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SUB SURFACE
Site Investigation Specialists,
Geotechnical & Environmental Consultants

GROUND INVESTIGATION REPORT

FOR
CAPITOL PARK,
WHINBY ROAD,
DODWORTH,
SOUTH YORKSHIRE

PREPARED FOR
CARNELL MANAGEMENT SERVICES LIMITED

REPORT NO. NE3834B Rev 2
JUNE 2020



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GROUND INVESTIGATION AT CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

CLIENT: CARNELL MANAGEMENT SERVICES LIMITED

ENGINEER: WILLIAM SAUNDERS

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1. INTRODUCTION

This report has been prepared in accordance with an email, dated 18 February 2020, from the Engineer on behalf of the Client. The brief was set out in our estimate, ref. E6152C dated 18 December 2019, with amendments as the investigation proceeded and includes:

The report is an update of our Ground Investigation Report, ref. NE3834A dated September 2019. This was prepared in accordance with an email, dated 9 May 2019, from the Engineer on behalf of the Client. The brief was set out in our estimate, ref. E6152A dated 29 March 2019.

The combined investigations comprise the following:

- 8 No. mini boreholes (M1, M2, M3, M4, M5, M6, M7 & M8)
- 3 No. rotary open hole boreholes (R1, R2 & R3)
- 5 No. rotary core boreholes (R4, R5, R6 R7 & R8)
- In-situ testing
- Geotechnical laboratory testing
- Contamination analysis
- Installation of standpipes followed by groundwater and ground gas monitoring
- Provision of an interpretative report on the above.

1.1 Site Location and Description

The site is located to the north west of the M1 Junction 37 on the northern outskirts of Dodworth, South Yorkshire, as shown on Figure 1. The approximate National Grid Reference of the centre of the site is SE. 3195 0600.

As shown on Figure 2 the trapazoidal shaped about 1.06 hectare site is bounded to the north west by a commercial development known as the Capitol Centre, to the south west and below by a roundabout on the A628 Whinby Road, to the south east and below by a live railway line (in a cutting) and to the north east and below by the M1 Motorway (in a cutting).

At the time of the ground investigations, in June 2019 and March 2020, the site was generally flat with slopes down to lower ground to the south west, south east and north east. The slopes were largely covered by trees and bushes.

1.2 Proposed Development and Purpose of the Ground Investigation

It is proposed to construct two large commercial/ industrial buildings (Unit 17 and 18) with car parks and service yards to the south east of the existing Capitol Park and accessed via Capitol Court, as shown on Figure 3.

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The purpose of the investigation was to determine the ground conditions at the positions of the exploratory holes, to assess the likelihood of a general pattern of strata being present below the site and to determine the presence of shallow mineral seams of coal and ironstone, and any associated mine workings and to assess the risk to near surface ground stability and to establish the load bearing characteristics of the strata deriving if possible an assessment of the suitability of appropriate founding techniques.

In addition, contamination analysis and assessment was required to determine necessary precautions and/or remedial measures required for the proposed development and to ascertain the need for any further sampling and analysis.

Ground gas monitoring and assessment was also required to determine necessary precautions and/or remedial measures.

2. INVESTIGATION

2.1 Investigation Details

2.1.1 2019 Ground Investigation

Eight mini boreholes (M1, M2, M3, M4, M5, M6, M7 & M8) were put down to depths of between 1.45 and 5.45 metres using a Dart Mini Sampling Rig fitted with windowless sample tubes of 86, 76, 73, 66, 63, 56 and 46mm diameter at the positions determined and set out by Sub Surface North East Limited, as shown on Figure 4. The samples were subsequently logged in accordance with BS EN ISO 14688-1: 2002 and BS EN ISO 14689-1: 2003 and the resulting Mini Borehole Records are appended.

Three rotary boreholes (R1, R2 & R3) were put down to depths of 30.00 metres using a Beretta T44 drill rig at the positions determined and set out by Sub Surface North East Limited, as shown on Figure 4. Boreholes were advanced by rotary open holing techniques, with a water flushing medium, using 89mm diameter rock roller bits and 121mm diameter temporary casing. The foreman driller logged chippings flushed to the surface during drilling and the resulting Rotary Borehole Records are appended.

On completion M2, M4, M7 and M8 were backfilled with Bentonite and arisings and R1 was backfilled with Bentonite as no installations were required.

Ground levels at the exploratory hole positions have been interpolated from spot heights and contours given on the topographical survey base plan to Figure 4. The reduced levels are related to Ordnance Datum.

2.1.2 2020 Ground Investigation

Five rotary boreholes (R4, R5, R6 R7 & R8) were put down using a Beretta T44 drill rig. The rotary boreholes were initially advanced by open holing using a 100mm diameter rock roller through 127mm diameter temporary casing with (water and air) mist flushing medium from 0.00 to 7.50 metres depth. R6 was also advanced using a 70mm diameter rock roller from 25.50 to 28.00 metres depth. The foreman driller logged chippings flushed to the surface during the open hole drilling.

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The rotary boreholes were then advanced by rotary coring techniques to depths of between 24.30 and 27.00 metres with a (water and air) mist flushing medium using a double walled core barrel with Mylar lining producing 72mm diameter core. The rock cores were carefully extruded, placed in core boxes and transported to Preston where they were photographed and logged, in accordance with BS EN ISO 14688-1: 2002 and BS EN ISO 14689-1: 2003, by a Chartered Engineering Geologist. The resulting Rotary Borehole Records are appended.

On completion the rotary boreholes were backfilled with arisings and grout as no installations were required.

Ground levels at the exploratory hole positions have been interpolated from spot heights and contours given on the topographical survey base plan to Figure 4. The reduced levels are related to Ordnance Datum.

2.2 Sub Surface Detail

Details of the strata encountered in the ground investigation are given on the appended Mini Borehole and Rotary Borehole Records. The exploratory holes found Made Ground overlying Coal Measures strata, the upper part of which was completely weathered to a soil. The depths of strata found were as follows:

TABLE 1 STRATA

Expl. Hole No.	Ground Level (mOD)	Depth of Made Ground (m))	Depth to CW Bedrock (m)	Depth of Rockhead (m)	Depth to Base (Thickness) of Coal (m)	Depth of Hole (m)
M1	149.20	3.70	3.70	> 5.45		5.45
M2	149.40	4.80	4.80	> 5.45		5.45
M3	149.35	4.35	4.35	> 5.45		5.45
M4	149.40	4.00	4.00	> 5.45		5.45
M5	149.45	3.25	3.25	3.25 $		5.45
M6	149.50	2.00	2.00	2.85		3.35
M7	149.50	0.20	0.20	> 1.45		1.45
M8	149.55	4.00	4.00	4.55	4.70 (0.15) D >5.30 (>0.40) D	5.30

M = Mini Borehole, CW = Completely Weathered.
$ Underlain by completely weathered bedrock from 3.50 to >5.45m.

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TABLE 2 STRATA

Expl. Hole No.	Ground Level (mOD)	Depth of Made Ground * (m)	Depth of Rockhead (m)	Depth to Base (Thickness) of Coal (m)	Depth to Base (Thickness) of Ironstone (m)	Depth of Hole (m)
R1	149.35	5.40	5.40	6.10 (0.30) D 17.60 (0.10) C		30.00
R2	149.40	5.00	5.00	11.30 (0.50) B 22.90 (0.20) A		30.00
R3	149.35	5.50	5.50	8.60 (0.30) C 19.20 (0.20) B		30.00
R4	149.50	1.20	1.80	3.20 (0.50) D 18.40 (0.15) C 25.65 (0.40#) B		27.00
R5	149.55	2.30	5.60	16.85 (0.20#) C 26.80 (0.20) B	7.70 (0.20#) Z	27.00
R6	149.50	5.00	6.00	14.40 (0.30) C 24.10 (0.20#) B 24.59 (0.09) B		28.00
R7	149.55	3.00	5.50	15.35 (0.75#) C 24.85 (0.25) B 25.25 (0.10) B	9.50 (0.50#) Y 13.92 (0.02) X 18.25 (0.25#) W	27.00
R8	149.40	2.00	4.50	13.30 (0.30) C 20.20 (0.10#) B 23.60 (0.15) B	12.35 (0.35#) X 17.70 (0.35#) W 22.90 (0.45#) V 24.25 (0.05#) U	24.30

R = Rotary Borehole, # = Mine workings/ Void, * depth less reliable than in M1 to M8.

The four significant coal seams, and associated mine workings, have been lettered A to D in Tables 1 and 2 for reference. We consider the lettered coal seams to be as follows:

D Top Haigh Moor Coal - 1 & 2 leafs
C Low Haigh Moor Coal [Top]
B Low Haigh Moor Coal [Bottom] - 1 & 2 leafs
A Lidget Coal

The six significant ironstone seams, and associated mine workings, have been lettered U to Z are not shown on the geological survey, an extract of which is given as Figure 5, and hence are not named.

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A general summary of the strata found is as follows:

2.2.1 Made Ground

Predominantly cohesive Made Ground was found with apparently interleaved relatively thin bands of granular Made Ground to between 0.20 and 4.80 metres depth; the shallow Made Ground being found in the northern part of the site. This material is considered to be colliery spoil. It is noted that the Made Ground in the rotary boreholes is indicated to be deeper. This is probably due to the foreman driller being unable to distinguish the boundary between colliery spoil and the underlying completely weathered bedrock from flush returns.

Cohesive Made Ground was found to be generally slightly gravelly slightly sandy silty clay, the gravel sized fragments comprising mudstone, coal, ironstone, sandstone and occasional siltstone, clinker, concrete, brick and metal. Shear strengths were generally found to be medium becoming high at depth.

Bands of granular Made Ground were found in M1, M4, M5 and M6 and were generally found to be slightly clayey silty sandy gravel sized fragments of mudstone and coal. Relative densities, where determined were in the medium dense and dense ranges.

We understand from JPG that the made ground comprises engineered fill, which was placed and compacted in accordance with an earthworks specification as part of a cut and fill exercise in 2007. The works were supervised by JPG (Leeds) Limited

2.2.2 Bedrock

Completely weathered derivatives of the bedrock were initially found in the mini boreholes and were found to be silty clays to slightly gravelly slightly sandy silty clays, the gravel sized fragments comprising mudstone, sandstone and coal lithorelicts. Shear strengths were found to be medium, high and very high and generally increased with depth. This was underlain by extremely weak highly weathered mudstones in M6 at 2.85 metres depth. In M8 at 4.55 metres a 0.15 metre thick band of extremely weak highly weathered coal was found to 4.70 metres depth and underlain by completely weathered mudstone. No samples were recovered below 4.85 metres depth, but the foreman driller indicated that a coal seam was present from 4.90 to 5.30 metres depth. No further progress was possible below 5.30 metres depth.

As indicated in Table 2 the rotary open hole and cored boreholes identified four significant coal seam horizons (A, B, C & D), as follows:

Coal D (Top Haigh Moor Coal)
The up to 0.70 metre thick coal seam was found in M8 (4.55-4.70 & 4.90->5.30m), R1 (5.80-6.10m) and R4 (2.70-3.20m) and was apparently intact. It is anticipated to crop out through the northern corner of the site.

Coal C (Low Haigh Moor Coal [Top])
The up to 0.30 metre thick coal seam, when intact, was found in R1 (17.50-17.60m), R3 (8.30-8.60m), R4 (18.25-18.40m), R5 (16.65-16.85m), R6 (14.10-14.40m), R7 (14.60-15.35m) and R8 (13.00-13.30m) and was apparently intact with the exception of R5 and R7. In R5 0.20 metres of broken coal, the remnants of mine workings, was present. In R7 a 0.60 metre void was underlain by 0.15 metres of stowed waste/ collapsed ground. A water inflow was also recorded at 13.70 metres depth. The coal seam was not found in R2 and hence is anticipated to crop out through the southern part of the site between R8 and R2.

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Coal B (Low Haigh Moor Coal [Bottom])
The up to 0.50 metre thick coal seam, when intact, was found as one or two leafs in R2 (10.80-11.30m), R3 (19.00-19.20m), R4 (25.25-25.65m), R5 (26.60-26.80m), R6 (23.90-24.10m & 24.50-24.59m), R7 (24.60-24.85m & 25.15-25.25m) and R8 (20.10-20.20m & 23.45-23.60m). The coal seam was not found in R1 and has probably been mined but not identified. In R4 a 0.40 metre void was present, in R6 0.10 metre of coal was underlain by a 0.10 metre void and in R8 0.10 metres of broken coal and mudstone was present trapped between the collapsed roof and floor of the mine workings. The voids, where present, are considered to be partially closed.

Coal A (Lidget Coal)
The typically 0.30 to 1.52 metre thick coal seam was found in R2 (22.70-22.90m) only and given the thickness has apparently been mined.

As indicated in Table 2 the rotary cored boreholes also identified six significant ironstone horizons (U, V, W, X, Y & Z), as follows:

Ironstone Z
An ironstone bed was found in R5 (7.50-7.70m) and was intact.

Ironstone Y
Ironstone mine workings (void) were found in R7 (9.00-9.50m) and was underlain by broken floor. The foreman driller also recorded loss of flush returns.

Ironstone X
An ironstone band was found in R7 (13.90-13.92m) and ironstone mine workings (void) were found in R8 (12.00-12.35m). The foreman driller recorded that the drill rods dropped through the void and also recorded loss of flush returns and loose drilling.

Ironstone W
Ironstone mine workings (void and stowed waste) were found in R7 (18.00-18.25m) and ironstone mine workings (void) were found in R8 (12.00-12.35m). The foreman driller recorded loss of flush returns in the larger void found in R8.

Ironstone V
In R8 an ironstone band (22.45-22.50m) was found overlying mine workings (22.50-22.90m) with some stowed waste including a ironstone nodule.

Ironstone U
In R8 an ironstone band (24.20-24.25m) was found overlying apparent closed mine workings. The foreman driller, however, recorded total loss of flush returns from 24.10 metres depth indicating a nearby void.

2.2.3 Groundwater

Groundwater seepages were recorded in M1, M2, M3, M4 and M5 at 1.00, 1.00, 0.90, 2.00 and 1.50 metres depth respectively. In M8 the natural strata was initially found to be wet indicating a groundwater seepage at the Made Ground/ natural ground contact at 4.00 metres depth.

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No groundwater was encountered in the remainder of the exploratory holes. It should be noted that groundwater inflows in the rotary boreholes may have been masked by the water flushing medium and all of the exploratory holes they were only left open for a short period of time and groundwater levels may be subject to seasonal and/ or climatic variations.

Monitoring of standpipes installed in M1, M3, M5, R2 and R3 was initially undertaken on 21 June 2019. R3 was then damaged, repaired, removed and substituted by M6 at the time of the second monitoring visit on 27 June 2019. Monitoring of standpipes installed in M1, M3, M5, M6 and R2 has subsequently been undertaken to 27 August 2019. The depth to groundwater in M1, M3, M5, M6, R2 and R3 was found to be at 0.70 to >5.00, 0.80 to >5.00, >5.00, 0.10 to >5.00 and 2.00 to >7.00 metres respectively.

3. SAMPLING, TESTING AND MONITORING

3.1 Sampling

33 No. continuous core samples were taken for the strata encountered in M1 to M8 inclusive and were subjected to careful examination and hand penetrometer/ hand shear vane tests, where appropriate.

63 No. rotary cores were obtained from the rock strata encountered in R4, R5, R6 , R7 and R8 and will be retained for a period of one month after the issue of this report, for reference purposes, and then disposed of unless otherwise instructed.

3.2 Field Testing

34 No. Standard (Cone) Penetration Tests (CPTs) were performed in cohesive and granular Made Ground, cohesive derivatives of the bedrock and bedrock, the results of which are recorded on the appended Standard Penetration Test Results Sheet with 'N' values and indicative relative density and shear strength, where appropriate, given on the Mini Borehole Records.

3.3 Installations and Monitoring

On completion of M1, M3, M5, M6, R2 and R3 HDPE standpipes were installed to depths of 5.00, 5.00, 5.00, 3.00, 7.00 and 7.00 metres respectively. The standpipes are slotted from 2.00, 2.00, 2.00, 1.00, 1.00 and 1.00 metres depth respectively, have an internal diameter of 50mm and have removable quick release gas valves to enable both ground gas and groundwater monitoring and sampling to be undertaken. Details of the installations are given on the Mini Borehole Records.

Monitoring of the standpipes for ground gas and groundwater has been undertaken on six scheduled occasions using portable equipment. A Gas Data GFM 435 was used for monitoring methane, carbon dioxide, oxygen, gas flows and atmospheric pressure. The results of the monitoring is given on the appended Ground Gas and Groundwater Monitoring Results sheet.

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3.4 Laboratory Testing

The following laboratory tests were carried out in accordance with BS.1377: 1990, where applicable, and the results are appended.

- 10 No. moisture content, plastic limit and liquid limit tests
- 9 No. sulphate content and pH value tests (including 3 No. pyritic ground tests).

Contamination analyses have been performed on 8 No. soil samples to determine: pH and concentrations of sulphate, sulphide, cyanide, arsenic, boron (soluble), cadmium, chromium, hexavalent chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, speciated total petroleum hydrocarbons (TPHs), the speciated polynuclear aromatic hydrocarbons (PAHs) suite, the benzene/ ethylbenzene/ toluene/ xylene (BTEX) suite and phenols. In addition, 6 No. soil samples were subjected to an asbestos screen. The results of the above analyses are appended.

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4. APPRAISAL AND RECOMMENDATIONS

4.1 Comments on the Profile

At the outset it should be appreciated that only a small proportion of the area to be developed has been investigated and consequently the recommendations made and opinions expressed in this report can only be applied to such conditions as were encountered in the exploratory holes.

The exploratory holes indicate a nature and degree of similarity to the extent that we consider them likely to be representative of the natural ground conditions. However, no guarantee can be given as the site is in an old coal mining area.

Whilst the exploratory holes indicate a degree of similarity they should not be interpolated or extrapolated to represent the ground conditions in adjacent areas.

Given the topography at the time of the ground investigation, earthworks have clearly been undertaken in the past indicating that there might be some degree of uniformity. As stated in Section 2.2.1, we have been informed by JPG that the made ground comprises engineered fill, which was placed and compacted in accordance with an earthworks specification, as part of a cut and fill exercise in 2007. The works were supervised by JPG (Leeds) Ltd. Consequently, some uniformity might be expected.

However, localised variations in thickness and composition should be anticipated and hence interpolation or extrapolation from the exploratory holes to adjoining areas should only be undertaken with caution.

Details of the findings of the investigation are given in the appended Mini Borehole and Rotary Borehole Records and a summary of the ground conditions is given in Section 2.2.

4.2 Geological and Mining Appraisal

4.2.1 Geological Appraisal

The British Geological Survey (BGS) have published sheet, ref. SE.30.NW, solid and drift edition at 1:10,560 scale, dated 1980, an extract of which is given as Figure 5.

The geological survey indicates that the site is underlain directly by Carboniferous Westphalian B Coal Measure strata with no Made Ground or drift deposits shown. However, the topography indicates that the ground has been raised by an unknown thickness of Made Ground.

Coal Measures strata in this area normally comprise interbedded mudstones, siltstones and subordinate sandstones with occasional economically important mineral seams of coal and ironstone. It should be noted that where Coal Measures strata are present at near surface level they are often completely weathered to a cohesive soil.

There is no indication of the dip of the rock strata in the immediately vicinity of the site. To the north north west of the site, and the M1 Motorway, the strata are shown to down dip at 5^{o} to the north north east. No major geological faults are shown to displace strata in the immediate vicinity of the site although minor faults may be present.

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The strata underlying the most northerly part of the site is shown to be the Haigh Moor Rock (sandstone). This sandstone horizon is underlain by the 0.69 to 1.19 metre thick Top Haigh Moor Coal seam which is shown to crop out in a west north west to east south east direction through the northern third of the site. The stratigraphical column indicates that there are then about 9 metres of measures (mudstones and siltstones) which are indicated to be underlain by the upper leaf of the 0.43 to 1.02 metre thick Low Haigh Moor Coal seam. This coal seam is shown to crop out in a west north west to east south east direction through the middle of the site. In the area of the site there is an apparent large parting (mudstones and siltstones) before the lower leaf of the Low Haigh Moor Coal seam which is shown to crop out about 110 metres to the south west of the site. Given the above, on a flat site, the strata would be expected to down dip to the north north east. It is noted that immediately to the north east, in the M1 Motorway cutting, the coal seams outcrops indicate that the strata are sub horizontal.

Extracts of our report, ref. NE3608A, for the land immediately to the north west of the site are appended. R5, just beyond the site boundary, found 0.50, 0.80 and 0.20 metre thick leaves of what was considered to be the Top Haigh Moor Coal seam between 1.60 to 4.50 metres depth and a 0.40 metre leaf of the Low Haigh Moor Coal seam between 7.40 and 7.80 metres depth.

4.2.2 Mining Appraisal

A Coal Authority Mining Report ref. 51002104044001 dated 15th April 2019 has been obtained by the Client's Engineer and is appended.

The report states that the site is in a surface area that could be affected by underground mining in 6 seams of coal at 90m to 300m depth and last worked in 1983. Any movement in the ground due to coal mining activity associated with these workings should have stopped by now.

In addition, the site is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk.

The site is not within a surface area that could be affected by present underground mining.

There are no recorded coal mine entries known to the Coal Authority within, or within 20m of the boundary of the site

In our opinion, as the site is in an old mining area it is likely that shallow coal seams beneath this site would have been worked prior to the Mines (Coal) Regulations Act of 1872, before which there was no statutory requirement to maintain and preserve plans of abandoned mines. Of those plans which were made, it is likely that not all will have survived with time and hence shallow mine workings may be present for which there is no record.

We are not aware of any old abandoned mineshafts or adits within or in close vicinity of the site. In any old mining area such as this, where records are generally incomplete, the existence of unrecorded mine entries should not be discounted and appropriate precautions should be taken during all earthworks. Should a mine entry be suspected appropriate action would need to be taken in the light of the established condition and location as determined by inspection and investigation.

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4.2.3 Findings of the Ground Investigation

Completely weathered derivatives of the bedrock were initially found to variable depths of between 1.80 to 6.00 metres. Highly weathered to fresh rock strata was then found which was predominantly siltstones with interbedded mudstones and sandstones and with occasional coal and ironstone horizons.

Four significant coal seams, and associated mine workings, were found and are considered to be the Top Haigh Moor Coal (D), the Low Haigh Moor Coal [Top] (C), the Low Haigh Moor Coal [Bottom] (B) and the Lidget Coal (A) seams. In addition, six significant ironstone seams (U to Z), and associated mine workings, have been found.

The up to 0.70 metre thick Top Haigh Moor Coal seam was apparently intact and is anticipated to crop out through the northern corner of the site.

Two Low Haigh Moor Coal seam horizons were found and are referred as the "Top" and "Bottom".

The Low Haigh Moor Coal [Top] seam was found to be mined in R5 and R7 but was generally found to be up to 0.30 metres thick and intact and is anticipated to crop out through the southern part of the site between R8 and R2. In R7 a 0.60 metre void was underlain by 0.15 metre of stowed waste/ collapsed ground. A water inflow was also recorded at 13.70 metres depth and is considered to be associated with these mine workings. The coal mine workings have 9.10 metres of rock cover but within this is a 0.50 void (Ironstone Y mine workings) with 3.50 metres of rock cover. These mine workings represent a significant risk to ground stability.

