

Scheme of Intrusive Site Investigation

Client		Taylor Design Architects
Introduction		Fairhurst have been commissioned to prepare a scheme for intrusive site investigation to discharge Condition 3 on the Application 19/00481/FUL. This condition is based on information from: - The Coal Authority records that indicate that the site is in an area of probable unrecorded underground coal mine workings at shallow depth. - Mining Investigation Report done in 2016 as part of a historical development recommended that further intrusive investigations are carried out across the western part of the site
Current Site Status		The site is undeveloped open land with a small area of hard standing associated with an industrial unit listed as a 'Garage' in the southeast corner of the site, to be renovated into the 'prep building' as labelled on the proposed site plan in Appendix A .
Development Proposals		The development is to consist of a car showroom with associated car parking bays, prep building and wet valet as shown on the Proposed Site Plan in Appendix A .
Site Conditions	Location	The site, at National Grid Coordinates 345920, 389260 is located off Coppice Lane in Tarbock, Merseyside.
Mining Legacy	Sources of Information	The following information of mining has been reviewed; - Integra Consulting Environmental Phase 1 Geo-environmental Report dated December 2015 (Ref. 1) with; - Envirocheck Historical Plans. - British Geological Survey (BGS) map. - BGS historical borehole records from the surrounding area. - Coal Authority Mining Report. - Coal Authority Mine Abandonment Plans. - Integra Consulting Environmental Mining Investigation Report dated Feb. 2016 (Ref. 2) with; - Rotary borehole (RH) records. - The Coal Authority Consultation Letter dated 13 June 2017 - Phase 1 Geo-environmental Report dated Sep.2024 (Ref. 3) with; - Envirocheck Historical Plans. - Consultants Coal Mining Report.

	Mining Risks	Based on a review of the mining information the following risks were identified, which are summarised below and presented on the geological feature layout and cross-section plans in Appendix A. <u>Coal Authority</u> • The site is located on a coal field and within close proximity of a high development risk area. • The site is in an area of probable unrecorded underground coal mine workings at shallow depth. • Mine entry located northwest of the site, outside the zone of influence for the proposed development. <u>Desk Study (Ref. 1)</u> • Coal bearing stratum as Pennie Middle Coal Measures underlays the site. • Felcroft Mine coal seam outcrops c. 15m north of the site, orientated east to west and dips south beneath the site. • BGS Borehole SJ48NE30 in the north western corner recorded the Felcroft Mine coal seam from 5.1mbgl, with a thickness of 2.20m, comprising: ○ Coal fragments – 0.22m ○ Seatearth – 1.31m ○ Sandstone – 0.10m ○ Coal – 0.21m ○ Carbonaceous mudstone – 0.13m ○ Coal – 0.22m • BGS Borehole SJ48NE30 in the north western corner recorded the Pastures / Discovery Mine coal seam from 9.4mbgl, with a thickness of 9.70m, comprising: ○ Coal – 0.48m ○ Mudstone – 0.17m ○ Coal – 0.13m ○ Mudstone – 0.43m ○ Coal – 0.31m ○ Mudstone – 0.18m ○ Coal – 0.35m • Other mine workings (SJ48NE31) are recorded at significant depth >52.48m towards the southern boundary of the site that are very unlikely to be a hazard. • Potentially unrecorded mine entries and shallow coal workings. <u>Mining Investigation Report (Ref. 2)</u> • Coal seams at 9.0m bgl, 5cm thickness in RH3 located in the north western corner of the site. • Seatearth beds recorded at depth from 17.65m to 19.80m bgl and 41.75m to 42.24mbgl in the north western corner of the site.
	Mine Recommendations	Based on a review of the mining risks the following recommendations remain outstanding: • Further intrusive investigations are carried out across the north western part of the site to establish the ground conditions on the land proposed for development.

