

Project name	Stopes Road, Bolton		
Design note title	Mine Shaft Investigation		
Document reference	15220-HYD-XX-XX-RP-GE-0011		
Author	Rob Crookes		
Checked & Approved	Daniel Fry BSc MSc CGeol FGS and Adam Cheers BSc CSci MEnvSc FGS		
Revision	P04		
Date	11 September 2023	Approved	✓

1. INTRODUCTION

The former Tarmac plant at Stopes Road, Bolton has been subject to remediation and earthworks for a residential development.

The site has a legacy of coal mining from a number of seams present below the site. The Phase 1 and Phase 2 investigations and Coal Mining Risk Assessment undertaken to date indicate the presence of four recorded mine entries within the site boundary.

Hydrock has been commissioned to carry out works to further investigate and potentially locate (or confirm the absence of) the four mine shafts that, based on Coal Authority (CA) records, are present at the site. These works have been completed over three investigation phases, in accordance with Hydrock fee proposal documents Ref. C-15220-FP-GE-0007, C-15220-FP-GE-0012 and C-15220-FP-GE-0012.

2. WORKS COMPLETED

The initial shaft investigation works were completed in September 2021 by Forkers Group Limited with Hydrock supervising the works.

The second phase of shaft investigation works were completed in May 2022 by Sonic Drilling Limited with Hydrock supervising the works.

The third phase of shaft investigation works were completed in August 2023 by Forkers Group Limited with Hydrock supervising the works.

Investigation works on shaft 376407-003 in September 2021 were completed in compliance with Coal Authority Permit 22581 (now closed), and in August 2023 in compliance with Coal Authority Permit 27175 (open at the time of writing). All investigation works on shaft 376407-007 were completed in compliance with Coal Authority Permit 22581 (now closed). All investigation works on shaft 376407-008 were completed in compliance with Coal Authority Permit 24460 (now closed).

Drawing 15220-HYD-XX-XX-DR-GE-1023 is presented in Appendix A. It shows the locations of the shafts investigated and, where found, the anticipated zone of collapse based on the depth to rockhead. This is accompanied by a co-ordinate sheet for located shafts. Summary figures for the works are presented in Appendix B. Pertinent photographs are presented in Appendix C. Drillers logs and associated plans are included in Appendix D.

The following sections 2.1 to 2.4 provide a summary of the findings at each shaft location.

2.1 Shaft Reference 376407-003 (Drillers Ref. Shaft 1)

2.1.1 *Original shaft location*

In September 2021 all of the proposed 365 no. probe holes were drilled on a 1m spaced grid within a 10m radius of the original Coal Authority coordinated location. Rockhead was encountered at between 6.8m and 10.2m bgl, the probe holes were drilled to depths of between 9.0m and 15.0m bgl to prove solid strata. The shaft co-ordinate provided by the Coal Authority is E 376224.000 N 407701.000. The recorded site level at the shaft coordinate at the time of drilling was 100.44m Above Ordnance Datum (AOD) with a range across the drilling grid between 100.26m and 100.53m AOD.

No indication of a mineshaft from the drilling was recorded. However, it should be noted that soft strata was noted by the drillers below rockhead in a significant number of holes (see Figure 1 in Appendix B), although this is not considered to be associated with a shaft, it is instead likely to be indicative of shallow underground workings. The results were discussed with the Coal Authority at the time and no further investigation was proposed. An additional watching brief was recommended during the site strip and enabling works to check for any evidence of the shaft. During the enabling works, which were completed in July 2023, no evidence of the shaft was recorded.

2.1.2 *Revised shaft location*

Following subsequent liaison with the Coal Authority it was brought to Hydrock's attention on 14th June 2023 that an additional geo-referencing exercise had been undertaken with regards to shaft 376407-003 and a revised coordinate was provided by the Coal Authority. The revised coordinate is E376225 N407707, which is approximately 6m north of the original location. The Coal Authority confirmed that the same 10m departure applies to the new location. On this basis, a further ground investigation was proposed in order that the section of the site within the revised departure be fully investigated.

In August 2023 a further 157 probe holes were drilled in accordance with the scope of completing a 1m probing grid within the area of the departure zone not previously investigated. The extent of the additional area of investigation is shown in Figure 2-1.

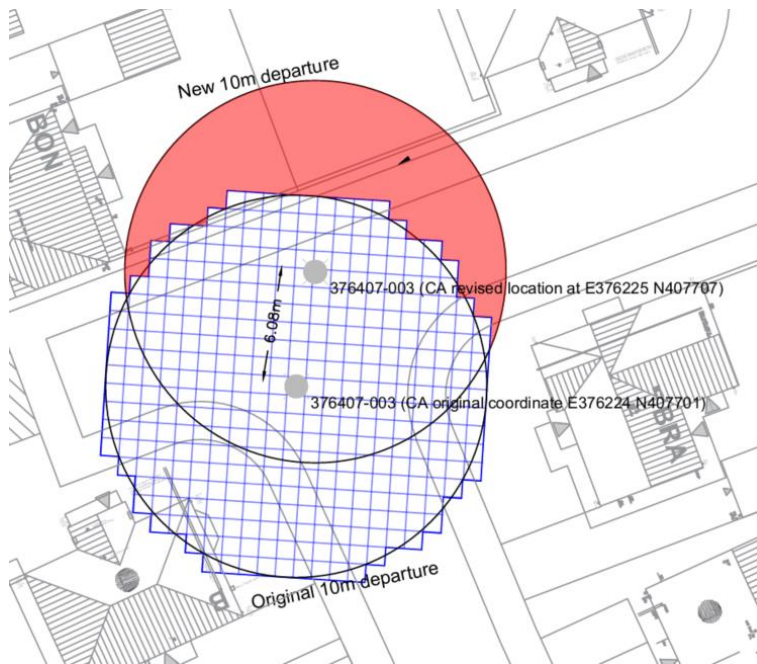


Figure 2-1: Revised location of Shaft 376407-003 and area subsequently investigated

Rockhead was encountered at between 8.5m and 12.0m bgl; the probe holes were drilled to depths of between 9.0m and 14.0m bgl to prove solid strata. The average recorded site level across the investigation area at the time of drilling was 101.70m AOD, reflecting the raising of ground levels in the area by approximately 1.5m during the earthworks.

No indication of a mineshaft from the further drilling was recorded. Soft strata was again noted by the drillers below rockhead in several holes (see Figure 5 in Appendix B), this is interpreted to be associated with shallow underground workings, which was also recorded during the previous investigation. During both investigations a minimum of 1.0m hard drilling was required below soft workings to confirm solid bedrock.

2.2 Shaft Reference 376407-006

This shaft was uncovered at ground level during the service clearance works whilst using vacuum excavation techniques. As such no probing with a drilling rig was required at this shaft location.

The shaft was found to have an internal diameter of 2.90m and is constructed with a three-brick skin. Photographs of the shaft are presented in Appendix C. The shaft appeared to have been loosely backfilled with arisings to the surface. Whilst no full-depth investigation has been undertaken through the shaft, the Coal Authority records indicate that it is 262m deep. The surveyed location of the shaft is shown on drawing 15220-HYD-XX-XX-DR-GE-1023 in Appendix A. The shaft co-ordinate provided by the Coal Authority is E 376352 N 407591 and the located shaft surveyed centre coordinate is E 376348.333 N 407592.727 with a level of 102.31m AOD.

