

**Environmental
Geotechnical
Specialists**



COAL RISK ASSESSMENT

job number	date
site address	
written by	
checked by	
issued by	

Rogers Geotechnical Services Ltd
Telephone 0843 50 666 87 **Fax** 0843 51 599 30
Email enquiries@rogersgeotech.co.uk
www.rogersgeotech.co.uk
Offices 1 & 2, Barncliffe Business Park, Near Bank, Shelley,
Huddersfield, West Yorkshire HD8 8LU.



GEO-TECH-NI-CAL
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Report on a Coal Mining Risk Assessment

Location: 61 to 65 New Street
Huddersfield, Kirklees, HD1 2BQ

For: SA and Associates Company Ltd

Consultants: Acumen Architects

Report No. C2046/21/E/3145

Report date: September 2021

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

Redacted

Redacted

Charlotte Mason BSc FGS
Geo-environmental Engineer

Rob Palmer MSc FGS
Senior Geo-environmental Engineer

1. Introduction

It is understood that as part of the planning application 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 sheet¹.
- British Geological Survey *Geology of Britain Viewer*².
- Coal Authority Consultants Coal Mining Report³.
- British Geological Survey *Borehole Records*⁴.

¹ Sources: British Geological Survey (NERC) Map Sheet 77; Huddersfield Solid and Drift Editions

² Sources: British Geological Survey (NERC) Geology of Britain Viewer [*online resource from www.bgs.ac.uk*]

³ Coal Authority Reference: 51002645363001 3rd September 2021

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 ⁵	Previous Name ⁶	Description ³
Superficial Geology	Head	-	Head is poorly sorted and poorly stratified, angular rock debris and/or clayey hillwash and soil creep, mantling a hillslope and deposited by solifluction and gelifluction processes. Solifluction is the slow viscous downslope flow of waterlogged soil and other unsorted and unsaturated superficial deposits. The term gelifluction is restricted to the slow flow of fluidized superficial deposits during the thawing of seasonally frozen ground. The flow is initiated by meltwater from thawing ice lenses. Polymict deposit: comprises gravel, sand and clay depending on upslope source and distance from source. Locally with lenses of silt, clay or peat and organic material.
Solid Geology	Middle Band Rock	-	The Middle Band Rock is a thin and relatively impersistent thinly bedded rubbly sandstone notable mainly in the north of the district and around Huddersfield.

On the geological map, there are several dip indicators relevant to the site (i.e. within 500m of the site or within the same fault block) that suggests the solid geology beneath the site dips between 2° and 5° to the south east.

Firstly, it should be appreciated that the site is located on superficial head deposits. The thickness of these soils cannot be defined by the geological map data. However, based on professional judgement and local knowledge, such deposits usually span to a depth of between 1m and 3m in central Huddersfield.

Secondly, in terms of solid geology, the site is situated on a sandstone member of the Pennine Lower Coal Measures Formation known as the Middle Band Rock. This unit is recorded to be rarely over 5m in thickness and often laterally impersistent.

There is one local coal seam that is shown to outcrop within the local area. This 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*}	Anticipated depth below site
Soft Bed Coal (aka Halifax Soft)	0 – 0.8m	~800m West	Between 25m and 30m bgl

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

⁵ Sources: British Geological Survey (NERC) Map Sheets 77; Huddersfield; Solid and Drift Edition, and Geology of Britain Viewer [online resource from www.bgs.ac.uk]

⁶ Sources: British Geological Survey (NERC) Lexicon of Named Rock Units [online resource from www.bgs.ac.uk]



The Soft Bed Coal is the lowest worked seam in the district. However, this seam is known to have been extracted by shallow workings during the 19th century. The seam is often accompanied by an underlying seatearth, which was notably worked in Elland.

2.2 Coal Authority Mines Report

As part of this study a Coal Authority Consultants Coal 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 Consultant's Coal Mining Report

