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**VERIFICATION REPORT
FOR THE
TREATMENT OF MINESHAFT
271515-008**

at

**PHASE 4 EDGEHILL PARK,
WILSON PIT ROAD,
WHITEHAVEN**

**Prepared for
STORY HOMES LIMITED**

Report No. 4046-G-R035

Date: March 2024

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Appendix B – Photographs

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Appendix D – Contractors Daily Drilling Returns

Appendix E – Concrete Test Certificate

Revision History

From	Date	Comments
4046-G-R035	March 2024	Original Report

VERIFICATION REPORT FOR THE TREATMENT OF MINESHAFT 271515-008

at

PHASE 4, EGEHILL PARK, WILSON PIT ROAD, WHITEHAVEN

1 INTRODUCTION

1.1 General

- 1.1.1 ID Geoenvironmental Limited (IDG), have been commissioned by Story Homes Limited to prepare a Verification Report for treatment of a mineshaft 271515-008, located within Phase 4, Edgehill Park, Wilson Pit Road, Whitehaven.
- 1.1.2 IDG have previously issued the following reports relating to the site.
- Supplementary Rotary Probehole Investigation – Phase 4, Edgehill Park, Whitehaven– Findings & Recommendations. IDG Letter Report Reference 4046-G-L020 dated 16th June 2022.
 - Specification for the Treatment of a Shaft at Phase 4 Edgehill Park, Wilson Pit Road, Whitehaven. IDG Report Reference 4046-G-R034 dated October 2023.
- 1.1.3 The objective of the works were to stabilise the infill materials within the shaft by drilling and injection of grout in accordance with IDG Report Reference 4046-G-R034.

2 BACKGROUND

2.1 Site Description

- 2.1.1 The proposed development comprises 107 two-storey residential properties. Shaft 271515-008 is located within 25m radius of Plots 69-73 & 85. At the time of the shaft treatment the site had been cleared of topsoil and original ground level reduced to the required external development levels.
- 2.1.2 The site location is shown on Drawing No. 4046-G-D038 presented in Appendix A. Site details are summarised in the following table.

Site Location	
Location	2.0 km southwest of Whitehaven town centre
NGR	297360, 515800
Approximate Area	3.95ha
Known services	None depicted on service drawings

2.2 Shaft Details

- 2.2.1 One phase of trial pitting and three phases of mining investigation have taken place in Phase 4 since 2020. Trial pits TP756, 758 & 759 identified that in the immediate vicinity of the shaft the ground conditions comprised up to 0.4m thickness of topsoil underlain to 1.0-1.2m bgl by natural superficial deposits (Glacial Till) comprising stiff sandy clay. Bedrock comprised weathered Coal Measures strata (weak grey mudstone and grey/orange-brown sandstone).
- 2.2.2 The shaft investigation presented in IDG report 4046-G-L020 states that the base of the shaft was proven at 37.5m bgl in Shaft BH01 and that 4.5m of solid rock was proven beneath the base of the shaft. Drilling within the shaft proceeded without rotation and without significant returns (other than water blowing out at surface) indicating the fill materials to be very soft and saturated. At the time of drilling a surface water retention pond/swale, which had never filled or had cause to spill, was located immediately adjacent to the shaft and it was considered likely that water was

migrating into the shaft from the pond.

- 2.2.3 A 0.5m grid of boreholes drilled to a maximum depth of 9m at the location of BH01 encountered solid bedrock at 3.0m. Based upon the positions of these boreholes the shaft is approximately 2.2m in diameter.
- 2.2.4 The shaft position had been previously investigated and proven by Story Homes during 2015. Story Homes investigation comprised trenching with a tracked excavator and as a consequence of this activity and construction of the adjacent retention pond, the natural glacial and bedrock surrounding the shaft entrance has been disturbed to an unknown radius and potentially to a depth of 4.0m bgl.
- 2.2.5 IDG concluded that construction of the shaft cap will therefore need to be at a position lower (i.e. 4-5m) than the original elevation of bedrock. The resultant zone of influence will therefore be correspondingly wider and this is likely to have implications for foundations of the adjacent plots

3 PERMISSIONS

3.1 Permit to Investigate and Treat

- 3.1.1 On behalf of Story Homes Limited IDG obtained permission to treat the shaft by grouting. A copy of Permission Reference 27574 is presented in Appendix C.

4 SHAFT INVESTIGATION & TREATMENT

4.1 Drilling Procedures

- 4.1.1 The contractor, Sirius mobilised to site on Monday 19th February 2024.
- 4.1.2 A steel safety platform shall was established centrally over the recorded position of the shaft, on which the drilling rig was positioned.
- 4.1.3 Boreholes were advanced on Tuesday 20th to Monday 26th February 2024 using a Comacchio MC15 rotary drilling rig with integrated water pump, 3 ½" drilling rods with an external diameter of 114.3mm and a 125mm drill bit. Sirius daily drilling returns are presented in Appendix D.
- 4.1.4 Treatment borehole BH1 was advanced on the 20th February using water flush with minimal resistance to the base of the shaft at 36.0m depth. The borehole was then drilled into bedrock strata to a depth of 39.0m. Drilling returns were not observed at the surface.
- 4.1.5 Treatment borehole BH2 was advanced on the 22nd February using water flush with minimal resistance to the base of the shaft at 36.0m depth. The borehole was then drilled into bedrock strata to a depth of 36.5m. Drilling returns were not observed at the surface.
- 4.1.6 Treatment borehole BH3 was advanced on the 23rd February using water flush with minimal resistance to the base of the shaft at 36.0m depth. The borehole was then drilled into bedrock strata to a depth of 36.5m. Partial drilling returns with grout traces were observed at the surface ponding within the drilling platform.
- 4.1.7 Treatment/verification borehole BH4 was advanced on the Monday 26th February using water flush with moderate resistance to the base of the shaft at 36.0m depth. The borehole was then drilled into bedrock strata to a depth of 36.5m. Full drilling returns including grout traces were observed at the surface.
- 4.1.8 Drillers logs presented in Appendix D indicate that no elevated concentrations of carbon-dioxide, methane or carbon monoxide were detected at the drill rig position during drilling.

