

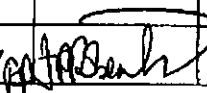


Claycliffe Road, Barugh Green, Barnsley

**REPORT ON A GEOENVIRONMENTAL ASSESSMENT**

**FOR**

**ALDI STORES LTD**

| Report<br>ref | Issue | Prepared<br>by | Signed                                                                              | Date     | Reviewed<br>by | Signed | Date     |
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**REPORT ON A GEOENVIRONMENTAL ASSESSMENT  
FOR  
ALDI STORES LTD**

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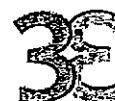
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### Executive Summary

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Site investigation</b>    | <p>The investigation has involved:</p> <ul style="list-style-type: none"><li>A review of desk study information.</li><li>11 trial pits to a maximum depth of 2.7 metres.</li><li>7 mini percussion boreholes to a maximum depth of 3.45 metres.</li><li>Installation and monitoring of 6 well installations.</li><li>Geotechnical and contamination related testing.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Site history</b>          | <p>Southern Part: The site was open fields until 1962 when a building was present within this part.</p> <p>Northern Part: The site was open fields until 1983 when buildings were present in the southern part of this area.</p> <p>Since the early 1990s all buildings were removed and the site is currently vacant open land.</p> <p>Claycliffe Road forms the eastern boundary of the site and from the late 1920s the area to the east of Claycliffe Road was occupied by a coke and by-product works, a chemical works and tip and re-developed with an industrial estate in the 1960s/70s. The area immediately southeast of the site was open until the late 1960s/early 1970s when it was developed with a garage and has recently been re-developed with a public house.</p>                                                                                                                                      |
| <b>Topography</b>            | <p>The site occupies an area of approximately 1.2 hectares sloping gently to the west with the southern part some 2 to 3 metres lower. An open drain runs along the northwestern boundary and is culverted in two lines across the southern part. The site is roughly grassed with areas of concrete hardstanding and semi-mature trees; an infestation of possible Japanese Knotweed occupies the northwestern part.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Environmental setting</b> | <ul style="list-style-type: none"><li>• The site is underlain directly by the Middle Coal Measures strata. The Swallow Wood coal seam outcrops approximately 350 metres north west of the site, and dips beneath the site, however, given the distance from the site this seam is not considered to impact up on the site.</li><li>• There are four former landfills within 250 metres of the site with the closest 50 metres to the south east.</li><li>• The nearest surface watercourse is a drain located adjacent to the western boundary of the site. The underlying soils are classed as a minor aquifer with the site underlain by soils of high leaching potential.</li><li>• There are no licensed water abstractions within 500 metres.</li><li>• There are no recorded pollution incidents within 250 metres.</li><li>• The site lies in an area where basic radon protective measures are necessary.</li></ul> |
| <b>Ground conditions</b>     | <p>A cover of reworked topsoil occupies the central part of the site and areas of concrete hardstanding overlie made ground to a maximum depth of 2.1 metres, but generally less than a metre, comprising reworked gravelly clay and granular materials including ash and cinder. The remainder of the site comprises a cover of topsoil, which together with the made ground materials, are underlain by firm to stiff and stiff clay with mudstone proved at the base of the exploratory holes. In the central part of the site relict topsoil is present beneath the made ground materials.</p>                                                                                                                                                                                                                                                                                                                          |

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Groundwater and excavation stability</b> | Groundwater was encountered at 2 metres during advancement of exploratory holes. Standing groundwater levels are generally between 1 and 2 metres.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Gas monitoring</b>                       | Slightly elevated levels of carbon dioxide have been recorded with low flow levels.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Appraisal</b>                            | <p><b>Contamination</b> - No evidence of significant contamination was noted during the investigation and the subsequent laboratory testing has shown there is no risk to human health for the proposed end use.</p> <p><b>Remediation</b> - No remediation is considered necessary to facilitate development. The suspected Japanese Knotweed in the northwestern part, if confirmed, will require treatment or removal by a suitably qualified contractor.</p> <p><b>Foundations</b> - For the proposed food retail store in the northern part of the site natural firm to stiff and stiff clays are present between 0.9 and 2.1 metres and traditional pad and strip foundations are appropriate with some deepening and the use of trench fill in areas of more extensive made ground in the northwestern part.</p> <p>For the proposed office development in the southern part of the site traditional pad and strip foundations are considered appropriate founding upon the firm to stiff and stiff clays. Some deepening of foundations may be required within the vicinity of the former tanks and sluices in the central part.</p> <p>Where trees are present, or are to be removed or planted, foundations will need to be deepened assuming medium volume change potential.</p> <p><b>Floor slabs</b> - Ground bearing floor slabs are considered appropriate across the site subject to treatment of the made ground materials. Alternatively, a suspended floor slab could be adopted.</p> <p><b>Gas precautions</b> - Gas monitoring has identified slightly elevated levels of carbon dioxide together with low flows and, as the site is in a radon affected area, basic radon precautions are required which mitigate those for carbon dioxide.</p> <p><b>Pavements</b> - A design CBR value of 4% is recommended for formations in the upper clays, with any soft spots identified by proof rolling adequately treated.</p> <p><b>Excavations</b> - If man entry is proposed into excavations the use of support to excavation sides is recommended. Seepages and water ingress into excavations should be controlled adequately by localised pumping from sumps. Use of a breaker should be anticipated for excavations within mudstone bedrock.</p> <p><b>Sulphate attack on buried concrete</b> - Buried concrete should be designed to BRE Special Digest 1:2005 Design Sulphate Class DS-1 with an ACEC site classification AC-1s.</p> <p><b>Drainage</b> - The presence of extensive cohesive soils together with the cohesive nature of the weathered bedrock materials would preclude the use of soakaways for surface water drainage.</p> |



**Claycliffe Road, Barugh Green, Barnsley**  
**REPORT ON A SITE INVESTIGATION**  
**FOR**  
**Aldi Stores Ltd**

**1. INTRODUCTION**

1.1 This investigation has been carried out for Aldi Stores Limited for a proposed retail and office development and as indicated on Waring and Netts Architects drawing 2000/439 SK14 Rev A, included in **Appendix A**.

1.2 The Investigation has been designed to assess contamination issues and foundation requirements at the site and has involved a review of Information provided by Aldi Stores Ltd and comprising:

- Environmental Site Assessment for a site at the junction of Claycliffe Road and Barugh Green Road, Quest, Ref: 67/826, June 1999;
- Phase I Geo-environmental Assessment, 3e Consulting Engineers Limited, Ref 7515, February 2007.

## **2. THE SITE**

### **Location and Description**

2.1 The site, centred on National Grid Reference 431900 408010, is located approximately 2.5 kilometres north west of Barnsley town centre within the district of Barugh Green. The site lies 100 metres north west of the junction between Claycliffe Road and Barugh Green Road. It is bound by the Chestnut Tree Public House and associated car parking to the southeast, Barugh Green Road to the south, an open drain with a works premises beyond to the west, open ground to the north and Claycliffe Road with car dealerships and a garage beyond to the east.

2.2 The site, occupying an area of approximately 1.2 hectares, is irregular in shape and currently vacant. The site can be divided into two parts, the northern part and the southern part.

### **Northern Part**

2.3 There are two fire damaged containers in the south western corner and a rectangular concrete slab in the south eastern corner. Generally in the southern half of this area site levels are undulating and a cover of rough grass is present with occasional building materials, plant pots, plastic bags and occasional pieces of asbestos cement corrugated sheeting. The northern half falls gently to the west and is surfaced with rough grass and is covered with semi-mature trees. Along the western edge of this area, there is an approximate 5 metre fall to an open drain. An infestation of possible Japanese Knotweed is present along the edge of this embankment and extending across the majority of the western part of the site.

### **Southern Part**

2.4 In the southern part, site levels are approximately 3 metres lower than the north and the ground is generally undulating with a gentle slope down to the west. The site is covered with rough grass, brambles and semi-mature trees with an area of concrete hardstanding located in the west. The open drain bordering the western boundary of the northern part is

present within this part of the site and culverted in a northwest – southeast direction and also a northeast – southwest direction. Former concrete tanks and a sluice, approximately 1 to 2 metres depth, are present within the north east and an electricity substation is present in the north eastern corner. The location of these features are shown on the exploratory hole location plan and included as **Figure 1**.

### **Site History**

2.5 In order to establish the site's history an inspection of historical maps, dating between 1855 and 2004 and obtained as part of an Envirocheck report (Ref. 20945143-1-1), has been made. The following represents a summary of the map information presented in the Phase I Geo-environmental Assessment.

2.6 In summary, the site was open fields site prior to 1962 when a building was present in the southern part of the site and prior to 1983 in the northern part, when buildings were present in the southern half of this area. Since the early 1990s all buildings were removed from the site it is currently vacant open land. Claycliffe Road forms the eastern boundary of the site and from the late 1920s the area to the east of Claycliffe Road was occupied by a coke and by-product works, a chemical works and tip and re-developed with an industrial estate in the 1960s/70s. The area immediately south east of the site was open ground until the late 1960s/early 1970s when the site was developed with a garage and has recently been re-developed with a public house.

### **3. GEO-ENVIRONMENTAL SETTING**

3.1 This section is based principally upon a search of Information available on public registers through the Envirocheck search (Ref. 20945143-1-1), included in the Phase I Geo-environmental Assessment.

#### **Geology and Mining**

3.2 British Geological Survey (BGS) Information, Sheet 87, 1:50,000 scale, indicates the site to be underlain by the Middle Coal Measures comprising an interbedded sequence of mudstone, siltstone, sandstone and coal. The Swallow Wood coal seam outcrops approximately 350 metres north west dipping beneath the site, however, given the distance from the site this seam is not considered to impact up on the site.

3.3 A report was requested from the Coal Authority, reference 00012743-07 dated 9 February 2007, and is included in the Phase I Geo-environmental Assessment. This identifies the site as being within the likely zone of influence from past workings in 6 seams of coal at between 50 to 340 metres depth, the last date of working being 1980. Ground movement from these should have ceased by now.

3.4 The Coal Authority also indicates that the site is not within the zone of likely physical influence at the surface from present underground workings or plans for future workings in their possession, however, reserves of coal exist in the locality that could be worked at some time in the future.

3.5 No mine entries are present at, or within 20 metres, of the site.

#### **Landfill Sites and Waste Management Facilities**

3.6 The Envirocheck report indicates there are four local authority recorded landfills within 250 metres of the site with the closest 50 metres south east of the site. There is no information available as to what these landfills have been infilled with.

### **Watercourses**

3.7 The nearest surface watercourse is a drain present beneath the southern part and adjacent to the western boundary of the northern part of the site. There is no river quality information pertaining to this drain.

### **Groundwater**

3.8 Reference to the "Environment Agency Policy and Practice for the Protection of Groundwater, Groundwater Vulnerability 1:100,000 Map series, Sheet 11, South Pennines" classifies the underlying soils as a minor aquifer with the site underlain by soils of high leaching potential. This classification is an assumed worst-case vulnerability relating to urban areas and based upon fewer observations.

### **Water Abstractions and Discharge Consents**

3.9 There are no licensed water abstractions within a 500 metres radius.

3.10 There are two discharge consents within a 500 metres radius of the site and both are located approximately 250 metres north west of the site and licensed to discharge drainage into a stream/river.

### **Pollution Controls**

3.11 The Envirocheck report indicates that there are no integrated pollution controls or local authority pollution and prevention controls within 500 metres of the site.

### **Pollution Incidents**

3.12 The Envirocheck report indicates that there are no recorded pollution incidents within 250 metres of the site.

3E

### **Radon**

3.13 The Envirocheck report indicates that the site lies within an area where basic radon protective measures are necessary.

### **Fuel Station Entries**

3.14 The area adjacent to the south eastern boundary of the site is registered as a former fuel filling station operated by Claycliffe Motors Ltd, its status now recorded as obsolete.

#### **4. SUMMARY OF PREVIOUS INTRUSIVE INVESTIGATION**

4.1 The former environmental site assessment report carried out by Quest in 1999 pertains to the former garage adjacent to the south eastern boundary of the site and was carried out prior to re-development. Its purpose was to assess hydrocarbon contamination associated with the former underground tanks and it is understood that at the time of this investigation all above and below ground tanks had been removed.

4.2 The boreholes sunk on the site proved made ground to depths of 0.4 and 1.5 metres, generally granular in composition varying from a sand to an ash fill and underlain by a natural silty clay which quickly grades into a weathered mudstone with sandstone bands.

4.3 The contamination assessment concluded that there were localised hotspots of hydrocarbon contamination but no evidence of areas of gross site wide hydrocarbon contamination.

## **5. 3E CONSULTING ENGINEERS INVESTIGATORY WORK**

### **Fieldwork**

5.1 Taking cognisance of the Phase I assessment and associated third party information, trial pitting and mini percussive boring was carried out to determine the general soil profile across the site on 12 April 2007. Disturbed samples were recovered as appropriate for soil descriptions and laboratory testing.

5.2 Gas and groundwater monitoring wells were installed within six mini percussion boreholes comprising slotted 50mm diameter HDPE pipe set within a granular filter, which was sealed with an upper bentonite seal and a gas tap with lockable cover fitted at the surface. These were subsequently monitored on four occasions for combustible gas, carbon dioxide and oxygen using a portable infra-red gas analyser with water levels recorded using an electronic dip meter between 9 May and 25 May 2007.

5.3 Fieldwork and soil descriptions were carried out in general accordance with BS5930:1999, "Code of Practice for Site Investigations".

5.4 The locations of the trial pits and mini percussion boreholes were determined by 3e Consulting Engineers to give a general coverage of the site where access and underground services allowed; these are indicated on the Exploratory Hole Location Plan included as **Figure 1**.

### **Laboratory Testing**

#### **Contamination Related Testing**

5.5 In view of no previously identified contaminative activities at the site, testing was limited to screening a total of eight samples including topsoil, reworked topsoil, made ground, relict topsoil and natural soils for the determinands indicated as follows:

- Arsenic
- Cadmium
- Chromium
- Lead
- Mercury
- Selenium
- Nickel
- Vanadium
- Copper
- Boron
- Zinc
- Water soluble sulphate
- pH
- Total petroleum hydrocarbons (TPH)
- Speciated polyaromatic hydrocarbons (PAH)

5.6 A further six water-soluble sulphate and pH determinations were carried out on samples of the natural soils to assess the soil chemistry with respect to sulphate attack on buried concrete.

5.7 In addition two samples of relict topsoil were tested for percentage organic matter (BS1377).

5.8 The analyses were carried out at an UKAS accredited laboratory.

### **Geotechnical Testing**

5.9 Geotechnical related testing was carried out to determine the physical characteristics of the soils and comprised the following:

- Seven Atterberg limits tests to determine the shrinkability of the cohesive soils to assist with foundation design;
- Five California Bearing Ratio tests to determine the strength of the natural soils to assist with pavement design.

## **6. RESULTS OF THE INVESTIGATION**

### **Soil Profile**

6.1 Detailed descriptions of the materials encountered together with observations of groundwater behaviour and sampling information are given on the trial pit and mini percussion borehole records attached as **Appendix B**. A summary of the materials encountered at the site is given below, however, due to the variability of the soils, it is recommended that individual exploratory hole records are consulted.

### **Topsoil**

6.2 Excepting the areas of concrete hardstanding, topsoil was encountered across the majority of the site at between 0.1 and 0.3 metre thickness. Reworked topsoil was proved generally within the central part of the site at thicknesses of between 0.05 and 0.3 metre. Relict topsoil was encountered below the made ground in exploratory holes WS3, WS4 and WS7 located within the central part of the site at depths of between 0.4 and 1.75 metres and proved to a maximum thickness of 0.5 metre.

### **Made Ground**

6.3 Significant areas of made ground were encountered in exploratory holes TP06 and WS4 located in the north western part of the site adjacent to the open drain to depths of between 1.75 and 2.1 metres comprising reworked firm and stiff gravelly clays with cobble and boulder size sandstone. A coated macadam layer was proved in TP06 between 0.9 and 1 metre, possibly indicative of former hardstanding.

6.4 Over the remainder of the site made ground generally comprising granular ash, clinker, brick and red shale, coated macadam hardstanding and firm and stiff reworked gravelly clay was proved at less than 0.9 metre thickness.

### **Cohesive Soils**

6.5 Firm to stiff and stiff slightly sandy gravelly clay was encountered below the topsoil and made ground materials in all of the exploratory holes and proved to depths of between 0.25 metre and in excess of 3.45 metres. The thickness of this stratum appeared to lessen towards the north western boundary.

### **Bedrock**

6.6 Weathered mudstone comprising clayey gravel size fragments was encountered between 0.75 and 2.3 metres depth and between 0.2 and 1.15 metres thick. This was underlain by more competent weak mudstone bedrock and proved at the majority of locations with the exception of WS3 and WS4 in the central and north western part of the site. Exploratory hole WS1 located in the southern edge of the site proved weak to moderately weak siltstone grading to sandstone at between 2.3 and 3 metres.

### **Contamination**

6.7 Excepting the presence of ash and cinder, there was no significant visual or olfactory evidence of contamination within the exploratory holes.

### **Groundwater**

6.8 During the advancement of WS1 and WS2 groundwater was encountered at 2 metres with the remaining exploratory holes dry. Water recorded in the monitoring wells indicated standing water levels at between 0.75 and 2.43 metres, typically between 1.5 and 2.5 metres. The raised groundwater levels above a metre are attributed to localised surface runoff flooding the monitoring installation.

6.9 It should be noted that groundwater levels vary seasonally and that a higher water table than that recorded could occur.

### **Contamination Related Testing**

6.10 A copy of the contamination test results is included in **Appendix C**.

6.11 Generally, the results have been assessed using guidelines introduced by DEFRA, in the CLEA (Contaminated Land Exposure Assessment) Model (March 2002) and more recently by the joint Land Quality Management Ltd (LQM) and Chartered Institute of Environmental Health (CIEH), November 2006. The CLEA guidelines include Soil Guideline Values (SGVs) appropriate to standard land uses. SGVs are currently available for a limited number of metalloid and organic contaminants and provide generic assessment criteria for assessing the risk to human health. The LQM/CIEH guidelines include Generic Assessment Criteria (GAC) appropriate to standard land uses and applicable to a wider range of both inorganic and organic contaminants. With regard to the assessment of the site, the most appropriate values are considered to be the SGVs and LQM/CIEH GACs given for a commercial/industrial end use. Both the SGV and GAC values are included as **Appendix D**.

6.12 Where guideline values are absent, reference has generally been made to Dutch Intervention Values (DIV).

6.13 A summary of the contamination related testing is presented as follows:

| Determinant            | Maximum<br>concn<br>mg/kg | Min/mean<br>concn<br>mg/kg | Location of<br>maximum<br>concentration | No. of<br>Samples<br>tested | Soil<br>Screening<br>Value<br>(SGV)<br>mg/kg | No. of<br>Samples<br>Exceeding<br>SGV |
|------------------------|---------------------------|----------------------------|-----------------------------------------|-----------------------------|----------------------------------------------|---------------------------------------|
| Arsenic                | 62.3                      | 7                          | TP07 @ 0.1m                             | 8                           | 500 <sup>(1)</sup>                           | 0                                     |
| Cadmium                | <0.2                      | -                          | n/a                                     | 8                           | 1400 <sup>(1)</sup>                          | 0                                     |
| Chromium               | 20.8                      | 13.8                       | TP07 @ 0.1m                             | 8                           | 5000 <sup>(1)</sup>                          | 0                                     |
| Lead                   | 64.9                      | 10.1                       | TP10 @ 0.1m                             | 8                           | 750 <sup>(1)</sup>                           | 0                                     |
| Mercury                | <0.1                      | -                          | n/a                                     | 8                           | 480 <sup>(1)</sup>                           | 0                                     |
| Selenium               | 1.4                       | <1                         | TP07 @ 0.1m                             | 8                           | 8000 <sup>(1)</sup>                          | 0                                     |
| Copper                 | 65.1                      | 14.8                       | TP08 @ 0.2m                             | 8                           | 45700 <sup>(2)</sup>                         | 0                                     |
| Nickel                 | 51.1                      | 9.3                        | TP08 @ 0.2m                             | 8                           | 5000 <sup>(1)</sup>                          | 0                                     |
| Vanadium               | 50.2                      | 31.9                       | TP08 @ 0.2m                             | 8                           | 4250 <sup>(2)</sup>                          | 0                                     |
| Zinc                   | 81                        | 33.4                       | WS4 @ 1.8m                              | 8                           | 188000 <sup>(2)</sup>                        | 0                                     |
| Boron (water sol)      | 4.2                       | <0.5                       | WS4 @ 1.8m                              | 8                           | 3 <sup>(3)</sup>                             | 1                                     |
| TPH                    | 110.3                     | 20.8                       | WS4 @ 1.8m                              | 8                           | -                                            | N/A                                   |
| PAH compounds:         |                           |                            |                                         |                             |                                              |                                       |
| Naphthalene            | 2.4                       | <0.1                       | TP08 @ 0.2m                             | 8                           | 290 <sup>(2)</sup>                           | 0                                     |
| Fluorene               | 0.6                       | <0.1                       | TP06 @ 1m                               | 8                           | 5900 <sup>(2)</sup>                          | 0                                     |
| Benzo(a)pyrene         | 3.0                       | <0.1                       | TP10 @ 0.1m                             | 8                           | 29.7 <sup>(2)</sup>                          | 0                                     |
| Dibenzo(a,h)Anthracene | 0.3                       | <0.1                       | various                                 | 8                           | 29.7 <sup>(2)</sup>                          | 0                                     |
| Water soluble sulphate | 0.344                     | 0.008                      | TP08 @ 0.2m                             | 14                          | 0.5g/l <sup>(4)</sup>                        | 0                                     |
| Acidity (pH)           | 7.9                       | 5.5                        | TP06 @ 1m                               | 8                           | <3 <sup>(1)</sup>                            | 0                                     |

#### Notes

- (1) CLEA soil guidance value for commercial end use
- (2) LQM/CIEH GAC for commercial end use
- (3) Dutch Intervention Value
- (4) Upper level for Class 1 concrete (BRE Special Digest:2005)

6.14 With respect to the phytotoxic metal boron, a single sample of reworked topsoil recovered from 1.8 metres within WS4 contained concentrations of water soluble boron in excess of the chosen assessment criteria.

