LYONS CMC
COAL MINING & GEOTECHNICAL CONSULTANCY
Web: www.lyonscmc.co.uk
Email: mark@lyonscmc.co.uk
Mob: 07887555580

Developments by Boutique
50 Hoyland Road
Hoyland Common
Barnsley
South Yorkshire
S74 0PB

Date: 11th November 2024
Your ref: (S70 1HA)
My Ref: SI 00313

FOR THE ATTENTION OF LEE DRURY

Dear Lee,

COAL MINING RISK INTERPRETATION REPORT – FOLLOWING THE SITE INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT AT 120 B THE BUNGALOW, ST. GEORGES ROAD, BARNSLEY S70 1HA

I am pleased to supply the following report for the above named project and trust that this satisfies your requirements. Please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,

M Lyons

M. Lyons
Consultant Mining Engineer
BSci CSci MIMMM

Contents

1. Introduction

Planning permission is being considered to develop a detached dwelling at the above location subject to the mining legacy risks been fully realised and mitigated from on site, if necessary. Cape Site Services has now undertaken this work via an intrusive site investigation of 3 boreholes, the location of which is outlined on plan no. 00313/B – as attached and illustrated in appendix 5.2.

2. Scope of the Report

The mining legacy risks to the development are as follows:

- Instability from shallow underground coal workings
- Geological faulting/unstable bedrock
- Uncharted mine entries
- Fugitive gas emissions

As such, these risks need to be properly determined to ensure sound stability for the development. A borehole investigation consisting of 3 holes was deemed a reasonable level of investigation in the outset regarding potential void migration given the scale and nature of development combined with the available geological and mining information. A watching brief would also be implemented for any signs of mine entries.

It should be noted that this investigation is focused mainly on determining stability from potential shallow historic coal workings and will only provide limited information regarding the risks of uncharted mine entries.

3. Site Investigation

3.1 Methodology

Prior to the intrusive site investigation, a search for utilities was undertaken both via online data providers and physically on site using a Cable Avoidance Tool (CAT). Boreholes were marked out with tape measure from boundary lines as illustrated on plan no. 00313/B outlined in appendix 5.2. As part of the mine entry watching brief, a pre survey was undertaken with no visible evidence of any unchartered mine entries.

An investigation utilising a tracked Beretta Rotary Drill Rig equipped with 2m long 75mm diameter drill rods was deemed appropriate in this instance along with water flush techniques to analyse returns and minimise any risks associated with mine gas emissions and spontaneous combustion. Gas monitoring equipment would be employed during works for risks associated

with Methane, Carbon Monoxide, Oxygen, Carbon Dioxide and Hydrogen Sulphide. Prior agreement had been secured for these works from the Coal Authority -permit ref: 28672 – as attached for reference in appendix 5.4.

Considering the geological/mining details along with our CMRA report ref: CMRA 00313 dated 4th May 2023, boreholes were to be taken to 30m deep to fully determine the position.

The works were to be supervised by the Drilling Engineers Mr. S. Fish and Mr I. Wiles, and overseen by the Principal Engineer Mr. M. Lyons.

3.2 Interpretation of Findings

Boreholes numbers 2 and 3 proved 0.4m of made ground before natural weathered sandstone bedrock to 1.2m deep & 1.0m deep respectively, at which point the sandstone became firm. Borehole (BH) number 1 encountered the weathered sandstone from the surface to 0.8m deep before becoming firm. It was noted in BH3 that the weathered sandstone became wet and then the firm sandstone above the coal was very wet, possibly suggesting water tracking along the fault plane.

An in-tact coal seam of 0.8m thickness (quite poor quality – weak/weathered) was then encountered beneath the sandstone at: 2m to 2.8m deep in BH1; 5.2m to 6.0m deep in BH2 and 2.4m to 3.2m deep in BH3. As such, it is considered that BH2 is on the north-western side of the fault (the downthrow side).

Mudstone, sandstone and further mudstone was then determined below the coal seam to a second in-tact coal seam of circa 1.8m thickness (dirty with black mudstone) at: 19m to 20.8m deep in BH1; 22.2m to 24.0m deep in BH2 and 19.3m to 21.1m deep in BH3 (anticipated as the 'Kents Thick' coal seam).

