

Coal Mining Risk Assessment

This assessment has been written in accordance with guidance contained in The Coal Authority document: *Risk based approach to development management, Guidance for developers, Version 4, 2017*.

The assessment aims to:

- Provide a desk-based report of information on the coal mining issues which are relevant to the application site;
- Use the available information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact or issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development;
- 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.

Site Location and Description:

Huddersfield Town AFC propose to redevelop the training complex at the site located at Canalside, Huddersfield, HD2 1YJ, West Yorkshire. The site is accessed via Leeds Road and the proposed redevelopment is shown on Drawing Number 6017_SK09. The redevelopment generally comprises the construction of new buildings/structures (security checkpoint building at access, first team training facility, viewing stand, and groundsmans store) and the conversion of an existing building into U18 & U23 team facilities. In addition to these building/structural works, the redevelopment includes reconfiguring the access from Leeds Road; parking areas; retention and modification to some of the existing pitches; construction of a new full specification undersoil heated floodlit pitch; and the construction of maintenance compounds/irrigation tanks.

Sources of information:

- *Phase I Desk Study Report prepared by Ever Group Ltd, referenced HTAFC 3339 and dated May 2018 (Appendix A).*
- *Coal Mining Report CON29M Non-Residential Mining Report (reference 51001812412001) prepared by The Coal Authority, dated 29th March 2018, and attached at Appendix C of the Ever Group report (HTAFC 3339). The site boundary of the CON29M report differs from the currently proposed site boundary (upon which this Coal Mining Risk Assessment is based).*
- *Consultants Coal Mining Report (reference 51001918768001) prepared by The Coal Authority (Appendix B).*
- *Coal Authority records <http://mapapps2.bgs.ac.uk/coalauthority/home.html>*
- *Geological information at the British Geological Survey (BGS), including the BGS Sheet 77 Geological Map of Huddersfield Solid and Drift.*
- *Coal Mine Abandonment plan and datasheets referenced Catalogue Number 7800/1 and provided by The Coal Authority (Appendix C).*
- *Historic Ordnance Survey topographical mapping*
- *Memoirs of the Geological Survey England and Wales entitled The Geology of the Country around Huddersfield and Halifax and dated 1930.*

Identification, Assessment and Mitigation of Site Specific Coal Mining Risk				
Issue	Hazard	Site Affected (Yes/No)	Consequences	Recommended Mitigation Measures
1. Are there any recorded coal mine entries within the site or within 20m of the site boundary?	- Catastrophic collapse of mine entry leading to ground instability or voids at the ground surface. - Settlement of the ground surface above/adjacent to the mine entry. - Potential pathway to the surface for mine gas emissions and mine water.	No. There are no recorded mine entries within 100m of the enquiry boundary.	N/A	N/A
2. Is the proposed development in the likely zone of influence of past deep underground mining?	- Ground subsidence. - Ground instability, loss of ground, generation of crown holes. - Transmission of mine gas emissions and mine water.	No. This is based on the assumption, that the mine workings recorded on coal mine abandonment plan (Cat No 7800/1) are within the Hard Bed Coal (Halifax Hard Bed). This seam name is referred to on the plan as an informal note, rather than being "inked in".	N/A	N/A
3. Is the proposed development in the likely zone of influence of any present underground coal workings?	- Ground subsidence. - Ground instability, loss of ground, generation of crown holes. - Transmission of mine gas emissions and mine water.	No.	N/A	N/A
4. Is the proposed development within the likely zone of influence of underground coal workings at shallow depth (depths of less than 30m)?	- Ground subsidence. - Ground instability, loss of ground, generation of crown holes. - Transmission of mine gas emissions and mine water.	Yes. The Coal Authority report has recorded past underground mining of the Halifax Hard coal seam at a depth of 30 metres below ground level (mbgl). Based upon the published BGS geological mapping and abandoned mine plan Cat No 7800/1, it is interpreted that these workings beneath the site are within the Halifax Hard Bed coal seam (also known as the Hard Bed Coal) which outcrops c. 1km to the west of the site. The Halifax Hard Bed coal is underlain by a fireclay horizon, with the recorded combined thickness of 1.52m (coal and fireclay). The seam is recorded to dip at a shallow gradient to the horizontal (1 in 24) i.e. 2.6° towards the south east. The seam was recorded to be last worked in 1895. The recorded	Ground subsidence related to collapse or settlement processes associated with shallow underground coal workings may result in: - Ground instability and damage to new structures and infrastructure. - Harm to human health, injury or death of site users or construction workers. - Potential for mine gas migration to surface, where it may represent a hazard to development.	Based upon a review of the available geological and mining information, it is possible that shallow mine workings are present beneath the site. Such workings will be of pillar and stall type and could potentially represent a source of future subsidence. The majority of the site will remain as existing pitches and it is generally not considered normal practice to implement costly investigation and stabilisation works for such development unless a very high risk of ground subsidence is identified. The three proposed new buildings will be more sensitive to ground subsidence.. To assess the mining ground instability risk it is