The up to 0.50 metre thick Low Haigh Moor Coal [Bottom] seam was found to be intact in R5 and R7 and is anticipated to crop out to the south of the site. Mine workings found in R4, R6 and R8 are all considered to have sufficient intact rock cover that surface instability is unlikely.

The up to 1.52 metre thick Lidget Coal seam was found in R2 (22.70-22.90m) only and given the thickness has apparently been mined. However, it is considered to have sufficient intact rock cover that surface instability is unlikely.

The ironstone mine workings, other than Ironstone Y above, also have sufficient intact rock cover that surface instability is unlikely.

A minor geological fault is evident between R6 and R7 with strata in R7 being downthrown about 1 to 2 metres. A geological fault is also apparently present between R2 and R7. Our calculations indicate that the rock strata (between R4 and R6) down dip at 4^{o} (1 in 13) to the north north east.

4.2.4 Conclusions and Recommendations

Surface instability arises when the collapse of mine workings migrates upwards through the roof strata and back to the surface or near surface level. There is considered to be a potential for this if there is less than ten times the unworked thickness of the coal seam in intact rock strata above the mined coal seam. In addition, residual settlement of incompletely collapsed and consolidated mine workings can take place over a long period after mining has taken place. It should be noted that although the risk of residual settlement may be increased by the stresses imposed by a surface load, settlement can and does occur irrespective of ground surface loads.

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Given the findings of the ground investigations mine workings/voids in R7 have insufficient intact rock cover and represent a significant risk to ground stability and require stabilisation measures. Mine workings/voids in R4, R6 and R8 apparently have sufficient intact rock cover such stabilisation measures are not required. We would, however, recommend that reinforcement is incorporated in the foundations to guard against residual settlement

In the area of Unit 18 (R7) we therefore recommend that the ground within and above the shallow mined horizons to about 16 metres depth be proven to be stable or rendered stable by drilling and grouting. Holes should be drilled into the mined horizon on a 3 metres grid in relation to the plan area of proposed buildings with centre holes where ground conditions dictate. Grout (liquid mixture of Pulverised Fuel Ash (PFA), cement, sand and water) should then be injected through each drill hole under an appropriate pressure to stabilise the any voids and broken ground encountered. In addition to the ground being stabilised by drilling and grouting, we recommend that the proposed building is constructed on a reinforced concrete ring beam foundation which is able to span 3.0 metres and cantilever 1.5 metres due to a loss of support, subject to other conditions detailed in Section 4.3.

Given the findings of the ground investigation we would not recommend piled foundations.

4.3 Foundations

We understand that it is proposed to construct two large commercial/ industrial buildings; Unit 17 being 53 by 42 metres and Unit 18 being 53 by 30 metres with offices and toilets at their corners, as shown on Figure 3. However, at the time of writing this report no specific details regarding the proposed foundations and design loadings were available and consequently the recommendations given are in general terms only.

The ground investigation found predominantly medium becoming high strength cohesive Made Ground with interleaved relatively thin bands of granular Made Ground to between 0.20 and 4.80 metres depth. However, in the south eastern part of the site, which is to be developed, the Made Ground was found to between 2.00 and 4.80 metres depth. The above was underlain by completely weathered derivatives of the bedrock which were found to be medium, high and very high strength silty clays to slightly gravelly slightly sandy silty clays which were underlain by extremely weak highly weathered mudstones. Coal and ironstone horizons, some of which have been mined, are present beneath the above strata.

Atterberg limit tests on the cohesive Made Ground indicate clays of intermediate to high plasticity which are considered to have a medium susceptibility to shrinkage and swelling with varying moisture content. It should be noted, that during prolonged dry weather the cohesive Made Ground is likely to be firm and trafficable but during prolonged wet weather it is likely to be soft and trafficability may be difficult.

We would not recommend founding in the Made Ground in its present condition because of its inherent variability in consistency and compaction, and in parts the nature of its constituents.

In view of the depth of Made Ground shallow foundations in natural ground are not feasible and hence alternative foundations need to be considered, ground improvement with shallow reinforced foundations being the preferred option.

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Given the depth of the Made Ground improvement by excavation and compaction is not considered to be feasible. Consideration could be given to ground treatment by vibroflotation. However, the buildings are close to the crest of slopes and vibrations could affect the stability of the slopes. Consequently, we would recommend that the advice of specialist Vibroflotation Contractors should be sought as to the feasibility of applying the technique.

The most common form of the vibroflotation treatment technique is vibro replacement whereby dense stone columns are formed through the full depth of any Made Ground that is present and variable near surface strata, utilising the passive resistance of cohesive soils and compacting granular soils to improve the bearing capacity and minimise differential settlements of the composite mass of near surface materials and compacted stone columns.

Due to the varying types, sizes and power of vibroflotation machines currently in use, the advice of a Specialist Contractor should be sought to ascertain the feasibility of applying the particular technique, the allowable bearing capacity and expected differential settlements each machine will achieve and in formulating the most economic scheme. Care must be taken when undertaking vibroflotation ground treatment to prevent vibrations being transmitted to adjacent/ nearby buildings, structures, services and/or slopes/ retaining walls as they may be detrimentally affected. Consequently, we recommend that any specialist Vibroflotation Contractor confirm that vibrations will not detrimentally affect adjacent/ nearby buildings, structures, services and/or slopes/ retaining walls.

Following vibroflotation the building would have to be placed on a reinforced concrete ring beam foundation which is able to span 3.0 metres and cantilever 1.5 metres due to a loss of support.

To formulate the most satisfactory and economic scheme we suggest that competitive tenders and designs from Specialist Contractors should be sought using the exploratory hole information obtained.

4.4 Floor Slab Construction

We recommend extending the near surface vibroflotation ground treatment in a grid pattern beneath the whole of the buildings followed by the construction of a suitably reinforced concrete ground bearing floor slab cast on a granular base layer.

4.5 Excavations and Groundwater

There should be no difficulties in excavating the strata indicated in the exploratory holes utilising an appropriate and suitably sized mechanical excavator.

It is recommended that all excavations to greater than 1.20 metres depth, or for shallower excavations where groundwater is encountered above this level, are closely supported, especially where man entry is required. Alternatively, where space permits, the excavations might be battered back to an appropriate angle.

Groundwater seepages were recorded in M1, M2, M3, M4 and M5 at 1.00, 1.00, 0.90, 2.00 and 1.50 metres depth respectively. In M8 the natural strata was initially found to be wet indicating a groundwater seepage at the Made Ground/ natural ground contact at 4.00 metres depth.

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No groundwater was encountered in the remainder of the exploratory holes. It should be noted that groundwater inflows in the rotary boreholes may have been masked by the water flushing medium and all of the exploratory holes they were only left open for a short period of time and groundwater levels may be subject to seasonal and/ or climatic variations.

Monitoring of standpipes installed in M1, M3, M5, R2 and R3 was initially undertaken on 21 June 2019. R3 was then damaged, repaired, removed and substituted by M6 at the time of the second monitoring visit on 27 June 2019. Monitoring of standpipes installed in M1, M3, M5, M6 and R2 has subsequently been undertaken to 27 August 2019. The depth to groundwater in M1, M3, M5, M6, R2 and R3 was found to be at 0.70 to >5.00, 0.80 to >5.00, >5.00, 0.10 to >5.00 and 2.00 to >7.00 metres respectively.

Where groundwater is encountered and accumulates in open excavations it is considered that it should be able to be removed by pumping from a filtered sump. If groundwater levels are to be lowered care will need to be taken to ensure that adjoining/ nearby buildings, services and slopes are not affected.

4.6 Buried Concrete

For the design of buried concrete the recommendations given in Building Research Establishment (BRE) Special Digest 1 (February 2017 revision), “Concrete in Aggressive Ground”, should be followed.

Determination of pH on the nine soil samples gave values in the range of 6.2 (slightly acidic) to 7.7 (near neutral). Soluble sulphate concentrations were also determined for the soil samples and the results ranged from 0.01 to 0.08 g/l.

In view of the Made Ground and underlying Coal Measures strata being potentially pyritic ground, total sulphate, total sulphur and magnesium have been determined for three soil samples and the results were <0.01 to 0.04%, 0.03% and <0.01 to 0.01 g/l respectively. Our calculations have determined that pyrite (sulphides), which might weather and produce higher levels of sulphates, are not present.

The results indicate that the Design Sulphate Class for the site should be DS-1.

Our knowledge of the site and ground conditions indicates that the site is “brownfield”/ and slightly acidic with potentially mobile groundwater. Consequently, in accordance with the Design Sulphate Class for the site together with the site and groundwater conditions an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-2 should be used as detailed on the appended extract.

4.7 Contamination Considerations

At the outset it should be noted that this contamination investigation is a baseline survey to provide a contamination risk assessment. Based upon the findings additional sampling, analysis and assessment may be required.

Analysis of a suite of common determinants has been undertaken in the absence of historical evidence of the source of the Made Ground. However, the absence of other specific contaminants cannot be guaranteed.

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4.7.1 Assessment (Soil)

To provide an assessment of the presence of contamination eight soil samples have been analysed for a suite of determinants and the results are appended.

Levels of the determinants has been compared against the most recently published guideline values. The Department for Environment, Food and Rural Affairs (DEFRA) and the Environment Agency published soil guideline values (SGVs) for mercury, selenium, benzene, toluene, ethylbenzene and xylene on 31 March 2009, arsenic and nickel on 12 May 2009 and cadmium and phenols in June 2009. In July 2009 Generic Assessment Criteria (GACs) were published by Land Quality Management Limited (LQM) in conjunction with the Chartered Institute of Environmental Health (CIEH). Contaminated Land: Applications in Real Environments (CL:AIRE) guideline values were also published in December 2009 to supplement the above.

DEFRA published in March 2014 Category 4 Screening Levels (C4SLs) for arsenic, cadmium, lead, hexavalent chromium, benzo(a)pyrene and benzene. In November 2014 Suitable for Use Levels (S4ULs) were then published by LQM/ CIEH which superseded the GACs. Updated S4ULs values for cadmium and phenols were published in July 2015 and for nickel in August 2015. The guideline values (SGVs, S4ULs, CL:AIRE and C4SLs) vary dependent upon the land use; allotment and residential use being the most sensitive and commercial/ industrial use being the least sensitive.

For the purposes of assessment, as the proposed development is for commercial/ industrial buildings, contamination analyses have been compared with the guideline values for a standard land use of commercial and industrial.

The contamination analysis determined no elevated levels of the determinants analysed for when compared with the guideline values for a standard land use of commercial and industrial. Guideline values for the assessment can be supplied directly to the Regulator, if requested.

An asbestos screen was undertaken on six soil samples and no asbestos was detected.

In addition to the above, an assessment of risk to personnel who will come into contact with on-site materials throughout the site has been undertaken.

4.7.2 Conclusions and Recommendations

Section 78a(2) of the Environmental Protection Act: 1990 as amended by the Contaminated Land (England) (Amendment) regulations 2012, and Section 86 of the Water Act 2003, defines CONTAMINATED LAND for the purposes of Part IIA as:

“any land which appears to the LOCAL AUTHORITY in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that:

(a) SIGNIFICANT HARM is being caused or there is a SIGNIFICANT POSSIBILITY of such harm being caused; or
(b) SIGNIFICANT POLLUTION OF CONTROLLED WATERS is being, or is likely to be, caused”

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Before a LOCAL AUTHORITY can make the judgement that land appears to be CONTAMINATED LAND on the basis that SIGNIFICANT HARM is being caused, or that there is a SIGNIFICANT POSSIBILITY of such harm being caused, the LOCAL AUTHORITY must identify a SIGNIFICANT POLLUTANT LINKAGE. This means that each of the following must be identified:

(a) a CONTAMINANT.
(b) a relevant RECEPTOR (defined as living organisms, ecological systems, controlled waters or property); and
(c) a PATHWAY by means of which either:
  (i) the CONTAMINANT is causing SIGNIFICANT HARM to that RECEPTOR, or
  (ii) there is a SIGNIFICANT POSSIBILITY of such harm being caused by that CONTAMINANT to that RECEPTOR

It should be noted that the words in capitals have a legal definition within the legislation.

Without a clear identification of all three elements of the pollutant linkage, land cannot be identified as contaminated under the regime.

The National Planning Policy Framework states that, “after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990”. Therefore, the general principles detailed above apply to this assessment.

Our assessment, based on eight soil samples, indicates that there are no contaminants requiring remediation and/or precautions to be taken for the proposed development.

If waste materials are to be removed from the site, classification of the waste should be undertaken to determine the most appropriate tip to use and the associated costs. It should be noted that significant cost savings can sometimes be made on waste disposal by correct classification of the waste, a service that we can provide.

S4ULs, C4SLs and CL:AIRE assume long term contact with contamination and assess chronic health risk. The risk of short term acute exposure to site personnel is dealt with in the remit of the Health and Safety Executive under the Health and Safety at Work Act: 1974 and Regulations made under the Act, including the Control of Substances Hazardous to Health (COSHH) Regulations. The levels of contamination and risk to site personnel should be considered under the Construction Design and Management (CDM) Regulations at the planning stage and in the development of the designers and contractors Health and Safety Plans and Method Statements. The risk of contact with on-site soils should be minimised and the following precautions should be taken as a minimum requirement.

Site personnel involved in earthworks and excavations should wear gloves, overalls, and boots and smoking should be prohibited.

Earthworks undertaken during dry weather might generate dust and in this instance, dust should be damped down and dust masks made available to site operatives. In addition, stockpiled materials should be sheeted over to prevent excessive airborne dust being formed.

Should it be necessary for groundwater to be pumped from on-site excavations the groundwater should be sampled and analysed and submitted to the appropriate wastewater authority with a request for a discharge consent. Following receipt of a discharge consent groundwater is likely to be discharged to a sewer or to an off-site licensed discharge point.

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4.8 Ground Gas Considerations

Ground gas monitoring has been undertaken on six scheduled occasions and the results of the monitoring visits are appended.

Ground gases: methane, carbon dioxide and oxygen and flow rate have been monitored and the ranges of ground gases and flow rate during the monitoring period are as follows:

TABLE 3 GROUND GAS CONCENTRATIONS AND FLOW RATE

Methane (% vol. In air)	Carbon Dioxide (% vol. in air)	Oxygen (% vol. in air)	Gas Flow Rate (litres/ hour)
0.0	0.0 to 13.9	21.0 to 7.2	< 0.1 to 0.3

It can be seen from the monitoring that no elevated levels of methane have been detected. However, increasing elevated levels of carbon dioxide and depleted levels of associated oxygen have been detected and gas flows have intermittently been detected in all but R3 and M6.

Methane gas when present between 5% volume in air (Lower Explosive Limit - L.E.L.) and 15% volume in air (Upper Explosive Limit - U.E.L.) is potentially explosive and inflammable whilst carbon dioxide in conjunction with depleted oxygen is an asphyxiant. Both methane and carbon dioxide are a by-product of the anaerobic and aerobic decomposition of biodegradable materials.

The levels of gas have been assessed in accordance with British Standard 8485, “Code of practice for the design of protective measures for methane and carbon dioxide gasses for new buildings”, published in June 2015 (BS.8485:2015).

The characteristic hazardous gas flow rate (Q_{hgs}) is calculated by dividing the maximum gas (methane or carbon dioxide) concentration by 100 and multiplying by the maximum flow rate in litres per hour (minimum 0.1 l/hr for Sub Surface monitoring equipment). For this site Q_{hgs} = [13.9/ 100] x 0.3 = 0.042 l/hr

BS.8485: 2015, Table 2, indicates that the site falls into Characteristic Situation 1 (CS1). However, as carbon dioxide levels have risen over the monitoring period to generally greater than 5%, the CS1 is increased by one to CS2.

BS.8485: 2015, Table 4, indicates that for a CS2 and the type of development proposed a score of 1.5 gives the level of protection and remedial measures required.

BS.8485: 2015 Tables 5, 6 and 7 indicate that a combination of the following protection and remedial measures should be considered to achieve the required score of 1.5:

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Table 5.2 reinforced cast in-situ monolithic ground bearing floor slab/ raft or reinforced cast in-situ suspended floor slab with minimal penetrations. (Score 1.0)

Table 5.3 additionally reinforced cast in-situ monolithic ground bearing floor slab/ raft or additionally reinforced cast in-situ suspended floor slab with minimal penetrations – slab of minimum 150mm thickness with reinforcement at the bottom and the top (Score 1.5)

……

Table 6.1 pressure relief pathway (low fines gravel blanket/ thin geo-composite blanket/ strips terminating in gravel trench external to the building) (Score 0.5)

Table 6.2 passive sub floor ventilation/ dispersal layer (clear void/ polystyrene void former/ geo-composite void former/ no fines gravel layer with gas drains/ no fines gravel layer) of very good performance. (Score 2.5)

Table 6.3 passive sub floor ventilation/ dispersal layer (clear void/ polystyrene void former/ geo-composite void former/ no fines gravel layer with gas drains/ no fines gravel layer) of good performance. (Score 1.5)

……

Table 7 gas resistant membrane meeting the following criteria:

- sufficiently impervious to gases with a methane gas transmission rate of <40.0 ml/day/m^2/atm (average) for sheets and joints (tested in accordance with BS.ISO.15105-1 manometric method).
- sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions.
- sufficiently strong to withstand in-service stresses due to say settlement if placed below a floor slab.
- sufficiently strong to withstand the installation process and following trades (penetration from steel fibres in fibre reinforced concrete/ penetration from reinforcement ties/ tearing due to working above it or dropped tools) until covered.
- after installation being capable of providing a complete barrier to the entry of the relevant gas.
- verified in accordance with CIRIA C735 [N1].

(Score 2.0)

……

Our preferred options would be a combination of Tables 5.2 and 7 or Table 5.3.

All excavations of greater than 1.20 metres depth should be routinely checked for air quality (methane, carbon dioxide and oxygen as a minimum) prior to man entry and appropriate precautions taken.

Any manholes, inspection chambers or other void spaces formed beneath the sites ground surface are potential ground gas traps. Precautions, as per the excavations above, should be taken.

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4.9 General

In the preparation of this report no consideration has been given to

- the historical and/ or environmental setting of the site
- the long term stability of the existing slopes and the short and long term stability of any proposed slopes and/or retaining structures required for the proposed development

as this was outside our brief. The above should be addressed prior to development.

We recommend that consultation should be undertaken with the Local Authority Environmental Health Officer, the Local Authority Building Control Officer and the Coal Authority prior to development.

Prior to development a Phase III remediation statement should be compiled from the findings of the Phase I (if undertaken) and Phase II Reports and submitted to the Regulator for approval. We would be happy to provide this service.

We trust that this report fulfils your present requirements but if you have any queries or we can be of further assistance please contact the undersigned or Mr David Simpson at our Ossett office.

SUB SURFACE CONSULTANTS LIMITED
REPORT No. NE3834B Rev 2
JUNE 2020

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EXTRACTS OF PREVIOUS REPORT

SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, DODWORTH, BARNSLEY, SOUTH YORKSHIRE	R5

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
Machine : BERETTA T44 Flush : MIST Core Dia : NONE mm Method : ROTARY OPEN HOLE			CARNELL MANAGEMENT SERVICES LIMITED	NE3608
	Location AS PLAN	**Dates** 12/06/2017	**Engineer** WILLIAM SAUNDERS	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					Open Hole (100mm dia) GL - 20.00m		(0.40) 0.40	Weak brown SHALE.			
							(1.20)	Moderately strong light brown MUDSTONE.			
							1.60				
							(0.50)	Black COAL.			
							2.10				
							(1.10)	Moderately strong brown MUDSTONE.			
							3.20				
							(0.80)	Black COAL.			
							4.00				
							(0.30)	Moderately strong light grey MUDSTONE.			
							4.30				
							(0.20)	Black COAL.			
							4.50	Light grey brown MUDSTONE.			
							(2.90)				
							7.40				
							(0.40)	Black COAL.			
							7.80	Moderately strong light grey to grey MUDSTONE.			