Has the report highlighted evidence or potential of:			
Ref	Mining Feature	Yes/No	Comments
1	Underground Coal Mining	No	No past mining recorded.
2	Probable Unrecorded Shallow Workings	Yes	No further details offered.
3	Spine Roadways at Shallow Depth	No	No spine roadway recorded at shallow depth.
4	Mine Entries	No	None recorded within 100m of the enquiry boundary.
5	Abandoned mine plans	No	None available.
6	Outcrops	No	No outcrops recorded.
7	Geological Faults	No	No faults, fissures or breaklines recorded.
8	Opencast Mines	No	None recorded within 500 metres of the enquiry boundary.
9	Coal Authority Managed Tips	No	None recorded within 500 metres of the enquiry boundary.
10	Site Investigations	No	None recorded within 50 metres of the enquiry boundary
11	Remediated Sites	No	None recorded within 50 metres of the enquiry boundary.
12	Coal Mining Subsidence	No	The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, 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.
13	Mine Gas	No	None recorded within 500 metres of the enquiry boundary.
14	Mine Water Treatment Schemes	No	None recorded within 500 metres of the enquiry boundary.
15	Future underground mining	No	For further information please see section 3 of the Consultant's Coal Mining Report (ref 51002645363001).
16	Coal mining licensing	No	
17	Court orders	No	
18	Section 46 notices	No	
19	Withdrawal of support notices	No	
20	Payments to owners of former copyhold land	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 website⁷. 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 of borehole (m)	Notable features
SE11NW216	60m NE	5m	Made ground -GL – 1.0m Very stiff yellow brown CLAY – 1m – 2.5m Weathered yellow SANDSTONE – 2.5m – 5m.
SE11NW964	78m NW	2.9m	Made ground – GL – 2.8m Highly weathered SANDSTONE – 2.8m – 2.9m....
SE11NW87	170m SW	15m	Thin capping of made ground underlain by stiff sandy silty CLAY – GL – 4.0m. Moderately weathered SANDSTONE – 4.0m – 6.2m. Interbedded dark grey / black MUDSTONES – 6.2m – 15m.
SE11NW90	240m SW	8m	Made ground underlain by stiff brown sandy CLAY – GL – 3.0m. Highly weathered SANDSTONE 3m – 5.8m. Highly weathered dark grey MUDSTONE – 5.8m – 8.0m.
SE11NW214	250m NW	22m	Made ground – GL – 3.8m. Mudstones – 3.8m – 7.0m. COAL - 7.0m – 7.3m . Mudstones 7.3m – 17.3m. VOID – 17.3 – 18.6m. No returns to base of borehole.
SE11NW215	230m NW	25m	Made ground – GL – 5.4m. Mudstones – 5.4m – 7.0m. COAL – 7.0 – 7.5m. Interbedded black and dark grey Mudstones – 7.5m – 18.0m. Coal – 18m – 18.6m. Interbedded sandstones and mudstones 18.6m – 25m.
SE11NW33	190m NW	Various	A series of boreholes and a cross section were undertaken – basic and incomplete data provided. 4 boreholes were drilled along Sergeantson Street – 4 boreholes intersected cavities at depths in excess of 14m bgl and of less than 1m thickness. 3 boreholes were drilled along Dundas Street – all boreholes intersected intact coal at between 10m and 12m bgl. 3 boreholes were drilling along Upperhead Row. 3 boreholes intersected cavities – exact depths unknown. 4 boreholes were drilled along Market Street. 2 boreholes intersected intact coal, 1 borehole intersected a cavity, 1 borehole intersected broken ground. Exact depths unknown



It should be appreciated that there was limited borehole data within the immediate vicinity of the site that was available for public viewing. Other borehole scans were available at a greater distance from the site (within other fault blocks), however, these were felt to be of limited value to the study as they are not anticipated to present comparable ground conditions to those below the surface of the site.

Nevertheless, the boreholes have indicated that, in areas where thicknesses of made ground are not significant, natural residual soils largely comprise sandy silty clays and span to depths ranging between 2.5m and 4m. Beneath these soils, a thin horizon of sandstone was recovered in the majority of boreholes (around 2m to 3.5m in thickness); this unit is anticipated to represent the Middle Band Rock.

Beneath the sandstone, all boreholes indicate that the stratum beneath the site predominantly comprises interbedded dark grey and grey mudstones. 2 out of 7 boreholes record a thin (0.3m – 0.5m) horizon of coal at 7m, with both boreholes noting this seam to be intact.

At the base of the mudstones (typically between 14m and 18m bgl, or un-qualified depths in the records attributed to the boreholes along Upperhead Road and Market Street) evidence of either voided strata or intact coal was recorded. Intact coal was noted to have a thickness of 0.6m, whereas voided stratum was recorded to be 1.3m in thickness. Given their thickness and depth below ground level, these features are anticipated to be associated with the Soft Bed Coal (Halifax Soft).

In view of the above information, it is reasoned that workings associated with the Soft Bed Coal (Halifax Soft) are present within the stratum profile within the local area.

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 attributed to	Coal Seam(s) Considered	Risk Rating
3.1	Shallow coal workings	Soft Bed Coal (SB)	Low
3.2	Coal workings at depth	The Coal Authority report indicates that the property is not within a surface area that could be affected by past underground mining.	Low
3.3	Mine gas	Shallow coal workings	Moderate



3.1 Risks Posed by Shallow Coal Workings

On the basis of all of the information provided above, the Soft Bed Coal is expected beneath the site within 30m of the site surface. Whilst this seam is often of limited thickness, the possibility of the seam being worked below the site cannot be ruled out. Historic coal mining activity is evident in the nearby area, and therefore it is considered that if coal was known to be close to ground level 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 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 coal seams, the table below suggests the thickness of competent overburden required above each seam to mitigate instability at the surface.

Table 6: Required Thickness of Competent Overburden

Seam Name	Seam thickness	Anticipated depth below site	Required thickness of competent overburden.
Soft Bed Coal (SB)	0.0 – 0.8m, however, workings of 1.3m recorded in the local area	In excess of 17m*	8.80m

*local BGS borehole records indicate workings attributed to this seam are present at depths of ~17m bgl. as this scan is located to the west of the site, and taking into consideration the dip of the solid geology (between 2° and 5° south-east), this seam is anticipated to be at a deeper depth beneath the site than identified in the borehole scan.

Based on the above information, it is considered that there will be a sufficient thickness of competent overburden above the Soft Bed Coal in order to prevent the risk of instability posed by the presence of any illicit workings. Therefore, a low risk rating has been assigned to this seam, such that no further action is required.

