 0.050	10.99	3.41	7.58	0.0067	0.0	0.0	1010	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 1.3 (S) 1.3	(D) 19.0 (S) 19.0	<1.0	<1.0	
CBH-07	25/10/2011 09:55	OC, SH (12°C)	3.70 0.050	10.99	3.37	7.62	0.0066	0.0	0.3	992	(P) 1.0 (S) 1.0	(P) 20.0 (S) 20.0	(P) 1.3 (S) 1.3	(D) 1.1 (S) 1.1	<1.0	<1.0	
CBH-07	08/11/2011 14:10	OC, DZ (11°C)	3.70 0.050	10.99	3.44	7.55	0.0068	0.0	1.3	1013	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 1.3 (S) 1.3	(D) 6.8 (S) 6.8	<1.0	<1.0	
CBH-07	24/11/2011 10:15	SW, CD (13°C)	3.70 0.050	10.99	3.49	7.50	0.0069	0.0	0.9	1018	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 1.4 (S) 1.4	(D) 16.8 (S) 16.8	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

		Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation		Client :- South Tyneside Council		AEG Contract No. :- 3842		Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU	
Date of Issue :- 24/11/2011		Page No. :- 5 of 7		Checked By :- S.F.		Approved By :- LC		Shows - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FG Snowing - SN	


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GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth of Well (m)	Ground Level (m(AD))	Water Level (m(BGL))	Reduced Water Level (m(ADD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-09	03/10/2011 14:30	OC (14°C)	18.50 0.050	10.55	4.05	6.50	0.0080	0.0	-0.2	1004	(P) 0.2 (S) 0.2	(P) 4.0 (S) 4.0	(P) <0.1 (S) <0.1	(D) 20.7 (S) 20.7	<1.0	<1.0	
CBH-09	13/10/2011 14:10	OC (12°C)	18.50 0.050	10.55	4.06	6.49	0.0080	0.0	1.8	1028	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.2 (S) <0.1	(D) 19.2 (S) 21.5	<1.0	<1.0	
CBH-09	19/10/2011 10:35	SU, CD (12°C)	18.50 0.050	10.55	4.00	6.55	0.0079	0.0	0.9	1010	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) <0.1 (S) <0.1	(D) 21.0 (S) 21.0	<1.0	<1.0	
CBH-09	25/10/2011 10:00	OC, SH (12°C)	18.50 0.050	10.55	3.97	6.58	0.0078	0.0	0.1	992	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) <0.1 (S) <0.1	(D) 20.6 (S) 20.6	<1.0	<1.0	
CBH-09	08/11/2011 14:15	OC, DZ (11°C)	18.50 0.050	10.55	3.90	6.65	0.0077	0.0	7.3	1013	(P) 0.4 (S) 0.4	(P) 8.0 (S) 8.0	(P) <0.1 (S) <0.1	(D) 19.9 (S) 19.9	<1.0	<1.0	
CBH-09	24/11/2011 10:20	SW, CD (13°C)	18.50 0.050	10.55	3.93	6.62	0.0077	0.0	0.7	1018	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) <0.1 (S) <0.1	(D) 20.7 (S) 20.7	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No. :- 3842	Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU Showers - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FG Snowing - SN
	Date of Issue :- 24/11/2011	Page No. :- 6 of 7	Checked By :- J.F.	


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GAS MONITORING RESULTS

Monitoring Point	Date and Time	Weather Condition and Temperature	Depth and Dia of Well (m)	Ground Level (m(AOD))	Water Level (mBGL)	Reduced Water Level (m(AOD))	Volume of Gas in Well (m ³)	Flow Range (l/hr)	Diff Pressure (l/hr)	ATM Pressure (mbar)	Methane % v/v	Methane % LEL	Carbon Dioxide % v/v	Oxygen % v/v	Hydrogen Sulphide (ppm)	Carbon Monoxide (ppm)	Remarks
CBH-10	03/10/2011 14:40	OC (14°C)	6.00 0.050	11.02	3.24	7.78	0.0064	0.0	7.0	1004	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.4 (S) 0.4	(D) 17.5 (S) 17.5	<1.0	<1.0	
CBH-10	13/10/2011 14:20	OC (12°C)	6.00 0.050	11.02	2.79	8.23	0.0055	0.0	0.0	1028	(P) 0.1 (S) 0.1	(P) 2.0 (S) 2.0	(P) 0.9 (S) 0.8	(D) 13.3 (S) 13.3	<1.0	<1.0	
CBH-10	19/10/2011 10:40	SU, CD (12°C)	6.00 0.050	11.02	2.60	8.42	0.0051	0.0	0.3	1010	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.9 (S) 0.9	(D) 8.4 (S) 8.4	<1.0	<1.0	
CBH-10	25/10/2011 10:05	OC, SH (12°C)	6.00 0.050	11.02	2.48	8.54	0.0049	0.0	0.3	992	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 0.8 (S) 0.8	(D) 8.7 (S) 8.7	<1.0	<1.0	
CBH-10	08/11/2011 14:20	OC, DZ (11°C)	6.00 0.050	11.02	2.33	8.69	0.0046	0.0	0.2	1012	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 1.2 (S) 1.2	(D) 7.8 (S) 7.8	<1.0	<1.0	
CBH-10	24/11/2011 10:25	SW, CD (13°C)	6.00 0.050	11.02	2.25	8.77	0.0044	0.0	0.3	1018	(P) <0.1 (S) <0.1	(P) <2.0 (S) <2.0	(P) 1.3 (S) 1.3	(D) 8.5 (S) 8.5	<1.0	<1.0	

See attached Calibration Certificate for Model No. and any other details. (P) = Peak - (S) = Steady - (D) = Decline

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No :- 3842	Weather Conditions Key :- Humid - HU Frosty - FT Fair - FR Cold - CD Overcast - OC Sunny - SU Showers - SH Heavy Rainfall - HR Breezy - BZ Strong Wind - SW Foggy - FC Snowing - SN
	Date of Issue :- 24/11/2011	Checked By :- S.F.	Approved By :- LC	

CERTIFICATION OF CALIBRATION



ISSUED BY: GEOTECH LABORATORY

Date Of Calibration: 24 August, 2011

Certificate Number: GA12206_2/7776

Page 1 of 1 Pages

Approved by Signatory

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Martin Moloney

Laboratory Inspection

Customer: *Allied Exploration & Geo Eng*

Unit 25, Stella Gill Ind. Est

Pelton Fell

Chester-Le-Street

Co Durham

DH2 2RJ

UNITED KINGDOM

Description: Gas Analyser

Model: GA2000Plus

Serial Number: GA12206

Methane (CH ₄)	
Certified Gas (%)	Instrument Reading (%)
50.01	49.32
15.01	15.10
5.02	5.10

Carbon Dioxide (CO ₂)	
Certified Gas (%)	Instrument Reading (%)
49.99	50.12
14.97	14.82
5.00	4.90

Oxygen (O ₂)	
Certified Gas (%)	Instrument Reading (%)
20.88	20.94

Barometer (mb)	
Reference	Reading
1005mb	1006mb

Additional Gas Cells		
Gas	Instrument Reading (ppm)	Certified Gas (ppm)
H ₂	LOW	1001.0
CO	483.47	499.0
H ₂ S	51.27	51.3

Internal Flow		
Normal (l/hr)	Applied (l/hr)	Measured (l/hr)
5	5	5.28
10	10	10.37

All concentrations are molar.

CH₄, CO₂ readings recorded at: 31.5°C

O₂ readings recorded at: 20.6°C

Barometric Pressure: 1005mb

Method of Test: The analyser is calibrated in a temperature controlled chamber using reference gases.

End of Certificate

ENCLOSURE 9

Existing Installation Gas and Groundwater Monitoring Results



EXISTING INSTALLATION GAS/WATER MONITORING DURING SITE WORKS

(In accordance with Ciria 665)

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG.
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL.

Tel: 01913874700
 Fax: 01913874710
 Tel: 01772735300
 Fax: 01772735999

Event Information		Initial Conditions			Gas Readings						Other Details			Remark Reference			
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide		Water Level	Volume of Gas in Well	Differential Pressure
		mBGL	mm	Litres/hr	mb	Peak	Steady	Peak	Steady	Low Decline	Steady	1.0 ppm	1.0 ppm	mBGL	m ³	mb	
PBBH-01	10:50	4.35	19	0.0	1020	<0.1	<0.1	<2.0	<2.0	0.1 %	21.3	<1.0	<1.0	4.31	0.08	-0.35	
PBBH-02	10:35	4.25	50	0.0	1020	0.1	0.1	2.0	2.0	19.5	19.5	<1.0	<1.0	3.85	0.08	-0.46	
PBBH-04/04A	10:30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	11:10	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-05	11:15	3.00	50	0.0	1020	<0.1	<0.1	<2.0	<2.0	1.4	19.9	<1.0	<1.0	2.21	0.04	-0.17	
PBBH-06	11:00	3.00	50	0.0	1020	0.1	0.1	2.0	2.0	3.8	18.5	<1.0	<1.0	2.99	0.06	-0.29	
PBBH-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
PBBH-02	10:40	5.83	19	0.0	1020	<0.1	<0.1	<2.0	<2.0	<0.1	21.2	<1.0	<1.0	2.88	0.06	-0.35	
PBBH-02	10:43	3.95	50	0.0	1020	0.1	0.1	2.0	2.0	0.1	21.2	<1.0	<1.0	2.82	0.06	-0.35	

Monitoring Equipment		Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	21.3	Weather	Sunny and clear	Temperature (°C)	24
Date of Calibration	15 th September 2011	Carbon Dioxide (%)	0.0	Operator(s)	Gary Teasdale	Office Location	
Equipment Serial Number	GA12205	Methane (%)	0.0	Date of Monitoring	28.09.2011		

Remarks

- (1) Blocked access due to parked cars
- (2) Blocked pipe – believed to be Watterra tubing.
- (3) In locked compound.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	Contract Title	Approved & Checked	Date of Issue	Sheet Number
	3842	Trinity South Residential Development, South Shields – Ground Investigation	J.F.	19.09.2011	Sheet 1 of 1



EXISTING INSTALLATION GAS/WATER MONITORING POST SITE WORKS

(In accordance with Ciria 665)

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG.
Regional Office: Unit B2 Anchorage Business Park, Chain Caut Way, Riverside Docklands, Preston, PR2 2YL.

Tel: 0191 3874700
Tel: 01772 735300
Fax: 0191 3874710
Fax: 01772 735999

Event Information		Initial Conditions				Gas Readings								Other Details			Remark Reference		
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Methane (% LEL)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide	Water Level		Volume of Gas in Well	Differential Pressure
		mBGL	mm	Litres/Hr	mb	Peak	Steady	Peak	Steady	Peak	Steady	Low Decline	Steady	1.0 ppm	1.0 ppm	mBGL	m ³	mb	
PBBH-01	16.20	4.35	19	0.0	1004	<0.1	<0.1	<2.0	<2.0	0.1	<0.1	0.1	21.0	<1.0	<1.0	4.34	0.09	-0.34	
PBBH-02	16.00	4.25	50	0.0	1004	<0.1	<0.1	<2.0	<2.0	1.4	1.4	18.7	18.7	<1.0	<1.0	3.85	0.08	-0.20	
PBBH-04/04A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	16.45	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-05	16.40	3.00	50	0.0	1004	<0.1	<0.1	<2.0	<2.0	0.9	0.9	19.5	19.5	<1.0	<1.0	2.20	0.04	-0.20	
PBBH-06	16.30	3.00	50	0.0	1004	<0.1	<0.1	<2.0	<2.0	2.1	2.1	18.3	18.3	<1.0	<1.0	2.98	0.06	-0.31	
PBBH-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
PBBH-02	16.10	5.83	19	0.0	1004	<0.1	<0.1	<2.0	<2.0	<0.1	<0.1	21.0	21.0	<1.0	<1.0	2.87	0.06	-0.14	
PBBH-02	16.15	3.95	50	0.0	1004	<0.1	<0.1	<2.0	<2.0	<0.1	<0.1	21.0	21.0	<1.0	<1.0	2.82	0.06	-0.14	

Monitoring Equipment		Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	21.3	Weather	Overcast	Temperature (°C)	14
Date of Calibration	15 th September 2011	Carbon Dioxide (%)	0.0	Operator(s)	Gary Teasdale <th>Office Location</th> <td>Office Location</td>	Office Location	Office Location
Equipment Serial Number	GA12205	Methane (%)	0.0	Date of Monitoring	03.10.2011 <th>Office Location</th> <td>Northeast</td>	Office Location	Northeast

Remarks

- (1) Blocked access due to parked cars
- (2) Blocked pipe – believed to be Watterra tubing.
- (3) In locked compound.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	Contract Title	Approved & Checked	Date of Issue	Sheet Number
	3842	Trinity South Residential Development, South Shields – Ground Investigation	J.F.	03.10.2011	Sheet 1 of 1



EXISTING INSTALLATION GAS/WATER MONITORING POST SITE WORKS

(In accordance with Ciria 665)

Head Office: Unit 25, Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG.
 Regional Office: Unit 62 Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL.

Tel: 01913874700
 Tel: 01772735300
 Fax: 01913874710
 Fax: 01772735999

Event Information		Initial Conditions				Gas Readings						Other Details			Remark Reference		
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide	Water Level		Volume of Gas in Well	Differential Pressure
		mbGL	mm	Litres/Hr	mb	Peak	Steady	Peak	Steady	Low Decline	Steady	1.0 ppm	1.0 ppm	mbGL	m ³		
PBBH-01	15.10	4.35	19	0.0	1027	0.1	0.1	2.0	2.0	0.1	20.9	<1.0	<1.0	DRY	0.09	0.04	
PBBH-02	15.20	4.25	50	0.0	1027	0.1	0.1	2.0	2.0	18.5	18.5	<1.0	<1.0	3.85	0.08	0.03	
PBBH-04/04A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	14.50	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-05	14.50	3.00	50	0.4	1028	0.1	0.1	2.0	2.0	20.0	20.5	<1.0	<1.0	2.15	0.04	0.14	
PBBH-06	15.05	3.00	50	0.1	1027	0.1	0.1	2.0	2.0	18.9	19.0	<1.0	<1.0	DRY	0.06	1.10	
PBRBH-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
PBRBH-02	13.50	5.83	19	0.0	1026	<0.1	<0.1	<2.0	<2.0	20.6	20.6	<1.0	<1.0	-	-	0.35	(2)
PBRBH-02	14.05	3.95	50	0.01	1026	<0.1	<0.1	<2.0	<2.0	20.6	20.6	<1.0	<1.0	2.82	0.06	0.01	

Monitoring Equipment			Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	Carbon Dioxide (%)	Methane (%)	Weather	Operator(s)	Date of Monitoring	Temperature (°C)
		21.0	0.0	0.0	ok	Greg Tinker	13.10.2011 and 14.10.2011	12
Date of Calibration	15 th September 2011				ok			Office Location
Equipment Serial Number	GA12205				ok			Northeast

Remarks

- (1) Blocked access due to parked cars
- (2) Blocked pipe – believed to be Waterra tubing.
- (3) In locked compound.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	3842	Contract Title	Trinity South Residential Development, South Shields – Ground Investigation	Approved & Checked	S.f.	Date of Issue	15.10.2011	Sheet Number	Sheet 1 of 1
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EXISTING INSTALLATION GAS/WATER MONITORING POST SITE WORKS

(In accordance with Ciria 665)

Head Office: Unit 25, Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG.
 Regional Office: Unit 62 Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL.

Tel: 0191 3874700
 Fax: 0191 3874710
 Tel: 01772 736300
 Fax: 01772 736999



Event Information		Initial Conditions				Gas Readings						Other Details			Remark Reference		
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide	Water Level		Volume of Gas in Well	Differential Pressure
		mbGL	mm	Litres/Hr	mb	Peak	Steady	Peak	Steady	Peak	Steady	Low Decline	Steady	mbGL	m ³	mb	
PBBH-01	10:45	4.35	19	-	-	2.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	3.12	0.06	-	(4)
PBBH-02	10:50	4.25	50	0.2	1011	<2.0	<0.1	2.8	2.8	18.4	18.4	<1.0	<1.0	3.86	0.08	-0.06	
PBBH-04/04A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	11:00	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-05	11:00	3.00	50	0.0	1011	2.0	0.1	1.3	1.3	20.3	20.3	<1.0	<1.0	2.06	0.04	0.07	
PBBH-06	11:10	3.00	50	0.1	1011	<2.0	<0.1	4.4	4.4	17.8	17.8	<1.0	<1.0	DRY	0.06	0.16	
PBBH-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
PBBH-02	10:55	5.83	19	0.0	1011	<2.0	<0.1	<0.1	<0.1	21.1	21.1	<1.0	<1.0	-	-	0.06	(2)
PBBH-02	10:55	3.95	50	0.0	1011	<2.0	<0.1	0.1	0.1	21.1	21.1	<1.0	<1.0	2.85	0.06	0.06	

Monitoring Equipment		Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	Carbon Dioxide (%)	Methane (%)	Weather	Sunny, Cold	Temperature (°C)
Date of Calibration	15 th September 2011		0.0	0.0	Operator(s)	Laura Clarke	Office Location
Equipment Serial Number	GA12205		0.0	0.0	Date of Monitoring	19.10.2011	Northeast

Remarks

- (1) Blocked access due to parked cars
- (2) Blocked pipe – believed to be Waterra tubing.
- (3) In locked compound.
- (4) Installation flooded, unable to obtain gas reading. Waited 5 minutes on removal of gas tap before obtaining water levels.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	3842	Approved & Checked	J.F.	Date of Issue	19.10.2011	Sheet Number	Sheet 1 of 1
	Contract Title	Trinity South Residential Development, South Shields – Ground Investigation						



EXISTING INSTALLATION GAS/WATER MONITORING POST SITE WORKS

(in accordance with Ciria 665)

Head Office: Unit 25, Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG. Tel: 01913874700 Fax: 01913874710
 Regional Office: Unit B2, Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL. Tel: 01772735300 Fax: 01772735999

Event Information		Initial Conditions				Gas Readings						Other Details			Remark Reference		
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide	Water Level		Volume of Gas in Well	Differential Pressure
		mBGL	mm	Litres/hr	mb	Peak	Steady	Peak	Steady	Low Decline	Steady	1.0 ppm	1.0 ppm	mBGL	m ³	mb	
PBBH-01	10:10	4.35	19	-	-	2.0%	0.1%	2.0%	0.1%	0.1%	0.1%	-	-	1.88	0.04	-	(4)
PBBH-02	10:20	4.25	50	0.0	992	0.1	0.1	2.0	2.5	17.9	17.9	<1.0	<1.0	3.86	0.08	0.03	
PBBH-04/04A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	10:30	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-05	10:30	3.00	50	0.0	992	<0.1	<0.1	<2.0	1.7	19.9	19.9	<1.0	<1.0	2.04	0.04	0.31	
PBBH-06	10:35	3.00	50	0.0	992	<0.1	<0.1	<2.0	5.2	17.3	17.3	<1.0	<1.0	DRY	0.06	0.09	
PBRBH-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
PBRBH-02	10:25	5.83	19	0.0	992	<0.1	<0.1	<2.0	<0.1	20.9	20.9	<1.0	<1.0	-	-	0.10	(2)
PBRBH-02	10:25	3.95	50	0.0	992	<0.1	<0.1	<2.0	<0.1	20.9	20.9	<1.0	<1.0	2.83	0.06	0.10	

Monitoring Equipment		Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	20.8	Weather	Overcast, Drizzle	Temperature (°C)	12
Date of Calibration	15 th September 2011	Carbon Dioxide (%)	0.0	Operator(s)	Laura Clarke	Office Location	
Equipment Serial Number	GA12205	Methane (%)	0.0	Date of Monitoring	25.10.2011		

Remarks

- (1) Blocked access due to parked cars
- (2) Blocked pipe – believed to be Waterra tubing.
- (3) In locked compound.
- (4) Installation flooded, unable to obtain gas reading. Waited 5 minutes on removal of gas tap before obtaining water levels.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	3842	Contract Title	Trinity South Residential Development, South Shields – Ground Investigation	Date of Issue	25.10.2011	Sheet Number	Sheet 1 of 1
	Approved & Checked	J.F.						



EXISTING INSTALLATION GASWATER MONITORING POST SITE WORKS

(In accordance with Ciria 665)

Head Office: Unit 25, Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG. Tel: 01913874700 Fax: 01913874710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL. Tel: 01772735300 Fax: 01772735999

Event Information		Initial Conditions				Gas Readings						Other Details			Remark Reference	
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide	Water Level		Volume of Gas in Well
		mBGL	mm	Litres/hr	mb	Peak	Steady	Peak	Steady	Low Decline	Steady	1.0 ppm	mBGL	m³	mb	
PBBH-01	14:35	4.35	19	-	-	2.0%	0.1%	2.0%	0.1%	0.1%	0.1%	1.0 ppm	3.74	0.07	-	(4)
PBBH-02	14:30	4.25	50	0.0	1013	<0.1	<0.1	<2.0	1.8	16.9	16.9	<1.0	3.80	0.07	0.72	
PBBH-04/04A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	14:35	-	19	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-06	14:35	3.00	50	0.0	1012	2.0	0.1	2.0	0.1	20.7	20.7	<1.0	2.00	0.04	0.24	
PBBH-01A	14:40	3.00	50	0.0	1012	<0.1	<0.1	<2.0	4.0	17.1	17.1	<1.0	DRY	0.06	0.77	
PBRBH-02	14:35	5.83	19	0.0	1012	<0.1	<0.1	<2.0	0.1	21.0	21.0	<1.0	-	-	1.51	(2)
PBRBH-02	14:35	3.95	50	0.0	1012	<0.1	<0.1	<2.0	<0.1	21.0	21.0	<1.0	2.85	0.06	1.51	

Monitoring Equipment		Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	Carbon Dioxide (%)	Methane (%)	Weather	Operator(s)	Date of Monitoring
		21.0	0.0	0.0	Overcast, Drizzle	Laura Clarke	08.11.2011
Date of Calibration	15 th September 2011						
Equipment Serial Number	GA12205						
							Office Location
							Northeast

Remarks

(1) Blocked access due to parked cars
 (2) Blocked pipe – believed to be Waterra tubing.
 (3) In locked compound.
 (4) Installation flooded, unable to obtain gas reading. Waited 5 minutes on removal of gas tap before obtaining water levels.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	3842	Approved & Checked	Date of Issue	Sheet Number
	Contract Title	Trinity South Residential Development, South Shields – Ground Investigation			



EXISTING INSTALLATION GAS/WATER MONITORING POST SITE WORKS

(in accordance with Ciria 665)

Tel: 01913874700
Tel: 01772735300

Fax: 01913874710
Fax: 01772735999

Event Information		Initial Conditions				Gas Readings						Other Details			Remark Reference		
Monitoring Point	Time	Depth of Well	Internal Diameter of Well	Flow Range	ATM Pressure Range	Methane (% v/v)		Carbon Dioxide (% v/v)		Oxygen (% v/v)		Hydrogen Sulphide	Carbon Monoxide	Water Level		Volume of Gas in Well	Differential Pressure
		mBGL	mm	Litres/Hr	mb	Peak	Steady	Peak	Steady	Low Decline	Steady	1.0 ppm	1.0 ppm	mBGL	m³	mb	
PBBH-01	10:30	4.35	19	-	-	0.1 %	0.1 %	2.0 %	2.0 %	0.1 %	0.1 %	1.0 ppm	1.0 ppm	3.08	0.06	-	(4)
PBBH-02	10:35	4.25	50	0.0	1018	<0.1	<0.1	<2.0	<2.0	17.4	17.4	<1.0	<1.0	3.88	0.07	8.60	
PBBH-04/04A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1)
PBBH-05	10:50	-	19	-	-	-	-	-	-	-	-	-	-	-	-	-	(2)
PBBH-05	10:50	3.00	50	0.0	1018	<0.1	<0.1	<2.0	<2.0	19.8	19.8	<1.0	<1.0	2.01	0.04	0.62	
PBBH-06	10:45	3.00	50	0.0	1018	<0.1	<0.1	<2.0	<2.0	17.0	17.0	<1.0	<1.0	DRY	0.06	0.27	
PBBH-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(3)
PBRBH-02	10:40	5.83	19	0.0	1018	<0.1	<0.1	<2.0	<2.0	21.1	21.1	<1.0	<1.0	-	-	0.73	(2)
PBRBH-02	10:40	3.95	50	0.0	1018	<0.1	<0.1	<2.0	<2.0	21.1	21.1	<1.0	<1.0	2.83	0.06	0.73	

Monitoring Equipment		Ambient Gas Concentration			Additional Information		
Monitoring Equipment	GA2000Plus	Oxygen (%)	21.1	Weather	Overcast, Drizzle	Temperature (°C)	13
Date of Calibration	15 th September 2011	Carbon Dioxide (%)	0.0	Operator(s)	Laura Clarke <th>Office Location</th> <td>Northeast</td>	Office Location	Northeast
Equipment Serial Number	GA12205	Methane (%)	0.0	Date of Monitoring	24.11.2011		

Remarks

(1) Blocked access due to parked cars
 (2) Blocked pipe – believed to be Watterra tubing.
 (3) In locked compound.
 (4) Installation flooded, unable to obtain gas reading. Waited 5 minutes on removal of gas tap before obtaining water levels.

Gas and groundwater readings taken from existing instrumentation installed during a previous investigation.

Contract Information	Contract Number	Contract Title	Approved & Checked	Date of Issue	Sheet Number
	3842	Trinity South Residential Development, South Shields – Ground Investigation	<i>J.F.</i>	24.11.2011	Sheet 1 of 1

IN-SITU ENCLOSURES

ENCLOSURE 0

Test Report Certificate

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 3874700 Fax: 0191 3874710
Regional Office: Unit 2B Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01722 735 300 Fax: 01722 735 999



IN-SITU TEST REPORT CERTIFICATE

Contract Title	Trinity South Residential Development, South Shields – Ground Investigation	AEG Reference No.	3842
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Client Address	South Tyneside Council Town Hall and Civic Offices Westoe Road South Shields Tyne and Wear NE33 2RL	Client Reference	
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I certify that *In-situ* testing was carried out on the above contract in accordance with techniques outlined in BS 1377: 1990: Part 9 or other appropriate standards as quoted, and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- Nick Vater (Technical Director)
- Kevin Warriner (HSE & Quality Director)
- Simon Warriner (Senior Laboratory and Site Technician)

Signed.....  Date: 21 October 2011

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

***IN-SITU* TEST REPORT CERTIFICATE**

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Test Report Certificate	N/A		2
1	Standard Penetration Test Results (SPT)	Yes	BS 1377 Part 9 1990	42
2	Photo-ionisation Detector Results	No		3
	Variable Head Permeability Test Results	No	BS 5930 1999:Section 4	
3	Determination of the Soil Infiltration Rate for Soakaway Design	No	BRE Digest 365:1991	8
4	Panda Probe Testing	No	BRE Digest 365	55
	Density by Sand Replacement Method	Yes	BS 1377 Part 9 1990	
	Density by Core Cutter Method	Yes	BS 1377 Part 9 1990	
	Determination of the Vane Shear Strength (Down the Hole)	Yes	BS 1377 Part 9 1990	
	Shallow Pad (skip) Load Test Results	No	BS 1377 Part 9 1990	
	Determination of the California Bearing Ratio	Yes	BS 1377 Part 9 1990	
	Plate Loading Test Results	No	BS 1377 Part 9 1990	
	Apparent Resistivity of Soil	No	BS 1377 Part 9 1990	
	Redox Potential of Soil	No	BS 1377 Part 9 1990	

ENCLOSURE 1

Standard Penetration Test Results (SPT)

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STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _s	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _r	Energy Ratio Corr. C _e	Pen (m)/Blow	SPT'N Value	SPT'N Value (Corr.) N ₆₀	Shoe or Cone	Remarks		
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Total Pen	Total Blows
						mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.								mm	No.
CBH-02	8.50 (-0.83)	(8.50)	8.50	ATH06	0.41	75	6	75	9	150	15	75	14	75	16	67	8	292	51	0.94	0.88	5.73	-	-	S	Water depth = Dry.
CBH-02	9.50 (-1.83)	(9.35)	9.50	ATH06	0.41	14	25			14	25							22	100	0.98	0.68	0.22	-	-	C	Water depth = Dry.
CBH-02	9.70 (-2.03)	(9.35)	9.70	ATH06	0.41	10	25	100	100	10	25	19	100					19	100	0.99	0.68	0.19	-	-	C	Water depth = Dry.
CBH-03	1.20 (6.91)	(1.20)	1.20	ATH06	0.41	75	3	75	4	150	7	75	3	75	2	75	3	300	11	0.65	0.68	27.27	11	5	C	Water depth = Dry.
CBH-03	1.70 (6.41)	(1.70)	1.70	ATH06	0.41	75	4	75	3	150	7	75	2	75	2	75	3	300	10	0.67	0.68	30.00	10	5	C	Water depth = Dry.
CBH-03	2.20 (5.91)	(2.20)	2.20	ATH06	0.41	75	2	75	1	150	3	75	2	75	3	75	2	300	9	0.69	0.68	33.33	9	4	C	Water depth = Dry.
CBH-03	2.70 (5.41)	(2.70)	2.70	ATH06	0.41	75	2	75	1	150	3	75	2	75	1	75	1	300	5	0.71	0.68	60.00	5	2	C	Water depth = Dry.
CBH-03	3.20 (4.91)	(3.20)	3.20	ATH06	0.41	75	2	75	1	150	3	75	1	75	1	75	1	300	3	0.73	0.68	100.00	3	1	C	Water depth = Dry.
CBH-03	3.70 (4.41)	(3.70)	3.70	ATH06	0.41	75	3	75	2	150	5	75	1	75	2	75	2	300	7	0.75	0.68	42.86	7	4	C	Water depth = Dry.
CBH-03	4.20 (3.91)	(4.20)	4.20	ATH06	0.41	75	3	75	2	150	5	75	1	75	0	75	2	300	5	0.77	0.68	60.00	5	3	C	Water depth = Damp
CBH-03	7.20 (0.91)	(6.20)	7.20	ATH06	0.41	75	2	75	4	150	6	75	9	75	13	75	14	300	42	0.89	0.68	7.14	42	25	S	Water depth = Dry.
CBH-03	9.20 (-1.09)	(6.20)	9.20	ATH06	0.41	75	12	75	9	150	21	75	10	27	40			102	50	0.97	0.68	2.04	-	-	C	Water depth = Dry.

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No. :- 3842	Certificate No. :- SPT/3842/2	

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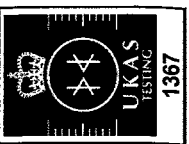
STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio F_3	SEATING DRIVE						TEST DRIVE						Rod Length Cor. C_R	Energy Ratio Cor. C_E	Pen (mm)/Blow	SPT'N Value	SPT'N Value (Corr.) N_{60}	Shoe or Cone	Remarks					
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	Total Blows	Total Pen	
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	No.	mm	No.
CBH-03	9.80 (-1.69)	(6.20)	9.80	ATH06	0.41	25	19	25	19	25	19	25	19	25	19	25	19	25	100	26	100	0.99	0.68	0.26	-	-	C	Water depth = Dry.	
CBH-04	1.20 (8.05)	(1.20)	1.20	ATH06	0.41	4	75	3	75	4	75	3	75	4	75	3	75	2	75	2	300	11	0.65	0.68	27.27	11	5	C	Water depth = Dry.
CBH-04	1.70 (7.55)	(1.70)	1.70	ATH06	0.41	8	75	7	150	15	150	7	150	15	150	7	150	8	300	30	0.67	0.68	10.00	30	14	C	Water depth = Dry.		
CBH-04	2.20 (7.05)	(2.20)	2.20	ATH06	0.41	2	75	1	150	3	150	2	75	2	75	2	75	3	300	8	0.69	0.68	37.50	8	4	C	Water depth = Dry.		
CBH-04	2.70 (6.55)	(2.70)	2.70	ATH06	0.41	2	75	2	150	4	150	2	75	4	75	4	75	4	300	15	0.71	0.68	20.00	15	7	C	Water depth = Dry.		
CBH-04	3.70 (5.55)	(3.70)	3.70	ATH06	0.41	1	75	1	150	2	150	1	75	2	75	2	75	5	300	12	0.75	0.68	25.00	12	6	S	Water depth = Dry.		
CBH-04	4.70 (4.55)	(4.70)	4.70	ATH06	0.41	1	75	1	150	2	150	1	75	3	75	3	75	8	300	18	0.79	0.68	16.67	18	10	S	Water depth = Dry.		
CBH-04	7.20 (2.05)	(6.20)	7.20	ATH06	0.41	12	75	10	150	22	150	14	75	13	75	19	75	4	237	50	0.89	0.68	4.74	-	-	C	Water depth = Dry.		
CBH-04	9.20 (0.05)	(6.20)	9.20	ATH06	0.41	2	75	4	150	6	150	7	75	9	75	12	75	14	300	42	0.97	0.68	7.14	42	28	S	Water depth = Dry.		
CBH-04	11.20 (-1.95)	(6.20)	11.20	ATH06	0.41	18	75	7	111	25	111	37	75	41	75	19	75	112	100	1.00	0.68	1.12	-	-	C	Water depth = Dry.			
CBH-04	11.60 (-2.35)	(6.20)	11.60	ATH06	0.41	25	21	100	21	25	21	17	100	75	22	48	28	17	100	0.65	0.68	0.17	-	-	C	Water depth = Dry.			
CBH-05	1.20 (8.14)	(1.20)	1.20	ATH06	0.41	14	75	11	146	25	146	75	22	48	28	75	22	146	0.65	0.68	0.68	0.68	0.68	-	-	C	Water depth = Dry.		

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No. :- 3842
	Date of Issue :- 07/11/2011	Checked By :- 	Certificate No. :- SPT/3842/3
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STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E _s %	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _{rs}	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPT N Value	SPT N Value (Corr.) N ₆₀	Shoe or Cone	Remarks				
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	Total Pen	Total Blows
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	mm	No.
CBH-05	1.70 (7.64)	(1.70)	1.70	ATH06	0.41	4	75	3	75	3	75	3	75	4	75	5	300	15	7	C	Water depth = Dry.							
CBH-05	2.20 (7.14)	(2.20)	2.20	ATH06	0.41	2	75	1	75	2	75	2	75	1	75	0	300	4	2	C	Water depth = Dry.							
CBH-05	2.70 (6.64)	(2.70)	2.70	ATH06	0.41	1	75	0	75	1	75	2	75	2	75	3	300	8	4	C	Water depth = Dry.							
CBH-05	3.70 (5.64)	(3.70)	3.70	ATH06	0.41	1	75	2	75	3	75	3	75	4	75	5	300	15	8	S	Water depth = Dry.							
CBH-05	4.70 (4.64)	(4.70)	4.70	ATH06	0.41	1	75	2	75	3	75	5	75	5	75	6	300	19	10	S	Water depth = Dry.							
CBH-05	5.40 (3.94)	(4.70)	5.40	ATH06	0.41	25	12	100	19	75	3	75	3	75	4	75	19	100	-	C	Water depth = Dry.							
CBH-06	1.20 (9.56)	(1.20)	1.20	ATH06	0.41	3	75	1	75	2	75	3	75	2	75	1	300	8	4	C	Water depth = Dry.							
CBH-06	1.70 (9.06)	(1.70)	1.70	ATH06	0.41	1	75	1	75	2	75	2	75	2	75	2	300	7	3	C	Water depth = Dry.							
CBH-06	2.20 (8.56)	(2.20)	2.20	ATH06	0.41	2	75	1	75	2	75	2	75	2	75	2	300	7	3	C	Water depth = Dry.							
CBH-06	2.70 (8.06)	(2.70)	2.70	ATH06	0.41	3	75	2	75	1	75	1	75	1	75	2	300	5	2	C	Water depth = Dry.							
CBH-06	3.70 (7.06)	(3.70)	3.70	ATH06	0.41	1	75	1	75	2	75	3	75	4	75	5	300	14	7	S	Water depth = Dry.							
CBH-06	4.70 (6.06)	(4.70)	4.70	ATH06	0.41	2	75	4	75	6	75	5	75	7	75	8	300	26	14	S	Water depth = Dry.							

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT N values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No :- 3842
	Date of Issue :- 07/11/2011	Checked By :- <i>LC</i>	Certificate No. :- SPT/3842/4
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STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _s	SEATING DRIVE				TEST DRIVE								Rod Length Cor. C _R	Energy Ratio Cor. C _E	Pen (mm)/Blow	SPT'N' Value	SPT'N' Value (Cor.) N ₆₀	Shoe or Cone	Remarks						
						Blows	Pen	Blows	Total Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	Blows	Pen	Blows	Total Pen
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	No.	mm	No.	mm
CBH-08	2.50 (9.34)	(2.50)	2.50	ATH06	0.41	3	75	2	150	5	75	1	75	2	75	2	75	2	75	1	300	6	50.00	6	3	C	Water depth = Dry.			
CBH-08	3.00 (8.84)	(2.50)	3.00	ATH06	0.41	5	75	4	150	9	75	3	75	5	75	3	75	3	75	3	300	14	21.43	14	7	C	Water depth = Dry.			
CBH-08	4.00 (7.84)	(4.00)	4.00	ATH06	0.41	1	75	2	150	3	75	2	75	3	75	4	75	3	75	5	300	14	21.43	14	7	S	Water depth = Dry.			
CBH-08	4.80 (7.04)	(4.60)	4.80	ATH06	0.41	25	39		39	25	56	100									56	100	0.66	-	-	C	Water depth = Dry.			
CBH-08	5.00 (6.84)	(4.60)	5.00	ATH06	0.41	25	21		21	25	26	100									26	100	0.68	-	-	C	Water depth = Dry.			
CBH-09	1.20 (9.35)	(1.20)	1.20	ATH06	0.41	3	75	4	150	7	75	6	75	5	75	6	75	6	75	6	300	23	13.04	23	10	C	Water depth = Dry.			
CBH-09	1.70 (6.85)	(1.70)	1.70	ATH06	0.41	2	75	3	150	5	75	2	75	4	75	3	75	4	75	2	300	11	27.27	11	5	C	Water depth = Dry.			
CBH-09	2.20 (8.35)	(2.20)	2.20	ATH06	0.41	2	75	1	150	3	75	1	75	2	75	4	75	2	75	4	300	11	27.27	11	5	C	Water depth = Dry.			
CBH-09	2.70 (7.85)	(2.70)	2.70	ATH06	0.41	3	75	2	150	5	75	1	75	2	75	3	75	3	75	3	300	9	33.33	9	4	C	Water depth = Dry.			
CBH-09	3.70 (6.85)	(3.70)	3.70	ATH06	0.41	0	75	1	150	1	75	1	75	2	75	3	75	2	75	4	300	10	30.00	10	5	S	Water depth = Dry.			
CBH-09	4.70 (5.85)	(4.70)	4.70	ATH06	0.41	2	75	3	150	5	75	4	75	6	75	8	75	8	75	8	300	26	11.54	26	14	S	Water depth = Dry.			
CBH-09	7.20 (3.35)	(4.70)	7.20	ATH06	0.41	4	75	6	150	10	75	12	75	15	75	18	75	18	75	5	252	50	5.04	-	-	S	Water depth = Dry.			

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT'N' values are presented on the attached graphical plot relative to each Exploratory Hole.

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No. :- 3842	
Date of Issue :- 07/11/2011	Checked By :- 	Approved By :- 	Certificate No. :- SPT/3842/6
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E _p	SEATING DRIVE				TEST DRIVE								Rod Length Corr. C _{ps}	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N ₆₀	Shoe or Cone	Remarks			
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	Total Pen
CBH-09	9.20 (1.35)	(4.70)	9.20	ATH06	0.41	5	75	7	150	12	75	15	75	21	66	14					0.97	0.68	4.32	-	-	S	Water depth = Dry.
CBH-09	11.20 (-0.65)	(4.70)	11.20	ATH06	0.41	12	29	13	104	25	75	36	21	14							1.00	0.68	1.92	-	-	C	Water depth = Dry.
CBH-09	13.20 (-2.66)	(4.70)	13.20	ATH06	0.41	25			59	25	46	100									1.00	0.68	0.46	-	-	C	Water depth = Dry.
CBH-09	13.50 (-2.95)	(4.70)	13.50	ATH06	0.41	25			19	25	22	100									1.00	0.68	0.22	-	-	C	Water depth = Dry.
CBH-10	1.20 (9.82)	(1.20)	1.20	ATH06	0.41	3	75	2	150	5	75	3	75	2	75	3	75	3	75	3	0.65	0.68	27.27	11	5	C	Water depth = Dry.
CBH-10	1.70 (9.32)	(1.70)	1.70	ATH06	0.41	2	75	1	150	3	75	2	75	3	75	2	75	1	300	8	0.67	0.68	37.50	8	4	C	Water depth = Dry.
CBH-10	2.20 (8.82)	(2.20)	2.20	ATH06	0.41	1	75	1	150	2	75	2	75	1	75	3	75	3	300	9	0.69	0.68	33.33	9	4	C	Water depth = Dry.
CBH-10	3.20 (7.82)	(3.20)	3.20	ATH06	0.41	1	75	1	150	2	75	2	75	2	75	3	75	5	300	12	0.73	0.68	25.00	12	6	S	Water depth = Dry.
CBH-10	4.20 (6.82)	(4.20)	4.20	ATH06	0.41	1	75	2	150	3	75	3	75	4	75	5	75	6	300	18	0.77	0.68	16.67	18	9	S	Water depth = Dry.
CBH-10	5.20 (5.82)	(5.20)	5.20	ATH06	0.41	15	26	10	101	25	18	50							18	50	0.81	0.68	0.36	-	-	C	Water depth = Dry.
CBH-10	6.20 (4.82)	(6.20)	6.20	ATH06	0.41	25			56	25	75	38	10	12					85	50	0.85	0.68	1.70	-	-	S	Water depth = Dry.
CBH-10	7.20 (3.82)	(6.20)	7.20	ATH06	0.41	19	31	6	106	25	75	37	75	46	14	7			164	90	0.89	0.68	1.82	-	-	C	Water depth = Dry.

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No :- 3842
	Date of Issue :- 07/11/2011	Checked By :- <i>LL</i>	Certificate No. :- SPT/3842/7
Page No. :- 7 of 14	Approved By :- <i>NW</i>		

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STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio F ₆₃	SEATING DRIVE						TEST DRIVE						Rod Length Cor. C _r	Energy Ratio Cor. C _e	Pen (mm)/Blow	SPTN Value	SPTN Value (Cor.) N ₆₀	Shoe or Cone	Remarks				
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Total Blows	Total Pen	Total Blows	Total Pen
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	No.	mm
CWS-03	2.10 (5.68)	(2.00)	2.10	ATHDP05	0.68	1	75	2	75	1	75	1	75	1	75	1	75	1	300	5	60.00	5	4	S	Water depth = Dry.			
CWS-03	3.10 (4.68)	(2.00)	3.10	ATHDP05	0.68	2	75	3	75	12	75	9	75	6	75	2	300	29	10.34	29	24	S	Water depth = Dry.					
CWS-03	4.10 (3.68)	(2.00)	4.10	ATHDP05	0.68	4	75	4	75	3	75	2	75	1	75	1	300	7	42.86	7	6	S	Water depth = Dry.					
CWS-03	5.10 (2.68)	(2.00)	5.10	ATHDP05	0.68	1	75	1	75	1	75	1	75	2	75	4	300	8	37.50	8	7	S	Water depth = Dry.					
CWS-04	1.20 (6.50)		1.20	ATHDP05	0.68	1	75	1	75	1	75	2	75	2	75	2	300	7	42.86	7	5	S	Water depth = Dry.					
CWS-04	2.10 (5.60)	(2.00)	2.10	ATHDP05	0.68	3	75	4	75	2	75	1	75	1	75	1	300	5	60.00	5	4	S	Water depth = Dry.					
CWS-04	3.10 (4.60)	(2.00)	3.10	ATHDP05	0.68	4	75	4	75	5	75	7	75	7	75	7	300	26	11.54	26	21	S	Water depth = Dry.					
CWS-04	4.10 (3.60)	(2.00)	4.10	ATHDP05	0.68	6	75	6	75	8	75	7	75	8	75	8	300	31	9.68	31	27	S	Water depth = Dry.					
CWS-04	5.10 (2.60)	(2.00)	5.10	ATHDP05	0.68	3	75	4	75	9	75	11	75	10	75	11	300	41	7.32	41	37	S	Water depth = Dry.					
CWS-05	1.20 (8.58)		1.20	ATHDP05	0.68	4	75	3	75	2	75	2	75	2	75	1	300	7	42.86	7	5	S	Water depth = Dry.					
CWS-05	2.10 (7.68)	(2.00)	2.10	ATHDP05	0.68	0	75	1	75	2	75	2	75	3	75	4	300	11	27.27	11	8	S	Water depth = Dry.					
CWS-05	3.10 (6.68)	(2.00)	3.10	ATHDP05	0.68	4	75	7	75	4	75	6	75	7	75	7	300	24	12.50	24	20	S	Water depth = Dry.					

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	Client :-	AEG Contract No. :-
	Trinity South Residential Development, South Shields - Ground Investigation	South Tyneside Council	3842
Date of Issue :-	Checked By :-	Approved By :-	Certificate No. :-
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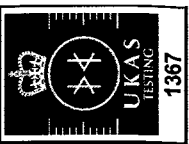
STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E_p	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C_R	Energy Ratio Corr. C_E	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N_{60}	Shoe or Cone	Remarks				
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	Total Blows	Total Pen
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	No.	mm
CWS-05	4.10 (5.68)	4.04 (2.00)	4.10	ATHDP05	0.68	3	75	4	150	7	75	6	75	8	75	8	75	10	300	32	0.76	1.13	9.38	32	27	S		
CWS-06	1.20 (7.99)		1.20	ATHDP05	0.68	2	75	2	150	4	75	4	75	4	75	4	75	7	300	19	0.65	1.13	15.79	19	14	S	Water depth = Dry.	
CWS-06	2.10 (7.09)	(2.00)	2.10	ATHDP05	0.68	4	75	5	150	9	75	3	75	2	75	1	75	1	300	7	0.68	1.13	42.86	7	5	S	Water depth = Dry.	
CWS-06	3.10 (6.09)	(2.00)	3.10	ATHDP05	0.68	1	75	1	150	2	75	2	75	3	75	3	75	3	300	11	0.72	1.13	27.27	11	9	S	Water depth = Dry.	
CWS-06	4.10 (5.09)	(2.00)	4.10	ATHDP05	0.68	1	75	1	150	2	75	2	75	2	75	4	75	4	300	12	0.76	1.13	25.00	12	10	S	Water depth = Dry.	
CWS-06	5.10 (4.09)	(2.00)	5.10	ATHDP05	0.68	2	75	3	150	5	75	4	75	5	75	7	75	7	300	22	0.80	1.13	13.64	22	20	S	Water depth = Dry.	
CWS-07	1.20 (7.36)		1.20	ATHDP05	0.68	2	75	2	150	4	75	1	75	1	75	1	75	1	300	4	0.65	1.13	75.00	4	3	S	Water depth = Dry.	
CWS-07	2.10 (6.46)	(2.00)	2.10	ATHDP05	0.68	2	75	1	150	3	75	1	75	1	75	1	75	1	300	4	0.68	1.13	75.00	4	3	S	Water depth = Dry.	
CWS-07	3.10 (5.46)	(2.00)	3.10	ATHDP05	0.68	1	75	2	150	3	75	3	75	2	75	5	75	5	300	15	0.72	1.13	20.00	15	12	S		
CWS-07	4.10 (4.46)	(2.00)	4.10	ATHDP05	0.68	2	75	3	150	5	75	3	75	4	75	5	75	6	300	18	0.76	1.13	16.67	18	15	S		
CWS-07	5.10 (3.46)	(2.00)	5.10	ATHDP05	0.68	1	75	3	150	4	75	4	75	5	75	7	75	7	300	21	0.80	1.13	14.29	21	19	S		
CWS-08	1.20 (8.92)	0.60	1.20	ATHDP05	0.68	6	75	5	150	11	75	4	75	4	75	4	75	4	300	16	0.65	1.13	18.75	16	12	S		

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	Trinity South Residential Development, South Shields - Ground Investigation	Client :-	South Tyneside Council	AEG Contract No. :-	3842
	Date of Issue :-	07/11/2011	Checked By :-	LC	Certificate No. :-	SPT/3842/10
			Approved By :-	NW		



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STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level)	Water Depth (Casing)	Rod Length	SPT Hammer Ref.	Energy Ratio E_s	SEATING DRIVE						TEST DRIVE						Rod Length Cor. C_{Rd}	Energy Ratio Cor. C_E	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) N_{60}	Shoe or Cone	Remarks				
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	Total Blows	Total Pen
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	No.	mm
CWS-08	2.10 (8.02)	1.50 (2.00)	2.10	ATHDP05	0.68	1	75	0	150	1	75	0	150	1	75	0	300	2	2	S								
CWS-08	3.10 (7.02)	2.10 (2.00)	3.10	ATHDP05	0.68	2	75	2	150	4	75	0	300	2	75	0	300	2	2	S								
CWS-08	4.10 (6.02)	3.20 (2.00)	4.10	ATHDP05	0.68	1	75	2	150	3	75	4	160	4	75	6	300	16	14	S								
CWS-08	5.10 (5.02)	3.31 (2.00)	5.10	ATHDP05	0.68	3	75	5	150	8	75	7	160	7	75	10	300	32	29	S								
CWS-09	1.20 (9.48)		1.20	ATHDP05	0.68	3	75	1	150	4	75	2	150	2	75	1	300	6	4	S	Water depth = Dry.							
CWS-09	2.10 (8.58)	(2.00)	2.10	ATHDP05	0.68	1	75	0	150	1	75	0	150	0	75	0	300	1	1	S	Water depth = Dry.							
CWS-09	3.10 (7.58)	(2.00)	3.10	ATHDP05	0.68	1	75	2	150	3	75	1	150	0	75	0	300	2	2	S	Water depth = Dry.							
CWS-09	4.10 (6.58)	(2.00)	4.10	ATHDP05	0.68	1	75	0	150	1	75	1	150	1	75	2	300	5	4	S	Water depth = Dry.							
CWS-09	5.10 (5.58)	(2.00)	5.10	ATHDP05	0.68	2	75	4	150	6	75	5	160	5	75	8	300	26	24	S	Water depth = Dry.							
CWS-10	1.20 (9.05)	0.40	1.20	ATHDP05	0.68	1	75	1	150	2	75	1	150	1	75	3	300	5	4	S								
CWS-10	2.10 (8.15)	0.70 (2.00)	2.10	ATHDP05	0.68	1	75	0	150	1	75	0	150	0	75	0	300	2	2	S								
CWS-10	3.10 (7.15)	2.53 (2.00)	3.10	ATHDP05	0.68	1	75	13	150	14	75	8	160	6	75	7	300	42	34	S								

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	Trinity South Residential Development, South Shields - Ground Investigation	Client :-	South Tyneside Council	AEG Contract No. :-	3842
	Date of Issue :-	07/11/2011	Checked By :-	LC	Certificate No. :-	SPT/3842/11
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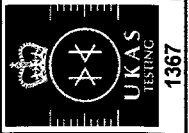
STANDARD PENETRATION TEST RESULTS

(BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref	Energy Ratio E _s	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C _s	Energy Ratio Corr. C _e	Pen (mm)/Blow	SPTN Value	SPTN Value (Corr.) No	Shoe or Cone	Remarks				
						Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen								Blows	Pen	Total Pen	Total Blows
						No.	mm	No.	mm	No.	mm	No.	mm	No.	mm	No.	mm								No.	mm	No.	mm
CWS-10	4.10 (6.15)	2.60 (2.00)	4.10	ATHDP05	0.68	1	75	3	150	4	75	4	75	4	75	5	75	6	300	19	16	15.79	19	16	S			
CWS-10	5.10 (5.15)	2.73 (2.00)	5.10	ATHDP05	0.68	5	75	5	150	10	75	7	75	11	75	10	75	11	300	39	35	7.69	39	35	S			
CWS-11	1.20 (10.38)		1.20	ATHDP05	0.68	1	75	1	150	2	75	1	75	1	75	1	75	1	300	4	3	75.00	4	3	S	Water depth = Dry.		
CWS-11	2.10 (9.48)	(2.00)	2.10	ATHDP05	0.68	7	75	6	150	13	75	2	75	1	75	2	75	2	300	7	5	42.86	7	5	S	Water depth = Dry.		
CWS-11	3.10 (8.48)	(2.00)	3.10	ATHDP05	0.68	1	75	2	150	3	75	2	75	3	75	5	75	8	300	18	15	16.67	18	15	S	Water depth = Dry.		
CWS-12	1.20 (9.65)		1.20	ATHDP05	0.68	3	75	2	150	5	75	2	75	1	75	1	75	0	300	4	3	75.00	4	3	S	Water depth = Dry.		
CWS-12	2.10 (8.75)	(2.00)	2.10	ATHDP05	0.68	0	75	0	150	0	75	0	75	0	75	1	75	1	300	2	2	150.00	2	2	S	Water depth = Dry.		
CWS-12	3.10 (7.75)	(2.00)	3.10	ATHDP05	0.68	2	75	3	150	5	75	2	75	5	75	6	75	7	300	20	16	15.00	20	16	S	Water depth = Dry.		
CWS-12	4.10 (6.75)	(2.00)	4.10	ATHDP05	0.68	3	75	3	150	6	75	5	75	5	75	6	75	8	300	24	21	12.50	24	21	S	Water depth = Dry.		
CWS-12	5.10 (5.75)	(2.00)	5.10	ATHDP05	0.68	3	75	3	150	6	75	5	75	6	75	7	75	10	300	28	25	10.71	28	25	S	Water depth = Dry.		
CWS-13	1.20 (10.02)		1.20	ATHDP05	0.68	1	75	1	150	2	75	2	75	1	75	3	75	3	300	9	7	33.33	9	7	S	Water depth = Dry.		
CWS-13	2.10 (9.12)	(2.00)	2.10	ATHDP05	0.68	2	75	3	150	5	75	2	75	4	75	4	75	6	300	16	12	18.75	16	12	S	Water depth = Dry.		

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPTN values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :-	Client :-	AEG Contract No. :-
	Trinity South Residential Development, South Shields - Ground Investigation	South Tyneside Council	3842
Date of Issue :-	Checked By :-	Approved By :-	Certificate No. :-
07/11/2011	LC	N/W	SPT/3842/12
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No.	Test Depth (Reduced Level) m	Water Depth (Casing) m	Rod Length m	SPT Hammer Ref.	Energy Ratio E_r	SEATING DRIVE						TEST DRIVE						Rod Length Corr. C_{Rk}	Energy Ratio Corr. C_e	Pen (mm)/Blow	SPT.N. Value	SPT.N. Value (Corr.) N_{60}	Shoe or Cone S/C	Remarks				
						Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows	Pen	Blows								Pen	Blows	Total Pen	Total Blows
						No.	No.	mm	No.	No.	mm	No.	No.	mm	No.	No.	mm								No.	No.		
CWS-13	3.10 (6.12)	(2.00)	3.10	ATHDP05	0.68	75	1	75	2	150	3	75	3	75	5	75	6	75	7	300	21	17	S	Water depth = Dry.				
CWS-13	4.10 (7.12)	(2.00)	4.10	ATHDP05	0.68	75	3	75	5	150	8	75	9	75	9	75	9	75	12	300	39	33	S	Water depth = Dry.				
CWS-13	5.10 (6.12)	(2.00)	5.10	ATHDP05	0.68	75	2	75	2	150	4	75	3	75	3	75	7	75	35	300	48	43	S	Water depth = Dry.				
CWS-14	1.20 (6.11)		1.20	ATHDP05	0.68	75	3	75	2	150	5	75	1	75	2	75	1	75	2	300	6	4	S	Water depth = Dry.				
CWS-14A	1.20 (6.03)		1.20	ATHDP05	0.68	75	3	75	2	150	5	75	2	75	4	75	2	75	2	300	10	7	S	Water depth = Dry.				
CWS-14A	2.10 (5.13)	(2.00)	2.10	ATHDP05	0.68	75	6	75	3	150	9	75	1	75	0	75	1	75	0	300	2	2	S	Water depth = Dry.				
CWS-14A	3.10 (4.13)	(2.00)	3.10	ATHDP05	0.68	75	1	75	0	150	1	75	1	75	2	75	2	75	3	300	8	7	S	Water depth = Dry.				
CWS-14A	4.10 (3.13)	(2.00)	4.10	ATHDP05	0.68	75	1	75	1	150	2	75	2	75	2	75	3	75	3	300	10	9	S	Water depth = Dry.				
CWS-14A	5.10 (2.13)	(2.00)	5.10	ATHDP05	0.68	75	2	75	4	150	6	75	6	75	5	75	6	75	9	300	26	24	S	Water depth = Dry.				
CWS-15	1.20 (7.03)		1.20	ATHDP05	0.68	75	3	75	5	150	8	75	4	75	2	75	2	75	3	300	11	8	S	Water depth = Dry.				
CWS-15	2.10 (6.13)	(2.00)	2.10	ATHDP05	0.68	75	2	75	1	150	3	75	1	75	1	75	1	75	2	300	5	4	S	Water depth = Dry.				
CWS-15	3.10 (5.13)	(2.00)	3.10	ATHDP05	0.68	75	2	75	3	150	5	75	4	75	4	75	6	75	8	300	22	18	S	Water depth = Dry.				

NOTE: Please refer to calibration certificate for additional information and corresponding Exploratory Hole record for sampling details. Uncorrected and corrected SPT.N. values are presented on the attached graphical plot relative to each Exploratory Hole.

	Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council	AEG Contract No :- 3842
	Date of Issue :- 07/11/2011	Checked By :- 	Certificate No. :- SPT/3842/13
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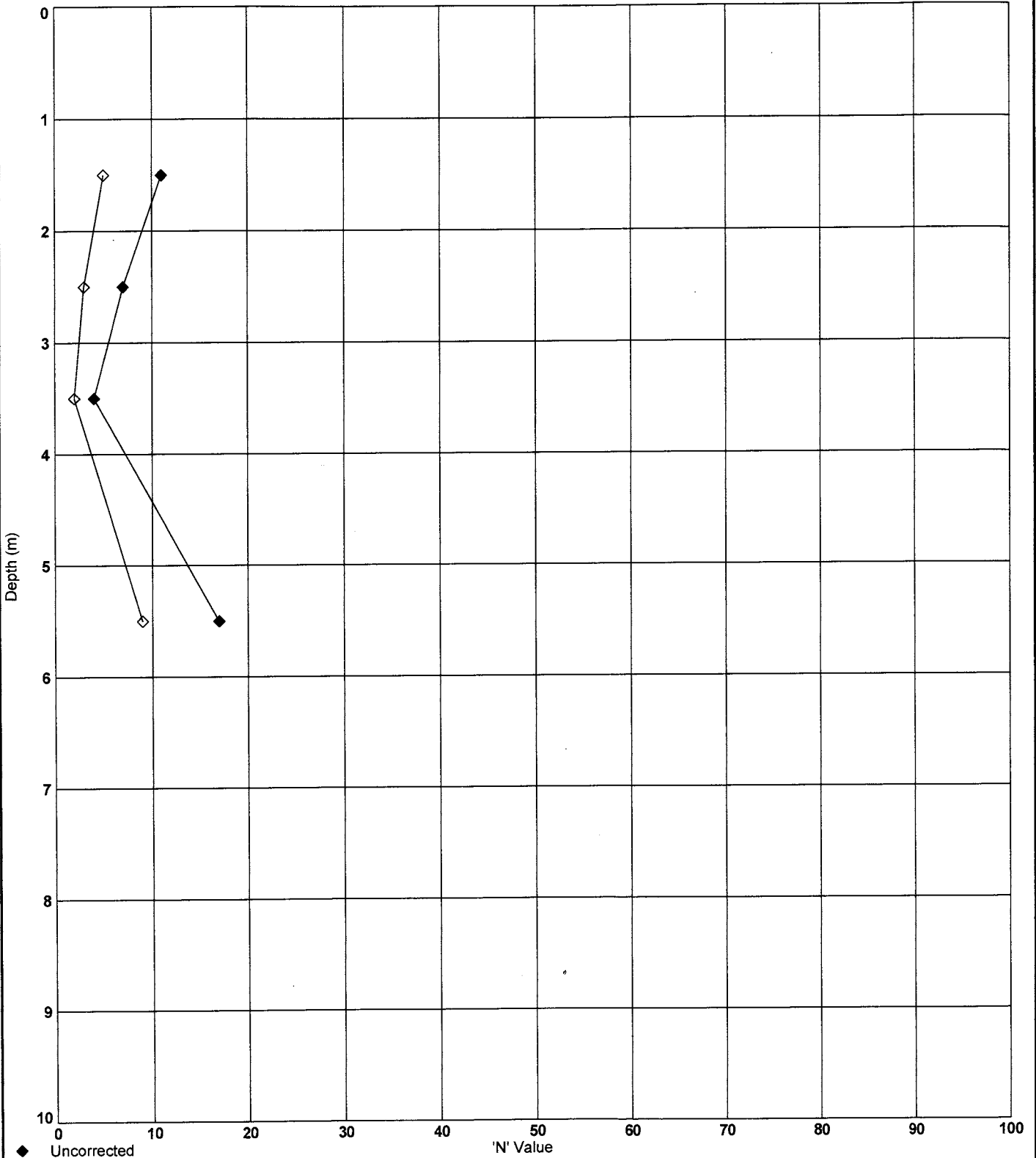
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-01



◆ Uncorrected
◇ Corrected

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CBH-01

Operator :- LH/EB

Checked By :- LC

Approved By :- NW

AEG Contract No. :- 3842



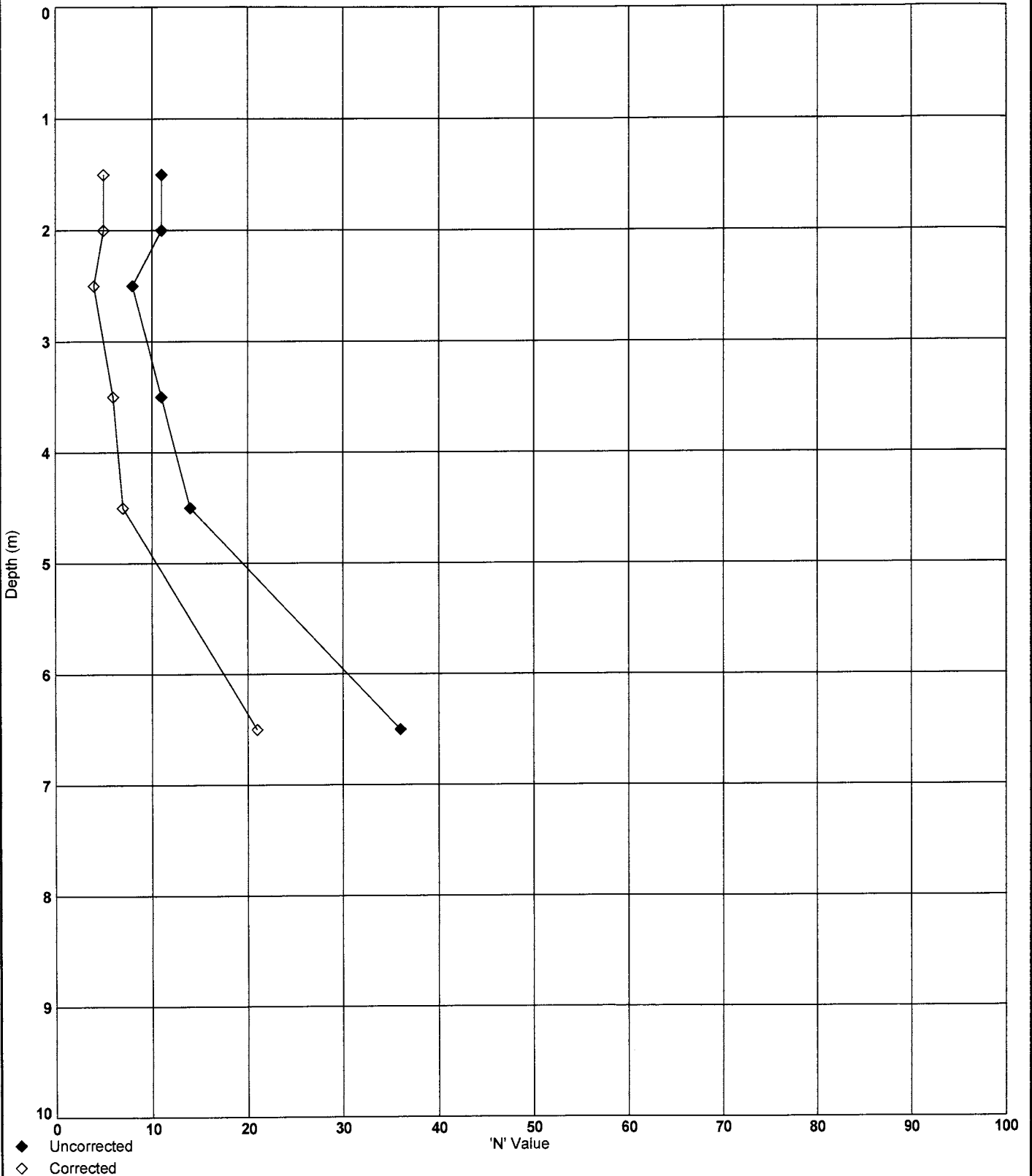
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-02



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CBH-02

Operator :- L. Hayes

Checked By :- LC

Approved By :- *NW*

AEG Contract No. :- 3842



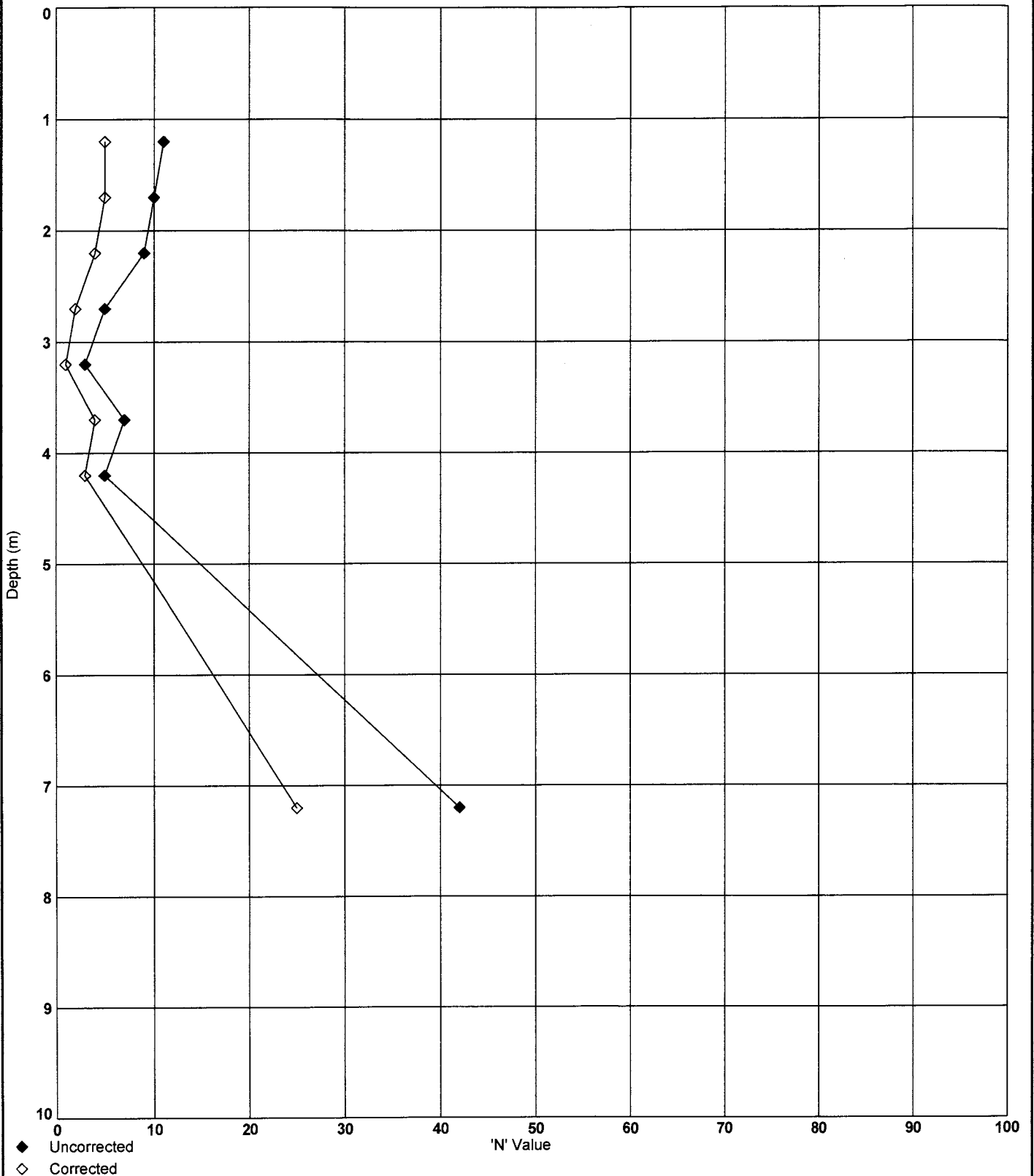
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-03



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CBH-03

Operator :- L. Hayes

Checked By :- LC

Approved By :- NIW

AEG Contract No. :- 3842



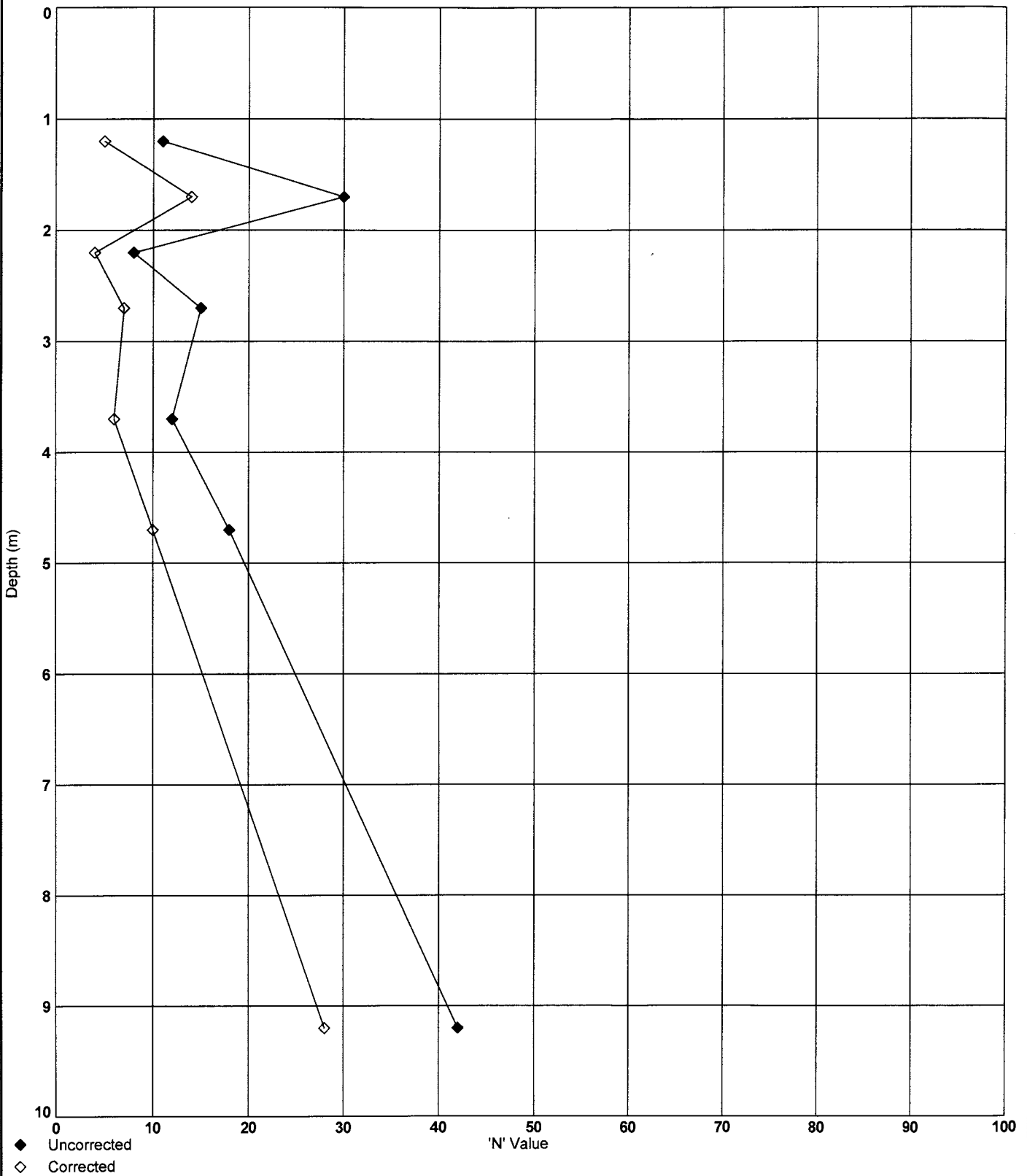
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STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-04



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011
 Checked By :- LC

Certificate No :- SPT/3842/Graph/CBH-04
 Approved By :- NW

Operator :- LH/EB
 AEG Contract No. :- 3842



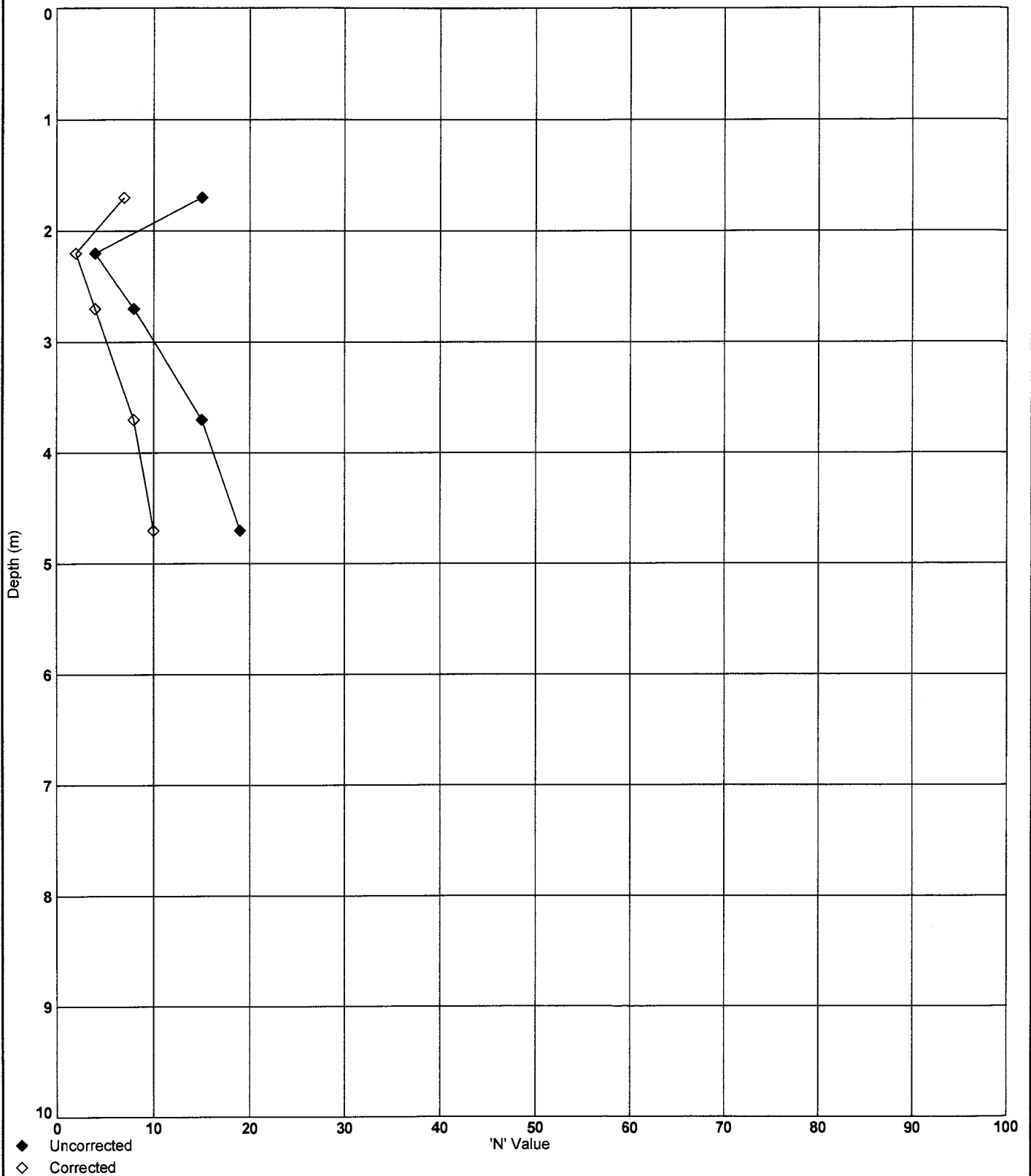
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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-05



Contract Title :-
 Trinity South Residential Development, South Shields - Ground Investigation

Client :-
 South Tyneside Council

AEG
 Date of issue :-
 07/11/2011
 Checked By :-
 LC

Certificate No :-
 SPT/3842/Graph/CBH-05
 Approved By :-
 NW

Operator :-
 L. Hayes
 AEG Contract No. :-
 3842



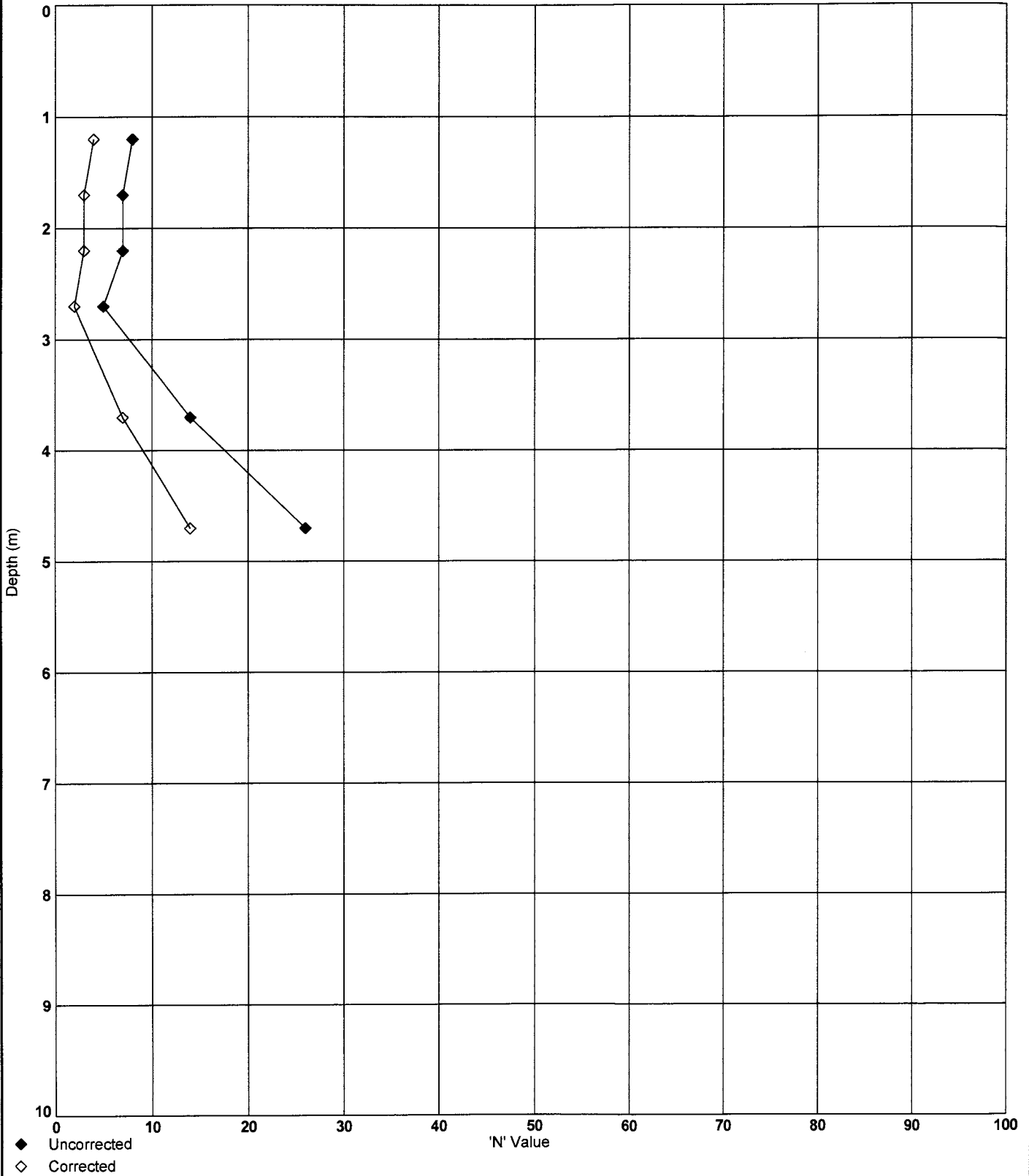
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-06