6.15 The results of the sulphate and pH determinations within the topsoil, made ground and natural soils indicate a BRE Special Digest 1:2005 Design Sulphate Class DS-1 with an ACEC site classification AC-1s.

6.16 The relict topsoil has an organic matter content of between 6.4 and 7.8%, assessed as insignificant in terms of influencing the behaviour of the soil.

#### Geotechnical Related Testing

6.17 The results of the geotechnical testing are presented in **Appendix E**.

6.18 The Atterberg limits determinations indicated plasticity indexes of between 22% and 42% for the natural soils corresponding to intermediate and high plasticity clays. Modified plasticity indices, as defined within NHBC Chapter 4.2 'Building Near Trees', indicates values of between 18% and 41% with two of the six samples below 20% and a single sample above 40%, which overall corresponds to a medium volume change potential. A sample of mudstone recovered from TP4 was recorded as non-plastic.

6.19 Results of five remoulded CBR tests carried out on the shallow natural cohesive soils recorded CBR values of between 3% and 10%, of which two results were below 6% and three between 6 and 10%.

#### Gas Monitoring

6.20 The results of the monitoring are presented in **Appendix F**. A summary of the results together with groundwater monitoring are presented below:

| Location | CH <sub>4</sub><br>(% v/v) | CO <sub>2</sub><br>(% v/v) | O <sub>2</sub><br>(% v/v) | Flow<br>(l/hr) | Barometric<br>Pressure<br>(mb) | Groundwater<br>(m) BGL |
|----------|----------------------------|----------------------------|---------------------------|----------------|--------------------------------|------------------------|
| WS1      | 0                          | 0.0 - 0.5                  | 20.0 - 20.7               | 0.0 - 0.4      | 992 - 1008                     | 0.8 - 1.55             |
| WS2      | 0                          | 0.0 - 1.1                  | 19.8 - 20.7               | 0.0 - 0.2      | 992 - 1008                     | 0.82 - 1.25            |
| WS3      | 0                          | 0.1 - 0.4                  | 19.5 - 20.5               | 0.0 - 0.1      | 991 - 1007                     | 1.3 - 1.85             |
| WS4      | 0                          | 1.1 - 3.7                  | 15.1 - 20.0               | 0.0 - 0.1      | 991 - 1007                     | 1.79 - Dry             |
| WS5      | 0                          | 0.3 - 0.8                  | 18.5 - 20.0               | 0.0 - 0.1      | 991 - 1007                     | 2.05 - Dry             |
| WS6      | 0                          | 0.2 - 0.7                  | 20.0 - 20.3               | 0.0 - 0.2      | 991 - 1007                     | 0.75 - 1.45            |

6.21 In summary, no combustible ground gas was detected and slightly elevated concentrations of carbon dioxide to a maximum of 3.7 % by volume with corresponding depleted oxygen concentrations were recorded on four separate occasions at all locations. Low flow rates were detected, generally between 0.1 and 0.2 l/hr, and up to a maximum of 0.4 l/hr within WS1 located within the southern part of the site.

## 7. DISCUSSION

7.1 Development proposals are for a new store located in the northern part of the site adjacent to Claycliffe Road and office units in the southern part adjacent to Barugh Green Road, as shown on the feasibility layout included as **Appendix A**.

### Contamination

#### Risk Philosophy

7.2 The presence of contamination is generally only of concern if there exists an actual or potentially unacceptable risk under current legislation (i.e. Section 57 of the Environment Act 1990). The interpretation of "unacceptable risk" is termed to be one where:

*"Significant harm is being caused or there is a significant possibility of such harm being caused, (where harm is defined as harm to health of living organism or other interference with the ecological systems of which they form a part of and, in the case of man, includes harm to his property); or pollution of controlled waters is being caused"*

7.3 The potential for harm to occur requires three conditions to be satisfied:

- *Presence of substance (potential contaminants/pollutants) that may cause harm (Source of Pollution);*
- *The presence of a receptor, which may be harmed, e.g. the water environment or humans, buildings, fauna and flora (The receptor);*
- *and the existence of a linkage between the source and the receptor (The Pathway).*

7.4 Therefore, the presence of a measurable concentration of contaminant within the ground and subsurface environment does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm.

7.5 The nature and importance of both pathways and receptors, which are relevant to a particular site, will vary according to the intended use of the site, its characteristics and its surroundings.

### **Sources of Contamination**

7.6 From the desk study the former fuel station to the south east is identified as the nearest potential source of contamination within the vicinity of the site. The southern part of the site is down gradient of the potential source, however, the previous investigation undertaken at the former fuel station site did not identify any significant impact of soils. Other potential sources of contamination identified are the former coke and chemical works and a tip located to the north east.

7.7 The investigation has revealed the ground conditions to comprise a cover of reworked topsoil across the central part of the site and areas of concrete hardstanding overlying made ground to a maximum depth of 2.1 metres, but generally less than a metre, comprising reworked gravelly clay and granular materials including ash and cinder. The remainder of the site comprised a cover of topsoil, which together with the made ground materials, was underlain by firm to stiff and stiff clay with mudstone proved at the base of the exploratory holes. In the central part of the site relict topsoil was encountered beneath the made ground materials. Standing groundwater levels are generally between 1 and 2 metres. There was no physical evidence to suggest significant contamination at the site.

7.8 Laboratory testing has identified no elevated concentrations of determinands considered likely to pose a risk to human health.

7.9 Monitoring at the site has generally shown slightly elevated concentrations of carbon dioxide with no combustible gas present. Low flow rates have been recorded at between 0.1 and exceptionally 0.4 l/hr.

### **Pollutant Linkage Assessment**

7.10 In view of no elevated contaminants of concern identified at the site there are considered to be no plausible pollutant linkages.

## **Remediation Assessment**

7.11 No remediation is considered necessary to facilitate development.

7.12 The Japanese Knotweed tentatively Identified in the north western part of the site will require treatment or removal by a suitably qualified ecological contractor.

7.13 General site clearance will be required to include the removal and suitable disposal of asbestos cement corrugated sheeting Identified at the site.

7.14 If during development areas of possible contamination are exposed, or conditions differ significantly from those identified, then appropriate advice should be sought.

## **Foundations**

7.15 The proposed development will comprise a food retail store in the north of the site and an office development in the south. The northern part of the site is approximately 2 to 3 metres higher than the southern part with a drain and culverts crossing beneath the southern part of the site.

7.16 For the proposed food retail store within the northern part natural firm to stiff and stiff clays are present at varying depths, consequently traditional pad and strip/trench fill foundations are considered appropriate. The foundations should be placed in the natural clays at between 0.9 and 2 metres depth with stepped, reinforced and deepened foundations required within the north west corner around the location of exploratory holes WS4 and TP06.

7.17 For the proposed office development within the southern part, traditional pad and strip foundations are considered appropriate founding within the shallow natural firm to stiff and stiff clays proved at between 0.2 and 0.6 metre. The former deep drainage chambers and sluice present will require removal, therefore, dependent upon the final layout deepening and reinforcing of foundations will be required.

7.18 An allowable bearing capacity of 150 kN/m<sup>2</sup> is considered appropriate for the natural firm to stiff and stiff clays.

7.19 Where trees are present, or are to be planted or removed, foundations will need to be deepened in accordance with current guidance assuming a medium volume change potential.

### **Floor Slabs**

7.20 Ground bearing floor slabs are considered appropriate across the site subject to treatment of the made ground materials involving excavation of the upper metre, proof rolling of the sub-grade and removal of soft spots, removal of unsuitable material and re-compaction in layers of no greater than 250mm thickness. Alternatively, a suspended floor slab could be adopted.

### **Gas Protection Measures**

7.21 The site is within the vicinity of four former landfills, the closest being 50 metres south east of the site and gas monitoring has identified slightly elevated concentrations of carbon dioxide with low flow rates. The site lies in an area where basic radon precautions are required and these should be incorporated into the development also affording protection with regard to carbon dioxide.

### **Excavations and Dewatering**

7.22 The use of mechanical breakers should be anticipated within the mudstone and siltstone bedrock, particularly within the north western part of the site.

7.23 If man entry is proposed into excavations the use of support to excavation sides is recommended, in line with health and safety guidelines.

7.24 Significant groundwater ingress into excavations is not anticipated, any that does occur, or within deeper excavations, should be controlled adequately by localised pumping from sumps within excavations.

### **Sulphate Attack on Buried Concrete**

7.25 The results of the chemical analyses indicate a BRE Special Digest 1:2005 Design Sulphate Class DS-1 with an ACEC site classification AC-1s and buried concrete should be designed accordingly.

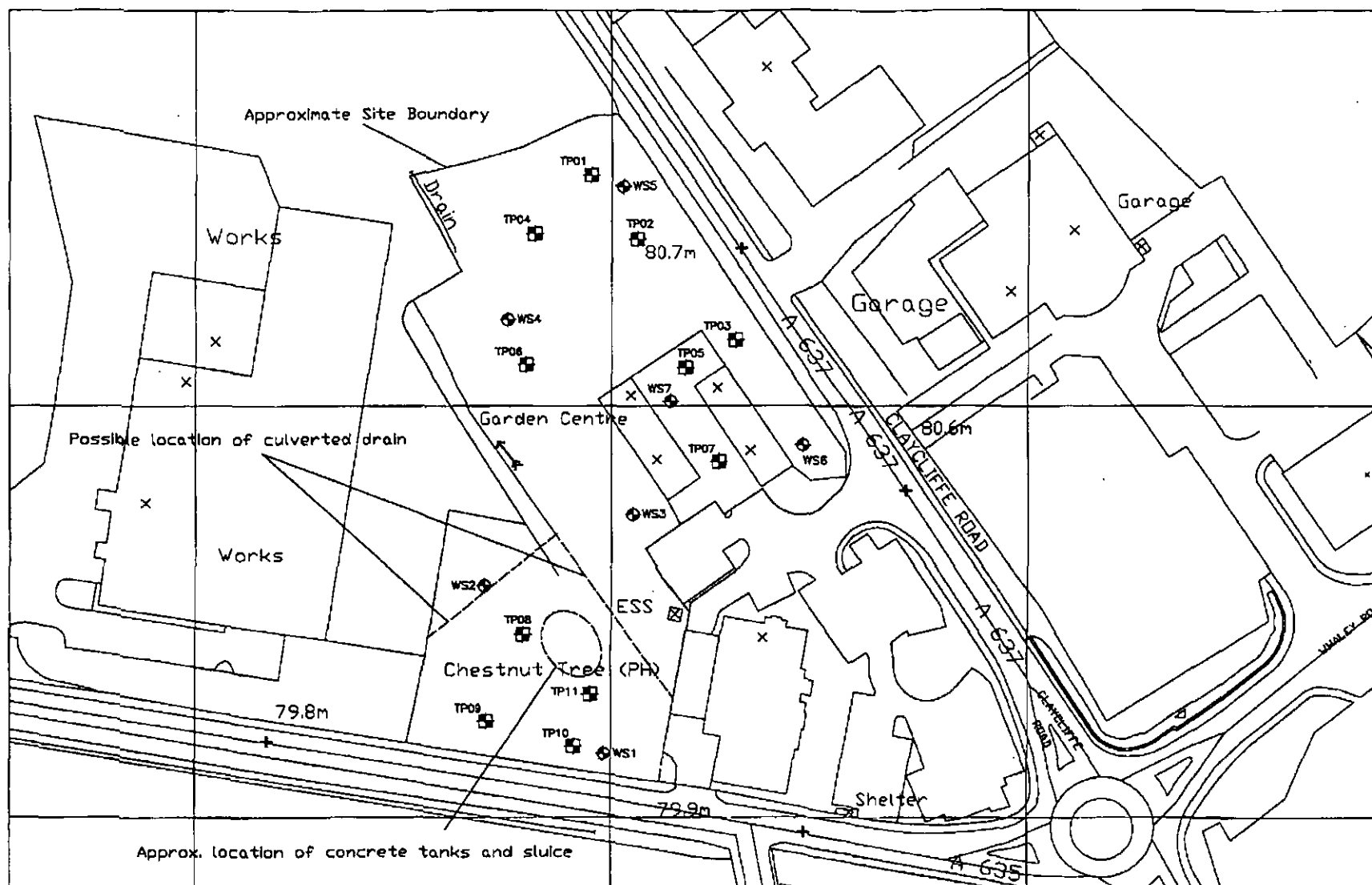
### **Pavement Design**

7.26 The results of the five remoulded CBR laboratory tests carried out on the near surface natural firm to stiff clays indicate CBR values of between 3% and 10%. In view of the variability an overall design CBR value of 4% is recommended for formations with any soft spots identified by proof rolling adequately treated.

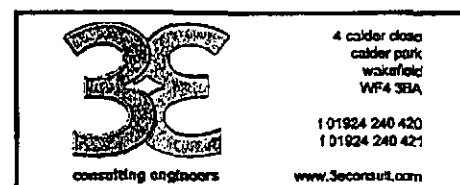
### **Site Drainage**

7.27 The presence of extensive cohesive soils together with the cohesive nature of the weathered bedrock materials would preclude the use of soakaways for surface drainage.

**FIGURE 1**  
**Exploratory Hole Location Plan**



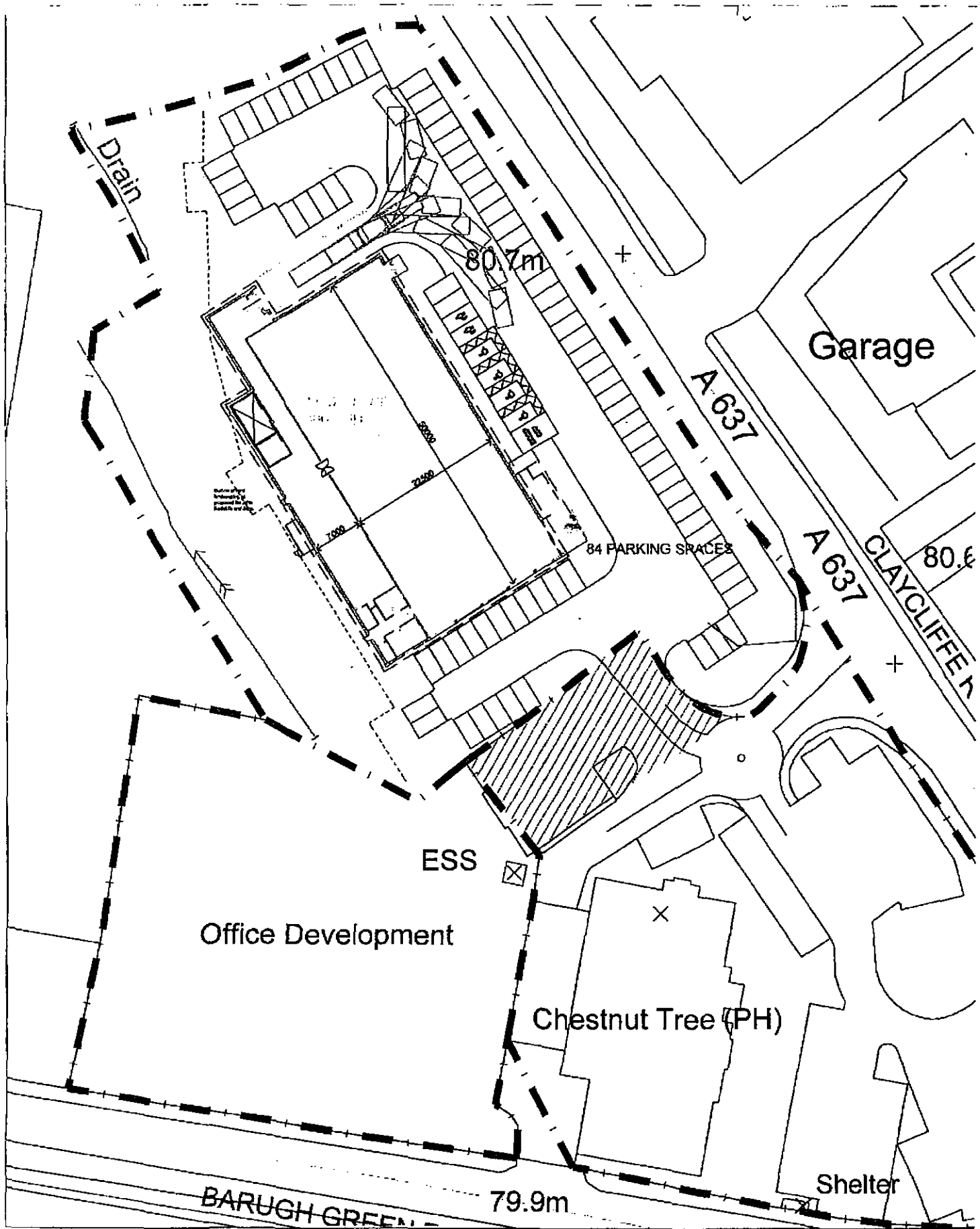
KEY  
 WS1 MINI RIG BOREHOLE LOCATION  
 TP11 TRIAL PIT LOCATION



|                              |                   |                 |             |
|------------------------------|-------------------|-----------------|-------------|
| Client ALDI STORES LTD.      |                   |                 |             |
| Project BARUGH GREEN BARNLEY |                   |                 |             |
| Title EXPLORATORY HOLE PLAN  |                   |                 |             |
| Scale 1:1000 @ A3            | Drawn AJB         | Checked CHECKED | Date MAY 07 |
| Job No. 7515                 | Drawing No. Fig 1 | Rev 0           |             |

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**APPENDIX A**  
**Proposed Layout**



BARUGH GREEN RD  
BARNSELY  
ALDI STORES LTD

FEASIBILITY

Site no. code 2000/439 SK14  
Scale 1:500 A3  
dmg. no. Drawn AM  
Rev. no. A  
Date 28 Nov 2006

WARING AND NETTS  
ARCHITECTS

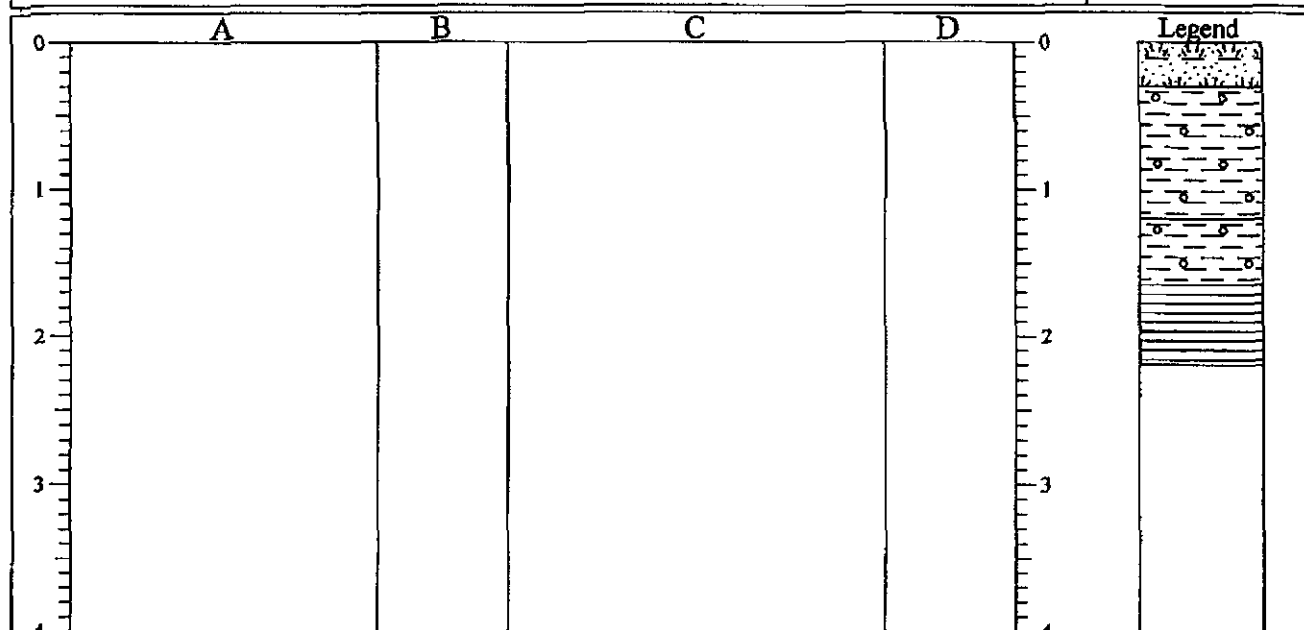
ARCADIA HOUSE, BARNOL BUSINESS PARK  
BENTON LAKE, NEWCASTLE UPON TYNE, NE12 1EW  
TEL 0191 259 6400 FAX 0191 259 6401  
E-mail newcastle@waring-netts.co.uk

