Environmental
Geotechnical
Specialists

REPORT

job number J3542/16/EDS	site address 83 Common End Lane, Lepton, Huddersfield, HD8 0AF
date June 2016	
written by C. E. Mason	
checked by S. P. Rogers	issued by C. E. Mason

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GEOTECHNICAL
ENVIRONMENTAL

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A REPORT ON A COAL MINING RISK ASSESSMENT

at

83 COMMON END LANE, LEPTON, HUDDERSFIELD, HD8 0AF

for

ARCHITECTS: FARRAR BAMFORTH ASSOCIATES LTD

Report No J3542/16/EDS **June 2016**

1. INTRODUCTION

It is understood that as part of the planning application for development at the site, a Coal Mining Risk Assessment has been requested by the planning authority. Consequently, a desktop study was commissioned in order to assess the risk to the development from coal mining. This report presents the findings of the study.

2. GEOLOGICAL DESK STUDY

The geological desk study has been undertaken using the following sources of information.

- British Geological Survey map sheet[1].
- British Geological Survey *Geology of Britain Viewer*[2].
- Coal Authority Report[3].
- British Geological Survey *Borehole Records*[4].

[1] Sources: British Geological Survey (NERC) Map Sheet 77; Huddersfield; Solid and Drift Edition
[2] Sources: British Geological Survey (NERC) Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]
[3] Coal Authority Reference: 51001185244001 dated 16th June 2016
[4] Sources: British Geological Survey (NERC) Borehole Records [*online resource from* http://www.bgs.ac.uk//]

2.1 British Geological Survey Maps and Viewer

The appropriate map sheet for the site and the geology viewer has been examined and the following table presents the indicated geology:

Table 1: *Geological Data for the Site*

Strata Type	Strata Name	Previous Name[5]	Description[5]
Superficial Geology	None indicated on BGS records.		
	Pennine Lower Coal Measures Formation (undifferentiated)	Lower Coal Measures Formation	Interbedded grey mudstone, siltstone and pale grey sandstone, commonly with mudstones containing marine fossils in the lower part, and more numerous and thicker coal seams in the upper part.

It should be appreciated that the undifferentiated strata of the Pennine Lower Coal Measures is anticipated to be present below the site. In addition, a member named the Kirkburton Sandstone is shown to outcrop approximately 20m east of the site. This unit is described as, 'a medium-bedded, very fine- to medium-grained, ripple cross-laminated, micaceous, buff to pale brown sandstone, interbedded with greenish grey siltstone'.

Furthermore, a north-west south-east trending fault, which is downthrown to the north-east is shown to outcrop 150m west of the site. This fault is not anticipated to affect the proposed development.

There are no dip indicators relevant to the site (i.e within the same faulted block) shown on the geological map. However, taking into account the outcrop patters and the topography of the area, it may be anticipated that the solid geology within the local area dips shallowly to the east. Although not directly comparable, the nearest geological dip indicator suggests that the solid geology dips 5° east.

There is one coal seam within the vicinity of the site that is anticipated to underlie any future development. This coal seam is summarised as follows:

Table 2: *Summary of coal seams within the vicinity of the site.*

Seam Name	Seam thickness[5]*	Outcrop distance from site*[5]
Black Bed Coal (BL)	0.20m – 1.80m	90m W

*All distances are given as approximations only. It should be noted that coal seam thicknesses vary over relatively short distances

Taking into account the topography of the local area and the generalised dip of the strata, the geological data suggests that the Black Bed Coal seam may be observed at depths ranging between 7m and 17m below ground level.