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CBH-06

Operator :- L. Hayes

Checked By :- *LC*

Approved By :- *NW*

AEG Contract No. :- 3842



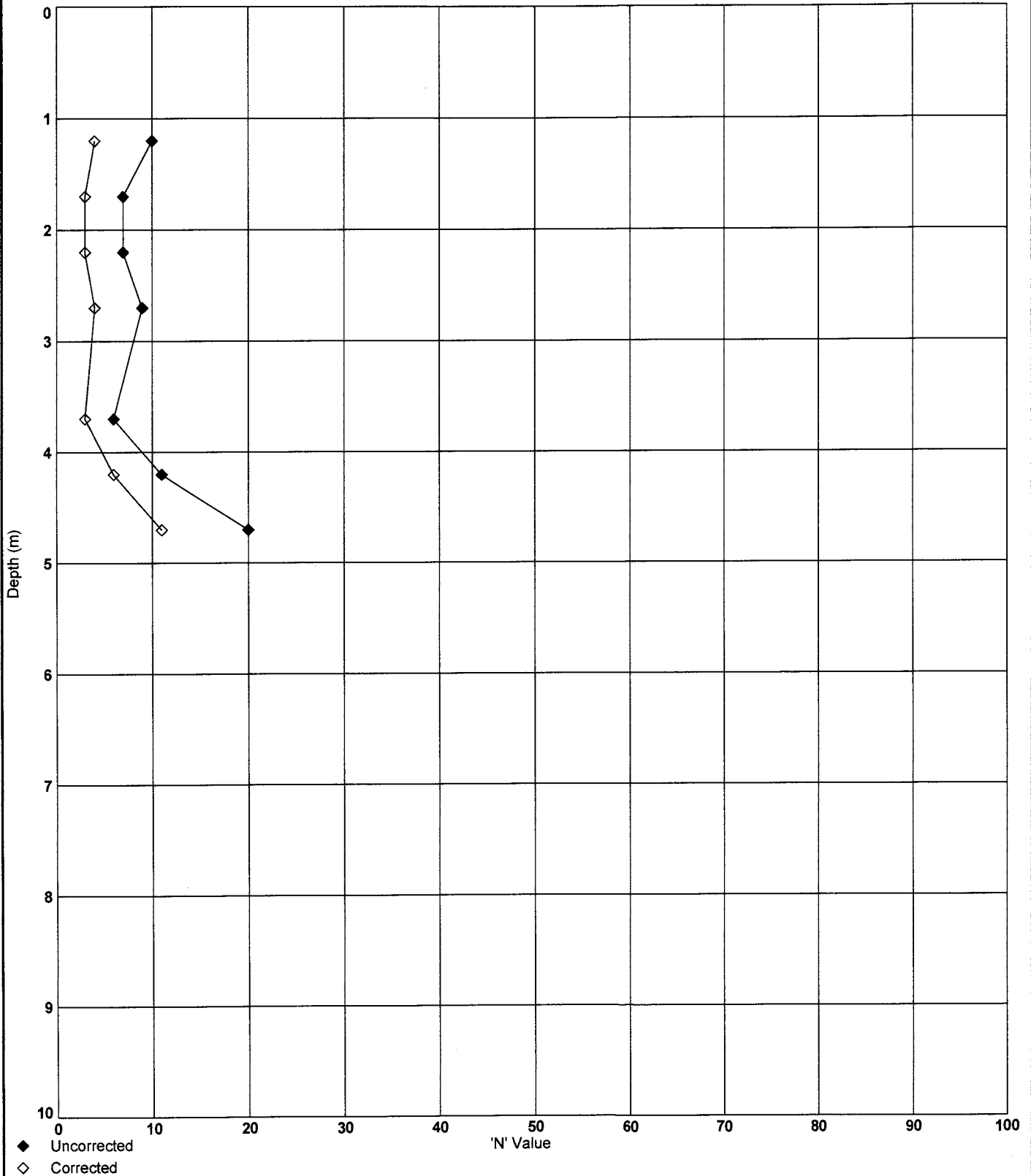
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-07



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011
Checked By :- LC

Certificate No :- SPT/3842/Graph/CBH-07
Approved By :- NW

Operator :- L. Hayes
AEG Contract No. :- 3842



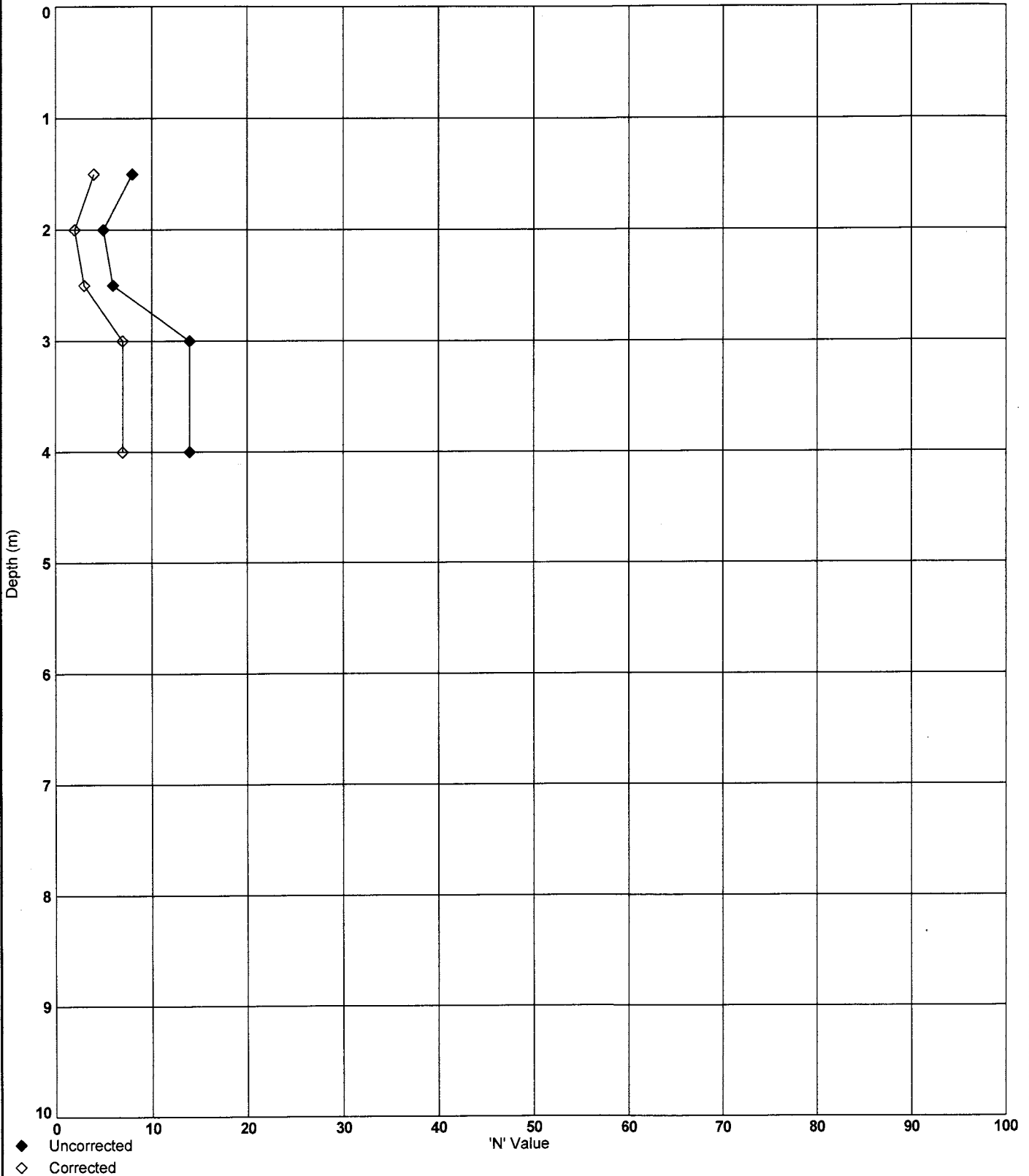
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-08



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CBH-08

Operator :- L. Hayes

Checked By :- LC

Approved By :- NW

AEG Contract No. :- 3842



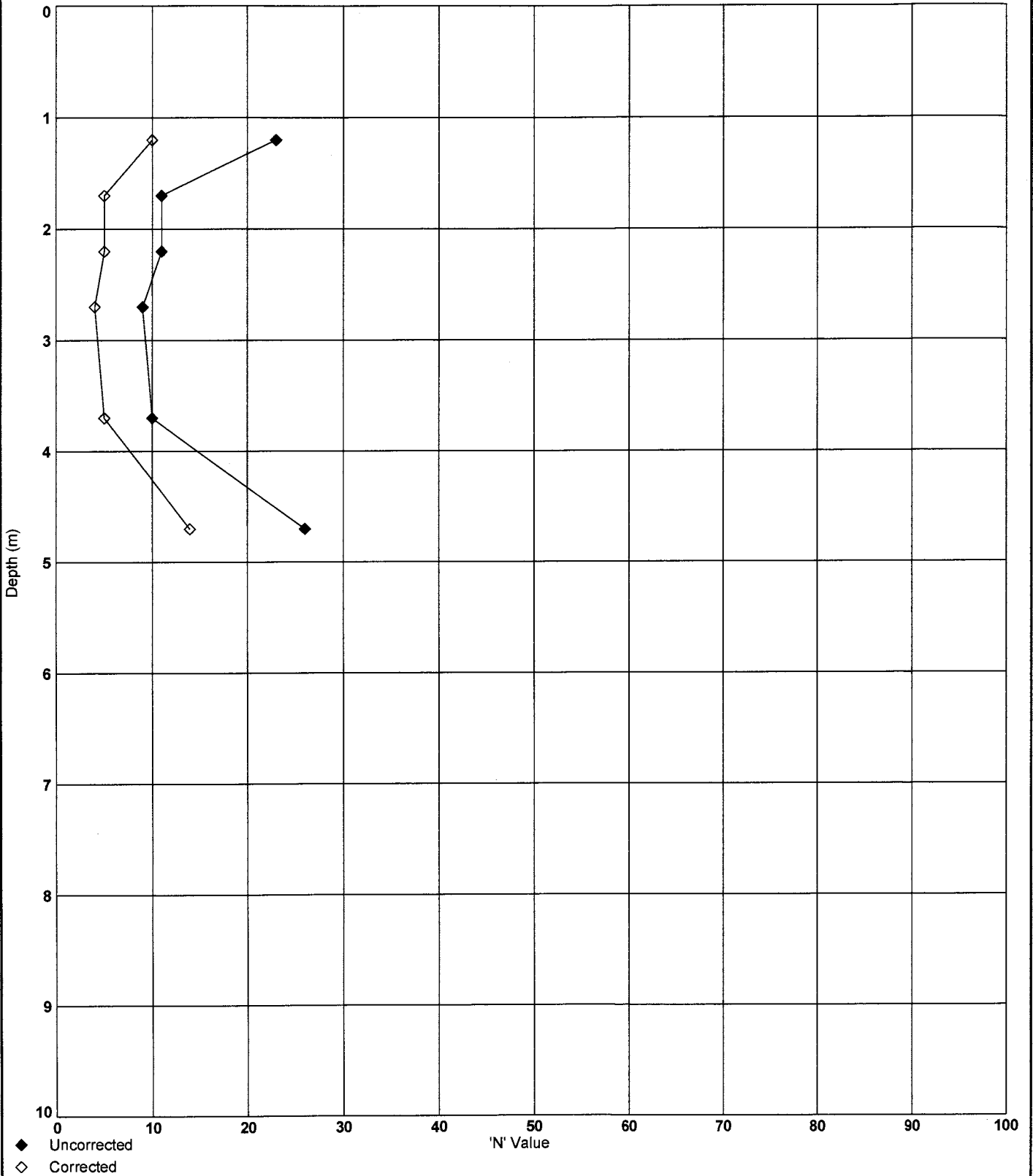
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-09



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CBH-09

Operator :-
LH/EB

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



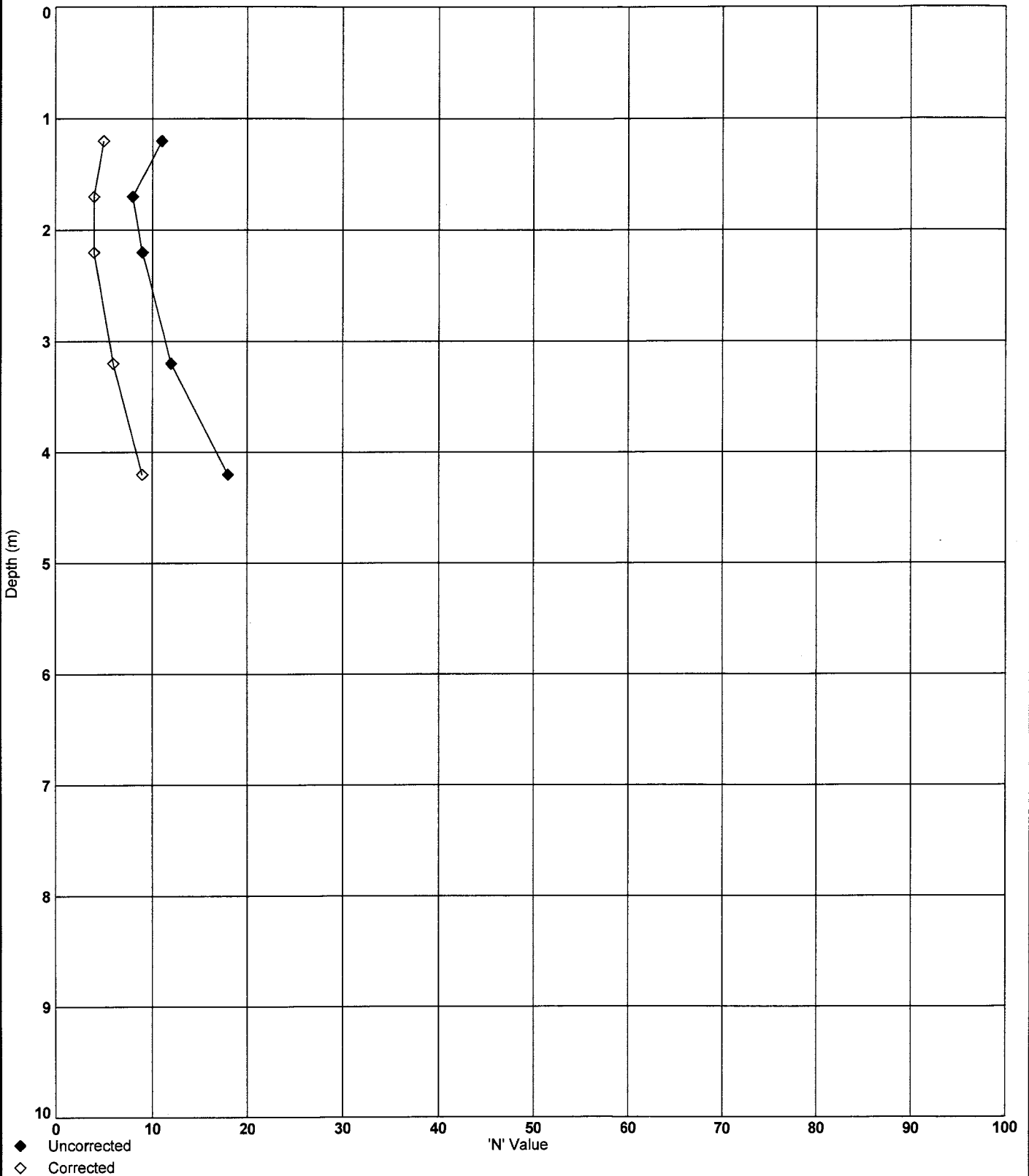
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CBH-10



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CBH-10

Operator :-
LH/EB

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



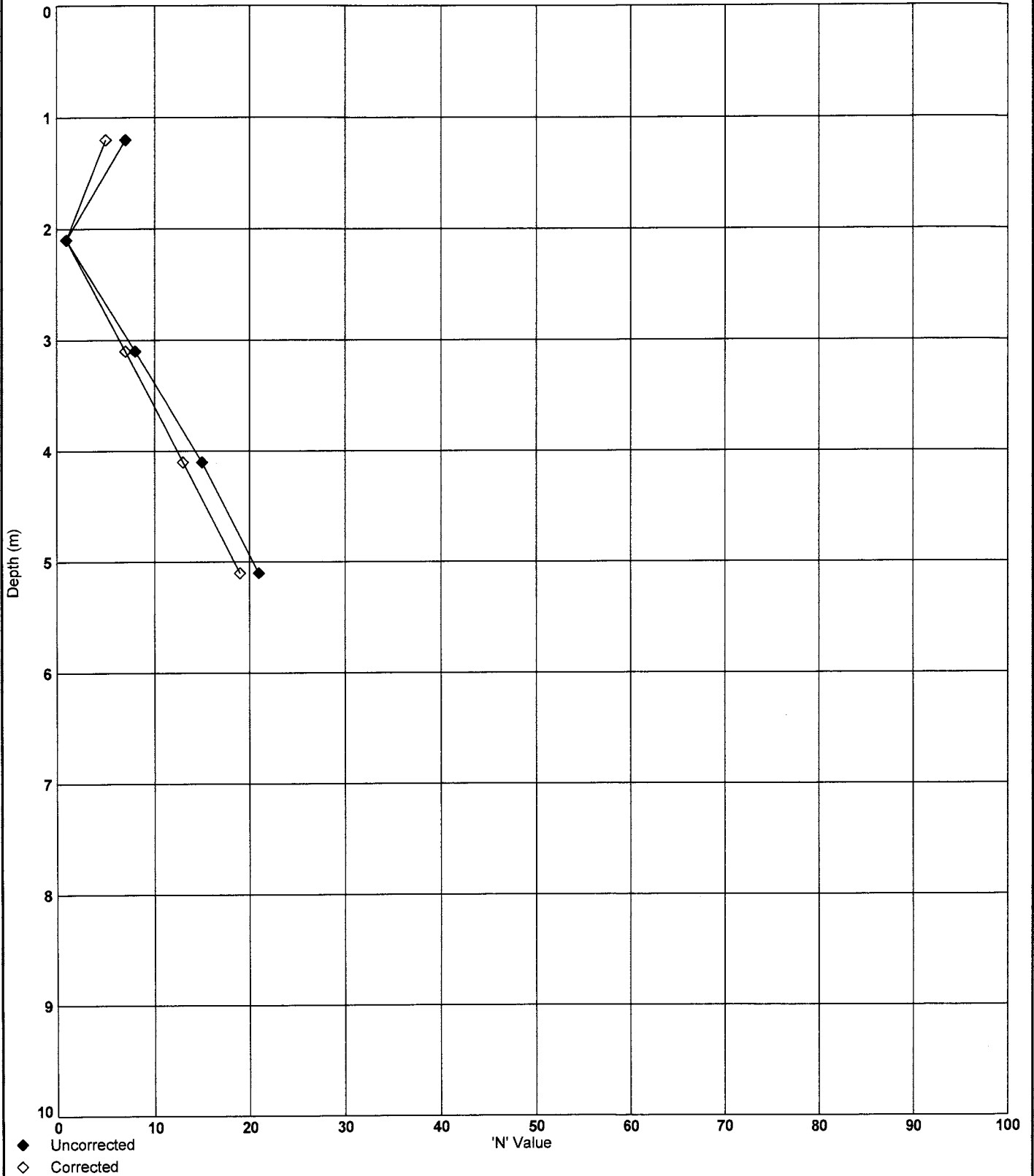
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-01B



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Checked By :-
LC

Certificate No :-
SPT/3842/Graph/CWS-01B

Approved By :-
NW

Operator :-
C. Copeland

AEG Contract No. :-
3842



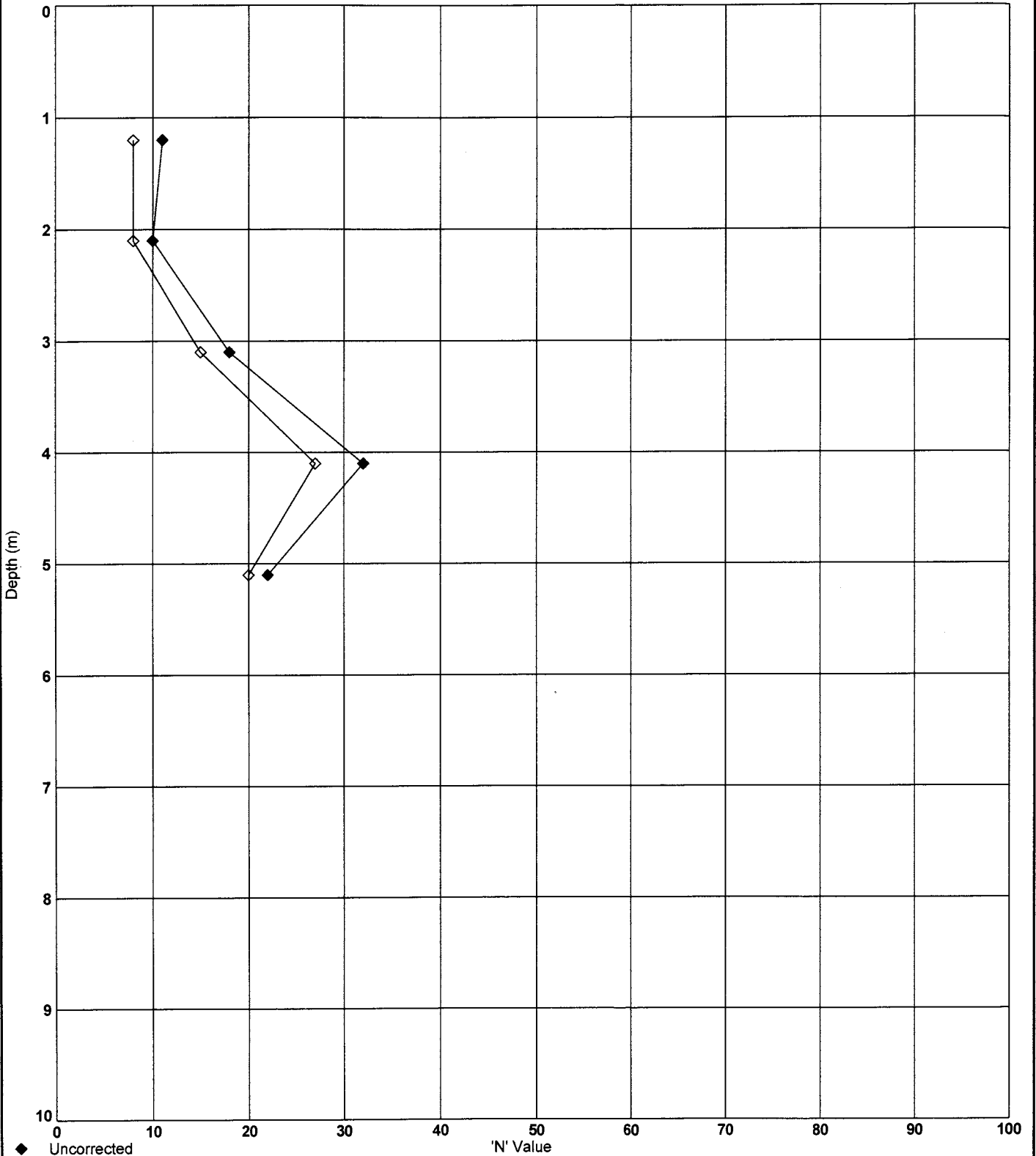
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-02



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CWS-02

Operator :- C. Copeland

Checked By :- LC

Approved By :- *NW*

AEG Contract No. :- 3842



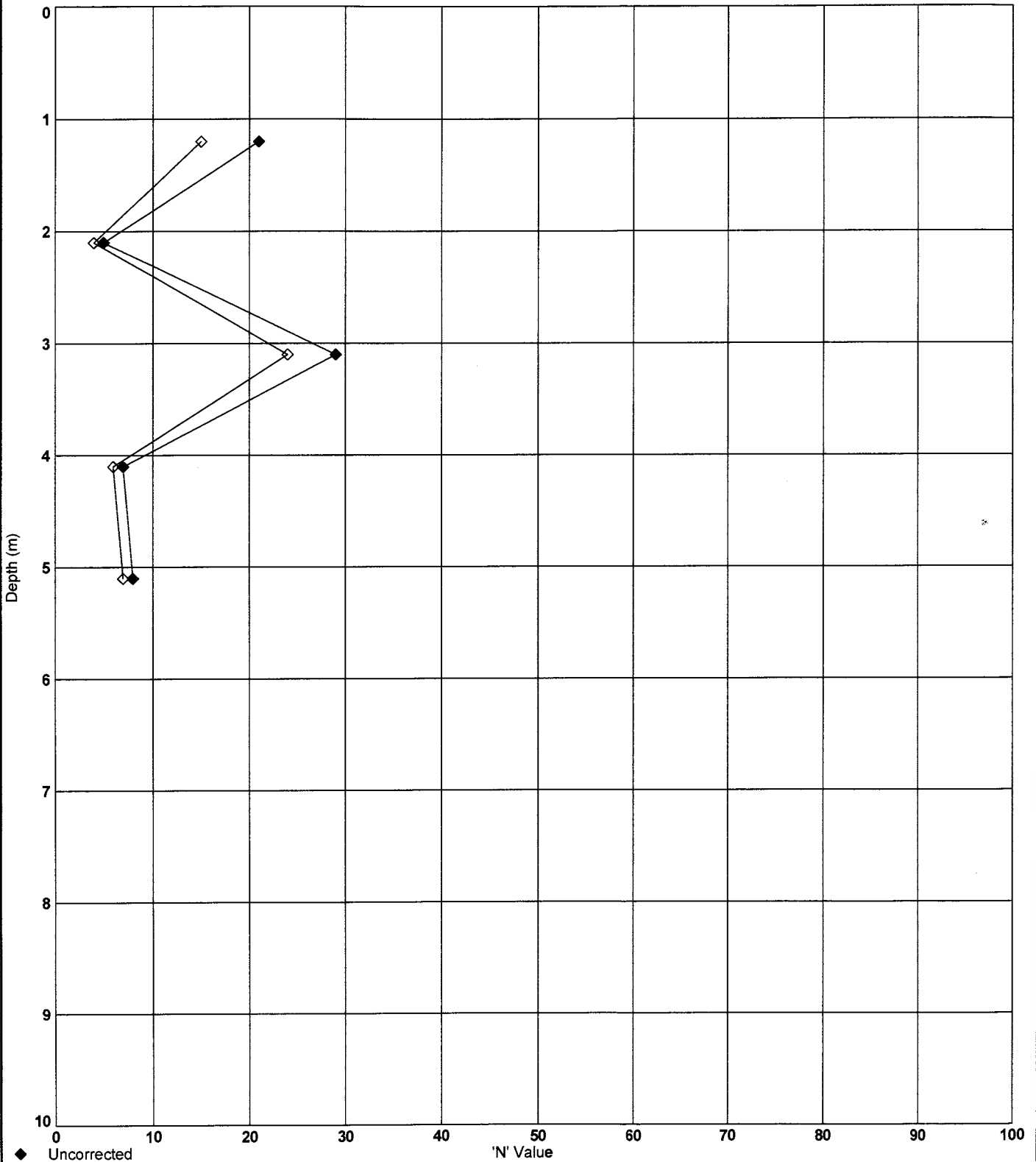
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-03



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-03

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



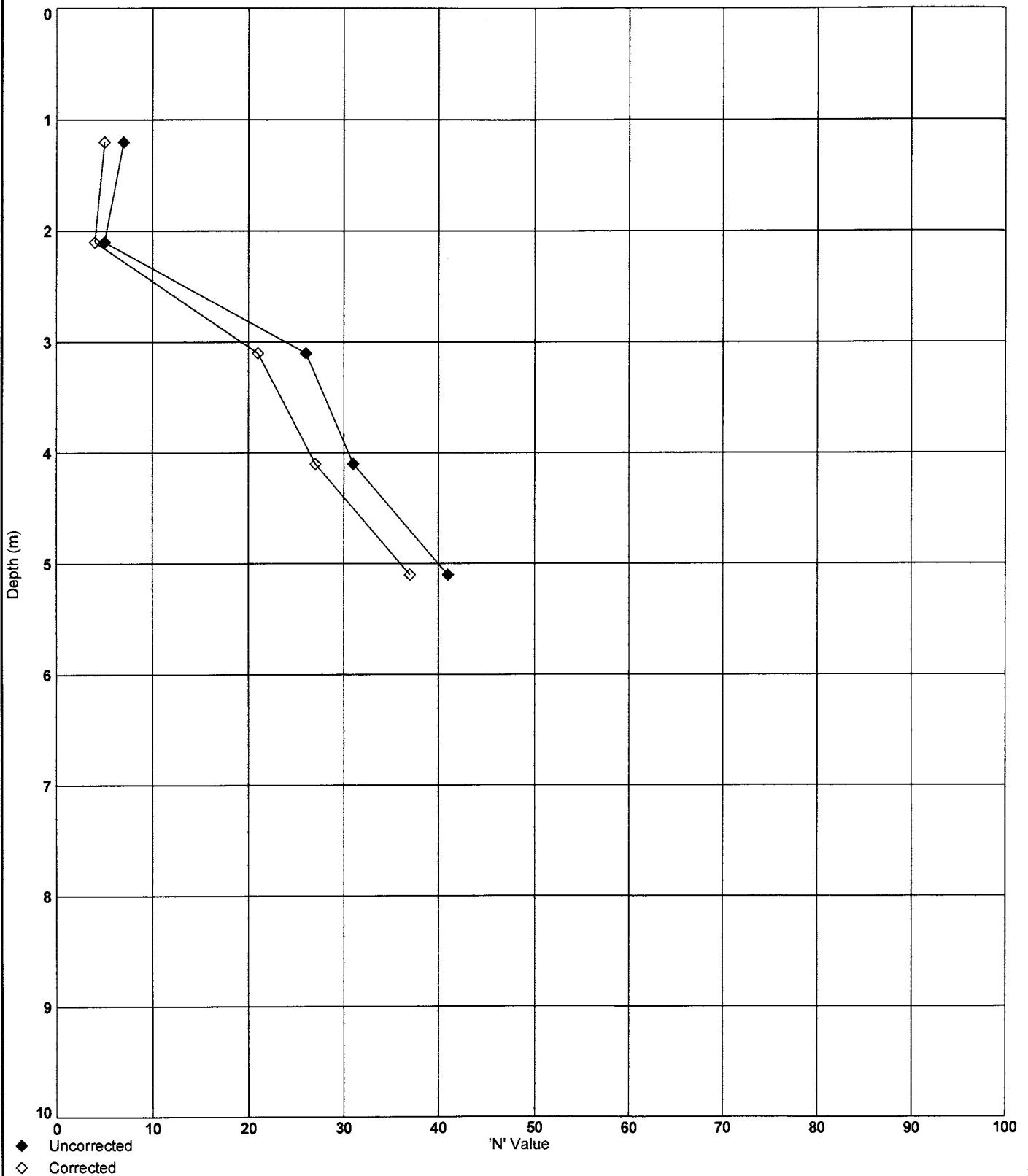
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-04



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CWS-04

Operator :- C. Copeland

Checked By :- *LC*

Approved By :- *NW*

AEG Contract No. :- 3842



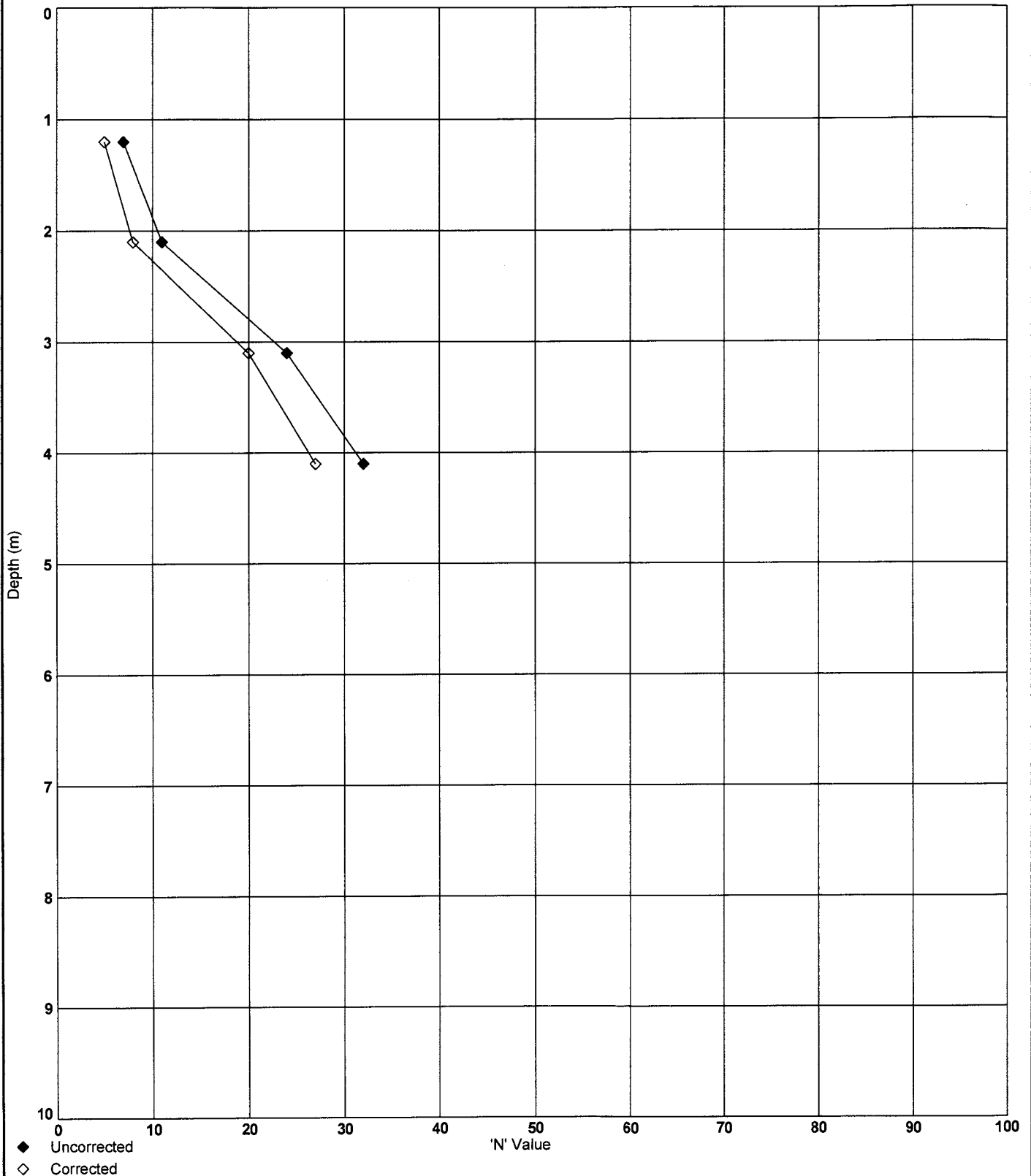
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Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-05



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-05

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



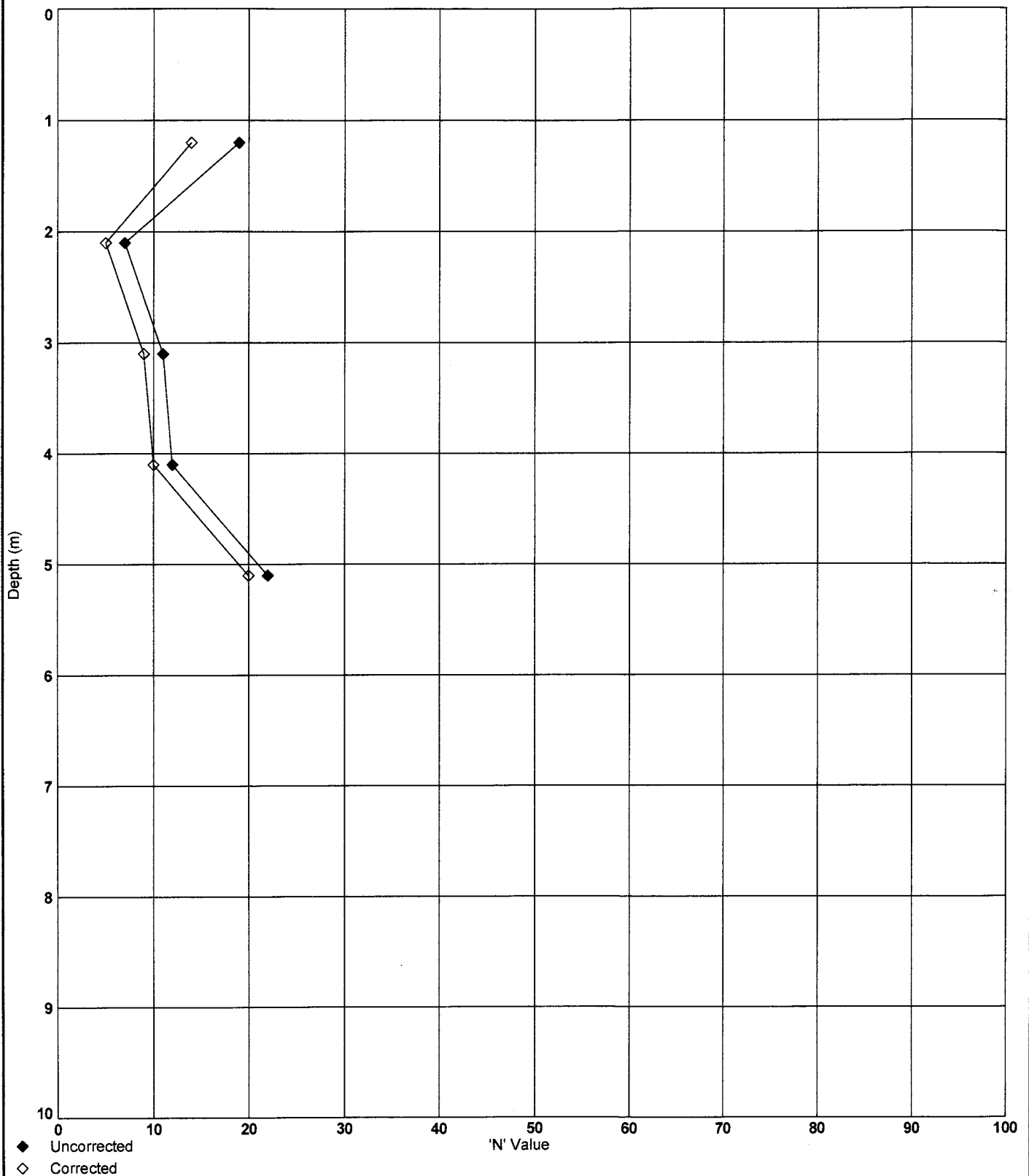
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-06



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CWS-06

Operator :- C. Copeland

Checked By :- *LC*

Approved By :- *NW*

AEG Contract No. :- 3842



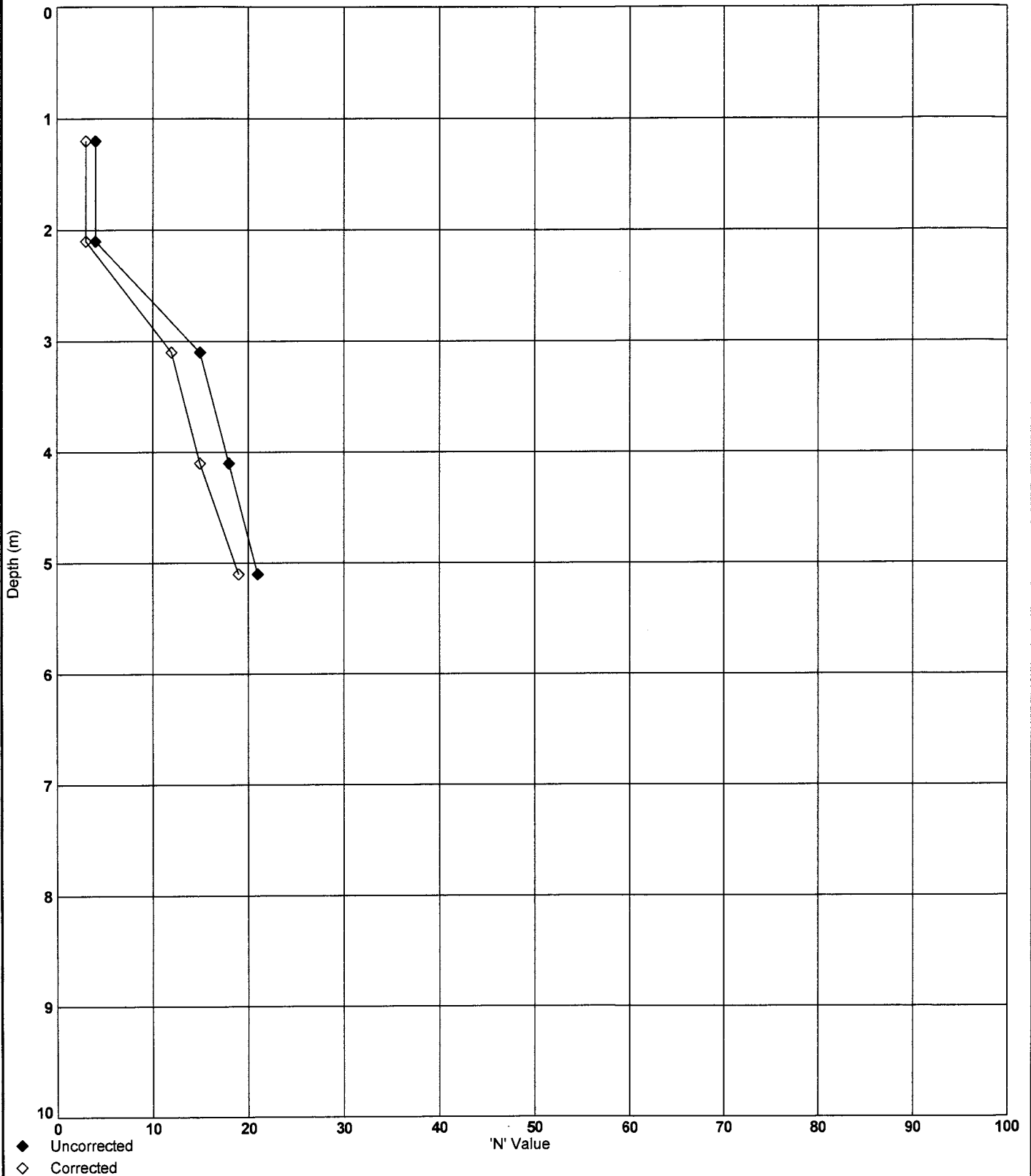
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-07



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Date of issue :- 07/11/2011

Certificate No :- SPT/3842/Graph/CWS-07

Operator :- C. Copeland

Checked By :- *LC*

Approved By :- *NW*

AEG Contract No. :- 3842



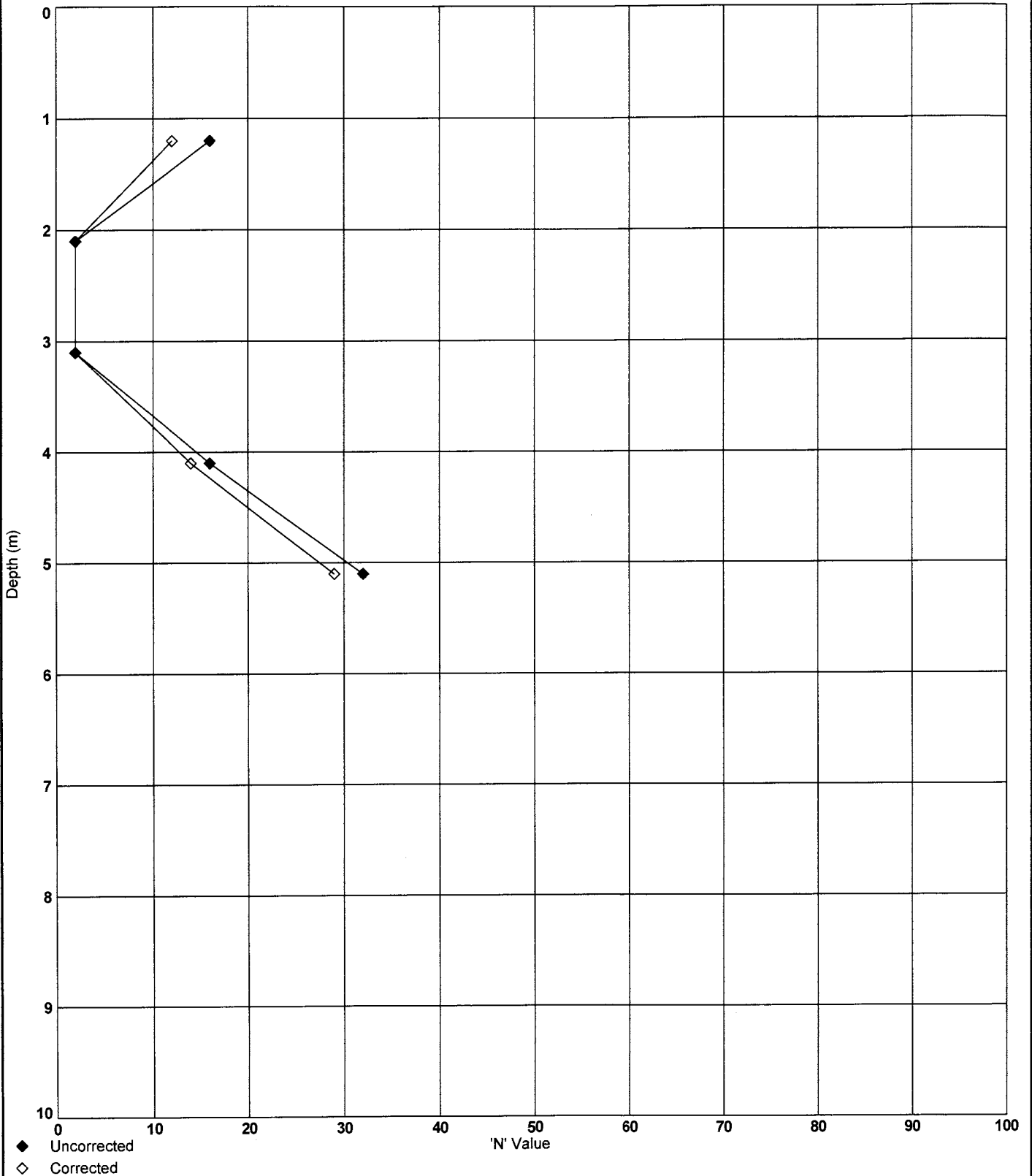
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-08



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-08

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



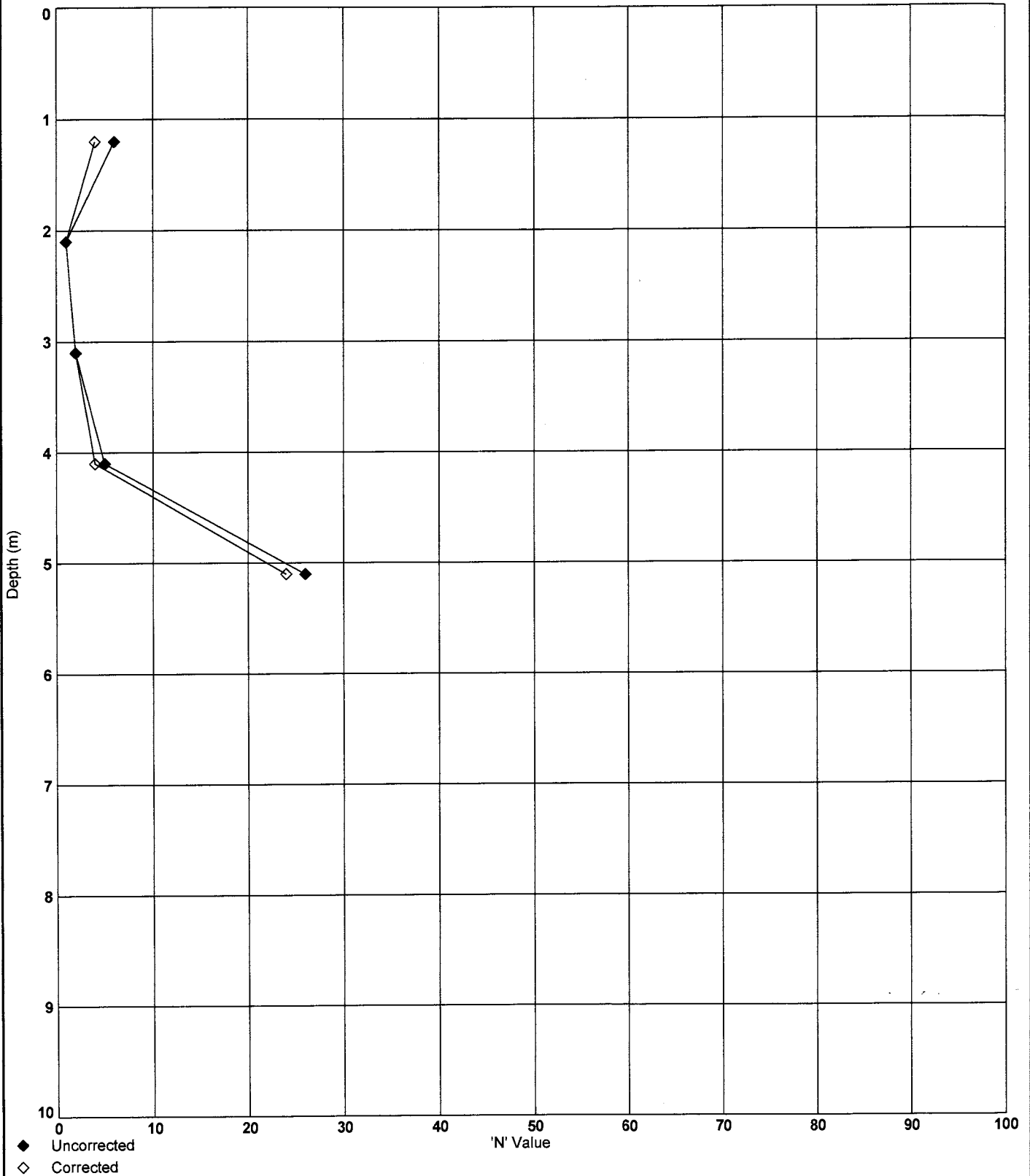
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-09



◆ Uncorrected
 ◇ Corrected

Contract Title :-
 Trinity South Residential Development, South Shields - Ground Investigation

Client :-
 South Tyneside Council



Date of issue :-
 07/11/2011

Checked By :-
LC

Certificate No :-
 SPT/3842/Graph/CWS-09

Approved By :-
NW

Operator :-
 C. Copeland

AEG Contract No. :-
 3842



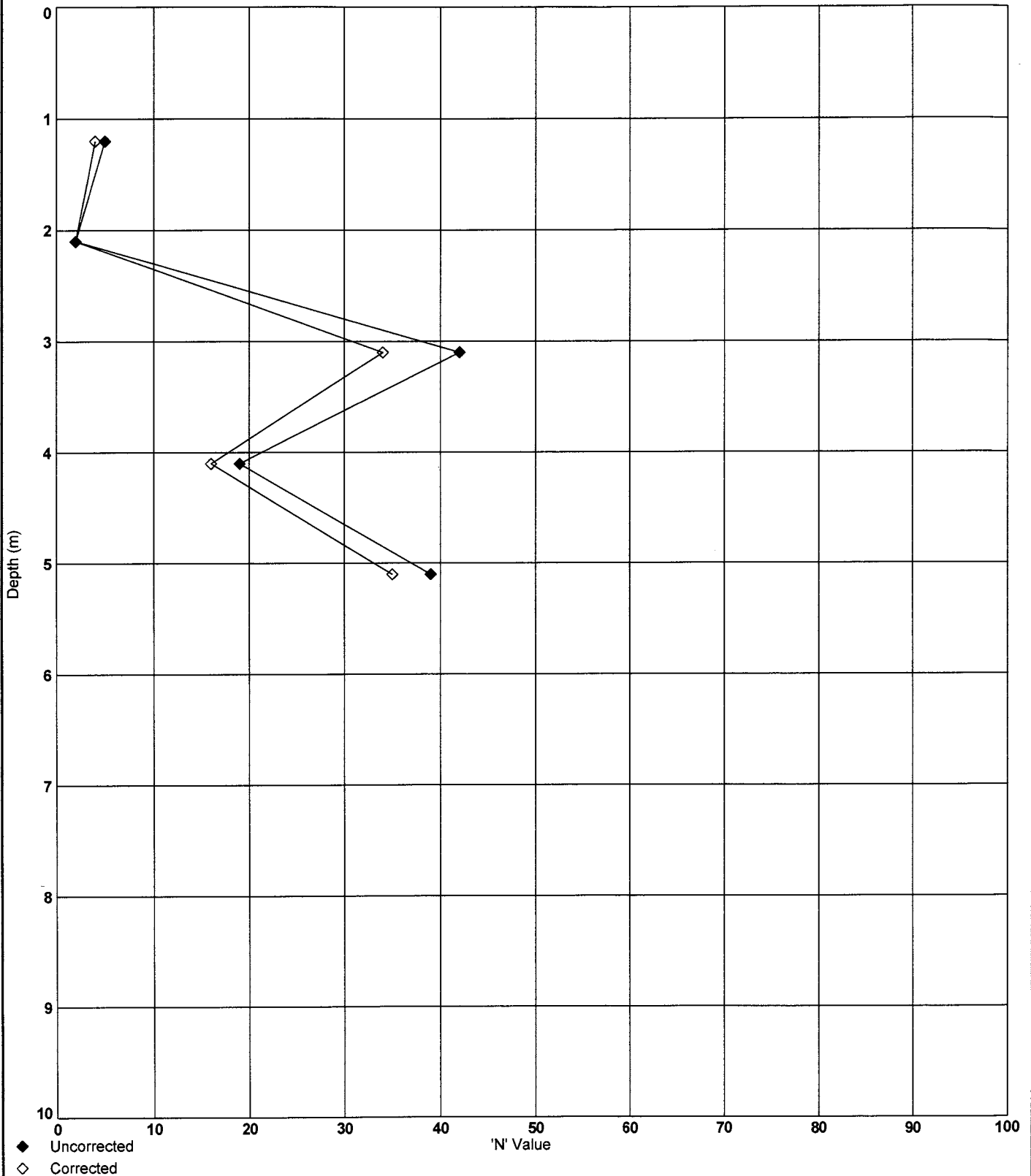
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-10



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-10

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



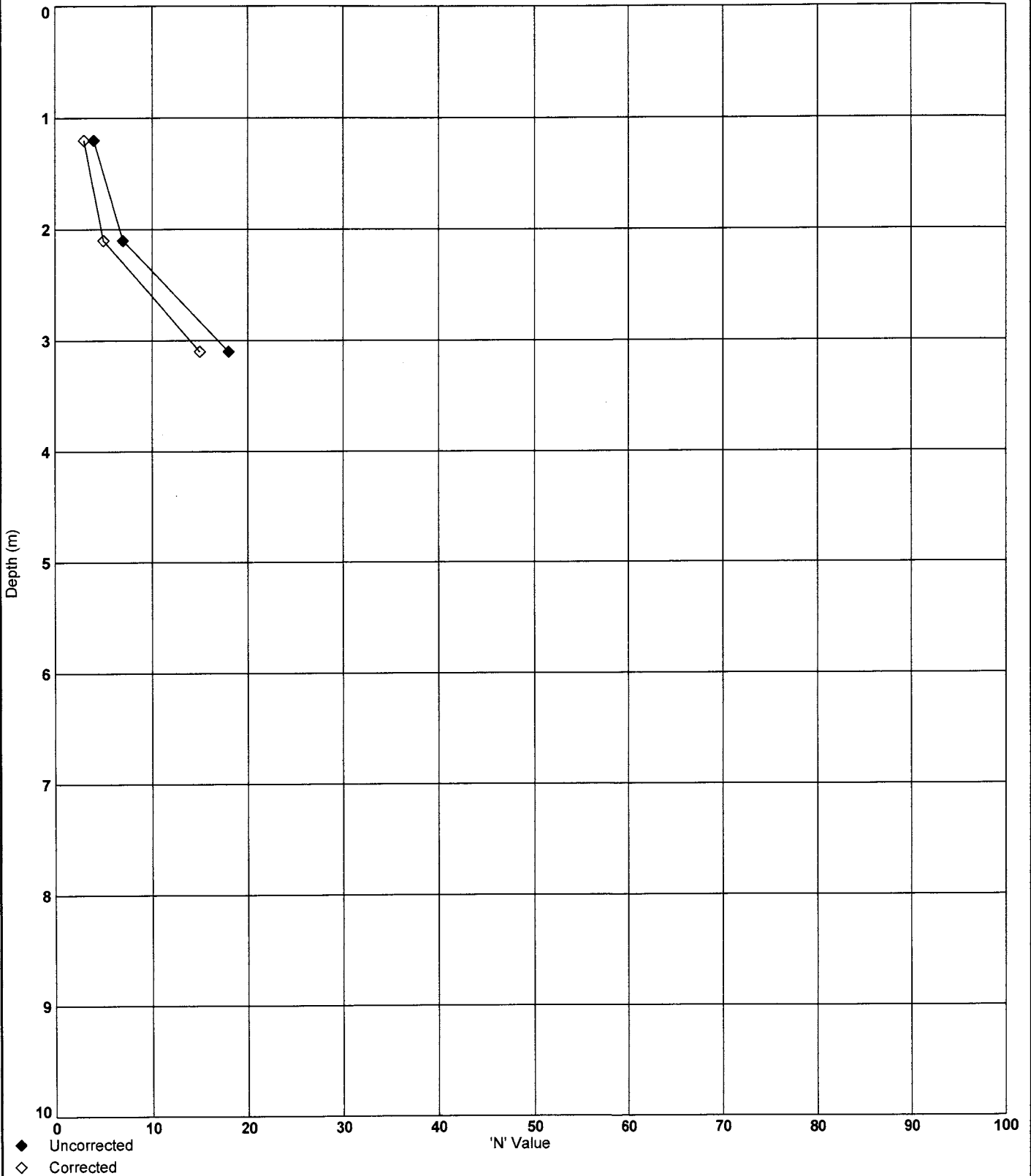
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-11



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
--	-------------------------------------

	Date of issue :- 07/11/2011	Certificate No :- SPT/3842/Graph/CWS-11	Operator :- C. Copeland
	Checked By :- <i>LC</i>	Approved By :- <i>NW</i>	AEG Contract No. :- 3842



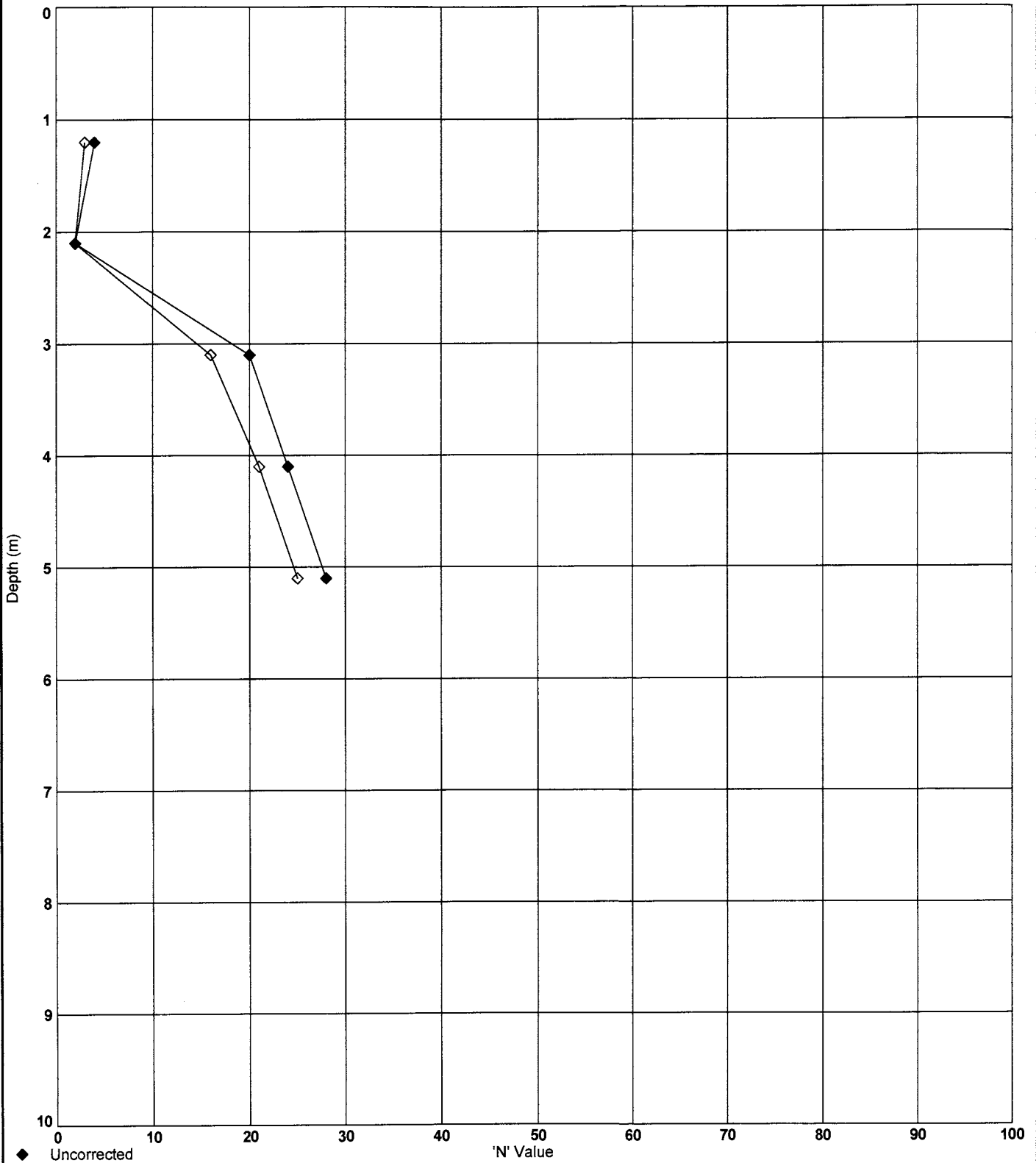
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-12



◆ Uncorrected
◇ Corrected

Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-12

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



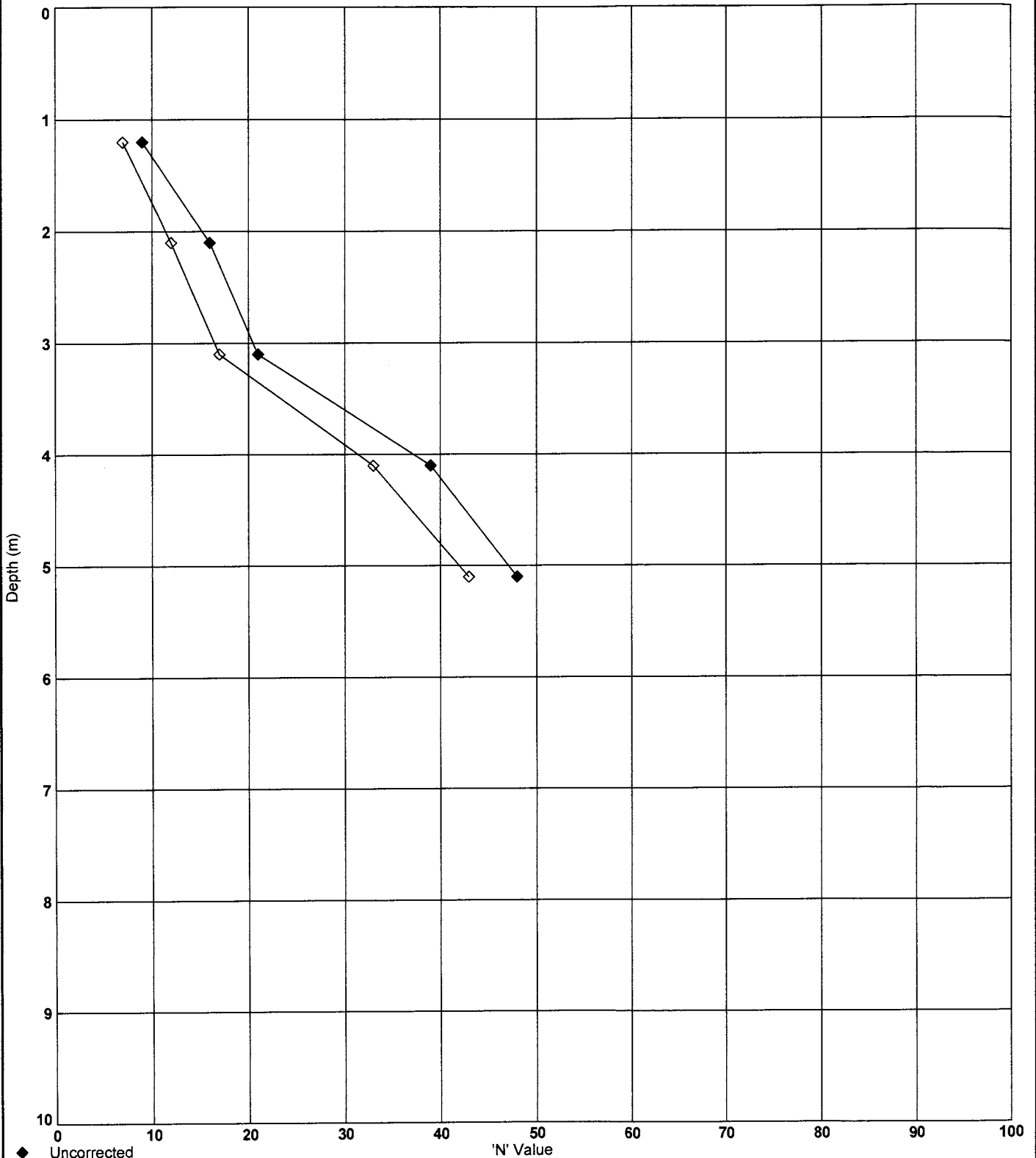
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-13



◆ Uncorrected
◇ Corrected

Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-13

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



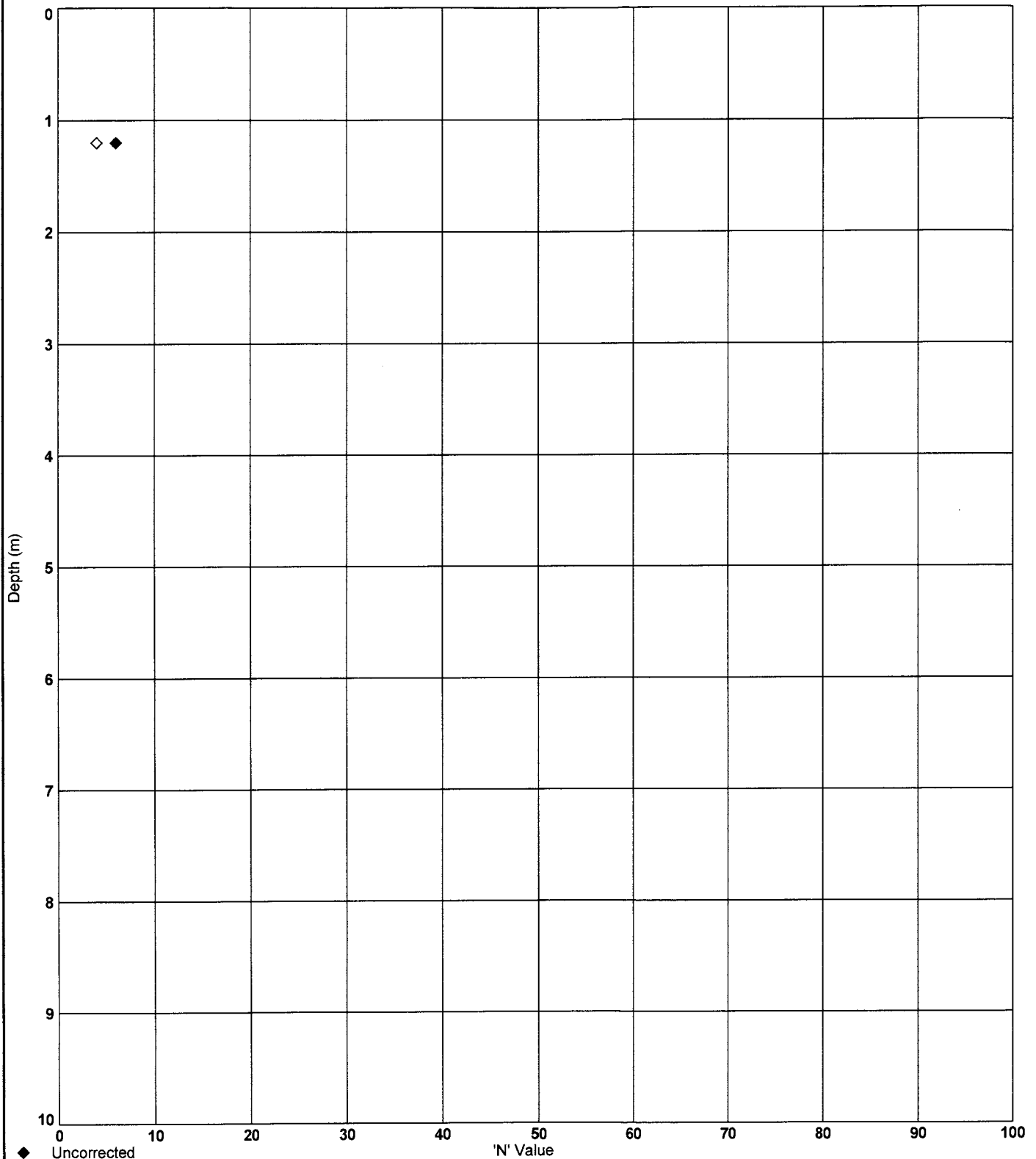
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-14



◆ Uncorrected
 ◇ Corrected

Contract Title :-
 Trinity South Residential Development, South Shields - Ground Investigation

Client :-
 South Tyneside Council



Date of issue :-
 07/11/2011

Certificate No :-
 SPT/3842/Graph/CWS-14

Operator :-
 C. Copeland

Checked By :-
 LC

Approved By :-
 NW

AEG Contract No. :-
 3842



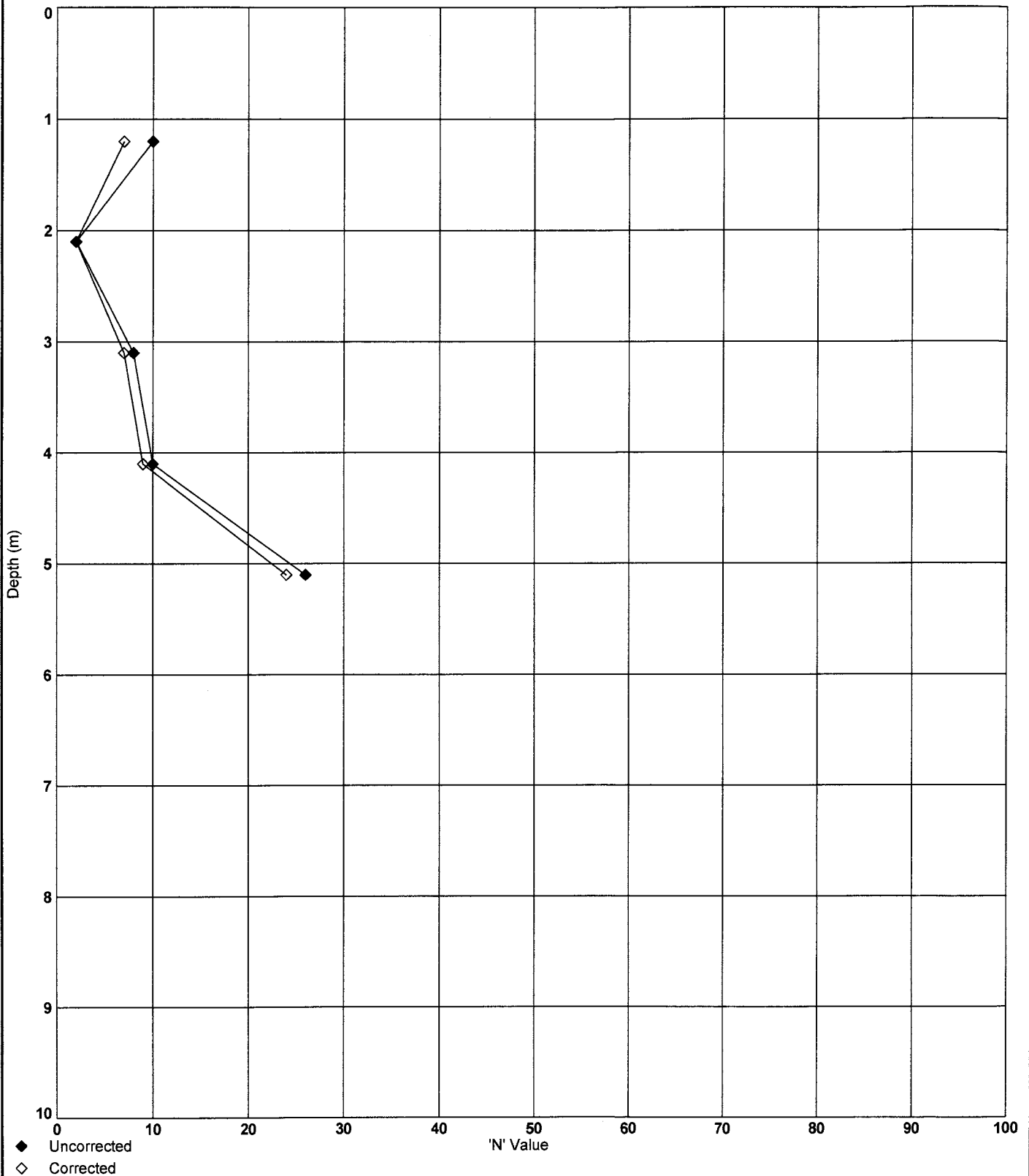
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-14A



Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation	Client :- South Tyneside Council
--	-------------------------------------

	Date of issue :- 07/11/2011	Certificate No :- SPT/3842/Graph/CWS-14A	Operator :- C. Copeland
	Checked By :- <i>LC</i>	Approved By :- <i>NW</i>	AEG Contract No. :- 3842



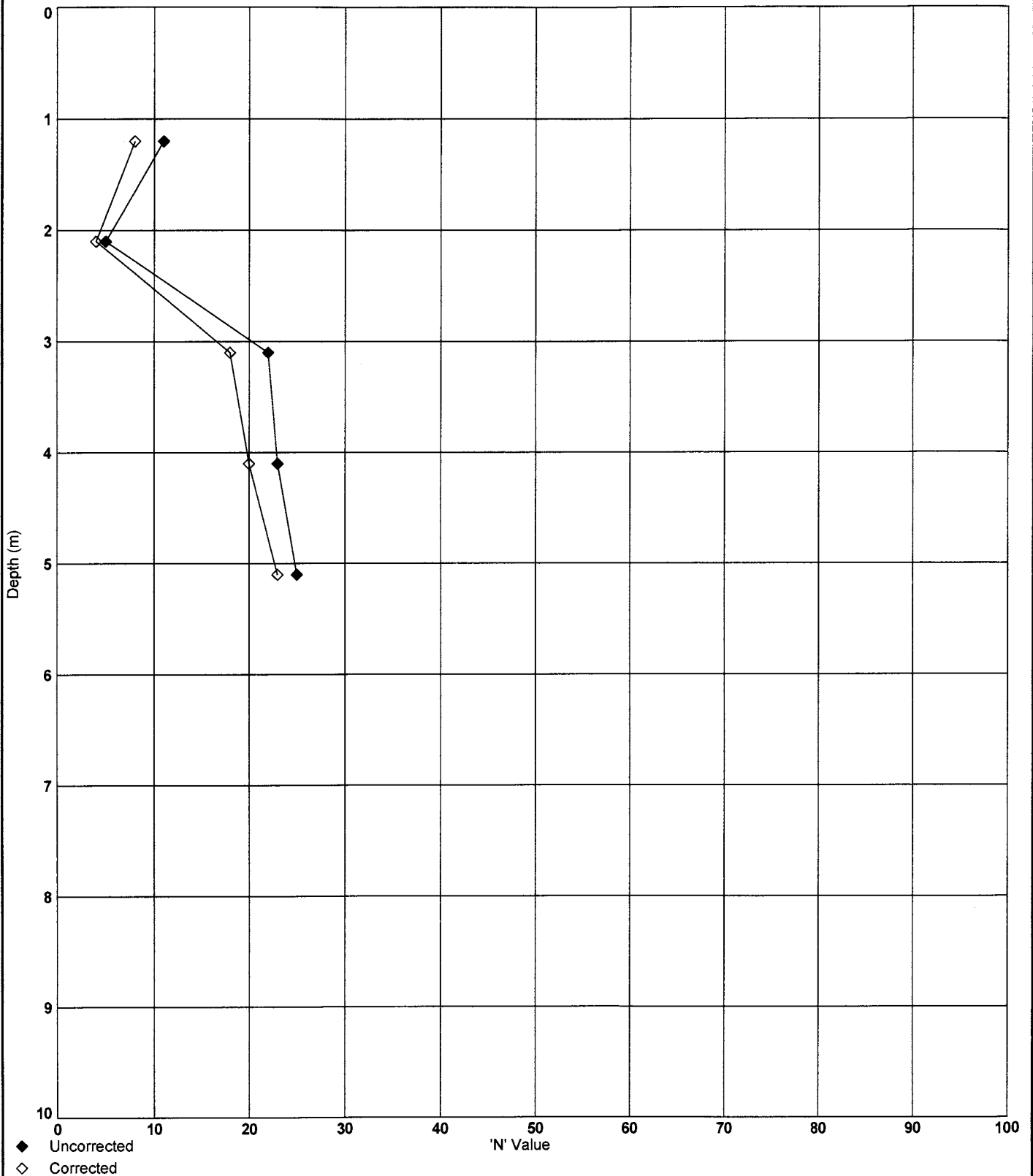
ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
 Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

STANDARD PENETRATION TEST RESULTS (BS EN ISO 22476-3: 2005)

Exploratory Hole No

CWS-15



Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Date of issue :-
07/11/2011

Certificate No :-
SPT/3842/Graph/CWS-15

Operator :-
C. Copeland

Checked By :-
LC

Approved By :-
NW

AEG Contract No. :-
3842



ENCLOSURE 2

Photo-Ionisation Detector Test Results

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

PHOTO-IONISATION DETECTOR

Exploratory Hole No.	Depth (m)	PID (ppm)	Date Tested	Remarks
CBH-01	0.50	0.0	19/09/2011	
CBH-01	1.00	0.0	19/09/2011	
CBH-02	0.50	0.4	20/09/2011	
CBH-02	1.00	1.9	20/09/2011	
CBH-04	0.50	0.0	26/09/2011	
CBH-04	1.00	0.2	26/09/2011	
CBH-05	0.50	0.2	22/09/2011	
CBH-05	1.00	0.1	22/09/2011	
CBH-06	0.50	0.0	22/09/2011	
CBH-06	1.00	0.0	22/09/2011	
CBH-07	0.50	0.3	23/09/2011	
CBH-07	1.00	0.2	23/09/2011	
CBH-08	0.50	0.0	29/09/2011	
CBH-08	1.00	0.0	29/09/2011	
CBH-09	0.50	1.5	28/09/2011	
CBH-09	1.00	1.6	28/09/2011	
CWS-01	0.50	0.0	21/09/2011	
CWS-01B	1.00	0.4	23/09/2011	
CWS-02	0.35	0.0	21/09/2011	
CWS-02	1.00	0.0	21/09/2011	
CWS-03	0.50	0.3	21/09/2011	
CWS-03	1.00	0.3	26/09/2011	
CWS-04	0.50	0.0	21/09/2011	
CWS-04	1.00	0.1	21/09/2011	
CWS-05	0.50	0.0	23/09/2011	
CWS-05	1.00	0.2	23/09/2011	
CWS-06	0.50	0.1	22/09/2011	
CWS-06	1.00	0.0	22/09/2011	
CWS-07	0.50	0.0	22/09/2011	
CWS-07	1.00	0.0	22/09/2011	
CWS-08	0.50	0.0	27/09/2011	
CWS-08	1.20	0.1	27/09/2011	
CWS-09	0.50	0.0	27/09/2011	
CWS-09	1.20	0.2	27/09/2011	
CWS-11	0.50	0.0	23/09/2011	
CWS-11	1.00	0.0	23/09/2011	
CWS-12	0.50	0.4	26/09/2011	
CWS-12	1.00	0.6	26/09/2011	
CWS-13	0.50	0.0	28/09/2011	
CWS-13	1.00	0.0	28/09/2011	

See attached Calibration Certificate for Model No. and any other details

Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Calibration Compliant :-
YES

Date of Issue :-
07/11/2011

Page No. :-
1 of 2

Checked by :-
LC

Approved by :-
skw

AEG Contract No. :-
3842



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

PHOTO-IONISATION DETECTOR

Exploratory Hole No.	Depth (m)	PID (ppm)	Date Tested	Remarks
CWS-14	0.50	0.5	27/09/2011	
CWS-14	1.00	1.5	27/09/2011	
CWS-15	0.50	0.0	22/09/2011	
CWS-15	1.00	0.0	22/09/2011	
HTP-01	0.50	0.0	20/09/2011	
HTP-01	1.00	0.1	20/09/2011	
HTP-02	0.50	0.0	20/09/2011	
HTP-02	1.00	0.0	20/09/2011	
HTP-03	0.50	0.0	20/09/2011	
HTP-03	1.00	0.0	20/09/2011	
HTP-04	0.35	0.0	20/09/2011	
HTP-04	1.00	0.0	20/09/2011	
HTP-05	0.50	0.0	20/09/2011	
HTP-05	1.00	0.0	20/09/2011	
TT-03	0.00	0.0	29/09/2011	
TT-04	0.00	0.0	29/09/2011	

See attached Calibration Certificate for Model No. and any other details

Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



Calibration Compliant :-
YES

Date of Issue :-
07/11/2011

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Checked by :-
LC

Approved by :-
AKW

AEG Contract No. :-
3842



Border Safety Supplies Ltd

www.bordersafety.co.uk

TEL: +44 (0) 1282 857730
FAX: +44 (0) 1282 857739
E-Mail: sales@bordersafety.co.uk

Unit 8 Primet Business Centre
Burnley Road, Colne
Lancashire, BB8 8DQ UK

Certificate of Calibration

Customer: **Allied Exploration & Geotechnics Ltd**
Instrument: **MiniRAE 2000**
Job: **Test and Recalibration, Service**
Serial number: **900113**
Fleet Number: **N/A**
Certificate no: **900113/161006**


Next calibration due date: 16th October 2007

Tested on 16/10/2006
Calibrated for Isobutylene

Applied Gas Concentration:	Cylinder Reference:	Initial Sensor Reading	Final Sensor Reading	Accuracy Limits
Isobutylene 100ppm	85314 cyl161	95ppm	98.6ppm	+/- 10%

The Instrument has been Re-zeroed & Calibrated utilising Calibration Gases traceable to national standards.

Calibration Engineer: ...Graham Wallis.....

RP
Signed: ........