The enabling earthworks contractor VHE and their specialist subcontractors Van Elle treated the shaft by grouting under Coal Authority Permit 25705 in October and November 2022. Design of the grout treatment is presented in Van Elle Report (July 2022), 'Specification for Consolidation of Mining Features – Stopes Road, Little Lever', ref: 221883. Van Elle are the permit agent and retain responsibility for closing the permit (reference 25705). Validation of the works is presented in Van Elle Report

reference 'Completion Report - Consolidation of Recorded Coal Mine Entry by Drilling and Grouting ref VE 221883', dated December 2022.

2.3 Shaft Reference 376407-007 (Drillers Ref. Shaft 3)

2.3.1 Initial Investigation (Forkers)

During the initial shaft investigation a total of 86 no. probe holes were completed in this location. The majority of these were drilled to the west of the coordinate provided by the Coal Authority due to the presence of a number of constraints. Completed locations are shown on Figure 2 in Appendix B. It should be noted that Forkers original drilling record sheet presented in Appendix D was not centred on the CA provided coordinate; more detail is provided on Figure 2.

Bedrock was encountered between 5.0m and 5.8m bgl; completed probe hole depths were between 7.0m to 8.0m bgl. No indication of a mineshaft was identified during this phase of drilling works. A depth summary is presented as Figure 3 in Appendix B.

The remaining probe holes on the grid were inaccessible at the time of the works due to the presence of underground services, vegetation and the discovery of an underground fuel storage tank (UST). Removal of the fuel tank was undertaken by a demolition contractor in April 2022, details of which can be found in Hydrock Technical Design Note reference 15220-HYD-XX-XX-RP-GE-0014. Hydrock undertook a watching brief during the works to ensure compliance with the Coal Authority Permit.

2.3.2 Remobilisation investigation (Sonic Drilling)

As part of the service clearance activities for this work, vacuum excavation was used to expose the exact route of the electric cables enabling exploratory hole locations to be drilled as close as possible. Note some locations were still unable to be advanced due to proximity to the cables.

This investigation was undertaken in May 2022 by Sonic Drilling Limited under Hydrock supervision. A total of 205 no. probe holes were completed as shown on Figure 2 in Appendix B. Bedrock was generally encountered between 5.0m and 6.0m bgl. Completed probe hole depths were generally between 6.0m to 8.0m bgl, though apparent shallow workings were found in the south east quadrant at depths approximately between 7.0m to 9.5m bgl. As such, probe holes were advanced to depths of up to 10.5m bgl in this area in order to rule out the presence of a shaft. In probe hole 128 a coal seam was encountered from 7.50m to 9.50m bgl; it was not recorded in any other probe holes.

The mine shaft was located by probing in the north east quadrant, as indicated on Figure 3. One probe hole was advanced to 42.0m bgl (the limit of the equipment available) showing that the shaft reaches a greater depth than this. Coal Authority records provide no indication of the depth or construction of this shaft. The diameter of the shaft was delineated and found to be between 2.5m and 3.5m by further probe holes, though proximity to the electric cables meant the diameter couldn't be fully determined. From the delineation achieved it appears that the shaft could be oval or rectangular in shape rather than circular. The drillers noted they believed they hit the edge of the shaft in probe locations 79 and 80 at 6.0m bgl, with the probe deflecting inside the shaft. The surveyed location of the shaft is shown on drawing 15220-HYD-XX-XX-DR-GE-0023 in Appendix A. The shaft co-ordinate provided by the Coal Authority is E 376365 N 407557 and the coordinate for the estimated centre of the located shaft is E 376367.595 N 407559.113 with a ground level of 102.88m AOD.

The shaft location was fenced off and signage was erected to alert people to the danger. The enabling earthworks contractor VHE, who are in control of the site as Principal Contractor at the time of writing,

have been provided with the position of the shaft and advised that a stand-off zone of at least 6.0 metres is required.

The further investigation and treatment for the shaft are to be determined as part of the Contractors design.

2.4 Shaft Reference 376407-008

2.4.1 Initial Investigation (Forkers)

No investigation was completed in this area of the site by Forkers due to the Coal Authority coordinate for the shaft being located within an existing building.

Demolition of the building, including removal of the slab and foundations, was undertaken by a demolition contractor in April 2022 details of which can be found in Hydrock Technical Design Note reference 15220-HYD-XX-XX-RP-GE-0014. Hydrock undertook a watching brief during the works to ensure compliance with Coal Authority Permit 24460.

2.4.2 Remobilisation investigation (Sonic Drilling)

A total of 22 no. probe holes were completed as shown on Figure 4 in Appendix A. Bedrock was generally encountered at 5.0m bgl. Completed probe hole depths were generally 6.0m bgl.

The shaft was located by probing approximately 3.0m north of the central co-ordinate, as indicated on Figure 4. One probe hole was advanced to 42.0m bgl (the limit of the equipment available) showing that the shaft reaches a greater depth than this. Coal Authority records provide no indication of the depth of this shaft. The approximate diameter of the shaft was delineated by further probe holes and determined to be approximately 3.0m. The surveyed location of the shaft is shown on drawing 15220-HYD-XX-XX-DR-GE-1023 in Appendix A. The shaft co-ordinate provided by the Coal Authority is E 376365 N 407557 and the coordinate for the estimated centre of the located shaft is E 376380.818, N 407524.433 with a ground level of 102.07m AOD.

The shaft location was fenced off and signage was erected to alert people to the danger. The enabling earthworks contractor VHE, who are in control of the site as Principal Contractor at the time of writing, have been provided with the position of the shaft and advised that a stand-off zone of at least 6.0 metres is required.

The further investigation and treatment for the shaft are to be determined as part of the Contractors design.

2.5 Conclusions

The two phases of works have proven the following:

- Shaft reference 376407-003 in the north of the site was investigated and not recorded, based on the drilling of an initial 365 probe holes covering a 10m radius from the original Coal Authority recorded co-ordinate. An additional 157 probe holes covering the an area within a 10m radius of the revised Coal Authority coordinate was undertaken and no evidence of the shaft was recorded.
- Shaft reference 376407-006 has been identified on site at the surface. It has been treated and validated by the specialist contractor as part of the enabling works.

- Shaft reference 376407-007 has been located by probing on site. The top of the shaft is likely to be set within the rockhead at approximately 5.0m - 6.0m bgl, and has a diameter of 3.0 - 4.0m, but unable to be fully constrained further due to electric cables in the vicinity.
- Shaft reference 376407-008 has been located by probing on site. The top of the shaft is likely to be set within the rockhead at approximately 5.0m bgl, and has an approximate diameter of 3.0m.

3. FURTHER WORKS

In order to satisfy the relevant Planning Conditions for the site, adherence to the Hydrock Geotechnical Design Report (ref: 15220-HYD-XX-XX-RP-GE-0005), Remediation Strategy and Verification Report (ref: 15220-HYD-XX-XX-RP-GE-0006) and Performance Specification for Stabilisation of Mineworkings (ref: 15220-HYD-XX-XX-RP-GE-0007) is required.