Silty grey mudstone was then experienced below the second coal seam to 30m deep in all boreholes.

No signs of underground shallow coal workings were encountered at any of the three borehole locations and no fugitive gases were detected at any point during the drilling operations.

4. CONCLUSIONS AND RECOMMENDATIONS

1) Given the findings (poor quality weathered coal & geological faulting) it is considered that the risks of shallow coal mining for this specific site is very low. As such no further works or considerations regarding shallow coal and/or coal mine workings will be necessary for the development. Usual foundations can therefore be considered in line with the advice from the appointed building control department at the time of development - **and taking into account no. 2 below.**

2) It appears very likely from this investigation that the conjectured fault will travel beneath the proposed dwelling. As such it would be advised that either a) further works/inspections of footing trenches are carried out to determine the surface position of this feature to enable strengthening of foundations to span; or b) foundations are suitably designed/strengthened throughout the entire footprint to fully safeguard stability; for example by utilising slightly thickened strip footings with two layers of appropriate grade mesh top and bottom.

3) No signs of any mine entries were observed during the investigation. Watching briefs are always prudent however during future ground works for any associated signs of either an old mine shaft or adit. The Coal Authority should be notified where any such feature is suspected.

4) No fugitive gases were encountered during this investigation; however, some associated risks will exist given the shallow coal coal seam along with overlying faulted sandstone. It would therefore be prudent, in the absence of any further gas monitoring (note informative no. 3 in appendix 2), to include gas protection measures (such as a methane membrane for example) within future foundation designs; which could also protect from radon issues if required. All usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place.

Note: should there be any uncertainty of actual conditions during future ground works Lyons CMC or indeed the Coal Authority themselves can be further consulted for on site assessment if necessary.

A suitably qualified and competent professional should be employed to use this report to determine the conditions on site, and ultimately advise on what action, if any, is necessary to safeguard the development. It should be noted that any future works to investigate any coal seam, mines of coal or associated mine entries will need the prior consent of the Coal Authority via their permitting procedure.

I trust that this satisfies your requirements, however please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,

M Lyons

M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

Enc.

5 Appendix

5.1 References

5.1.1 CIRIA C758D ‘Abandoned mine workings manual’.

5.1.2 British Standards Institution: BS 5930:2015 ‘Code of practice for ground investigations’ BSI 2015.

5.1.3 British Standards Institution: BS EN ISO 14688-1: 2002 + A1 2013 ‘Geotechnical Investigation and Testing - Identification and Classification of Soil - Part 1 - Identification and Description. BSI 2013.

5.1.4 British Standards Institution: BS EN ISO 14689-1: 2003 ‘Geotechnical Investigation and Testing – Identification and Classification of Rock – Part 1 – Identification and Description. BSI 2003. Incorporating Corrigendum No. 1 February 2007.

5.1.5 British Standards Institution: BS 10175 ‘The Investigation of Potentially Contaminated Sites. Codes of Practice’. BSI 2011+A1 2013.

5.1.6 British Standards Institution: BS EN ISO 22476-3: 2005 + A1 2011 ‘Geological Investigating and Testing. Field Testing. Standard Penetration Test’.

5.1.7 British Standard 1377:1990 Parts 1-9 ‘Methods of Test for Soils for Civil Engineering Purposes’.

5.2 Borehole Location Plan No. 00313/B

120 B THE BUNGALOW, ST. GEORGES ROAD, BARNSLEY S70 1HA
Site Investigation
Borehole Location Plan
(NTS)

5.3 Drilling log sheets

Client: Lyons CMC	**Site: Land at 120B The Bungalow, St Georges Road, Barnsley. S70 1HA**		**Cape Site Services unit 2, rear of Castle Buildings Carlton Road, Barnsley, S71 3HX**
Date: 04/11/2024	**Method:** water flush	**Permit No:** 28672	
Driller: Ian Wiles		**Driller Assistant: Simon Fish, Richard Hawkins, Jonathon Doughty**	
		Page No: 1	