BS EN ISO 9000 Registered Firm
ISO9001:2000
Certificate Number: GB.05/240

**Essential Supplies
For Essential Customers**

ENCLOSURE 3

Determination of the Soil infiltration Rate
for Soakaway Design Test Results

ALLIED EXPLORATION & GEOTECHNICS LTD.

Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Trial Pit

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 POSITION: CWS-03 DEPTH: 1.00 mBGL

SOAKAWAY PIT CONDITIONS

Soakaway Depth:	1.00	mBGL
Soakaway Length:	0.30	m
Soakaway Width:	0.30	m
Initial Water Level:	0.00	mBGL
Operator:	E. Bacon	
Test Date:	26.09.2011	

EFFECTIVE VOLUME DETAILS

Soakaway 25% Full:	0.750	m
Soakaway 75% Full:	0.250	m
Soakaway 50% Full:	0.500	m
Test:	1 of 1	
Weather Conditions:	Dry and fine	
Test Zone (m):	0.00	to 1.00

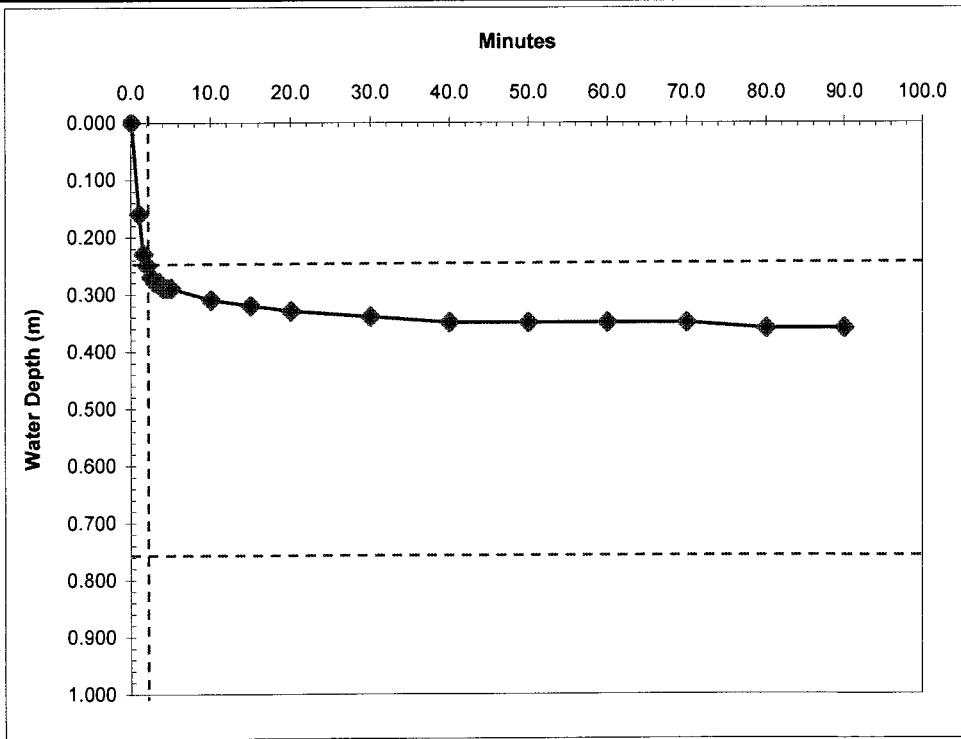
TEST CALCULATION

Soil Infiltration (f)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the trial pit 75% and 25% effective depth.
- a_{p50} = the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.0	0.000	Start
1.0	0.160	
1.5	0.230	
2.0	0.250	
2.5	0.270	
3.0	0.280	
3.5	0.280	
4.0	0.290	
4.5	0.290	
5.0	0.290	
10.0	0.310	
15.0	0.320	
20.0	0.330	
30.0	0.340	
40.0	0.350	
50.0	0.350	
60.0	0.350	
70.0	0.350	
80.0	0.360	
90.0	0.360	Finish



Time (from Graph) 75% Full: 2.0 Minutes
 Time (from Graph) 25% Full: n/a Minutes
 $t_{p75-25} =$ n/a Minutes

REMARKS

Trial pit soakaway dry prior to filling. Soakaway infiltration test result not calculated as 25% effective depth not achieved - minimal water movement, test effectively failed. Terminated procedure in accordance with Contract Specification after 90mins of monitoring.

SOIL INFILTRATION RESULTS

$V_{p75-25} = 0.045 \text{ m}^3$
 $a_{p50} = 0.690 \text{ m}^2$
 Soil Infiltration Rate (f) = n/a m/s From (i)

Calculated: N. Vater Date: 08.10.2011

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Borehole

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 **BOREHOLE:** CWS-03 **DEPTH:** 2.00 **mBGL**

SOAKAWAY PIT CONDITIONS

Ground Water Level:	2.00	mBGL
Soakaway Diameter:	0.100	m
Water Level (Test Start):	1.00	mBGL
Operator:	E. Bacon	
Test Date:	27.09.2011	

EFFECTIVE VOLUME DETAILS

Soakaway 25% Full:	1.750	m
Soakaway 75% Full:	1.250	m
Soakaway 50% Full:	1.500	m
Test Number:	1 of 2	
Weather Conditions:	Dry and sunny	
Test Zone (m):	1.00	to 2.00

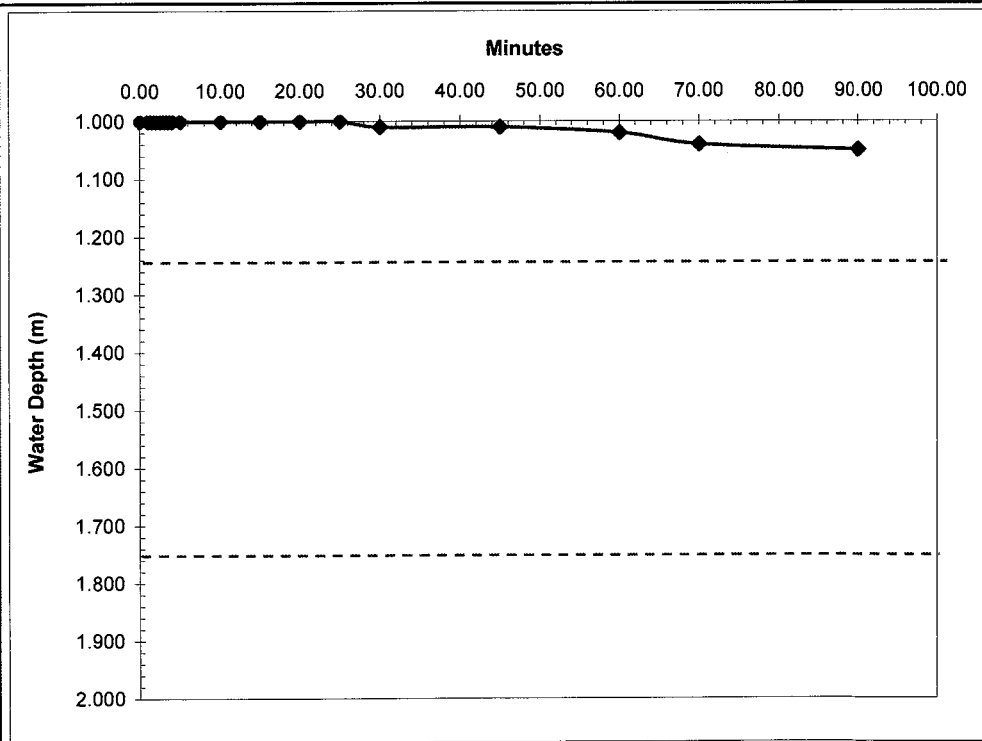
TEST CALCULATION

Soil Infiltration (f)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the borehole 75% and 25% effective depth.
- a_{p50} = the internal surface area of the borehole up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.00	1.000	Test Start
1.00	1.000	
1.50	1.000	
2.00	1.000	
2.50	1.000	
3.00	1.000	
3.50	1.000	
4.00	1.000	
5.00	1.000	
10.00	1.000	
15.00	1.000	
20.00	1.000	
25.00	1.000	
30.00	1.010	
45.00	1.010	
60.00	1.020	
70.00	1.040	
90.00	1.050	Test Finish



Time (from Graph) 75% Full: n/a Minutes
Time (from Graph) 25% Full: n/a Minutes
 $t_{p75-25} =$ n/a Minutes

REMARKS

Alternative calculation based on a modified form of BRE 365 (Soakaway Design) provided without prejudice further to the request of the Engineer. 75% and 25% full effective depths not achieved - water movement extremely slow, test failed. Procedure terminated in accordance with Contract Specification.

SOIL INFILTRATION RESULTS

$V_{p75-25} =$ 0.004 m³
 $a_{p50} =$ 0.165 m²
Soil Infiltration Rate (f) = n/a m/s **From (i)**

Calculated: N. Vater **Date:** 08.10.2011

ALLIED EXPLORATION & GEOTECHNICS LTD.
 Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG
SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))
 Installation Type: Trial Pit

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation
 CONTRACT: 3842 POSITION: CWS-08 DEPTH: 1.00 mBGL

SOAKAWAY PIT CONDITIONS

Soakaway Depth:	1.00	mBGL
Soakaway Length:	0.30	m
Soakaway Width:	0.30	m
Initial Water Level:	0.00	mBGL
Operator:	E. Bacon	
Test Date:	26.09.2011	

EFFECTIVE VOLUME DETAILS

Soakaway 25% Full:	0.750	m
Soakaway 75% Full:	0.250	m
Soakaway 50% Full:	0.500	m
Test:	1 of 1	
Weather Conditions:	Dry and fine	
Test Zone (m):	0.00	to 1.00

TEST CALCULATION

Minutes	Water Depth (m)	Remarks
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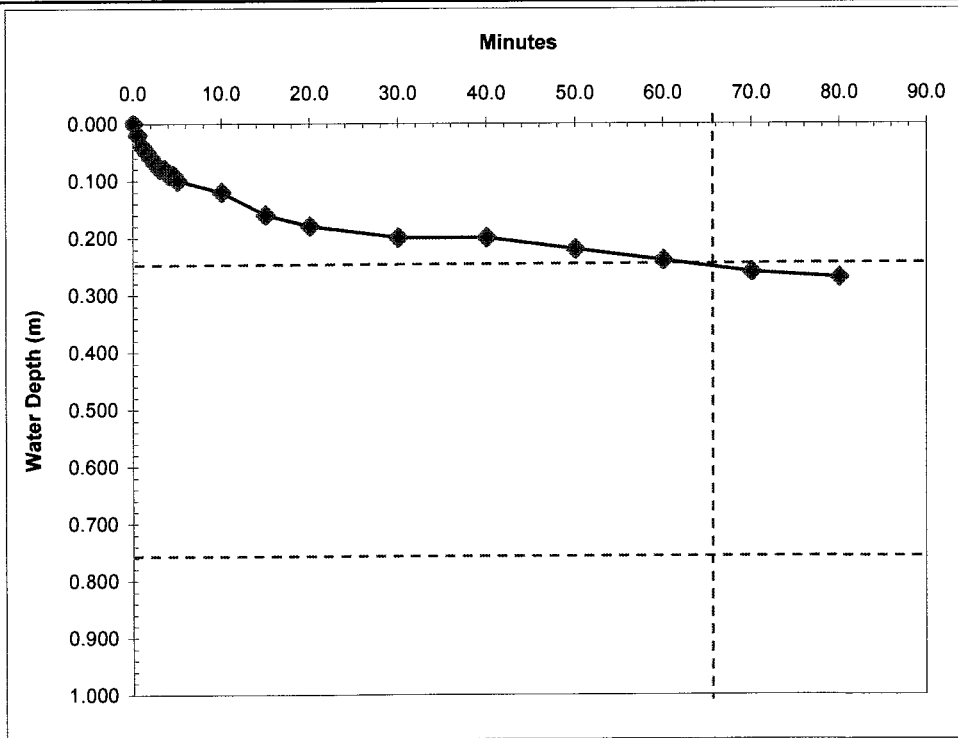
Soil Infiltration (f)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the trial pit 75% and 25% effective depth.
- a_{p50} = the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

0.0	0.000	Start
0.5	0.020	
1.0	0.040	
1.5	0.050	
2.0	0.060	
2.5	0.070	
3.0	0.080	
3.5	0.080	
4.0	0.090	
4.5	0.090	
5.0	0.100	
10.0	0.120	
15.0	0.160	
20.0	0.180	
30.0	0.200	
40.0	0.200	
50.0	0.220	
60.0	0.240	
70.0	0.260	
80.0	0.270	
90.0	0.280	

Finish



Time (from Graph) 75% Full: 66.0 Minutes
 Time (from Graph) 25% Full: n/a Minutes

$$t_{p75-25} = \text{n/a} \quad \text{Minutes}$$

REMARKS

Trial pit soakaway dry prior to filling. Soakaway infiltration test result not calculated as 25% effective depth not achieved - minimal water movement, test effectively failed. Terminated procedure in accordance with Contract Specification after 90mins of monitoring.

SOIL INFILTRATION RESULTS

$$V_{p75-25} = 0.045 \quad \text{m}^3$$

$$a_{p50} = 0.690 \quad \text{m}^2$$

$$\text{Soil Infiltration Rate (f)} = \text{n/a} \quad \text{m/s} \quad \text{From (i)}$$

Calculated: N. Vater Date: 08.10.2011

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Borehole

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 BOREHOLE: CWS-08 DEPTH: 2.00 mBGL

SOAKAWAY PIT CONDITIONS

Ground Water Level:	2.00	mBGL
Soakaway Diameter:	0.100	m
Water Level (Test Start):	1.00	mBGL
Operator:	E. Bacon	
Test Date:	27.09.2011	

EFFECTIVE VOLUME DETAILS

Soakaway 25% Full:	1.750	m
Soakaway 75% Full:	1.250	m
Soakaway 50% Full:	1.500	m
Test Number:	1 of 2	
Weather Conditions:	Dry and sunny	
Test Zone (m):	1.00	to 2.00

TEST CALCULATION

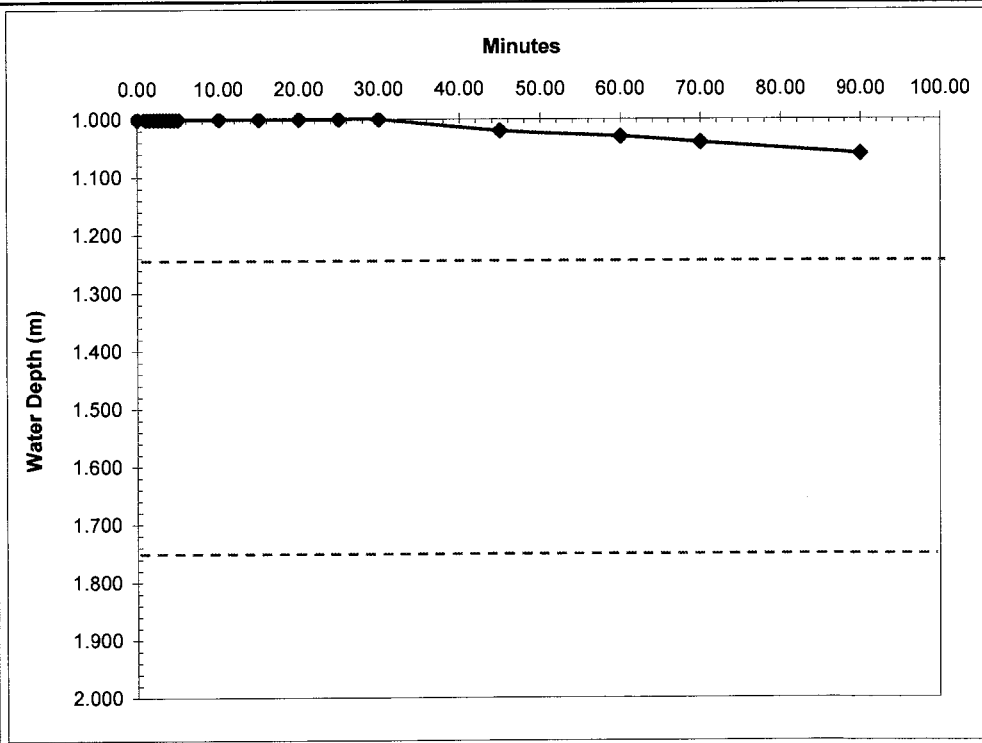
Minutes	Water Depth (m)	Remarks
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Soil Infiltration (f)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the borehole 75% and 25% effective depth.
- a_{p50} = the internal surface area of the borehole up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

0.00	1.000	Test Start
1.00	1.000	
1.50	1.000	
2.00	1.000	
2.50	1.000	
3.00	1.000	
3.50	1.000	
4.00	1.000	
4.50	1.000	
5.00	1.000	
10.00	1.000	
15.00	1.000	
20.00	1.000	
25.00	1.000	
30.00	1.000	
45.00	1.020	
60.00	1.030	
70.00	1.040	
90.00	1.060	Test Finish



Time (from Graph) 75% Full: n/a Minutes
 Time (from Graph) 25% Full: n/a Minutes
 $t_{p75-25} =$ n/a Minutes

REMARKS

Alternative calculation based on a modified form of BRE 365 (Soakaway Design) provided without prejudice further to the request of the Engineer. 75% and 25% full effective depths not achieved - water movement extremely slow, test failed. Procedure terminated in accordance with Contract Specification.

SOIL INFILTRATION RESULTS

$V_{p75-25} = 0.004 \text{ m}^3$
 $a_{p50} = 0.165 \text{ m}^2$
 Soil Infiltration Rate (f) = n/a m/s From (i)

Calculated: N. Vater Date: 08.10.2011

ALLIED EXPLORATION & GEOTECHNICS LTD.

Unit 25, Stella Gill Industrial Site, Pelton Fell, Chester-le-Street, County Durham, DH2 2RG

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Trial Pit

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 POSITION: CWS-10 DEPTH: 1.00 mBGL

SOAKAWAY PIT CONDITIONS

Soakaway Depth:	1.00	mBGL
Soakaway Length:	0.30	m
Soakaway Width:	0.30	m
Initial Water Level:	0.00	mBGL
Operator:	E. Bacon	
Test Date:	27.09.2011	

EFFECTIVE VOLUME DETAILS

Soakaway 25% Full:	0.750	m
Soakaway 75% Full:	0.250	m
Soakaway 50% Full:	0.500	m
Test:	1 of 1	
Weather Conditions:	Dry and fine	
Test Zone (m):	0.00	to 1.00

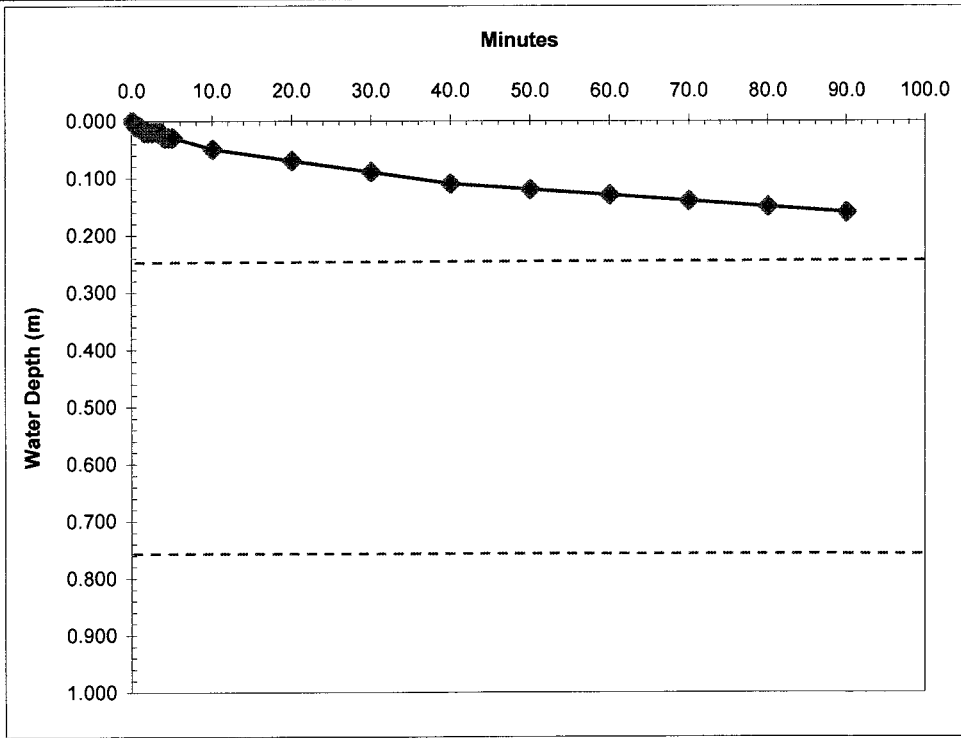
TEST CALCULATION

Soil Infiltration (*f*)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the trial pit 75% and 25% effective depth.
- a_{p50} = the internal surface area of the trial pit up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.0	0.000	Start
0.5	0.010	
1.0	0.010	
1.5	0.020	
2.0	0.020	
2.5	0.020	
3.0	0.020	
3.5	0.020	
4.0	0.030	
4.5	0.030	
5.0	0.030	
10.0	0.050	
20.0	0.070	
30.0	0.090	
40.0	0.110	
50.0	0.120	
60.0	0.130	
70.0	0.140	
80.0	0.150	
90.0	0.160	Finish



Time (from Graph) 75% Full: n/a Minutes
 Time (from Graph) 25% Full: n/a Minutes
 $t_{p75-25} =$ n/a Minutes

REMARKS

Trial pit soakaway dry prior to filling. Soakaway infiltration test result not calculated as 25% effective depth not achieved - minimal water movement, test effectively failed. Terminated procedure in accordance with Contract Specification after 90mins of monitoring.

SOIL INFILTRATION RESULTS

$V_{p75-25} = 0.045 \text{ m}^3$
 $a_{p50} = 0.690 \text{ m}^2$
 Soil Infiltration Rate (*f*) = n/a m/s From (i)

Calculated: N. Vater Date: 08.10.2011

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Borehole

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 **BOREHOLE:** CWS-10 **DEPTH:** 2.00 **mBGL**

SOAKAWAY PIT CONDITIONS

Ground Water Level:	2.00	mBGL
Soakaway Diameter:	0.100	m
Water Level (Test Start):	0.66	mBGL
Operator:	C. Copeland	
Test Date:	28.09.2011	

EFFECTIVE VOLUME DETAILS

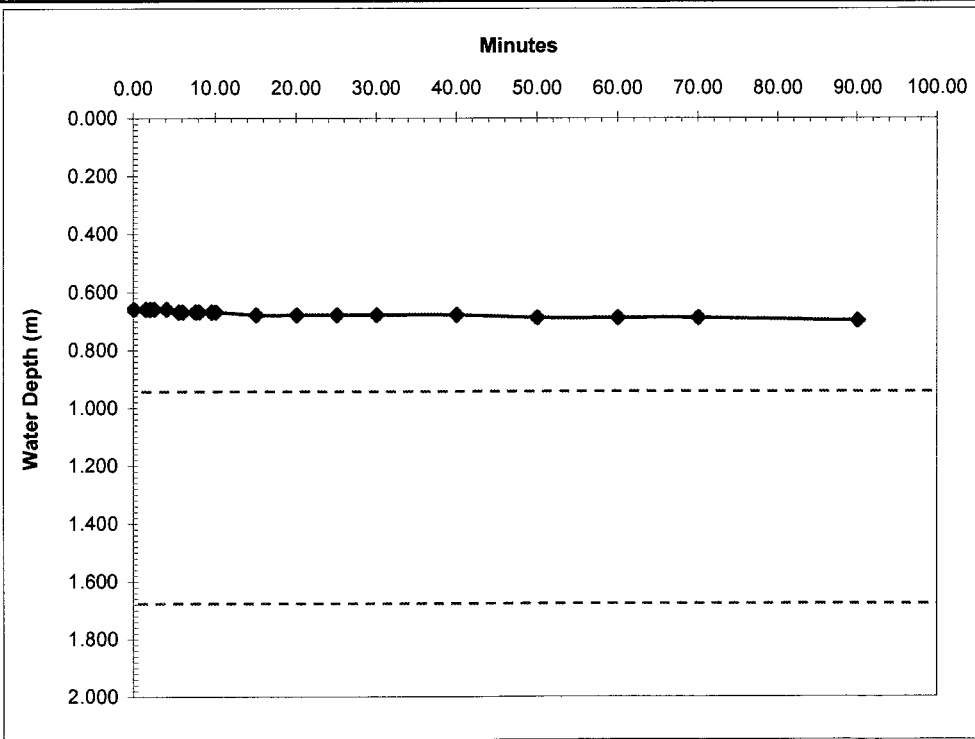
Soakaway 25% Full:	1.665	m
Soakaway 75% Full:	0.995	m
Soakaway 50% Full:	1.330	m
Test Number:	1 of 1	
Weather Conditions:	Dry and sunny	
Test Zone (m):	0.66	to 2.00

TEST CALCULATION

Soil Infiltration (f)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the borehole 75% and 25% effective depth.
- a_{p50} = the internal surface area of the borehole up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.



Minutes	Water Depth (m)	Remarks
0.00	0.660	Test Start
1.50	0.660	
2.00	0.660	
2.50	0.660	
4.00	0.660	
5.50	0.670	
6.00	0.670	
7.50	0.670	
8.00	0.670	
9.50	0.670	
10.00	0.670	
15.00	0.680	
20.00	0.680	
25.00	0.680	
30.00	0.680	
40.00	0.680	
50.00	0.690	
60.00	0.690	
70.00	0.690	
90.00	0.700	Test Finish

Time (from Graph) 75% Full: n/a Minutes
 Time (from Graph) 25% Full: n/a Minutes
 $t_{p75-25} =$ n/a Minutes

REMARKS

Alternative calculation based on a modified form of BRE 365 (Soakaway Design) provided without prejudice further to the request of the Engineer. 75% and 25% full effective depths not achieved - water movement extremely slow, test failed. Procedure terminated in accordance with Contract Specification.

SOIL INFILTRATION RESULTS

$V_{p75-25} =$	0.005	m ³	
$a_{p50} =$	0.218	m ²	
Soil Infiltration Rate (f) =	n/a	m/s	From (i)

Calculated: N. Vater **Date:** 08.10.2011

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Trial Pit

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 POSITION: CWS-13 DEPTH: 1.00 mBGL

SOAKAWAY PIT CONDITIONS

Soakaway Depth:	1.00	mBGL
Soakaway Length:	0.30	m
Soakaway Width:	0.30	m
Initial Water Level:	0.00	mBGL
Operator:	C. Copeland	
Test Date:	28.09.2011	

EFFECTIVE VOLUME DETAILS

Soakaway 25% Full:	0.750	m
Soakaway 75% Full:	0.250	m
Soakaway 50% Full:	0.500	m
Test:	1 of 1	
Weather Conditions:	Dry and fine	
Test Zone (m):	0.00	to 1.00

TEST CALCULATION

Soil Infiltration (f)

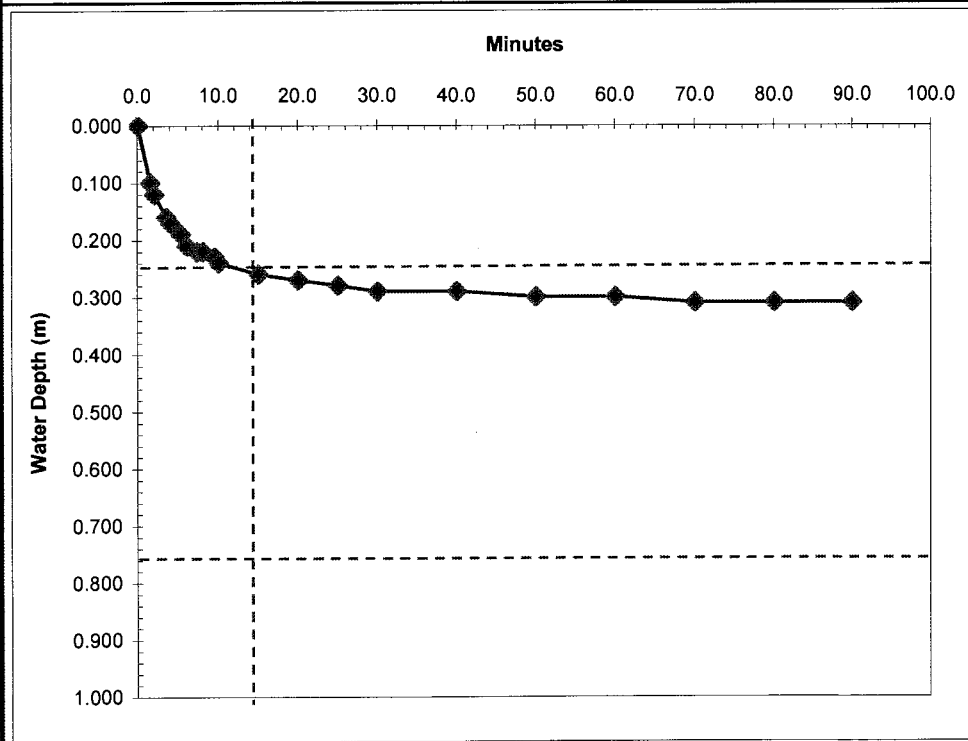
$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

V_{p75-25} = the effective storage volume of water in the trial pit 75% and 25% effective depth.

a_{p50} = the internal surface area of the trial pit up to 50% effective depth and including the base area

t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.

Minutes	Water Depth (m)	Remarks
0.0	0.000	Start
1.5	0.100	
2.0	0.120	
3.5	0.160	
4.0	0.170	
5.3	0.190	
6.0	0.210	
7.3	0.220	
8.0	0.220	
9.5	0.230	
10.0	0.240	
15.0	0.260	
20.0	0.270	
25.0	0.280	
30.0	0.290	
40.0	0.290	
50.0	0.300	
60.0	0.300	
70.0	0.310	
80.0	0.310	
90.0	0.310	Finish



Time (from Graph) 75% Full:	14.0	Minutes
Time (from Graph) 25% Full:	n/a	Minutes
$t_{p75-25} =$	n/a	Minutes

REMARKS

Trial pit soakaway dry prior to filling. Soakaway infiltration test result not calculated as 25% effective depth not achieved - minimal water movement, test effectively failed. Terminated procedure in accordance with Contract Specification after 90mins of monitoring.

Calculated: N. Vater Date: 08.10.2011

SOIL INFILTRATION RESULTS

$V_{p75-25} = 0.045 \text{ m}^3$
 $a_{p50} = 0.690 \text{ m}^2$

Soil Infiltration Rate (f) = n/a m/s From (i)

SOIL INFILTRATION DETERMINATION (SOAKAWAY DESIGN (BRE Digest 365))

Installation Type: Borehole

CONTRACT & POSITION DETAILS

SITE: Trinity South Residential Development, South Shields - Ground Investigation

CONTRACT: 3842 BOREHOLE: CWS-13 DEPTH: 2.00 mBGL

SOAKAWAY PIT CONDITIONS

Ground Water Level:	2.00	mBGL
Soakaway Diameter:	0.100	m
Water Level (Test Start):	0.80	mBGL
Operator:	C. Copeland	
Test Date:	28.09.2011	

EFFECTIVE VOLUME DETAILS

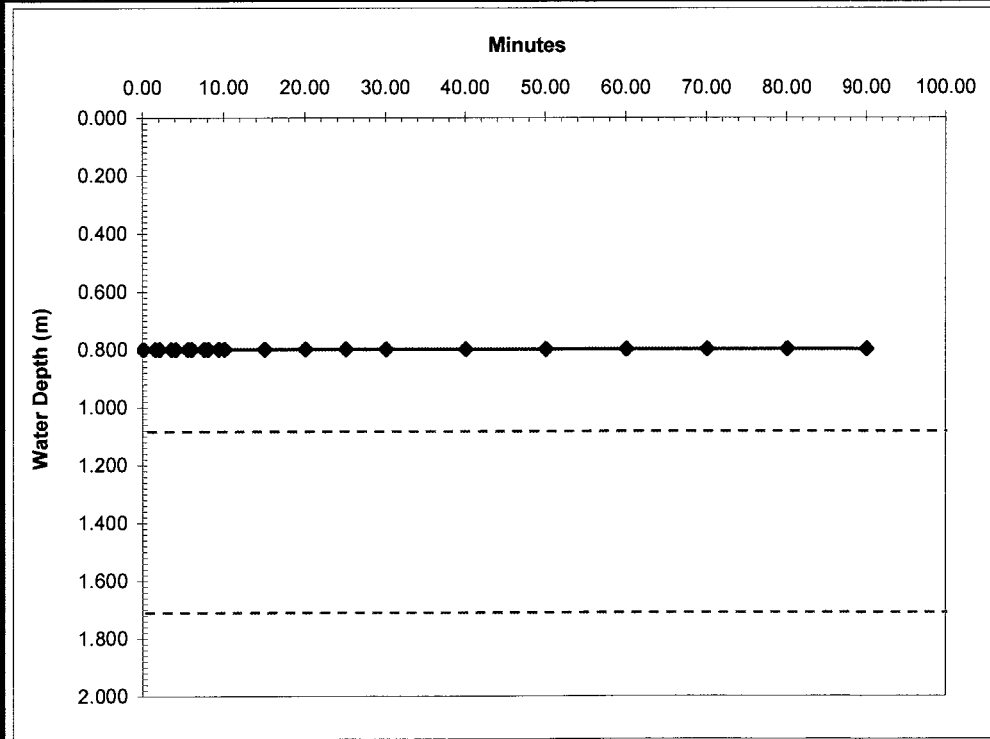
Soakaway 25% Full:	1.700	m
Soakaway 75% Full:	1.100	m
Soakaway 50% Full:	1.400	m
Test Number:	1 of 1	
Weather Conditions:	Dry and sunny	
Test Zone (m):	0.80	to 2.00

TEST CALCULATION

Soil Infiltration (f)

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}} \quad \text{Equation (i)}$$

- V_{p75-25} = the effective storage volume of water in the borehole 75% and 25% effective depth.
- a_{p50} = the internal surface area of the borehole up to 50% effective depth and including the base area
- t_{p75-25} = the time for the water level to fall from 75% to 25% effective depth.



Time (from Graph) 75% Full: n/a Minutes
Time (from Graph) 25% Full: n/a Minutes

$$t_{p75-25} = \text{n/a} \quad \text{Minutes}$$

Minutes	Water Depth (m)	Remarks
0.00	0.800	Test Start
1.50	0.800	
2.00	0.800	
3.50	0.800	
4.00	0.800	
5.50	0.800	
6.00	0.800	
7.50	0.800	
8.00	0.800	
9.30	0.800	
10.00	0.800	
15.00	0.800	
20.00	0.800	
25.00	0.800	
30.00	0.800	
40.00	0.800	
50.00	0.800	
60.00	0.800	
70.00	0.800	
80.00	0.800	
90.00	0.800	Test Finish

REMARKS

Alternative calculation based on a modified form of BRE 365 (Soakaway Design) provided without prejudice further to the request of the Engineer. 75% and 25% full effective depths not achieved - water movement extremely slow, test failed. Procedure terminated in accordance with Contract Specification.

SOIL INFILTRATION RESULTS

$$V_{p75-25} = 0.005 \quad m^3$$

$$a_{p50} = 0.196 \quad m^2$$

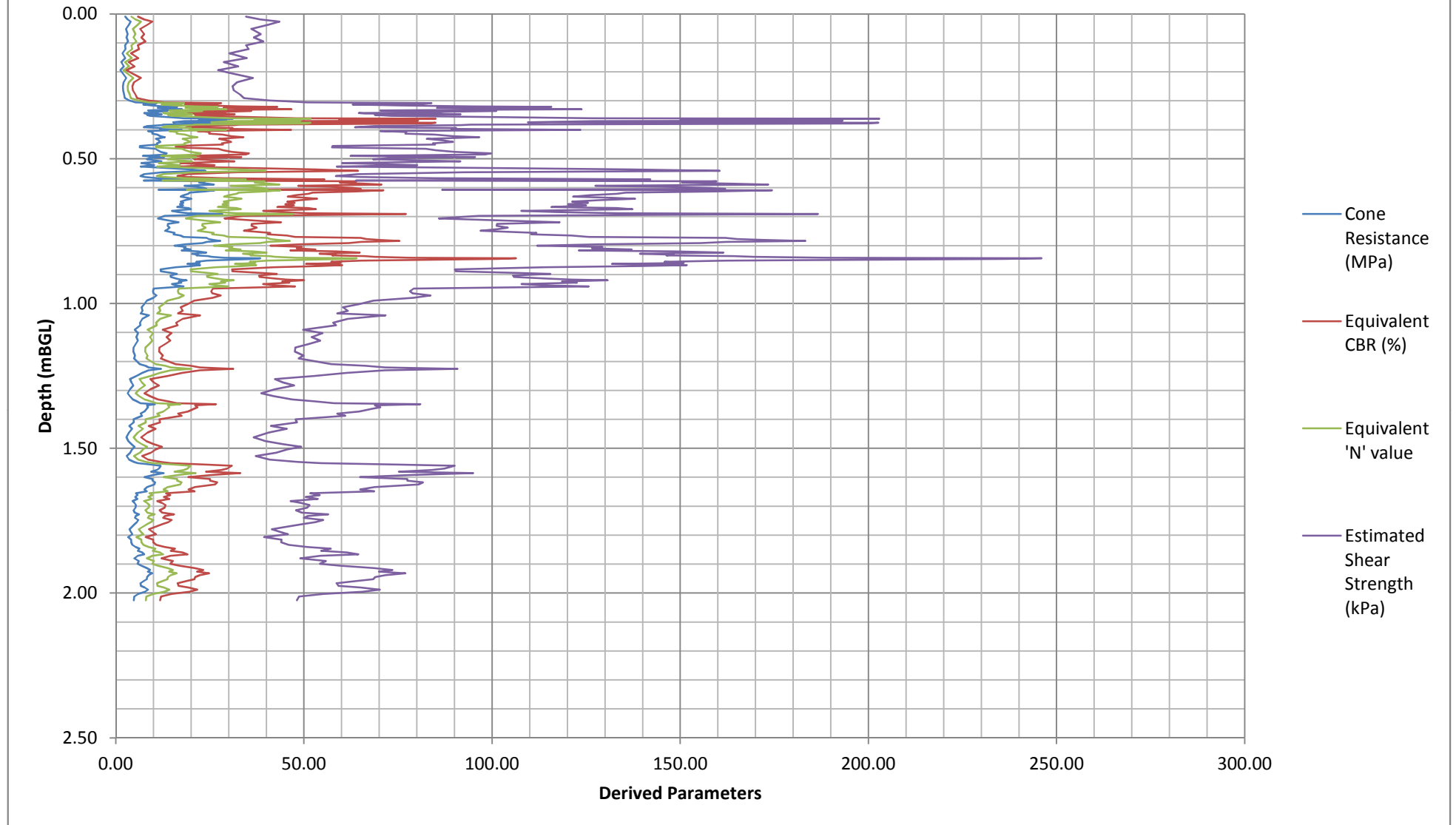
Soil Infiltration Rate (f) = n/a m/s From (i)

Calculated: N. Vater Date: 08.10.2011

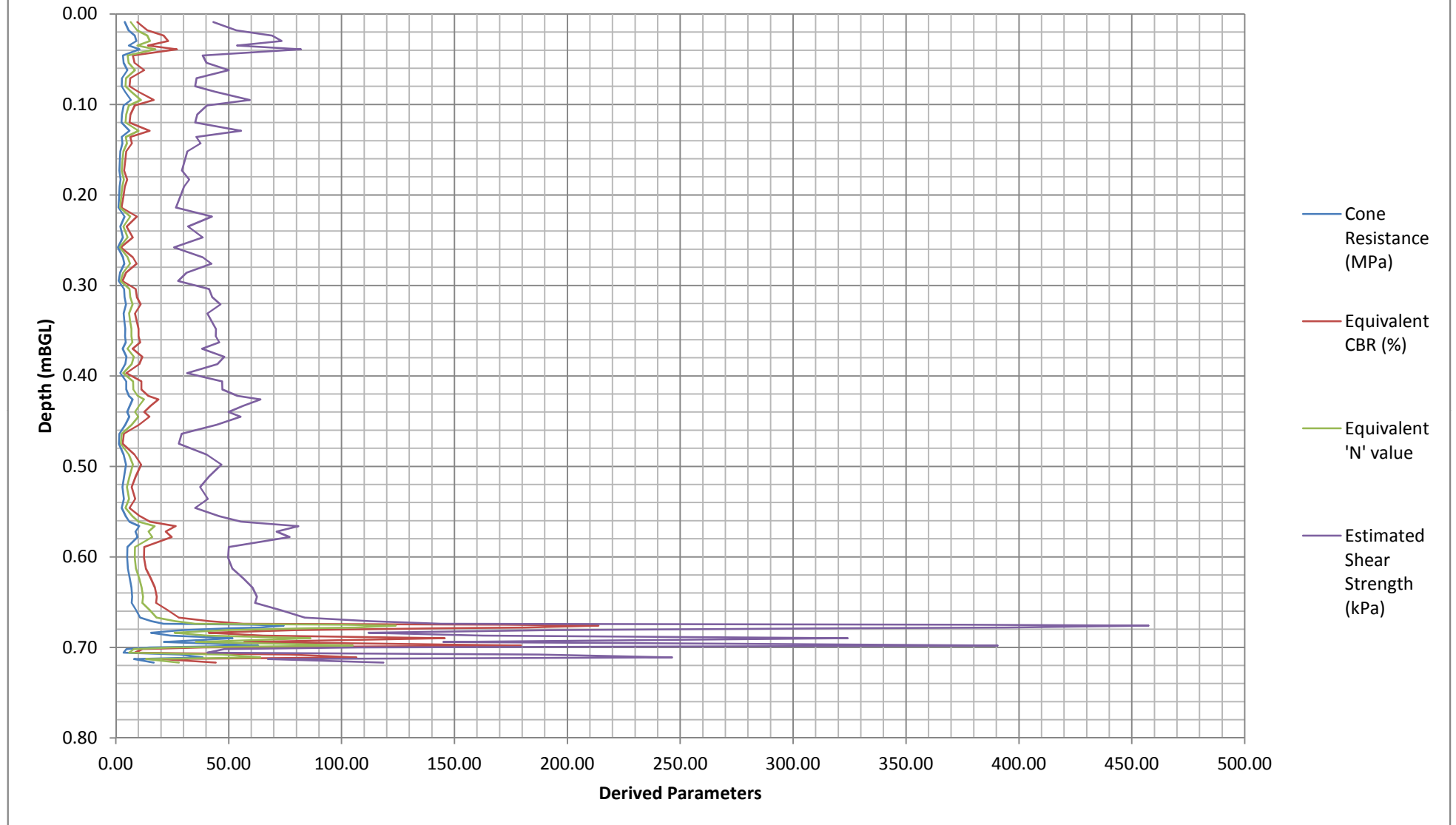
ENCLOSURE 4

Panda Probe Testing

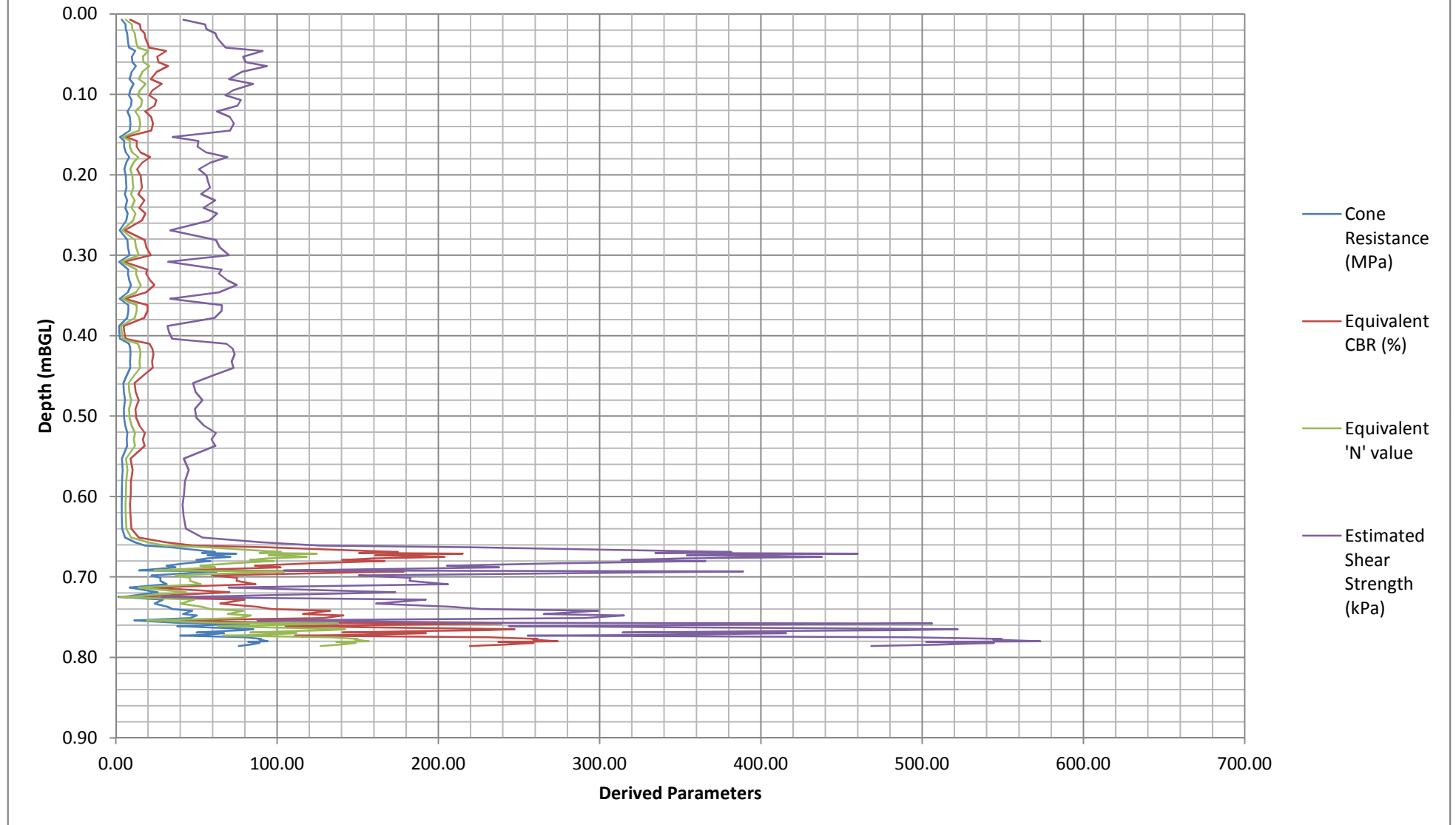
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-01



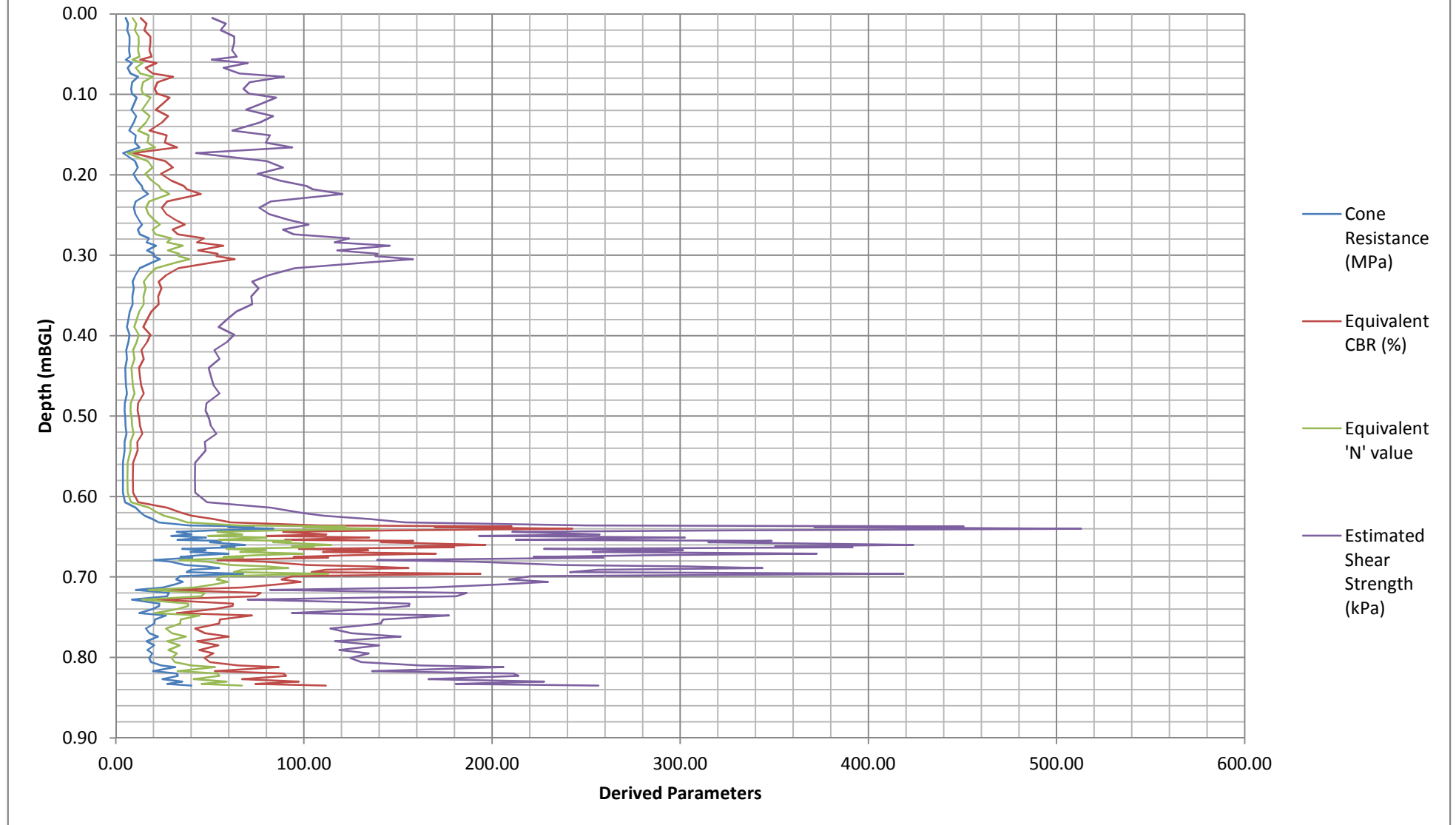
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-02



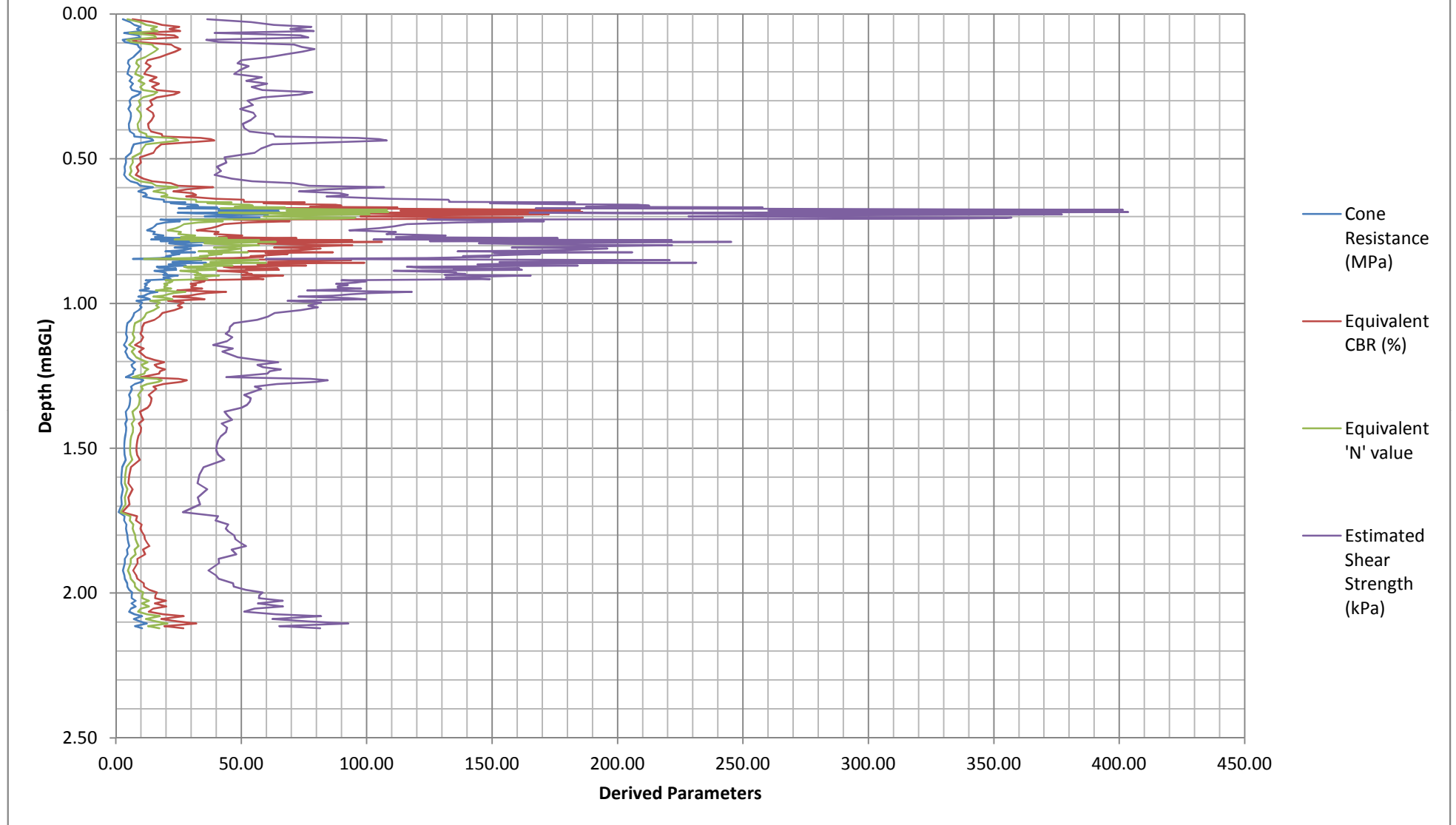
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-02A



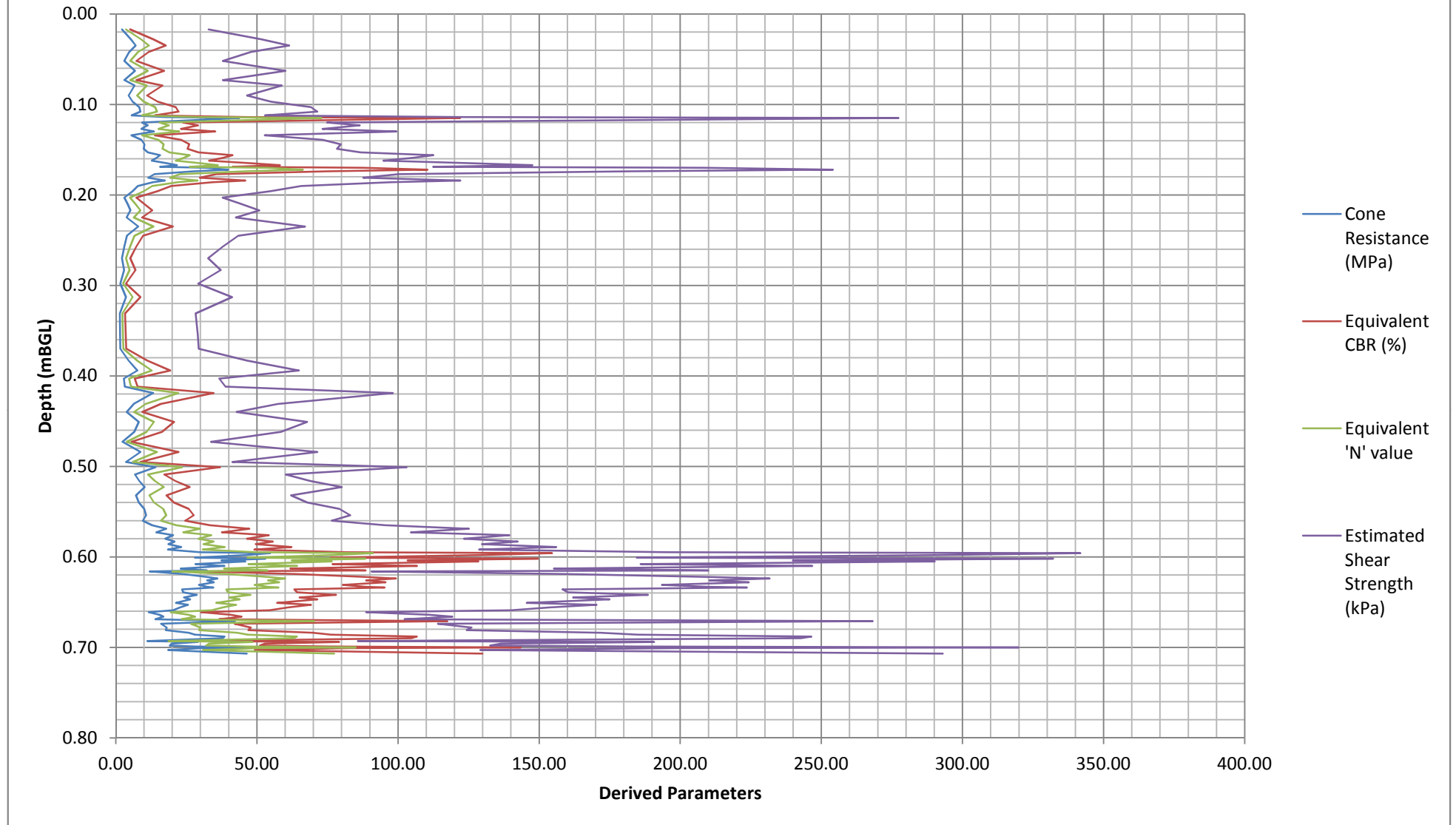
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-03



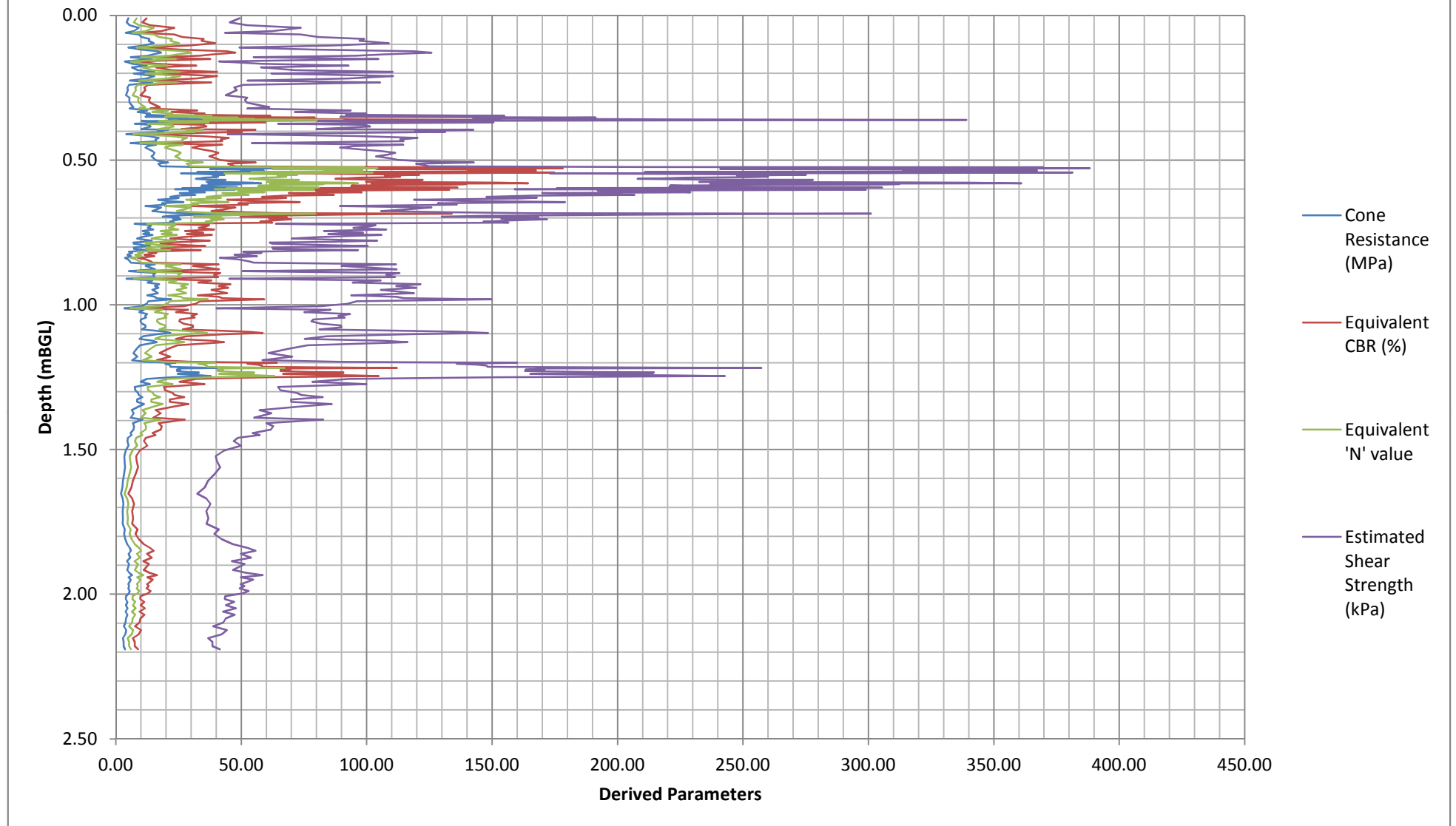
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-03A



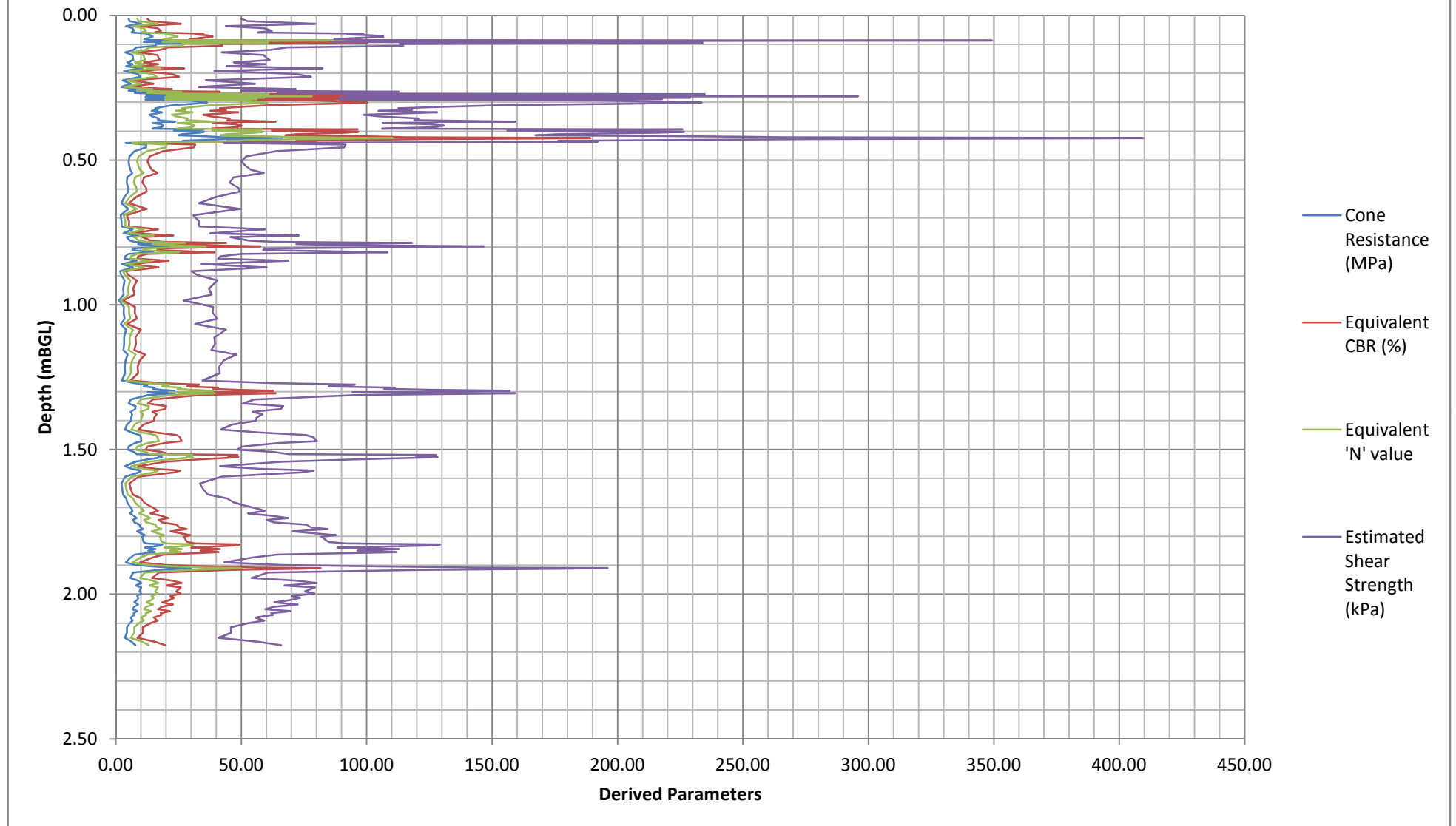
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-04



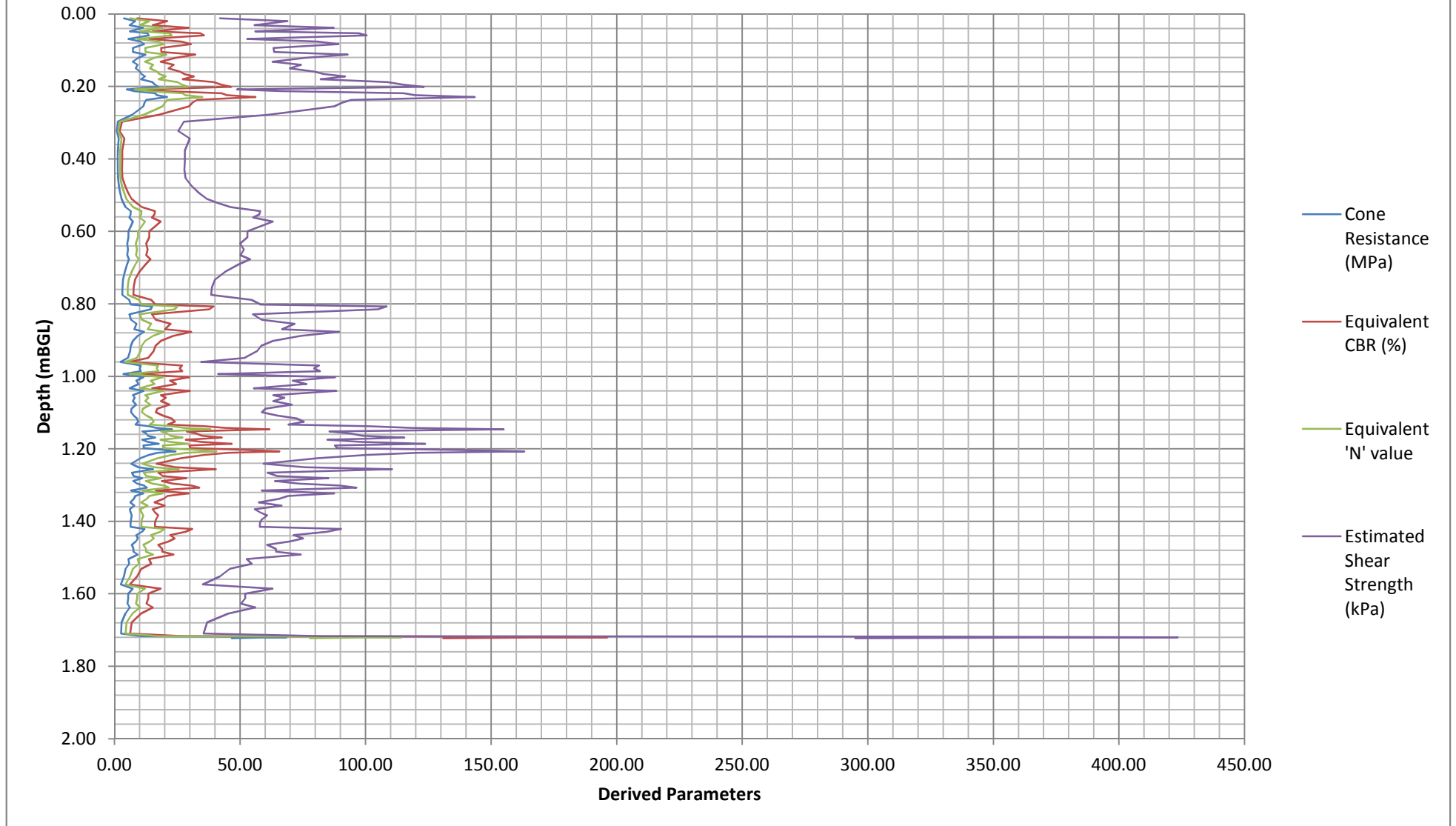
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-04A



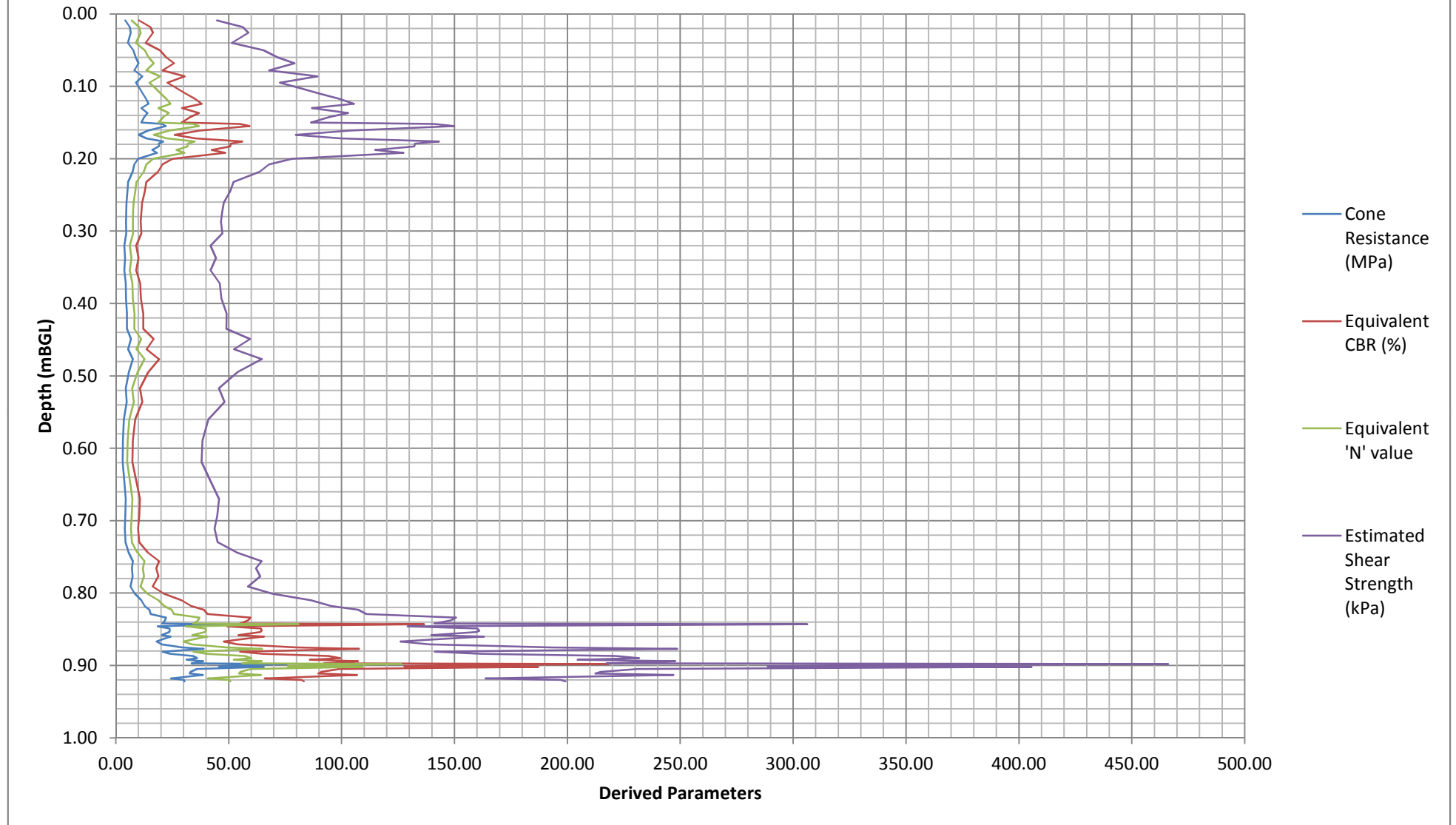
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-05



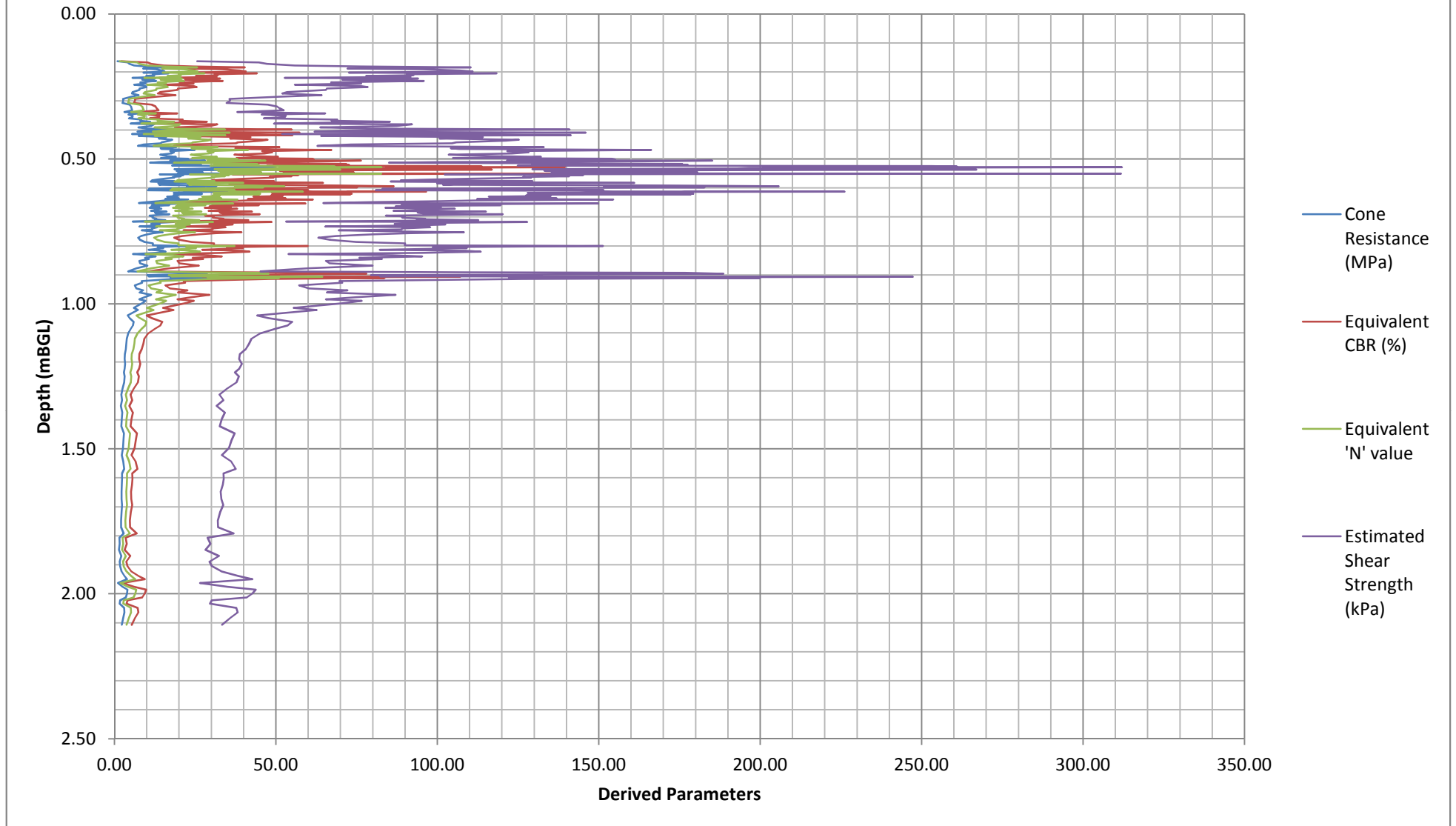
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-06



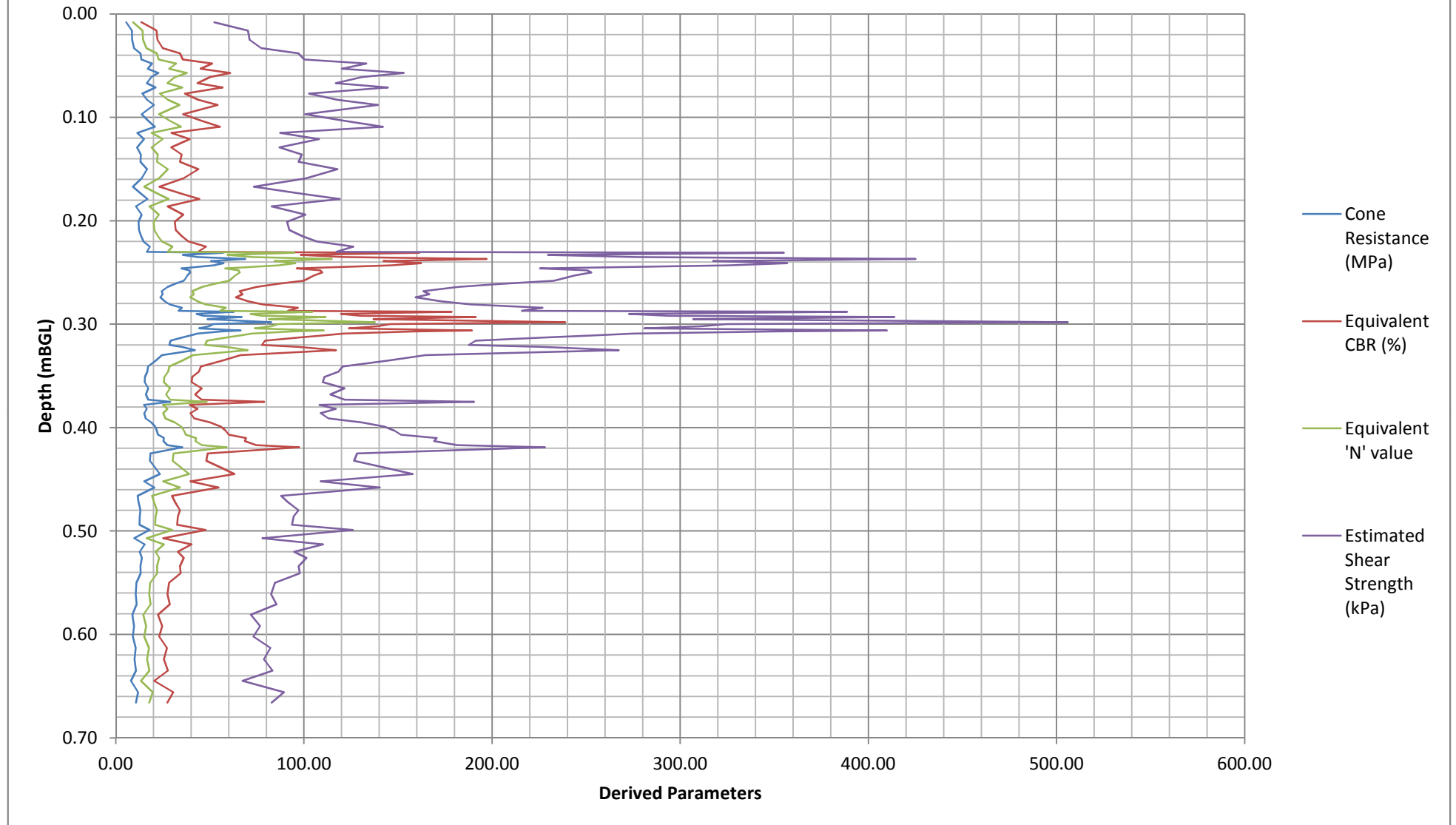
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-07



