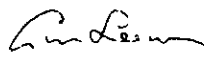

A PHASE 2 REPORT
OF LAND OFF OAK CLOSE
HOYLAND
FOR
GUINNESS NORTHERN COUNTIES

Job No. : 32525

Report Status : 1

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Approved : A handwritten signature in black ink, appearing to read 'A. L. L.' or similar.

**A PHASE 2 REPORT
OF LAND OFF OAK CLOSE
HOYLAND
FOR
GUINNESS NORTHERN COUNTIES**

32525

APRIL 2010

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EXECUTIVE SUMMARY

1. Eastwood & Partners were instructed by Guinness Northern Counties to carry out a Phase 2 site investigation of approximately 0.5 hectares of land off Oak Close in Hoyland at approximate Grid Reference 436450, 400240.
2. Topsoil covers the outer sections of the site to around 0.3 m depth. Around 3.0 m of reworked clay was encountered in the western section of the site, with less than 1.0 m of similar ground in the east. The natural ground comprises firm to stiff clay over mudstone, which was encountered between around 1 m and 3 m depth across the site. A broken land drain was encountered in TP3 at 3.2 m depth, creating standing water and many ceramic fragments.
3. Precautions against the effects of coal mining will not be required.
4. Unreinforced strip or trench footings should be suitable for the eastern plots of the proposed residential development, founded at a minimum depth of 900 mm within the natural clay. The footings will also need to be deepened where within influence of existing trees in accordance with NHBC standards. Where footings are to be deepened in excess of 1.5 m due to the effect of existing trees, heave precautions will be required.
5. Deeper made ground up to around 3.0 m depth was encountered in the eastern section of the site. If levels in this area are to be lowered, deep trench fill footings will be appropriate. However, if over 3 m of fill is to remain, piled foundations may be more economical.
6. Ground bearing slabs will be suitable where less than 600 mm of made ground is present beneath. Where more than 600 mm of made ground is present, suspended slabs will be required. If the effect of trees cause the footing depth to exceed 1.5 m, a precast concrete floor with an underlying 175 mm void will be required.
7. A minor fault is shown through the north eastern corner of the site. Ground movement is not expected across a fault unless there is mining activity in the area, which is not expected in the future. However, it will be prudent to reinforce the foundations in the vicinity of the fault as a nominal precaution.

- 8 DS2 AC2 precautions in sub surface concrete should be appropriate. This would require using FND2 concrete.
- 9 No radon or ground gas precautions are required.
- 10 Slightly elevated chromium and high benzo(a)pyrene concentrations were encountered in the topsoil, which pose a risk to human health. If the topsoil is to remain beneath gardens and landscaped areas, it will need to be capped with 600 mm of clean cover, comprising clean imported topsoil and subsoil. However, further testing may show the elevated concentrations to be a localised hotspot, and the remainder of the material to be suitable for re-use.
- 11 These conclusions are subject to agreement with the NHBC and the Local Authority.

1.0 INTRODUCTION

This report presents the findings of a Phase 2 investigation by Eastwood & Partners for Guinness Northern Counties. It is based on a site walkover, trial pit investigation, borehole investigation and chemical test results for contamination levels.

This report should be read in conjunction with our Phase 1 report for this site, reference 32525-01 and dated February 2010.

The recommendations are based on the assumption that the site will be developed with residential properties and associated hardstanding and landscaping. It is also assumed that ground levels for the proposed development will remain similar to those at present. Where assessments of the site areas affected in particular ways are given these are approximate.

All information, comments and opinions given in this report are based on the information gained from the ground conditions encountered during the site work and the results of laboratory testing. However, there may be conditions at the site, which have not been taken into account, such as unpredictable soil strata and groundwater conditions between or below trial pit excavations. It should be noted that groundwater levels vary due to seasonal or other effects and may differ from those occurring during the investigation.

This report was prepared for Guinness Northern Counties in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded, unless previously authorised by Eastwood & Partners.

2.0 GROUND INVESTIGATION

2.1 Site Works

Six trial pits, designated TP1 to TP6, were excavated across the site on 31 March 2010 to a maximum depth of 3.3 m bgl in order to ascertain the ground conditions and any contaminative issues that may be present. The central section of the site could not be investigated due to the presence of live sewers.

Five rotary drilled boreholes, designated BH1 to BH5, were drilled on 26 April 2010 to search for coal. The results are discussed in Section 4.2.

The positions of the exploratory locations were set out by Eastwood & Partners following consultation with available services records and scanning the positions with a Cable Avoidance Tool (CAT).

The trial pit and trench logs are enclosed in the appendix and their locations are shown on the appended Site Plan, Drawing Number 32525/Fig1A.

2.2 Laboratory Testing

During the fieldwork, samples of soil were obtained for subsequent laboratory testing. Two samples of topsoil, four samples of made ground and one sample of natural clay were tested for chemical contaminants, as discussed in section 5.0, by ChemTest which is a UKAS accredited laboratory which provides testing to MCERT standards. The results are enclosed in the appendix.

Two samples of natural clay were dispatched to Professional Soils Laboratory in Doncaster for plasticity testing. The results are also enclosed in the appendix.

3.0 GROUND CONDITIONS

The general ground conditions encountered on site were:

Topsoil

Topsoil covers the outer sections of the site to around 0.3 m depth and contains occasional mudstone fragments.

Made Ground

TP2 encountered reworked natural clay to 3.1 m depth, also containing occasional concrete cobbles and boulders. TP3 encountered soft clay with roots to 1.7 m depth, and reworked natural clay to at least 3.3 m. A broken land drain was encountered at 3.2 m depth. Standing water and many ceramic fragments were also encountered at this depth.

Reworked clay was also encountered to 0.7 m depth in TP4 and TP6 in the eastern section of the site.

Natural Ground

The natural ground comprises firm to stiff clay over mudstone, which was encountered between around 1 m and 3 m depth across the site.

Groundwater

Standing water was encountered in TP3 from a broken land drain. The upper soft clay in TP3 was noted to be quite wet, but this is most likely due to surface infiltration.

Groundwater was not encountered elsewhere in the intrusive investigation.

