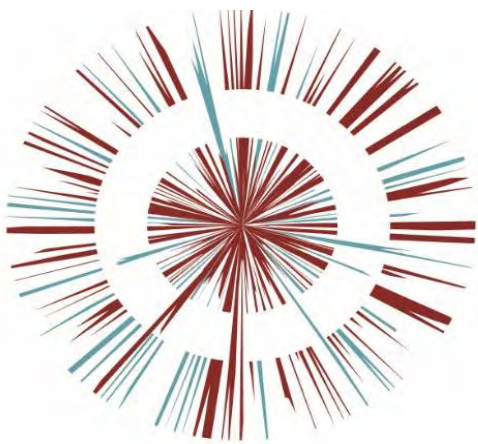




OMEGA ZONE 8, ST HELENS

Omega St Helens Ltd / T. J. Morris Limited

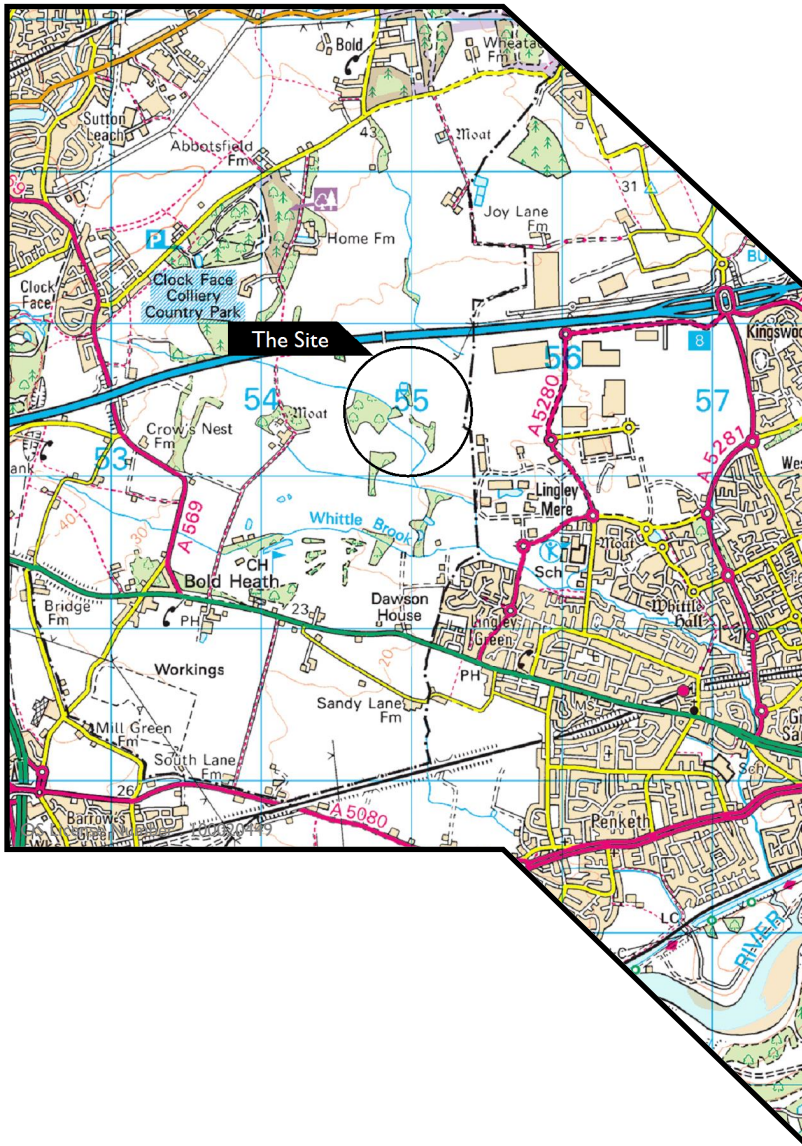


Ground Investigation Report
& Remediation Strategy
Appendix D Part 1
OPP DOC. 2.5

Ground Investigation



www.geotechnics.co.uk



OMEGA DEVELOPMENT

Factual Report

for
WSP UK Limited

Project Number PN194027

January 2020

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Factual Report

OMEGA DEVELOPMENT

for
WSP UK Limited

Project No:

PN194027

January 2020

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1.0 INTRODUCTION

A geotechnical and geo-environmental investigation was undertaken by Geotechnics Limited at the site of Omega Zone 8, a proposed extension to the existing Omega Development on the north-western fringe of Warrington. The investigation was carried out to the instructions of WSP UK Limited, acting in the role of both Engineer and Client. This report describes the work undertaken and presents the data obtained.

2.0 OBJECT AND SCOPE OF THE INVESTIGATION

The object of the investigation was to obtain information on the ground and groundwater conditions relating to the design of the proposed works within the limitations posed by trial hole numbers, locations, depths, methods adopted and the scope of approved in situ and laboratory testing. The investigation comprised cable percussive boreholes, some with rotary-cored follow-on, dynamic sample boreholes, trial pits, in situ and laboratory testing and reporting. A Factual Report was also commissioned.

3.0 PRESENTATION

A description of the site and a summary of the procedures followed during the investigation process are presented in Sections 4 to 6. The factual data so obtained are presented in Appendices 2 to 12 of this report. Attention is drawn to the General Notes and Investigation Procedures presented in Appendix 13 to aid an understanding of the procedures followed and the context in which the report should be read.

In addition, data in electronic format in accordance with "The Electronic Transfer of Geotechnical Data from Ground Investigations" published by the AGS (the AGS Format) are presented separately on disk.

4.0 THE SITE

4.1 Location

The site is located to the south of the M62 motorway, approximately 6km west-north-west of Warrington town centre. The approximate Ordnance Survey National Grid Reference for the centre of the site is 355170E, 390420N and an extract from the relevant 1:50,000 Scale O.S. Map is included as Appendix 1.

4.2 Description

The site is irregularly shaped with maximum dimensions of approximately 1200m (east to west) and 1140m (north to south). The site comprises a number of field enclosures, some laid to grass, some to crops and others ploughed. The ground surface falls gently towards the south-east from around 27m OD to around 20m OD. A number of ponds are present within the site as are some copses of trees. Field boundaries are marked by hedgerows and fences. At the time of the investigation fieldwork, the ground surface was soft and wet in many places.

The site is bounded by the M62 motorway to the north and by the existing Omega Zone 7 industrial development to the east. Agricultural land bounds the site to the south and west.

4.3 Site Geology

The 1:50,000 scale maps published by the British Geological Survey, Sheet 97 Runcorn dated 1977 (Drift edition) and 1980 (Solid edition), show the site to be underlain by drift deposits of Boulder Clay (now known as Glacial Till above solid strata of the Upper Mottled Sandstone, (now known as the Chester Formation), part of the Sherwood Sandstone Group of Triassic age.

The conjectured traces of two geological faults (Roaring Meg Fault/Preston Brook Fault) are shown passing through the site, the fault lines trending

roughly north to south or north-north-west to south-south-east. In both cases the strata to the west of the faults are indicated to be downthrown.

Made Ground is not noted to be present on the BGS maps but there may be Made Ground deposits present for which the BGS have no record or which are too thin to be incorporated in the BGS maps.

4.4 Hydrogeology

The Government's DEFRA Magic Map website, <https://magic.defra.gov.uk/MagicMap.aspx>, accessed on 20th November 2019, shows the Glacial Till to be classed as a Secondary (undifferentiated) Aquifer. The underlying Chester Formation rocks are classed as a Principal Aquifer.

5.0 PROCEDURE

5.1 Commissioning

The work was awarded following submission of a tender for work designed by WSP UK Limited for ground investigation of the site in accordance with their requirements.

5.2 General

The procedures followed in this site investigation are based on *BS 5930: 2015 – Code of Practice for Site Investigations* and *BS 10175:2011+A2:2017 – Investigation of Potentially Contaminated Sites*. The soils and rocks encountered have been described in accordance with BS5930:2015 and BS EN ISO 14688-1:2018 and BS EN ISO 14689:2018. The positions of the Cable Percussion/Rotary Follow-on Boreholes, Dynamic Sample Boreholes, Trial Pits and In Situ Test locations are shown on the Exploratory Hole Location Plan in Appendix 12.

The Exploratory Hole locations were specified by WSP UK Limited. The co-ordinates and levels shown on the Exploratory Hole Records were measured using a Leica GPS survey device and the depths quoted on the exploratory hole records are in metres below ground level.

At each exploratory hole location with the exception of the trial pits an inspection pit was excavated using hand tools to a depth of 1.20m below ground level to check for the presence of underground services. Prior to and on completion

of the excavation, the location was scanned using a cable avoidance tool (CAT).

5.3 Boreholes

Nineteen (19 No.), 150mm diameter boreholes (numbered BH8A01 to BH8A08, BH8A02A, BH8B01 to BH8B03, BH8C01 to BH8C03, BH8D01 to BH8D03 and BH8D01A) were sunk by Cable Percussion Tool techniques to depths varying between 0.80m (BH8D01, terminated within the inspection pit) and 16.95m (BH8A07) below ground level. The work was carried out between 18th September and 30th October 2019.

Representative disturbed (D and B) and driven open-tube thin-walled (UT) samples of the soils encountered were obtained at regular intervals. In addition, Environmental Soil samples (ES) were recovered at the depths indicated on the Borehole Records, presented in Appendix 2.

Eleven (11 No.) of the boreholes (numbered BH8A01 to BH8A08, BH8A02A and BH8B03) were extended utilising rotary coring techniques to depths varying between 13.00m (BH8A02) and 28.50m (BH8A07) below ground level. The rotary coring commenced through the base of Cable Percussion section of these boreholes which had been left open and cased to facilitate coring as instructed by WSP UK Limited. This element of the work was carried out during the period between 27th September and 24th October 2019.

The drilling equipment on this particular contract utilised water as the flushing medium. Rock cores were extruded horizontally in transparent liners and placed into suitable core boxes. Photographs of the individual core boxes are included in Appendix 3.

Standard Penetration Tests (SPTs) were undertaken at the depths indicated on the borehole records in accordance with BS EN ISO 22476-3:2005+A1:2011 to obtain a measure of the engineering properties of the proved strata.

Groundwater observations are included on the Borehole Records where appropriate and any rise in water level was recorded over 20 minutes whilst the boring/drilling operations were suspended. It should be noted that the addition of water to the borehole as part of the drilling process may have masked the presence of groundwater in the borehole. Where water was added it has been noted on the Borehole Records.

On completion, standpipes were installed in the majority of the boreholes (see Section 5.6). Where standpipes were not installed, the boreholes were backfilled with bentonite.

5.4 Trial Pits

Seventy-six (76 No.) Trial Pits (numbered TP8A01 to TP8A04, TP8A08, TP8A11, TP8B01 to TP8B20, TP8B08A, TP8B18A, TP8B18B, TP8B19A, TP8C01 to TP8C08, and TP8D01 to TP8D38) were excavated to depths varying between 0.40m and 3.00m below ground level using an 8 tonne tracked excavator between 23rd September and 18th October 2019. This work was supervised on site by a geotechnical / geo-environmental engineer.

A further three (3 No.) Trial Pits (numbered TP8E01 to TP8E03) were each excavated to a depth of 1.20m below ground level using hand tools on 23rd October 2019. This work was again supervised on site by a geotechnical / geo-environmental engineer.

In addition to the above, due to access restrictions, a further seven (7 No.) intended machine dug Trial Pits (numbered TP8A05 to TP8A07, TP8A09, TP8A10, TP8A12 and TP8A13) were each carried out using Cable Percussion Tool boring techniques instead to a depth of 3.00m. This work was carried out between 18th and 22nd October 2019.

The profiles of strata or other features were recorded as excavation proceeded and measurements taken from ground level. Representative samples were taken, where appropriate, for laboratory examination and analysis and in addition, Environmental Soil samples (ES) were recovered at the depths indicated on the Trial Pit Records, presented in Appendix 4. Samples were taken directly from excavated materials deposited at the surface. Groundwater observations and trench stability notes are included on the Trial Pit Records. Photographs of the pits are presented in Appendix 5.

5.5 Dynamic Sample Boreholes

Twenty-four (24 No.) Dynamic Sample Boreholes (numbered WS8A01 to WS8A03, WS8B03 to WS8B05, WS8C01 to WS8C08, WS8C04A, WS8D01 to WS8D08 and WS8D02A) were undertaken at the site to depths varying between 2.45m and 5.45m below ground level. The work was carried out between 30th September and 17th October 2019.

The Dynamic Samples were taken using the super-heavy Dynamic Probe apparatus which drives lined steel tubes into the ground in 1m lengths. Samples are retrieved in the plastic liners. The retrieved liners were split and the recovered soils described before being sub-sampled into ES, D and B samples as shown on the Borehole Records, presented in Appendix 6. The hole is not cased and progress depends on the nature of the strata penetrated.