Further to ground investigation within the revised departure of shaft 376407-003, no evidence of the shaft was recorded within a 10m departure of both the original and revised shaft coordinates. Pending the submission of this report and agreement of the regulator, no further works are anticipated in relation to this shaft. Hydrock will then execute closure of permit 27175 under their role as Agent.

Shaft 376407-006 was located and has been treated to a design and specification accepted by the Coal Authority under permit 25705. Pending submission of the as built records and verification report, and agreement of the regulator, no further works are required in relation to this shaft. Van Elle (the agent) retain responsibility for closure of permit 25705.

Detailed design of appropriate treatment for located shafts 376407-007 and 376407-008 has been completed and at the time of writing is being reviewed by the client.

As part of on-going works for the site the following works in relation to the remaining 2 no. Coal Authority recorded mine shafts (376407-007 and 376407-008) are to be undertaken by the Contractor:

- Remediation and treatment of the mine shafts as per the detailed design and relevant Coal Authority Permit.
- Provision of as built records to the Client for review.
- Provision of the as built records of the mine shaft treatment to the Local Planning Authority as part of the discharge of planning conditions.
- Submission of appropriate records to the Coal Authority to close the relevant permit.

Appendix A Drawings



MIDLAND SURVEY LIMITED
Topographical (Land) Surveyors
Building Measurement Surveyors
Utility Mapping Surveyors
3D Laser Scanning

Midland Survey Limited
Cromwell House,
Westfield Road,
Southam
CV47 0JH

P: 01926 810811
F: 01926 810812
E: utilities@midlandsurvey.co.uk
W: www.MidlandSurvey.co.uk

Client Info: Hydrock
Site: Stopes Road, Bolton,
Date: 01/06/2022
Job: U07918 + U06473

Shaft	Probe hole / ID	EASTINGS	NORTHINGS	LEVEL
376407-006	Centre	376348.333	407592.727	102.312
	Shaft edge 1	376346.889	407593.212	102.347
	Shaft edge 2	376348.480	407594.198	102.586
	Shaft edge 3	376348.646	407594.041	102.560
	Shaft edge 4	376348.837	407593.957	102.431
	Shaft edge 5	376349.751	407592.224	102.380
	Shaft edge 6	376348.360	407591.373	102.323
376407-007	10	376367.056	407558.165	102.951
	25	376366.879	407559.027	102.671
	26	376367.687	407559.003	102.876
	27	376367.768	407558.065	102.911
	48	376366.727	407560.145	102.877
	49	376367.673	407559.946	102.882
	50	376368.789	407560.14	102.895
	51	376369.001	407559.183	102.822
	52	376368.953	407558.189	102.543
	79	376366.941	407561.09	102.897
	80	376367.728	407561.02	102.907
	Approx centre	376367.595	407559.113	Modelled on AutoCAD by Hydrock
	CABLE A 1	376373.739	407556.995	102.358
	CABLE A 2	376366.568	407557.006	102.327
	CABLE A 3	376363.616	407560.289	102.172
	CABLE A 4	376358.238	407565.952	102.196
	CABLE B 1	376368.689	407547.394	102.417
	CABLE B 2	376367.065	407552.385	102.402
	CABLE B 3	376365.807	407556.499	102.388
	CABLE B 4	376364.328	407560.740	102.505
	CABLE B 5	376362.801	407565.633	102.619
	CABLE B 6	376362.267	407567.049	102.537
	CABLE B 7	376344.742	407591.795	102.266
	CABLE B 8	376346.608	407590.340	102.348
	CABLE B 9	376348.983	407588.824	102.471
	CABLE B 10	376348.967	407588.860	102.474
	CABLE B 11	376352.641	407588.216	102.472
376407-008	115	376379.841	407525.309	102.174
	116	376380.872	407525.524	102.127
	45	376380.404	407523.435	102.042
	46	376381.289	407523.392	102.022
	76	376380.176	407524.265	102.088
	77	376380.992	407524.543	102.066
	78	376381.843	407524.817	102.065
	Approx centre	376380.818	407524.433	Modelled on AutoCAD by Hydrock
	GA51	376388.763	407522.591	101.861
	GA52	376386.219	407521.867	102.002
	GA53	376384.224	407521.501	102.259

Appendix B Figures

FIGURE 1 – Shaft 1 Drilling depth summary (Forkers, September 2021)



							357	358	359	360	361	362	363	364	365								Key
						319	320	321	322	323	324	325	326	327	328	329							
				271	272	273	274	275	276	277	278	279	280	281	282	283	284	285					
			270	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226				
			269	210	157	158	159	160	161	162	163	164	165	166	167	168	169	170	227				
		318	268	209	156	111	112	113	114	115	116	117	118	119	120	121	122	171	228	286			
	356	317	267	208	155	110	73	74	75	76	77	78	79	80	81	82	123	172	229	287	330		
	355	316	266	207	154	109	72	43	44	45	46	47	48	49	50	83	124	173	230	288	331		
	354	315	265	206	153	108	71	42	21	22	23	24	25	26	51	84	125	174	231	289	332		
	353	314	264	205	152	107	70	41	20	7	8	9	10	27	52	85	126	175	232	290	333		
	352	313	263	204	151	106	69	40	19	6	1	2	11	28	53	86	127	176	233	291	334		
	351	311	262	203	150	105	68	39	18	5	4	3	12	29	54	87	128	177	234	292	335		
	350	310	261	202	149	104	67	38	17	16	15	14	13	30	55	88	129	178	235	293	336		
	349	309	260	201	148	103	66	37	36	35	34	33	32	31	56	89	130	179	236	294	337		
	348	308	259	200	147	102	65	64	63	62	61	60	59	58	57	90	131	180	237	295	338		
		312	258	199	146	101	100	99	98	97	96	95	94	93	92	91	132	181	238	296			
			257	198	145	144	143	142	141	140	139	138	137	136	135	134	133	182	239				
			256	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	240				
				255	254	253	252	251	250	249	248	247	246	245	244	243	242	241					
						307	306	305	304	303	302	301	300	299	298	297							
							347	346	345	344	343	342	341	340	339								