4.2 Grouting Procedure

4.2.1 Ninety-three tonnes of pulverised fuel ash (PFA) was delivered in bulk to the site between Monday 19th to Monday 26th February. Grout was mixed in 4 tonne batches at a ratio of 9:1:4 (PFA:OPC:Water) using a 4 tonne mixing plant with separate grout pump.

4.2.2 Grout was injected down boreholes BH1-BH4 via flexible tubing and a T-connection with pressure gauge connected to the drilling rods. Grout was introduced in 1.5m, 2.0m and 3.0m lifts. Grout takes and grout pressure within each hole are summarised below.

Depth (m) (rod length)	BH1 20-2-2024 to 21-2-24			BH2 22-2-2018		
	Grout Take (tonnes)	Grout Pressure Held (bar)	Observations	Grout Take (tonnes)	Grout Pressure Held (bar)	Observations
36	23		Did not pressure	17.5	2.2	
34	0.5	2.0		0.2	2.0	
32	0.5	2.0		3.3	2.0	
30	0.2	2.0		0.2	2.0	
28	0.2	2.0		0.2	2.0	
26	0.6	2.0		0.1	2.5	
24	7		Water driven to surface then grout break at surface (TBH1)	0.1	2.5	
22.5				0.1	2.0	
21	0.3		Grout break at surface (TBH1)	0.1	2.0	
18				0.1	2.0	
15	0.4		Grout break at surface (TBH1)	0.1	1.8	
12				0.2	1.4	Grout break at surface (TBH2)
9	0.5		Grout break at surface (TBH1)	0.1		Immediate grout breakout
6				0.1		Immediate grout breakout
3	0.5		Grout topped up			
Total	33.7			22.4		

Depth (m) (rod length)	TBH3 23-2-2024 to 26-2-24			TBH4 26-2-2018		
	Grout Take (tonnes)	Grout Pressure Held (bar)	Observations	Grout Take (tones)	Grout Pressure Held (bar)	Observations
36	6	2.0	Sand added, pressured to 2.0 bar	0.1	3.5	Pressured to 4 bar immediately
34	0.4	1.8	Sand added, Water then grout break at surface (TBH3)	0.2	0.5	Grout break at surface (TBH4)
32	0.1	2.0		0.1	1.5	Grout break at surface (TBH4)
30		2.0		0.1	1.5	Grout break at surface (TBH4)
28	0.3	2.0		0.1	2.0	No breakout
26				0.1	2.0	
24	0.1	2.3		0.1	2.0	No breakout
22.5	0.2	1.0	Grout break at surface (TBH3)	0.1	2.0	No breakout
21			Grout break at surface (TBH1)			
19.5	0.1	0.5	Grout break at surface (TBH1)	0.1	3.5	No breakout
18						
16.5	0.2	0.5	Grout break at surface (TBH1)	0.2	2.0	Grout break at surface (TBH4)
15						

13.5	0.1	0.5	Grout break at surface (TBH1)	0.1	1.9	Grout break at surface (TBH4)
12						
10.5	0.1	0.5	Grout break at surface (TBH1)	0.1	2.0	Grout break at surface (TBH4)
9						
7.5	0.1	0.5	Grout break at surface (TBH1)	0.1	0.5	Grout break at surface (TBH4)
4.5	0.1	0.5	Grout break at surface (TBH1)	0.1	0.5	Grout break at surface (TBH4)
3						
Total	7.8			1.6		

- 4.2.3 12 tonnes of grout was injected in to BH1 at a depth of 36m on 20th February. A further 11 tonnes was injected at 36m on 21st February. The Engineer instructed injection to cease at 36m to allow the injected grout to allow to solidify. BH1 was pressure grouted in stages as indicated in the table above. A further 7 tonnes was injected at 22.5m which accompanied a significant volume of water being expelled from the shaft followed by grout breakout at the surface. A total of 33.7 tonnes was injected in BH1.
- 4.2.4 A further 17.5 tonnes was injected at a depth of 36m into BH2 on 22nd February, at which point the Engineer instructed injection to cease. Grout injection continued in lifts as indicated in the table above. Grout takes above the base were minimal.
- 4.2.5 6 tonnes of grout was injected into BH3 on 23rd February, at which point the Engineer instructed injection to cease. Grout injection continued in lifts as indicated in the table above. Grout takes above the base were minimal.
- 4.2.6 BH4 was drilled on Monday 26th February after a two day weekend. The borehole pressured up with minimal grout take at 36m and in all subsequent lifts.
- 4.2.7 A total of 65.5 tonnes of grout was injected into the borehole, the majority of which was used to fill the base of the shaft which was likely to have been open to workings. IDG consider a suitable plug of grout has been injected into the workings surrounding the shaft.

