

MILLWOOD SEN SCHOOL RADCLIFFE

SHALLOW COAL MINING SITE INVESTIGATION WORKS

Job Number: LKC 23 1383
Date: September 2023
Client: ISG Construction Ltd



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Site Address	School Street, Radcliffe, Manchester, M26 3BW		
Report Title	Shallow Coal Mining Investigation Works		
Job Number	LKC 23 1383	Document Ref.	LKC 23 1383-B1-CMSI-Millwood SEN School
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Prepared By	Hannah Moss	Reviewed By	Catherine Baranek

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1 Introduction

1.1 Background

LK Consult Ltd (LKC) has been commissioned by ISG Construction Ltd to carry out an investigation works into the potential coal mining risks at Millwood SEN School, Radcliffe.

The following work was previously undertaken by LKC:

- Coal Mining Risk Assessment (CMRA) undertaken by LKC (Ref: LKC 23 1383-A1-CMRA-Millwood SEN School, dated July 2023).

This investigation has been undertaken to confirm the ground conditions below the site and allow an assessment of the potential for the site to be affected by shallow coal seams / workings. The report will aim to confirm the risks from historical coal mining and recommend further assessment and / or remediation as required.

The assessment and interpretation of the factual data obtained as part of this investigation has been undertaken in line with currently accepted national and international guidelines including CIRIA758¹.

Ground conditions can change rapidly, especially in areas of Made Ground; however, it is assumed that the ground conditions observed are typical and representative of the site as a whole. The ground conditions have been determined from a limited number of exploratory holes, therefore only a small percentage of the total area of the property has been investigated. Conclusions drawn from the ground investigation should be read in this context. LKC cannot accept responsibility for any situations resulting from locally unforeseen ground conditions occurring between exploratory holes.

1.2 Site Details

A summary of the site details is presented in Table 1-1. Figures 1 and 2 indicate the site location, boundary and proposed development plan.

Site Location	Western end of School Street, to the rear of Millwood School building, Radcliffe, Manchester. Centred at approximate National Grid Reference 377850E 407120N.
Approximate Area	2000m ² .
Topography	Approximately 80 metres Above Ordnance Datum (AOD). Site is approximately level.
Current Site Use	Site is vacant and grass covered.
Purpose of Report	Pre-planning.
Proposed Development	Erection of new classroom block associated with school.

Table 1-1. Summary of site details.

¹ CIRIA2019: C758D Abandoned mine workings manual. ISBN: 978-0-860017-765-4

2 Summary of Previous Work

The following sections provide a summary of previous work relating to historical coal mining on the site.

2.1 LKC Desk Based Coal Mining Risk Assessment

2.1.1 *Geology*

Artificial

No BGS recorded artificial deposits are recorded on site.

Worked Ground (undivided) is recorded running northeast-southwest approximately 15m northwest, presumably associated with the Manchester, Bolton & Bury Canal.

Superficial

The superficial geology is mapped as Devensian Till (Diamicton).

Bedrock

The bedrock is mapped as the Pennine Middle Coal Measures Formation (Mudstone, Siltstone and Sandstone). No dip data is recorded on site, however strata in the wider area dips to the southeast at 7°, and Coal Authority data indicates that worked coal seams beneath the site dip towards the south/southeast between 6.9-15.2°.

A coal seam is shown to subcrop (at rockhead) approximately 60m northwest which is expected to dip below the site, (approximately 7.37-16.30metres below rockhead assuming a dip of between 7-15°). This coal seam is anticipated to be the Top Five Quarters (Bin) coal seam based on 1:50,000 sheet mapping dated 1975, which is also referred to as the Ince Yard (Bland, Bin, Binn) seam based on the Sheet 85 explanatory notes. The seam name is not labelled on 2010 edition 1:50,000 sheet mapping.

2.1.2 *Coal Authority Consultants Report*

As part of the CMRA, LKC obtained a Consultants Coal Mining Report. Table 2-1 summarises the findings.