[5] Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [*online resource from www.bgs.ac.uk*]

2.2 Coal Authority Mines Report

As part of this study a Non-residential Coal Authority Mining Report has been obtained. The report is presented as Appendix 2 and for the purposes of discussion has been summarised below:

Table 3: Summary of the Non-residential Coal Authority Mining Report

Has the search report highlighted evidence or potential of:			
Ref	**Mining Feature**	**Yes/No**	**Comments**
1&2&3	Underground Coal Mining: Past	Yes	The property is not within a surface area that could be affected by past underground mining. However the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity.
	Underground Coal Mining: Present	No	Please refer to CON29M Non-residential Mining report (Appendix 2) for additional information.
	Underground Coal Mining: Future	Yes	The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods. The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods. The property is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future. No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.
4	Mine Entries	Yes	There are no known coal mine entries within, or within 20 metres of, the boundary of the property. There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.
5	Coal Mining Geology	No	Please refer to CON29M Non-residential Mining report (Appendix 2) for additional information.
6&7&8	Opencast Coal Mining: Past	No	
	Opencast Coal Mining: Present	No	
	Opencast Coal Mining: Future	No	
9	Coal Mining Subsidence	No	
10	Mine Gas	No	
11	Hazards Related to Coal Mining	No	
12	Withdrawal of Support	No	

2.3 Geological Survey Borehole Records

The British Geological Survey (NERC) keeps borehole records from across Britain which are available for public viewing through their website[6]. As part of this study, the records in the area around the site have been reviewed in order to assist in establishing the geological conditions.

Based upon records provided by the British Geological Survey (NERC) the following table has been produced as a summary for the most applicable features of note in relation to this study, the logs of the boreholes are presented as Appendix 3:

Table 4: *Notable Geological Features*

Borehole	Approx. Distance from Site	Depth below ground level	Coal Seam Thickness
SE11SE29	490m SE	No coal encountered	-
SE11SE25	490m SE	No coal encountered	-
SE11SE28	490m SE	No coal encountered	-
SE11SE24	490m SE	No coal encountered	-

It should be appreciated that there were limited long range boreholes within the vicinity of the site. Some shorter range borehole scans were available, however, were felt to be of limited use to this study. Furthermore, there were other boreholes at a greater distance from the site; however, these were felt to be of lesser value as they may not represent ground conditions comparable to those found below the site.

In general terms, the boreholes indicate that below a capping of clays , interbedded layers of sandstone, siltstone and mudstone were encountered. This strata is anticipated to represent the Pennine Lower Coal Measures formation. No coal seams were encountered within any of the borehole records studied.

3. RISK ASSESSMENT

The risk to the stability of the proposed residential development has been evaluated from the data obtained and with reference to the following ratings and definitions:

Low - The possibility of instability is unlikely therefore no further action is necessary.

Moderate - The possibility of instability is likely and further investigation or remedial action may be required.

High - The possibility of instability is highly likely and further investigation or remedial action will be necessary.

Table 5: *Development specific risk assessment*

Item	Risk of Instability	Coal Seam(s) Considered	Risk Rating
1	Shallow coal workings	Black Bed Coal (BL)	Moderate
2	Coal workings at depth	The property is not within a surface area that could be affected by past underground mining.	Low

[6] http://www.bgs.ac.uk/data/boreholescans/

On the basis of all of the information provided above it is concluded that there is one shallow coal seams in the vicinity of the site. Whilst these seams may be of limited thickness, the possibility of this seam being worked below the site cannot be ruled out. Therefore it is considered that if coal was known to be close to ground level below the site, it could have been removed illicitly via shallow mining methods with relative ease.

It may be noted that guidance available from both the NHBC and the CIRIA publication, SP32 - *construction over abandoned mine workings,* suggests that competent overburden thickness above a coal seam should be greater than 10 times the thickness of a seam plus the seam thickness in order that the collapse of workings would pose a low risk to surface structures.

On this basis, assuming a maximum thickness of the Black Bed Coal to be 1.80m , 19.80m of competent overburden is required to prevent instability to future surface structures. As this coal seam is anticipated at depths ranging between 7m and 17m below the surface of the site, a moderate risk rating has been assigned to this seam and further investigation is recommended to prove/disprove the presence of illicit mining activity.

In regards to deeper mining which could affect the site, the Coal Authority holds no records that the property is in the likely zone of influence from past underground workings. Therefore, there is considered to be a low risk of instability at the site due workings at depth.