**APPENDIX B**  
**Exploratory Hole Records**

3e Consulting Engineers Ltd  
 4 Calder Close, Calder Park  
 Wakefield WF2 7AU  
 Telephone: 01924 240420  
 Fax: 01924 240421

## TRIAL PIT LOG

|                                          |                         |                  |                  |                              |
|------------------------------------------|-------------------------|------------------|------------------|------------------------------|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | <b>TRIAL PIT No<br/>TP01</b> |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                              |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>       |



| STRATA    |    |                                                                                                       | SAMPLES & TESTS |    |               |
|-----------|----|-------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                           | Depth           | No | Remarks/Tests |
| 0.00-0.30 |    | TOPSOIL.                                                                                              | 0.10            | D  |               |
| 0.30-1.20 |    | Firm becoming stiff brown mottled grey slightly sandy gravelly CLAY (Weathered Middle Coal Measures). | 0.60            | D  |               |
| 1.20-1.65 |    | Stiff grey friable slightly gravelly CLAY (Weathered Middle Coal Measures).                           | 1.00            | B  |               |
| 1.65-2.10 |    | Weak grey MUDSTONE with occasional ironstone nodules recovered as gravel (Middle Coal Measures).      |                 |    |               |
| 2.10-2.20 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                            |                 |    |               |

|                                                                                               |                                                                                                                                       |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Shoring/Support: None<br>Stability: Very good<br><br><div style="text-align: center;"> </div> | <b>GENERAL REMARKS</b><br><br>1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|

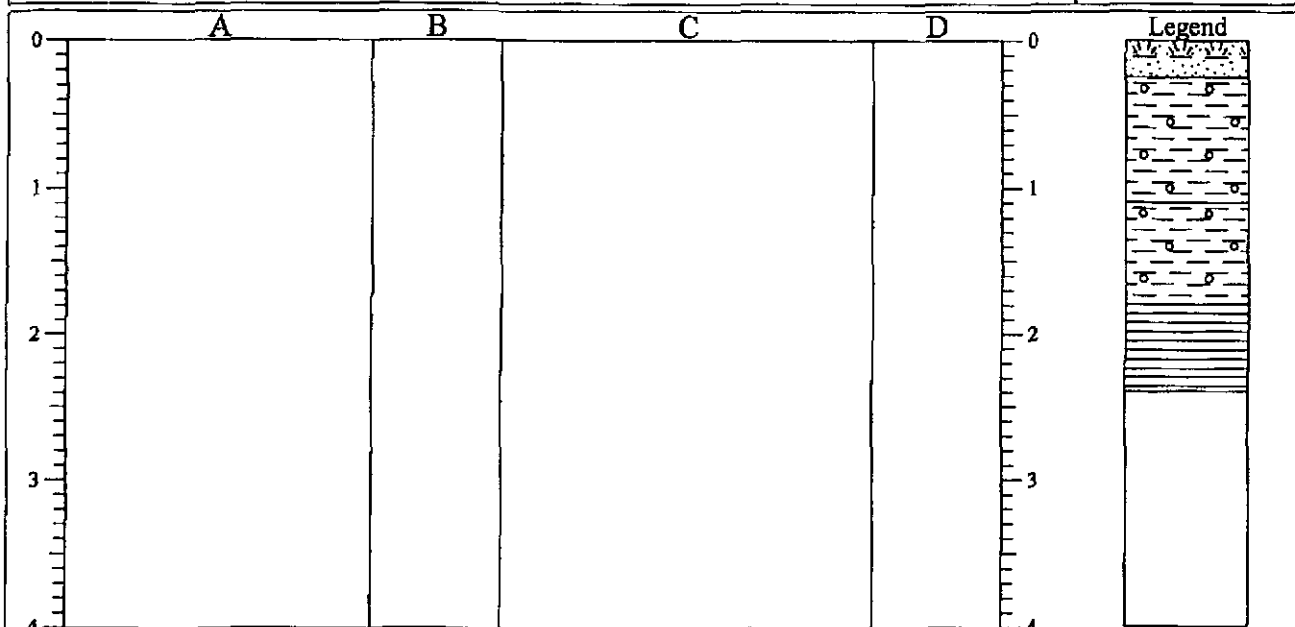
|                                        |                                |                                      |                      |
|----------------------------------------|--------------------------------|--------------------------------------|----------------------|
| All dimensions in metres<br>Scale 1:50 | Client <b>Aldi Stores Ltd.</b> | Method/<br>Plant Used <b>JCB 3cx</b> | Logged By <b>AJB</b> |
|----------------------------------------|--------------------------------|--------------------------------------|----------------------|

AGS3 UK TP 7515.GPJ AGS3 ALL.GDT 06/06/07

3e Consulting Engineers Limited  
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 Wakefield  
 Telephone: 01924 240420  
 Fax: 01924 240421

## TRIAL PIT LOG

|                                          |                         |                  |                 |                             |  |
|------------------------------------------|-------------------------|------------------|-----------------|-----------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                 | TRIAL PIT No<br><b>TP02</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates () |                             |  |
| Contractor                               |                         |                  |                 | Sheet<br><b>1 of 1</b>      |  |



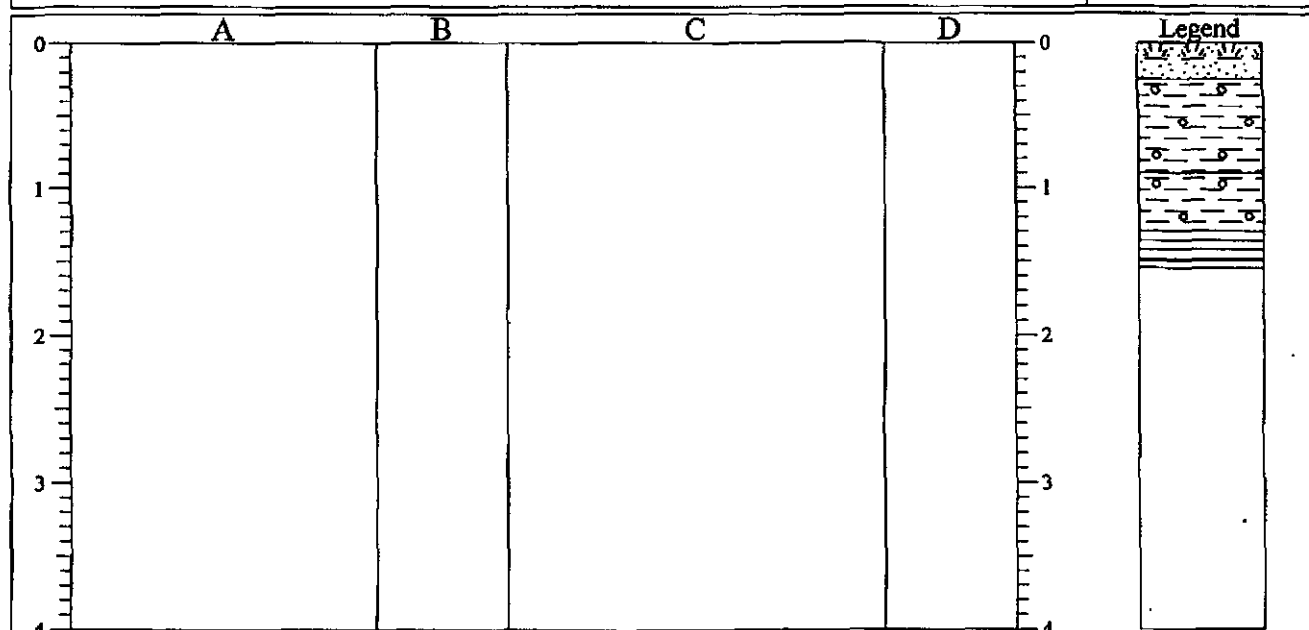
| STRATA    |    |                                                                                                                            | SAMPLES & TESTS |    |               |
|-----------|----|----------------------------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                                                | Depth           | No | Remarks/Tests |
| 0.00-0.25 |    | TOPSOIL.                                                                                                                   |                 |    |               |
| 0.25-1.10 |    | Firm becoming stiff brown mottled grey very slightly sandy slightly gravelly cobbly CLAY (Weathered Middle Coal Measures). | 0.60            | D  |               |
| 1.10-1.80 |    | Stiff grey friable slightly gravelly CLAY (Weathered Middle Coal Measures).                                                | 1.40            | D  |               |
| 1.80-2.30 |    | Weak grey MUDSTONE with rare ironstone nodules, recovered as a gravel (Middle Coal Measures).                              | 2.00            | D  |               |
| 2.30-2.40 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                                                 |                 |    |               |

|                                               |                                |                                      |                                                                                                         |  |
|-----------------------------------------------|--------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------|--|
| Shoring/Support: None<br>Stability: Very good |                                |                                      | <b>GENERAL REMARKS</b>                                                                                  |  |
|                                               |                                |                                      | 1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |  |
| All dimensions in metres<br>Scale 1:50        | Client <b>Aldi Stores Ltd.</b> | Method/<br>Plant Used <b>JCB 3cx</b> | Logged By <b>AJB</b>                                                                                    |  |

AG83 UK TP 7515 GP 1 AG83 ALL GDT 240507

## TRIAL PIT LOG

|                                          |                         |                  |                 |                             |  |
|------------------------------------------|-------------------------|------------------|-----------------|-----------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                 | TRIAL PIT No<br><b>TP03</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates () |                             |  |
| Contractor                               |                         |                  |                 | Sheet<br><b>1 of 1</b>      |  |

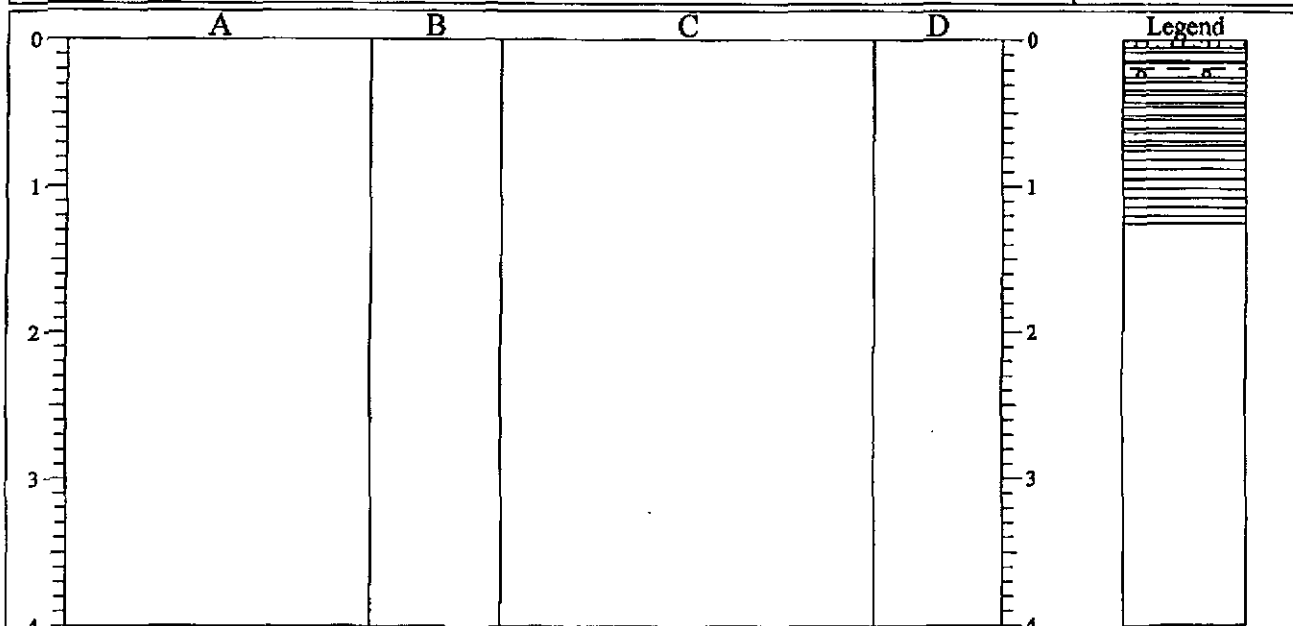


| STRATA    |    |                                                                                                                                | SAMPLES & TESTS |    |               |
|-----------|----|--------------------------------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                                                    | Depth           | No | Remarks/Tests |
| 0.00-0.25 |    | TOPSOIL.                                                                                                                       | 0.10            | D  |               |
| 0.25-0.90 |    | Firm becoming stiff with depth brown mottled grey very slightly sandy slightly gravelly CLAY (Weathered Middle Coal Measures). | 0.40            | D  |               |
| 0.90-1.30 |    | Stiff grey friable slightly gravelly CLAY (Weathered Middle Coal Measures).                                                    | 1.00            | B  |               |
| 1.30-1.50 |    | Weak grey MUDSTONE, recovered as a gravel (Weathered Middle Coal Measures).                                                    |                 |    |               |
| 1.50-1.55 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                                                     |                 |    |               |

|                                               |                                   |                                         |                                                                                                         |  |
|-----------------------------------------------|-----------------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------------|--|
| Shoring/Support: None<br>Stability: Very good |                                   |                                         | GENERAL REMARKS                                                                                         |  |
|                                               |                                   |                                         | 1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |  |
| All dimensions in metres<br>Scale 1:50        | Client<br><b>Aldi Stores Ltd.</b> | Method/<br>Plant Used<br><b>JCB 3cx</b> | Logged By<br><b>AJB</b>                                                                                 |  |

## TRIAL PIT LOG

|                                   |                  |                  |                 |                             |
|-----------------------------------|------------------|------------------|-----------------|-----------------------------|
| Project<br>Barugh Green, Barnsley |                  |                  |                 | TRIAL PIT No<br><b>TP04</b> |
| Job No<br>7515                    | Date<br>12-04-07 | Ground Level (m) | Co-Ordinates () |                             |
| Contractor                        |                  |                  |                 | Sheet<br>1 of 1             |



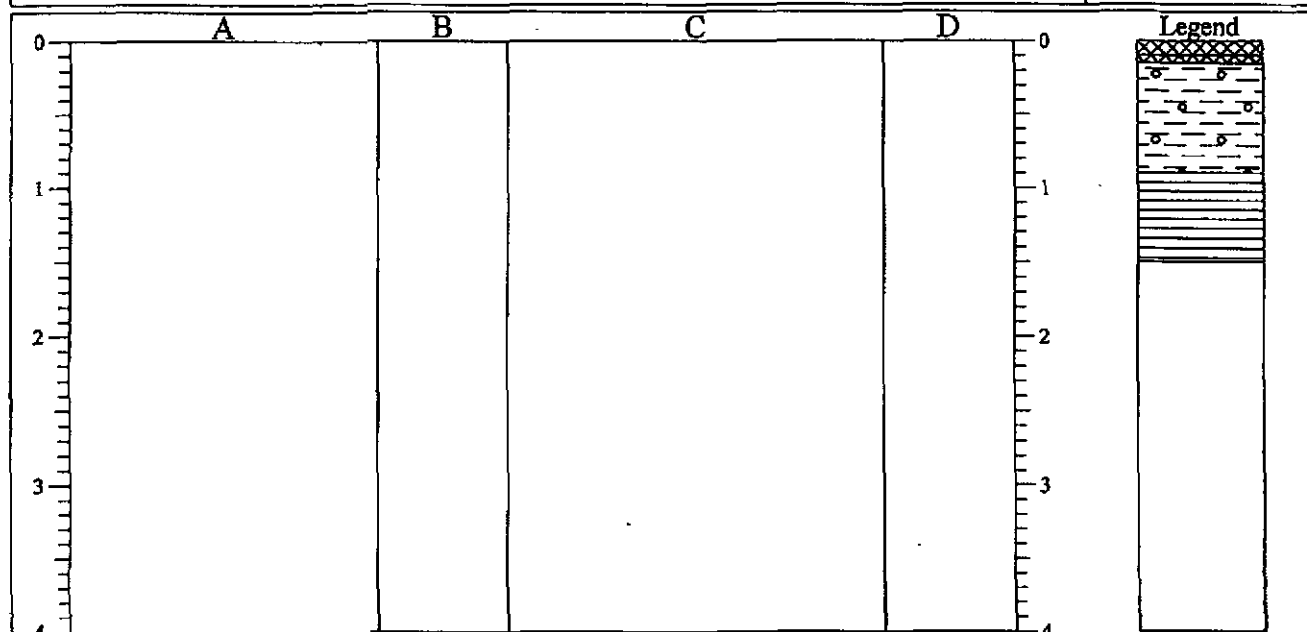
| STRATA    |    |                                                                                                 | SAMPLES & TESTS |    |               |
|-----------|----|-------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                     | Depth           | No | Remarks/Tests |
| 0.00-0.05 |    | TOPSOIL.                                                                                        |                 |    |               |
| 0.05-0.15 |    | Very weak black thinly laminated SHALE, recovered as a gravel (Weathered Middle Coal Measures). | 0.10            | D  |               |
| 0.15-0.25 |    | Firm brown mottled grey gravelly CLAY (Weathered Middle Coal Measures).                         | 0.40            | D  |               |
| 0.25-0.75 |    | Very weak grey SHALE, recovered as gravel (Weathered Middle Coal Measures).                     |                 |    |               |
| 0.75-0.95 |    | Weak grey MUDSTONE recovered as gravel (Weathered Middle Coal Measures).                        |                 |    |               |
| 0.95-1.20 |    | Weak grey MUDSTONE recovered a gravelly cobbles (Middle Coal Measures).                         |                 |    |               |
| 1.20-1.25 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                      |                 |    |               |

|                                               |                  |                                                                                                                                   |         |
|-----------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------|
| Shoring/Support: None<br>Stability: Very good |                  | <b>GENERAL REMARKS</b><br>1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |         |
|                                               |                  | All dimensions in metres<br>Scale 1:50                                                                                            |         |
| Client                                        | Aldi Stores Ltd. | Method/<br>Plant Used                                                                                                             | JCB 3cx |
| Logged By                                     |                  | AJB                                                                                                                               |         |

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 Wakefield  
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 Fax: 01924 240421

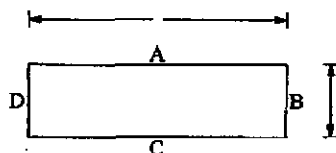
## TRIAL PIT LOG

|                                   |                  |                  |                 |                             |
|-----------------------------------|------------------|------------------|-----------------|-----------------------------|
| Project<br>Barugh Green, Barnsley |                  |                  |                 | TRIAL PIT No<br><b>TP05</b> |
| Job No<br>7515                    | Date<br>12-04-07 | Ground Level (m) | Co-Ordinates () |                             |
| Contractor                        |                  |                  |                 | Sheet<br>1 of 1             |



| STRATA    |    |                                                                                                             | SAMPLES & TESTS |     |               |
|-----------|----|-------------------------------------------------------------------------------------------------------------|-----------------|-----|---------------|
| Depth     | No | DESCRIPTION                                                                                                 | Depth           | No  | Remarks/Tests |
| 0.00-0.10 |    | MADE GROUND comprising sand.                                                                                |                 |     |               |
| 0.10-0.15 |    | MADE GROUND comprising pea gravel.                                                                          |                 |     |               |
| 0.15-0.90 |    | Firm becoming stiff with depth very slightly sandy slightly gravelly CLAY (Weathered Middle Coal Measures). | 0.30            | D   |               |
|           |    |                                                                                                             | 0.50            | HSV |               |
| 0.90-1.35 |    | Weak grey MUDSTONE, recovered as a gravel and cobbles (Middle Coal Measures).                               | 1.00            | D   |               |
| 1.35-1.50 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                                  |                 |     |               |

Shoring/Support: None  
 Stability: Very good



### GENERAL REMARKS

1. No groundwater encountered.
2. Pit terminated on hard strata.
3. Pit backfilled with arisings.

All dimensions in metres  
 Scale 1:50

Client Aldi Stores Ltd.