Mining Activity and Geology	
Past underground mining	Yes: See Plate 2-1.
Probable unrecorded shallow workings	Yes.
Spine roadways at shallow depth	No spine roadway recorded at shallow depth.
Mine entries (within 100m)	Yes: See Plate 2-2.
Abandoned mine plan catalogue numbers	3428, 1209, NW983, 16820, 1507, NW991, 1249.
Outcrops	No outcrops recorded.
Geological faults, fissures and breaklines	No faults, fissures or breaklines recorded.
Opencast mines	None recorded within 500m of the enquiry boundary.
Coal Authority managed tips	None recorded within 500m of the enquiry boundary.
Investigative or Remedial Activity	
Site investigations	1no. site investigation recorded on site.
Remediated sites	None recorded within 50m of the enquiry boundary.
Coal mining subsidence	Not received a damage notice or claim for the subject property, or any property within 50m, since 1994. No current Stop Notice delaying remedial works or repairs to property. Not aware of any request made to carry out preventative works before coal is worked.
Mine gas	1no. incident recorded 63m S of site.
Mine water treatment schemes	None recorded within 500m of the enquiry boundary.
Licensing and Future Mining Activity	
Future underground mining	None recorded.
Coal mining licensing	None recorded within 200m of the enquiry boundary.
Court Orders	None recorded.
Section 46 notices	No notices have been given, stating that the land is at risk of subsidence.
Withdrawal of support notices	Not in an area where a notice to withdraw support has been given or where a notice has been given cancelling the entitlement to withdraw support.
Payments to owners of former copyhold land	Not in an area where a relevant notice has been published.

Table 2-1: Summary of Coal Authority Consultants Coal Mining Report.

Further Information
The following potential risks have been identified and as part of your risk assessment should be investigated further. Future development 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 specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor. Development advice The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us. Site investigations The site is within an area of previous interest. It is close to where the Coal Authority has received information relating to past site investigations. The site requires further investigation and may influence how you approach your risk assessment. Mine gas remedial works The site is within an area of previous interest. It is close to where the Coal Authority has investigated and subsequently remediated the effects of mine or ground gas emissions following specific reported hazards. The site requires further investigation and may influence your risk assessment. We recommend that you order the Coal Authority Mine Gas Emission Report, which will include more information about the hazard.

Table 2-1 (continued): Summary of Coal Authority Consultants Coal Mining Report.

Plate 2-1 shows the past underground mining. This is defined by the Coal Authority as *'details of all recorded underground mining relative to the enquiry boundary. Only 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'*.

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	ROGER	Coal	3Z3E	67	Beneath Property	9.5	South-East	200	1900
unnamed	RAMS	Coal	3YQ3	88	Beneath Property	6.9	South	180	1900
unnamed	DOE	Coal	3YMY	268	Beneath Property	15.2	South-East	180	1883
unnamed	WIGAN FIVE FEET	Coal	3YQX	280	Beneath Property	10.0	South-East	120	1883
unnamed	TRENCHERB ONE	Coal	3YYL	352	West	11.2	South	110	1888
unnamed	TRENCHERB ONE	Coal	3YZ7	367	Beneath Property	11.2	South	110	1888
unnamed	CANNEL	Coal	3YPA	431	Beneath Property	9.3	South	90	1888

Plate 2-1: Extract from Coal Authority Report showing past underground mining.

Probable unrecorded shallow workings are defined as ‘*areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30m deep)*’.

Plate 2-2 shows the mine entries within 100m of the site boundary.

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	377407-019	377781 407070		Coal	
Shaft	377407-020	377847 407015	This shaft was re-capped in 1978 with a concrete cap incorporating a methane vent and is monitored on a three monthly basis for gas by The Coal Authority or a representative thereof	Coal	

Plate 2-2: Extract from Coal Authority Report showing mine entries within 100m.

Shaft reference 377407-019 is located 45m southwest of site and 377407-020 is located 70m south of the site boundary (offsite). Given the distances of the shafts to site, they are not considered to pose a significant risk.

2.2 Previous Investigations

The following investigations have been undertaken on land adjacent to the east of the site:

- Desk-Based Coal Mining Risk Assessment (CMRA) undertaken by LKC (ref: CL-602-LKC 20 1836-01, dated December 2020).
- Report on Coal Mining Related Site Investigative Works undertaken by The Land Consultancy Ltd (TLC) (ref: T010 SFK (TLC1135) rep BS LKConsult 120121 (Rev B), dated January 2021).

The CMRA concluded that intrusive investigation work should be carried out to confirm the risk associated with shallow coal mining.

The intrusive investigation works, comprising the drilling of 5no. rotary open hole boreholes to 40mbgl, was carried out in December 2020 and January 2021.

An extract summarised the ground conditions encountered is provided in Plate 2-3.