5 GROUT

5.1 Constituent Materials for Grouting

- 5.1.1 Water was obtained from the mains supply via a Licensed United Utilities standpipe.
- 5.1.2 The cement used was Ordinary Portland Cement conforming to BS EN 197-1:2011.
- 5.1.3 Pulverised Fuel Ash (PFA) dry powder ash, of a type suitable as a constituent for grout, obtained from an approved supplier and conforming to BS EN 450-1:2005+A1:2007.
- 5.1.4 Sand was used in two batches of grout on Friday 23rd February.

5.2 Storage and Use of Materials

- 5.2.1 Ninety-three tonnes of pulverised fuel ash (PFA) was delivered in bulk to the site on 19th and 21st February 2024.

5.3 Grouting Plant and Mix

- 5.3.1 Grout was mixed at a ratio of 9:1 (PFA:OPC) using a small 4 tonne mixing plant with separate grout pump.

5.4 Grout Properties and Testing

- 5.4.1 Flowability tests were undertaken on samples tested using a Colcrete flow meter. Flow test results of 400mm to 500mm are indicated on the drillers logs.
- 5.4.2 Bleed tests were conducted with a range of 1% - 3% bleed recorded on each test as indicated on drillers logs.
- 5.4.3 The Contractor prepared three sets of 3 test cubes on 20th, 21st and 26th February 2024. The Contractor arranged for 3 samples to be tested by crushing at 7 days and three at 28 days in accordance with BS1881. Test results undertaken by an independent laboratory are presented in Appendix E. 7-day strength tests (actually 8-9 days) range from 0.5 N/mm² (0.5 MN/m²) to 1.0 N/mm² (1.0 MN/m²) which are all in excess of the minimum interim strength of 0.4 MN/m² stated in the specification. 28-day strength tests range from 1.5 N/mm² (1.5 MN/m²) to 2.8 N/mm² (2.8 MN/m²) which are all in excess of the minimum strength of 0.7 MN/m² stated in the specification.

6 RECORDS

- 6.1.1 Daily drilling returns were recorded by the contractor and these are presented in Appendix D.