FIGURE 2 – Shaft 3 drilling records

							357	358	359	360	361	362	363	364	365							Key
						319	320	321	322	323	324	325	326	327	328	329						85 total
				271	272	273	274	275	276	277	278	279	280	281	282	283	284	285				205 total
			270	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226			
			269	210	157	158	159	160	161	162	163	164	165	166	167	168	169	170	227			327
		318	268	209	156	111	112	113	114	115 (281)	116 (282)	117	118	119	120	121	122	171	228	286		
	356	317	267 (214)	208 (215)	155 (216)	110 (217)	73 (218)	74 (219)	75	76	77 (222)	78	79	80	81	82	123	172	229	287	330	
	355	316	266 (159)	207 (160)	154 (161)	109 (162)	72 (163)	43 (164)	44	45	46 (167)	47	48	49	50	83	124	173	230	288	331	
	354	315	265 (112)	206 (113)	153 (114)	108 (115)	71 (116)	42 (117)	21	22	23	24	25	2	51	84	125	174	231	289	332	
	353	314	264 (73)	205 (74)	152 (75)	107 (76)	70 (77)	41 (78)	20	7	8 (81)	9	10	27	52	85	126	175	232	290	333	
	352	313	263 (72)	204 (43)	151 (44)	106 (45)	69 (46)	40 (47)	19	6	1 (50)	2	11	28	53	86	127	176	233	291	334	
	351	311	262 (71)	203 (42)	150 (21)	105 (22)	68 (23)	39 (24)	18 (25)	5	4 (51)	3	12	29	54	87	128	177	234	292	335	
	350	310	261 (70)	202 (41)	149 (20)	104 (7)	67 (8)	38 (9)	17 (10)	16	15 (52)	14 (85)	13	30	55	88	129	178	235	293	336	
	349	309	260 (69)	201 (40)	148 (19)	103 (6)	66 (1)	37 (2)	36 (11)	35	34 (53)	33 (86)	32	31 (176)	56	89	130	179	236	294	337	
	348	308	259 (68)	200 (39)	147 (18)	102 (5)	65 (4)	64 (3)	63 (12)	62	61 (54)	60 (87)	59	58 (177)	57 (234)	90 (292)	131	180	237	295	338	
		312	258 (67)	199 (38)	146 (17)	101 (16)	100 (15)	99 (14)	98 (13)	97	96 (55)	95 (88)	94	93	92 (235)	91 (293)	132	181	238	296		
			257	198	145	144	143	142	141	140	139	138	137	136	135	134	133	182	239			
			256	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	240			
				255	254	253	252	251	250	249	248	247	246	245	244	243	242	241				
						307	306	305	304	303	302	301	300	299	298	297						
							347	346	345	344	343	342	341	340	339							

Forkers, September 2021*

Sonic, May 2022

Cable or obstruction (not drilled)

Undrilled – mine shaft already located

*Forkers drilling records erroneously recorded the positions of their probe holes on the grid, shifted by 4m east and 3m north. The central coordinate hits grid square 50 on their records. The numbers shown in brackets on this figure match the number recorded on Forker's drilling logs, hence there are numerous repeated numbers shown. A corrected grid was drafted before the second phase of drilling; only two holes were unintentionally drilled in both investigations (Forkers 85, Sonic 14) and (Forkers 67, Sonic 258).

FIGURE 3 – Shaft 3 Drilling depth summary (Forkers, September 2021 & Sonic Drilling, May 2022)

							357	358	359	360	361	362	363	364	365							Key
						319	320	321	322	323	324	325	326	327	328	329						~5.0m bgl rockhead
				271	272	273	274	275	276	277	278	279	280	281	282	283	284	285				~6.0m bgl rockhead
			270	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226			~8.0m – 9.5m bgl rockhead or collapsed shallow workings*
			269	210	157	158	159	160	161	162	163	164	165	166	167	168	169	170	227			~6.0m bgl rockhead with ~2.0m soft strata / broken ground below*
		318	268	209	156	111	112	113	114	115	116	117	118	119	120	121	122	171	228	286		Shaft (with depth probed)
	356	317	267	208	155	110	73	74	75	76	77	78	79 21m	80 21m	81	82	123	172	229	287	330	Not drilled – cable or obstruction present
	355	316	266	207	154	109	72	43	44	45	46	47	48 18m	49 18m	50 18m	83	124	173	230	288	331	xxx Not drilled – mine shaft already located
	354	315	265	206	153	108	71	42	21	22	23	24	25 42m	26 18m	51 18m	84	125	174	231	289	332	*Minimum 1.0m competent rock proven below
	353	314	264	205	152	107	70	41	20	7	8	9	10 18m	27 18m	52 18m	85	126	175	232	290	333	+ Coal seam found 7.5 – 9.0m bgl in 128
	352	313	263	204	151	106	69	40	19	6	1	2	11	28	53	86	127	176	233	291	334	
	351	311	262	203	150	105	68	39	18	5	4	3	12	29	54	87	128 +	177	234	292	335	
	350	310	261	202	149	104	67	38	17	16	15	14	13	30	55	88	129	178	235	293	336	
	349	309	260	201	148	103	66	37	36	35	34	33	32	31	56	89	130	179	236	294	337	
	348	308	259	200	147	102	65	64	63	62	61	60	59	58	57	90	131	180	237	295	338	
		312	258	199	146	101	100	99	98	97	96	95	94	93	92	91	132	181	238	296		
			257	198	145	144	143	142	141	140	139	138	137	136	135	134	133	182	239			
			256	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	240			
				255	254	253	252	251	250	249	248	247	246	245	244	243	242	241				
						307	306	305	304	303	302	301	300	299	298	297						
							347	346	345	344	343	342	341	340	339							

Hydrock 

Hydrock

COAL AUTHORITY SHAFT REFERENCE: 376407-008
COAL AUTHORITY SHAFT COORDINATE: 376382, 407521

FIGURE 5 – Shaft 1 Drilling depth summary (Forkers, September 2021 & August 2023)

							512	505	498	491	484	477	470	463								
					525	518	511	504	497	490	483	476	469	462	456	449						
				532	524	517	510	503	496	489	482	475	468	461	455	448	441					
			538	531	523	516	509	502	495	488	481	474	467	460	454	447	440	434				
		544	537	530	522	515	508	501	494	487	480	473	466	459	453	446	439	433	427			
	551	543	536	529	521	514	507	500	493	486	479	472	465	458	452	445	438	432	426	419		
	550	542	535	528	520	513	506	499	492	485	478	471	464	457	451	444	437	431	425	418	411	
557	549	541	534	527	519	357	358	359	360	361	362	363	364	365	450	443	436	430	424	417	410	
556	548	540	533	526	319	320	321	322	323	324	325	326	327	328	329	442	435	429	423	416	409	
555	547	539	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	428	422	415	408	
554	546	270	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	421	414	407	
553	545	269	210	157	158	159	160	161	162	163	164	165	166	167	168	169	170	227	420	413	406	
552	318	268	209	156	111	112	113	114	115	116	117	118	119	120	121	122	171	228	286	412	405	
356	317	267	208	155	110	73	74	75	76	77	78	79	80	81	82	123	172	229	287	330	404	
355	316	266	207	154	109	72	43	44	45	46	47	48	49	50	83	124	173	230	288	331	403	
354	315	265	206	153	108	71	42	21	22	23	24	25	26	51	84	125	174	231	289	332	402	401
353	314	264	205	152	107	70	41	20	7	8	9	10	27	52	85	126	175	232	290	333		
352	313	263	204	151	106	69	40	19	6	1	2	11	28	53	86	127	176	233	291	334		
351	311	262	203	150	105	68	39	18	5	4	3	12	29	54	87	128	177	234	292	335		
350	310	261	202	149	104	67	38	17	16	15	14	13	30	55	88	129	178	235	293	336		
349	309	260	201	148	103	66	37	36	35	34	33	32	31	56	89	130	179	236	294	337		
348	308	259	200	147	102	65	64	63	62	61	60	59	58	57	90	131	180	237	295	338		
	312	258	199	146	101	100	99	98	97	96	95	94	93	92	91	132	181	238	296			
		257	198	145	144	143	142	141	140	139	138	137	136	135	134	133	182	239				
		256	197	196	195	194	193	192	191	190	189	188	187	186	185	184	183	240				
			255	254	253	252	251	250	249	248	247	246	245	244	243	242	241					
					307	306	305	304	303	302	301	300	299	298	297							
						347	346	345	344	343	342	341	340	339								