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		workings shown on abandoned mine plan Cat Ref 7800/1 are pillar and stall, with the extraction ratio beneath the site in that horizon estimated to vary between 40 and 70%. The BGS boreholes to the west of the site records old mine workings at depths of between 12mbgl and 15mbgl which seem to correspond with recorded workings on the abandoned mine plan. From an interpretation of the information on abandoned mine plan Cat No 7800/1, the Halifax Hard Bed coal seam (Hard Bed Coal) may be deeper than the Coal Authority report suggests and may potentially be present at 40 to 50m depth beneath the site. If this is the case, there is a possibility for workings (recorded and/or unrecorded) within the next seam up, the Hard Bed Band coal, to be beneath the site. This seam comprises c. 0.6m of coal and 1.8m of fireclay.		recommended that the geological and mining setting beneath the site is proved by intrusive physical site investigation (rotary boreholes). The results of the physical site investigation should be used to inform a mining instability risk assessment that would consider the potential mechanisms of mine workings closure including roof failure, pillar collapse and floor heave. If, following the completion of the physical site investigation, it is considered that there is a potential risk of ground instability associated with the former mining, it may be necessary to design and carry out a programme of detailed investigation and stabilisation by drilling and pressure grouting. Such works are routinely carried out in former coalfield areas and would be designed bearing in mind current industry practice e.g. CIRIA Special Publication 32.
5. Is there a possibility of unrecorded shallow mine workings and/or mine entries?	- Ground subsidence. - Ground instability, loss of ground, generation of crown holes. - Catastrophic collapse of mine entry leading to ground instability or voids at the ground surface. - Settlement of the ground surface above/adjacent to the mine entry. - Mines gas emissions and mine water migration.	Unrecorded Shallow Mine Workings Yes	Unrecorded Shallow Mine Workings Ground subsidence related to collapse or settlement processes associated with mine workings may result in: - Ground instability and damage to new structures and infrastructure. - Harm to human health, injury or death of occupiers of property or construction workers. - Potential for mine gas migration to surface, where it	Unrecorded Shallow Mine Workings: In the event that unrecorded shallow workings do exist, they would be of pillar and stall type and could potentially represent a source of future subsidence. The intrusive physical site investigation recommended in the answer to Question 4 (above) will investigate the potential risks associated with unrecorded shallow mine workings. Identical mitigation as proposed in Item 4 applies to unrecorded shallow mine workings.