Exploratory Hole	Depth Coal Seam Observed (bgl)	Coal Seam Thickness	Notes/Tentative Coal Seam Interpretation
RH1	27.50 to 28.40m	0.90m	Upper leaf of the Top Three Yards coal seam (a.k.a. Brassey)? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover) – 12.00m.
	30.20 to 32.00m	1.80m	Lower leaf of the Top Three Yards coal seam (a.k.a. Brassey). Separated from the upper leaf by 1.80m of dark grey MUDSTONE (fireclay?). No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover – does not include overlying coal seam) – 13.80m. It is noted that the CA record that the Brassey coal seam has been worked beneath the site at 54m and 63m depth. This would be the expected depth to this coal seam in the centre and SE of the site based on an ~9° rock dip angle. Stonefield pit is located only ~42m to the NE of the centre NE site boundary.
RH2	21.50 to 22.00m	0.50m	Ince Yard coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover) – 4.50m.
	32.50 to 33.70m	1.20m	Top Yard coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover – does not include the overlying coal seam) – 15.00m.
RH3	25.00 to 25.90	0.90m	Ince Yard coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover) – 8.00m.
	31.50 to 32.20m	0.70m	Top Yard coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover – does not include the overlying coal seam) – 13.60m
RH4	21.50 to 22.60m	1.10m	Ashclough coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover) – 6.50m.
	31.60 to 33.00m	1.40m	Ince Yard coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover – does not include the overlying coal seam) – 15.50m.
RH5	20.50 to 21.50m	1.00m	Ashclough coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover) – 4.00m.
	29.90 to 31.00m	1.10m	Ince New coal seam? No evidence for coal workings recorded by the drilling foreman. Thickness of overlying rock strata (acceptable cover – does not include the overlying coal seam) – 12.40m

Plate 2-3: Summary of ground conditions from TLC 2021 report.

It was recommended that a programme of drilling and grouting should take place across the entire site to reduce the risk posed from the recorded and unrecorded potential coal workings within the Top Three Yards (Brassey), the Top Yard, Ince Yard, Ince New and Ashclough coal seams.

It was concluded that there was a very low risk of subsidence to the site from the offsite mine shaft approximately 42m to the northeast and no remedial works was recommended.

2.2.2 Risk Assessment

Based upon the available information, LKC have identified potential shallow coal mining risks which are summarised in Table 2.2.

Coal Mining Issue	Potential Risk
Underground coal mining (recorded at shallow depths)	X
Underground coal mining (probable at shallow depths)	✓
Mine entries (shafts / adits)	?
Coal mining geology (fissures)	X
Record of past mine gas emissions	✓
Recorded coal mining surface hazard	X
Surface mining (opencast workings)	X

Table 2-2: Summary of coal mining potential risks.

Considering the available information and guidance given in CIRIA C758², LKC considered that intrusive investigation work should be carried out to confirm the risk associated with coal mining.

² CIRIA (2019). "Abandoned Mine Workings Manual". CIRIA C758

3 Investigation Works

3.1 Site Investigation Design and Methodology

Site investigation works were carried out by LKC on 16th-22nd August 2023 and comprised the following:

» 3no. open hole rotary boreholes to 50.00mbgl (ref: RBH101-103).

The drilling was carried out to determine the presence / absence of shallow workings across site.

The boreholes were undertaken by Taylor Drilling Services using a Baretta T41 Rotary rig fitted with a PCD drill bit.

Upon completion the boreholes were grouted up.

In order to carry out the above works permission is required from the Coal Authority. The permission certificate is included in Appendix A.

All site investigation locations are shown in Figure 3.

4 Ground Conditions

4.1 Rotary Open Hole Drilling

The rotary borehole logs are provided in Appendix B. The investigation locations are shown on Figure 3.

4.1.1 *Made Ground*

Made ground comprising topsoil over ash and brick fill was encountered in all locations to depths of between 2.50mbgl and 3.10mbgl.

4.1.2 *Superficial*

Stiff consistency light grey and brown clay with sand and gravel bands was recorded in all locations between 2.50mbgl and 21.20mbgl.

Occasional boulders were recorded in RBH103 between 2.50mbgl and 20.70mbgl.