In addition to the above, due to access restrictions, a further four (4 No.) intended Dynamic Sample Boreholes (numbered WS8B01, WS8B02, WS8B06 and WS8B07) were each carried out using Cable Percussion Tool boring techniques instead to depths of 3.60m (WS8B01) and 5.00m below ground level. This work was carried out between 25th and 30th September 2019.

Standard Penetration Tests (SPTs) were undertaken at the depths indicated on the borehole records in accordance with BS EN ISO 22476-3:2005+A1:2011 to obtain a measure of the engineering properties of the proved strata.

Groundwater observations are included on the Borehole Records where appropriate and any rise in water level was recorded over 20 minutes whilst drilling operations were suspended.

On completion, standpipes were installed in a number of the boreholes (see Section 5.6). Where standpipes were not installed, the boreholes were backfilled with bentonite.

5.6 Instrumentation and Monitoring

Long-term monitoring of the gas and groundwater levels was made possible by the installation of standpipes as follows:

Exploratory Hole	Standpipe Slotted Pipe & Filter Zone (m)
BH8A01	1.00 to 6.00
BH8A02	1.00 to 5.00
BH8A03	12.00 to 20.10
BH8A05	6.00 to 8.50
BH8A06	6.00 to 8.00
BH8A08	6.00 to 12.00
BH8B01	1.00 to 6.00
BH8B03	9.00 to 19.00
BH8C01	1.00 to 3.00
BH8C02	6.00 to 9.00
BH8C03	1.00 to 4.00

BH8D01A	1.00 to 6.00
BH8D02	1.00 to 6.00
BH8D03	1.00 to 6.00
WS8A01	1.00 to 5.45
WS8A02	1.00 to 5.45
WS8A03	1.00 to 5.45
WS8B02	1.00 to 5.00
WS8B03	0.50 to 4.50
WS8B04	0.50 to 4.50
WS8B05	1.00 to 4.00
WS8B06	0.50 to 5.00
WS8B07	1.00 to 5.00
WS8C06	1.00 to 4.00
WS8C08	1.00 to 5.45
WS8D04	1.00 to 4.00
WS8D05	1.00 to 5.12

No monitoring of the gas and groundwater levels at the site was commissioned. It is understood that monitoring is to be carried out separately by WSP UK Limited.

5.7 Static Cone Penetration Tests

Nineteen (19 No.) Static Cone Penetration Tests (numbered CPT8A01 to CPT8A07, CPT8A08A, CPT8A09 to CPT8A11, CPT8B01 to CPT8B03, CPTP8A01 to CPTP8A03, CPTP8A04A and CPTP8B01) were completed to depths varying between 7.36m and 13.48m below ground level by Lankelma Limited. The test locations were specified by WSP UK Limited and the work was carried out between 25th September and 1st October 2019.

The static cone penetration tests were undertaken in accordance with BS EN ISO 22476-1:2012 using heavy track-truck mounted 17.5 tonne capacity hydraulic penetrometer equipment, ballasted to provide a reaction weight of about eighteen tonnes. A 15 tonne capacity, 15cm² electric cone was used for each of the tests and measurements of local side friction and the pore pressure were made in addition to cone end resistance. The tests were terminated at the depths at which refusal was reached based on the maximum safe thrust capacity of the equipment.

At selected depths at the following test locations, CPTP8A01, CPTP8A03, CPTP8A04A and CPTP8B01 direct-push full-displacement pressuremeter tests were also carried out using a full displacement pressuremeter mounted on the CPT rods. The tests were carried out at the following depths:-

Exploratory Hole Number	Depth (m below ground level)
CPTP8A01	2.00
CPTP8A01	4.00
CPTP8A03	3.00
CPTP8A03	6.42
CPTP8A04A	2.50
CPTP8A04A	4.50
CPTP8B01	2.75
CPTP8B01	3.50
CPTP8B01	4.20
CPTP8B01	5.50

The CPT Records together with an interpreted identification of the soils tested and an estimate of the undrained shear strength and coefficient of volume compressibility are presented in a Report prepared by Lankelma Limited which is included in Appendix 7. The results of the pressuremeter tests with derived values of undrained shear strength are also presented in the report in Appendix 7.

Records for Inspection Pits carried out using hand tools ahead of the Static Cone Penetration Tests to a maximum depth of 1.20m below ground level are also included in Appendix 7. It should be noted that due to time constraints, Static Cone Penetration Tests were not performed at the locations of the Inspection Pits CPT8B08 and CPT8B13. In addition, Inspection Pits at the locations of CPT8A08 and CPTP8A04 were terminated early due to encountering possible buried services and the Static Cone Penetration Tests were therefore located at revised positions CPT8A08A and CPTP8A04A, respectively.

5.9 Plate Load Tests

Fifteen (15 No.) Plate Load Tests were carried out at the locations marked on the Exploratory Hole Location Plan (see Appendix 12) and numbered PL8A01 to PL8A11, PL8B01, TP8B01, TP8B11 and TP8B17, each at a depth of 0.45m below ground level. The incremental loading tests were carried out in accordance with BS 1377-9:1990, Test 4.1 using a 600mm diameter plate and were carried out in order to obtain equivalent CBR values for the subgrade soils to aid pavement design. The reaction for the test was provided by an 8 tonne tracked excavator. The test loads were selected by Geotechnics Limited and the results are presented in Appendix 8. Records for the shallow Trial Pits excavated for each of the Plate Load Tests are also included in Appendix 8.

5.10 Dynamic Cone Penetration Tests

Thirteen (13 No.) Dynamic Cone Penetration (DCP) Tests were carried out adjacent to Trial Pits TP8A01, TP8A02, TP8A04, TP8A08, TP8A11, TP8B03, TP8B05, TP8B06, TP8B09, TP8B13, TP8B14, TP8B17 and TP8B18 and numbered DCP8A01 to DCP8A05 and DCP8B01 to DCP8B08, respectively. The tests were commenced from Ground Level and were performed to give an indication of CBR values at shallow depths to aid pavement design. The test comprises the measurement of increments of penetration of a 60° cone driven into the ground using an 8kg hammer falling a distance of 575mm. The CBR is obtained from the relationship between the CBR and the DCP readings;

$$\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 \times \text{Log}_{10}(\text{mm/blow})$$

as defined in Interim Advice Note 73/06 Revision 1 (2009) "Design Guidance for Road Pavement Foundations (Draft HD25)" published by the Highways Agency. The test results are presented in Appendix 9.

6.0 LABORATORY TESTING

6.1 Geotechnical

The laboratory testing schedule was specified by WSP UK Limited. Unless otherwise stated, the tests were carried out in Geotechnics Limited's UKAS accredited Laboratory (Testing No. 1365) and were undertaken in accordance with the appropriate Standards as indicated below and on the Laboratory Test Certificate in Appendix 10. Any descriptions, opinions and interpretations are outside the scope of UKAS accreditation.

The tests undertaken can be summarised as follows:-

BS EN ISO 17892-1:2014

101 No. Water Content Determination

BS EN ISO 17892-2:2014

2 No. Bulk Density Determination

BS EN ISO 17892-3:2015

12 No. Particle Density Determination

BS EN ISO 17892-4:2016

7 No. Particle Size Distribution Determination – Sieving Method

7 No. Particle Size Distribution Determination – Pipette Method

BS EN ISO 17892-5:2017

9 No. Incremental Loading Oedometer Test

BS EN ISO 17892-8:2018

26 No. Unconsolidated Undrained Triaxial Test

BS EN ISO 17892-12:2018

65 No. Determination of Liquid and Plastic Limits

BS 1377:1990

Test No. Test Description

Part 4

3.3 11 No. Dry Density/Moisture Content relationship determination. Compaction Test - British Standard (2.5 kg Hammer)

ISRM Testing Methods

78 No. Point Load Determination

The following testing was carried out at the laboratories of Professional Soils Laboratory Limited (UKAS Accredited Laboratory, Number 4043).

ISRM Testing Methods

2 No. Point Load Determination

8 No. Unconfined Compressive Strength Determination

The following testing was carried out at the laboratories of Derwentside Environmental Testing Services Limited (UKAS Accredited Laboratory, Number 2139).

30 No. Soluble Sulphate

8 No. Total Sulphate

8 No. Total Sulphur

30 No. pH

8 No. Organic Content

The results of these tests are also presented in Appendix 10.

6.2 Contamination

Selected samples of soil were tested at the laboratories of Derwentside Environmental Testing Services Limited (UKAS Accredited Laboratory, Number 2139) for a number of determinands in order to check on potential site contamination. The determinands were specified by WSP UK Limited and are detailed on the results sheets in Appendix 11 together with the test result as well as the test method, accreditation and detection limit.

Signed for and on behalf of Geotechnics Limited.

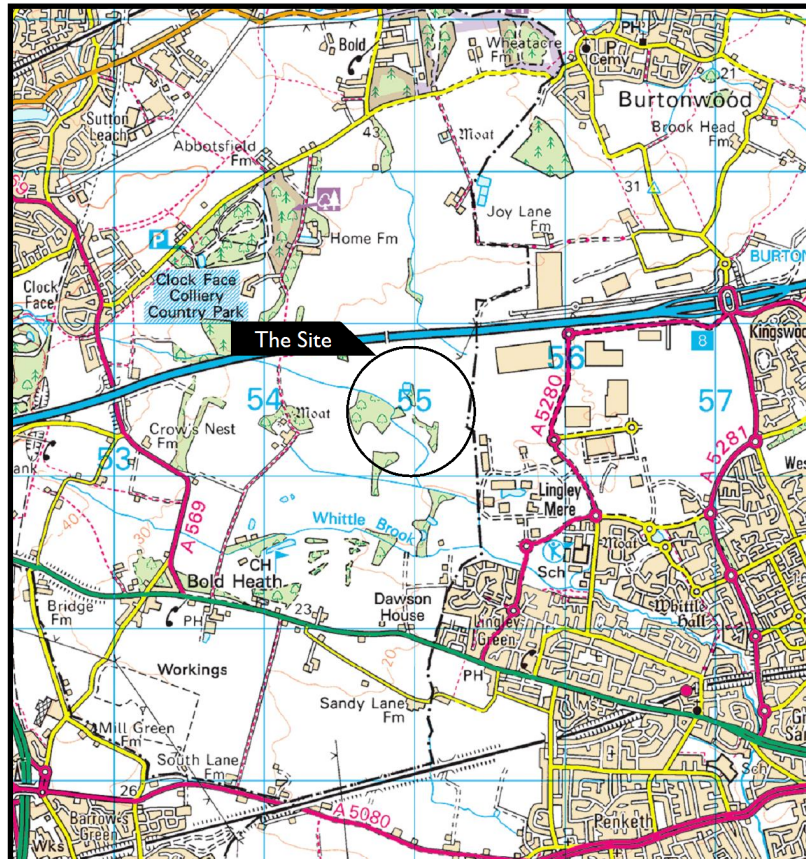
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APPENDIX I

Site Location Plan

SITE LOCATION PLAN



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OMEGA DEVELOPMENT
for
WSP UK Limited

GEOTECHNICS
geotechnical and geoenvironmental specialists

APPENDIX 2

Borehole Records, SPT Results Summary Sheets & SPT Hammer Calibration Certificates

DATA SHEET - Symbols and Abbreviations used on Records



Sample Types	
B	Bulk disturbed sample
BLK	Block sample
C	Core sample
D	Small disturbed sample (tub/jar)
E	Environmental test sample
ES	Environmental soil sample
EW	Environmental water sample
G	Gas sample
L	Liner sample
LB	Large bulk disturbed sample
P	Piston sample (PF - failed P sample)
TW	Thin walled push in sample
U	Open Tube - 102mm diameter with blows to take sample. (UF - failed U sample)
UT	Thin wall open drive tube sampler - 102mm diameter with blows to take sample. (UTF - failed UT sample)
V	Vial sample
W	Water sample
#	Sample Not Recovered

Insitu Testing / Properties	
CBRP	CBR using TRL probe
CHP	Constant Head Permeability Test
COND	Electrical conductivity
TC	Thermal Conductivity
TR	Thermal Resistivity
HV	Strength from Hand Vane
ICBR	CBR Test
IDEN	Density Test
IRES	Resistivity Test
MEX	CBR using Mexecon Probe Test
PKR	Packer Permeability Test
PLT	Plate Load Test
PP	Strength from Pocket Penetrometer
Temp	Temperature
VHP	Variable Head Permeability Test
VN	Strength from Insitu Vane
w%	Water content
(All other strengths from undrained triaxial testing)	
S	Standard Penetration Test (SPT)
C	SPT with cone
N	SPT Result
-/-	Blows/penetration (mm) after seating drive
-*/- (mm)	Total blows/penetration
()	Extrapolated value