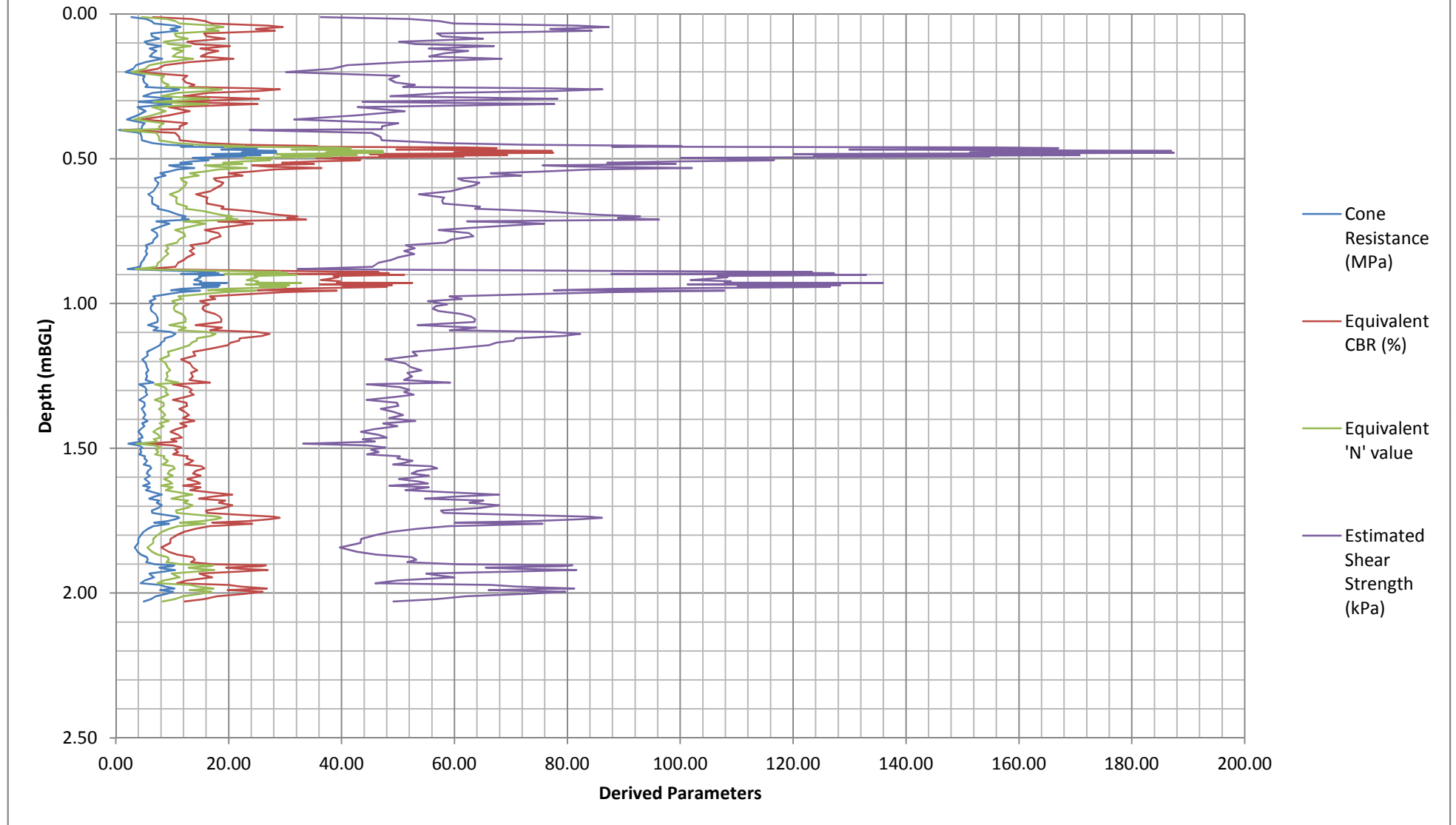
PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-08



PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-09

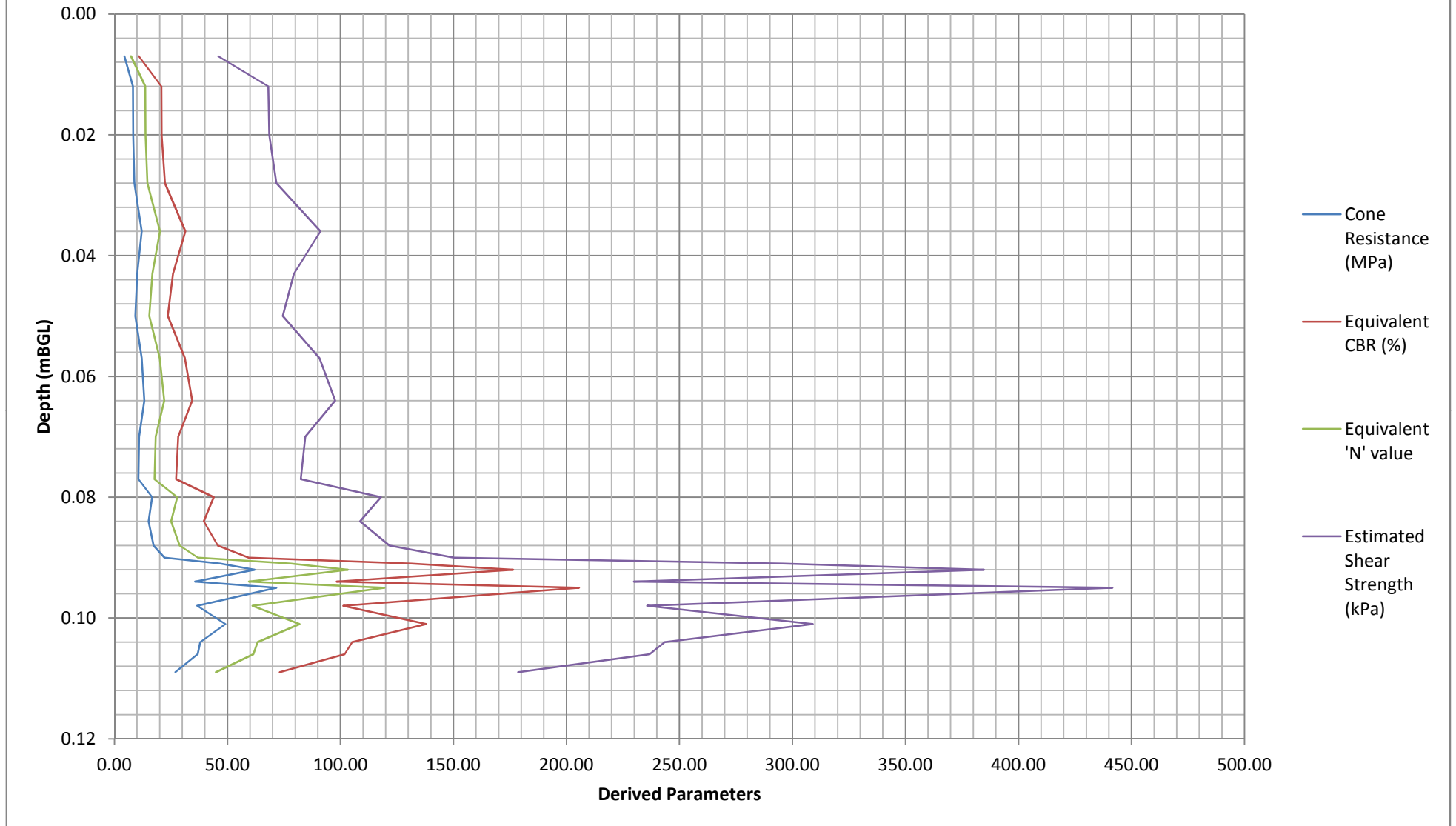


PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-10

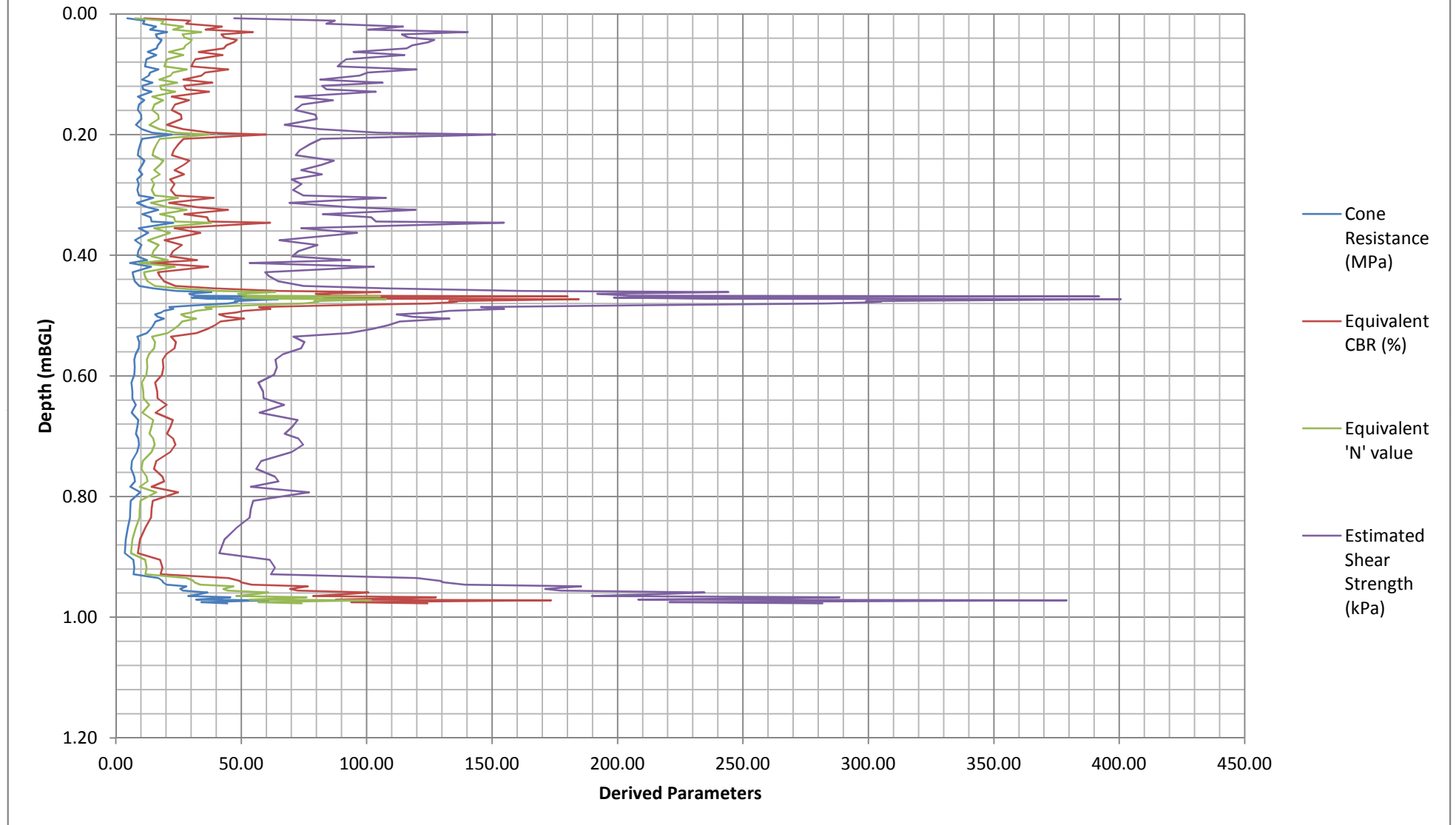


PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS

Position CBR-11

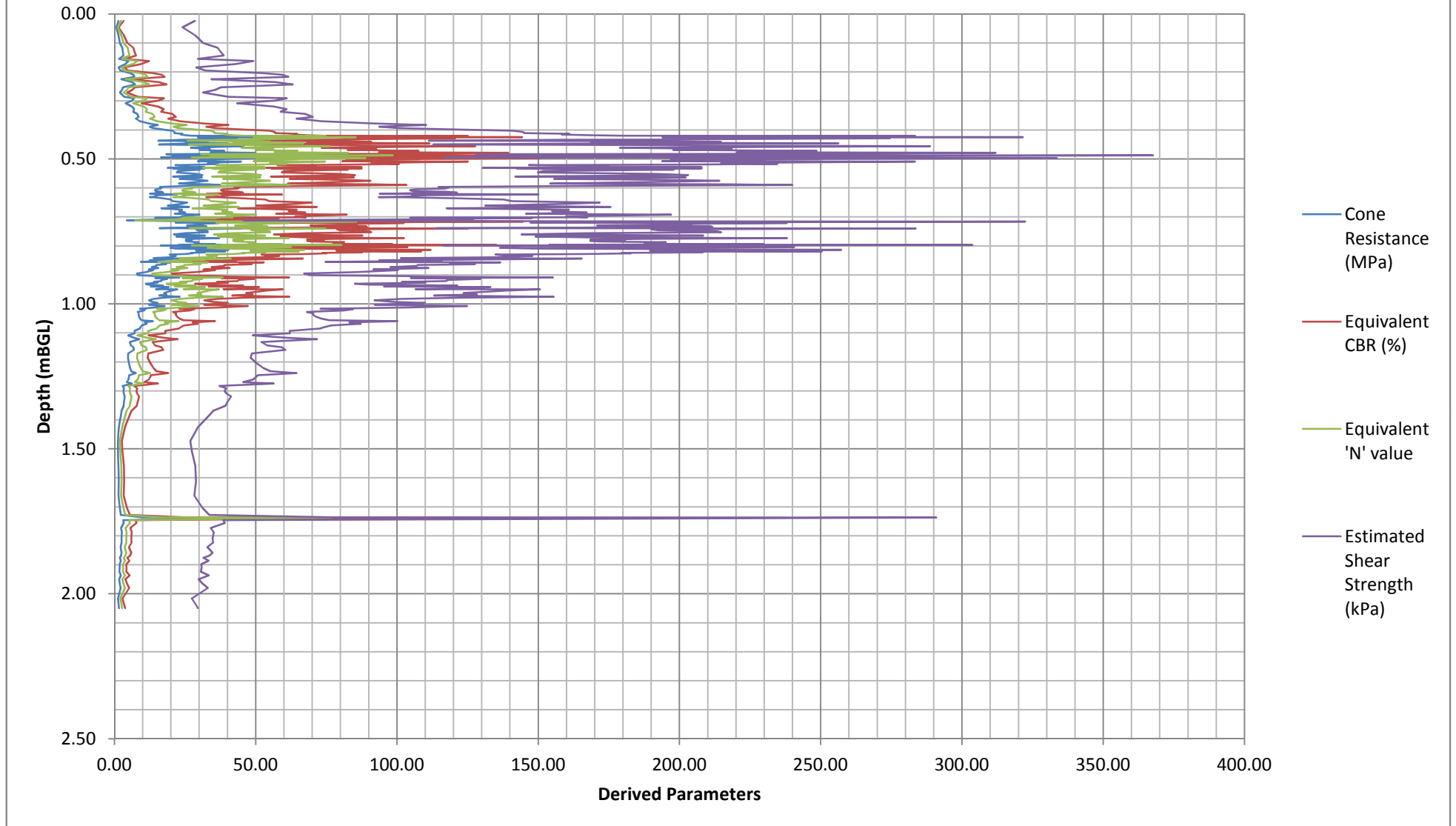


PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS Position CBR-11A



PANDA PROBE DATA PLOT - CONE RESISTANCE AND DERIVED PARAMETERS

Position CBR-12



ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-01	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435986.20	
Northing (m):	565946.18	
Level (mAOD):	7.03	
Number of measures Qd :	312	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	2.49	40.16	5.90	4.15	34.65
1.00	0.02	3.14	31.85	7.54	5.23	38.47
2.00	0.03	3.99	25.06	9.71	6.65	43.47
3.00	0.04	3.50	28.57	8.45	5.83	40.59
4.00	0.05	2.72	36.76	6.48	4.53	36.00
5.00	0.07	3.15	31.75	7.56	5.25	38.53
6.00	0.08	2.84	35.21	6.78	4.73	36.71
7.00	0.10	3.27	30.58	7.87	5.45	39.24
8.00	0.11	2.48	40.32	5.87	4.13	34.59
9.00	0.12	2.60	38.46	6.17	4.33	35.29
10.00	0.14	1.74	57.47	4.04	2.90	30.24
11.00	0.15	2.52	39.68	5.97	4.20	34.82
12.00	0.17	1.48	67.57	3.40	2.47	28.71
13.00	0.18	2.13	46.95	5.00	3.55	32.53
14.00	0.19	1.22	81.97	2.78	2.03	27.18
15.00	0.21	1.81	55.25	4.21	3.02	30.65
16.00	0.22	2.79	35.84	6.65	4.65	36.41
17.00	0.24	2.08	48.08	4.88	3.47	32.24
18.00	0.25	1.88	53.19	4.38	3.13	31.06
19.00	0.26	1.93	51.81	4.51	3.22	31.35

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.28	2.22	45.05	5.23	3.70	33.06
21.00	0.29	2.39	41.84	5.65	3.98	34.06
22.00	0.30	3.54	28.25	8.56	5.90	40.82
23.00	0.30	4.45	22.47	10.90	7.42	46.18
24.00	0.31	5.23	19.12	12.93	8.72	50.76
25.00	0.31	10.86	9.21	27.98	18.10	83.88
26.00	0.31	10.42	9.60	26.78	17.37	81.29
27.00	0.31	7.30	13.70	18.39	12.17	62.94
28.00	0.32	9.46	10.57	24.18	15.77	75.65
29.00	0.32	12.73	7.86	33.10	21.22	94.88
30.00	0.32	16.28	6.14	42.93	27.13	115.76
31.00	0.32	14.17	7.06	37.07	23.62	103.35
32.00	0.32	11.11	9.00	28.66	18.52	85.35
33.00	0.33	16.21	6.17	42.73	27.02	115.35
34.00	0.33	14.57	6.86	38.17	24.28	105.71
35.00	0.33	17.64	5.67	46.72	29.40	123.76
36.00	0.33	13.12	7.62	34.17	21.87	97.18
37.00	0.33	8.55	11.70	21.73	14.25	70.29
38.00	0.34	13.79	7.25	36.02	22.98	101.12
39.00	0.34	11.47	8.72	29.65	19.12	87.47
40.00	0.34	11.16	8.96	28.80	18.60	85.65
41.00	0.34	7.58	13.19	19.13	12.63	64.59
42.00	0.34	7.85	12.74	19.86	13.08	66.18
43.00	0.35	12.18	8.21	31.59	20.30	91.65
44.00	0.35	8.31	12.03	21.09	13.85	68.88
45.00	0.35	9.04	11.06	23.05	15.07	73.18
46.00	0.36	13.74	7.28	35.88	22.90	100.82
47.00	0.36	18.11	5.52	48.04	30.18	126.53
48.00	0.36	31.09	3.22	85.06	51.82	202.88
49.00	0.37	22.12	4.52	59.35	36.87	150.12
50.00	0.37	29.44	3.40	80.29	49.07	193.18
51.00	0.37	18.20	5.49	48.29	30.33	127.06
52.00	0.37	15.22	6.57	39.98	25.37	109.53
53.00	0.38	31.05	3.22	84.94	51.75	202.65
54.00	0.38	30.52	3.28	83.41	50.87	199.53
55.00	0.38	12.64	7.91	32.85	21.07	94.35
56.00	0.38	12.18	8.21	31.59	20.30	91.65
57.00	0.39	8.28	12.08	21.01	13.80	68.71
58.00	0.39	7.41	13.50	18.68	12.35	63.59
59.00	0.39	11.97	8.35	31.01	19.95	90.41
60.00	0.40	11.76	8.50	30.44	19.60	89.18
61.00	0.40	17.59	5.69	46.58	29.32	123.47
62.00	0.40	8.55	11.70	21.73	14.25	70.29
63.00	0.41	9.73	10.28	24.91	16.22	77.24
64.00	0.41	9.69	10.32	24.81	16.15	77.00
65.00	0.42	11.01	9.08	28.39	18.35	84.76
66.00	0.42	11.89	8.41	30.79	19.82	89.94
67.00	0.43	13.02	7.68	33.90	21.70	96.59
68.00	0.43	10.65	9.39	27.41	17.75	82.65
69.00	0.44	11.45	8.73	29.59	19.08	87.35
70.00	0.44	11.84	8.45	30.66	19.73	89.65
71.00	0.45	10.93	9.15	28.17	18.22	84.29
72.00	0.45	11.02	9.07	28.42	18.37	84.82
73.00	0.46	6.40	15.63	16.00	10.67	57.65
74.00	0.46	6.37	15.70	15.92	10.62	57.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.47	10.60	9.43	27.27	17.67	82.35
76.00	0.47	11.05	9.05	28.50	18.42	85.00
77.00	0.48	11.91	8.40	30.85	19.85	90.06
78.00	0.48	13.55	7.38	35.36	22.58	99.71
79.00	0.49	13.27	7.54	34.58	22.12	98.06
80.00	0.49	7.20	13.89	18.12	12.00	62.35
81.00	0.49	12.83	7.79	33.37	21.38	95.47
82.00	0.50	8.99	11.12	22.92	14.98	72.88
83.00	0.50	8.22	12.17	20.85	13.70	68.35
84.00	0.51	12.17	8.22	31.56	20.28	91.59
85.00	0.52	6.83	14.64	17.14	11.38	60.18
86.00	0.52	10.22	9.78	26.24	17.03	80.12
87.00	0.53	6.58	15.20	16.48	10.97	58.71
88.00	0.53	14.59	6.85	38.23	24.32	105.82
89.00	0.54	19.83	5.04	52.88	33.05	136.65
90.00	0.54	23.88	4.19	64.35	39.80	160.47
91.00	0.55	12.34	8.10	32.03	20.57	92.59
92.00	0.55	7.53	13.28	19.00	12.55	64.29
93.00	0.56	6.54	15.29	16.37	10.90	58.47
94.00	0.56	7.62	13.12	19.24	12.70	64.82
95.00	0.57	11.02	9.07	28.42	18.37	84.82
96.00	0.57	20.75	4.82	55.47	34.58	142.06
97.00	0.58	7.45	13.42	18.79	12.42	63.82
98.00	0.58	23.73	4.21	63.93	39.55	159.59
99.00	0.58	22.18	4.51	59.52	36.97	150.47
100.00	0.59	24.39	4.10	65.81	40.65	163.47
101.00	0.59	26.08	3.83	70.64	43.47	173.41
102.00	0.59	18.27	5.47	48.49	30.45	127.47
103.00	0.60	21.24	4.71	56.86	35.40	144.94
104.00	0.60	23.41	4.27	63.02	39.02	157.71
105.00	0.60	24.13	4.14	65.07	40.22	161.94
106.00	0.61	11.34	8.82	29.29	18.90	86.71
107.00	0.61	26.25	3.81	71.12	43.75	174.41
108.00	0.61	23.73	4.21	63.93	39.55	159.59
109.00	0.62	19.63	5.09	52.31	32.72	135.47
110.00	0.62	19.23	5.20	51.19	32.05	133.12
111.00	0.63	17.99	5.56	47.71	29.98	125.82
112.00	0.63	17.26	5.79	45.66	28.77	121.53
113.00	0.64	19.06	5.25	50.71	31.77	132.12
114.00	0.64	20.06	4.99	53.53	33.43	138.00
115.00	0.64	18.37	5.44	48.77	30.62	128.06
116.00	0.65	17.22	5.81	45.55	28.70	121.29
117.00	0.65	17.93	5.58	47.54	29.88	125.47
118.00	0.66	17.04	5.87	45.05	28.40	120.24
119.00	0.66	17.85	5.60	47.31	29.75	125.00
120.00	0.67	16.28	6.14	42.93	27.13	115.76
121.00	0.67	19.23	5.20	51.19	32.05	133.12
122.00	0.67	19.94	5.02	53.19	33.23	137.29
123.00	0.68	14.92	6.70	39.14	24.87	107.76
124.00	0.68	16.51	6.06	43.57	27.52	117.12
125.00	0.69	19.31	5.18	51.41	32.18	133.59
126.00	0.69	28.32	3.53	77.07	47.20	186.59
127.00	0.70	12.99	7.70	33.81	21.65	96.41
128.00	0.71	11.19	8.94	28.88	18.65	85.82
129.00	0.71	13.86	7.22	36.21	23.10	101.53

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.72	16.65	6.01	43.96	27.75	117.94
131.00	0.73	13.83	7.23	36.13	23.05	101.35
132.00	0.73	13.80	7.25	36.05	23.00	101.18
133.00	0.74	14.31	6.99	37.46	23.85	104.18
134.00	0.74	13.87	7.21	36.24	23.12	101.59
135.00	0.75	13.08	7.65	34.06	21.80	96.94
136.00	0.76	15.60	6.41	41.03	26.00	111.76
137.00	0.76	15.37	6.51	40.39	25.62	110.41
138.00	0.77	17.17	5.82	45.41	28.62	121.00
139.00	0.77	17.97	5.56	47.65	29.95	125.71
140.00	0.77	24.14	4.14	65.10	40.23	162.00
141.00	0.78	24.67	4.05	66.61	41.12	165.12
142.00	0.78	26.00	3.85	70.41	43.33	172.94
143.00	0.78	27.75	3.60	75.43	46.25	183.24
144.00	0.79	24.16	4.14	65.15	40.27	162.12
145.00	0.79	23.03	4.34	61.94	38.38	155.47
146.00	0.80	18.51	5.40	49.16	30.85	128.88
147.00	0.80	15.63	6.40	41.12	26.05	111.94
148.00	0.80	18.59	5.38	49.39	30.98	129.35
149.00	0.81	18.12	5.52	48.07	30.20	126.59
150.00	0.81	19.90	5.03	53.07	33.17	137.06
151.00	0.82	17.52	5.71	46.39	29.20	123.06
152.00	0.82	21.85	4.58	58.59	36.42	148.53
153.00	0.82	24.05	4.16	64.84	40.08	161.47
154.00	0.83	20.28	4.93	54.15	33.80	139.29
155.00	0.83	21.81	4.59	58.47	36.35	148.29
156.00	0.83	21.48	4.66	57.54	35.80	146.35
157.00	0.84	24.52	4.08	66.18	40.87	164.24
158.00	0.84	25.42	3.93	68.75	42.37	169.53
159.00	0.84	28.80	3.47	78.45	48.00	189.41
160.00	0.84	38.42	2.60	106.38	64.03	246.00
161.00	0.85	36.71	2.72	101.39	61.18	235.94
162.00	0.85	29.42	3.40	80.23	49.03	193.06
163.00	0.85	24.18	4.14	65.21	40.30	162.24
164.00	0.86	21.39	4.68	57.28	35.65	145.82
165.00	0.86	22.26	4.49	59.75	37.10	150.94
166.00	0.86	19.01	5.26	50.57	31.68	131.82
167.00	0.87	22.40	4.46	60.15	37.33	151.76
168.00	0.87	20.23	4.94	54.01	33.72	139.00
169.00	0.88	15.95	6.27	42.01	26.58	113.82
170.00	0.88	11.92	8.39	30.88	19.87	90.12
171.00	0.89	11.96	8.36	30.99	19.93	90.35
172.00	0.89	14.77	6.77	38.73	24.62	106.88
173.00	0.90	16.23	6.16	42.79	27.05	115.47
174.00	0.90	14.54	6.88	38.09	24.23	105.53
175.00	0.91	14.59	6.85	38.23	24.32	105.82
176.00	0.91	16.11	6.21	42.45	26.85	114.76
177.00	0.92	17.18	5.82	45.44	28.63	121.06
178.00	0.92	18.82	5.31	50.03	31.37	130.71
179.00	0.92	16.76	5.97	44.26	27.93	118.59
180.00	0.93	17.43	5.74	46.14	29.05	122.53
181.00	0.93	14.93	6.70	39.17	24.88	107.82
182.00	0.94	15.89	6.29	41.84	26.48	113.47
183.00	0.94	17.97	5.56	47.65	29.95	125.71
184.00	0.95	10.06	9.94	25.81	16.77	79.18

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	0.96	9.89	10.11	25.35	16.48	78.18
186.00	0.97	10.01	9.99	25.67	16.68	78.88
187.00	0.97	10.82	9.24	27.87	18.03	83.65
188.00	0.98	10.04	9.96	25.75	16.73	79.06
189.00	0.99	8.24	12.14	20.90	13.73	68.47
190.00	1.00	7.58	13.19	19.13	12.63	64.59
191.00	1.01	6.86	14.58	17.22	11.43	60.35
192.00	1.03	7.09	14.10	17.83	11.82	61.71
193.00	1.03	6.60	15.15	16.53	11.00	58.82
194.00	1.04	8.79	11.38	22.38	14.65	71.71
195.00	1.05	7.07	14.14	17.78	11.78	61.59
196.00	1.07	6.42	15.58	16.05	10.70	57.76
197.00	1.08	6.55	15.27	16.40	10.92	58.53
198.00	1.09	5.06	19.76	12.48	8.43	49.76
199.00	1.10	5.94	16.84	14.79	9.90	54.94
200.00	1.12	5.46	18.32	13.53	9.10	52.12
201.00	1.13	5.83	17.15	14.50	9.72	54.29
202.00	1.14	5.32	18.80	13.16	8.87	51.29
203.00	1.15	4.71	21.23	11.57	7.85	47.71
204.00	1.17	4.69	21.32	11.52	7.82	47.59
205.00	1.18	5.08	19.69	12.53	8.47	49.88
206.00	1.19	4.86	20.58	11.96	8.10	48.59
207.00	1.20	5.54	18.05	13.74	9.23	52.59
208.00	1.21	6.34	15.77	15.84	10.57	57.29
209.00	1.22	7.89	12.67	19.96	13.15	66.41
210.00	1.22	8.78	11.39	22.35	14.63	71.65
211.00	1.23	12.04	8.31	31.20	20.07	90.82
212.00	1.23	8.77	11.40	22.32	14.62	71.59
213.00	1.24	7.02	14.25	17.64	11.70	61.29
214.00	1.25	5.57	17.95	13.82	9.28	52.76
215.00	1.26	3.79	26.39	9.20	6.32	42.29
216.00	1.27	4.14	24.15	10.10	6.90	44.35
217.00	1.28	4.66	21.46	11.44	7.77	47.41
218.00	1.30	3.79	26.39	9.20	6.32	42.29
219.00	1.31	3.17	31.55	7.61	5.28	38.65
220.00	1.32	3.73	26.81	9.04	6.22	41.94
221.00	1.33	4.56	21.93	11.18	7.60	46.82
222.00	1.34	5.58	17.92	13.84	9.30	52.82
223.00	1.34	6.46	15.48	16.16	10.77	58.00
224.00	1.35	10.36	9.65	26.62	17.27	80.94
225.00	1.35	8.31	12.03	21.09	13.85	68.88
226.00	1.36	8.55	11.70	21.73	14.25	70.29
227.00	1.36	8.16	12.25	20.69	13.60	68.00
228.00	1.37	7.60	13.16	19.19	12.67	64.71
229.00	1.38	6.60	15.15	16.53	11.00	58.82
230.00	1.39	6.97	14.35	17.51	11.62	61.00
231.00	1.40	4.72	21.19	11.60	7.87	47.76
232.00	1.41	4.79	20.88	11.78	7.98	48.18
233.00	1.42	3.61	27.70	8.74	6.02	41.24
234.00	1.43	4.33	23.09	10.59	7.22	45.47
235.00	1.45	3.50	28.57	8.45	5.83	40.59
236.00	1.46	2.83	35.34	6.75	4.72	36.65
237.00	1.48	3.36	29.76	8.10	5.60	39.76
238.00	1.49	4.16	24.04	10.15	6.93	44.47
239.00	1.50	4.98	20.08	12.27	8.30	49.29

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	1.50	4.35	22.99	10.64	7.25	45.59
241.00	1.52	3.84	26.04	9.32	6.40	42.59
242.00	1.53	2.92	34.25	6.98	4.87	37.18
243.00	1.54	3.54	28.25	8.56	5.90	40.82
244.00	1.55	4.85	20.62	11.94	8.08	48.53
245.00	1.55	5.88	17.01	14.63	9.80	54.59
246.00	1.56	9.35	10.70	23.89	15.58	75.00
247.00	1.56	11.91	8.40	30.85	19.85	90.06
248.00	1.57	11.68	8.56	30.22	19.47	88.71
249.00	1.57	11.44	8.74	29.56	19.07	87.29
250.00	1.58	10.86	9.21	27.98	18.10	83.88
251.00	1.58	9.38	10.66	23.97	15.63	75.18
252.00	1.59	12.74	7.85	33.13	21.23	94.94
253.00	1.59	9.93	10.07	25.46	16.55	78.41
254.00	1.60	7.63	13.11	19.27	12.72	64.88
255.00	1.61	9.77	10.24	25.02	16.28	77.47
256.00	1.61	9.77	10.24	25.02	16.28	77.47
257.00	1.62	10.48	9.54	26.95	17.47	81.65
258.00	1.63	10.27	9.74	26.38	17.12	80.41
259.00	1.63	8.29	12.06	21.03	13.82	68.76
260.00	1.64	7.64	13.09	19.29	12.73	64.94
261.00	1.65	8.27	12.09	20.98	13.78	68.65
262.00	1.66	5.38	18.59	13.32	8.97	51.65
263.00	1.66	5.81	17.21	14.45	9.68	54.18
264.00	1.67	5.18	19.31	12.80	8.63	50.47
265.00	1.68	5.73	17.45	14.24	9.55	53.71
266.00	1.68	4.50	22.22	11.03	7.50	46.47
267.00	1.69	4.97	20.12	12.25	8.28	49.24
268.00	1.70	5.35	18.69	13.24	8.92	51.47
269.00	1.71	5.24	19.08	12.95	8.73	50.82
270.00	1.71	4.74	21.10	11.65	7.90	47.88
271.00	1.72	5.01	19.96	12.35	8.35	49.47
272.00	1.73	6.20	16.13	15.47	10.33	56.47
273.00	1.73	5.29	18.90	13.08	8.82	51.12
274.00	1.74	5.10	19.61	12.59	8.50	50.00
275.00	1.75	5.97	16.75	14.87	9.95	55.12
276.00	1.76	5.62	17.79	13.95	9.37	53.06
277.00	1.76	5.06	19.76	12.48	8.43	49.76
278.00	1.77	4.35	22.99	10.64	7.25	45.59
279.00	1.78	3.65	27.40	8.84	6.08	41.47
280.00	1.79	4.01	24.94	9.76	6.68	43.59
281.00	1.80	4.38	22.83	10.72	7.30	45.76
282.00	1.81	3.30	30.30	7.94	5.50	39.41
283.00	1.82	4.09	24.45	9.97	6.82	44.06
284.00	1.83	4.07	24.57	9.92	6.78	43.94
285.00	1.83	4.41	22.68	10.79	7.35	45.94
286.00	1.84	5.26	19.01	13.00	8.77	50.94
287.00	1.85	6.31	15.85	15.76	10.52	57.12
288.00	1.85	5.88	17.01	14.63	9.80	54.59
289.00	1.86	7.05	14.18	17.72	11.75	61.47
290.00	1.87	7.56	13.23	19.08	12.60	64.47
291.00	1.87	5.84	17.12	14.52	9.73	54.35
292.00	1.88	4.94	20.24	12.17	8.23	49.06
293.00	1.89	6.09	16.42	15.18	10.15	55.82
294.00	1.90	5.82	17.18	14.47	9.70	54.24

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

295.00	1.91	6.74	14.84	16.90	11.23	59.65
296.00	1.91	8.27	12.09	20.98	13.78	68.65
297.00	1.92	9.10	10.99	23.21	15.17	73.53
298.00	1.93	8.49	11.78	21.57	14.15	69.94
299.00	1.93	9.69	10.32	24.81	16.15	77.00
300.00	1.94	8.76	11.42	22.30	14.60	71.53
301.00	1.95	8.32	12.02	21.11	13.87	68.94
302.00	1.95	8.23	12.15	20.87	13.72	68.41
303.00	1.96	7.52	13.30	18.97	12.53	64.24
304.00	1.97	6.57	15.22	16.45	10.95	58.65
305.00	1.98	6.66	15.02	16.69	11.10	59.18
306.00	1.98	7.66	13.05	19.35	12.77	65.06
307.00	1.99	8.53	11.72	21.68	14.22	70.18
308.00	2.00	7.75	12.90	19.59	12.92	65.59
309.00	2.00	6.00	16.67	14.95	10.00	55.29
310.00	2.01	4.88	20.49	12.01	8.13	48.71
311.00	2.03	4.78	20.92	11.75	7.97	48.12

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-02	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435950.10	
Northing (m):	565999.33	
Level (mAOD):	7.79	
Number of measures Qd :	96	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	3.94	25.38	9.58	6.57	43.18
1.00	0.02	5.68	17.61	14.10	9.47	53.41
2.00	0.02	8.36	11.96	21.22	13.93	69.18
3.00	0.03	9.08	11.01	23.16	15.13	73.41
4.00	0.04	5.73	17.45	14.24	9.55	53.71
5.00	0.04	10.54	9.49	27.11	17.57	82.00
6.00	0.05	3.15	31.75	7.56	5.25	38.53
7.00	0.05	3.43	29.15	8.28	5.72	40.18
8.00	0.06	5.10	19.61	12.59	8.50	50.00
9.00	0.07	2.68	37.31	6.38	4.47	35.76
10.00	0.08	2.58	38.76	6.12	4.30	35.18
11.00	0.09	4.07	24.57	9.92	6.78	43.94
12.00	0.10	6.70	14.93	16.79	11.17	59.41
13.00	0.10	3.47	28.82	8.38	5.78	40.41
14.00	0.11	2.74	36.50	6.53	4.57	36.12
15.00	0.12	2.57	38.91	6.10	4.28	35.12
16.00	0.13	6.04	16.56	15.05	10.07	55.53
17.00	0.14	2.67	37.45	6.35	4.45	35.71
18.00	0.14	2.99	33.44	7.16	4.98	37.59
19.00	0.15	1.99	50.25	4.65	3.32	31.71

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.16	1.79	55.87	4.16	2.98	30.53
21.00	0.17	1.58	63.29	3.65	2.63	29.29
22.00	0.18	2.13	46.95	5.00	3.55	32.53
23.00	0.19	1.73	57.80	4.01	2.88	30.18
24.00	0.20	1.45	68.97	3.33	2.42	28.53
25.00	0.21	1.13	88.50	2.56	1.88	26.65
26.00	0.22	3.84	26.04	9.32	6.40	42.59
27.00	0.24	2.04	49.02	4.78	3.40	32.00
28.00	0.25	3.15	31.75	7.56	5.25	38.53
29.00	0.26	0.98	102.04	2.20	1.63	25.76
30.00	0.27	3.14	31.85	7.54	5.23	38.47
31.00	0.28	3.80	26.32	9.22	6.33	42.35
32.00	0.29	1.93	51.81	4.51	3.22	31.35
33.00	0.30	1.29	77.52	2.94	2.15	27.59
34.00	0.30	3.63	27.55	8.79	6.05	41.35
35.00	0.31	3.85	25.97	9.35	6.42	42.65
36.00	0.32	4.49	22.27	11.00	7.48	46.41
37.00	0.33	3.51	28.49	8.48	5.85	40.65
38.00	0.34	3.80	26.32	9.22	6.33	42.35
39.00	0.35	4.15	24.10	10.12	6.92	44.41
40.00	0.36	4.13	24.21	10.07	6.88	44.29
41.00	0.36	4.40	22.73	10.77	7.33	45.88
42.00	0.37	3.09	32.36	7.41	5.15	38.18
43.00	0.38	4.77	20.96	11.73	7.95	48.06
44.00	0.39	4.25	23.53	10.38	7.08	45.00
45.00	0.40	1.97	50.76	4.61	3.28	31.59
46.00	0.41	4.61	21.69	11.31	7.68	47.12
47.00	0.42	4.63	21.60	11.36	7.72	47.24
48.00	0.42	5.77	17.33	14.34	9.62	53.94
49.00	0.43	7.50	13.33	18.92	12.50	64.12
50.00	0.43	6.19	16.16	15.45	10.32	56.41
51.00	0.44	5.09	19.65	12.56	8.48	49.94
52.00	0.45	5.99	16.69	14.92	9.98	55.24
53.00	0.45	4.20	23.81	10.25	7.00	44.71
54.00	0.46	1.56	64.10	3.60	2.60	29.18
55.00	0.48	1.34	74.63	3.06	2.23	27.88
56.00	0.49	3.45	28.99	8.33	5.75	40.29
57.00	0.50	4.56	21.93	11.18	7.60	46.82
58.00	0.51	3.63	27.55	8.79	6.05	41.35
59.00	0.52	2.94	34.01	7.03	4.90	37.29
60.00	0.54	3.54	28.25	8.56	5.90	40.82
61.00	0.55	2.58	38.76	6.12	4.30	35.18
62.00	0.56	4.39	22.78	10.74	7.32	45.82
63.00	0.56	6.03	16.58	15.02	10.05	55.47
64.00	0.57	10.34	9.67	26.57	17.23	80.82
65.00	0.57	8.70	11.49	22.13	14.50	71.18
66.00	0.58	9.69	10.32	24.81	16.15	77.00
67.00	0.59	5.11	19.57	12.61	8.52	50.06
68.00	0.60	5.06	19.76	12.48	8.43	49.76
69.00	0.61	5.38	18.59	13.32	8.97	51.65
70.00	0.62	6.22	16.08	15.53	10.37	56.59
71.00	0.63	6.89	14.51	17.30	11.48	60.53
72.00	0.64	7.22	13.85	18.17	12.03	62.47
73.00	0.65	7.08	14.12	17.80	11.80	61.65
74.00	0.66	9.04	11.06	23.05	15.07	73.18

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.67	10.83	9.23	27.90	18.05	83.71
76.00	0.67	15.72	6.36	41.37	26.20	112.47
77.00	0.67	21.08	4.74	56.41	35.13	144.00
78.00	0.68	60.50	1.65	171.92	100.83	375.88
79.00	0.68	74.36	1.34	213.80	123.93	457.41
80.00	0.68	63.57	1.57	181.15	105.95	393.94
81.00	0.68	51.22	1.95	144.17	85.37	321.29
82.00	0.68	29.17	3.43	79.51	48.62	191.59
83.00	0.68	15.62	6.40	41.09	26.03	111.88
84.00	0.69	24.23	4.13	65.35	40.38	162.53
85.00	0.69	51.72	1.93	145.66	86.20	324.24
86.00	0.69	21.27	4.70	56.94	35.45	145.12
87.00	0.70	42.18	2.37	117.42	70.30	268.12
88.00	0.70	63.00	1.59	179.43	105.00	390.59
89.00	0.70	14.89	6.72	39.06	24.82	107.59
90.00	0.70	4.77	20.96	11.73	7.95	48.06
91.00	0.71	3.51	28.49	8.48	5.85	40.65
92.00	0.71	28.45	3.51	77.44	47.42	187.35
93.00	0.71	38.48	2.60	106.56	64.13	246.35
94.00	0.71	8.04	12.44	20.36	13.40	67.29
95.00	0.72	16.75	5.97	44.24	27.92	118.53

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-02A	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435950.10	
Northing (m):	565999.33	
Level (mAOD):	7.79	
Number of measures Qd :	131	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	3.72	26.88	9.02	6.20	41.88
1.00	0.01	6.00	16.67	14.95	10.00	55.29
2.00	0.02	6.16	16.23	15.37	10.27	56.24
3.00	0.02	7.09	14.10	17.83	11.82	61.71
4.00	0.03	7.31	13.68	18.41	12.18	63.00
5.00	0.04	7.71	12.97	19.48	12.85	65.35
6.00	0.04	8.19	12.21	20.77	13.65	68.18
7.00	0.05	12.07	8.29	31.29	20.12	91.00
8.00	0.05	10.03	9.97	25.73	16.72	79.00
9.00	0.06	10.29	9.72	26.43	17.15	80.53
10.00	0.07	12.52	7.99	32.52	20.87	93.65
11.00	0.07	9.90	10.10	25.37	16.50	78.24
12.00	0.08	8.54	11.71	21.70	14.23	70.24
13.00	0.09	11.07	9.03	28.55	18.45	85.12
14.00	0.10	8.95	11.17	22.81	14.92	72.65
15.00	0.10	8.16	12.25	20.69	13.60	68.00
16.00	0.11	9.79	10.21	25.08	16.32	77.59
17.00	0.11	9.43	10.60	24.10	15.72	75.47
18.00	0.12	7.25	13.79	18.25	12.08	62.65
19.00	0.13	8.61	11.61	21.89	14.35	70.65

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.14	9.05	11.05	23.08	15.08	73.24
21.00	0.15	8.66	11.55	22.03	14.43	70.94
22.00	0.15	2.58	38.76	6.12	4.30	35.18
23.00	0.16	5.31	18.83	13.13	8.85	51.24
24.00	0.17	5.21	19.19	12.87	8.68	50.65
25.00	0.17	6.10	16.39	15.21	10.17	55.88
26.00	0.18	8.37	11.95	21.25	13.95	69.24
27.00	0.19	6.53	15.31	16.34	10.88	58.41
28.00	0.19	5.36	18.66	13.27	8.93	51.53
29.00	0.20	6.16	16.23	15.37	10.27	56.24
30.00	0.21	6.30	15.87	15.74	10.50	57.06
31.00	0.22	6.54	15.29	16.37	10.90	58.47
32.00	0.22	5.60	17.86	13.89	9.33	52.94
33.00	0.23	7.09	14.10	17.83	11.82	61.71
34.00	0.24	5.84	17.12	14.52	9.73	54.35
35.00	0.25	7.28	13.74	18.33	12.13	62.82
36.00	0.26	6.47	15.46	16.19	10.78	58.06
37.00	0.27	2.35	42.55	5.55	3.92	33.82
38.00	0.28	7.15	13.99	17.99	11.92	62.06
39.00	0.29	7.53	13.28	19.00	12.55	64.29
40.00	0.30	8.54	11.71	21.70	14.23	70.24
41.00	0.31	2.13	46.95	5.00	3.55	32.53
42.00	0.32	7.75	12.90	19.59	12.92	65.59
43.00	0.32	7.45	13.42	18.79	12.42	63.82
44.00	0.33	8.37	11.95	21.25	13.95	69.24
45.00	0.34	9.35	10.70	23.89	15.58	75.00
46.00	0.35	7.48	13.37	18.87	12.47	64.00
47.00	0.35	2.35	42.55	5.55	3.92	33.82
48.00	0.36	7.79	12.84	19.69	12.98	65.82
49.00	0.37	7.77	12.87	19.64	12.95	65.71
50.00	0.38	7.01	14.27	17.62	11.68	61.24
51.00	0.39	2.04	49.02	4.78	3.40	32.00
52.00	0.40	2.23	44.84	5.25	3.72	33.12
53.00	0.40	2.55	39.22	6.05	4.25	35.00
54.00	0.41	8.26	12.11	20.95	13.77	68.59
55.00	0.42	8.90	11.24	22.67	14.83	72.35
56.00	0.42	9.13	10.95	23.29	15.22	73.71
57.00	0.43	8.80	11.36	22.40	14.67	71.76
58.00	0.44	9.01	11.10	22.97	15.02	73.00
59.00	0.45	6.95	14.39	17.46	11.58	60.88
60.00	0.46	4.75	21.05	11.68	7.92	47.94
61.00	0.47	5.02	19.92	12.38	8.37	49.53
62.00	0.48	5.75	17.39	14.29	9.58	53.82
63.00	0.49	4.95	20.20	12.20	8.25	49.12
64.00	0.50	5.10	19.61	12.59	8.50	50.00
65.00	0.51	5.90	16.95	14.68	9.83	54.71
66.00	0.52	7.17	13.95	18.04	11.95	62.18
67.00	0.53	6.69	14.95	16.77	11.15	59.35
68.00	0.54	7.10	14.08	17.86	11.83	61.76
69.00	0.55	3.77	26.53	9.15	6.28	42.18
70.00	0.57	4.29	23.31	10.48	7.15	45.24
71.00	0.58	3.88	25.77	9.43	6.47	42.82
72.00	0.60	3.80	26.32	9.22	6.33	42.35
73.00	0.61	3.63	27.55	8.79	6.05	41.35
74.00	0.62	3.74	26.74	9.07	6.23	42.00

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.64	4.00	25.00	9.74	6.67	43.53
76.00	0.65	5.71	17.51	14.18	9.52	53.59
77.00	0.66	11.92	8.39	30.88	19.87	90.12
78.00	0.66	18.13	5.52	48.10	30.22	126.65
79.00	0.66	33.90	2.95	93.20	56.50	219.41
80.00	0.67	43.45	2.30	121.16	72.42	275.59
81.00	0.67	61.49	1.63	174.89	102.48	381.71
82.00	0.67	53.46	1.87	150.84	89.10	334.47
83.00	0.67	74.81	1.34	215.17	124.68	460.06
84.00	0.67	56.80	1.76	160.82	94.67	354.12
85.00	0.67	63.67	1.57	181.45	106.12	394.53
86.00	0.68	71.05	1.41	203.75	118.42	437.94
87.00	0.68	56.38	1.77	159.57	93.97	351.65
88.00	0.68	49.90	2.00	140.25	83.17	313.53
89.00	0.68	58.75	1.70	166.66	97.92	365.59
90.00	0.68	43.00	2.33	119.83	71.67	272.94
91.00	0.69	31.50	3.17	86.24	52.50	205.29
92.00	0.69	37.01	2.70	102.26	61.68	237.71
93.00	0.69	14.33	6.98	37.51	23.88	104.29
94.00	0.69	62.74	1.59	178.65	104.57	389.06
95.00	0.70	22.22	4.50	59.64	37.03	150.71
96.00	0.70	27.69	3.61	75.26	46.15	182.88
97.00	0.71	27.55	3.63	74.85	45.92	182.06
98.00	0.71	31.63	3.16	86.62	52.72	206.06
99.00	0.71	8.49	11.78	21.57	14.15	69.94
100.00	0.72	26.05	3.84	70.55	43.42	173.24
101.00	0.72	7.65	13.07	19.32	12.75	65.00
102.00	0.73	1.41	70.92	3.23	2.35	28.29
103.00	0.73	29.29	3.41	79.86	48.82	192.29
104.00	0.73	24.04	4.16	64.81	40.07	161.41
105.00	0.74	31.80	3.14	87.11	53.00	207.06
106.00	0.74	35.15	2.84	96.84	58.58	226.76
107.00	0.74	47.44	2.11	132.95	79.07	299.06
108.00	0.75	41.70	2.40	116.01	69.50	265.29
109.00	0.75	50.18	1.99	141.08	83.63	315.18
110.00	0.75	45.98	2.17	128.63	76.63	290.47
111.00	0.75	11.53	8.67	29.81	19.22	87.82
112.00	0.76	38.06	2.63	105.33	63.43	243.88
113.00	0.76	82.64	1.21	239.04	137.73	506.12
114.00	0.76	38.05	2.63	105.30	63.42	243.82
115.00	0.76	59.86	1.67	169.99	99.77	372.12
116.00	0.77	85.35	1.17	247.33	142.25	522.06
117.00	0.77	79.79	1.25	230.33	132.98	489.35
118.00	0.77	68.67	1.46	196.55	114.45	423.94
119.00	0.77	50.03	2.00	140.63	83.38	314.29
120.00	0.77	67.27	1.49	192.31	112.12	415.71
121.00	0.77	54.35	1.84	153.50	90.58	339.71
122.00	0.77	40.01	2.50	111.04	66.68	255.35
123.00	0.78	80.20	1.25	231.59	133.67	491.76
124.00	0.78	90.00	1.11	261.60	150.00	549.41
125.00	0.78	89.09	1.12	258.80	148.48	544.06
126.00	0.78	94.06	1.06	274.09	156.77	573.29
127.00	0.78	82.02	1.22	237.14	136.70	502.47
128.00	0.78	89.17	1.12	259.05	148.62	544.53
129.00	0.78	83.42	1.20	241.43	139.03	510.71

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.79	76.23	1.31	219.49	127.05	468.41
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ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-03	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435996.70	
Northing (m):	565998.46	
Level (mAOD):	7.76	
Number of measures Qd :	145	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	5.34	18.73	13.21	8.90	51.41
1.00	0.01	6.54	15.29	16.37	10.90	58.47
2.00	0.02	6.08	16.45	15.16	10.13	55.76
3.00	0.03	7.29	13.72	18.36	12.15	62.88
4.00	0.04	7.31	13.68	18.41	12.18	63.00
5.00	0.05	7.10	14.08	17.86	11.83	61.76
6.00	0.05	7.54	13.26	19.03	12.57	64.35
7.00	0.06	5.27	18.98	13.03	8.78	51.00
8.00	0.06	8.52	11.74	21.65	14.20	70.12
9.00	0.07	6.33	15.80	15.82	10.55	57.24
10.00	0.07	7.76	12.89	19.61	12.93	65.65
11.00	0.08	11.79	8.48	30.52	19.65	89.35
12.00	0.09	8.70	11.49	22.13	14.50	71.18
13.00	0.09	8.13	12.30	20.60	13.55	67.82
14.00	0.10	8.62	11.60	21.92	14.37	70.71
15.00	0.10	11.09	9.02	28.61	18.48	85.24
16.00	0.11	9.84	10.16	25.21	16.40	77.88
17.00	0.12	8.36	11.96	21.22	13.93	69.18
18.00	0.13	10.80	9.26	27.82	18.00	83.53
19.00	0.14	9.60	10.42	24.56	16.00	76.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.15	7.12	14.04	17.91	11.87	61.88
21.00	0.15	10.52	9.51	27.06	17.53	81.88
22.00	0.16	10.14	9.86	26.02	16.90	79.65
23.00	0.17	12.54	7.97	32.58	20.90	93.76
24.00	0.17	3.85	25.97	9.35	6.42	42.65
25.00	0.18	10.23	9.78	26.27	17.05	80.18
26.00	0.19	11.71	8.54	30.30	19.52	88.88
27.00	0.20	9.42	10.62	24.08	15.70	75.41
28.00	0.21	11.41	8.76	29.48	19.02	87.12
29.00	0.21	13.82	7.24	36.10	23.03	101.29
30.00	0.22	14.40	6.94	37.70	24.00	104.71
31.00	0.22	17.07	5.86	45.13	28.45	120.41
32.00	0.23	10.63	9.41	27.36	17.72	82.53
33.00	0.24	9.56	10.46	24.45	15.93	76.24
34.00	0.25	10.46	9.56	26.89	17.43	81.53
35.00	0.26	12.22	8.18	31.70	20.37	91.88
36.00	0.26	14.02	7.13	36.65	23.37	102.47
37.00	0.27	11.70	8.55	30.27	19.50	88.82
38.00	0.27	12.68	7.89	32.96	21.13	94.59
39.00	0.28	17.68	5.66	46.84	29.47	124.00
40.00	0.28	16.37	6.11	43.18	27.28	116.29
41.00	0.29	21.36	4.68	57.20	35.60	145.65
42.00	0.29	16.61	6.02	43.85	27.68	117.71
43.00	0.30	20.27	4.93	54.12	33.78	139.24
44.00	0.30	20.05	4.99	53.50	33.42	137.94
45.00	0.31	23.46	4.26	63.16	39.10	158.00
46.00	0.31	19.29	5.18	51.36	32.15	133.47
47.00	0.32	12.77	7.83	33.21	21.28	95.12
48.00	0.33	10.39	9.62	26.70	17.32	81.12
49.00	0.33	8.92	11.21	22.73	14.87	72.47
50.00	0.34	9.51	10.52	24.32	15.85	75.94
51.00	0.35	8.83	11.33	22.48	14.72	71.94
52.00	0.36	8.92	11.21	22.73	14.87	72.47
53.00	0.37	7.49	13.35	18.89	12.48	64.06
54.00	0.38	6.63	15.08	16.61	11.05	59.00
55.00	0.39	5.88	17.01	14.63	9.80	54.59
56.00	0.40	7.30	13.70	18.39	12.17	62.94
57.00	0.41	6.63	15.08	16.61	11.05	59.00
58.00	0.42	5.51	18.15	13.66	9.18	52.41
59.00	0.43	5.97	16.75	14.87	9.95	55.12
60.00	0.44	4.99	20.04	12.30	8.32	49.35
61.00	0.45	5.20	19.23	12.85	8.67	50.59
62.00	0.46	5.43	18.42	13.45	9.05	51.94
63.00	0.47	5.98	16.72	14.89	9.97	55.18
64.00	0.48	4.79	20.88	11.78	7.98	48.18
65.00	0.49	4.70	21.28	11.55	7.83	47.65
66.00	0.50	5.03	19.88	12.40	8.38	49.59
67.00	0.51	5.19	19.27	12.82	8.65	50.53
68.00	0.52	5.70	17.54	14.16	9.50	53.53
69.00	0.53	4.65	21.51	11.42	7.75	47.35
70.00	0.54	4.71	21.23	11.57	7.85	47.71
71.00	0.56	3.77	26.53	9.15	6.28	42.18
72.00	0.58	3.74	26.74	9.07	6.23	42.00
73.00	0.60	3.77	26.53	9.15	6.28	42.18
74.00	0.61	4.87	20.53	11.99	8.12	48.65

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.61	10.62	9.42	27.33	17.70	82.47
76.00	0.62	13.27	7.54	34.58	22.12	98.06
77.00	0.62	15.39	6.50	40.45	25.65	110.53
78.00	0.63	19.53	5.12	52.03	32.55	134.88
79.00	0.63	22.70	4.41	61.00	37.83	153.53
80.00	0.64	39.14	2.55	108.49	65.23	250.24
81.00	0.64	73.21	1.37	210.31	122.02	450.65
82.00	0.64	59.73	1.67	169.60	99.55	371.35
83.00	0.64	83.81	1.19	242.62	139.68	513.00
84.00	0.64	51.60	1.94	145.30	86.00	323.53
85.00	0.64	32.41	3.09	88.88	54.02	210.65
86.00	0.65	40.31	2.48	111.92	67.18	257.12
87.00	0.65	29.41	3.40	80.20	49.02	193.00
88.00	0.65	48.02	2.08	134.67	80.03	302.47
89.00	0.65	32.75	3.05	89.86	54.58	212.65
90.00	0.66	55.87	1.79	158.04	93.12	348.65
91.00	0.66	50.13	1.99	140.93	83.55	314.88
92.00	0.66	68.67	1.46	196.55	114.45	423.94
93.00	0.66	56.17	1.78	158.94	93.62	350.41
94.00	0.66	63.16	1.58	179.91	105.27	391.53
95.00	0.67	35.29	2.83	97.25	58.82	227.59
96.00	0.67	47.84	2.09	134.13	79.73	301.41
97.00	0.67	39.67	2.52	110.05	66.12	253.35
98.00	0.67	59.94	1.67	170.23	99.90	372.59
99.00	0.67	44.17	2.26	123.28	73.62	279.82
100.00	0.68	34.34	2.91	94.48	57.23	222.00
101.00	0.68	40.65	2.46	112.92	67.75	259.12
102.00	0.68	20.21	4.95	53.95	33.68	138.88
103.00	0.68	29.02	3.45	79.08	48.37	190.71
104.00	0.68	33.02	3.03	90.65	55.03	214.24
105.00	0.69	36.83	2.72	101.74	61.38	236.65
106.00	0.69	48.27	2.07	135.41	80.45	303.94
107.00	0.69	55.03	1.82	155.53	91.72	343.71
108.00	0.69	40.17	2.49	111.51	66.95	256.29
109.00	0.69	37.64	2.66	104.10	62.73	241.41
110.00	0.70	67.76	1.48	193.79	112.93	418.59
111.00	0.70	34.14	2.93	93.90	56.90	220.82
112.00	0.70	32.15	3.11	88.12	53.58	209.12
113.00	0.71	35.66	2.80	98.32	59.43	229.76
114.00	0.71	31.85	3.14	87.25	53.08	207.35
115.00	0.71	25.03	4.00	67.64	41.72	167.24
116.00	0.72	10.54	9.49	27.11	17.57	82.00
117.00	0.72	28.30	3.53	77.01	47.17	186.47
118.00	0.72	27.34	3.66	74.25	45.57	180.82
119.00	0.73	8.52	11.74	21.65	14.20	70.12
120.00	0.73	23.14	4.32	62.25	38.57	156.12
121.00	0.74	23.09	4.33	62.11	38.48	155.82
122.00	0.74	19.67	5.08	52.43	32.78	135.71
123.00	0.75	12.49	8.01	32.44	20.82	93.47
124.00	0.75	26.70	3.75	72.41	44.50	177.06
125.00	0.75	20.73	4.82	55.42	34.55	141.94
126.00	0.76	20.54	4.87	54.88	34.23	140.82
127.00	0.76	15.99	6.25	42.12	26.65	114.06
128.00	0.77	17.89	5.59	47.43	29.82	125.24
129.00	0.77	22.35	4.47	60.00	37.25	151.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.78	16.39	6.10	43.23	27.32	116.41
131.00	0.79	20.40	4.90	54.49	34.00	140.00
132.00	0.79	16.80	5.95	44.38	28.00	118.82
133.00	0.80	19.45	5.14	51.81	32.42	134.41
134.00	0.80	17.80	5.62	47.17	29.67	124.71
135.00	0.81	18.78	5.32	49.92	31.30	130.47
136.00	0.81	24.13	4.14	65.07	40.22	161.94
137.00	0.81	31.63	3.16	86.62	52.72	206.06
138.00	0.82	19.75	5.06	52.65	32.92	136.18
139.00	0.82	32.54	3.07	89.25	54.23	211.41
140.00	0.82	32.98	3.03	90.53	54.97	214.00
141.00	0.83	24.84	4.03	67.09	41.40	166.12
142.00	0.83	35.31	2.83	97.30	58.85	227.71
143.00	0.83	27.31	3.66	74.16	45.52	180.65
144.00	0.84	40.20	2.49	111.60	67.00	256.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-03A	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435996.70	
Northing (m):	565998.46	
Level (mAOD):	7.76	
Number of measures Qd :	266	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.02	2.80	35.71	6.68	4.67	36.47
1.00	0.03	5.76	17.36	14.31	9.60	53.88
2.00	0.04	7.32	13.66	18.44	12.20	63.06
3.00	0.04	9.86	10.14	25.27	16.43	78.00
4.00	0.05	8.43	11.86	21.41	14.05	69.59
5.00	0.06	10.02	9.98	25.70	16.70	78.94
6.00	0.07	3.30	30.30	7.94	5.50	39.41
7.00	0.07	9.12	10.96	23.27	15.20	73.65
8.00	0.08	9.65	10.36	24.70	16.08	76.76
9.00	0.09	2.73	36.63	6.50	4.55	36.06
10.00	0.10	3.56	28.09	8.61	5.93	40.94
11.00	0.11	8.69	11.51	22.11	14.48	71.12
12.00	0.11	9.20	10.87	23.48	15.33	74.12
13.00	0.12	10.06	9.94	25.81	16.77	79.18
14.00	0.13	9.23	10.83	23.56	15.38	74.29
15.00	0.14	8.13	12.30	20.60	13.55	67.82
16.00	0.15	7.00	14.29	17.59	11.67	61.18
17.00	0.16	5.11	19.57	12.61	8.52	50.06
18.00	0.17	4.85	20.62	11.94	8.08	48.53
19.00	0.18	5.60	17.86	13.89	9.33	52.94

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.19	4.99	20.04	12.30	8.32	49.35
21.00	0.21	4.63	21.60	11.36	7.72	47.24
22.00	0.22	6.50	15.38	16.26	10.83	58.24
23.00	0.23	5.44	18.38	13.47	9.07	52.00
24.00	0.24	6.85	14.60	17.19	11.42	60.29
25.00	0.25	5.82	17.18	14.47	9.70	54.24
26.00	0.26	6.53	15.31	16.34	10.88	58.41
27.00	0.27	9.92	10.08	25.43	16.53	78.35
28.00	0.28	9.08	11.01	23.16	15.13	73.41
29.00	0.29	6.52	15.34	16.32	10.87	58.35
30.00	0.30	5.52	18.12	13.68	9.20	52.47
31.00	0.31	5.89	16.98	14.66	9.82	54.65
32.00	0.33	5.03	19.88	12.40	8.38	49.59
33.00	0.34	5.92	16.89	14.73	9.87	54.82
34.00	0.35	6.08	16.45	15.16	10.13	55.76
35.00	0.37	5.76	17.36	14.31	9.60	53.88
36.00	0.38	5.20	19.23	12.85	8.67	50.59
37.00	0.39	5.30	18.87	13.11	8.83	51.18
38.00	0.41	5.66	17.67	14.05	9.43	53.29
39.00	0.42	7.29	13.72	18.36	12.15	62.88
40.00	0.42	7.39	13.53	18.63	12.32	63.47
41.00	0.43	13.00	7.69	33.84	21.67	96.47
42.00	0.43	14.46	6.92	37.87	24.10	105.06
43.00	0.44	14.96	6.68	39.26	24.93	108.00
44.00	0.45	7.22	13.85	18.17	12.03	62.47
45.00	0.47	6.43	15.55	16.08	10.72	57.82
46.00	0.48	6.01	16.64	14.97	10.02	55.35
47.00	0.50	3.96	25.25	9.63	6.60	43.29
48.00	0.51	4.10	24.39	9.99	6.83	44.12
49.00	0.53	3.45	28.99	8.33	5.75	40.29
50.00	0.54	3.73	26.81	9.04	6.22	41.94
51.00	0.56	3.30	30.30	7.94	5.50	39.41
52.00	0.57	4.46	22.42	10.92	7.43	46.24
53.00	0.58	5.85	17.09	14.55	9.75	54.41
54.00	0.58	8.60	11.63	21.87	14.33	70.59
55.00	0.59	9.70	10.31	24.83	16.17	77.06
56.00	0.60	14.78	6.77	38.76	24.63	106.94
57.00	0.61	11.05	9.05	28.50	18.42	85.00
58.00	0.61	9.00	11.11	22.94	15.00	72.94
59.00	0.62	11.75	8.51	30.41	19.58	89.12
60.00	0.63	12.33	8.11	32.00	20.55	92.53
61.00	0.63	10.88	9.19	28.04	18.13	84.00
62.00	0.64	13.39	7.47	34.91	22.32	98.76
63.00	0.64	15.18	6.59	39.87	25.30	109.29
64.00	0.64	19.15	5.22	50.96	31.92	132.65
65.00	0.65	19.19	5.21	51.08	31.98	132.88
66.00	0.65	19.18	5.21	51.05	31.97	132.82
67.00	0.65	27.72	3.61	75.34	46.20	183.06
68.00	0.65	21.95	4.56	58.87	36.58	149.12
69.00	0.66	26.98	3.71	73.22	44.97	178.71
70.00	0.66	31.97	3.13	87.60	53.28	208.06
71.00	0.66	32.74	3.05	89.83	54.57	212.59
72.00	0.67	28.45	3.51	77.44	47.42	187.35
73.00	0.67	40.42	2.47	112.25	67.37	257.76
74.00	0.67	25.06	3.99	67.72	41.77	167.41

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.67	40.02	2.50	111.07	66.70	255.41
76.00	0.68	54.56	1.83	154.13	90.93	340.94
77.00	0.68	63.14	1.58	179.85	105.23	391.41
78.00	0.68	64.86	1.54	185.04	108.10	401.53
79.00	0.68	40.85	2.45	113.51	68.08	260.29
80.00	0.68	52.66	1.90	148.46	87.77	329.76
81.00	0.68	49.08	2.04	137.81	81.80	308.71
82.00	0.68	65.20	1.53	186.06	108.67	403.53
83.00	0.69	59.92	1.67	170.17	99.87	372.47
84.00	0.69	24.63	4.06	66.49	41.05	164.88
85.00	0.69	32.02	3.12	87.75	53.37	208.35
86.00	0.69	58.60	1.71	166.21	97.67	364.71
87.00	0.69	60.72	1.65	172.58	101.20	377.18
88.00	0.69	52.15	1.92	146.94	86.92	326.76
89.00	0.70	41.07	2.43	114.16	68.45	261.59
90.00	0.70	35.40	2.82	97.57	59.00	228.24
91.00	0.70	45.72	2.19	127.86	76.20	288.94
92.00	0.70	57.30	1.75	162.32	95.50	357.06
93.00	0.71	56.89	1.76	161.09	94.82	354.65
94.00	0.71	52.77	1.90	148.79	87.95	330.41
95.00	0.71	17.72	5.64	46.95	29.53	124.24
96.00	0.71	21.47	4.66	57.51	35.78	146.29
97.00	0.72	25.61	3.90	69.29	42.68	170.65
98.00	0.72	19.78	5.06	52.74	32.97	136.35
99.00	0.73	16.33	6.12	43.07	27.22	116.06
100.00	0.73	15.49	6.46	40.73	25.82	111.12
101.00	0.74	14.44	6.93	37.81	24.07	104.94
102.00	0.75	12.42	8.05	32.25	20.70	93.06
103.00	0.75	15.58	6.42	40.98	25.97	111.65
104.00	0.76	14.95	6.69	39.23	24.92	107.94
105.00	0.77	18.96	5.27	50.43	31.60	131.53
106.00	0.77	15.57	6.42	40.95	25.95	111.59
107.00	0.77	26.55	3.77	71.98	44.25	176.18
108.00	0.78	14.06	7.11	36.76	23.43	102.71
109.00	0.78	34.26	2.92	94.25	57.10	221.53
110.00	0.79	17.88	5.59	47.40	29.80	125.18
111.00	0.79	38.31	2.61	106.06	63.85	245.35
112.00	0.79	21.21	4.71	56.77	35.35	144.76
113.00	0.80	25.81	3.87	69.87	43.02	171.82
114.00	0.80	34.29	2.92	94.33	57.15	221.71
115.00	0.80	28.69	3.49	78.13	47.82	188.76
116.00	0.81	23.43	4.27	63.07	39.05	157.82
117.00	0.81	29.91	3.34	81.65	49.85	195.94
118.00	0.81	27.85	3.59	75.71	46.42	183.82
119.00	0.82	26.74	3.74	72.53	44.57	177.29
120.00	0.82	19.75	5.06	52.65	32.92	136.18
121.00	0.82	31.60	3.16	86.53	52.67	205.88
122.00	0.83	22.22	4.50	59.64	37.03	150.71
123.00	0.83	25.36	3.94	68.58	42.27	169.18
124.00	0.83	22.76	4.39	61.17	37.93	153.88
125.00	0.84	20.13	4.97	53.72	33.55	138.41
126.00	0.84	21.93	4.56	58.81	36.55	149.00
127.00	0.84	17.64	5.67	46.72	29.40	123.76
128.00	0.85	6.76	14.79	16.95	11.27	59.76
129.00	0.85	28.61	3.50	77.90	47.68	188.29

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.85	34.13	2.93	93.87	56.88	220.76
131.00	0.85	25.59	3.91	69.24	42.65	170.53
132.00	0.86	26.28	3.81	71.21	43.80	174.59
133.00	0.86	22.60	4.42	60.71	37.67	152.94
134.00	0.86	35.94	2.78	99.14	59.90	231.41
135.00	0.86	23.96	4.17	64.58	39.93	160.94
136.00	0.87	21.10	4.74	56.46	35.17	144.12
137.00	0.87	24.32	4.11	65.61	40.53	163.06
138.00	0.87	27.91	3.58	75.89	46.52	184.18
139.00	0.87	16.33	6.12	43.07	27.22	116.06
140.00	0.88	17.34	5.77	45.89	28.90	122.00
141.00	0.88	23.95	4.18	64.55	39.92	160.88
142.00	0.88	19.51	5.13	51.98	32.52	134.76
143.00	0.88	24.12	4.15	65.04	40.20	161.88
144.00	0.89	15.42	6.49	40.53	25.70	110.71
145.00	0.89	17.96	5.57	47.62	29.93	125.65
146.00	0.89	19.66	5.09	52.40	32.77	135.65
147.00	0.90	19.56	5.11	52.12	32.60	135.06
148.00	0.90	20.28	4.93	54.15	33.80	139.29
149.00	0.90	18.89	5.29	50.23	31.48	131.12
150.00	0.90	24.72	4.05	66.75	41.20	165.41
151.00	0.91	23.13	4.32	62.22	38.55	156.06
152.00	0.91	20.70	4.83	55.33	34.50	141.76
153.00	0.91	18.95	5.28	50.40	31.58	131.47
154.00	0.91	20.92	4.78	55.95	34.87	143.06
155.00	0.92	21.95	4.56	58.87	36.58	149.12
156.00	0.92	11.89	8.41	30.79	19.82	89.94
157.00	0.92	13.56	7.37	35.38	22.60	99.76
158.00	0.93	12.84	7.79	33.40	21.40	95.53
159.00	0.93	11.53	8.67	29.81	19.22	87.82
160.00	0.94	12.33	8.11	32.00	20.55	92.53
161.00	0.94	11.64	8.59	30.11	19.40	88.47
162.00	0.95	11.63	8.60	30.08	19.38	88.41
163.00	0.95	13.23	7.56	34.47	22.05	97.82
164.00	0.95	11.46	8.73	29.62	19.10	87.41
165.00	0.96	9.57	10.45	24.48	15.95	76.29
166.00	0.96	16.66	6.00	43.99	27.77	118.00
167.00	0.96	13.92	7.18	36.38	23.20	101.88
168.00	0.97	12.50	8.00	32.47	20.83	93.53
169.00	0.97	11.32	8.83	29.24	18.87	86.59
170.00	0.98	8.97	11.15	22.86	14.95	72.76
171.00	0.98	12.36	8.09	32.08	20.60	92.71
172.00	0.99	13.56	7.37	35.38	22.60	99.76
173.00	0.99	8.23	12.15	20.87	13.72	68.41
174.00	1.00	10.51	9.51	27.03	17.52	81.82
175.00	1.00	10.19	9.81	26.16	16.98	79.94
176.00	1.01	9.65	10.36	24.70	16.08	76.76
177.00	1.01	10.29	9.72	26.43	17.15	80.53
178.00	1.02	9.14	10.94	23.32	15.23	73.76
179.00	1.03	7.39	13.53	18.63	12.32	63.47
180.00	1.05	6.93	14.43	17.40	11.55	60.76
181.00	1.06	6.18	16.18	15.42	10.30	56.35
182.00	1.07	4.61	21.69	11.31	7.68	47.12
183.00	1.08	4.34	23.04	10.61	7.23	45.53
184.00	1.09	4.28	23.36	10.46	7.13	45.18

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	1.11	4.04	24.75	9.84	6.73	43.76
186.00	1.12	4.49	22.27	11.00	7.48	46.41
187.00	1.13	4.14	24.15	10.10	6.90	44.35
188.00	1.14	3.19	31.35	7.66	5.32	38.76
189.00	1.16	4.53	22.08	11.10	7.55	46.65
190.00	1.17	3.82	26.18	9.27	6.37	42.47
191.00	1.18	4.30	23.26	10.51	7.17	45.29
192.00	1.19	4.86	20.58	11.96	8.10	48.59
193.00	1.20	6.15	16.26	15.34	10.25	56.18
194.00	1.20	7.61	13.14	19.21	12.68	64.76
195.00	1.21	6.19	16.16	15.45	10.32	56.41
196.00	1.22	6.59	15.17	16.50	10.98	58.76
197.00	1.23	7.78	12.85	19.67	12.97	65.76
198.00	1.23	7.03	14.22	17.67	11.72	61.35
199.00	1.24	6.87	14.56	17.25	11.45	60.41
200.00	1.25	4.10	24.39	9.99	6.83	44.12
201.00	1.26	9.78	10.22	25.05	16.30	77.53
202.00	1.27	10.97	9.12	28.28	18.28	84.53
203.00	1.27	10.16	9.84	26.08	16.93	79.76
204.00	1.28	7.52	13.30	18.97	12.53	64.24
205.00	1.29	6.02	16.61	15.00	10.03	55.41
206.00	1.30	6.45	15.50	16.13	10.75	57.94
207.00	1.31	5.91	16.92	14.71	9.85	54.76
208.00	1.32	5.30	18.87	13.11	8.83	51.18
209.00	1.33	5.74	17.42	14.26	9.57	53.76
210.00	1.34	5.68	17.61	14.10	9.47	53.41
211.00	1.35	5.49	18.21	13.61	9.15	52.29
212.00	1.36	5.12	19.53	12.64	8.53	50.12
213.00	1.37	3.97	25.19	9.66	6.62	43.35
214.00	1.39	4.19	23.87	10.23	6.98	44.65
215.00	1.40	4.48	22.32	10.97	7.47	46.35
216.00	1.42	3.78	26.46	9.17	6.30	42.24
217.00	1.43	4.14	24.15	10.10	6.90	44.35
218.00	1.44	4.06	24.63	9.89	6.77	43.88
219.00	1.46	3.71	26.95	8.99	6.18	41.82
220.00	1.47	3.54	28.25	8.56	5.90	40.82
221.00	1.49	3.43	29.15	8.28	5.72	40.18
222.00	1.51	3.40	29.41	8.20	5.67	40.00
223.00	1.52	3.53	28.33	8.53	5.88	40.76
224.00	1.54	3.95	25.32	9.61	6.58	43.24
225.00	1.57	2.56	39.06	6.07	4.27	35.06
226.00	1.59	2.27	44.05	5.35	3.78	33.35
227.00	1.62	2.14	46.73	5.03	3.57	32.59
228.00	1.64	2.80	35.71	6.68	4.67	36.47
229.00	1.67	2.15	46.51	5.05	3.58	32.65
230.00	1.69	2.32	43.10	5.47	3.87	33.65
231.00	1.72	1.14	87.72	2.58	1.90	26.71
232.00	1.74	3.53	28.33	8.53	5.88	40.76
233.00	1.75	3.35	29.85	8.07	5.58	39.71
234.00	1.76	4.22	23.70	10.30	7.03	44.82
235.00	1.78	4.04	24.75	9.84	6.73	43.76
236.00	1.79	4.23	23.64	10.33	7.05	44.88
237.00	1.80	4.63	21.60	11.36	7.72	47.24
238.00	1.81	4.71	21.23	11.57	7.85	47.71
239.00	1.83	5.04	19.84	12.43	8.40	49.65

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	1.84	5.42	18.45	13.42	9.03	51.88
241.00	1.85	4.45	22.47	10.90	7.42	46.18
242.00	1.87	4.77	20.96	11.73	7.95	48.06
243.00	1.88	3.56	28.09	8.61	5.93	40.94
244.00	1.90	3.59	27.86	8.68	5.98	41.12
245.00	1.92	2.88	34.72	6.88	4.80	36.94
246.00	1.94	3.38	29.59	8.15	5.63	39.88
247.00	1.95	3.57	28.01	8.63	5.95	41.00
248.00	1.97	4.55	21.98	11.16	7.58	46.76
249.00	1.98	4.59	21.79	11.26	7.65	47.00
250.00	1.99	5.41	18.48	13.40	9.02	51.82
251.00	2.00	6.55	15.27	16.40	10.92	58.53
252.00	2.01	6.32	15.82	15.79	10.53	57.18
253.00	2.02	6.29	15.90	15.71	10.48	57.00
254.00	2.03	7.92	12.63	20.04	13.20	66.59
255.00	2.04	6.23	16.05	15.55	10.38	56.65
256.00	2.05	7.93	12.61	20.07	13.22	66.65
257.00	2.05	6.00	16.67	14.95	10.00	55.29
258.00	2.06	5.30	18.87	13.11	8.83	51.18
259.00	2.07	7.47	13.39	18.84	12.45	63.94
260.00	2.08	10.52	9.51	27.06	17.53	81.88
261.00	2.09	7.21	13.87	18.15	12.02	62.41
262.00	2.10	9.61	10.41	24.59	16.02	76.53
263.00	2.11	12.36	8.09	32.08	20.60	92.71
264.00	2.11	7.68	13.02	19.40	12.80	65.18
265.00	2.12	10.45	9.57	26.87	17.42	81.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-04	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435973.19	
Northing (m):	566058.18	
Level (mAOD):	8.31	
Number of measures Qd :	133	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.02	2.19	45.66	5.15	3.65	32.88
1.00	0.03	5.39	18.55	13.34	8.98	51.71
2.00	0.04	7.04	14.20	17.70	11.73	61.41
3.00	0.04	4.75	21.05	11.68	7.92	47.94
4.00	0.05	3.05	32.79	7.31	5.08	37.94
5.00	0.06	6.82	14.66	17.11	11.37	60.12
6.00	0.07	3.05	32.79	7.31	5.08	37.94
7.00	0.08	6.60	15.15	16.53	11.00	58.82
8.00	0.09	4.51	22.17	11.05	7.52	46.53
9.00	0.10	5.95	16.81	14.81	9.92	55.00
10.00	0.10	8.35	11.98	21.19	13.92	69.12
11.00	0.11	8.74	11.44	22.24	14.57	71.41
12.00	0.11	5.59	17.89	13.87	9.32	52.88
13.00	0.11	17.47	5.72	46.25	29.12	122.76
14.00	0.12	43.74	2.29	122.01	72.90	277.29
15.00	0.12	9.32	10.73	23.81	15.53	74.82
16.00	0.12	11.29	8.86	29.15	18.82	86.41
17.00	0.13	9.05	11.05	23.08	15.08	73.24
18.00	0.13	13.51	7.40	35.25	22.52	99.47
19.00	0.13	5.58	17.92	13.84	9.30	52.82

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.14	9.06	11.04	23.10	15.10	73.29
21.00	0.14	10.15	9.85	26.05	16.92	79.71
22.00	0.15	9.93	10.07	25.46	16.55	78.41
23.00	0.15	11.34	8.82	29.29	18.90	86.71
24.00	0.16	15.73	6.36	41.39	26.22	112.53
25.00	0.16	14.50	6.90	37.98	24.17	105.29
26.00	0.16	12.72	7.86	33.07	21.20	94.82
27.00	0.17	18.09	5.53	47.99	30.15	126.41
28.00	0.17	21.69	4.61	58.13	36.15	147.59
29.00	0.17	15.71	6.37	41.34	26.18	112.41
30.00	0.17	32.00	3.13	87.69	53.33	208.24
31.00	0.17	39.80	2.51	110.43	66.33	254.12
32.00	0.17	27.54	3.63	74.82	45.90	182.00
33.00	0.18	13.64	7.33	35.60	22.73	100.24
34.00	0.18	11.51	8.69	29.75	19.18	87.71
35.00	0.18	17.36	5.76	45.94	28.93	122.12
36.00	0.19	13.17	7.59	34.31	21.95	97.47
37.00	0.19	7.77	12.87	19.64	12.95	65.71
38.00	0.20	5.92	16.89	14.73	9.87	54.82
39.00	0.20	3.04	32.89	7.28	5.07	37.88
40.00	0.21	4.16	24.04	10.15	6.93	44.47
41.00	0.22	5.24	19.08	12.95	8.73	50.82
42.00	0.23	3.83	26.11	9.30	6.38	42.53
43.00	0.24	8.00	12.50	20.26	13.33	67.06
44.00	0.25	3.97	25.19	9.66	6.62	43.35
45.00	0.26	3.06	32.68	7.34	5.10	38.00
46.00	0.27	2.17	46.08	5.10	3.62	32.76
47.00	0.28	2.92	34.25	6.98	4.87	37.18
48.00	0.30	1.56	64.10	3.60	2.60	29.18
49.00	0.31	3.60	27.78	8.71	6.00	41.18
50.00	0.33	1.41	70.92	3.23	2.35	28.29
51.00	0.35	1.53	65.36	3.53	2.55	29.00
52.00	0.37	1.59	62.89	3.67	2.65	29.35
53.00	0.38	4.51	22.17	11.05	7.52	46.53
54.00	0.39	7.63	13.11	19.27	12.72	64.88
55.00	0.40	2.83	35.34	6.75	4.72	36.65
56.00	0.41	3.21	31.15	7.72	5.35	38.88
57.00	0.42	13.29	7.52	34.64	22.15	98.18
58.00	0.43	6.37	15.70	15.92	10.62	57.47
59.00	0.44	3.87	25.84	9.40	6.45	42.76
60.00	0.45	8.13	12.30	20.60	13.55	67.82
61.00	0.46	6.55	15.27	16.40	10.92	58.53
62.00	0.47	2.33	42.92	5.50	3.88	33.71
63.00	0.48	8.74	11.44	22.24	14.57	71.41
64.00	0.50	3.62	27.62	8.76	6.03	41.29
65.00	0.50	14.12	7.08	36.93	23.53	103.06
66.00	0.51	6.84	14.62	17.17	11.40	60.24
67.00	0.52	8.30	12.05	21.06	13.83	68.82
68.00	0.52	10.21	9.79	26.21	17.02	80.06
69.00	0.53	7.15	13.99	17.99	11.92	62.06
70.00	0.54	8.12	12.32	20.58	13.53	67.76
71.00	0.55	10.07	9.93	25.83	16.78	79.24
72.00	0.55	10.72	9.33	27.60	17.87	83.06
73.00	0.56	9.61	10.41	24.59	16.02	76.53
74.00	0.57	12.82	7.80	33.35	21.37	95.41