4.1.3 *Bedrock (Coal Measures)*

Rockhead was encountered from 20.70-21.20mbgl in all locations and was proven to depths of 50.00mbgl. Bedrock comprised:

- Light grey sandstone with mudstone bands recorded between 21.20mbgl and 30.80mbgl.
- Light grey mudstone recorded between 30.10mbgl and 42.00mbgl. Sandstone bands were recorded within the light grey mudstone in RBH103 between 30.10mbgl and 41.50mbgl.
- Shaley mudstone was recorded in RBH103 between 43.00mbgl and 43.30mbgl.
- **Coal** recorded in RBH101 at 42.00-43.50mbgl (shaley coal, intact) and at 43.8-44.7mbgl (coal, intact). Thin band of dark grey mudstone (0.30m thick) between the coal seams.
- **Coal** recorded in RBH102 at 40.80-41.90mbgl (shaley coal, intact) and at 43.00-43.80mbgl (coal, intact). Thin band of dark grey mudstone (1.10m thick) between the coal seams.
- **Coal** recorded in RBH103 at 41.50-43.00mbgl (coal, intact) and 43.30-44.20mbgl (coal, intact). Thin band of dark grey shaley mudstone (0.3m thick) between the coal seams.
- Dark grey mudstone recorded below the coal seams from 43.8-44.70mbgl to the base of the boreholes.

It should be noted that evidence for the presence of coal workings can include (but is not limited to) partial or total loss of flush, broken drilling, voids, fast drilling or the sudden dropping of the drill string.

No evidence of loss of flush, loss of flush, broken drilling, fast drilling or the sudden dropping of the drill string were recorded. However, as described above, intact coal seams were encountered, in which potential for workings cannot be ruled out. This is discussed further in Sections 5.

A summary is provided in Table 4-1, showing the depth to rockhead, top of coal seams (mbgl), and the thickness of cover above the coal seam for all locations.

Borehole	Depth to Rockhead (mbgl)	Thickness of Rock Cover Above Coal (m)	Coal Depth (mbgl)*	Coal Thickness (m)*
RBH101	21.20	20.80	42.00-43.50 (43.50-43.80 Mdst) 43.80-44.70	1.50 (0.30 Mdst) 0.90 Total = 2.70
RBH102	21.00	19.80	40.80-41.90 (41.90-43.00 Mdst) 43.00-43.80	1.10 (1.10 Mdst) 0.80 Total = 3.00
RBH103	20.70	20.80	41.50-43.00 (43.00-43.30 Mdst) 43.30-44.20	1.50 (0.30 Mdst) 0.90 Total = 2.70m

Table 4-1: Rotary Borehole Summary.

* Including thin mudstone between coal seams.

The thin layer of mudstone between the coal seams may suggest leaves of the same coal seam. The coal is assumed to represent the Ince Yard (also named Five Quarters and Bin) seam based on Coal Authority data and desk based assessments.

The total thickness of both the coal seams with the thin mudstone layer in between is 2.70m (RBH101), 3.00m (RBH102) and 2.70m (RH103).

4.1.4 Ground Gas

No elevated concentrations of methane, carbon dioxide, carbon monoxide or hydrogen sulphide or any oxygen depletions were measured during the rotary drilling process.

5 Conclusions and Recommendations

5.1 Shallow Coal Mining

The site is within a Development High Risk Area relating to probable shallow coal workings.

To investigate the potential coal mining hazards 3no. rotary open hole boreholes were sunk to 50.00mbgl across site.

The investigation works identified up to 3.10m of made ground, overlying superficial clay deposits with sand and gravel bands to 20.70-21.20mbgl. Bedrock was recorded as mudstone and sandstone to the base of the boreholes.

In each borehole, two coal seams were identified with a thin layer of mudstone in between (assumed to be leaves of the Ince Yard / Five Quarters coal seam). The coal was identified from 40.80-42.00mbgl with a total thickness of 1.70-2.00m (including both coal seams and the mudstone).

No evidence of loss of flush, loss of flush, broken drilling, fast drilling or the sudden dropping of the drill string were recorded.

Although workings may not always be identified, it should be considered that boreholes may be sunk into 'pillars' of intact coal. Early 19th century workings using pillar and room methods left significant areas of coal intact with extraction ratios in the range of 30-70%. Later workings typically have extraction ratios of 50-60%³.

Shallow workings related ground subsidence events may manifest as localised crown hole collapses at the surface (which are related to workings roof failures), or can be associated with more extensive ground movements, typically associated with pillar collapse, floor heave, or a combination of roof and pillar failure. As there is limited evidence for structural damage caused by pillar failure compared with that resulting from roof collapses, the focus of engineering assessments of the potential instability at the surface has focussed on roof collapses as the more likely mechanism of failure.