Site Investigation	Rationale	In view of the mining information reviewed, a site investigation has been designed with regards to potential coal workings on site based on the proposed development layout shown in Appendix A. The aim is to: • Identify geotechnical hazards associated with potential shallow mine workings; • Target intrusive investigations to the western part of the site, moreover the building footprint of the proposed car showroom. • Further characterise the ground conditions at the site; • Determine the engineering parameters of the sub-surface soils to inform detailed foundation design; • Establish a suitable bearing strata; • Establish any potential abnormalities prior to the construction phase of the site.
	Site Investigation Scope	The site investigation is presented on the exploratory hole plan (Appendix A) and summarised below; • 6 no. rotary open holes using air mist flush to 30m bgl covering the car showroom footprint. • 12 no. trial pits to assess the shear strength and CBR values present within the superficial deposits across the site.
	Justification	The site investigation proposed is justified as follows: • The Integra report infers the Feltham Mine coal seam dips at an angle of 26.7° to the south, encountered at a combined thickness of 2.2m in the northwest of the site. • As such, 6no. rotary boreholes are proposed around the footprint of the planned car showroom to investigate shallow coal workings related to this seam, as well as any potentially unrecorded coal workings.

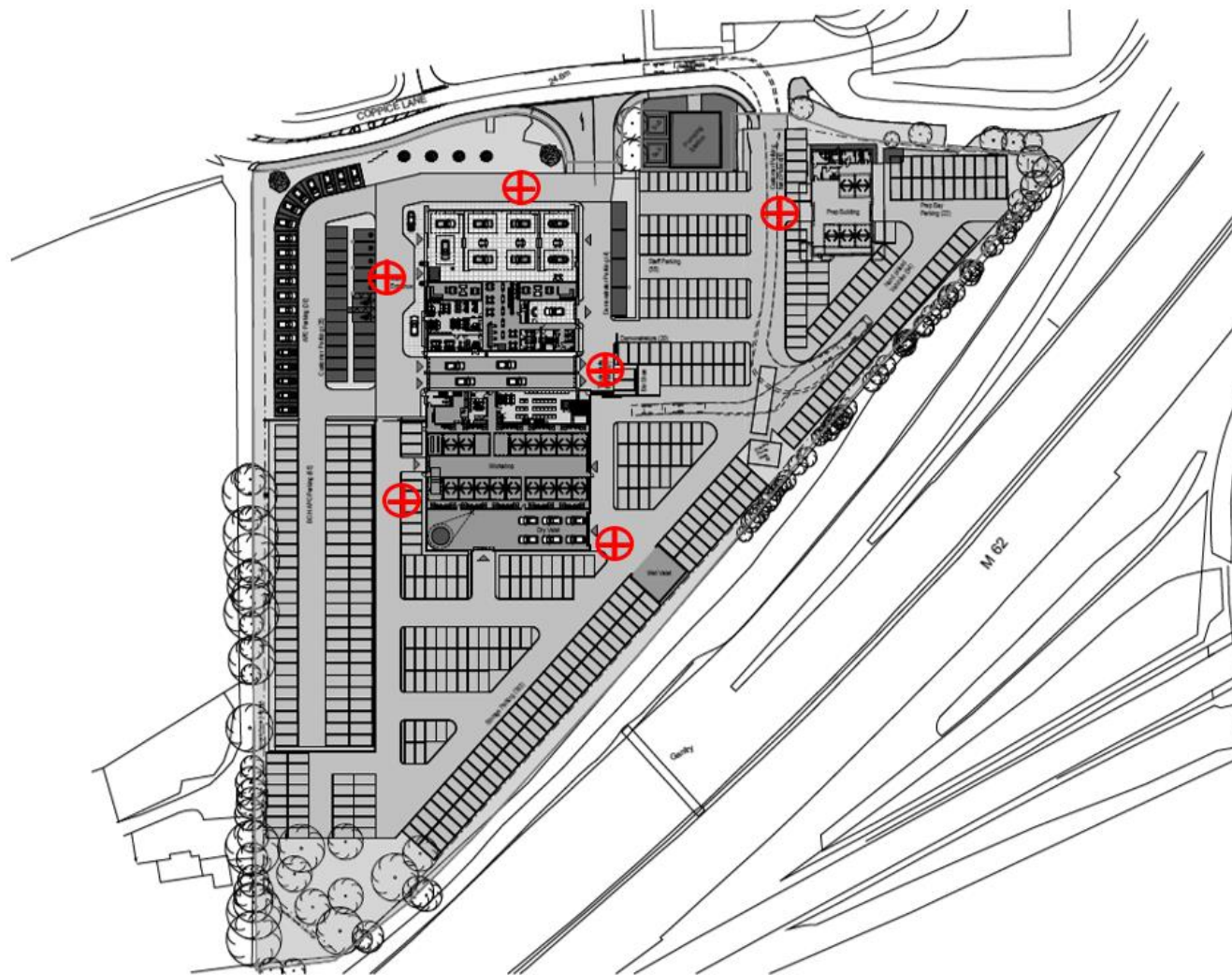
REFERENCES:

1. INTEGRA LTD (2015). PHASE 1 GEO-ENVIRONMENTAL REPORT. CRANTON ROAD. HUYTON, LIVERPOOL
2. INTEGRA LTD (2016). ENVIRONMENTAL AND MINING INVESTIGATION. CRANTON ROAD. HUYTON, LIVERPOOL.
3. FAIRHURST (2024). PHASE 1 GEO-ENVIRONMENTAL REPORT. CRANTON ROAD. HUYTON, LIVERPOOL.

APPENDIX A

PROPOSED SITE PLAN WITH PROPOSED EXPLORATORY HOLE PLAN

GEOLOGICAL FEATURES LAYOUT & CROSS-SECTIONS



KEY:

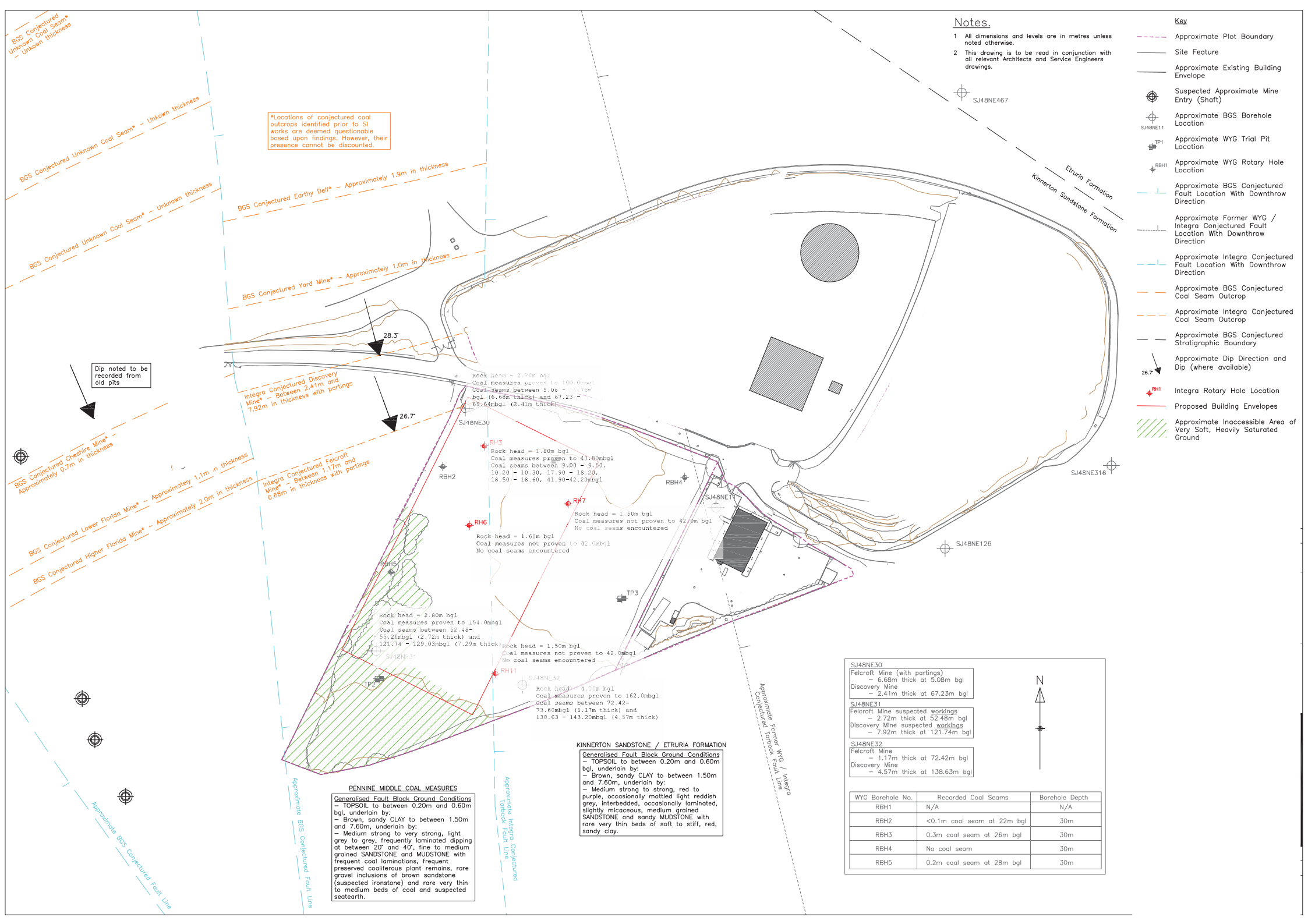


Rotary open holes

FAIRHURST



Project	130827 Hatfields JLR, Liverpool		
Date	22/09/2024		
Drawing Title & No.	Proposed site plan and exploratory boreholes		
Section		Revision	



Notes:

- 1 All dimensions and levels are in metres unless noted otherwise.
- 2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.

Key

- Approximate Plot Boundary
- Site Feature
- Approximate Existing Building Envelope
- Suspected Approximate Mine Entry (Shaft)
- Approximate BGS Borehole Location
- Approximate WYG Trial Pit Location
- Approximate WYG Rotary Hole Location
- Approximate BGS Conjectured Fault Location With Downthrow Direction
- Approximate Former WYG / Integra Conjectured Fault Location With Downthrow Direction