Groundwater	
Water Strike	
Depth Water Rose To	

Instrumentation	
Seal	
Filter	
Seal	

Strata	Legend
Made Ground Granular	
Made Ground Cohesive	
Topsoil	
Cobbles and Boulders	
Gravel	
Sand	
Silt	
Clay	
Peat	

Note: Composite soil types shown by combined symbols

Chalk	
Limestone	
Sandstone	
Coal	

Strata, Continued	
Mudstone	
Siltstone	
Metamorphic Rock	
Fine Grained	
Medium Grained	
Coarse Grained	
Igneous Rock	
Fine Grained	
Medium Grained	
Coarse Grained	

Backfill Materials	
Arisings	
Bentonite Seal	
Concrete	
Fine Gravel Filter	
General Fill	
Gravel Filter	
Grout	
Sand Filter	
Tarmacadam	

Rotary Core	
RQD	Rock Quality Designation (% of intact core >100mm)
FRACTURE INDEX	
Fractures/metre	
FRACTURE SPACING (m)	Maximum
NI	Non-intact core
NR	No core recovery
AZCL	Assumed zone of core loss
(where core recovery is unknown it is assumed to be at the base of the run)	

BOREHOLE RECORD - Cable Percussion and Rotary

Project		OMEGA DEVELOPMENT GI		Engineer		WSP		Borehole		BH8A01	
Client		WSP		National Grid		354715.5 E		Project No		PN194027	
				Coordinates		390584.6 N		Ground Level		23.89 m OD	

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD		
0.00- 0.30	B					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with some rootlets. Gravel is subangular fine of sandstone and coal.	G.L.		23.89		
0.25	ES						0.30		23.59		
0.50- 1.20	B										
0.50	ES					Firm brown mottled grey slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone, mudstone and coal.					
1.00	ES										
1.20- 1.65	UT41	(DRY)		13							
1.70	D					Below 1.80m, stiff, brown.					
1.80	D										
2.00- 2.45	B										
2.00- 2.45		1.70 (DRY)			S24						
2.80	D					Below 4.00m, very stiff.					
3.00- 3.45	UT79	3.00 (DRY)	174	9.3							
3.50	D										
3.80	D					Below 4.00m, very stiff.					
4.00- 4.45	B										
4.00- 4.12		4.00 (DRY)			S50/63						
4.80	D					Below 4.00m, very stiff.					
5.00- 5.45	UT100	4.50 (DRY)									
5.50	D			9.9							
6.00	D					Below 4.00m, very stiff.					
6.50- 6.95	B										
6.50- 6.95		6.00 (DRY)			S41						
7.50	D					Below 4.00m, very stiff.					
8.00- 8.45	UT100	7.50 (DRY)	451	9.0							
8.50	D										
9.00	D					Below 4.00m, very stiff.					
9.50- 9.95	B										
9.50- 9.94		9.00 (DRY)			S50/292						

Boring				Progress				Groundwater						
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			08/10/19	08:00	5.60	4.50		20		Slow inflow.
14.15	0.15	Cable Percussion	SL	11.00	10.50	DRY	08/10/19	18:00						
25.50	0.13	Rotary Core	JB	11.00	10.50	7.40	09/10/19	08:00						
				14.15	13.50	10.70	09/10/19	18:00						
				14.15	13.50	12.10	10/10/19	08:00						
				25.50	13.50	22.30	10/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. ES sample = 1 x vial, 1 x plastic jar and 1 amber jar. Water was added to assist boring between 12.50m and 13.70m. A 50mm gas monitoring pipe was installed to 6.00m with a geowrapped slotted section from 1.00m to 6.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 6.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 4.00-4.50m for 80 minutes and 9.90-10.20m for 40 minutes and 10.80-11.00m for 35 minutes. Symbols and abbreviations are explained on the accompanying key sheet. All dimensions are in metres.												Logged by MM Figure 1 of 3 18/12/2019	
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Sampling			Properties			Strata		Scale 1:50								
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (Ft)	Description		Depth	Legend	Level m OD						
10.50	D			7.7												
11.00-11.45 11.00-11.26	B	10.50 (7.40)			S50/ 130											
12.00	D					Extremely weak reddish brown fine to coarse grained SANDSTONE.		11.60		12.29						
12.50-12.95 12.50-12.64	B	12.00 (11.90)			C50/68											
13.50	D				(AZCL) C50/52											
13.70-13.81		13.50 (10.70)														
Core Run/Depth (Core Dia/Time)	Depth Cased	TCR/SCR / Type	Length Max/Min	ROD %	SPT (Ft)	Continued by Rotary techniques General		14.15		9.74						
13.50-15.00		73 28	0.14 0.10	28	(10) (NI) (8)	Extremely weak to medium strong reddish brown fine to coarse grained SANDSTONE with some subrounded to rounded fine clasts of mudstone and quartz. Discontinuities are closely to extremely closely spaced horizontal to vertical planar smooth to rough and clean.										
15.00-16.50		87 65	0.36 0.04	57	(AZCL) (10) (8)											
16.50-18.00		90 37	0.15 0.03	27	(AZCL) (NI) (>25) (7)	Between 17.00-17.05m, band of red sandy clay.										
18.00-19.50		97 87	0.29 0.08	73	(AZCL) (15) (6)	Between 18.90-19.00m, clay smear on core.										
19.50-21.00		87 40	0.22 0.01	33	(AZCL) (6)											
Boring					Progress				Ground water							
Depth	Dia	Technique		Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater	
Remarks															Logged by	MM
minutes and 11.00-11.60m for 70 minutes and 13.40-13.70m for 60 minutes.															Figure	2 of 3
Flush: 13.50-18.00m, Water, 100% returns; 18.00-19.50m, Water, 50% returns; 19.50-25.50m, Water, 30% return.																18/12/2019
Symbols and abbreviations are explained on the accompanying key sheet.															geotechnics	
All dimensions are in metres.															Logged in accordance with BS5930:2015	

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole Project No **BH8A01**
 Client **WSP** National Grid Coordinates **354715.5 E 390584.6 N** Ground Level **23.89 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
					(15)					
21.00-22.50		67 0	- -	0	(AZCL)					
					(10)					
					(NI)					
					(9)					
22.50-24.00		100 59	0.27 0.02	58	(10)					
					(NI)					
					(4)					
24.00-25.50		100 90	0.40 0.05	87	(NI)					
					(8)					
					(0)					
						End of Borehole		25.50		-1.61

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater


Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MM**

Figure **3 of 3**
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BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A02**
 Client **WSP** National Grid Coordinates **354789.9 E 390674.5 N** Project No **PN194027**
 Ground Level **26.00 m OD**


Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD
0.20- 0.60	B					Grass over TOPSOIL: Soft dark brown slightly sandy clay with some rootlets.	G.I.		26.00
0.25	ES						0.40		25.60
0.50	ES								
0.60- 1.20	B								
1.00	ES								
1.20- 1.65	UT42	(DRY)	72	19					
1.70	D								
1.80	D								
2.00- 2.45	B	1.70 (DRY)			S17				
2.00- 2.45						Below 2.30m, stiff.			
2.80	D								
3.00- 3.45	UT77	3.00 (DRY)		13					
3.50	D								
3.80	D								
4.00- 4.45	B	4.00 (DRY)			S19				
4.00- 4.45									
4.80	D								
5.00- 5.45	UT67	4.50 (DRY)	100	13					
5.50	D								
6.00	D								
6.50- 6.95	B	6.00 (DRY)			S26				
6.50- 6.95						Below 6.90m, very stiff.			
7.50	D								
8.00- 8.45	UT100	8.00 (DRY)							
8.50	D								
9.00	D								
9.50- 9.95	B	9.00 (DRY)			S50/282				
9.50- 9.93									

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			09/10/19	08:00						None encountered.
12.00	0.15	Cable Percussion	SL	5.00	4.70	DRY	09/10/19	18:00						
13.00	0.13	Rotary Core	JB	5.00	4.50	4.30	10/10/19	08:00						
				12.00	12.00	ADDED	10/10/19	18:00						
				12.00	12.00	11.20	11/10/19	08:00						
				13.00	12.00	12.30	11/10/19	18:00						

Remarks  Inspection pit hand excavated to 1.20m depth and no services were found.
 ES sample = 1 x vial, 1 x plastic jar and 1 amber jar.
 Water was added to assist boring at 12.00m where borehole encountered an obstruction - probable boulder - no progress despite chiselling for 1 hour, so switched to rotary techniques.
 A 50mm gas monitoring pipe was installed to 5.00m with a geowrapped slotted section from 1.00m to 5.00m with upright lockable protective cover. Backfill details from base of hole: collapsed material up to 10.00m, bentonite seal up to 5.00m, gravel filter up to 1.00m,
 Logged in accordance with BS5930:2015

Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres.

Logged by **MM**
 Figure **1 of 2**
 18/12/2019



BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI Engineer WSP Borehole BH8A02
 Project No PN194027
 Client WSP National Grid Coordinates 354789.9 E 390674.5 N Ground Level 26.00 m OD

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description		Depth	Legend	Level m OD
10.50	D									
11.00-11.45	UT100	10.50 (DRY)								
11.50	D									
12.00	D							12.00		14.00
Core Run/Depth (Core Dia/Time)	Depth Cased	TCR/SCR / Type	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	Detail			
12.00-12.50	12.00 (11.20)	100 100	0.50 0.50	100	(0) (AZCL)	BOULDERS of extremely strong white mottled grey and black granite.	At 12.00m, boulder of granite. Between 12.50-12.60m, band of red fine to coarse sand.			
12.50-13.00	12.00 (ADDED)	80 80	0.40 0.40	80	(0)	End of Borehole		13.00		13.00

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks
 bentonite seal up to 0.20m, concrete up to ground level.
 Chiselling: 10.50-11.00m for 60 minutes and 12.00-12.00m for 60 minutes.
 Flush: 12.00-13.00m, Water, 100% return.

Logged by MM
 Figure 2 of 2
 18/12/2019

geotechnics

All dimensions are in metres. Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A02A**
 Client **WSP** National Grid Coordinates **354786.0 E 390678.3 N** Project No **PN194027**
 Ground Level **25.95 m OD**

Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD
0.25	ES					Grass over TOPSOIL: Soft dark brown slightly sandy clay with some rootlets.	G.L.		25.95
0.30- 0.60	B					Firm yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium of sandstone, mudstone and coal. Between 0.60-1.20m, sandy.	0.30		25.65
0.50	ES								
0.60- 1.20	B								
1.00	ES								
1.20- 1.65	UT62	(DRY)		13		Below 1.60m, stiff, reddish brown.			
1.70	D								
1.80	D								
2.00- 2.45	B								
2.00- 2.45		1.70 (DRY)			S20				
2.80	D								
3.00- 3.45	UT78	3.00 (DRY)							
3.50	D								
3.80	D								
4.00- 4.45	B								
4.00- 4.45		4.00 (DRY)			S18				
4.80	D								
5.00- 5.45	UT91	4.70 (DRY)		13					
5.50	D								
6.00	D								
6.50- 6.95	B								
6.50- 6.95		6.00 (DRY)			S21				
7.50	D								
8.00- 8.45	UT100	7.50 (DRY)		11		Below 7.80m, very stiff.			
8.50	D								
9.00	D								
				12					

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			16/10/19	08:00						None encountered.
14.50	0.15	Cable Percussion	SL	9.00	9.00	DRY	16/10/19	18:00						
26.50	0.13	Rotary Core	JB	9.00	9.00	7.70	17/10/19	08:00						
				14.50	14.50		17/10/19	18:00						
				14.50	14.50	14.00	22/10/19	08:00						
				17.50	14.50	16.70	22/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Backfill details from base of hole: bentonite seal up to 0.50m, arisings up to ground level. Chiselling: 8.60-9.00m for 55 minutes and 11.90-12.40m for 85 minutes and 13.30-13.70m for 75 minutes and 14.30-14.50m for 60 minutes. Flush: 14.50-16.00m, Water, 100% returns; 16.00-17.50m, Water, 10% returns; 17.50-19.00m, Water, 0% returns; 19.00-20.50m, Water, 10% returns; 20.50-22.00m, Water, 0% returns; 22.00-23.50m, Water, 60% returns; 23.50-25.00m, Water, 0% returns; 25.00-26.50m, Water, 40% return.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by **MM**

Figure **1 of 3**

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geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer WSP

Borehole BH8A02A
Project No PN194027

Client WSP

National Grid Coordinates 354786.0 E
390678.3 N

Ground Level 25.95 m OD

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description		Depth	Legend	Level m OD
						Extremely weak reddish brown fine to coarse grained SANDSTONE with subangular to subrounded fine clasts of mudstone and quartz. Between 11.90-13.70m, recovered as slightly gravelly sand.		11.90		14.05