4.0 GEOTECHNICAL APPRAISAL

4.1 General

Topsoil covers the outer sections of the site to around 0.3 m depth. Around 3.0 m of reworked clay was encountered in the western section of the site, with less than 1.0 m of similar ground in the east. The natural ground comprises firm to stiff clay over mudstone, which was encountered between around 1m and 3 m depth across the site. A broken land drain was encountered in TP3 at 3.2 m depth, creating standing water and many ceramic fragments.

The natural clay should provide a safe bearing capacity of 125 kN/m², rapidly increasing in the mudstone below.

Two samples of the natural clay were sent for plasticity testing which recorded modified plasticity indices of 32 and 17 %. This equates to medium and low shrinkability respectively, in accordance with NHBC Standards. It would be prudent to assume a medium classification for this site.

4.2 Mining

The Phase 1 report identifies the shallowest coal seam beneath the site to be the Kent's Thick. This seam is inferred from the geological maps to outcrop around 90 m to the south east of the site. Its thickness is stated as being between 0.86 m and 2.26 m on the geological section. The significant thicknesses recorded suggest that the seam will have been widely worked.

The strata in the area are assumed to dip towards the north east, however no indication of the angle of dip is provided on the geological map. Due to the proximity of the outcrop however, it is possible that the seam lies at a shallow depth beneath the site.

The Coal Authority Mining Report states that the property is within the zone of likely physical influence from workings in ten seams of coal at 60 to 400 m depth, last worked in 1960. The seam mined at 60 m depth is the Barnsley seam. Stratigraphically, this seam lies around 70 m beneath the Kent's Thick seam. This would therefore mean the Kent's

Thick seam does not underlie the site, which contradicts the information shown on the geological map.

Due to the uncertainty between the maps and the Coal Authority, boreholes were drilled to determine if coal was present at shallow depth beneath the site. The boreholes encountered up to 0.3 m of coal from depths between 9.7 and 12.4 m. Stratigraphically, the shallowest named seam beneath the site is expected to be the Kent's Thick, however, the stratigraphic column for the area notes a thin coal seam around 7 m above the Kent's Thick. The boreholes were taken down to over 20 m depth and no further evidence of coal was encountered. This thin seam is not always present in the surrounding collieries. Therefore, the seam encountered in the boreholes is most likely the Kent's Thick coal seam.

No evidence of workings was encountered. Precautions against the effects of coal mining will not be required.

4.3 Foundations

Unreinforced strip or trench footings should be suitable for the eastern plots of the proposed residential development, founded at a minimum depth of 900 mm within the natural clay. The footings will also need to be deepened when within influence of existing trees in accordance with NHBC standards. Where footings are to be deepened in excess of 1.5 m due to the effect of existing trees, heave precautions will be required.

Deeper made ground up to around 3.0 m depth was encountered in the eastern section of the site. If levels in this section of the site are to be lowered, deep trench fill footings will be appropriate. However, if over 3.0 m of fill is to remain, piled foundations may be more economical.

A minor fault is shown through the north eastern corner of the site. Ground movement is not expected across a fault unless there is mining activity in the area. With the demise of the coal fields, future mining is very unlikely. Thus no particular restrictions on building is required other than reinforcing foundations in the vicinity of the fault as a nominal precaution.

4.4 Ground Slabs

Ground bearing slabs will be suitable where less than 600 mm of made ground is present beneath. Where more than 600 mm of made ground is present, suspended slabs will be required. An in-situ concrete slab, suitably reinforced to span between supports, could be used or beam and block floors with an underlying void.

If the effect of trees cause the footing depth to exceed 1.5 m, a precast concrete floor with an underlying 175 mm void will be required.

4.5 Superstructure Precautions

The ground conditions encountered will not require superstructure precautions.

4.6 Problems Due to Past Development

The site formerly comprised housing from the 1970s to the 1990s, with garages in the north western site corner.

4.7 Excavation Problems

Shallow mudstone was encountered in the eastern section of the site but should not create excessive difficulty during excavation. On the basis of the materials encountered, it is likely that the sides of any excavations will be unstable within the made ground, particularly near TP3 where the reworked clay was noted to be quite wet. Excavations in the natural ground should be stable.

Where excavations which workers will enter are over 1.2 m deep, or less where there is a risk of harm from collapse of the side of the excavation, the sides should be supported or battered back to make them safe.

4.8 Roads

The ground may vary between made ground and natural clay at formation level beneath the proposed road. On the basis of the material in the trial pits a CBR value of 2% is appropriate. Localised softer zones may be present. The ground should be inspected at

formation level and any soft areas replaced. The Highway Authority may also request that CBR tests are carried out.

Before work begins, the construction details of adoptable roads should be approved by the Highway Authority.

4.9 Surface Water Drainage

Due to the clayey ground conditions, soakaways will not be suitable on site. Surface water should therefore be taken to an existing drainage system.

4.10 Sulphate Attack of Buried Concrete

As discussed in Section 7.5, DS2 AC2 precautions in sub surface concrete should be appropriate. This would require using FND2 concrete.

5.0 CONTAMINATION APPRAISAL

5.1 Objectives of the Investigation

The purpose of this section of the report is to make a site specific assessment of the potential risks resulting from the presence of likely contaminants applicable to the site's proposed end use. The approach used will be through characterisation of the sources and redefinition of the conceptual model on the basis of the additional information about the site such as the ground conditions, hydrogeological regime and contaminant levels, to determine the significant pollutant linkages present. Where unacceptable risks are identified an options appraisal detailing feasible remediation strategies will be made.

5.2 Site Categorisation

The site was previously developed with housing, demolished in the 1990s. Some contamination is expected from the remaining made ground.

5.3 Sampling Strategy

On the basis of the above, samples were taken with the objective of ascertaining the levels of possible contaminants. Two samples of topsoil, four samples of made ground and one sample of natural clay were sent for chemical testing. The soil samples were collected in 1000 ml plastic tubs and 250 ml amber glass jars. Each sample was labelled with the sample position and depth.

