

MINING INVESTIGATION REPORT

**12 HILLHOUSE LANE, FARTOWN, HUDDERSFIELD,
WEST YORKSHIRE**

Report 551079MI May 2015

Client:

Applied Experts Ltd
12 Hillhouse Lane
Fartown
Huddersfield
West Yorkshire
HD1 6EF

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CONTENTS

1. INTRODUCTION
2. OBJECTIVES
3. THE SITE
4. GEOLOGY
5. MINING
6. FIELDWORK
7. GROUND CONDITIONS
8. ENGINEERING CONSIDERATIONS
9. REGULATORY APPROVAL
10. SUMMARY

APPENDICES

FIGURES

- Figure 1 - Key Plan
- Figure 2 - Site Plan
- Figure 3 - Section

EXPLORATION LOGS

COAL AUTHORITY REPORT

COAL AUTHORITY PERMIT TO DRILL

APPENDIX A - FURTHER REPORTING

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1. INTRODUCTION

On the instruction of Toheed Ahmed, on behalf of Applied Experts Ltd, a Shallow Mining Investigation was carried out by Abbeydale Building Environment Consultants Ltd on a site off Hillhouse Lane, Huddersfield.

The site is located on the north side of Huddersfield and is centred within National Grid Reference square SE 1448 1784, at approximately 79m AOD. See Fig 1.

This report was produced on behalf of our client, and their advisors and financiers and should not be relied upon or transferred to any other parties without the express written authorisation of Abbeydale BEC Ltd and our client. If any unauthorised third party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.

The comments and recommendations presented in this report are based on the findings of a review of available information and assessment of the ground conditions encountered during the intrusive investigation work. There may be other conditions prevailing on the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

A previous shallow mining risk assessment, including Coal Authority (CA) report, has been undertaken by SGM Structural Design and has been used in this assessment. When writing this report the proposals were for the addition of a second floor to an existing commercial premises. It is understood that no changes are proposed to the existing footprint of the building. If there are changes to these proposals, then some modification to the comments and recommendations given may be required.

2. OBJECTIVES

This report has been undertaken to investigate and evaluate the potential risk to the development from historical mining at shallow depth, beneath the site. The report evaluates the current site proposals (where known) with regard to geotechnical and engineering considerations to determine what impact the existing ground conditions will have on the integrity of the proposed building. As part of this evaluation the report gives foundation, highway, drainage and remedial recommendations.

3. **THE SITE**

The site comprises of a one storey commercial property housing several business, bound to the north by Hillhouse Lane, with a concrete parking area separating the existing building from the road. To the east of the building lies a small area of grass, separated from Bradford Road by a brick wall. Rough ground and garages surround the property to the south and west, with residential properties beyond these.

It was noted that the western wall of the existing commercial building had a large crack, which had fractured not only the mortar between the bricks but the actual bricks themselves. Ground levels across the site are essentially level. However, the surrounding areas slope gently to the south and east such that the eastern end of the site is set approximately 1m above Bradford Road. See Fig 2.

Examination of archived historic maps show the site has previously been occupied by a series of residential properties from the earliest available maps dated 1854. The surrounding areas are also heavily residential. Between the 1930s and the mid 1950's the site and immediately adjacent areas appear to have been cleared. The site becomes developed to the current configuration by the 1970's with a single building recorded to the centre of the site and smaller garage type structures to the immediate west. Between 1978 and the present day there are no significant changes recorded to buildings within the site boundaries. The surrounding areas remain predominately residential.

4. **GEOLOGY**

The Geological Survey maps of the area, BGS Sheet 77 and Yorkshire County Series Sheet 246SE have been examined along with the memoir of the area. The site is shown to be underlain by undifferentiated Carboniferous Lower Coal Measures, and indicated to be dipping gently to the east. The site is located at a stratigraphic level similar to the Middle Band Coal, as this seam is conjectured on the Geological maps to outcrop within the site boundary.

The nearest geological fault shown is conjectured approximately 10m to the southwest of the site, trending southeast-northwest. Strata are downthrown to the northeast.

Drift deposits are not shown within or adjacent to the site area.

5. **MINING**

The presence of rock and mineral seams, including coal, which may have been mined or quarried in the area has been determined from the published geological map and the memoir of the area. In addition a previous shallow mining risk assessment undertaken by SGM Structural Design, has been examined.

