



Littleborough Fire Station Drilling & Grouting Report

Prepared for Greater Manchester Combined Authority

DOCUMENT CONTROL

Client:	Greater Manchester Combined Authority
Report No. :	2868/WSH/DGR
Project:	Littleborough Fire Station
Report Title:	Drilling & Grouting Report
Report Status:	FINAL
Version No.:	1
Project Engineer:	Phillip Windslow
Date of Issue:	18/05/2023

This report has been prepared by GroundSolve Ltd with all reasonable care and diligence, within the best practice and guidance current at the time of issue within the proposed redline boundary and proposed Site end use as presented by the Client.

This report is confidential to the Client and GroundSolve Ltd accepts no responsibility whatsoever to third parties to whom this report is presented.

Version No.	Description	Date of Issue	Author	Reviewed By	Approved By
1	Final	18/05/23	Phillip Windslow	Stefan Imiolczyk	Stefan Imiolczyk
			MSc FGS	BSc (Hons) MSc FGS CEng MICE	BSc (Hons) MSc FGS CEng MICE

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1.0 INTRODUCTION

Greater Manchester Combined Authority / Greater Manchester Fire and Rescue are currently developing an extension to Littleborough Fire Station, Whitelees Road, Littleborough, OL15 8DU (393360E, 416660N).

The site has previously been investigated by The Land Consultancy Ltd (TLC), who identified a shallow coal seam at a depth of around 17.50mbgl that may have been mined in the past. A deeper seam was also encountered at 31.50mbgl however, due to the thickness of overlying rock, this was not considered a risk to the site.

Pennine Geotechnical Services Ltd (PGS) were subsequently appointed to treat the workings by drilling and grouting.

GroundSolve Ltd (GSL) were appointed by Pennine Geotechnical Services Ltd (PGS) to act as their agent and assist with obtaining the relevant Coal Authority permit, and to produce the closure report to be submitted to the Coal Authority, by compiling the drilling and grouting records provided to them by PGS.

This report therefore presents the findings of the drilling and grouting, the Coal Authority Permit Closure Form, and may be submitted to the Coal Authority to discharge the permit conditions.

2.0 THE SITE

2.1 Site Location and Description

The site is located immediately to the southeast of Whitelees Road, across from Salts Drive, Littleborough as shown on **Figure 1**.

The site lies at an elevation of approximately 155m AOD.

The site covers an area of roughly 3400m² and is an active fire station, comprising buildings, areas of hardstanding and grassed soft landscaping.

2.2 Geology

The TLC report provided the following description of the site geology:

Superficial comprises Glacial Till (diamicton) is mapped across the centre and N of the site. Head deposits (diamicton) are indicated across the S.

Bedrock comprises Carboniferous rock strata–Woodhead Hill Rock (sandstone)–BGS 1:10,000 and 1:50,000 scale mapping. Pennine Lower Coal Measures strata–Undifferentiated strata–1:10,560 scale mapping. Undifferentiated strata comprise of cyclical sequences of sandstone, mudstone and siltstone with subordinate coal seams and seat earths; ironstone and marine bands can also be present.

No rock dips are indicated on BGS mapping in the immediate vicinity of the site. However, the outcrop patterns and stratigraphic column suggest that rock dip is shallow and southerly.

Although the property is not indicated to be affected by known faulting, numerous faults are depicted in the general area of the site which have affected the local geology.

2.3 Abandoned Mining

The TLC report presents a Coal Mining Risk Assessment for the site, which found the following coal seams to sub-crop beneath the site:

The 1:10,560 scale map indicates that the NW-SE trending Lower Foot (a.k.a Little) coal seam sub-crops through the centre of the site. This plan shows a coal seam to sub-crop ≈50m to the NE and the Six-Inch coal seam to sub-crop ≈250m to the NE of the site. The coal seam ≈50m NE is labelled as the Yard on the 1:10,560 plan but is called the

Bassy by the Coal Authority (CA). If the sub-crop position of the Lower Foot coal seam is correct, this coal seam will be present beneath the site at very shallow depth to the S of its sub-crop position. With a southerly rock dip angle there is also potential for the Bassy coal seam to be present beneath the site at shallow depth. The 1:10,560 scale plan suggests that the Six-Inch coal seam will not be present beneath the site at shallow depth.

Desk study information suggests the proposed development is at moderate risk from ground subsidence related to roof collapse and surface crown hole formation over probable unrecorded shallow workings within the Lower Foot and Bassy coal seams.

A Coal Authority Mining Report was also obtained by TLC, which found the following:

- The NE portion of the site is located within a Development High Risk Area which is associated with an area at risk from unrecorded probable shallow coal workings (within the Bassy coal seam – TLC).
- Known coal workings are not present beneath the site.
- No known mine entries are located within at least 100m of the site.
- The site and surrounding area are not affected by known fissures or breaklines.
- The site and immediate surrounding area are not affected by known opencast coal mining.

An intrusive investigation was recommended and subsequently carried out, which is discussed in Section 4 below.

3.0 PROPOSED DEVELOPMENT

The proposed development is for an extension to the north of the existing building.

The development layout is presented on **Figure 2**.

4.0 PREVIOUS INVESTIGATIONS

An investigation was undertaken by TLC between the 13th and 15th September 2021. This comprised 3no. Rotary Open Holes (RH1 to RH3) drilled to depths of 40.00mbgl drilled by Taylor Drilling Services Ltd.

The ground encountered generally comprised of topsoil to 0.20mbgl over glacial CLAY to between 8.80m and 9.00mbgl.