The soil samples were tested for a general suite of common contaminants derived from both natural and man made sources, which cover those likely to result in the aforementioned types of materials. The basic suite chosen analysed the concentrations of the following determinands:

Arsenic	Nickel	Cadmium
Lead	Mercury	Copper
Chromium	Selenium	Zinc
Speciated PAH	pH	

The samples of made and natural ground were also tested for a sulphate test suite comprising total sulphur, water soluble sulphate and acid soluble sulphate.

All samples were tested to MCERTS standards by ChemTest in Newmarket, which is a UKAS accredited laboratory. The results have been received and are reported on below and in the sections that follow.

5.4 Chemical Assessment Values

When assessing the chemical test results, the values are initially compared with an assessment value. Concentrations of particular contaminants below their assessment value are considered to be too low to be a cause for concern. Only chemicals with concentrations higher than the threshold values are then considered in the risk assessment section which follows.

Human Receptors

Where available, Soil Guideline Values (SGVs) designed for a residential with plant uptake land use have been used to assess the levels of contamination identified with respect to human health. The threshold values for the first seven metals or metalloids (arsenic to selenium) are the SGVs derived by DEFRA and Environment Agency using the '*Contaminated Land Exposure Assessment*' model. The assessment concentrations for arsenic, cadmium, mercury, nickel and selenium are outlined in the Environment Agency's Science Report series SC050021. The assessment concentrations for the remaining metals/metalloids are described in the Contaminated Land Report Series (CLR), which have now been withdrawn.

Plant Receptors

Copper and zinc are phytotoxic elements that have been included in the test suite. The assessment values have been taken from '*The Soil Code*'.

A summary table of all the assessment values used is enclosed in the appendix.

Cementitious Products

In accordance with BRE Special Digest 1:2005 '*Concrete in Aggressive Ground*', soil samples were tested for pH, total sulphur, acid-soluble sulphate and water-soluble sulphate in order to determine any requirement for concrete precautions. The site is classified as a brownfield site and water is expected to be generally mobile.

5.5 Contamination Test Results

The results of the chemical laboratory analysis have been received and are presented in the appendix. None of the chemical contaminants exceeded their assessment values in the made or natural ground. A visual inspection for asbestos of the samples is carried out by the laboratory before sample preparation. No asbestos was reported to be present.

The following contaminants were found to exceed their assessment values in the topsoil:

Chromium

One sample (TP1 0.15 m) out of two recorded a chromium concentration exceeding the threshold of 130 mg/kg with a concentration of 180 mg/kg.

Benzo(a)pyrene

One sample (TP1 0.15 m) out of two recorded a benzo(a)pyrene concentration of 59 mg/kg, which significantly exceeds the 1 mg/kg assessment value.

6.0 CONCEPTUAL MODEL

6.1 Description of the Site and Surrounding Area

The site is approximately 0.5 hectares in area and is currently undeveloped. The land generally falls gently to the south, except where the north eastern section of the site forms a plateau which then dips more steeply towards the centre of the site.

A substation is present in the south eastern corner off the site. Trees and hedges border the site. Residential properties surround the site.

Ground Conditions

Topsoil covers the outer sections of the site to around 0.3 m depth. Around 3.0 m of reworked clay was encountered in the western section of the site, with less than 1.0 m of similar ground in the east. A broken land drain was encountered in TP3 at 3.2 m depth, creating standing water and many ceramic fragments. The natural ground comprises firm to stiff clay over mudstone, which was encountered between around 1m and 3 m depth across the site.

Groundwater

The Groundwater Vulnerability map shows the site to lie on a minor aquifer with overlying soils of high leaching potential. The site does not lie within a groundwater Source Protection Zone (as identified by the Environment Agency).

The nearest surface water feature is an open drain over 400 m to the south west of the site. There are no water abstractions within 1000 m of the site.

Receptors

Human Receptors

Construction workers, future residents and visitors to the site are potential receptors.

Plants

Plants in landscaped areas at the development will be receptors.

Controlled Waters

Groundwater is the nearest receptor.

Construction Materials

Cementitious products such as concrete in foundations are receptors.

Sources of Contamination

The topsoil recorded slightly elevated concentrations of chromium and benzo(a)pyrene. Significant contamination was not encountered in the made or natural ground.

The Phase 1 report indicates there are no recorded landfill sites within 250 m of the site. However, the report does identify an old sandstone quarry adjacent to the eastern boundary of the site, and possibly extending into the site. The quarry was backfilled by 1893 and any organic material is likely to have decomposed by now. Therefore significant amounts of landfill gas are not expected to still be present. TP6 was excavated adjacent to the site's north eastern corner and encountered natural clay and mudstone beneath around 0.7 m of reworked clay. No evidence of quarrying was found.

6.2 Significant Pollutant Linkages

Contaminant	Pathway	Receptor
Chromium and benzo(a)pyrene in the topsoil	Direct contact	Construction workers Future end users of the site
Sulphate	Direct contact	Cementitious products

7.0 RISK ASSESSMENT

7.1 Human Health During Construction

Site workers should be made aware of the elevated concentrations of contaminants within the topsoil. Normal precautions, such as washing hands before eating, should be sufficient to mitigate any risk posed to construction workers. Any unusual, brightly coloured or odorous material encountered during construction should be brought to the attention of the site staff and investigated.

7.2 Human Health After Development

The topsoil contained slightly elevated concentrations of chromium (maximum concentration of 180 mg/kg compared to 130 mg/kg threshold) and benzo(a)pyrene (maximum concentration of 59 mg/kg compared to a 1.0 mg/kg threshold). The made and natural ground did not record significant contamination.

Chromium occurs in two forms; the less toxic trivalent chromium and the more toxic hexavalent chromium. The assessment value used assumes that all of the chromium recorded is in the hexavalent form, which will not actually be the case. Given that an elevated level of chromium was only recorded in one of the two samples, and that not all of the chromium will be the more toxic hexavalent form, the overall risk from the slightly elevated chromium is not significant.

The benzo(a)pyrene concentration in the sample of topsoil from TP1 is very high. If the topsoil is to remain beneath gardens and landscaped areas, it will need to be capped with 600 mm of clean cover, comprising clean imported topsoil and subsoil.