3.2 Risks Posed by Coal Workings at Depth

In regard to deeper mining which could affect the site, the property is not within a surface area that could be affected by past underground mining.

3.3 Risks Posed by Mine Gas

This assessment has concluded that there is potential for shallow mine workings to be present beneath the site, albeit the risks of instability posed by these features can be considered low. Nonetheless, it should be appreciated the shallow mine workings represent a potential source of ground gas. As such, a moderate risk rating has been assigned, and a detailed ground gas risk assessment should be commissioned (usually undertaken as part of a Phase 1 Desk Study). Such assessments may stipulate that a regime of gas monitoring is undertaken to quantify the risks posed by mine gas. Alternatively, in a scenario where gas monitoring has not been considered, suitable gas protection measures may be required. It should be appreciated that such measures could be designed in accordance with BS8485: 2015 +A1: 2019: *Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings*. It should be noted that in any event, the above will need to be agreed with the local authority prior to construction, as they are the final arbiters on these matters.



4. Conclusions

In light of the potential risks of instability at the site from the working of shallow coal, it has been determined that whilst there is a possibility that workings associated with the Soft Bed Coal could be present beneath the site, due to their anticipated depth and thickness, they are likely to pose a low risk to the development, such that no further action is required.

It is of note that Rogers Geotechnical Services would be happy to assist in any further intrusive investigation that may be required.



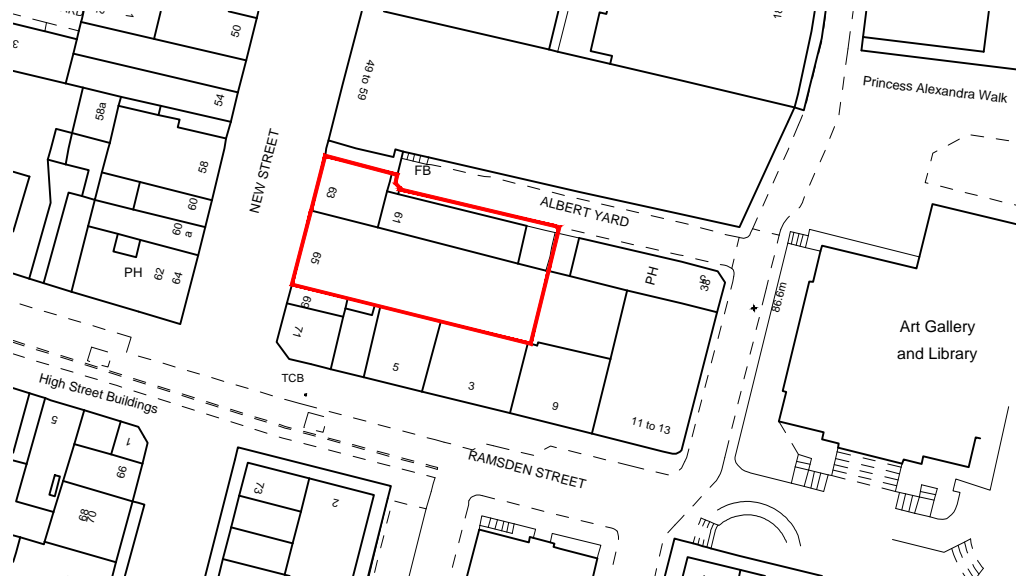
Appendix 1

Site Plan

Only figured dimensions should be used.

Scaled dimensions should be checked with the Architect.

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rev	description	drwn	auth	date
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Client SA ASSOCIATES		Project 61-65 NEW STREET HUDDERSFIELD			Description LOCATION PLAN		
Project No 2655	Drawing No LOC	Rev /	Scale 1:1250@ A3	Date Drawn AUG'20	Drawn By JF	Authorised By JC	Purpose of Issue Planning <input checked="" type="radio"/> Building Regs <input type="radio"/> Tender <input type="radio"/> Construction <input type="radio"/> Comment <input type="radio"/> info <input type="radio"/>

ACUMEN
DESIGNERS & ARCHITECTS

acumenarchitects.co.uk 01484 546 000
Headrow House, Old Leeds Road, Huddersfield, HD1 1SG