Method/  
 Plant Used

JCB 3cx

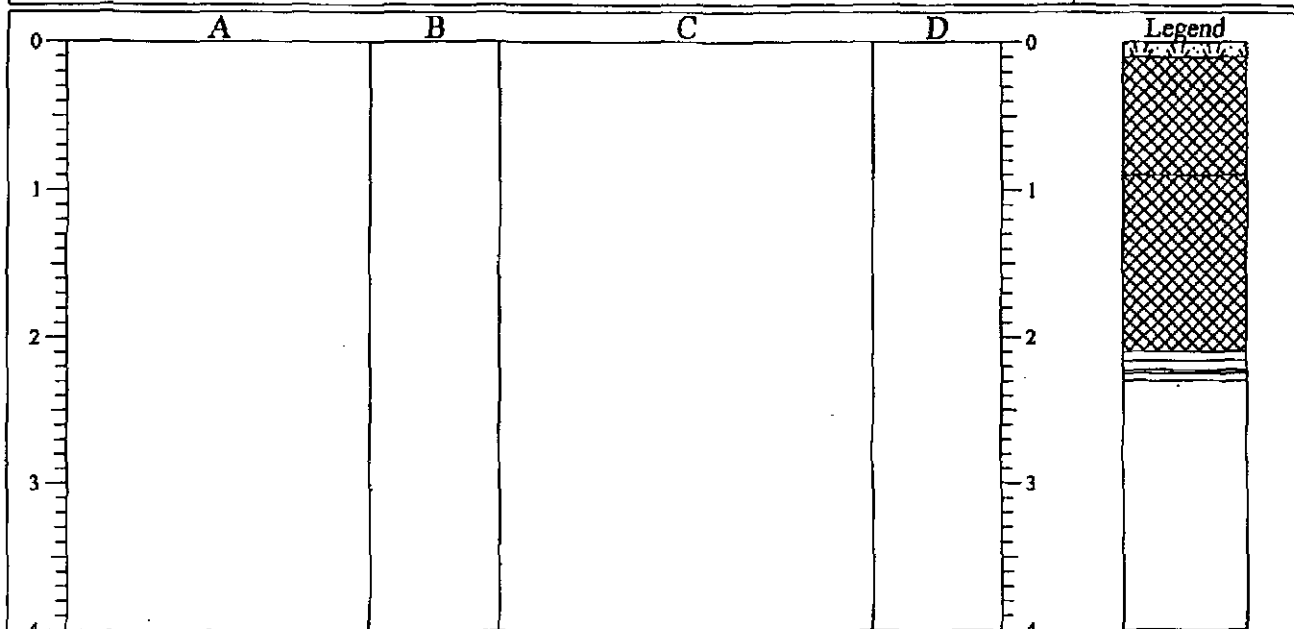
Logged By

AJB

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 Fax: 01924 240421

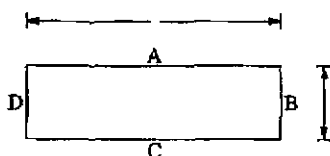
## TRIAL PIT LOG

|                                   |                  |                  |                 |                             |
|-----------------------------------|------------------|------------------|-----------------|-----------------------------|
| Project<br>Barugh Green, Barnsley |                  |                  |                 | TRIAL PIT No<br><b>TP06</b> |
| Job No<br>7515                    | Date<br>12-04-07 | Ground Level (m) | Co-Ordinates () |                             |
| Contractor                        |                  |                  |                 | Sheet<br>1 of 1             |



| STRATA    |    |                                                                                                                                        | SAMPLES & TESTS |    |               |
|-----------|----|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                                                            | Depth           | No | Remarks/Tests |
| 0.00-0.10 |    | TOPSOIL                                                                                                                                | 0.05            | D  |               |
| 0.10-0.90 |    | MADE GROUND comprising reworked gravelly clay.                                                                                         |                 |    |               |
| 0.90-2.10 |    | MADE GROUND comprising reworked gravelly clay and sandstone cobbles and boulders.<br>0.90 - 1.00 Tarmac layer in the north of the pit. | 1.00            | D  |               |
| 2.10-2.25 |    | Weak grey MUDSTONE recovered as gravel (Middle Coal Measures).                                                                         |                 |    |               |
| 2.25-2.30 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                                                             |                 |    |               |

Shoring/Support: None  
 Stability: Relatively unstable to 2.10m



### GENERAL REMARKS

1. No groundwater encountered.
2. Pit terminated on hard strata.
3. Pit backfilled with arisings.

All dimensions in metres  
 Scale 1:50

Client Aldi Stores Ltd.

Method/  
 Plant Used

JCB 3cx

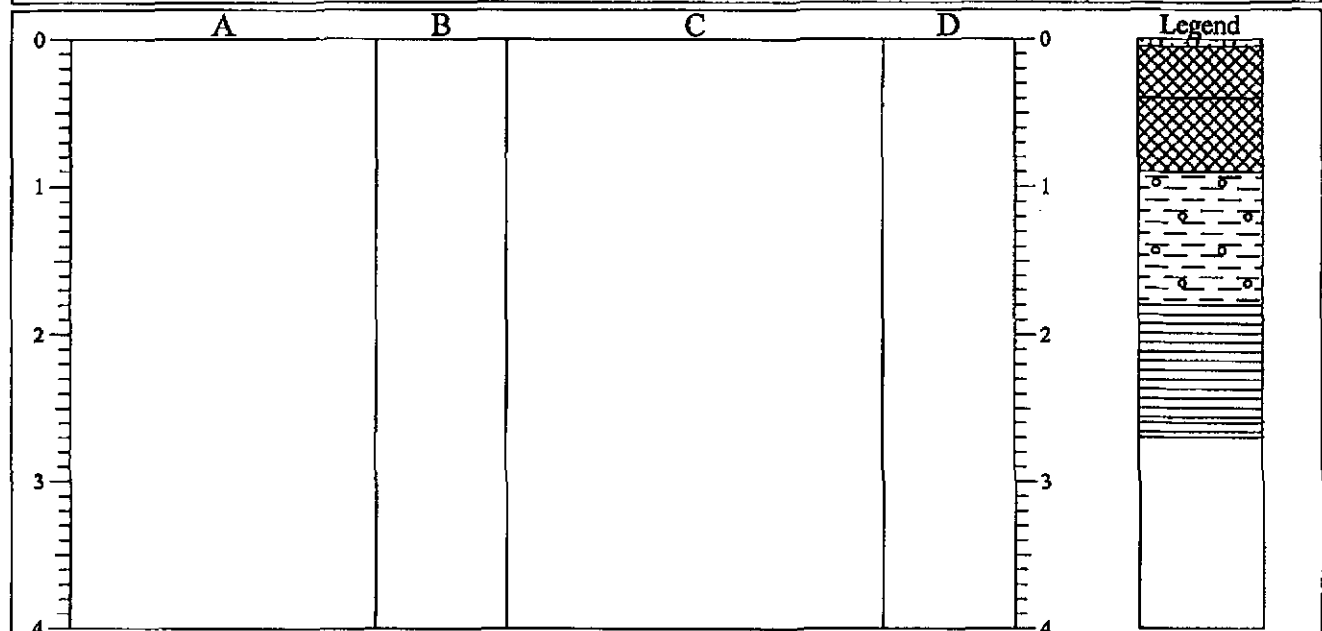
Logged By

AJB

AGS UK TP 7515 GP1 AGS ALL GDT 240507

## TRIAL PIT LOG

|                                          |                         |                  |                  |                             |
|------------------------------------------|-------------------------|------------------|------------------|-----------------------------|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | TRIAL PIT No<br><b>TP07</b> |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                             |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>      |

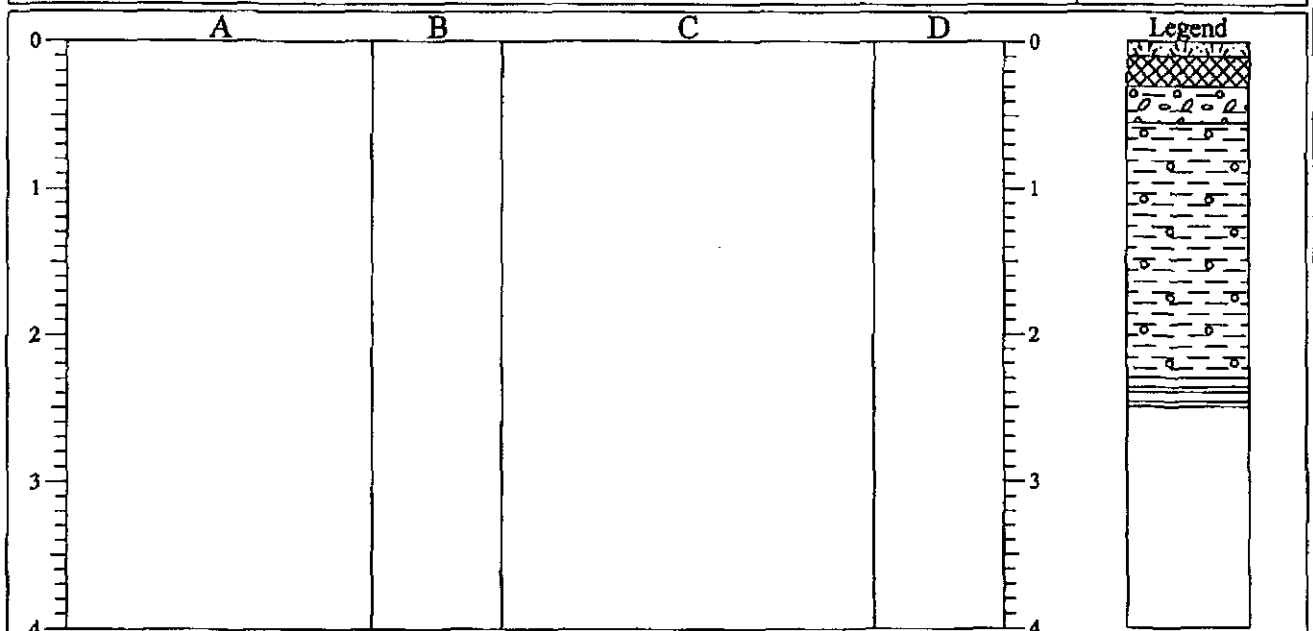


| STRATA    |    |                                                                                                       | SAMPLES & TESTS |    |               |
|-----------|----|-------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                           | Depth           | No | Remarks/Tests |
| 0.00-0.05 |    | Ashy TOPSOIL.                                                                                         | 0.10            | D  |               |
| 0.05-0.40 |    | MADE GROUND comprising burnt red shale.                                                               | 0.50            | D  |               |
| 0.40-0.90 |    | MADE GROUND comprising reworked black very silty slightly gravelly clay.                              | 1.00            | D  |               |
| 0.90-1.80 |    | Firm becoming stiff brown mottled grey sandy slightly gravelly CLAY (Weathered Middle Coal Measures). | 1.10            | B  |               |
| 1.80-2.60 |    | Weak grey MUDSTONE, becoming stronger with depth (Middle Coal Measures).                              |                 |    |               |
| 2.60-2.70 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                            |                 |    |               |

|                                                   |                                                                        |                                                                                                                                                                             |
|---------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shoring/Support: None<br>Stability: Very good<br> |                                                                        | <b>GENERAL REMARKS</b><br>1. No groundwater encountered.<br>2. Pit terminated on competent strata.<br>3. Pit backfilled with arisings.<br>4. Gas main encountered at 0.65m. |
| All dimensions in metres<br>Scale 1:50            | Client <b>Aldi Stores Ltd.</b><br>Method/<br>Plant Used <b>JCB 3cx</b> |                                                                                                                                                                             |

## TRIAL PIT LOG

|                                   |                  |                  |                  |                             |
|-----------------------------------|------------------|------------------|------------------|-----------------------------|
| Project<br>Barugh Green, Barnsley |                  |                  |                  | TRIAL PIT No<br><b>TP08</b> |
| Job No<br>7515                    | Date<br>12-04-07 | Ground Level (m) | Co-Ordinates ( ) |                             |
| Contractor                        |                  |                  |                  | Sheet<br>1 of 1             |



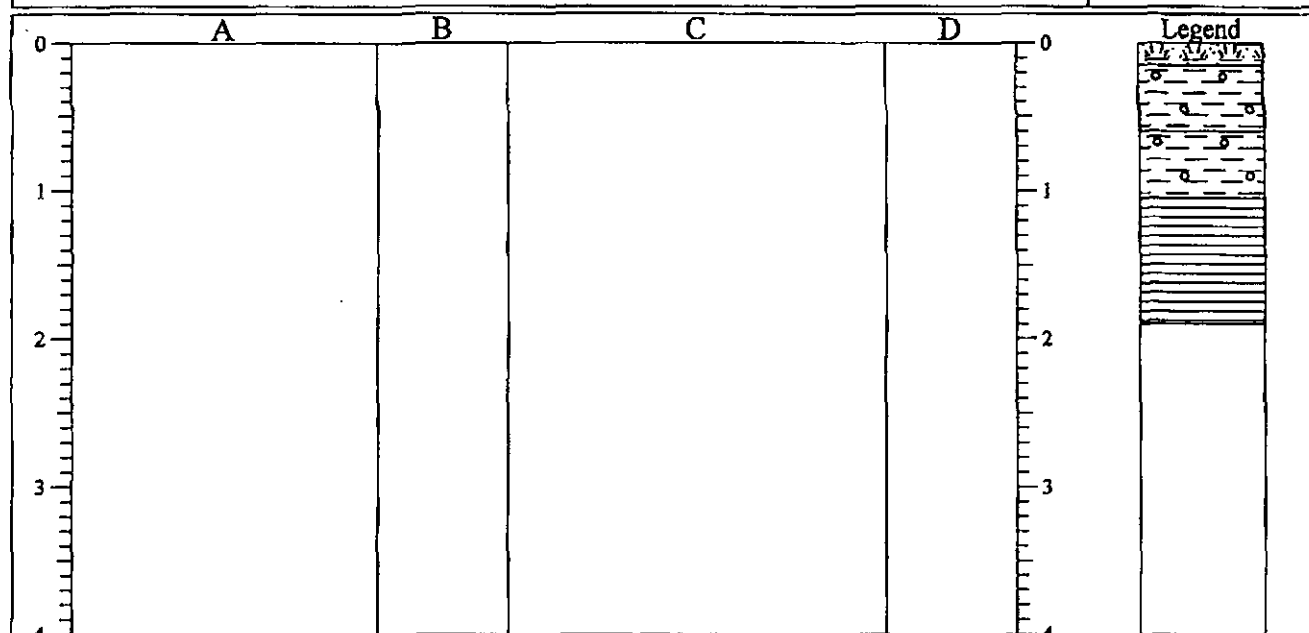
| STRATA    |    |                                                                                                      | SAMPLES & TESTS |    |               |
|-----------|----|------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                          | Depth           | No | Remarks/Tests |
| 0.00-0.10 |    | TOPSOIL.                                                                                             |                 |    |               |
| 0.10-0.30 |    | MADE GROUND comprising black ashy gravel of clinker.                                                 | 0.20            | D  |               |
| 0.30-0.55 |    | Medium dense grey clayey sub angular to angular GRAVEL of mudstone (Weathered Middle Coal Measures). | 0.40            | D  |               |
| 0.55-2.30 |    | Firm brown mottled grey friable slightly sandy gravelly CLAY (Weathered Middle Coal Measures).       | 0.60            | D  |               |
| 2.30-2.40 |    | Weak grey MUDSTONE recovered as gravel and cobbles (Middle Coal Measures).                           |                 |    |               |
| 2.40-2.50 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                           |                 |    |               |

|                                               |                  |                                                                                                                                   |         |
|-----------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------|
| Shoring/Support: None<br>Stability: Very good |                  | <b>GENERAL REMARKS</b><br>1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |         |
|                                               |                  | All dimensions in metres<br>Scale 1:50                                                                                            |         |
| Client                                        | Aldi Stores Ltd. | Method/<br>Plant Used                                                                                                             | JCB 3cx |
| Logged By                                     |                  | AJB                                                                                                                               |         |

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 4 Calder Close, Calder Park  
 Wakefield  
 Telephone: 01924 240420  
 Fax: 01924 240421

## TRIAL PIT LOG

|                                          |                         |                  |                  |                             |
|------------------------------------------|-------------------------|------------------|------------------|-----------------------------|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | TRIAL PIT No<br><b>TP09</b> |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                             |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>      |



| STRATA    |    |                                                                                                       | SAMPLES & TESTS |     |               |
|-----------|----|-------------------------------------------------------------------------------------------------------|-----------------|-----|---------------|
| Depth     | No | DESCRIPTION                                                                                           | Depth           | No  | Remarks/Tests |
| 0.00-0.15 |    | TOPSOIL                                                                                               |                 |     |               |
| 0.15-0.60 |    | Soft to firm brown friable gravelly CLAY (Potentially reworked).                                      | 0.20            | D   |               |
| 0.60-1.05 |    | Firm becoming stiff grey mottled brown slightly sandy gravelly CLAY (Weathered Middle Coal Measures). | 0.70            | D   |               |
| 1.05-1.75 |    | Weak grey MUDSTONE with some ironstone banding (Middle Coal Measures).                                | 0.75            | HSV |               |
| 1.75-1.90 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                            | 0.80            | B   |               |

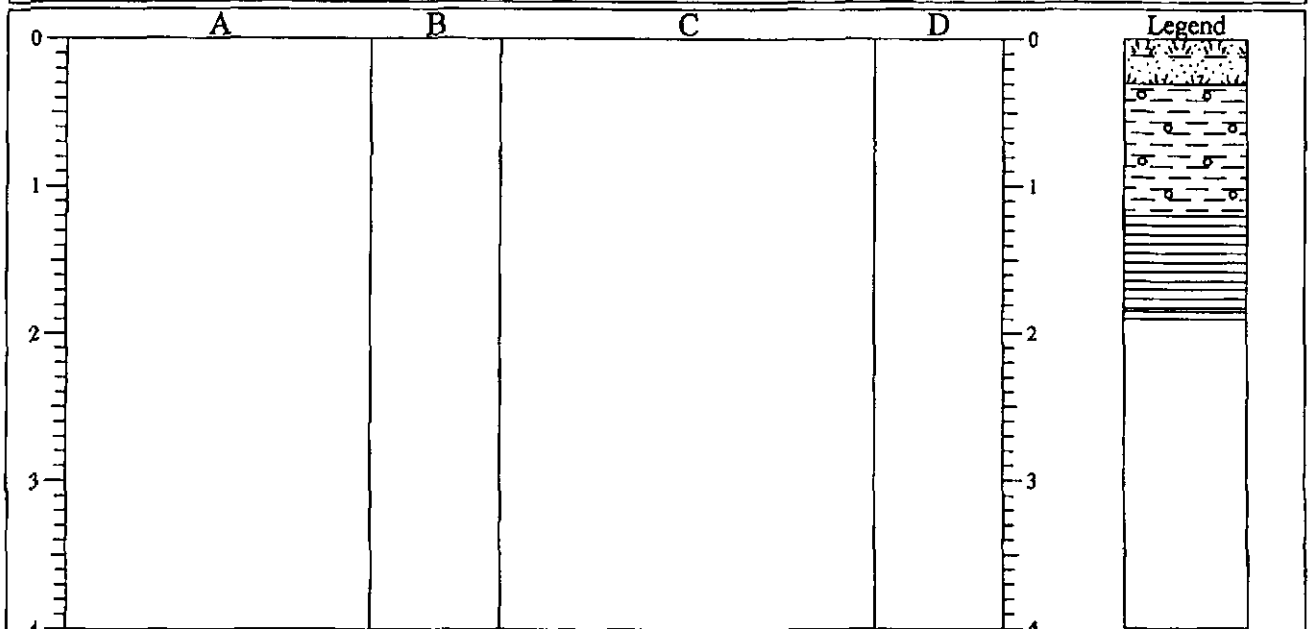
|                                                                    |                  |                                                                                                                            |         |
|--------------------------------------------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------|---------|
| Shoring/Support: None<br>Stability: Very good                      |                  | GENERAL REMARKS<br>1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |         |
| <p>Diagram of the trial pit showing dimensions A, B, C, and D.</p> |                  | <p>All dimensions in metres<br/>Scale 1:50</p>                                                                             |         |
| Client                                                             | Aldi Stores Ltd. | Method/<br>Plant Used                                                                                                      | JCB 3cx |
| Logged By                                                          | AJB              |                                                                                                                            |         |

AGSS UK TP 7515.GPJ AGSS ALL.GDT 240507

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 Wakefield  
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 Fax: 01924 240421

## TRIAL PIT LOG

|                                          |                         |                  |                 |                             |
|------------------------------------------|-------------------------|------------------|-----------------|-----------------------------|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                 | TRIAL PIT No<br><b>TP10</b> |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates () |                             |
| Contractor                               |                         |                  |                 | Sheet<br><b>1 of 1</b>      |



| STRATA    |    |                                                                                                                            | SAMPLES & TESTS |    |               |
|-----------|----|----------------------------------------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                                                | Depth           | No | Remarks/Tests |
| 0.00-0.30 |    | TOPSOIL.                                                                                                                   | 0.60            | D  |               |
| 0.30-1.20 |    | Firm becoming stiff grey mottled brown very slightly sandy gravelly slightly cobbly CLAY (Weathered Middle Coal Measures). |                 |    |               |
| 1.20-1.70 |    | Very weak black/grey carbonaceous MUDSTONE recovered as gravel (Weathered Middle Coal Measures).                           | 1.30            | D  |               |
| 1.70-1.85 |    | Weak grey MUDSTONE recovered as a gravel (Middle Coal Measures)                                                            |                 |    |               |
| 1.85-1.90 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                                                 |                 |    |               |