However, further testing may show the elevated concentrations to be a localised hotspot, and the remainder of the material to be suitable for re-use.

The above conclusions will need to be approved by the regulators.

7.3 Plants

The materials on site should not pose a risk to plants.

7.4 Ground Gas

No radon precautions are required. Made ground up to 3.0 m was encountered, however, significant volumes of degradable material were not noted to be present. Levels are also likely to be lowered across the area with the deeper fill, therefore lessening the amount of made ground left beneath the proposed plots. The materials on site should therefore not pose a significant risk of ground gas to the site. Offsite migration of ground gas is also not expected to pose a risk to the site.

7.5 Attack on Construction Materials

Tests for water-soluble sulphate, acid-soluble sulphate, sulphur and pH were carried out and these results were compared with BRE Special Digest 1 "Concrete in Aggressive Ground".

Water soluble sulphate results of up to 0.02 g/l were recorded. A maximum total potential sulphate of 0.03 % was calculated. These results equate to a DS1 AC1 concrete classification. However, due to the presence of made ground, we recommend the use of DS2 AC2 precautions. This would require using FND2 concrete.

7.6 Controlled Waters

The materials on site should not pose a significant risk to controlled waters. Contaminants are not present in significant or leachable quantities and are therefore unlikely to migrate far off site.

7.7 Disposal of Materials

Ideally, the site will be designed in such a way as to ensure that all excavated material can be kept on the site. If materials are to be disposed of off-site, they will need to be taken to a suitable waste disposal site.

7.8 Conclusions and Recommendations

1. Slightly elevated chromium and high benzo(a)pyrene concentrations were encountered in the topsoil, which pose a risk to human health. If the topsoil is to remain beneath gardens and landscaped areas, it will need to be capped with 600 mm of clean cover, comprising clean imported topsoil and subsoil. However, further testing may show the elevated concentrations to be a localised hotspot, and the remainder of the material to be suitable for re-use.
2. No radon or ground gas precautions are required.
3. DS2 AC2 precautions in sub surface concrete should be appropriate. This would require using FND2 concrete.
4. It is possible that localised zones of contaminated material may be found on the site in areas that were not covered by the investigation. If ashy, odorous, brightly coloured or apparently contaminated material is found on site, this should be tested to check if it is contaminated. If it is found to be contaminated, after consultation with the regulatory authorities, it should be removed or capped.
5. The above conclusions must be agreed with the regulators.

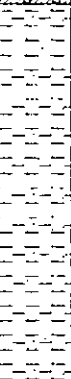
APPENDIX 1

Trial Pit Logs TP1 to TP6

Borehole Logs BH1-5

Project Name Oak Close, Hoyland	Project No. 32525	Co-ords: - Level: -	Date 31/03/2010
------------------------------------	----------------------	------------------------	--------------------

Location: Oak Close, Hoyland	Dimensions: Depth 1.70m	Scale 1:25
Client: Guinness North Counties		Logged By KE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.15	D		0.20			TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with many roots. Gravel is fine to coarse subangular of mixed lithologies and mudstone.
0.70	D					Stiff to very stiff orange brown mottled grey slightly sandy CLAY.
			1.50			Moderately strong grey MUDSTONE.
			1.70			Trialpit Complete at 1.70 m

Remarks:

Groundwater: No groundwater observed.



Project Name

Oak Close, Hoyland

Project No.

32525

Co-ords: -

Level: -

Date

31/03/2010

Location: Oak Close, Hoyland

Dimensions:

Depth

3.30m

Scale

1:25

Client:

Guinness North Counties

Logged By

KE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.20	D		0.30			TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with many roots. Gravel is fine to coarse subangular of mixed lithologies and mudstone.
1.10	D					MADE GROUND: Firm pale brown slightly sandy slightly gravelly CLAY with occasional cobbles and boulders. Gravel is fine to coarse subangular brick and concrete fragments. Cobbles and boulders are subangular concrete.
			3.10			Moderately weak grey brown MUDSTONE.
			3.30			Trialpit Complete at 3.30 m

Remarks:

Groundwater: No groundwater observed.



Project Name
 Oak Close, Hoyland

Project No.
 32525

Co-ords: -
 Level: -

Date
 31/03/2010

Location: Oak Close, Hoyland

Dimensions: -

Depth
 3.30m

Scale
 1:25

Client: Guinness North Counties

Logged By
 KE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
0.90	D		0.10			MADE GROUND: Soft pale brown slightly sandy CLAY.	1
			1.70			MADE GROUND: Soft pale blue grey CLAY with occasional roots and pockets of limestone gravel, less than 30 cm in diameter.	2
			3.30			MADE GROUND: Stiff orange brown CLAY. Land drain encountered from 3.2 m, standing water from 3.2 m with many ceramic fragments.	3
						Trialpit Complete at 3.30 m	4

Remarks: Pit sides unstable with partial collapse.

Groundwater: Clay encountered was wet from surface and standing water / land drain was encountered at 3.2m.



Project Name
Oak Close, Hoyland

Project No.
32525

Co-ords: -
Level: -

Date
31/03/2010

Location: Oak Close, Hoyland

Dimensions:

Depth
1.30m

Scale
1:25

Client: Guinness North Counties

Logged By
KE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.00	D		0.05			TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with many roots. Gravel is fine to coarse subangular of mixed lithologies and mudstone.
			0.20			MADE GROUND: Limestone hardcore.
						MADE GROUND: Firm orange brown slightly sandy CLAY with rare brick cobbles.
0.50	D		0.70			Stiff to very stiff orange brown mottled grey slightly sandy CLAY.
0.90	D		0.90			Moderately weak to moderately strong black MUDSTONE.
			1.30			Trialpit Complete at 1.30 m

Remarks:

Groundwater: No groundwater observed.