Appendix 2

Coal Authority Report



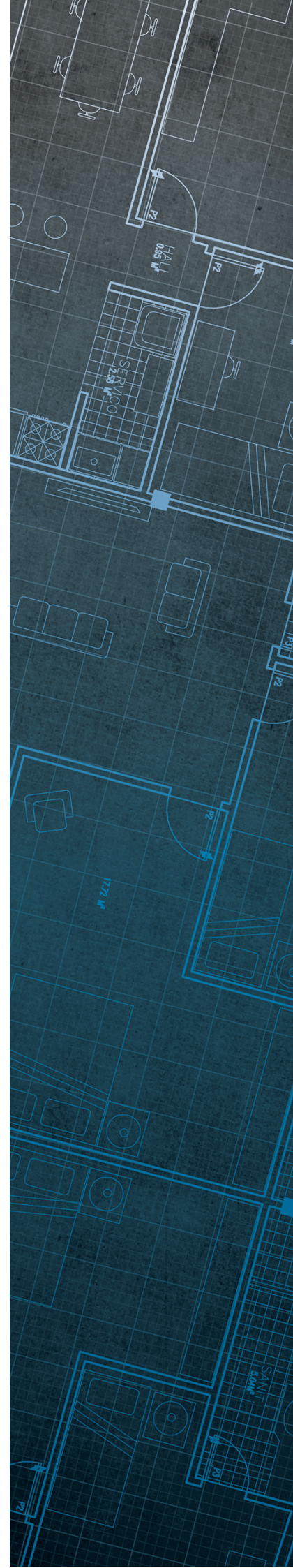
The Coal
Authority

Consultants Coal Mining Report

61-65 New Street
Huddersfield
Kirklees
HD1 2BQ

Date of enquiry: 3 September 2021
Date enquiry received: 3 September 2021
Issue date: 3 September 2021

Our reference: 51002645363001
Your reference: C/2046/21/E/3145



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

ROGERS GEOTECHNICAL SERVICES LTD

Enquiry address

61-65 New Street
Huddersfield
Kirklees
HD1 2BQ

How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

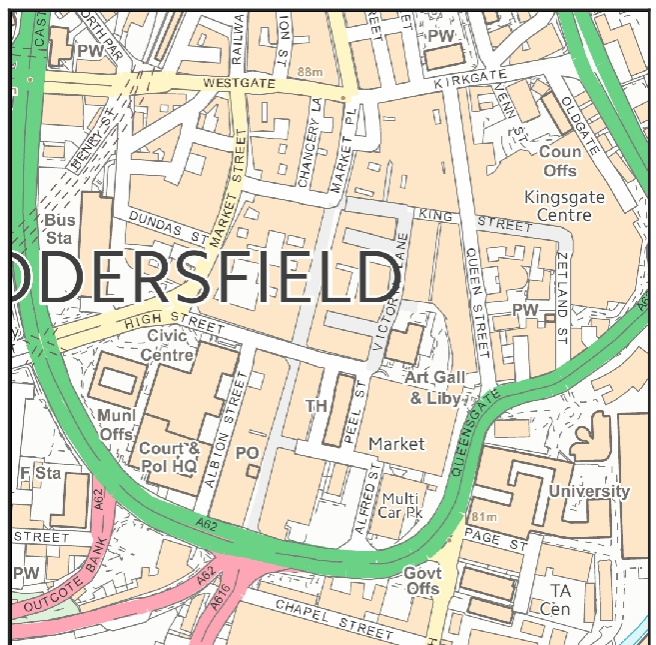
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 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

None available.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 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.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

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.

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.

Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices


Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

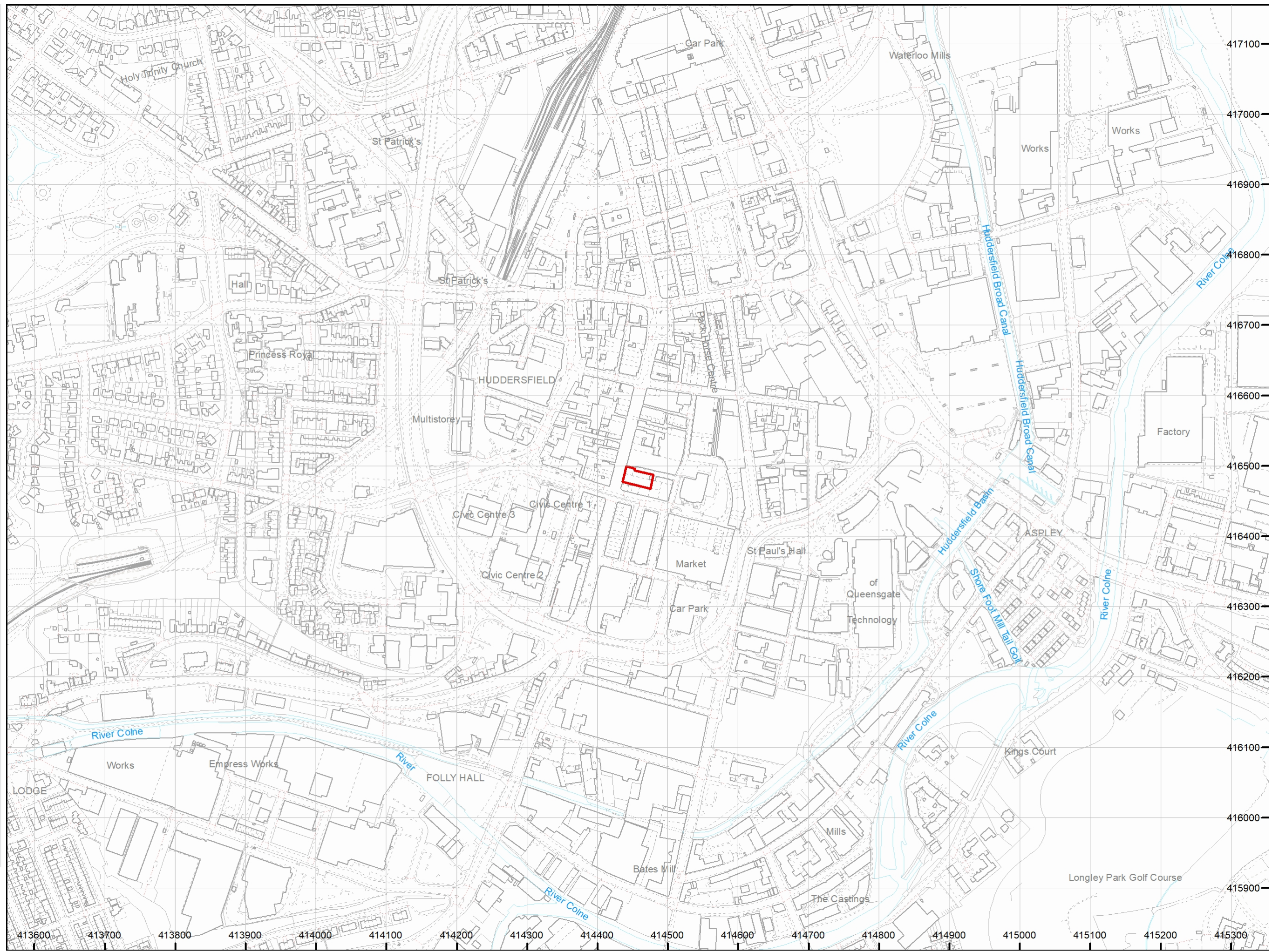
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