The CA report, included within the mining risk assessment, indicates the property is in the likely zone of influence from workings in one coal seam at shallow depth, last worked in 1848. The report also notes that although future extractive works are not currently proposed, reserves of coal do exist in the area that may be worked in the future. No known mine entrances are recorded within, or within 20m of, the boundary of the site.

The mining risk assessment summarises the CA report and does not provide any additional information regarding the potential risk from shallow mining beneath the site.

The Middle Band Coal is shown on the geological maps to outcrop within the site boundary. The memoir states that this coal generally has a thickness of up to 30cm, and is described as having no commercial importance. This seam is often found to overlie a sandstone known as the Middle Band Rock, especially in the Huddersfield area, and can be up to 9m thick.

The next coal seam in the geological sequence is the Soft Bed Coal, found roughly 15m below the Middle Band Coal. The memoir states that the Soft Bed Coal is up to 0.5m in thickness, and has been worked considerably from outcrops. This coal seam is anticipated beneath the site at a depth of roughly 15m bgl.

Although the geological maps and CA report do not record any shafts within or adjacent to the site, the site has several shafts within a 1km radius, therefore the risk of unrecorded shafts is deemed **very high**.

There is no indication that any quarrying has taken place within the area which may affect the proposed development. It is considered that the risk from quarrying of minerals other than coal and ironstone is **low**.

6. **FIELDWORK**

Fieldwork was undertaken on the 26th of May 2015, in general accordance with Eurocode 7, BS 5930:1999 and BS 10175. Prior to undertaking site works permission to disturb CA property was obtained. The CA Permit to Drill is appended to the end of this report.

A total of three openhole boreholes (BH1 to BH3) were carried out using a lorry mounted top drive rotary rig with a 102mm diameter down the hole hammer and water flush. The strata descriptions were logged by our engineer from the arisings. The percentage flush returns and time to drill was also recorded. Holes were drilled to locate the Soft Bed coal with drilling depths of between 19.9m and 20.2m bgl. Continuous gas monitoring for Carbon Dioxide (CO₂), Methane (CH₄) and Carbon Monoxide (CO) was undertaken during drilling.

The ground levels of the exploratory holes were assessed on site using a tape measure relative to existing features. The levels should be reassessed once a topographical

survey is available. The positions of the holes were assessed relative to existing features using a tape measure and their approximate locations are shown on Fig 2.

No laboratory testing was required as part of this investigation.

7. GROUND CONDITIONS

The ground conditions encountered are recorded in detail within the openhole logs and are summarised on a section, Fig 3. Any diagram of the possible configuration of ground conditions between exploratory holes is conjectural and given for guidance only and confirmation of intermediate ground conditions should be considered if deemed critical.

For the purpose of this investigation, the drilling was carried out to determine the presence and depth of the Soft Bed coal and any associated historical workings. Openhole drilling is designed to establish general descriptions of the underlying strata. It can only provide the approximate thickness and depth of superficial deposits.

The site was covered by up to 3m of made ground consisting of sandy gravelly clay containing frequent brick fragments. This made ground possibly represents the backfilled cellars of the residential properties that existed on site before 1950, as the made ground in BH3 terminated on a 0.1m thick sandstone slab. The made ground was underlain by sandstone bedrock to a depth between 4.2m to 7.4m, with mudstone and shale below this.

The Middle Band Coal, shown on geological maps to outcrop within the site boundary was not encountered in any of the boreholes.

The Soft Bed Coal was not recovered from any of the three boreholes. BH1 recorded a zone of fast drilling between 18.8m to 19.3m bgl. Flush was completely lost at this point so there were no arisings meaning that the strata could not be identified. In BH2 flush was completely lost at 18.3m bgl, but the drilling speed did not increase. BH3 recorded a void between 18.8m and 19.1m bgl, and a complete loss of flush. Solid strata was then encountered at 19.1m until the borehole terminated at 20.2m bgl.

Due to the water drilling flush used, any ground water present could not be determined. No ground gas emissions were detected during the drilling.

8. ENGINEERING CONSIDERATIONS

8.1 General

An outline plan was available when completing this report. It is understood that no change to the footprint of the existing building is proposed with the development proposals being the addition of a second storey. The increase in proposed ground loadings were not known, but for the purpose of this report

the total loadings are assumed to be less than 100 kN/m². If there are any changes to these proposals, then some modification to the comments and recommendations given may be required.

8.2 Mining

The information recorded by the geological and archive information suggested the potential for historical mine workings beneath the site at shallow depth. The intrusive investigation undertaken confirms the archive information and indicates the presence of historical workings.