Project Name
Oak Close, Hoyland

Project No.
32525

Co-ords: -
Level: -

Date
31/03/2010

Location: Oak Close, Hoyland

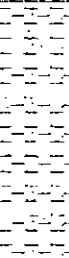
Dimensions:

Scale
1:25

Client: Guinness North Counties

Depth
1.70m

Logged By
KE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.70	D		0.20			MADE GROUND: Limestone hardcore.
						Stiff to very stiff orange brown mottled grey slightly sandy CLAY.
			1.10		Moderately weak to moderately strong dark grey MUDSTONE.	
			1.70		Trial Complete at 1.70 m	

Remarks:

Groundwater: No groundwater observed.



Project Name
Oak Close, Hoyland

Project No.
32525

Co-ords: -
Level: -

Date
31/03/2010

Location: Oak Close, Hoyland

Dimensions: -

Scale
1:25

Client: Guinness North Counties

Depth
1.70m

Logged By
KE

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.15	D					TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY with many roots. Gravel is fine to coarse subangular of mixed lithologies and mudstone.
0.40	D		0.30			MADE GROUND: Firm orange brown slightly sandy CLAY with rare brick cobbles, glass and polythene.
			0.70			Stiff to very stiff orange brown mottled grey slightly sandy CLAY.
1.00	D					
			1.30			Moderately weak to moderately strong grey brown MUDSTONE.
			1.70			
Trialpit Complete at 1.70 m						

Remarks:

Groundwater: No groundwater observed.





GROUND SUPPORT SERVICES (UK) LTD

GEOTECHNICAL AND GROUND SUPPORT FOUNDATION SPECIALISTS

Ivy Mount, High Road, Carlton in Lindrick, Worksop, Notts, England, S819EB
Phone: 0800 458 6004 Email: drillrig@hotmail.com Fax: 01909 540756

Site Investigation Drillers log			Site: Oak Close		Sheet: 1 of 1	
Rig: Soilmecc 400			Crew: G Pillington D Parks		Date: 26.4.10	
Hours on site:			Travelling Time:			
Equipment used:						
BH	Depth	Strata Description	BH	Depth	Strata Description	
move rig & comp to Oak Close						
1	0.00 - 0.20	Soil	4	0.00 - 0.80	made ground	
	0.20 - 2.90	made ground		0.80 - 1.40	Clay brown	
	2.90 - 5.10	mudstone brown		1.40 - 12.60	mudstone grey	
	5.10 - 10.00	mudstone grey		12.60 - 12.80	Coal	
	10.00 - 10.20	Coal		12.80 - 22.00	mudstone grey	
	10.20 - 22.00	mudstone grey				
2	0.00 - 0.20	Soil	3	0.00 - 0.70	made ground	
	0.20 - 2.80	made ground		0.70 - 1.00	Clay brown	
	2.80 - 4.90	mudstone brown		1.00 - 2.60	mudstone brown	
	4.90 - 9.70	mudstone grey		2.60 - 12.40	mudstone grey	
	9.70 - 9.90	Coal		12.40 - 12.60	Coal	
	9.90 - 22.00	mudstone grey		12.60 - 22.00	mudstone grey	
				Backfill BH's to 1.00 mt		
5	0.00 - 0.20	Soil		Bentonite BH's to 0.00 mt		
	0.20 - 1.90	made ground		2 bags bentonite used		
	1.90 - 3.60	mudstone brown				
	3.60 - 10.50	mudstone grey		move rig & comp.		
	10.50 - 10.80	Coal		from Oak Close		
	10.80 - 22.00	mudstone grey				

Casing / Water level details

BH	Die	Casing Depth	Strike	Water Rise	Scaled	Totals	BH's	Drill	Case	Core
1			10.20			Today	5	110.00		
2			9.90			Previous	-	-		
5			10.80			To date	5	110.00		

4
3

12.80
12.60

Signed  Driller

APPENDIX 2

Chemtest Results, Report Number 99412

Table of Assessment Values

Plasticity Results

Eastwood & Partners
St. Andrews House
23 Kingfield Road
Sheffield
S11 9AS

FAO Kate Edwards
14 April 2010

Dear Kate Edwards

Test Report Number 99412
Your Project Reference Oak Close, Hoyland - 32525-05

Please find enclosed the results of analysis for the samples received 6 April 2010.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely



Authorised Signatory

☐ Darrell Hall	Director
☐ Phil Hellier	Director
☒ Keith Jones	Technical Manager
☐ John Crawford	Quality Manager
☐ Malcolm Avis	Director



2183



Notes to accompany report:

- The sign < means 'less than'
- Tests marked 'U' hold UKAS accreditation
- Tests marked 'M' hold MCertS (and UKAS) accreditation
- Tests marked 'N' do not currently hold UKAS accreditation
- Tests marked 'S' were subcontracted to an approved laboratory
- n/e means 'not evaluated'
- i/s means 'insufficient sample'
- u/s means 'unsuitable sample'
- Comments or interpretations are outside of the scope of UKAS accreditation
- The results relate only to the items tested
- Stones represent the quantity of material removed prior to analysis
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- Soil descriptions, including colour and texture, are beyond the scope of MCertS accreditation

