

**Environmental
Geotechnical
Specialists**



REPORT

job number	date
site address	
written by	
checked by	
issued by	

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GEO TECHNICAL
ENVIRONMENTAL



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Report on Rotary Probing

Location: **Dene House**
Kirkburton, HD8 0RW

For: Corgi Group Ltd

Consultants: Acumen Designers & Architects Ltd

Report No. J4323/18/E/C

Report date: August 2018

For and on behalf of **Rogers Geotechnical Services Ltd**

Steve Rogers CEng, CGeol, MICE, MCIHT, FGS
Technical Director

Rob Palmer MSc FGS ACIEH
Senior Geo-environmental Engineer

1. Introduction

It is understood that the site is to be developed by the demolition of an existing unit, and the construction of a replacement industrial building. As part of the planning process a site investigation has been undertaken to establish if coal workings are present beneath the area of the proposed works. This report presents the data obtained and discusses the ground conditions in relation to the proposed development.

2. Limitations

The recommendations made and opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of the laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between borehole positions, these are for guidance only and no liability can be accepted for their accuracy.

This report has been prepared in accordance with our understanding of current best practice. However, new information or legislation, or changes to best practice may necessitate revision of the report after the date of issue.



3. Preliminary Desk Study

The following information has been considered during the works.

- Appraisal of available on-line British Geological Survey and Coal Authority data.
- Acquisition of The Coal Authority licence.

4. Fieldworks

4.1 Acquisition of Licence

In order to undertake this investigation it was necessary to obtain permission to enter or disturb Coal Authority interests. This was permission was granted on the 18th August 2018 as permit reference number 16458, which is presented in Appendix 1 to this report. In accordance with the joint Coal Authority and Health and Safety Executive positioning statement, and under the requirements of the licence, the works were undertaken employing water flush drilling techniques with gas monitoring of the boreholes during the fieldworks.

4.2 Rotary Open-hole Boreholes

The fieldworks were undertaken on the 13th and 14th August 2018 in accordance with the instruction to proceed issued by the client. These works were required in order to prove that workings were not present to a depth of 30m beneath this site.

The boreholes were sunk using a Geo 205 rotary drilling rig employing rotary open-hole drilling techniques with 140mm diameter drag and tricone roller bits. Where necessary, 150mm diameter casing was temporarily installed through the overburden to support the bore. The investigation was undertaken using water flush drilling techniques in accordance with the Coal Authority and Health and Safety Executive positioning statement. Drill chippings brought to surface in the flush returns were inspected by the driller on a screen, which forms part of the re-circulation tanks. In addition, representative disturbed samples of the arisings were taken at regular depth intervals and sealed in plastic containers. These samples were returned to the laboratory for further inspection. The borehole positions are shown on the site plan, which is presented in Appendix 2 and the strata conditions are presented on the borehole records in Appendix 3.

Whilst it was necessary to ensure at least one borehole position was drilled to 30m depth, the required termination depth of the other position was reviewed during the course of the fieldworks. In this case, borehole BH1 was sunk to 30m, BH2 to 15m and BH3 was curtailed at 10m on the basis that sufficient data had been obtained.



5. Geological Appraisal

The available published geological data for the site has been examined and the following table presents the anticipated geology.

Table 1: Geological Data for the Site

Strata Type	Strata Name ¹	Previous Name	Description ²
Superficial Geology	None recorded	-	-
Solid Geology	Pennine Lower Coal Measures Formation	Lower Coal Measures	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 site is located on a tongue of the Pennine Lower Coal Measures Formation which protrudes into the outcropping Kirkburton Rock, which is a named sandstone member within the formation. On the basis of the geological section it should be noted that this sandstone unit will not be revealed beneath the site. There are no geological dip indicators relevant to the site (ie within the same faulted block) shown on the available geological map data. However, taking into account the outcrop pattern of the strata and the topography of the area, it may be assumed that the solid geology gently dips to the east. In addition, the nearest geological dip indicator to the site suggests that the strata dips 5° to the east.