All three boreholes recorded a complete loss of flush at between 18.3m to 18.8m bgl. BH1 found a zone of increased drill speed associated with the loss of flush, between 18.8m to 19.3m bgl. BH3 showed a void between 18.8m and 19.1m bgl, indicative of collapsed workings.

8.3 Foundations

For a piled foundation solution, the depth of workings may be of concern and would require further consideration. For spread foundations founded below the made ground at least 250mm into undisturbed natural ground, the workings found are at sufficient depth not to be a significant concern. However we would recommend that foundations are reinforced to meet the structural engineers requirements. A net allowable bearing pressure of 80 kN/m² may be assumed.

8.4 Highways & Hardstanding

Highways and hardstanding will need to be constructed on re-engineered material. For design purposes a CBR of 2.5% may be assumed provided the formation is proof rolled and any soft spots are removed.

8.5 Drainage & Excavatability

Some difficulties in excavation of trenches for sewers and foundations in the bedrock should be anticipated. Consideration should be given to providing safe temporary support of excavations within made ground or where greater than 1.2m deep.

Given the proximity to existing properties beyond the site boundaries, and the potential shallow workings, soakaways are not considered suitable for this site. Off-site drainage should therefore be considered.

8.6 Chemical Precautions

No laboratory testing has been requested as part of this assessment. Consequently, at this stage it is recommended that sulphate and pH resistant cement is used as a precaution for all subsurface structures.

9. REGULATORY APPROVAL

The recommendations given in this report are based on the findings of available information and the intrusive site investigation, undertaken as described. The conclusions cannot be guaranteed to gain regulatory approval, should the report be required as part of a planning application. If it is required as such, it should therefore be passed to the appropriate authorities for comment and approval, prior to undertaking any remediation or development work.

