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Date: 12th July 2019
Your ref: (S75 4HS).
My Ref: CMRA 00215

FOR THE ATTENTION OF KIRSTY WILLIAMS & ANDY ENGLAND

Dear Sir/Madam,

**COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED RESIDENTIAL
DEVELOPMENT AT 1 HORN CROFT, CAWTHORNE, BARNSELY S75 4HS.**

Introduction

Planning permission is being sought for the development of a detached dwelling at the above named site, the location of which can be seen on the attached Plan No. 00215/A. The site is centred around national grid reference E: 428467 / N: 408179. A Coal Mining Risk Assessment is required for the proposals, in order to competently address the mining legacy for the site and determine what impact this may have had upon the land. The assessment is intended to be included as a supporting document to the current Barnsley MBC planning application no. 2017/0134.

Scope of the Coal Mining Risk Assessment

The purpose of this Coal Mining Risk Assessment Report is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site;
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any further works that may be necessary; and
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

British Geological Survey Information

Surface Geology (inc. any superficial deposits)

Records indicate the site to be located on shales, mudstones and the Parkgate Rock Sandstone of the Lower Coal Measure series from the Carboniferous formation. No superficial deposits are indicated in this vicinity. Strata is shown to dip to the north-east at around 1 in 12.

Coal Seam Outcrops

The 'Middelton Little' coal seam, also known as the 'Parkgate' seam is conjectured to outcrop some 40m to the west of the site which will dip beneath the land at relatively shallow depth – anticipate at between 5m and 15m should the conjectured detail be accurate. Records indicate that this specific coal can be up to around 2m in section.

The 'Middelton Main' coal seam, also known as the 'Thorncliffe' seam, is conjectured to outcrop some 130m away to the south-west which will lie beneath the Middelton Little seam by around 15m or more. Records indicate this coal to be in the region of 0.60m in section.

Made Ground

No made ground is indicated in the vicinity; a slight potential will exist may for discovering unknown historic localised 'digging out' of shallow coal, particularly if the actual seam outcrop position is closer to the site than expected.

Fault Planes or Fissures

Geological faulting is conjectured to pass the site some 70m to the north-east and around 150m to the south-west, both trending in a north-west to south-east orientation. The throw of these faults are both towards the site, making it within a 'trough' or 'graben' formation of strata. Although faults can sometimes be a zone of fractured planes it is unlikely that any will extend to affect the site itself.

Although no records of fissuring are known, some potential will exist if bedrock is proved to be the Parkgate Rock sandstone. Any natural fissures present within the rock could have been opened out by past mining settlement, particularly if any shallow coal workings are present.

Abandoned Mines Records

Opencast Coal Workings.

None known within 250m of site.

Underground Coal Workings - Deep

No records of deep coal mining (in excess of 30m) beneath this area are known, and as no coalfields now remain the site should be stable from the deep coal mining perspective for the foreseeable future.

Underground Coal Workings - Shallow

Although no workings are known beneath the site itself in the Middleton Little (Parkgate) coal seam, it is known to have been worked via the 'Clay Hall' opencast operations of 1952 around 450m away to the east. The abandonment plans from those workings shows to leaves of coal separated by a dirt band, indicated as: coal 28"/dirt 28"/coal 20"; which equates to coal 0.71m/dirt 0.71m/coal 0.5m. Total seam thickness therefore is just short of 2m. The plan detail also shows the strata to dip to the ENE (east-north-east) at a rate of 1 in 11. Given this detail there will be some risk of encountering old historic underground workings of the seam of which there is no record. Given seam thickness in relation to anticipated depth, there will be relatively high risk for any such mining voids, if present, affecting the stability of the development. It should be noted that it often takes many years for void migration to the surface to occur, in which case buildings can have been built over such risks without any affects to present.

No workings are known in the Middleton Main (Thorncliffe) coal seam beneath the site itself, although it has been worked via the 'Weir II' opencast operations of 1955 some 320m away to the NNW (north-north-west). The abandonment plan form those workings indicates a coal seam thickness of 16" which equates to around 0.4m, and a dip rate of the strata to the NE (north-east) of 1 in 14. Underground workings are known of this coal around 780m away to the SE (south-east) from the former 'Stanhope Colliery' during 1925. Those workings proved a seam thickness in the region of 0.6m in that area. In relation to the site itself, given the anticipated depth in relation to seam thickness it is unlikely that any uncharted workings of this seam would interact with the higher seam and in turn affect surface stability.

Mine Entries

No mine entries are known within 50m of the site. However, given the nature of the anticipated shallow coal in this vicinity there will be some risk of associated mine entries being present/encountered of which there are no records.

Fugitive Gases

As far as we are aware, no evidence of coal mining related fugitive gas emissions are known within 250m of the site. However there will be some risk for associated gases in relation to the shallow coal anticipated. These risks will increase if shallow coal workings are present and fissured sandstone bedrock is encountered to increase potential pathways.

Historical Records

According to the historical OS sheets for this area no indications are apparent of any old quarrying or other mining related operations in the vicinity of this land.

Coal Mining Risk Assessment (based on the above).