4. CONCLUSIONS

In light of the potential risks of instability at the site from the working of shallow coal at the site, it cannot be recommended that development takes place without further investigation to conclusively determine the presence of such workings. This work should include physical drilling methods to explore the ground conditions.

General practice is to undertake rotary openhole boreholes at three locations across the site to mitigate against the potential for drilling through pillars associated with pillar and stall workings. Furthermore, it is normal to investigate the ground to 30m below ground level; any workings below this depth are unlikely to result in significant instability. However, in this case, the risk of instability is due to shallow workings, therefore, drilling to these depths may not be necessary and the objective should be to ensure that the seams are un-worked. It may therefore be possible to undertake one borehole to 30m in the first instance with the remaining boreholes proving the depth and continuity of the coal seam. In any event, it is considered that approval should be sought with the Local Authority as to the efficacy of this approach.

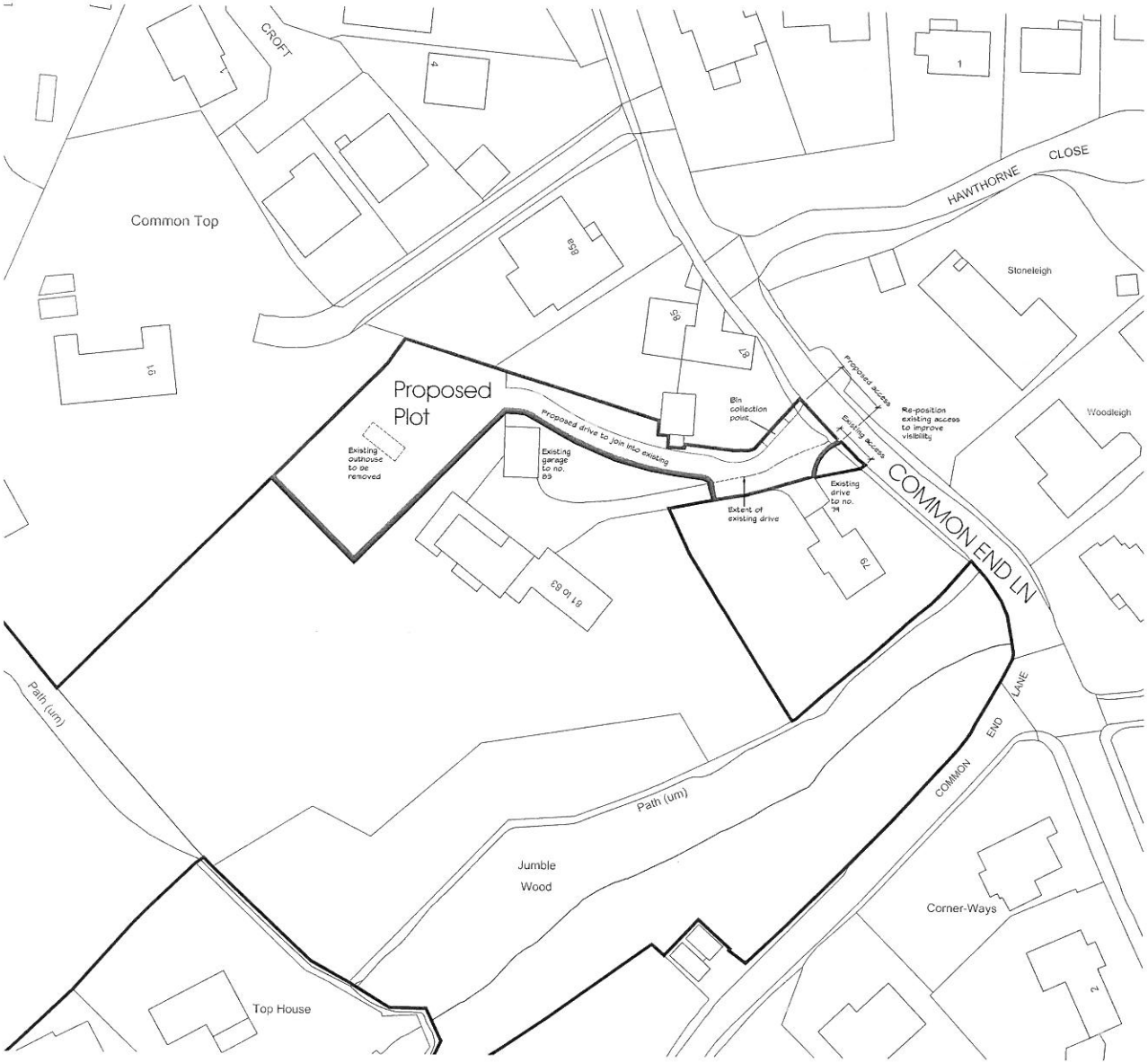
For and on behalf of
Rogers Geotechnical Services Ltd,