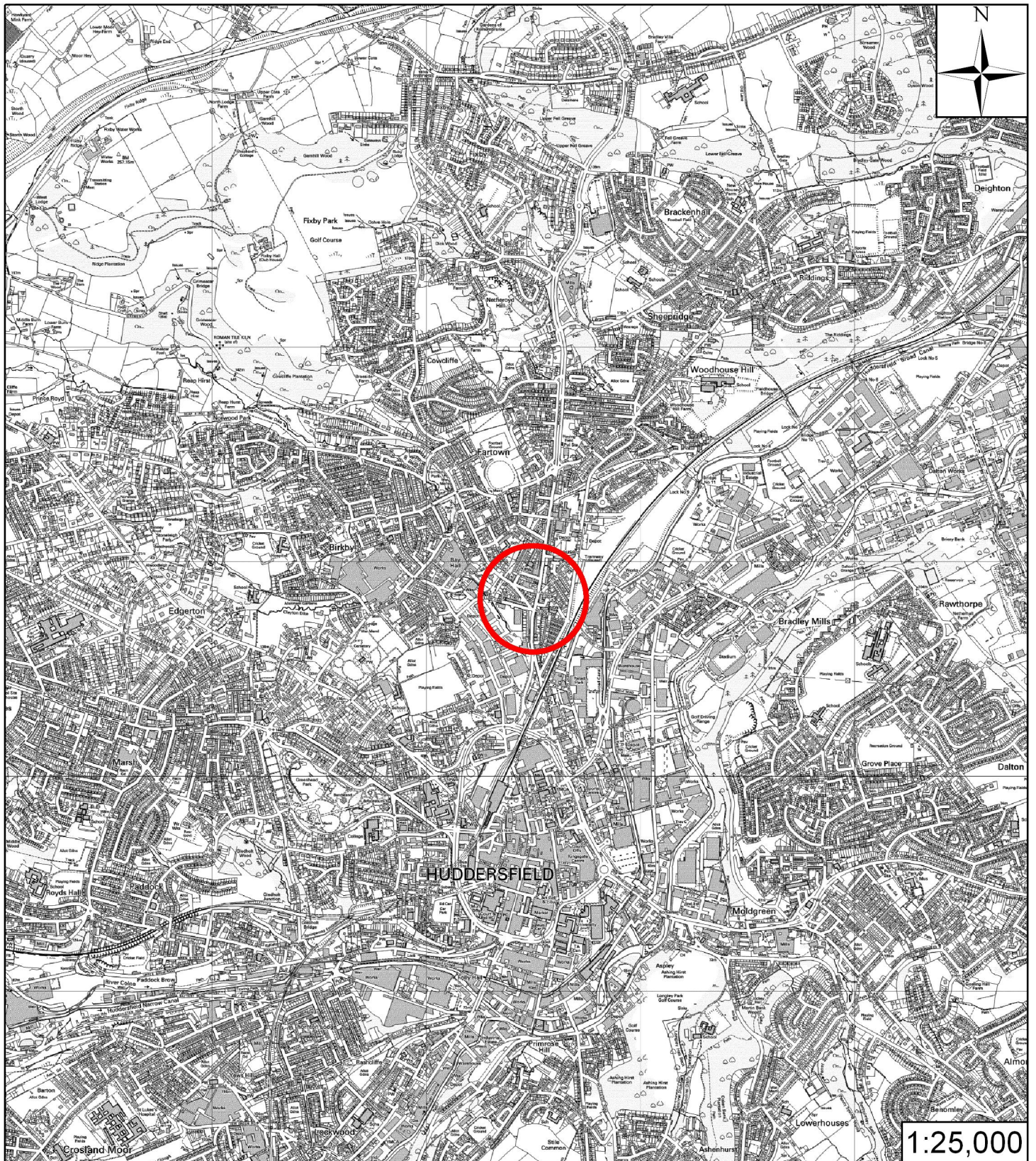
10. SUMMARY

- The site was previously occupied by residential housing, demolished sometime before 1950. The made ground encountered possibly represents the backfilled cellars of these buildings.
- The ground conditions encountered comprised of made ground over sandstone bedrock.
- Loss of flush in all three boreholes, associated with voids and increased drilling speeds indicate the presence of historical mining in the Soft Bed Coal seam, at a depth of 18.3m to 19.3m bgl.
- If pile foundations were to be used, further assessment will be required.
- Reinforced strip or pad foundations can be considered on undisturbed natural ground.
- There is a very high risk of unrecorded shafts.
- Soakaways are not considered suitable for this site.

For and on behalf of Abbeydale BEC Ltd.

Peter J Lloyd BSc. MSc. C.~~Geol~~FGS.
Senior Geologist
Report 551079MI/PJL/MW May 2015.

FIGURES



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Measurements should not be scaled from this map.



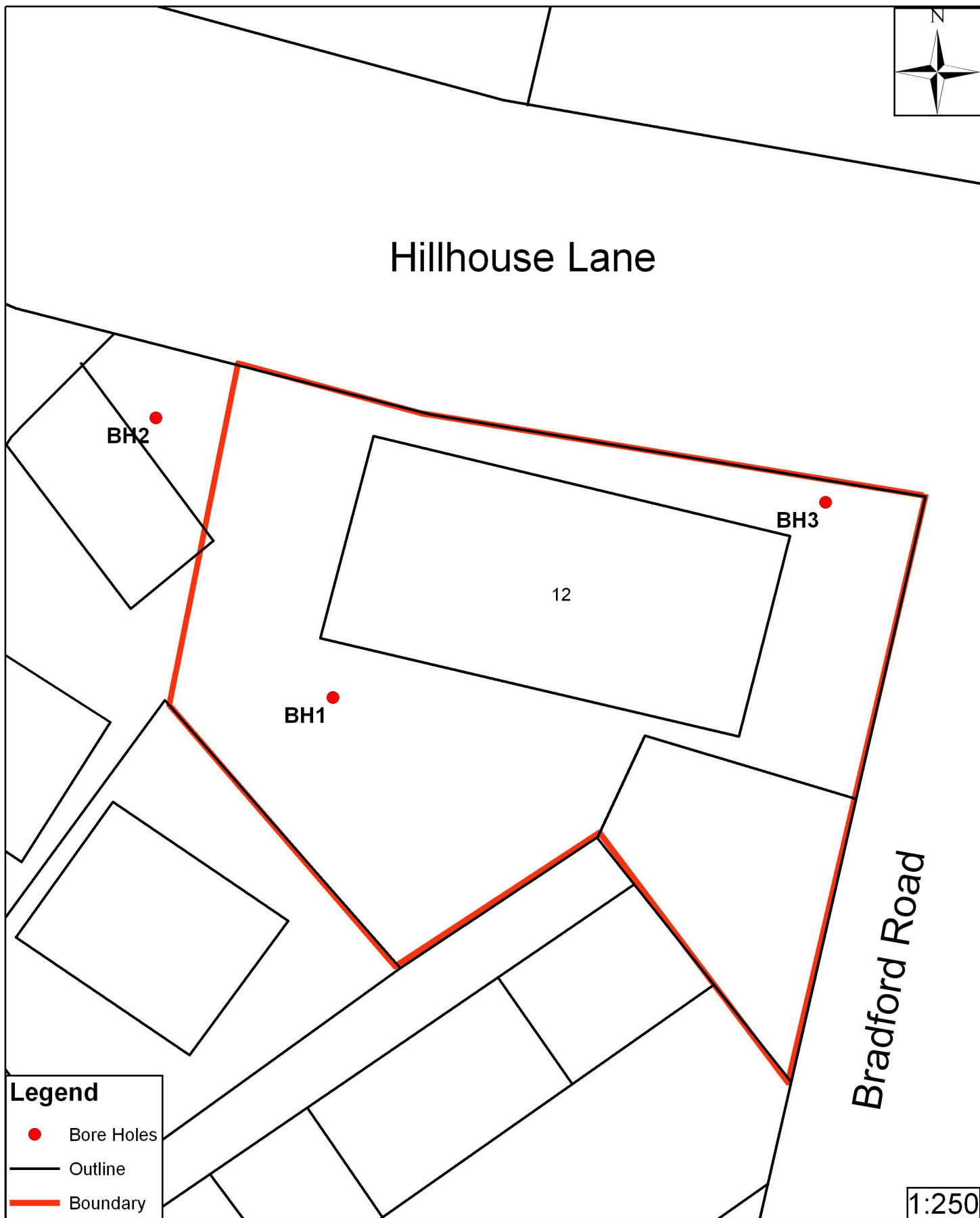
Abbeydale
Building Environment Consultants