Test Report 99412 Cover Sheet

Eastwood & Partners
St. Andrews House
23 Kingfield Road
Sheffield
S11 9AS

LABORATORY TEST REPORT



Report Date
14 April 2010

Results of analysis of 7 samples
received 06 April 2010

FAO Kate Edwards

Oak Close, Hoyland - 32525-05

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

				99412						
				AE83257	AE83258	AE83259	AE83260	AE83261	AE83262	AE83263
				TP1	TP1	TP2	TP3	TP4	TP6	TP6
				31/3/2010	31/3/2010	31/3/2010	31/3/2010	31/3/2010	31/3/2010	31/3/2010
				0.15m	0.7m	1.1m	0.9m	0.5m	0.15m	0.4m
				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
SOP↓	Determinand↓	CAS No↓	Units↓	*						
2175	Sulfur (total TRL report 447)		%	N		0.01	0.01	0.01	0.01	<0.01
2120	Sulfate (2:1 water soluble) as SO ₄	14808798	g l ⁻¹	M		0.02	<0.01	<0.01	0.01	<0.01
2430	Sulfate (total) by BS1377 (HCl extract)	14808798	%	N		0.01	0.02	0.02	0.03	<0.01
2450	Arsenic	7440382	mg kg ⁻¹	M	12	4.7	8.6	8.2	7.9	13
	Cadmium	7440439	mg kg ⁻¹	M	0.38	<0.10	0.18	0.23	0.15	0.25
	Chromium	7440473	mg kg ⁻¹	M	180	21	16	17	19	21
	Copper	7440508	mg kg ⁻¹	M	110	19	15	18	20	26
	Mercury	7439976	mg kg ⁻¹	M	0.19	0.13	0.12	<0.10	<0.10	<0.10
	Nickel	7440020	mg kg ⁻¹	M	24	16	16	18	26	23
	Lead	7439921	mg kg ⁻¹	M	60	17	27	28	18	53
	Selenium	7782492	mg kg ⁻¹	M	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	Zinc	7440666	mg kg ⁻¹	M	110	40	55	57	54	94
2800	Naphthalene	91203	mg kg ⁻¹	M	2.2	<0.1	<0.1	<0.1	<0.1	<0.1
	Acenaphthylene	208968	mg kg ⁻¹	N	1.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Acenaphthene	83329	mg kg ⁻¹	M	8.7	<0.1	<0.1	<0.1	<0.1	<0.1
	Fluorene	86737	mg kg ⁻¹	M	6.5	<0.1	<0.1	<0.1	<0.1	<0.1
	Phenanthrene	85018	mg kg ⁻¹	M	73	1.7	0.5	0.1	<0.1	0.4
	Anthracene	120127	mg kg ⁻¹	M	17	0.3	<0.1	<0.1	<0.1	<0.1
	Fluoranthene	206440	mg kg ⁻¹	M	100	2.3	1	0.4	<0.1	1.3
	Pyrene	129000	mg kg ⁻¹	M	90	2.2	0.8	0.3	<0.1	1
	Benzo[a]anthracene	56553	mg kg ⁻¹	M	50	0.8	0.3	0.1	<0.1	0.4
	Chrysene	218019	mg kg ⁻¹	M	46	0.7	0.3	<0.1	<0.1	0.5
	Benzo[b]fluoranthene	205992	mg kg ⁻¹	M	62	0.9	0.5	0.2	<0.1	0.7
	Benzo[k]fluoranthene	207089	mg kg ⁻¹	N	23	0.2	<0.1	<0.1	<0.1	0.2
	Benzo[a]pyrene	50328	mg kg ⁻¹	M	59	0.8	0.4	0.2	<0.1	0.5
	Dibenzo[a,h]anthracene	53703	mg kg ⁻¹	N	9.8	<0.1	<0.1	<0.1	<0.1	<0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg ⁻¹	M	30	0.2	<0.1	<0.1	<0.1	0.1
	Benzo[g,h,i]perylene	191242	mg kg ⁻¹	M	35	0.2	<0.1	<0.1	<0.1	0.1
	Total (of 16) PAHs		mg kg ⁻¹	N	610	10	3.6	<2	<2	5.2

All tests undertaken between 07-Apr-2010 and 13-Apr-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

Column page 1

Report page 1 of 2

Report sample ID range AE83257 to AE83263

Eastwood & Partners
St. Andrews House
23 Kingfield Road
Sheffield
S11 9AS

LABORATORY TEST REPORT



Report Date
14 April 2010

Results of analysis of 7 samples
received 06 April 2010

FAO Kate Edwards

Oak Close, Hoyland - 32525-05

				99412						
				AE83257	AE83258	AE83259	AE83260	AE83261	AE83262	AE83263
				TP1	TP1	TP2	TP3	TP4	TP6	TP6
				31/3/2010	31/3/2010	31/3/2010	31/3/2010	31/3/2010	31/3/2010	31/3/2010
				0.15m	0.7m	1.1m	0.9m	0.5m	0.15m	0.4m
				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
2010	pH	-	M	9.6	7.5	8.2	8.0	8.3	7.6	8.1
2030	Moisture	%	n/a	12.5	17.4	14	21.3	13.2	21.8	14.9
	Stones content (>50mm)	%	n/a	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
2140	Soil colour		n/a	black	grey	brown	brown	brown	black	brown
	Soil texture		n/a	loam	clay	clay	clay	clay	loam	clay
	Other material		n/a	stone	stone	stone	stone	stone	stone	stone

All tests undertaken between 07-Apr-2010 and 13-Apr-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

Column page 1

Report page 2 of 2

Report sample ID range AE83257 to AE83263

Metals/Metalloids	Intended Land Use
	Residential (mg/kg)
Arsenic	32
Cadmium	10
Chromium	130
Lead	450
Mercury	1
Nickel	130
Selenium	350
Copper	80 ^{*1}
Zinc	200 ^{*1}

Notes:

*¹ - These are pH dependent; the most conservative value is given in this case.

The assessment values for the first seven metals or metalloids (arsenic to selenium) are the Soil Guideline Values (SGVs) derived by DEFRA and Environment Agency using the 'Contaminated Land Exposure Assessment' model. The assessment concentrations for arsenic, cadmium, nickel, mercury and selenium are outlined in the Environment Agency's Science Report series SC050021. These are based on a sandy loam soil and 6% soil organic matter. The assessment concentrations for the remaining metals/metalloids are described in the Contaminated Land Report Series (CLR), which have now been withdrawn.

The SGV threshold value is not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. The modified mean value should instead be compared with the SGV.

The assessment values for the metals copper and zinc are levels at which plant growth is thought to be affected. These are taken from the maximum permissible and advisable concentrations in soil after application of soil sludge given in the 'The Code of Good Agricultural Practice for the Protection of Soil', MAFF, 1998.