The limit height on void migration, where no appreciable surface subsidence can result is termed 'acceptable cover'. The calculation of the amount of acceptable cover is determined by the worked thickness of the seam (t) and the amount of overlying rock cover (h). The acceptable cover criterion is generally referred to as ht.

According to CIRIA C758D⁴, from the examination of mines within Coal Measures, the height of collapse migration might exceptionally extend to 10t the height of the original extraction. As a result of this, the 10t criterion has been adopted by the industry as providing reasonable assurance against surface subsidence from roof collapses in old pillar and stall mines. However, there are documented cases, albeit rare, where migrations in excess of 20t have been observed.

CIRIA C758D, lists a number of circumstances where the acceptable cover criterion may need to be increased from 10t. These include:

- » Where the strata dip is >20°.

³CIRIA (2019). "Abandoned Mine Workings Manual". CIRIA C758D

⁴CIRIA (2019). "Abandoned Mine Workings Manual". CIRIA C758D

- » Strong groundwater flows within workings and rising or falling groundwater levels. The deep groundwater regime is unknown beneath the site.
- » Where multi-seam extractions have taken place.

It is assumed that if underground workings have occurred in one of the coal seams, then extraction is likely to have extended to both seams and the mudstone in between. As a precaution, the potential worked thickness of the seam (t) has been taken as 3m (total of the two coal seams with mudstone in between). Assuming a 10t criterion for the acceptable rock cover (as a minimum), the height of rock cover (h) would need to be 30m.

The investigation has proven that the rock cover above the shallowest seam is 19.80-20.80m.

Competent thick superficial deposits (>10m) can contribute to the mitigation of the extent of void migration and may provide a contribution to the rock cover equivalent to half its thickness (e.g. half the depth of the glacial till would be considered equivalent to rock of that thickness). However, the majority of the stability should be provided by actual rock cover and the Coal Authority adopts the rule of thumb that the rock cover contribution should be in excess of 80%.

Although there is a sufficient thickness of superficial deposits to contribute 20% of the total cover, there is not sufficient bedrock to contribute 80% of the total cover. 24.00m of rock cover (bedrock) would be required to contribute 80% and only 19.80-20.80m is present.

Based on the above assessment, stabilisation work (i.e. grouting) is recommended and should be designed by an appropriately experienced and qualified contractor using the information provided. The scope should be agreed with the Coal Authority prior to undertaking the work.

5.2 Additional Advice

The conclusions in this report will need to be agreed with the Coal Authority's engineering department, the local authority and building control.