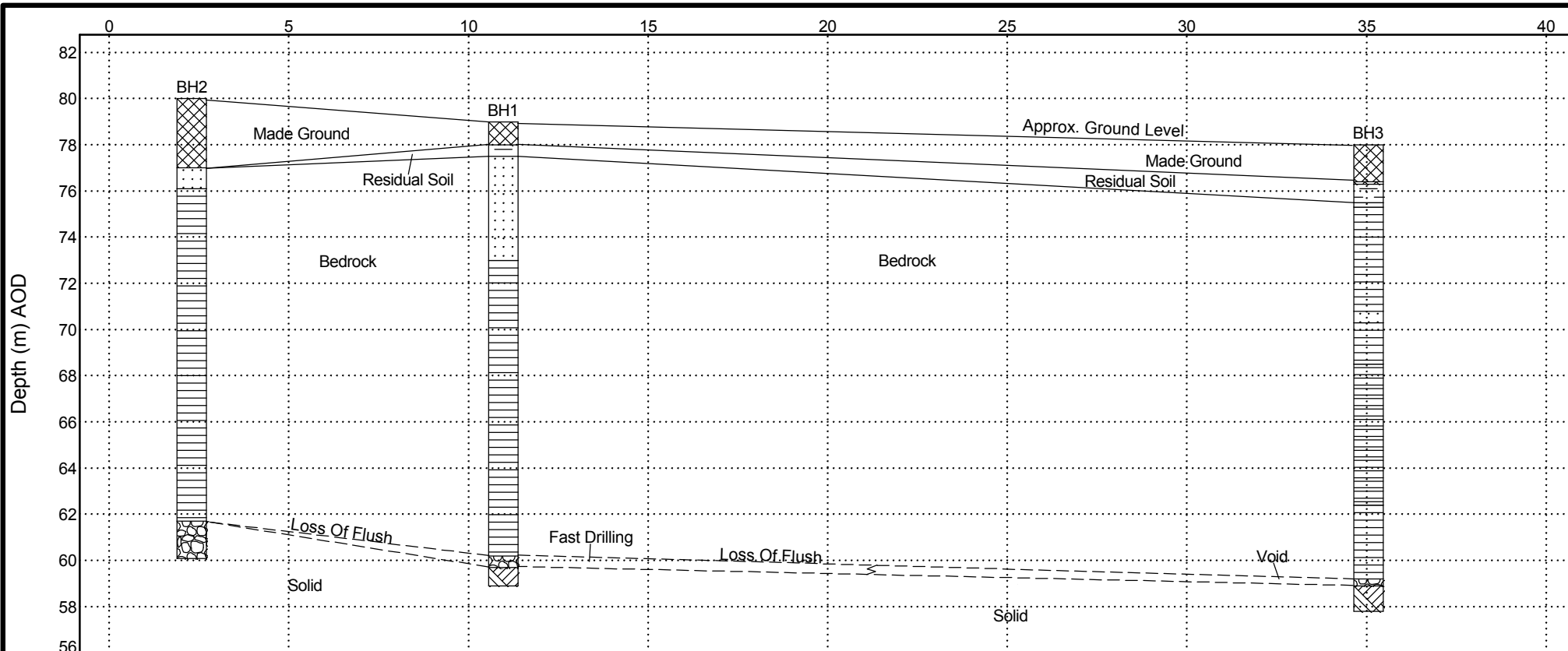
4 Neville Street WF1 5EF Tel: 01924 376622
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Key Plan