Remarks

Descriptions based upon foreman drillers records of flush returns.
Foreman driller recorded no voids, broken ground or loss of flush returns.
On completion backfilled with grout and arisings to 5.00m and installed a 50mm slotted standpipe with a gas valve and a gravel surround to 5.00m, a Bentonite seal from 1.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)	Logged By
1:50	AJP/SJ

Figure No. NE3608.R5

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site CAPITOL PARK, DODWORTH, BARNSLEY, SOUTH YORKSHIRE			**Borehole Number** R5
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE	**Casing Diameter**	**Ground Level (mOD)**	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Job Number** NE3608
	Location AS PLAN	**Dates** 12/06/2017	**Engineer** WILLIAM SAUNDERS **Sheet** 2/2

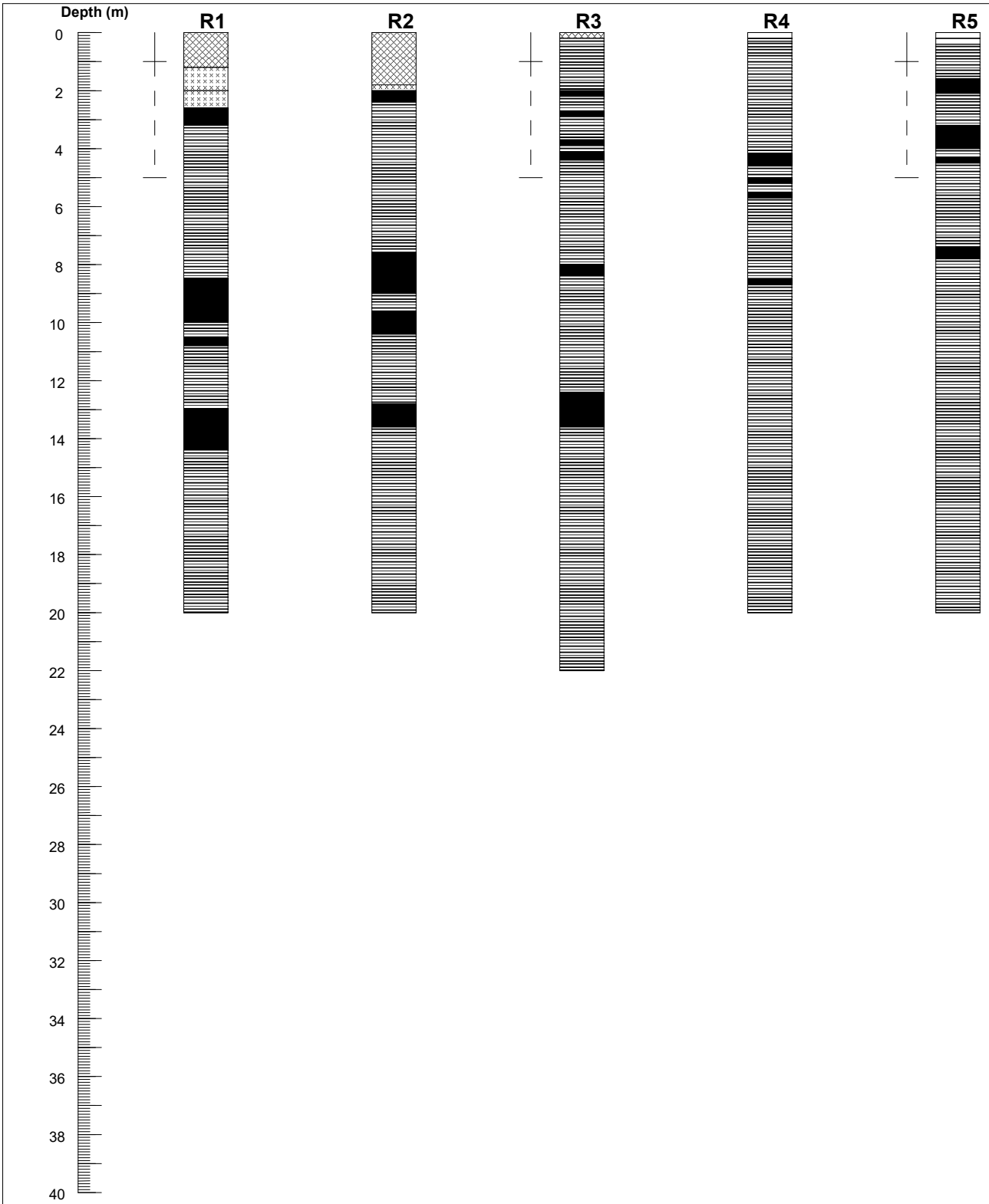
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(12.20)	Moderately strong light grey to grey MUDSTONE.			
					12/06/2017:		20.00				

Remarks

Scale (approx)	Logged By
1:50	AJP/SJ

Figure No. NE3608.R5

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Key

- Groundwater Strike
- Strike Rise Level
- Highest recorded piezo level
- Piezometer Tip
- Slotted Standpipe
- MADE GROUND
- MUDSTONE
- SILTSTONE
- COAL
- Shale

SUB SURFACE
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
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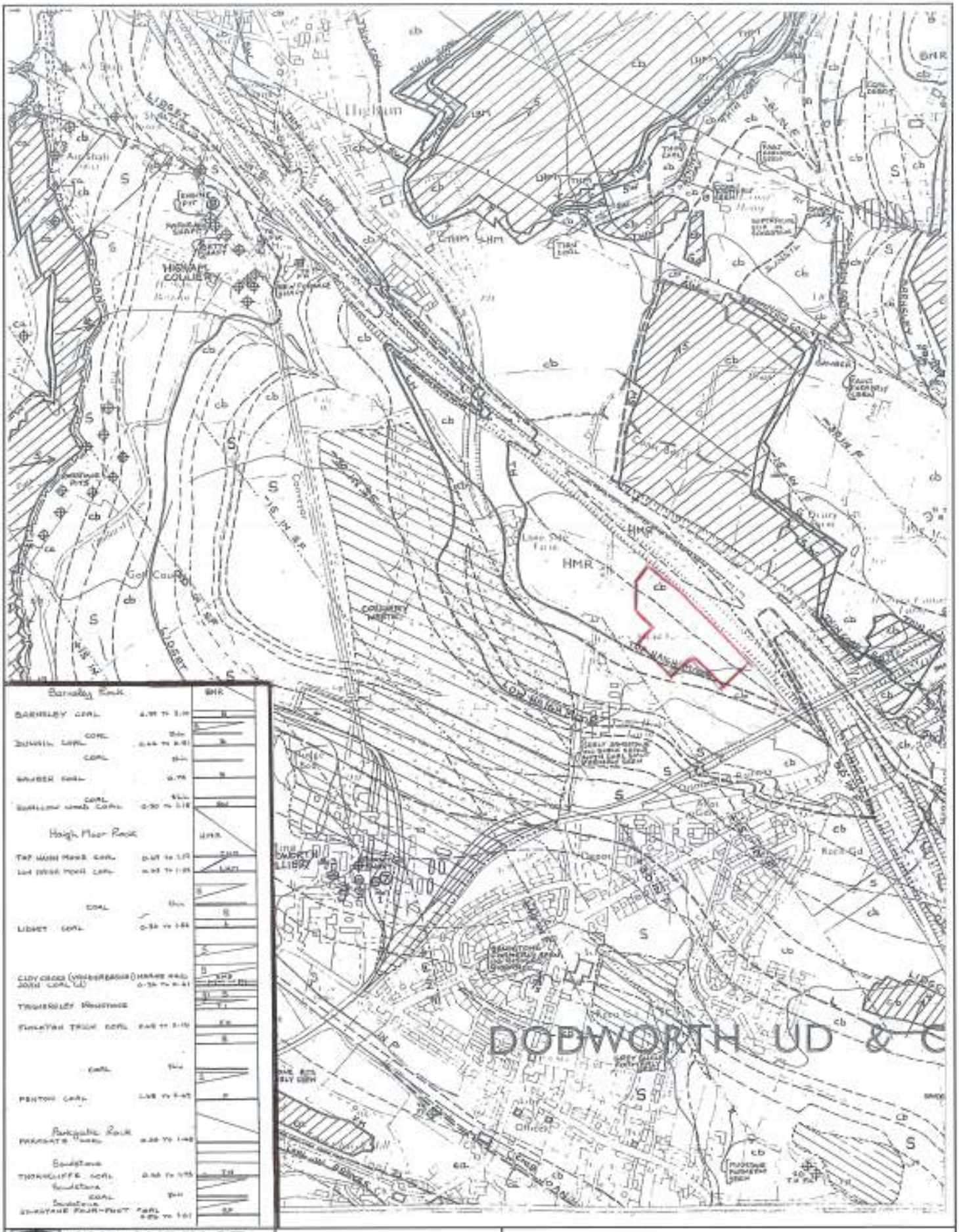
Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
CAPITOL PARK, DODWORTH, BARNSLEY, SOUTH YORKSHIRE	14/07/2017		1/1	NE3608
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED			1:200[V]	NE3608.1

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SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	EXPLORATORY HOLE LOCATION PLAN.			
Site CAPITOL PARK, DODWORTH, BARNSLEY, SOUTH YORKSHIRE.	Date Drawn 07-07-17	Date Checked 07-07-17	Orientation N	Job No. NE3608
Client CARNELL MANAGEMENT SERVICES LIMITED.	Drawn By DS	Checked By CAM	Scale NTS	Figure No. 2



SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

EXTRACT OF GEOLOGICAL SURVEY SHEET SE30NW

Site	Date Drawn	Date Checked	Orientation	Job No.
CAPITOL PARK, DODWORTH, BARNSLEY, SOUTH YORKSHIRE.	07-07-17	07-07-17	N	NE3608
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED.	DS	CAM	NTS	3

INSITU TEST RESULTS

SUB SURFACE
SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Standard Penetration Test Results

Site : CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Client : CARNELL MANAGEMENT SERVICES LIMITED

Engineer : WILLIAM SAUNDERS

Job Number NE3834

Sheet 1 / 1

Borehole Number	Base of Borehole (m)	End of Seating Drive (m)	End of Test Drive (m)	Test Type	Seating Blows per 75mm		Blows for each 75mm penetration				Result	Comments
					1	2	1	2	3	4		
M1	1.00	1.15	1.45	CPT	2	2	2	3	4	5	N=14	
M1	2.00	2.15	2.45	CPT	2	4	5	5	5	5	N=20	
M1	3.00	3.15	3.45	CPT	4	6	8	10	10	10	N=38	
M1	4.00	4.15	4.45	CPT	3	4	5	6	6	9	N=26	
M1	5.00	5.15	5.45	CPT	6	6	7	11	12	15	N=45	
M2	1.00	1.15	1.45	CPT	1	2	2	3	2	3	N=10	
M2	2.00	2.15	2.45	CPT	2	3	3	4	4	5	N=16	
M2	3.00	3.15	3.45	CPT	3	3	2	3	5	5	N=15	
M2	4.00	4.15	4.45	CPT	2	3	3	4	5	6	N=18	
M2	5.00	5.15	5.45	CPT	4	6	6	8	11	11	N=36	
M3	1.00	1.15	1.45	CPT	1	3	3	3	3	5	N=14	
M3	2.00	2.15	2.45	CPT	3	4	3	3	3	4	N=13	
M3	3.00	3.15	3.45	CPT	3	4	4	5	4	6	N=19	
M3	4.00	4.15	4.45	CPT	6	5	6	6	8	10	N=30	
M3	5.00	5.15	5.45	CPT	6	7	8	12	14	16	N=50	
M4	1.00	1.15	1.45	CPT	2	3	2	3	3	4	N=12	
M4	2.00	2.15	2.45	CPT	2	2	8	4	4	7	N=23	
M4	3.00	3.15	3.45	CPT	2	1	2	3	3	4	N=12	
M4	4.00	4.15	4.45	CPT	4	5	6	5	5	7	N=23	
M4	5.00	5.15	5.45	CPT	3	5	10	11	12	19	N=52	
M5	1.00	1.15	1.45	CPT	2	2	3	3	4	4	N=14	
M5	2.00	2.15	2.45	CPT	2	3	4	4	5	5	N=18	
M5	3.00	3.15	3.45	CPT	2	4	4	4	5	5	N=18	
M5	4.00	4.15	4.45	CPT	4	3	4	4	4	6	N=18	
M5	5.00	5.15	5.45	CPT	5	7	9	11	14	21	N=55	
M6	1.00	1.15	1.45	CPT	3	4	4	5	6	6	N=21	
M6	2.00	2.15	2.45	CPT	3	4	4	4	5	8	N=21	
M6	3.00	3.15	3.32	CPT	4	5	12	26	26		64/170mm	
M7	1.00	1.15	1.45	CPT	2	3	9	11	11	12	N=43	
M8	1.00	1.15	1.45	CPT	1	2	4	3	4	4	N=15	
M8	2.00	2.15	2.45	CPT	2	2	3	4	6	6	N=19	
M8	3.00	3.15	3.45	CPT	3	2	3	3	5	6	N=17	
M8	4.00	4.15	4.45	CPT	3	4	4	7	6	7	N=24	
M8	5.00	5.15	5.30	CPT	9	12	18	22			40/150mm	

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SUB SURFACE
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Insitu Test Results

Site: CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job Number: NE3834A

Sheet: 1 / 1

Ground Gas and Groundwater Monitoring Results Sheet

Date	Hole No.	Methane (% Volume)	Carbon Dioxide (% Volume)	Oxygen (% Volume)	Gas Flow Rate (l/hr)	Atmospheric Pressure (m bars)	Depth to Groundwater (m)
21/06/2019	M1	0.0	0.0	20.9	< 0.1	1007	0.90
	M3	0.0	***2.0***	18.9	< 0.1		0.90
	M5	0.0	***2.0***	19.2	< 0.1		Dry to 5.00
	R2	0.0	***2.0***	19.3	< 0.1		2.00
	R3	0.0	***1.9***	19.1	< 0.1		2.00
27/06/2019	M1	0.0	0.0	20.9	0.3	1010	0.70
	M3	0.0	***1.9***	***17.6***	0.3		0.80
	M5	0.0	***2.0***	***11.9***	0.3		Dry to 5.00
	M6 **	0.0	0.0	21.0	< 0.1		0.10
	R2	0.0	***2.7***	***14.7***	0.1		2.20
	R3 *	–	–	–	–		–
05/07/2019	M1	0.0	***2.2***	***15.5***	< 0.1	1000	Dry to 5.00
	M3	0.0	***6.6***	***12.1***	< 0.1		Dry to 5.00
	M5	0.0	***1.8***	***17.3***	< 0.1		Dry to 5.00
	M6	0.0	0.5	20.5	< 0.1		0.80
	R2	0.0	***7.0***	***10.3***	< 0.1		4.00
30/07/2019	M1	0.0	***8.3***	***12.6***	0.3	995	Dry to 5.00
	M3	0.0	***2.2***	18.4	0.2		Dry to 5.00
	M5	0.0	***6.6***	***16.1***	0.3		Dry to 5.00
	M6	0.0	***1.7***	19.6	< 0.1		0.40
	R2	0.0	***2.4***	18.4	0.1		Dry to 7.00
18/08/2019	M1	0.0	***10.6***	***10.7***	< 0.1	996	Dry to 5.00
	M3	0.0	***4.5***	***16.0***	< 0.1		Dry to 5.00
	M5	0.0	***5.6***	***16.5***	< 0.1		Dry to 5.00
	M6	0.0	0.8	20.2	< 0.1		0.40
	R2	0.0	***4.9***	***16.1***	< 0.1		Dry to 7.00
27/08/2019	M1	0.0	***13.9***	***7.2***	0.1	997	Dry to 5.00
	M3	0.0	***6.4***	***12.9***	0.1		Dry to 5.00
	M5	0.0	***8.5***	***14.3***	0.1		Dry to 5.00
	M6	0.0	0.7	***20.2***	< 0.1		Dry to 3.00
	R2	0.0	***4.8***	***17.2***	0.1		Dry to 7.00

Remarks: Elevated levels of methane and carbon dioxide and depleted levels of oxygen are shown in ***bold/italics.***

* damaged by during earthworks by others, repaired by SSNE and then removed by others.

** standpipe installed in M6 on 27/06/2019 to replace lost standpipe in R3

LABORATORY TEST RESULTS

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Laboratory Test Results

Site : CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Client : CARNELL MANAGEMENT SERVICES LIMITED

Engineer : WILLIAM SAUNDERS

Job Number NE3834

Sheet 1 / 1

DETERMINATION OF MOISTURE CONTENT, LIQUID LIMIT AND PLASTIC LIMIT AND DERIVATION OF PLASTICITY AND LIQUIDITY INDEX

Borehole/ Trial Pit	Depth (m)	Sample	Natural Moisture Content %	Sample Passing 425µm Sieve		Liquid Limit %	Plastic Limit %	Plasticity Index %	Liquidity Index	Group Symbol	Laboratory Description
				Percentage %	Moisture Content %						
M1	2.50	C	18	82	22	45	22	23	0.00	CI	MADE GROUND: light brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone.
M1	3.50	C	23	83	28	51	24	27	0.15	CH	MADE GROUND: greyish brown slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone and ironstone.
M3	0.90	C	20	88	23	45	23	22	0.00	CI	MADE GROUND: light brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone and coal.
M3	1.90	C	26	84	31	59	24	35	0.20	CH	MADE GROUND: brown, orangish brown and dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium mudstone, coal and sandstone.
M3	2.90	C	18	85	21	42	21	21	0.00	CI	MADE GROUND: brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, sandstone and coal.
M4	1.90	C	19	80	24	40	21	19	0.16	CI	MADE GROUND: dark brown slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, ironstone and coal.
M4	2.90	C	27	87	31	47	24	23	0.30	CI	MADE GROUND: orangish brown and occasional dark brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone.
M4	3.90	C	27	92	29	56	24	32	0.16	CH	MADE GROUND: orangish brown, light brown and light grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium mudstone.
M5	0.90	C	18	86	21	47	23	24	-0.08	CI	MADE GROUND: light brown and occasional orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, ironstone and coal.
M5	2.90	C	19	84	23	44	22	22	0.05	CI	MADE GROUND: light brown, dark brown and orangish brown mottled slightly gravelly slight sandy silty clay. Gravel sized fragments are fine to coarse mudstone and sandstone.

Method of Preparation : BS 1377:PART 1:1990:7.4 Preparation of samples for classification tests BS 1377:PART 2:1990:4.2 & 5.2 Sample preparations

Method of Test : BS 1377:PART 2:1990:3 Determination of moisture content 1990:4 Determination of the liquid limit BS 1377:PART 2:1990:5 Determination of the plastic limit and plasticity index

Remarks :

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Laboratory Test Results

Site : CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Client : CARNELL MANAGEMENT SERVICES LIMITED

Engineer : WILLIAM SAUNDERS

Job Number NE3834

Sheet 1 / 1

DETERMINATION OF pH, SULPHATE CONTENT AND TOTAL SULPHUR OF SOIL AND GROUNDWATER AND MAGNESIUM AND CHLORIDE CONTENT AND NITRATE CONTENT

Borehole/ Trial Pit	Depth (m)	Sample	Concentration of Sulphate			Total Sulphur %	Magnesium mg/l	Water Soluble Chloride mg/l	Water Soluble Nitrate mg/l	pH	Design Class	Laboratory Description
			Soil		Ground Water g /l							
			Total S03 %	S04 in 2:1 water:soil g /l								
M1	1.40	C		0.02						7.5	DS-1	MADE GROUND: light brown, orangish brown and occasional dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, sandstone and coal.
M1	4.60	C		0.03						7.1	DS-1	Dark brown and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine mudstone and coal lithorelicts.
M3	3.20	C		0.03						6.7	DS-1	MADE GROUND: light brown and occasional orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone, siltstone, mudstone and coal.
M4	1.90	C		0.05						7.2	DS-1	MADE GROUND: dark brown slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, ironstone and coal.
M4	4.90	C	0.03	0.08		0.03	<0.01			6.2	DS-1	Light brown and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine to medium sandstone, mudstone and coal lithorelicts.
M5	0.50	C	0.01	0.03		0.03	<0.01			6.2	DS-1	MADE GROUND: light brown and occasional orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, ironstone and coal.
M5	0.90	C		0.04						6.4	DS-1	MADE GROUND: light brown and occasional orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, ironstone and coal.
M5	3.90	C		0.02						7.7	DS-1	Brown and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine to coarse mudstone and coal lithorelicts.
M6	2.90	C	<0.01	0.01		0.03	<0.01			7.5	DS-1	Brown highly weathered MUDSTONE with coarse gravel sized ironstone nodules.

Method of Preparation : BS 1377:PART 1:1990:7.5 Preparation of soil for chemical tests BS 1377:PART 3:1990:5.2, 5.3, 5.4 & 9.4

Method of Test : Lab in-house methods based on BS1377: Part 3 for contents of water sol sulphate, pH, chloride and magnesium. Lab in-house method based on MEWAM (EA, 2006) for total sulphur

Remarks : Classification relates to Design Sulphate Class of BRE Special Digest 1 (2005)

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AGGRESSIVE CHEMICAL ENVIRONMENT FOR CONCRETE (ACEC) SITE CLASSIFICATION

Table C1 Aggressive Chemical Environment for Concrete (ACEC) classification for natural ground locations[a]

Sulfate				Groundwater		
Design Sulfate Class for Location	2:1 water/soil extract[b]	Groundwater	Total potential sulfate[c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (SO_4 mg/l)	4 (SO_4 %)	5 (pH)	6 (pH)	7
DS-1	<500	<400	<0.24	≥2.5		AC-1s
					>5.5d	AC-1[d]
					2.5 - 5.5	AC-2z
DS-2	500 - 1500	400 - 1400	0.24 - 0.6	>3.5		AC-1s
					>5.5	AC-2
				2.5-3.5		AC-2s
					2.5 - 5.5	AC-3z
DS-3	1600-3000	1500-3000	0.7 - 1.2	>3.5		AC-2s
					>5.5	AC-3
				2.5 - 3.5		AC-3s
					2.5 - 5.5	AC-4
DS-4	3100 - 6000	3100 - 6000	1.3 - 2.4	>3.5		AC-3s
					>5.5	AC-4
				2.5 - 3.5		AC-4s
					2.5 - 5.5	AC-5
DS-5	>6000	>6000	>2.4	>3.5		AC-4s
				2.5 - 3.5	≥2.5	AC-5

Notes

a Applies to locations on sites that comprise either undisturbed ground that is in its natural state (ie not brownfield - Table C2) or clean fill derived from such ground

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO_4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).

d For flowing water that is potentially aggressive to concrete owing to high purity or an aggressive carbon dioxide level greater than 15mg/l (Section C2.2.3), increase the ACEC Class to AC-2z.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static
- Concrete placed in ACEC Classes that included the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.

Table C2 Aggressive Chemical Environment for Concrete (ACEC) classification for brownfield locations[a]

Sulfate						Groundwater		
Design Sulfate Class for Location	2:1 water/soil extract[b]		Groundwater		Total potential sulfate[c]	Static water	Mobile water	ACEC Class for location
1	2 (SO_4 mg/l)	3 (Mg mg/l)	4 (SO_4 mg/l)	5 (Mg mg/l)	6 (SO_4 %)	7 (pH)[d]	8 (pH)[d]	9
DS-1	<500		<400		<0.24	≥2.5		AC-1s
							>6.5[d]	AC-1
							5.5 - 6.5	AC-2z
							4.5 - 5.5	AC-3z
							2.5 - 4.5	AC-4z
DS-2	500 - 1500		400 - 1400		0.24 - 0.6	>5.5		AC-1s
							>6.5	AC-2
						2.5 - 5.5		AC-2s
							5.5 - 6.5	AC-3z
							4.5 - 5.5	AC-4z
							2.5 - 5.5	AC-5z
DS-3	1600 - 3000		1500 - 3000		0.7 - 1.2	>5.5		AC-2s
							>6.5	AC-3
						2.5 - 5.5		AC-3s
							5.5 - 6.5	AC-4
							2.5 - 5.5	AC-5
DS-4	3100 - 6000	≤1200	3100 - 6000	≤1000	1.3 - 2.4	>5.5		AC-3s
							>6.5	AC-4
						2.5 - 5.5		AC-4s
							2.5 - 6.5	AC-5
DS-4m	3100 - 6000	>1200[e]	3100 - 6000	>1000[e]	1.3 - 2.4	>5.5		AC-3s
							>6.5	AC-4m
						2.5 - 5.5		AC-4ms
							2.5 - 6.5	AC-5m
DS-5	>6000	≤1200	>6000	≤1000	>2.4	>5.5		AC-4s
						2.5 - 5.5	≥2.5	AC-5
DS-5m	>6000	>1200[e]	>6000	>1000[e]	>2.4	>5.5		AC-4ms
						2.5 - 5.5	≥2.5	AC-5m

Notes

a Brownfield sites are those sites, or parts of sites, that might contain chemical residues produced by or associated with industrial production (Section C5.1.3).

b The limits of Design Sulfate Classes based on 2:1 water/soil extracts have been lowered relative to previous Digests (Box C7).

c Applies only to locations where concrete will be exposed to sulfate ions (SO_4) which may result from the oxidation of sulfides (eg pyrite) following ground disturbance (Appendix A1 and Box C8).

d An additional account is taken of hydrochloric and nitric acids by adjustment to sulfate content (Section C5.1.3).

e The limit on water-soluble magnesium does not apply to brackish groundwater (chloride content between 12 000 mg/l and 17000 mg/l). This allows 'm' to be omitted from the relevant ACEC Classification. Seawater (chloride content about 18 000 mg/l) and stronger brines are not covered by this table.

Explanation of suffix symbols to ACEC Class

- Suffix 's' indicates that the water has been classified as static.
- Concrete placed in ACEC Classes that included the suffix 'z' primarily have to resist acid conditions and may be made with any of the cements or combinations listed in Table D2 on page 42.
- Suffix 'm' relates to the higher levels of magnesium in Design Sulfate Classes 4 and 5.