Bedrock comprised MUDSTONE, SILTSTONE and SANDSTONE of the Pennine Middle Coal Measures.

The following coal seams were encountered.

- RH1 – A 1.00m thick intact COAL seam was encountered at 17.00mbgl.
- RH2 –A 0.90m thick intact COAL seam was encountered at 17.50mbgl.
- RH2 –A 0.50m thick intact COAL seam was encountered at 31.50mbgl.
- RH3 –A 0.90m thick intact COAL seam was encountered at 17.50mbgl.

No evidence of broken ground or workings was noted, and although water strikes could not be recorded accurately due to the use of water flush, no loss of flush was noted.

The shallow coal seam (17.00-17.50mbgl) was considered to be the Bassey Coal Seam. The deeper coal seam (31.50mbgl) may have been the Margery or the Six Inch Coal.

TLC concluded that, as either 8.20m or 8.50m of bedrock cover was encountered above what was considered to be the Bassy Coal Seam at between 17.00m to 17.50mbgl, was less than the generally required thickness of at least 10 times the seam thickness of acceptable cover (15.00m).

To mitigate against the risk, TLC advised that drilling and grouting works were to be carried out in the vicinity of the proposed extension on a 6.00m grid stabilise any potential unrecorded workings. An increased density of grouting was recommended should large grout uptakes occur.

5.0 THE WORKS

5.1 Design & Tender

TLC produced a specification for the grouting works, with the grouting itself carried out by Pennine Geotechnical Services Ltd.

The grouting borehole locations are presented on **Figure 3**, drilled on a 6m x 6m grid pattern across the entire extension area.

Grouting was to be carried out using a 10:1 PFA/Cement grout, which was to be tremied to the base of the drill hole to ensure any groundwater was displaced. A "Banjo T pipe" was then placed on top of the casing to allow the grout to be pressurised into the workings. A grout strength of 1.0MPa at 28 days was specified.

5.2 CA Treatment Permit

Prior to the works, GSL obtained a permit from the CA on behalf of Pennine Geotechnical and Greater Manchester Combined Authority. The license is presented in **Appendix A** - Permit Reference 26318.

5.3 The Drilling & Grouting Works

The works were undertaken by Pennine Geotechnical Services Ltd between the 9th March and 17th March 2023. The drilling was carried out using a Soilmec SM-14 drilling rig with water flush. The drill bit diameter was 64mm, with the casing being 101mm in diameter. A maximum of 12.00m of casing was used, sunk into the mudstone bedrock. Ground gases were monitored at the rig head, with none being encountered during the works.

The boreholes were drilled to between 20.00m to 22.00mbgl. No voids were recorded during the grouting works.

Boreholes A2, A4, A6, B3, C2, C4, C6, D1, D3, D5, E2 and E4 were drilled to 20.00mbgl and did not encounter any coal seams.

Boreholes E7, E8, E9, F1, G2, G4, G6, G8, G9, H1, I2, I6, I8 and I9 encountered the target coal seam at depths of between 17.00m and 20.50mbgl, with a thickness of 0.50m to 2.00m.

An additional thin coal was also recorded in boreholes I6, I8 and I9 at around 21.50mbgl. This seam was less than 0.50m thick.

The driller's daily log sheets for the drilling works are presented in **Appendix B**.

All of the grouting records are presented in **Appendix C**.

5.4 Testing

During the works grout cubes were taken on a daily basis, the results of which are presented in full in **Appendix D**.

6 no. grout cubes were tested, achieving strengths ranging from 1.30-2.50 N/mm² (MPa). The average value achieved was 2.02 N/mm².

The required grout strength after 28 days was 1 MPa, and therefore an adequate strength has been achieved.

5.5 Conclusions/Risk Assessment

The deep borehole logs, together with the drilling and grouting records for the grouting boreholes, were reviewed by GSL. Based on the findings of the site work, no broken ground, voids or loss of flush was encountered to suggest that the coal seam at 17.00mbgl had been worked.

The thin seam recorded at around 21.50mbgl was recorded as intact in all locations where it was encountered, and has at least 10 times rock cover based on a maximum 0.5m high potential void, meaning even if it had been worked then grouting would not have been necessary.

6.0 SUMMARY

The site has been drilled & grouted by PGS in line with the grouting specification. GSL have reviewed the site records and have determined that the site has been treated in accordance with the specification.

The Permit Closure form is therefore presented in **Appendix E**.

FIGURES



KEY



Site Location

(C) OpenStreetMap Contributors

Sampling locations and features annotated 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.