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.57	17.87	5.60	47.37	29.78	125.12
76.00	0.57	14.37	6.96	37.62	23.95	104.53
77.00	0.58	20.31	4.92	54.23	33.85	139.47
78.00	0.58	17.57	5.69	46.53	29.28	123.35
79.00	0.58	20.81	4.81	55.64	34.68	142.41
80.00	0.59	18.65	5.36	49.56	31.08	129.71
81.00	0.59	23.14	4.32	62.25	38.57	156.12
82.00	0.59	18.49	5.41	49.11	30.82	128.76
83.00	0.60	29.88	3.35	81.56	49.80	195.76
84.00	0.60	54.70	1.83	154.54	91.17	341.76
85.00	0.60	46.15	2.17	129.13	76.92	291.47
86.00	0.60	27.99	3.57	76.12	46.65	184.65
87.00	0.60	53.06	1.88	149.65	88.43	332.12
88.00	0.60	37.39	2.67	103.37	62.32	239.94
89.00	0.61	45.93	2.18	128.48	76.55	290.18
90.00	0.61	28.21	3.54	76.75	47.02	185.94
91.00	0.61	38.55	2.59	106.76	64.25	246.76
92.00	0.61	22.99	4.35	61.82	38.32	155.24
93.00	0.62	32.29	3.10	88.53	53.82	209.94
94.00	0.62	12.01	8.33	31.12	20.02	90.65
95.00	0.62	23.71	4.22	63.87	39.52	159.47
96.00	0.62	32.03	3.12	87.78	53.38	208.41
97.00	0.62	35.98	2.78	99.26	59.97	231.65
98.00	0.63	32.36	3.09	88.73	53.93	210.35
99.00	0.63	34.73	2.88	95.61	57.88	224.29
100.00	0.63	29.49	3.39	80.44	49.15	193.47
101.00	0.63	32.32	3.09	88.62	53.87	210.12
102.00	0.63	34.61	2.89	95.27	57.68	223.59
103.00	0.64	23.51	4.25	63.30	39.18	158.29
104.00	0.64	23.81	4.20	64.16	39.68	160.06
105.00	0.64	28.66	3.49	78.04	47.77	188.59
106.00	0.65	24.14	4.14	65.10	40.23	162.00
107.00	0.65	26.35	3.80	71.41	43.92	175.00
108.00	0.65	21.35	4.68	57.17	35.58	145.59
109.00	0.65	25.56	3.91	69.15	42.60	170.35
110.00	0.66	22.74	4.40	61.11	37.90	153.76
111.00	0.66	20.43	4.89	54.57	34.05	140.18
112.00	0.66	11.68	8.56	30.22	19.47	88.71
113.00	0.66	15.48	6.46	40.70	25.80	111.06
114.00	0.67	16.87	5.93	44.57	28.12	119.24
115.00	0.67	13.99	7.15	36.57	23.32	102.29
116.00	0.67	42.19	2.37	117.45	70.32	268.18
117.00	0.67	16.00	6.25	42.15	26.67	114.12
118.00	0.68	18.03	5.55	47.82	30.05	126.06
119.00	0.68	17.74	5.64	47.00	29.57	124.35
120.00	0.68	25.81	3.87	69.87	43.02	171.82
121.00	0.69	28.02	3.57	76.20	46.70	184.82
122.00	0.69	38.50	2.60	106.62	64.17	246.47
123.00	0.69	37.86	2.64	104.75	63.10	242.71
124.00	0.69	11.18	8.94	28.85	18.63	85.76
125.00	0.69	29.03	3.44	79.11	48.38	190.76
126.00	0.70	19.80	5.05	52.79	33.00	136.47
127.00	0.70	19.16	5.22	50.99	31.93	132.71
128.00	0.70	28.02	3.57	76.20	46.70	184.82
129.00	0.70	50.98	1.96	143.46	84.97	319.88

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.70	30.29	3.30	82.74	50.48	198.18
131.00	0.70	18.55	5.39	49.28	30.92	129.12
132.00	0.71	46.42	2.15	129.93	77.37	293.06

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-04A	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435973.19	
Northing (m):	566058.18	
Level (mAOD):	8.31	
Number of measures Qd :	337	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	4.98	20.08	12.27	8.30	49.29
1.00	0.02	4.32	23.15	10.56	7.20	45.41
2.00	0.03	5.49	18.21	13.61	9.15	52.29
3.00	0.04	9.14	10.94	23.32	15.23	73.76
4.00	0.05	7.20	13.89	18.12	12.00	62.35
5.00	0.06	4.00	25.00	9.74	6.67	43.53
6.00	0.07	9.11	10.98	23.24	15.18	73.59
7.00	0.08	10.34	9.67	26.57	17.23	80.82
8.00	0.08	13.44	7.44	35.05	22.40	99.06
9.00	0.09	13.11	7.63	34.14	21.85	97.12
10.00	0.10	15.11	6.62	39.67	25.18	108.88
11.00	0.10	11.21	8.92	28.94	18.68	85.94
12.00	0.11	4.98	20.08	12.27	8.30	49.29
13.00	0.12	10.03	9.97	25.73	16.72	79.00
14.00	0.12	16.75	5.97	44.24	27.92	118.53
15.00	0.13	17.99	5.56	47.71	29.98	125.82
16.00	0.13	14.88	6.72	39.03	24.80	107.53
17.00	0.14	12.85	7.78	33.43	21.42	95.59
18.00	0.14	5.94	16.84	14.79	9.90	54.94
19.00	0.15	14.40	6.94	37.70	24.00	104.71

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.16	3.59	27.86	8.68	5.98	41.12
21.00	0.17	6.49	15.41	16.24	10.82	58.18
22.00	0.17	12.38	8.08	32.14	20.63	92.82
23.00	0.18	6.43	15.55	16.08	10.72	57.82
24.00	0.19	8.77	11.40	22.32	14.62	71.59
25.00	0.20	15.36	6.51	40.37	25.60	110.35
26.00	0.20	7.14	14.01	17.96	11.90	62.00
27.00	0.21	15.39	6.50	40.45	25.65	110.53
28.00	0.22	12.41	8.06	32.22	20.68	93.00
29.00	0.23	5.53	18.08	13.71	9.22	52.53
30.00	0.23	14.51	6.89	38.01	24.18	105.35
31.00	0.24	5.25	19.05	12.98	8.75	50.88
32.00	0.25	4.62	21.65	11.34	7.70	47.18
33.00	0.26	4.80	20.83	11.81	8.00	48.24
34.00	0.27	4.44	22.52	10.87	7.40	46.12
35.00	0.28	4.04	24.75	9.84	6.73	43.76
36.00	0.28	5.51	18.15	13.66	9.18	52.41
37.00	0.29	5.34	18.73	13.21	8.90	51.41
38.00	0.30	5.47	18.28	13.55	9.12	52.18
39.00	0.31	6.34	15.77	15.84	10.57	57.29
40.00	0.32	7.00	14.29	17.59	11.67	61.18
41.00	0.32	5.51	18.15	13.66	9.18	52.41
42.00	0.33	12.52	7.99	32.52	20.87	93.65
43.00	0.33	8.73	11.45	22.22	14.55	71.35
44.00	0.34	13.56	7.37	35.38	22.60	99.76
45.00	0.34	12.20	8.20	31.64	20.33	91.76
46.00	0.35	22.93	4.36	61.65	38.22	154.88
47.00	0.35	11.81	8.47	30.58	19.68	89.47
48.00	0.35	29.11	3.44	79.34	48.52	191.24
49.00	0.36	20.81	4.81	55.64	34.68	142.41
50.00	0.36	34.78	2.88	95.76	57.97	224.59
51.00	0.36	54.25	1.84	153.20	90.42	339.12
52.00	0.37	10.30	9.71	26.46	17.17	80.59
53.00	0.37	22.20	4.50	59.58	37.00	150.59
54.00	0.37	7.60	13.16	19.19	12.67	64.71
55.00	0.38	13.45	7.43	35.08	22.42	99.12
56.00	0.38	13.84	7.23	36.16	23.07	101.41
57.00	0.39	10.20	9.80	26.19	17.00	80.00
58.00	0.40	20.84	4.80	55.73	34.73	142.59
59.00	0.40	16.89	5.92	44.63	28.15	119.35
60.00	0.40	18.93	5.28	50.34	31.55	131.35
61.00	0.41	4.18	23.92	10.20	6.97	44.59
62.00	0.42	12.82	7.80	33.35	21.37	95.41
63.00	0.42	17.05	5.87	45.07	28.42	120.29
64.00	0.43	15.87	6.30	41.78	26.45	113.35
65.00	0.44	16.10	6.21	42.42	26.83	114.71
66.00	0.44	5.82	17.18	14.47	9.70	54.24
67.00	0.45	16.08	6.22	42.37	26.80	114.59
68.00	0.45	12.67	7.89	32.93	21.12	94.53
69.00	0.46	11.80	8.47	30.55	19.67	89.41
70.00	0.46	13.26	7.54	34.56	22.10	98.00
71.00	0.47	14.62	6.84	38.31	24.37	106.00
72.00	0.48	15.53	6.44	40.84	25.88	111.35
73.00	0.48	15.01	6.66	39.39	25.02	108.29
74.00	0.49	14.24	7.02	37.26	23.73	103.76

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.49	15.06	6.64	39.53	25.10	108.59
76.00	0.50	15.71	6.37	41.34	26.18	112.41
77.00	0.50	17.50	5.71	46.33	29.17	122.94
78.00	0.51	20.87	4.79	55.81	34.78	142.76
79.00	0.51	16.95	5.90	44.80	28.25	119.71
80.00	0.52	17.55	5.70	46.47	29.25	123.24
81.00	0.52	17.84	5.61	47.29	29.73	124.94
82.00	0.52	32.54	3.07	89.25	54.23	211.41
83.00	0.53	59.45	1.68	168.76	99.08	369.71
84.00	0.53	42.14	2.37	117.30	70.23	267.88
85.00	0.53	62.60	1.60	178.23	104.33	388.24
86.00	0.53	62.55	1.60	178.08	104.25	387.94
87.00	0.53	37.55	2.66	103.84	62.58	240.88
88.00	0.53	56.64	1.77	160.34	94.40	353.18
89.00	0.53	50.68	1.97	142.56	84.47	318.12
90.00	0.54	59.03	1.69	167.50	98.38	367.24
91.00	0.54	49.96	2.00	140.42	83.27	313.88
92.00	0.54	55.81	1.79	157.86	93.02	348.29
93.00	0.54	32.45	3.08	88.99	54.08	210.88
94.00	0.54	54.56	1.83	154.13	90.93	340.94
95.00	0.54	61.44	1.63	174.74	102.40	381.41
96.00	0.55	47.32	2.11	132.59	78.87	298.35
97.00	0.55	26.01	3.84	70.44	43.35	173.00
98.00	0.55	36.00	2.78	99.31	60.00	231.76
99.00	0.55	43.37	2.31	120.92	72.28	275.12
100.00	0.55	38.70	2.58	107.20	64.50	247.65
101.00	0.56	39.42	2.54	109.31	65.70	251.88
102.00	0.56	40.80	2.45	113.36	68.00	260.00
103.00	0.56	39.42	2.54	109.31	65.70	251.88
104.00	0.56	35.19	2.84	96.95	58.65	227.00
105.00	0.56	33.58	2.98	92.27	55.97	217.53
106.00	0.57	31.95	3.13	87.54	53.25	207.94
107.00	0.57	35.87	2.79	98.94	59.78	231.00
108.00	0.57	43.84	2.28	122.31	73.07	277.88
109.00	0.57	43.48	2.30	121.25	72.47	275.76
110.00	0.57	38.88	2.57	107.73	64.80	248.71
111.00	0.57	40.57	2.46	112.69	67.62	258.65
112.00	0.58	36.12	2.77	99.66	60.20	232.47
113.00	0.58	50.12	2.00	140.90	83.53	314.82
114.00	0.58	54.42	1.84	153.71	90.70	340.12
115.00	0.58	57.97	1.73	164.33	96.62	361.00
116.00	0.58	36.88	2.71	101.88	61.47	236.94
117.00	0.58	49.68	2.01	139.59	82.80	312.24
118.00	0.59	47.55	2.10	133.27	79.25	299.71
119.00	0.59	34.17	2.93	93.99	56.95	221.00
120.00	0.59	36.11	2.77	99.64	60.18	232.41
121.00	0.59	34.12	2.93	93.84	56.87	220.71
122.00	0.59	41.30	2.42	114.83	68.83	262.94
123.00	0.60	48.54	2.06	136.21	80.90	305.53
124.00	0.60	26.50	3.77	71.84	44.17	175.88
125.00	0.60	32.44	3.08	88.96	54.07	210.82
126.00	0.60	23.63	4.23	63.64	39.38	159.00
127.00	0.60	47.42	2.11	132.89	79.03	298.94
128.00	0.60	38.26	2.61	105.92	63.77	245.06
129.00	0.61	29.26	3.42	79.77	48.77	192.12

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.61	34.61	2.89	95.27	57.68	223.59
131.00	0.61	35.53	2.81	97.94	59.22	229.00
132.00	0.61	25.48	3.92	68.92	42.47	169.88
133.00	0.62	29.03	3.44	79.11	48.38	190.76
134.00	0.62	31.75	3.15	86.96	52.92	206.76
135.00	0.62	24.70	4.05	66.69	41.17	165.29
136.00	0.63	21.72	4.60	58.22	36.20	147.76
137.00	0.63	25.14	3.98	67.95	41.90	167.88
138.00	0.63	24.01	4.16	64.73	40.02	161.24
139.00	0.64	16.80	5.95	44.38	28.00	118.82
140.00	0.64	19.94	5.02	53.19	33.23	137.29
141.00	0.65	27.04	3.70	73.39	45.07	179.06
142.00	0.65	18.42	5.43	48.91	30.70	128.35
143.00	0.65	19.71	5.07	52.54	32.85	135.94
144.00	0.66	11.79	8.48	30.52	19.65	89.35
145.00	0.66	17.99	5.56	47.71	29.98	125.82
146.00	0.67	16.32	6.13	43.04	27.20	116.00
147.00	0.68	14.57	6.86	38.17	24.28	105.71
148.00	0.68	19.03	5.25	50.63	31.72	131.94
149.00	0.68	24.62	4.06	66.46	41.03	164.82
150.00	0.69	47.77	2.09	133.93	79.62	301.00
151.00	0.69	38.62	2.59	106.97	64.37	247.18
152.00	0.69	30.66	3.26	83.81	51.10	200.35
153.00	0.69	21.55	4.64	57.74	35.92	146.76
154.00	0.70	18.69	5.35	49.67	31.15	129.94
155.00	0.70	25.24	3.96	68.24	42.07	168.47
156.00	0.70	22.72	4.40	61.06	37.87	153.65
157.00	0.71	25.83	3.87	69.92	43.05	171.94
158.00	0.71	23.15	4.32	62.28	38.58	156.18
159.00	0.71	21.51	4.65	57.62	35.85	146.53
160.00	0.72	23.21	4.31	62.45	38.68	156.53
161.00	0.72	7.45	13.42	18.79	12.42	63.82
162.00	0.73	14.21	7.04	37.18	23.68	103.59
163.00	0.73	13.78	7.26	35.99	22.97	101.06
164.00	0.73	12.70	7.87	33.02	21.17	94.71
165.00	0.74	14.93	6.70	39.17	24.88	107.82
166.00	0.75	10.71	9.34	27.57	17.85	83.00
167.00	0.75	13.35	7.49	34.80	22.25	98.53
168.00	0.76	11.00	9.09	28.36	18.33	84.71
169.00	0.76	14.61	6.84	38.29	24.35	105.94
170.00	0.76	11.22	8.91	28.96	18.70	86.00
171.00	0.77	9.99	10.01	25.62	16.65	78.76
172.00	0.77	8.53	11.72	21.68	14.22	70.18
173.00	0.78	11.41	8.76	29.48	19.02	87.12
174.00	0.78	14.32	6.98	37.48	23.87	104.24
175.00	0.78	11.31	8.84	29.21	18.85	86.53
176.00	0.79	7.03	14.22	17.67	11.72	61.35
177.00	0.79	7.22	13.85	18.17	12.03	62.47
178.00	0.79	11.00	9.09	28.36	18.33	84.71
179.00	0.80	13.67	7.32	35.69	22.78	100.41
180.00	0.80	7.19	13.91	18.10	11.98	62.29
181.00	0.81	7.25	13.79	18.25	12.08	62.65
182.00	0.81	13.01	7.69	33.87	21.68	96.53
183.00	0.82	5.23	19.12	12.93	8.72	50.76
184.00	0.82	6.47	15.46	16.19	10.78	58.06

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	0.83	4.64	21.55	11.39	7.73	47.29
186.00	0.83	6.17	16.21	15.39	10.28	56.29
187.00	0.84	3.65	27.40	8.84	6.08	41.47
188.00	0.84	4.88	20.49	12.01	8.13	48.71
189.00	0.85	5.58	17.92	13.84	9.30	52.82
190.00	0.85	5.96	16.78	14.84	9.93	55.06
191.00	0.86	15.58	6.42	40.98	25.97	111.65
192.00	0.87	11.89	8.41	30.79	19.82	89.94
193.00	0.87	14.16	7.06	37.04	23.60	103.29
194.00	0.88	15.64	6.39	41.14	26.07	112.00
195.00	0.88	5.18	19.31	12.80	8.63	50.47
196.00	0.89	15.83	6.32	41.67	26.38	113.12
197.00	0.90	14.93	6.70	39.17	24.88	107.82
198.00	0.90	15.52	6.44	40.81	25.87	111.29
199.00	0.91	4.28	23.36	10.46	7.13	45.18
200.00	0.92	14.54	6.88	38.09	24.23	105.53
201.00	0.92	12.65	7.91	32.88	21.08	94.41
202.00	0.93	17.26	5.79	45.66	28.77	121.53
203.00	0.94	15.60	6.41	41.03	26.00	111.76
204.00	0.94	16.96	5.90	44.82	28.27	119.76
205.00	0.95	14.56	6.87	38.15	24.27	105.65
206.00	0.95	15.73	6.36	41.39	26.22	112.53
207.00	0.96	16.81	5.95	44.40	28.02	118.88
208.00	0.97	12.56	7.96	32.63	20.93	93.88
209.00	0.97	15.59	6.41	41.01	25.98	111.71
210.00	0.98	16.11	6.21	42.45	26.85	114.76
211.00	0.98	22.05	4.54	59.15	36.75	149.71
212.00	0.99	12.94	7.73	33.68	21.57	96.12
213.00	1.00	12.28	8.14	31.86	20.47	92.24
214.00	1.01	10.45	9.57	26.87	17.42	81.47
215.00	1.01	3.42	29.24	8.25	5.70	40.12
216.00	1.02	11.16	8.96	28.80	18.60	85.65
217.00	1.03	9.37	10.67	23.94	15.62	75.12
218.00	1.03	12.47	8.02	32.38	20.78	93.35
219.00	1.04	11.68	8.56	30.22	19.47	88.71
220.00	1.04	12.12	8.25	31.42	20.20	91.29
221.00	1.05	9.99	10.01	25.62	16.65	78.76
222.00	1.06	9.86	10.14	25.27	16.43	78.00
223.00	1.07	10.51	9.51	27.03	17.52	81.82
224.00	1.07	11.84	8.45	30.66	19.73	89.65
225.00	1.08	11.90	8.40	30.82	19.83	90.00
226.00	1.09	10.40	9.62	26.73	17.33	81.18
227.00	1.09	15.44	6.48	40.59	25.73	110.82
228.00	1.09	19.86	5.04	52.96	33.10	136.82
229.00	1.10	21.83	4.58	58.53	36.38	148.41
230.00	1.10	16.71	5.98	44.13	27.85	118.29
231.00	1.11	10.88	9.19	28.04	18.13	84.00
232.00	1.12	9.40	10.64	24.02	15.67	75.29
233.00	1.12	14.82	6.75	38.87	24.70	107.18
234.00	1.13	16.37	6.11	43.18	27.28	116.29
235.00	1.14	9.60	10.42	24.56	16.00	76.47
236.00	1.15	8.28	12.08	21.01	13.80	68.71
237.00	1.17	6.95	14.39	17.46	11.58	60.88
238.00	1.18	8.56	11.68	21.76	14.27	70.35
239.00	1.19	6.54	15.29	16.37	10.90	58.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	1.20	11.96	8.36	30.99	19.93	90.35
241.00	1.20	23.81	4.20	64.16	39.68	160.06
242.00	1.20	19.69	5.08	52.48	32.82	135.82
243.00	1.21	21.14	4.73	56.58	35.23	144.35
244.00	1.21	21.73	4.60	58.25	36.22	147.82
245.00	1.21	21.78	4.59	58.39	36.30	148.12
246.00	1.22	29.12	3.43	79.37	48.53	191.29
247.00	1.22	40.35	2.48	112.04	67.25	257.35
248.00	1.22	25.12	3.98	67.89	41.87	167.76
249.00	1.22	25.14	3.98	67.95	41.90	167.88
250.00	1.22	24.36	4.11	65.72	40.60	163.29
251.00	1.23	25.65	3.90	69.41	42.75	170.88
252.00	1.23	24.33	4.11	65.64	40.55	163.12
253.00	1.23	25.31	3.95	68.44	42.18	168.88
254.00	1.23	28.89	3.46	78.71	48.15	189.94
255.00	1.23	33.06	3.02	90.76	55.10	214.47
256.00	1.24	33.00	3.03	90.59	55.00	214.12
257.00	1.24	24.68	4.05	66.64	41.13	165.18
258.00	1.24	30.26	3.30	82.66	50.43	198.00
259.00	1.24	34.21	2.92	94.10	57.02	221.24
260.00	1.25	37.87	2.64	104.78	63.12	242.76
261.00	1.25	22.50	4.44	60.43	37.50	152.35
262.00	1.26	12.40	8.06	32.19	20.67	92.94
263.00	1.27	9.92	10.08	25.43	16.53	78.35
264.00	1.27	13.58	7.36	35.44	22.63	99.88
265.00	1.28	7.60	13.16	19.19	12.67	64.71
266.00	1.30	7.76	12.89	19.61	12.93	65.65
267.00	1.30	8.88	11.26	22.62	14.80	72.24
268.00	1.31	9.17	10.91	23.40	15.28	73.94
269.00	1.32	10.62	9.42	27.33	17.70	82.47
270.00	1.33	8.47	11.81	21.52	14.12	69.82
271.00	1.34	8.49	11.78	21.57	14.15	69.94
272.00	1.34	11.23	8.90	28.99	18.72	86.06
273.00	1.35	9.03	11.07	23.02	15.05	73.12
274.00	1.36	6.34	15.77	15.84	10.57	57.29
275.00	1.38	7.14	14.01	17.96	11.90	62.00
276.00	1.39	5.98	16.72	14.89	9.97	55.18
277.00	1.40	10.66	9.38	27.44	17.77	82.71
278.00	1.41	6.81	14.68	17.09	11.35	60.06
279.00	1.42	7.28	13.74	18.33	12.13	62.82
280.00	1.43	7.12	14.04	17.91	11.87	61.88
281.00	1.44	5.88	17.01	14.63	9.80	54.59
282.00	1.45	6.35	15.75	15.87	10.58	57.35
283.00	1.46	4.86	20.58	11.96	8.10	48.59
284.00	1.47	4.59	21.79	11.26	7.65	47.00
285.00	1.49	5.09	19.65	12.56	8.48	49.94
286.00	1.50	3.94	25.38	9.58	6.57	43.18
287.00	1.52	3.37	29.67	8.12	5.62	39.82
288.00	1.54	3.45	28.99	8.33	5.75	40.29
289.00	1.56	3.67	27.25	8.89	6.12	41.59
290.00	1.58	3.31	30.21	7.97	5.52	39.47
291.00	1.61	2.84	35.21	6.78	4.73	36.71
292.00	1.63	2.63	38.02	6.25	4.38	35.47
293.00	1.65	2.12	47.17	4.98	3.53	32.47
294.00	1.67	2.73	36.63	6.50	4.55	36.06

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

295.00	1.69	3.02	33.11	7.23	5.03	37.76
296.00	1.71	2.73	36.63	6.50	4.55	36.06
297.00	1.74	2.87	34.84	6.85	4.78	36.88
298.00	1.76	2.75	36.36	6.55	4.58	36.18
299.00	1.78	3.58	27.93	8.66	5.97	41.06
300.00	1.79	3.27	30.58	7.87	5.45	39.24
301.00	1.81	3.78	26.46	9.17	6.30	42.24
302.00	1.83	4.53	22.08	11.10	7.55	46.65
303.00	1.84	5.54	18.05	13.74	9.23	52.59
304.00	1.85	6.07	16.47	15.13	10.12	55.71
305.00	1.86	5.07	19.72	12.51	8.45	49.82
306.00	1.87	5.77	17.33	14.34	9.62	53.94
307.00	1.89	4.46	22.42	10.92	7.43	46.24
308.00	1.90	5.33	18.76	13.19	8.88	51.35
309.00	1.91	4.92	20.33	12.12	8.20	48.94
310.00	1.92	4.54	22.03	11.13	7.57	46.71
311.00	1.93	5.43	18.42	13.45	9.05	51.94
312.00	1.93	6.55	15.27	16.40	10.92	58.53
313.00	1.94	5.08	19.69	12.53	8.47	49.88
314.00	1.95	5.91	16.92	14.71	9.85	54.76
315.00	1.96	5.49	18.21	13.61	9.15	52.29
316.00	1.97	5.05	19.80	12.46	8.42	49.71
317.00	1.97	5.31	18.83	13.13	8.85	51.24
318.00	1.98	4.99	20.04	12.30	8.32	49.35
319.00	1.99	5.60	17.86	13.89	9.33	52.94
320.00	2.00	5.20	19.23	12.85	8.67	50.59
321.00	2.01	4.02	24.88	9.79	6.70	43.65
322.00	2.02	3.99	25.06	9.71	6.65	43.47
323.00	2.03	4.63	21.60	11.36	7.72	47.24
324.00	2.04	4.07	24.57	9.92	6.78	43.94
325.00	2.05	4.74	21.10	11.65	7.90	47.88
326.00	2.06	3.87	25.84	9.40	6.45	42.76
327.00	2.07	4.66	21.46	11.44	7.77	47.41
328.00	2.08	4.04	24.75	9.84	6.73	43.76
329.00	2.10	3.89	25.71	9.45	6.48	42.88
330.00	2.11	3.20	31.25	7.69	5.33	38.82
331.00	2.12	4.13	24.21	10.07	6.88	44.29
332.00	2.14	3.78	26.46	9.17	6.30	42.24
333.00	2.15	2.86	34.97	6.83	4.77	36.82
334.00	2.17	3.15	31.75	7.56	5.25	38.53
335.00	2.18	3.15	31.75	7.56	5.25	38.53
336.00	2.19	3.65	27.40	8.84	6.08	41.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-05	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	436036.65	
Northing (m):	566063.14	
Level (mAOD):	8.56	
Number of measures Qd :	251	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	5.09	19.65	12.56	8.48	49.94
1.00	0.02	5.51	18.15	13.66	9.18	52.41
2.00	0.03	10.11	9.89	25.94	16.85	79.47
3.00	0.04	4.04	24.75	9.84	6.73	43.76
4.00	0.04	6.66	15.02	16.69	11.10	59.18
5.00	0.05	6.95	14.39	17.46	11.58	60.88
6.00	0.05	7.17	13.95	18.04	11.95	62.18
7.00	0.06	6.23	16.05	15.55	10.38	56.65
8.00	0.06	13.38	7.47	34.89	22.30	98.71
9.00	0.07	12.28	8.14	31.86	20.47	92.24
10.00	0.07	14.01	7.14	36.63	23.35	102.41
11.00	0.07	14.74	6.78	38.65	24.57	106.71
12.00	0.08	13.33	7.50	34.75	22.22	98.41
13.00	0.08	11.39	8.78	29.43	18.98	87.00
14.00	0.09	14.08	7.10	36.82	23.47	102.82
15.00	0.09	55.98	1.79	158.37	93.30	349.29
16.00	0.09	15.09	6.63	39.62	25.15	108.76
17.00	0.09	11.17	8.95	28.83	18.62	85.71
18.00	0.09	36.37	2.75	100.39	60.62	233.94
19.00	0.10	15.85	6.31	41.73	26.42	113.24

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.11	16.08	6.22	42.37	26.80	114.59
21.00	0.11	8.18	12.22	20.74	13.63	68.12
22.00	0.12	7.12	14.04	17.91	11.87	61.88
23.00	0.13	3.78	26.46	9.17	6.30	42.24
24.00	0.14	6.62	15.11	16.58	11.03	58.94
25.00	0.15	6.79	14.73	17.03	11.32	59.94
26.00	0.15	7.03	14.22	17.67	11.72	61.35
27.00	0.16	4.59	21.79	11.26	7.65	47.00
28.00	0.17	6.73	14.86	16.87	11.22	59.59
29.00	0.18	4.09	24.45	9.97	6.82	44.06
30.00	0.18	10.61	9.43	27.30	17.68	82.41
31.00	0.19	3.27	30.58	7.87	5.45	39.24
32.00	0.20	8.81	11.35	22.43	14.68	71.82
33.00	0.21	9.83	10.17	25.18	16.38	77.82
34.00	0.22	2.70	37.04	6.43	4.50	35.88
35.00	0.24	6.04	16.56	15.05	10.07	55.53
36.00	0.25	2.22	45.05	5.23	3.70	33.06
37.00	0.26	8.80	11.36	22.40	14.67	71.76
38.00	0.26	5.07	19.72	12.51	8.45	49.82
39.00	0.26	15.76	6.35	41.48	26.27	112.71
40.00	0.27	7.54	13.26	19.03	12.57	64.35
41.00	0.27	14.27	7.01	37.34	23.78	103.94
42.00	0.27	36.51	2.74	100.80	60.85	234.76
43.00	0.28	12.19	8.20	31.62	20.32	91.71
44.00	0.28	28.32	3.53	77.07	47.20	186.59
45.00	0.28	46.89	2.13	131.32	78.15	295.82
46.00	0.28	11.76	8.50	30.44	19.60	89.18
47.00	0.28	35.51	2.82	97.89	59.18	228.88
48.00	0.29	13.26	7.54	34.56	22.10	98.00
49.00	0.29	33.63	2.97	92.42	56.05	217.82
50.00	0.29	11.76	8.50	30.44	19.60	89.18
51.00	0.29	29.14	3.43	79.43	48.57	191.41
52.00	0.30	34.00	2.94	93.49	56.67	220.00
53.00	0.30	36.31	2.75	100.22	60.52	233.59
54.00	0.31	30.98	3.23	84.74	51.63	202.24
55.00	0.31	22.58	4.43	60.66	37.63	152.82
56.00	0.32	18.64	5.36	49.53	31.07	129.65
57.00	0.32	15.75	6.35	41.45	26.25	112.65
58.00	0.33	16.67	6.00	44.01	27.78	118.06
59.00	0.33	14.39	6.95	37.68	23.98	104.65
60.00	0.34	18.37	5.44	48.77	30.62	128.06
61.00	0.34	13.41	7.46	34.97	22.35	98.88
62.00	0.35	14.43	6.93	37.79	24.05	104.88
63.00	0.36	17.16	5.83	45.38	28.60	120.94
64.00	0.36	16.82	5.95	44.43	28.03	118.94
65.00	0.37	23.67	4.22	63.76	39.45	159.24
66.00	0.37	14.68	6.81	38.48	24.47	106.35
67.00	0.38	17.86	5.60	47.34	29.77	125.06
68.00	0.38	18.85	5.31	50.12	31.42	130.88
69.00	0.39	18.19	5.50	48.27	30.32	127.00
70.00	0.39	14.64	6.83	38.37	24.40	106.12
71.00	0.39	35.01	2.86	96.43	58.35	225.94
72.00	0.40	23.12	4.33	62.19	38.53	156.00
73.00	0.40	35.12	2.85	96.75	58.53	226.59
74.00	0.41	33.37	3.00	91.66	55.62	216.29

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.41	26.57	3.76	72.04	44.28	176.29
76.00	0.41	25.03	4.00	67.64	41.72	167.24
77.00	0.42	33.78	2.96	92.85	56.30	218.71
78.00	0.42	39.35	2.54	109.11	65.58	251.47
79.00	0.42	41.58	2.41	115.65	69.30	264.59
80.00	0.42	64.10	1.56	182.75	106.83	397.06
81.00	0.42	66.24	1.51	189.20	110.40	409.65
82.00	0.43	43.85	2.28	122.34	73.08	277.94
83.00	0.43	38.76	2.58	107.38	64.60	248.00
84.00	0.43	26.58	3.76	72.07	44.30	176.35
85.00	0.44	29.26	3.42	79.77	48.77	192.12
86.00	0.44	3.92	25.51	9.53	6.53	43.06
87.00	0.45	12.18	8.21	31.59	20.30	91.65
88.00	0.46	12.07	8.29	31.29	20.12	91.00
89.00	0.47	7.50	13.33	18.92	12.50	64.12
90.00	0.49	5.44	18.38	13.47	9.07	52.00
91.00	0.50	5.11	19.57	12.61	8.52	50.06
92.00	0.52	5.40	18.52	13.37	9.00	51.76
93.00	0.53	5.77	17.33	14.34	9.62	53.94
94.00	0.54	6.63	15.08	16.61	11.05	59.00
95.00	0.56	4.58	21.83	11.23	7.63	46.94
96.00	0.58	4.31	23.20	10.54	7.18	45.35
97.00	0.60	4.91	20.37	12.09	8.18	48.88
98.00	0.61	4.99	20.04	12.30	8.32	49.35
99.00	0.63	3.36	29.76	8.10	5.60	39.76
100.00	0.65	2.23	44.84	5.25	3.72	33.12
101.00	0.67	5.02	19.92	12.38	8.37	49.53
102.00	0.69	1.85	54.05	4.31	3.08	30.88
103.00	0.71	2.24	44.64	5.27	3.73	33.18
104.00	0.73	2.26	44.25	5.32	3.77	33.29
105.00	0.74	6.72	14.88	16.85	11.20	59.53
106.00	0.75	2.99	33.44	7.16	4.98	37.59
107.00	0.76	9.01	11.10	22.97	15.02	73.00
108.00	0.77	4.36	22.94	10.66	7.27	45.65
109.00	0.77	4.91	20.37	12.09	8.18	48.88
110.00	0.78	5.63	17.76	13.97	9.38	53.12
111.00	0.78	7.33	13.64	18.47	12.22	63.12
112.00	0.79	16.67	6.00	44.01	27.78	118.06
113.00	0.79	8.83	11.33	22.48	14.72	71.94
114.00	0.79	10.66	9.38	27.44	17.77	82.71
115.00	0.80	21.54	4.64	57.71	35.90	146.71
116.00	0.81	6.70	14.93	16.79	11.17	59.41
117.00	0.81	6.58	15.20	16.48	10.97	58.71
118.00	0.82	15.00	6.67	39.37	25.00	108.24
119.00	0.82	5.09	19.65	12.56	8.48	49.94
120.00	0.83	3.69	27.10	8.94	6.15	41.71
121.00	0.84	3.54	28.25	8.56	5.90	40.82
122.00	0.85	8.29	12.06	21.03	13.82	68.76
123.00	0.86	2.41	41.49	5.70	4.02	34.18
124.00	0.87	6.82	14.66	17.11	11.37	60.12
125.00	0.88	1.73	57.80	4.01	2.88	30.18
126.00	0.90	2.09	47.85	4.90	3.48	32.29
127.00	0.92	3.48	28.74	8.40	5.80	40.47
128.00	0.94	2.90	34.48	6.93	4.83	37.06
129.00	0.97	3.10	32.26	7.44	5.17	38.24

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.99	1.20	83.33	2.73	2.00	27.06
131.00	1.01	3.20	31.25	7.69	5.33	38.82
132.00	1.03	3.16	31.65	7.59	5.27	38.59
133.00	1.05	3.47	28.82	8.38	5.78	40.41
134.00	1.07	1.97	50.76	4.61	3.28	31.59
135.00	1.09	4.07	24.57	9.92	6.78	43.94
136.00	1.11	3.27	30.58	7.87	5.45	39.24
137.00	1.14	3.33	30.03	8.02	5.55	39.59
138.00	1.16	3.07	32.57	7.36	5.12	38.06
139.00	1.17	4.77	20.96	11.73	7.95	48.06
140.00	1.19	3.91	25.58	9.50	6.52	43.00
141.00	1.21	3.59	27.86	8.68	5.98	41.12
142.00	1.24	3.65	27.40	8.84	6.08	41.47
143.00	1.26	2.47	40.49	5.85	4.12	34.53
144.00	1.27	7.33	13.64	18.47	12.22	63.12
145.00	1.28	12.79	7.82	33.26	21.32	95.24
146.00	1.28	11.03	9.07	28.44	18.38	84.88
147.00	1.29	15.51	6.45	40.78	25.85	111.24
148.00	1.29	14.78	6.77	38.76	24.63	106.94
149.00	1.29	17.94	5.57	47.57	29.90	125.53
150.00	1.30	23.29	4.29	62.68	38.82	157.00
151.00	1.30	12.63	7.92	32.82	21.05	94.29
152.00	1.31	23.65	4.23	63.70	39.42	159.12
153.00	1.31	12.90	7.75	33.57	21.50	95.88
154.00	1.33	5.97	16.75	14.87	9.95	55.12
155.00	1.34	5.20	19.23	12.85	8.67	50.59
156.00	1.35	7.94	12.59	20.10	13.23	66.71
157.00	1.36	7.78	12.85	19.67	12.97	65.76
158.00	1.37	5.87	17.04	14.60	9.78	54.53
159.00	1.38	6.54	15.29	16.37	10.90	58.47
160.00	1.39	6.14	16.29	15.31	10.23	56.12
161.00	1.40	6.09	16.42	15.18	10.15	55.82
162.00	1.41	4.47	22.37	10.95	7.45	46.29
163.00	1.43	3.73	26.81	9.04	6.22	41.94
164.00	1.44	6.24	16.03	15.58	10.40	56.71
165.00	1.45	9.47	10.56	24.21	15.78	75.71
166.00	1.46	9.99	10.01	25.62	16.65	78.76
167.00	1.46	10.10	9.90	25.92	16.83	79.41
168.00	1.47	10.23	9.78	26.27	17.05	80.18
169.00	1.48	7.61	13.14	19.21	12.68	64.76
170.00	1.49	5.12	19.53	12.64	8.53	50.12
171.00	1.50	4.83	20.70	11.88	8.05	48.41
172.00	1.51	7.22	13.85	18.17	12.03	62.47
173.00	1.52	8.34	11.99	21.17	13.90	69.06
174.00	1.52	18.29	5.47	48.55	30.48	127.59
175.00	1.52	16.96	5.90	44.82	28.27	119.76
176.00	1.53	18.41	5.43	48.88	30.68	128.29
177.00	1.53	12.79	7.82	33.26	21.32	95.24
178.00	1.54	7.79	12.84	19.69	12.98	65.82
179.00	1.56	3.66	27.32	8.86	6.10	41.53
180.00	1.57	6.40	15.63	16.00	10.67	57.65
181.00	1.57	10.02	9.98	25.70	16.70	78.94
182.00	1.58	9.14	10.94	23.32	15.23	73.76
183.00	1.59	3.78	26.46	9.17	6.30	42.24
184.00	1.62	2.29	43.67	5.40	3.82	33.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	1.64	2.51	39.84	5.95	4.18	34.76
186.00	1.66	2.81	35.59	6.70	4.68	36.53
187.00	1.67	4.15	24.10	10.12	6.92	44.41
188.00	1.68	4.58	21.83	11.23	7.63	46.94
189.00	1.69	5.20	19.23	12.85	8.67	50.59
190.00	1.70	6.22	16.08	15.53	10.37	56.59
191.00	1.71	6.69	14.95	16.77	11.15	59.35
192.00	1.72	5.55	18.02	13.76	9.25	52.65
193.00	1.73	7.15	13.99	17.99	11.92	62.06
194.00	1.74	8.28	12.08	21.01	13.80	68.71
195.00	1.74	6.81	14.68	17.09	11.35	60.06
196.00	1.75	7.32	13.66	18.44	12.20	63.06
197.00	1.76	9.53	10.49	24.37	15.88	76.06
198.00	1.77	9.83	10.17	25.18	16.38	77.82
199.00	1.78	10.96	9.12	28.25	18.27	84.47
200.00	1.78	8.60	11.63	21.87	14.33	70.59
201.00	1.79	10.21	9.79	26.21	17.02	80.06
202.00	1.80	11.51	8.69	29.75	19.18	87.71
203.00	1.80	10.52	9.51	27.06	17.53	81.88
204.00	1.81	10.72	9.33	27.60	17.87	83.06
205.00	1.81	10.83	9.23	27.90	18.05	83.71
206.00	1.82	11.04	9.06	28.47	18.40	84.94
207.00	1.83	12.20	8.20	31.64	20.33	91.76
208.00	1.83	18.59	5.38	49.39	30.98	129.35
209.00	1.83	17.78	5.62	47.12	29.63	124.59
210.00	1.84	11.63	8.60	30.08	19.38	88.41
211.00	1.84	15.77	6.34	41.51	26.28	112.76
212.00	1.85	12.97	7.71	33.76	21.62	96.29
213.00	1.86	15.59	6.41	41.01	25.98	111.71
214.00	1.86	7.55	13.25	19.05	12.58	64.41
215.00	1.87	5.83	17.15	14.50	9.72	54.29
216.00	1.89	3.95	25.32	9.61	6.58	43.24
217.00	1.90	7.88	12.69	19.94	13.13	66.35
218.00	1.90	14.40	6.94	37.70	24.00	104.71
219.00	1.91	20.85	4.80	55.76	34.75	142.65
220.00	1.91	29.93	3.34	81.70	49.88	196.06
221.00	1.91	26.86	3.72	72.87	44.77	178.00
222.00	1.92	17.14	5.83	45.33	28.57	120.82
223.00	1.93	6.90	14.49	17.32	11.50	60.59
224.00	1.94	6.29	15.90	15.71	10.48	57.00
225.00	1.94	5.80	17.24	14.42	9.67	54.12
226.00	1.95	8.79	11.38	22.38	14.65	71.71
227.00	1.96	10.22	9.78	26.24	17.03	80.12
228.00	1.97	8.03	12.45	20.34	13.38	67.24
229.00	1.98	10.09	9.91	25.89	16.82	79.35
230.00	1.98	9.73	10.28	24.91	16.22	77.24
231.00	1.99	9.42	10.62	24.08	15.70	75.41
232.00	2.00	10.06	9.94	25.81	16.77	79.18
233.00	2.01	8.54	11.71	21.70	14.23	70.24
234.00	2.01	9.09	11.00	23.18	15.15	73.47
235.00	2.02	8.44	11.85	21.44	14.07	69.65
236.00	2.03	7.35	13.61	18.52	12.25	63.24
237.00	2.04	8.92	11.21	22.73	14.87	72.47
238.00	2.04	7.27	13.76	18.31	12.12	62.76
239.00	2.05	6.72	14.88	16.85	11.20	59.53

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	2.06	8.46	11.82	21.49	14.10	69.76
241.00	2.07	7.13	14.03	17.94	11.88	61.94
242.00	2.07	7.25	13.79	18.25	12.08	62.65
243.00	2.08	6.06	16.50	15.10	10.10	55.65
244.00	2.09	6.67	14.99	16.71	11.12	59.24
245.00	2.10	5.56	17.99	13.79	9.27	52.71
246.00	2.11	4.40	22.73	10.77	7.33	45.88
247.00	2.13	4.42	22.62	10.82	7.37	46.00
248.00	2.15	3.57	28.01	8.63	5.95	41.00
249.00	2.16	6.21	16.10	15.50	10.35	56.53
250.00	2.18	7.81	12.80	19.75	13.02	65.94

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-06	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435992.71	
Northing (m):	566084.85	
Level (mAOD):	9.21	
Number of measures Qd :	162	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	3.74	26.74	9.07	6.23	42.00
1.00	0.02	8.31	12.03	21.09	13.85	68.88
2.00	0.03	6.09	16.42	15.18	10.15	55.82
3.00	0.04	11.45	8.73	29.59	19.08	87.35
4.00	0.05	6.14	16.29	15.31	10.23	56.12
5.00	0.05	13.15	7.60	34.25	21.92	97.35
6.00	0.06	13.68	7.31	35.71	22.80	100.47
7.00	0.07	5.58	17.92	13.84	9.30	52.82
8.00	0.08	10.35	9.66	26.59	17.25	80.88
9.00	0.08	11.77	8.50	30.47	19.62	89.24
10.00	0.09	7.37	13.57	18.57	12.28	63.35
11.00	0.11	7.41	13.50	18.68	12.35	63.59
12.00	0.11	12.39	8.07	32.16	20.65	92.88
13.00	0.12	9.45	10.58	24.16	15.75	75.59
14.00	0.13	7.31	13.68	18.41	12.18	63.00
15.00	0.14	9.23	10.83	23.56	15.38	74.29
16.00	0.15	8.48	11.79	21.54	14.13	69.88
17.00	0.16	10.16	9.84	26.08	16.93	79.76
18.00	0.17	10.77	9.29	27.74	17.95	83.35
19.00	0.17	12.21	8.19	31.67	20.35	91.82

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.18	10.57	9.46	27.19	17.62	82.18
21.00	0.19	15.08	6.63	39.59	25.13	108.71
22.00	0.20	16.17	6.18	42.62	26.95	115.12
23.00	0.20	17.54	5.70	46.45	29.23	123.18
24.00	0.21	4.89	20.45	12.04	8.15	48.76
25.00	0.21	7.91	12.64	20.02	13.18	66.53
26.00	0.22	16.19	6.18	42.68	26.98	115.24
27.00	0.22	16.94	5.90	44.77	28.23	119.65
28.00	0.23	20.99	4.76	56.15	34.98	143.47
29.00	0.24	12.64	7.91	32.85	21.07	94.35
30.00	0.25	12.00	8.33	31.10	20.00	90.59
31.00	0.26	11.50	8.70	29.73	19.17	87.65
32.00	0.26	9.92	10.08	25.43	16.53	78.35
33.00	0.28	6.98	14.33	17.54	11.63	61.06
34.00	0.30	1.31	76.34	2.99	2.18	27.71
35.00	0.32	0.91	109.89	2.04	1.52	25.35
36.00	0.34	1.71	58.48	3.97	2.85	30.06
37.00	0.38	1.36	73.53	3.11	2.27	28.00
38.00	0.41	1.36	73.53	3.11	2.27	28.00
39.00	0.43	1.34	74.63	3.06	2.23	27.88
40.00	0.45	1.41	70.92	3.23	2.35	28.29
41.00	0.47	1.82	54.95	4.24	3.03	30.71
42.00	0.49	2.30	43.48	5.42	3.83	33.53
43.00	0.51	2.85	35.09	6.80	4.75	36.76
44.00	0.52	3.62	27.62	8.76	6.03	41.29
45.00	0.53	4.46	22.42	10.92	7.43	46.24
46.00	0.54	6.47	15.46	16.19	10.78	58.06
47.00	0.55	6.40	15.63	16.00	10.67	57.65
48.00	0.56	5.99	16.69	14.92	9.98	55.24
49.00	0.57	7.32	13.66	18.44	12.20	63.06
50.00	0.59	6.49	15.41	16.24	10.82	58.18
51.00	0.60	5.60	17.86	13.89	9.33	52.94
52.00	0.62	5.60	17.86	13.89	9.33	52.94
53.00	0.63	5.11	19.57	12.61	8.52	50.06
54.00	0.65	5.36	18.66	13.27	8.93	51.53
55.00	0.67	5.14	19.46	12.69	8.57	50.24
56.00	0.68	5.78	17.30	14.37	9.63	54.00
57.00	0.69	5.00	20.00	12.33	8.33	49.41
58.00	0.71	4.12	24.27	10.04	6.87	44.24
59.00	0.73	3.40	29.41	8.20	5.67	40.00
60.00	0.76	3.19	31.35	7.66	5.32	38.76
61.00	0.78	3.15	31.75	7.56	5.25	38.53
62.00	0.79	5.88	17.01	14.63	9.80	54.59
63.00	0.80	6.51	15.36	16.29	10.85	58.29
64.00	0.81	15.03	6.65	39.45	25.05	108.41
65.00	0.82	14.43	6.93	37.79	24.05	104.88
66.00	0.83	5.98	16.72	14.89	9.97	55.18
67.00	0.84	6.57	15.22	16.45	10.95	58.65
68.00	0.86	8.80	11.36	22.40	14.67	71.76
69.00	0.87	7.94	12.59	20.10	13.23	66.71
70.00	0.88	11.82	8.46	30.60	19.70	89.53
71.00	0.89	9.22	10.85	23.54	15.37	74.24
72.00	0.90	7.35	13.61	18.52	12.25	63.24
73.00	0.92	6.53	15.31	16.34	10.88	58.41
74.00	0.93	6.25	16.00	15.60	10.42	56.76

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.95	5.41	18.48	13.40	9.02	51.82
76.00	0.96	2.48	40.32	5.87	4.13	34.59
77.00	0.97	10.45	9.57	26.87	17.42	81.47
78.00	0.98	10.11	9.89	25.94	16.85	79.47
79.00	0.99	10.51	9.51	27.03	17.52	81.82
80.00	0.99	3.62	27.62	8.76	6.03	41.29
81.00	1.00	11.54	8.67	29.84	19.23	87.88
82.00	1.01	8.67	11.53	22.05	14.45	71.00
83.00	1.02	9.60	10.42	24.56	16.00	76.47
84.00	1.03	6.04	16.56	15.05	10.07	55.53
85.00	1.04	11.62	8.61	30.06	19.37	88.35
86.00	1.05	7.36	13.59	18.55	12.27	63.29
87.00	1.06	8.10	12.35	20.52	13.50	67.65
88.00	1.07	7.35	13.61	18.52	12.25	63.24
89.00	1.08	8.61	11.61	21.89	14.35	70.65
90.00	1.09	6.82	14.66	17.11	11.37	60.12
91.00	1.10	6.58	15.20	16.48	10.97	58.71
92.00	1.11	7.63	13.11	19.27	12.72	64.88
93.00	1.12	8.93	11.20	22.75	14.88	72.53
94.00	1.13	9.43	10.60	24.10	15.72	75.47
95.00	1.13	8.38	11.93	21.27	13.97	69.29
96.00	1.14	13.85	7.22	36.18	23.08	101.47
97.00	1.14	16.70	5.99	44.10	27.83	118.24
98.00	1.15	22.95	4.36	61.71	38.25	155.00
99.00	1.15	11.15	8.97	28.77	18.58	85.59
100.00	1.16	12.62	7.92	32.80	21.03	94.24
101.00	1.16	13.36	7.49	34.83	22.27	98.59
102.00	1.17	16.23	6.16	42.79	27.05	115.47
103.00	1.18	11.01	9.08	28.39	18.35	84.76
104.00	1.18	13.31	7.51	34.69	22.18	98.29
105.00	1.19	17.64	5.67	46.72	29.40	123.76
106.00	1.19	11.53	8.67	29.81	19.22	87.82
107.00	1.20	11.67	8.57	30.19	19.45	88.65
108.00	1.20	19.88	5.03	53.02	33.13	136.94
109.00	1.21	24.35	4.11	65.69	40.58	163.24
110.00	1.21	17.14	5.83	45.33	28.57	120.82
111.00	1.22	13.65	7.33	35.63	22.75	100.29
112.00	1.23	10.30	9.71	26.46	17.17	80.59
113.00	1.24	6.69	14.95	16.77	11.15	59.35
114.00	1.25	9.52	10.50	24.35	15.87	76.00
115.00	1.26	15.39	6.50	40.45	25.65	110.53
116.00	1.27	6.97	14.35	17.51	11.62	61.00
117.00	1.28	7.61	13.14	19.21	12.68	64.76
118.00	1.28	11.08	9.03	28.58	18.47	85.18
119.00	1.29	7.47	13.39	18.84	12.45	63.94
120.00	1.30	9.11	10.98	23.24	15.18	73.59
121.00	1.30	11.84	8.45	30.66	19.73	89.65
122.00	1.31	12.98	7.70	33.79	21.63	96.35
123.00	1.32	6.57	15.22	16.45	10.95	58.65
124.00	1.32	11.48	8.71	29.67	19.13	87.53
125.00	1.33	8.34	11.99	21.17	13.90	69.06
126.00	1.34	7.75	12.90	19.59	12.92	65.59
127.00	1.35	6.37	15.70	15.92	10.62	57.47
128.00	1.36	7.91	12.64	20.02	13.18	66.53
129.00	1.37	6.10	16.39	15.21	10.17	55.88

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	1.38	6.45	15.50	16.13	10.75	57.94
131.00	1.38	6.94	14.41	17.43	11.57	60.82
132.00	1.40	6.59	15.17	16.50	10.98	58.76
133.00	1.41	6.45	15.50	16.13	10.75	57.94
134.00	1.42	6.44	15.53	16.11	10.73	57.88
135.00	1.42	11.95	8.37	30.96	19.92	90.29
136.00	1.43	10.98	9.11	28.31	18.30	84.59
137.00	1.44	8.73	11.45	22.22	14.55	71.35
138.00	1.45	9.38	10.66	23.97	15.63	75.18
139.00	1.46	8.46	11.82	21.49	14.10	69.76
140.00	1.47	6.94	14.41	17.43	11.57	60.82
141.00	1.48	7.53	13.28	19.00	12.55	64.29
142.00	1.48	7.54	13.26	19.03	12.57	64.35
143.00	1.49	9.22	10.85	23.54	15.37	74.24
144.00	1.50	5.55	18.02	13.76	9.25	52.65
145.00	1.52	5.89	16.98	14.66	9.82	54.65
146.00	1.53	4.41	22.68	10.79	7.35	45.94
147.00	1.55	3.74	26.74	9.07	6.23	42.00
148.00	1.57	2.58	38.76	6.12	4.30	35.18
149.00	1.59	7.31	13.68	18.41	12.18	63.00
150.00	1.60	5.45	18.35	13.50	9.08	52.06
151.00	1.61	5.46	18.32	13.53	9.10	52.12
152.00	1.63	5.17	19.34	12.77	8.62	50.41
153.00	1.64	6.13	16.31	15.29	10.22	56.06
154.00	1.66	4.31	23.20	10.54	7.18	45.35
155.00	1.68	2.88	34.72	6.88	4.80	36.94
156.00	1.71	2.64	37.88	6.28	4.40	35.53
157.00	1.72	10.61	9.43	27.30	17.68	82.41
158.00	1.72	52.41	1.91	147.71	87.35	328.29
159.00	1.72	68.57	1.46	196.24	114.28	423.35
160.00	1.72	58.59	1.71	166.18	97.65	364.65
161.00	1.72	46.75	2.14	130.91	77.92	295.00

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-07	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435982.65	
Northing (m):	566134.53	
Level (mAOD):	10.06	
Number of measures Qd :	102	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	4.22	23.70	10.30	7.03	44.82
1.00	0.02	6.16	16.23	15.37	10.27	56.24
2.00	0.03	6.58	15.20	16.48	10.97	58.71
3.00	0.04	5.34	18.73	13.21	8.90	51.41
4.00	0.05	7.73	12.94	19.53	12.88	65.47
5.00	0.06	8.78	11.39	22.35	14.63	71.65
6.00	0.07	10.06	9.94	25.81	16.77	79.18
7.00	0.08	8.14	12.29	20.63	13.57	67.88
8.00	0.09	11.80	8.47	30.55	19.67	89.41
9.00	0.10	8.96	11.16	22.83	14.93	72.71
10.00	0.10	10.61	9.43	27.30	17.68	82.41
11.00	0.11	11.94	8.38	30.93	19.90	90.24
12.00	0.12	13.37	7.48	34.86	22.28	98.65
13.00	0.12	14.53	6.88	38.06	24.22	105.47
14.00	0.13	11.36	8.80	29.35	18.93	86.82
15.00	0.14	14.09	7.10	36.85	23.48	102.88
16.00	0.14	12.73	7.86	33.10	21.22	94.88
17.00	0.15	11.30	8.85	29.18	18.83	86.47
18.00	0.15	20.56	4.86	54.94	34.27	140.94
19.00	0.16	22.09	4.53	59.27	36.82	149.94

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.16	14.24	7.02	37.26	23.73	103.76
21.00	0.17	10.16	9.84	26.08	16.93	79.76
22.00	0.17	13.52	7.40	35.27	22.53	99.53
23.00	0.18	20.94	4.78	56.01	34.90	143.18
24.00	0.18	19.14	5.22	50.93	31.90	132.59
25.00	0.18	19.06	5.25	50.71	31.77	132.12
26.00	0.19	16.13	6.20	42.51	26.88	114.88
27.00	0.19	18.26	5.48	48.46	30.43	127.41
28.00	0.20	9.88	10.12	25.32	16.47	78.12
29.00	0.21	8.14	12.29	20.63	13.57	67.88
30.00	0.22	7.42	13.48	18.71	12.37	63.65
31.00	0.23	5.47	18.28	13.55	9.12	52.18
32.00	0.25	5.19	19.27	12.82	8.65	50.53
33.00	0.26	4.74	21.10	11.65	7.90	47.88
34.00	0.27	4.60	21.74	11.29	7.67	47.06
35.00	0.29	4.51	22.17	11.05	7.52	46.53
36.00	0.30	4.62	21.65	11.34	7.70	47.18
37.00	0.32	3.73	26.81	9.04	6.22	41.94
38.00	0.34	4.14	24.15	10.10	6.90	44.35
39.00	0.35	3.74	26.74	9.07	6.23	42.00
40.00	0.37	4.43	22.57	10.85	7.38	46.06
41.00	0.39	4.55	21.98	11.16	7.58	46.76
42.00	0.41	4.95	20.20	12.20	8.25	49.12
43.00	0.44	4.93	20.28	12.14	8.22	49.00
44.00	0.45	6.71	14.90	16.82	11.18	59.47
45.00	0.46	5.50	18.18	13.63	9.17	52.35
46.00	0.48	7.60	13.16	19.19	12.67	64.71
47.00	0.50	5.77	17.33	14.34	9.62	53.94
48.00	0.52	4.36	22.94	10.66	7.27	45.65
49.00	0.54	4.78	20.92	11.75	7.97	48.12
50.00	0.56	3.57	28.01	8.63	5.95	41.00
51.00	0.59	3.13	31.95	7.51	5.22	38.41
52.00	0.62	3.05	32.79	7.31	5.08	37.94
53.00	0.65	3.75	26.67	9.09	6.25	42.06
54.00	0.67	4.38	22.83	10.72	7.30	45.76
55.00	0.69	4.24	23.58	10.35	7.07	44.94
56.00	0.71	4.04	24.75	9.84	6.73	43.76
57.00	0.73	4.26	23.47	10.41	7.10	45.06
58.00	0.74	5.70	17.54	14.16	9.50	53.53
59.00	0.76	7.59	13.18	19.16	12.65	64.65
60.00	0.77	7.15	13.99	17.99	11.92	62.06
61.00	0.78	7.47	13.39	18.84	12.45	63.94
62.00	0.79	6.55	15.27	16.40	10.92	58.53
63.00	0.80	8.37	11.95	21.25	13.95	69.24
64.00	0.81	11.31	8.84	29.21	18.85	86.53
65.00	0.82	12.81	7.81	33.32	21.35	95.35
66.00	0.82	14.86	6.73	38.98	24.77	107.41
67.00	0.83	15.46	6.47	40.64	25.77	110.94
68.00	0.83	22.23	4.50	59.66	37.05	150.76
69.00	0.84	21.84	4.58	58.56	36.40	148.47
70.00	0.84	20.59	4.86	55.02	34.32	141.12
71.00	0.84	48.66	2.06	136.57	81.10	306.24
72.00	0.85	18.57	5.39	49.33	30.95	129.24
73.00	0.85	23.85	4.19	64.27	39.75	160.29
74.00	0.85	23.97	4.17	64.61	39.95	161.00

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.85	23.74	4.21	63.96	39.57	159.65
76.00	0.86	20.36	4.91	54.37	33.93	139.76
77.00	0.86	24.33	4.11	65.64	40.55	163.12
78.00	0.86	20.61	4.85	55.08	34.35	141.24
79.00	0.87	18.03	5.55	47.82	30.05	126.06
80.00	0.87	20.21	4.95	53.95	33.68	138.88
81.00	0.87	24.68	4.05	66.64	41.13	165.18
82.00	0.88	29.40	3.40	80.18	49.00	192.94
83.00	0.88	38.87	2.57	107.70	64.78	248.65
84.00	0.88	20.62	4.85	55.11	34.37	141.29
85.00	0.88	24.16	4.14	65.15	40.27	162.12
86.00	0.89	34.22	2.92	94.13	57.03	221.29
87.00	0.89	36.00	2.78	99.31	60.00	231.76
88.00	0.89	31.37	3.19	85.86	52.28	204.53
89.00	0.89	38.74	2.58	107.32	64.57	247.88
90.00	0.90	33.55	2.98	92.18	55.92	217.35
91.00	0.90	75.84	1.32	218.30	126.40	466.12
92.00	0.90	51.28	1.95	144.35	85.47	321.65
93.00	0.90	45.68	2.19	127.74	76.13	288.71
94.00	0.90	65.56	1.53	187.15	109.27	405.65
95.00	0.91	35.90	2.79	99.02	59.83	231.18
96.00	0.91	33.12	3.02	90.94	55.20	214.82
97.00	0.91	32.70	3.06	89.72	54.50	212.35
98.00	0.91	38.59	2.59	106.88	64.32	247.00
99.00	0.92	24.44	4.09	65.95	40.73	163.76
100.00	0.92	30.11	3.32	82.22	50.18	197.12
101.00	0.92	30.46	3.28	83.23	50.77	199.18

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-08	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.15	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	436056.02	
Northing (m):	566141.76	
Level (mAOD):	10.65	
Number of measures Qd :	305	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.16	0.96	104.17	2.15	1.60	25.65
1.00	0.17	4.20	23.81	10.25	7.00	44.71
2.00	0.17	4.63	21.60	11.36	7.72	47.24
3.00	0.18	6.09	16.42	15.18	10.15	55.82
4.00	0.18	9.54	10.48	24.40	15.90	76.12
5.00	0.18	15.36	6.51	40.37	25.60	110.35
6.00	0.19	8.87	11.27	22.59	14.78	72.18
7.00	0.19	12.84	7.79	33.40	21.40	95.53
8.00	0.20	14.80	6.76	38.81	24.67	107.06
9.00	0.20	15.46	6.47	40.64	25.77	110.94
10.00	0.20	8.94	11.19	22.78	14.90	72.59
11.00	0.21	16.72	5.98	44.15	27.87	118.35
12.00	0.21	12.00	8.33	31.10	20.00	90.59
13.00	0.21	12.34	8.10	32.03	20.57	92.59
14.00	0.21	9.86	10.14	25.27	16.43	78.00
15.00	0.22	12.19	8.20	31.62	20.32	91.71
16.00	0.22	5.56	17.99	13.79	9.27	52.71
17.00	0.22	12.59	7.94	32.71	20.98	94.06
18.00	0.23	8.60	11.63	21.87	14.33	70.59
19.00	0.23	12.89	7.76	33.54	21.48	95.82

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.24	8.01	12.48	20.28	13.35	67.12
21.00	0.24	9.60	10.42	24.56	16.00	76.47
22.00	0.24	6.10	16.39	15.21	10.17	55.88
23.00	0.25	9.52	10.50	24.35	15.87	76.00
24.00	0.25	9.93	10.07	25.46	16.55	78.41
25.00	0.26	7.78	12.85	19.67	12.97	65.76
26.00	0.26	7.74	12.92	19.56	12.90	65.53
27.00	0.27	5.69	17.57	14.13	9.48	53.47
28.00	0.27	5.44	18.38	13.47	9.07	52.00
29.00	0.28	7.51	13.32	18.95	12.52	64.18
30.00	0.29	5.15	19.42	12.72	8.58	50.29
31.00	0.29	2.66	37.59	6.33	4.43	35.65
32.00	0.30	2.69	37.17	6.40	4.48	35.82
33.00	0.31	2.50	40.00	5.92	4.17	34.71
34.00	0.31	4.68	21.37	11.49	7.80	47.53
35.00	0.32	5.16	19.38	12.74	8.60	50.35
36.00	0.33	5.29	18.90	13.08	8.82	51.12
37.00	0.33	5.51	18.15	13.66	9.18	52.41
38.00	0.34	3.07	32.57	7.36	5.12	38.06
39.00	0.34	7.70	12.99	19.45	12.83	65.29
40.00	0.35	4.35	22.99	10.64	7.25	45.59
41.00	0.35	5.62	17.79	13.95	9.37	53.06
42.00	0.36	5.58	17.92	13.84	9.30	52.82
43.00	0.36	4.47	22.37	10.95	7.45	46.29
44.00	0.36	8.33	12.00	21.14	13.88	69.00
45.00	0.37	8.03	12.45	20.34	13.38	67.24
46.00	0.37	11.11	9.00	28.66	18.52	85.35
47.00	0.38	7.75	12.90	19.59	12.92	65.59
48.00	0.38	5.00	20.00	12.33	8.33	49.41
49.00	0.38	12.27	8.15	31.84	20.45	92.18
50.00	0.39	11.47	8.72	29.65	19.12	87.47
51.00	0.39	7.43	13.46	18.73	12.38	63.71
52.00	0.40	10.14	9.86	26.02	16.90	79.65
53.00	0.40	20.56	4.86	54.94	34.27	140.94
54.00	0.40	8.76	11.42	22.30	14.60	71.53
55.00	0.41	7.13	14.03	17.94	11.88	61.94
56.00	0.41	21.42	4.67	57.37	35.70	146.00
57.00	0.41	5.42	18.45	13.42	9.03	51.88
58.00	0.42	20.63	4.85	55.13	34.38	141.35
59.00	0.42	7.49	13.35	18.89	12.48	64.06
60.00	0.43	16.00	6.25	42.15	26.67	114.12
61.00	0.43	13.71	7.29	35.80	22.85	100.65
62.00	0.43	17.89	5.59	47.43	29.82	125.24
63.00	0.44	17.22	5.81	45.55	28.70	121.29
64.00	0.44	14.60	6.85	38.26	24.33	105.88
65.00	0.45	14.37	6.96	37.62	23.95	104.53
66.00	0.45	9.05	11.05	23.08	15.08	73.24
67.00	0.46	7.28	13.74	18.33	12.13	62.82
68.00	0.46	19.20	5.21	51.10	32.00	132.94
69.00	0.46	14.31	6.99	37.46	23.85	104.18
70.00	0.47	14.74	6.78	38.65	24.57	106.71
71.00	0.47	24.86	4.02	67.15	41.43	166.24
72.00	0.47	17.28	5.79	45.72	28.80	121.65
73.00	0.48	18.40	5.43	48.86	30.67	128.24
74.00	0.48	17.55	5.70	46.47	29.25	123.24

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.49	14.20	7.04	37.15	23.67	103.53
76.00	0.49	15.02	6.66	39.42	25.03	108.35
77.00	0.49	16.41	6.09	43.29	27.35	116.53
78.00	0.49	19.05	5.25	50.68	31.75	132.06
79.00	0.50	18.02	5.55	47.79	30.03	126.00
80.00	0.50	14.43	6.93	37.79	24.05	104.88
81.00	0.50	22.78	4.39	61.23	37.97	154.00
82.00	0.50	22.96	4.36	61.74	38.27	155.06
83.00	0.51	17.27	5.79	45.69	28.78	121.59
84.00	0.51	28.08	3.56	76.38	46.80	185.18
85.00	0.51	24.54	4.07	66.24	40.90	164.35
86.00	0.51	13.77	7.26	35.96	22.95	101.00
87.00	0.51	11.05	9.05	28.50	18.42	85.00
88.00	0.52	18.29	5.47	48.55	30.48	127.59
89.00	0.52	26.50	3.77	71.84	44.17	175.88
90.00	0.52	18.59	5.38	49.39	30.98	129.35
91.00	0.52	26.78	3.73	72.64	44.63	177.53
92.00	0.52	17.83	5.61	47.26	29.72	124.88
93.00	0.53	39.64	2.52	109.96	66.07	253.18
94.00	0.53	40.96	2.44	113.83	68.27	260.94
95.00	0.53	30.77	3.25	84.13	51.28	201.00
96.00	0.53	49.65	2.01	139.50	82.75	312.06
97.00	0.53	30.00	3.33	81.91	50.00	196.47
98.00	0.53	29.39	3.40	80.15	48.98	192.88
99.00	0.54	18.61	5.37	49.44	31.02	129.47
100.00	0.54	31.71	3.15	86.85	52.85	206.53
101.00	0.54	41.99	2.38	116.86	69.98	267.00
102.00	0.54	19.23	5.20	51.19	32.05	133.12
103.00	0.54	19.32	5.18	51.44	32.20	133.65
104.00	0.55	26.78	3.73	72.64	44.63	177.53
105.00	0.55	27.29	3.66	74.11	45.48	180.53
106.00	0.55	19.59	5.10	52.20	32.65	135.24
107.00	0.55	26.60	3.76	72.13	44.33	176.47
108.00	0.55	49.60	2.02	139.36	82.67	311.76
109.00	0.55	13.99	7.15	36.57	23.32	102.29
110.00	0.56	21.28	4.70	56.97	35.47	145.18
111.00	0.56	18.97	5.27	50.46	31.62	131.59
112.00	0.56	20.54	4.87	54.88	34.23	140.82
113.00	0.56	18.12	5.52	48.07	30.20	126.59
114.00	0.57	18.54	5.39	49.25	30.90	129.06
115.00	0.57	15.46	6.47	40.64	25.77	110.94
116.00	0.57	13.12	7.62	34.17	21.87	97.18
117.00	0.57	11.68	8.56	30.22	19.47	88.71
118.00	0.58	18.61	5.37	49.44	31.02	129.47
119.00	0.58	11.14	8.98	28.74	18.57	85.53
120.00	0.58	15.69	6.37	41.28	26.15	112.29
121.00	0.58	19.07	5.24	50.74	31.78	132.18
122.00	0.58	23.97	4.17	64.61	39.95	161.00
123.00	0.58	13.59	7.36	35.47	22.65	99.94
124.00	0.59	16.33	6.12	43.07	27.22	116.06
125.00	0.59	14.64	6.83	38.37	24.40	106.12
126.00	0.59	13.90	7.19	36.32	23.17	101.76
127.00	0.59	23.14	4.32	62.25	38.57	156.12
128.00	0.59	25.93	3.86	70.21	43.22	172.53
129.00	0.59	31.58	3.17	86.47	52.63	205.76

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.60	23.14	4.32	62.25	38.57	156.12
131.00	0.60	22.36	4.47	60.03	37.27	151.53
132.00	0.60	27.67	3.61	75.20	46.12	182.76
133.00	0.60	17.69	5.65	46.86	29.48	124.06
134.00	0.60	10.70	9.35	27.55	17.83	82.94
135.00	0.61	16.44	6.08	43.37	27.40	116.71
136.00	0.61	22.35	4.47	60.00	37.25	151.47
137.00	0.61	10.35	9.66	26.59	17.25	80.88
138.00	0.61	21.08	4.74	56.41	35.13	144.00
139.00	0.61	22.83	4.38	61.37	38.05	154.29
140.00	0.61	35.04	2.85	96.52	58.40	226.12
141.00	0.61	26.61	3.76	72.16	44.35	176.53
142.00	0.62	25.90	3.86	70.12	43.17	172.35
143.00	0.62	18.36	5.45	48.74	30.60	128.00
144.00	0.62	25.69	3.89	69.52	42.82	171.12
145.00	0.62	27.08	3.69	73.50	45.13	179.29
146.00	0.62	20.42	4.90	54.54	34.03	140.12
147.00	0.62	26.96	3.71	73.16	44.93	178.59
148.00	0.62	18.52	5.40	49.19	30.87	128.94
149.00	0.63	18.28	5.47	48.52	30.47	127.53
150.00	0.63	19.57	5.11	52.14	32.62	135.12
151.00	0.63	16.31	6.13	43.01	27.18	115.94
152.00	0.63	17.30	5.78	45.77	28.83	121.76
153.00	0.63	17.31	5.78	45.80	28.85	121.82
154.00	0.64	19.88	5.03	53.02	33.13	136.94
155.00	0.64	15.70	6.37	41.31	26.17	112.35
156.00	0.64	22.86	4.37	61.45	38.10	154.47
157.00	0.64	15.58	6.42	40.98	25.97	111.65
158.00	0.65	13.74	7.28	35.88	22.90	100.82
159.00	0.65	10.09	9.91	25.89	16.82	79.35
160.00	0.65	7.60	13.16	19.19	12.67	64.71
161.00	0.65	22.07	4.53	59.21	36.78	149.82
162.00	0.66	11.71	8.54	30.30	19.52	88.88
163.00	0.66	16.93	5.91	44.74	28.22	119.59
164.00	0.66	11.41	8.76	29.48	19.02	87.12
165.00	0.67	13.79	7.25	36.02	22.98	101.12
166.00	0.67	10.87	9.20	28.01	18.12	83.94
167.00	0.67	14.53	6.88	38.06	24.22	105.47
168.00	0.68	12.70	7.87	33.02	21.17	94.71
169.00	0.68	11.29	8.86	29.15	18.82	86.41
170.00	0.68	16.16	6.19	42.59	26.93	115.06
171.00	0.69	12.56	7.96	32.63	20.93	93.88
172.00	0.69	13.02	7.68	33.90	21.70	96.59
173.00	0.69	17.04	5.87	45.05	28.40	120.24
174.00	0.69	13.03	7.67	33.92	21.72	96.65
175.00	0.70	10.89	9.18	28.06	18.15	84.06
176.00	0.70	11.89	8.41	30.79	19.82	89.94
177.00	0.70	11.74	8.52	30.38	19.57	89.06
178.00	0.70	11.79	8.48	30.52	19.65	89.35
179.00	0.71	12.97	7.71	33.76	21.62	96.29
180.00	0.71	12.52	7.99	32.52	20.87	93.65
181.00	0.71	15.76	6.35	41.48	26.27	112.71
182.00	0.71	13.02	7.68	33.90	21.70	96.59
183.00	0.72	5.64	17.73	14.00	9.40	53.18
184.00	0.72	18.33	5.46	48.66	30.55	127.82

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	0.72	12.78	7.82	33.24	21.30	95.18
186.00	0.72	11.36	8.80	29.35	18.93	86.82
187.00	0.73	14.02	7.13	36.65	23.37	102.47
188.00	0.73	12.71	7.87	33.04	21.18	94.76
189.00	0.73	7.70	12.99	19.45	12.83	65.29
190.00	0.74	13.23	7.56	34.47	22.05	97.82
191.00	0.74	11.76	8.50	30.44	19.60	89.18
192.00	0.74	11.72	8.53	30.33	19.53	88.94
193.00	0.75	8.41	11.89	21.36	14.02	69.47
194.00	0.75	12.65	7.91	32.88	21.08	94.41
195.00	0.75	15.00	6.67	39.37	25.00	108.24
196.00	0.76	12.11	8.26	31.40	20.18	91.24
197.00	0.76	10.18	9.82	26.13	16.97	79.88
198.00	0.77	8.26	12.11	20.95	13.77	68.59
199.00	0.77	7.34	13.62	18.49	12.23	63.18
200.00	0.78	7.96	12.56	20.15	13.27	66.82
201.00	0.79	9.33	10.72	23.83	15.55	74.88
202.00	0.79	11.90	8.40	30.82	19.83	90.00
203.00	0.80	11.89	8.41	30.79	19.82	89.94
204.00	0.80	22.33	4.48	59.95	37.22	151.35
205.00	0.80	13.36	7.49	34.83	22.27	98.59
206.00	0.81	15.15	6.60	39.78	25.25	109.12
207.00	0.81	10.57	9.46	27.19	17.62	82.18
208.00	0.82	15.10	6.62	39.64	25.17	108.82
209.00	0.82	15.89	6.29	41.84	26.48	113.47
210.00	0.82	12.84	7.79	33.40	21.40	95.53
211.00	0.83	5.76	17.36	14.31	9.60	53.88
212.00	0.83	11.25	8.89	29.04	18.75	86.18
213.00	0.84	12.80	7.81	33.29	21.33	95.29
214.00	0.84	9.49	10.54	24.26	15.82	75.82
215.00	0.85	10.68	9.36	27.49	17.80	82.82
216.00	0.85	7.74	12.92	19.56	12.90	65.53
217.00	0.86	7.92	12.63	20.04	13.20	66.59
218.00	0.87	10.19	9.81	26.16	16.98	79.94
219.00	0.88	6.81	14.68	17.09	11.35	60.06
220.00	0.89	4.29	23.31	10.48	7.15	45.24
221.00	0.89	15.09	6.63	39.62	25.15	108.76
222.00	0.89	26.64	3.75	72.24	44.40	176.71
223.00	0.90	28.67	3.49	78.07	47.78	188.65
224.00	0.90	10.11	9.89	25.94	16.85	79.47
225.00	0.90	19.11	5.23	50.85	31.85	132.41
226.00	0.91	10.59	9.44	27.25	17.65	82.29
227.00	0.91	38.64	2.59	107.03	64.40	247.29
228.00	0.91	17.37	5.76	45.97	28.95	122.18
229.00	0.91	30.59	3.27	83.61	50.98	199.94
230.00	0.91	18.03	5.55	47.82	30.05	126.06
231.00	0.92	8.44	11.85	21.44	14.07	69.65
232.00	0.93	8.60	11.63	21.87	14.33	70.59
233.00	0.94	6.33	15.80	15.82	10.55	57.24
234.00	0.95	6.85	14.60	17.19	11.42	60.29
235.00	0.95	8.87	11.27	22.59	14.78	72.18
236.00	0.96	7.78	12.85	19.67	12.97	65.76
237.00	0.97	11.41	8.76	29.48	19.02	87.12
238.00	0.98	9.33	10.72	23.83	15.55	74.88
239.00	0.98	7.73	12.94	19.53	12.88	65.47

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	0.99	9.62	10.40	24.62	16.03	76.59
241.00	1.00	8.80	11.36	22.40	14.67	71.76
242.00	1.01	7.35	13.61	18.52	12.25	63.24
243.00	1.01	6.04	16.56	15.05	10.07	55.53
244.00	1.02	7.25	13.79	18.25	12.08	62.65
245.00	1.03	6.14	16.29	15.31	10.23	56.12
246.00	1.04	4.11	24.33	10.02	6.85	44.18
247.00	1.05	4.70	21.28	11.55	7.83	47.65
248.00	1.06	5.96	16.78	14.84	9.93	55.06
249.00	1.07	5.73	17.45	14.24	9.55	53.71
250.00	1.09	5.08	19.69	12.53	8.47	49.88
251.00	1.10	4.27	23.42	10.43	7.12	45.12
252.00	1.12	3.81	26.25	9.25	6.35	42.41
253.00	1.14	3.69	27.10	8.94	6.15	41.71
254.00	1.16	3.51	28.49	8.48	5.85	40.65
255.00	1.17	3.20	31.25	7.69	5.33	38.82
256.00	1.19	3.17	31.55	7.61	5.28	38.65
257.00	1.21	3.32	30.12	8.00	5.53	39.53
258.00	1.22	3.18	31.45	7.64	5.30	38.71
259.00	1.24	2.94	34.01	7.03	4.90	37.29
260.00	1.25	3.15	31.75	7.56	5.25	38.53
261.00	1.27	3.03	33.00	7.26	5.05	37.82
262.00	1.29	2.52	39.68	5.97	4.20	34.82
263.00	1.31	2.13	46.95	5.00	3.55	32.53
264.00	1.33	2.34	42.74	5.52	3.90	33.76
265.00	1.35	1.98	50.51	4.63	3.30	31.65
266.00	1.38	2.42	41.32	5.72	4.03	34.24
267.00	1.40	2.26	44.25	5.32	3.77	33.29
268.00	1.42	2.14	46.73	5.03	3.57	32.59
269.00	1.45	2.93	34.13	7.01	4.88	37.24
270.00	1.47	2.77	36.10	6.60	4.62	36.29
271.00	1.50	2.63	38.02	6.25	4.38	35.47
272.00	1.52	2.26	44.25	5.32	3.77	33.29
273.00	1.54	2.74	36.50	6.53	4.57	36.12
274.00	1.57	2.99	33.44	7.16	4.98	37.59
275.00	1.59	2.34	42.74	5.52	3.90	33.76
276.00	1.60	2.35	42.55	5.55	3.92	33.82
277.00	1.62	2.30	43.48	5.42	3.83	33.53
278.00	1.65	2.19	45.66	5.15	3.65	32.88
279.00	1.67	2.23	44.84	5.25	3.72	33.12
280.00	1.69	2.33	42.92	5.50	3.88	33.71
281.00	1.72	2.17	46.08	5.10	3.62	32.76
282.00	1.75	2.04	49.02	4.78	3.40	32.00
283.00	1.77	2.06	48.54	4.83	3.43	32.12
284.00	1.79	2.88	34.72	6.88	4.80	36.94
285.00	1.81	1.51	66.23	3.48	2.52	28.88
286.00	1.83	1.65	60.61	3.82	2.75	29.71
287.00	1.85	1.39	71.94	3.19	2.32	28.18
288.00	1.87	2.10	47.62	4.93	3.50	32.35
289.00	1.89	1.60	62.50	3.70	2.67	29.41
290.00	1.91	1.73	57.80	4.01	2.88	30.18
291.00	1.92	2.23	44.84	5.25	3.72	33.12
292.00	1.94	3.10	32.26	7.44	5.17	38.24
293.00	1.95	3.86	25.91	9.38	6.43	42.71
294.00	1.96	1.11	90.09	2.51	1.85	26.53