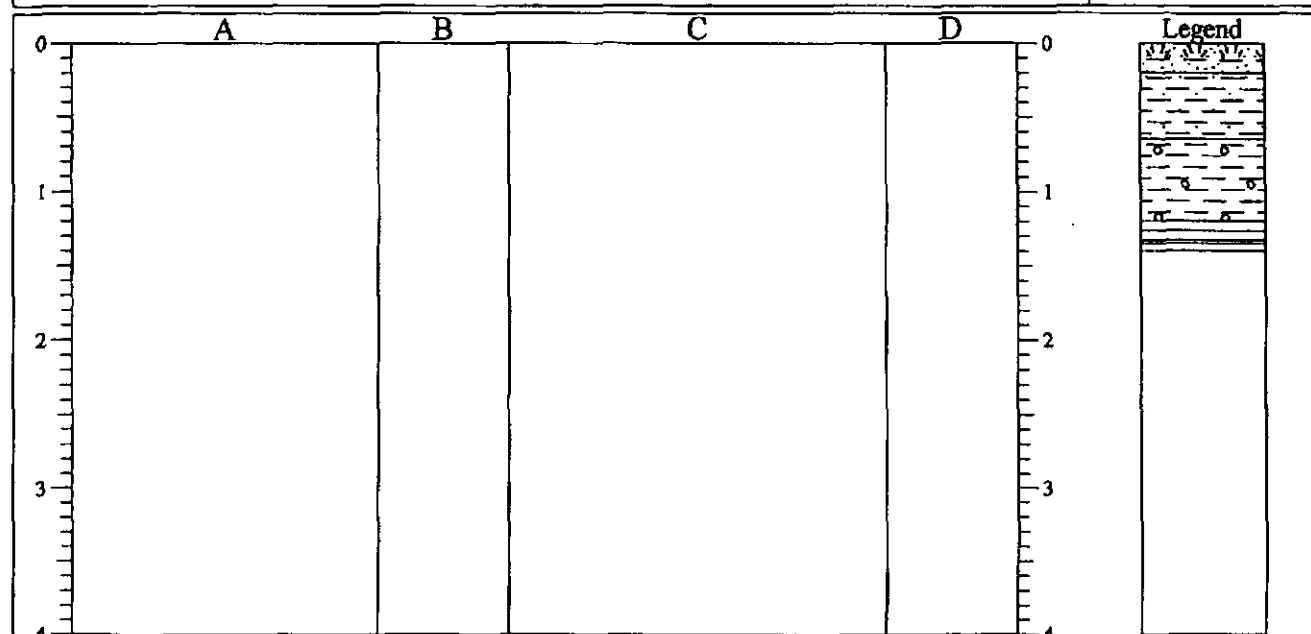
|                                                       |                                                                                                         |                                      |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------|
| Shoring/Support: None<br>Stability: Very good<br><br> | GENERAL REMARKS                                                                                         |                                      |
|                                                       | 1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |                                      |
| All dimensions in metres<br>Scale 1:50                | Client <b>Aldi Stores Ltd.</b>                                                                          | Method/<br>Plant Used <b>JCB 3cx</b> |
| Logged By <b>AJB</b>                                  |                                                                                                         |                                      |

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## TRIAL PIT LOG

|                                   |                  |                  |                 |                             |
|-----------------------------------|------------------|------------------|-----------------|-----------------------------|
| Project<br>Barugh Green, Barnsley |                  |                  |                 | TRIAL PIT No<br><b>TP11</b> |
| Job No<br>7515                    | Date<br>12-04-07 | Ground Level (m) | Co-Ordinates () |                             |
| Contractor                        |                  |                  |                 | Sheet<br>1 of 1             |



| STRATA    |    |                                                                                             | SAMPLES & TESTS |    |               |
|-----------|----|---------------------------------------------------------------------------------------------|-----------------|----|---------------|
| Depth     | No | DESCRIPTION                                                                                 | Depth           | No | Remarks/Tests |
| 0.00-0.20 |    | TOPSOIL.                                                                                    |                 |    |               |
| 0.20-0.65 |    | Soft to firm brown friable slightly sandy CLAY (Potentially reworked).                      | 0.30            | D  |               |
| 0.65-1.20 |    | Firm brown mottled grey very slightly sandy gravelly CLAY (Weathered Middle Coal Measures). | 0.90            | D  |               |
| 1.20-1.35 |    | Weak grey MUDSTONE recovered as a gravel (Middle Coal Measures).                            | 1.00            | B  |               |
| 1.35-1.40 |    | Weak grey MUDSTONE (Middle Coal Measures).                                                  |                 |    |               |

|                                                   |                         |                               |                                                                                                                                   |
|---------------------------------------------------|-------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Shoring/Support: None<br>Stability: Very good<br> |                         |                               | <b>GENERAL REMARKS</b><br>1. No groundwater encountered.<br>2. Pit terminated on hard strata.<br>3. Pit backfilled with arisings. |
| All dimensions in metres<br>Scale 1:50            | Client Aldi Stores Ltd. | Method/<br>Plant Used JCB 3cx |                                                                                                                                   |

AGS3 UK TP 7515.GPJ AGS3 ALL.GDT 240607

## BOREHOLE LOG

|                                          |                         |                  |                  |                               |  |
|------------------------------------------|-------------------------|------------------|------------------|-------------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | BOREHOLE No<br><br><b>WS1</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                               |  |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>        |  |

| SAMPLES & TESTS |         |             | STRATA                                                                            |                                                                                   |                                                                                   |                   |                                                                                |         |                                                                                     |
|-----------------|---------|-------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------|
| Depth           | Type No | Test Result | Water                                                                             | Reduced Level                                                                     | Legend                                                                            | Depth (Thickness) | DESCRIPTION                                                                    | Geology | Instrument/Backfill                                                                 |
| 0.20            | D       | N26         |  |                                                                                   |  | 0.30              | TOPSOIL                                                                        |         |  |
| 0.80            | D       |             |                                                                                   |                                                                                   |  | (2.00)            | Firm fissured orange brown mottled grey gravelly to very gravelly CLAY         |         |                                                                                     |
| 1.00            | D       |             |                                                                                   |                                                                                   |  |                   | 1.50 Becoming stiff and very gravelly                                          |         |                                                                                     |
| 2.40            | D       |             |                                                                                   |  | 2.30                                                                              |                   |                                                                                |         |                                                                                     |
|                 |         |             |                                                                                   |                                                                                   |  | (0.70)            | Weak to moderately weak thinly laminated grey and yellow brown sandy SILTSTONE |         |                                                                                     |
|                 |         |             |                                                                                   |                                                                                   |  | 3.00              | 2.70 Becoming moderately weak silty fine grained SANDSTONE                     |         |                                                                                     |
|                 |         |             |                                                                                   |                                                                                   |                                                                                   |                   |                                                                                |         |                                                                                     |
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|                 |         |             |                                                                                   |                                                                                   |                                                                                   |                   |                                                                                |         |                                                                                     |

| Boring Progress and Water Observations |      |       |              |         |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                               |
|----------------------------------------|------|-------|--------------|---------|-----------|------------|----|-------|-------------|----|---------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                               |
|                                        |      |       |              |         |           |            |    |       |             |    | Groundwater strike at 2m.<br>Monitoring well installed at 3m. |
|                                        |      |       |              |         |           |            |    |       |             |    |                                                               |

|                                        |                                |                                                      |                        |
|----------------------------------------|--------------------------------|------------------------------------------------------|------------------------|
| All dimensions in metres<br>Scale 1:50 | Client <b>Aldi Stores Ltd.</b> | Method/<br>Plant Used <b>Mini Percussive Sampler</b> | Logged By<br><b>JR</b> |
|----------------------------------------|--------------------------------|------------------------------------------------------|------------------------|

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Fax: 01924 240421

## BOREHOLE LOG

|                                          |                         |                  |                  |                           |  |
|------------------------------------------|-------------------------|------------------|------------------|---------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | BOREHOLE No<br><b>WS2</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                           |  |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>    |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |                                                                                    |                   | Geology                                                                                        | Instrument/Backfill                                                                  |
|-----------------|---------|-------------|-------|---------------|------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend                                                                             | Depth (Thickness) |                                                                                                |                                                                                      |
| 0.60            | D       |             | ↓     |               |   | 0.20              | TOPSOIL                                                                                        |  |
| 0.90            | D       |             |       |               |   | (2.30)            | Firm to stiff becoming stiff fissured orange brown mottled grey gravelly to very gravelly CLAY |                                                                                      |
| 1.70            | D       |             |       |               |                                                                                    | 2.50              |                                                                                                |                                                                                      |
|                 |         |             |       |               |  | (0.50)<br>3.00    | Weak thinly laminated grey MUDSTONE with occasional gravel size ironstone nodules              |                                                                                      |
|                 |         |             |       |               |                                                                                    |                   |                                                                                                |                                                                                      |

| Boring Progress and Water Observations |      |       |              |                |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                            |
|----------------------------------------|------|-------|--------------|----------------|-----------|------------|----|-------|-------------|----|------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                            |
|                                        |      |       |              |                |           |            |    |       |             |    | Groundwater strike at 2m. Monitoring well installed at 3m. |
|                                        |      |       |              |                |           |            |    |       |             |    |                                                            |

|                                        |                                |                                                      |                        |
|----------------------------------------|--------------------------------|------------------------------------------------------|------------------------|
| All dimensions in metres<br>Scale 1:50 | Client <b>Aldi Stores Ltd.</b> | Method/<br>Plant Used <b>Mini Percussive Sampler</b> | Logged By<br><b>JR</b> |
|----------------------------------------|--------------------------------|------------------------------------------------------|------------------------|

AGSS UK BH 7515.GPJ AGSS ALL.GIT 14/05/07

## BOREHOLE LOG

|                                          |                         |                  |                  |                           |  |
|------------------------------------------|-------------------------|------------------|------------------|---------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | BOREHOLE No<br><b>WS3</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                           |  |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>    |  |

| SAMPLES & TESTS |            |                | Water | STRATA           |                                                                                    |                                                                                                      | Geology                                                                               | Instrument/<br>Backfill                                                              |
|-----------------|------------|----------------|-------|------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Depth           | Type<br>No | Test<br>Result |       | Reduced<br>Level | Legend                                                                             | Depth<br>(Thick-<br>ness)                                                                            |                                                                                       |                                                                                      |
| 0.40            | D          | N13            |       |                  |   | 0.10                                                                                                 | Reworked TOPSOIL                                                                      |   |
|                 |            |                |       | (0.40)           |                                                                                    | MADE GROUND: Grey brown sandy angular to subangular gravel size part brick, burnt shale and concrete |                                                                                       |                                                                                      |
|                 |            |                |       | 0.50             |                                                                                    |                                                                                                      |                                                                                       |                                                                                      |
|                 |            |                |       | 0.60             |                                                                                    | MADE GROUND: Stiff brown gravelly clay                                                               |                                                                                       |                                                                                      |
| 0.90            | D          |                |       |                  |   | 0.70                                                                                                 | MADE GROUND: Coated macadam                                                           |   |
|                 |            |                |       | (0.50)           |                                                                                    | Relict TOPSOIL                                                                                       |                                                                                       |                                                                                      |
| 1.40            | D          |                |       |                  |  | 1.20                                                                                                 | Firm to stiff fissured orange brown mottled grey gravelly becoming very gravelly CLAY |  |
| 2.00            | D          |                |       | (2.25)           |                                                                                    |                                                                                                      |                                                                                       |                                                                                      |
|                 |            |                |       | 3.45             |                                                                                    |                                                                                                      |                                                                                       |                                                                                      |

| Boring Progress and Water Observations |      |       |              |                |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                              |
|----------------------------------------|------|-------|--------------|----------------|-----------|------------|----|-------|-------------|----|--------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                              |
|                                        |      |       |              |                |           |            |    |       |             |    | No groundwater encountered. Monitoring well installed at 3m. |
|                                        |      |       |              |                |           |            |    |       |             |    |                                                              |

All dimensions in metres  
Scale 1:50

Client **Aldi Stores Ltd.**

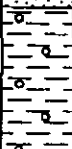
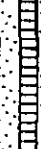
Method/  
Plant Used **Mini Percussive Sampler**

Logged By  
**JR**

3e Consulting Engineers Ltd  
4 Calder Close, Calder Park  
Wakefield WF2 7AU  
Telephone: 01924 240420  
Fax: 01924 240421

## BOREHOLE LOG

|                                          |                         |                  |                  |                           |  |
|------------------------------------------|-------------------------|------------------|------------------|---------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | BOREHOLE No<br><b>WS4</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                           |  |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>    |  |

| SAMPLES & TESTS |         |             | Water | STRATA                                                                            |                                                                                    |                    |                                                                                                                                                                                 | Geology | Instrument/<br>Backfill                                                              |  |
|-----------------|---------|-------------|-------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------------------------------------------------------------------------------|--|
| Depth           | Type No | Test Result |       | Reduced Level                                                                     | Legend                                                                             | Depth (Thick-ness) | DESCRIPTION                                                                                                                                                                     |         |                                                                                      |  |
|                 |         |             |       |                                                                                   |   | 0.25               | Reworked TOPSOIL                                                                                                                                                                |         |   |  |
| 0.80            | D       |             |       |  | (1.50)                                                                             |                    | MADE GROUND: Stiff brown mottled grey and orange brown gravelly clay. Gravel is angular to subangular of mudstone, sandstone, shale, occasional part brick and cinder fragments |         |   |  |
| 1.20            | D       |             |       |                                                                                   |                                                                                    | 1.75               |                                                                                                                                                                                 |         |                                                                                      |  |
| 1.80            | D       |             |       |                                                                                   |                                                                                    | 2.00               | Relict TOPSOIL                                                                                                                                                                  |         |                                                                                      |  |
|                 |         |             |       |                                                                                   |  |                    | Stiff fissured orange brown mottled grey gravelly CLAY                                                                                                                          |         |  |  |
| 2.40            | D       |             |       | (1.00)                                                                            |                                                                                    |                    |                                                                                                                                                                                 |         |                                                                                      |  |
|                 |         |             |       | 3.00                                                                              |                                                                                    |                    |                                                                                                                                                                                 |         |                                                                                      |  |
|                 |         |             |       |                                                                                   |                                                                                    |                    |                                                                                                                                                                                 |         |                                                                                      |  |

| Boring Progress and Water Observations |      |       |              |                |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                              |
|----------------------------------------|------|-------|--------------|----------------|-----------|------------|----|-------|-------------|----|--------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                              |
|                                        |      |       |              |                |           |            |    |       |             |    | No groundwater encountered. Monitoring well installed at 3m. |
|                                        |      |       |              |                |           |            |    |       |             |    |                                                              |

|                                        |                                |                                                      |                        |
|----------------------------------------|--------------------------------|------------------------------------------------------|------------------------|
| All dimensions in metres<br>Scale 1:50 | Client <b>Aldi Stores Ltd.</b> | Method/<br>Plant Used <b>Mini Percussive Sampler</b> | Logged By<br><b>JR</b> |
|----------------------------------------|--------------------------------|------------------------------------------------------|------------------------|

AGSS UK BH 7516.GPJ AGSS ALL GDT 14/05/07

3e Consulting Engineers Ltd  
4 Calder Close, Calder Park  
Wakefield WF2 7AU  
Telephone: 01924 240420  
Fax: 01924 240421

## BOREHOLE LOG

|                                          |                         |                  |                 |                           |  |
|------------------------------------------|-------------------------|------------------|-----------------|---------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                 | BOREHOLE No<br><b>WS5</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates () |                           |  |
| Contractor                               |                         |                  |                 | Sheet<br><b>1 of 1</b>    |  |

| SAMPLES & TESTS |         |             | Water | STRATA        |        |                                                          | Geology | Instrument/<br>Backfill |
|-----------------|---------|-------------|-------|---------------|--------|----------------------------------------------------------|---------|-------------------------|
| Depth           | Type No | Test Result |       | Reduced Level | Legend | Depth (Thickness)                                        |         |                         |
| 0.10            | D       |             |       |               | 0.20   | TOPSOIL                                                  |         |                         |
|                 |         |             |       |               | (0.80) | Stiff fissured orange brown mottled grey gravelly CLAY   |         |                         |
| 0.80<br>0.90    | D<br>D  |             |       |               | 1.00   | Weak thinly laminated grey stained orange brown MUDSTONE |         |                         |
| 1.50            | D       |             |       |               | (2.00) |                                                          |         |                         |
|                 |         |             |       |               | 3.00   |                                                          |         |                         |
|                 |         |             |       |               |        |                                                          |         |                         |
|                 |         |             |       |               |        |                                                          |         |                         |
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| Boring Progress and Water Observations |      |       |              |                |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS                                              |
|----------------------------------------|------|-------|--------------|----------------|-----------|------------|----|-------|-------------|----|--------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From       | To | Hours | From        | To |                                                              |
|                                        |      |       |              |                |           |            |    |       |             |    | No groundwater encountered. Monitoring well installed at 3m. |
|                                        |      |       |              |                |           |            |    |       |             |    |                                                              |

All dimensions in metres  
Scale 1:50

Client **Aldi Stores Ltd.**

Method/  
Plant Used **Mini Percussive Sampler**

Logged By **JR**

AGS3 UK BH 7515.GPJ AGS3 ALL.GDT 14/06/07

3e Consulting Engineers Ltd  
4 Calder Close, Calder Park  
Wakefield WF2 7AU  
Telephone: 01924 240420  
Fax: 01924 240421

## BOREHOLE LOG

|                                          |                         |                  |                  |                           |  |
|------------------------------------------|-------------------------|------------------|------------------|---------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | BOREHOLE No<br><b>WS6</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                           |  |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>    |  |

| SAMPLES & TESTS |         |             | STRATA |               |                                                                                   |                   |                                                   | Geology | Instrument/<br>Backfill                                                             |
|-----------------|---------|-------------|--------|---------------|-----------------------------------------------------------------------------------|-------------------|---------------------------------------------------|---------|-------------------------------------------------------------------------------------|
| Depth           | Type No | Test Result | Water  | Reduced Level | Legend                                                                            | Depth (Thickness) | DESCRIPTION                                       |         |                                                                                     |
|                 |         |             |        |               |  | 0.30              | TOPSOIL                                           |         |  |
| 0.70            | D       |             |        |               |  |                   | Stiff fissured orange brown mottled grey CLAY     |         |  |
| 0.90            | D       |             |        |               |  | (1.60)            | 1.20 Becoming gravelly                            |         |  |
|                 |         |             |        |               |  | 1.90              | Weak thinly laminated grey stained black MUDSTONE |         |  |
|                 |         |             |        |               |  | (1.10)            |                                                   |         |  |
|                 |         |             |        |               |  | 3.00              |                                                   |         |  |

| Boring Progress and Water Observations |      |       |                                |         |           | Chiselling                                           |    |       | Water Added            |    | GENERAL REMARKS                                              |
|----------------------------------------|------|-------|--------------------------------|---------|-----------|------------------------------------------------------|----|-------|------------------------|----|--------------------------------------------------------------|
| Date                                   | Time | Depth | Casing Depth                   | Dia. mm | Water Dpt | From                                                 | To | Hours | From                   | To |                                                              |
|                                        |      |       |                                |         |           |                                                      |    |       |                        |    | No groundwater encountered. Monitoring well installed at 3m. |
|                                        |      |       |                                |         |           |                                                      |    |       |                        |    |                                                              |
| All dimensions in metres<br>Scale 1:50 |      |       | Client <b>Aldi Stores Ltd.</b> |         |           | Method/<br>Plant Used <b>Mini Percussive Sampler</b> |    |       | Logged By<br><b>JR</b> |    |                                                              |