CONTAMINATION ANALYSIS RESULTS

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UKAS TESTING
2183

Final Report

Report No.:	19-21516-1
Initial Date of Issue:	05-Jul-2019
Client	Sub Surface
Client Address:	3 Peel Street Preston Lancashire PR2 2QS
Contact(s):	Simon Gabbatt
Project	(NE3834) Capital Park, Whinby Road, Dodworth, South Yorkshre

Quotation No.:		**Date Received:**	27-Jun-2019
Order No.:		**Date Instructed:**	27-Jun-2019
No. of Samples:	16		
Turnaround (Wkdays):	7	**Results Due:**	05-Jul-2019
Date Approved:	05-Jul-2019		

Approved By:



Details: Robert Monk, Technical Manager

Results - Soil

Client: Sub Surface				Chemtest Job No.:	19-21516	19-21516	19-21516	19-21516	19-21516	19-21516
Quotation No.:				Chemtest Sample ID.:	849210	849213	849214	849216	849219	849222
				Client Sample ID.:	302	307	312	318	322	327
				Sample Location:	M1	M2	M3	M4	M5	M6
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.40	0.90	0.00	1.50	0.50	0.20
				Date Sampled:	13/06/19	13/06/19	13/06/19	13/06/19	13/06/19	13/06/19
				Asbestos Lab:	Coventry	Coventry	Coventry			Coventry
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Moisture	N	2030	%	0.020	16	13	19	21	12	17
Stones and Removed Materials	N	2030	%	0.020					< 0.020	
ACM Type	U	2192		N/A	-	-	-			-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected			No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-			-
pH	U	2010		N/A	6.1	5.3	7.3	5.9	6.2	7.2
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010					0.028	
Sulphate (Acid Soluble)	U	2430	%	0.010					0.011	
Total Sulphur	U	2175	%	0.010					0.030	
Magnesium (Water Soluble)	N	2120	g/l	0.010					< 0.010	
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	2.5	1.8	1.7	1.6	2.2	1.4
Sulphate (Total)	U	2430	%	0.010	0.048	0.21	0.026	0.032	0.026	0.017
Arsenic	U	2450	mg/kg	1.0	69	9.2	4.5	6.5	16	9.7
Cadmium	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chromium	U	2450	mg/kg	1.0	20	19	23	22	20	21
Molybdenum	U	2450	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Copper	U	2450	mg/kg	0.50	27	31	33	18	31	30
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Nickel	U	2450	mg/kg	0.50	32	29	44	18	40	45
Lead	U	2450	mg/kg	0.50	19	15	16	16	20	22
Selenium	U	2450	mg/kg	0.20	0.55	< 0.20	< 0.20	0.32	< 0.20	0.20
Zinc	U	2450	mg/kg	0.50	75	80	93	61	86	88
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C10-C21	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH >C21-C40	N	2670	mg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total TPH >C6-C40	U	2670	mg/kg	10	< 10	< 10	< 10	< 10	< 10	< 10
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	1.3
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.27
Fluoranthene	U	2700	mg/kg	0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10	1.2
Pyrene	U	2700	mg/kg	0.10	0.22	< 0.10	< 0.10	< 0.10	< 0.10	1.2
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	4.0
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30

Results - Soil

Client: Sub Surface				Chemtest Job No.:	19-21516	19-21516			19-21516	19-21516
Quotation No.:				Chemtest Sample ID.:	849224	849225			849211	849212
				Client Sample ID.:	330	331			303	306
				Sample Location:	M7	M8			M1	M1
				Sample Type:	SOIL	SOIL			SOIL	SOIL
				Top Depth (m):	0.50	0.60			1.40	4.60
				Date Sampled:	13/06/19	13/06/19			13/06/19	13/06/19
				Asbestos Lab:	Coventry	Coventry				
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Moisture	N	2030	%	0.020	19	20			12	16
Stones and Removed Materials	N	2030	%	0.020						
ACM Type	U	2192		N/A	-	-				
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected				
ACM Detection Stage	U	2192		N/A	-	-				
pH	U	2010		N/A	5.9	5.4			7.5	7.1
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010					0.017	0.033
Sulphate (Acid Soluble)	U	2430	%	0.010						
Total Sulphur	U	2175	%	0.010						
Magnesium (Water Soluble)	N	2120	g/l	0.010						
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	0.40	0.57				
Cyanide (Total)	U	2300	mg/kg	0.50	< 0.50	< 0.50				
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	1.6	1.4				
Sulphate (Total)	U	2430	%	0.010	0.022	< 0.010				
Arsenic	U	2450	mg/kg	1.0	19	42				
Cadmium	U	2450	mg/kg	0.10	< 0.10	< 0.10				
Chromium	U	2450	mg/kg	1.0	22	21				
Molybdenum	U	2450	mg/kg	2.0	< 2.0	< 2.0				
Copper	U	2450	mg/kg	0.50	26	27				
Mercury	U	2450	mg/kg	0.10	< 0.10	< 0.10				
Nickel	U	2450	mg/kg	0.50	21	25				
Lead	U	2450	mg/kg	0.50	22	22				
Selenium	U	2450	mg/kg	0.20	0.33	0.27				
Zinc	U	2450	mg/kg	0.50	49	62				
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50				
TPH >C6-C10	N	2670	mg/kg	1.0	< 1.0	< 1.0				
TPH >C10-C21	N	2670	mg/kg	1.0	< 1.0	< 1.0				
TPH >C21-C40	N	2670	mg/kg	1.0	< 1.0	< 1.0				
Total TPH >C6-C40	U	2670	mg/kg	10	< 10	< 10				
Naphthalene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Acenaphthylene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Acenaphthene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Fluorene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Phenanthrene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Benzo[a]anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Chrysene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Benzo[b]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Benzo[k]fluoranthene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Benzo[a]pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10	< 0.10	< 0.10				
Total Of 16 PAH's	U	2700	mg/kg	2.0	< 2.0	< 2.0				
Benzene	U	2760	µg/kg	1.0	< 1.0	< 1.0				
Toluene	U	2760	µg/kg	1.0	< 1.0	< 1.0				
Ethylbenzene	U	2760	µg/kg	1.0	< 1.0	< 1.0				
m & p-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0				
o-Xylene	U	2760	µg/kg	1.0	< 1.0	< 1.0				
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	< 1.0	< 1.0				
Total Phenols	U	2920	mg/kg	0.30	< 0.30	< 0.30				

Results - Soil

Client: Sub Surface				Chemtest Job No.:	19-21516	19-21516	19-21516	19-21516	19-21516	19-21516
Quotation No.:				Chemtest Sample ID.:	849215	849217	849218	849220	849221	849223
				Client Sample ID.:	315	318	321	322	325	329
				Sample Location:	M3	M4	M4	M5	M5	M6
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	3.20	1.90	4.90	0.90	3.90	2.90
				Date Sampled:	13/06/19	13/06/19	13/06/19	13/06/19	13/06/19	13/06/19
				Asbestos Lab:						
Determinand	**Accred.**	**SOP**	**Units**	**LOD**						
Moisture	N	2030	%	0.020	15	19	14	16	15	11
Stones and Removed Materials	N	2030	%	0.020			< 0.020			< 0.020
ACM Type	U	2192		N/A						
Asbestos Identification	U	2192	%	0.001						
ACM Detection Stage	U	2192		N/A						
pH	U	2010		N/A	6.7	7.2	6.2	6.4	7.7	7.5
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	0.026	0.046	0.078	0.043	0.022	0.013
Sulphate (Acid Soluble)	U	2430	%	0.010			0.028			< 0.010
Total Sulphur	U	2175	%	0.010			0.027			0.026
Magnesium (Water Soluble)	N	2120	g/l	0.010			0.013			< 0.010
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40						
Cyanide (Total)	U	2300	mg/kg	0.50						
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50						
Sulphate (Total)	U	2430	%	0.010						
Arsenic	U	2450	mg/kg	1.0						
Cadmium	U	2450	mg/kg	0.10						
Chromium	U	2450	mg/kg	1.0						
Molybdenum	U	2450	mg/kg	2.0						
Copper	U	2450	mg/kg	0.50						
Mercury	U	2450	mg/kg	0.10						
Nickel	U	2450	mg/kg	0.50						
Lead	U	2450	mg/kg	0.50						
Selenium	U	2450	mg/kg	0.20						
Zinc	U	2450	mg/kg	0.50						
Chromium (Hexavalent)	N	2490	mg/kg	0.50						
TPH >C6-C10	N	2670	mg/kg	1.0						
TPH >C10-C21	N	2670	mg/kg	1.0						
TPH >C21-C40	N	2670	mg/kg	1.0						
Total TPH >C6-C40	U	2670	mg/kg	10						
Naphthalene	U	2700	mg/kg	0.10						
Acenaphthylene	U	2700	mg/kg	0.10						
Acenaphthene	U	2700	mg/kg	0.10						
Fluorene	U	2700	mg/kg	0.10						
Phenanthrene	U	2700	mg/kg	0.10						
Anthracene	U	2700	mg/kg	0.10						
Fluoranthene	U	2700	mg/kg	0.10						
Pyrene	U	2700	mg/kg	0.10						
Benzo[a]anthracene	U	2700	mg/kg	0.10						
Chrysene	U	2700	mg/kg	0.10						
Benzo[b]fluoranthene	U	2700	mg/kg	0.10						
Benzo[k]fluoranthene	U	2700	mg/kg	0.10						
Benzo[a]pyrene	U	2700	mg/kg	0.10						
Indeno(1,2,3-c,d)Pyrene	U	2700	mg/kg	0.10						
Dibenz(a,h)Anthracene	U	2700	mg/kg	0.10						
Benzo[g,h,i]perylene	U	2700	mg/kg	0.10						
Total Of 16 PAH's	U	2700	mg/kg	2.0						
Benzene	U	2760	µg/kg	1.0						
Toluene	U	2760	µg/kg	1.0						
Ethylbenzene	U	2760	µg/kg	1.0						
m & p-Xylene	U	2760	µg/kg	1.0						
o-Xylene	U	2760	µg/kg	1.0						
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0						
Total Phenols	U	2920	mg/kg	0.30						

Chemtest
The right chemistry to deliver results

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis
The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols
For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

MINI BOREHOLE RECORD SHEETS

SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.20	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
Location		**Dates**	**Engineer**	**Sheet**
AS PLAN		13/06/2019	WILLIAM SAUNDERS	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.00	C			0.00m to 1.00m - 90% Recovery		(0.20)	MADE GROUND: friable becoming firm dark brown and orange mottled slightly sandy silty clay with many rootlets.			
					149.00	0.20				
						(0.20)	MADE GROUND: brown slightly clayey silty sandy fine to coarse gravel sized fragments of mudstone and coal.			
					148.80	0.40				
						(0.60)	MADE GROUND: firm dark brown, light brown and orangish brown mottled slightly gravelly slightly sandy silty clay with occasional pockets of sand. Gravel sized fragments are fine to coarse mudstone and coal.			
					148.20	1.00			▽1	
1.00-2.00	C			Seepage(1) at 1.00m, not sealed. 1.00m to 2.00m - 100% Recovery			MADE GROUND: firm to stiff medium strength light greyish brown becoming light brown, orangish brown and occasional dark grey mottled slightly gravelly to gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium coal, ironstone, mudstone and sandstone.			
1.00-1.45	SPT(C) N=14			2,2/2,3,4,5		(1.00)				
2.00-3.00	C			2.00m to 3.00m - 100% Recovery	147.20	2.00	MADE GROUND: stiff high strength light brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone. (organic odour)			
2.00-2.45	SPT(C) N=20			2,4/5,5,5,5		(0.70)				
					146.50	2.70				
					146.40	(0.10) 2.80	MADE GROUND: stiff dark grey gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone and coal.			
3.00-4.00	C			3.00m to 4.00m - 100% Recovery		(0.50)	MADE GROUND: stiff high strength brown, light brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium mudstone, coal and ironstone.			
3.00-3.45	SPT(C) N=38			4,6/8,10,10,10						
					145.90	3.30	MADE GROUND: dense orangish brown gravelly slightly clayey silty sand. Gravel sized fragments are fine to coarse sandstone, ironstone, mudstone and coal.			
						(0.20)				
					145.70	3.50				
						(0.20)	MADE GROUND: stiff greyish brown slightly gravelly slightly sandy silty clay. Gravel is fine to coarse mudstone and ironstone.			
					145.50	3.70				
4.00-5.00	C			4.00m to 5.00m - 70% Recovery			Stiff high strength dark brown, orangish brown and light brown mottled slightly gravelly slightly sandy silty CLAY with occasional rootlets to 4.00m. Gravel sized fragments are fine mudstone and coal lithorelicts. (completely weathered bedrock)			
4.00-4.45	SPT(C) N=26			3,4/5,6,6,9		(1.00)				
					144.50	4.70	Stiff very high strength light brown and orangish brown mottled silty CLAY. (completely weathered mudstone)			
5.00-5.45	SPT(C) N=45			6,6/7,11,12,15						

Remarks

C = Plastic lined core sample.
Core diameter: 86mm to 1.00m, 66mm to 3.00m, 56mm to 4.00m and 46mm to 5.00m.
On completion backfilled with gravel to 5.00m and installed a 50mm dia hdpe slotted gas monitoring standpipe with a gas valve and a gravel surround to 5.00m, a Bentonite seal from 2.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M1

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M1

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.20	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						(0.75)	Stiff very high strength light brown and orangish brown mottled silty CLAY. (completely weathered mudstone)			
				13/06/2019:	143.75	5.45	Complete at 5.45m			

Remarks

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M1

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3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.40	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	C			0.00m to 1.00m - 100% Recovery		(0.55)	MADE GROUND: friable becoming firm to stiff dark brown and occasional dark grey mottled slightly gravelly to gravelly slightly sandy silty clay with low cobble sized fragments of concrete and with occasional rootlets. Gravel sized fragments are fine to coarse mudstone, concrete, coal and clinker.		
					148.85	0.55	MADE GROUND: firm becoming firm to stiff medium strength orangish brown, grey, light grey brown and occasional dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone, mudstone and coal.		
1.00-2.00	C			Seepage(1) at 1.00m, not sealed. 1.00m to 2.00m - 100% Recovery					▽1
1.00-1.45	SPT(C) N=10			1,2/2,3,2,2,3					
2.00-3.00	C			2.00m to 3.00m - 85% Recovery		(3.25)			
2.00-2.45	SPT(C) N=16			2,3/3,4,4,5					
3.00-4.00	C			3.00m to 4.00m - 90% Recovery					
3.00-3.45	SPT(C) N=15			3,3/2,3,5,5					
					145.60	3.80	....at 3.80m: 50mm band of dark grey gravel sized fragments of coal. (hydrocarbon odour)		
4.00-5.00	C			4.00m to 5.00m - 70% Recovery			MADE GROUND: stiff medium becoming high strength light greyish brown slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone.		
4.00-4.45	SPT(C) N=18			2,3/3,4,5,6		(1.00)			
					144.60	4.80	Stiff high strength orangish brown and light grey mottled silty CLAY. (completely weathered mudstone)		
5.00-5.45	SPT(C) N=36			4,6/6,8,11,11					

Remarks

C = Plastic lined core sample.
Core diameter: 86mm to 1.00m, 76mm to 2.00m, 66mm to 3.00m, 56mm to 4.00m and 46mm to 5.00m.
On completion backfilled with arisings and Bentonite.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M2

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M2

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.40	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.65)	Stiff high strength orangish brown and light grey mottled silty CLAY. (completely weathered mudstone)		
				13/06/2019:	143.95	5.45	Complete at 5.45m		

Remarks

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M2

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.35	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.00	C			0.00m to 1.00m - 100% Recovery		(1.00)	MADE GROUND: friable becoming stiff light brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone and coal.		▽1	
				Seepage(1) at 0.90m, not sealed.	148.35	1.00				
1.00-2.00	C			1.00m to 2.00m - 100% Recovery			MADE GROUND: stiff medium strength brown, orangish brown and dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium mudstone, coal and sandstone.			
1.00-1.45	SPT(C) N=14			1,3/3,3,3,5		(1.00)				
					147.35	2.00				
2.00-3.00	C			2.00m to 3.00m - 100% Recovery			MADE GROUND: stiff medium strength dark brown and occasional dark grey mottled slightly gravelly becoming gravelly slightly sandy silty clay.Gravel sized fragments are fine to coarse mudstone and sandstone.			
2.00-2.45	SPT(C) N=13			3,4/3,3,3,4		(0.50)				
					146.85	2.50				
						(0.50)	MADE GROUND: stiff brown and orangish brown mottled slightly gravelly slightly sandy silty clay with pockets of gravelly sandy. Gravel sized fragments are fine to coarse mudstone, sandstone and coal.			
					146.35	3.00				
3.00-4.00	C			3.00m to 4.00m - 100% Recovery			MADE GROUND: stiff high strength orangish brown, dark grey and light brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone, siltstone, mudstone, coal and occasional brick.			
3.00-3.45	SPT(C) N=19			3,4/4,5,4,6		(1.35)				
4.00-5.00	C			4.00m to 5.00m - 100% Recovery						
4.00-4.45	SPT(C) N=30			6,5/6,6,8,10						
					145.00	4.35				
						(0.55)	Stiff high strength fissured orangish brown, brown, light brown and light grey mottled silty CLAY with occasional rootlets. (completely weathered mudstone)			
					144.45	4.90				
5.00-5.45	SPT(C) N=50			6,7/8,12,14,16			CLAY (as sheet 2/2)			

Remarks

C = Plastic lined core sample.
Core diameter: 83mm to 1.00m, 73mm to 2.00m, 63mm to 3.00m, 56mm to 4.00m and 46mm to 5.00m.
On completion backfilled with gravel to 5.00m and installed a 50mm dia hdpe slotted gas monitoring standpipe with a gas valve and a gravel surround to 5.00m, a Bentonite seal from 2.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M3

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SUB SURFACE

SITE INVESTIGATION, GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M3

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.35	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location AS PLAN	**Dates** 13/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						(0.55)	Stiff very high strength brown, light grey and occasional orangish brown mottled silty CLAY. (completely weathered mudstone)			
				13/06/2019:	143.90	5.45	Complete at 5.45m			

Remarks

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M3

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.40	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	C			0.00m to 1.00m - 100% Recovery		(0.35)	MADE GROUND: friable light greyish brown slightly gravelly slightly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse mudstone, ironstone and metal.		
					149.05	0.35	MADE GROUND: stiff medium strength orangish brown, light grey and occasional dark grey mottled becoming orangish brown slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone. (localised organic odour)		
1.00-2.00	C			1.00m to 2.00m - 90% Recovery		(1.35)			
1.00-1.45	SPT(C) N=12			2,3/2,3,3,4					
					147.70	1.70	MADE GROUND: firm to stiff high strength dark brown becoming brown and orangish brown mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, ironstone and coal.		
2.00-3.00	C			Seepage(1) at 2.00m, not sealed. 2.00m to 3.00m - 100% Recovery		(0.65)			▽1
2.00-2.45	SPT(C) N=23			2,2/8,4,4,7					
					147.05	2.35	MADE GROUND: medium dense brown and orangish brown mottled slightly clayey silty sandy fine to coarse gravel sized fragments of mudstone.		
					146.85	(0.20) 2.55	MADE GROUND; stiff becoming soft to firm medium strength orangish brown and occasional light brown and dark brown mottled slightly gravelly slightly sandy silty clay with occasional pockets of sand. Gravel sized fragments are fine to coarse sandstone and mudstone. (localised organic odour)		
3.00-4.00	C			3.00m to 4.00m - 90% Recovery		(0.95)			
3.00-3.45	SPT(C) N=12			2,1/2,3,3,4					
					145.90	3.50	MADE GROUND: light brown slightly clayey silty sand and fine to medium gravel sized fragments of mudstone. (organic odour)		
					145.75	(0.15) 3.65	MADE GROUND: firm to stiff dark grey becoming orangish brown, light brown and light grey mottled slighlty gravelly slighlty sandy silty clay. Gravel sized fragments are fine to medium mudstone. (strong organic odour at the top)		
4.00-5.00	C			4.00m to 5.00m - 40% Recovery		(0.35)			
4.00-4.45	SPT(C) N=23			4,5/6,5,5,7	145.40	4.00	Stiff high becoming very high strength light brown and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine to medium sandstone, mudstone and coal lithorelicts. (completely weathered bedrock)		
						(1.45)			
5.00-5.45	SPT(C) N=52			3,5/10,11,12,19					

Remarks

C = Plastic lined core sample.
Core diameter: 86mm to 1.00m, 76mm to 2.00m 66mm to 3.00m, 56mm to 4.00m and 46mm to 5.00m.
On completion backfilled with arisings and Bentonite.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M4

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M4

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.40	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location AS PLAN	**Dates** 13/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				13/06/2019:	143.95	5.45 (5.45)	Stiff high becoming very high strength light brown and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine to medium sandstone, mudstone and coal lithorelicts. (completely weathered bedrock) ....from 5.15m: very high strength. Complete at 5.45m		

Remarks

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M4

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M5

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.45	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.00	C			0.00m to 1.00m - 100% Recovery		(0.20)	MADE GROUND: light brown slightly silty sandy fine to coarse gravel sized fragments of mudstone and coal.			
					149.25	0.20	MADE GROUND; stiff light brown becoming orangish brown, light grey brown and occasional dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, sandstone and occasional ironstone and coal at top. (organic odour)			
1.00-2.00	C			1.00m to 2.00m - 100% Recovery						
1.00-1.45	SPT(C) N=14			2,2/3,3,4,4			....from 1.15m: medium strength.			
				Seepage(1) at 1.50m, not sealed.		(2.85)			▽1	
2.00-3.00	C			2.00m to 3.00m - 100% Recovery						
2.00-2.45	SPT(C) N=18			2,3/4,4,5,5						
3.00-4.00	C			3.00m to 4.00m - 100% Recovery	146.40	3.05	MADE GROUND: stiff medium strength ashy slightly gravelly slightly sandy silty clay. Gravel is fine to medium mudstone and coal.			
3.00-3.45	SPT(C) N=18			2,4/4,4,5,5		(0.20)				
					146.20	3.25	Extremely weak brown and orangish brown mottled highly weathered MUDSTONE.			
						(0.25)				
					145.95	3.50	Stiff medium strength brown and orangish brown mottled slightly gravelly slightly sandy silty CLAY with bands (30 to 60mm) of highly weathered sandstone, mudstone and coal. Gravel sized fragments are fine to coarse mudstone and coal lithorelicts. (completely weathered bedrock)			
4.00-5.00	C			4.00m to 5.00m - 90% Recovery		(1.00)				
4.00-4.45	SPT(C) N=18			4,3/4,4,4,6						
					144.95	4.50	Stiff high becoming very high strength grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine to medium sandstone, mudstone and coal lithorelicts. (completely weathered bedrock)			
5.00-5.45	SPT(C) N=55			5,7/9,11,14,21						

Remarks

C = Plastic lined core sample.
Core diameter: 86mm to 1.00m, 76mm to 2.00m, 63mm to 3.00m, 56mm to 4.00m and 46mm to 5.00m.
On completion backfilled with gravel to 5.00m and installed a 50mm dia hdpe slotted gas monitoring standpipe with a gas valve and a gravel surround to 5.00m, a Bentonite seal from 2.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M5

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M5

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI PERCUSSIVE		149.45	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location AS PLAN	**Dates** 13/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						(0.95)	Stiff high becoming very high strength grey and orangish brown mottled slightly gravelly slightly sandy silty CLAY. Gravel sized fragments are fine to medium sandstone, mudstone and coal lithorelicts. (completely weathered bedrock)			
				13/06/2019:	144.00	5.45	Complete at 5.45m			