North (indicative)

Key

	Rockhead at ~91.5 - 93.5m AOD		Rockhead at ~89.5 – 91.5m AOD
	Rockhead at ~91.5 - 93.5m AOD with ~3.0m soft strata below*		Rockhead at ~89.5 – 91.5m AOD with ~2.0m soft strata below*
*minimum of 1.0m competent rock proven below			

Notes:

- 1) This is an indicative figure and is not to scale.
- 2) Probes 1 to 365 completed during 2021 shaft investigation. Probes 401 to 557 completed during 2023 revised shaft investigation.
- 3) Ground level has been raised due to earthworks between drilling stages, hence presentation of OD levels rather than metres below ground level (m bgl) as seen in Figure 1.

PROJECT NUMBER: 15220

COAL AUTHORITY SHAFT REFERENCE: 376407-003

SITE NAME: Stopes Road Shaft Investigation

COAL AUTHORITY REVISED SHAFT COORDINATE: E376225, N407707

Appendix C Photographs

Photograph 3-1	
Date: 14/09/21	
Description: Shaft Reference 376407-006. Located during Vacuum Excavation works	

Desk Study Photograph 3-2	
Date: 14/09/21	
Description: Shaft Reference 376407-006.	

Desk Study Photograph 3-3	
Date: 14/09/21	
Description: Shaft Reference 376407-006.	

Desk Study Photograph 3-4	
Date: 14/09/21	
Description: Shaft Reference 376407-006. Showing 2.9m diameter of shaft.	

Desk Study Photograph 3-5	
Date: 14/09/21	
Description: Shaft Reference 376407-006. Following completion of investigation works.	

Desk Study Photograph 3-6	
Date: 14/09/21	
Description: Shaft Reference 376407-006. Asbestos cement identified in the backfill around Shaft.	

Appendix D Drillers Logs

TECHNICAL DESIGN NOTE



Forkers site logs - September 2021

Foreman's Daily Journal – Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd
Civil & Ground Engineering Contractors

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX
Tel: 0121 505 1010 • Email: admin@forkers.com

Contract: Bolton STONES ROAD		Contract No: G157	Date: 15/09/21	Sheet No: 1	Ground Level (m):
			Date Commenced:		
Drilling Method: Rotary Percussive	Drilling Equipment / Rig No: J.C.B		Drilling / Casing Diam (mm): 138 Rods		Bit Type: BB Flush Type: Water

Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)
		From	To				
SHAFT 01							
1 to 18	✓	0m	6.9m	Soft			
		6.9m	8.5m	Hard			8.5m
19/20/21	✓	0m	7m	Soft			
22		7m	7.9m	Hard			
		7.9m	10.8m	Soft			
		10.8m	12m	Hard			12.0m
23 to 26m	✓	0m	7m	Hard Soft			
		7m	9m	Hard			9.0m
27/28	✓	0m	7.1m	Soft			
		7.1m	8m	Hard			
		8m	11.5m	Soft			
		11.5m	14m	Hard			14.0m
29 to 36	✓	0m	7.1m	Soft			
		7.1m	9m	Hard			9.0m
37/38	✓	0m	7m	Soft			
		7m	7.9m	Hard			
		7.9m	11.5m	Soft			
		11.5m	13.5m	Hard			13.5m

Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc: No GAS DETECTED O2 = 20.9% CO = 0% CO2 = 0% H2S = 0% CH4 = 0%	Signed for Forkers Ltd: 
From	To	Total		Signed for Client:

X/C/000/AP19

Civil & Ground Engineering Contractors

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX

Tel: 0121 505 1010 • Email: admin@forkers.com

Contract:				Contract No:		Date:	Sheet No:		Ground Level (m):		
Bolton STOKES ROAD				G-157		16/09/21	2				
Date Commenced:											
Drilling Method:				Drilling Equipment / Rig No:		Drilling / Casing Diam (mm):		Bit Type:		Flush Type:	
Rotary Percussive				J.C.B.		101 casing T38 rod		BB		Water	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata			Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)		
		From	To								
SHAFT 01											
39-55	✓	0m	7m	Soft							
		7m	7.5m	Hard							
		7.5m	10.5m	Soft							
		10.5m	12m	Hard					12.0m		
56-66	✓	0m	7m	Soft							
		7m	9m	Hard					9.0m		
67-72	✓	0m	7.1m	Soft							
		7.1m	7.8m	Hard							
		7.8m	10.6m	Soft							
		10.6m	12m	Hard					12.0m		
73-77	✓	0m	6.8m	Soft							
		6.8m	7.8m	Hard							
		7.8m	10.7m	Soft							
		10.7m	12m	Hard					12.0m		
Hours Worked on Site				Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:			
From	To	Total	No GAS DETECTED O ₂ = 20.9% CO = 0% CO ₂ = 0% H ₂ S = 0% CH ₄ = 0%								
							Signed for Client				

X/C/000/AP19

Tel: 0121 505 1010 • Email: admin@forkers.com

[illegible]

Foreman's Daily Journal – Rotary Percussive Drilling

Forkers Ltd
Civil & Ground Engineering Contractors

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX
Tel: 0121 505 1010 • Email: admin@forkers.com

Contract: Bolton Stapes Road				Contract No: C157		Date: 21/09/21 Date Commenced:		Sheet No: 5		Ground Level (m):		
Drilling Method: Rotary Percussive			Drilling Equipment / Rig No: J.C.B			Drilling / Casing Diam (mm): T38Rod			Bit Type: BB		Flush Type: Water	

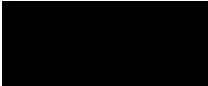
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)
		From	To				
149-152	✓	0m	7m				
		7m	9m				9.0m
153-155	✓	0m	10.5m	Soft			
		10.5m	11m	Hard			
		11m	13m	Soft			
		13m	15m	Hard			15.0m
156-158	✓	0m	6.8m	Soft			
		6.8m	9m	Hard			9.0m
159-161	✓	0m	7m	Soft			
		7m	7.6m	Hard			
		7.6m	10.4m	Soft			
		10.4m	12m	Hard			12.0m
162-178	✓	0m	10.2m	Soft			
		10.2m	12m	Hard			12.0m
179-194	✓	0m	6.8m	Soft			
		6.8m	9m	Hard			9.0m

Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:		Signed for Forkers Ltd:	
From	To	Total	No GAS DETECTED O2 = 20.9% CO = 0% CO2 = 0% H2S = 0% CH4 = 0%		Signed for Client	