There are two notable coal seams that outcrop within the vicinity of the site as summarised below:

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

Seam name	Seam thickness*	Outcrop distance from site*
Black Bed Coal (BL)	0.2m – 1.8m	Immediately N
Better Bed Band Coal (BB)	0m – 0.1m	840m NW

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

The geological data suggests that the Black Bed Coal seam will be observed at shallow depths (within the top 10m) of the site surface. Furthermore, taking into account the generalised dip of the local strata and the topography of the area, the Better Bed Coal is anticipated to be present at a depth in excess of 30m bgl. It is considered that any coal seams within 30m bgl, if worked, could pose a risk of instability to the proposed development. Taking the above information into consideration, it is likely that an intrusive investigation will encounter one coal seam (anticipated to represent the Black Bed Coal) at relatively shallow depth.

¹ Sources: British Geological Survey (NERC) Map Sheets 86; Glossop; Solid and Drift Edition, and the Geology of Britain Viewer [online resource from www.bgs.ac.uk]



6. Strata Conditions

In accordance with the geology of the area, the succession has been shown to include the following:

Table 3: Generalised strata profile

Depth to base (m)	Strata type	Positions strata was revealed	Groundwater strikes (m)
0.10 – 0.50	TOPSOIL	All	None
2.50	MADE GROUND (Black sandy clayey gravel)	BH1 and BH2	None
3.20 – 3.50	Brown sandy CLAY	BH1 and BH3	None
+10m - +30m	Interbedded Layers of SANDSTONE and MUDSTONE (Pennine Lower Coal Measures Formation)	All	None

'+' Denotes that the strata extended below the termination depth of the investigated positions, thus the extent of the deposit is only proven to the depths indicated.

During this investigation, after initially encountering approximately 0.5m of topsoil, orangish brown clay was revealed to a maximum depth of 5m. This stratum is anticipated to represent the upper most weathered fraction of the Pennine Lower Coal Measures formation, as indicated by the geological data for the site. Casing was installed to 3m within BH1 and BH2, and to 4.5m within BH3 due to soft ground conditions.

Below this stratum, competent layers of the Pennine Lower Coal Measures Formation were revealed to a depth of 30m, comprising interbedded layers of mudstones and siltstone. No coal seams were encountered during this work. Moreover, no voids were revealed during the drilling operations.

No obvious groundwater strikes were recorded during drilling. However, it is possible that the use of water flushing techniques may have masked the presence of any water strikes. In any event, it should be appreciated that groundwater levels are subject to seasonal variation or changes in local drainage conditions.

7. Discussion of Ground Conditions

On the basis of all of the information provided above it is noted that no coal seams were revealed to a maximum depth of 30m. In addition, the results of the gas monitoring conducted during the drilling phase suggest that there is a negligible risk of gasses associated with mine workings being present below the proposed development.



8. Risk Assessment

In light of the findings of this investigation, the risk to the proposed development is considered 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 4: Development specific risk assessment

Item	Risk of Instability	Coal Seam(s) Considered	Risk Rating
1	Shallow coal workings	No coal seams revealed	Low

In view of all the information obtained in this investigation, it is considered that there is a null to negligible risk of ground movement as a consequence of coal workings beneath the site.

9. References

- British Standards Institution (2015) BS5930: *Code of practice for site investigations*, B.S.I., London.
- P.R.HEALY, J.M.HEAD: Construction over abandoned mine workings, SP 32, 1984, CIRIA
- British Geological Survey (NERC) (2018), BGS, Keyworth.
 - Geology of Britain Viewer:
(http://maps.bgs.ac.uk/geologyviewer_google/googleviewer.html)
 - Borehole Scans:
(<http://www.bgs.ac.uk/data/boreholescans/>)
 - Lexicon of Named Rock Units:
(<http://www.bgs.ac.uk/lexicon/>)



Appendix 1

Coal Authority Licence



The Coal
Authority

Permit to Enter or Disturb Coal Authority Mining Interests

Permit Reference Number 16458

Name and Address of Permit Holder:

*Cogri Group Ltd
Dene House
North Road
Kirkburton
Huddersfield
West Yorkshire
HD8 0RW*

Site Location:

*Land at Dene House
North Road
Kirkburton
Huddersfield
West Yorkshire
HD8 0RW*

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

3 boreholes to 30m to investigate ground conditions

within the Authority's mining interests at the identified site location for the period of 12 months from the granted date shown below. The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Applicant's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.