Prepared	CAS	Checked	CAS	Date	20.04.10	Job No	32525
----------	-----	---------	-----	------	----------	--------	-------

E+P Eastwood & Partners CONSULTING ENGINEERS St Andrews House 23 Kingfield Road Sheffield S11 9AS Tel: (0114) 2554554 Fax: (0114) 2554330	GUINNESS NORTHERN COUNTIES OAK CLOSE, HOYLAND GENERIC ASSESSMENT CRITERIA - RESIDENTIAL
--	---

Organic Compounds	Intended Land Use
	Residential (mg/kg)
Phenol	420
Benzene	0.33
Toluene	610
Ethylbenzene	350
o-Xylene	250
m-Xylene	240
p-Xylene	230
Naphthalene	8.7
Acenaphthylene	850
Acenaphthene	1000
Fluorene	780
Phenanthrene	380
Anthracene	9200
Fluoranthene	670
Pyrene	1600
Benzo(a)anthracene	5.9
Chrysene	9.3
Benzo(b)fluoranthene	7
Benzo(k)fluoranthene	10
Benzo(a)pyrene	1.0
Dibenz(a,h)anthracene	0.9
Indeno(1,2,3-cd)pyrene	4.2
Benzo(g,h,i)perylene	47

The assessment values for phenol and the BTEX compounds are the Soil Guideline Values derived by DEFRA and Environment Agency using the 'Contaminated Land Exposure Assessment' model. These are outlined in the Environment Agency's Science Report series SC050021. The assessment criteria for the sixteen polycyclic aromatic hydrocarbon (PAH) species covered under the USEPA test have been taken from Nathanail, C. P., McCaffrey, C., Ashmore, M. H., Cheng, Y. Y., Gillett, A., Ogden, R. & Scott, D., 2009 'The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment 2nd Edition', Land Quality Press, Nottingham.

These are also all based on a sandy loam soil and 6% soil organic matter. The SGV threshold value is not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. The modified mean value should instead be compared with the SGV.

Prepared	CAS	Checked	CAS	Date	20.04.10	Job No	32525
----------	-----	---------	-----	------	----------	--------	-------

E+P Eastwood&Partners CONSULTING ENGINEERS St Andrews House 23 Kingfield Road Sheffield S11 9AS Tel: (0114) 2554554 Fax: (0114) 2554330	GUINNESS NORTHERN COUNTIES OAK CLOSE, HOYLAND GENERIC ASSESSMENT CRITERIA - RESIDENTIAL
--	---

Contract Number: PSL10/0607

Client's Reference:

Report Date: 09 April 2010

Client Name: Eastwood & Partners
St Andrew's House
23 Kingfield Road
Sheffield
S11 9AS

For the attention of: G M Seaman

Contract Title: Oak Close, Hoyland

Date Received: 6-Apr-10

Date Commenced: 6-Apr-10

Date Completed: 9-Apr-10

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.

Checked and Approved Signatories:

R Gunson
(Director)



A Watkins
(Director)

D Lambe
(Senior Technician)

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

PSL

Professional Soils Laboratory

Compiled by	Date	Checked by	Date	Approved by	Date
<i>mat</i>	9/4/10	<i>RL</i>	9/4/10	<i>RL</i>	9/4/10
OAK CLOSE, HOYLAND.				Contract No: PSL10/0607	
				Client Ref: 32525	

SUMMARY OF SOIL CLASSIFICATION TESTS

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

[illegible]

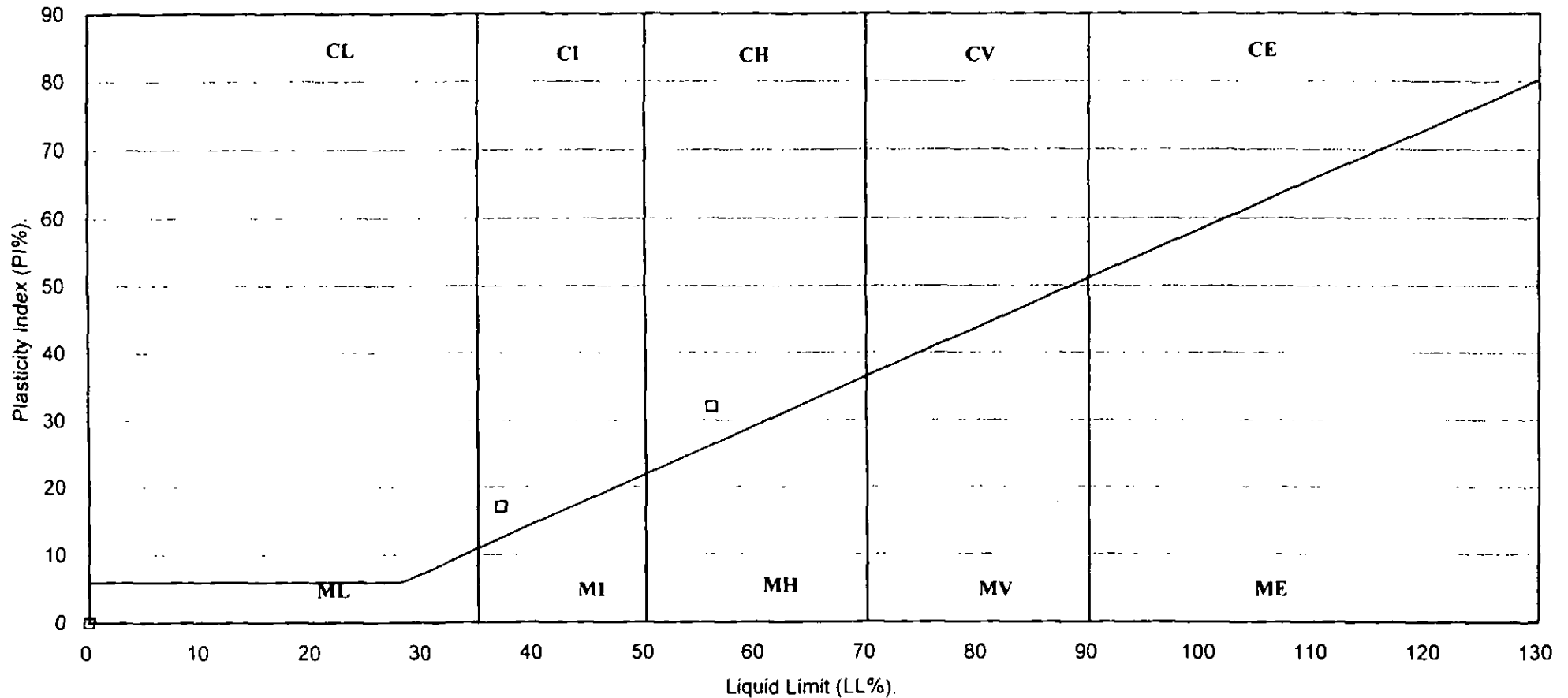
SYMBOLS : NP : Non Plastic

* : Liquid Limit and Plastic Limit Wet Sieved.