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

295.00	1.98	2.56	39.06	6.07	4.27	35.06
296.00	1.99	4.04	24.75	9.84	6.73	43.76
297.00	2.00	3.86	25.91	9.38	6.43	42.71
298.00	2.01	3.56	28.09	8.61	5.93	40.94
299.00	2.02	1.73	57.80	4.01	2.88	30.18
300.00	2.03	1.63	61.35	3.77	2.72	29.59
301.00	2.05	3.02	33.11	7.23	5.03	37.76
302.00	2.06	3.09	32.36	7.41	5.15	38.18
303.00	2.08	2.70	37.04	6.43	4.50	35.88
304.00	2.11	2.27	44.05	5.35	3.78	33.35

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-09	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	436012.42	
Northing (m):	566214.62	
Level (mAOD):	11.60	
Number of measures Qd :	128	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	5.51	18.15	13.66	9.18	52.41
1.00	0.02	8.54	11.71	21.70	14.23	70.24
2.00	0.03	8.70	11.49	22.13	14.50	71.18
3.00	0.03	9.74	10.27	24.94	16.23	77.29
4.00	0.04	13.09	7.64	34.09	21.82	97.00
5.00	0.04	13.64	7.33	35.60	22.73	100.24
6.00	0.05	19.24	5.20	51.22	32.07	133.18
7.00	0.05	17.03	5.87	45.02	28.38	120.18
8.00	0.06	22.63	4.42	60.80	37.72	153.12
9.00	0.06	18.86	5.30	50.15	31.43	130.94
10.00	0.07	16.48	6.07	43.48	27.47	116.94
11.00	0.07	21.19	4.72	56.72	35.32	144.65
12.00	0.08	14.07	7.11	36.79	23.45	102.76
13.00	0.08	16.61	6.02	43.85	27.68	117.71
14.00	0.09	20.28	4.93	54.15	33.80	139.29
15.00	0.10	13.71	7.29	35.80	22.85	100.65
16.00	0.10	17.02	5.88	44.99	28.37	120.12
17.00	0.11	20.74	4.82	55.45	34.57	142.00
18.00	0.12	11.44	8.74	29.56	19.07	87.29
19.00	0.12	14.95	6.69	39.23	24.92	107.94

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.13	11.39	8.78	29.43	18.98	87.00
21.00	0.14	13.40	7.46	34.94	22.33	98.82
22.00	0.14	13.11	7.63	34.14	21.85	97.12
23.00	0.15	16.62	6.02	43.87	27.70	117.76
24.00	0.16	13.76	7.27	35.94	22.93	100.94
25.00	0.17	9.07	11.03	23.13	15.12	73.35
26.00	0.17	13.45	7.43	35.08	22.42	99.12
27.00	0.18	16.84	5.94	44.49	28.07	119.06
28.00	0.19	10.69	9.35	27.52	17.82	82.88
29.00	0.19	13.74	7.28	35.88	22.90	100.82
30.00	0.20	12.08	8.28	31.31	20.13	91.06
31.00	0.21	12.29	8.14	31.89	20.48	92.29
32.00	0.22	13.47	7.42	35.14	22.45	99.24
33.00	0.22	14.74	6.78	38.65	24.57	106.71
34.00	0.23	18.07	5.53	47.93	30.12	126.29
35.00	0.23	16.53	6.05	43.62	27.55	117.24
36.00	0.23	56.97	1.76	161.33	94.95	355.12
37.00	0.23	35.65	2.81	98.29	59.42	229.71
38.00	0.24	43.61	2.29	121.63	72.68	276.53
39.00	0.24	68.87	1.45	197.15	114.78	425.12
40.00	0.24	50.57	1.98	142.24	84.28	317.47
41.00	0.24	57.26	1.75	162.20	95.43	356.82
42.00	0.24	51.95	1.92	146.34	86.58	325.59
43.00	0.25	34.93	2.86	96.20	58.22	225.47
44.00	0.25	39.18	2.55	108.61	65.30	250.47
45.00	0.25	39.56	2.53	109.72	65.93	252.71
46.00	0.25	38.03	2.63	105.24	63.38	243.71
47.00	0.26	36.96	2.71	102.12	61.60	237.41
48.00	0.26	36.18	2.76	99.84	60.30	232.82
49.00	0.26	31.48	3.18	86.18	52.47	205.18
50.00	0.26	27.55	3.63	74.85	45.92	182.06
51.00	0.27	24.40	4.10	65.84	40.67	163.53
52.00	0.27	24.93	4.01	67.35	41.55	166.65
53.00	0.27	23.69	4.22	63.81	39.48	159.35
54.00	0.28	26.02	3.84	70.47	43.37	173.06
55.00	0.28	28.70	3.48	78.16	47.83	188.82
56.00	0.28	35.15	2.84	96.84	58.58	226.76
57.00	0.29	33.30	3.00	91.46	55.50	215.88
58.00	0.29	62.67	1.60	178.44	104.45	388.65
59.00	0.29	42.96	2.33	119.72	71.60	272.71
60.00	0.29	46.54	2.15	130.28	77.57	293.76
61.00	0.29	66.95	1.49	191.35	111.58	413.82
62.00	0.30	48.77	2.05	136.89	81.28	306.88
63.00	0.30	82.61	1.21	238.95	137.68	505.94
64.00	0.30	51.78	1.93	145.84	86.30	324.59
65.00	0.30	49.51	2.02	139.09	82.52	311.24
66.00	0.30	44.36	2.25	123.84	73.93	280.94
67.00	0.31	66.28	1.51	189.32	110.47	409.88
68.00	0.31	56.08	1.78	158.67	93.47	349.88
69.00	0.31	43.37	2.31	120.92	72.28	275.12
70.00	0.31	39.68	2.52	110.08	66.13	253.41
71.00	0.31	35.13	2.85	96.78	58.55	226.65
72.00	0.32	29.11	3.44	79.34	48.52	191.24
73.00	0.32	28.51	3.51	77.61	47.52	187.71
74.00	0.32	35.04	2.85	96.52	58.40	226.12

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.33	42.04	2.38	117.01	70.07	267.29
76.00	0.33	24.59	4.07	66.38	40.98	164.65
77.00	0.34	21.36	4.68	57.20	35.60	145.65
78.00	0.34	17.10	5.85	45.21	28.50	120.59
79.00	0.35	16.72	5.98	44.15	27.87	118.35
80.00	0.35	15.46	6.47	40.64	25.77	110.94
81.00	0.36	15.31	6.53	40.23	25.52	110.06
82.00	0.36	17.27	5.79	45.69	28.78	121.59
83.00	0.37	15.99	6.25	42.12	26.65	114.06
84.00	0.37	17.28	5.79	45.72	28.80	121.65
85.00	0.38	28.97	3.45	78.94	48.28	190.41
86.00	0.38	15.00	6.67	39.37	25.00	108.24
87.00	0.38	16.47	6.07	43.46	27.45	116.88
88.00	0.39	15.11	6.62	39.67	25.18	108.88
89.00	0.39	15.82	6.32	41.64	26.37	113.06
90.00	0.40	18.83	5.31	50.06	31.38	130.76
91.00	0.40	20.89	4.79	55.87	34.82	142.88
92.00	0.40	21.78	4.59	58.39	36.30	148.12
93.00	0.41	22.36	4.47	60.03	37.27	151.53
94.00	0.41	25.60	3.91	69.26	42.67	170.59
95.00	0.41	25.36	3.94	68.58	42.27	169.18
96.00	0.42	27.46	3.64	74.59	45.77	181.53
97.00	0.42	35.37	2.83	97.48	58.95	228.06
98.00	0.43	18.40	5.43	48.86	30.67	128.24
99.00	0.43	18.13	5.52	48.10	30.22	126.65
100.00	0.44	21.02	4.76	56.24	35.03	143.65
101.00	0.45	23.44	4.27	63.10	39.07	157.88
102.00	0.45	15.12	6.61	39.70	25.20	108.94
103.00	0.46	20.46	4.89	54.65	34.10	140.35
104.00	0.47	11.54	8.67	29.84	19.23	87.88
105.00	0.47	12.13	8.24	31.45	20.22	91.35
106.00	0.48	13.11	7.63	34.14	21.85	97.12
107.00	0.49	12.67	7.89	32.93	21.12	94.53
108.00	0.49	12.53	7.98	32.55	20.88	93.71
109.00	0.50	18.01	5.55	47.76	30.02	125.94
110.00	0.51	9.84	10.16	25.21	16.40	77.88
111.00	0.51	15.33	6.52	40.28	25.55	110.18
112.00	0.52	12.71	7.87	33.04	21.18	94.76
113.00	0.53	13.82	7.24	36.10	23.03	101.29
114.00	0.53	13.11	7.63	34.14	21.85	97.12
115.00	0.54	13.23	7.56	34.47	22.05	97.82
116.00	0.55	10.99	9.10	28.34	18.32	84.65
117.00	0.56	10.64	9.40	27.38	17.73	82.59
118.00	0.57	11.12	8.99	28.69	18.53	85.41
119.00	0.58	8.79	11.38	22.38	14.65	71.71
120.00	0.59	9.64	10.37	24.67	16.07	76.71
121.00	0.60	9.03	11.07	23.02	15.05	73.12
122.00	0.61	10.58	9.45	27.22	17.63	82.24
123.00	0.62	9.98	10.02	25.59	16.63	78.71
124.00	0.64	10.76	9.29	27.71	17.93	83.29
125.00	0.65	8.04	12.44	20.36	13.40	67.29
126.00	0.66	11.80	8.47	30.55	19.67	89.41
127.00	0.67	10.67	9.37	27.46	17.78	82.76

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-10	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435970.54	
Northing (m):	566208.90	
Level (mAOD):	11.03	
Number of measures Qd :	266	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	2.77	36.10	6.60	4.62	36.29
1.00	0.02	5.43	18.42	13.45	9.05	51.94
2.00	0.03	6.34	15.77	15.84	10.57	57.29
3.00	0.03	6.78	14.75	17.01	11.30	59.88
4.00	0.04	10.51	9.51	27.03	17.52	81.82
5.00	0.05	11.45	8.73	29.59	19.08	87.35
6.00	0.05	9.68	10.33	24.78	16.13	76.94
7.00	0.06	10.94	9.14	28.20	18.23	84.35
8.00	0.07	6.27	15.95	15.66	10.45	56.88
9.00	0.08	6.42	15.58	16.05	10.70	57.76
10.00	0.09	7.66	13.05	19.35	12.77	65.06
11.00	0.10	5.13	19.49	12.66	8.55	50.18
12.00	0.10	5.63	17.76	13.97	9.38	53.12
13.00	0.11	7.99	12.52	20.23	13.32	67.00
14.00	0.12	6.02	16.61	15.00	10.03	55.41
15.00	0.13	7.21	13.87	18.15	12.02	62.41
16.00	0.14	6.49	15.41	16.24	10.82	58.18
17.00	0.15	6.04	16.56	15.05	10.07	55.53
18.00	0.16	8.22	12.17	20.85	13.70	68.35
19.00	0.17	5.28	18.94	13.06	8.80	51.06

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.18	3.57	28.01	8.63	5.95	41.00
21.00	0.19	3.11	32.15	7.46	5.18	38.29
22.00	0.20	1.73	57.80	4.01	2.88	30.18
23.00	0.21	5.14	19.46	12.69	8.57	50.24
24.00	0.23	4.83	20.70	11.88	8.05	48.41
25.00	0.24	5.03	19.88	12.40	8.38	49.59
26.00	0.25	5.61	17.83	13.92	9.35	53.00
27.00	0.25	5.25	19.05	12.98	8.75	50.88
28.00	0.26	9.75	10.26	24.97	16.25	77.35
29.00	0.26	11.26	8.88	29.07	18.77	86.24
30.00	0.27	9.88	10.12	25.32	16.47	78.12
31.00	0.27	6.52	15.34	16.32	10.87	58.35
32.00	0.28	4.87	20.53	11.99	8.12	48.65
33.00	0.29	9.90	10.10	25.37	16.50	78.24
34.00	0.30	4.03	24.81	9.81	6.72	43.71
35.00	0.31	9.81	10.19	25.13	16.35	77.71
36.00	0.32	3.88	25.77	9.43	6.47	42.82
37.00	0.34	5.30	18.87	13.11	8.83	51.18
38.00	0.35	3.83	26.11	9.30	6.38	42.53
39.00	0.36	1.97	50.76	4.61	3.28	31.59
40.00	0.38	5.11	19.57	12.61	8.52	50.06
41.00	0.39	4.62	21.65	11.34	7.70	47.18
42.00	0.40	4.61	21.69	11.31	7.68	47.12
43.00	0.40	0.63	158.73	1.38	1.05	23.71
44.00	0.41	4.31	23.20	10.54	7.18	45.35
45.00	0.42	4.57	21.88	11.21	7.62	46.88
46.00	0.44	4.61	21.69	11.31	7.68	47.12
47.00	0.45	6.49	15.41	16.24	10.82	58.18
48.00	0.45	9.01	11.10	22.97	15.02	73.00
49.00	0.46	13.64	7.33	35.60	22.73	100.24
50.00	0.46	11.54	8.67	29.84	19.23	87.88
51.00	0.46	22.98	4.35	61.79	38.30	155.18
52.00	0.46	24.99	4.00	67.52	41.65	167.00
53.00	0.47	24.64	4.06	66.52	41.07	164.94
54.00	0.47	18.69	5.35	49.67	31.15	129.94
55.00	0.47	22.56	4.43	60.60	37.60	152.71
56.00	0.47	28.39	3.52	77.27	47.32	187.00
57.00	0.48	24.21	4.13	65.30	40.35	162.41
58.00	0.48	22.33	4.48	59.95	37.22	151.35
59.00	0.48	28.47	3.51	77.50	47.45	187.47
60.00	0.48	17.02	5.88	44.99	28.37	120.12
61.00	0.49	17.88	5.59	47.40	29.80	125.18
62.00	0.49	25.63	3.90	69.35	42.72	170.76
63.00	0.49	17.63	5.67	46.70	29.38	123.71
64.00	0.49	22.92	4.36	61.62	38.20	154.82
65.00	0.50	13.62	7.34	35.55	22.70	100.12
66.00	0.50	14.96	6.68	39.26	24.93	108.00
67.00	0.50	16.43	6.09	43.34	27.38	116.65
68.00	0.51	16.36	6.11	43.15	27.27	116.24
69.00	0.51	13.58	7.36	35.44	22.63	99.88
70.00	0.51	11.40	8.77	29.45	19.00	87.06
71.00	0.52	13.47	7.42	35.14	22.45	99.24
72.00	0.52	9.45	10.58	24.16	15.75	75.59
73.00	0.53	10.49	9.53	26.97	17.48	81.71
74.00	0.53	13.95	7.17	36.46	23.25	102.06

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.54	10.96	9.12	28.25	18.27	84.47
76.00	0.54	9.43	10.60	24.10	15.72	75.47
77.00	0.55	7.89	12.67	19.96	13.15	66.41
78.00	0.56	8.81	11.35	22.43	14.68	71.82
79.00	0.56	8.26	12.11	20.95	13.77	68.59
80.00	0.57	6.91	14.47	17.35	11.52	60.65
81.00	0.58	7.06	14.16	17.75	11.77	61.53
82.00	0.58	7.55	13.25	19.05	12.58	64.41
83.00	0.59	7.40	13.51	18.65	12.33	63.53
84.00	0.60	7.02	14.25	17.64	11.70	61.29
85.00	0.61	6.69	14.95	16.77	11.15	59.35
86.00	0.62	5.73	17.45	14.24	9.55	53.71
87.00	0.63	6.49	15.41	16.24	10.82	58.18
88.00	0.64	6.43	15.55	16.08	10.72	57.82
89.00	0.66	6.46	15.48	16.16	10.77	58.00
90.00	0.67	7.57	13.21	19.11	12.62	64.53
91.00	0.67	7.42	13.48	18.71	12.37	63.65
92.00	0.68	9.32	10.73	23.81	15.53	74.82
93.00	0.69	10.38	9.63	26.68	17.30	81.06
94.00	0.69	11.19	8.94	28.88	18.65	85.82
95.00	0.70	12.39	8.07	32.16	20.65	92.88
96.00	0.71	11.72	8.53	30.33	19.53	88.94
97.00	0.71	12.96	7.72	33.73	21.60	96.24
98.00	0.72	7.18	13.93	18.07	11.97	62.24
99.00	0.72	8.81	11.35	22.43	14.68	71.82
100.00	0.72	9.50	10.53	24.29	15.83	75.88
101.00	0.73	8.55	11.70	21.73	14.25	70.29
102.00	0.74	7.37	13.57	18.57	12.28	63.35
103.00	0.75	6.32	15.82	15.79	10.53	57.18
104.00	0.76	7.24	13.81	18.23	12.07	62.59
105.00	0.77	7.37	13.57	18.57	12.28	63.35
106.00	0.78	6.71	14.90	16.82	11.18	59.47
107.00	0.79	6.53	15.31	16.34	10.88	58.41
108.00	0.80	5.34	18.73	13.21	8.90	51.41
109.00	0.81	5.60	17.86	13.89	9.33	52.94
110.00	0.82	5.29	18.90	13.08	8.82	51.12
111.00	0.83	5.59	17.89	13.87	9.32	52.88
112.00	0.84	5.11	19.57	12.61	8.52	50.06
113.00	0.85	4.90	20.41	12.07	8.17	48.82
114.00	0.86	4.51	22.17	11.05	7.52	46.53
115.00	0.87	4.33	23.09	10.59	7.22	45.47
116.00	0.88	2.08	48.08	4.88	3.47	32.24
117.00	0.89	10.96	9.12	28.25	18.27	84.47
118.00	0.89	17.57	5.69	46.53	29.28	123.35
119.00	0.89	14.98	6.68	39.31	24.97	108.12
120.00	0.90	18.23	5.49	48.38	30.38	127.24
121.00	0.90	11.52	8.68	29.78	19.20	87.76
122.00	0.90	19.20	5.21	51.10	32.00	132.94
123.00	0.91	14.73	6.79	38.62	24.55	106.65
124.00	0.91	15.02	6.66	39.42	25.03	108.35
125.00	0.91	14.53	6.88	38.06	24.22	105.47
126.00	0.92	13.91	7.19	36.35	23.18	101.82
127.00	0.92	15.12	6.61	39.70	25.20	108.94
128.00	0.93	14.94	6.69	39.20	24.90	107.88
129.00	0.93	19.70	5.08	52.51	32.83	135.88

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.93	16.66	6.00	43.99	27.77	118.00
131.00	0.93	13.82	7.24	36.10	23.03	101.29
132.00	0.94	18.42	5.43	48.91	30.70	128.35
133.00	0.94	15.33	6.52	40.28	25.55	110.18
134.00	0.94	18.11	5.52	48.04	30.18	126.53
135.00	0.95	11.63	8.60	30.08	19.38	88.41
136.00	0.95	9.79	10.21	25.08	16.32	77.59
137.00	0.96	14.92	6.70	39.14	24.87	107.76
138.00	0.96	11.55	8.66	29.86	19.25	87.94
139.00	0.97	9.33	10.72	23.83	15.55	74.88
140.00	0.98	6.65	15.04	16.66	11.08	59.12
141.00	0.98	7.02	14.25	17.64	11.70	61.29
142.00	0.99	6.00	16.67	14.95	10.00	55.29
143.00	1.00	6.58	15.20	16.48	10.97	58.71
144.00	1.01	6.24	16.03	15.58	10.40	56.71
145.00	1.02	6.15	16.26	15.34	10.25	56.18
146.00	1.03	6.33	15.80	15.82	10.55	57.24
147.00	1.04	7.00	14.29	17.59	11.67	61.18
148.00	1.05	7.30	13.70	18.39	12.17	62.94
149.00	1.05	7.42	13.48	18.71	12.37	63.65
150.00	1.06	7.40	13.51	18.65	12.33	63.53
151.00	1.07	5.69	17.57	14.13	9.48	53.47
152.00	1.08	7.45	13.42	18.79	12.42	63.82
153.00	1.09	6.66	15.02	16.69	11.10	59.18
154.00	1.10	9.72	10.29	24.89	16.20	77.18
155.00	1.11	10.59	9.44	27.25	17.65	82.29
156.00	1.11	10.09	9.91	25.89	16.82	79.35
157.00	1.12	8.64	11.57	21.97	14.40	70.82
158.00	1.13	8.59	11.64	21.84	14.32	70.53
159.00	1.14	8.07	12.39	20.44	13.45	67.47
160.00	1.14	7.84	12.76	19.83	13.07	66.12
161.00	1.16	6.77	14.77	16.98	11.28	59.82
162.00	1.17	5.54	18.05	13.74	9.23	52.59
163.00	1.18	5.67	17.64	14.08	9.45	53.35
164.00	1.19	4.72	21.19	11.60	7.87	47.76
165.00	1.21	5.32	18.80	13.16	8.87	51.29
166.00	1.22	5.49	18.21	13.61	9.15	52.29
167.00	1.23	5.80	17.24	14.42	9.67	54.12
168.00	1.24	5.38	18.59	13.32	8.97	51.65
169.00	1.25	5.52	18.12	13.68	9.20	52.47
170.00	1.26	5.28	18.94	13.06	8.80	51.06
171.00	1.27	6.67	14.99	16.71	11.12	59.24
172.00	1.28	4.15	24.10	10.12	6.92	44.41
173.00	1.29	5.15	19.42	12.72	8.58	50.29
174.00	1.30	5.44	18.38	13.47	9.07	52.00
175.00	1.31	5.29	18.90	13.08	8.82	51.12
176.00	1.32	5.57	17.95	13.82	9.28	52.76
177.00	1.32	4.98	20.08	12.27	8.30	49.29
178.00	1.33	4.15	24.10	10.12	6.92	44.41
179.00	1.34	5.07	19.72	12.51	8.45	49.82
180.00	1.35	5.11	19.57	12.61	8.52	50.06
181.00	1.36	4.58	21.83	11.23	7.63	46.94
182.00	1.37	4.95	20.20	12.20	8.25	49.12
183.00	1.39	5.25	19.05	12.98	8.75	50.88
184.00	1.40	4.83	20.70	11.88	8.05	48.41

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	1.41	5.62	17.79	13.95	9.37	53.06
186.00	1.41	4.65	21.51	11.42	7.75	47.35
187.00	1.42	5.08	19.69	12.53	8.47	49.88
188.00	1.43	4.36	22.94	10.66	7.27	45.65
189.00	1.44	3.98	25.13	9.68	6.63	43.41
190.00	1.45	4.50	22.22	11.03	7.50	46.47
191.00	1.46	4.76	21.01	11.70	7.93	48.00
192.00	1.47	4.04	24.75	9.84	6.73	43.76
193.00	1.48	4.40	22.73	10.77	7.33	45.88
194.00	1.48	2.24	44.64	5.27	3.73	33.18
195.00	1.49	4.16	24.04	10.15	6.93	44.47
196.00	1.50	4.72	21.19	11.60	7.87	47.76
197.00	1.51	4.29	23.31	10.48	7.15	45.24
198.00	1.51	4.52	22.12	11.08	7.53	46.59
199.00	1.52	4.17	23.98	10.17	6.95	44.53
200.00	1.53	5.15	19.42	12.72	8.58	50.29
201.00	1.54	5.08	19.69	12.53	8.47	49.88
202.00	1.54	5.54	18.05	13.74	9.23	52.59
203.00	1.55	5.25	19.05	12.98	8.75	50.88
204.00	1.56	4.95	20.20	12.20	8.25	49.12
205.00	1.56	6.09	16.42	15.18	10.15	55.82
206.00	1.57	6.28	15.92	15.68	10.47	56.94
207.00	1.58	5.69	17.57	14.13	9.48	53.47
208.00	1.59	5.51	18.15	13.66	9.18	52.41
209.00	1.60	6.03	16.58	15.02	10.05	55.47
210.00	1.61	5.13	19.49	12.66	8.55	50.18
211.00	1.62	5.79	17.27	14.39	9.65	54.06
212.00	1.62	6.00	16.67	14.95	10.00	55.29
213.00	1.63	4.84	20.66	11.91	8.07	48.47
214.00	1.64	6.03	16.58	15.02	10.05	55.47
215.00	1.65	5.32	18.80	13.16	8.87	51.29
216.00	1.65	6.79	14.73	17.03	11.32	59.94
217.00	1.66	8.14	12.29	20.63	13.57	67.88
218.00	1.67	6.85	14.60	17.19	11.42	60.29
219.00	1.67	5.91	16.92	14.71	9.85	54.76
220.00	1.68	7.67	13.04	19.37	12.78	65.12
221.00	1.69	7.25	13.79	18.25	12.08	62.65
222.00	1.70	8.15	12.27	20.66	13.58	67.94
223.00	1.71	7.57	13.21	19.11	12.62	64.53
224.00	1.72	6.39	15.65	15.97	10.65	57.59
225.00	1.72	6.47	15.46	16.19	10.78	58.06
226.00	1.73	8.60	11.63	21.87	14.33	70.59
227.00	1.74	10.88	9.19	28.04	18.13	84.00
228.00	1.74	11.24	8.90	29.02	18.73	86.12
229.00	1.75	10.55	9.48	27.14	17.58	82.06
230.00	1.75	9.09	11.00	23.18	15.15	73.47
231.00	1.76	6.81	14.68	17.09	11.35	60.06
232.00	1.76	9.45	10.58	24.16	15.75	75.59
233.00	1.77	6.63	15.08	16.61	11.05	59.00
234.00	1.78	5.69	17.57	14.13	9.48	53.47
235.00	1.79	4.90	20.41	12.07	8.17	48.82
236.00	1.80	4.44	22.52	10.87	7.40	46.12
237.00	1.81	3.99	25.06	9.71	6.65	43.47
238.00	1.83	3.97	25.19	9.66	6.62	43.35
239.00	1.84	3.35	29.85	8.07	5.58	39.71

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	1.86	3.86	25.91	9.38	6.43	42.71
241.00	1.87	4.44	22.52	10.87	7.40	46.12
242.00	1.88	5.51	18.15	13.66	9.18	52.41
243.00	1.89	5.65	17.70	14.03	9.42	53.24
244.00	1.89	5.38	18.59	13.32	8.97	51.65
245.00	1.90	6.92	14.45	17.38	11.53	60.71
246.00	1.90	10.35	9.66	26.59	17.25	80.88
247.00	1.91	10.07	9.93	25.83	16.78	79.24
248.00	1.91	7.74	12.92	19.56	12.90	65.53
249.00	1.92	8.64	11.57	21.97	14.40	70.82
250.00	1.92	10.47	9.55	26.92	17.45	81.59
251.00	1.93	8.49	11.78	21.57	14.15	69.94
252.00	1.93	5.95	16.81	14.81	9.92	55.00
253.00	1.94	6.30	15.87	15.74	10.50	57.06
254.00	1.95	6.80	14.71	17.06	11.33	60.00
255.00	1.96	5.10	19.61	12.59	8.50	50.00
256.00	1.97	4.42	22.62	10.82	7.37	46.00
257.00	1.97	7.90	12.66	19.99	13.17	66.47
258.00	1.98	8.67	11.53	22.05	14.45	71.00
259.00	1.98	10.41	9.61	26.76	17.35	81.24
260.00	1.99	7.83	12.77	19.80	13.05	66.06
261.00	2.00	10.14	9.86	26.02	16.90	79.65
262.00	2.00	8.91	11.22	22.70	14.85	72.41
263.00	2.01	7.14	14.01	17.96	11.90	62.00
264.00	2.02	6.26	15.97	15.63	10.43	56.82
265.00	2.03	4.96	20.16	12.22	8.27	49.18

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-11	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435921.51	
Northing (m):	566213.70	
Level (mAOD):	10.45	
Number of measures Qd :	24	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	4.41	22.68	10.79	7.35	45.94
1.00	0.01	8.18	12.22	20.74	13.63	68.12
2.00	0.02	8.24	12.14	20.90	13.73	68.47
3.00	0.03	8.78	11.39	22.35	14.63	71.65
4.00	0.04	12.10	8.26	31.37	20.17	91.18
5.00	0.04	10.10	9.90	25.92	16.83	79.41
6.00	0.05	9.26	10.80	23.64	15.43	74.47
7.00	0.06	12.02	8.32	31.15	20.03	90.71
8.00	0.06	13.21	7.57	34.42	22.02	97.71
9.00	0.07	10.95	9.13	28.23	18.25	84.41
10.00	0.08	10.61	9.43	27.30	17.68	82.41
11.00	0.08	16.65	6.01	43.96	27.75	117.94
12.00	0.08	15.07	6.64	39.56	25.12	108.65
13.00	0.09	17.29	5.78	45.75	28.82	121.71
14.00	0.09	22.13	4.52	59.38	36.88	150.18
15.00	0.09	46.91	2.13	131.38	78.18	295.94
16.00	0.09	62.01	1.61	176.45	103.35	384.76
17.00	0.09	35.66	2.80	98.32	59.43	229.76
18.00	0.10	71.67	1.40	205.63	119.45	441.59
19.00	0.10	36.66	2.73	101.24	61.10	235.65

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.10	49.13	2.04	137.96	81.88	309.00
21.00	0.10	38.00	2.63	105.16	63.33	243.53
22.00	0.11	36.87	2.71	101.85	61.45	236.88
23.00	0.11	26.96	3.71	73.16	44.93	178.59

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-11A	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	4.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435921.51	
Northing (m):	566213.70	
Level (mAOD):	10.45	
Number of measures Qd :	142	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.01	4.63	21.60	11.36	7.72	47.24
1.00	0.01	11.45	8.73	29.59	19.08	87.35
2.00	0.02	10.87	9.20	28.01	18.12	83.94
3.00	0.02	16.07	6.22	42.34	26.78	114.53
4.00	0.03	13.69	7.30	35.74	22.82	100.53
5.00	0.03	20.45	4.89	54.63	34.08	140.29
6.00	0.03	15.99	6.25	42.12	26.65	114.06
7.00	0.04	16.40	6.10	43.26	27.33	116.47
8.00	0.04	18.19	5.50	48.27	30.32	127.00
9.00	0.05	17.79	5.62	47.15	29.65	124.65
10.00	0.05	16.71	5.98	44.13	27.85	118.29
11.00	0.06	16.33	6.12	43.07	27.22	116.06
12.00	0.06	12.71	7.87	33.04	21.18	94.76
13.00	0.07	16.16	6.19	42.59	26.93	115.06
14.00	0.08	12.22	8.18	31.70	20.37	91.88
15.00	0.08	11.95	8.37	30.96	19.92	90.29
16.00	0.09	11.64	8.59	30.11	19.40	88.47
17.00	0.09	16.98	5.89	44.88	28.30	119.88
18.00	0.10	13.67	7.32	35.69	22.78	100.41
19.00	0.10	13.11	7.63	34.14	21.85	97.12

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.11	10.45	9.57	26.87	17.42	81.47
21.00	0.11	14.68	6.81	38.48	24.47	106.35
22.00	0.12	10.58	9.45	27.22	17.63	82.24
23.00	0.13	10.88	9.19	28.04	18.13	84.00
24.00	0.13	14.22	7.03	37.21	23.70	103.65
25.00	0.14	8.75	11.43	22.27	14.58	71.47
26.00	0.14	11.31	8.84	29.21	18.85	86.53
27.00	0.15	9.23	10.83	23.56	15.38	74.29
28.00	0.16	8.75	11.43	22.27	14.58	71.47
29.00	0.17	10.13	9.87	26.00	16.88	79.59
30.00	0.17	10.23	9.78	26.27	17.05	80.18
31.00	0.18	8.05	12.42	20.39	13.42	67.35
32.00	0.19	10.43	9.59	26.81	17.38	81.35
33.00	0.20	14.40	6.94	37.70	24.00	104.71
34.00	0.20	22.33	4.48	59.95	37.22	151.35
35.00	0.21	10.51	9.51	27.03	17.52	81.82
36.00	0.22	9.75	10.26	24.97	16.25	77.35
37.00	0.23	9.07	11.03	23.13	15.12	73.35
38.00	0.23	8.80	11.36	22.40	14.67	71.76
39.00	0.24	11.38	8.79	29.40	18.97	86.94
40.00	0.25	10.58	9.45	27.22	17.63	82.24
41.00	0.26	9.17	10.91	23.40	15.28	73.94
42.00	0.27	10.56	9.47	27.17	17.60	82.12
43.00	0.27	8.52	11.74	21.65	14.20	70.12
44.00	0.28	9.18	10.89	23.43	15.30	74.00
45.00	0.29	8.61	11.61	21.89	14.35	70.65
46.00	0.30	9.30	10.75	23.75	15.50	74.71
47.00	0.31	14.91	6.71	39.12	24.85	107.71
48.00	0.31	8.37	11.95	21.25	13.95	69.24
49.00	0.32	12.34	8.10	32.03	20.57	92.59
50.00	0.33	16.92	5.91	44.71	28.20	119.53
51.00	0.33	10.62	9.42	27.33	17.70	82.47
52.00	0.34	13.90	7.19	36.32	23.17	101.76
53.00	0.34	14.23	7.03	37.23	23.72	103.71
54.00	0.35	22.91	4.36	61.60	38.18	154.76
55.00	0.36	9.16	10.92	23.37	15.27	73.88
56.00	0.36	12.96	7.72	33.73	21.60	96.24
57.00	0.38	7.69	13.00	19.43	12.82	65.24
58.00	0.38	10.27	9.74	26.38	17.12	80.41
59.00	0.39	8.98	11.14	22.89	14.97	72.82
60.00	0.40	8.55	11.70	21.73	14.25	70.29
61.00	0.41	12.48	8.01	32.41	20.80	93.41
62.00	0.41	5.66	17.67	14.05	9.43	53.29
63.00	0.42	14.09	7.10	36.85	23.48	102.88
64.00	0.43	6.72	14.88	16.85	11.20	59.53
65.00	0.44	6.98	14.33	17.54	11.63	61.06
66.00	0.44	7.59	13.18	19.16	12.65	64.65
67.00	0.45	9.33	10.72	23.83	15.55	74.88
68.00	0.46	14.87	6.72	39.01	24.78	107.47
69.00	0.46	24.11	4.15	65.01	40.18	161.82
70.00	0.46	38.11	2.62	105.48	63.52	244.18
71.00	0.46	29.23	3.42	79.69	48.72	191.94
72.00	0.47	31.42	3.18	86.01	52.37	204.82
73.00	0.47	63.24	1.58	180.16	105.40	392.00
74.00	0.47	30.35	3.29	82.92	50.58	198.53

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.47	36.77	2.72	101.56	61.28	236.29
76.00	0.47	64.71	1.55	184.59	107.85	400.65
77.00	0.48	47.44	2.11	132.95	79.07	299.06
78.00	0.48	48.46	2.06	135.97	80.77	305.06
79.00	0.48	47.84	2.09	134.13	79.73	301.41
80.00	0.48	44.69	2.24	124.82	74.48	282.88
81.00	0.48	31.43	3.18	86.04	52.38	204.88
82.00	0.49	21.34	4.69	57.14	35.57	145.53
83.00	0.49	22.92	4.36	61.62	38.20	154.82
84.00	0.49	19.21	5.21	51.13	32.02	133.00
85.00	0.50	18.09	5.53	47.99	30.15	126.41
86.00	0.50	15.64	6.39	41.14	26.07	112.00
87.00	0.50	16.71	5.98	44.13	27.85	118.29
88.00	0.51	19.21	5.21	51.13	32.02	133.00
89.00	0.51	15.85	6.31	41.73	26.42	113.24
90.00	0.52	15.04	6.65	39.48	25.07	108.47
91.00	0.52	14.02	7.13	36.65	23.37	102.47
92.00	0.53	12.39	8.07	32.16	20.65	92.88
93.00	0.54	8.64	11.57	21.97	14.40	70.82
94.00	0.54	9.39	10.65	23.99	15.65	75.24
95.00	0.55	9.17	10.91	23.40	15.28	73.94
96.00	0.56	7.93	12.61	20.07	13.22	66.65
97.00	0.57	7.41	13.50	18.68	12.35	63.59
98.00	0.59	7.52	13.30	18.97	12.53	64.24
99.00	0.60	7.32	13.66	18.44	12.20	63.06
100.00	0.61	6.26	15.97	15.63	10.43	56.82
101.00	0.63	6.58	15.20	16.48	10.97	58.71
102.00	0.64	6.62	15.11	16.58	11.03	58.94
103.00	0.65	8.01	12.48	20.28	13.35	67.12
104.00	0.66	6.34	15.77	15.84	10.57	57.29
105.00	0.67	8.93	11.20	22.75	14.88	72.53
106.00	0.68	8.57	11.67	21.79	14.28	70.41
107.00	0.70	8.04	12.44	20.36	13.40	67.29
108.00	0.70	8.97	11.15	22.86	14.95	72.76
109.00	0.71	9.30	10.75	23.75	15.50	74.71
110.00	0.73	8.53	11.72	21.68	14.22	70.18
111.00	0.74	6.46	15.48	16.16	10.77	58.00
112.00	0.75	6.11	16.37	15.24	10.18	55.94
113.00	0.77	7.38	13.55	18.60	12.30	63.41
114.00	0.78	7.62	13.12	19.24	12.70	64.82
115.00	0.78	5.74	17.42	14.26	9.57	53.76
116.00	0.79	9.69	10.32	24.81	16.15	77.00
117.00	0.81	5.91	16.92	14.71	9.85	54.76
118.00	0.82	5.75	17.39	14.29	9.58	53.82
119.00	0.84	5.66	17.67	14.05	9.43	53.29
120.00	0.85	4.82	20.75	11.86	8.03	48.35
121.00	0.87	3.96	25.25	9.63	6.60	43.29
122.00	0.89	3.61	27.70	8.74	6.02	41.24
123.00	0.91	7.03	14.22	17.67	11.72	61.35
124.00	0.92	7.39	13.53	18.63	12.32	63.47
125.00	0.93	7.11	14.06	17.88	11.85	61.82
126.00	0.94	17.01	5.88	44.96	28.35	120.06
127.00	0.94	18.58	5.38	49.36	30.97	129.29
128.00	0.94	18.79	5.32	49.95	31.32	130.53
129.00	0.95	20.25	4.94	54.06	33.75	139.12

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.95	28.14	3.55	76.55	46.90	185.53
131.00	0.95	25.69	3.89	69.52	42.82	171.12
132.00	0.96	26.74	3.74	72.53	44.57	177.29
133.00	0.96	36.50	2.74	100.77	60.83	234.71
134.00	0.96	34.31	2.91	94.39	57.18	221.82
135.00	0.97	28.86	3.47	78.62	48.10	189.76
136.00	0.97	45.65	2.19	127.65	76.08	288.53
137.00	0.97	42.33	2.36	117.86	70.55	269.00
138.00	0.97	32.01	3.12	87.72	53.35	208.29
139.00	0.97	61.03	1.64	173.51	101.72	379.00
140.00	0.98	34.12	2.93	93.84	56.87	220.71
141.00	0.98	44.48	2.25	124.20	74.13	281.65

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

Probe number:	CBR-12	
Probe type:	Non-smoothed measures	
Panda type :	Panda 2	
Type of investigation :	Ground Investigation	
Hammering weight :	Panda 2 Hammer	
Date Processed :	21-28/09/2011	
Water table :	Indefinite	
Water table depth :	???	m
Cone area :	4.00	cm ²
Pre-sounding depth :	0.00	m
Origin :	0.00	m
Targeted depth :	2.00	m
Targeted angle :	0.00	m
Breaking condition :	Temporary	
Elevation :	0.00	m
Equipment:	Panda Probe Version 2	
Equip. calibration :	Yes	
Operator :	N. Vater	
Supervisor :	N. Vater	
Company :	Allied Exploration & Geotechnics Ltd.	
Comments:	(1) Panda probe testing conducted from ground level. (2) See Exploratory Hole Plan for location details. (3) Probe results post processed in Microsoft Excel.	
	Location	
Easting (m):	435924.47	
Northing (m):	566262.80	
Level (mAOD):	10.88	
Number of measures Qd :	341	

Index	Depth (m)	Cone Resistance (MPa)	Equivalent TRL (mm)	Equivalent CBR (%)	Equivalent 'N' value	Estimated Shear Strength (kPa)
0.00	0.02	1.43	69.93	3.28	2.38	28.41
1.00	0.05	0.69	144.93	1.52	1.15	24.06
2.00	0.07	1.47	68.03	3.38	2.45	28.65
3.00	0.10	1.93	51.81	4.51	3.22	31.35
4.00	0.12	2.80	35.71	6.68	4.67	36.47
5.00	0.13	2.96	33.78	7.08	4.93	37.41
6.00	0.14	3.17	31.55	7.61	5.28	38.65
7.00	0.16	1.62	61.73	3.75	2.70	29.53
8.00	0.16	4.96	20.16	12.22	8.27	49.18
9.00	0.17	3.87	25.84	9.40	6.45	42.76
10.00	0.18	1.52	65.79	3.50	2.53	28.94
11.00	0.20	2.07	48.31	4.85	3.45	32.18
12.00	0.20	5.50	18.18	13.63	9.17	52.35
13.00	0.21	6.70	14.93	16.79	11.17	59.41
14.00	0.22	7.07	14.14	17.78	11.78	61.59
15.00	0.23	2.44	40.98	5.77	4.07	34.35
16.00	0.24	6.30	15.87	15.74	10.50	57.06
17.00	0.24	7.33	13.64	18.47	12.22	63.12
18.00	0.25	3.01	33.22	7.21	5.02	37.71
19.00	0.26	2.65	37.74	6.30	4.42	35.59

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

20.00	0.27	1.93	51.81	4.51	3.22	31.35
21.00	0.28	2.76	36.23	6.58	4.60	36.24
22.00	0.29	3.46	28.90	8.35	5.77	40.35
23.00	0.29	6.97	14.35	17.51	11.62	61.00
24.00	0.30	6.27	15.95	15.66	10.45	56.88
25.00	0.31	3.98	25.13	9.68	6.63	43.41
26.00	0.32	6.20	16.13	15.47	10.33	56.47
27.00	0.33	6.95	14.39	17.46	11.58	60.88
28.00	0.34	6.60	15.15	16.53	11.00	58.82
29.00	0.35	8.09	12.36	20.50	13.48	67.59
30.00	0.36	8.54	11.71	21.70	14.23	70.24
31.00	0.36	7.55	13.25	19.05	12.58	64.41
32.00	0.37	9.08	11.01	23.16	15.13	73.41
33.00	0.38	12.05	8.30	31.23	20.08	90.88
34.00	0.38	15.36	6.51	40.37	25.60	110.35
35.00	0.39	12.53	7.98	32.55	20.88	93.71
36.00	0.39	13.67	7.32	35.69	22.78	100.41
37.00	0.40	17.30	5.78	45.77	28.83	121.76
38.00	0.40	20.56	4.86	54.94	34.27	140.94
39.00	0.41	21.06	4.75	56.35	35.10	143.88
40.00	0.41	21.21	4.71	56.77	35.35	144.76
41.00	0.41	21.26	4.70	56.92	35.43	145.06
42.00	0.41	23.97	4.17	64.61	39.95	161.00
43.00	0.42	23.52	4.25	63.33	39.20	158.35
44.00	0.42	25.24	3.96	68.24	42.07	168.47
45.00	0.42	27.19	3.68	73.82	45.32	179.94
46.00	0.42	44.79	2.23	125.11	74.65	283.47
47.00	0.42	30.68	3.26	83.87	51.13	200.47
48.00	0.43	51.27	1.95	144.32	85.45	321.59
49.00	0.43	29.58	3.38	80.69	49.30	194.00
50.00	0.43	34.60	2.89	95.24	57.67	223.53
51.00	0.43	43.26	2.31	120.60	72.10	274.47
52.00	0.43	34.02	2.94	93.55	56.70	220.12
53.00	0.43	31.32	3.19	85.72	52.20	204.24
54.00	0.43	23.43	4.27	63.07	39.05	157.82
55.00	0.44	19.07	5.24	50.74	31.78	132.18
56.00	0.44	15.51	6.45	40.78	25.85	111.24
57.00	0.44	28.41	3.52	77.32	47.35	187.12
58.00	0.44	33.09	3.02	90.85	55.15	214.65
59.00	0.44	25.55	3.91	69.12	42.58	170.29
60.00	0.44	25.27	3.96	68.32	42.12	168.65
61.00	0.45	40.16	2.49	111.48	66.93	256.24
62.00	0.45	24.39	4.10	65.81	40.65	163.47
63.00	0.45	15.78	6.34	41.53	26.30	112.82
64.00	0.45	26.32	3.80	71.33	43.87	174.82
65.00	0.45	33.71	2.97	92.65	56.18	218.29
66.00	0.46	45.68	2.19	127.74	76.13	288.71
67.00	0.46	37.19	2.69	102.79	61.98	238.76
68.00	0.46	27.01	3.70	73.30	45.02	178.88
69.00	0.47	33.74	2.96	92.74	56.23	218.47
70.00	0.47	30.22	3.31	82.54	50.37	197.76
71.00	0.47	38.86	2.57	107.67	64.77	248.59
72.00	0.47	35.33	2.83	97.36	58.88	227.82
73.00	0.48	34.06	2.94	93.67	56.77	220.35
74.00	0.48	49.62	2.02	139.41	82.70	311.88

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

75.00	0.48	38.58	2.59	106.85	64.30	246.94
76.00	0.48	18.37	5.44	48.77	30.62	128.06
77.00	0.49	37.74	2.65	104.39	62.90	242.00
78.00	0.49	20.37	4.91	54.40	33.95	139.82
79.00	0.49	59.10	1.69	167.71	98.50	367.65
80.00	0.49	44.05	2.27	122.93	73.42	279.12
81.00	0.49	32.94	3.04	90.41	54.90	213.76
82.00	0.49	16.41	6.09	43.29	27.35	116.53
83.00	0.50	39.61	2.52	109.87	66.02	253.00
84.00	0.50	53.32	1.88	150.43	88.87	333.65
85.00	0.50	38.56	2.59	106.79	64.27	246.82
86.00	0.50	38.95	2.57	107.94	64.92	249.12
87.00	0.50	30.07	3.33	82.11	50.12	196.88
88.00	0.51	35.70	2.80	98.44	59.50	230.00
89.00	0.51	29.55	3.38	80.61	49.25	193.82
90.00	0.51	44.78	2.23	125.08	74.63	283.41
91.00	0.51	37.04	2.70	102.35	61.73	237.88
92.00	0.52	33.10	3.02	90.88	55.17	214.71
93.00	0.52	36.48	2.74	100.71	60.80	234.59
94.00	0.52	30.30	3.30	82.77	50.50	198.24
95.00	0.52	21.53	4.64	57.68	35.88	146.65
96.00	0.52	23.10	4.33	62.14	38.50	155.88
97.00	0.52	26.20	3.82	70.98	43.67	174.12
98.00	0.53	26.33	3.80	71.35	43.88	174.88
99.00	0.53	25.57	3.91	69.18	42.62	170.41
100.00	0.53	31.94	3.13	87.51	53.23	207.88
101.00	0.53	18.76	5.33	49.87	31.27	130.35
102.00	0.53	31.94	3.13	87.51	53.23	207.88
103.00	0.53	20.82	4.80	55.67	34.70	142.47
104.00	0.54	30.27	3.30	82.69	50.45	198.06
105.00	0.54	22.41	4.46	60.18	37.35	151.82
106.00	0.55	22.08	4.53	59.24	36.80	149.88
107.00	0.55	29.21	3.42	79.63	48.68	191.82
108.00	0.56	31.12	3.21	85.14	51.87	203.06
109.00	0.56	20.72	4.83	55.39	34.53	141.88
110.00	0.56	30.98	3.23	84.74	51.63	202.24
111.00	0.57	23.06	4.34	62.02	38.43	155.65
112.00	0.57	30.85	3.24	84.36	51.42	201.47
113.00	0.58	33.01	3.03	90.62	55.02	214.18
114.00	0.58	30.74	3.25	84.04	51.23	200.82
115.00	0.58	26.16	3.82	70.87	43.60	173.88
116.00	0.59	22.82	4.38	61.34	38.03	154.24
117.00	0.59	33.54	2.98	92.16	55.90	217.29
118.00	0.59	37.40	2.67	103.40	62.33	240.00
119.00	0.59	24.55	4.07	66.27	40.92	164.41
120.00	0.60	16.10	6.21	42.42	26.83	114.71
121.00	0.60	16.71	5.98	44.13	27.85	118.29
122.00	0.60	16.47	6.07	43.46	27.45	116.88
123.00	0.61	14.70	6.80	38.53	24.50	106.47
124.00	0.61	14.39	6.95	37.68	23.98	104.65
125.00	0.61	14.59	6.85	38.23	24.32	105.82
126.00	0.61	16.59	6.03	43.79	27.65	117.59
127.00	0.62	17.21	5.81	45.52	28.68	121.24
128.00	0.62	14.87	6.72	39.01	24.78	107.47
129.00	0.62	12.56	7.96	32.63	20.93	93.88

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

130.00	0.62	21.25	4.71	56.89	35.42	145.00
131.00	0.62	22.12	4.52	59.35	36.87	150.12
132.00	0.63	15.35	6.51	40.34	25.58	110.29
133.00	0.63	14.47	6.91	37.90	24.12	105.12
134.00	0.63	14.50	6.90	37.98	24.17	105.29
135.00	0.63	12.50	8.00	32.47	20.83	93.53
136.00	0.63	14.23	7.03	37.23	23.72	103.71
137.00	0.64	17.24	5.80	45.61	28.73	121.41
138.00	0.64	20.01	5.00	53.38	33.35	137.71
139.00	0.65	20.53	4.87	54.85	34.22	140.76
140.00	0.65	25.80	3.88	69.84	43.00	171.76
141.00	0.66	23.96	4.17	64.58	39.93	160.94
142.00	0.66	18.91	5.29	50.29	31.52	131.24
143.00	0.67	26.45	3.78	71.70	44.08	175.59
144.00	0.67	16.58	6.03	43.76	27.63	117.53
145.00	0.68	23.95	4.18	64.55	39.92	160.88
146.00	0.68	22.93	4.36	61.65	38.22	154.88
147.00	0.69	25.01	4.00	67.58	41.68	167.12
148.00	0.69	21.36	4.68	57.20	35.60	145.65
149.00	0.69	30.10	3.32	82.19	50.17	197.06
150.00	0.70	23.77	4.21	64.04	39.62	159.82
151.00	0.70	25.06	3.99	67.72	41.77	167.41
152.00	0.70	14.40	6.94	37.70	24.00	104.71
153.00	0.70	21.72	4.60	58.22	36.20	147.76
154.00	0.71	17.21	5.81	45.52	28.68	121.24
155.00	0.71	18.19	5.50	48.27	30.32	127.00
156.00	0.71	4.36	22.94	10.66	7.27	45.65
157.00	0.72	25.32	3.95	68.46	42.20	168.94
158.00	0.72	51.40	1.95	144.71	85.67	322.35
159.00	0.72	21.64	4.62	57.99	36.07	147.29
160.00	0.72	37.06	2.70	102.41	61.77	238.00
161.00	0.72	30.07	3.33	82.11	50.12	196.88
162.00	0.73	31.30	3.19	85.66	52.17	204.12
163.00	0.73	25.65	3.90	69.41	42.75	170.88
164.00	0.73	32.45	3.08	88.99	54.08	210.88
165.00	0.74	32.59	3.07	89.40	54.32	211.71
166.00	0.74	15.97	6.26	42.06	26.62	113.94
167.00	0.74	44.81	2.23	125.17	74.68	283.59
168.00	0.74	28.92	3.46	78.79	48.20	190.12
169.00	0.75	29.35	3.41	80.03	48.92	192.65
170.00	0.75	31.58	3.17	86.47	52.63	205.76
171.00	0.75	32.86	3.04	90.18	54.77	213.29
172.00	0.75	33.10	3.02	90.88	55.17	214.71
173.00	0.76	25.05	3.99	67.69	41.75	167.35
174.00	0.76	21.10	4.74	56.46	35.17	144.12
175.00	0.76	32.03	3.12	87.78	53.38	208.41
176.00	0.77	21.93	4.56	58.81	36.55	149.00
177.00	0.77	25.16	3.97	68.01	41.93	168.00
178.00	0.77	37.07	2.70	102.44	61.78	238.06
179.00	0.78	28.40	3.52	77.30	47.33	187.06
180.00	0.78	25.24	3.96	68.24	42.07	168.47
181.00	0.78	27.33	3.66	74.22	45.55	180.76
182.00	0.78	25.23	3.96	68.21	42.05	168.41
183.00	0.79	25.74	3.89	69.66	42.90	171.41
184.00	0.79	29.78	3.36	81.27	49.63	195.18

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

185.00	0.79	28.49	3.51	77.56	47.48	187.59
186.00	0.79	29.30	3.41	79.89	48.83	192.35
187.00	0.79	35.66	2.80	98.32	59.43	229.76
188.00	0.80	22.75	4.40	61.14	37.92	153.82
189.00	0.80	48.22	2.07	135.26	80.37	303.65
190.00	0.80	33.16	3.02	91.05	55.27	215.06
191.00	0.80	16.40	6.10	43.26	27.33	116.47
192.00	0.80	36.75	2.72	101.50	61.25	236.18
193.00	0.80	25.58	3.91	69.21	42.63	170.47
194.00	0.80	37.50	2.67	103.69	62.50	240.59
195.00	0.81	29.73	3.36	81.13	49.55	194.88
196.00	0.81	19.80	5.05	52.79	33.00	136.47
197.00	0.81	21.93	4.56	58.81	36.55	149.00
198.00	0.81	29.80	3.36	81.33	49.67	195.29
199.00	0.81	40.33	2.48	111.98	67.22	257.24
200.00	0.82	34.15	2.93	93.93	56.92	220.88
201.00	0.82	28.83	3.47	78.53	48.05	189.59
202.00	0.82	39.16	2.55	108.55	65.27	250.35
203.00	0.82	29.84	3.35	81.44	49.73	195.53
204.00	0.82	32.00	3.13	87.69	53.33	208.24
205.00	0.82	27.11	3.69	73.59	45.18	179.47
206.00	0.83	27.65	3.62	75.14	46.08	182.65
207.00	0.83	24.80	4.03	66.98	41.33	165.88
208.00	0.83	19.52	5.12	52.00	32.53	134.82
209.00	0.83	20.05	4.99	53.50	33.42	137.94
210.00	0.84	21.75	4.60	58.30	36.25	147.94
211.00	0.84	20.60	4.85	55.05	34.33	141.18
212.00	0.84	20.35	4.91	54.34	33.92	139.71
213.00	0.84	13.83	7.23	36.13	23.05	101.35
214.00	0.84	24.72	4.05	66.75	41.20	165.41
215.00	0.85	17.17	5.82	45.41	28.62	121.00
216.00	0.85	12.53	7.98	32.55	20.88	93.71
217.00	0.85	16.30	6.13	42.98	27.17	115.88
218.00	0.85	15.06	6.64	39.53	25.10	108.59
219.00	0.86	9.30	10.75	23.75	15.50	74.71
220.00	0.86	19.82	5.05	52.85	33.03	136.59
221.00	0.86	16.80	5.95	44.38	28.00	118.82
222.00	0.86	18.30	5.46	48.57	30.50	127.65
223.00	0.87	14.84	6.74	38.92	24.73	107.29
224.00	0.87	14.80	6.76	38.81	24.67	107.06
225.00	0.87	13.21	7.57	34.42	22.02	97.71
226.00	0.88	15.50	6.45	40.75	25.83	111.18
227.00	0.88	12.18	8.21	31.59	20.30	91.65
228.00	0.88	13.66	7.32	35.66	22.77	100.35
229.00	0.89	11.19	8.94	28.88	18.65	85.82
230.00	0.90	8.01	12.48	20.28	13.35	67.12
231.00	0.90	8.35	11.98	21.19	13.92	69.12
232.00	0.90	14.28	7.00	37.37	23.80	104.00
233.00	0.91	15.28	6.54	40.14	25.47	109.88
234.00	0.91	22.99	4.35	61.82	38.32	155.24
235.00	0.91	14.43	6.93	37.79	24.05	104.88
236.00	0.91	18.61	5.37	49.44	31.02	129.47
237.00	0.92	16.72	5.98	44.15	27.87	118.35
238.00	0.92	16.51	6.06	43.57	27.52	117.12
239.00	0.92	13.91	7.19	36.35	23.18	101.82

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

240.00	0.93	15.31	6.53	40.23	25.52	110.06
241.00	0.93	11.07	9.03	28.55	18.45	85.12
242.00	0.93	11.95	8.37	30.96	19.92	90.29
243.00	0.94	17.23	5.80	45.58	28.72	121.35
244.00	0.94	12.82	7.80	33.35	21.37	95.41
245.00	0.94	19.22	5.20	51.16	32.03	133.06
246.00	0.94	18.10	5.52	48.01	30.17	126.47
247.00	0.95	18.84	5.31	50.09	31.40	130.82
248.00	0.95	14.71	6.80	38.56	24.52	106.53
249.00	0.95	22.21	4.50	59.61	37.02	150.65
250.00	0.95	20.16	4.96	53.81	33.60	138.59
251.00	0.96	18.96	5.27	50.43	31.60	131.53
252.00	0.96	17.61	5.68	46.64	29.35	123.59
253.00	0.97	18.41	5.43	48.88	30.68	128.29
254.00	0.97	15.83	6.32	41.67	26.38	113.12
255.00	0.98	23.04	4.34	61.96	38.40	155.53
256.00	0.98	17.48	5.72	46.28	29.13	122.82
257.00	0.98	13.88	7.20	36.27	23.13	101.65
258.00	0.99	12.25	8.16	31.78	20.42	92.06
259.00	0.99	13.47	7.42	35.14	22.45	99.24
260.00	1.00	15.29	6.54	40.17	25.48	109.94
261.00	1.00	12.26	8.16	31.81	20.43	92.12
262.00	1.01	17.82	5.61	47.23	29.70	124.82
263.00	1.01	14.39	6.95	37.68	23.98	104.65
264.00	1.02	8.99	11.12	22.92	14.98	72.88
265.00	1.02	10.93	9.15	28.17	18.22	84.29
266.00	1.02	10.39	9.62	26.70	17.32	81.12
267.00	1.03	8.19	12.21	20.77	13.65	68.18
268.00	1.03	8.57	11.67	21.79	14.28	70.41
269.00	1.04	8.55	11.70	21.73	14.25	70.29
270.00	1.04	8.73	11.45	22.22	14.55	71.35
271.00	1.05	9.04	11.06	23.05	15.07	73.18
272.00	1.06	9.53	10.49	24.37	15.88	76.06
273.00	1.06	13.63	7.34	35.58	22.72	100.18
274.00	1.06	10.74	9.31	27.65	17.90	83.18
275.00	1.07	11.42	8.76	29.51	19.03	87.18
276.00	1.07	9.64	10.37	24.67	16.07	76.71
277.00	1.08	9.24	10.82	23.59	15.40	74.35
278.00	1.09	8.97	11.15	22.86	14.95	72.76
279.00	1.09	7.14	14.01	17.96	11.90	62.00
280.00	1.10	7.16	13.97	18.02	11.93	62.12
281.00	1.11	4.91	20.37	12.09	8.18	48.88
282.00	1.12	6.97	14.35	17.51	11.62	61.00
283.00	1.12	8.80	11.36	22.40	14.67	71.76
284.00	1.13	5.45	18.35	13.50	9.08	52.06
285.00	1.14	5.78	17.30	14.37	9.63	54.00
286.00	1.15	6.68	14.97	16.74	11.13	59.29
287.00	1.16	6.88	14.53	17.27	11.47	60.47
288.00	1.17	4.87	20.53	11.99	8.12	48.65
289.00	1.19	4.79	20.88	11.78	7.98	48.18
290.00	1.20	5.13	19.49	12.66	8.55	50.18
291.00	1.22	5.57	17.95	13.82	9.28	52.76
292.00	1.23	5.98	16.72	14.89	9.97	55.18
293.00	1.24	7.56	13.23	19.08	12.60	64.47
294.00	1.25	5.21	19.19	12.87	8.68	50.65

ALLIED EXPLORATION GEOTECHNICS LTD.
PANDA PROBE TABULATED DATA AND DERIVED PARAMETERS

295.00	1.25	5.12	19.53	12.64	8.53	50.12
296.00	1.26	4.95	20.20	12.20	8.25	49.12
297.00	1.27	4.34	23.04	10.61	7.23	45.53
298.00	1.28	6.19	16.16	15.45	10.32	56.41
299.00	1.28	2.92	34.25	6.98	4.87	37.18
300.00	1.29	3.34	29.94	8.05	5.57	39.65
301.00	1.30	3.23	30.96	7.77	5.38	39.00
302.00	1.31	3.36	29.76	8.10	5.60	39.76
303.00	1.32	3.62	27.62	8.76	6.03	41.29
304.00	1.33	3.51	28.49	8.48	5.85	40.65
305.00	1.34	3.40	29.41	8.20	5.67	40.00
306.00	1.35	3.27	30.58	7.87	5.45	39.24
307.00	1.37	2.55	39.22	6.05	4.25	35.00
308.00	1.39	2.26	44.25	5.32	3.77	33.29
309.00	1.42	1.65	60.61	3.82	2.75	29.71
310.00	1.47	1.16	86.21	2.63	1.93	26.82
311.00	1.51	1.26	79.37	2.87	2.10	27.41
312.00	1.56	1.46	68.49	3.36	2.43	28.59
313.00	1.61	1.51	66.23	3.48	2.52	28.88
314.00	1.66	1.41	70.92	3.23	2.35	28.29
315.00	1.70	1.90	52.63	4.43	3.17	31.18
316.00	1.73	2.30	43.48	5.42	3.83	33.53
317.00	1.74	9.76	10.25	24.99	16.27	77.41
318.00	1.74	46.05	2.17	128.83	76.75	290.88
319.00	1.75	3.13	31.95	7.51	5.22	38.41
320.00	1.76	3.25	30.77	7.82	5.42	39.12
321.00	1.77	2.39	41.84	5.65	3.98	34.06
322.00	1.79	2.58	38.76	6.12	4.30	35.18
323.00	1.81	2.51	39.84	5.95	4.18	34.76
324.00	1.82	2.54	39.37	6.02	4.23	34.94
325.00	1.84	2.19	45.66	5.15	3.65	32.88
326.00	1.86	2.51	39.84	5.95	4.18	34.76
327.00	1.87	2.34	42.74	5.52	3.90	33.76
328.00	1.88	1.95	51.28	4.56	3.25	31.47
329.00	1.89	2.26	44.25	5.32	3.77	33.29
330.00	1.90	1.82	54.95	4.24	3.03	30.71
331.00	1.91	1.85	54.05	4.31	3.08	30.88
332.00	1.92	1.79	55.87	4.16	2.98	30.53
333.00	1.94	2.28	43.86	5.37	3.80	33.41
334.00	1.95	1.66	60.24	3.84	2.77	29.76
335.00	1.96	1.87	53.48	4.36	3.12	31.00
336.00	1.98	2.22	45.05	5.23	3.70	33.06
337.00	2.00	1.76	56.82	4.09	2.93	30.35
338.00	2.02	1.25	80.00	2.85	2.08	27.35
339.00	2.03	1.44	69.44	3.31	2.40	28.47
340.00	2.05	1.62	61.73	3.75	2.70	29.53

LABORATORY ENCLOSURES

ENCLOSURE 0

Laboratory Report Certificate

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 3874700 Fax: 0191 3874710
Regional Office: Unit 2B Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01722 735 300 Fax: 01722 735 999



LABORATORY REPORT CERTIFICATE



Contract Title: Trinity South Residential Development, South Shields – Ground Investigation AEG Reference: 3842

Client Address: South Tyneside Council
Town Hall and Civic Offices
Westoe Road
South Shields
Tyne & Wear
NE33 2RL

Client Reference:

We certify that Laboratory testing was carried out on samples from the above contract in accordance with techniques outlined in BS 1377: 1990 or other appropriate standards as quoted. The samples were received from September 2011 and the following results, given on the attached enclosures, were obtained.

The tests carried out are indicated in the attached table showing the enclosure number and the total number of pages.

For and on behalf of Allied Exploration & Geotechnics Limited

- Nick Vater (Technical Director)
- Kevin Warriner (HSE & Quality Director)
- Michelle Selkirk (Laboratory Manager)
- Keith Gargett (Laboratory Supervisor)

Signed

Date: 14 October 2011

Tests marked not UKAS accredited in this certificate are not included in the UKAS accreditation schedule for our laboratory. Any opinions and interpretations expressed herein are outside the scope of the laboratory's UKAS accreditation.

Please note the material was derived from samples taken outside the control of the laboratory.

LABORATORY REPORT CERTIFICATE

ENCLOSURES

Enclosure Number	Description	UKAS Accredited	Reference	No. of Pages
0	Laboratory Report Certificate	N/A		3
1	Sample Description Sheets	N/A		2
2	Moisture Content	Yes	BS 1377 Part 2 1990	1
2	Plasticity Index and Moisture Content	Yes	BS 1377 Part 2 1990	1
-	Determination of Density by Linear Measurement	Yes	BS 1377 Part 2 1990	-
-	Determination of Particle Density	Yes	BS 1377 Part 2 1990	-
-	Particle Size Distribution Sieving	Yes	BS 1377 Part 2 1990	-
-	Particle Size Distribution Sedimentation	No	BS 1377 Part 2 1990	-
3	Determination of Sulphate and pH (Tested externally)	No	BS 1377 Part 3 1990	6
4	Determination of Dry Density/Moisture Content Relationship	Yes	BS 1377 Part 4 1990	10
-	Determination of Dry Density/Moisture/CBR Relationship	Yes	BS 1377 Part 4 1990	-
-	Determination of Moisture Condition Value	Yes	BS 1377 Part 4 1990	-
-	Determination of MCV / Moisture Relationship	Yes	BS 1377 Part 4 1990	-
-	Determination of California Bearing Ratio	Yes	BS 1377 Part 4 1990	-
5	Determination of One Dimensional Consolidation Properties	Yes	BS 1377 Part 5 1990	16
-	Determination of Permeability (Falling Head)	Yes	<i>In-house Method</i>	-
-	Determination of Permeability in a Triaxial Cell	No	BS 1377 Part 6 1990	-
-	Shear Strength by Hand Vane	No	BS 1377 Part 7 1990	-
-	Shear Strength by Direct Shear	Yes	BS 1377 Part 7 1990	-
-	Determination of Residual Strength using Ring Shear Apparatus	No	BS 1377 Part 7 1990	-
6	Undrained Shear Strength in Triaxial Cell without Pore Water Pressure Measurement	Yes	BS 1377 Part 7 1990	1
-	Consolidated Undrained Shear Strength in Triaxial Cell with Measurement of Pore Pressure	No	BS 1377 Part 8 1990	-
-	Consolidated Drained Shear Strength in Triaxial Cell with Measurement of Volume Change	No	BS 1377 Part 8 1990	-
7	Determination of Point Load Index	Yes	ISRM 1985	1
8	Determination of Unconfined Compressive Strength (Tested externally)	No	ISRM 1985	3

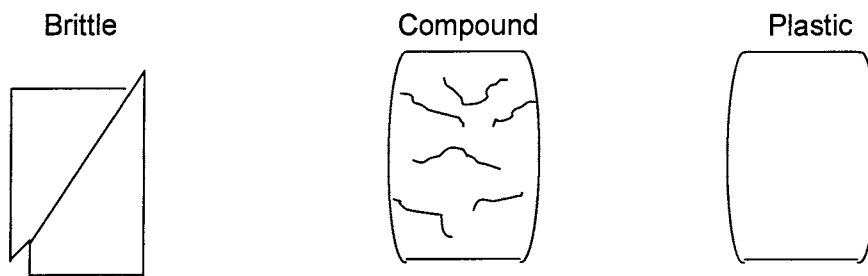
LABORATORY REPORT CERTIFICATE

ABBREVIATIONS

All the abbreviations used on the laboratory certificates are given below:

Br	Brittle	PSD	Particle Size Distribution by sieve analysis
C	Compound	SB	Shear Box
CBR	California Bearing Ratio	SED	Sedimentation Analysis
CDT	Consolidated Drained Triaxial	SO3	Sulphate (total, water extract, groundwater)
CL	Chloride content (water or soil)	CP2	Dry Density/Moisture Content 2.5kg rammer
US	Unsuitable sample for test	CP4	As above using 4.5kg rammer
UUT	Undrained Unconsolidated Triaxial	CPV	As above using vibrating hammer
HSV	Vane Test	CUT	Consolidated Undrained Triaxial
IS	Insufficient sample for test	R	Remoulded
LOI	Loss On Ignition	U	Undisturbed
M	Multi-stage testing	MC	Moisture Content
MCV	Moisture Content Value	PL	Point Load
NAT	Natural preparation method	NMC	Natural (or as received) moisture content
P	Plastic	PFH	Permeability Falling Head Method
OED	Oedometer	PTXL	Permeability in Triaxial Cell
OMC	Optimum Moisture Content	ORG	Organic content
B	Large disturbed (bulk) sample	PD	Particle Density (SG)
J	Small disturbed (jar) sample	PI	Liquid limit, plastic limit and plasticity index

Typical Mode of Failure for Triaxial Testing



ENCLOSURE 1

Sample Description Sheets

ALLIED EXPLORATION & GEOTECHNICS LIMITED

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Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth	ID	Description	Laboratory Tests/Remarks
CBH-01	0.20	B2	MADE GROUND(Brown sandy gravelly clay with a medium cobble content and occasional rootlets. Gravel includes brick fragments).	SO4+pH
CBH-01	1.50	B6	MADE GROUND(Brown clayey very sandy gravel including brick fragments).	MC SO4+pH
CBH-01	3.20	B9	Brown with grey mottling sandy gravelly CLAY.	MC SO4+pH
CBH-01	4.20	B12	Brown with grey mottling slightly organic slightly sandy slightly gravelly CLAY.	SO4+pH
CBH-01	4.50	U13	High strength brown with grey mottling slightly sandy CLAY of high plasticity.	MC PI UUT OED
CBH-02	4.00	U12	High strength brown with grey mottling slightly sandy CLAY of high plasticity.	MC PI UUT
CBH-02	5.50	U18	High strength brown slightly sandy slightly gravelly CLAY with some sand bands.	UUT
CBH-02	7.50	U22	High strength brown slightly sandy gravelly CLAY.	UUT
CBH-03	4.70	U13	High strength brown with grey veining slightly sandy CLAY of high plasticity.	MC PI UUT OED
CBH-03	6.20	U17	Very high strength brown slightly sandy slightly gravelly CLAY.	UUT
CBH-04	0.60	B3	MADE GROUND(Brown sandy gravelly clay. Gravel includes brick fragments).	SO4+pH
CBH-04	1.20	B5	MADE GROUND(Brown sandy gravelly clay. Gravel includes brick fragments).	MC SO4+pH
CBH-04	2.20	B7	MADE GROUND(Grey/brown sandy slightly gravelly clay).	MC SO4+pH
CBH-04	3.20	U9	Medium strength brown with grey mottling slightly sandy CLAY of high plasticity.	MC PI UUT OED SO4+pH
CBH-04	4.20	U13	High strength brown with grey veining slightly sandy CLAY of intermediate to high plasticity.	MC PI UUT OED
CBH-04	6.20	U19	Extremely high strength brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI UUT
CBH-04	8.20	U24	Very high strength brown slightly sandy gravelly CLAY.	UUT
CBH-05	3.20	U10	Medium strength brown with grey mottling slightly sandy CLAY of high plasticity.	MC PI UUT OED
CBH-05	4.20	U14	High strength brown with grey veining slightly sandy CLAY of high plasticity.	MC PI UUT OED
CBH-06	0.70	B4	MADE GROUND(Brown very sandy gravel includes brick fragments).	SO4+pH
CBH-06	1.70	B7	MADE GROUND(Brown sandy gravelly clay. Gravel includes brick fragments).	SO4+pH

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



Signed :- [REDACTED]

Name :- **M. SELKIRK**

Page 1 of 2

Date of issue :- **14/10/2011**

Certificate No :- **SD/3842/1**

AEG Contract No. :- **3842**



ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

LABORATORY SAMPLE DESCRIPTION SHEET

Exploratory Hole No.	Sample Depth	ID	Description	Laboratory Tests/Remarks
CBH-06	3.20	U10	High strength brown silty slightly sandy CLAY of intermediate plasticity.	MC PI UUT OED
CBH-06	4.20	U14	High strength brown slightly sandy slightly gravelly CLAY of low plasticity.	MC PI UUT OED
CBH-06	6.20	U20	High strength brown slightly sandy slightly gravelly CLAY.	UUT
CBH-07	0.20	B2	MADE GROUND(Brown sandy slightly gravelly clay with occasional organic matter. Gravel includes brick fragments).	SO4+pH
CBH-07	1.70	B6	MADE GROUND(Brown with grey mottling slightly sandy slightly gravelly clay. Gravel includes brick fragments).	MC SO4+pH
CBH-07	2.70	B8	Laminated brown CLAY with pockets of gravelly sand.	SO4+pH
CBH-07	3.20	U9	Brown gravelly SAND.	SO4+pH
CBH-07	3.70	B11	Brown sandy gravelly CLAY.	SO4+pH
CWS-01	0.30	B1	MADE GROUND(Brown slightly sandy gravelly clay with occasional rootlets. Gravel includes slag, brick and ceramic fragments).	MC CP2
CWS-04	0.50	B2	MADE GROUND(Brown slightly sandy gravelly clay with a low cobble content and occasional rootlets. Gravel includes glass, slag, concrete, brick and ceramic fragments).	MC CP2
CWS-06	0.50	B2	MADE GROUND(Dark brown slightly sandy gravelly clay with a low cobble content and occasional rootlets. Gravel includes slag, concrete, brick and ceramic fragments).	MC CP2
CWS-11	0.50	B2	MADE GROUND(Brown slightly sandy gravelly clay with a low cobble content and occasional rootlets. Gravel includes wood, concrete and ceramic fragments).	MC CP2
CWS-12	0.50	B2	MADE GROUND(Dark brown gravelly sand with occasional clay pockets and occasional rootlets. Gravel includes ash, slag and brick fragments).	MC CP2
HTP-01	0.20	LB	MADE GROUND(Dark grey/brown slightly sandy slightly gravelly clay with occasional rootlets. Gravel includes glass and brick fragments).	MC CP2
HTP-01	0.70	LB	MADE GROUND(Dark brown sandy slightly gravelly clay with occasional rootlets. Gravel includes slag, metal, brick and ceramic fragments).	MC CP2
HTP-03	0.50	LB	MADE GROUND(Brown/grey slightly sandy gravelly clay. Gravel includes slag, concrete, glass and brick fragments).	MC CP2
HTP-04	0.50	LB	MADE GROUND(Brown slightly gravelly sand with occasional clay pockets and occasional rootlets. Gravel includes brick and ceramic fragments).	MC CP2
HTP-05	0.50	LB	MADE GROUND(Dark brown gravelly sand with a low cobble content, occasional clay pockets and occasional rootlets. Gravel includes slag, ash, glass, brick and ceramic fragments).	MC CP2

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Client :- **South Tyneside Council**



Signed :- [REDACTED]

Name :- **M. SELKIRK**

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Date of issue :-
14/10/2011

Certificate No :-
SD/3842/2

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ENCLOSURE 2

Moisture Content/Plasticity Index and Moisture Content

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MOISTURE CONTENT CERTIFICATE

BS 1377 : Part 2 : Clause 3.2

Exploratory Hole No.	Sample Depth (m)	Sample ID	Moisture Content (%)	Date Tested	Remarks
CBH-01	1.50	B6	9.8	05/10/2011	
CBH-01	3.20	B9	20.6	05/10/2011	
CBH-04	1.20	B5	19.7	05/10/2011	
CBH-04	2.20	B7	30.0	05/10/2011	
CBH-07	1.70	B6	19.1	05/10/2011	
CWS-01	0.30	B1	9.0	03/10/2011	
CWS-04	0.50	B2	11.8	03/10/2011	
CWS-06	0.50	B2	10.9	03/10/2011	
CWS-11	0.50	B2	8.5	03/10/2011	
CWS-12	0.50	B2	11.3	04/10/2011	
HTP-01	0.20	LB	15.9	04/10/2011	
HTP-01	0.70	LB	14.7	07/10/2011	
HTP-03	0.50	LB	14.9	07/10/2011	
HTP-04	0.50	LB	14.7	07/10/2011	
HTP-05	0.50	LB	9.7	04/10/2011	

For description of sample please refer to the Laboratory Sample Description Sheet

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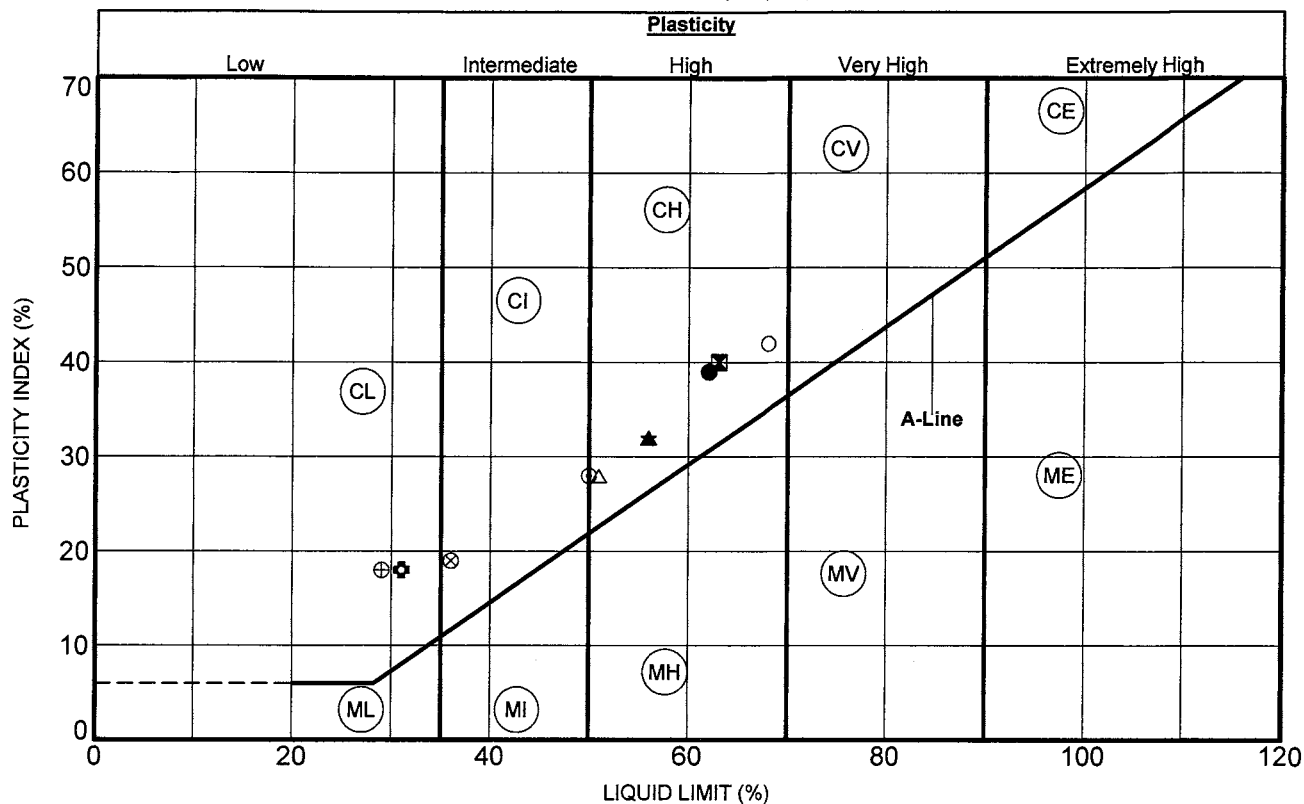
	Signed :- 	Name :- M. SELKIRK	Page 1 of 1
	Date of issue :- 14/10/2011	Certificate No :- MC/3842/1	AEG Contract No. :- 3842

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ATTERBERG LIMITS & NATURAL MOISTURE CONTENT

Test Method :- BS 1377 : Part 2 : Clause 3.2, 4.1, 4.3, 4.4 & 5.3 : 1990



Specimen Identification	LL	PL	PI	I _c	<0.425mm (%)	m/c (%)	Date Tested		
● CBH-01	4.50	U13	62	23	39	0.85	NAT	28.8	05/10/2011
▣ CBH-02	4.00	U12	63	23	40	0.84	NAT	29.4	05/10/2011
▲ CBH-03	4.70	U13	56	24	32	0.82	NAT	29.7	05/10/2011
★ CBH-04	3.20	U9	56	24	32	0.94	NAT	25.9	05/10/2011
⊙ CBH-04	4.20	U13	50	22	28	0.86	NAT	25.8	05/10/2011
⊕ CBH-04	6.20	U19	31	13	18	1.17	68	9.9	05/10/2011
○ CBH-05	3.20	U10	68	26	42	0.89	NAT	30.5	06/10/2011
△ CBH-05	4.20	U14	51	23	28	0.86	NAT	26.8	06/10/2011
⊗ CBH-06	3.20	U10	36	17	19	0.66	NAT	23.4	06/10/2011
⊕ CBH-06	4.20	U14	29	11	18	0.82	NAT	14.2	06/10/2011

For description of sample please refer to the Laboratory Sample Description Sheet. # = Insufficient for 4 point PI

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Name :- M. SELKIRK

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Certificate No :- PI/3842/1

AEG Contract No :- 3842



ENCLOSURE 3

Determination of Total Sulphate and pH
(Tested Externally)



2139

Certificate of Analysis

Date: 14/10/2011

Certificate Number: 11-54494

Client: Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference: 11-54494

Client Reference: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

Description: 15 soil samples

Date Received: 05 October 2011

Date Started: 06 October 2011

Date Completed: 14 October 2011

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: Observations and interpretations are outside the scope of UKAS accreditation

Approved By: 
Paul Woodbridge, Senior Operations Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Information in Support of the Analytical Results

Analysis

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425um sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample.