Signed: *Graham Law* Granted Date: *18th August 2018*

For and on behalf of The Coal Authority

Nominated Representative: Graham Law, Permitting Manager;

The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG

Tel: 01623 637320; E-Mail: permissions@coal.gov.uk



Appendix 2

Site Plan



Plan not to scale and investigation positions approximated from site operative's notes.

Title: **Investigation Location Plan**



Rogers Geotechnical Services Ltd

Site Name:
Dene House, Kirkburton

Job No:
J4323/18/E/C



Appendix 3

Rotary Borehole Records



Borehole Log

Borehole No.

BH1

Sheet 1 of 3

Project Name: Dene House

Project No.
J4323/18/E/C

Co-ords:

Hole Type
RO

Location: Kirkburton

Level:

Scale
1:50

Client: Cogrig Group

Dates: 13/08/2018

Logged By
DG

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.10			TOPSOIL (Driller's description). MADE GROUND (Black sandy gravelly CLAY) (Driller's description).	1
					2.50			Brown sandy CLAY (Driller's description).	2
					3.50			Grey MUDSTONE and SILTSTONE (Driller's description).	3
					4.50			Grey SILTSTONE (Driller's description).	4
									5
									6
									7
									8
									9
									10
								Continued on Next Sheet	

Remarks

Casing to 4.5m. 30 bags of gravel for backfill.





Borehole Log

Borehole No.

BH2

Sheet 1 of 2

Project Name: Dene House

Project No.
J4323/18/E/C

Co-ords:

Hole Type
RO

Location: Kirkburton

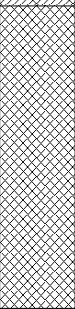
Level:

Scale
1:50

Client: Cogrig Group

Dates: 14/08/2018

Logged By
DG

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.50			TOPSOIL (Driller's description).	
								MADE GROUND (Black clayey sandy GRAVEL) (Driller's description).	1
					2.50			Light grey MUDSTONE and SILTSTONE (Driller's description).	2 3 4 5 6 7 8 9 10
								Continued on Next Sheet	

Remarks

Casing to 3m. 15 bags of gravel for backfill.





Borehole Log

Borehole No.

BH2

Sheet 2 of 2

Project Name: Dene House

Project No.
J4323/18/E/C

Co-ords:

Hole Type
RO

Location: Kirkburton

Level:

Scale
1:50

Client: Cogrig Group

Dates: 14/08/2018

Logged By
DG

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					11.70			Grey MUDSTONE and SILTSTONE (Driller's description).	11
									12
									13
									14
					15.00			End of Borehole at 15.00m	15
									16
									17
									18
									19
									20

Remarks

Casing to 3m. 15 bags of gravel for backfill.





Borehole Log

Borehole No.

BH3

Sheet 1 of 2

Project Name: Dene House

Project No.
J4323/18/E/C

Co-ords:

Hole Type
RO

Location: Kirkburton

Level:

Scale
1:50

Client: Cogrig Group

Dates: 14/08/2018

Logged By
DG

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								Brown sandy CLAY (Driller's description).	1
					3.20			SANDSTONE (Driller's description).	2
					5.00			Grey MUDSTONE and SILTSTONE (Driller's description).	3
					7.30			SANDSTONE (Driller's description).	4
					9.70			Light grey SILTSTONE and MUDSTONE	5
					10.00			Continued on Next Sheet	6

Remarks

Casing to 3m. 10 bags of gravel for backfill.





Borehole Log

Borehole No.

BH3

Sheet 2 of 2

Project Name: Dene House

Project No.
J4323/18/E/C

Co-ords:

Hole Type
RO

Location: Kirkburton

Level:

Scale
1:50

Client: Cogrig Group

Dates: 14/08/2018

Logged By
DG

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
								(Driller's description). End of Borehole at 10.00m	
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20

Remarks

Casing to 3m. 10 bags of gravel for backfill.