- Approximate Integra Conjectured Fault Location With Downthrow Direction
- Approximate BGS Conjectured Coal Seam Outcrop
- Approximate Integra Conjectured Coal Seam Outcrop
- Approximate BGS Conjectured Stratigraphic Boundary
- Approximate Dip Direction and Dip (where available)
- Integra Rotary Hole Location
- Proposed Building Envelopes
- Approximate Inaccessible Area of Very Soft, Heavily Saturated Ground

SJ48NE30		
Felcroft Mine (with partings)		
- 6.68m thick at 5.08m bgl		
Discovery Mine		
- 2.41m thick at 67.23m bgl		
SJ48NE31		
Felcroft Mine suspected workings		
- 2.72m thick at 52.48m bgl		
Discovery Mine suspected workings		
- 7.92m thick at 121.74m bgl		
SJ48NE32		
Felcroft Mine		
- 1.17m thick at 72.42m bgl		
Discovery Mine		
- 4.57m thick at 138.63m bgl		
WYG Borehole No.	Recorded Coal Seams	Borehole Depth
RBH1	N/A	N/A
RBH2	<0.1m coal seam at 22m bgl	30m
RBH3	0.3m coal seam at 26m bgl	30m
RBH4	No coal seam	30m
RBH5	0.2m coal seam at 28m bgl	30m

*Locations of conjectured coal outcrops identified prior to SI works are deemed questionable based upon findings. However, their presence cannot be discounted.