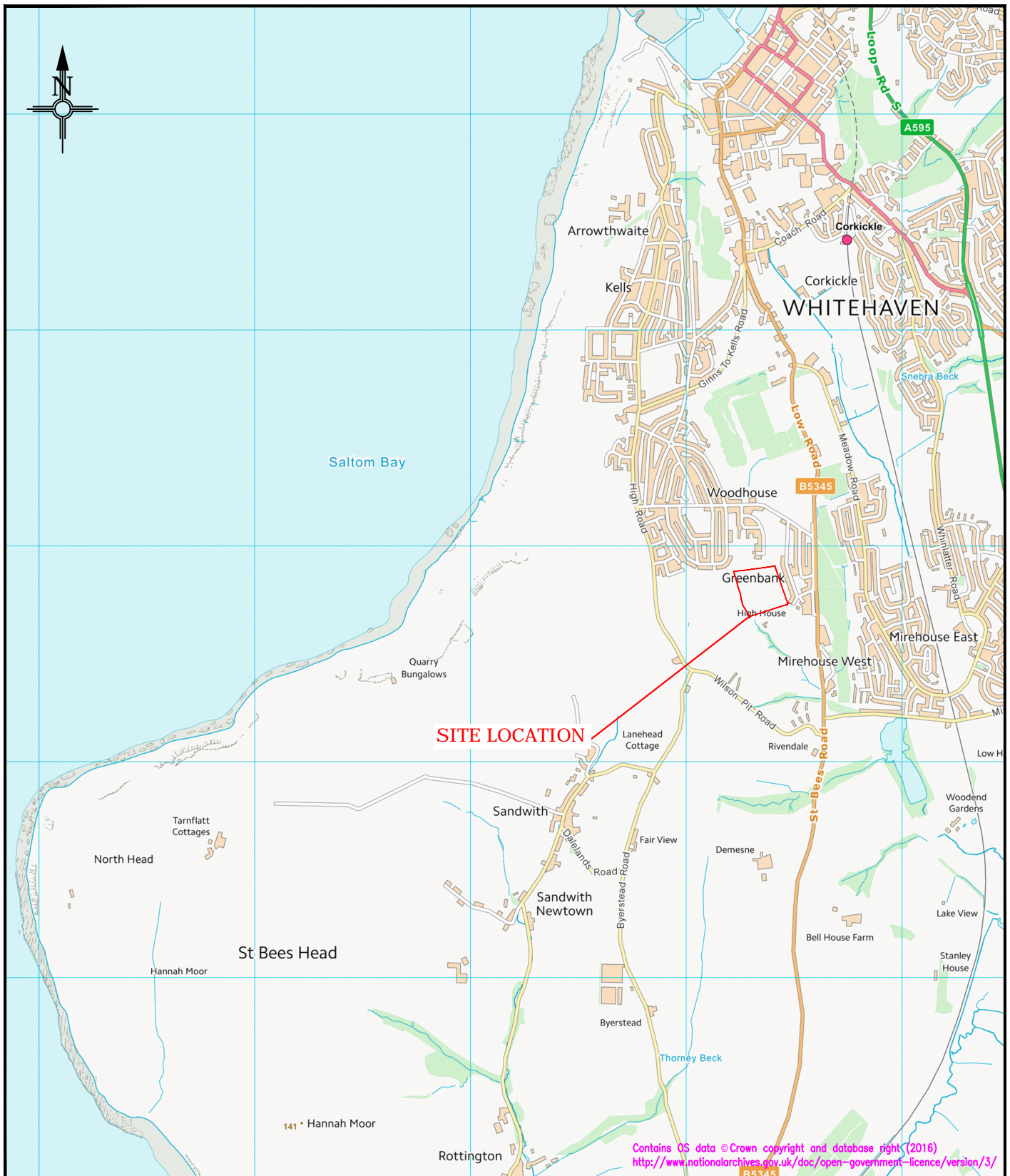
7 VERIFICATION

- 7.1.1 IDG confirm that treatment of the shaft fill by pressure injection of OPC/PFA grout was conducted in general accordance with the IDG Report Reference 4046-G-R034.
- 7.1.2 The shaft has a diameter of 2.2m and a depth of 36.0m. Therefore, the total volume of the shaft would be approximately 137m³. Assuming a pre-treatment void ratio of 0.25, this would equate to a potential total void of approximately 34m³. The total grout take of 65.5 tonnes would, assuming a grout density of 1.5 tonnes per cubic metre, equates to a grout volume of approximately 43m³ and a post-treatment voids ratio of close to zero. The majority of the grout take is considered to be used to seal the pathways to workings.
- 7.1.3 IDG consider that, following curing of the grout, the long-term settlement of the treated fill will be very low to negligible.

8 RECOMMENDATIONS

- 8.1.1 It is recommended that this report be submitted to the Coal Authority in to discharge conditions of Permit Reference 27574 dated 23rd November 2023.
- 8.1.2 It is recommended that this report be provided to the Structural Engineer responsible for design to inform the design of a reinforced concrete shaft cap and a re-assessment of foundation design. Based on the findings of this investigation, the mineshaft cap should be founded on competent bedrock strata at a depth of 4.0m below current site levels.

Appendix A



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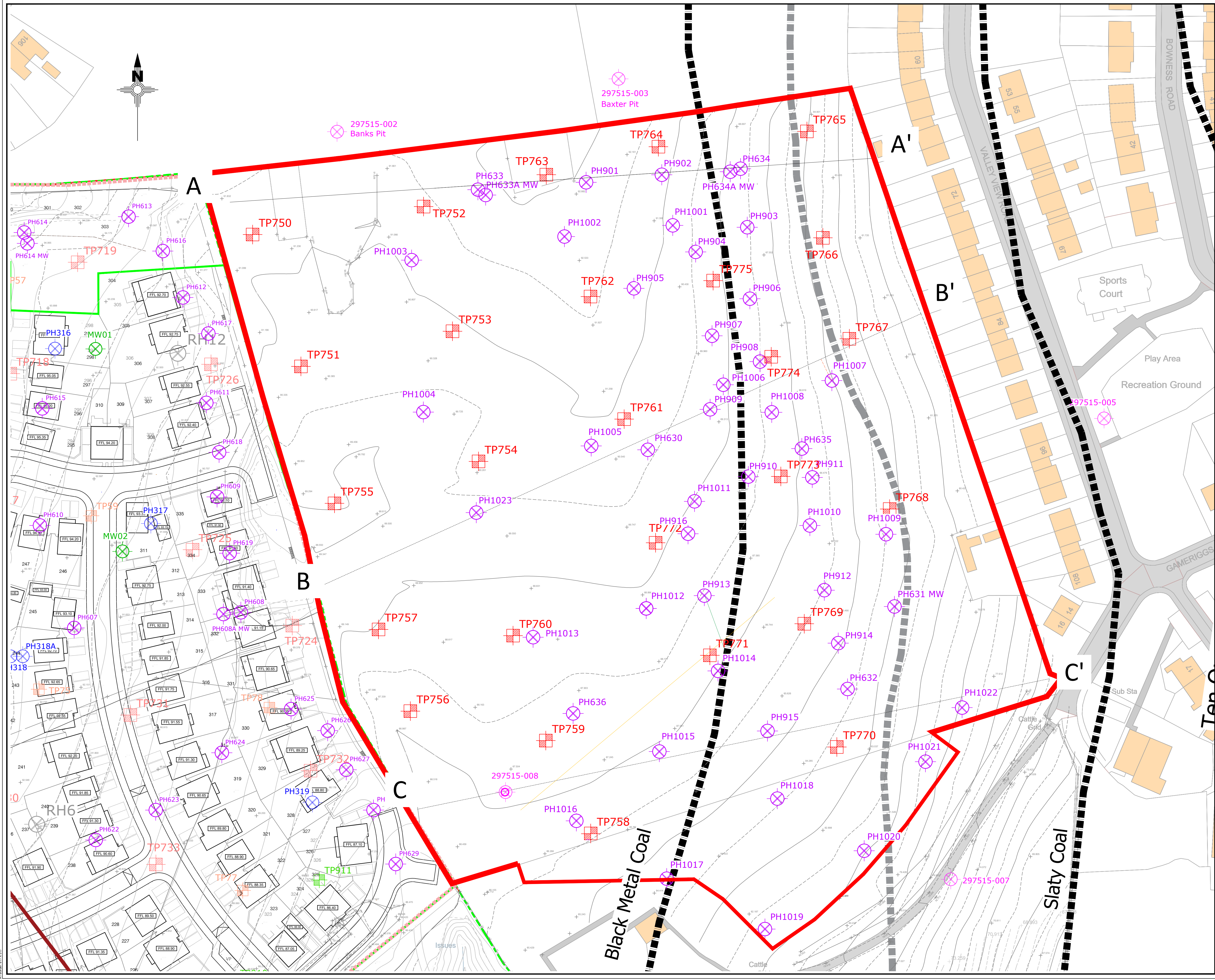
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 iD GeoEnvironmental Consulting Engineers