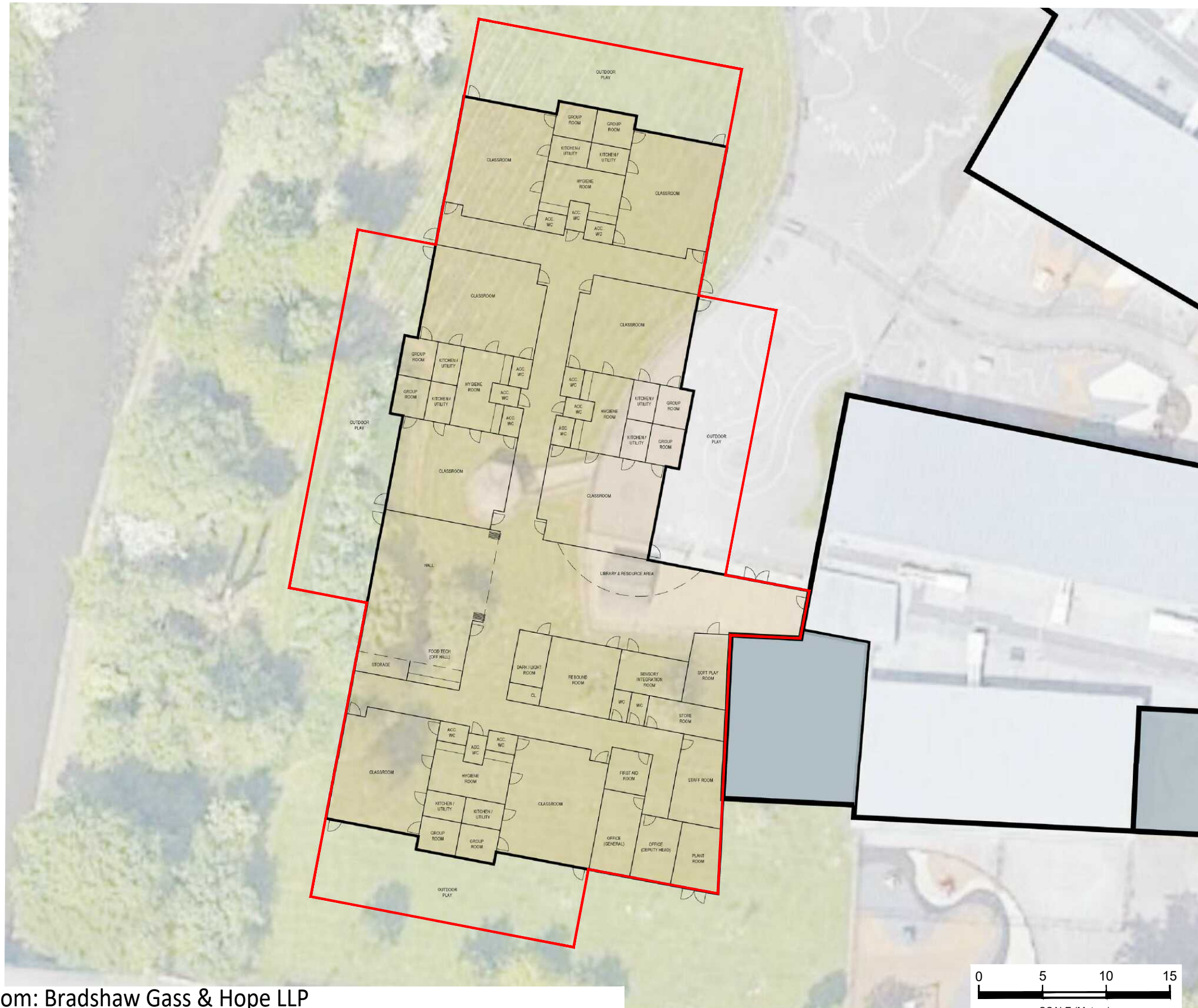
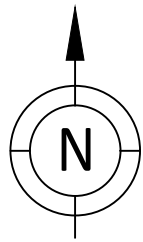
The ground gas risk assessment is included in the LKC Phase 2 Report for the site (reference LKC 23 1383-B2-GI, dated September 2023).

In line with the guidance supplied by the Coal Authority there also remains a risk of encountering unrecorded mine entries during the redevelopment of the site. Mine entries are likely to manifest as potentially square, rectangular or circular areas of dark deep made ground (which may or may not be brick lined) surrounded by natural soils/weathered rock; mine shafts could also potentially be capped – e.g. with a large block of concrete. If the presence of mine entries is suspected, the affected area should be cordoned off immediately and the advice of a coal mining engineer sought.

Figures



Client: ISG Construction Ltd				Title: Site Location & Boundary Plan			
Site: Milward SEN School, Radcliffe				Scale (see scale bar): 1:15,000 & 1:1000 @ A4			Figure: 1
Job No.: LKC 23 1383	Drawn By: AE	Checked By: HM	Drawn: Jul 2023	Revision:			