Key

- * Denotes test not included in laboratory scope of accreditation
- # Denotes test that holds MCERTS accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
- \$ Denotes tests completed by an approved subcontractor
- I/S Denotes insufficient sample to carry out test
- U/S Denotes that the sample is not suitable for testing

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month

Liquids - 2 weeks

Asbestos (test portion) - 6 months

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-54494

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

				Lab No.	360208	360209	360210	360211	360212
				Sample ID	CBH-01	CBH-01	CBH-01	CBH-01	CBH-04
				Depth	0.20	1.50	3.20	4.20	0.60
				Sample Ref	2	6	9	12	3
				Sample Type	B	B	B	B	B
				Sampling Date	//	//	//	//	//
				Sampling Time					
Test	Units	DETSxx	LOD						
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	10	320	180	300	590	640	
pH		DETS 008#		9.4	10.2	8.5	7.9	8.9	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-54494

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground

				Lab No.	360213	360214	360215	360216	360217
				Sample ID	CBH-04	CBH-04	CBH-04	CBH-06	CBH-06
				Depth	1.20	2.20	3.20	0.70	1.70
				Sample Ref	5	7	9	4	7
				Sample Type	B	B	U	B	B
				Sampling Date	//	//	//	//	//
				Sampling Time					
Test	Units	DETSxx	LOD						
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	10	710	530	88	120	1700	
pH		DETS 008#		8.5	8.2	8.4	8.5	7.3	

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-54494

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground

			Lab No.	360218	360219	360220	360221	360222
			Sample ID	CBH-07	CBH-07	CBH-07	CBH-07	CBH-07
			Depth	0.20	1.70	2.70	3.20	3.70
			Sample Ref	2	6	8	9	11
			Sample Type	B	B	B	U	B
			Sampling Date	//	//	//	//	//
			Sampling Time					
Test	Units	DETSxx	LOD					
Sulphate Aqueous Extract as SO4	mg/l	DETS 076#	10	610	890	360	120	150
pH		DETS 008#		8.3	8.4	8.4	8.4	8.8

Sample Comments

(The laboratory cannot be held responsible for the integrity of sample(s) received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note "Guidance on Deviating Samples".)

Lab No.	Sample ID	Date Sampled	Sample exceeded holding time for test	Sample not received in appropriate containers for test
360208	CBH-01 0.20	-	Cannot evaluate without date sampled.	ICP Metals
360208	CBH-01 0.20	-	Cannot evaluate without date sampled.	METERS
360209	CBH-01 1.50	-	Cannot evaluate without date sampled.	ICP Metals
360209	CBH-01 1.50	-	Cannot evaluate without date sampled.	METERS
360210	CBH-01 3.20	-	Cannot evaluate without date sampled.	ICP Metals
360210	CBH-01 3.20	-	Cannot evaluate without date sampled.	METERS
360211	CBH-01 4.20	-	Cannot evaluate without date sampled.	ICP Metals
360211	CBH-01 4.20	-	Cannot evaluate without date sampled.	METERS
360212	CBH-04 0.60	-	Cannot evaluate without date sampled.	ICP Metals
360212	CBH-04 0.60	-	Cannot evaluate without date sampled.	METERS
360213	CBH-04 1.20	-	Cannot evaluate without date sampled.	ICP Metals
360213	CBH-04 1.20	-	Cannot evaluate without date sampled.	METERS
360214	CBH-04 2.20	-	Cannot evaluate without date sampled.	ICP Metals
360214	CBH-04 2.20	-	Cannot evaluate without date sampled.	METERS
360215	CBH-04 3.20	-	Cannot evaluate without date sampled.	ICP Metals
360215	CBH-04 3.20	-	Cannot evaluate without date sampled.	METERS
360216	CBH-06 0.70	-	Cannot evaluate without date sampled.	ICP Metals
360216	CBH-06 0.70	-	Cannot evaluate without date sampled.	METERS
360217	CBH-06 1.70	-	Cannot evaluate without date sampled.	ICP Metals
360217	CBH-06 1.70	-	Cannot evaluate without date sampled.	METERS
360218	CBH-07 0.20	-	Cannot evaluate without date sampled.	ICP Metals
360218	CBH-07 0.20	-	Cannot evaluate without date sampled.	METERS
360219	CBH-07 1.70	-	Cannot evaluate without date sampled.	ICP Metals
360219	CBH-07 1.70	-	Cannot evaluate without date sampled.	METERS
360220	CBH-07 2.70	-	Cannot evaluate without date sampled.	ICP Metals
360220	CBH-07 2.70	-	Cannot evaluate without date sampled.	METERS
360221	CBH-07 3.20	-	Cannot evaluate without date sampled.	ICP Metals
360221	CBH-07 3.20	-	Cannot evaluate without date sampled.	METERS
360222	CBH-07 3.70	-	Cannot evaluate without date sampled.	ICP Metals
360222	CBH-07 3.70	-	Cannot evaluate without date sampled.	METERS

ENCLOSURE 4

Determination of Dry Density/Moisture Content Relationship

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- CWS-01

Depth (mBGL) :- 0.30

Sample Type & No :- B1

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = 11.2

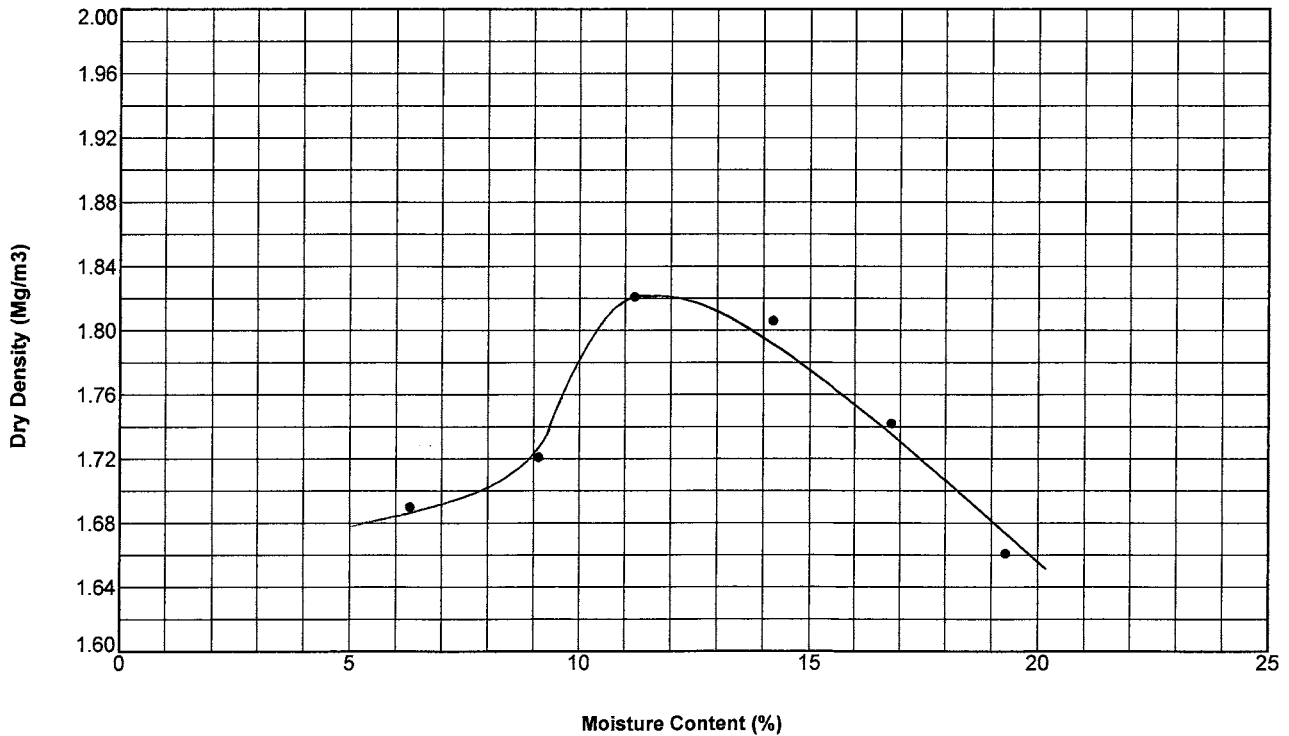
Particle Density (Assumed) = 2.65

Maximum Dry Density (Mg/m³) = 1.82

Retained on 20mm Sieve (%) = 11.9

Date Tested = 03/10/2011

Retained on 37.5mm Sieve (%) = 4.5



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation

Client :- South Tyneside Council



Signed :-



Name :-

M. SELKIRK

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Date of issue :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **CWS-04**

Depth (mBGL) :- **0.50**

Sample Type & No :- **B2**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **15.9**

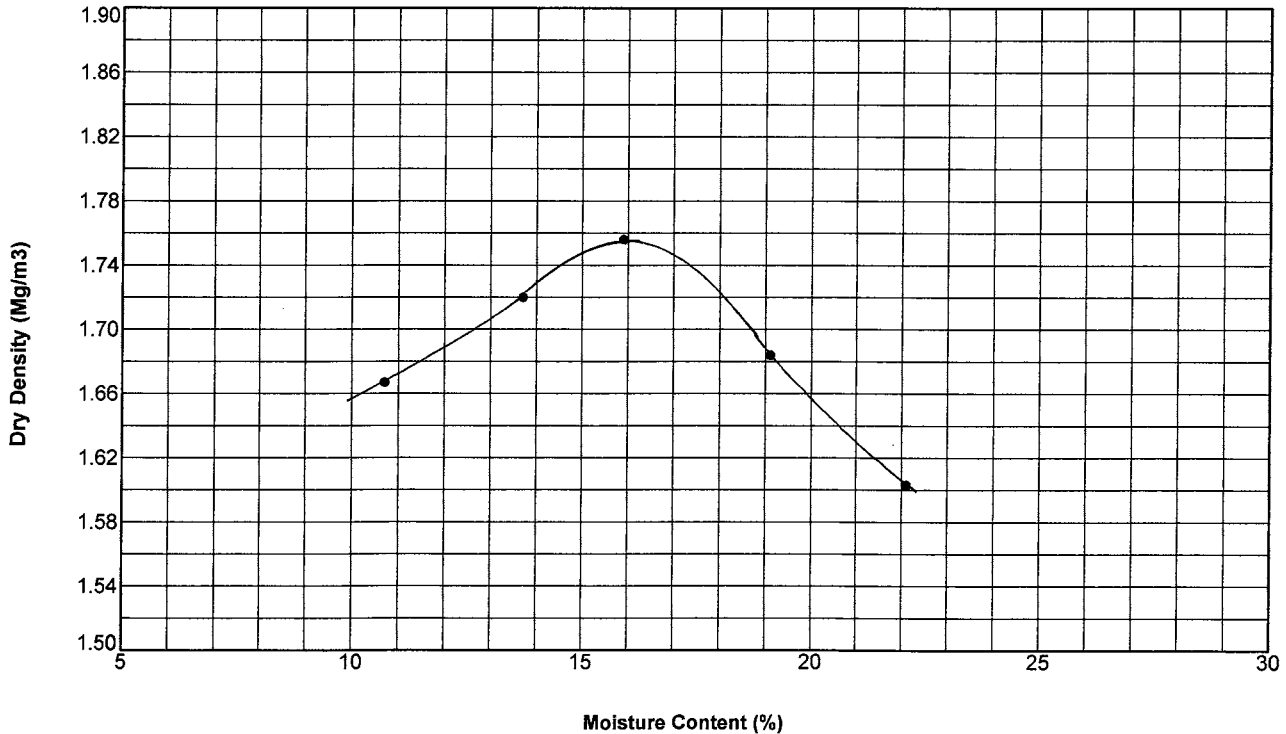
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.76**

Retained on 20mm Sieve (%) = **10.9**

Date Tested = **03/10/2011**

Retained on 37.5mm Sieve (%) = **5.2**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :-
Trinity South Residential Development, South Shields - Ground Investigation

Client :-
South Tyneside Council



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M. SELKIRK

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **CWS-06**

Depth (mBGL) :- **0.50**

Sample Type & No :- **B2**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **15.0**

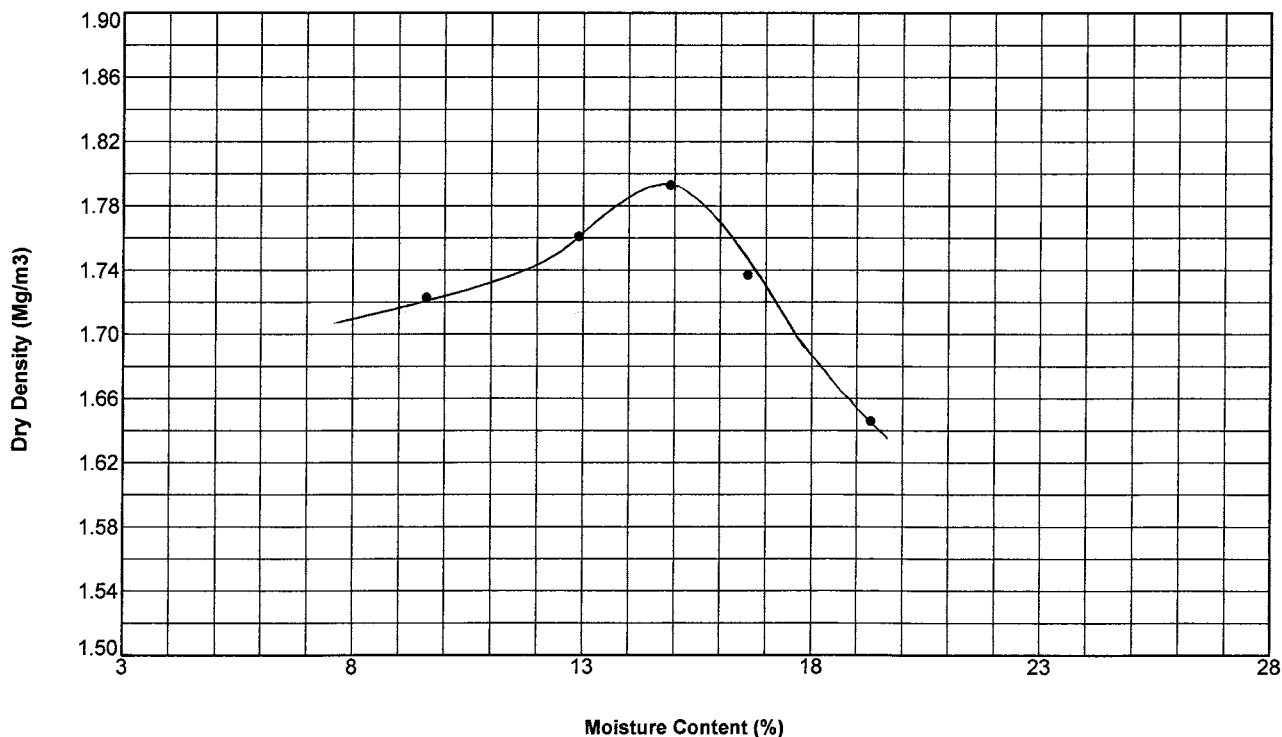
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.77**

Retained on 20mm Sieve (%) = **13.0**

Date Tested = **03/10/2011**

Retained on 37.5mm Sieve (%) = **6.0**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



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M SELKIRK

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **CWS-11**

Depth (mBGL) :- **0.50**

Sample Type & No :- **B2**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **11.4**

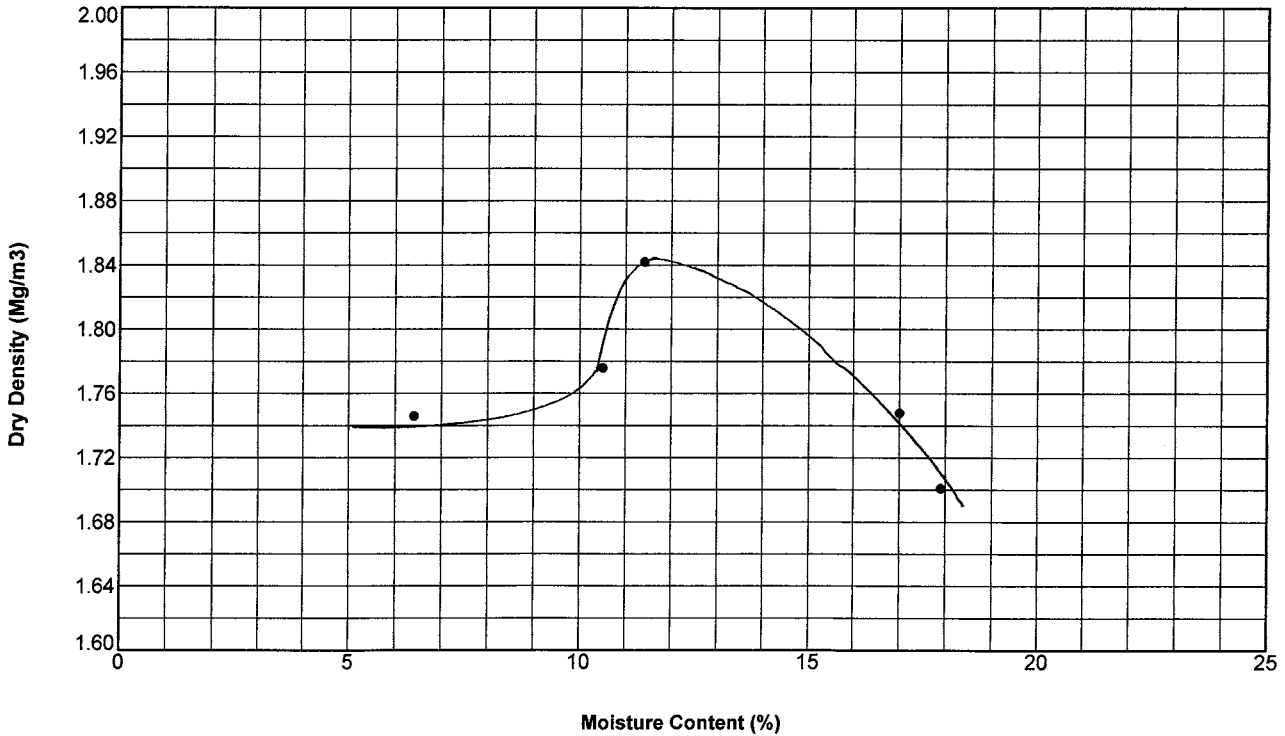
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.84**

Retained on 20mm Sieve (%) = **22.9**

Date Tested = **03/10/2011**

Retained on 37.5mm Sieve (%) = **16.4**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **CWS-12**

Depth (mBGL) :- **0.50**

Sample Type & No :- **B2**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **18.5**

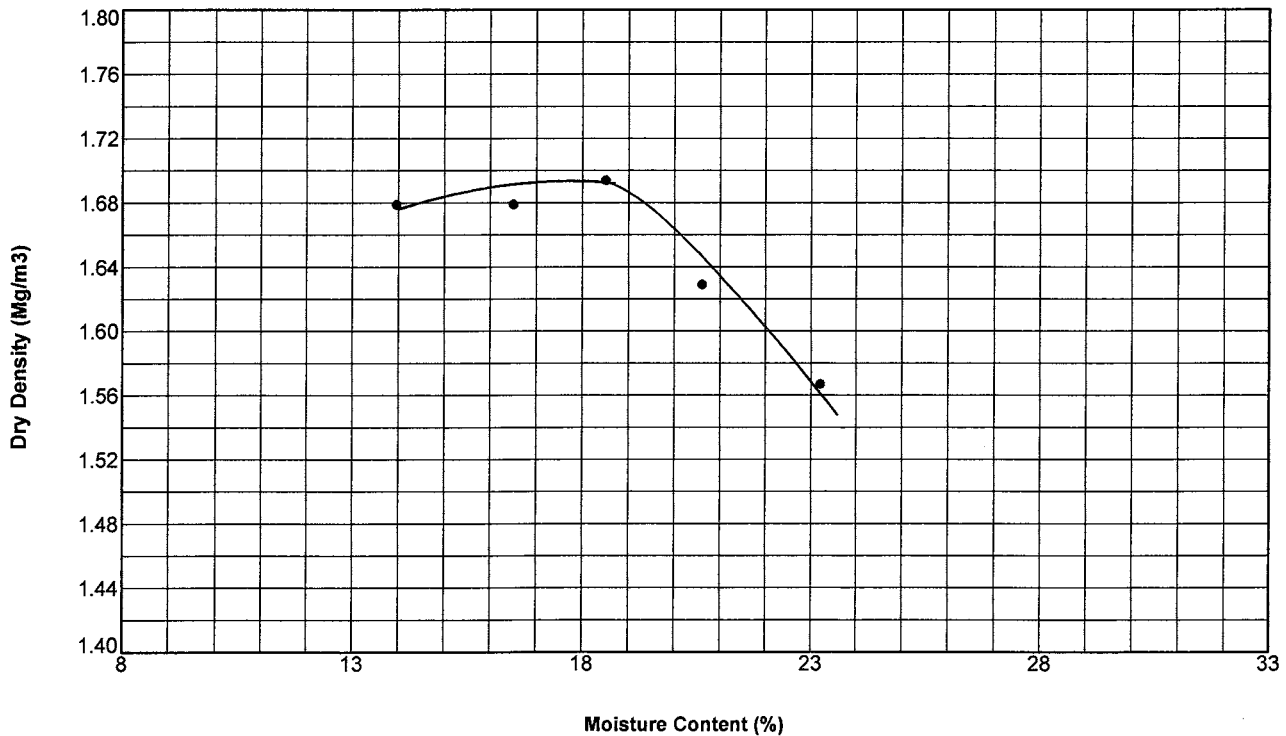
Particle Density (Assumed) = **2.65**

Maximum Dry Density (Mg/m³) = **1.69**

Retained on 20mm Sieve (%) = **11.7**

Date Tested = **04/10/2011**

Retained on 37.5mm Sieve (%) = **3.9**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



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Name :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **HTP-01**

Depth (mBGL) :- **0.20**

Sample Type & No :- **LB**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **17.9**

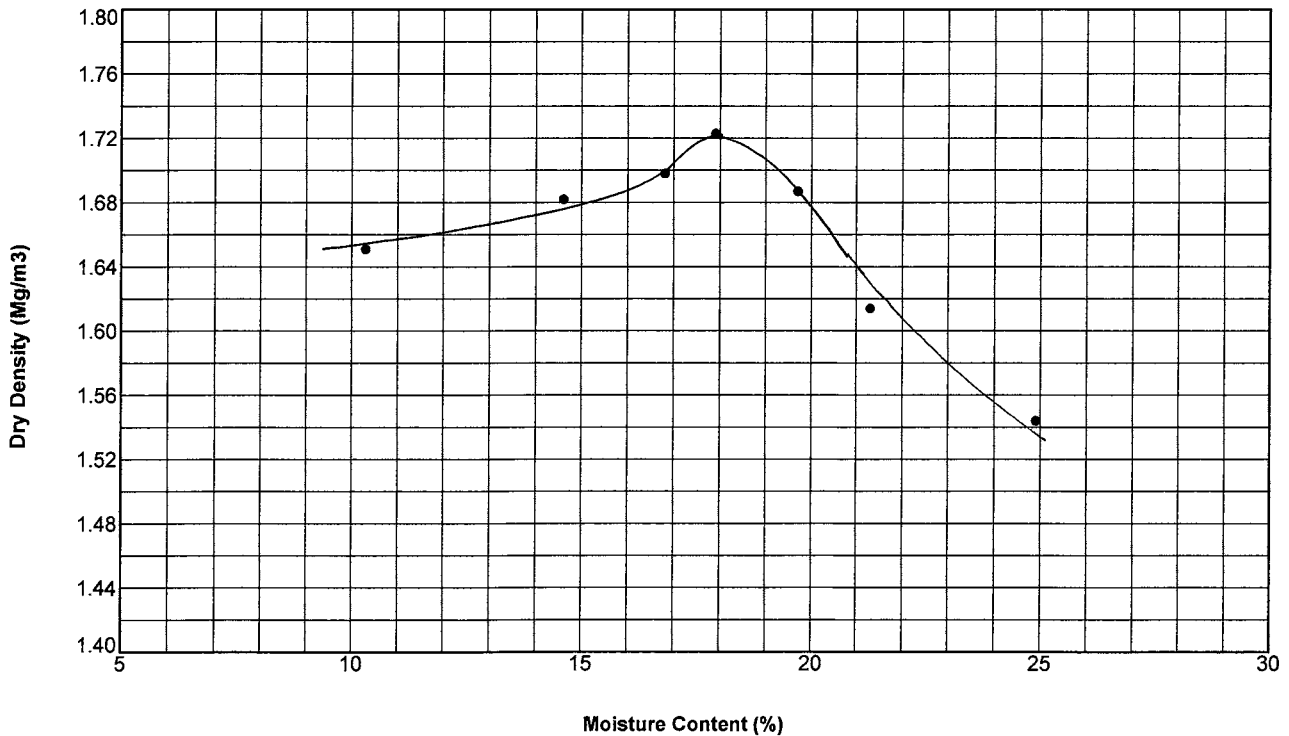
Particle Density (Assumed) = **2.65**

Maximum Dry Density (Mg/m³) = **1.72**

Retained on 20mm Sieve (%) = **8.8**

Date Tested = **04/10/2011**

Retained on 37.5mm Sieve (%) = **4.7**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



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Name :-

M. DELKING

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **HTP-01**

Depth (mBGL) :- **0.70**

Sample Type & No :- **LB**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **13.3**

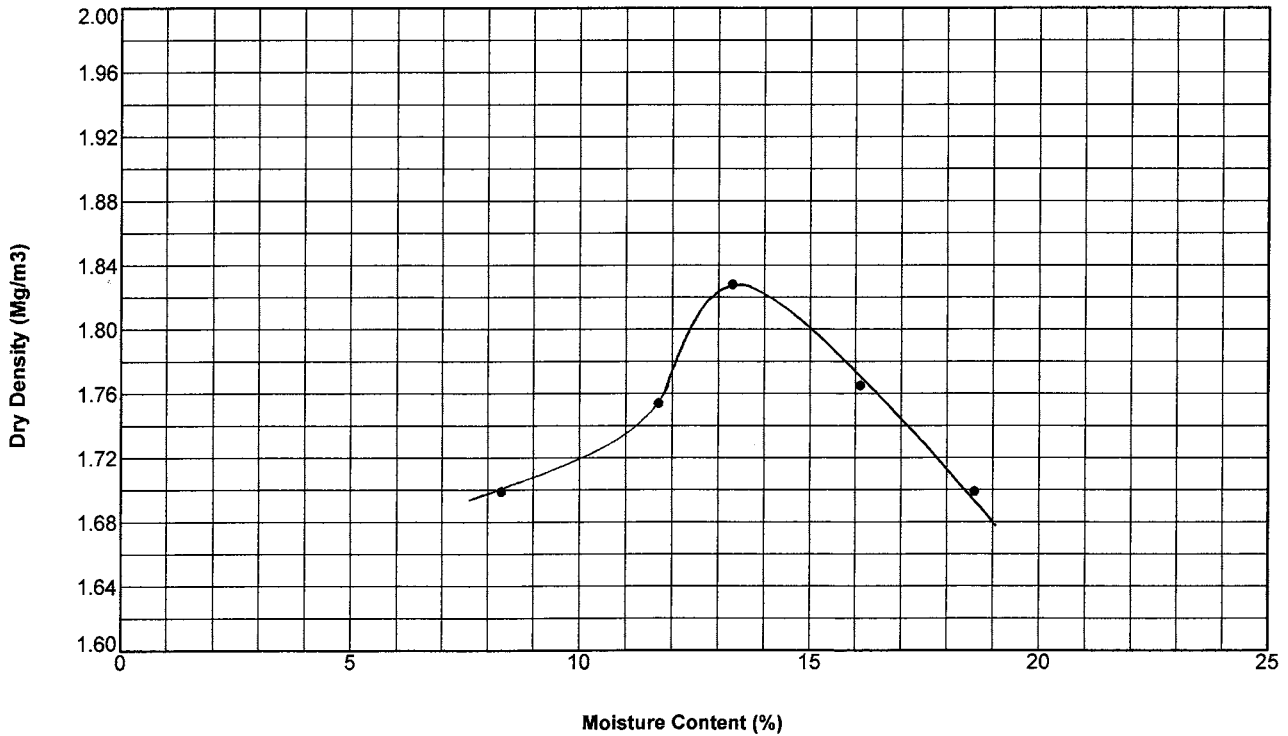
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.83**

Retained on 20mm Sieve (%) = **7.6**

Date Tested = **07/10/2011**

Retained on 37.5mm Sieve (%) = **2.8**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



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M. SELKIRK

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **HTP-03**

Depth (mBGL) :- **0.50**

Sample Type & No :- **LB**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **14.2**

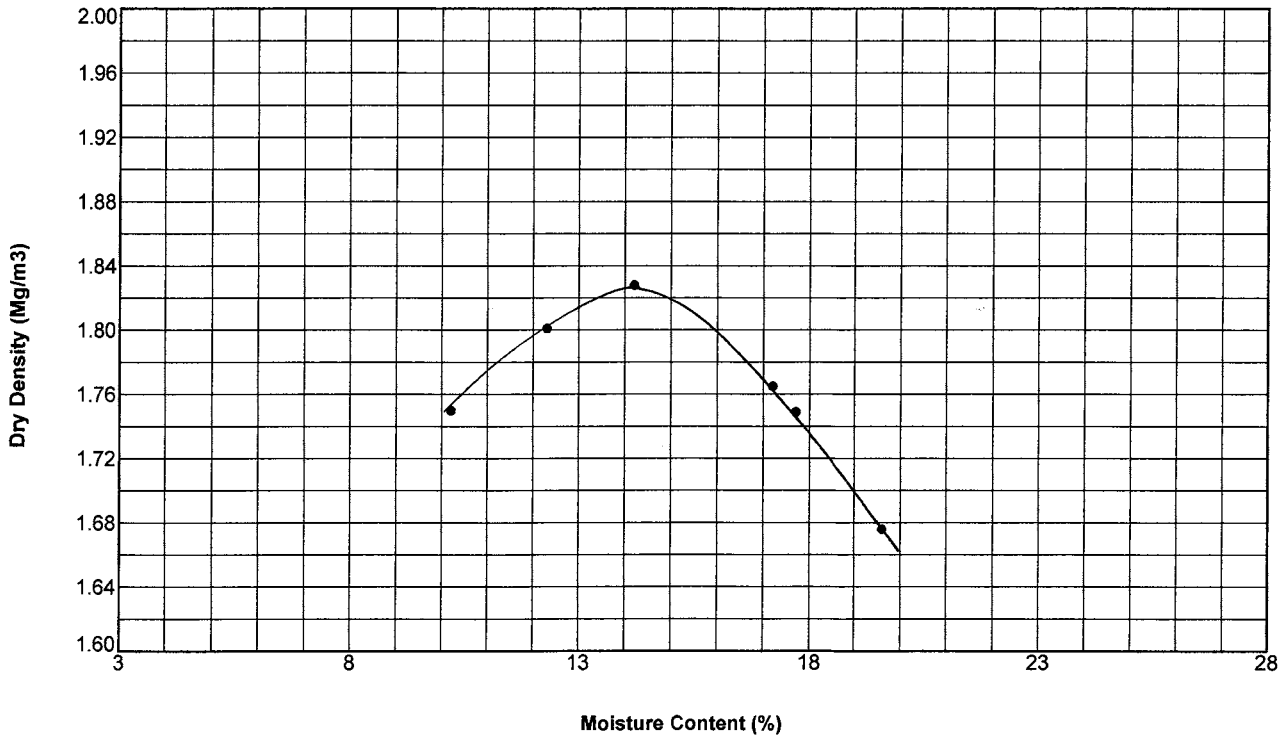
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.83**

Retained on 20mm Sieve (%) = **13.6**

Date Tested = **07/10/2011**

Retained on 37.5mm Sieve (%) = **6.6**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



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Name :-

M. SELKIRK

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Date of issue :-

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MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **HTP-04**

Depth (mBGL) :- **0.50**

Sample Type & No :- **LB**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **17.7**

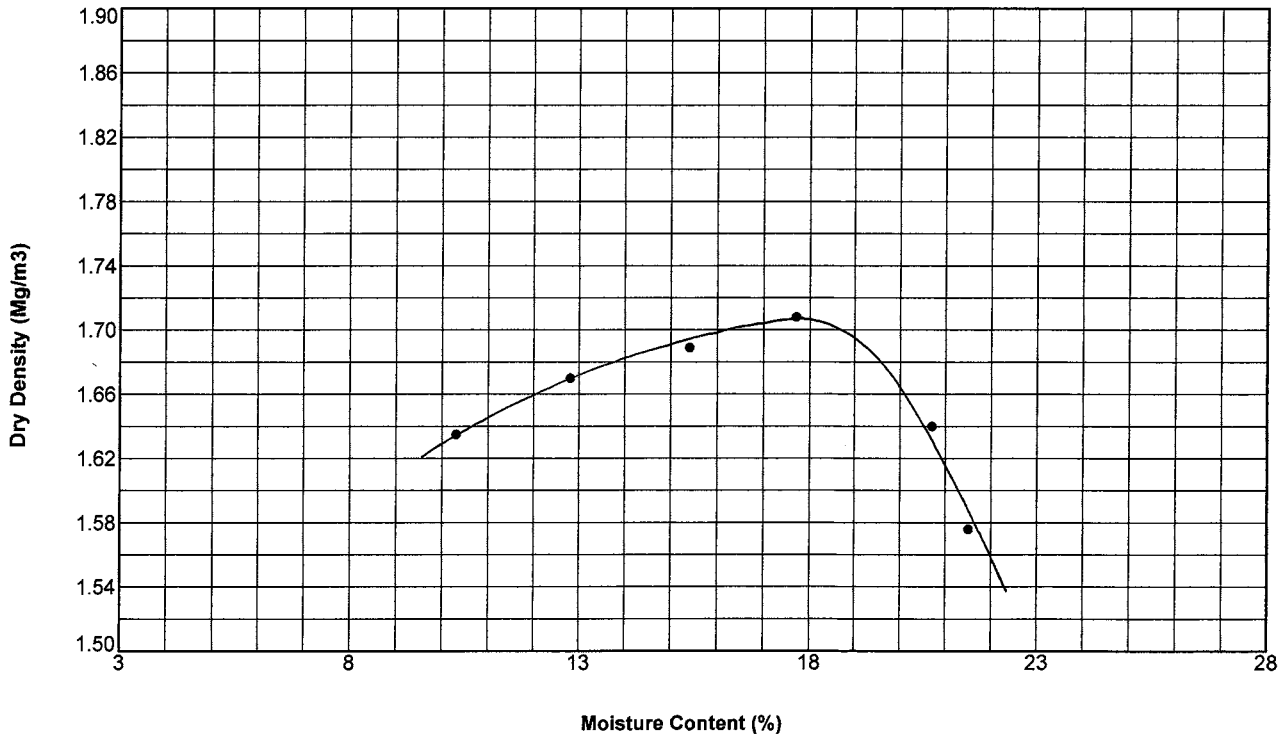
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.71**

Retained on 20mm Sieve (%) = **6.0**

Date Tested = **07/10/2011**

Retained on 37.5mm Sieve (%) = **0.8**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



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Regional Office: Unit B2 Anchorage Business Park, Chain Caul Way, Riversway Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

MOISTURE CONTENT/DRY DENSITY RELATIONSHIP

BS 1377 : Part 4 : 1990

Specimen Identification

Exploratory Hole No :- **HTP-05**

Depth (mBGL) :- **0.50**

Sample Type & No :- **LB**

Test Method

2.5kg Compaction

Separate Samples

Test Results

Optimum Moisture Content (%) = **13.3**

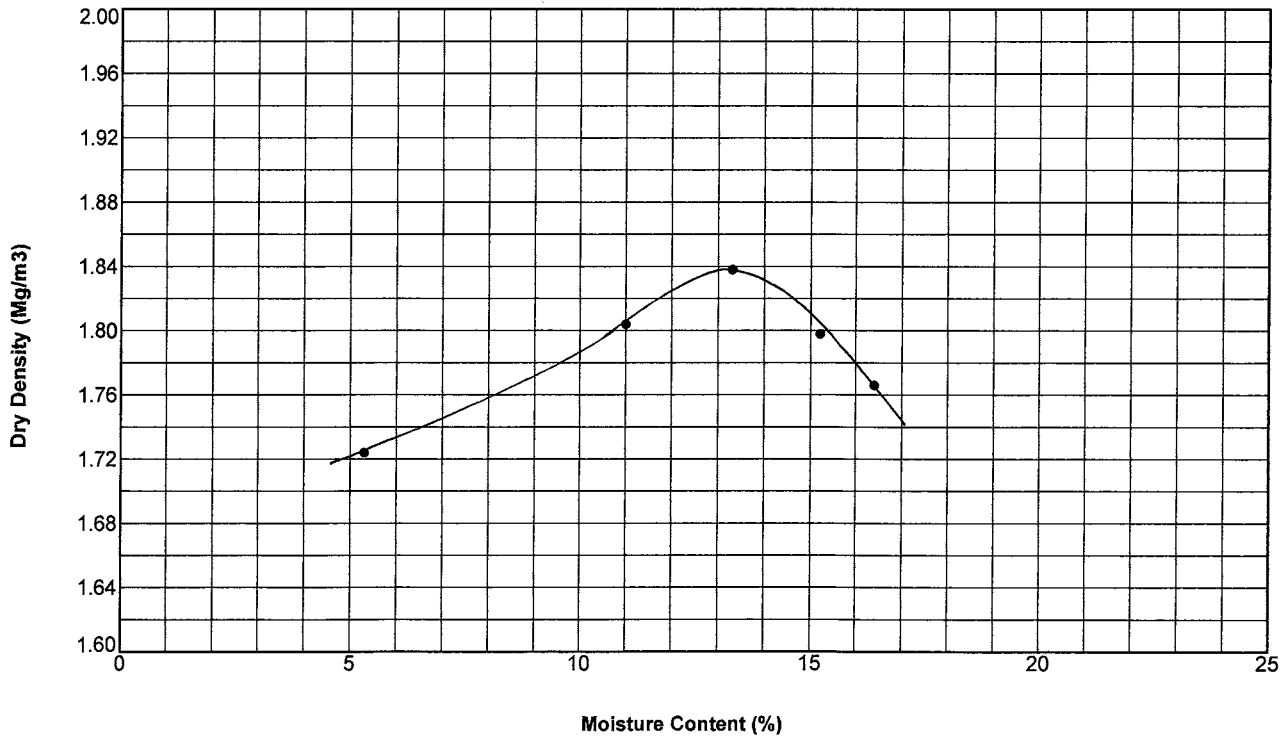
Particle Density (Assumed) = **2.55**

Maximum Dry Density (Mg/m³) = **1.84**

Retained on 20mm Sieve (%) = **20.3**

Date Tested = **04/10/2011**

Retained on 37.5mm Sieve (%) = **7.4**



For description of sample please refer to the Laboratory Sample Description Sheet

Contract Title :- **Trinity South Residential Development, South Shields - Ground Investigation**

Client :- **South Tyneside Council**



Signed :-



Name :-

M. SELKIRK

Page 1 of 1

Date of issue :-

14/10/2011

Certificate No :-

COMP/3842/1

AEG Contract No. :-

3842



ENCLOSURE 5

Determination of One Dimensional Consolidation Properties

ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3




Exploratory Hole No	CBH-01	Sample	U13	Depth	4.50m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.50m
	INITIAL	FINAL			
Height	18.8	17.8	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm	Degree of Saturation (%)	98.4
Moisture Content	32	33	%	Test Duration (Days)	5
Wet Density	1.90	2.03	Mg/m ³	Date Tested	04/10/2011
Dry Density	1.44	1.53	Mg/m ³		
Swelled at 25 kPa					

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.872
0 - 50	0.179	.	24	0.856
50 - 100	0.239	1.39	24	0.833
100 - 200	0.212	1.11	24	0.795
200 - 400	0.148	0.85	23	0.742
400 - 100	0.055	Swelling	23	0.770

For sample description please refer to the Laboratory Sample Description Sheet.

Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**

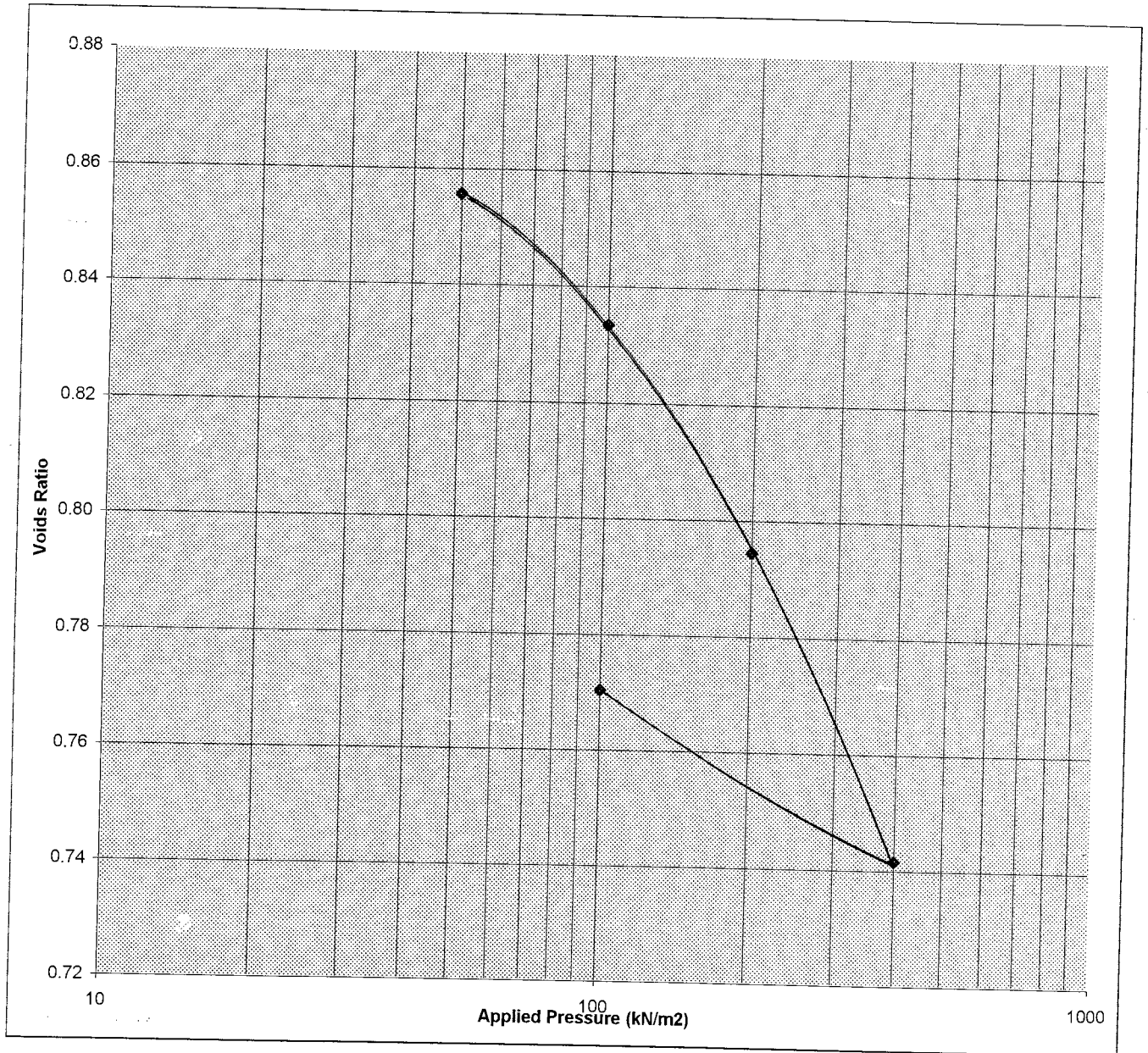
Client **South Tyneside Council**

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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-01	Sample	U13	Depth	4.50m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.50m



Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**
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		AEG Contract No	3842	 1367




ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-03	Sample	U13	Depth	4.70m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.70m
	INITIAL	FINAL			
Height	19.2	18.3	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm	Degree of Saturation (%)	99.6
Moisture Content	32	32	%	Test Duration (Days)	5
Wet Density	1.90	1.99	Mg/m ³		
Dry Density	1.44	1.51	Mg/m ³		
Swelled at 25 kPa				Date Tested	04/10/2011

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.875
0 - 50	0.210	.	24	0.856
50 - 100	0.236	1.00	24	0.834
100 - 200	0.171	1.16	24	0.802
200 - 400	0.113	1.14	23	0.762
400 - 100	0.050	Swelling	23	0.788

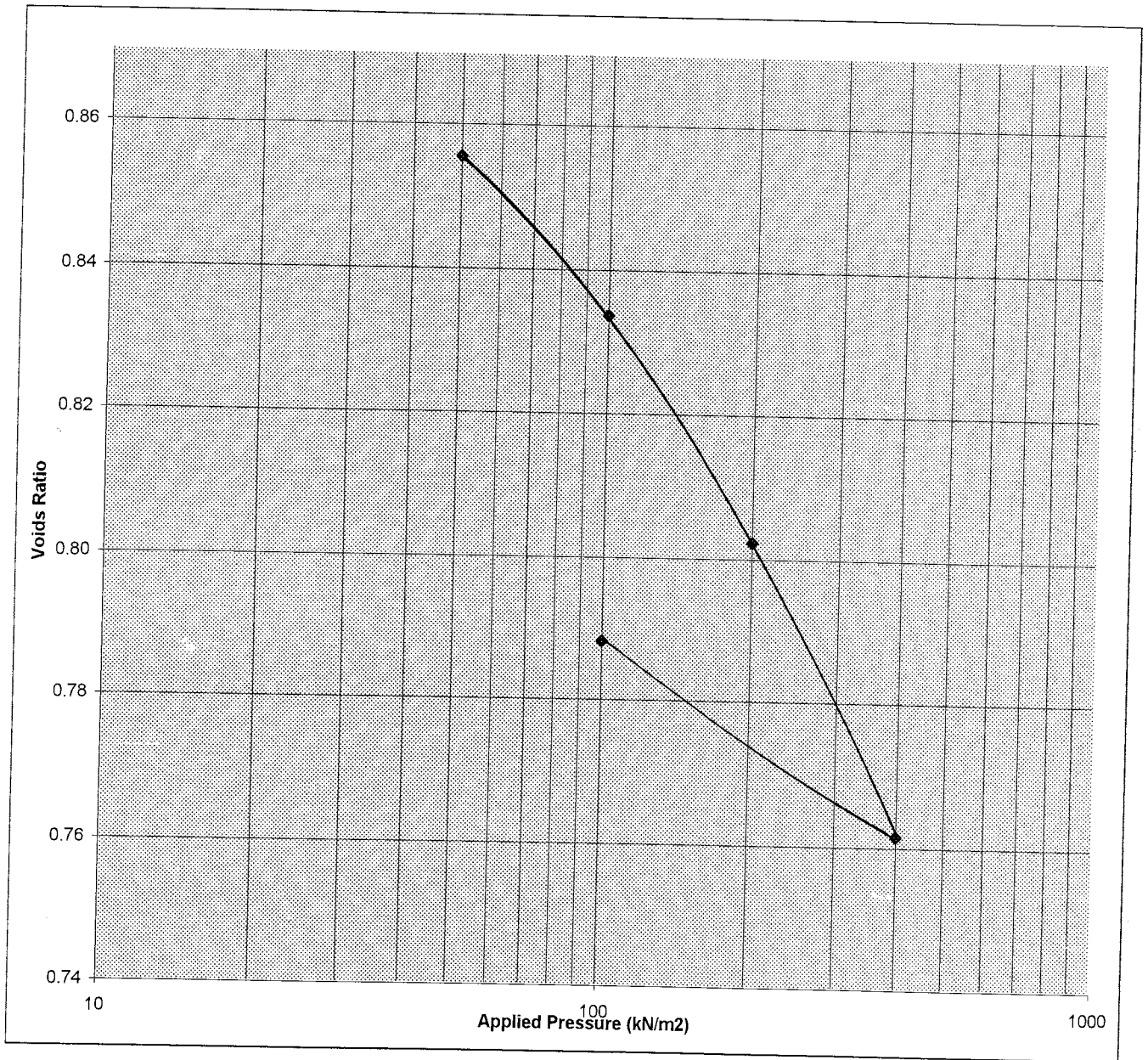
For sample description please refer to the Laboratory Sample Description Sheet.

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	Date of Issue 13/10/2011	Certificate No 3842B	AEG Contract No 3842	

ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-03	Sample	U13	Depth	4.70m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.70m



Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**
 Client **South Tyneside Council**

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ONE DIMENSIONAL CONSOLIDATION PROPERTIES


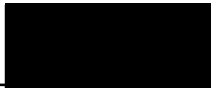

BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-04	Sample	U9	Depth	3.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	3.20m
	INITIAL	FINAL			
Height	18.8	17.8	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm	Degree of Saturation (%)	99.0
Moisture Content	33	31	%	Test Duration (Days)	5
Wet Density	1.89	1.98	Mg/m ³	Date Tested	04/10/2011
Dry Density	1.42	1.50	Mg/m ³		
Swelled at 25 kPa					

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.896
0 - 50	0.173	.	24	0.880
50 - 100	0.252	0.71	24	0.856
100 - 200	0.214	0.60	24	0.817
200 - 400	0.144	0.51	23	0.764
400 - 100	0.061	Swelling	23	0.796

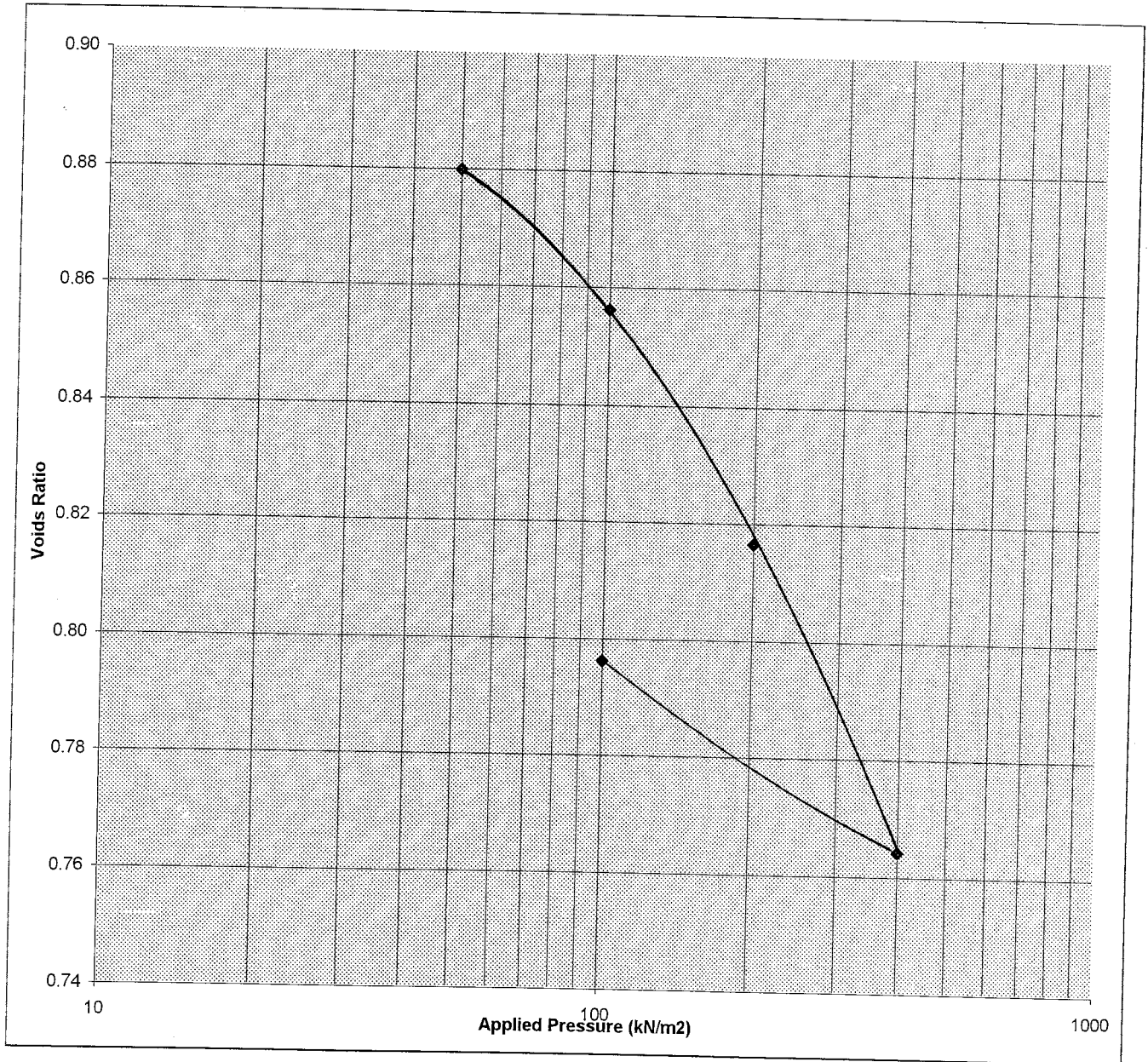
For sample description please refer to the Laboratory Sample Description Sheet.

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Client	South Tyneside Council




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		M. SELKIRK	
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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-04	Sample	U9	Depth	3.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	3.20m



Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**
 Client **South Tyneside Council**

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ONE DIMENSIONAL CONSOLIDATION PROPERTIES




BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-04	Sample	U13	Depth	4.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.20m
	INITIAL	FINAL			
Height	18.9	18.2	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm		
Moisture Content	27	28	%	Degree of Saturation (%)	99.4
Wet Density	1.97	2.06	Mg/m ³		
Dry Density	1.55	1.61	Mg/m ³	Test Duration (Days)	5
Swelled at 25 kPa				Date Tested	04/10/2011

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.742
0 - 50	0.103	.	24	0.733
50 - 100	0.189	1.42	24	0.717
100 - 200	0.147	1.38	24	0.692
200 - 400	0.107	1.48	23	0.655
400 - 100	0.051	Swelling	23	0.681

For sample description please refer to the Laboratory Sample Description Sheet.

Contract Title	Trinity South Residential Development, South Shields-Ground Investigation
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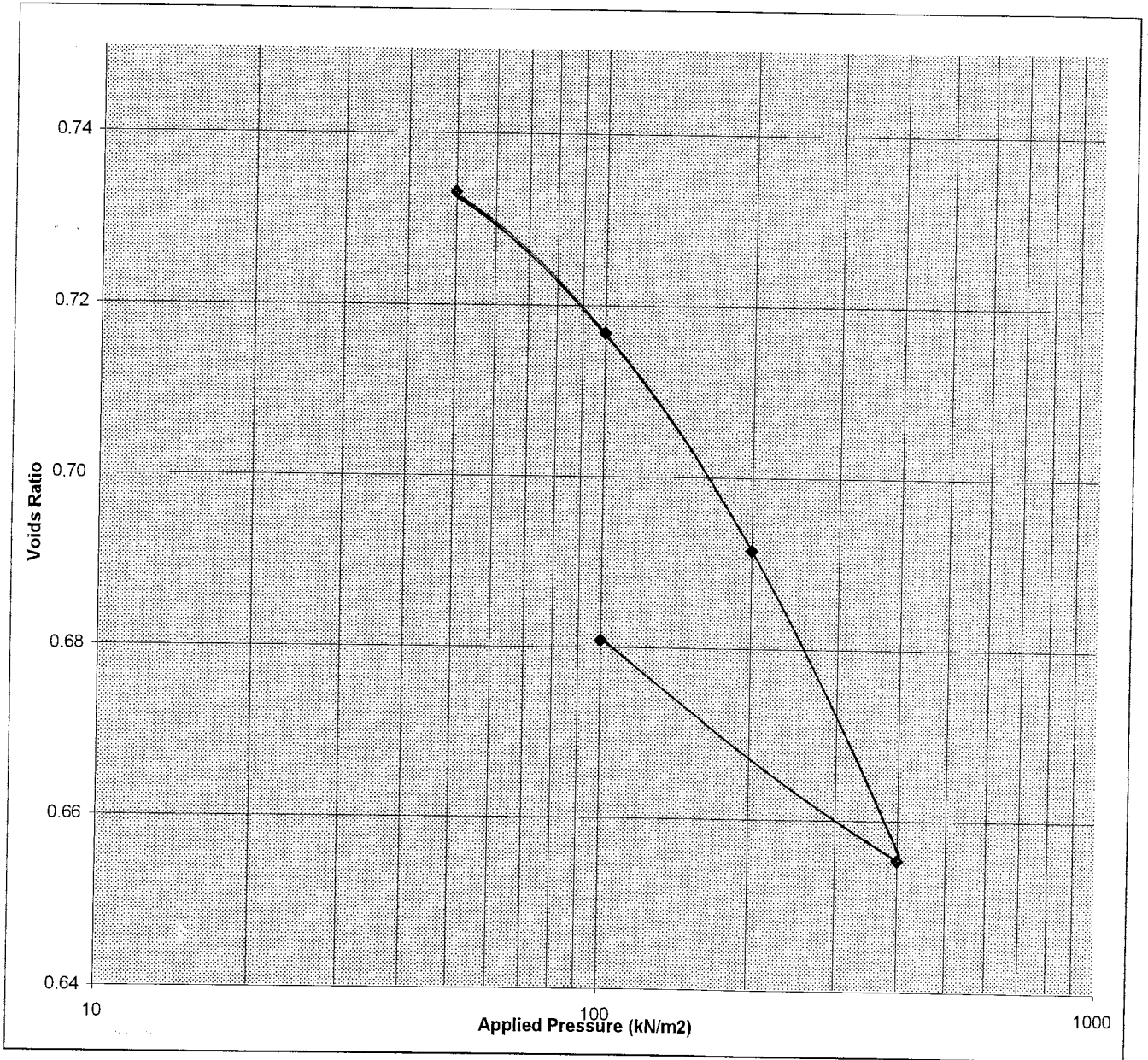
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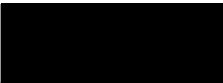

ONE DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-04	Sample	U13	Depth	4.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.20m



Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**
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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
BS 1377 : PART 5 : 1990 : CLAUSE 3

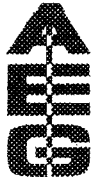
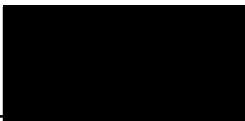

Exploratory Hole No	CBH-05	Sample	U10	Depth	3.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	3.20m
	INITIAL	FINAL			
Height	19.7	18.6	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm		
Moisture Content	35	33	%	Degree of Saturation (%)	99.1
Wet Density	1.86	1.94	Mg/m ³		
Dry Density	1.37	1.46	Mg/m ³	Test Duration (Days)	5
Swelled at 25 kPa				Date Tested	04/10/2011

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Void Ratio
Initial				0.964
0 - 50	0.368	.	24	0.928
50 - 100	0.153	0.10	24	0.913
100 - 200	0.177	0.10	24	0.879
200 - 400	0.162	0.08	23	0.818
400 - 100	0.066	Swelling	23	0.854

For sample description please refer to the Laboratory Sample Description Sheet.

Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**

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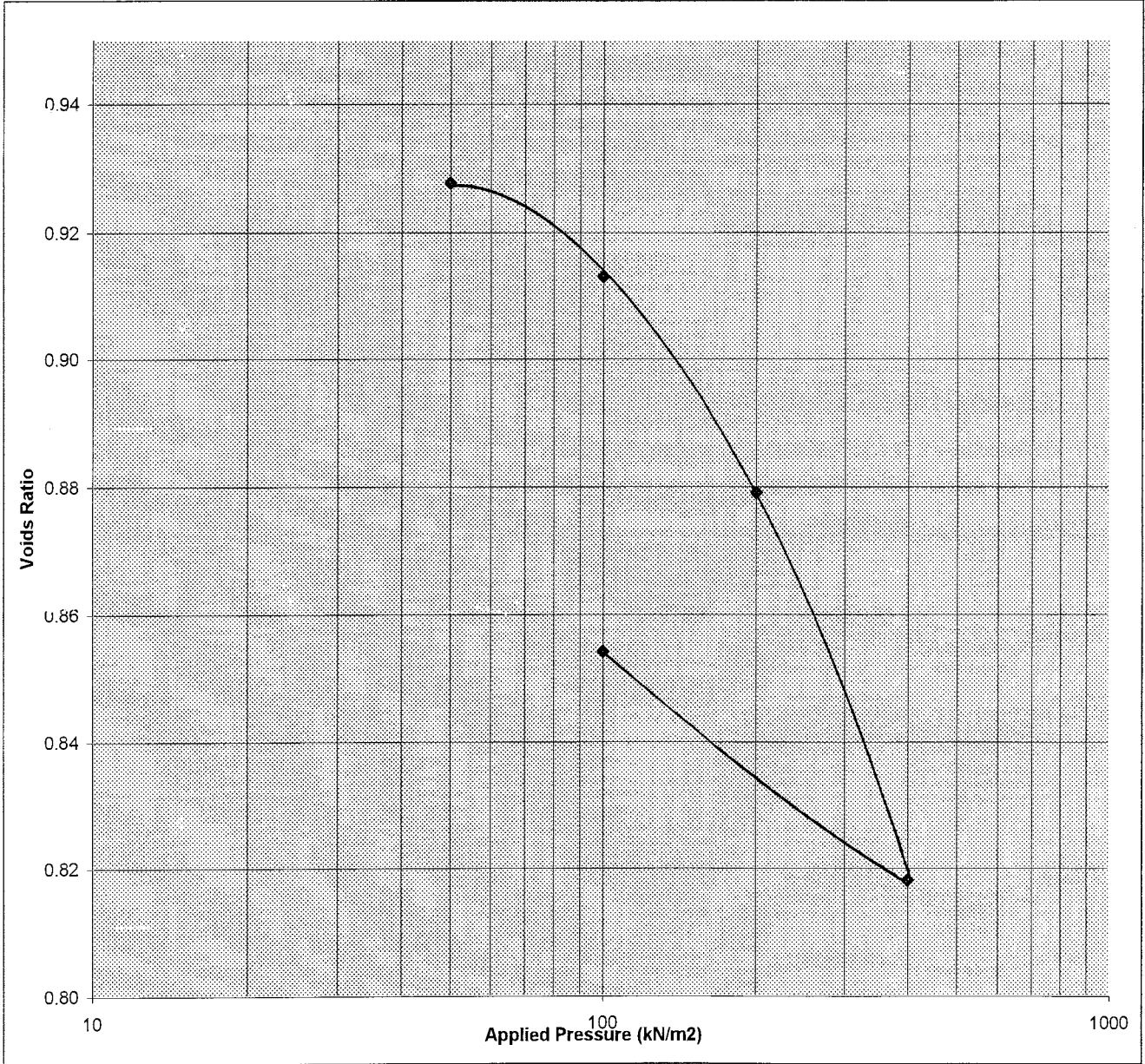
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ONE DIMENSIONAL CONSOLIDATION PROPERTIES

BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-05	Sample	U10	Depth	3.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	3.20m



Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**

Client **South Tyneside Council**



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ONE DIMENSIONAL CONSOLIDATION PROPERTIES


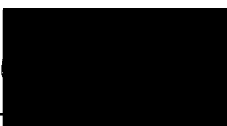

BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-05	Sample	U14	Depth	4.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.20m
	INITIAL	FINAL			
Height	18.9	17.9	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm		
Moisture Content	30	27	%	Degree of Saturation (%)	99.1
Wet Density	1.94	2.01	Mg/m ³		
Dry Density	1.50	1.58	Mg/m ³	Test Duration (Days)	5
Swelled at 25 kPa				Date Tested	04/10/2011

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.805
0 - 50	0.206	.	24	0.787
50 - 100	0.249	0.11	24	0.765
100 - 200	0.192	0.13	23	0.731
200 - 400	0.135	0.17	23	0.684
400 - 100	0.049	Swelling	23	0.709

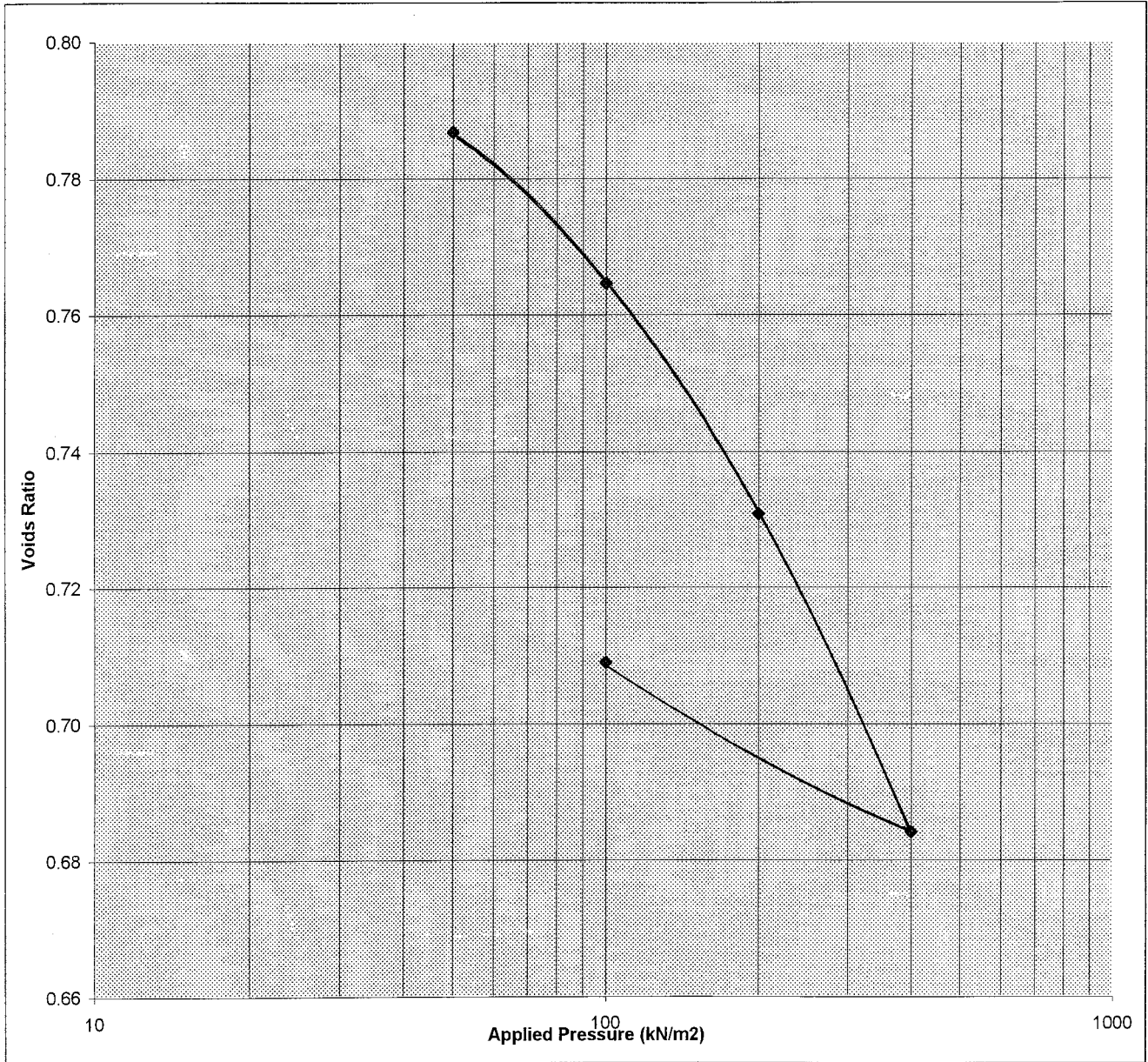
For sample description please refer to the Laboratory Sample Description Sheet.

Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**
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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-05	Sample	U14	Depth	4.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.20m



Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**
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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
BS 1377 : PART 5 : 1990 : CLAUSE 3




Exploratory Hole No	CBH-06	Sample	U10	Depth	3.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	3.20m
	INITIAL	FINAL			
Height	18.6	17.6	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm		
Moisture Content	26	24	%	Degree of Saturation (%)	97.7
Wet Density	1.98	2.07	Mg/m ³		
Dry Density	1.57	1.67	Mg/m ³	Test Duration (Days)	5
				Date Tested	04/10/2011

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.717
0 - 25	0.834	.	24	0.681
25 - 50	0.426	0.68	24	0.664
50 - 100	0.313	0.90	24	0.638
100 - 200	0.190	1.27	23	0.606
200 - 50	0.062	Swelling	23	0.621

For sample description please refer to the Laboratory Sample Description Sheet.

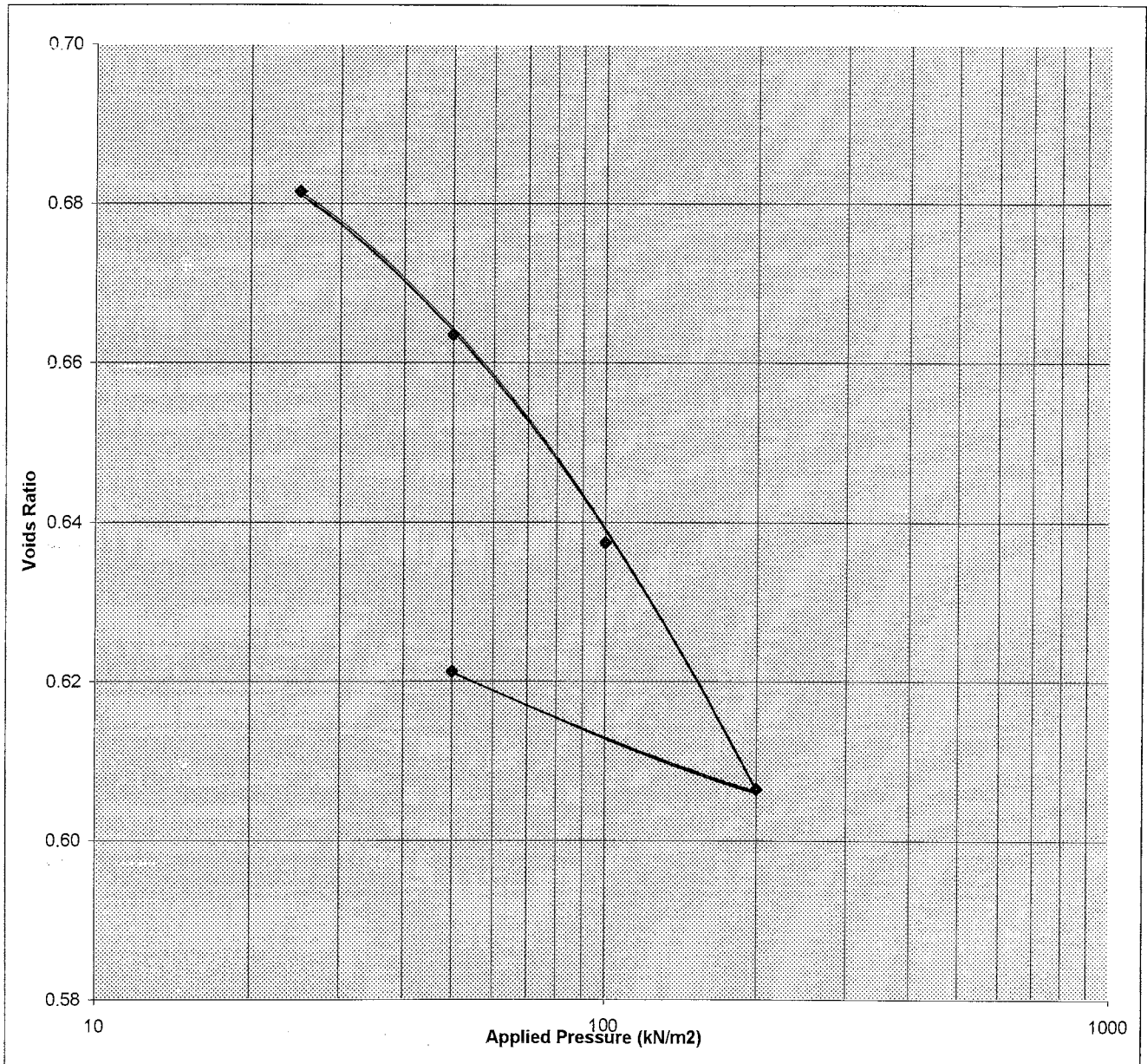
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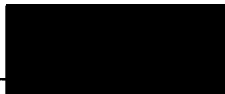

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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-06	Sample	U10	Depth	3.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	3.20m



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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
BS 1377 : PART 5 : 1990 : CLAUSE 3



Exploratory Hole No	CBH-06	Sample	U14	Depth	4.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.20m
	INITIAL	FINAL			
Height	18.7	18.1	mm	Particle Density (Assumed)	2.70
Diameter	75	75	mm		
Moisture Content	15	15	%	Degree of Saturation (%)	93.5
Wet Density	2.18	2.26	Mg/m ³		
Dry Density	1.90	1.97	Mg/m ³	Test Duration (Days)	5
				Date Tested	04/10/2011

Square Root of Time Fitting Method				
Pressure Range kN/m ²	Mv m ² /MN	Cv m ² /yr	Temp C	Voids Ratio
Initial				0.420
0 - 25	0.282	.	24	0.410
25 - 50	0.231	1.38	24	0.401
50 - 100	0.218	1.36	24	0.386
100 - 200	0.158	1.67	23	0.364
200 - 50	0.035	Swelling	23	0.371

For sample description please refer to the Laboratory Sample Description Sheet.

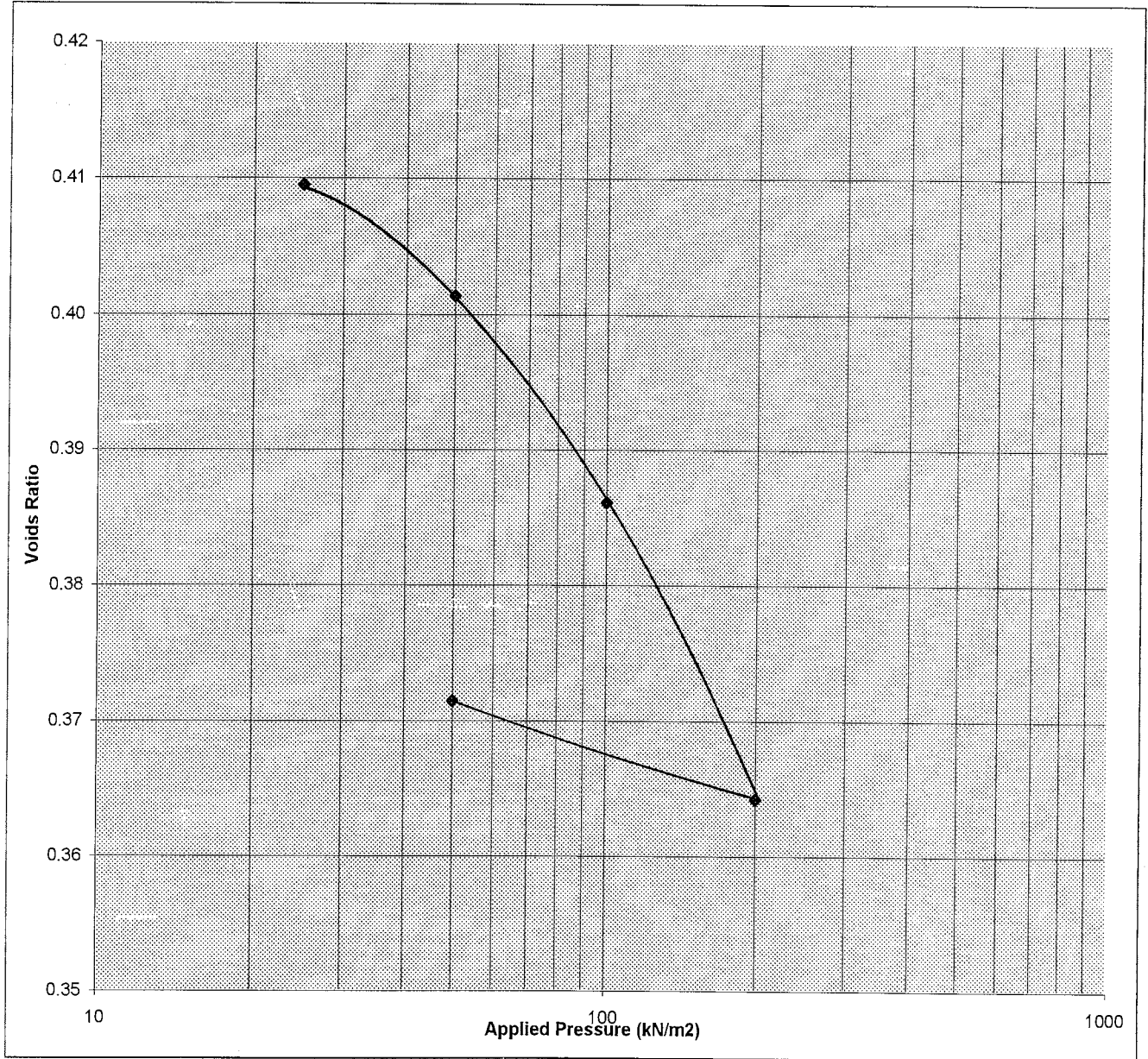
Contract Title **Trinity South Residential Development, South Shields-Ground Investigation**

Client **South Tyneside Council**


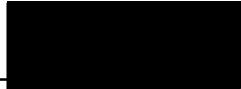

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ONE DIMENSIONAL CONSOLIDATION PROPERTIES
 BS 1377 : PART 5 : 1990 : CLAUSE 3

Exploratory Hole No	CBH-06	Sample	U14	Depth	4.20m
Specimen Type	Undisturbed	Orientation	Vertical	Specific Depth	4.20m



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ENCLOSURE 6

Undrained Shear Strength in a Triaxial Cell
Without Pore Water Pressure Measurement

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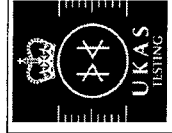
UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION WITHOUT MEASUREMENT OF PORE PRESSURE

BS 1377 : Part 7 : Clauses 8 & 9 : 1990 Part 2 Clause 3.2

Exploratory Hole	Sample ID	Sample Depth (m)	Depth Type	Specific Depth (m)	Diameter (mm)	Length (mm)	Prep. Method	Stage No.	Initial Moisture Content (%)	Bulk Density (Mg/m ³)	Dry Density (Mg/m ³)	Membrane Thickness (mm)	Membrane Correction (kPa)	Cell Pressure (kPa)	Corrected Deviator Stress (kPa)	Failure Strain (%)	Mode of Failure	cu (kPa)	Date Tested
CBH-01	U13	4.50	U13	4.65	101.9	192.5	U	1	30.2	2.00	1.53	0.50	0.89	75	178.6	7.5	BR	89	05/10/2011
CBH-02	U12	4.00	U12	4.15	101.7	191.9	U	1	26.7	2.05	1.62	0.50	1.12	75	205.2	10.0	BR	103	05/10/2011
CBH-02	U18	5.50	U18	5.80	103.1	194.8	U	1	17.8	2.19	1.86	0.50	1.84	100	203.4	20.0	C	102	07/10/2011
CBH-02	U22	7.50	U22	7.65	102.7	195.3	U	1	12.2	2.14	1.91	0.60	1.52	150	270.9	12.0	C	135	07/10/2011
CBH-03	U13	4.70	U13	4.70	101.9	192.9	U	1	29.8	1.97	1.52	0.50	0.93	80	158.1	8.0	BR	79	05/10/2011
CBH-03	U17	6.20	U17	6.35	102.1	192.9	U	1	13.5	2.26	1.99	0.50	1.86	90	399.4	20.0	C	200	07/10/2011
CBH-04	U9	3.20	U9	3.35	102.1	191.3	U	1	27.2	2.02	1.59	0.40	0.68	60	147.3	7.0	BR	74	05/10/2011
CBH-04	U13	4.20	U13	4.20	101.9	192.3	U	1	29.7	2.03	1.56	0.40	0.746	80	169.3	8.0	P	85	05/10/2011
CBH-04	U19	6.20	U19	6.35	101.7	194.7	U	1	11.5	2.28	2.04	0.50	1.47	120	716.3	14.5	C	358	05/10/2011
CBH-04	U24	8.20	U24	8.35	102.8	193.9	U	1	12.3	2.16	1.92	0.60	2.17	160	488.0	19.5	C	244	07/10/2011
CBH-05	U10	3.20	U10	3.35	102.5	192.3	U	1	30.8	1.94	1.49	0.50	0.72	60	147.4	6.0	BR	74	06/10/2011
CBH-05	U14	4.20	U14	4.35	101.4	193.1	U	1	27.5	2.02	1.59	0.40	0.72	75	263.2	7.5	BR	132	06/10/2011
CBH-06	U10	3.20	U10	3.35	103.1	193.5	U	1	24.4	2.02	1.63	0.40	1.01	60	187.4	12.0	C	94	06/10/2011
CBH-06	U14	4.20	U14	4.35	102.1	191.9	U	1	14.8	2.18	1.90	0.50	1.86	80	250.5	20.0	C	125	06/10/2011
CBH-06	U20	6.20	U20	6.35	103.0	194.9	U	1	13.2	2.15	1.90	0.40	0.89	120	235.9	10.0	C	118	07/10/2011

For description of sample please refer to the Laboratory Sample Description Sheet. Please note the rate of strain was 2% per minute and the orientation of the test specimen was vertical. Latex membrane used.