X/C/000/AP19

Civil & Ground Engineering Contractors

Tel: 0121 505 1010 • Email: admin@forkers.com

Contract:			Contract No:		Date:	Sheet No:	Ground Level (m):	
Bolton Stopes Road			G157		22/09/21	6		
Date Commenced:								
Drilling Method:			Drilling Equipment / Rig No:		Drilling / Casing Diam (mm):		Bit Type:	Flush Type:
Rotary Percussive			J.C.B		T38 Rod		BB	Water
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)	
		From	To					
195-211	✓	0m	6.8m	7m Soft				
		6.8m	9m	Hard			9.0m	
212-226	✓	0m	7m	Soft				
		7m	7.6m	Hard				
		7.6m	10.8m	Soft				
		10.8m	12m	Hard			12.0m	
227-240	✓	0m	10.2m	Soft				
		10.2m	12m	Hard			12.0m	
Hours Worked on Site				Remarks: Standing Time / Weather Conditions / Groundwater etc:		Signed for Forkers Ltd:		
From	To	Total	No GAS DETECTED O2 = 20.9% CO = 0% CO2 = 0% H2S = 0% CH4 = 0%					
					Signed for Client			

X/C/000/AP19

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX
Tel: 0121 505 1010 • Email: admin@forkers.com

[illegible]

Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:	Signed for Forkers Ltd:
From	To	Total		
			NO GAS DETECTED $O_2 = 20\%$ $CO = 0\%$ $CO_2 = 0\%$ $H_2S = 0\%$ $CH_4 = 0\%$	Signed for Client

Foreman's Daily Journal - Rotary Percussive Drilling

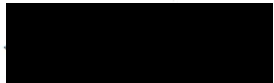
X/C/000/AP19

Forkers Ltd

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX
Tel: 0121 505 1010 • Email: admin@forkers.com

Contract:		Contract No:		Date:	Sheet No:	Ground Level (m):	
BOLTON STOPS ROAD		G-157		28/09/21	10		
Drilling Method:		Drilling Equipment / Rig No:		Drilling / Casing Diam (mm):		Bit Type:	Flush Type:
RIP		SCB		T38		BB	WATER

Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)
		From	To				
SHAFT 03							
293, 235	V	G/L	5m	SOFT			7.0m
88, 55		5m	7m	HARD			
13, 14, 15, 16				"			
17, 38, 292				"			
234, 177, 176				"			
54, 84, 53,				"			
86, 2, 3, 11				"			
12, 4, 1, 6, 5				"			
19, 18, 40				"			
39, 69, 68, 31				"			7.0m
32	V	G/L	5m	SOFT			
		5m	7m	HARD			
9, 10, 24, 25	V	G/L	5.8m	SOFT			8.0m
8, 7, 22, 23		5.8	8.0m	HARD			
20, 21, 41, 42				"			
70, 71, 72, 73				"			
43, 44, 74				"			
75, 45, 46				"			
47, 48, 76				"			
77, 78, 50				"			
81	V	G/L	5.8m	SOFT			
		5.8m	8.0	HARD			8.0m

Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:	Signed for Forkers Ltd:
From	To	Total		
			No Gms DETECTED O2 = 20.90% CO = 0.1% CO2 = 0.1% H2S = 0.1% CH4 = 0.1%	 Signed for Client

TECHNICAL DESIGN NOTE



Sonic Drilling site logs - May 2022



24/5/22

[illegible]



DAILY REPORT SD-DR-1



Stopes RD

SHAFT - 007

26/5/22

CONTRACT					CONTRACT INFO			REPORT NUMBER		DATE
Hole No	Angle	Strata Description	From	To	Flush Type	% of Flush	Casing Diameter and Depth	Drill Bit Diameter	Grout Injected	Remarks/Obstructions
Probe holes		122, 181, 238, 296, 131, 180, 237, 295, 338, 55, 56, 87, 130, 179, 220, 277, 327								
		14, 13, 20, 88, 128, 178, 235, 293, 336, 12, 29, 54, 87, 128, 177, 221, 272, 325, 308, 351								
		349, 350, 210, 351, 31, 352, 33, 353, 314, 354, 315, 355, 316, 356, 317, 318, 288, 209, 150,								
		111, 269, 210, 157, 158, 270, 211, 212, 213, 271, 272, 319, 348, 312								
		Mixed fill	0	4	Water	100%	None	70mm	None	
		Brown clay	4	5		100%				
		Grey mudstone	5	6		100%				
										27/5/22
Probe holes		10, 27								
		Very soft	0	12.5	Water	0%	None	70mm	None	
		Hard mudstone	12.5	14		0%				
		Very soft	14	18		0%				
Probe hole		24								
		Very soft	0	7.5	Water	0%	None	70mm	None	
		Hard	7.5	9		0%				
Probe hole		25								
		Very soft	0	4.2	Water	0%	None	70mm	None	
Signed For			Hrs Worked		Plant on Site			Standing Time or Delays		Site Crew
Client Hydroxide					Klemm RD					
Main Contractor										
Sonic Drilling Ltd										



DAILY REPORT SD-DR-1



Stopes RD

SHAFT - 007

26/5/22

CONTRACT					CONTRACT INFO			REPORT NUMBER		DATE
Hole No	Angle	Strata Description	From	To	Flush Type	% of Flush	Casing Diameter and Depth	Drill Bit Diameter	Grout Injected	Remarks/Obstructions
Probe holes										
		177, 178, 129, 234, 235, 237								
		Mixed fill	0	4.5	water	50%	NONE	70mm	NONE	
		Brown clay	4.5	6		100%				
		Grey mudstone	6	7.2		100%				
		Very soft Broken	7.2	8.7		0%				
		Gravel lost / hard								
		HARD	8.7	10.5		0%				
Hole no										
128		Mixed fill	0	4.5	water	100%	NONE	70mm	NONE	
		Brown clay	4.5	6		100%				
		Grey mudstone	6	7.5		100%				
		COAL	7.5	9		100%				
		Grey mudstone	9	10		100%				
Probe holes										
		294, 236								
		VERY SOFT	0	6	water	0%	NONE	70mm	NONE	
		Firm	6	7.8		0%				
		VERY SOFT	7.8	9.6		0%				
		HARD	9.6	10.5		0%				
Signed For			Hrs Worked		Plant on Site			Standing Time or Delays		Site Crew
Client Hydracore					Kleppan 812					
Main Contractor										
Sonic Drilling Ltd										



DAILY REPORT SD-DR-1



SHAFT - 007 Stopes RD

27/5/22

CONTRACT					CONTRACT INFO			REPORT NUMBER		DATE
Hole No	Angle	Strata Description	From	To	Flush Type	% of Flush	Casing Diameter and Depth	Drill Bit Diameter	Grout Injected	Remarks/Obstructions
Probe holes		80, 79								
		very soft	0	12	water	0%	None	70mm	None	
		HARD to firm	12	15		0%				
		very soft	15	21		0%				
Probe holes		26, 49, 48, 50, 51, 52								
		very soft	0	18	water	0%	None	70mm	None	
Probe holes		119, 118, 117, 78, 47, 120, 121, 81, 82, 83, 84, 85								
		Mixed fill	0	4.5	water	100%	None	70mm	None	
		Brown clay	4.5	6		100%				
		Grey mudstone	6	12		100%				
					<u>SHAFT - 008</u>					
Probe holes		21, 116, 118, 48, 20								
		mixed fill	0	4	water	100%	None	70mm	None	
		Brown clay	4	5		100%				
		Grey mudstone	5	6		100%				
Signed For			Hrs Worked		Plant on Site			Standing Time or Delays		Site Crew
Client Hydriock					Klemm 802					
Main Contractor										
Sonic Drilling Ltd										