KEY

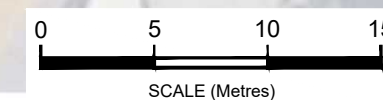
 Site Boundary

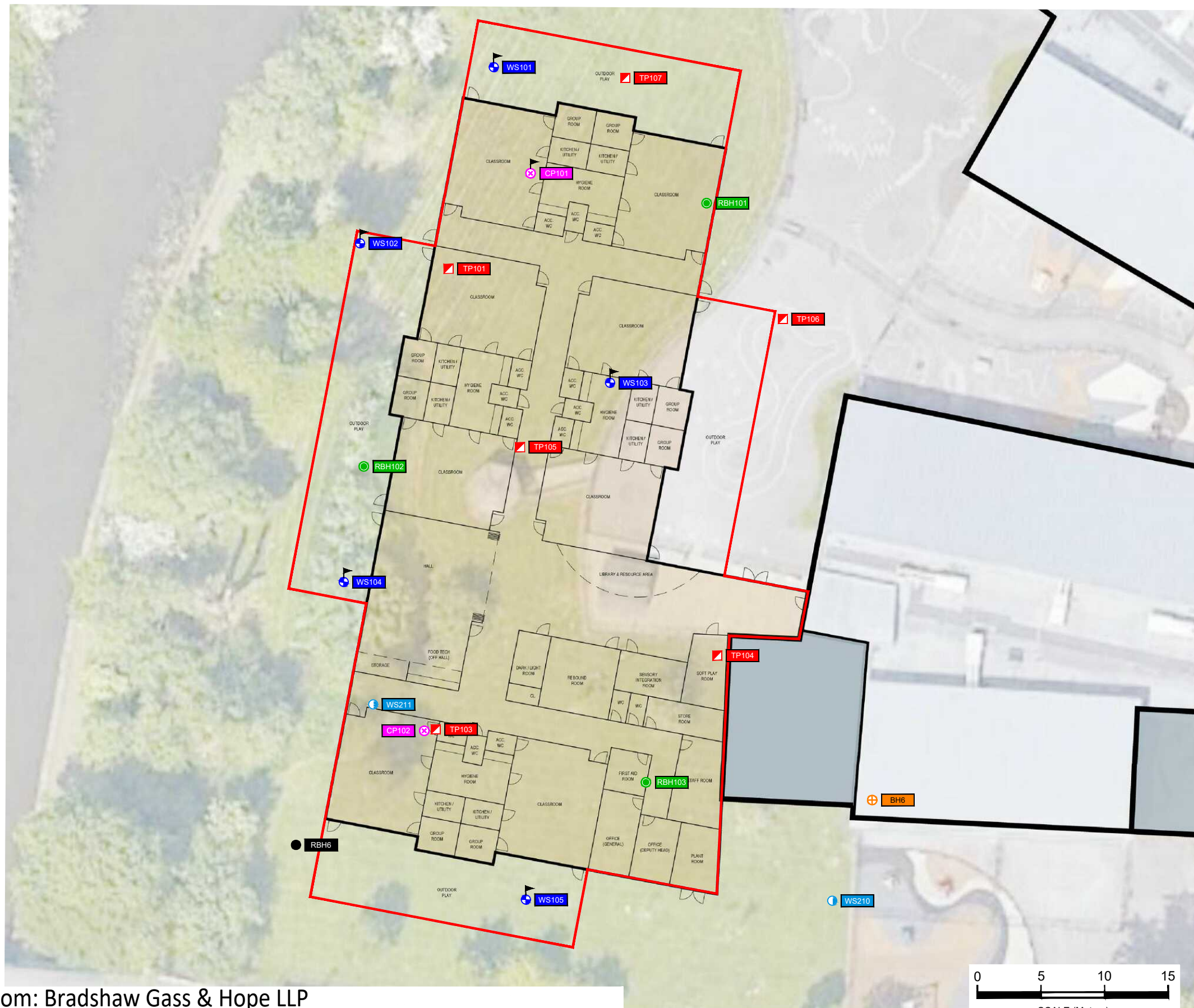
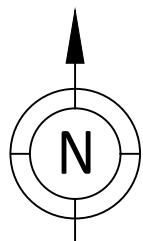
Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



Client: ISG Construction Ltd			
Site: Millwood SEN School, Radcliffe			
Title: Proposed Development Plan			
Job No.: LKC 23 1383	Scale (See Scale Bar): See Scale Bar	Figure: 2	Revision:
Drawn By: AC	Checked By: HM	Drawn: Aug 2023	

Extract From: Bradshaw Gass & Hope LLP
Drawing Ref: Proposed Floor Plan, No.2128.26.301, Rev:P4 (19/05/2023)





KEY

- Site Boundary
- Window Sample Borehole (WS)
- Rotary Borehole (RBH)
- Cable Percussive Borehole (CP)
- Installation

Previous Site Investigations:

Encia Site Investigation (2005)

- Borehole (BH)
- Rotary Borehole (RBH)

Atkins Site Investigation (2010)

- Window Sample Borehole (WS)

LKC Site Investigation (2010)

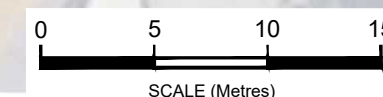
- Trial Pit (TP)

Sampling Locations and features annotated by LK Consult Ltd are approximate and are based upon observed measurements unless otherwise stated. Do not scale from this drawing and work from marked dimensions only. All dimensions and features should be confirmed on site by the Contractor. Where this drawing includes information provided to LK Consult Ltd by others, LK Consult Ltd gives no warranty, representation or assurance as to the accuracy of such information.