Project: 12 Hillhouse Lane
Job No: 551079
Client: Applied Experts Ltd

Fig 1





BH2

BH3



4 Neville Street, Wakefield, WF1 5EF Tel: 01924 376622 E-mail: info@abbeydalebec.com



SUBSURFACE DIAGRAM

Client: Applied Experts Ltd

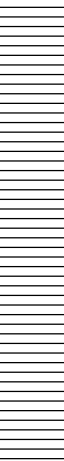
Project: 12 Hillhouse Lane, Huddersfield

Number: 551079

Fig 3

EXPLORATION LOGS

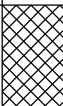
Project 12 Hillhouse Lane, Huddersfield, West Yorkshire				OPENHOLE No BH1
Job No 551079	Date 26-05-15	Ground level (m AOD) 79.00	Co-Ordinates (National) E 414,482.6 N 417,842.5	
Method/Plant Used Hans England, Lorry mounted, Top driven.				Sheet 1 of 1

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	Time Min/m	Flush %	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
Date						Flush			Detail
0.00	2.86	100 % Water	78.00		1.00		MADE GROUND. Black sandy clay. Sand consists of brick fragments.		
2.10		100 % Water	77.50		1.50		Brown CLAY.		
	2.66	100 % Water	73.00		(4.50)		Yellow SANDSTONE.		
5.10									
	2.66	100 % Water			6.00	Dark grey interbedded MUDSTONE and SHALE.			
8.10									
	3								
11.10									
	4								
14.10									
	6.33								
17.10									
	4.66	0 % Water	60.20		18.80	Loss of flush. No returns. Fast drilling but not void.			
20.10			59.70		19.30				
		0 % Water	58.90		20.10	No returns. Solid.			

Drilling Progress and Water Observations							GENERAL REMARKS	
Date	Time	Depth	Casing	WL m	Strike	Water Standing		
							CAT used to check for services. Backfilled with arisings. Stable	

All dimensions in metres Scale 1:200	Client Applied Experts Ltd	Contractor Infofoil	Logged By GH
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Project 12 Hillhouse Lane, Huddersfield, West Yorkshire				OPENHOLE No BH2	
Job No 551079	Date 26-05-15	Ground level (m AOD) 80.00	Co-Ordinates (National) E 414,473.9 N 417,856.2		
Method/Plant Used Hans England, Lorry mounted, Top driven.				Sheet 1 of 1	

RUN DETAILS			STRATA				Geology	Instrument/ Backfill	
Depth	Time Min/m	Flush %	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION			
Date						Flush			Detail
0.00 1.90	0.53	100 %			(3.00)		MADE GROUND. Dark grey gravelly sandy clay. Gravel is fine to coarse, angular to subangular brick. Possible backfilled cellar. Casing pushed down very easily from 2m.		
	2.66	100 %	77.00 76.10		3.00 3.90				
4.90		100 %			(14.40)				
	2.33								
7.90									
	2.33								
10.90									
	3								
13.90									
	4								
16.90									
	3		61.70		18.30				
19.90		0 %	60.10		(1.60) 19.90		Loss of flush. No returns. Solid.		