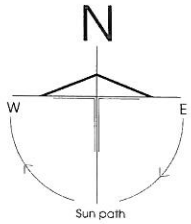
C. E. Mason BSc
Graduate Geotechnical Engineer

S.P. Rogers CEng, CGeol, MICE, MCIHT, FGS
Technical Director

APPENDIX 1

SITE PLAN





Site Layout Plan

Rev A: Blue line boundary added 13.05.16
REVISIONS:

Residential Development

at 83 Common End Ln
Lepton
Huddersfield
W. Yorkshire
HD8 0AF

Proposed Site Layout

Farrar Bamforth Associates Ltd.

Chartered Architectural Technologists

51, Trinity Street, Huddersfield HD1 4DN
Tel. (01484) 424008 Fax. (01484) 512305
E-mail : design@farrarbamforth.co.uk
Website : www.farrarbamforth.co.uk

Drawn	PLG
Date	May 2016
Scales	1:500 @ A2
Drawing No:	15/D28/02 Rev.: A

APPENDIX 2

COAL AUTHORITY MINING REPORT

The Coal Authority

Resolving the impacts of mining

CON29M Non-Residential Mining Report

83 COMMON END LANE
FENAY BRIDGE
HUDDERSFIELD
HD8 0AF

Date of enquiry:	16 June 2016
Date enquiry received:	16 June 2016
Issue date:	16 June 2016
Our reference:	51001185244001
Your reference:	J3542/16/EDS

CON29M Non-Residential Mining Report

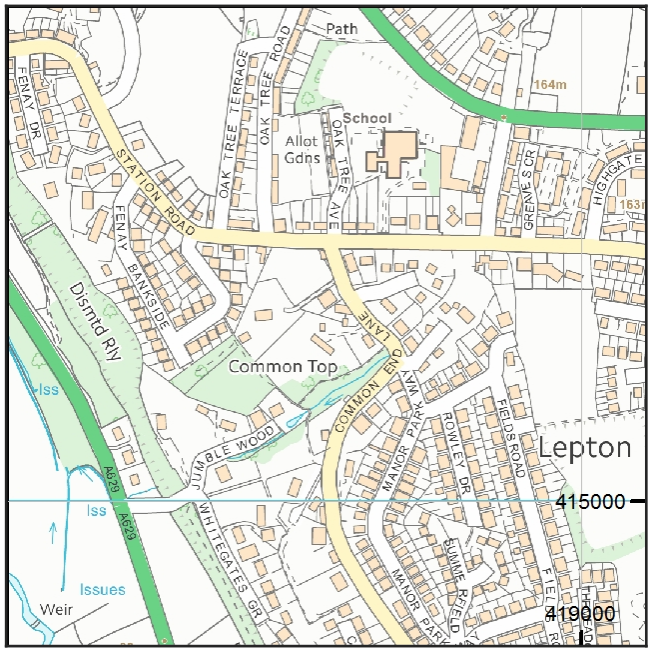
This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

Rogers Geotechnical Services Ltd

Enquiry address

83 COMMON END LANE, FENAY BRIDGE, HUDDERSFIELD, HD8 0AF



Approximate position of property

Mapping sourced from Ordnance Survey

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200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.gov.uk/coalauthority

/company/the-coal-authority
/thecoalauthority
/coalauthority

Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	Yes
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is not within a surface area that could be affected by past underground mining.