Approximate position of the enquiry boundary shown 

How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com







Appendix 3

BGS Borehole Records

RECORD OF BORING

BORING STARTED 4/3/81
 BORING FINISHED 4/5/81
 HOLE SIZE 88mm dia to 24.0m

GROUND LEVEL 95.0m O.D. Open hole rotary air flush
 20 degrees to vertical

SAMPLE OR TEST		Vertical		CHANGE OF STRATA	
DEPTH	TYPE	LEGEND	DEPTH	D.D. LEVEL	DESCRIPTION
					SE 11 NW 133 (P)
			3.8	91.2	Fill merging down into clay
			4.3	90.7	SANDSTONE with clay
					Dark grey MUDSTONE
<p>REMARKS</p> <ol style="list-style-type: none"> 1. Cased to 6m. 2. No cavity encountered 3. Groundwater encountered 					
<p>KEY: D — DISTURBED SAMPLE B — BULK DISTURBED SAMPLE W — WATER SAMPLE U — UNDISTURBED SAMPLE</p>		<p>S () STANDARD PENETRATION TEST C () CONE PENETRATION TEST NO. OF BLOWS FOR 300 mm PENETRATION IN BRACKETS</p>			

RECORD OF BORING (cont.) HODDERSFIELD
 GROUND LEVEL 95.0m O.D. Open hole rotary air flush
 20 degrees to vertical

BORING STARTED 4/3/81
 BORING FINISHED 4/5/81
 HOLE SIZE 88mm dia to 24.0m

SAMPLE OR TEST			Vertical		CHANGE OF STRATA
DEPTH	TYPE	LEGEND	DEPTH	O.D. LEVEL	DESCRIPTION
					SE 11 NW / 33 (D)
					Dark grey MUDSTONE
			15.0	80.0	
					Hard, light grey MUDSTONE
			18.5	76.5	
			19.0	76.0	COAL
					Hard, light grey MUDSTONE
REMARKS					
KEY: D - DISTURBED SAMPLE S () STANDARD PENETRATION TEST B - BULK DISTURBED SAMPLE C () CONE PENETRATION TEST W - WATER SAMPLE NO. OF BLOWS FOR 300 mm U - UNDISTURBED SAMPLE PENETRATION IN BRACKETS					

GROUND LEVEL 95.0m O.D. Open hole rotary air flush
20 degrees to vertical

BORING: STARTED 4/5/81
BORING: FINISHED 4/5/81
HOLE SIZE 88mm dia to 24.0m

SAMPLE OR TEST			Vertical		CHANGE OF STRATA
DEPTH	TYPE	LEGEND	DEPTH	O.D. LEVEL	DESCRIPTION
					SE 11 NW / 33 (C)
					Hard, light grey MUDSTONE
			22.8	72.2	

REMARKS

KEY: D - DISTURBED SAMPLE S () STANDARD PENETRATION TEST
 S - BULK DISTURBED SAMPLE C () CONE PENETRATION TEST
 W - WATER SAMPLE NO. OF BLOWS FOR 300 mm
 U - UNDISTURBED SAMPLE PENETRATION IN BRACKETS

GROUND LEVEL 95.0m O.D. Open hole rotary air flush
20 degrees to vertical

BORING: STARTED 4/5/81
BORING: FINISHED 4/5/81
HOLE SIZE 88mm dia to 24.0m

SAMPLE OR TEST			Vertical		CHANGE OF STRATA
DEPTH	TYPE	LEGEND	DEPTH	O.D. LEVEL	DESCRIPTION
					SE 11 NW / 33 (C)
					Hard, light grey MUDSTONE
			22.8	72.2	