AGS3 UK BH 7515.GPJ AGS3 ALL.GDT 14/05/07

## BOREHOLE LOG

|                                          |                         |                  |                  |                           |  |
|------------------------------------------|-------------------------|------------------|------------------|---------------------------|--|
| Project<br><b>Barugh Green, Barnsley</b> |                         |                  |                  | BOREHOLE No<br><b>WS7</b> |  |
| Job No<br><b>7515</b>                    | Date<br><b>12-04-07</b> | Ground Level (m) | Co-Ordinates ( ) |                           |  |
| Contractor                               |                         |                  |                  | Sheet<br><b>1 of 1</b>    |  |

| SAMPLES & TESTS |         |             | Water | STRATA                                                                             |                                                                                   |                                                                                                                          | Geology                                                                | Instrument/<br>Backfill |             |
|-----------------|---------|-------------|-------|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------|-------------|
| Depth           | Type No | Test Result |       | Reduced Level                                                                      | Legend                                                                            | Depth (Thickness)                                                                                                        |                                                                        |                         | DESCRIPTION |
| 0.25            | D       | N11         |       |   | 0.10                                                                              | Reworked TOPSOIL.                                                                                                        |                                                                        |                         |             |
| 0.50            | D       |             |       |   | 0.40                                                                              | MADE GROUND: Stiff dark grey brown sandy gravelly clay. Gravel is angular to subangular of cinder, burnt shale and brick |                                                                        |                         |             |
|                 |         |             |       |                                                                                    |  | 0.70                                                                                                                     | Relict TOPSOIL.                                                        |                         |             |
| 1.00            | D       |             |       |                                                                                    |  | (0.60)                                                                                                                   | Stiff fissured orange brown mottled grey CLAY                          |                         |             |
|                 |         |             |       |                                                                                    |  | 1.30                                                                                                                     | Weak thinly laminated yellow brown becoming light brown sandy MUDSTONE |                         |             |
|                 |         |             |       |   | (1.70)                                                                            |                                                                                                                          |                                                                        |                         |             |
|                 |         |             |       |  | 3.00                                                                              |                                                                                                                          |                                                                        |                         |             |

| Boring Progress and Water Observations |      |       |              |                |           | Chiselling |    |       | Water Added |    | GENERAL REMARKS             |
|----------------------------------------|------|-------|--------------|----------------|-----------|------------|----|-------|-------------|----|-----------------------------|
| Date                                   | Time | Depth | Casing Depth | Casing Dia. mm | Water Dpt | From       | To | Hours | From        | To |                             |
|                                        |      |       |              |                |           |            |    |       |             |    | No groundwater encountered. |
|                                        |      |       |              |                |           |            |    |       |             |    |                             |

|                                        |                                |                                                      |                     |
|----------------------------------------|--------------------------------|------------------------------------------------------|---------------------|
| All dimensions in metres<br>Scale 1:50 | Client <b>Aldi Stores Ltd.</b> | Method/<br>Plant Used <b>Mini Percussive Sampler</b> | Logged By <b>JR</b> |
|----------------------------------------|--------------------------------|------------------------------------------------------|---------------------|

**APPENDIX C**  
**Contamination Testing Results**



**Client:** 3a Consulting Engineers Limited  
4 Calder Close  
Calder Park  
Wakefield  
WF4 3BA

**FAO:** Mr A Cooper

**Analytical Report Number: R07/0831**

|                               |                              |
|-------------------------------|------------------------------|
| <b>Client Project Name:</b>   | <b>Baugh Green, Barnsley</b> |
| <b>Client Project Number:</b> | <b>7515</b>                  |
| <b>Your Order Number:</b>     | <b>None Specified</b>        |
| <b>Order Receipt Date:</b>    | <b>03/05/07</b>              |
| <b>Reporting Date:</b>        | <b>Friday 18 May 2007</b>    |

If you have any queries regarding this report please contact our Customer Services Section



Client Project Name: Baugh Green, Barnsley  
Project Number: 7515

Client: 3e Consulting Engineers Limited  
Reporting Date: Friday 18 May 2007

### Comments

All analyses are carried out using the laboratory's standard methods unless otherwise agreed.

The test results in this report refer only to the actual samples on which testing has been performed.

Any opinions and/or interpretations expressed herein are outside the scope of the testing laboratory's UKAS accreditation.

The test report shall not be reproduced, except in full, without the testing laboratory's written approval.

This testing laboratory cannot be held responsible for the condition or suitability of samples submitted for testing by a third party or for the competency of personnel other than its own staff.

This testing laboratory cannot be held responsible for the accuracy of test sample locations or descriptions when supplied by a third party.

### Soil Samples

Results are expressed based on dried mass @ 40°C unless otherwise stated.

See key in Notes section for explanation of numerical categories for asbestos results, if applicable.

Stones (for example inert flints and inorganic minerals) >10mm are removed prior to analysis. Unless otherwise stated, results have not been corrected for this loss.

Samples submitted for leachate determination were prepared using agreed procedures and analysed using UKAS accredited methodology where appropriate.

Results are expressed without correction for recovery factors.

### Sample Pretreatment (Appended to Method of Detection)

AD = Assisted drying @ 40°C

R = As Received

### Sample Type

B = Bulk disturbed sample

C = Core Sample

D = Small disturbed sample

P = Piston sample

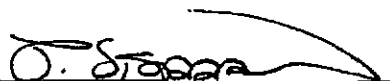
U = Undisturbed sample - open drive

W = Water Sample

### Sample Results

# = Analysis not requested

\*\*\* Test not completed. Please see notes on last page

Signed: 

For and on behalf of ECOS Environmental Limited

Approved signatories:

Name

Position

J R Brown

Business Development Manager

L Dewell

Production Manager

P Richardson

Section Head

J Stoddart ✓

Technical Manager



Client Project Name: Baugh Green, Barnsley  
Project Number: 7515

Client: 3e Consulting Engineers Limited  
Reporting Date: Friday 18 May 2007

## Soil Samples

## Method Statement

| Determinand              | Method of Detection | Sample Pretreatment | Limit of Detection        | UKAS Accreditation | Sub-Contracted | Result Date |
|--------------------------|---------------------|---------------------|---------------------------|--------------------|----------------|-------------|
| Arsenic                  | ICP-OES             | AD                  | 0.1 mg/kg                 | Yes                | No             | 17/05/07    |
| Cadmium                  | ICP-OES             | AD                  | 0.2 mg/kg                 | Yes                | Yes            | 11/05/07    |
| Chromium (total)         | ICP-OES             | AD                  | 0.2 mg/kg                 | Yes                | No             | 11/05/07    |
| Lead                     | ICP-OES             | AD                  | 0.5 mg/kg                 | Yes                | No             | 11/05/07    |
| Mercury                  | ICP-OES             | AD                  | 0.1 mg/kg                 | Yes                | No             | 17/05/07    |
| Selenium                 | ICP-OES             | AD                  | 1.0 mg/kg                 | Yes                | No             | 11/05/07    |
| Boron (water soluble)    | ICP-OES             | AD                  | 0.5 mg/kg                 | Yes                | No             | 17/05/07    |
| Copper                   | ICP-OES             | AD                  | 0.2 mg/kg                 | Yes                | No             | 11/05/07    |
| Nickel                   | ICP-OES             | AD                  | 0.2 mg/kg                 | Yes                | No             | 11/05/07    |
| Vanadium                 | ICP-OES             | AD                  | 0.2 mg/kg                 | No                 | No             | 11/05/07    |
| Zinc                     | ICP-OES             | AD                  | 0.2 mg/kg                 | Yes                | No             | 11/05/07    |
| Sulphate (water soluble) | HPLC-IC             | AD                  | 0.001 g/l SO <sub>4</sub> | Yes                | No             | 15/05/07    |
| pH                       | pH-meter            | AD                  | N/A                       | Yes                | No             | 11/05/07    |
| TPH (with clean up)      | GC-FID              | AD                  | 5.0 mg/kg                 | Yes                | No             | 14/05/07    |
| PAH (sum of PAH 17)      | GC-MS               | AD                  | 0.1 mg/kg                 | No                 | No             | 15/05/07    |
| Naphthalene              | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Acenaphthylene           | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Acenaphthene             | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Fluorene                 | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Phenanthrene             | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Anthracene               | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Fluoranthene             | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Pyrene                   | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Benzo(a)anthracene       | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Chrysene                 | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Benzo(b)+(j)fluoranthene | GC-MS               | AD                  | 0.1 mg/kg                 | No                 | No             | 15/05/07    |
| Benzo(k)fluoranthene     | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Benzo(a)pyrene           | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Indeno(1,2,3-cd)pyrene   | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Dibenz(a,h)anthracene    | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| Benzo(g,h,i)perylene     | GC-MS               | AD                  | 0.1 mg/kg                 | Yes                | No             | 15/05/07    |
| TOC                      | Colorimetry         | AD                  | 0.1 %                     | No                 | No             | 17/05/07    |
| Organic Matter           | Titration           | AD                  | 0.1 %                     | No                 | No             | 11/05/07    |



Client Project Name: Baugh Green, Barnsley  
Project Number: 7515

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| Hole No./Sample ID       |         | TP01     | TP06     | TP06     | TP07     | TP08     |
|--------------------------|---------|----------|----------|----------|----------|----------|
| Top Depth / m            |         | 0.10     | 0.05     | 1.00     | 0.10     | 0.20     |
| Bottom Depth / m         |         |          |          |          |          |          |
| Sample No.               |         |          |          |          |          |          |
| Sample Type              |         |          |          |          |          |          |
| Date Sampled             |         |          |          |          |          |          |
| Receipt Date             |         | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 |
| EC&S Sample ID           |         | S0706581 | S0706582 | S0706583 | S0706584 | S0706585 |
| Matrix Type              |         | Soil     | Soil     | Soil     | Soil     | Soil     |
| Determinand              | Units   |          |          |          |          |          |
| Arsenic                  | mg/kg   | 14.3     | 17.9     | 7.9      | 62.3     | 53.6     |
| Cadmium                  | mg/kg   | <0.2     | <0.2     | <0.2     | <0.2     | <0.2     |
| Chromium (total)         | mg/kg   | 13.8     | 19.0     | 17.4     | 20.8     | 14.1     |
| Lead                     | mg/kg   | 42.1     | 56.7     | 10.1     | 26.7     | 14.5     |
| Mercury                  | mg/kg   | <0.1     | <0.1     | <0.1     | <0.1     | <0.1     |
| Selenium                 | mg/kg   | <1.0     | <1.0     | <1.0     | 1.4      | <1.0     |
| Boron (water soluble)    | mg/kg   | <0.5     | 0.6      | <0.5     | 0.5      | 0.5      |
| Copper                   | mg/kg   | 26.3     | 33.8     | 22.0     | 36.7     | 65.1     |
| Nickel                   | mg/kg   | 13.5     | 16.0     | 27.8     | 18.3     | 51.1     |
| Vanadium                 | mg/kg   | 31.9     | 36.5     | 35.8     | 49.3     | 50.2     |
| Zinc                     | mg/kg   | 63.7     | 73.3     | 62.2     | 39.8     | 33.4     |
| Sulphate (water soluble) | g/l SO4 | 0.011    | 0.013    | 0.018    | 0.098    | 0.344    |
| pH                       | N/A     | 5.5      | 6.4      | 7.9      | 7.5      | 6.6      |
| TPH (with clean up)      | mg/kg   | 22.7     | 51.2     | 34.0     | 25.3     | 51.6     |
| PAH (sum of PAH 17)      | mg/kg   | 6.4      | 11.1     | 21.1     | 13.4     | 3.9      |
| Naphthalene              | mg/kg   | 0.3      | 0.3      | 0.2      | 0.6      | 2.4      |
| Acenaphthylene           | mg/kg   | <0.1     | <0.1     | <0.1     | <0.1     | 0.1      |
| Acenaphthene             | mg/kg   | <0.1     | 0.1      | 0.4      | <0.1     | 0.1      |
| Fluorene                 | mg/kg   | <0.1     | <0.1     | 0.6      | <0.1     | 0.3      |
| Phenanthrene             | mg/kg   | <0.1     | 1.2      | 2.8      | 1.7      | <0.1     |
| Anthracene               | mg/kg   | <0.1     | <0.1     | 0.6      | 0.3      | <0.1     |
| Fluoranthene             | mg/kg   | 1.5      | 2.0      | 4.2      | 2.6      | 0.5      |
| Pyrene                   | mg/kg   | 1.2      | 1.7      | 3.3      | 2.2      | 0.5      |
| Benzo(a)anthracene       | mg/kg   | 0.5      | 0.9      | 1.5      | 0.8      | <0.1     |
| Chrysene                 | mg/kg   | 0.7      | 0.8      | 1.5      | 1.1      | 0.2      |
| Benzo(b)+(f)fluoranthene | mg/kg   | 0.9      | 1.2      | 1.9      | 1.1      | <0.1     |
| Benzo(k)fluoranthene     | mg/kg   | 0.3      | 0.6      | 0.8      | 0.6      | <0.1     |
| Benzo(a)pyrene           | mg/kg   | 0.3      | 0.8      | 1.4      | 1.0      | <0.1     |
| Indeno(1,2,3-cd)pyrene   | mg/kg   | 0.3      | 0.6      | 0.9      | 0.7      | <0.1     |
| Dibenz(a,h)anthracene    | mg/kg   | <0.1     | 0.2      | 0.3      | <0.1     | <0.1     |
| Benzo(g,h,i)perylene     | mg/kg   | 0.4      | 0.8      | 1.1      | 0.9      | <0.1     |
| TOC                      | %       | 2.9      | 4.2      | 1.3      | 1.5      | 5.2      |



Client Project Name: Baugh Green, Barnsley

Client: 3e Consulting Engineers Limited

Project Number: 7515

Reporting Date: Friday 18 May 2007

| Hole No./Sample ID       |         | TP09     | TP10     | WS4      | WS3      | TP01     |
|--------------------------|---------|----------|----------|----------|----------|----------|
| Top Depth / m            |         | 0.20     | 0.10     | 1.80     | 0.90     | 0.60     |
| Bottom Depth / m         |         |          |          |          |          |          |
| Sample No.               |         |          |          |          |          |          |
| Sample Type              |         |          |          |          |          |          |
| Date Sampled             |         |          |          |          |          |          |
| Receipt Date             |         | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 |
| EC&S Sample ID           |         | S0706586 | S0706587 | S0706588 | S0706589 | S0706590 |
| Matrix Type              |         | Soil     | Soil     | Soil     | Soil     | Soil     |
| Determinand              | Units   |          |          |          |          |          |
| Arsenic                  | mg/kg   | 7.0      | 20.3     | 21.1     | #        | #        |
| Cadmium                  | mg/kg   | <0.2     | <0.2     | <0.2     | #        | #        |
| Chromium (total)         | mg/kg   | 14.3     | 15.4     | 15.3     | #        | #        |
| Lead                     | mg/kg   | 13.1     | 84.9     | 59.5     | #        | #        |
| Mercury                  | mg/kg   | <0.1     | <0.1     | <0.1     | #        | #        |
| Selenium                 | mg/kg   | <1.0     | 1.0      | 1.0      | #        | #        |
| Boron (water soluble)    | mg/kg   | <0.5     | 0.8      | 4.2      | #        | #        |
| Copper                   | mg/kg   | 14.8     | 43.3     | 31.0     | #        | #        |
| Nickel                   | mg/kg   | 24.4     | 9.3      | 15.5     | #        | #        |
| Vanadium                 | mg/kg   | 32.8     | 42.1     | 38.9     | #        | #        |
| Zinc                     | mg/kg   | 58.3     | 74.8     | 81.0     | #        | #        |
| Sulphate (water soluble) | g/l SO4 | 0.008    | 0.014    | 0.073    | #        | 0.009    |
| pH                       | N/A     | 7.8      | 7.5      | 6.3      | #        | #        |
| TPH (with clean up)      | mg/kg   | 8.4      | 110.3    | 20.8     | #        | #        |
| PAH (sum of PAH 17)      | mg/kg   | <0.1     | 35.3     | 9.6      | #        | #        |
| Naphthalene              | mg/kg   | <0.1     | 0.4      | 0.2      | #        | #        |
| Acenaphthylene           | mg/kg   | <0.1     | 0.1      | <0.1     | #        | #        |
| Acenaphthene             | mg/kg   | <0.1     | 0.2      | <0.1     | #        | #        |
| Fluorene                 | mg/kg   | <0.1     | 0.2      | <0.1     | #        | #        |
| Phenanthrene             | mg/kg   | <0.1     | 2.5      | 1.3      | #        | #        |
| Anthracene               | mg/kg   | <0.1     | 0.4      | 0.2      | #        | #        |
| Fluoranthene             | mg/kg   | <0.1     | 6.5      | 2.1      | #        | #        |
| Pyrene                   | mg/kg   | <0.1     | 5.4      | 1.6      | #        | #        |
| Benzo(a)anthracene       | mg/kg   | <0.1     | 3.0      | 0.6      | #        | #        |
| Chrysene                 | mg/kg   | <0.1     | 2.9      | 0.8      | #        | #        |
| Benzo(b)+(j)fluoranthene | mg/kg   | <0.1     | 4.2      | 0.9      | #        | #        |
| Benzo(k)fluoranthene     | mg/kg   | <0.1     | 1.8      | 0.4      | #        | #        |
| Benzo(a)pyrene           | mg/kg   | <0.1     | 3.0      | 0.6      | #        | #        |
| Indeno(1,2,3-cd)pyrene   | mg/kg   | <0.1     | 2.1      | 0.5      | #        | #        |
| Dibenz(a,h)anthracene    | mg/kg   | <0.1     | 0.3      | 0.1      | #        | #        |
| Benzo(g,h,i)perylene     | mg/kg   | <0.1     | 2.4      | 0.5      | #        | #        |
| TOC                      | %       | 1.7      | 3.9      | 3.8      | #        | #        |
| Organic Matter           | %       | #        | #        | 7.8      | 6.4      | #        |



Client Project Name: Baugh Green, Barnsley  
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Client: 3e Consulting Engineers Limited  
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|                          |         |          |          |          |          |          |
|--------------------------|---------|----------|----------|----------|----------|----------|
| Hole No./Sample ID       |         | TP01     | TP06     | TP06     | TP07     | TP08     |
| Top Depth / m            |         | 0.10     | 0.05     | 1.00     | 0.10     | 0.20     |
| Bottom Depth / m         |         |          |          |          |          |          |
| Sample No.               |         |          |          |          |          |          |
| Sample Type              |         |          |          |          |          |          |
| Date Sampled             |         |          |          |          |          |          |
| Receipt Date             |         | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 |
| EC&S Sample ID           |         | S0706581 | S0706582 | S0706583 | S0706584 | S0706585 |
| Matrix Type              |         | Soil     | Soil     | Soil     | Soil     | Soil     |
| Determinand              | Units   |          |          |          |          |          |
| Arsenic                  | mg/kg   | 14.3     | 17.9     | 7.9      | 62.3     | 53.6     |
| Cadmium                  | mg/kg   | <0.2     | <0.2     | <0.2     | <0.2     | <0.2     |
| Chromium (total)         | mg/kg   | 13.8     | 19.0     | 17.4     | 20.8     | 14.1     |
| Lead                     | mg/kg   | 42.1     | 58.7     | 10.1     | 26.7     | 14.5     |
| Mercury                  | mg/kg   | <0.1     | <0.1     | <0.1     | <0.1     | <0.1     |
| Selenium                 | mg/kg   | <1.0     | <1.0     | <1.0     | 1.4      | <1.0     |
| Boron (water soluble)    | mg/kg   | <0.5     | 0.6      | <0.5     | 0.5      | 0.5      |
| Copper                   | mg/kg   | 26.3     | 33.8     | 22.0     | 36.7     | 65.1     |
| Nickel                   | mg/kg   | 13.5     | 16.0     | 27.8     | 18.3     | 51.1     |
| Vanadium                 | mg/kg   | 31.9     | 36.5     | 35.6     | 49.3     | 50.2     |
| Zinc                     | mg/kg   | 63.7     | 73.3     | 62.2     | 39.8     | 33.4     |
| Sulphate (water soluble) | g/l SO4 | 0.011    | 0.013    | 0.018    | 0.098    | 0.344    |
| pH                       | N/A     | 5.5      | 6.4      | 7.9      | 7.5      | 6.6      |
| TPH (with clean up)      | mg/kg   | 22.7     | 51.2     | 34.0     | 25.3     | 51.8     |
| PAH (sum of PAH 17)      | mg/kg   | 6.4      | 11.1     | 21.1     | 13.4     | 3.9      |
| Naphthalene              | mg/kg   | 0.3      | 0.3      | 0.2      | 0.6      | 2.4      |
| Acenaphthylene           | mg/kg   | <0.1     | <0.1     | <0.1     | <0.1     | 0.1      |
| Acenaphthene             | mg/kg   | <0.1     | 0.1      | 0.4      | <0.1     | 0.1      |
| Fluorene                 | mg/kg   | <0.1     | <0.1     | 0.6      | <0.1     | 0.3      |
| Phenanthrene             | mg/kg   | <0.1     | 1.2      | 2.8      | 1.7      | <0.1     |
| Anthracene               | mg/kg   | <0.1     | <0.1     | 0.6      | 0.3      | <0.1     |
| Fluoranthene             | mg/kg   | 1.5      | 2.0      | 4.2      | 2.6      | 0.5      |
| Pyrene                   | mg/kg   | 1.2      | 1.7      | 3.3      | 2.2      | 0.5      |
| Benzo(a)anthracene       | mg/kg   | 0.5      | 0.9      | 1.5      | 0.8      | <0.1     |
| Chrysene                 | mg/kg   | 0.7      | 0.8      | 1.5      | 1.1      | 0.2      |
| Benzo(b)+(j)fluoranthene | mg/kg   | 0.9      | 1.2      | 1.9      | 1.1      | <0.1     |
| Benzo(k)fluoranthene     | mg/kg   | 0.3      | 0.6      | 0.8      | 0.6      | <0.1     |
| Benzo(a)pyrene           | mg/kg   | 0.3      | 0.8      | 1.4      | 1.0      | <0.1     |
| Indeno(1,2,3-cd)pyrene   | mg/kg   | 0.3      | 0.6      | 0.9      | 0.7      | <0.1     |
| Dibenz(a,h)anthracene    | mg/kg   | <0.1     | 0.2      | 0.3      | <0.1     | <0.1     |
| Benzo(g,h,i)perylene     | mg/kg   | 0.4      | 0.8      | 1.1      | 0.9      | <0.1     |
| TOC                      | %       | 2.9      | 4.2      | 1.3      | 1.5      | 5.2      |