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MM

Figure 2 of 3
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geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A02A**
 Project No **PN194027**
 Client **WSP** National Grid Coordinates **354786.0 E**
390678.3 N Ground Level **25.95 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
20.50-22.00	14.50 (ADDED)	87 55	0.28 0.03	49	(AZCL) (50)					
22.00-23.50	22.00 (ADDED)	98 63	0.22 0.04	53	(AZCL) (NI) (6)					
23.50-25.00	22.00 (ADDED)	66 37	0.14 0.04	9	(AZCL) (10) (NI)					
25.00-26.50	22.00 (23.20)	84 66	0.17 0.04	28	(AZCL) (12) (0) (NA) (13)		Between 25.60-25.70m, band of soft reddish brown slightly sandy clay.			
						End of Borehole		26.50		-0.55

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A03**
 Client **WSP** National Grid Coordinates **354697.8 E 390742.6 N** Project No **PN194027**
 Ground Level **26.10 m OD**

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD		
0.00- 0.30	B ES					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with occasional rootlets. Gravel is subangular to subrounded fine to coarse of sandstone.	G.L.		26.10		
0.50- 1.20	B ES					MADE GROUND: Soft yellowish brown sandy clay. At 0.60m, land drain encountered, running NW-SE.	0.30		25.80		
1.00	ES					Soft to firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to medium of sandstone, siltstone, mudstone and coal.	1.00		25.10		
1.20- 1.65	UT46	(DRY)									
1.70	D										
1.80	D										
2.00- 2.45	B	1.70 (DRY)			S21	Between 2.00-2.45m, sandy.					
2.00- 2.45											
2.80	D										
3.00- 3.45	UT63	3.00 (DRY)		12							
3.50	D										
3.80	D										
4.00- 4.45	B	4.00 (DRY)			S18						
4.00- 4.45											
4.80	D										
5.00- 5.45	UT100	4.50 (DRY)		12							
5.50	D										
6.00	D										
6.50- 6.95	B										
6.50- 6.95		6.00 (DRY)			S23	Below 6.80m, stiff with bands of brown fine to medium sand.					
7.50	D										
8.00- 8.45	B										
8.00- 8.42		7.50 (DRY)			S50/ 267						
9.00	D										
9.50- 9.95	B										
9.50- 9.89		9.00 (DRY)			S50/ 243						

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			14/10/19	08:00						None encountered.
12.55	0.15	Cable Percussion	SL	2.00	1.70	DRY	14/10/19	18:00						
24.10	0.13	Rotary Core	JB	2.00	1.70	DRY	15/10/19	08:00						
				12.55	12.00	9.20	15/10/19	18:00						
				12.10	12.00	11.10	17/10/19	08:00						
				15.10	12.10	10.40	17/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth. Land drain encountered at 0.60m depth running NW-SE, so inspection pit extended to avoid damaging drain. Water was added to assist boring between 10.30m and 12.10m. A 50mm gas monitoring pipe was installed to 20.10m with a geowrapped slotted section from 12.00m to 20.10m with upright lockable protective cover. Backfill details from base of hole: collapsed material up to 20.10m, gravel filter up to 12.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 7.20-7.70m for 75 minutes and 8.30-9.00m for 95 minutes and 11.70-12.10m for 60 minutes. Logged by **MM** Figure **1 of 3** 18/12/2019

Symbols and abbreviations are explained on the accompanying key sheet. All dimensions are in metres. Logged in accordance with BS5930:2015

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer WSP

Borehole
Project No

BH8A03
PN194027

Client WSP

National Grid
Coordinates 354697.8 E
390742.6 N

Ground Level 26.10 m OD

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD	
10.50	D					Extremely weak reddish brown fine to coarse grained SANDSTONE. (Recovered as sand).	10.30		15.80	
11.00-11.45 11.00-11.14	B	10.50 (8.80)		S50/63						
12.00 12.10-12.22	D	12.00 (9.20)		S50/56						
12.10-13.60	12.10 (11.10)	47 11	0.17 0.07	11	(AZCL) (NI)	Extremely weak reddish brown fine to coarse grained SANDSTONE with subrounded fine clasts of mudstone and quartz. Discontinuities are horizontal to vertical closely to very closely spaced planar smooth and clean.				
13.60-15.10	12.10 (ADDED)	81 51	0.16 0.10	51	(0) (AZCL) (NI) (12) (NI) (28)					
15.10-16.60	12.10 (10.20)	69 57	0.13 0.07	16	(AZCL) (NI) (11)					
16.60-18.10	12.10 (ADDED)	84 67	0.23 0.03	55	(AZCL) (12) (6)					
18.10-19.60	12.10 (ADDED)	93 64	0.38 0.02	63	(AZCL) (NI) (27) (3)	Weak to medium strong reddish brown fine to coarse grained SANDSTONE with subrounded to rounded fine clasts of mudstone and quartz. Discontinuities are horizontal to subvertical closely to very closely spaced smooth and clean.				
19.60-21.10	12.10 (ADDED)	71 37	0.15 0.02	17	(AZCL)					
Continued by Rotary techniques General						Detail				
Between 14.34-14.50m, band of slightly gravelly sandy clay. At 14.60m, lens (30mm thick) of soft orange clay.										

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				15.10 24.10	12.10 12.10	10.20 21.00	18/10/19 18/10/19	08:00 18:00						

Remarks

minutes.
Flush: 12.10-16.60m, Water, 100% returns; 16.60-18.10m, Water, 70% returns; 18.10-24.10m, Water, 0% return.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MM


Figure 2 of 3
18/12/2019

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A03**
 Project No **PN194027**
 Client **WSP** National Grid Coordinates **354697.8 E**
390742.6 N Ground Level **26.10 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
					(14)					
					(NI)					
					(14)					
21.10-22.60	12.10 (ADDED)	100 35	0.20 0.04	13	(NI)		Below 20.50m, discontinuities are subhorizontal to vertical.			
					(10)					
22.60-24.10	12.10 (ADDED)	100 64	0.26 0.03	53	(7)					
					(23)		Between 23.50-23.70m, yellowish grey.			
					(5)					
						End of Borehole		24.10		2.00

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks 


Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by **MM**

Figure **3 of 3**
18/12/2019



BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI				Engineer WSP				Borehole Project No BH8A04 PN194027			
Client WSP				National Grid Coordinates 354853.6 E 390755.9 N				Ground Level 25.35 m OD			

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD		
0.25	ES					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with many rootlets. Gravel is subrounded fine of sandstone.	G.L.		25.35		
0.30- 0.60	B						0.30		25.05		
0.50	ES										
0.60- 1.20	B										
1.00	ES					Firm yellowish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone, mudstone and quartz.					
1.20- 1.65	UT44	(DRY)	70	16							
1.70	D										
1.80	D										
2.00- 2.45	B	1.70 (DRY)			S16	Below 2.30m, stiff, brown.					
2.00- 2.45											
2.80	D										
3.00- 3.45	UT89	3.00 (DRY)		13							
3.50	D										
3.80	D										
4.00- 4.45	B	4.00 (DRY)			S15						
4.00- 4.45											
4.80	D										
5.00- 5.45	UT82	4.70 (DRY)	84	13							
5.50	D										
6.00	D										
6.50- 6.95	B	6.00 (DRY)			S50/ 208	Below 6.80m, very stiff.					
6.50- 6.86											
7.50	D										
8.00- 8.45	B	7.50 (DRY)			S50/ 108						
8.00- 8.25											
9.00	D										
9.50- 9.95	B	9.00 (DRY)			S50/ 70						
9.50- 9.70											
						Extremely weak reddish brown fine to coarse grained SANDSTONE.	9.30		16.05		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			11/10/19	08:00	18.30					Overnight inflow.
10.80	0.15	Cable Percussion	SL	7.50	7.50	DRY	11/10/19	18:00						
22.80	0.13	Rotary Core	JB	7.50	7.50	3.50	12/10/19	08:00						
				11.25	10.80	9.20	12/10/19	18:00						
				10.80	10.80	DRY	16/10/19	08:00						
				22.80	10.80	DRY	16/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Water was added to assist boring between 9.50m and 10.80m. Backfill details from base of hole: bentonite seal up to ground level. Chiselling: 6.80-7.10m for 85 minutes and 8.00-9.30m for 160 minutes and 10.50-10.80m for 60 minutes. Flush: 10.80-12.30m, Water, 90% returns; 12.30-15.30m, Water, 70% returns; 15.30-22.80m, Water, 0% return.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MM

Figure 1 of 3

18/12/2019

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer WSP


Borehole
Project No

BH8A04
PN194027

Client WSP

National Grid
Coordinates 354853.6 E
390755.9 N

Ground Level 25.35 m OD

Sampling			Properties			Strata		Scale 1:50							
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description		Depth	Legend	Level m OD					
10.50	D	10.50 (9.20)	0.11 0.05	20	C50/53 (AZCL)	Extremely weak to weak, occasionally medium strong, reddish brown fine to coarse grained SANDSTONE with subrounded to rounded fine clasts of mudstone and quartz. Discontinuities are horizontal to vertical closely to very closely spaced planar smooth and clean with occasional sand infill.		10.50		14.85					
10.80-10.91															
10.80-12.30															
Core Run/Depth (Core Dia/Time)	Depth Cased	TCR/SCR / Type	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General		Detail							
12.30-13.80	10.80 (ADDED)	100 60	0.14 0.05	47	(13)										
					(12)										
					(NI)										
					(18)										
13.80-15.30	10.80 (ADDED)	96 93	0.30 0.01	73	(AZCL)										
					(0)										
					(NI)										
					(6)										
15.30-16.80	10.80 (ADDED)	100 77	0.38 0.01	53	(22)										
					(3)										
16.80-18.30	10.80 (ADDED)	100 38	0.20 0.04	20	(NI)										
					(21)										
					(6)										
18.30-19.80	10.80 (ADDED)	100 66	0.14 0.04	47	(7)										
					(NI)										
19.80-21.30	10.80 (ADDED)	93 66	0.37 0.06	63	(AZCL)										
Boring					Progress					Ground water					
Depth	Dia	Technique		Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
					22.80 22.80	10.80 10.80	18.30 18.10	17/10/19 17/10/19	08:00 18:00						

Boring				Progress					Groundwater					
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				22.80	10.80	18.30	17/10/19	08:00						
				22.80	10.80	18.10	17/10/19	18:00						

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MM

Figure 2 of 3
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geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole Project No **BH8A04**
 Client **WSP** National Grid Coordinates **354853.6 E 390755.9 N** Ground Level **25.35 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
					(NI)					
					(28)					
21.30-22.80	10.80 (ADDED)	86 57	0.45 0.02	40	(AZCL)					
					(16)					
					(0)					
					(NI)					
						End of Borehole		22.80		2.55

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater


Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MM**

Figure **3 of 3**
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BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer WSP

Borehole
Project No

BH8A05
PN194027

Client WSP

National Grid
Coordinates 355021.0 E
390770.4 N

Ground Level 23.86 m OD

Sampling			Properties			Strata		Scale 1:50							
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD						
0.00- 0.40	B					Grass over TOPSOIL: Soft dark brown sandy clay with rare rootlets.	G.L.		23.86						
0.25	ES														
0.40- 0.70	B					POSSIBLE MADE GROUND: Yellowish brown slightly gravelly sand with some clayey pockets. Gravel is subrounded to rounded fine to medium of mudstone.	0.40		23.46						
0.50	ES														
0.70- 1.20	B						0.70		23.16						
1.00	ES					Firm brown slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to medium of sandstone and mudstone.									
1.20- 1.65	UT37	(1.10)													
1.70	D														
1.80	D														
2.00- 2.45	B														
2.00- 2.45		1.70 (DRY)			S12	Below 2.40m, stiff.									
2.80	D														
3.00- 3.45	UT56	3.00 (DRY)													
3.50	D														
3.80	D														
4.00- 4.45	B														
4.00- 4.45		4.00 (DRY)			S17										
4.80	D														
5.00- 5.45	UT43	4.70 (DRY)													
5.50	D														
6.00	D					Between 6.10-6.40m, low cobble content.									
6.50- 6.95	B														
6.50- 6.95		6.00 (DRY)			S35										
7.50	D														
8.00- 8.45	B					Extremely weak reddish brown fine to coarse grained SANDSTONE. (Recovered as sand).	7.90		15.96						
8.00- 8.14		7.50 (DRY)			C50/63										
9.00	D														
9.50- 9.95	B														
9.50- 9.62		9.50 (6.90)			C50/52		9.70		14.16						
Core Run/Depth (Core Dia/Time)	Depth Cased	TCR/SCR / Type	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General		Detail							
Boring					Progress				Groundwater						
Depth	Dia	Technique		Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit		SL	G.L.			01/10/19	08:00	6.10	6.00	4.90	20		Fast inflow.
9.95	0.15	Cable Percussion		SL	8.45	8.00	DRY	01/10/19	18:00						
21.70	0.13	Rotary Core		JB	8.45	8.00	6.10	02/10/19	08:00						
					9.95	9.50	6.90	02/10/19	12:00						
					9.95	9.70	9.20	02/10/19	12:01						
					12.20	11.30	11.10	02/10/19	18:00						
Remarks															
Inspection pit hand excavated to 1.20m depth and no services were found.															
ES sample = 1 x vial, 1 x plastic jar and 1 amber jar.															
Water was added to assist boring between 8.00m and 9.70m.															
A 50mm gas monitoring pipe was installed to 8.50m with a geowrapped slotted section from 6.00m to 8.50m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 8.50m, gravel filter up to 6.00m, bentonite seal up to 0.20m, concrete up to ground level.															
Chiselling: 6.10-6.40m for 55 minutes and 8.50-9.70m for 150 minutes.															
All dimensions are in metres.															
Logged in accordance with BS5930:2015															
Logged by MM															
Figure 1 of 3															
18/12/2019															
geotechnics															