However the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity. Your attention is drawn to the Comments on the Coal Authority information section of the report.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, since 31st October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10. Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13. Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

15. Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Comments on the Coal Authority information

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In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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Alternative formats

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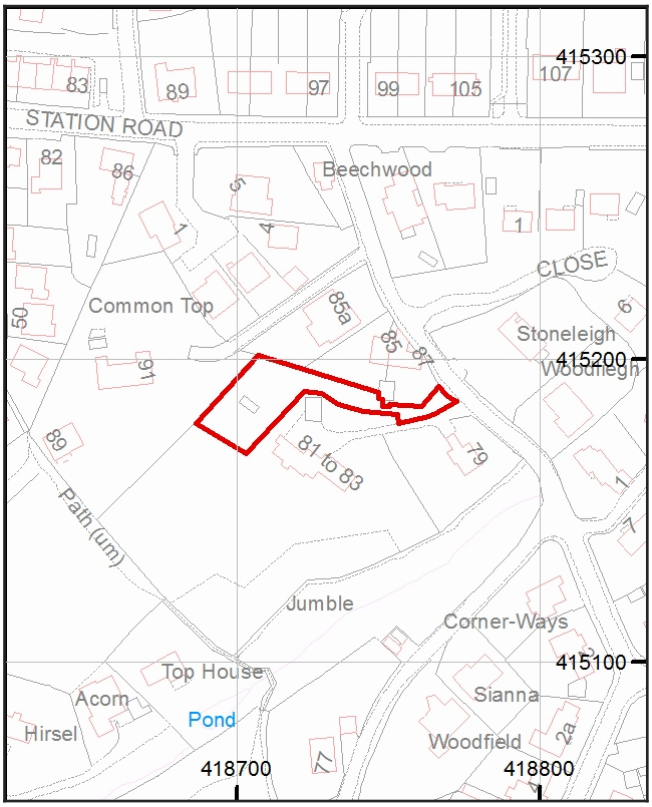
Enquiry boundary

Key

Approximate position of enquiry boundary shown



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VAT receipt	
Issued by:	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date:	16 June 2016
Issued to:	ROGERS GEOTECHNICAL SERVICES LTD BARNCLIFFE MILLS NEAR BANK HUDDERSFIELD HD8 8LU
Property search for:	83 COMMON END LANE FENAY BRIDGE HUDDERSFIELD HD8 0AF
Reference number:	51001185244001
Date of issue:	16 June 2016
Cost:	£77.00
VAT @ 20%:	£15.40
Total received:	£92.40
VAT registration:	598 5850 68

APPENDIX 3

BGS BOREHOLE RECORDS

HOLST & CO. LTD.

SITE INVESTIGATION DEPT

PARKSIDE LANE

LEEDS LS11 5SX.

SE11SE- 24

1916, 1490

Contract No. S10500/F2184

Borehole No. 3

Location Lepton

Ground Level

Client WEST RIDING COUNTY ARCHITECT

Date

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/in²	φ deg	m.c %	γ lb/cu. ft.	N
Topsoil		1'0	1'0						
Stiff grey and brown mottled silty shaley CLAY with Sandstone fragments		5'6	4'6	2'0	17.4	0	19.4	133	
Stiff grey & brown mottled silty CLAY		6'6	1'0	5'0	10.0	5	20.1	124	
Weathered shaley MUDSTONE and coal traces at 8'		16'0	9'6	8'6					56
Yellow SANDSTONE		34'6	18'6						
Grey MUDSTONE		44'6	10'0						
Dark Grey MUDSTONE		46'6	2'0						
Grey SILTSTONE		50'0	3'6						

Water Struck at None encountered

Maximum Observed Water Level

Undisturbed Sample ⁚⁚
Disturbed Sample o
Water Sample Δ
Penetration Test I

c = Cohesion
φ = Angle of Internal Friction
m.c = Moisture Content
γ = Bulk Density
N = Standard Penetration Value

Water levels are subject to seasonal or tidal variation and should not be taken as constant

British Geological Survey

HOLST & CO. LTD.