Client:
Pennine Geotechnical Services Ltd

Title:
Site Location and Boundary

Site:
Littleborough Fire Station

GroundSolve Ltd
Consulting Geotechnical Engineers

Job No.:
GSL 2868

Drawn By:
PW

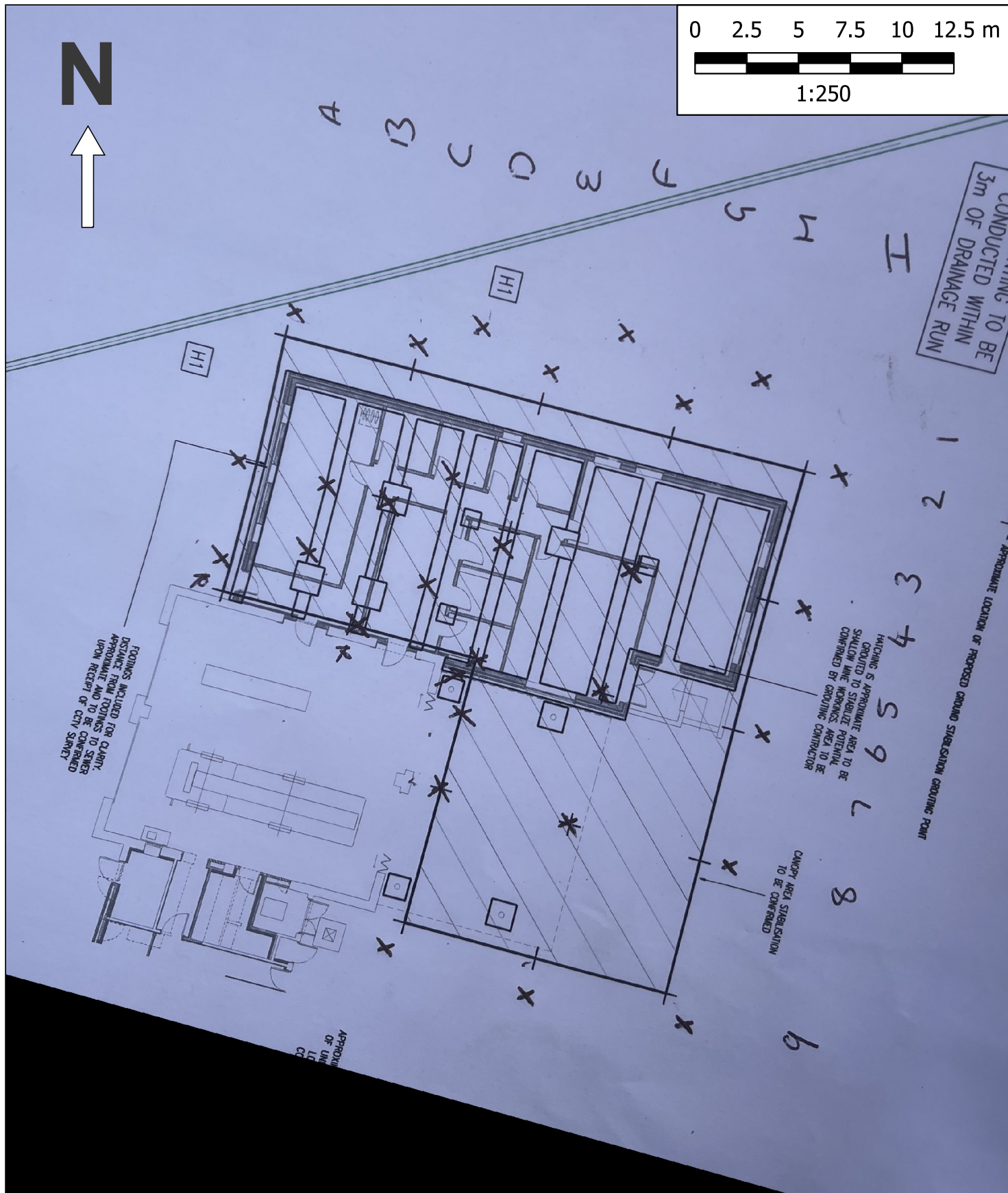
Checked By:
SI

Drawn:
May 2023

Scale (see scale bar):
1:25,000 @ A4
1:1,000 @ A4

Figure:
1

Revision:



Drawing provided by client

Sampling locations and features annotated 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.

Client: Pennine Geotechnical Services Ltd				Title: Proposed Development and Proposed Grouting Plan			 GroundSolve Ltd Consulting Geotechnical Engineers
Site: Littleborough Fire Station							
Job No.: GSL 2868	Drawn By: PW	Checked By: SI	Drawn: May 2023	Scale (see scale bar): 1:250 @ A4		Figure: 2	

APPENDIX A – COAL AUTHORITY PERMIT



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 26318

Name and Address of Permit Holder:

Greater Manchester Combined Authority
Total Buildings
56 Oxford Street
Manchester
M1 6EU

Site Location:

Littleborough Fire Station
Whitelees Road
Littleborough
OL15 8DU

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

Treatment of shallow mine workings by drilling and grouting to 20m on 6m grid

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: Paul Hobson Granted Date: 08 March 2023

For and on behalf of The Coal Authority

Nominated Representative: Paul Hobson, Permitting Manager;

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

Tel: 01623 637450; E-Mail: permissions@coal.gov.uk

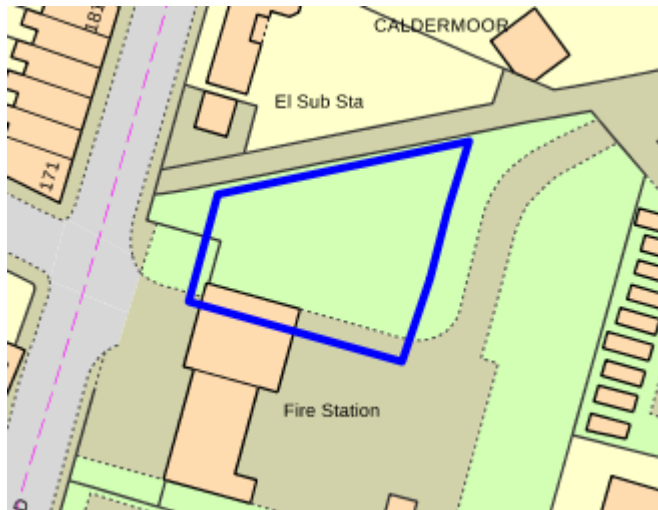


The Coal
Authority

Granted Permit Boundary

Permit Ref: 26318

Permit Boundary:



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APPENDIX B – DRILLER'S DAILY LOG SHEETS