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A05**
 Client **WSP** National Grid Coordinates **355021.0 E 390770.4 N** Project No **PN194027**
 Ground Level **23.86 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (F)	Description General	Description Detail	Depth	Legend	Level m OD
9.70-10.70	9.70 (9.20)	80 23	0.13 0.10	23	(AZCL)	Extremely weak to weak reddish brown fine to coarse grained SANDSTONE with some subrounded to rounded fine clasts of mudstone and quartz. Discontinuities are closely to very closely spaced horizontal to subvertical planar smooth and clean.				
					(NI)					
					(2)					
10.70-12.20	11.30 (ADDED)	80 49	0.23 0.04	34	(AZCL)					
					(10)					
12.20-13.70	11.30 (11.35)	97 47	0.26 0.03	45	(AZCL)					
					(NI)					
					(8)					
13.70-14.70	11.30 (ADDED)	84 39	0.17 0.05	17	(AZCL)					
					(NI)					
					(8)					
14.70-16.20	11.30 (ADDED)	100 75	0.38 0.10	75	(NA)					
					(6)					
16.20-17.70	11.30 (ADDED)	100 87	0.30 0.03	70	(NI)					
					(7)					
17.70-19.20	11.30 (ADDED)	87 73	0.30 0.11	73	(AZCL)					
					(3)					
					(4)					
19.20-20.70	11.30 (ADDED)	100 81	0.41 0.20	64	(NI)					
					(8)					

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				12.20 21.70	11.30 11.30	11.35 10.05	03/10/19 03/10/19	08:00 18:00						

Remarks **Flush:** 9.70-10.70m, Water, 0% returns; 10.70-11.30m, Water, 100% returns; 11.30-14.70m, Water, 70% returns; 14.70-19.20m, Water, 60% returns; 19.20-21.70m, Water, 50% return.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by **MM**

Figure **2 of 3**
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BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A05**
 Project No **PN194027**
 Client **WSP** National Grid Coordinates **355021.0 E**
390770.4 N Ground Level **23.86 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
20.70-21.70	11.30 (ADDED)	70 70	0.20 0.07	61	(AZCL) (4)			21.70		2.16
						End of Borehole				

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI			Engineer WSP			Borehole Project No BH8A06 PN194027		
Client WSP			National Grid Coordinates 354923.4 E 390672.3 N			Ground Level 24.90 m OD		

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (F)	Description	Depth	Legend	Level m OD		
0.00- 0.30	B					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with occasional rootlets.	G.L.		24.90		
0.25	ES										
0.30- 0.60	B						0.30		24.60		
0.50	ES					POSSIBLE MADE GROUND: Yellowish brown clayey fine to medium sand.	0.60		24.30		
0.60- 1.20	B										
1.00	ES					Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, mudstone and coal.					
1.20- 1.65	UT42	(DRY)									
1.70	D										
1.80	D										
2.00- 2.45	B					Below 2.00m, stiff.					
2.00- 2.45		1.70 (DRY)			S16						
2.80	D										
3.00- 3.45	UT57	3.00 (DRY)									
3.50	D										
3.80	D										
4.00- 4.45	B										
4.00- 4.45		4.00 (DRY)			S19						
4.80	D										
5.00- 5.45	UT79	4.70 (DRY)									
5.50	D										
6.00	D										
6.50- 6.95	B					Below 6.60m, sandy.					
6.50- 6.95		6.00 (DRY)			S45						
7.50	D										
8.00- 8.45	UT76	7.50 (DRY)									
8.50	D										
9.00- 9.45	B					Below 8.80m, very stiff.					
9.00	D										
9.00- 9.29		9.00 (DRY)			S50/143						

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			02/10/19	08:00	5.70					Overnight inflow
12.65	0.15	Cable Percussion	SL	5.70	4.70	DRY	02/10/19	18:00						
24.20	0.13	Rotary Core	JB	5.70	4.70	5.20	03/10/19	08:00						
				12.95	12.20	10.70	03/10/19	18:00						
				12.95	12.20	11.10	04/10/19	08:00						
				15.20	12.20	0.30	04/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. ES sample = 1 x vial, 1 x plastic jar and 1 amber jar. Water was added to assist boring between 11.00m and 12.20m. A 50mm gas monitoring pipe was installed to 8.00m with a geowrapped slotted section from 6.00m to 8.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 8.00m, gravel filter up to 6.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 5.60-5.70m for 50 minutes and 10.10-10.50m for 70 minutes and 11.70-12.20m for										Logged by MM Figure 1 of 3 18/12/2019	
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Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres.

Logged in accordance with BS5930:2015

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer WSP

Borehole
Project No

BH8A06
PN194027

Client WSP

National Grid
Coordinates 354923.4 E
390672.3 N

Ground Level 24.90 m OD

Sampling			Properties			Strata		Scale 1:50						
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD					
10.50	D					Extremely weak reddish brown fine to coarse grained SANDSTONE with some subrounded to rounded fine to medium clasts of various lithologies.	10.55		14.35					
11.00-11.45 11.00-11.14	B	10.70 (DRY)		S50/68										
12.00	D													
12.20-12.32		12.20 (10.70)			S50/55									
Core Run/Depth (Core Dia/Time)	Depth Cased	TCR/SCR / Type	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General	12.65		12.25					
12.20-13.70	12.20 (11.10)	80 48	0.21 0.03	25	(AZCL) (NI) (16) (NI)	Extremely weak to weak reddish brown fine to coarse grained SANDSTONE with some subrounded to rounded fine clasts of mudstone and quartz. Discontinuities are closely to very closely spaced subvertical to horizontal planar smooth and clean.								
13.70-15.20	12.20 (ADDED)	93 70	0.18 0.01	12	(9) (AZCL) (NI) (30) (5)									
15.20-16.70	12.20 (14.10)	80 40	0.09 0.04	0	(AZCL) (NI) (20)									
16.70-18.20	12.20 (ADDED)	97 57	0.25 0.04	40	(AZCL) (NI)									
18.20-19.70	12.20 (ADDED)	100 100	0.37 0.03	73	(10)									
19.70-21.20	12.20 (ADDED)	80 80	0.35 0.05	73	(AZCL)									
Boring			Progress			Groundwater								
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
				15.20 24.20	12.20 12.20	14.10 11.10	07/10/19 07/10/19	08:00 18:00						
Remarks 60 minutes. Flush: 12.20-13.70m, Water, 100% returns; 13.20-15.20m, Water, 90% returns; 15.20-18.20m, Water, 50% returns; 18.20-19.70m, Water, 60% returns; 19.70-24.20m, Water, 50% return.														
Symbols and abbreviations are explained on the accompanying key sheet. All dimensions are in metres.														

Logged by MM

Figure 2 of 3
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Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A06**
 Project No **PN194027**
 Client **WSP** National Grid Coordinates **354923.4 E**
390672.3 N Ground Level **24.90 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
					(4)					
					(NI)					
21.20-22.70	12.20 (ADDED)	100 73	0.25 0.03	56	(0)		Between 20.90-20.95m, band of soft reddish brown very sandy clay.			
					(NI)					
					(10)					
22.70-24.20	12.20 (ADDED)	100 70	0.37 0.05	67	(4)					
					(NI)					
						End of Borehole		24.20		0.70

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater


Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MM**

Figure **3 of 3**
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BOREHOLE RECORD - Cable Percussion

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A07**
 Client **WSP** National Grid Coordinates **354871.4 E 390602.4 N** Project No **PN194027**
 Ground Level **24.91 m OD**

Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD
0.00- 0.40	B ES					Grass over TOPSOIL: Soft dark brown slightly sandy clay with rootlets.	G.L.		24.91
0.50- 1.20	B ES					Firm brown slightly sandy slightly gravelly CLAY with a low subrounded cobble content of sandstone. Gravel is subrounded to rounded fine to coarse of sandstone, mudstone and coal.	0.40		24.51
1.00	ES								
1.20- 1.65	UT47	(DRY)	107	13					
1.70	D								
1.80	D								
2.00- 2.45	B	1.70 (DRY)			S14				
2.00- 2.45						Below 2.60m, stiff.			
2.80	D								
3.00- 3.45	UT100	3.00 (DRY)		12					
3.50	D								
3.80	D								
4.00- 4.45	B	4.00 (DRY)			S17				
4.00- 4.45									
4.80	D								
5.00- 5.45	UT79	4.70 (DRY)							
5.50	D								
6.00	D			9.7					
6.50- 6.95	B	6.00 (DRY)			S22				
6.50- 6.95									
7.50	D								
8.00- 8.45	UT100	7.50 (DRY)							
8.50	D								
9.00	D								
9.50- 9.95	B	9.00 (DRY)			S38				
9.50- 9.95						Below 9.80m, very stiff.			

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20		Inspection Pit	SL	G.I.			04/10/19	08:00	13.00		7.30	840		Overnight inflow.
16.95	0.15	Cable Percussion	SL	13.00	12.00	12.60	04/10/19	18:00						
28.50	0.13	Rotary Core	JB	13.00	12.00	7.30	07/10/19	08:00						
				16.95	16.50	14.90	07/10/19	18:00						
				16.50	16.50	15.20	08/10/19	08:00						
				24.00	16.50	20.50	08/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 ES sample = 1 x vial, 1 x plastic jar and 1 amber jar.
 Water was added to assist boring between 12.50m and 13.00m, and between 16.00m and 16.50m.
 Backfill details from base of hole: bentonite seal up to 1.20m, arisings up to ground level.
 Chiselling: 11.60-11.80m for 45 minutes and 13.60-13.90m for 75 minutes and 16.00-16.50m for 60 minutes.
 Flush: 16.50-18.00m, Water, 90% returns; 18.00-21.00m, Water, 80% returns; 21.00-24.00m, Water, 70% returns; 24.00-28.50m, Water, 50% return.
 All dimensions are in metres. Logged in accordance with BS5930:2015


Logged by **MM**
 Figure **1 of 3**
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BOREHOLE RECORD - Cable Percussion

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A07**
 Project No **PN194027**
 Client **WSP** National Grid Coordinates **354871.4 E**
390602.4 N Ground Level **24.91 m OD**

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD		
10.50	D										
11.00-11.45	UT100	10.50 (DRY)									
11.50	D										
12.00	D										
12.50-12.95	B	12.00 (DRY)			S50/138	Very dense reddish brown very gravelly fine to coarse SAND. Gravel is subangular to rounded fine to coarse of sandstone, mudstone and coal.	12.30		12.61		
13.50	D										
13.90	D					At 13.90m, cobble of sandstone.					
14.00-14.45	B	13.70 (9.20)			S30	Stiff brown slightly sandy CLAY.	14.20		10.71		
14.00-14.45							14.30		10.61		
15.00	D					Extremely weak reddish brown MUDSTONE with very closely spaced bands of angular to subrounded fine to medium gravel of sandstone.					
15.50-15.95	UT100	14.30 (15.20)				Extremely weak reddish brown fine to coarse grained SANDSTONE.	15.50		9.41		
16.00	D										
16.50	D	16.30 (14.90)			S50/60	Extremely weak to weak reddish brown fine to coarse grained SANDSTONE with some subrounded to rounded fine to medium clasts of quartz. Discontinuities are horizontal to vertical closely to very closely spaced planar smooth and clean.	16.50		8.41		
16.50-16.63											

Boring				Progress					Groundwater						
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater	
				24.00	16.50	20.60	09/10/19	08:00							
				28.50	16.50	26.30	09/10/19	18:00							


Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

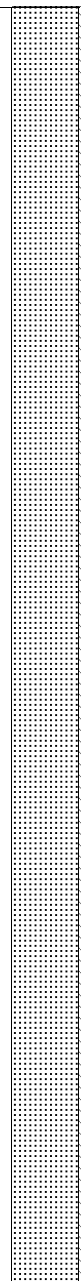
Logged by **MM**

Figure **2 of 3**
18/12/2019




BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI				Engineer WSP				Borehole Project No BH8A07 PN194027			
Client WSP				National Grid Coordinates 354871.4 E 390602.4 N				Ground Level 24.91 m OD			

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD		
											
						End of Borehole	28.50		-3.59		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks 										Logged by MM				
Symbols and abbreviations are explained on the accompanying key sheet.										Figure 3 of 3 18/12/2019				
All dimensions are in metres.										geotechnics				

Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A08**
 Client **WSP** National Grid Coordinates **355034.3 E 390616.8 N** Project No **PN194027**
 Ground Level **24.01 m OD**

Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD
0.00- 0.40	B					Grass over TOPSOIL: Very soft to soft dark brown slightly sandy slightly gravelly clay with some rootlets. Gravel is subangular to subrounded fine to coarse of various lithologies.	G.L.		24.01
0.25	ES						0.40		23.61
0.50- 1.20	B					Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to coarse of sandstone and mudstone.			
0.50	ES								
1.00	ES								
1.20- 1.65	UT41	(DRY)	53	19					
1.70	D								
1.80	D								
2.00- 2.45	B								
2.00- 2.45		1.70 (DRY)			S14				
2.80	D								
3.00- 3.45	UT68	3.00 (DRY)	220	12					
3.50	D								
3.80	D								
4.00- 4.45	B								
4.00- 4.45		4.00 (DRY)			S16				
4.80	D								
5.00- 5.45	UT79	4.50 (DRY)	84	11					
5.50	D								
6.00	D					Below 6.00m, pockets of red fine to coarse sand.			
6.50- 6.95	B								
6.50- 6.95		6.00 (DRY)			S24				
7.50	D								
8.00- 8.45	UT79	7.50 (DRY)	124	10					
8.50	D								
9.00	D								
9.50- 9.95	B								
9.50- 9.95		9.00 (DRY)			S50				

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.50	Inspection Pit	SL/JL	G.I.			19/09/19	08:00						None encountered.
12.62	0.15	Cable Percussion	SL/JL	6.00	6.00	DRY	19/09/19	18:00						
24.50	0.13	Rotary Core	JB/SW	6.00	6.00	DRY	20/09/19	08:00						
				12.62	12.20	11.10	20/09/19	18:00						
				12.50	12.50	0.30	01/10/19	08:00						
				24.50	12.50	9.30	01/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars.
 Water was added to assist boring between 11.40m and 12.50m.
 A 50mm gas monitoring pipe was installed to 12.00m with a geowrapped slotted section from 6.00m to 12.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 12.00m, gravel filter up to 6.00m, bentonite seal up to 0.20m, concrete up to ground level.
 Chiselling: 5.70-6.00m for 45 minutes and 10.50-11.00m for 70 minutes and 12.00-12.50m for
 Logged in accordance with BS5930:2015

Logged by **MM**
 Figure **1 of 3**
 18/12/2019

geotechnics

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer

WSP

Borehole
Project No

BH8A08
PN194027

Client WSP

National Grid
Coordinates 355034.3 E
390616.8 N

Ground Level 24.01 m OD

Sampling			Properties			Strata		Scale 1:50						
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD					
10.50	D													
10.83-10.95	C													
11.00-11.45	UT100	10.50 (DRY)												
11.50	D													
12.00	D													
12.50-12.62		12.20 (11.10)			C50/59									
Core Run/Depth (Core Dia/Time)						Continued by Rotary techniques General		Detail						
12.50-14.00	12.50 (0.30)	100	0.22	33	(NI)	Extremely weak to very weak reddish brown fine to coarse grained SANDSTONE with many subrounded to rounded clasts of mudstone and quartz. Discontinuities are closely to very closely spaced subhorizontal to subvertical planar smooth clean with occasional sand and gravel infill.								
12.68-12.78		73	0.02	(20)										
13.50-13.65		C												
		C												
14.00-15.50	12.50 (ADDED)	100	0.42	27	(4)	Below 16.65m, very weak to weak, in places.								
		91	0.07	(NI)										
				(7)										
15.50-17.00	12.50 (ADDED)	97	0.21	33	(AZCL)									
15.76-16.13		62	0.04	(12)										
		C												
16.65-16.85		C												
17.00-18.50	12.50 (ADDED)	93	0.29	37	(AZCL)									
17.27-17.54		37	0.04	(7)										
		C		(NI)										
				(5)										
18.50-20.00	12.50 (ADDED)	70	0.32	50	(AZCL)									
18.56-18.76		50	0.12	(NI)										
		C		(6)										
19.17-19.37		C												
Boring			Progress			Groundwater								
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

60 minutes.

Flush: 12.50-15.50m, Water, 100% returns; 15.50-20.00m, Water, 90% returns; 20.00-24.50m, Water, 80% return.

Logged by MM

Figure 2 of 3
18/12/2019

geotechnics


Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8A08**
 Client **WSP** National Grid Coordinates **355034.3 E 390616.8 N** Project No **PN194027**
 Ground Level **24.01 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50		
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (FI)	Description General	Description Detail	Depth	Legend	Level m OD
20.00-21.50	12.50 (ADDED)	87	0.20	51						
20.50-20.64		87	0.01							
		C			(14)					
21.50-23.00	12.50 (ADDED)	100	0.21	23						
21.95-22.12		73	0.07		(8)					
		C			(NI)		Between 22.20-22.30m, recovered as sandy gravel.			
					(6)					
23.00-24.50	12.50 (ADDED)	93	0.30	67	(AZCL)					
23.37-23.51		67	0.10							
		C			(5)					
						End of Borehole		24.50		-0.49

Drilling				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater


Remarks 

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015









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Figure **3 of 3**
18/12/2019




BOREHOLE RECORD - Cable Percussion

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8B01**
 Client **WSP** National Grid Coordinates **355367.1 E 390710.0 N** Project No **PN194027**
 Ground Level **22.16 m OD**

Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD
0.00- 0.50	B ES					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with occasional rootlets. Gravel is subangular to subrounded fine to coarse of various lithologies.	G.L.		22.16
0.50- 1.20	B ES				0.50		21.66		
1.00	ES								
1.20- 1.65	UT43	(DRY)	60	19					
1.70	D					Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to medium of sandstone, mudstone and occasional coal fragments.			
1.80	D								
2.00- 2.45	B								
2.00- 2.45		1.70 (DRY)		S23	Below 2.00m, stiff.				
2.80	D								
3.00- 3.45	UT100	3.00 (DRY)	246	13					
3.50	D								
3.80	D								
4.00- 4.45	B								
4.00- 4.45		4.00 (DRY)		S19					
4.80	D								
5.00- 5.45	UT100	4.70 (DRY)	56	13					
5.50	D				At 5.50m, band of sand.				
6.00	D								
6.50- 6.95	B								
6.50- 6.95		6.00 (DRY)		S31					
7.50	D								
8.00- 8.11		6.00 (DRY)			S50/55	Extremely weak reddish brown fine to coarse grained SANDSTONE recovered as fine to coarse sand.	7.60		14.56
						End of Borehole	8.11		14.05

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.40	Inspection Pit	SL/JL	G.I.			24/09/19	08:00	5.50	4.70	5.40	20		Slow inflow.
8.11	0.15	Cable Percussion	SL/JL	8.11	6.00	DRY	24/09/19	18:00						

Remarks  Inspection pit hand excavated to 1.20m depth and no services were found.
 ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars.
 A 50mm standpipe was installed to 6.00m with a geowrapped slotted section from 1.00m to 6.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 6.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.
 Chiselling: 2.60-2.80m for 35 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by **MM**
 Figure **1 of 1**
 18/12/2019

geotechnics

BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI				Engineer WSP				Borehole Project No BH8B02 PN194027			
Client WSP				National Grid Coordinates 355247.7 E 390792.8 N				Ground Level 22.53 m OD			

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD		
0.00- 0.50	B ES					Grass over TOPSOIL: Soft dark brown slightly sandy clay with occasional rootlets.	G.L.		22.53		
0.50- 1.20	B ES					Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, mudstone and coal fragments.	0.50		22.03		
1.00	ES										
1.20- 1.65	UT37	(DRY)		18							
1.70	D										
1.80	D										
2.00- 2.45	B	1.70 (DRY)			S12						
2.00- 2.45											
2.80	D										
3.00- 3.45	UT100	3.00 (DRY)	298	12							
3.50	D										
3.80	D										
4.00- 4.45	B	3.00 (DRY)			S19	Below 4.00m, stiff.					
4.00- 4.45											
4.80	D										
5.00- 5.45	UT63	4.00 (DRY)	80	13							
5.50	D										
6.00	D					Below 6.00m, sandy.					
6.50- 6.95	B										
6.50- 6.95		6.00 (DRY)			S44						
7.50	D			9.5							
8.00- 8.19		7.50 (DRY)			S50/58	Extremely weak reddish brown fine to coarse grained SANDSTONE recovered as fine to coarse sand.	7.60		14.93		
						End of Borehole	8.19		14.34		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
1.20	0.40	Inspection Pit	SL/JL	G.I.			23/09/19	08:00						None encountered.
8.19	0.15	Cable Percussion	SL/JL	8.19	7.50	DRY	23/09/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.

ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars.

Backfill details from base of hole: bentonite seal up to 0.50m, arisings up to ground level.

Chiselling: 7.00-7.30m for 40 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by MM

Figure 1 of 1

18/12/2019

BOREHOLE RECORD - Cable Percussion and Rotary

Project OMEGA DEVELOPMENT GI

Engineer WSP

Borehole
Project No

BH8B03
PN194027

Client WSP

National Grid
Coordinates 355137.7 E
390701.5 N

Ground Level 23.12 m OD

Sampling			Properties			Strata		Scale 1:50						
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N (FI)	Description	Depth	Legend	Level m OD					
0.00- 0.40	B	(1.10)	123	14	S9	Crops over TOPSOIL: Very soft dark brown slightly sandy clay with some rootlets.	G.L.		23.12					
0.25	ES													
0.40- 0.70	B					MADE GROUND: Brown slightly gravelly slightly silty fine to medium sand. Gravel is angular to rounded fine to medium of sandstone and brick fragments.	0.40		22.72					
0.50	ES													
0.70- 1.20	B						0.70		22.42					
1.00	ES	(1.10)	123	14	S9	Firm brown sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to medium of mudstone and sandstone.								
1.20- 1.65	B													
1.20- 1.65														
1.80	D													
2.00	ES					Below 2.00m, slightly sandy.								
2.00- 2.45	UT45	1.50 (DRY)	211	13	S23									
2.50	D													
2.80	D													
3.00- 3.45	B	3.00 (DRY)				Below 3.00m, stiff.								
3.00- 3.45														
3.80	D	4.00 (DRY)	211	13	S17									
4.00- 4.45	UT66													
4.50	D													
4.80	D													
5.00- 5.45	B					4.70 (DRY)	Below 5.00m, firm.							
5.00- 5.45			9.4		S50/68	Below 5.60m, sandy.								
6.00	D													
6.50- 6.95	UT100	6.00 (DRY)												
7.00	D													
7.50	D													
8.00- 8.45	B	7.50 (DRY)			S50/68	Extremely weak to weak reddish brown medium to coarse grained SANDSTONE.	8.00		15.12					
8.00- 8.19														
Core Run/Depth (Core Dia/Time)	Depth Cased	TCR/SCR / Type	Length Max/Min	RQD %	SPT (FI)	Continued by Rotary techniques General								
8.40- 9.40	8.00 (1.20)	33 0 D	-	0	(NI) C50/57									
9.00- 9.10														
9.10- 9.23	9.00 (2.10)													
9.40-10.40	8.00 (ADDED)	41 0	-	0	C50/37	Extremely weak to very weak reddish brown medium to coarse grained SANDSTONE with may subrounded to rounded	9.40		13.72					
9.40- 9.59	8.00 (ADDED)													
Boring			Progress					Groundwater						
Depth	Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.50	Inspection Pit	SL/JL	G.L.			18/09/19	08:00	1.20		1.10	20		Slow inflow.
9.23	0.15	Cable Percussion	SL/JL	8.45	7.50	DRY	18/09/19	18:00	7.10		6.90	20		Slow inflow.
20.40	0.13	Rotary Core	JB/SW	8.45	7.50	2.10	19/09/19	08:00						
				9.23	9.00	2.10	19/09/19	18:00						
				8.40	8.00	1.20	27/09/19	08:00						
				20.40	8.00	4.20	27/09/19	18:00						
Remarks														
Inspection pit hand excavated to 1.20m depth and no services were found. ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars. Water was added to assist boring between 8.70m and 9.10m. A 50mm gas monitoring pipe was installed to 19.00m with a geowrapped slotted section from 9.00m to 19.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 19.00m, gravel filter up to 9.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 6.10-6.30m for 40 minutes and 8.80-9.10m for 60 minutes. All dimensions are in metres. Logged in accordance with BS5930:2015														
										Logged by MM Figure 1 of 3 18/12/2019 				