SITE INVESTIGATION DEPT

PARKSIDE LANE

LEEDS LS11 5SX.

SE11SE- 25

1915, 1492

Contract No. S10500/F2184

Location Lepton

Client WEST RIDING COUNTY ARCHITECT

Borehole No. 4

Ground Level

Date

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/in²	φ deg	m.c. %	γ lb/cu. ft.	N
Topsoil		1'0	1'0						
Firm brown silty CLAY with fine gravel		6'0	5'0	2'0 □	7.1.	0	29.5	123	
Brown mottled grey weathered shaley MUDSTONE		16'0	10'0	5'3 □ 9'0 I	16.2	6	16.9	133	84 for 1'
Yellow SANDSTONE		34'6	18'6						
Grey MUDSTONE with Siltstone bands		50'0	15'6						

Water Struck at None encountered

Maximum Observed Water Level

Undisturbed Sample ⁚⁚
Disturbed Sample o
Water Sample Δ
Penetration Test I

c = Cohesion
φ = Angle of Internal Friction
m.c = Moisture Content
γ = Bulk Density
N = Standard Penetration Value

Water levels are subject to seasonal or tidal variation and should not be taken as constant.

British Geological Survey

SE11SE-28

1911, 1488

HOLST & CO. LTD.

SITE INVESTIGATION DEPT

PARKSIDE LANE

LEEDS LS11 5SX.

Contract No. S10500/F2184

Location Lepton

Client WEST RIDING COUNTY ARCHITECT

Borehole No. 7

Ground Level

Date

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/in²	φ deg	m.c %	γ lb/cu.ft.	N
Topsoil		1'0	1'0	2'0					
Stiff grey and brown mottled silty CLAY		6'0	5'0	5'6	14.1	0	24.3	123	27
Brown shaley MUDSTONE		9'0	3'0	8'3					87 for 9"
Yellow SANDSTONE		27'6	18'6						
Grey MUDSTONE		38'0	10'6						
Dark grey MUDSTONE		40'6	2'6						
Grey SILTSTONE with Mudstone bands		50'0	9'6						

Water Struck at None encountered. Maximum Observed Water Level

Undisturbed Sample
Disturbed Sample o
Water Sample Δ
Penetration Test I

c = Cohesion
φ = Angle of Internal Friction
m.c = Moisture Content
γ = Bulk Density
N = Standard Penetration Value

Water levels are subject to seasonal or tidal variation and should not be taken as constant.

British Geological Survey

SE11SE-29
1910.1492

HOLST & CO. LTD.

SITE INVESTIGATION DEPT

PARKSIDE LANE

LEEDS LS11 5SX.

Contract No. S10500/F2184

Location Lepton

Client WEST RIDING COUNTY ARCHITECT

Borehole No. 8

Ground Level

Date

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/in²	φ deg	m.c %	γ lb/cu.ft	N
Topsoil		1'0	1'0	2'3					
Stiff yellow and brown mottled silty CLAY		7'0	6'0	5'3	14.0	0	27.5	123	
					10.0	5	20.7	126	
Brown weathered shaley MUDSTONE with coal traces at 9'		13'0	6'0	9'0					103 for 1'
Medium grained yellow SANDSTONE with Mudstone band 21'6 - 22'		28'0	15'0						
Grey shaley SILTSTONE		31'0	3'0						
Grey fractured MUDSTONE with Siltstone bands		41'6	10'6						
Dark shaley MUDSTONE with coal traces		43'0	1'6						
Brown and Grey SILTSTONE		50'0	7'0						

Water Struck at 20'0" Maximum Observed Water Level

Undisturbed Sample
Disturbed Sample o
Water Sample Δ
Penetration Test

c = Cohesion
φ = Angle of Internal Friction
m.c = Moisture Content
γ = Bulk Density
N = Standard Penetration Value

Water levels are subject to seasonal or tidal variation and should not be taken as constant

British Geological Survey