Coal Seam / Coal Mining Issue	Risk Assessment (VeryHigh/High/Moderate/Low/VeryLow)
Underground coal mining (at shallow depths)	Moderate to High
Mine entries (shafts and adits)	Moderate
Geological faulting	Low to Moderate
Geological fissures	Moderate
Fugitive gas emissions	Low to Moderate
Surface mining (opencast workings)	Low
Aggressive ground	Moderate to Moderate
Coal exposed / near foundation level	Low to Moderate

Defined Risk Assessment

(Where 'Underground Coal Mining' above = Very High to Moderate)

Extent of known underground mining in this/these shallow coal seam/s in the wider vicinity	(Extensive / Much / Occasional / None Known) Much
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Intrusive Site Investigation of Coal Seam / Mines of Coal (given nature of proposals).	(Required / Recommended / Unnecessary)** Required
Advised critical depth beneath foundation level to investigate considering geology and nature of the shallow coal/s*	25m (inc. one hole to 30m if no coal encountered)

Key:

* The critical depth is calculated according to Ciria Publication 32 guidance which details that for the land to be regarded as stable from any voided mineworkings, then a suitable section of competent rock cover above the workings should be proved that is equal or greater than ten times the 'in-tact' coal seam thickness. The advised critical depth to investigate to in this report takes into account the available geological information, any nearby mining records and may include a contingency for the seam to be of a slightly greater thickness than anticipated. Due care and diligence should be employed on-site to ensure that sound information is gathered of the in-tact seam thickness, particularly if concluding that old workings are outside the critical depth of affecting stability for the proposed development.

** Where :

Required	Intrusive Site Investigation required of the shallow coal/s and/or mine entries to determine any necessary stabilisation works for the given development.
Recommended	Intrusive Site investigation recommended – given a lower level of risk in relation to the nature of proposed development some proposals may reduce the risk to an acceptable level via suitable design considerations.
Unnecessary	Intrusive Site Investigation deemed unnecessary – given geological/mining information.

Coal Authority

Prior written permission from The Coal Authority is required for intrusive activities which will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). Further information on The Coal Authority's permissions process can be found at:

www.coal.gov.uk/services/permissions/index.cfm

Note: permission is not usually required for minimal coal that is encountered in excavations for foundations for example.

Information sources:

- *British Geological Survey Map Sheet ST 67 SW 1955 Edition*
- *British Geological Survey – Geology Of Britain Viewer*
- *Coal Authority Interactive Viewer and Mine Abandonment Plans*
- *Historical Mapping – old-maps.co.uk*

CONCLUSIONS

- 1) The site is stable from the **Deep Coal Mining** perspective, and as no coal fields now remain this position should continue for the foreseeable future.
- 2) Given the level of risk from the **Shallow Coal Mining** perspective is MODERATE to HIGH, an intrusive investigation would be deemed necessary for the proposed development. Considering the scale of the proposals between 2 and 5 boreholes would be thought adequate to determine the position, unless actual findings show a degree of uncertainty in which case more may be required. The holes should check the depth and nature of either the Middleton Little coal seam (also known as the Parkgate seam) which, according to the available information, is calculated at between 5 to 15m deep. Considering the thickness of this seam boreholes should be taken to the base of the coal, with at least one hole to 30m if no coal is encountered. The annex system chart indicates the recommended procedure for such works. As outlined, if any voids are encountered that calculate to be within an influencing depth beneath likely formation levels then further works may be required to stabilise the land. Conversely, if the seam is either in-tact or too deep then no further works would be recommended. Note: prior permission from the Coal Authority will be required to undertake the investigation.
- 3) Although unlikely, coal may be encountered close to the surface should the actual geology be somewhat different to that conjectured. A watching brief should be employed during the future grounds works for any signs of shallow coal and/or any historic spoil associated with historic digging out of former shallow coal – this may require treatment works to stabilise and/or foundations designed accordingly. The site investigation works would determine to some extent any sections of made ground if present. If coal is encountered it should be removed and blinded off to help prevent spontaneous combustions risks.
- 4) Although only moderate risk, any uncharted mine entries encountered should be reported to the Coal Authority (as owners) for their comments on what further operations may be

necessary to safeguard the development. Note: prior permission from the Coal Authority would be required to investigate or treat a coal mine entry.

- 5) Considering the potential for shallow coal, particularly if worked, and sandstone bedrock, all usual safety precautions should be employed regarding possible fugitive gases in any future investigations and/or deep excavation work taking place. These risks will increase should any shallow coal workings and/or mine entries be proved along with fissuring of sandstone bedrock. Mitigation measures may be required within foundation design, such as a methane membrane or positive ventilation. Further consultations with the Coal Authority would be recommended if such conditions are proved or suspected to ensure appropriate designs.

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 or associated mine entries will need the prior consent of the Coal Authority.

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

Consultant Mining Engineer

BSc CSci MIMMM

Enc.

THIS COAL MINING RISK ASSESSMENT IS BASED ON AND LIMITED TO THE INFORMATION IN MY RECORD AT THE TIME THE ENQUIRY IS ANSWERED. It is based on my professional opinion in line with the guidelines set out in CIRIA Special Publication 32 - "Construction Over Abandoned Mine Workings." The opinion may be overruled by Government Authorities decisions based on other information not in my record. If a site investigation is recommended then this risk assessment will be superseded by the factual findings of that investigation. All site investigation work should be carried out by a competent professional from which independent conclusions and recommendations for safe development should be provided. It should be noted that: no operation should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. The investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases; these risks both under and adjacent the site should be fully considered in any proposals both for personnel and public safety. Copyright in this CMRA belongs to M.A.Lyons. All rights are reserved and unauthorised use is prohibited. Copyright is not transferred to external parties by possession of this report, however, those for whom the report is compiled have the right to use it. If any unauthorised third party comes into possession of this report, they rely upon it entirely at their own risk and the author does not owe them any Duty of Care or Skill.

Annex:

Borehole Site Investigation (SI) Process Guide (Shallow Underground Coal Workings)

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