**PENNINE**

Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

*** NIGHT/DAY SHIFT RECORD**Our Ref: 609 / No. 15507

Telephone: 01706 658299 Fax: 01706 860560

CLIENT H. H. Smith SonsDATE 17-03-23SITE Littledon Fire StationWEATHER Cold + Sunny

PLANT ON SITE:

- | | |
|---------------------------------------|--------------------------|
| 1. <u>Soil Mix</u> | 7. <u>Rods + Casings</u> |
| 2. <u>Cx 2.10</u> | 8. <u>Tool Box</u> |
| 3. <u>Large water tank/water pump</u> | |
| 4. <u>Hoses</u> | 10. <u></u> |
| 5. <u>Press washer</u> | 11. <u></u> |
| 6. <u>Telehandler</u> | 12. <u></u> |

MATERIAL DELIVERED / USED:

- | | |
|---------|-------------------|
| 1. | QTY. / |
| 2. | QTY. / |
| 3. | QTY. / |
| 4. | QTY. / |
| 5. | QTY. / |
| 6. | QTY. / |

LABOUR:

- | | |
|-----------------------|----------|
| 1. <u>D. Smart</u> | 7. |
| 2. <u>S. Robinson</u> | 8. |
| 3. | 9. |
| 4. | 10. |
| 5. | 11. |
| 6. | 12. |

No. OF HOLES DRILLED:

- | | |
|------------|-----------|
| 1. Q. | QTY. |
| 2. Q. | QTY. |
| 3. Q. | QTY. |
| 4. Q. | QTY. |
| 5. Q. | QTY. |
| 6. Q. | QTY. |

DAILY COMMENTS:

Last 3 holes drilled All Bore holes
no fully grouted 80 Bag/lot mixed
cement used
All Above plant off site except
The telehandler.

DELAY TIME:

REASON:

- | |
|-------------|
| 1. hrs |
| 2. hrs |
| 3. hrs |

- | |
|---------|
| 1. |
| 2. |
| 3. |

Compiled by.....

D. Smart

Received by.....

* Delete as applicable



www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

*** NIGHT/DAY SHIFT RECORD**
Our Ref: 609 / No. 15501

CLIENT H. H. Smith and son LTD Telephone: 01706 658299 Fax: 01706 660560
SITE Littleborough Fire Station DATE 09.03.23

WEATHER Overcast Cool

PLANT ON SITE:

- | | |
|----------------------------|---------------------|
| 1. <u>Cx 110</u> | 7. <u>Tekhammer</u> |
| 2. <u>large water tank</u> | 8. <u>Soilmax A</u> |
| 3. <u>stand pipe</u> | 9. |
| 4. <u>Disc cutter</u> | 10. |
| 5. <u>2 water pumps</u> | 11. |
| 6. <u>Tool Box</u> | 12. |

MATERIAL DELIVERED / USED:

- | | |
|---------|-------------------|
| 1. | QTY. / |
| 2. | QTY. / |
| 3. | QTY. / |
| 4. | QTY. / |
| 5. | QTY. / |
| 6. | QTY. / |

LABOUR:

- | | |
|-----------------------|----------|
| 1. <u>D. Bennett</u> | 7. |
| 2. <u>S. Robinson</u> | 8. |
| 3. <u>J. Greenham</u> | 9. |
| 4. | 10. |
| 5. | 11. |
| 6. | 12. |

No. OF HOLES DRILLED:

- | | |
|------------|-----------|
| 1. Q. | QTY. |
| 2. Q. | QTY. |
| 3. Q. | QTY. |
| 4. Q. | QTY. |
| 5. Q. | QTY. |
| 6. Q. | QTY. |

DAILY COMMENTS:

Inductions Taking Reinsures Setting up Site
Drilled 3 bore holes

DELAY TIME: REASON:

- | | |
|--------|---------|
| 1. hrs | 1. |
| 2. hrs | 2. |
| 3. hrs | 3. |

Compiled by [Signature]

Received by

* Delete as applicable



PENNINE
Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

*** NIGHT/DAY SHIFT RECORD**

Our Ref: 609 / No. 15504

Telephone: 01706 658299 Fax: 01706 860560

CLIENT M. H. Smith and Son LTD

DATE 10.03.23

SITE Lillibagh fire Station

WEATHER overcast

PLANT ON SITE:

- | | |
|---------------------------|----------------------------|
| 1. <u>Cx 410</u> | 7. <u>Large water tank</u> |
| 2. <u>SM 14</u> | 8. <u>Stil Saw</u> |
| 3. <u>Pressure washer</u> | 9. <u>Gas monitor</u> |
| 4. <u>2x Water pumps</u> | 10. <u>Hoses</u> |
| 5. <u>Tool Box</u> | 11. <u>Casing + rods</u> |
| 6. <u>Telehandler</u> | 12. <u></u> |

MATERIAL DELIVERED / USED:

- | | |
|---------|-------------------|
| 1. | QTY. / |
| 2. | QTY. / |
| 3. | QTY. / |
| 4. | QTY. / |
| 5. | QTY. / |
| 6. | QTY. / |

LABOUR:

- | | |
|--------------------|----------|
| 1. <u>D. Smart</u> | 7. |
| 2. <u>J. Smart</u> | 8. |
| 3. | 9. |
| 4. | 10. |
| 5. | 11. |
| 6. | 12. |

No. OF HOLES DRILLED:

- | | |
|------------|-----------|
| 1. Q. | QTY. |
| 2. Q. | QTY. |
| 3. Q. | QTY. |
| 4. Q. | QTY. |
| 5. Q. | QTY. |
| 6. Q. | QTY. |

DAILY COMMENTS:

Grouted bore holes no A2, A4, A6, B3 + 5.
C 2, C4, C6, D1, D3, D5, E2 + E4

40 Bags of Graft used

DELAY TIME:

REASON:

1. hrs

1.