REMARKS

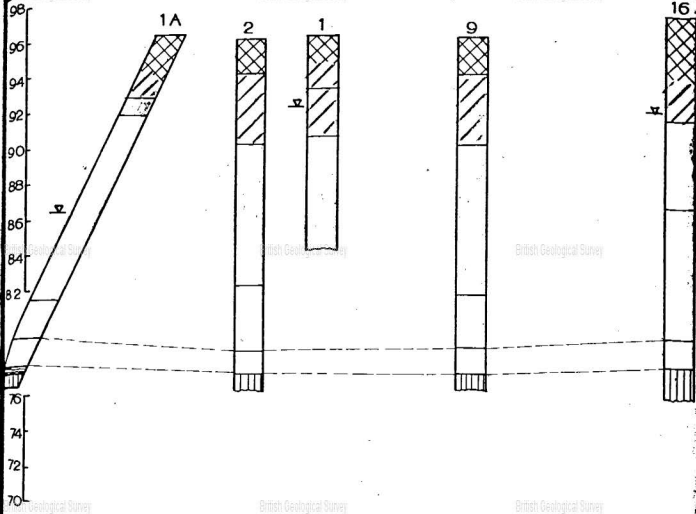
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 S - BULK DISTURBED SAMPLE C () CONE PENETRATION TEST
 W - WATER SAMPLE NO. OF BLOWS FOR 300 mm
 U - UNDISTURBED SAMPLE PENETRATION IN BRACKETS

SERGEANTSON STREET

SE11NW/33 A-S

DUNDAS

Level m (OD)



British Geological Survey

British Geological Survey

British Geological Survey

TREET

HUDDERSFIELD
DUNDAS STREET

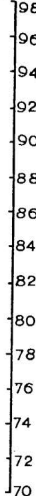
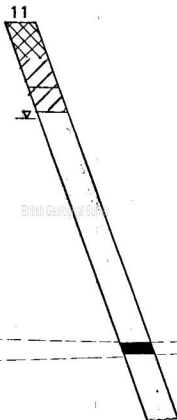
SE11NW/33A-S

British Geological Survey










British Geological Survey

British Geological Survey

Level m(OD)



KEY

-  Made Ground
-  Sandstone with clay
-  Sandstone
-  Mudstone
-  Coal
-  Cavity
-  Soft ground
-  Hard ground (presumed mudstone)
-  Water encountered

British Geological Survey

British Geological Survey

British Geological Survey

British Geological Survey

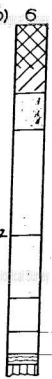
British Geological Survey

British Geological Survey

UPPERHEAD ROW

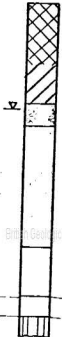
SE11NW/33A-S

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(OD)



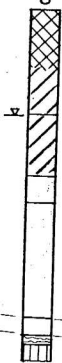
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7



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8



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Holst Soil Engineering Limited

Borehole No. 2

BOREHOLE LOG

SE 11 HW/87

Contract No. S11923/F2981
 Location Huddersfield
 Client Kirkless M.D.C.
 Method of Boring Percussion/Rotary Coring
 Diameter of Borehole 0.20m/8.10in

Sheet 1 of _____
 Chainage _____
 Ground Level 98.00m A.O.D.
 Date 15/8/74

14290 16468

Description of Strata	Legend	Depth below G.L.(m)	Thickness of Strata(m)	Type of Sample	c KN/sq.m	φ deg	m.c. %	γ Kg/cum	N
MADE GROUND, Ash, brick, stone		0.60	0.60						
Stiff dark brown mottled silty sandy CLAY with stone fragments.		0.70		□	103	13	20.8	2130	
		1.50		□	101	0	15.5	2255	
Moderately weathered highly fractured pale grey/brown fine micaceous SANDSTONE.		2.35		□	Large Sandstone fragment.		18.2		
		4.00	3.40	I					85 for 0.15m
Highly weathered silty MUDSTONE .		6.20	2.20						
Highly weathered highly fractured dark grey/black shaley MUDSTONE.		6.80	0.66						
Slightly weathered, slightly fractured dark grey black MUDSTONE.		12.70	5.90						
		15.00	2.30						

Type of Sample
 Undisturbed Sample φ Angle of Friction
 Disturbed Sample m.c. Moisture Content
 Water Sample γ Bulk Density
 Penetration Test N S.P.T. Value
 Apparent Cohesion

Remarks (Observations of Ground Water etc)
 Borehole Dry.
 Water levels are subject to seasonal or tidal variations and should not be taken as constant

Holst Soil Engineering Limited

Borehole No. 5

BOREHOLE LOG SE 11 NH/90

Contract No. S11923/EZ981

 Location Huddersfield

 Client Kirkless M.D.C.

 Method of Boring Percussion/Rotary Coring

 Diameter of Borehole 0.20m/0.10m

Sheet 1 of 1

Chainage

 Ground Level 100.10m A.O.D.

Date

14232 16452

Description of Strata	Legend	Depth below G.L.(m)	Thickness of Strata(m)	Type of Sample	c KN/sq.m	φ deg	m.c. %	γ Kg/cum	N
MADEGROUND. Ash, clay stone Stiff dark grey mottled silty clay with occasional stone fragments.		0.50	0.50	0.60 	62	0	26.3	1980	
Stiff light brown very sandy CLAY with stone fragments.		1.35	1.45	1.50 	114	0	25.1	2080	
		3.00	1.05	2.35 	120	0	16.1	2235	
Highly weathered moderately fractured pale grey/brown fine micaceous SANDSTONE with occasional mudstone bands.		5.80	2.60	3.50 					72
		8.00	2.20						
Highly weathered highly fractured dark grey/black shaley MUDSTONE.									