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			may represent a hazard to development (discussed in Question 6)	
		Unrecorded Mine Entries Yes	Unrecorded Mine Entries Ground subsidence related to collapse or settlement processes associated with mine entries may result in: • Ground instability and damage to new structures and infrastructure. • Harm to human health, injury or death of site users or construction workers. Potential for mine gas migration to surface, where it may represent a hazard to development.	Unrecorded Mine Entries: The potential for unrecorded mine entries to be present should be considered by all parties involved with works on site and appropriate methods of working should be adopted. Appropriate contingency plans should be prepared in the event that an unrecorded mine entry is located. Close vigilance should be maintained during the development. If any anomalous features are encountered, they should be reported for further investigation and treated appropriately.
6. Is there a record of mine gas emissions within the site boundaries?	• Mixtures of noxious or explosive gases reaching the ground surface via superficial deposits, faulted/broken strata, porous strata or poorly filled mine entries and entering buildings, structures, confined spaces etc, when an explosive or asphyxiating hazard may be generated.	No. There are no records of mine gas within 500 metres of the enquiry boundary.	N/A	N/A
7. Is the proposed development in an area for which The Coal Authority is determining or has granted a licence to remove coal by underground methods?	• Ground subsidence. • Ground instability, loss of ground, generation of crown holes.	No. There are no records of future underground mining or coal mining licensing within 200 metres of the enquiry boundary.	N/A	N/A
8. Are there known faults or other lines of weakness due to coal mining at the site?	• Ground subsidence. • Mixtures of noxious or explosive gases and mine waters reaching the ground surface via faulted/broken strata and entering buildings, structures, confined spaces etc, when an explosive or	No. The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining. There are no faults, fissures or breaklines recorded.	N/A	N/A

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	asphyxiating hazard may be generated. Stepped rockhead profiles where there has been subsidence across faults, potentially impacting differential settlement of proposed structures.			
9. Is there a record of coal mining surface hazards within the site boundary? Has the site been subject to remedial works by, or on behalf of, the Coal Authority under its surface hazard call out procedures?	Indication of past and potential future subsidence issues on site.	No. The site has not been subject to remedial works under its Emergency Surface Hazard Call Out Procedure.	N/A	N/A
10. Is the proposed development within the boundary of a surface mining/opencast site from which coal has been removed by surface mining/opencast methods?	- Ground subsidence and restrictions on proposed development associated with settlement of proposed structures. - Potential ground instability and migration pathway of mine gases and mine water from disturbance of backfilled material. - Migration pathway of mine gas and mine water if the base of the excavation is connected to underground mine workings. - Mixtures of noxious or explosive gases generated by decomposition/oxidation of any organic materials/coal deposited in the former excavations representing a ground gas hazard to proposed development.	No. There are no opencast mines recorded within 500 metres of the enquiry boundary. There are no recorded Coal Authority managed tips within 500 metres of the enquiry boundary.	N/A	N/A
11. Is the proposed development within 200m of a surface mining/opencast site from which coal is being removed?	Development constraints associated with environment/noise/dust	No. The site is not within 200 metres of the boundary of an opencast coal site.	N/A	N/A

Assessment of Cumulative Impact of Coal Mining Issues:

From a review of the available geological and mining information, there is evidence to suggest that shallow (<30mbgl) coal and potentially fireclay mining has occurred beneath the site. It is recommended that, prior to redevelopment, the geological and mining setting beneath the site is proved by carrying out an intrusive physical site investigation. Once a physical site investigation has been carried out, the results should be used to inform a detailed ground stability risk assessment. Following the risk assessment, there may be a requirement to carry out mitigation measures, such as detailed investigation and stabilisation of mine workings by drilling and pressure grouting to ensure that the proposed development is safe/stable. Such mitigation is routinely carried out prior to development in certain former coalfield areas, and does not generally preclude development.

There are no recorded mine entries affecting the site, however the potential remains for unrecorded ones to exist. During the construction stage of the project, contingency plans should be allowed for to deal with such unrecorded features should they be encountered. A close vigilance should be maintained during future site works and should any potentially mining related anomalous features be identified they should be reported for investigation and treated appropriately.

The proposed development is not considered to sterilise a future coal mineral resource.

Prior to carrying out any works which may intersect, disturb or enter any coal seams, coal mine workings or mine entries (within the ownership of the Coal Authority), the written permission of the Coal Authority shall be obtained (<http://coal.decc.gov.uk/en/coal/cms/services/permits/permits.aspx>). The legal implications of acceptance of The Coal Authority permit conditions should be considered fully before accepting them.

N/A = Not Applicable

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