Remarks

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M5

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M6

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI CABLE PERCUSSIVE		149.50	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00-1.00	C			0.00m to 1.00m - 100% Recovery		(0.85)	MADE GROUND: friable becoming firm to stiff orangish brown and light brown mottled slightly gravelly to gravelly slightly sandy silty clay with rootlets to 0.30m. Gravel sized fragments are coarse ironstone.			
					148.65	0.85 (0.15)	MADE GROUND: firm to stiff black and grey brown mottled ashy slightly gravelly to gravelly slightly sandy silty clay.Gravel sized fragments are coarse mudstone and concrete.			
1.00-2.00	C			1.00m to 2.00m - 100% Recovery	148.50	1.00 (0.10)				
1.00-1.45	SPT(C) N=21			3,4/4,5,6,6	148.40	1.10	MADE GROUND: grey and light greyish brown mottle slightly clayey silty sandy fine to coarse gravel sized fragments of ironstone and mudstone.			
						(0.75)	MADE GROUND: stiff high strength orangish brown, grey, light brown and occasional dark grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse mudstone, coal and sandstone. ....at 1.40m: band (50mm) of gravel sized fragments of mudstone and ironstone.			
					147.65	1.85 (0.15)	MADE GROUND: dark brown clayey silty sandy fine to coarse gravel sized fragments of brick, concrete, clinker, mudstone and sandstone.			
2.00-3.00	C			2.00m to 3.00m - 100% Recovery	147.50	2.00				
2.00-2.45	SPT(C) N=21			3,4/4,4,5,8		(0.85)	Stiff high strength light brown and orangish brown mottled slightly gravelly silty CLAY with bands (30 to 55mm) of ironstone. Gravel sized fragments are fine to medium mudstone lithorelicts. (completely weathered mudstone)			
					146.65	2.85	Extremely weak brown highly weathered MUDSTONE with coarse gravel sized ironstone nodules.			
3.00-3.32	SPT(C) 64/170			4,5/12,26,26		(0.50)				
				13/06/2019:DRY	146.15	3.35	Complete at 3.35m			

Remarks

C = Plastic lined core sample.
Core diameter: 86mm to 1.00m, 76mm to 2.00m and 63mm to 3.00m.
On completion backfilled with gravel to 3.00m and installed a 50mm dia hdpe slotted gas monitoring standpipe with a gas valve and a gravel surround to 3.00m, a Bentonite seal from 1.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M6

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M7

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI CABLE PERCUSSIVE		149.50	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	C			0.00m to 1.00m - 70% Recovery		(0.20)	MADE GROUND: firm brown slightly gravelly slightly sandy silty clay with some rootlets. Gravel sized fragments are fine to coarse mudstone.		
					149.30	0.20			
				HV @ 0.55m, c=122kPa			Stiff high becoming very high strength light brown and orangish brown mottled becoming orangish brown, light brown and light grey mottled slightly gravelly silty CLAY with coarse gravel sized ironstone modules to 0.45m. Gravel sized fragments are fine to medium mudstone and coal lithorelicts. (completely weathered bedrock)		
						(1.25)			
1.00-1.45	SPT(C) N=43			2,3/9,11,11,12			....from 1.15m: very high strength.		
				13/06/2019:DRY	148.05	1.45			
							Complete at 1.45m		

Remarks

C = Plastic lined core sample.
Core diameter: 56mm to 1.00m.
HV = Hand Shear Vane test.
On completion backfilled with arisings.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M7

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI CABLE PERCUSSIVE		149.55	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	1/2

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	C			0.00m to 1.00m - 100% Recovery		(0.55)	MADE GROUND: friable becoming firm light brown, orangish brown and dark brown mottled slightly gravelly slightly sandy silty clay with occasional rootlets. Gravel sized fragments are fine to coarse mudstone and coal.		
					149.00	0.55			
						(0.70)	MADE GROUND: firm to stiff orangish brown and dark brown mottled, with black staining, slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium mudstone.		
1.00-2.00	C			1.00m to 2.00m - 90% Recovery					
1.00-1.45	SPT(C) N=15			1,2/4,3,4,4					
					148.30	1.25			
						(0.15)	MADE GROUND: stiff medium strength dark grey and orangish brown mottled gravelly slightly sandy silty clay. Gravel sized fragments are fine to medium coal, mudstone, sandstone and brick.		
					148.15	1.40			
							MADE GROUND: stiff high strength brown, orangish brown and grey mottled slightly gravelly slightly sandy silty clay. Gravel sized fragments are fine to coarse sandstone, mudstone, coal and occasional concrete and ironstone.		
2.00-3.00	C			2.00m to 3.00m - 100% Recovery					
2.00-2.45	SPT(C) N=19			2,2/3,4,6,6		(1.60)			
					146.55	3.00			
3.00-4.00	C			3.00m to 4.00m - 80% Recovery			MADE GROUND: soft to firm becoming stiff medium strength light brown, orangish brown, brown, light grey and occasional dark grey mottled slightly gravelly slightly sandy silty clay with occasional pockets of sand. Gravel sized fragments are fine to coarse coal and mudstone.		
3.00-3.45	SPT(C) N=17			3,2/3,3,5,6		(1.00)			
					145.55	4.00			▽1
4.00-5.00	C			Seepage(1) at 4.00m, not sealed. 4.00m to 5.00m - 85% Recovery			Soft (wet) high strength yellowish brown, orangish brown and light brown mottled slightly gravelly silty CLAY with gravel sized ironstone nodules. Gravel sized fragments are mudstone lithorelicts. (completely weathered mudstone)		
4.00-4.45	SPT(C) N=24			3,4/4,7,6,7		(0.45)			
					145.10	4.45			
				HP @ 4.45m, c = 40kPa		(0.10)	Stiff low strength brown and light grey mottled silty CLAY with bands of coal. (completely weathered mudstone)		
				HV @ 4.50m, c = 35kPa	145.00	4.55			
						(0.15)	Extremely weak thinly to thickly laminated highly weathered COAL, in parts completely weathered to gravelly clayey silt.		
					144.85	4.70			
						(0.20)	Firm yellowish brown and light greyish brown mottled silty CLAY. (completely weathered mudstone)		
					144.65	4.90			
5.00-5.30	SPT(C) 40/150			9,12/18,22					

Remarks

C = Plastic lined core sample.
Core diameter: 86mm to 1.00m, 76mm to 2.00m, 63mm to 3.00m, 56mm to 4.00m and 46mm to 5.00m.
HP = Hand Penetrometer test.
HV - Hand Shear Vane test.
On completion backfilled with arisings and Bentonite.

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M8

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	M8

Boring Method	Casing Diameter	Ground Level (mOD)	Client	Job Number
MINI CABLE PERCUSSIVE		149.55	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
	Location	**Dates**	**Engineer**	**Sheet**
	AS PLAN	13/06/2019	WILLIAM SAUNDERS	2/2

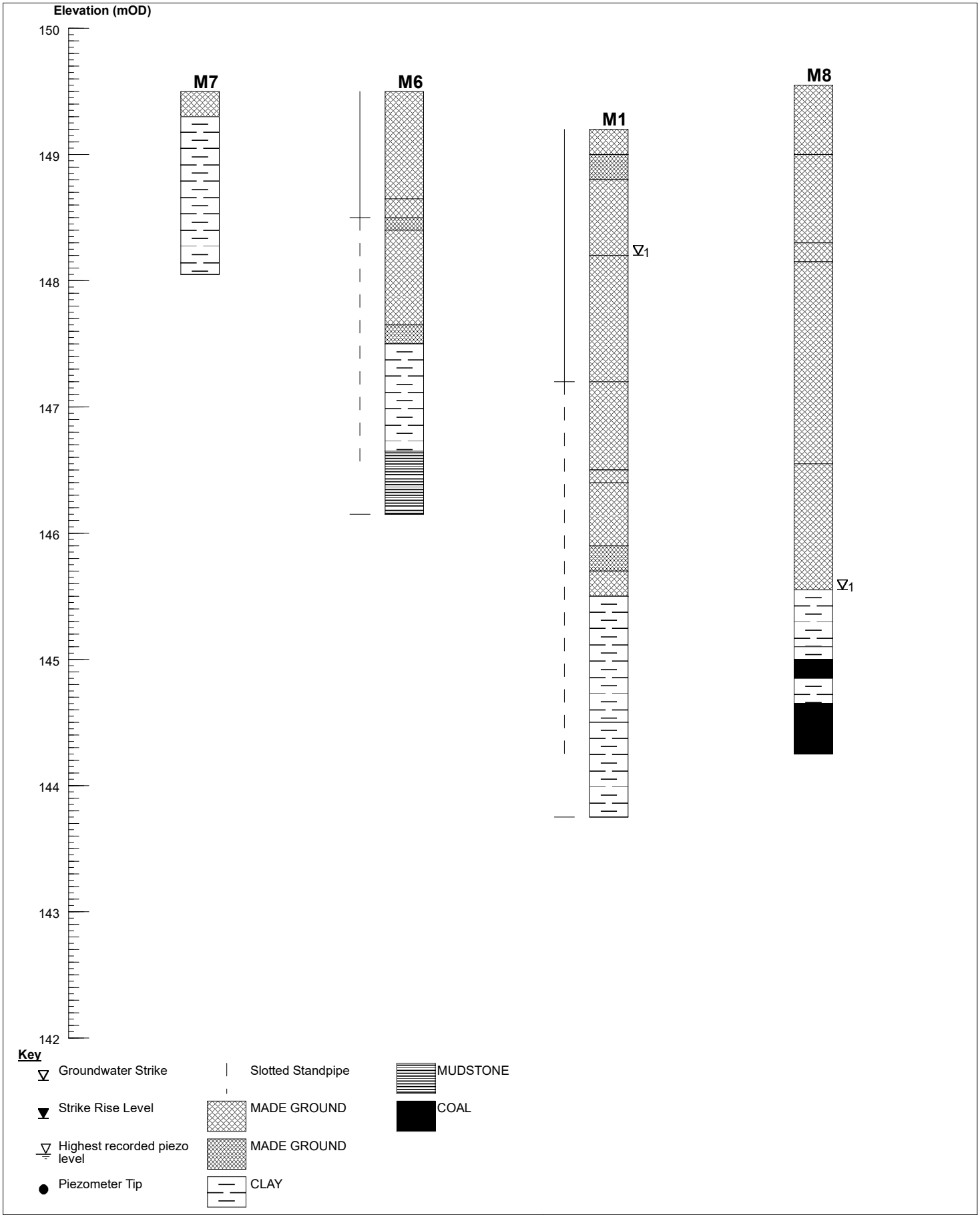
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						(0.40)	Extremely weak black COAL. (drillers description)		
				13/06/2019:DRY	144.25	5.30	Complete at 5.30m		

Remarks

Scale (approx)	Logged By
1:25	TRB/MJE

Figure No. NE3834.M8

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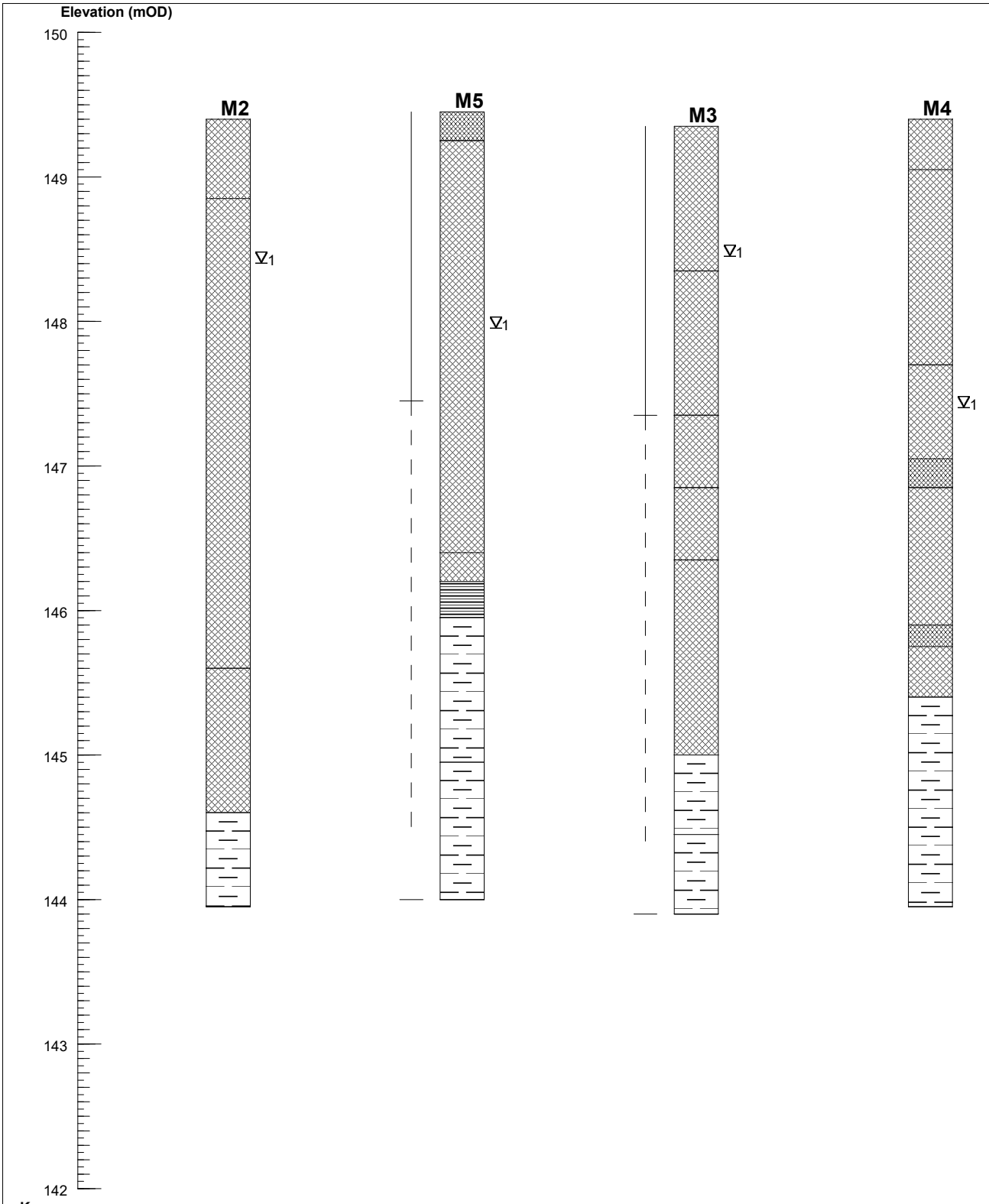


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Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	08/08/2019		1/2	NE3834
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED			1:40[V]	NE3834.1

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Key

- ∇ Groundwater Strike
- ▼ Strike Rise Level
- ∇ Highest recorded piezo level
- ● Piezometer Tip
- Slotted Standpipe
- MADE GROUND
- MADE GROUND
- CLAY
- MUDSTONE
- COAL

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Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	08/08/2019		2/2	NE3834
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED			1:40[V]	NE3834.1

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ROTARY BOREHOLE RECORD SHEETS

SUB SURFACE

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R1
Machine : BERETTA T44 **Flush :** WATER **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE	**Casing Diameter** 121mm to 1.20m	**Ground Level (mOD)** 149.35	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834
	Location AS PLAN	**Dates** 19/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					Open holing (89mm dia) GL to 30.00m			MADE GROUND: clay (colliery spoil).		
							(5.40)			
						143.95	5.40	Grey/brown weathered MUDSTONE.		
							(0.40)			
						143.55	5.80	Black COAL.		
							(0.30)			
						143.25	6.10	Grey MUDSTONE with bands of sandstone.		
							(11.40)			
						131.85	17.50	Black COAL.		
						131.75	17.60	Grey MUDSTONE.		

Remarks
Descriptions based upon foreman drillers records of flush returns.
Foreman driller recorded no voids or loss of flush returns.

Scale (approx)	Logged By
1:100	AJP/SJ

Figure No. NE3834.R1

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R1

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	121mm to 1.20m	149.35	CARNELL MANAGEMENT SERVICES LIMITED	NE3834
Flush : WATER				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE	**Location** AS PLAN	**Dates** 19/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(12.40)	Grey MUDSTONE.		
					19/06/2019:	119.35	30.00	Complete at 30.00m		

Remarks

Scale (approx)	Logged By
1:100	AJP/SJ

Figure No. NE3834.R1

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Site
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Borehole Number
R2

Machine : BERETTA T44
Flush : WATER
Core Dia : NONE mm
Method : ROTARY OPEN HOLE

Casing Diameter
121mm to 1.20m

Ground Level (mOD)
149.40

Client
CARNELL MANAGEMENT SERVICES LIMITED

Job Number
NE3834

Location
AS PLAN

Dates
20/06/2019-21/06/2019

Engineer
WILLIAM SAUNDERS

Sheet
1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					Open holing (89mm dia) GL to 30.00m		(5.00)	MADE GROUND: Clay (colliery spoil)			
						144.40	5.00	Grey MUDSTONE.			
							(5.80)				
						138.60	10.80				
					20/06/2019:		(0.50)	Black COAL.			
						138.10	11.30	Grey MUDSTONE.			
					21/06/2019:						
							(11.40)				

Remarks
Descriptions based upon foreman drillers records of flush returns.
Foreman driller recorded no voids or loss of flush returns.
On completion backfilled with Bentonite and installed a 50mm dia slotted standpipe with a gas valve and a gravel surround to 7.00m, a Bentonite seal from 1.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)
1:100

Logged By
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Figure No.
NE3834.R2

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R2
Machine : BERETTA T44 **Flush :** WATER **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE	**Casing Diameter** 121mm to 1.20m	**Ground Level (mOD)** 149.40	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834
	Location AS PLAN	**Dates** 20/06/2019-21/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
								Grey MUDSTONE.			
						126.70	22.70				
						126.50	22.90	Black COAL.			
								Grey MUDSTONE.			
							(7.10)				
					21/06/2019:	119.40	30.00	Complete at 30.00m			

Remarks

Scale (approx)	Logged By
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Figure No. NE3834.R2

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Site
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Borehole Number
R3

Machine : BERETTA T44
Flush : WATER
Core Dia : NONE mm
Method : ROTARY OPEN HOLE

Casing Diameter
121mm to 1.20m

Ground Level (mOD)
149.35

Client
CARNELL MANAGEMENT SERVICES LIMITED

Job Number
NE3834

Location
AS PLAN

Dates
21/06/2019

Engineer
WILLIAM SAUNDERS

Sheet
1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
					Open holing (89mm dia) GL to 30.00m			MADE GROUND: clay (colliery spoil).			
							(5.50)				
						143.85	5.50	Grey MUDSTONE.			
							(2.80)				
						141.05	8.30				
						140.75	(0.30) 8.60	Black COAL.			
								Grey MUDSTONE.			
							(10.40)				
						130.35	19.00				
						130.15	19.20	Black COAL.			
								Grey MUDSTONE.			

Remarks
Descriptions based upon foreman drillers records of flush returns.
Foreman driller recorded no voids or loss of flush returns.
On completion backfilled with Bentonite to 7.00m and installed a 50mm dia slotted standpipe with a gas valve and a gravel surround to 7.00m, a Bentonite seal from 1.00m to 0.20m and a concreted in lockable steel protective cover from 0.20m to GL.

Scale (approx)
1:100

Logged By
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Figure No.
NE3834.R3

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R3
Machine : BERETTA T44 **Flush :** WATER **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE	**Casing Diameter** 121mm to 1.20m	**Ground Level (mOD)** 149.35	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834
	Location AS PLAN	**Dates** 21/06/2019	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/2

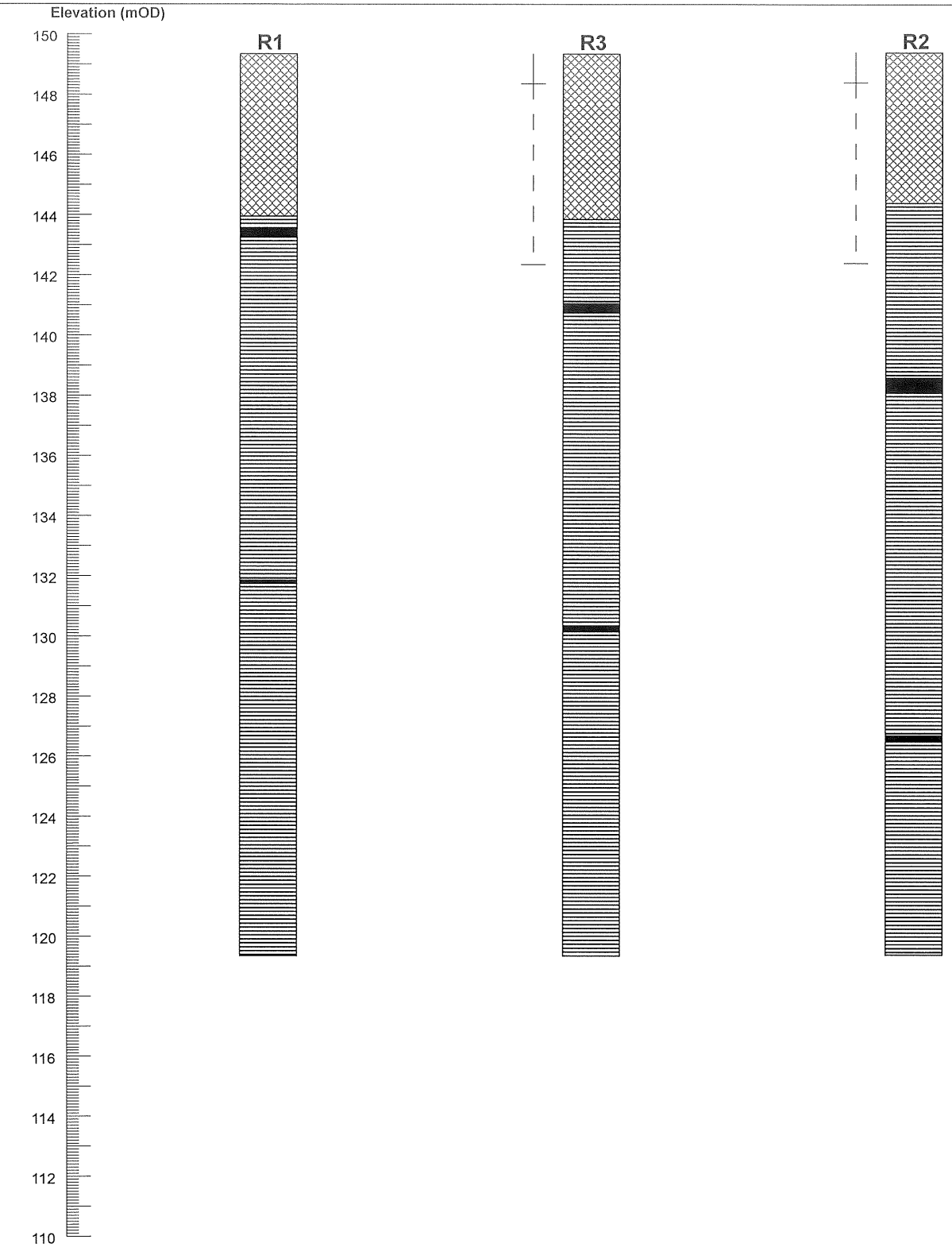
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
							(10.80)	Grey MUDSTONE.			
					21/06/2019:	119.35	30.00	Complete at 30.00m			

Remarks

Scale (approx)	Logged By
1:100	AJP/SJ

Figure No. NE3834.R3

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Key

- Groundwater Strike
- Strike Rise Level
- Highest recorded piezo level
- Piezometer Tip
- Slotted Standpipe
- MADE GROUND
- MUDSTONE
- COAL

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Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	06/08/2019		1/1	NE3834
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED			1:200[V]	NE3834.1

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Site
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Borehole Number
R4

Machine : BERETTA T44
Flush : MIST
Core Dia : NONE mm
Method : ROTARY OPEN HOLE & CORED

Casing Diameter
127mm to 7.50m

Ground Level (mOD)
149.50

Client
CARNELL MANAGEMENT SERVICES LIMITED

Job Number
NE3834B

Location
AS PLAN

Dates
13/03/2020-17/03/2020

Engineer
WILLIAM SAUNDERS

Sheet
1/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					Open holing (100mm dia) GL to 7.50m		(0.30)	MADE GROUND: brown silty topsoil.		
						149.20	0.30	MADE GROUND: soft to firm brown silty clay.		
							(0.90)			
						148.30	1.20	Firm brown and grey mottled silty CLAY / MUDSTONE.		
							(0.60)			
						147.70	1.80	Firm to stiff brown and grey MUDSTONE.		
							(0.90)			
						146.80	2.70	Black COAL.		
							(0.50)			
						146.30	3.20	Grey MUDSTONE.		
							(0.80)			
						145.50	4.00	Brown and grey shaley MUDSTONE.		
							(1.20)			

Remarks
Descriptions for open hole section based upon foreman driller records of flush returns.
Foreman driller recorded no voids or loss of flush returns.
On completion backfilled with arisings and grout.