KINNERTON SANDSTONE / ETRURIA FORMATION

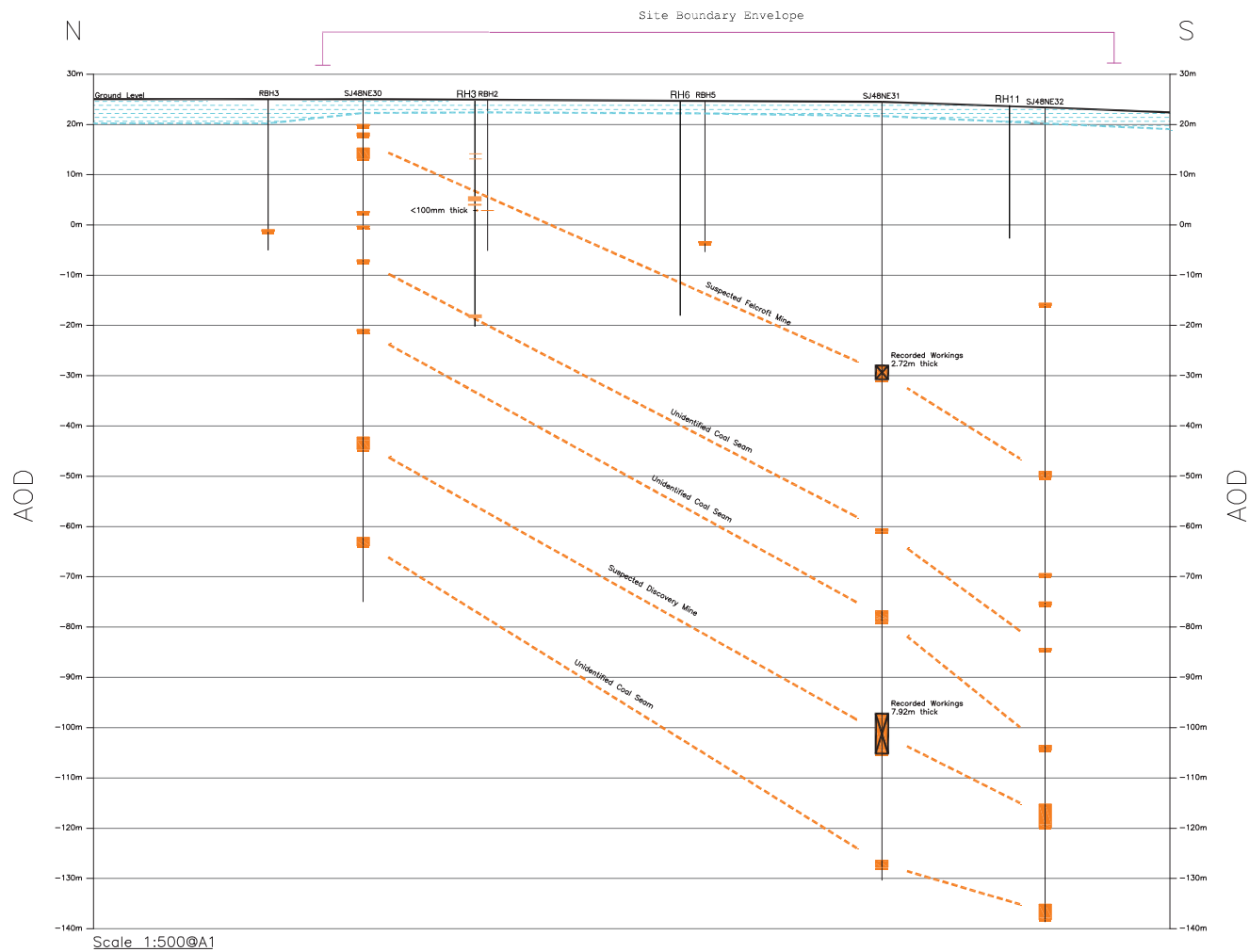
Generalised Fault Block Ground Conditions

- TOPSOIL to between 0.20m and 0.60m bgl, underlain by:
- Brown, sandy CLAY to between 1.50m and 7.60m, underlain by:
- Medium strong to strong, red to purple, occasionally mottled light reddish grey, interbedded, occasionally laminated, slightly micaceous, medium grained SANDSTONE and sandy MUDSTONE with rare very thin beds of soft to stiff, red, sandy clay.