2. hrs

2.

3. hrs

3.

Compiled by E. David Smart

Received by

* Delete as applicable



PENNINE
Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

CLIENT H. H. Smith & Son Ltd

SITE Lilthborough fire Station

*** NIGHT/DAY SHIFT RECORD**

Our Ref: 609 / No. 15502

Telephone: 01706 658299 Fax: 01706 860560

DATE 10.03.23

WEATHER Cool + Rain

PLANT ON SITE:

- | | |
|--------------------------|-----------------------|
| 1. <u>Sm 14</u> | 7. <u>2x Nitrogen</u> |
| 2. <u>Hydraulic tank</u> | 8. <u>Start pipe</u> |
| 3. <u>Filler tank</u> | 9. <u>Red casing</u> |
| 4. <u>Ca 410</u> | 10. |
| 5. <u>Various hoses</u> | 11. |
| 6. <u>Tool Box</u> | 12. |

MATERIAL DELIVERED / USED:

- | | |
|---------|-----------|
| 1. | QTY |
| 2. | QTY |
| 3. | QTY |
| 4. | QTY |
| 5. | QTY |
| 6. | QTY |

LABOUR:

- | | |
|--------------------|----------|
| 1. <u>Smart</u> | 7. |
| 2. <u>Robinson</u> | 8. |
| 3. <u>Stinson</u> | 9. |
| 4. | 10. |
| 5. | 11. |
| 6. | 12. |

No. OF HOLES DRILLED:

- | | |
|------------|-----------|
| 1. Q. | QTY |
| 2. Q. | QTY |
| 3. Q. | QTY |
| 4. Q. | QTY |
| 5. Q. | QTY |
| 6. Q. | QTY |

DAILY COMMENTS:

Drilled 10 Bore holes installed plastic
Pipes in each hole drilled.

DELAY TIME:

REASON:

1. hrs

1.

2. hrs

2.

3. hrs

Compiled by

[Signature]

Received by

* Delete as applicable



PENNINE

Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

*** NIGHT/DAY SHIFT RECORD**

Our Ref:.....609...../ No. 15460

Telephone: 01706 658299 Fax: 01706 860560

CLIENT.....M M Smith.....

DATE.....13.03.23.....

SITE.....LITTLEBOROUGH FIRE STATION.....

WEATHER.....FINE.....

PLANT ON SITE:

- | | |
|----------------|--------------|
| 1. SM 16 | 7. DTH TOOLS |
| 2. CX 40 | 8. FCT |
| 3. WATER TANK | 9. |
| 4. Qty 6 HOSES | 10. |
| 5. w HOSES | 11. |
| 6. w/pumps | 12. |

MATERIAL DELIVERED / USED:

- | | |
|----|----------------|
| 1. | QTY...../..... |
| 2. | QTY...../..... |
| 3. | QTY...../..... |
| 4. | QTY...../..... |
| 5. | QTY...../..... |
| 6. | QTY...../..... |

LABOUR:

- | | |
|----------------------|-----|
| 1. D SMART 1/2 DAY | 7. |
| 2. J GAINSHAW | 8. |
| 3. S CURRICE 1/2 DAY | 9. |
| 4. | 10. |
| 5. | 11. |
| 6. | 12. |

No. OF HOLES DRILLED:

- | | | |
|------------|----------------|------------|
| 1. Q. 88.9 | QTY.....1..... | FI x 20mts |
| 2. Q. | QTY..... | |
| 3. Q. | QTY..... | |
| 4. Q. | QTY..... | |
| 5. Q. | QTY..... | |
| 6. Q. | QTY..... | |

DAILY COMMENTS:

✓ S/C ON SITE PM.
✓ Set up over FI Drill
✓ Complete Drilling
✓ Set up over G2 ST Drilling.

A LAY SITE 1600 HRS.

DELAY TIME:

REASON:

- | | |
|--------|----|
| 1. hrs | 1. |
| 2. hrs | 2. |
| 3. hrs | 3. |

Compiled by.....

Received by.....

* Delete as applicable

CL-03.23



PENNINE

Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

*** NIGHT/DAY SHIFT RECORD**

Our Ref:.....⁶⁰⁹...../ No. 15461

Telephone: 01706 658299 Fax: 01706 860560

CLIENT.....M. M. Smith.....

DATE.....14.03.23.....

SITE.....LITTLEBOURNE FIRE STATION.....

WEATHER.....fine.....

PLANT ON SITE:

- | | |
|----------------------------|-----------------------------|
| 1. <u>SM 14</u> | 7. <u>WATER PUMPS</u> |
| 2. <u>CA 410</u> | 8. <u>OTH TOOLS</u> |
| 3. <u>Any 6 HOSE</u> | 9. |
| 4. <u>W HOSE</u> | 10. |
| 5. <u>FAT</u> | 11. |
| 6. <u>WATER TANK</u> | 12. |

MATERIAL DELIVERED / USED:

- | | |
|---------|------------------|
| 1. | QTY..... / |
| 2. | QTY..... / |
| 3. | QTY..... / |
| 4. | QTY..... / |
| 5. | QTY..... / |
| 6. | QTY..... / |

LABOUR:

- | | |
|-----------------------------|----------|
| 1. <u>S CHABLE</u> | 7. |
| 2. <u>T SUDERLAND</u> | 8. |
| 3. | 9. |
| 4. | 10. |
| 5. | 11. |
| 6. | 12. |