Scale (approx)
1:25

Logged By
AJP/MJE

Figure No.
NE3834B.R4

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R4

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.50	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 13/03/2020-17/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Brown and grey shaley MUDSTONE.		
						144.30	5.20	Grey MUDSTONE.		
							(2.30)			
7.50					Rotary Coring (72mm diameter) 7.50m to 27.00m.	142.00	7.50 (0.10)	Stiff brownish grey slighlty gravelly clayey SILT. Gravel sized fragments are fine to coarse siltstone and coal. (completely weathered bedrock).		
7.60						141.90	7.60	Very weask very thinly to thinly bedded brownish grey highly weathered SILTSTONE, in parts completely weathered to clayey silt.		
				11			(0.73)			
8.33	97	37	9			141.17	8.33	Black freash COAL (recovered as fine to medium gravel sized fragments of coal).		
8.35				NI		141.15	8.35	Very weak very thinly to medium bedded grey with light brown staining slightly weathered SILTSTONE. .... at 8.38m: 5mm band of coal at 30 degree.		
				7.7			(0.40)			
8.77						140.75	8.75	Weak very thinly to thinly bedded, locally thickly laminated, grey with light grey staining moderately weathered SILTSTONE.		
				V			(0.50)			
9.00				8.0						
9.15				NI						
9.25				10		140.25	9.25	Very weak thinly to medium bedded grey fresh SILTSTONE. .... at 9.35m: 50mm band of thickly laminated highly weathered siltstone.		
9.35				NI						
9.40										
				9.2			(0.85)			
	93	61	37							

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R4
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.50	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 13/03/2020-17/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 3/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Very weak thinly to medium bedded grey fresh SILTSTONE.		
10.05				NI		139.40	10.10			
10.11				14			(0.50)	Medium strong becoming weak thinly bedded grey fresh fine grained SANDSTONE with smooth 70 degree joint.		
10.50						138.90	10.60			
10.62				11				Very weak very thinly to thinly bedded grey fresh, locally slighlty weathered, SILTSTONE.		
11.00				V						
11.15	91	36	29	18			(1.85)	.... at 11.35m: smooth 60 degree joint stained orangish brown.		
11.78				V						
12.00								.... at 12.25m: friable clayey silt on subvertical joint.		
12.45	92	60	53	5.5		137.05	12.45	Medium strong thinly to medium bedded fresh fine grained SANDSTONE.		
13.18				31		136.35	13.15 (0.15)	Extremely weak to very weak thickly laminated to thinly bedded grey fresh SILTSTONE.		
13.31				11		136.20	13.30 (0.20)	Medium strong medium bedded light grey fresh fine grained SANDSTONE.		
13.50	100	58	47	9.4		136.00	13.50 (1.05)	Weak medium becoming very thinly to thinly bedded grey with orangish brown staining slighlty weathered SILTSTONE.		
14.54				5.9		134.95	14.55	Medium strong thinly bedded grey and light grey banded fresh fine grained SANDSTONE.		
14.71				V			(0.30)			
14.84				6.3		134.65	14.85	Medium strong very thinly to thinly becoming medium bedded grey fresh fine grained SANDSTONE.		
15.00										

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

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Site	CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	**Borehole Number**	R4
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.50 **Dates** 13/03/2020-17/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 4/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				10			(0.45)	Medium strong very thinly to thinly becoming medium bedded grey fresh fine grained SANDSTONE.		
15.30						134.20	15.30			
				V				Very weak thinly bedded grey fresh SILTSTONE.		
								.... at 15.45m: 40mm band of highly to completely weathered siltstone.		
15.65	100	61	50	9.1			(0.70)			
15.98				NI		133.50	16.00	Medium strong thinly to medium bedded grey becoming with dark grey bands fresh fine grained SANDSTONE.		
16.08				6.3						
16.50				14			(1.00)	.... at 16.65m: fossilised tree/branch (55mm x 25mm)		
17.00				30		132.50	17.00	Weak thinly to medium bedded grey fresh SILTSTONE with interbedded medium strong fine grained sandstone.		
17.10				8.3						
17.22	91	41	27	10						
17.32				25			(0.70)			
17.36				V						
17.69				9.7		131.80	17.70	Medium strong very thinly to thinly bedded grey fresh fine grained SANDSTONE.		
							(0.30)			
18.00				V		131.50	18.00	Medium strong thinly bedded becoming thickly laminated grey with orangish brown staining slightly weathered fine grained SANDSTONE.		
18.10				NI			(0.25)			
18.15				V						
18.23				NI		131.25	18.25	Extremely weak thickly laminated black fresh vitreous COAL.		
18.30				>100			(0.15)			
18.41						131.10	18.40	Firm thickly laminated grey, light grey and black mottled gravelly silty CLAY. (seatearth)		
18.52						131.00	(0.10) 18.50			
				3.0			(0.35)	Extremely weak thinly laminated grey highly weathered MUDSTONE, in parts completely weathered to silty clay.		
	99	53	38							
18.85				9.6		130.65	18.85	.... at 18.83m: 20mm band of black carbonacaous mudstone.		
							(0.50)	Extremely weak thinly laminated grey fresh SILTSTONE.		
19.37				15		130.15	19.35	.... at 19.25m: brown rounded coarse gravel sized ironstone nodules.		
19.50								Medium strong becoming weak very thinly to medium bedded grey fresh SILTSTONE.		
				7.1			(1.00)			

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R4
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.50	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 13/03/2020-17/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 5/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
	94	79	66					Medium strong becoming weak very thinly to medium bedded grey fresh SILTSTONE.		
						129.15	20.35			
20.35				NI			(0.15)	Very weak thickly laminated to very thinly bedded grey fresh SILTSTONE.		
20.52				23		129.00	20.50			
							(0.15)	Weak very thinly to thinly bedded grey fresh SILTSTONE.		
20.65						128.85	20.65			
				2.9	13/03/2020:DRY			Medium strong thinly to medium bedded light grey fresh fine grained SANDSTONE.		
21.00					17/03/2020:DRY					
				15						
21.27										
							(1.50)			
	95	77	55	2.4						
				V		127.35	22.15	.... at 22.10m: subvertical joint.		
22.10										
22.15								Weak very thinly to medium bedded grey fresh SILTSTONE.		
22.50										
				5.5						
	95	75	64							
							(3.00)			
23.80				V				.... at 23.80m: subvertical joint.		
24.00										
				13						
24.45				V				.... at 24.45m: subvertical joint.		
24.54										
				12						
	84	54	35							
24.80				V				.... at 24.80m: subvertical joint.		
24.87				5.6						

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R4

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.50	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 13/03/2020-17/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 6/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Weak very thinly to medium bedded grey fresh SILTSTONE.		
25.05				V						
25.15						124.35	25.15 (0.10)	.... at 25.05m: subvertical joint.		
				20		124.25	25.25	Very weak very thinly bedded dark grey fresh carboarceous MUDSTONE.		
25.25							(0.40)	MINEWORKINGS (void).		
25.50										
25.65						123.85	25.65 (0.15)	Weak very thinly bedded becoming thickly laminated grey fresh SILTSTONE.		
				20		123.70	25.80 (0.20)	Very weak thinly bedded becoming thickly laminated grey fresh MUDSTONE.		
				100		123.50	26.00	Extremely weak thinly to thickly laminated highly weathered SILTSTONE.		
26.00						123.45	26.05			
26.06	88	49	27					Very weak very thinly to medium bedded grey fresh SILTSTONE.		
				12			(0.95)			
26.80				V				.... at 26.80m: 70 degree and subvertical joint.		
27.00					17/03/2020:DRY	122.50	27.00	Complete at 27.00m		

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

Figure No. NE3834B.R4

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Site
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Borehole Number
R5

Machine : BERETTA T44
Flush : MIST
Core Dia : NONE mm
Method : ROTARY OPEN HOLE & CORED

Casing Diameter
127mm to 7.50m

Ground Level (mOD)
149.55

Client
CARNELL MANAGEMENT SERVICES LIMITED

Job Number
NE3834B

Location
AS PLAN

Dates
17/03/2020-18/03/2020

Engineer
WILLIAM SAUNDERS

Sheet
1/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					Open holing (100mm dia) GL to 7.50m		(0.80)	MADE GROUND: soft brown sandy silty clay.		
						148.75	0.80			
							(0.20)	MADE GROUND: soft to firm light brown silty clay.		
						148.55	1.00			
							(0.40)	MADE GROUND: soft to firm grey silty clay.		
						148.15	1.40			
							(0.70)	MADE GROUND: firm grey and brown silty clay and mudstone.		
						147.45	2.10			
							(0.20)	MADE GROUND: dark grey silty clay and mudstone.		
						147.25	2.30			
							(3.30)	Light grey and brown mottled silty CLAY / MUDSTONE.		

Remarks
Descriptions for open hole section based upon foreman driller records of flush returns.
Foreman driller recorded broken ground and loss of flush returns from 16.50m to 17.70m.
On completion backfilled with arisings and grout.

Scale (approx)
1:25

Logged By
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Figure No.
NE3834B.R5

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SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907

Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R5
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.55	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 17/03/2020-18/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Light grey and brown mottled silty CLAY / MUDSTONE.		
						143.95	5.60			
							(0.20)	Dark grey MUDSTONE.		
						143.75	5.80			
								Grey MUDSTONE.		
							(1.70)			
7.50						142.05	7.50		Fe	
				V	Rotary Coring (72mm dia) 750m to 27.00m		(0.20)	Medium strong very thinly to thinly bedded grey with brown and orangish brown staining moderately weathered IRONSTONE with irregular subvertical joint.	Fe Fe	
7.70						141.85	7.70			
	98	63	9	10			(1.30)	Very weak thinly to medium bedded grey with orangish brown stained discontinuities slightly weathered SILTSTONE.		
9.00						140.55	9.00			
	97	57	17	13			(1.50)	Very weak to weak very thinly to thinly bedded grey with orangish brown stained discontinuities slightly weathered SILTSTONE.		

Remarks

Scale (approx)	Logged By
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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R5

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.55	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 17/03/2020-18/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 3/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Very weak to weak very thinly to thinly bedded grey with orangish brown stained discontinuities slightly weathered SILTSTONE.		
10.50						139.05	10.50			
							(0.20)	Stiff grey and orangish brown mottled slightly gravelly silty CLAY. (completely weathered mudstone).		
10.70				>100		138.85	10.70			
							(0.15)	Extremely weak thinly to thickly laminated grey and orangish brown mottled highly weathered MUDSTONE, in parts completely weathered to silty clay.		
10.85				40		138.70	10.85			
							(0.20)	Very weak very thinly bedded grey with orangish brown staining slightly weathered SILTSTONE.		
11.05	91	37	23	2.5		138.50	11.05	.... at 10.95m: lamination of coal.		
							(0.40)	Weak to medium strong medium bedded light grey fresh SILTSTONE with quartz vein.		
11.45				24		138.10	11.45	Very weak grey very thinly to thinly bedded grey with orangish brown stained discontinuities slightly weathered SILTSTONE.		
							(0.70)			
12.00				6.7						
12.15						137.40	12.15			
12.20				5.0		137.35	12.20	Stiff grey and brown mottled slightly gravelly silty CLAY. (completely weathered mudstone).		
							(0.40)	Very weak medium becoming thinly bedded grey with orangish brown stained discontinuities slightly weathered SILTSTONE.		
12.60	91	59	43	17		136.95	12.60	Very weak very thinly to thinly bedded grey with orangish brown stained discontinuities slightly weathered SILTSTONE.		
12.95				V				.... at 12.60m: 45 degree joint.		
13.10				7.5				.... at 12.95m: subvertical joint.		
13.50							(2.40)			
	92	46	15	11	17/03/2020:DRY					
15.00					18/03/2020:DRY					

Remarks

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R5

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.55	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 17/03/2020-18/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 4/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						134.55	15.00	Very weak very thinly to medium bedded fresh SILTSTONE.		
								.... at 15.10m: 10 to 45 degree dark grey polished joint.		
				10						
	93	41	31				(1.50)			
15.90								.... at 15.90m: subvertical joint.		
				V						
16.35				10						
16.50				V	From 16.50m: 80% flush returns.	133.05	16.50 (0.15)	Extremely weak very thinly bedded grey highly weathered SILTSTONE.		
16.65				NI		132.90	16.65 (0.20)	Weak thickly laminated black with light grey staining slightly weathered COAL. (broken remnants of mineworkings).		
16.85				>100		132.70	16.85 (0.35)	Extremely weak thinly laminated grey highly weathered MUDSTONE with much becoming a little silty clay.		
17.20	89	33	0			132.35	17.20 (0.75)	Extremely weak becoming very weak grey highly weathered MUDSTONE, at top with many leaf fossils.		
				19						
17.95						131.60	17.95	Weak very thinly to medium bedded grey and light grey banded fresh SILTSTONE.		
18.00					From 18.00m: 100% flush returns.		(0.75)			
				9.3						
18.70						130.85	18.70 (0.20)	Very weak very thinly to thinly bedded grey with orangish brown staining slightly weathered SILTSTONE.		
	95	39	22			130.65	18.90	Medium strong medium becoming thinly bedded grey with orangish brown staining slightly to moderately weathered fine grained SANDSTONE.		
				V			(0.60)			
19.50						130.05	19.50	Very weak to weak thinly bedded grey fresh SILTSTONE.		
				7.5			(0.40)			
19.90						129.65	19.90	SILTSTONE (as sheet 5/6)		
				53						

Remarks

Scale (approx)	Logged By
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Figure No. NE3834B.R5

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R5
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.55 **Dates** 17/03/2020-18/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 5/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.15)			
						129.50	20.05	Very weak thickly laminated to very thinly bedded grey with orangish brown staining slightly weathered SILTSTONE.		
20.05	97	65	58	5.0				Weak thinly to medium bedded grey fresh to slightly weathered SILTSTONE.		
20.45				V				.... at 20.45m: orangish brown stained subvertical joint.		
20.75							(1.65)			
21.00				6.3						
21.70	94	84	82			127.85	21.70			
21.75				2.7		127.80	21.75	Firm grey and brown mottled gravelly clayey SILT. Gravel sized fragments are fine to medium siltstone lithorelicts. (completely weathered siltstone).		
								Weak medium becoming very thinly bedded grey fresh SILTSTONE.		
22.50							(1.80)	.... at 22.70m: 10mm band of firm silty clay.		
	97	60	60	5.9						
23.35				NI						
23.55						126.00	23.55			
23.62				1.0		125.90	(0.10) 23.65	Friable brownish grey gravelly clayey SILT.		
23.70				6.7		125.85	23.70	Extremely weak thickly laminated dark grey MUDSTONE.		
23.85						125.70	(0.15) 23.85	Medium strong thinly bedded grey SILTSTONE.		
23.95				20		125.60	(0.10) 23.95	Friable brownish grey gravelly clayey SILT.		
24.00						125.55	24.00	Weak very thinly bedded grey MUDSTONE.		
								Weak thinly bedded, in parts thickly laminated, grey fresh SILTSTONE.		
				18			(1.25)			
	100	53	24							

Remarks

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R5
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.55	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 17/03/2020-18/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 6/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Weak thinly bedded, in parts thickly laminated, grey fresh SILTSTONE.		
25.25						124.30	25.25			
				V				Weak very thinly bedded becoming very weak thinly bedded grey fresh SILTSTONE.		
25.50							(0.45)			
25.60				10						
25.70						123.85	25.70	Very weak very thinly to thinly bedded fresh SILTSTONE with bands of broken extremely weak thinly to thickly laminated highly to completely weathered siltstone.		
	94	23	0	40			(0.85)			
				NI		123.00	26.55			
26.55						122.95	26.60	Weak thickly laminated dark grey with light grey staining slightly weathered carbonaceous MUDSTONE.		
26.60				V			(0.20)			
						122.75	26.80	Very weak to weak thickly laminated black with light grey staining slightly weathered dull COAL with orangish brown veins.		
26.80				10			(0.10)			
						122.65	26.90			
27.00					18/03/2020:DRY	122.55	(0.10) 27.00	Very weak thinly bedded grey fresh SILTSTONE with leaf fossils. (seatearth)		
								Extremely weak very thinly bedded highly weathered SILTSTONE.		
								Complete at 27.00m		

Remarks

Scale (approx)	Logged By
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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R6

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.50	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 12/03/2020-13/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 1/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					Open holing (100mm dia) GL to 7.50m		(0.40)	MADE GROUND: firm grey and brown mottled silty clay.		
						149.10	0.40	MADE GROUND: soft light brown silty clay.		
							(1.60)			
					Water Inflow(1) at 1.50m.					▽1
						147.50	2.00	MADE GROUND: firm grey silty clay and mudstone.		
							(0.70)			
						146.80	2.70	MADE GROUND: firm to stiff brown and grey silty clay and mudstone.		
							(2.30)			

Remarks
Descriptions for open hole sections based upon foreman driller records of flush returns.
Foreman driller recorded no loss of flush returns but mineworkings at 24.10m.
On completion backfilled with arisings and grout.

Scale (approx)	Logged By
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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R6

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.50	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 12/03/2020-13/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						144.50	5.00	Firm light brown silty CLAY.		
							(1.00)			
						143.50	6.00	Grey and brown MUDSTONE.		
							(1.50)			
7.50					Rotary Coring (72mm dia) 7.50m - 25.50m	142.00	7.50	Stiff brown, orangish brown and occasional light grey mottled silty CLAY. (completely weathered siltstone).		
							(0.20)			
7.70						141.80	7.70	Very weak very thinly to thinly bedded grey with light brown staining highly weathered SILTSTONE.		
				19						
	94	47	0				(0.95)			
8.50				V						
8.65						140.85	8.65	Very weak very thinly to thinly bedded grey with light brown staining highly to moderately weathered SILTSTONE.		
				8.6						
							(0.45)			
9.00				20						
9.10				NI		140.40	9.10	Extremely weak thickly laminated becoming very thinly to thinly bedded grey with brown staining moderately to highly weathered SILTSTONE.		
9.20										
				17			(0.40)			
9.50				V		140.00	9.50	Weak very thinly bedded grey with orangish brown staining moderately weathered fine grained SANDSTONE.		
9.65							(0.15)			
						139.85	9.65	Weak very thinly to medium bedded grey with orangish brown staining slightly weathered SILTSTONE.		
	95	65	35							

Remarks

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R6
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.50 **Dates** 12/03/2020-13/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 3/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				13			(0.70)	Weak very thinly to medium bedded grey with orangish brown staining slightly weathered SILTSTONE.		
10.35					12/03/2020:	139.15	10.35	Medium strong becoming weak very thinly to thinly bedded grey with orangish brown staining slightly weathered fine grained SANDSTONE.		
10.50				12	13/03/2020:		(0.60)			
10.85				V		138.55	10.95	Very weak very thinly to thinly bedded grey with orangish brown staining slightly weathered SILSTONE.		
10.95				7.4						
11.17	89	51	13	V			(0.65)			
11.60				10		137.90	11.60 (0.10)	Weak thinly bedded grey with light grey staining slightly weathered fine grained SANDSTONE.		
11.70				20		137.80	11.70 (0.30)	Very weak very thinly to thinly bedded grey fresh SILTSTONE.		
12.00				12		137.50	12.00 (0.30)	Weak very thinly to thinly bedded grey fresh fine grained SANDSTONE.		
12.22				NI						
12.30				15		137.20	12.30 (0.30)	Very weak very thinly to thinly bedded grey fresh SILTSTONE.		
12.47	93	34	20	V		136.90	12.60 (0.30)	Weak very thinly to medium bedded grey fresh fine grained SANDSTONE.		
12.90				17		136.60	12.90 (0.60)	Very weak thinly to medium bedded becoming very thinly bedded grey fresh SILTSTONE.		
13.50				14		136.00	13.50			
13.57				13		135.95	13.55 (0.55)	Medium strong very thinly bedded grey fresh fine grained SANDSTONE. Very weak thinly becoming very thinly bedded grey fresh SILTSTONE.		
14.10	93	33	9	V		135.40	14.10 (0.30)	Very weak to weak thickly laminated black with light grey staining slightly weathered COAL.		
14.40				20		135.10	14.40 (0.20)	Very weak very thinly bedded grey fresh MUDSTONE.		
14.60				>100		134.90	14.60 (0.20)	Extremely weak thickly laminated grey highly weathered MUDSTONE with occasional thick laminations of coal.		
14.82				V		134.70	14.80	Very weak very thinly to thinly bedded, in parts thickly laminated, grey fresh SILTSTONE.		
15.00										

Remarks

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R6
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.50	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 12/03/2020-13/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 4/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				23			(0.85)	Very weak very thinly to thinly bedded, in parts thickly laminated, grey fresh SILTSTONE.		
15.65	97	61	40	13		133.85	15.65 (0.10)	Extremely weak thickly laminated grey highly weathered MUDSTONE.		
15.73				10		133.75	15.75 (0.75)	Weak very thinly to medium bedded grey fresh fine grained SANDSTONE with plant fossils.		
16.50				7.7		133.00	16.50 (0.15)	Weak thinly bedded grey fresh SILTSTONE.		
16.63	98	63	44	6.1		132.85	16.65 (1.05)	Weak thinly to medium bedded grey fresh to slightly weathered fine grained SANDSTONE.		
17.29				V				.... from 17.30m: orangish brown stained subvertical joint.		
17.68				6.3		131.80	17.70 (0.30)	Very weak medium becoming very thinly grey with orangish brown staining slightly weathered SILTSTONE.		
18.00	97	73	35	12		131.50	18.00 (1.10)	Very weak very thinly to thinly bedded grey fresh SILTSTONE.		
19.10				16		130.40	19.10	.... at 19.09m: 10mm band of stiff gravelly clayey silt.		
19.29				V				Weak very thinly to thinly bedded grey fresh SILTSTONE. .... from 19.29m: subvertial joint.		
19.50										
19.65				9.6				.... at 19.87m: wet and highly weathered on bedding plane.		