PENNINE MIDDLE COAL MEASURES

Generalised Fault Block Ground Conditions

- TOPSOIL to between 0.20m and 0.60m bgl, underlain by:
- Brown, sandy CLAY to between 1.50m and 7.60m, underlain by:
- Medium strong to very strong, light grey to grey, frequently laminated dipping at between 20° and 40°, fine to medium grained SANDSTONE and MUDSTONE with frequent coal laminations, frequent preserved coariferous plant remains, rare gravel inclusions of brown sandstone (suspected ironstone) and rare very thin to medium beds of coal and suspected seat earth.

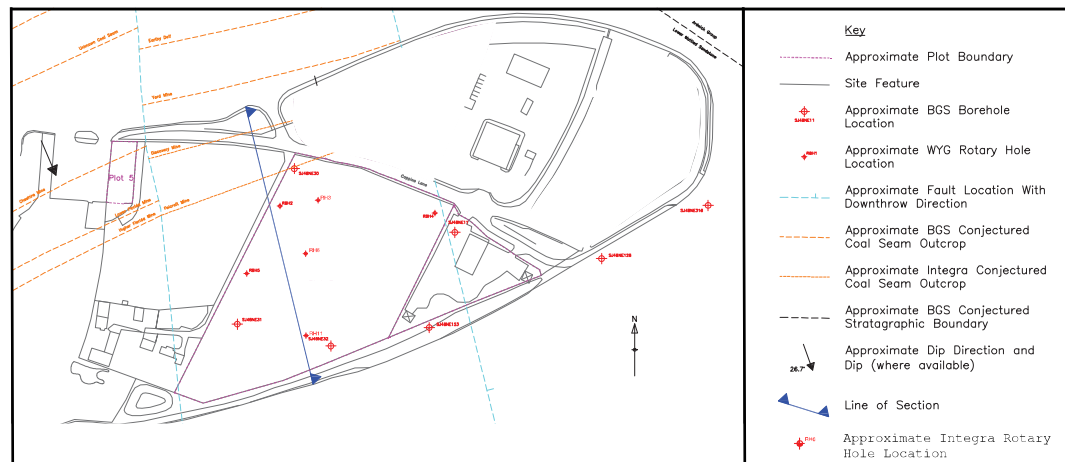


Notes.

- 1 All dimensions and levels are in metres unless noted otherwise.
- 2 This drawing is to be read in conjunction with all relevant Architects and Service Engineers drawings.
- 3 Anticipated strata depths are for informative purposes only and may not be a true representation of the underlying ground conditions.

Key

- Approximate Ground Level
- Approximate Plot Envelope
- - - Anticipated Coal Seam
- Recorded Coal Seam
- Recorded Coal Workings
- Anticipated Glacial Till / Made Ground Deposits
- SJ48NE30 BGS / WYG Borehole (With Reference No.)



Key

- - - Approximate Plot Boundary
- Site Feature
- Approximate BGS Borehole Location
- Approximate WYG Rotary Hole Location
- Approximate Fault Location With Downthrow Direction
- - - Approximate BGS Conjectured Coal Seam Outcrop
- - - Approximate Integra Conjectured Coal Seam Outcrop
- - - Approximate BGS Conjectured Stratigraphic Boundary
- Approximate Dip Direction and Dip (where available)
- Line of Section
- Approximate Integra Rotary Hole Location

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