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| Hole No./Sample ID       |         | TP09     | TP10     | WS4      | WS3      | TP01     |
|--------------------------|---------|----------|----------|----------|----------|----------|
| Top Depth / m            |         | 0.20     | 0.10     | 1.80     | 0.90     | 0.60     |
| Bottom Depth / m         |         |          |          |          |          |          |
| Sample No.               |         |          |          |          |          |          |
| Sample Type              |         |          |          |          |          |          |
| Date Sampled             |         |          |          |          |          |          |
| Receipt Date             |         | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 |
| EC&S Sample ID           |         | S0706586 | S0706587 | S0706588 | S0706589 | S0706590 |
| Matrix Type              |         | Soil     | Soil     | Soil     | Soil     | Soil     |
| Determinand              | Units   |          |          |          |          |          |
| Arsenic                  | mg/kg   | 7.0      | 20.3     | 21.1     | #        | #        |
| Cadmium                  | mg/kg   | <0.2     | <0.2     | <0.2     | #        | #        |
| Chromium (total)         | mg/kg   | 14.3     | 15.4     | 15.3     | #        | #        |
| Lead                     | mg/kg   | 13.1     | 64.9     | 59.5     | #        | #        |
| Mercury                  | mg/kg   | <0.1     | <0.1     | <0.1     | #        | #        |
| Selenium                 | mg/kg   | <1.0     | 1.0      | 1.0      | #        | #        |
| Boron (water soluble)    | mg/kg   | <0.5     | 0.8      | 4.2      | #        | #        |
| Copper                   | mg/kg   | 14.8     | 43.3     | 31.0     | #        | #        |
| Nickel                   | mg/kg   | 24.4     | 9.3      | 15.5     | #        | #        |
| Vanadium                 | mg/kg   | 32.8     | 42.1     | 38.9     | #        | #        |
| Zinc                     | mg/kg   | 58.3     | 74.8     | 81.0     | #        | #        |
| Sulphate (water soluble) | g/l SO4 | 0.008    | 0.014    | 0.073    | #        | 0.009    |
| pH                       | N/A     | 7.8      | 7.5      | 6.3      | #        | #        |
| TPH (with clean up)      | mg/kg   | 6.4      | 110.3    | 20.8     | #        | #        |
| PAH (sum of PAH 17)      | mg/kg   | <0.1     | 35.3     | 9.6      | #        | #        |
| Naphthalene              | mg/kg   | <0.1     | 0.4      | 0.2      | #        | #        |
| Acenaphthylene           | mg/kg   | <0.1     | 0.1      | <0.1     | #        | #        |
| Acenaphthene             | mg/kg   | <0.1     | 0.2      | <0.1     | #        | #        |
| Fluorene                 | mg/kg   | <0.1     | 0.2      | <0.1     | #        | #        |
| Phenanthrene             | mg/kg   | <0.1     | 2.5      | 1.3      | #        | #        |
| Anthracene               | mg/kg   | <0.1     | 0.4      | 0.2      | #        | #        |
| Fluoranthene             | mg/kg   | <0.1     | 6.5      | 2.1      | #        | #        |
| Pyrene                   | mg/kg   | <0.1     | 5.4      | 1.6      | #        | #        |
| Benzo(a)anthracene       | mg/kg   | <0.1     | 3.0      | 0.6      | #        | #        |
| Chrysene                 | mg/kg   | <0.1     | 2.9      | 0.8      | #        | #        |
| Benzo(b)+(j)fluoranthene | mg/kg   | <0.1     | 4.2      | 0.9      | #        | #        |
| Benzo(k)fluoranthene     | mg/kg   | <0.1     | 1.8      | 0.4      | #        | #        |
| Benzo(a)pyrene           | mg/kg   | <0.1     | 3.0      | 0.6      | #        | #        |
| Indeno(1,2,3-cd)pyrene   | mg/kg   | <0.1     | 2.1      | 0.5      | #        | #        |
| Dibenz(a,h)anthracene    | mg/kg   | <0.1     | 0.3      | 0.1      | #        | #        |
| Benzo(g,h,i)perylene     | mg/kg   | <0.1     | 2.4      | 0.5      | #        | #        |
| TOC                      | %       | 1.7      | 3.9      | 3.8      | #        | #        |
| Organic Matter           | %       | #        | #        | 7.8      | 6.4      | #        |



Client Project Name: Baugh Green, Barnsley  
Project Number: 7515

Client: 3a Consulting Engineers Limited  
Reporting Date: Friday 18 May 2007

|                          |         |          |          |          |          |          |
|--------------------------|---------|----------|----------|----------|----------|----------|
| Hole No./Sample ID       |         | TP03     | TP05     | TP08     | TP10     | TP11     |
| Top Depth / m            |         | 0.40     | 1.00     | 0.60     | 1.30     | 0.90     |
| Bottom Depth / m         |         |          |          |          |          |          |
| Sample No.               |         |          |          |          |          |          |
| Sample Type              |         |          |          |          |          |          |
| Date Sampled             |         |          |          |          |          |          |
| Receipt Date             |         | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 | 03/05/07 |
| EC&S Sample ID           |         | S0708591 | S0708592 | S0708593 | S0708594 | S0708595 |
| Matrix Type              |         | Soil     | Soil     | Soil     | Soil     | Soil     |
| Determinand              | Units   |          |          |          |          |          |
| Sulphate (water soluble) | g/l SO4 | 0.062    | 0.064    | 0.031    | 0.075    | 0.011    |



**Client Project Name:** Baugh Green, Barnsley

**Project Number:** 7515

**Client:** 3e Consulting Engineers Limited

**Reporting Date:** Friday 18 May 2007

### **Notes and Preservation Details**

Cadmium analysis undertaken by UKAS laboratory number 2531.

**APPENDIX D**  
**Assessment Criteria**

| PMH            | Assessment Criteria | Residential Use (per 1000 lbs) |        |        |         | Industrial Use (per 1000 lbs) |        |        |         | YCV       | Notes |
|----------------|---------------------|--------------------------------|--------|--------|---------|-------------------------------|--------|--------|---------|-----------|-------|
|                |                     | 1% SOM                         | 2% SOM | 5% SOM | 10% SOM | 1% SOM                        | 2% SOM | 5% SOM | 10% SOM |           |       |
| Benzene (BENZ) | LOM CIBH GAC        | 1.17                           | 1.08   | 1.11   | 1.09    | 1.17                          | 1.08   | 1.11   | 1.09    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
| Metals         | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
| TPH/CWG        | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
| BTX            | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |
|                | LOM CIBH GAC        | 1.14                           | 1.13   | 1.11   | 1.10    | 1.14                          | 1.13   | 1.11   | 1.10    | Threshold |       |

Notes: LOMCIBH GAC: Genetic Assessment Criteria for Human Health Risk Assessment, Nov. 2005  
 SGV: Contaminated Land Exposure Assessment: DSEPA March 2002  
 Units: mg/kg

**APPENDIX E**  
**Geotechnical Testing Results**



# LABORATORY REPORT



**Contract Number: PSL07/0810**

**Client's Reference:**

**Report Date: 15 May 2007**

**Client Name:** 3E Consulting  
4 Calder Close  
Calder Park  
Wakefield  
WF4 3BA

**For the attention of: Jonny Roberts**

**Contract Title:** Baugh Green, Barnsley

**Date Received:** 13-Apr-07

**Date Commenced:** 13-Apr-07

**Date Completed:** 15-May-07

**Notes:** Observations and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. 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 in full, without the prior written approval of the laboratory.

**Approved Signatories:**

R Gunson  
(Director)

A Watkins  
(Director)

D Lambe  
(Senior Technician)

5 - 7 Hexthorpe Road, Hexthorpe,  
Doncaster DN4 0AG  
tel: +44 (0)870 240 1964  
fax: +44 (0)870 240 1965  
e-mail: rgunson@prosoils.co.uk  
awatkins@prosoils.co.uk

Page 1 of 11

## SUMMARY OF LABORATORY SOIL DESCRIPTIONS

| Trial Pit Number | Sample Number | Depth m | Description of Sample                                          |
|------------------|---------------|---------|----------------------------------------------------------------|
| TP01             |               | 1.00    | Brown mottled grey sandy CLAY.                                 |
| TP02             |               | 0.60    | Pale brown mottled grey gravelly slightly sandy CLAY.          |
| TP03             |               | 1.00    | Grey mottled brown slightly sandy CLAY.                        |
| TP04             |               | 0.40    | Dark brown GRAVEL.                                             |
| TP05             |               | 0.30    | Pale brown mottled grey slightly gravelly slightly sandy CLAY. |
| TP07             |               | 1.00    | Brown slightly gravelly slightly sandy CLAY.                   |
| TP07             |               | 1.10    | Brown slightly gravelly sandy CLAY.                            |
| TP08             |               | 0.40    | Dark brown gravelly slightly sandy CLAY.                       |
| TP09             |               | 0.70    | Brown mottled grey gravelly slightly sandy CLAY.               |
| TP09             |               | 0.80    | Brown and grey slightly gravelly sandy CLAY.                   |
| TP10             |               | 0.60    | Pale brown slightly gravelly sandy CLAY.                       |
| TP11             |               | 1.00    | Brown slightly gravelly slightly sandy CLAY.                   |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |
|                  |               |         |                                                                |

|                                                                                     |                                                                                      |         |                                                                                       |         |                                                                                       |                         |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------------------|-------------------------|
|  | Compiled by                                                                          | Date    | Checked by                                                                            | Date    | Approved by                                                                           | Date                    |
|                                                                                     |  | 12/5/07 |  | 14/5/07 |  | 14/5/07                 |
|                                                                                     | BAUGH GREEN, BARNSLEY.                                                               |         |                                                                                       |         |                                                                                       | Contract No: PSL07/0810 |
|                                                                                     |                                                                                      |         |                                                                                       |         |                                                                                       | Client Ref: 7515        |

## SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

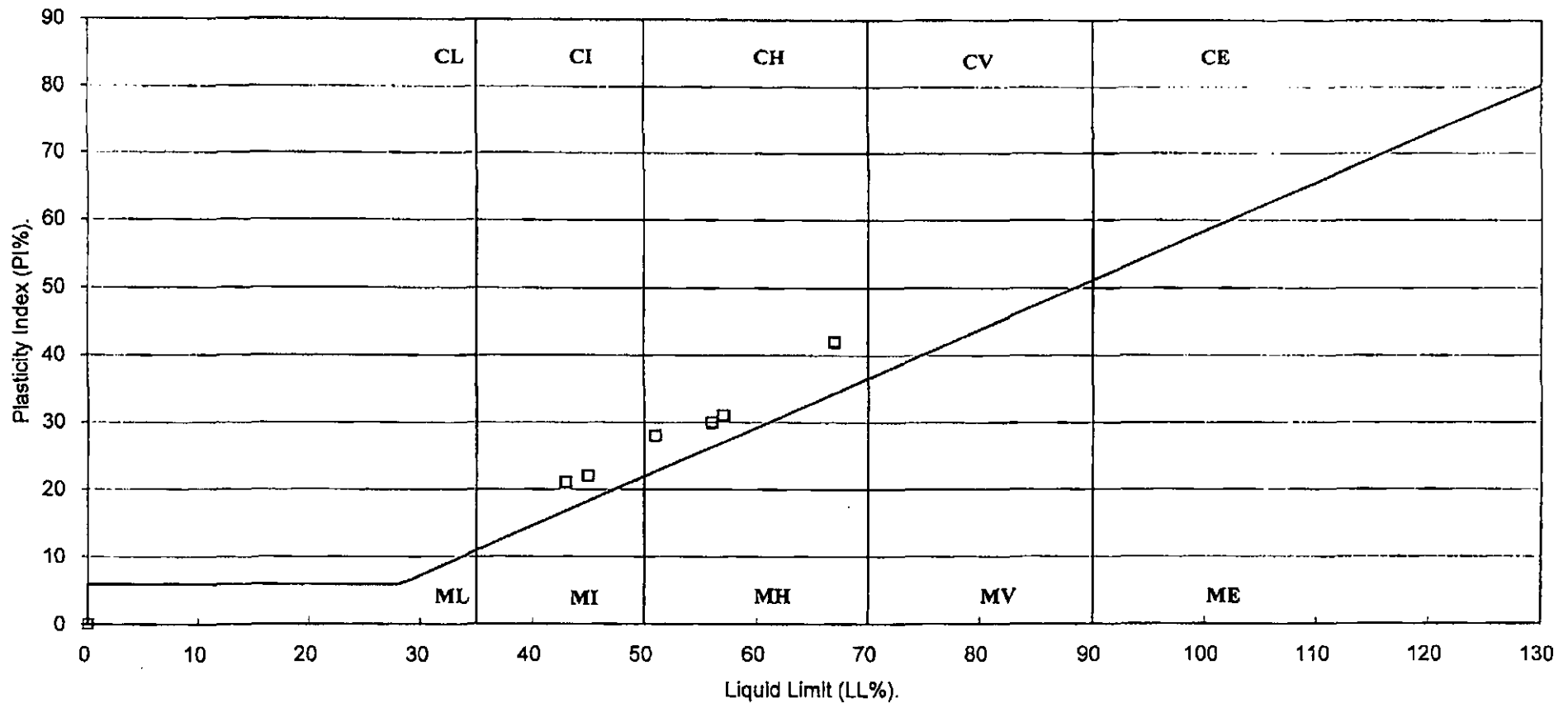
**SYMBOLS :** NP : Non Plastic

\* : Liquid Limit and Plastic Limit Wet Sieved.

|                                                                                                                             |             |         |            |         |             |                                             |
|-----------------------------------------------------------------------------------------------------------------------------|-------------|---------|------------|---------|-------------|---------------------------------------------|
| <br><b>Professional Soils Laboratory</b> | Compiled by | Date    | Checked by | Date    | Approved by | Date                                        |
|                                                                                                                             | <i>mtg</i>  | 14/5/07 | <i>ll</i>  | 14/5/07 | <i>ll</i>   | 14/5/07                                     |
| BAUGH GREEN, BARNSELY.                                                                                                      |             |         |            |         |             | Contract No: PSL07/0810<br>Client Ref: 7515 |

# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



| Compiled by             | Date    | Checked by         | Date    | Approved by        | Date                    |
|-------------------------|---------|--------------------|---------|--------------------|-------------------------|
| <i>[Signature]</i>      | 14/5/07 | <i>[Signature]</i> | 14/5/07 | <i>[Signature]</i> | 14/5/07                 |
| BAUGH GREEN, BARNSELEY. |         |                    |         |                    | Contract No: PSL07/0810 |
|                         |         |                    |         |                    | Client Ref: 7515        |

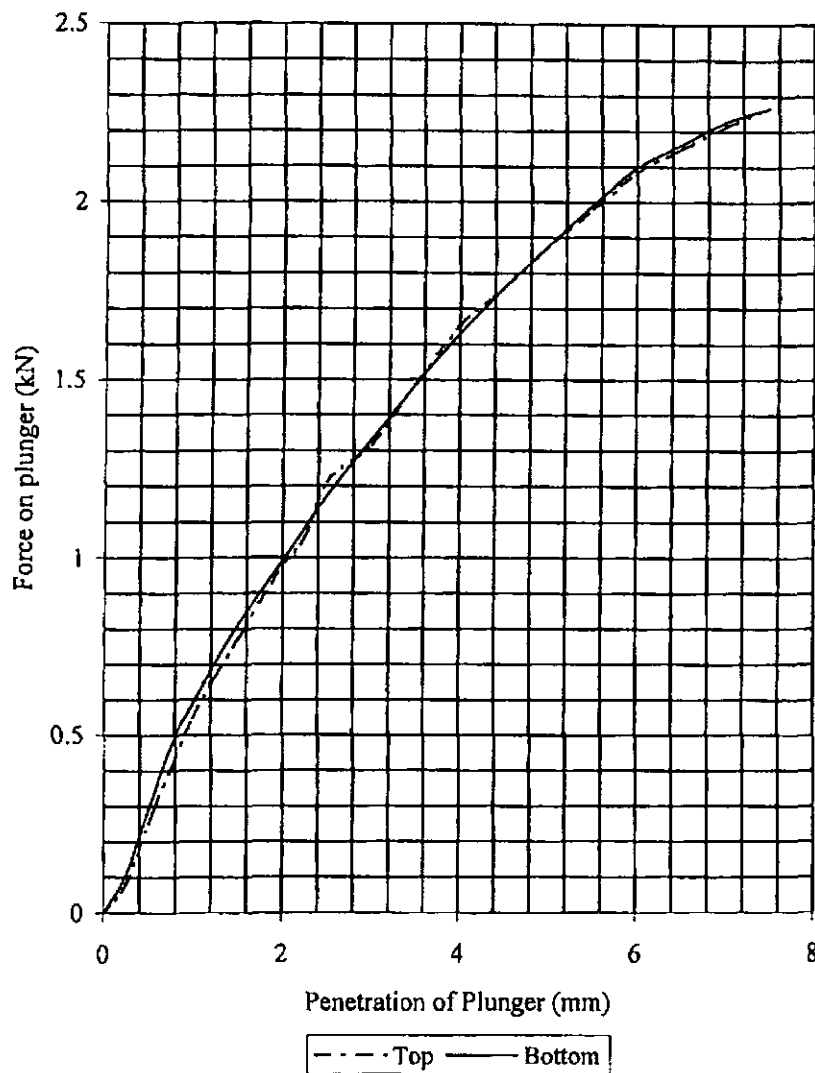
# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

Trial Pit Number

TP01

Depth (m) : 1.00



| Initial Sample Conditions   |      | Test Conditions  |      | Method of compaction             |      | 4.5Kg          |     |
|-----------------------------|------|------------------|------|----------------------------------|------|----------------|-----|
| Moisture Content:           | 19.3 | Surcharge Kg:    | 4.20 | Final Moisture Content %         |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.12 | Soaking Time hrs | 0    | Sample Top                       | 19.3 | Sample Top     | 9.4 |
| Dry Density Mg/m3:          | 1.78 | Swelling mm:     | 0    | Sample Bottom                    | 19.2 | Sample Bottom  | 9.4 |
| Percentage retained on 20mm |      | Remarks:         |      | See Summary of Soil Description. |      |                |     |
| BS test sieve:              | 0    |                  |      |                                  |      |                |     |

| Checked by | Date    | Approved By | Date    |
|------------|---------|-------------|---------|
| RO         | 14/5/07 | RO          | 14/5/07 |



BAUGH GREEN, BARNSELEY.