	Date of issue :- 14/10/2011	Certificate No :- TXL/3842/1	Signed :- 	Name :- M. SELKIN	Page 1 of 1
	Client :- South Tyneside Council				



ENCLOSURE 7

Determination of Point Load Index

ALLIED EXPLORATION & GEOTECHNICS LIMITED

Head Office: Unit 25 Stella Gill Industrial Estate, Pelton Fell, Chester-le-Street, Co. Durham, DH2 2RG - Tel: 0191 387 4700 Fax: 0191 387 4710
Regional Office: Unit G2 Anchorage Business Park, Chain Caul Way, Riverside Docklands, Preston, PR2 2YL - Tel: 01772 735 300 Fax: 01772 735 999

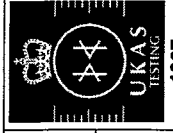
POINT LOAD STRENGTH INDEX

ISRM : 1985

Exploratory Hole No	Depth (m)	Type/Orientation	Width (mm)	Platen Separation (mm)	Failure Load (kN)	De ² (mm ²)	Point Load (IS) (MN/m ²)	Size Factor	Point Load Index (IS50) (MN/m ²)	Type	Date Tested
CBH-01	9.28	Axial	72.8	52.2	10.1	4838.5	2.09	1.16	2.422	Sandstone	07/10/2011
CBH-01	10.67	Axial	73.0	36.4	2.5	3383.3	0.74	1.07	0.791	Sandstone	07/10/2011
CBH-01	12.85	Axial	72.6	60.1	5.0	5555.5	0.90	1.20	1.077	Sandstone	07/10/2011
CBH-01	13.34	Axial	72.6	40.6	9.6	3752.9	2.56	1.10	2.803	Sandstone	07/10/2011
CBH-04	12.30	Axial	72.5	33.9	7.1	3129.3	2.27	1.05	2.386	Sandstone	07/10/2011
CBH-04	13.35	Axial	72.6	44.0	7.0	4067.2	1.72	1.12	1.920	Sandstone	07/10/2011
CBH-04	14.00	Axial	72.6	39.7	6.1	3669.8	1.66	1.09	1.812	Sandstone	07/10/2011
CBH-04	16.43	Axial	72.8	42.1	6.5	3902.3	1.67	1.11	1.841	Sandstone	07/10/2011
CBH-09	14.76	Axial	72.7	55.6	6.5	5146.6	1.26	1.18	1.486	Sandstone	07/10/2011
CBH-09	18.05	Axial	72.8	41.6	0.8	3856.0	0.21	1.10	0.229	Mudstone	07/10/2011
CBH-10	8.10	Axial	72.6	51.5	5.4	4760.5	1.13	1.16	1.311	Sandstone	07/10/2011
CBH-10	8.92	Axial	72.6	47.2	10.2	4363.0	2.34	1.13	2.650	Sandstone	07/10/2011
CBH-10	10.44	Axial	72.5	38.1	0.1	3517.0	0.03	1.08	0.031	Siltstone	07/10/2011
CBH-10	10.66	Axial	72.4	39.0	0.1	3595.1	0.03	1.09	0.030	Siltstone	07/10/2011
CBH-10	11.46	Axial	72.6	45.3	6.1	4187.4	1.46	1.12	1.636	Sandstone	07/10/2011

NOTE - Loads of less than 5kN Outside of UKAS accreditation # - Invalid Failure (Did not pass through both points)

Date of issue :- 14/10/2011	Certificate No :- PL/3842/1	Signed :- 	Name :- M. SELKIN	Page 1 of 1
Client :- South Tyneside Council		Contract Title :- Trinity South Residential Development, South Shields - Ground Investigation		AEG Contract No :- 3842



1367

ENCLOSURE 8

Determination of Unconfined Compressive Strength
(Tested Externally)



TEST CERTIFICATE

Your Ref: 3842
Our Ref: CON113091

11/10/2011

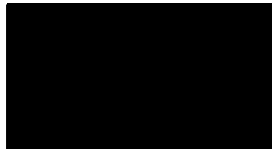
For the attention of: **Ms Michelle Selkirk**
Allied Exploration & Geotechnics Ltd.
Unit 25, Stella Gill Industrial Estate,
Pelton Fell,
Chester-le-Street,
Co. Durham
DH2 2RG

Location: **TRINITY SOUTH RESIDENTIAL DEVELOPMENT, SOUTH SHIELDS - GROUND INVESTIGATION**

Description: **8 Core samples**

Date Received: **05 October 2011**

Test Procedures: * ISRM Uniaxial Compressive Strength.
The Complete ISRM Suggested Methods For Rock Characterization, Testing And Monitoring:
1974-2006 Editors: R. Ulusay & J.A. Hudson



C S Hunt
Deputy Laboratory Manager
for FUGRO ENGINEERING SERVICES LIMITED

Tests marked with an asterisk fall outside the accreditation status of the laboratory.



GENERAL NOTES ON LABORATORY TEST RESULTS

1. TEST METHODS

The tests reported on the following sheets have been carried out in accordance with the methods given in BS 1377:1990 'Methods of test for soils for civil engineering purposes', and ISRM 'Suggested methods for rock characterization, testing and monitoring', subject to a small number of variances as described below under the respective headings. These notes also serve as keysheets to any notation used in reporting the laboratory tests.

2. KEY TO NOTATION OF SAMPLE TYPE

- D: Disturbed sample.
- B: Bulk disturbed sample.
- U: General purpose open drive tube sample.
- P: Piston sample.
- C: Core sample.

3. CLASSIFICATION TESTS

% passing 425 μ m: this figure is only correctly reported when 'WS' is shown in the 'Method of preparation' column. For 'HP' and 'AR', the reported figure is an estimate only.

- WS: sample prepared by Wet Sieving.
- HP: sample prepared by Hand Picking (removal) of gravel sized fragments.
- AR: sample tested As Received.
- NP: non-plastic.

4. COMPACTION RELATED TESTS

Sample preparation: **Individual** indicates test carried out on individual sub-samples.
Single indicates test carried out on a single sample.

Assumed values of particle density are reported in brackets e.g. (2.67)

5. SAMPLE DESCRIPTIONS

The sample descriptions shown on the test report sheets are the technician's visual descriptions of the test samples, in accordance with Clause 9.1 of Part 1 of BS 1377:1990 and do not necessarily comply with the requirements of BS5930:1999. For a more comprehensive description of the soil samples to BS5930, reference should be made to the exploratory hole records, or an engineering description can be provided on request.



SUMMARY OF ROCK STRENGTH TESTS
ISRM 1981 Part 2

Hole	Sample no	Type	Depth (m)	Bulk Density (Mg/m3)	Water Content (%)	Dry Density (Mg/m3)	Diameter (mm)	Length (mm)	Stress Rate (Mpa / min)	Load at failure (kN)	Tensile Strength (MPa)	UCS (MPa)	Mode of Failure	Lithology
BH 1		C	10.28	2.36	6.6	2.22	73	133	2.48	97.1		22.9		Brown SANDSTONE, weak
BH 1		C	13.00	2.29	3.4	2.21	73	138	3.91	130.2		30.8		Brown SANDSTONE, medium strong
BH 4		C	14.37	2.36	5.1	2.24	73	139	3.37	129		30.7		Brown SANDSTONE, medium strong
BH 4		C	16.04	2.42	5.6	2.29	73	148	2.59	87.6		21.0		Brown SANDSTONE, weak
BH 9		C	14.50	2.31	6.8	2.17	73	155	2.17	69.9		16.7		Brown SANDSTONE, weak
BH 10		C	8.34	2.37	6.1	2.24	73	131	2.5	93		22.1		Grey SANDSTONE, weak
BH 10		C	9.18	2.38	5.9	2.25	73	156	2.41	96.4		23.0		Brown SANDSTONE, weak
BH 10		C	11.16	2.30	7.3	2.15	73	125	3.25	123.8		29.0		Brown SANDSTONE, medium strong

Remarks	
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2139

Certificate of Analysis

Date: 24/10/2011

Certificate Number: 11-54389-1

Client: Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference: 11-54389-1

Client Reference: 3842

Contract Title: Trinity South Residential Development, South Shields

Description: 5 water samples


Date Received: 30 September 2011

Date Started: 03 October 2011

Date Completed: 10 October 2011

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: **This report supersedes 11-54389. Amended metal results on 359664**
Observations and interpretations are outside the scope of UKAS accreditation

Approved By: 
Paul Woodbridge, Senior Operations Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Information in Support of the Analytical Results

Analysis

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425um sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample.

Key

- * Denotes test not included in laboratory scope of accreditation
- # Denotes test that holds MCERTS accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
- \$ Denotes tests completed by an approved subcontractor
- I/S Denotes insufficient sample to carry out test
- U/S Denotes that the sample is not suitable for testing

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month

Liquids - 2 weeks

Asbestos (test portion) - 6 months

Summary of Chemical Analysis Water Samples

Our Ref: 11-54389-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields

				Lab No.	359663	359664	359665	359666
				Sample ID	CBH-01	CBH-02	PBRBH-02 (P)	PBRBH-02 (S)
				Depth				
				Sample Ref				
				Sample Type	EW	EW	EW	EW
				Sampling Date	29/09/2011	29/09/2011	29/09/2011	29/09/2011
				Sampling Time				
Test	Units	DETSxx	LOD					
Dibutyl Tin	ug/l	*	1		< 1.0		< 1.0	< 1.0
Arsenic Dissolved	ug/l	DETS 2326	1		< 1.0	< 1.0	< 1.0	4.2
Cadmium Dissolved	ug/l	DETS 042	1		< 1.0	< 1.0	< 1.0	< 1.0
Chromium Dissolved	ug/l	DETS 042	5		< 5.0	< 5.0	< 5.0	< 5.0
Copper Dissolved	ug/l	DETS 042	1		< 1.0	< 1.0	< 1.0	3.5
Lead Dissolved	ug/l	DETS 042	4		< 4.0	< 4.0	< 4.0	< 4.0
Mercury Dissolved	ug/l	DETS 078	0.05		< 0.05	< 0.05	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	10		< 10	11	< 10	< 10
Selenium Dissolved	ug/l	DETS042	10		< 10	< 10	< 10	< 10
Zinc Dissolved	ug/l	DETS 042	1		< 1.0	< 1.0	< 1.0	< 1.0
Chloride	mg/l	DETS 055	0.1		230	240	260	51
Sulphate as SO4	mg/l	DETS 055	0.1		430	1400	610	350
Boron	ug/l	DETS 020	100		290	570	270	270
Cyanide total	ug/l	DETS 067	20		< 20	< 20	< 20	< 20
Ammoniacal Nitrogen as N	mg/l	DETS C2207	0.015		0.51	3.2	0.12	0.07
pH		DETS 008			7.3	7.1	7.2	7.5
Acenaphthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	ug/l	DETS 074*	160		< 160	< 160	< 160	< 160
Anthracene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Naphthalene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	0.14	< 0.01
Phenanthrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
PAH	ug/l	DETS 074*	0.2		< 0.20	< 0.20	< 0.20	< 0.20
PRO (C6-C10)	ug/l	DETS 062*	1		< 1.0	< 1.0	22	1.4
DRO (C10-C24)	ug/l	DETS 051	10		34	39	55	40
Mineral Oils	ug/l	DETS 051	10		26	25	52	99

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54389-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields

				Lab No.	359663	359664	359665	359666
				Sample ID	CBH-01	CBH-02	PBRBH-02 (P)	PBRBH-02 (S)
				Depth				
				Sample Ref				
				Sample Type	EW	EW	EW	EW
				Sampling Date	29/09/2011	29/09/2011	29/09/2011	29/09/2011
				Sampling Time				
Test	Units	DETSxx	LOD					
Phenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
4-Chloro-3-methylphenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dichlorophenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
2,4-Dimethylphenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
p-cresol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dimethylphenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
2,6-Dichlorophenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
2,4,6-Trichlorophenol	ug/l	DETS 054*	0.1		< 0.10	< 0.10	< 0.10	< 0.10
Trichloroethylene	ug/l	DETS 068*	1		< 1		3	< 1

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54389-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields

			Lab No.	359667
			Sample ID	PBBH-05
			Depth	
			Sample Ref	
			Sample Type	EW
			Sampling Date	29/09/2011
			Sampling Time	
Test	Units	DETSxx	LOD	
Dibutyl Tin	ug/l	*	1	
Arsenic Dissolved	ug/l	DETS 2326	1	< 1.0
Cadmium Dissolved	ug/l	DETS 042	1	< 1.0
Chromium Dissolved	ug/l	DETS 042	5	< 5.0
Copper Dissolved	ug/l	DETS 042	1	2
Lead Dissolved	ug/l	DETS 042	4	< 4.0
Mercury Dissolved	ug/l	DETS 078	0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	10	< 10
Selenium Dissolved	ug/l	DETS042	10	< 10
Zinc Dissolved	ug/l	DETS 042	1	< 1.0
Chloride	mg/l	DETS 055	0.1	180
Sulphate as SO4	mg/l	DETS 055	0.1	260
Boron	ug/l	DETS 020	100	210
Cyanide total	ug/l	DETS 067	20	< 20
Ammoniacal Nitrogen as N	mg/l	DETS C2207	0.015	0.08
pH		DETS 008		7.3
Acenaphthene	ug/l	DETS 074*	0.01	< 0.01
Acenaphthylene	ug/l	DETS 074*	160	< 160
Anthracene	ug/l	DETS 074*	0.01	< 0.01
Benzo(a)anthracene	ug/l	DETS 074*	0.01	< 0.01
Benzo(a)pyrene	ug/l	DETS 074*	0.01	< 0.01
Benzo(b)fluoranthene	ug/l	DETS 074*	0.01	< 0.01
Benzo(k)fluoranthene	ug/l	DETS 074*	0.01	< 0.01
Benzo(g,h,i)perylene	ug/l	DETS 074*	0.01	< 0.01
Chrysene	ug/l	DETS 074*	0.01	< 0.01
Dibenzo(a,h)anthracene	ug/l	DETS 074*	0.01	< 0.01
Fluoranthene	ug/l	DETS 074*	0.01	< 0.01
Fluorene	ug/l	DETS 074*	0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	ug/l	DETS 074*	0.01	< 0.01
Naphthalene	ug/l	DETS 074*	0.01	< 0.01
Phenanthrene	ug/l	DETS 074*	0.01	< 0.01
Pyrene	ug/l	DETS 074*	0.01	< 0.01
PAH	ug/l	DETS 074*	0.2	< 0.20
PRO (C6-C10)	ug/l	DETS 062*	1	< 1.0
DRO (C10-C24)	ug/l	DETS 051	10	< 10
Mineral Oils	ug/l	DETS 051	10	< 10

Summary of Chemical Analysis Water Samples

Our Ref: 11-54389-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields

Lab No.	359667
Sample ID	PBBH-05
Depth	
Sample Ref	
Sample Type	EW
Sampling Date	29/09/2011
Sampling Time	

Test	Units	DETSxx	LOD	
Phenol	ug/l	DETS 054*	0.1	< 0.10
4-Chloro-3-methylphenol	ug/l	DETS 054*	0.1	< 0.10
2,4-Dichlorophenol	ug/l	DETS 054*	0.1	< 0.10
2,4-Dimethylphenol	ug/l	DETS 054*	0.1	< 0.10
p-cresol	ug/l	DETS 054*	0.1	< 0.10
2,6-Dimethylphenol	ug/l	DETS 054*	0.1	< 0.10
2,6-Dichlorophenol	ug/l	DETS 054*	0.1	< 0.10
2,4,6-Trichlorophenol	ug/l	DETS 054*	0.1	< 0.10
Trichloroethylene	ug/l	DETS 068*	1	

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54389-1

Client Ref: 3842

Contract Title: Tninity South Residential Development, South Shields

				Lab No.	359663	359665	359666
				Sample ID	CBH-01	PBRBH-02 (P)	PBRBH-02 (S)
				Depth			
				Sample Ref			
				Sample Type	EW	EW	EW
				Sampling Date	29/09/2011	29/09/2011	29/09/2011
				Sampling Time			
Test	Units	DETSxx	LOD				
Phenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Aniline	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2-Chlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Benzyl Alcohol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2-Methylphenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Bis(2-chloroisopropyl)ether	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
3&4-Methylphenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,4-Dimethylphenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Bis(2-chloroethoxy)methane	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,4-Dichlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Naphthalene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
4-Chloro-3-methylphenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2-Methylnaphthalene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Hexachlorocyclopentadiene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,4,6-Trichlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,4,5-Trichlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2-Chloronaphthalene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2-Nitroaniline	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,4-Dinitrotoluene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Acenaphthylene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
3-Nitroaniline	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Acenaphthene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
4-Nitrophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Dibenzofuran	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,6-Dinitrotoluene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,3,4,6-Tetrachlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Diethylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
4-Chlorophenylphenylether	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Fluorene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
4-Nitroaniline	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2-Methyl-4,6-Dinitrophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Diphenylamine	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
4-Bromophenylphenylether	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Hexachlorobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Pentachlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Phenanthrene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Anthracene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Di-n-butylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Fluoranthene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Pyrene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Butylbenzylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54389-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields

				Lab No.	359663	359665	359666
				Sample ID	CBH-01	PBRBH-02 (P)	PBRBH-02 (S)
				Depth			
				Sample Ref			
				Sample Type	EW	EW	EW
				Sampling Date	29/09/2011	29/09/2011	29/09/2011
				Sampling Time			
Test	Units	DETSxx	LOD				
Benzo(a)anthracene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Chrysene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Di-n-octylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Benzo(b)fluoranthene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Benzo(k)fluoranthene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Benzo(a)pyrene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Indeno(123cd)pyrene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Dibenzo(ah)anthracene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Benzo(ghi)perylene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
1,4-Dinitrobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Dimethylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
1,3-Dinitrobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
1,2-Dinitrobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Azobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0
Carbazole	ug/l	DETS 071*	1		< 1.0	< 1.0	< 1.0



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Certificate of Analysis

Date: 18/10/2011

Certificate Number: 11-54649

Client: Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference: 11-54649

Client Reference: 3842

Contract Title: Trinity South Residential Development South Shields

Description: 3 water samples

Date Received: 10 October 2011

Date Started: 10 October 2011

Date Completed: 18 October 2011

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: Observations and interpretations are outside the scope of UKAS accreditation

Approved By: 
Paul Woodbridge, Senior Operations Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Information in Support of the Analytical Results

Analysis

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425um sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample.

Key

- * Denotes test not included in laboratory scope of accreditation
- # Denotes test that holds MCERTS accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
- \$ Denotes tests completed by an approved subcontractor
- I/S Denotes insufficient sample to carry out test
- U/S Denotes that the sample is not suitable for testing

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month

Liquids - 2 weeks

Asbestos (test portion) - 6 months

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54649

Client Ref: 3842

Contract Title: Trinity South Residential Development South Shields

				Lab No.	361207	361208	361209
				Sample ID	CBH-04	CBH-09	CBH-10
				Depth			
				Sample Ref			
				Sample Type	EW	EW	EW
				Sampling Date	03/10/2011	03/10/2011	03/10/2011
				Sampling Time			
Test	Units	DETSxx	LOD				
Dibutyl Tin	ug/l	*	1		< 1.0	< 1.0	< 1.0
Arsenic Dissolved	ug/l	DETS 2326	1		2.6	1.0	< 1.0
Cadmium Dissolved	ug/l	DETS 042	1		< 1.0	< 1.0	< 1.0
Chromium Dissolved	ug/l	DETS 042	5		< 5.0	< 5.0	< 5.0
Copper Dissolved	ug/l	DETS 042	1		14	< 1.0	< 1.0
Lead Dissolved	ug/l	DETS 042	4		< 4.0	4.6	6.4
Mercury Dissolved	ug/l	DETS 078	0.05		< 0.05	< 0.05	< 0.05
Nickel Dissolved	ug/l	DETS 042	10		72	18	< 10
Selenium Dissolved	ug/l	DETS042	10		16	< 10	< 10
Zinc Dissolved	ug/l	DETS 042	1		29	6.6	3.8
Chloride	mg/l	DETS 055	0.1		280	220	170
Sulphate as SO4	mg/l	DETS 055	0.1		1000	430	340
Boron	ug/l	DETS 020	100		260	210	190
Cyanide total	ug/l	DETS 067	20		< 20	< 20	< 20
Ammoniacal Nitrogen as N	mg/l	DETSC2207	0.015		4.2	1.9	1.3
pH		DETS 008			7.2	7.3	7.4
Acenaphthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Acenaphthylene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Anthracene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	ug/l	DETS 074*	0.01		< 0.01	0.02	< 0.01
Benzo(a)pyrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Benzo(g,h,i)perylene	ug/l	DETS 074*	0.01		< 0.01	0.02	< 0.01
Chrysene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Dibenzo(a,h)anthracene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Fluoranthene	ug/l	DETS 074*	0.01		< 0.01	0.05	< 0.01
Fluorene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Indeno(1,2,3-c,d)pyrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
Naphthalene	ug/l	DETS 074*	0.01		< 0.01	0.11	< 0.01
Phenanthrene	ug/l	DETS 074*	0.01		< 0.01	0.02	< 0.01
Pyrene	ug/l	DETS 074*	0.01		< 0.01	< 0.01	< 0.01
PAH	ug/l	DETS 074*	0.2		< 0.20	0.21	< 0.20
PRO (C6-C10)	ug/l	DETS 062*	1		< 1.0	1.6	< 1.0
DRO (C10-C24)	ug/l	DETS 051	10		< 10	< 10	< 10
Mineral Oils	ug/l	DETS 051	10		25	14	< 10

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54649

Client Ref: 3842

Contract Title: Trinity South Residential Development South Shields

				Lab No.	361207	361208	361209
				Sample ID	CBH-04	CBH-09	CBH-10
				Depth			
				Sample Ref			
				Sample Type	EW	EW	EW
				Sampling Date	03/10/2011	03/10/2011	03/10/2011
				Sampling Time			
Test	Units	DETSxx	LOD				
Catechol	ug/l	DETS3422	0.1	< 0.10	< 0.10	< 0.10	< 0.10
Cresols	ug/l	DETS3422	0.1	< 0.10	0.31	0.31	0.31
Naphthols	ug/l	DETS3422	0.1	< 0.10	< 0.10	< 0.10	< 0.10
Phenol	ug/l	DETS3422	0.1	< 0.10	0.24	0.38	0.38
Resorcinol	ug/l	DETS3422	0.1	< 0.10	< 0.10	< 0.10	< 0.10
Trimethylphenol	ug/l	DETS3422	0.1	< 0.10	< 0.10	< 0.10	< 0.10
Total Phenols	ug/l	DETS3422	0.1	< 0.10	0.55	0.94	0.94
Xylenols & Ethylphenols	ug/l	DETS3422	0.1	< 0.10	< 0.10	0.25	0.25
Trichloroethylene	ug/l	DETS 068*	1		< 1	< 1	< 1

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54649

Client Ref: 3842

Contract Title: Trinity South Residential Development South Shields

Test	Units	DETSxx	LOD	Lab No.	361208	361209
				Sample ID	CBH-09	CBH-10
				Depth		
				Sample Ref		
				Sample Type	EW	EW
				Sampling Date	03/10/2011	03/10/2011
				Sampling Time		
Phenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Aniline	ug/l	DETS 071*	1	< 1.0	< 1.0	
2-Chlorophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Benzyl Alcohol	ug/l	DETS 071*	1	< 1.0	< 1.0	
2-Methylphenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Bis(2-chloroisopropyl)ether	ug/l	DETS 071*	1	< 1.0	< 1.0	
3&4-Methylphenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,4-Dimethylphenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Bis(2-chloroethoxy)methane	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,4-Dichlorophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
1,2,4-Trichlorobenzene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Naphthalene	ug/l	DETS 071*	1	< 1.0	< 1.0	
4-Chloro-3-methylphenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
2-Methylnaphthalene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Hexachlorocyclopentadiene	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,4,6-Trichlorophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,4,5-Trichlorophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
2-Chloronaphthalene	ug/l	DETS 071*	1	< 1.0	< 1.0	
2-Nitroaniline	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,4-Dinitrotoluene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Acenaphthylene	ug/l	DETS 071*	1	< 1.0	< 1.0	
3-Nitroaniline	ug/l	DETS 071*	1	< 1.0	< 1.0	
Acenaphthene	ug/l	DETS 071*	1	< 1.0	< 1.0	
4-Nitrophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Dibenzofuran	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,6-Dinitrotoluene	ug/l	DETS 071*	1	< 1.0	< 1.0	
2,3,4,6-Tetrachlorophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Diethylphthalate	ug/l	DETS 071*	1	< 1.0	< 1.0	
4-Chlorophenylphenylether	ug/l	DETS 071*	1	< 1.0	< 1.0	
Fluorene	ug/l	DETS 071*	1	< 1.0	< 1.0	
4-Nitroaniline	ug/l	DETS 071*	1	< 1.0	< 1.0	
2-Methyl-4,6-Dinitrophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Diphenylamine	ug/l	DETS 071*	1	< 1.0	< 1.0	
4-Bromophenylphenylether	ug/l	DETS 071*	1	< 1.0	< 1.0	
Hexachlorobenzene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Pentachlorophenol	ug/l	DETS 071*	1	< 1.0	< 1.0	
Phenanthrene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Anthracene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Di-n-butylphthalate	ug/l	DETS 071*	1	< 1.0	< 1.0	
Fluoranthene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Pyrene	ug/l	DETS 071*	1	< 1.0	< 1.0	
Butylbenzylphthalate	ug/l	DETS 071*	1	< 1.0	< 1.0	

Summary of Chemical Analysis

Water Samples

Our Ref: 11-54649

Client Ref: 3842

Contract Title: Trinity South Residential Development South Shields

Test	Units	DETSxx	LOD	Lab No.	361208	361209
				Sample ID	CBH-09	CBH-10
				Depth		
				Sample Ref		
				Sample Type	EW	EW
				Sampling Date	03/10/2011	03/10/2011
				Sampling Time		
Benzo(a)anthracene	ug/l	DETS 071*	1		< 1.0	< 1.0
Chrysene	ug/l	DETS 071*	1		< 1.0	< 1.0
Bis(2-ethylhexyl)phthalate	ug/l	DETS 071*	1		< 1.0	< 1.0
Di-n-octylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0
Benzo(b)fluoranthene	ug/l	DETS 071*	1		< 1.0	< 1.0
Benzo(k)fluoranthene	ug/l	DETS 071*	1		< 1.0	< 1.0
Benzo(a)pyrene	ug/l	DETS 071*	1		< 1.0	< 1.0
Indeno(123cd)pyrene	ug/l	DETS 071*	1		< 1.0	< 1.0
Dibenzo(ah)anthracene	ug/l	DETS 071*	1		< 1.0	< 1.0
Benzo(ghi)perylene	ug/l	DETS 071*	1		< 1.0	< 1.0
1,4-Dinitrobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0
Dimethylphthalate	ug/l	DETS 071*	1		< 1.0	< 1.0
1,3-Dinitrobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0
1,2-Dinitrobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0
2,3,5,6-Tetrachlorophenol	ug/l	DETS 071*	1		< 1.0	< 1.0
Azobenzene	ug/l	DETS 071*	1		< 1.0	< 1.0
Carbazole	ug/l	DETS 071*	1		< 1.0	< 1.0

Sample Comments

(The laboratory cannot be held responsible for the integrity of sample(s) received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note "Guidance on Deviating Samples".)

Lab No.	Sample ID	Date Sampled	Sample exceeded holding time for test	Sample not received in appropriate containers for test
361207	CBH-04	03/10/2011	BTEX/PRO (4 days).	
361207	CBH-04	03/10/2011	Naphthalene (4 days).	
361208	CBH-09	03/10/2011	BTEX/PRO (4 days).	
361208	CBH-09	03/10/2011	Naphthalene (4 days).	
361208	CBH-09	03/10/2011	Naphthalene (4 days).	
361208	CBH-09	03/10/2011	VOC liquid (4 days).	
361209	CBH-10	03/10/2011	BTEX/PRO (4 days).	
361209	CBH-10	03/10/2011	Naphthalene (4 days).	
361209	CBH-10	03/10/2011	Naphthalene (4 days).	
361209	CBH-10	03/10/2011	VOC liquid (4 days).	



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Certificate of Analysis



Certificate Number: 11-54352-1

Date: 19/10/2011

Client: Allied Exploration & Geotechnics Limited
Unit 25
Stella Gill Industrial Estate
Pelton Fell
DH2 2RG

Our Reference: 11-54352-1

Client Reference: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

Description: 21 soil samples, 6 leachate samples

Date Received: 30 September 2011

Date Started: 30 September 2011

Date Completed: 19 September 2011

Test Procedures: Identified by prefix DETSn, details available upon request.

Notes: **This report supersedes 11-54352, additional testing carried out**
Observations and interpretations are outside the scope of UKAS accreditation

Approved By: 

Paul Woodbridge, Senior Operations Manager

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Information in Support of the Analytical Results

Analysis

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425um sieve, in accordance with BS1377.

Organic soil analysis was carried out on an 'as received' sample.

Key

- * Denotes test not included in laboratory scope of accreditation
- # Denotes test that holds MCERTS accreditation, however, MCERTS accreditation is only implied if the report carries the MCERTS logo
- \$ Denotes tests completed by an approved subcontractor
- I/S Denotes insufficient sample to carry out test
- U/S Denotes that the sample is not suitable for testing

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-

Soils - 1 month

Liquids - 2 weeks

Asbestos (test portion) - 6 months

Summary of Chemical Analysis Matrix Descriptions

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

Sample ID	Other ID	Depth	Sample No	Completed	Matrix Description
CBH-01	3	0.50	359406	18/10/2011	dark brown gravelly clayey SAND inclusion odd rootlets
CBH-02	3	0.50	359407	18/10/2011	dark brown gravelly sandy CLAY inclusion odd rootlets
CBH-02	5	1.00	359408	18/10/2011	brown gravelly sandy CLAY inclusion numerous rootlets made ground contains poss brick
CBH-04	4	1.00	359409	18/10/2011	brown gravelly sandy CLAY made ground contains brick
CBH-07	3	0.50	359410	18/10/2011	brown gravelly sandy CLAY made ground contains brick
CWS-01	2	0.50	359411	18/10/2011	brown gravelly clayey SAND inclusion numerous rootlets made ground contains poss brick
CWS-04	1	0.50	359412	18/10/2011	brown gravelly clayey SAND inclusion numerous rootlets
CWS-04	3	1.00	359413	18/10/2011	dark brown gravelly clayey SAND made ground contains brick and coal
CWS-05	1	1.70	359414	18/10/2011	brown gravelly SAND
CWS-06	1	0.50	359415	18/10/2011	brown gravelly very sandy CLAY
CWS-06	3	1.00	359416	18/10/2011	brown gravelly sandy CLAY inclusion organic matter
CWS-07	3	1.00	359417	18/10/2011	brown gravelly clayey SAND inclusion numerous rootlets
CWS-09	3	1.00	359418	18/10/2011	brown gravelly SAND
CWS-11	1	0.50	359419	18/10/2011	brown gravelly SAND inclusion numerous rootlets made ground contains poss brick
CWS-11	3	1.00	359420	18/10/2011	brown gravelly sandy CLAY
CWS-12	3	1.00	359421	18/10/2011	brown gravelly SAND inclusion odd rootlets
CWS-15	1	0.50	359422	18/10/2011	brown gravelly clayey SAND inclusion numerous rootlets
HDP-01	4	1.00	359423	18/10/2011	dark brown gravelly clayey SAND inclusion odd rootlets
HDP-02	1	0.50	359424	18/10/2011	brown gravelly SAND made ground contains poss brick
HDP-03	1	0.50	359425	18/10/2011	brown gravelly very clayey SAND made ground contains poss brick
HDP-04	1	0.35	359426	18/10/2011	brown gravelly very clayey SAND inclusion numerous rootlets

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

			Lab No.	359406	359407	359408	359409
			Sample ID	CBH-01	CBH-02	CBH-02	CBH-04
			Depth	0.50	0.50	1.00	1.00
			Sample Ref	3	3	5	4
			Sample Type	ES	ES	ES	ES
			Sampling Date	//	//	//	//
			Sampling Time				
Test	Units	DETSxx	LOD				
Arsenic	mg/kg	DETS 042#	0.2	19	14	13	15
Cadmium	mg/kg	DETS 042#	0.1	0.8	0.7	0.6	0.7
Chromium	mg/kg	DETS 042#	0.15	28	25	22	24
Hexavalent Chromium	mg/kg	DETS02204*	1	< 1.0	< 1.0	< 1.0	< 1.0
Copper	mg/kg	DETS 042#	0.2	47	88	53	62
Lead	mg/kg	DETS 042#	0.3	110	54	46	89
Mercury	mg/kg	DETS 081#	0.05	0.27	0.11	0.10	0.21
Nickel	mg/kg	DETS 042#	1	20	21	17	23
Selenium	mg/kg	DETS 042#	0.5	1.4	< 0.5	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	1	120	82	72	78
Boron (water soluble)	mg/kg	DETS 020#	0.1	1.0	< 0.1	< 0.1	1.0
Calorific Value	MJ/kg	DETS05008	1				< 1.0
Thiocyanate	mg/kg	DETS 067#	0.6	< 0.6	< 0.6	< 0.6	< 0.6
Cyanide total	mg/kg	DETS 067#	0.1	0.2	< 0.1	< 0.1	0.1
Cyanide free	mg/kg	DETS 067#	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	%	DETS 002#	0.1	6.6	3.0	2.5	3.3
Total Sulphate as SO4	%	DETS 075#	0.01	0.10	0.15	0.19	0.14
pH		DETS 008#		9.6	11.2	11.6	9.2
Aliphatic C5-C6	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	1.2	< 1.2	< 1.2	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	1.5	< 1.5	< 1.5	< 1.5	8.8
Aliphatic C21-C35	mg/kg	DETS 072*	3.4	3.8	< 3.4	< 3.4	26
Aliphatic C35-C44	mg/kg	DETS 072*	3.4	< 3.4	< 3.4	< 3.4	12
Aromatic C5-C7	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	0.6	4.4	4.2	4.9	7.9
Aromatic C21-C35	mg/kg	DETS 072#	1.4	15	9.9	19	40
Aromatic C35-C44	mg/kg	DETS 072#	1.4	< 1.4	1.8	4.8	15
Aliphatic C5-C44	mg/kg	DETS 072*	10	< 10	< 10	< 10	47
Aromatic C5-C44	mg/kg	DETS 072*	10	19	14	24	63
TPH Ali/Aro	mg/kg	DETS 072*	10	23	14	24	110

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

					Lab No.	359406	359407	359408	359409
					Sample ID	CBH-01	CBH-02	CBH-02	CBH-04
					Depth	0.50	0.50	1.00	1.00
					Sample Ref	3	3	5	4
					Sample Type	ES	ES	ES	ES
					Sampling Date	//	//	//	//
					Sampling Time				
Test	Units	DETSxx	LOD						
Acenaphthene	mg/kg	DETS 050	0.1	0.4	1.6	< 0.1	0.2		
Acenaphthylene	mg/kg	DETS 050	0.1	< 0.1	1.8	< 0.1	< 0.1		
Anthracene	mg/kg	DETS 050	0.1	0.7	0.8	0.3	0.2		
Benzo(a)anthracene	mg/kg	DETS 050	0.1	2.1	6.5	1.2	0.8		
Benzo(a)pyrene	mg/kg	DETS 050	0.1	2.0	2.3	1.5	0.6		
Benzo(b)fluoranthene	mg/kg	DETS 050	0.1	1.8	2.2	1.2	0.7		
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1	0.9	< 0.1	0.6	0.3		
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.1	1.3	0.7	0.8	0.7		
Chrysene	mg/kg	DETS 050	0.1	2.1	1.9	1.4	0.9		
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.1	0.2	0.6	0.2	< 0.1		
Fluoranthene	mg/kg	DETS 050	0.1	5.1	3.8	2.1	1.8		
Fluorene	mg/kg	DETS 050	0.1	0.4	0.9	< 0.1	0.3		
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.1	1.7	1.2	1.2	0.7		
Naphthalene	mg/kg	DETS 050	0.1	0.1	0.3	< 0.1	< 0.1		
Phenanthrene	mg/kg	DETS 050	0.1	3.2	2.0	1.0	0.6		
Pyrene	mg/kg	DETS 050	0.1	3.6	3.3	1.8	1.2		
PAH	mg/kg	DETS 050	1.6	26	30	14	9.0		
Benzene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Ethylbenzene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Toluene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Xylene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01		
MTBE	mg/kg	DETS 062	0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Phenol - Monohydric	mg/kg	DETS 067#	0.3	1.3	< 0.3	< 0.3	< 0.3		
PCB	mg/kg	DETS 052#	0.01				< 0.01		
2,4,4'-Trichlorobiphenyl PCB 28	mg/kg	DETS 052#	0.01				< 0.01		
2,2',5,5'-Tetrachlorobiphenyl PCB 52	mg/kg	DETS 052#	0.01				< 0.01		
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	mg/kg	DETS 052#	0.01				< 0.01		
2,3',4,4',5-Pentachlorobiphenyl PCB 118	mg/kg	DETS 052#	0.01				< 0.01		
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	mg/kg	DETS 052#	0.01				< 0.01		
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	mg/kg	DETS 052#	0.01				< 0.01		
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	mg/kg	DETS 052#	0.01				< 0.01		
Trichloroethylene	mg/kg	DETS 068*	0.01				< 0.01		
Dibutyltin	mg/kg						< 1.0		

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

			Lab No.	359410	359411	359412	359413
			Sample ID	CBH-07	CWS-01	CWS-04	CWS-04
			Depth	0.50	0.50	0.50	1.00
			Sample Ref	3	2	1	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	//	//	//	//
			Sampling Time				
Test	Units	DETSxx	LOD				
Arsenic	mg/kg	DETS 042#	0.2	8.0	9.3	13	12
Cadmium	mg/kg	DETS 042#	0.1	0.7	0.6	0.8	0.6
Chromium	mg/kg	DETS 042#	0.15	31	27	35	25
Hexavalent Chromium	mg/kg	DETSC2204*	1	< 1.0	< 1.0	< 1.0	< 1.0
Copper	mg/kg	DETS 042#	0.2	46	42	41	37
Lead	mg/kg	DETS 042#	0.3	60	79	60	73
Mercury	mg/kg	DETS 081#	0.05	0.07	0.11	0.19	0.10
Nickel	mg/kg	DETS 042#	1	25	21	26	23
Selenium	mg/kg	DETS 042#	0.5	< 0.5	0.5	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	1	97	110	93	63
Boron (water soluble)	mg/kg	DETS 020#	0.1	1.0	< 0.1	< 0.1	< 0.1
Calorific Value	MJ/kg	DETSC 5008	1	< 1.0			
Thiocyanate	mg/kg	DETS 067#	0.6	< 0.6	< 0.6	< 0.6	< 0.6
Cyanide total	mg/kg	DETS 067#	0.1	< 0.1	< 0.1	0.2	< 0.1
Cyanide free	mg/kg	DETS 067#	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	%	DETS 002#	0.1	3.1	3.4	3.2	2.7
Total Sulphate as SO4	%	DETS 075#	0.01	0.20	0.12	0.09	0.15
pH		DETS 008#		9.4	9.5	8.7	9.7
Aliphatic C5-C6	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	1.2	< 1.2	1.5	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	1.5	2.2	4.6	< 1.5	< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*	3.4	15	45	3.5	6.0
Aliphatic C35-C44	mg/kg	DETS 072*	3.4	4.2	9.6	< 3.4	< 3.4
Aromatic C5-C7	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	0.5	0.6	1.8	1.3	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	0.6	4.1	15	11	2.5
Aromatic C21-C35	mg/kg	DETS 072#	1.4	26	79	27	21
Aromatic C35-C44	mg/kg	DETS 072#	1.4	9.7	22	4.2	4.5
Aliphatic C5-C44	mg/kg	DETS 072*	10	21	61	< 10	< 10
Aromatic C5-C44	mg/kg	DETS 072*	10	40	120	44	28
TPH Ali/Aro	mg/kg	DETS 072*	10	61	180	47	34

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

				Lab No.	359410	359411	359412	359413
				Sample ID	CBH-07	CWS-01	CWS-04	CWS-04
				Depth	0.50	0.50	0.50	1.00
				Sample Ref	3	2	1	3
				Sample Type	ES	ES	ES	ES
				Sampling Date	//	//	//	//
				Sampling Time				
Test	Units	DETSxx	LOD					
Acenaphthene	mg/kg	DETS 050	0.1		< 0.1	0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050	0.1		< 0.1	0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETS 050	0.1		0.1	0.4	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETS 050	0.1		0.3	2.2	0.7	0.6
Benzo(a)pyrene	mg/kg	DETS 050	0.1		0.4	2.3	0.9	0.4
Benzo(b)fluoranthene	mg/kg	DETS 050	0.1		0.6	1.9	0.9	0.2
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1		0.2	1.1	0.4	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.1		0.3	1.4	0.5	0.4
Chrysene	mg/kg	DETS 050	0.1		0.2	2.5	0.7	0.7
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.1		0.1	0.3	0.2	< 0.1
Fluoranthene	mg/kg	DETS 050	0.1		0.9	4.6	1.2	1.7
Fluorene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.1		0.2	1.5	0.5	< 0.1
Naphthalene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	0.1
Phenanthrene	mg/kg	DETS 050	0.1		0.3	1.4	0.6	0.8
Pyrene	mg/kg	DETS 050	0.1		0.3	3.3	0.9	1.6
PAH	mg/kg	DETS 050	1.6		4.1	23	7.8	6.8
Benzene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
MTBE	mg/kg	DETS 062	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Phenol - Monohydric	mg/kg	DETS 067#	0.3		< 0.3	< 0.3	< 0.3	< 0.3
PCB	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,4,4'-Trichlorobiphenyl PCB 28	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,2',5,5'-Tetrachlorobiphenyl PCB 52	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,3',4,4',5'-Pentachlorobiphenyl PCB 118	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	mg/kg	DETS 052#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Trichloroethylene	mg/kg	DETS 068*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Dibutyltin	mg/kg				< 1.0	< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

				Lab No.	359414	359415	359416	359417
				Sample ID	CWS-05	CWS-06	CWS-06	CWS-07
				Depth	1.70	0.50	1.00	1.00
				Sample Ref	1	1	3	3
				Sample Type	SUB	ES	ES	ES
				Sampling Date	//	//	//	//
				Sampling Time				
Test	Units	DETSxx	LOD					
Arsenic	mg/kg	DETS 042#	0.2		37	13	12	16
Cadmium	mg/kg	DETS 042#	0.1		0.5	0.7	0.7	0.7
Chromium	mg/kg	DETS 042#	0.15		17	18	23	17
Hexavalent Chromium	mg/kg	DETS02204*	1		< 1.0	< 1.0	< 1.0	< 1.0
Copper	mg/kg	DETS 042#	0.2		37	51	41	39
Lead	mg/kg	DETS 042#	0.3		350	90	60	73
Mercury	mg/kg	DETS 081#	0.05		0.10	0.17	0.08	0.11
Nickel	mg/kg	DETS 042#	1		46	20	27	19
Selenium	mg/kg	DETS 042#	0.5		< 0.5	0.6	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	1		30	120	67	85
Boron (water soluble)	mg/kg	DETS 020#	0.1		1.5	0.3	0.2	0.4
Caloric Value	MJ/kg	DETS05008	1			< 1.0		1.0
Thiocyanate	mg/kg	DETS 067#	0.6		< 0.6	< 0.6	< 0.6	< 0.6
Cyanide total	mg/kg	DETS 067#	0.1		< 0.1	< 0.1	< 0.1	0.1
Cyanide free	mg/kg	DETS 067#	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	%	DETS 002#	0.1		5.1	3.3	3.0	3.9
Total Sulphate as SO4	%	DETS 075#	0.01		0.09	0.16	0.11	0.13
pH		DETS 008#			9.0	8.9	8.4	9.1
Aliphatic C5-C6	mg/kg	DETS 072*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	0.01		0.04	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	1.5		< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	1.2		< 1.2	1.7	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	1.5		< 1.5	5.5	< 1.5	1.9
Aliphatic C21-C35	mg/kg	DETS 072*	3.4		< 3.4	27	< 3.4	18
Aliphatic C35-C44	mg/kg	DETS 072*	3.4		< 3.4	9.9	< 3.4	5.3
Aromatic C5-C7	mg/kg	DETS 072*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	0.01		0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	0.9		< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	0.5		< 0.5	0.9	< 0.5	0.9
Aromatic C16-C21	mg/kg	DETS 072#	0.6		< 0.6	6.6	3.5	20
Aromatic C21-C35	mg/kg	DETS 072#	1.4		< 1.4	34	14	79
Aromatic C35-C44	mg/kg	DETS 072#	1.4		< 1.4	9.2	1.5	16
Aliphatic C5-C44	mg/kg	DETS 072*	10		< 10	44	< 10	25
Aromatic C5-C44	mg/kg	DETS 072*	10		< 10	51	19	120
TPH Ali/Aro	mg/kg	DETS 072*	10		< 10	95	21	150

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

				Lab No.	359414	359415	359416	359417
				Sample ID	CWS-05	CWS-06	CWS-06	CWS-07
				Depth	1.70	0.50	1.00	1.00
				Sample Ref	1	1	3	3
				Sample Type	SUB	ES	ES	ES
				Sampling Date	//	//	//	//
				Sampling Time				
Test	Units	DETSxx	LOD					
Acenaphthene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	0.1
Acenaphthylene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	0.1
Anthracene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	0.5
Benzo(a)anthracene	mg/kg	DETS 050	0.1		< 0.1	0.4	0.4	2.3
Benzo(a)pyrene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	1.9
Benzo(b)fluoranthene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	2.1
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	1.2
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	1.6
Chrysene	mg/kg	DETS 050	0.1		< 0.1	0.2	< 0.1	2.0
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	0.2
Fluoranthene	mg/kg	DETS 050	0.1		< 0.1	0.8	0.7	4.4
Fluorene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	1.4
Naphthalene	mg/kg	DETS 050	0.1		0.7	0.1	< 0.1	0.1
Phenanthrene	mg/kg	DETS 050	0.1		0.4	0.5	0.2	2.3
Pyrene	mg/kg	DETS 050	0.1		< 0.1	0.7	0.5	3.5
PAH	mg/kg	DETS 050	1.6		< 1.6	2.8	1.9	24
Benzene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01		0.01	< 0.01	< 0.01	< 0.01
MTBE	mg/kg	DETS 062	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Phenol - Monohydric	mg/kg	DETS 067#	0.3		< 0.3	< 0.3	< 0.3	< 0.3
PCB	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,4,4'-Trichlorobiphenyl PCB 28	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,2',5,5'-Tetrachlorobiphenyl PCB 52	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,3',4,4',5-Pentachlorobiphenyl PCB 118	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	mg/kg	DETS 052#	0.01			< 0.01	< 0.01	< 0.01
Trichloroethylene	mg/kg	DETS 068*	0.01			< 0.01	< 0.01	< 0.01
Dibutyltin	mg/kg					< 1.0	< 1.0	< 1.0

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

			Lab No.	359418	359419	359420	359421
			Sample ID	CWS-09	CWS-11	CWS-11	CWS-12
			Depth	1.00	0.50	1.00	1.00
			Sample Ref	3	1	3	3
			Sample Type	ES	ES	ES	ES
			Sampling Date	//	//	//	//
			Sampling Time				
Test	Units	DETSxx	LOD				
Arsenic	mg/kg	DETS 042#	0.2	25	6.7	7.0	14
Cadmium	mg/kg	DETS 042#	0.1	0.4	0.7	0.6	0.7
Chromium	mg/kg	DETS 042#	0.15	15	26	28	19
Hexavalent Chromium	mg/kg	DETS C2204*	1	< 1.0	< 1.0	< 1.0	< 1.0
Copper	mg/kg	DETS 042#	0.2	29	37	27	840
Lead	mg/kg	DETS 042#	0.3	86	61	29	1900
Mercury	mg/kg	DETS 081#	0.05	< 0.05	0.06	< 0.05	1.6
Nickel	mg/kg	DETS 042#	1	21	19	36	20
Selenium	mg/kg	DETS 042#	0.5	0.5	< 0.5	< 0.5	< 0.5
Zinc	mg/kg	DETS 042#	1	37	76	62	160
Boron (water soluble)	mg/kg	DETS 020#	0.1	< 0.1	0.5	0.6	< 0.1
Calorific Value	MJ/kg	DETS C 5008	1				1.1
Thiocyanate	mg/kg	DETS 067#	0.6	< 0.6	< 0.6	< 0.6	< 0.6
Cyanide total	mg/kg	DETS 067#	0.1	< 0.1	0.1	< 0.1	0.2
Cyanide free	mg/kg	DETS 067#	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	%	DETS 002#	0.1	3.1	3.9	1.6	3.9
Total Sulphate as SO4	%	DETS 075#	0.01	0.07	0.06	0.05	0.10
pH		DETS 008#		8.5	10.1	8.7	9.2
Aliphatic C5-C6	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	1.2	< 1.2	1.6	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	1.5	1.9	5.0	< 1.5	< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*	3.4	< 3.4	35	14	8.1
Aliphatic C35-C44	mg/kg	DETS 072*	3.4	< 3.4	25	3.6	< 3.4
Aromatic C5-C7	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	0.5	< 0.5	0.9	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	0.6	1.9	20	5.1	3.9
Aromatic C21-C35	mg/kg	DETS 072#	1.4	3.3	120	36	19
Aromatic C35-C44	mg/kg	DETS 072#	1.4	< 1.4	57	14	3.8
Aliphatic C5-C44	mg/kg	DETS 072*	10	< 10	67	18	< 10
Aromatic C5-C44	mg/kg	DETS 072*	10	< 10	200	55	27
TPH Ali/Aro	mg/kg	DETS 072*	10	< 10	270	73	36

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

				Lab No.	359418	359419	359420	359421
				Sample ID	CWS-09	CWS-11	CWS-11	CWS-12
				Depth	1.00	0.50	1.00	1.00
				Sample Ref	3	1	3	3
				Sample Type	ES	ES	ES	ES
				Sampling Date	//	//	//	//
				Sampling Time				
Test	Units	DETSxx	LOD					
Acenaphthene	mg/kg	DETS 050	0.1	< 0.1	4.3	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050	0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETS 050	0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETS 050	0.1	< 0.1	2.4	0.1	< 0.1	< 0.1
Benzo(a)pyrene	mg/kg	DETS 050	0.1	< 0.1	8.7	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	DETS 050	0.1	< 0.1	4.6	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1	< 0.1	1.8	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.1	< 0.1	5.2	< 0.1	< 0.1	< 0.1
Chrysene	mg/kg	DETS 050	0.1	< 0.1	0.9	0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.1	< 0.1	3.9	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	DETS 050	0.1	< 0.1	1.9	0.6	0.4	
Fluorene	mg/kg	DETS 050	0.1	< 0.1	1.7	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.1	< 0.1	8.8	< 0.1	< 0.1	< 0.1
Naphthalene	mg/kg	DETS 050	0.1	< 0.1	0.7	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	DETS 050	0.1	< 0.1	1.3	0.3	0.3	
Pyrene	mg/kg	DETS 050	0.1	< 0.1	1.9	0.5	0.8	
PAH	mg/kg	DETS 050	1.6	< 1.6	49	1.7	1.7	
Benzene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
MTBE	mg/kg	DETS 062	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenol - Monohydric	mg/kg	DETS 067#	0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
PCB	mg/kg	DETS 052#	0.01		< 0.01	< 0.01		
2,4,4'-Trichlorobiphenyl PCB 28	mg/kg	DETS 052#	0.01					
2,2',5,5'-Tetrachlorobiphenyl PCB 52	mg/kg	DETS 052#	0.01					
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	mg/kg	DETS 052#	0.01					
2,3',4,4',5-Pentachlorobiphenyl PCB 118	mg/kg	DETS 052#	0.01					
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	mg/kg	DETS 052#	0.01					
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	mg/kg	DETS 052#	0.01					
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	mg/kg	DETS 052#	0.01					
Trichloroethylene	mg/kg	DETS 068*	0.01					
Dibutyltin	mg/kg							

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

			Lab No.	359422	359423	359424	359425
			Sample ID	CWS-15	HDP-01	HDP-02	HDP-03
			Depth	0.50	1.00	0.50	0.50
			Sample Ref	1	4	1	1
			Sample Type	ES	ES	ES	ES
			Sampling Date	//	//	//	//
			Sampling Time				
Test	Units	DETSxx	LOD				
Arsenic	mg/kg	DETS 042#	0.2	6.4	13	7.6	8.4
Cadmium	mg/kg	DETS 042#	0.1	0.7	0.5	0.7	0.6
Chromium	mg/kg	DETS 042#	0.15	20	17	28	18
Hexavalent Chromium	mg/kg	DETS C2204*	1	< 1.0	< 1.0	< 1.0	< 1.0
Copper	mg/kg	DETS 042#	0.2	36	46	46	39
Lead	mg/kg	DETS 042#	0.3	76	110	54	81
Mercury	mg/kg	DETS 081#	0.05	0.08	0.18	0.09	0.39
Nickel	mg/kg	DETS 042#	1	20	18	25	19
Selenium	mg/kg	DETS 042#	0.5	< 0.5	< 0.5	0.6	< 0.5
Zinc	mg/kg	DETS 042#	1	88	77	100	110
Boron (water soluble)	mg/kg	DETS 020#	0.1	0.6	0.7	0.6	0.3
Calorific Value	MJ/kg	DETS 5008	1				
Thiocyanate	mg/kg	DETS 067#	0.6	< 0.6	< 0.6	< 0.6	< 0.6
Cyanide total	mg/kg	DETS 067#	0.1	< 0.1	< 0.1	< 0.1	0.1
Cyanide free	mg/kg	DETS 067#	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic matter	%	DETS 002#	0.1	3.3	2.8	3.6	3.8
Total Sulphate as SO4	%	DETS 075#	0.01	0.20	0.12	0.10	0.11
pH		DETS 008#		8.6	8.6	8.7	9.3
Aliphatic C5-C6	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	0.04
Aliphatic C10-C12	mg/kg	DETS 072#	1.5	< 1.5	< 1.5	< 1.5	< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	1.2	< 1.2	8.2	< 1.2	< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	1.5	< 1.5	36	4.7	1.6
Aliphatic C21-C35	mg/kg	DETS 072*	3.4	11	43	33	21
Aliphatic C35-C44	mg/kg	DETS 072*	3.4	< 3.4	47	16	6.1
Aromatic C5-C7	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	0.01	< 0.01	< 0.01	< 0.01	0.01
Aromatic C10-C12	mg/kg	DETS 072#	0.9	< 0.9	< 0.9	< 0.9	< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	0.5	< 0.5	3.8	< 0.5	< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	0.6	6.1	24	6.9	6.2
Aromatic C21-C35	mg/kg	DETS 072#	1.4	26	88	69	42
Aromatic C35-C44	mg/kg	DETS 072#	1.4	5.9	87	30	14
Aliphatic C5-C44	mg/kg	DETS 072*	10	11	130	54	29
Aromatic C5-C44	mg/kg	DETS 072*	10	38	180	110	62
TPH Ali/Aro	mg/kg	DETS 072*	10	49	310	160	91

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

					359422	359423	359424	359425
					CWS-15	HDP-01	HDP-02	HDP-03
					0.50	1.00	0.50	0.50
					1	4	1	1
					ES	ES	ES	ES
					//	//	//	//
Test	Units	DETSxx	LOD					
Acenaphthene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	mg/kg	DETS 050	0.1		0.2	< 0.1	< 0.1	0.4
Benzo(a)anthracene	mg/kg	DETS 050	0.1		0.5	< 0.1	0.4	0.7
Benzo(a)pyrene	mg/kg	DETS 050	0.1		0.5	0.3	0.6	1.1
Benzo(b)fluoranthene	mg/kg	DETS 050	0.1		0.7	0.3	0.7	0.8
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1		0.3	< 0.1	0.4	0.4
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.1		0.3	0.2	0.4	0.7
Chrysene	mg/kg	DETS 050	0.1		0.5	< 0.1	0.3	0.6
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.1		< 0.1	0.1	< 0.1	0.1
Fluoranthene	mg/kg	DETS 050	0.1		0.9	0.5	0.8	2.2
Fluorene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.1		0.5	< 0.1	0.7	0.7
Naphthalene	mg/kg	DETS 050	0.1		< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	DETS 050	0.1		0.5	< 0.1	< 0.1	1.0
Pyrene	mg/kg	DETS 050	0.1		0.8	0.4	0.6	1.6
PAH	mg/kg	DETS 050	1.6		5.8	1.9	5.0	10
Benzene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01		< 0.01	< 0.01	< 0.01	< 0.01
MTBE	mg/kg	DETS 062	0.01		< 0.01	< 0.01	< 0.01	< 0.01
Phenol - Monohydric	mg/kg	DETS 067#	0.3		< 0.3	< 0.3	< 0.3	< 0.3
PCB	mg/kg	DETS 052#	0.01			< 0.01		< 0.01
2,4,4'-Trichlorobiphenyl PCB 28	mg/kg	DETS 052#	0.01					
2,2',5,5'-Tetrachlorobiphenyl PCB 52	mg/kg	DETS 052#	0.01					
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	mg/kg	DETS 052#	0.01					
2,3',4,4',5-Pentachlorobiphenyl PCB 118	mg/kg	DETS 052#	0.01					
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	mg/kg	DETS 052#	0.01					
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	mg/kg	DETS 052#	0.01					
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	mg/kg	DETS 052#	0.01					
Trichloroethylene	mg/kg	DETS 068*	0.01					
Dibutyltin	mg/kg							

Summary of Chemical Analysis

Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

					Lab No.	359426
					Sample ID	HDP-04
					Depth	0.35
					Sample Ref	1
					Sample Type	ES
					Sampling Date	/ /
					Sampling Time	
Test	Units	DETSxx	LOD			
Arsenic	mg/kg	DETS 042#	0.2			8.5
Cadmium	mg/kg	DETS 042#	0.1			0.6
Chromium	mg/kg	DETS 042#	0.15			17
Hexavalent Chromium	mg/kg	DETSC2204*	1			< 1.0
Copper	mg/kg	DETS 042#	0.2			34
Lead	mg/kg	DETS 042#	0.3			72
Mercury	mg/kg	DETS 081#	0.05			0.37
Nickel	mg/kg	DETS 042#	1			14
Selenium	mg/kg	DETS 042#	0.5			0.8
Zinc	mg/kg	DETS 042#	1			86
Boron (water soluble)	mg/kg	DETS 020#	0.1			0.4
Caloric Value	MJ/kg	DETSC 5008	1			
Thiocyanate	mg/kg	DETS 067#	0.6			2.1
Cyanide total	mg/kg	DETS 067#	0.1			0.2
Cyanide free	mg/kg	DETS 067#	0.1			< 0.1
Organic matter	%	DETS 002#	0.1			4.0
Total Sulphate as SO4	%	DETS 075#	0.01			0.05
pH		DETS 008#				8.4
Aliphatic C5-C6	mg/kg	DETS 072*	0.01			< 0.01
Aliphatic C6-C8	mg/kg	DETS 072*	0.01			0.04
Aliphatic C8-C10	mg/kg	DETS 072*	0.01			< 0.01
Aliphatic C10-C12	mg/kg	DETS 072#	1.5			< 1.5
Aliphatic C12-C16	mg/kg	DETS 072#	1.2			< 1.2
Aliphatic C16-C21	mg/kg	DETS 072#	1.5			< 1.5
Aliphatic C21-C35	mg/kg	DETS 072*	3.4			7.5
Aliphatic C35-C44	mg/kg	DETS 072*	3.4			< 3.4
Aromatic C5-C7	mg/kg	DETS 072*	0.01			< 0.01
Aromatic C7-C8	mg/kg	DETS 072*	0.01			< 0.01
Aromatic C8-C10	mg/kg	DETS 072*	0.01			< 0.01
Aromatic C10-C12	mg/kg	DETS 072#	0.9			< 0.9
Aromatic C12-C16	mg/kg	DETS 072#	0.5			< 0.5
Aromatic C16-C21	mg/kg	DETS 072#	0.6			1.5
Aromatic C21-C35	mg/kg	DETS 072#	1.4			13
Aromatic C35-C44	mg/kg	DETS 072#	1.4			< 1.4
Aliphatic C5-C44	mg/kg	DETS 072*	10			< 10
Aromatic C5-C44	mg/kg	DETS 072*	10			15
TPH Ali/Aro	mg/kg	DETS 072*	10			22

Summary of Chemical Analysis Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

Test	Units	DETSxx	LOD	
Acenaphthene	mg/kg	DETS 050	0.1	< 0.1
Acenaphthylene	mg/kg	DETS 050	0.1	< 0.1
Anthracene	mg/kg	DETS 050	0.1	< 0.1
Benzo(a)anthracene	mg/kg	DETS 050	0.1	0.4
Benzo(a)pyrene	mg/kg	DETS 050	0.1	0.3
Benzo(b)fluoranthene	mg/kg	DETS 050	0.1	0.5
Benzo(k)fluoranthene	mg/kg	DETS 050	0.1	< 0.1
Benzo(g,h,i)perylene	mg/kg	DETS 050	0.1	0.3
Chrysene	mg/kg	DETS 050	0.1	< 0.1
Dibenzo(a,h)anthracene	mg/kg	DETS 050	0.1	< 0.1
Fluoranthene	mg/kg	DETS 050	0.1	0.3
Fluorene	mg/kg	DETS 050	0.1	< 0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	DETS 050	0.1	< 0.1
Naphthalene	mg/kg	DETS 050	0.1	< 0.1
Phenanthrene	mg/kg	DETS 050	0.1	< 0.1
Pyrene	mg/kg	DETS 050	0.1	0.3
PAH	mg/kg	DETS 050	1.6	2.2
Benzene	mg/kg	DETS 062#	0.01	< 0.01
Ethylbenzene	mg/kg	DETS 062#	0.01	< 0.01
Toluene	mg/kg	DETS 062#	0.01	< 0.01
Xylene	mg/kg	DETS 062#	0.01	< 0.01
MTBE	mg/kg	DETS 062	0.01	< 0.01
Phenol - Monohydric	mg/kg	DETS 067#	0.3	< 0.3
PCB	mg/kg	DETS 052#	0.01	
2,4,4'-Trichlorobiphenyl PCB 28	mg/kg	DETS 052#	0.01	
2,2',5,5'-Tetrachlorobiphenyl PCB 52	mg/kg	DETS 052#	0.01	
2,2',4,5,5'-Pentachlorobiphenyl PCB 101	mg/kg	DETS 052#	0.01	
2,3',4,4',5'-Pentachlorobiphenyl PCB 118	mg/kg	DETS 052#	0.01	
2,2',4,4',5,5'-Hexachlorobiphenyl PCB 153	mg/kg	DETS 052#	0.01	
2,2',3,4,4',5'-Hexachlorobiphenyl PCB 138	mg/kg	DETS 052#	0.01	
2,2',3,4,4',5,5'-Heptachlorobiphenyl PCB 180	mg/kg	DETS 052#	0.01	
Trichloroethylene	mg/kg	DETS 068*	0.01	
Dibutyltin	mg/kg			

Lab No.	359426
Sample ID	HDP-04
Depth	0.35
Sample Ref	1
Sample Type	ES
Sampling Date	/ /
Sampling Time	

Summary of Asbestos Analysis

Soil Samples

Our Ref: 11-54352-1

Client Ref: 3842

Contract Title: Trinity South Residential Development, South Shields - Ground Investigation

<u>Lab No</u>	<u>Sample Ref</u>	<u>Depth</u>	<u>Other Ref</u>	<u>Material</u>	<u>Result</u>
359406	CBH-01	0.50	3	SOIL	NAD
359409	CBH-04	1.00	4	SOIL	NAD
359410	CBH-07	0.50	3	SOIL	Chrysotile
359413	CWS-04	1.00	3	SOIL	NAD
359415	CWS-06	0.50	1	SOIL	NAD
359416	CWS-06	1.00	3	SOIL	NAD
359419	CWS-11	0.50	1	SOIL	NAD
359420	CWS-11	1.00	3	SOIL	NAD
359423	HDP-01	1.00	4	SOIL	NAD
359425	HDP-03	0.50	1	SOIL	NAD
359426	HDP-04	0.35	1	SOIL	NAD

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos

NAD = No Asbestos Detected. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos

Samples are analysed by DETS 082 using polarised light microscopy in accordance with HSG248 and documented in-house methods. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'

**WASTE ACCEPTANCE CRITERIA TESTING
ANALYTICAL REPORT**

Job Title: Trinity South Residential Development, South Shields - GI
Client Reference: 3842
Sample ID: CWS-06 / 0.50 / 1 / ES

Job Number: 11-54352-1
Sample Number: 359415 359427
Date Analysed: 12/10/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	1.6
003 Loss On Ignition	%	5.2
062 BTEX	mg/kg	<0.04
052 PCB's (7 congeners)	mg/kg	<0.01
051 TPH (C10 - C40)	mg/kg	48
050 PAH's	mg/kg	2.8
008 pH	pH Units	8.9
073 Acid Neutralisation Capacity (pH4)*	mol/kg	1.4
073 Acid Neutralisation Capacity (pH7)*	mol/kg	<1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1.0	<1.0	<0.002	<0.01
042 Barium as Ba*	120	38	0.24	0.49
042 Cadmium as Cd	<2.0	<2.0	<0.004	<0.02
042 Chromium as Cr	<5.0	<5.0	<0.02	<0.1
042 Copper as Cu	11	3.7	0.022	0.047
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	54	10	0.11	0.16
042 Lead as Pb	<4.0	<4.0	<0.01	<0.05
2328 Antimony as Sb	3.3	<1.0	<0.01	<0.05
017 Selenium as Se	<12	<12	<0.006	<0.03
042 Zinc as Zn	14	2.9	0.028	0.044
055 Chloride as Cl	14000	2000	28	<100
055 Fluoride as F	580	360	1.2	3.9
055 Sulphate as SO4	260000	41000	520	713
035 Total Dissolved Solids *	350000	100000	700	1346
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	10000	6000	20	66
Additional Information				
008 pH	8.5	8.4		
009 Conductivity uS/cm	512	150		
Temperature*	15	15		
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.124			
Stage 1				
Volume of Leachant L2	0.233			
Volume of Eluate VE1	0.172			
Stage 2				
Volume of Leachant L8	0.995			
Volume of Eluate VE2	0.905			

WAC Limit Values limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

Disclaimer: The WAC limit values are provided for guidance only. DETS does not accept responsibility for errors or omissions. Values are correct at time of issue.

DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

**WASTE ACCEPTANCE CRITERIA TESTING
ANALYTICAL REPORT**

Job Title: Trinity South Residential Development, South Shields - GI
Client Reference: 3842
Sample ID: CWS-06 / 1.00 / 3 / ES

Job Number: 11-54352-1
Sample Number: 359416 359429
Date Analysed: 12/10/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	1.7
003 Loss On Ignition	%	5.3
062 BTEX	mg/kg	<0.04
052 PCB's (7 congeners)	mg/kg	<0.01
051 TPH (C10 - C40)	mg/kg	57
050 PAH's	mg/kg	1.9
008 pH	pH Units	8.4
073 Acid Neutralisation Capacity (pH4)*	mol/kg	1.3
073 Acid Neutralisation Capacity (pH7)*	mol/kg	<1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1.0	<1.0	<0.002	<0.01
042 Barium as Ba*	94	21	0.19	0.31
042 Cadmium as Cd	<2.0	<2.0	<0.004	<0.02
042 Chromium as Cr	<5.0	<5.0	<0.02	<0.1
042 Copper as Cu	16	2.5	0.032	0.043
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	130	17	0.26	0.32
042 Lead as Pb	<4.0	<4.0	<0.01	<0.05
2328 Antimony as Sb	19	4.8	0.038	0.067
017 Selenium as Se	<12	<12	<0.006	<0.03
042 Zinc as Zn	9.7	1.9	0.019	0.029
055 Chloride as Cl	17000	2000	34	<100
055 Fluoride as F	790	380	1.6	4.3
055 Sulphate as SO4	160000	25000	320	426
035 Total Dissolved Solids *	290000	51000	580	822
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	11000	6700	22	73
Additional Information				
008 pH	8.2	8.3		
009 Conductivity uS/cm	424	75.0		
Temperature*	15	15		
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.123			
Stage 1				
Volume of Leachant L2	0.228			
Volume of Eluate VE1	0.160			
Stage 2				
Volume of Leachant L8	0.982			
Volume of Eluate VE2	0.895			

WAC Limit Values limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

**WASTE ACCEPTANCE CRITERIA TESTING
ANALYTICAL REPORT**

Job Title: Trinity South Residential Development, South Shields - GI
 Client Reference: 3842
 Sample ID: CWS-11 / 0.50 / 1 / ES

Job Number: 11-54352-1
 Sample Number: 359419 359431
 Date Analysed: 12/10/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	2.6
003 Loss On Ignition	%	5.9
062 BTEX	mg/kg	<0.04
052 PCB's (7 congeners)	mg/kg	<0.01
051 TPH (C10 - C40)	mg/kg	3100
050 PAH's	mg/kg	49
008 pH	pH Units	10.1
073 Acid Neutralisation Capacity (pH4)*	mol/kg	1.2
073 Acid Neutralisation Capacity (pH7)*	mol/kg	<1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1.0	<1.0	<0.002	<0.01
042 Barium as Ba*	35	17	0.070	0.20
042 Cadmium as Cd	<2.0	<2.0	<0.004	<0.02
042 Chromium as Cr	<5.0	<5.0	<0.02	<0.1
042 Copper as Cu	3.9	<2.0	0.008	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4.0	<4.0	<0.01	<0.05
2328 Antimony as Sb	2.0	<1.0	<0.01	<0.05
017 Selenium as Se	<12	<12	<0.006	<0.03
042 Zinc as Zn	3.4	<1.0	0.007	<0.01
055 Chloride as Cl	12000	2000	24	<100
055 Fluoride as F	630	290	1.3	3.4
055 Sulphate as SO4	27000	17000	54	184
035 Total Dissolved Solids *	95000	37000	190	452
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	8200	6700	16	69
Additional Information				
008 pH	8.2	8.2		
009 Conductivity uS/cm	139	54.5		
Temperature*	15	15		
Mass of Sample Kg	0.130			
Mass of dry Sample Kg	0.123			
Stage 1				
Volume of Leachant L2	0.239			
Volume of Eluate VE1	0.174			
Stage 2				
Volume of Leachant L8	0.985			
Volume of Eluate VE2	0.875			

WAC Limit Values limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

**WASTE ACCEPTANCE CRITERIA TESTING
ANALYTICAL REPORT**

Job Title: Trinity South Residential Development, South Shields - GI
Client Reference: 3842
Sample ID: CWS-11 / 1.00 / 3 / ES

Job Number: 11-54352-1
Sample Number: 359420 359433
Date Analysed: 12/10/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	0.9
003 Loss On Ignition	%	4.9
062 BTEX	mg/kg	<0.04
052 PCB's (7 congeners)	mg/kg	<0.01
051 TPH (C10 - C40)	mg/kg	110
050 PAH's	mg/kg	1.7
008 pH	pH Units	8.7
073 Acid Neutralisation Capacity (pH4)*	mol/kg	<1.0
073 Acid Neutralisation Capacity (pH7)*	mol/kg	<1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1.0	<1.0	<0.002	<0.01
042 Barium as Ba*	62	16	0.12	0.23
042 Cadmium as Cd	<2.0	<2.0	<0.004	<0.02
042 Chromium as Cr	<5.0	<5.0	<0.02	<0.1
042 Copper as Cu	3	<2.0	0.006	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	29	11	0.058	0.14
042 Lead as Pb	<4.0	<4.0	<0.01	<0.05
2328 Antimony as Sb	<1.0	<1.0	<0.01	<0.05
017 Selenium as Se	<12	<12	<0.006	<0.03
042 Zinc as Zn	2.1	1	0.004	0.012
055 Chloride as Cl	11000	8300	22	<100
055 Fluoride as F	1000	660	2.0	7.1
055 Sulphate as SO4	110000	27000	220	395
035 Total Dissolved Solids *	220000	84000	440	1044
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	8100	6100	16	64
Additional Information				
008 pH	8.0	8.1		
009 Conductivity uS/cm	330	123		
Temperature*	15	15		
Mass of Sample Kg	0.140			
Mass of dry Sample Kg	0.113			
Stage 1				
Volume of Leachant L2	0.200			
Volume of Eluate VE1	0.170			
Stage 2				
Volume of Leachant L8	0.906			
Volume of Eluate VE2	0.815			

WAC Limit Values limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

**WASTE ACCEPTANCE CRITERIA TESTING
ANALYTICAL REPORT**

Job Title: Trinity South Residential Development, South Shields - GI
Client Reference: 3842
Sample ID: HDP-01 / 1.00 / 4 / ES

Job Number: 11-54352-1
Sample Number: 359423 359435
Date Analysed: 12/10/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	1.4
003 Loss On Ignition	%	3.9
062 BTEX	mg/kg	<0.04
052 PCB's (7 congeners)	mg/kg	<0.01
051 TPH (C10 - C40)	mg/kg	150
050 PAH's	mg/kg	1.9
008 pH	pH Units	8.6
073 Acid Neutralisation Capacity (pH4)*	mol/kg	1.2
073 Acid Neutralisation Capacity (pH7)*	mol/kg	<1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1.0	<1.0	<0.002	<0.01
042 Barium as Ba*	130	29	0.26	0.44
042 Cadmium as Cd	<2.0	<2.0	<0.004	<0.02
042 Chromium as Cr	<5.0	<5.0	<0.02	<0.1
042 Copper as Cu	<2.0	<2.0	<0.004	<0.02
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4.0	<4.0	<0.01	<0.05
2328 Antimony as Sb	1.1	<1.0	<0.01	<0.05
017 Selenium as Se	<12	<12	<0.006	<0.03
042 Zinc as Zn	9.8	2	0.020	0.032
055 Chloride as Cl	14000	2300	28	<100
055 Fluoride as F	830	320	1.7	4.0
055 Sulphate as SO4	340000	32000	680	784
035 Total Dissolved Solids *	410000	110000	820	1552
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	6500	6400	13	64
Additional Information				
008 pH	7.7	8.0		
009 Conductivity uS/cm	599	164		
Temperature*	15	15		
Mass of Sample Kg	0.130			
Mass of dry Sample Kg	0.119			
Stage 1				
Volume of Leachant L2	0.228			
Volume of Eluate VE1	0.180			
Stage 2				
Volume of Leachant L8	0.956			
Volume of Eluate VE2	0.865			

WAC Limit Values limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

**WASTE ACCEPTANCE CRITERIA TESTING
ANALYTICAL REPORT**

Job Title: Trinity South Residential Development, South Shields - GI
 Client Reference: 3842
 Sample ID: HDP-03 / 0.50 / 4 / ES

Job Number: 11-54352-1
 Sample Number: 359425 359437
 Date Analysed: 12/10/2011

Test Results On Waste		
Determinand and Method Reference	Units	Result
002 Total Organic Carbon	%	2.2
003 Loss On Ignition	%	5.8
062 BTEX	mg/kg	<0.04
052 PCB's (7 congeners)	mg/kg	<0.01
051 TPH (C10 - C40)	mg/kg	210
050 PAH's	mg/kg	10
008 pH	pH Units	9.3
073 Acid Neutralisation Capacity (pH4)*	mol/kg	<1.0
073 Acid Neutralisation Capacity (pH7)*	mol/kg	<1.0

WAC Limit Values		
Inert Waste	SNRHW	Hazardous Waste
3	5	6
n/a	n/a	10
6	n/a	n/a
1	n/a	n/a
500	n/a	n/a
100	n/a	n/a
n/a	>6	n/a
n/a	TBE	TBE
n/a	TBE	TBE

Test Results On Leachate				
Determinand and Method Reference	Conc in Eluate ug/l		Amount Leached mg/kg	
	2:1	8:1	LS2	LS10
2326 Arsenic as As	<1.0	<1.0	<0.002	<0.01
042 Barium as Ba*	120	36	0.24	0.49
042 Cadmium as Cd	<2.0	<2.0	<0.004	<0.02
042 Chromium as Cr	<5.0	<5.0	<0.02	<0.1
042 Copper as Cu	3.6	2.8	0.007	0.029
081 Mercury as Hg	<0.05	<0.05	<0.0004	<0.002
042 Molybdenum as Mo*	<10	<10	<0.02	<0.1
042 Nickel as Ni	<10	<10	<0.02	<0.1
042 Lead as Pb	<4.0	<4.0	<0.01	<0.05
2328 Antimony as Sb	11	3.8	0.022	0.049
017 Selenium as Se	<12	<12	<0.006	<0.03
042 Zinc as Zn	2.4	<1.0	0.005	<0.01
055 Chloride as Cl	18000	5400	36	<100
055 Fluoride as F	750	570	1.5	6.0
055 Sulphate as SO4	190000	54000	380	755
035 Total Dissolved Solids *	300000	79000	600	1140
067 Phenol Index	<100	<100	<0.2	<1.0
033 Dissolved Organic Carbon*	9300	5800	19	64
Additional Information				
008 pH	7.8	7.9		
009 Conductivity uS/cm	440	116		
Temperature*	15	15		
Mass of Sample Kg	0.130			
Mass of dry Sample Kg	0.120			
Stage 1				
Volume of Leachant L2	0.230			
Volume of Eluate VE1	0.190			
Stage 2				
Volume of Leachant L8	0.960			
Volume of Eluate VE2	0.870			

WAC Limit Values limit values for LS10 Leachate		
Inert Waste	SNRHW	Hazardous Waste
0.5	2	25
20	100	300
0.04	1	5
0.5	10	70
2	50	100
0.01	0.2	2
0.5	10	30
0.4	10	40
0.5	10	50
0.06	0.7	5
0.1	0.5	7
4	50	200
800	15,000	25,000
10	150	500
1000	20,000	50,000
4000	60,000	100,000
1	n/a	n/a
500	800	1000

TBE = To Be Evaluated

SNRHW = Stable Non-Reactive Hazardous Waste

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DERWENTSIDE ENVIRONMENTAL TESTING SERVICES LIMITED

359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359426	HDP-04 0.50	-	Cannot evaluate without date sampled.	No containers input
359427	CWS-06 0.50	-	Cannot evaluate without date sampled.	No containers input
359428	CWS-06 0.50	-	Cannot evaluate without date sampled.	No containers input
359429	CWS-06 1.00	-	Cannot evaluate without date sampled.	No containers input
359430	CWS-06 1.00	-	Cannot evaluate without date sampled.	No containers input
359431	CWS-11 0.50	-	Cannot evaluate without date sampled.	No containers input
359432	CWS-11 0.50	-	Cannot evaluate without date sampled.	No containers input
359433	CWS-11 1.00	-	Cannot evaluate without date sampled.	No containers input
359434	CWS-11 1.00	-	Cannot evaluate without date sampled.	No containers input
359435	HDP-01 1.00	-	Cannot evaluate without date sampled.	No containers input
359436	HDP-01 1.00	-	Cannot evaluate without date sampled.	No containers input
359437	HDP-03 0.35	-	Cannot evaluate without date sampled.	No containers input
359438	HDP-03 0.35	-	Cannot evaluate without date sampled.	No containers input

Analytical Comments

Lab No.	Sample ID	Comments
359410	CBH-07 0.50	loose bundles

Appendix A - Details of Analysis

Method details are shown only for those determinants listed in Annex A of the MCERTS standard. Anything not included on this list falls outside the scope of MCERTS. No Recovery Factors are used in the determination of results. Results reported assume 100% recovery. Full method statements are available on request.

<u>Method</u>	<u>Name of Parameter</u>	<u>Units</u>	<u>Limit of Detection</u>	<u>Sample Preparation</u>	<u>Sub-Contracted</u>	<u>UKAS</u>	<u>MCERTS</u>
DETS 002	Organic Matter	%	0.01	Air Dried	No	Yes	Yes
DETS 003	Loss on Ignition	%	0.01	Air Dried	No	Yes	Yes
DETS 004	Total Sulphate	%	0.01	Air Dried	No	Yes	Yes
DETS 075	Total Sulphate	%	0.01	Air Dried	No	Yes	Yes
DETS 004	Water Soluble Sulphate	mg/l	10.00	Air Dried	No	Yes	Yes
DETS 076	Water Soluble Sulphate	mg/l	10.00	Air Dried	No	Yes	Yes
DETS 006	Chloride	mg/kg	0.01	Air Dried	No	Yes	Yes
DETS 008	pH	pH Units	0.10	Air Dried	No	Yes	Yes
DETS 042	Selenium	mg/kg	0.50	Air Dried	No	Yes	Yes
DETS 019	Ammonia	mg/kg	0.02	Air Dried	No	Yes	Yes
DETS 020	Boron (Water Soluble)	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 024	Sulphide	mg/kg	10.00	Air Dried	No	Yes	Yes
DETS 042	Antimony	mg/kg	1.00	Air Dried	No	No	No
DETS 042	Arsenic	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Barium	mg/kg	1.50	Air Dried	No	Yes	Yes
DETS 042	Beryllium	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Cadmium	mg/kg	0.10	Air Dried	No	Yes	Yes
DETS 042	Cobalt	mg/kg	0.70	Air Dried	No	Yes	Yes
DETS 042	Copper	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Chromium	mg/kg	0.15	Air Dried	No	Yes	Yes

DETS 042	Iron	mg/kg	1.00	Air Dried	No	Yes	No
DETS 042	Lead	mg/kg	0.30	Air Dried	No	Yes	Yes
DETS 042	Manganese	mg/kg	20.00	Air Dried	No	Yes	Yes
DETS 081	Mercury	mg/kg	0.05	Air Dried	No	Yes	Yes
DETS 042	Molybdenum	mg/kg	0.40	Air Dried	No	Yes	Yes
DETS 042	Nickel	mg/kg	0.20	Air Dried	No	Yes	Yes
DETS 042	Thallium	mg/kg	1.00	Air Dried	No	No	No
DETS 042	Vanadium	mg/kg	0.80	Air Dried	No	Yes	Yes
DETS 042	Zinc	mg/kg	1.00	Air Dried	No	Yes	Yes
DETS 049	Sulphur (Free)	mg/kg	0.50	As Received	No	Yes	Yes
DETS 050	PAH	mg/kg	0.10	As Received	No	Yes	No
DETS 051	TPH (C10 - C40)	mg/kg	20.00	As Received	No	Yes	Yes
DETS 052	PCB	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Benzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Toluene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Ethylbenzene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 062	Xylene	mg/kg	0.01	As Received	No	Yes	Yes
DETS 067	Phenol - Monohydric	mg/kg	0.3	Air Dried	No	Yes	Yes
DETS 067	Easily Liberatable Cyanide	mg/kg	0.1	Air Dried	No	Yes	Yes
DETS 067	Complex Cyanide	mg/kg	0.30	Air Dried	No	Yes	No
DETS 067	Total Cyanide	mg/kg	0.40	Air Dried	No	Yes	Yes
DETS 067	Thiocyanate	mg/kg	0.6	Air Dried	No	Yes	Yes
DETS 068	VOC	mg/kg	0.01	As Received	No	No	No

APPENDICES

APPENDIX I

Specialist Chemical Testing
(Tested Externally)