TECHNICAL DESIGN NOTE



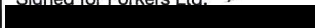
Forkers site logs - August 2023

X/C/000/AP19

Civil & Ground Engineering Contractors

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX
Tel: 0121 505 1010 • Email: admin@forkers.com

Drilling Method: <i>RIP</i>	Drilling Equipment / Rig No: <i>Kennam 36004</i>	Drilling / Casing Diam (mm): <i>76</i>	Bit Type: <i>2W</i>	Flush Type: <i>Water</i>
--------------------------------	---	---	------------------------	-----------------------------

Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:	Signed for Forkers Ltd:	
From	To	Total			
				Signed for Client	

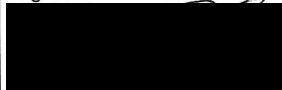
Foreman's Daily Journal – Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd Civil & Ground Engineering Contractors Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX Tel: 0121 505 1010 • Email: admin@forkers.com											
Contract: STOLES ROAD				Contract No: G277		Date: 22-8-23		Sheet No: —		Ground Level (m): —	
Drilling Method: R/P				Drilling Equipment / Rig No: KUEMM J60604		Drilling / Casing Diam (mm): 70--		Bit Type: JTW		Flush Type: WATER	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)				
		From	To								
541	✓	c~	9.0	Black Ash / clay fin		100					
		9.0	11.0	Clay mudstone		"	11-				
542	✓	"	"	" "		"	11				
535	✓	"	"	" "		"	11				
536	✓	"	"	" "		"	11				
543	✓	"	"	" "		"	11				
544	✓	c~	8.5	Black Ash / clay fin		"					
		8.5	10.5	Clay mudstone		"	10.5				
537	✓	"	"	" "		"	10.5				
538	✓	"	"	" "		"	10.5				
552	✓	c~	12.0	Black Ash / clay fin		"					
		12.0	14.0	Clay mudstone		"	14.0				
545	✓	"	"	" "		"	14.0				
553	✓	c~	10.0	Black Ash / clay fin		"					
		10.0	12.0	Clay mudstone		"	12-				
554	✓	"	"	" "		"	12.				
486	✓	c~	9.5	Black Ash / clay fin		"					
		9.5	10.0	Clay mudstone		"					
		10.0	12.0	Soft Drift		0					
		12.0	14.0	Hard Drift		0	14-				
547	✓	"	"	" "		"	"				
488	✓	c~	8.5	Black Ash / clay fin		100					
586		8.5	10.5	Clay mudstone		"	10.5				
548	✓	"	"	" "		"	10.5				
549	✓	"	"	" "		"	10.5				
Hours Worked on Site				Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:			
From	To	Total		(All B/H's Gravelled w.c cement + Turbidity)				Signed for Client			

Foreman's Daily Journal – Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd Civil & Ground Engineering Contractors Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX Tel: 0121 505 1010 • Email: admin@forkers.com												
Contract:				Contract No:		Date:		Sheet No:		Ground Level (m):		
STOKES ROAD				G277		18-8-23		-		-		
						Date Commenced:						
Drilling Method:			Drilling Equipment / Rig No:			Drilling / Casing Diam (mm):			Bit Type:		Flush Type:	
RIP			KUMM 30004			7-			Jr		water	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)					
		From	To									
480	✓	C~	10.0	Black ASH / clay fin		100						
		10.0	12.0	Grey mudstone		-	12-					
487	✓	"	"	"		100	12-					
488	✓	C~	9.0	Black ASH / clay fin		100						
		9.0	11.0	Grey mudstone		"	11-					
481	✓	"	"	"		"	11-					
482	✓	"	"	"		"	11-					
489	✓	"	"	"		"	11					
490	✓	"	"	"		"	11					
483	✓	"	"	"		"	11					
484	✓	"	"	"		"	11					
491	✓	"	"	"		"	11					
492	✓	C.C	10.0	Black ASH / clay fin		"						
				Grey mudstone		"	12					
499	✓	"	"	"		"	12					
500	✓	"	"	"		"	12					
493	✓	"	"	"		"	12					
494	✓	"	"	"		"	12					
501	✓	"	"	"		"	12					
502	✓	"	"	"		"	12					
495	✓	"	"	"		"	12					
496	✓	GC	9.0	Black ASH / clay fin		"						
503		9.0	11.0	Grey mudstone		"	11					
504	✓	"	"	"		"	11					
497	✓	"	"	"		"	11					
Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:					
From	To	Total	(All 3/4's Cased with Cement + Trenching)									
							Signed for Client					

Foreman's Daily Journal – Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd Civil & Ground Engineering Contractors Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX Tel: 0121 505 1010 • Email: admin@forkers.com												
Contract: Stokes Road				Contract No: G277		Date: 21-8-23		Sheet No: —		Ground Level (m): —		
						Date Commenced:						
Drilling Method: RIP			Drilling Equipment / Rig No: KUMH 10004			Drilling / Casing Diam (mm): 76			Bit Type: DW		Flush Type: WATER	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)					
		From	To									
498	✓	c-~	9.0	BLACK ASH / clay fine		100						
		9.0	11.0	Grey mudstone		~	11-					
505		~	~	~		~	11					
506	✓	c-~	9.5	BLACK ASH / clay fine		100						
		9.5	11.5	Grey mudstone		~	11.5					
513	✓	~	~	~		~	11.5					
514	✓	~	~	~		~	11.5					
515	✓	~	~	~		~	11.5					
507	✓	~	~	~		~	11.5					
508	✓	~	~	~		~	11.5					
509	✓	~	~	~		~	11.5					
516	✓	~	~	~		~	11.5					
517	✓	~	~	~		~	11.5					
510	✓	~	~	~		~	11.5					
511	✓	c-~	9.0	BLACK ASH / clay fine		~						
		9.0	11.0	Grey mudstone		~	11-					
512	✓	~	~	~		~	11-					
518	✓	~	~	~		~	11-					
519	✓	c-~	9.0	Dark ASH / clay fine		~						
		9.0	9.5	Grey mudstone		~						
		9.5	12.0	Very soft Druse		0						
		12.0	14.0	Hard Druse		0	14-					
527	✓	~	~	~		0	14-					
528	✓	~	~	~		0	14-					
520	✓	~	~	~		0	14-					
Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:					
From	To	Total										
									Signed for Client			

X/C/000/AP19

Civil & Ground Engineering Contractors

Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX
Tel: 0121 505 1010 • Email: admin@forkers.com