 Professional Soils Laboratory	Compiled by	Date	Checked by	Date	Approved by	Date
	<i>Mar</i>	9/4/10	<i>RL</i>	9/4/10	<i>RL</i>	9/4/10
	OAK CLOSE, HOYLAND.					Contract No: PSL10/0607
						Client Ref: 32525

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



PSL

Professional Soils Laboratory

Compiled by

mar

Date

9/4/10

Checked by

RL

Date

9/4/10

Approved by

RL

Date

9/4/10

OAK CLOSE, HOYLAND.

Contract No:

PSL10/0607

Client Ref:

32525

DRAWINGS

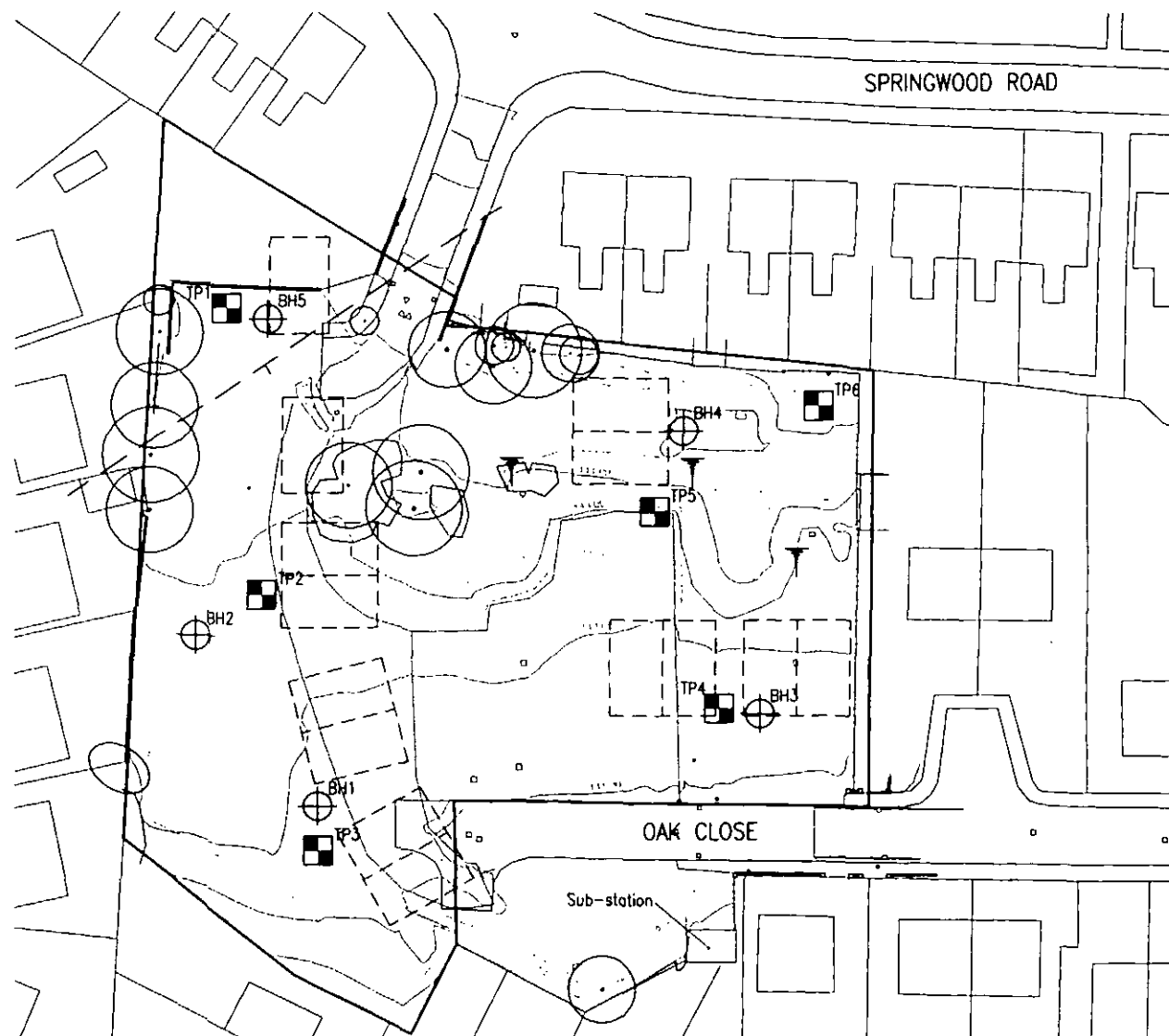
Site Plan 32525/Fig1A

Information within this drawing is not necessarily produced to scale.
Always use figured dimensions and co-ordinates - if in doubt, ask.



KEY

- Approximate site boundary
- ▣ Approximate location of trial pit excavated by Eastwood & Partners, 31/03/2010
- ⊕ Approximate location of rotary drilled boreholes drilled on 26/04/2010
- - - Approximate position of new housing
- - - Inferred position of fault
- Manholes



Eastwood & Partners
CONSULTING ENGINEERS

St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS
Tel: 0114 255 4554
Fax: 0114 255 4330

mail@eastwoodandpartners.com
www.eastwoodandpartners.com



GUINNESS NORTHERN COUNTIES
OAK CLOSE, HOYLAND
EXPLORATORY HOLE LOCATION PLAN

A	First Issue.					
REV	DESCRIPTION			SIG	CHK	DATE
SCALE WHEN PLOTTED AT A3			DRAWING STATUS			
1:500			INFORMATION			
DRAWN	CHECKED	DATE	DRAWING NUMBER		REV	
GB	KE	29.04.10	32525/FIG1		A	