Measurements In Meters

BH No:	FROM	TO	THICKNESS	DESCRIPTION
1				
	0	0.8	0.8	Sandstone brown weathered
	0.8	2	1.2	Sandstone brown
	2	2.8	0.8	Coal (weak/weathered)
	2.8	4.7	1.9	Mudstone grey brown silty
	4.7	8.5	3.8	Sandstone brown grey silty some water loss
	8.5	19	10.5	Mudstone grey silty
	19	20.8	1.8	Coal dirty with black mudstone
	20.8	30	9.2	Mudstone grey silty odd sandstone bands
2				
	0	0.4	0.4	Made ground
	0.4	1.2	0.8	Sandstone brown weathered
	1.2	5.2	4	Sandstone brown
	5.2	6	0.8	Coal (weak/weathered)
	6	7.9	1.9	Mudstone grey brown silty
	7.9	11.7	3.8	Sandstone brown grey silty some water loss
	11.7	22.2	10.5	Mudstone grey silty
	22.2	24	1.8	Coal dirty with black mudstone
	24	30	6	Mudstone grey silty odd sandstone bands
3				
	0	0.4	0.4	Made ground
	0.4	1	0.6	Sandstone brown weathered; wet
	1	2.4	1.4	Sandstone brown; very wet
	2.4	3.2	0.8	Coal (weak/weathered)
	3.2	5.1	1.9	Mudstone grey brown silty
	5.1	8.9	3.8	Sandstone brown grey silty some water loss
	8.9	19.3	10.4	Mudstone grey silty
	19.3	21.1	1.8	Coal dirty with black mudstone
	21.1	30	8.9	Mudstone grey silty odd sandstone bands

5.4 Coal Authority Permit

The Coal Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 28672

Name and Address of Permit Holder:

Developments By Boutique
50 Hoyland Road
Hoyland Common
Barnsley
S74 0PB

Site Location:

Land at
120B The Bungalow
St Georges Road
Barnsley

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

Ground investigation by four boreholes to 30m to determine the depth and nature of shallow coal seams

within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) 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 Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- *Manned entry (i.e.) into mine entries/workings) is strictly prohibited.*
- *Water flush*
- *Gas Monitoring CO, CH_4, CO_2, O_2, H_2S at borehole and rig*
- *Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works*
- *Appropriate borehole sealing without delay and to withstand site level changes*

Signed: Ruth Griffiths Granted Date: *5th August 2024*

For and on behalf of The Coal Authority

Nominated Representative: Ruth Griffiths, Permitting Manager;
The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG
Tel: 01623 637450; E-Mail: permissions@coal.gov.uk

Appendix 5.5 Informatives:

1) The relatively recently revised CIRIA document titled 'Abandoned Mine Workings Manual', which replaced Special Publication 32 (1984), indicates that the use of empirical or 'rule of thumb' guides, as the design basis for treatment depth, has been successfully observed for many years for a wide range of abandoned mine workings and overlying rock/soil strata scenarios. As such, the guidance indicates that further design/ground stabilisation consideretions will be required if there is less than 10 times the aggregate measured height of mine workings as competent rock cover above the workings.

2) For information, should the grouting of any mine workings be required, a 10:1 PFA/cement mix or similar would need to be injected into the workings and any other disturbed strata above it under pressure on an OS coordinated treatment grid approved by the Coal Authority (and Building Control/third-party Warranty provider as required). Specific proposals to treat any mine workings would need to be submitted in the form of a standalone 'Specification', with a separate permit to treat being obtained from the Coal Authority. The method of consolidation is dependent on the nature of the bedrock strata and the underground mining conditions encountered, although fissile strata, such as shales and mudstone deposits, do permit mining voids to migrate upwards to quite high levels. All grouting works would need to be supervised by a competent engineer, with a final validation report being produced to confirm what works were undertaken and whether they were successful or not.

3) Ground gas monitoring can be undertaken to confirm or discount the presence of an elevated gassing regime within the underlying soils. Elevated concentrations of mine gases (e.g. CO2, CH4) may be present within the coal seams, voids in or above any shallow mine workings, areas of made ground/opencast backfill, and in any permeable bedrock strata (and any organic rich surficial soils). The period of monitoring to be undertaken should be broadly completed in accordance with current guidance [BS8485]. Piezometers would need to be installed (during drilling works for example) to facilitate this.