No. OF HOLES DRILLED:

- | | | | |
|-----------|----------|-----------|--------------|
| 1. Q..... | QTY..... | <u>G2</u> | <u>x 20m</u> |
| 2. Q..... | QTY..... | <u>H1</u> | <u>x 20m</u> |
| 3. Q..... | QTY..... | <u>G4</u> | <u>x 20m</u> |
| 4. Q..... | QTY..... | <u>G6</u> | <u>x 20m</u> |
| 5. Q..... | QTY..... | <u>I2</u> | <u>x 20m</u> |
| 6. Q..... | QTY..... | | |

DAILY COMMENTS:

- X ON SITE 0720 TS ARRIVE / NOULTON ETC
- X START DRILLING @ 0800HRS
- X DRILLING
- X Hyd Hole Done @ 1100am - 1245
- X CONT DRILLING
- X FINISHED DRILL @ 16.10HRS
- X LEFT SITE

DELAY TIME:

REASON:

- | | |
|--------|----|
| 1. hrs | 1. |
| 2. hrs | 2. |
| 3. hrs | 3. |

Compiled by.....[Signature].....

Received by.....[Signature].....

* Delete as applicable



PENNINE

Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

* NIGHT/DAY SHIFT RECORD

Our Ref: 609 / No. 15505

Telephone: 01706 658299 Fax: 01706 860560

CLIENT: H. H. Smith + Son

DATE: 15.03.23

SITE: Little Borey Fire Station

WEATHER:

PLANT ON SITE:

1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

MATERIAL DELIVERED / USED:

1.	QTY. /
2.	QTY. /
3.	QTY. /
4.	QTY. /
5.	QTY. /
6.	QTY. /

LABOUR:

1. <u>D. Smart</u>	7.
2. <u>T. Sunderland</u>	8.
3.	9.
4.	10.
5.	11.
6.	12.

No. OF HOLES DRILLED:

1. Q.	QTY.
2. Q.	QTY.
3. Q.	QTY.
4. Q.	QTY.
5. Q.	QTY.
6. Q.	QTY.

DAILY COMMENTS:

Drilling All Day 4 Bore hole to 22-0

DELAY TIME:

REASON:

1. hrs	1.
2. hrs	2.
3. hrs	3.

Compiled by:

Received by:

* Delete as applicable



PENNINE

Geotechnical Services Ltd

www.penninegrouting.co.uk email: enquiries@penninegrouting.co.uk

*** NIGHT/DAY SHIFT RECORD**

Our Ref: 609 / No. 15506

Telephone: 01706 658299 Fax: 01706 860560

CLIENT H. H. Smith & Son

DATE 16.03.23

SITE Catthorpe Fire Station

WEATHER

PLANT ON SITE:

1. 7.
2. 8.
3. 9.
4. 10.
5. 11.
6. 12.

MATERIAL DELIVERED / USED:

1. QTY /
2. QTY /
3. QTY /
4. QTY /
5. QTY /
6. QTY /

LABOUR:

1. D. Smart 7.
2. T. Sunderland 8.
3. 9.
4. 10.
5. 11.
6. 12.

No. OF HOLES DRILLED:

1. Q. QTY
2. Q. QTY
3. Q. QTY
4. Q. QTY
5. Q. QTY
6. Q. QTY

DAILY COMMENTS:

Drilling all day 4 bore hole drilled to 2200

DELAY TIME:

REASON:

1. hrs 1.
2. hrs 2.
3. hrs 3.

Compiled by D. Smart

Received by

* Delete as applicable

APPENDIX C – GROUTING RECORDS



234 College Road
Rochdale Lancs OL12 6AF
Tel: (01706) 658299/861623
Fax: (01706) 860560
email: enquiries@penninegrouting.co.uk
www.penninegrouting.co.uk

Drillers Daily Drilling Record

(Soil Nail/Anchor/Pile Installation)

Contract no/site: **609**
Date: **17-03-23**
Driller: **D. Smart**

Equipment on Site:

☒ Rig
☒ Compressor
☒ Grout Pump
☒ Mixer
☒ Water Pump
☒ Power Pack
☒ Telehandler
☒ Jet Wash
☒ Fuel Bowser
☒ Water Tank
☒ Generator
☒ Augers
☒ Casing
☒ Rods
☒ OTH Hammer
☒ Welder
☒ Other

Deliveries: **1405**

OPC:

Sand:

Gravel:

PFA:

OTHER:

DRILLING DATA

Start time

End time

Activity/Strata Description

Bore Hole No.

Cage lth m

Bore Hole Dia

Flush type

Bit type & size

Casing size

Casing depth

Struts from depth (m)

Struts to depth (m)

Grout m3

Grout 1 take KG

Grout 2 take KG

Grout 3 take KG

Sand KG

Gravel KG

GROUTING MATERIAL

NOTES

Completed last bore hole. Then Grouted all drilled Bore holes. Loaded All Plant + Equipment at Site today. Telehandler left on site for collection.