Drilling Progress and Water Observations							GENERAL REMARKS	
Date	Time	Depth	Casing	WL m	Strike	Water Standing		
							CAT used to check for services. Backfilled with arisings. Stable	
All dimensions in metres Scale 1:200			Client Applied Experts Ltd			Contractor Infofoil	Logged By GH	

Project 12 Hillhouse Lane, Huddersfield, West Yorkshire				OPENHOLE No BH3
Job No 551079	Date 26-05-15	Ground level (m AOD) 78.00	Co-Ordinates (National) E 414,506.7 N 417,852.0	
Method/Plant Used Hans England, Lorry mounted, Top driven.				Sheet 1 of 1

RUN DETAILS			STRATA				Geology	Instrument/ Backfill
Depth Date	Time Min/m	Flush %	Red'cd Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.00	0.45	100 % Water	76.40		(1.60)	MADE GROUND. Dark grey sandy gravelly clay. Gravel is fine to coarse, angular to subangular brick. Possible backfilled cellar.		
2.20		100 % Water	76.30		1.60			
		100 % Water	75.50		2.50			
	1.33	100 % Water	75.30		2.70	MADE GROUND. Yellow sandstone. Possible flagstone of cellar floor.		
5.20		100 % Water			(4.50)	Yellow-brown CLAY.		
		100 % Water				Dark brown MUDSTONE.		
	2		70.80		7.20	Dark grey MUDSTONE.		
8.20		100 % Water	70.30		7.70	Yellow SANDSTONE.		
		100 % Water	68.50		(1.80)	Dark grey MUDSTONE.		
	2.33				9.50			
11.20						Dark grey SHALE.		
	3.66	100 % Water			(6.10)			
14.20								
	4		62.40		15.60			
17.20		100 % Water			(3.20)	Brown MUDSTONE.		
	4		59.20		18.80			
20.20		0 % Water	58.90		19.10	Void. Loss of flush. No returns.		
		0 % Water	57.80		20.20	Solid. No returns.		

Drilling Progress and Water Observations							GENERAL REMARKS	
Date	Time	Depth	Casing	WL m	Strike	Water Standing		
							CAT used to check for services. Backfilled with arisings. Stable	
All dimensions in metres Scale 1:200			Client Applied Experts Ltd			Contractor Infofoil	Logged By GH	

COAL AUTHORITY REPORT



The Coal Authority

Issued by:

The Coal Authority, Property Search Services, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire, NG18 4RG
Website: www.groundstability.com Phone: 0845 762 6848 DX 716176 MANSFIELD 5

SGM STRUCTURAL DESIGN LTD
24 THORNHILL ROAD
HUDDERSFIELD
HD3 3DD

Our reference: **51000693387001**
Your reference: **2014/336 Banson Tool**
Date of your enquiry: **14 November 2014**
Date we received your enquiry: **14 November 2014**
Date of issue: **14 November 2014**

This report is for the property described in the address below and the attached plan.

Non-Residential Coal Authority Mining Report

12 HILLHOUSE LANE, HUDDERSFIELD, HD1 6EF

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.

Coal mining	See comments below
Brine Compensation District	No

Information from the Coal Authority

Underground coal mining

Past

The property is in the likely zone of influence from workings in 1 seam of coal at shallow depth, and last worked in 1848.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

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

The property is not in an area that is likely to be affected at the surface from any planned future workings.

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

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

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

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal mining geology

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

Opencast coal mining

Past

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

Present

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

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

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.

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 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

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

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.

Withdrawal of support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

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

Working facilities orders

The property is not in an area for which 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.

Payments to owners of former copyhold land

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

Comments on Coal Authority information

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.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