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CLIENT	Story Homes		
JOB TITLE	Phase 4, Edgehill Park, Whitehaven		
DRAWING TITLE	Site Location Plan		

DRAWN BY NW	SIGNATURE	DATE 5-10-20	STATUS FINAL	
APPROVED BRB	SIGNATURE	DATE 5-10-20	SCALE 1:25,000@A4	DRG No. 4046-G-D038



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KEY

- Phase 4 Boundary
- PH1000 IDG Probehole 2022
- PH900 IDG Probehole 2021
- PH600 IDG Probehole 2020
- TP750- IDG Trial Pit 2021
- PH300 IDG Probehole Dec 2016
- A-A' Geological Cross Section (Drawing 4046-G-D054 Rev A)
- BGS Inferred Coal Outcrop
- IDG Inferred Un-Named Coal Outcrop
- CA Recorded Mine Shaft

Revision	Description	Date
F	Final PH1000 positions depicted.	28-10-22
E	Proposed PH1000 series depicted.	19-12-21
D	Geological Section A-A', B-B' & C-C'	15-12-21
C	Final Exploratory Hole Positions	29-9-21
B	Revised Proposed RH NO. & Positions	5-7-21
A	Supplementary Probeholes & Trial Pits	6-6-20

Revision **Description** **Date**

CLIENT

Story Homes

JOB TITLE

Phase 4 Edgehill Park, Whitehaven

DRAWING TITLE

Exploratory Hole Location Plan

STATUS **FINAL**

DRAWN BY	SIGNATURE	DATE
NW		3-10-20

APPROVED	SIGNATURE	DATE
BRB		5-10-20

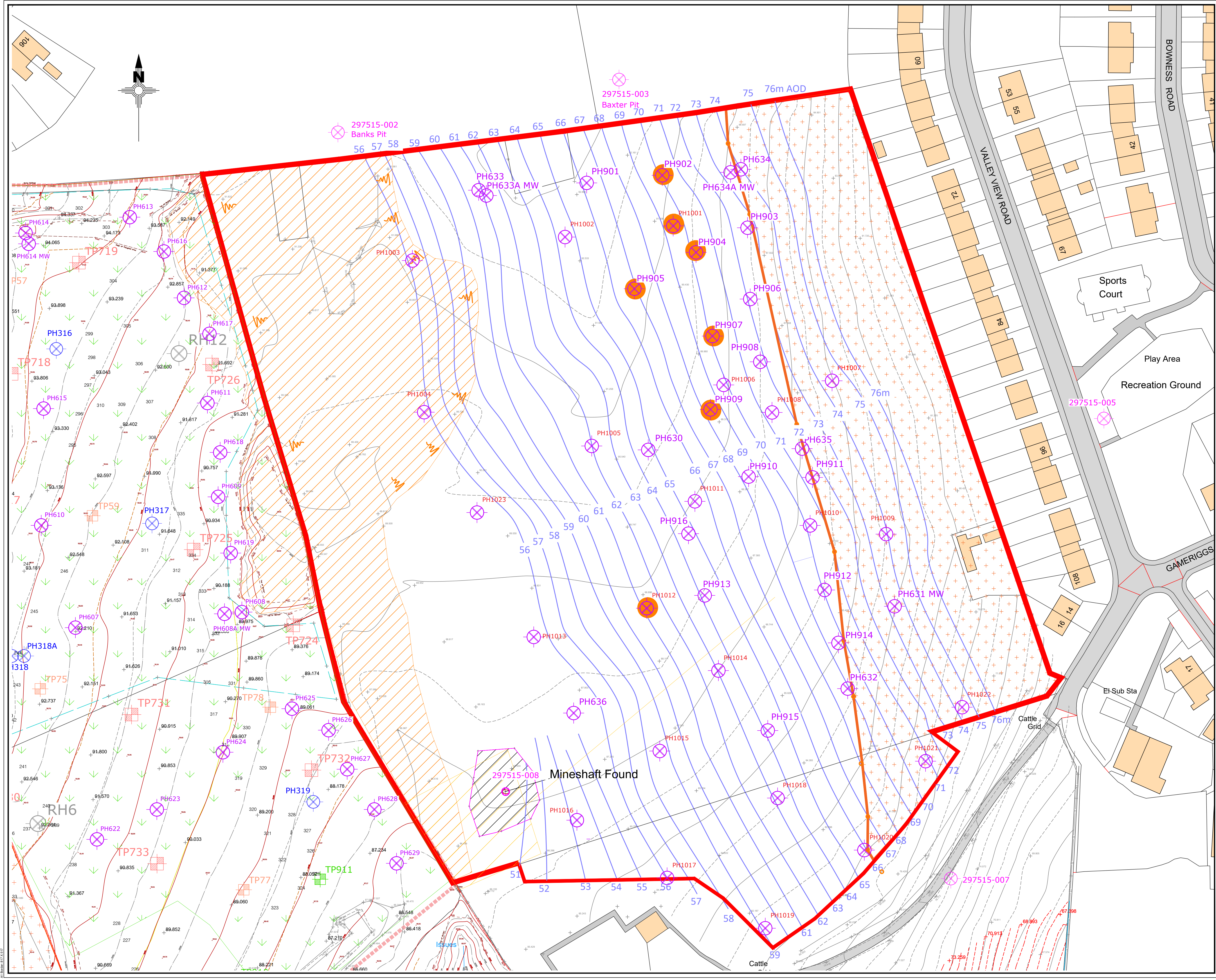
SCALE: 1:500@A1

DWG NO: 4046-G-D040

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KEY

- Phase 4 Boundary
- PH1000 IDG Probehole 2022
- PH900 IDG Probehole 2021
- PH600 IDG Probehole 2020
- Evidence of Abandoned Workings
- Base of Coal Contour (m AOD)
- Evidence of Surface Excavation
- Worked Coal <14m of Surface
- CA Recorded Mine Shaft

C	Final PH1000 & Mine Influence Area Positions	14-6-22
B	Anticipated Treatment Area Depicted	17-5-22
A	66D Rev F Layout dated 3-5-22	6-5-22
Revision	Description	Date

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CLIENT

Story Homes

JOB TITLE

Phase 4 Edgehill Park, Whitehaven

DRAWING TITLE

Mining Influence Plan

STATUS

Final

DRAWN BY	SIGNATURE	DATE
NW		26-10-21
APPROVED	SIGNATURE	DATE
BRB		15-12-21
SCALE	1:500@A1	DRG No: 4046-G-D055

Appendix B



Photograph 1: Rig setup over shaft using shaft safety platform.



Photograph 2: Survey Position of centre of shaft.



Photograph 3: Grout mixer, platform, compressor and OPC stockpile.