CREW: **D. Smart**
S. Robinson

Signed Driller:

D. Smart



234 College Road
Rochdale Lancs OL12 6AF
Tel: (01706) 658299/861623
Fax: (01706) 860560
email: enquiries@penninegrouting.co.uk
www.penninegrouting.co.uk

Drillers Daily Drilling Record

Contract no/Sheet: 609
Date: 01.03.23
Driller: David Smith

Equipment on Site:

☒ Rig
☒ Compressor
☒ Groud Pump
☒ Mixer
☒ Water Pump
☒ Hole

☒ Power Pack
☒ Telehandler
☒ Jet Wash
☒ Fuel Bowser
☒ Water Tank
☒ Generator

☒ Augers
☒ Casing
☒ Rods
☒ DTH Hammer
☒ Welder
☒ Other

Deliveries: 1401

OPC: _____
 Sand: _____
 Gravel: _____
 PFA: _____
 OTHER: _____

Start time	End time	Activity/Strata Description	DRILLING DATA										GROUTING MATERIAL				
			Bore Hole No.	Cage lth m	Bore Hole Depth	Bore Hole Dia	Flush type	Bit type & size	Casing size	Casing depth	Strata from depth (m)	Strata to depth (m)	GROUT mix	GROUT take KG	GROUT take KG	Sand Kg	Gravel Kg
13:00	14:20	0-0 - 0-5 Siltsand	A6	11m	20-0		water	889	889	5-0							
14:35	15:20	0-5 - 5-00 Firm light	A9	11	11		11	64mm	11	11							
15:25	16:25	brown clay - 5-00 - 8-00	A2	11	11		11	64mm	11	11							
		MED MUDSTONE 8-0 - 20-00															
		Hard to Very hard Mudstone															
		Water Return did not change															
		Below 20 all during drilling															
		on each Bore hole drilled.															

Report NO 1

CREW: D Smart
 S Robinson
 S Gainsborough
 Signed Driller:

Notes

LABOUR:

1. *D. Smart*

No. OF HOLES DRILLED:

1. *Q* QTY



234 College Road
Rockdale Lancs OL12 6AF
Tel: (01706) 658299/861623
Fax: (01706) 860560
email: enquiries@penninegouting.co.uk
www.penninegouting.co.uk

Drillers Daily Drilling Record
(Soil Nail/Anchor/
Pile Installation)

Contract no./Site: **609**
Date: **10-03-23**
Driller: **D. Smart**

Equipment on Site:

☒ Rig
☒ Compressor
☒ Grout Pump
☒ Mixer
☒ Water Tank
☒ Hose

☒ Power Pack
☒ Technician
☒ Jet Wash
☒ Water Tank
☒ Generator

☒ Augers
☒ OTM Hammer
☒ Welder
☒ Other

Cellarings: **1402**

OPC: _____
Sand: _____
Gravel: _____
PEA: _____
OTM: _____

DRILLING DATA

Start time	End time	Activity/Strata Description	Hole No.	Cage Lth m	Hole Depth	Hole Dia	Flush type	Bit type & size	Casing size	Casing depth	Strata from depth (m)	Strata to depth (m)	Groove width	CROWTING MATERIAL				
		0-0 ~ 0-5 Made Ground	B5	11m	20m	90	110	4mm	89	5-0				Groat 1	Groat 2	Groat 3	Sand	Gravel
		0-5 - 5-00 Firm clay	B3											1mm to	1mm to	1mm to	kg	kg
		5-0 - 8-00 MED MUDSTONE	B2															
		8-00 20-00 Firm to c4	B4															
		Very hard beds of Mud-stone, A good section of water is lost at all. No change on any bore hole.	B1															
			B3															
			B5															
			B2															
			B4															
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			B1											</				



www.penninegrouting.co.uk

Driller:

<u>Notes</u>	CREW:
	Signed Driller:

CREW:

Signed Driller:



234 College Road
Rockdale Lancs OL12 6AF
Tel: (01706) 658299/861623
Fax: (01706) 860560
email: enquiries@penninegrouping.co.uk
www.penninegrouping.co.uk

Drillers Daily Drilling

Record (Soil Nail/Anchor
Pile Installation)

Contract no/ Site: 609

Date: 15.03.23

Driller: D. Smith

Equipment on Site:

Page

Compressor

Group Pump

Miller

Water Pump

Hose

Power Pack

Telehandie

Jet Wash

Fuel Bows

Walter Tann

Generator

August

Chasing

Results

DTH +

Weid.

Other

Deliveries:

1403

OPC-

Sand

Gran

PFA

0574

Start time	End time	Activity/Strata Description	DRILLING DATA										GROUTING MATERIAL					
			Bore Hole No.	Cage lth m	Bore Hole Depth	Bore Hole Dia	Flush type	Bit type & size	Casing size	Casing depth	Strata from depth (m)	Strata to depth (m)	GROUT mlt	GROUT 1 take KG	GROUT 2 take KG	GROUT 3 take KG	Sand Kg	Gravel Kg
		54 AS Before	54	NP	20	90mm	Wt	64	884									
		I 6 I 6 I 9	I 6	"	23			64mm	884	12								
		AS Before 20mts	I 8	"	23			64mm	884	9.0								
		20 - 21.5 Rock	I 9	"	22			64mm	884	9.0								
		21.5 - 22 coal 1mm																
		Back into bed rock.																
														</				

Notes

CREW:

REW: ① Smart
T. S. Underhill

Signed Drille

APPENDIX D – GROUT CUBE TEST RESULTS

29 Rufford Court
Woolston
Warrington
WA1 4RF
United Kingdom
Tel: +44(0) 1925 286220

CONCRETE TEST CUBE REPORT



Date: 20/04/2023

Report no: WAB51426221_01

Client: PENNINE GEOTECHNICAL SERVICES LTD

Scheme: 609 - Littleborough Fire Station, Whitelees Road

Contract no: 51074727

Request Sheet No.	Lab Ref.	Client Ref.	Date Made	Time Made	Date Received in Laboratory	Date Tested	Age days	Dimensions mm	Density kg/m ³	Failure Load kN	Compressive Strength N/mm ²	Specified Strength N/mm ²
NOR024439	51417892	A	10/03/2023		14/03/2023	17/03/2023	7	100x100x100	1640	14.1	1.4	not given
Location: GROUT Mix details: N/A Remarks: Degree of saturation uncertain. Annex B Procedure used. Outside dimensional tolerances stated in BS EN 12390:3:2009.												
NOR024439	51417893	B	10/03/2023		14/03/2023	08/04/2023	29	100x100x100	1650	25.1	2.5	not given
Location: GROUT Mix details: N/A Remarks: Degree of saturation uncertain.												
NOR024439	51417894	C	10/03/2023		14/03/2023	08/04/2023	29	100x100x100	1660	23.1	2.3	not given
Location: GROUT Mix details: N/A Remarks: Degree of saturation uncertain.												