Remarks

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Site	CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	**Borehole Number**	**R6**
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.50 **Dates** 12/03/2020-13/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 5/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.90)	Weak very thinly to thinly bedded grey fresh SILTSTONE.		
20.17	97	48	34	V				.... from 20.17m: 3 subvertical joints and broken.		
20.55				13				.... at 20.75m: 45 degree joint.		
21.00						128.50	21.00			
				V			(0.15)	Very weak thickly laminated to very thinly bedded dark grey slightly weathered carbonaceous MUDSTONE.		
						128.35	21.15			
							(0.15)	Weak very thinly bedded grey slightly weathered SILTSTONE with many fissures and fossils. (seatearth).		
21.32				26		128.20	21.30			
							(0.35)	Very weak very thinly to thinly bedded grey fresh SILTSTONE.		
						127.85	21.65			
21.67	96	30	11	64			(0.15)	Very weak thickly laminated to very thinly bedded grey slightly weathered silty MUDSTONE.		
21.81						127.70	21.80			
				16				Weak very thinly to thinly bedded grey fresh SILTSTONE.		
							(0.70)			
22.23				V						
22.50						127.00	22.50			
				17			(0.30)	Very weak thinly bedded, locally thickly laminated, grey fresh SILTSTONE.		
						126.70	22.80			
22.80				V			(0.15)	Very weak thickly laminated to very thinly bedded grey with light grey staining slightly weathered SILTSTONE.		
22.93						126.55	22.95			
				28				Weak becoming very weak very thinly to thinly bedded grey fresh SILTSTONE.		
	95	59	8							
23.43				NI			(0.95)			
23.55				17						
23.89				50		125.60	23.90			
23.91				NI			(0.10)	Weak very thinly bedded black with light grey staining slightly weathered COAL.		
24.00						125.50	24.00			
24.02							(0.10)			
24.10						125.40	24.10	MINEWORKINGS (remnant void)		
				10				Very weak becoming weak thinly bedded grey fresh MUDSTONE with relic rootlets. (seatearth).		
							(0.40)			
24.50				NI		125.00	24.50			
24.59						124.91	(0.09) 24.59	Weak thickly laminated black slightly weathered COAL.		
								Very weak very thinly to thinly bedded grey fresh MUDSTONE.		
	89	72	40	12			(0.51)			

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

Figure No. NE3834B.R6

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SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
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Site			**Borehole Number**
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**R6**
Machine : BERETTA T44	**Casing Diameter**	**Ground Level (mOD)**	**Client**
Flush : MIST	127mm to 7.50m	149.50	CARNELL MANAGEMENT SERVICES LIMITED
Core Dia : NONE mm			**Job Number** NE3834B
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 12/03/2020-13/03/2020	**Engineer** WILLIAM SAUNDERS
			Sheet 6/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						124.40	25.10	Very weak very thinly to thinly bedded grey fresh MUDSTONE.		
25.10				10			(0.40)	Weak thinly bedded light grey slightly weathered fine grained SANDSTONE. .... at 25.30m: 45 degree orangish brown stained joint.		
25.50					Open holing (70mm dia) 25.50m to 28.00m	124.00	25.50	Dark grey MUDSTONE.		
							(2.50)			
					13/03/2020:	121.50	28.00	Complete at 28.00m		

Remarks

Scale (approx)	Logged By
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Figure No. NE3834B.R6

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Site
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Borehole Number
R7

Machine : BERETTA T44
Flush : MIST
Core Dia : NONE mm
Method : ROTARY OPEN HOLE & CORED

Casing Diameter
127mm to 7.50m

Ground Level (mOD)
149.55

Client
CARNELL MANAGEMENT SERVICES LIMITED

Job Number
NE3834B

Location
AS PLAN

Dates
11/03/2020-12/03/2020

Engineer
WILLIAM SAUNDERS

Sheet
1/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					Open holing (100mm dia) GL to 7.50m		(0.20)	MADE GROUND: stone hardcore.		
						149.35	0.20	MADE GROUND: Soft grey and brown mottled silty clay.		
							(0.60)			
						148.75	0.80	MADE GROUND: Soft brown and orange mottled silty clay.		
							(0.30)			
						148.45	1.10	MADE GROUND: Soft grey silty clay.		
							(1.90)			
						146.55	3.00	Grey silty CLAY / MUDSTONE.		
							(0.60)			
						145.95	3.60	Brown and grey mottled silty CLAY / MUDSTONE.		
							(1.90)			

Remarks
Descriptions for open hole section based upon foreman driller records of flush returns.
Foreman driller recorded water inflow, soft ground and loss of flush from 9.00m to 10.50m and from 13.50m to 15.00m.
On completion backfilled with arisings and grout.

Scale (approx)
1:25

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Figure No.
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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R7
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.55	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 11/03/2020-12/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								Brown and grey mottled silty CLAY / MUDSTONE.		
						144.05	5.50	Brown MUDSTONE.		
							(0.60)			
						143.45	6.10	Grey MUDSTONE.		
							(1.40)			
7.50				NI	Rotary Coring (72mm dia) 7.50m to 27.00m.	142.05	7.50	Medium strong thickly laminated brown fine grained SANDSTONE with ironstone nodules in silty clay matrix.		
7.69						141.85	(0.20) 7.70	Stiff brownish grey gravelly silty CLAY.		
7.74				9.1		141.80	7.75 (0.30)	Extremely weak very thinly to thinly bedded brownish grey with black and orangish brown staining highly weathered SILTSTONE.		
8.07	95	35	27	7.5		141.50	8.05 (0.95)	Very weak becoming weak medium becoming thinly bedded grey with dark orangish brown staining moderately becoming slightly weathered SILTSTONE.		
9.00					From 9.00m 70% flush returns.	140.55	9.00	MINEWORKINGS (void).		
9.50				NI		140.05	(0.50) 9.50	Weak thickly laminated grey with orangish brown staining slightly weathered (broken) SILTSTONE.		
9.60	63	20	0			139.95	(0.10) 9.60	Weak very thinly to thinly bedded grey with orangish brown staining slightly weathered SILTSTONE.		

Remarks

Scale (approx)	Logged By
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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R7

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.55	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 11/03/2020-12/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 3/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				16			(0.90)	Weak very thinly to thinly bedded grey with orangish brown staining slightly weathered SILTSTONE.		
10.40				NI		139.05	10.50			
10.50				14	From 10.50m 100% flush returns.			Very weak very thinly to thinly bedded grey fresh SILTSTONE.		
							(0.95)			
11.00				NI				.... at 11.00m: broken siltstone.		
11.10	89	37	19	14						
11.45				45		138.10	11.45	Weak very thinly bedded light grey with orangish brown staining slightly weathered SILTSTONE.		
11.65				V		137.90	(0.20) 11.65	Extremely weak becoming weak to medium strong very thinly to thinly bedded grey with dark orangish brown stained discontinuities slightly weathered SILTSTONE. .... from 11.65m to 11.95m: completely weathered to gravelly clayey silt on subvertical joint.		
11.90										
12.00				14			(0.85)			
12.25				V						
12.50						137.05	12.50	Medium strong medium bedded light grey fresh fine grained SANDSTONE.		
	95	49	44	1.8			(0.50)			
13.01				20		136.55	13.00	Medium strong very thinly to thinly bedded dark grey with orangish brown staining slightly weathered SILTSTONE.		
13.31				V			(0.50)			
13.50					From 13.50m 70% flush returns.	136.05	13.50	Weak thinly bedded grey fresh SILTSTONE. .... from 13.50m to 13.65m: 60 degree joint.		▽1
				11	Water Inflow(1) at 13.70m.		(0.40)			
13.90				50		135.65	13.90	Medium strong thickly laminated grey fresh IRONSTONE.		
13.94				V		135.63	13.92	Very weak thickly laminated becoming weak very thinly to thinly bedded grey fresh SILTSTONE.		
14.04	75	25	8	20			(0.68)			
14.60						134.95	14.60	MINEWORKINGS (void).		
15.00							(0.60)			

Remarks

Scale (approx)	Logged By
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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R7

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.55	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE & CORED	**Location** AS PLAN	**Dates** 11/03/2020-12/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 4/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					From 15.00m 100% flush returns.			MINEWORKINGS (void).		
15.18				NI		134.35	15.20 (0.15)	STOWED WASTE/COLLAPSED GROUND: soft grey and dark grey mottled slightly gravelly silty clay. Gravel sized fragments are fine mudstone.		
15.33				7.7		134.20	15.35 (0.10)			
15.46				27		134.10	15.45	Extremely weak thinly laminated black fresh carbonaceous MUDSTONE with laminae of coal.		
15.61	88	38	7	13			(0.65)	Very weak very thinly to thinly bedded dark grey becoming grey fresh MUDSTONE.		
15.91				V						
16.09				15		133.45	16.10 (0.40)	Very weak very thinly to thinly bedded grey fresh SILTSTONE.		
16.50				8.0		133.05	16.50 (0.75)	Weak medium becoming very thinly bedded grey fresh SILTSTONE.		
17.25	97	45	36	V		132.30	17.25 (0.75)	Medium strong medium becoming thinly bedded light grey with orangish brown staining moderately weathered fine grained SANDSTONE with four dark reddish brown stained subvertical joints		
18.00						131.55	18.00 (0.22)	MINEWORKINGS (void).		
18.25				V		131.33	18.22	STOWED WASTE: friable slightly gravelly clayey silt. Gravel sized fragments are siltstone.		
18.60	82	49	45	4.3		131.30	18.25 (0.35)	Weak thickly laminated to thinly bedded grey with orangish brown staining moderately weathered SILTSTONE with dark orangish brown stained subvertical joint.		
19.30						130.95	18.60 (0.70)	Weak medium bedded grey fresh SILTSTONE.		
19.50				12	11/03/2020: 12/03/2020:	130.25	19.30	Weak very thinly to thinly bedded grey fresh SILTSTONE.		

Remarks

Scale (approx)	Logged By
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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R7
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.55 **Dates** 11/03/2020-12/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 5/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(1.55)	Weak very thinly to thinly bedded grey fresh SILTSTONE.		
	89	52	28							
20.30				V				.... at 20.30m: subvertical joint.		
20.45				9.8						
						128.70	20.85			
20.86							(0.25)	Friable clayey SILT (completely weathered siltstone).		
21.00						128.45	21.10			
21.10				7.5				Weak thickly laminated to thinly bedded grey fresh SILTSTONE.		
							(0.70)			
21.50				NI						
21.60	94	47	29	35						
21.80				>100		127.75	21.80	Very weak thinly laminated to weak thinly bedded dark grey fresh MUDSTONE with occasional laminae of black carbonaceous mudstone.		
							(0.25)			
22.05				11		127.50	22.05	Very weak thinly bedded dark grey fresh SILTSTONE.		
							(0.35)			
22.40				V		127.15	22.40	Weak very thinly to medium bedded grey fresh SILTSTONE.		
22.50										
				12			(1.35)			
	95	43	8							
23.51				V				.... from 23.50m: two subvertical joints at right angles to each other.		
23.76				>100		125.80	23.75	Extremely weak to very weak thinly to thickly laminated dark grey fresh MUDSTONE, in parts completely weathered to gravelly silty clay.		
23.93				29			(0.20)			
24.00				40		125.60	23.95	Weak thickly laminated to very thinly bedded grey fresh SILTSTONE.		
24.05				33		125.50	(0.10) 24.05	Very weak thickly laminated to thinly bedded dark grey fresh MUDSTONE.		
							(0.50)			
24.38				V		125.00	24.55	Weak thickly laminated grey fresh SILTSTONE.		
24.62				10		124.95	24.60	Very weak to weak thickly laminated to very thinly bedded black fresh carbonaceous MUDSTONE (30mm) over vitreous COAL (220mm).		
	99	35	7				(0.25)			
24.82				>100		124.70	24.85	MUDSTONE (as sheet 6/6).		
24.84				10						

Remarks

Scale (approx)	Logged By
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Figure No. NE3834B.R7

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R7
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE & CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.55	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 11/03/2020-12/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 6/6

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(0.30)	Extremely weak very thinly to thinly bedded grey fresh MUDSTONE.		
25.13				>100		124.40	25.15 (0.10)	Very weak thickly laminated black fresh COAL.		
25.26				22		124.30	25.25 (0.10)	Extremely weak very thinly bedded dark grey fresh MUDSTONE.		
25.35				20		124.20	25.35 (0.25)	Very weak thinly bedded grey fresh SILTSTONE.		
25.50				NI						
25.58				100		123.95	25.60	Very weak thinly laminated dark grey fresh carbonaceous MUDSTONE.		
25.66				V 33		123.90	25.65			
25.70						123.85	25.70	Weak very thinly bedded grey fresh SILTSTONE.		
25.76						123.80	25.75	Extremely weak thinly laminated grey fresh MUDSTONE.		
				5.8			(0.70)	Weak thinly becoming medium bedded light grey with grey bands fresh fine grained SANDSTONE.		
	96	65	38							
26.45						123.10	26.45	Medium strong very thinly to thinly bedded grey fresh fine grained SANDSTONE.		
				20			(0.55)			
26.89				V						
27.00					12/03/2020:	122.55	27.00	Complete at 27.00m		

Remarks

Scale (approx)	Logged By
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Figure No. NE3834B.R7

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R8
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE/CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.40	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 09/03/2020-10/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 1/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					Open holing (100mm dia.) GL to 7.50m		(2.00)	MADE GROUND: black ashy stone hardcore.		
						147.40	2.00	Light brown and cream mottled silty CLAY / MUDSTONE.		
							(2.50)			
						144.90	4.50	Brown and grey MUDSTONE.		

Remarks
Descriptions for open hole section based upon foreman driller records of flush returns. Foreman driller recorded rods dropped through void at 12.00m, loss of flush returns from 12.00m to 13.50m, 16.50m to 18.00m, 19.50m to 21.00m and total loss of flush returns at 24.10m (terminated at 24.30m).
On completion backfilled with arisings and grout.

Scale (approx)	Logged By
1:25	AJP/MJE

Figure No. NE3834B.R8

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Site	Borehole Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	R8

Machine	Casing Diameter	Ground Level (mOD)	Client	Job Number
BERETTA T44	127mm to 7.50m	149.40	CARNELL MANAGEMENT SERVICES LIMITED	NE3834B
Flush : MIST				
Core Dia : NONE mm				
Method : ROTARY OPEN HOLE/CORED	**Location** AS PLAN	**Dates** 09/03/2020-10/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 2/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
							(3.00)	Brown and grey MUDSTONE.		
7.50					Rotary Coring (72mm dia.) 7.50m to 24.30m	141.90	7.50 (0.20)	Very stiff friable brown gravelly clayey SILT with occasional gravel sized ironstone nodules. Gravel sized fragments are medium to coarse siltstone (completely weathered siltstone).		
7.70						141.70	7.70	Very weak very thinly to thinly bedded brownish grey becoming grey with orangish brown staining moderately weathered SILTSTONE.		
	95	39	7	7.5			(0.80)			
8.50				18		140.90	8.50 (0.15)	Medium strong very thinly bedded grey with orangish brown staining slightly weathered fine grained SANDSTONE.		
8.61				V		140.75	8.65	Extremely weak thinly bedded brownish grey with dark orangish brown staining highly weathered SILTSTONE.		
8.93				14			(0.40)			
9.00				NI						
9.07				5.0		140.35	9.05 (0.20)	Weak thickly laminated to thinly bedded grey with brown staining moderately weathered SILTSTONE.		
9.27				8.7		140.15	9.25 (0.50)	Medium strong thinly bedded light grey fresh fine grained SANDSTONE. .... from 9.66m: with dark grey laminations.		
9.73	100	83	42			139.65	9.75	Very weak thinly to medium bedded fresh SILTSTONE.		

Remarks

Scale (approx)	Logged By
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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R8
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE/CORED	**Casing Diameter** 127mm to 7.50m	**Ground Level (mOD)** 149.40	**Client** CARNELL MANAGEMENT SERVICES LIMITED	**Job Number** NE3834B
	Location AS PLAN	**Dates** 09/03/2020-10/03/2020	**Engineer** WILLIAM SAUNDERS	**Sheet** 3/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				5.7			(0.70)	SILTSTONE (as sheet 2/5) .... at 10.05m and 10.20m: pockets of medium to coarse ironstone nodules.		
10.43				14		138.95	10.45			
10.50						138.90	10.50 (0.10)	Medium strong thinly bedded grey fresh fine grained SANDSTONE.		
10.62				11		138.80	10.60	Friable light grey slightly gravelly clayey SILT. Gravel sized fragments are fine siltstone lithorelicts (completely weathered siltstone).		
	91	47	31				(0.65)	Medium strong very thinly to medium bedded light grey and grey banded fresh fine grained SANDSTONE.		
11.27				17		138.15	11.25 (0.10)	Extremely weak very thinly bedded dark grey fresh MUDSTONE.		
11.33				5.9		138.05	11.35 (0.15)	Very weak thinly bedded grey fresh SILTSTONE.		
11.50				V		137.90	11.50 (0.10)	Weak thinly bedded grey fresh fine grained SANDSTONE.		
11.60				7.5		137.80	11.60	Very weak grey thinly bedded grey fresh SILTSTONE.		
12.00					From 12.00m rods dropped (void), 80% flush returns and loose drilling.	137.40	12.00 (0.35)	MINEWORKINGS (void).		
12.36				15	From 12.50m firm drilling.	137.05	12.35	Very weak becoming weak very thinly to thinly bedded grey fresh SILTSTONE.		
12.62	76	38	0	19			(0.55)			
12.89						136.50	12.90	Extremely weak brownish grey MUDSTONE.		
12.93				30		136.45	12.95			
13.03				V		136.40	13.00	Medium strong light grey fresh fine to medium grained SANDSTONE with 5mm band of coal.		
							(0.30)	Weak thickly laminated black fresh vitreous COAL.		
13.32				11		136.10	13.30 (0.10)	Very stiff thinly laminated grey silty CLAY. (seatearth).		
13.50					From 13.50m 100% flush returns.	136.00	13.40	Extremely weak thinly to thickly laminated grey highly weathered MUDSTONE with bands of siltstone and laminae of coal.		
13.61				21			(0.50)			
13.89				3.3		135.50	13.90	Very weak medium becoming very thinly bedded grey fresh SILTSTONE.		
14.19								.... at 14.19m: 40mm band of stiff grey slightly gravelly clayey silt.		
14.23	97	50	32	16			(0.90)			
14.79				38		134.60	14.80 (0.15)	Very weak thickly laminated dark grey highly weathered MUDSTONE, in parts completely weathered to silty clay.		
14.95						134.45	14.95			
15.00										

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

Figure No. NE3834B.R8

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SUB SURFACE

SITE INVESTIGATION SPECIALISTS, GEOTECHNICAL & ENVIRONMENTAL CONSULTANTS
3 Peel Street, Preston, Lancashire, PR2 2QS. Tel: (01772) 561135 Fax: (01772) 204907

Site	CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	**Borehole Number**	R8
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE/CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.40 **Dates** 09/03/2020-10/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 4/5

Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				V						
15.05				22			(0.35)	Very weak thickly laminated becoming very thinly to thinly bedded dark grey slightly weathered SILTSTONE.		
15.28						134.10	15.30			
				10			(0.25)	Weak thinly bedded grey fresh fine grained SANDSTONE.		
15.57				NI		133.85	15.55			
15.65	92	74	39					Weak becoming very weak dark grey and grey banded fresh SILTSTONE.		
				11			(0.75)			
16.30					09/03/2020:DRY	133.10	16.30			
16.35						133.05	16.35	Very stiff thinly laminated grey gravelly clayey SILT. Gravel sized fragments are medium to coarse siltstone lithorelicts (completely weathered siltstone).		
16.50					10/03/2020:DRY From 16.50m 80% flush returns.			Weak thinly bedded grey fresh SILTSTONE.		
				13			(1.00)			
	75	47	7							
17.35						132.05	17.35	MINEWORKINGS (void).		
							(0.35)			
17.71				NI		131.70	17.70	Weak thinly bedded grey fresh SILTSTONE.		
17.75				V						
17.90				10			(0.40)			
18.00					From 18.00m					
				17	100% flush returns.	131.30	18.10			
18.12				V			(0.10)			
18.19						131.20	18.20	Very weak thickly laminated to very thinly bedded grey fresh SILTSTONE.		
				6.8			(0.45)	Weak thinly bedded grey fresh SILTSTONE.		
18.63				V		130.75	18.65			
18.73	93	71	60	13		130.65	(0.10) 18.75	Very weak thickly laminated to very thinly bedded grey fresh SILTSTONE.		
18.88								Weak thinly bedded grey fresh SILTSTONE.		
18.89								.... at 18.88m: 10mm band of soft grey clayey silt.		
				4.0			(0.65)			
19.39				NI		130.00	19.40	Weak thickly laminated to thinly bedded grey fresh SILTSTONE.		
19.50					From 19.50m 90% flush returns.		(0.25)			
				20						
19.65						129.75	19.65	Very weak very thinly to medium bedded grey fresh SILTSTONE with smooth undulating subvertical joint.		
				V			(0.45)			

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

Figure No. NE3834B.R8

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Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE			**Borehole Number** R8
Machine : BERETTA T44 **Flush :** MIST **Core Dia :** NONE mm **Method :** ROTARY OPEN HOLE/CORED	**Casing Diameter** 127mm to 7.50m **Location** AS PLAN	**Ground Level (mOD)** 149.40 **Dates** 09/03/2020-10/03/2020	**Client** CARNELL MANAGEMENT SERVICES LIMITED **Engineer** WILLIAM SAUNDERS	**Job Number** NE3834B **Sheet** 5/5