Client: ISG Construction Ltd			
Site: Millwood SEN School, Radcliffe			
Title: Site Investigation Location Plan			
Job No.: LKC 23 1383	Scale (See Scale Bar): See Scale Bar	Figure: 3	Revision: A
Drawn By: AC	Checked By: EK	Drawn: Sep 2023	

Extract From: Bradshaw Gass & Hope LLP
Drawing Ref: Proposed Floor Plan, No.2128.26.301, Rev:P4 (19/05/2023)



Appendix A

Coal Authority Permit to Enter or Disturb Mine Workings



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 27152

Name and Address of Permit Holder:

ISG Ltd
Think Park
Mosley Road
Trafford Park
Greater Manchester
M17 1FQ

Site Location:

Millwood Primary Special School
School Street
Radcliffe
Greater Manchester
M26 3BW

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

Ground investigation by three boreholes to 50m 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, CH₄, CO₂, O₂, H₂S 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: Izaak Hayes Granted Date: 11/08/2023

For and on behalf of The Coal Authority

Nominated Representative: Izaak Hayes, Permitting Manager;

The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG

Tel: 01623 637147; E-Mail: permissions@coal.gov.uk



The Coal
Authority

Granted Permit Boundary

Permit Ref: 27152

Permit Boundary:



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Appendix B

Rotary Borehole Logs



LK CONSULT LTD
Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Site Millwood SEN Primary School, Radcliffe	Borehole Number RBH101
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Machine : Baretta T41 Flush : Air Mist Core Dia: 100 mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD) 78.29	Client ISG	Job Number LKC 23 1383
	Location (dGPS) 377858.2 E 407141.1 N	Dates 16/08/2023- 17/08/2023	Engineer LKC	Sheet 1/2

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						78.14	0.15	MADE GROUND: Topsoil.		
							(2.95)	MADE GROUND: Ash and brickfill.		
						75.19	3.10	Stiff light grey and brown CLAY with sand and gravel bands.		
							(18.10)			
						57.09	21.20	Light grey SANDSTONE with mudstone bands.		
							(9.60)			
						47.49	30.80	Light grey MUDSTONE.		
							(11.20)			

Remarks Borehole dry. Strata descriptions derived from drillers logs. Borehole dry.	Scale (approx) 1:200	Logged By JW
	Figure No. LKC 23 1383.RBH101	



Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						36.29	42.00 (1.50)	Shaley COAL (intact).		
						34.79	43.50	Dark grey MUDSTONE.		
						34.49	43.80 (0.90)	Dark grey MUDSTONE.		
						33.59	44.70	COAL seam (intact).		
								Dark grey MUDSTONE.		
							(5.30)			
						28.29	50.00	Complete at 50.00m		

Remarks Strata descriptions derived from drillers logs.	Scale (approx) 1:200	Logged By JW
	Figure No. LKC 23 1383.RBH101	
	(Empty space for additional remarks or notes)	

[illegible]

Remarks Borehole dry. Strata descriptions derived from drillers logs. Borehole dry.	Scale (approx) 1:200	Logged By JW
	Figure No. LKC 23 1383.RBH101	

Machine : Baretta T41 Flush : Air Mist Core Dia: 100 mm Method : Rotary Cored	Casing Diameter 	Ground Level (mOD) 78.77	Client ISG	Job Number LKC 23 1383
	Location (dGPS) 377831.3 E 407120.4 N	Dates 17/08/2023-18/08/2023	Engineer LKC	Sheet 2/2

[illegible]

Remarks

Strata descriptions derived from drillers logs.

Scale (approx)

1:200

Logged
By

JW

Figure No.

LKC 23 1383.RBH101



LK CONSULT LTD
Eton Business Park, Eton Hill Road, Radcliffe, M26 2ZS
Tel: 0161 763 7200 web: www.thelkgroup.com

Site
Millwood SEN Primary School, Radcliffe
Borehole Number
RBH103

Machine : Baretta T41 Flush : Air Mist Core Dia : 100 mm Method : Rotary Cored			Casing Diameter		Ground Level (mOD) 78.30	Client ISG		Job Number LKC 23 1383	
			Location (dGPS) 377853.5 E 407095.6 N		Dates 21/08/2023- 22/08/2023	Engineer LKC		Sheet 2/2	

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						36.80	41.50 (1.50)	COAL (intact).		
						35.30	43.00	Dark grey shaley MUDSTONE.		
						35.00	43.30 (0.30)	COAL (intact).		
						34.10	44.20	Dark grey MUDSTONE.		
							(5.80)			
						28.30	50.00	Complete at 50.00m		

Remarks Strata destriptions derived from drillers logs.								Scale (approx) 1:200	Logged By JW
								Figure No. LKC 23 1383.RBH101	

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