The following apply unless otherwise stated under Remarks.

- 1) Laboratory curing range 18°-22°C.
- 2) Cube appearance as received satisfactory.
- 3) Test moisture condition and density saturated.
- 4) Cube failure normal. Concrete appearance normal.
- 5) Volume determined by measurement or designated size. Any fins removed by abrasive stone.
- 6) Laboratory curing conditions cannot be assured during tank cleaning.
- 7) Certificate of sampling not received. Certificate of making and curing not received.
- 8) Rate of Loading 0.4 to 0.8 N/mm² per sec.

Certified that curing of the hardened concrete in the laboratory and testing for shape, dimensions, density and compressive strength was carried out in accordance with BS EN 12390-1:2021, BS EN 12390-2:2019, BS EN 12390-7:2019 and BS 12390-3:2019
Air Content determined in accordance with BS EN 12350-7:2019, Slump test carried out in accordance with BS EN 12350-2:2019

Signed

Julie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: PENNINE GEOTECHNICAL SERVICES LTD

CONCRETE TEST CUBE REPORT



Date: 20/04/2023

Report no: WAB51426225_01

Client: PENNINE GEOTECHNICAL SERVICES LTD

Scheme: 609 - Littleborough Fire Station, Whitelees Road

Contract no: 51074727

Request Sheet No.	Lab Ref.	Client Ref.	Date Made	Time Made	Date Received in Laboratory	Date Tested	Age days	Dimensions mm	Density kg/m ³	Failure Load kN	Compressive Strength N/mm ²	Specified Strength N/mm ²
NOR024440	51426225	A	17/03/2023		22/03/2023	24/03/2023	7	100x100x100	1640	12.9	1.3	not given
Location: GROUT Mix details: N/A Remarks: Degree of saturation uncertain.												
NOR024440	51426226	B	17/03/2023		22/03/2023	14/04/2023	28	100x100x100	1650	21.8	2.2	not given
Location: GROUT Mix details: N/A Remarks: Degree of saturation uncertain.												
NOR024440	51426227	C	17/03/2023		22/03/2023	14/04/2023	28	100x100x100	1630	24.0	2.4	not given
Location: GROUT Mix details: N/A Remarks: Degree of saturation uncertain.												

The following apply unless otherwise stated under Remarks.

- 1) Laboratory curing range 18°-22°C.
- 2) Cube appearance as received satisfactory.
- 3) Test moisture condition and density saturated.
- 4) Cube failure normal. Concrete appearance normal.
- 5) Volume determined by measurement or designated size. Any fins removed by abrasive stone.
- 6) Laboratory curing conditions cannot be assured during tank cleaning.
- 7) Certificate of sampling not received. Certificate of making and curing not received.

8) Rate of Loading 0.4 to 0.8 N/mm² per sec.

Certified that curing of the hardened concrete in the laboratory and testing for shape, dimensions, density and compressive strength was carried out in accordance with BS EN 12390-1:2021, BS EN 12390-2:2019, BS EN 12390-7:2019 and BS 12390-3:2019
Air Content determined in accordance with BS EN 12350-7:2019, Slump test carried out in accordance with BS EN 12350-2:2019

Signed

Julie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: PENNINE GEOTECHNICAL SERVICES LTD

APPENDIX E – COAL AUTHORITY PERMIT CLOSURE FORM



Permit Ref.	26318	Project / Site Location	Littleborough Fire Station, Whitelees Road, Littleborough, , OL15 8DU
-------------	--------------	-------------------------	--

Please supply all relevant documents, including this completed form within 3 months of the permitted works being completed.

Where relevant the report should include; borehole logs and details of mine or mine entry treatment works carried out (incl. engineering drawings, grout takes etc.) and a scaled site layout plan (correlated to O.S N' Grid) showing all relevant mine entry positions, coal seams, voids and broken ground proved by the works.

Summary of works

Start date **09/03/23**

Finish date **17/03/23**

Have any variations occurred? ☒ No ☐ Yes If so was the Authority notified? ☐ No ☐ Yes

Please describe;

Did if any of the following incidents occur?

- ☐ Spontaneous combustion ☐ Water emission ☐ Gas emission (elevated or above action levels)
☐ Geotechnical instability ☐ Legal issues incl. damage or potential claims ☒ None

If yes, please detail each item;

Were any of the following encountered? Please give a brief summary of the works undertaken.

- ☒ Intact coal only ☐ Broken ground ☐ Backfilled ground ☐ Voids

Description;

Coal recorded at anticipated seam depth, but no voids
or broken ground, or significant loss of flush.

Will further works be necessary that require a Permit? ☒ No ☐ Yes

If yes, please describe, including any recommendations;

Name: STEFAN IMIOLCZYK	Email: stefan.imiolczyk@groundsolve.com
Company: GROUND SOLVE LTD	Tel: 01244 661361