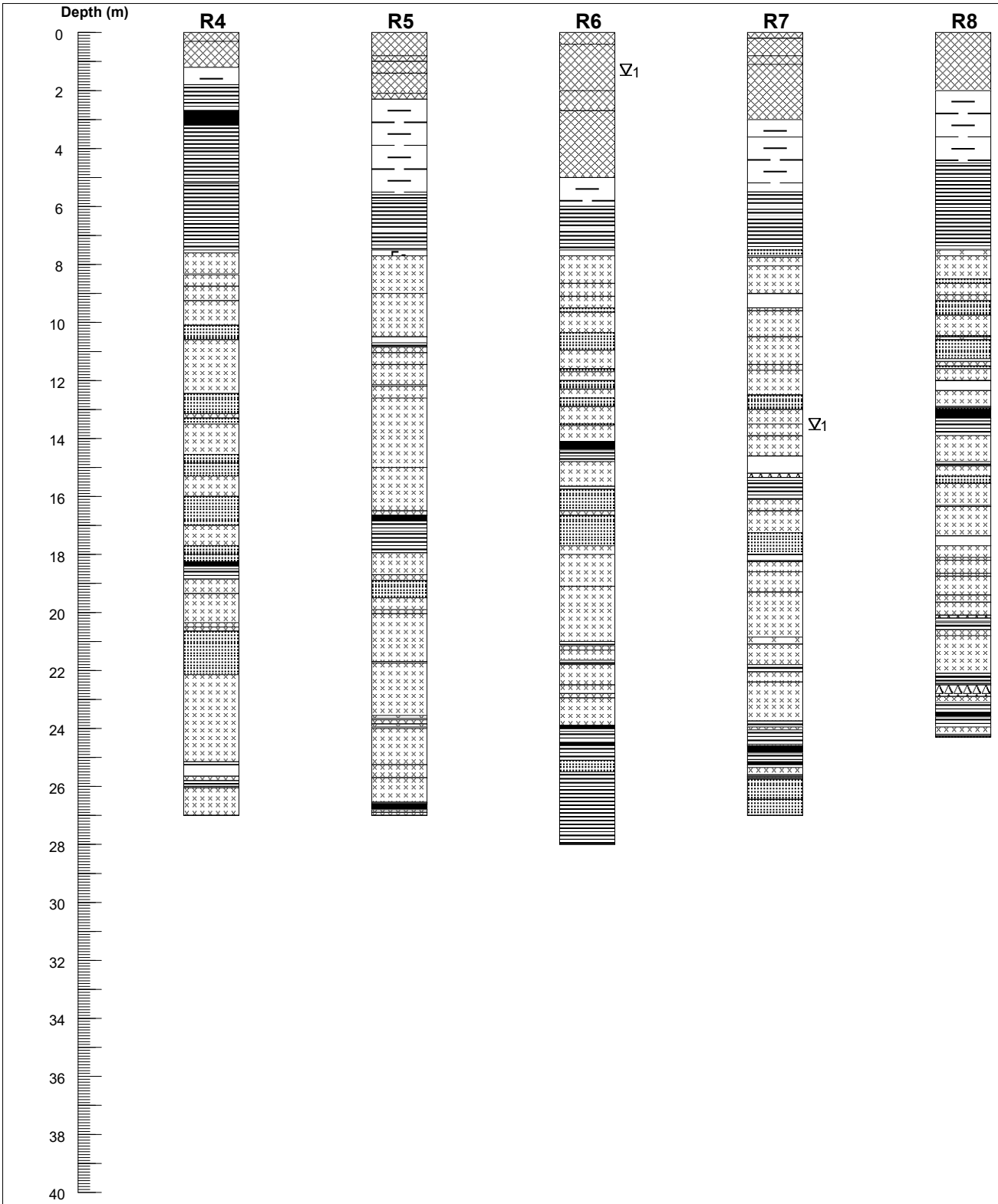
Depth (m)	TCR (%)	SCR (%)	RQD (%)	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
								SILTSTONE (as sheet 4/5)		
						129.30	20.10 (0.10)	MINEWORKINGS: medium to coarse gravel sized fragments of black coal and grey mudstone.		
20.10				NI	At 20.10m mineworkings closed.					
20.20	86	78	9	V		129.20	20.20 (0.10)			
20.34				NI		129.10	20.30	Weak very thinly bedded dark grey fresh carbonaceous MUDSTONE.	Fe	
20.40				30		129.05	20.35 (0.25)	Strong grey with brown staining IRONSTONE.		
20.60				V		128.80	20.60 (0.20)	Very weak thickly laminated to thinly bedded dark grey fresh MUDSTONE.		
20.79				7.1		128.60	20.80	Very weak thickly laminated to very thinly bedded grey fresh SILTSTONE.		
20.93				V				Weak thinly to medium bedded grey fresh SILTSTONE.		
21.00				NI	From 21.00m 100% flush returns.					
21.05				7.5						
21.45				V			(1.30)	.... from 21.45m: subvertical joint.		
21.77	96	35	22	21						
22.10				100		127.30	22.10 (0.15)	Weak thickly laminated dark grey fresh MUDSTONE in parts completely weathered to silty clay.		
22.24				11		127.15	22.25 (0.20)	Very weak very thinly to thinly bedded grey fresh MUDSTONE.		
22.43				14		126.95	22.45	Medium strong very thinly bedded grey fresh IRONSTONE.	Fe	
22.50					From 22.50m 75% flush returns.	126.90	22.50 (0.40)	MINEWORKINGS: soft grey gravelly silty clay, friable clayey silt and rounded coarse gravel sized ironstone nodule.		
				NI		126.50	22.90 (0.20)	Very weak thickly laminated to very thinly bedded dark grey fresh SILTSTONE.		
						126.30	23.10 (0.35)	Very weak thickly laminated becoming very thinly bedded dark grey fresh MUDSTONE.		
23.25	76	22	0	V						
23.32				23						
23.45				100		125.95	23.45 (0.15)	Very weak to weak thickly laminated to very thinly bedded black fresh vitreous COAL.		
23.58				20		125.80	23.60 (0.35)	Very weak very thinly to thinly bedded grey fresh MUDSTONE with 5mm band of black vitreous coal. (seatearth)		
23.83				NI						
23.95						125.45	23.95	Weak thinly bedded grey fresh SILTSTONE with 10mm band of black carbonaceous mudstone.		
24.00	100	53	43	8.3	From 24.10m 0% flush returns (void).		(0.25)			
24.19				NI		125.20	24.20	Medium strong very thinly bedded grey with black and orangish brown staining slightly weathered IRONSTONE.	Fe	
24.24				V		125.15	24.25			
24.30					10/03/2020:DRY	125.10	24.30	Medium strong thinly bedded grey with brown staining slightly weathered fine grained SANDSTONE.		
								Complete at 24.30m		

Remarks

Scale (approx)	Logged By
1:25	AJP/MJE

Figure No. NE3834B.R8

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Key

- ∇ Groundwater Strike
- ▼ Strike Rise Level
- MADE GROUND
- CLAY
- SILT
- MUDSTONE
- SILTSTONE
- SANDSTONE
- COAL
- BRECCIA
- Fe Fe Fe Ironstone
- No Recovery

SUB SURFACE

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Nominal Section

Site	Date Drawn	Date Checked	Sheet	Job Number
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	28/04/2020		1/1	NE3834B
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED			1:200[V]	NE3926A.1

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PHOTOGRAPHS

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Photographs

Site: CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE

Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job No. NE3834B

Sheet 1/18

Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R4)





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Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job No. NE3834B

Sheet 2/18

Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R4)





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Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job No. NE3834B

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Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R4)





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Site:	CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	Job No. NE3834B
Client:	CARNELL MANAGEMENT SERVICES LIMITED	Sheet 4/18
Engineer:	WILLIAM SAUNDERS	Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R4)



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Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job No. NE3834B

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Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R5)





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Site:	CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	Job No. NE3834B
Client:	CARNELL MANAGEMENT SERVICES LIMITED	Sheet 6/18
Engineer:	WILLIAM SAUNDERS	Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R5)





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Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R5)





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Engineer: WILLIAM SAUNDERS

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R5)



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Engineer: WILLIAM SAUNDERS

Job No. NE3834B

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R6)





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ROTARY BOREHOLE CORE PHOTOGRAPHS (R6)





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Engineer: WILLIAM SAUNDERS

Job No. NE3834B

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R6)





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Engineer: WILLIAM SAUNDERS

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R7)





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Engineer: WILLIAM SAUNDERS

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R7)





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Engineer: WILLIAM SAUNDERS

Job No. NE3834B

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ROTARY BOREHOLE CORE PHOTOGRAPHS (R7)





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ROTARY BOREHOLE CORE PHOTOGRAPHS (R7)



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Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job No. NE3834B

Sheet 16/18

Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R8)





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ROTARY BOREHOLE CORE PHOTOGRAPHS (R8)





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Client: CARNELL MANAGEMENT SERVICES LIMITED

Engineer: WILLIAM SAUNDERS

Job No. NE3834B

Sheet 18/18

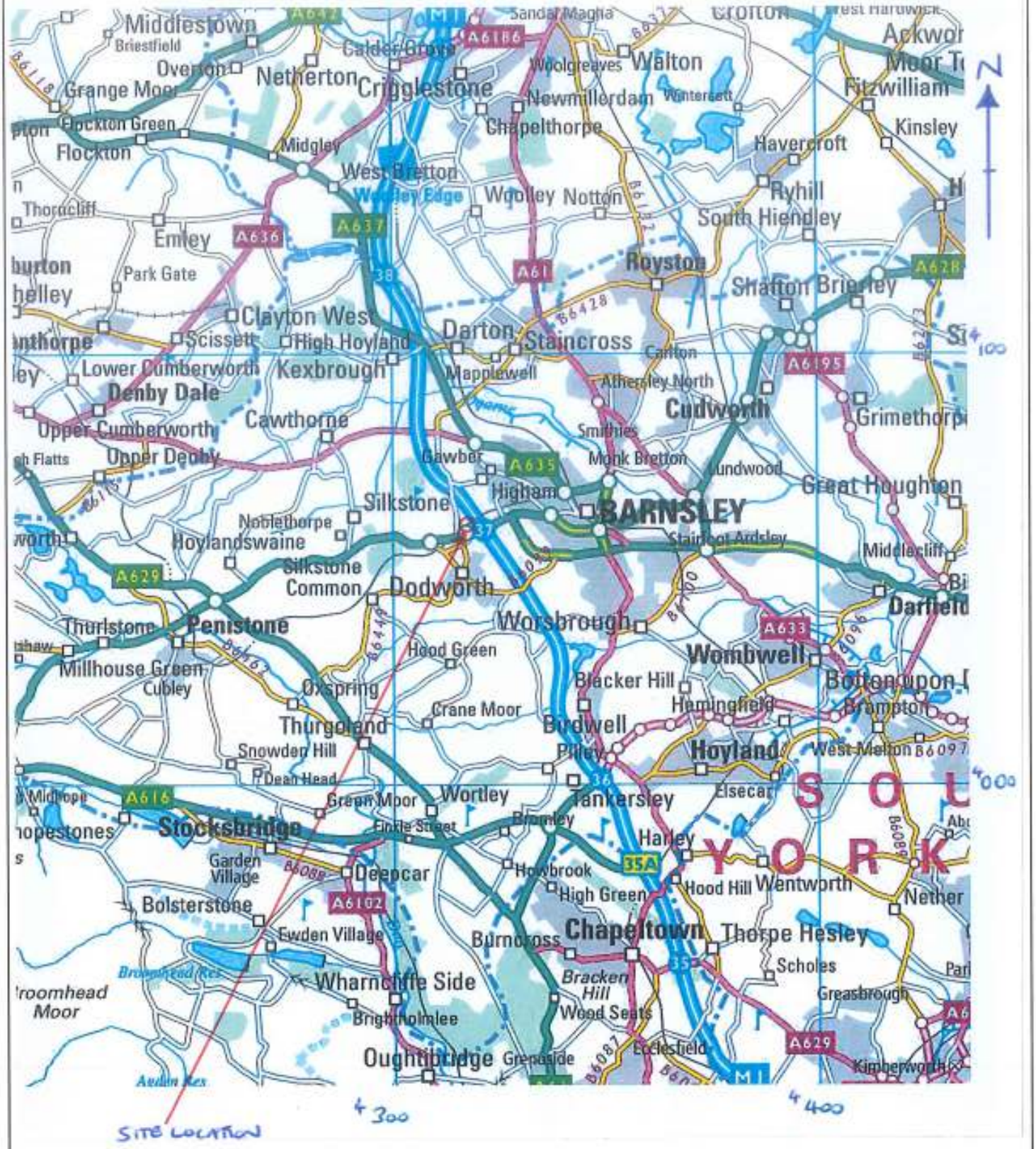
Date March 20

ROTARY BOREHOLE CORE PHOTOGRAPHS (R8)





FIGURES

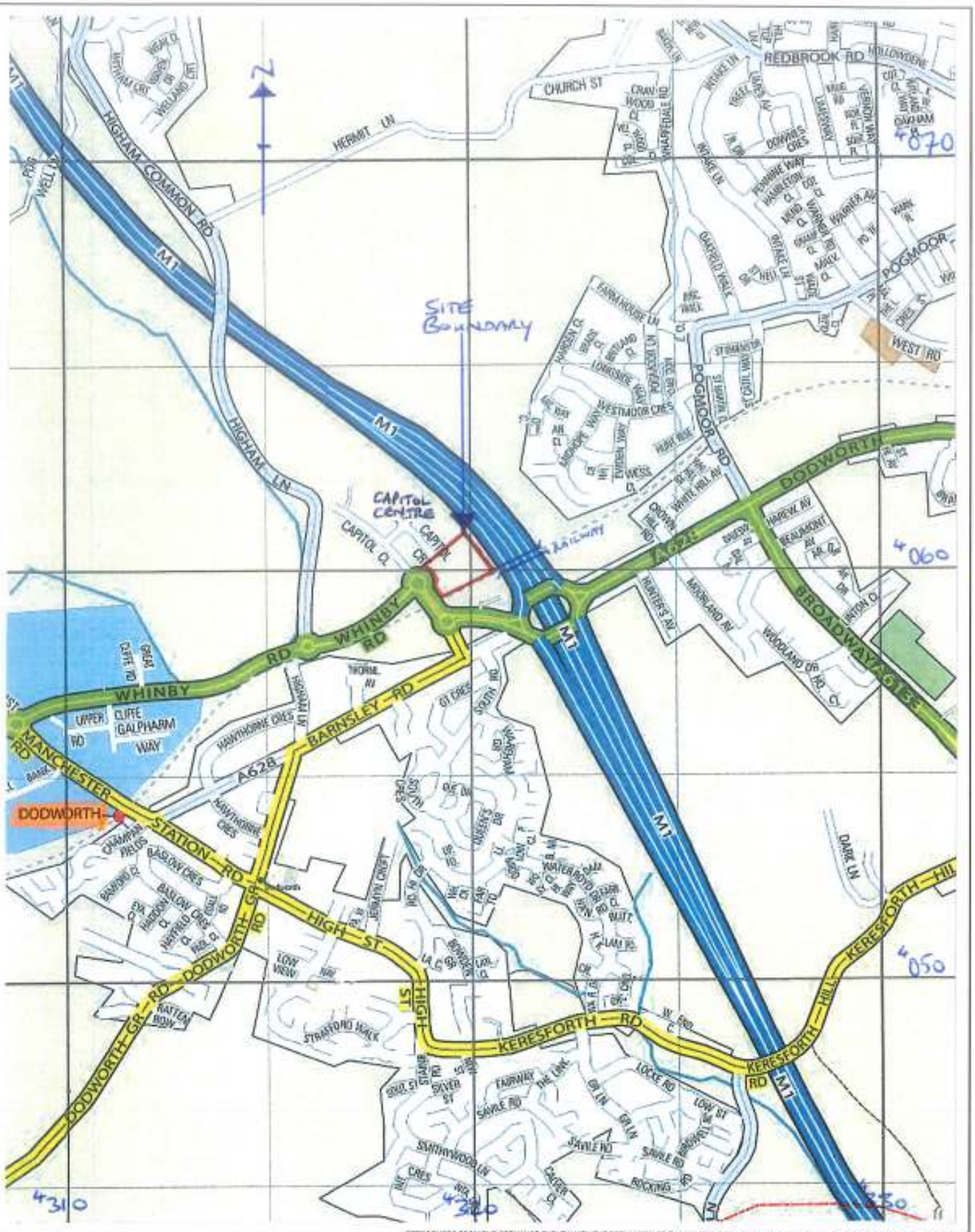


REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE LICENCE NO. 100035848

SUB SURFACE
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Site Location Plan

Site	Date Drawn	Date Checked	Sheet	Job No.
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	31-Jul-19		1 / 1	NE3834
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED	AJP		1:125,000	1



REPRODUCED FROM THE ORDNANCE SURVEY WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONARY OFFICE (LICENCE NO. 100033494)

SUB SURFACE
SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS
3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Site Boundary Plan

Site	Date Drawn	Date Checked	Sheet	Job No.
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	31-Jul-19		1 / 1	NE3834
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED	AJP		1:12,500	2

M1 MOTORWAY

Gabians to fence line.

Unit 6.
10,000 Sq.Ft

Service Yard.
25no. cars.

22350

Unit 9
25,000 Sq.Ft

Bins.

Cycles.

26950

Bins.

CAPITOL COURT

New electricity sub-station.

Service Yard.

31/50

Unit 10
17,500 Sq.Ft

RAILWAY LINE (IN CUTTING)

SITE BOUNDARY

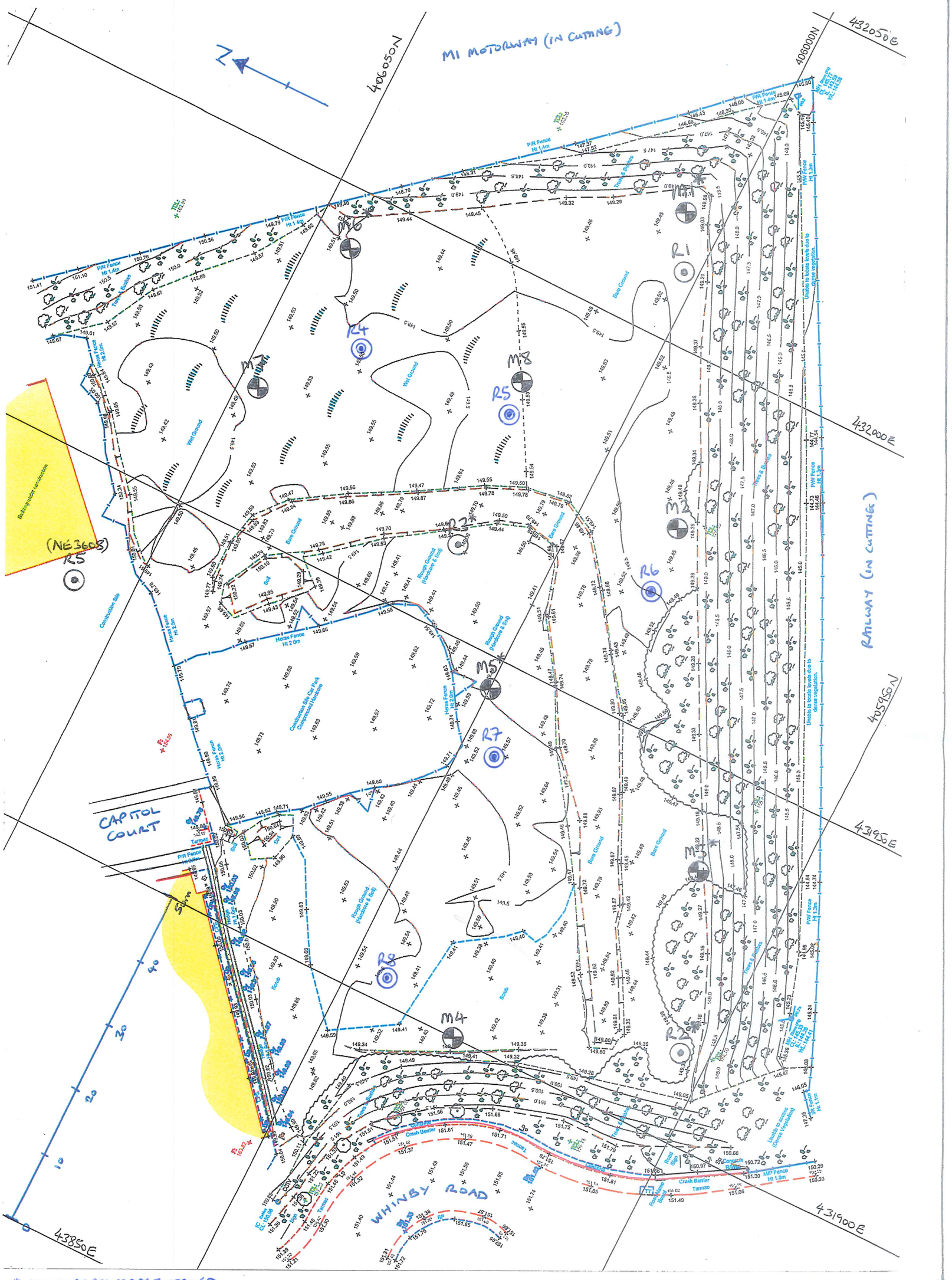
25no. cars.

Fencing to rear & between buildings.

Cycles.

WHINBY ROAD

SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907	Proposed Development Layout Plan (William Saunders Drg. No. 11933-WMS-ZZ-ZZ-DR-A-10003-S2-P3 dated March 2019)			
Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	Date Drawn 31-Jul-19	Date Checked	Sheet 1 / 1	Job No. NE3834
Client CARNELL MANAGEMENT SERVICES LIMITED	Drawn By AJP	Checked By	Scale 1:500 (at A3)	Figure No. 3



KEY:

* INDICATES STANDPIPE INSTALLED

- ROTARY OPEN HOLE BOREHOLE } NE3834
- MINI BOREHOLE
- ROTARY CASED BOREHOLE NE3834B

SUB SURFACE

SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS

3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135 Fax (01772) 204907

Exploratory Hole Location Plan

(Greenhatch Group Topographical Survey Drg. No. 33114-T Rev.0 dated 21 March 2019)

Site	Date Drawn	Date Checked	Sheet	Job No.
CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	21-Apr-20		1 / 1	NE3834B
Client	**Drawn By**	**Checked By**	**Scale**	**Figure No.**
CARNELL MANAGEMENT SERVICES LIMITED	AJP		1:500 (at A3)	4

BARNSLEY COAL 1.29 TO 3.10
COAL thin
INSIL COAL 0.66 TO 0.91
COAL thin
GAWBER COAL 0.72
COAL thin
SWALLOW WOOD COAL 0.30 TO 1.18
Haigh Moor Rock
TOP HAIGH MOOR COAL 0.69 TO 1.19
LOW HAIGH MOOR COAL 0.63 TO 1.02
COAL thin
LIDGET COAL 0.30 TO 1.52
CLAY CROSS (VANDERBECKEI) MARINE BAND
JOAN COAL (J) 0.36 TO 0.61
TANKERSLEY IRONSTONE
FLOCKTON THICK COAL 0.48 TO 2.16
COAL thin
FENTON COAL 1.46 TO 2.49
Parkgate Rock
PARKGATE COAL 0.56 TO 1.45
Sandstone
THORNCLIFFE COAL 0.46 TO 1.73
Sandstone
COAL thin
Sandstone
SILKSTONE FOUR-FOOT COAL 0.56 TO 1.61
Silkstone Rock
CLAYWOOD IRONSTONE
SILKSTONE COAL 0.93 TO 1.70
Sandstone
COAL thin
Sandstone
COAL thin
BLACK BAND COAL 0.35 TO 0.61
WHINMOOR COAL 1.17 TO 1.52
COAL thin

(1:2,000)

CTHM LHM
THIN COAL
SUPERFICIAL SLIP IN SANDSTONE
SANDY SHALE
DUNSIL
THIN COAL
BARNSLEY
GAWBER
FAULT FORMERLY SEEN
-30 IN. F
Const Bd
TH
HMR
Lane Side Farm
Head Farm
TOP HAIGH MOOR
LOW HAIGH MOOR
SHALY SANDSTONE ON BLACK SHALE WITH COAL SEAM FORMERLY SEEN
Judge Bed
Railway
Dismantled
A Not Gdn
Mine
DODWORTH COLLIERY
Shaft
Depot
A635
Recn Gd
SANDSTONE FORMERLY SEEN IN DISUSED QUARRY
APPROXIMATE SITE BOUNDARY
GREY SHALE FORMERLY SEEN
DODWORTH UD &
(1:5,000)
SANDSTONE PITS FORMERLY SEEN

SUB SURFACE SITE INVESTIGATION AND SPECIALIST GEOTECHNICAL CONSULTANTS 3 Peel Street, Preston, PR2 2QS. Tel. (01772) 561135. Fax (01772) 204907	Extract of Geological Survey (SE.30.NW, Solid & Drift, 1:10,000, 1980)			
Site CAPITOL PARK, WHINBY ROAD, DODWORTH, SOUTH YORKSHIRE	Date Drawn 06-Aug-19	Date Checked	Sheet 1 / 1	Job No. NE3834
Client CARNELL MANAGEMENT SERVICES LIMITED	Drawn By AJP	Checked By	Scale As shown (at A3)	Figure No. 5