BOREHOLE RECORD - Cable Percussion and Rotary

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8B03**
 Project No **PN194027**
 Client **WSP** National Grid Coordinates **355137.7 E 390701.5 N** Ground Level **23.12 m OD**

Drilling		Properties/Sampling				Strata		Scale 1:50			
Core Run/Depth (Core Dia/Time)	Depth Cased & (to Water)	Type TCR/SCR%	Length Max/Min	RQD %	SPT N (F)	Description General	Description Detail	Depth	Legend	Level m OD	
10.40-11.40	8.00 (ADDED)	100	0.13	44	C50/15 (11)	clasts of quartz. Discontinuities are closely to very closely spaced subhorizontal to subvertical planar smooth and clean.					
10.40-10.49	8.00 (ADDED)	72	0.03								
10.95-11.07		C									
11.40-12.40	8.00 (ADDED)	57	0.17	36							
11.40-11.59		36 C	0.03								
12.40-13.40	8.00 (ADDED)	79	0.23	47	(AZCL)						
12.40-12.57	8.00 (ADDED)	64	0.04		C50/21 (2)						
					(NI)						
13.40-13.90	8.00 (ADDED)	84	0.18	84	(6)						
		84	0.10								
13.90-15.40	8.00 (ADDED)	96	0.25	54							
		89	0.02								
14.53-14.66		C			(13)						
15.40-16.90	8.00 (ADDED)	98	0.37	69							
		77	0.02		(7)						
16.13-16.36		C									
					(NI)						
16.90-18.40	8.00 (ADDED)	95	0.20	68	(0)						
		83	0.02		(NI)						
					(9)						
18.40-19.90	8.00 (ADDED)	83	0.22	64	(AZCL)						
18.42-18.62		77	0.10		(1)						
18.70-19.00		C			(NI)						
		C			(7)						
19.40-19.61		C			(AZCL)						
					(4)						
19.90-20.40	8.00 (ADDED)	82	0.09	0							
		82	0.06								

Remarks **AGS** Flush: 8.40-10.40m, Water, 100% returns; 10.40-20.40m, Water, 30% return.


Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MM**


Figure **2 of 3**
18/12/2019

geotechnics

Remarks  Symbols and abbreviations are explained on the accompanying key sheet. All dimensions are in metres. Logged in accordance with BS5930:2015

Logged by **MM**

Figure **3 of 3**
18/12/2019




BOREHOLE RECORD - Cable Percussion

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8C01**
 Client **WSP** National Grid Coordinates **355028.3 E 390015.1 N** Project No **PN194027**
 Ground Level **19.68 m OD**

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD		
0.00- 0.30	B ES					Grass over TOPSOIL: Soft dark brown slightly sandy clay with many rootlets.	G.L.		19.68		
0.50- 1.20	B ES					Firm brown mottled grey slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium of sandstone and mudstone.	0.30		19.38		
1.00	ES										
1.20- 1.65	UT57	(DRY)				Below 1.40m, reddish brown, slightly sandy.					
1.70	D			12							
1.80	D										
2.00- 2.45	B	1.70 (DRY)			S17						
2.00- 2.45											
2.80	D										
3.00- 3.45	UT100	1.70 (DRY)	32	17							
3.50	D					Extremely weak reddish brown fine to coarse grained SANDSTONE.	3.20		16.48		
3.80	D										
4.00- 4.45	B	4.00 (3.10)			S50/69						
4.00- 4.20											
4.80	D										
5.00- 5.45	B	4.70 (3.30)			C50/62						
5.00- 5.13											
6.00	D										
6.00- 6.09		5.80 (3.90)			C50/43						
						End of Borehole	6.45		13.23		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.15	Inspection Pit	SL	G.I.	5.80	3.90	23/10/19	08:00						None encountered.
6.45		Cable Percussion	SL	6.45			23/10/19	18:00						


Remarks  Inspection pit hand excavated to 1.20m depth and no services were found.
 Water was added to assist boring between 3.50m and 6.00m.
 A 50mm gas monitoring pipe was installed to 3.00m with a geowrapped slotted section from 1.00m to 3.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 3.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.
 Chiselling: 5.50-6.00m for 60 minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015

Logged by **MM**
 Figure **1 of 1**
 18/12/2019



BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI				Engineer WSP				Borehole Project No BH8C02 PN194027			
Client WSP				National Grid Coordinates 355019.8 E 390366.0 N				Ground Level 22.63 m OD			

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD	
0.20- 0.60	B					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with many rootlets. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and brick fragments.	G.L.		22.63	
0.25	ES						0.20		22.43	
0.50	ES					MADE GROUND: Firm yellowish brown slightly gravelly sandy clay. Gravel is angular to rounded fine to coarse of sandstone, coal and brick fragments.				
0.60- 1.20	B									
1.00	ES									
1.20- 1.65	UT54	(DRY)								
1.70	D			14						
1.80	D									
2.00- 2.45	B				S21					
2.00- 2.45		1.70 (DRY)				Firm to stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subrounded to rounded fine to medium of sandstone and mudstone.	2.20		20.43	
2.80	D									
3.00- 3.45	UT89	3.00 (DRY)								
3.50	D									
3.80	D									
4.00- 4.45	B				S50/96	Below 4.00m, very stiff/hard.				
4.00- 4.19		4.00 (DRY)								
4.80	D									
5.00- 5.45	UT100	4.70 (DRY)	348	10						
5.50	D									
6.00	D									
6.50- 6.95	B				S31					
6.50- 6.95		6.00 (DRY)								
7.50	D			15						
8.00- 8.45	UT100	7.50 (DRY)								
8.50	D									
9.00	D									
9.50- 9.95	B				S50/48					
9.50- 9.60		9.00 (DRY)								
						Extremely weak reddish brown fine to coarse grained SANDSTONE. (Recovered as sand).	9.70		12.93	

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.15	Inspection Pit	SL	G.I.	10.70	9.30	24/10/19	08:00						None encountered.
11.45		Cable Percussion	SL				24/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Water was added to assist boring between 9.70m and 11.00m. A 50mm gas monitoring pipe was installed to 9.00m with a geowrapped slotted section from 6.00m to 9.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 9.00m, gravel filter up to 6.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 4.00-4.40m for 65 minutes and 10.70-11.20m for 60 minutes.														Logged by MM Figure 1 of 2 18/12/2019
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Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres.

Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8C02**
 Client **WSP** National Grid Coordinates **355019.8 E** Project No **PN194027**
390366.0 N Ground Level **22.63 m OD**

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD		
10.50	D										
11.00-11.45	B	10.70 (9.30)			C50/53						
11.00-11.11											
						End of Borehole	11.45		11.18		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI			Engineer WSP			Borehole Project No BH8C03 PN194027		
Client WSP			National Grid Coordinates 354880.0 E 390164.5 N			Ground Level 22.42 m OD		

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD		
0.00- 0.40	B ES					Crops over TOPSOIL: Soft dark brown slightly sandy clay with some rootlets.	G.L.		22.42		
0.50- 1.20	B ES					Firm brownish grey slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and coal.	0.40		22.02		
1.00	ES										
1.20- 1.65	UT39	(DRY)				Below 1.50m, reddish brown.					
1.70	D			15							
1.80	D										
2.00- 2.45	B	1.70 (DRY)			S11						
2.00- 2.45											
2.80	D										
3.00- 3.45	UT100	3.00 (DRY)	142	10							
3.50	D										
3.80	D										
4.00- 4.45	B	4.00 (DRY)			S50/206						
4.00- 4.36											
4.80	D										
5.00- 5.45	B	4.70 (3.80)			C50/47	Extremely weak reddish brown fine to coarse grained SANDSTONE with some subrounded fine clasts of mudstone and quartz.	4.80		17.62		
5.00- 5.10											
6.00	D										
6.50- 6.59		6.50 (3.80)			C50/42						
						End of Borehole	6.95		15.47		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	In Mins	Depth Sealed	Remarks on Groundwater
1.20	0.15	Inspection Pit	SL	G.I.	5.80	3.80	22/10/19	08:00						None encountered.
6.95		Cable Percussion	SL	6.95	5.80	4.40	22/10/19	18:00						
				6.95			23/10/19	08:00						
				0.00			23/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Water was added to assist boring between 4.80m and 6.50m. A 50mm gas monitoring pipe was installed to 4.00m with a geowrapped slotted section from 1.00m to 4.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 4.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 3.60-3.80m for 45 minutes and 6.00-6.50m for 60 minutes.										Logged by MM Figure 1 of 1 18/12/2019	
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Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres.

Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI				Engineer WSP				Borehole Project No BH8D01 PN194027			
Client WSP				National Grid Coordinates 355377.2 E 389875.2 N				Ground Level 20.00 m OD			

Sampling			Properties		Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %		Description	Depth	Legend	Level m OD
						Grass over TOPSOIL: Soft dark brown slightly sandy clay with many rootlets.	G.I.		20.00
						MADE GROUND: Firm greyish brown slightly sandy gravelly clay. Gravel is angular to subrounded fine to coarse of sandstone, siltstone and mudstone.	0.30		19.70
						At 0.80m, possible land drain.	0.80		19.20
						End of Borehole			

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
0.80	0.50	Inspection Pit	SL/J1	G.I. 0.80			30/10/19 30/10/19	08:00 18:00						None encountered.

Remarks Borehole BH8D01 was terminated at a depth of 0.80m on encountering a possible land drain in the middle of the inspection pit. Rig was moved 1m east to BH8D01A. Backfill details from base of hole: arisings up to ground level.															Logged by MM Figure 1 of 1 18/12/2019
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Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

geotechnics

Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI

Engineer WSP

Borehole BH8D01A
Project No PN194027

Client WSP

National Grid Coordinates 355377.2 E
389875.2 N

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend			
0.00- 0.30	B					Grass over TOPSOIL: Soft dark brown slightly sandy slightly gravelly clay with some rootlets. Gravel is angular to subangular fine to coarse of sandstone, siltstone, mudstone and quartz.	G.L.				
0.25	ES						0.30				
0.50- 1.20	B						0.50				
0.50	ES					MADE GROUND: Firm greyish brown mottled grey slightly gravelly sandy clay. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone, coal and some brick fragments.					
1.00	ES										
1.20- 1.65	UT47	(DRY)									
						Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and coal.					
1.70	D										
1.80	D										
2.00- 2.45	B					Below 2.20m, stiff.					
2.00- 2.45		1.70 (DRY)			S21						
2.80	D										
3.00- 3.45	UT58	3.00 (DRY)	118	11							
3.50	D										
3.80	D										
4.00- 4.45	B										
4.00- 4.45		4.00 (DRY)			S21	Below 4.70m, very stiff.					
4.80	D										
5.00- 5.45	UT100	4.70 (DRY)	115	10							
5.50	D										
6.00	D										
6.50- 6.95	B										
6.50- 6.95		6.00 (DRY)			S38						
7.50	D										
8.00- 8.45	B					Between 8.00-8.20m, band of cobbles.					
8.00- 8.09		7.50 (DRY)			C50/47						
9.00	D					Extremely weak reddish brown fine to coarse grained SANDSTONE with occasional subrounded to rounded fine clasts of mudstone and quartz. (Recovered as slightly gravelly sand).	8.20				
9.50- 9.95	B										
9.50- 9.64		9.00 (8.10)			C50/67						

Boring				Progress				Groundwater						
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.50	Inspection Pit Cable Percussion	SL/JL SL/JL	G.I.			29/10/19	08:00	3.50	3.00	3.30	20		Slow inflow. No rise.
11.45	0.15			2.00	1.70	DRY	29/10/19	18:00	6.70	6.00				
				2.00	1.70	DRY	30/10/19	08:00						
				11.45	11.00	8.90	30/10/19	18:00						

Remarks

Inspection pit hand excavated to 1.20m depth and no services were found.

ES sample = 1 x 60ml glass vial, 2 x 258ml amber glass jars.

Water was added to assist boring between 8.40m and 11.00m.

A 50mm gas monitoring pipe was installed to 6.00m with a geowrapped slotted section from 1.00m to 6.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 6.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.

Chiselling: 7.00-7.30m for 50 minutes and 8.00-8.40m for 95 minutes and 10.50-11.00m for 60

Logged in accordance with BS5930:2015

Logged by MM

Figure 1 of 2

18/12/2019

geotechnics

BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI Engineer WSP Borehole BH8D01A
Project No PN194027

Client WSP National Grid Coordinates 355377.2 E 389875.2 N

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend			
10.50	D										
11.00-11.12		10.50 (8.90)			C50/57						
						End of Borehole	11.45				

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks  minutes.