Type of Sample

- Undisturbed Sample φ Angle of Friction
 Disturbed Sample m.c. Moisture Content
 Water Sample γ Bulk Density
 Penetration Test N S.P.T. Value
 Apparent Cohesion

Remarks (Observations of Ground Water etc)

Borehole Dry.

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

1

Contract No. F6193

BOREHOLE LOG

Location George Street, Huddersfield

Sheet 1 of 3

Client J. Sainsbury P.L.C.

Chainage 98.31

Method of Boring Percussion/Rotary Open hole

Ground Level 9.10 m.A.O.D.

Diameter of Borehole 150mm/105mm

SE1NW/214

Date 9.10.84

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
MADE GROUND: reinforced concrete		0.30	98.01		0.40		
MADE GROUND: loose grey clayey sandy angular, flat sandstone gravel, cobbles and boulders.					1.05	6	
		2.35	95.96		1.50		
MADE GROUND: brown sandstone boulder					2.05	32 for 100mm	
		3.00	95.31		2.50		
MADE GROUND: sandy clay with sandstone gravel and cobbles.					3.05	18	
		3.80	94.51				
Stiff brown highly weathered MUDSTONE with sandstone fragments.					4.05 (75)		
		5.30	93.01				
Dark grey weathered shaly MUDSTONE, weak.				150mm + 140mm to 6.50m	5.55	97	
		7.00	91.31		6.55	144	
COAL		7.30	91.01				
Black, micaceous, carbonaceous MUDSTONE					Openhole drilling from 7.00m		

Type of Sample

- S.P.T. Undisturbed
 C.P.T. Vane
 Jar Water
 Bulk Piezometer

Remarks (Observations of Ground Water etc.)

() U100 blows
 Borehole dry during boring. Water standing in bottom of hole prior to rotary drilling.
 Inspection pit dug for services
 Chiselling boulder 2.35m to 3.00m, 3/4 hour

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

1

Contract No. F6193

BOREHOLE LOG

Sheet 2 of 3

Location George Street, Huddersfield

Client J. Sainsbury P.L.C.

Chainage

Method of Boring Rotary Percussion

Ground Level 98.31 m.A.O.D.

Diameter of Borehole 105mm

Date 12/10/84

SE11NW 214

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
MUDSTONE becoming slightly silty below 10m		14.00	84.31		○		
Dark grey micaceous slightly silty fissile MUDSTONE		17.30	81.01		○		
VOID		18.60	79.71		○		
SANDSTONE/MUDSTONE? - no returns							

Type of Sample

- Is S.P.T. Undisturbed
 Ic. C.P.T. X Vane
 O Jar Δ Water
 ● Bulk Piezometer

Remarks (Observations of Ground Water etc.)

No returns 18.60m - 22.00m. Descriptions by reference to borehole 2.

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

1

 Contract No. F6193
 Location George Street, Huddersfield
 Client J. Sainsbury P.L.C.
 Method of Boring Rotary Percussion
 Diameter of Borehole 105mm

BOREHOLE LOG

 Sheet 3 of 3
 Chainage
 Ground Level 98.31 m.A.O.D.
 Date 12/10/84

BSE 11NW 214

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
SANDSTONE/MUDSTONE? - no returns		22.00	76.31				
END OF BOREHOLE							

Type of Sample
 S.P.T. Undisturbed
 C.P.T. Vane
 Jar Water
 Bulk Piezometer

Remarks (Observations of Ground Water etc.)

Hard drilling at 20m and 22m
 No progress beyond 22m (hard strata) - hole not being cleaned -
 drilling terminated on clients instructions.

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

2

 Contract No. FB193

BOREHOLE LOG

 Location George Street Huddersfield
[14291665]

 Sheet 1 of 3

 Client J. Sainsbury P.L.C.

 Chainage 96.68

 Method of Boring Percussion/Rotary Open hole

 Ground Level 8.10.84 m.A.O.D.

 Diameter of Borehole 150mm/105mm
SE11NW/215

 Date 8.10.84

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D. %	Daily Progress
MADE GROUND: reinforced concrete		0.25	88.43		0.40		
MADE GROUND: sandy sandstone gravel with flat angular sandstone cobbles and boulder, bricks and brick fragments					1.05	11	
					1.40		
		2.40	94.28		2.05	12	
MADE GROUND: firm brown and dark grey silty sandy clay and sandstone gravel and cobbles.					2.55 (56)		
					3.50		
					4.05	42	
					4.75		
Brown sandstone BOULDER		5.40	91.28	150mm + 140mm to 6.05m	5.05	107	
Dark grey carbonaceous MUDSTONE		6.05	90.63		5.75		
					6.05	76 for 125mm	
					Open hole drilling from 6.20m		
COAL		7.00	89.68				
		7.50	88.18				
Black, slightly micaceous, carbonaceous MUDSTONE, iron staining to 10.00m							

Type of Sample

- S.P.T. Undisturbed
 C.P.T. Vane
 Jar Water
 Bulk Piezometer

Remarks (Observations of Ground Water etc.) () U100 blows *seating blows only
 Water struck at 5.40m, rising to 2.80m (20 minutes)
 Concrete broken out and pit dug for services
 Chiselling boulder 5.40m to 6.05m (1 hour)
 Water standing in bottom of hole prior to rotary drilling

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

2

Contract No. F6193

BOREHOLE LOG

Sheet 2 of 3

Location George Street, Huddersfield

Client J. Sainsbury P.L.C.