Photograph 4: Telescopic loader and delivery 1 of PFA.



Photograph 5: Flow test.



Photograph 6: Flow test at approximately 450mm.



Photograph 7: Set of three grout cubes being cast.



Photograph 8: Set of three grout cubes.



Photograph 9: Sand addition to grout mix.



Photograph 10: Sand pre-mixed into PFA.

Appendix C



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 27574

Name and Address of Permit Holder:

Story Homes
Story House
Lords Way
Kingsmoor Business Park
Carlisle
CA6 4SL

Site Location:

Phase 4 Edgehill Park
Wilson Pit Road
Whitehaven
Cumbria
CA28 9DN

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

Treatment of one mine entry by grouting (297515-008)

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/rig & monitoring points*
- *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: _____ Granted Date: **23 November 2023**

For and on behalf of The Coal Authority

Nominated Representative: Helen Day, Permitting Manager;

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

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

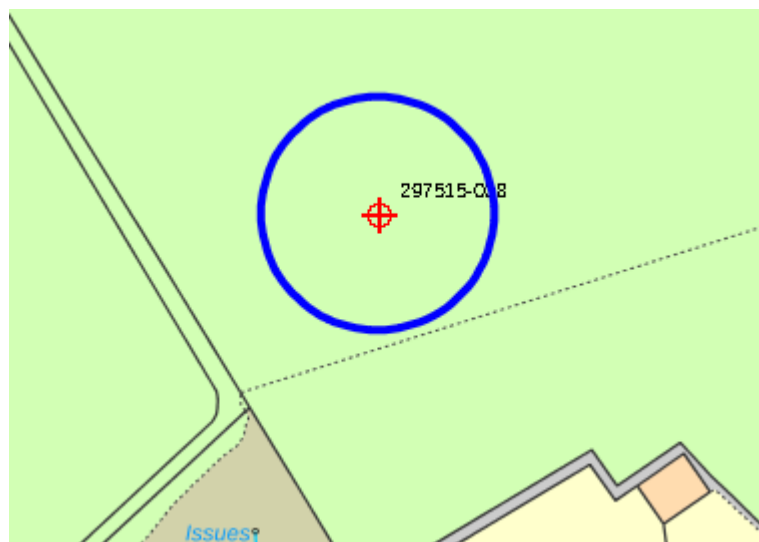


The Coal
Authority

Granted Permit Boundary

Permit Ref: 27574

Permit Boundary:



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Appendix D



OPENHOLE DRILL LOG

Job No. 4628
 Contract Name: Edghill Park
 Working Day: Monday

Date: 26-02-24
 Client: Story Homes.
 Sheet: 1 of 1

Hole No.	From	To	Flush (W/A/M)	Casing T/S (m)	Strata Description	Rig Type: <u>MC15R</u>
Shaft	00	36.00			Grout - Full returns	Crew Details:
TH	36.00	36.50			Hard Strata - Full returns.	
					- Grouted under pressure	Remarks:
					- Engineer instructed to drill 0.5m into rock.	
						Gas Monitoring
						% O ₂ CO ₂ CH ₄ CO
						Start <u>20.8</u> <u>0</u> <u>0</u> <u>0</u>
						Mid <u>20.8</u> <u>0</u> <u>0</u> <u>0</u>
						End <u>20.8</u> <u>0</u> <u>0</u> <u>0</u>
						Weather Conditions:
						<u>OK.</u>
						Boreholes Total
						Today <u>1</u>
						Previous <u>3</u>
						To Date <u>4</u>
						Drilled Total
						Today <u>36.50</u>
						Previous <u>112</u>
						To Date <u>148.50</u>
						Casing Total
						Today
						Previous
						To Date
						Signed by Client:



DAILY GROUTING RETURN

Job No. 4628
 Contract Name: Edgahill Park
 Working Day: 2

Date: Wens 21.2.24
 Client: Story Homes
 Sheet: 1 of 1

Hole No.	Depth (m)	Strata*	PFA	OPC	Sand	Gravel	Total Grout	Full	Still Taking	Top Up	Press (psi/bar)	Crew Details		
BH1	36.00		9.900	1.100			11.00		✓			Material Delivered Today		
	34.00		• 450	• 050			• 500	✓			2 Bar			
	32.00		• 450	• 050			• 500	✓			2 Bar			
	30.00		• 180	• 020			• 200	✓			2 Bar			
	28.00		• 180	• 020			• 200	✓			2 Bar			
	26.00		• 540	• 060			• 600	✓			2 Bar	Item	Quant	Ticket No.
	24.00		6.300	• 700			7.00	Broke to surface				PFA	19.100	13670
	21.00		• 270	• 030			• 300	11		11		PFA	17.860	133803
	15.00		• 360	• 040			• 400	11		11		PFA	18.280	133669
	09.00		• 450	• 050			• 500	11		11		PFA	18.920	133807
	03.00		• 450	• 050			• 500	11		11				
After a further			11.00T	at 36.00 metres			Engineer	Instructed						
to start and with			Draw	Drill			String.							
(Engineer			instructed all lift			variations)								
												Flow (mm)	Bleed (%)	Bleed (%)
Grout			Broke to			surface		from		24.00 metres.		400	2hr	29%
												500	4hr	39%
												450	6hr	39%
												Number of Cubes Taken		3
Total Used			19.53	2.17			21.70				PFA	OPC	Sand	Gravel
												Today	74.16	✓
Previous Total			10.800	1.200			12.00				Previous	19.22	6.00	
												Total Delivered	93.38	6.00
Total to Date			30.33	3.37			37.070				Total Used	30.33	3.37	
												Stock on Site	63.050	2.63.

Signed by Sirius Drilling Ltd:

Signed by Client:

Date: 21-02-24.

Date: 21-02-24

*C-Coal, S-Soft, BG-Broken Ground, v-vold, 19/C-190 Coal workings

White - Office Copy

Pink - Site Copy



DAILY GROUTING RETURN

Job No. 4628
 Contract Name: Edge Hill Park.
 Working Day: 3

Date: Thurs 22.2.24
 Client: Story Homes
 Sheet: 1 of 1

Hole No.	Depth (m)	Strata*	PFA	OPC	Sand	Gravel	Total Grout	Full	Still Taking	Top Up	Press (psi/bar)	Crew Details		
BH 2	36.00		15.75	1.750			17.500	✓			2 Bar			
	34.00		.180	.020			.200	✓			2 Bar			
	32.00		2.970	.330			3.300	✓			"			
	30.00		.180	.020			.200	✓			"			
	28.00		.180	.020			.200	✓			"	Material Delivered Today		
	26.00		.090	.010			.100	✓			2 Bar			
	24.00		.090	.010			.100	✓			"	Item	Quant	Ticket No.
	22.00		.090	.010			.100	✓			"	OPC	6.00	
	20.50		.090	.010			.100	✓			"	Sand	2.00	
	17.50		.180	.020			.200	✓			"			
	14.50		.180	.020			.200	✓			2 Bar			
	11.50		.180	.020			.200	Broke to Surface						
	09.50		.090	.010			.100	"	"	"				
	06.50		.090	.010			.100	"	"	"		Testing		
	03.50		.090	.010			.100	"	"	"		Flow (mm)	Bleed (%)	Bleed (%)
												450	2hr 2%	2hr
												400	4hr 3%	4hr
												400	6hr 3%	6hr
												Number of Cubes Taken		
Total Used			20.43	2.270			22.70				PFA	OPC	Sand	Gravel
											Today	6.00	2.00	
Previous Total			30.33	3.37			37.070				Previous	93.38	6.00	✓
											Total Delivered	93.38	12.00	2.00
Total to Date			50.76	5.64			37.070 56.400				Total Used	50.76	5.64	✓
											Stock on Site	42.62	6.36	2.00

Signed by Sirius [

Date: 22-02-24.

Signed by Client:

Date: 22-02-24

*C-Coal, S-Soft, BG-Broken Ground, V-Void, N/C-No Coal Workings

White - Office Copy

Pink - Site Copy



DAILY GROUTING RETURN

Job No. 4628
 Contract Name: Edge Hill Park
 Working Day: 5

Date: mon 26.2.24
 Client: Story Homes
 Sheet: 1 of 1

Hole No.	Depth (m)	Strata*	PFA	OPC	Sand	Gravel	Total Grout	Full	Still Taking	Top Up	Press (psi/bar)	Crew Details		
BH4														
	36.00		.090	.010			.100	/			3 Bar			
	34.00		.180	.020			.200	/			Broke to Surface			
	32.00		.090	.010			.100	/			Broke to Surface	Material Delivered Today		
	30.00		.090	.010			.100	/			Broke to Surface			
	28.00		.090	.010			.100	/			2 Bar			
	26.00		.090	.010			.100	/			2 Bar			
	24.00		.090	.010			.100	/			2 Bar			
	22.50		.090	.010			.100	/			2 Bar			
	19.50		.090	.010			.100	/			2 Bar			
	16.50		.180	.020			.200	/			Broke to Surface			
	13.50		.090	.010			.100	/			" " "			
	10.50		.090	.010			.100	/			" " "			
	07.50		.090	.010			.100	/			Broke to Surface	Testing		
	04.50		.090	.010			.100	/			" " "	Flow (mm)	Bleed (%)	Bleed (%)
	01.50		.090	.010			.100	/			" " "		2hr	2hr
													4hr	4hr
													6hr	6hr
All lift variations and Press instructed By Engineer.														
												Number of Cubes Taken		
Total Used			1.53	.170			1.700				PFA	OPC	Sand	Gravel
											Today			
Previous Total			57.960	6.440	1.00		65.40				Previous			
											Total Delivered	43.38	12.00	2.00
Total to Date			59.49	6.610	1.00		67.10				Total Used	59.49	6.610	1.00
											Stock on Site	33.89	5.39	1.00

Signed by Sirius Drilling

Date: 26-02-24

Signed by Client:

Date:

*C-Coal, S-Soft, BG-Broken Ground, V-Void, N/C-No Coal Workings

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Pink - Site Copy

Appendix E

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

CONCRETE TEST CUBE REPORT



Date: 01/03/2024

Report no: WAB51517942_01

Client: SIRIUS DRILLING LTD

Scheme: SIRIUS DRILLING LTD

Contract no: 51073069

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
NOR040948	51517942	4628	20/02/2024		28/02/2024	29/02/2024	9	100x100x100	1500	4.8	0.5	1.0
Location: SDL4628 EDGEHILL PARK												
Mix details: 10:1												
Remarks: Does not meet the BSEN for Flatness. Degree of saturation uncertain. Load below Calibration Parameters.												

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 12390-7:2
Air Content detern
BS EN 12350-2:2

30-7:2019, Slump test carried out in accordance with

Signed

Julie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: SIRIUS DRILLING LTD, SIRIUS DRILLING LTD

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

CONCRETE TEST CUBE REPORT



Date: 01/03/2024

Report no: WAB51517944_01

Client: SIRIUS DRILLING LTD

Scheme: SIRIUS DRILLING LTD

Contract no: 51073069

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
NOR040948	51517944	4628	21/02/2024		28/02/2024	29/02/2024	8	100x100x100	1590	7.8	0.8	1.0
Location: SDL4628 EDGEHILL PARK												
Mix details: 10:1												
Remarks: Does not meet the BSEN for Flatness. Degree of saturation uncertain. Load below Calibration Parameters.												

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 12390-7:2019, 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: SIRIUS DRILLING LTD, SIRIUS DRILLING LTD

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

CONCRETE TEST CUBE REPORT



Date: 07/03/2024

Report no: WAB51520056_01

Client: SIRIUS DRILLING LTD

Scheme: SIRIUS DRILLING LTD

Contract no: 51073069

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
NOR040950	51520056	4628	26/02/2024		06/03/2024	07/03/2024	10	100x100x100	1580	9.8	1.0	1.0
Location: NOT GIVEN												
Mix details: 10:1												
Remarks: Degree of saturation uncertain. Load below Calibration Parameters.												

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 determ
BS EN 12350-2:20

50-7:2019, Slump test carried out in accordance with

Signed

Julie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: SIRIUS DRILLING LTD, SIRIUS DRILLING LTD

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

CONCRETE TEST CUBE REPORT



Date: 19/03/2024

Report no: WAB51517943_01

Client: SIRIUS DRILLING LTD

Scheme: SIRIUS DRILLING LTD

Contract no: 51073069

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
NOR040948	51517943	4628	20/02/2024		28/02/2024	19/03/2024	28	100x100x100	1350	14.8	1.5	1.0
Location: SDL4628 EDGEHILL PARK												
Mix details: 10:1												

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 det
BS EN 12350-

50-7:2019, Slump test carried out in accordance with

Signed

Julie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: SIRIUS DRILLING LTD, SIRIUS DRILLING LTD

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

CONCRETE TEST CUBE REPORT



Date: 20/03/2024

Report no: WAB51517945_01

Client: SIRIUS DRILLING LTD

Scheme: SIRIUS DRILLING LTD

Contract no: 51073069

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
NOR040948	51517945	4628	21/02/2024		28/02/2024	20/03/2024	28	100x100x100	1520	21.5	2.2	1.0
Location: SDL4628 EDGEHILL PARK												
Mix details: 10:1												
Remarks: Does not meet the BSEN for Flatness. Annex B Procedure used.												

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 dete

-7:2019, Slump test carried out in accordance with

BS EN 12350-2:

Signed

ulie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

Issued to: SIRIUS DRILLING LTD, SIRIUS DRILLING LTD

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

CONCRETE TEST CUBE REPORT



Date: 25/03/2024

Report no: WAB51520057_01

Client: SIRIUS DRILLING LTD

Scheme: SIRIUS DRILLING LTD

Contract no: 51073069

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
NOR040950	51520057	4628	26/02/2024		06/03/2024	25/03/2024	28	100x100x100	1560	27.9	2.8	1.0
Location: NOT GIVEN												
Mix details: 10:1												

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 dete
BS EN 12350-2

350-7:2019, Slump test carried out in accordance with

Signed

Julie Schofield - Concrete Section Manager

for and on behalf of SOCOTEC UK Limited

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