Contract:				Contract No:		Date:	Sheet No:	Ground Level (m):	
STOKES ROAD				G277		21-8-23			
						Date Commenced:			
Drilling Method:				Drilling Equipment / Rig No:		Drilling / Casing Diam (mm):		Bit Type:	Flush Type:
R/P				Klemm JB6002		76		DW	water
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata		Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)	
		From	To						
521	✓	c.-	9.0	Black ASH/clay fine			100		
		9.0	11.0	Grey mudstone			-	11	
529	✓	"	"	"			-	11	
530	✓	"	"	"			-	11	
522	✓	"	"	"			-	11	
523	✓	"	"	"			-	11	
524	✓	"	"	"			-	11	
525	✓	"	"	"			-	11	
539	✓	c.-	9.5	Thick ASH/clay fine			100		
		9.5	10.2	Clay mudstone			-		
		10.2	12.0	Soft Shale			0		
		12.0	14.0	Hard Shale			0	14-	
540	✓	"	"	"				14-	
533	✓	"	"	"				14-	
534	✓	"	"	"				14-	
Hours Worked on Site		Remarks: Standing Time / Weather Conditions / Groundwater etc:							
From	To	Total	All 7H's Quaries were covered + Insured						
			Signed for Forkers Ltd:						
			Signed for Client:						

Foreman's Daily Journal – Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd Civil & Ground Engineering Contractors Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX Tel: 0121 505 1010 • Email: admin@forkers.com												
Contract:				Contract No:		Date:		Sheet No:		Ground Level (m):		
STOKES ROAD				G277		17-8-23		—		—		
						Date Commenced:						
Drilling Method:			Drilling Equipment / Rig No:			Drilling / Casing Diam (mm):			Bit Type:		Flush Type:	
R/P			KEMM 360604			76			DTR		WATER	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)					
		From	To									
457	✓	6-2	9-5	Black Ash / Clay Fin		100						
		9-5	11-5	Grey MUDSTONE		"	11-5					
458	✓	"	"	"			11-5					
452	✓	"	"	"			11-5					
453	✓	"	"	"			11-5					
459	✓	"	"	"			11-5					
454	✓	"	"	"			11-5					
460	✓	"	"	"			11-5					
461	✓	"	"	"			11-5					
455	✓	6-2	9-0	Black Ash / Clay Fin		100						
456		9-0	11-0	Grey MUDSTONE		"	11-0					
462	✓	"	"	"			11					
463	✓	"	"	"			11					
471	✓	6-2	10-0	Black Ash / Clay Fin								
		10-0	12-0	Grey MUDSTONE			12					
464	✓	"	"	"			12					
465	✓	"	"	"			12					
472	✓	"	"	"			12					
473	✓	"	"	"			12					
466	✓	"	"	"			12					
467	✓	6-2	9-0	Black Ash / Clay Fin								
		9-0	11-0	Grey MUDSTONE			11					
474	✓	"	"	"			11					
475	✓	"	"	"			11					
468	✓	"	"	"			11					
Hours Worked on Site				Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:				
From	To	Total		(All DH's Covered with Cement + Transmitters!)				 Signed for Client				

Foreman's Data - Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd Civil & Ground Engineering Contractors Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX Tel: 0121 505 1010 • Email: admin@forkers.com												
Contract:				Contract No:		Date:		Sheet No:		Ground Level (m):		
STOKES ROAD				G277		10-8-23		-		-		
						Date Commenced:						
Drilling Method:			Drilling Equipment / Rig No:			Drilling / Casing Diam (mm):			Bit Type:		Flush Type:	
RIP			Klemm 300004			70			20		Air Water	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)					
		From	To									
422	✓	0	9.0	BRACK ASH / CLAY FILL		100						
		9.0	10.0	SOFT DRILLING		0						
		10.0	12.0	HARD DRILLING		0	12-					
428	✓	"	"	"			12-					
429	✓	"	"	"			12-					
423	✓	"	"	"			12-					
424	✓	"	"	"			12-					
430	✓	"	"	"			12-					
431	✓	"	"	"			12-					
425	✓	"	"	"			12-					
426	✓	"	"	"			12-					
432	✓	"	"	"			12-					
433	✓	"	"	"			12-					
427	✓	"	"	"			12-					
434	✓	"	"	"			12-					
435	✓	"	"	"			12-					
442	✓	"	"	"			12-					
443	✓	"	"	"			12-					
436	✓	"	"	"			12-					
437	✓	"	"	"			12-					
444	✓	"	"	"			12-					
445	✓	"	"	"			12-					
438	✓	"	"	"			12-					
439	✓	0	9.5	BRACK ASH / CLAY FILL								
		9.5	11.5	CLAY MUDSTONE			11.5-					
Hours Worked on Site				Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:				
From	To	Total	(Acc PH's Casings) with Cement + Borewater INSTRUCTED BY ENGINEER TO DRILL WITH WATER!				 Signed for Client					

Foreman's Daily Journal – Rotary Percussive Drilling

X/C/000/AP19

Forkers Ltd Civil & Ground Engineering Contractors Golds Green House, Shaw Street, West Bromwich, West Midlands B70 0TX Tel: 0121 505 1010 • Email: admin@forkers.com												
Contract:				Contract No:		Date:		Sheet No:		Ground Level (m):		
STONES ROAD				G277		15-8-23		-		-		
						Date Commenced:						
Drilling Method:			Drilling Equipment / Rig No:			Drilling / Casing Diam (mm):			Bit Type:		Flush Type:	
R/P			KUMM 360604			75--			3H		Air	
Borehole No	Angle of Hole	Strata Thickness (m)		Description of Strata	Depth of Casing (m)	Flush Return (%)	Final Depth Borehole (m)					
		From	To									
401	✓	c-	9.0	Beach ASH / clay fine		100						
			9.0	10.0	Grey mudstone		4					
			10.0	12.0	Soft Drum		0					
			12.0	14.0	Hard Drum		0	14-				
402	✓	c-	11.0	Beach ASH / clay fine		100						
			11.0	12.0	finer coal		100					
			12.0	14.0	Grey mudstone		100	14-				
403	✓	n	n	n		100	14-					
404	✓	n	n	n		100	14-					
405	✓	c-	11.5	Beach ASH / clay fine		100						
			11.5	13.5	Grey m/s stone		100	13.5-				
406	✓	n	n	n		100	13.5-					
412	✓	n	n	n		100	13.5-					
413	✓	n	n	n		100	13.5-					
414	✓	n	n	n		100	13.5-					
407	✓	n	n	n		100	13.5-					
408	✓	c-	11.0	Beach ASH / clay fine		100						
			11.0	13.0	Grey m/s stone		100	13-				
415	✓	n	n	n		100	13-					
416	✓	n	n	n		100	13-					
409	✓	c-	10.0	Beach ASH / clay fine		100						
			10.0	12.0	Grey m/s stone		100	12-				
410	✓	n	n	n		100	12-					
417	✓	n	n	n		100	12-					
418	✓	n	n	n		100	12-					
Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:				Signed for Forkers Ltd:					
From	To	Total	(All 3/4's Grouted with cement + bentonite)				 Signed for Client					

X/C/000/AP19

Tel: 0121 505 1010 • Email: admin@forkers.com

Contract:	Contract No:	Date:	Sheet No:	Ground Level (m):
Stakes Row	G277	15-8-23	—	—
		Date Commenced:		

Drilling Method:	Drilling Equipment / Rig No:	Drilling / Casing Diam (mm):	Bit Type:	Flush Type:
RIP	Kenn J60004	76	Dr	Air

[illegible]

Hours Worked on Site			Remarks: Standing Time / Weather Conditions / Groundwater etc:	Signed for Forkers Ltd:
From	To	Total		
				Signed for Client