Symbols and abbreviations are explained on the accompanying key sheet.

All dimensions are in metres.

Logged in accordance with BS5930:2015









































Logged by MM

Figure 2 of 2
18/12/2019



BOREHOLE RECORD - Cable Percussion

Project **OMEGA DEVELOPMENT GI** Engineer **WSP** Borehole **BH8D02**
 Client **WSP** National Grid Coordinates **355301.2 E 390395.6 N** Project No **PN194027**
 Ground Level **21.22 m OD**

Sampling			Properties			Strata	Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD
0.20- 0.60	B					Grass over TOPSOIL: Soft dark brown slightly sandy clay with many rootlets.	G.L.		21.22
0.25	ES						0.20		21.02
0.50	ES					MADE GROUND: Firm greyish brown slightly sandy gravelly clay. Gravel is subangular to rounded fine to coarse of sandstone, mudstone, coal and fragments of brick and ceramics.	0.60		20.62
0.60- 1.20	B								
1.00	ES					Firm reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse of sandstone, mudstone and coal.			
1.20- 1.65	UT47	(DRY)	88	23					
									
1.70	D								
1.80	D								
2.00- 2.45	B								
2.00- 2.45		1.70 (DRY)			S16				
									
									
									
2.80	D								
3.00- 3.45	UT77	3.00 (DRY)							
									
3.50	D								
									
3.80	D								
4.00- 4.45	B								
4.00- 4.45		4.00 (DRY)			S26				
									
									
4.80	D								
5.00- 5.45	UT100	4.50 (DRY)							
									
5.50	D								
									
6.00	D								
									
6.50- 6.95	B								
6.50- 6.95		6.00 (DRY)			S46				
									
									
7.50	D								
									
8.00- 8.45	UT100	7.50 (DRY)	260	12					
									
8.50	D								
9.00	D								
9.50- 9.95	B								
9.50- 9.90		9.00 (DRY)			S50/247				
						Below 10.00m, low subrounded cobble content.			

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.15	Inspection Pit	SL	G.I.			25/10/19	08:00	9.50	9.00	9.10	20		Slow inflow.
12.80		Cable Percussion	SL	10.00	9.00	9.70	25/10/19	18:00						
				10.00	9.00	1.60	28/10/19	08:00						
				12.80	10.50	DRY	28/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found.
 A 50mm gas monitoring pipe was installed to 6.00m with a geowrapped slotted section from 1.00m to 6.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 6.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level.
 Chiselling: 3.70-3.90m for 50 minutes and 9.10-9.20m for 30 minutes and 10.90-11.60m for 105 minutes and 12.50-12.80m for 80 minutes.
 Symbols and abbreviations are explained on the accompanying key sheet.
 All dimensions are in metres.
 Logged in accordance with BS5930:2015


Logged by **MM**
 Figure **1 of 2**
 18/12/2019

BOREHOLE RECORD - Cable Percussion

Project OMEGA DEVELOPMENT GI				Engineer WSP				Borehole Project No BH8D02 PN194027			
Client WSP				National Grid Coordinates 355301.2 E 390395.6 N				Ground Level 21.22 m OD			

Sampling			Properties			Strata		Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD	
10.50	D									
11.00-11.45 11.00-11.21	B	10.50 (6.20)			S50/ 105					
12.00	D									
12.50-12.95 12.50-12.58	B	10.50 (DRY)			C50/38	At 12.80m, possible sandstone.	12.80		8.42	
						End of Borehole				

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater

Remarks 										Logged by MM				
Symbols and abbreviations are explained on the accompanying key sheet.										Figure 2 of 2 18/12/2019				
All dimensions are in metres.										geotechnics				

Logged in accordance with BS5930:2015

BOREHOLE RECORD - Cable Percussion

Project		OMEGA DEVELOPMENT GI		Engineer		WSP		Borehole		BH8D03	
Client		WSP		National Grid		355274.1 E 390068.3 N		Project No		PN194027	
				Ground Level		21.41 m OD					

Sampling			Properties			Strata			Scale 1:50		
Depth	Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Description	Depth	Legend	Level m OD		
0.00- 0.50	B ES					Grass over TOPSOIL: Soft dark brown slightly sandy clay with some rootlets.	G.L.		21.41		
0.50- 1.20	B ES					MADE GROUND: Firm brown slightly sandy gravelly clay. Gravel is angular to subangular fine to medium of sandstone, mudstone and fragments of brick and ceramics.	0.50		20.91		
1.00	ES										
1.20- 1.65	UT42	(DRY)									
1.70	D					Firm to stiff reddish brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and coal.	1.80		19.61		
1.80	D										
2.00- 2.45	B	1.70 (DRY)			S21						
2.00- 2.45											
2.80	D										
3.00- 3.45	UT100	3.00 (0.60)	10	14							
3.50	D										
3.80	D										
4.00- 4.45	B	4.00 (DRY)			S50/102						
4.00- 4.17						Below 5.00m, very stiff with a low cobble content and occasional pockets of fine to coarse sand.					
4.80	D										
5.00- 5.45	B	4.70 (DRY)			C50/95						
5.00- 5.18											
6.00	D										
6.50- 6.95	UT100	6.00 (DRY)									
7.00	D										
7.50	D										
8.00- 8.45	B	7.70 (6.80)			C50/68		7.30		14.11		
8.00- 8.17						Extremely weak reddish brown fine to coarse grained SANDSTONE with occasional subrounded to rounded fine clasts of mudstone. (Recovered as slightly gravelly sand).					
8.70	D	7.70 (7.10)			C50/53						
8.70- 8.81											
						End of Borehole	9.15		12.26		

Boring				Progress					Groundwater					
Depth	Hole Dia	Technique	Crew	Depth of Hole	Depth Cased	Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remarks on Groundwater
1.20	0.50	Inspection Pit Cable Percussion	SL/JL SL/JL	G.I.	0.00	DRY	28/10/19	08:00						None encountered.
9.15	0.15			3.00	1.70	DRY	28/10/19	18:00						
				3.00	3.00	0.60	29/10/19	08:00						
				9.15	7.70	DRY	29/10/19	18:00						

Remarks Inspection pit hand excavated to 1.20m depth and no services were found. Water was added to assist boring between 7.30m and 8.70m. A 50mm gas monitoring pipe was installed to 6.00m with a geowrapped slotted section from 1.00m to 6.00m with upright lockable protective cover. Backfill details from base of hole: bentonite seal up to 6.00m, gravel filter up to 1.00m, bentonite seal up to 0.20m, concrete up to ground level. Chiselling: 3.50-4.20m for 80 minutes and 5.00-5.30m for 45 minutes and 8.40-8.70m for 60 minutes. All dimensions are in metres.										Logged in accordance with BS5930:2015	
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Symbols and abbreviations are explained on the accompanying key sheet.

Logged by **MM**

Figure **1 of 1**

18/12/2019

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'					
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50	
BH8A01	2.00	21.89	S	-	2	3	4	5	7	8	24			*			
BH8A01	4.00	19.89	S	-	25/56		50/63				50/63						>
BH8A01	6.50	17.39	S	-	7	9	10	10	9	12	41					*	
BH8A01	9.50	14.39	S	-	8	9	11	13	14	12/67	50/292						>
BH8A01	11.00	12.89	S	-	14	11/58	27	23/55			50/130						>
BH8A01	12.50	11.39	C	-	25		50/68				50/68						>
BH8A01	13.70	10.19	C	-	25/56		50/52				50/52						>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005										
Hammer No.			AR2636														
Energy Ratio, Er (%)			71.00														
Calibration Date			15/02/2019														

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS

Project No PN194027

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

Project No PN194027

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'				
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50
BH8A03	2.00	24.10	S	-	2	3	4	5	5	7	21		*			
BH8A03	4.00	22.10	S	-	2	2	3	4	5	6	18		*			
BH8A03	6.50	19.60	S	-	2	2	3	5	7	8	23		*			
BH8A03	8.00	18.10	S	-	5	7	9	13	17	11/42	50/267					>
BH8A03	9.50	16.60	S	-	5	8	11	14	19	6/18	50/243					>
BH8A03	11.00	15.10	S	-	25/72		50/63				50/63					>
BH8A03	12.10	14.00	S	-	25/61		50/56				50/56					>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005									
Hammer No.			AR2636													
Energy Ratio, Er (%)			71.00													
Calibration Date			15/02/2019													

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS



Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'					
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50	
BH8A07	2.00	22.91	S	-	2	3	3	3	4	4	14		*				
BH8A07	4.00	20.91	S	-	2	3	3	4	4	6	17		*				
BH8A07	6.50	18.41	S	-	2	4	4	5	6	7	22			*			
BH8A07	9.50	15.41	S	-	3	5	7	9	10	12	38				*		
BH8A07	12.50	12.41	S	-	11	14/67	26	24/63			50/138						>
BH8A07	14.00	10.91	S	-	3	5	9	6	7	8	30			*			
BH8A07	16.50	8.41	S	-	25/67		50/60				50/60						>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005										
Hammer No.			AR2636														
Energy Ratio, Er (%)			71.00														
Calibration Date			15/02/2019														

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'					
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50	
BH8A08	2.00	22.01	S	-	1	2	3	3	4	4	14		*				
BH8A08	4.00	20.01	S	-	1	2	3	4	4	5	16		*				
BH8A08	6.50	17.51	S	-	2	3	4	5	7	8	24			*			
BH8A08	9.50	14.51	S	-	3	6	8	12	14	16	50						*
BH8A08	12.50	11.51	C	-	25/63		50/59				50/59						>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005										
Hammer No.			AR2636														
Energy Ratio, Er (%)			71.00														
Calibration Date			15/02/2019														

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS

Project No PN194027

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'				
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50
BH8B02	2.00	20.53	S	-	1	2	2	3	3	4	12	*				
BH8B02	4.00	18.53	S	-	2	3	4	5	5	5	19		*			
BH8B02	6.50	16.03	S	-	6	7	8	9	10	17	44				*	
BH8B02	8.00	14.53	S	-	9	16/54	50/58				50/58					>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005									
Hammer No.			AR2636													
Energy Ratio, Er (%)			71.00													
Calibration Date			15/02/2019													

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'				
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50
BH8B03	1.20	21.92	S	-	1	2	2	2	2	3	9	*				
BH8B03	3.00	20.12	S	-	2	3	5	5	6	7	23		*			
BH8B03	5.00	18.12	S	-	1	2	3	4	5	5	17		*			
BH8B03	8.00	15.12	S	-	8	17/48	50/68				50/68					>
BH8B03	9.10	14.02	C	-	25/70		50/57				50/57					>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005									
Hammer No.			AR2636													
Energy Ratio, Er (%)			71.00													
Calibration Date			15/02/2019													

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'				
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50
BH8D01A	2.00		S	-	2	3	4	5	5	7	21		*			
BH8D01A	4.00		S	-	2	3	4	5	6	6	21		*			
BH8D01A	6.50		S	-	2	5	7	7	11	13	38				*	
BH8D01A	8.00		C	-	25/41		50/47				50/47					>
BH8D01A	9.50		C	-	25/72		50/67				50/67					>
BH8D01A	11.00		C	-	25/62		50/57				50/57					>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005									
Hammer No.			AR2636													
Energy Ratio, Er (%)			71.00													
Calibration Date			15/02/2019													

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

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GEOTECHNICS

Project No PN194027

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

Fieldwork Results - SPT Results Summary

Project OMEGA DEVELOPMENT GI

Project No PN194027

Client WSP

Hole	Depth m bgl	Level m OD	Type	SWP (mm)	Seating Drive		Test Drive				SPT 'N' Value	Uncorrected SPT 'N'				
					0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)		10	20	30	40	50
BH8D03	2.00	19.41	S	-	2	3	4	5	5	7	21		*			
BH8D03	4.00	17.41	S	-	25/72		33	17/27			50/102					>
BH8D03	5.00	16.41	C	-	19	6/14	39	11/20			50/95					>
BH8D03	8.00	13.41	C	-	17	8/22	50/68				50/68					>
BH8D03	8.70	12.71	C	-	25/58		50/53				50/53					>
Driller			Steve Lowery				Remarks Equipment checked and calibration carried out in accordance with BS EN ISO 22476-3: 2005									
Hammer No.			AR2636													
Energy Ratio, Er (%)			71.00													
Calibration Date			15/02/2019													

-/- Blows/penetration (mm) after seating

-*/- Total blows/penetration (mm)

SWP Penetration under own weight (mm)

S - Standard Penetration Test (SPT)

C - SPT with cone

L - Split Spoon with liner used

GEOTECHNICS