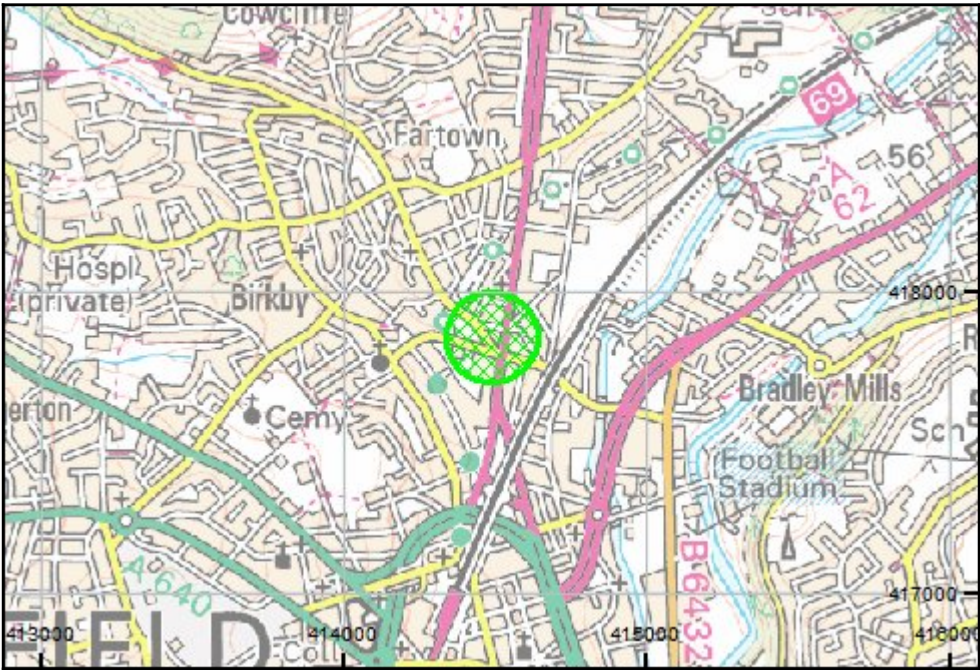
Additional Remarks

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 2006. The Coal Authority owns the copyright in this report. The information we have used to write this report is protected by our database right. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

Location map



Approximate position
of property

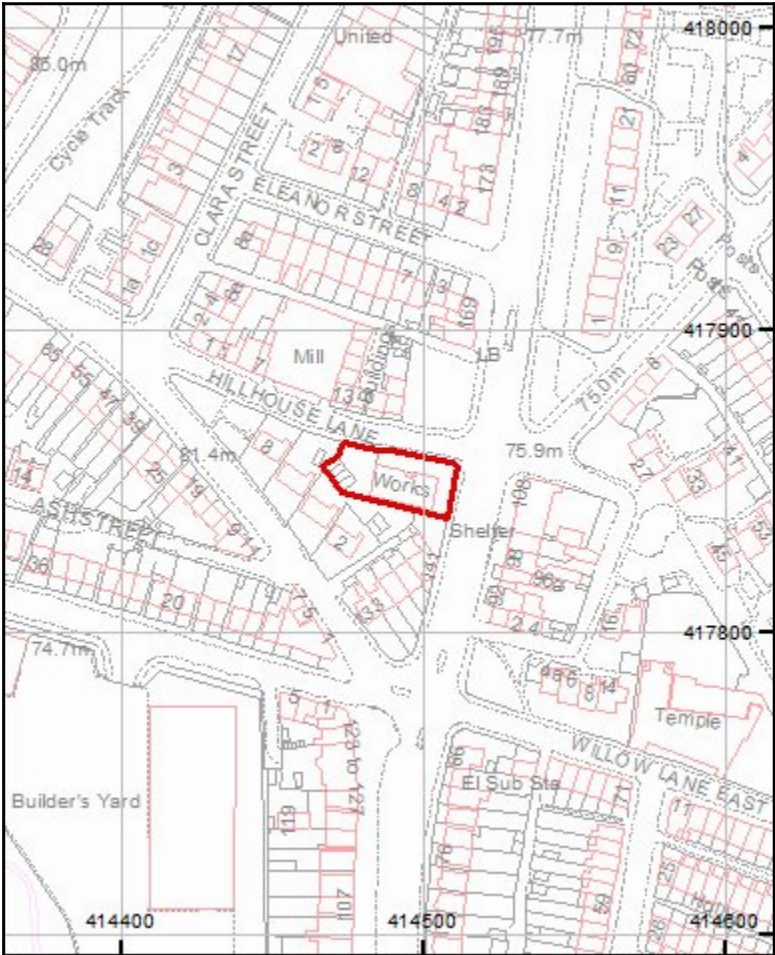


Enquiry boundary

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Key

Approximate position of enquiry
boundary shown



COAL AUTHORITY PERMIT TO DRILL



**The Coal
Authority**

Permit Reference Number 10680

Permission to Enter or Disturb Coal Authority Mining Interests

Name and Address of Permit Holder:

Abbeydale BEC Ltd
4 Neville Street
WAKEFIELD
WF1 5EF

Site Location:

12 Hillhouse Lane
Huddersfield
Kirklees

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

Investigation by boreholes to determine depth and condition of shallow coal seams within the Authority's mining interests at the identified site location for the period of 12 months from the effective date shown below. The granting of this Permission 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:

Effective Date: 18th May 2015

For and on behalf of The Director of Operations at the Coal Authority

Nominated Representative: Toni R. Lane, Licensing and Permissions Manager;

The Coal Authority, Licensing & Permits Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG

Tel: ; E-Mail: tonilane@coal.gov.uk

APPENDIX A - FURTHER REPORTING