Contract No.  
PSL07/0810

# California Bearing Ratio Test.

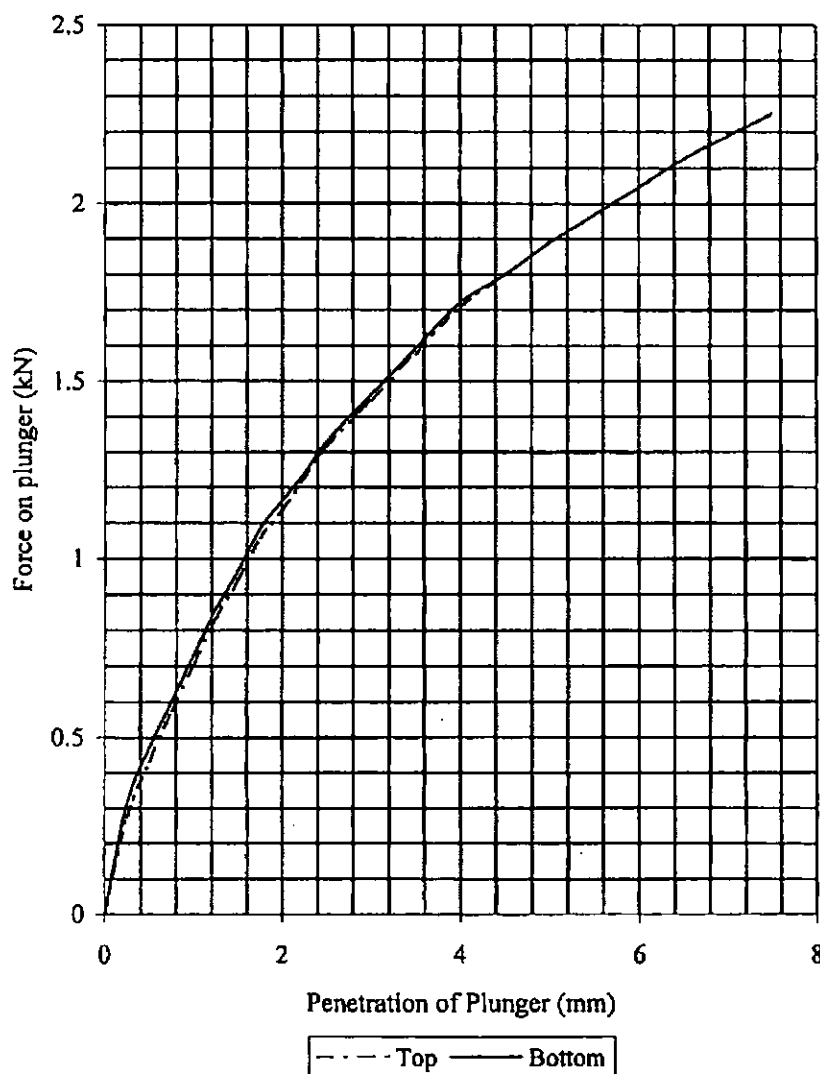
BS 1377 : Part 4 : 1990

Trial Pit Number

TP03

Depth (m) :

1.00



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 4.5Kg          |      |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|------|
| Moisture Content:           | 20.2 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |      |
| Bulk Density Mg/m3:         | 2.11 | Soaking Time hrs                          | 0    | Sample Top               | 20.4 | Sample Top     | 10.0 |
| Dry Density Mg/m3:          | 1.76 | Swelling mm:                              | 0    | Sample Bottom            | 19.9 | Sample Bottom  | 10.1 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |      |
| BS test sieve:              | 0    |                                           |      |                          |      |                |      |

| Checked by         | Date    | Approved By        | Date    |
|--------------------|---------|--------------------|---------|
| <i>[Signature]</i> | 14/1/04 | <i>[Signature]</i> | 14/1/04 |



BAUGH GREEN, BARNSELY.

Contract No.  
PSL07/0810

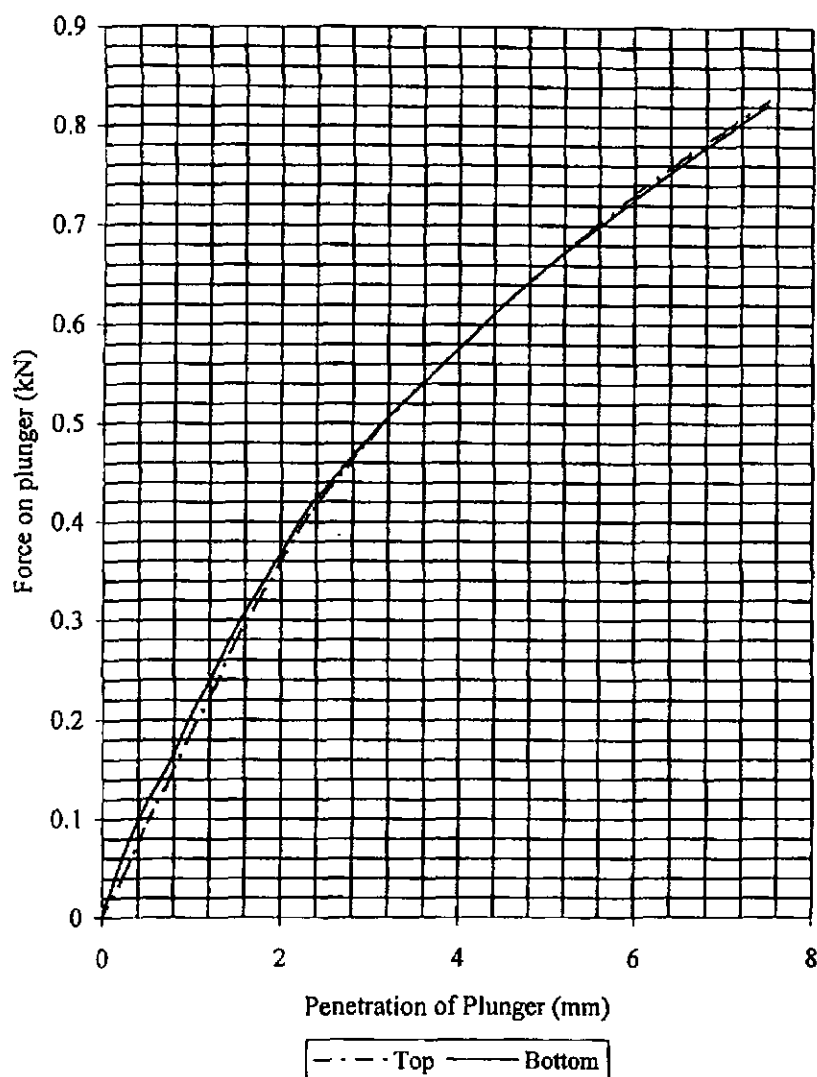
# California Bearing Ratio Test.

BS 1377 : Part 4 : 1990

Trial Pit Number

TP07

Depth (m) : 1.10



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 4.5Kg          |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 24.0 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.05 | Soaking Time hrs                          | 0    | Sample Top               | 24.1 | Sample Top     | 3.3 |
| Dry Density Mg/m3:          | 1.66 | Swelling mm:                              | 0    | Sample Bottom            | 24.0 | Sample Bottom  | 3.3 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 0    |                                           |      |                          |      |                |     |

| Checked by | Date    | Approved By | Date    |
|------------|---------|-------------|---------|
| <i>KE</i>  | 14/5/01 | <i>KE</i>   | 14/5/01 |



BAUGH GREEN, BARNSELY.

Contract No.  
PSL07/0810

# California Bearing Ratio Test.

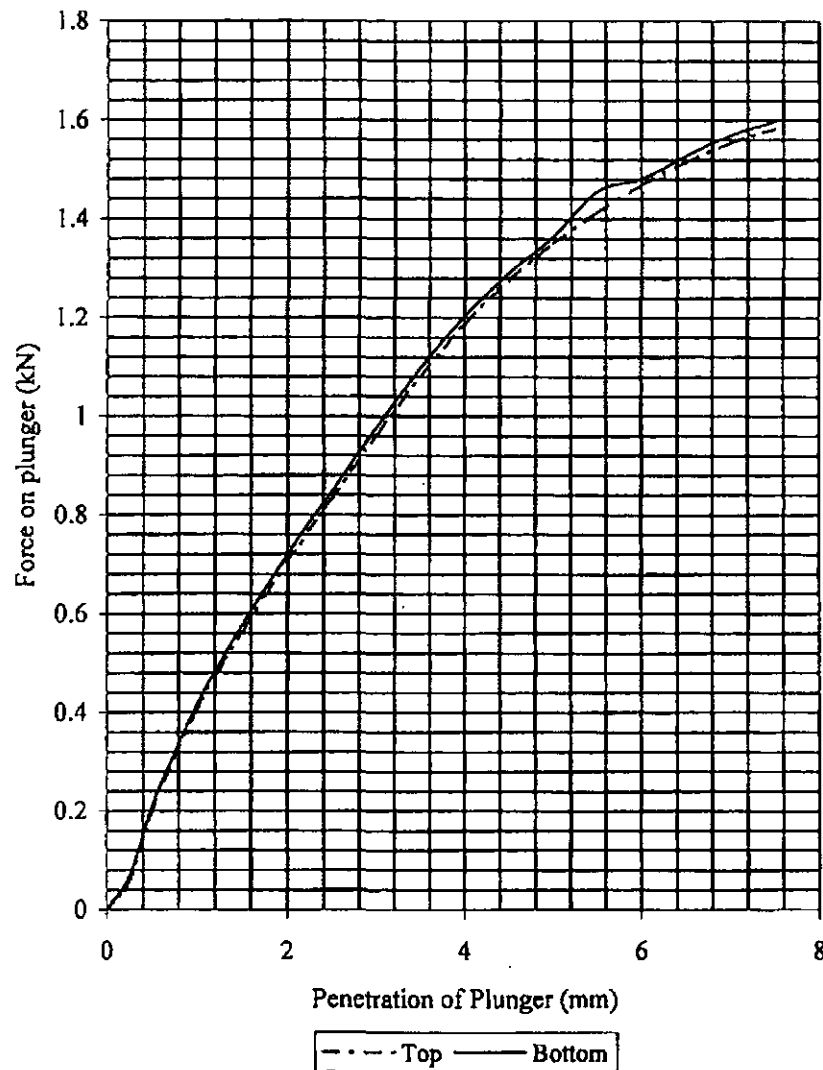
BS 1377 : Part 4 : 1990

Trial Pit Number

TP09

Depth (m) :

0.80



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 4.5Kg          |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 21.5 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.11 | Soaking Time hrs                          | 0    | Sample Top               | 21.5 | Sample Top     | 6.8 |
| Dry Density Mg/m3:          | 1.74 | Swelling mm:                              | 0    | Sample Bottom            | 21.5 | Sample Bottom  | 6.8 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 0    |                                           |      |                          |      |                |     |

| Checked by | Date    | Approved By | Date    |
|------------|---------|-------------|---------|
| <i>RE</i>  | 14/5/01 | <i>RE</i>   | 14/5/01 |



BAUGH GREEN, BARNSELEY.

Contract No.  
PSL07/0810

# California Bearing Ratio Test.

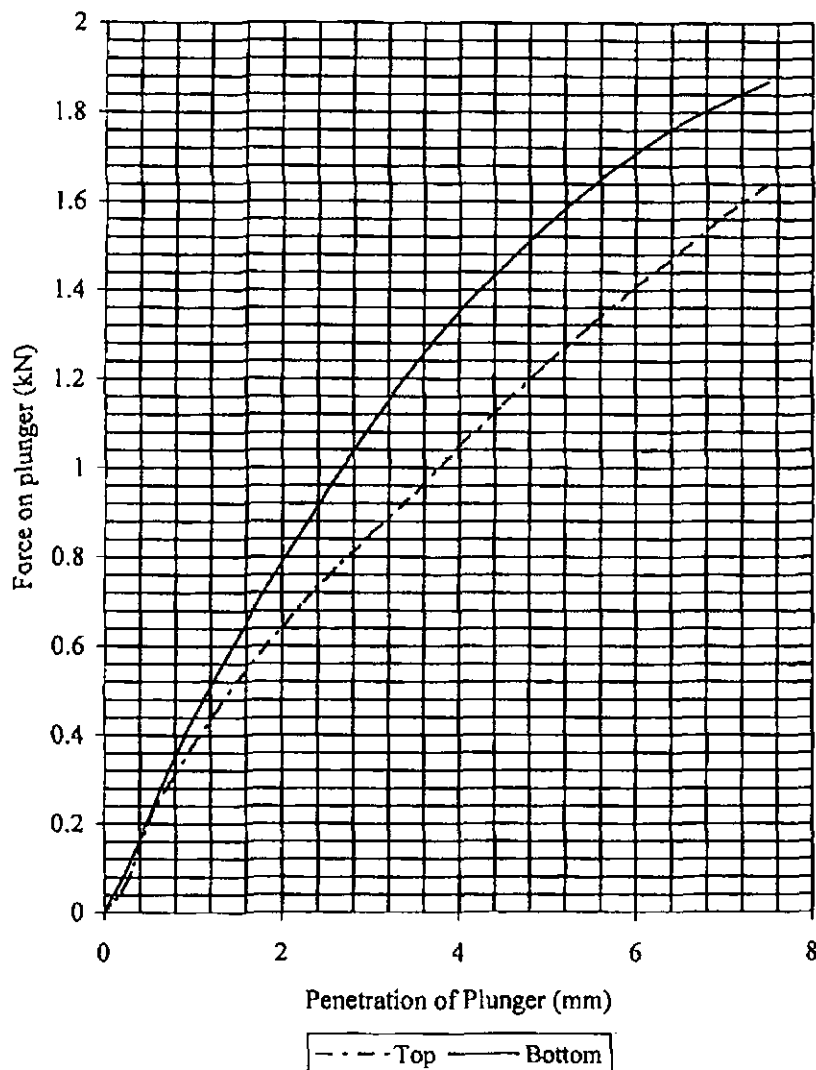
BS 1377 : Part 4 : 1990

Trial Pit Number

TP11

Depth (m) :

1.00



| Initial Sample Conditions   |      | Test Conditions                           |      | Method of compaction     |      | 4.5Kg          |     |
|-----------------------------|------|-------------------------------------------|------|--------------------------|------|----------------|-----|
| Moisture Content:           | 25.9 | Surcharge Kg:                             | 4.20 | Final Moisture Content % |      | C.B.R. Value % |     |
| Bulk Density Mg/m3:         | 2.14 | Soaking Time hrs                          | 0    | Sample Top               | 26.2 | Sample Top     | 6.2 |
| Dry Density Mg/m3:          | 1.70 | Swelling mm:                              | 0    | Sample Bottom            | 25.4 | Sample Bottom  | 7.7 |
| Percentage retained on 20mm |      | Remarks: See Summary of Soil Description. |      |                          |      |                |     |
| BS test sieve:              | 0    |                                           |      |                          |      |                |     |

| Checked by | Date    | Approved By | Date    |
|------------|---------|-------------|---------|
| <i>RL</i>  | 14/5/07 | <i>RL</i>   | 14/5/07 |



BAUGH GREEN, BARNSLEY.

Contract No.  
PSL07/0810

# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK



Accredited to  
ISO/IEC 17025:2005

### Professional Soils Laboratory Ltd

Issue No: 001 Issue date: 26 October 2006

5/7 Hexthorpe Road  
Hexthorpe  
Doncaster  
DN4 0AG

Contact: Mr A Watkins  
Tel: +44 (0)870 240 1964  
Fax: +44 (0)870 240 1965  
E-Mail: [awatkn@prosoils.co.uk](mailto:awatkn@prosoils.co.uk)  
Website: [www.prosoils.co.uk](http://www.prosoils.co.uk)

Testing performed at the above address only

### DETAIL OF ACCREDITATION

| Materials/Products tested            | Type of test/Properties measured/Range of measurement             | Standard specifications/ Equipment/Techniques used |
|--------------------------------------|-------------------------------------------------------------------|----------------------------------------------------|
| AGGREGATES                           | Particle size distribution<br>- sieving method                    | BS EN 933-1:1997                                   |
| SOILS for civil engineering purposes | Moisture content<br>- oven drying method                          | BS 1377-2:1990                                     |
|                                      | Liquid limit<br>- cone penetrometer                               | BS 1377-2:1990                                     |
|                                      | Liquid limit<br>- cone penetrometer<br>- one point                | BS 1377-2:1990                                     |
|                                      | Plastic limit                                                     | BS 1377-2:1990                                     |
|                                      | Plasticity index and liquidity index                              | BS 1377-2:1990                                     |
|                                      | Particle size distribution<br>- wet sieving                       | BS 1377-2:1990                                     |
|                                      | Particle size distribution<br>- dry sieving                       | BS 1377-2:1990                                     |
|                                      | Particle size distribution<br>- sedimentation<br>- pipette method | BS 1377-2:1990                                     |
|                                      | Dry density/moisture content relationship (2.5 kg rammer)         | BS 1377-4:1990                                     |
|                                      | Dry density/moisture content relationship (4.5 kg rammer)         | BS 1377-4:1990                                     |
|                                      | California Bearing Ratio (CBR)<br>(loads from 0.2 to 50 kN)       | BS 1377-4:1990                                     |



4043  
Accredited to  
ISO/IEC 17025:2005

**Schedule of Accreditation**  
Issued by  
**United Kingdom Accreditation Service**  
21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

**Professional Soils Laboratory Ltd**  
Issue No: 001    Issue date: 26 October 2008

Testing performed at main address only

| Materials/Products tested            | Type of test/Properties measured/Range of measurement | Standard specifications/ Equipment/Techniques used |
|--------------------------------------|-------------------------------------------------------|----------------------------------------------------|
| SOILS for civil engineering purposes | Moisture condition value (MCV)                        | BS 1377-4:1990                                     |
|                                      | MCV - natural moisture content                        | BS 1377:Part 4:1990                                |
|                                      | MCV/moisture content relation                         | BS 1377:Part 4:1990                                |
|                                      | Uniformity coefficient (221 2217)                     | BS 6100-2.2.1:1992                                 |
| END                                  |                                                       |                                                    |

**APPENDIX F**  
**Gas Monitoring Results**

# Gas Monitoring Record

3e Consulting Engineers Ltd

4 Calder Close

Calder Park

Wakefield

WF4 3BA

Job no:

7515

Site:

Barugh Green, Barnsley

Date:

09-May-07

Weather:

Overcast & windy

Barometric pressure trend:

Steady

| WS No | Methane<br>(%v/v) | Carbon<br>dioxide<br>(%v/v) | Oxygen<br>(%v/v) | Barometric<br>Pressure<br>(mb) | Flow<br>(l/hr) | Water<br>level<br>(m bgl) | Remarks |
|-------|-------------------|-----------------------------|------------------|--------------------------------|----------------|---------------------------|---------|
| 1     | 0.0               | 0.5                         | 20.0             | 1002                           | 0.4            | 1.50                      |         |
| 2     | 0.0               | 1.1                         | 19.8             | 1002                           | 0.2            | 1.25                      |         |
| 3     | 0.0               | 0.4                         | 19.5             | 1002                           | 0.1            | 1.85                      |         |
| 4     | 0.0               | 1.1                         | 18.9             | 1002                           | 0.0            | DRY                       |         |
| 5     | 0.0               | 0.3                         | 20.0             | 1002                           | 0.0            | DRY                       |         |
| 6     | 0.0               | 0.8                         | 20.0             | 1002                           | 0.2            | 1.45                      |         |

Date:

11-May-07

Weather:

Heavily overcast

Barometric pressure trend:

Steady

| WS No | Methane<br>(%v/v) | Carbon<br>dioxide<br>(%v/v) | Oxygen<br>(%v/v) | Barometric<br>Pressure<br>(mb) | Flow<br>(l/hr) | Water<br>level<br>(m bgl) | Remarks |
|-------|-------------------|-----------------------------|------------------|--------------------------------|----------------|---------------------------|---------|
| 1     | 0.0               | 0.5                         | 20.2             | 992                            | 0.3            | 1.55                      |         |
| 2     | 0.0               | 1.1                         | 20.0             | 992                            | 0.2            | 1.20                      |         |
| 3     | 0.0               | 0.4                         | 20.0             | 991                            | 0.0            | 1.85                      |         |
| 4     | 0.0               | 3.7                         | 15.2             | 991                            | 0.0            | 1.80                      |         |
| 5     | 0.0               | 0.8                         | 19.8             | 991                            | 0.0            | DRY                       |         |
| 6     | 0.0               | 0.7                         | 20.0             | 991                            | 0.0            | 1.45                      |         |

Date:

21-May-07

Weather:

Dry and sunny

Barometric pressure trend:

Steady

| WS No | Methane<br>(%v/v) | Carbon<br>dioxide<br>(%v/v) | Oxygen<br>(%v/v) | Barometric<br>Pressure<br>(mb) | Flow<br>(l/hr) | Water<br>level<br>(m bgl) | Remarks |
|-------|-------------------|-----------------------------|------------------|--------------------------------|----------------|---------------------------|---------|
| 1     | 0.0               | 0.0                         | 20.6             | 1008                           | 0.0            | 0.80                      |         |
| 2     | 0.0               | 0.0                         | 20.6             | 1008                           | 0.1            | 0.82                      |         |
| 3     | 0.0               | 0.1                         | 20.5             | 1007                           | 0.1            | 1.30                      |         |
| 4     | 0.0               | 1.9                         | 15.1             | 1007                           | 0.1            | 1.50                      |         |
| 5     | 0.0               | 0.3                         | 18.5             | 1007                           | 0.0            | 2.05                      |         |
| 6     | 0.0               | 0.3                         | 20.0             | 1007                           | 0.1            | 0.75                      |         |

Date:

25-May-07

Weather:

Overcast

Barometric pressure trend:

Steady

| WS No | Methane<br>(%v/v) | Carbon<br>dioxide<br>(%v/v) | Oxygen<br>(%v/v) | Barometric<br>Pressure<br>(mb) | Flow<br>(l/hr) | Water<br>level<br>(m bgl) | Remarks |
|-------|-------------------|-----------------------------|------------------|--------------------------------|----------------|---------------------------|---------|
| 1     | 0.0               | 0.1                         | 20.7             | 1000                           | 0.0            | 1.32                      |         |
| 2     | 0.0               | 0.0                         | 20.7             | 1000                           | 0.0            | 0.90                      |         |
| 3     | 0.0               | 0.2                         | 20.3             | 1000                           | 0.0            | 1.48                      |         |
| 4     | 0.0               | 0.4                         | 20.0             | 1000                           | 0.1            | 1.79                      |         |
| 5     | 0.0               | 0.6                         | 19.5             | 1000                           | 0.1            | 2.43                      |         |
| 6     | 0.0               | 0.2                         | 20.3             | 1000                           | 0.0            | 0.82                      |         |