Chainage

Method of Boring Rotary Percussion

Ground Level 95.68 m.A.O.D.

Diameter of Borehole 105mm

Date 12/10/84

SE 11 NW 215

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
Black slightly micaceous carbonaceous fissile MUDSTONE.		13.50	83.18				
Dark grey slightly silty fissile MUDSTONE.		18.00	78.63				
COAL		18.60	78.08				
Light grey fine grained SANDSTONE with thin mudstone bands.							

Type of Sample

- Is S.P.T. Undisturbed
 Ic. C.P.T. Vane
 O Jar Water
 ● Bulk Piezometer

Remarks (Observations of Ground Water etc.)

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

2

Contract No. ER 183

BOREHOLE LOG

Sheet 3 of 3

Location George Street, Huddersfield

Client J. Sainsbury P.L.C.

Chainage

Method of Boring Rotary Percussion

Ground Level 96.68 m.A.O.D.

Diameter of Borehole 105mm

Date 12/10/84

SE11NW 215

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.O.D.%	Daily Progress
Light grey fine grained SANDSTONE with thin mudstone bands		20.50	76.18				
Grey silty fissile MUDSTONE		21.20	75.48				
White fine grained SANDSTONE with calcareous cement.							
Becoming very fine grained below 23m.							
25.00			71.68				
END OF BOREHOLE							

Type of Sample

- S.P.T. Undisturbed
 C.P.T. Vane
 Jar Water
 Bulk Piezometer

Remarks (Observations of Ground Water etc.)

Hard drilling at 21.80m, 22.60m and 24.60m

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

Norwest Holst Soil Engineering Ltd.

Borehole No.

1

 Contract No. F8103
 Location Victoria Lane, Huddersfield
 Client Birkett Stevens Colman
 Method of Boring PERCUSSION
 Diameter of Borehole 150mm

BOREHOLE LOG

SE11NW/216

 Sheet 1 of 1
 Chainage.....
 Ground Level..... m.A.O.D.
 Date 14.8.84 - 15.8.84

Description of Strata	Legend	Depth Below G.L. (m)	O.D. Level (m)	Casing Depth at Sampling	Sampling and Coring	"N"/R.Q.D.%	Daily Progress
MADE GROUND: bricks, masonry blocks, sand, plaster, steel sections		0.80					
MADE GROUND: re-inforced concrete		1.00					
Very stiff yellow brown CLAY with yellow sandstone fragments, cobbles and boulders.		2.50		150mm to 2.50m	1.50 ** (240)		
Weathered yellow SANDSTONE		5.00			2.50 3.50 5.00	50 for 30mm* 50 for 20mm* 95 for 60mm*	
End of Borehole		5.00					

Type of Sample

- S.P.T. Undisturbed
 C.P.T. Vane
 Jar Water
 Bulk Piezometer

Remarks (Observations of Ground Water etc.)

Borehole dry
 Chiselling obstructions 0.30-0.80m (2 hours)
 Chiselling concrete 0.80-1.00m (1 hour)
 Chiselling sandstone 2.50-5.00m (4 hours)
 *Seating blows only. **Boulder in hole

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



TRIAL PIT RECORD

TP No. **TP5**
Sheet 1 of 1

Site: **30-34 New Street, Huddersfield**

Contract No:
Q1115

Client: **CDP Ltd**

Dates:
24/01/2003

Method: **Komatsu 180 Tracked Excavator with 0.9m wide toothed bucket.**

Scale **1:25**

SAMPLE DETAILS

STRATA RECORD

Logged By: **RS**

Type	Depth From - To(m)	Vane Results kN/m ²	Groundwater	Description	Depth (m)	Level (MAOD) EGM	Legend	Well
D	0.00m - 0.50m			MADE GROUND: Brown sandy silty GRAVEL to boulders of fine to coarse subangular sandstone (some setts), brick and slate, with occasional fragments of plastic piping, wood, plastic sheeting and metalwork. (Reported to be recent cellar infill).				
D	1.30m - 1.60m							
D	2.00m - 2.40m							
D	2.80m - 2.90m			Light brown highly weathered SANDSTONE recovered as a sandy clayey gravel with cobbles of fine to coarse subrounded sandstone. End of Trial Pit at 2.90 m	2.80 2.90			

Remarks and Water Observations

1. No groundwater flows encountered
2. Slumping 0.0-2.8m.
3. Foundations of brick wall atop old cellar encountered on south side. Brick foundations of existing building, 0.0-0.3m, onto curved sandstone archway, 0.3-0.6m, onto brick cellar wall, 0.6-2.6m, trending west-east. Void 2.6-2.8m, reported to be flagstones removed during recent infilling of cellar. Cellar wall stepping out by 0.5m in SW and SE corners.

GL (m AOD)

-

Easting:

-

Northing:

-

Fig. No.

TP 5