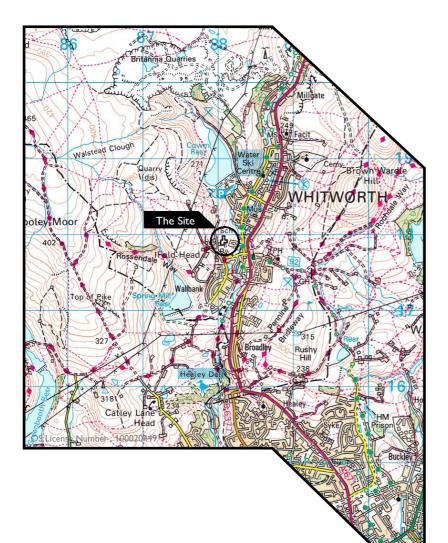


Ground Investigation





www.geotechnics.co.uk

Whitworth Community High School, Rochdale

Factual Report

for Campbell Reith LLP

Project Number PN204160

February 2021

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Factual Report

Whitworth Community High School, Rochdale

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> Project No: PN204160 February 2021

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Factual Report

Ground Investigation at Whitworth Community High School, Rochdale

I.0 INTRODUCTION

A geotechnical and geo-environmental investigation was undertaken by Geotechnics Limited at the site of proposed redevelopment works at the existing Whitworth Community High School in Rochdale, Lancashire. The investigation was carried out to the instructions of the Client, Campbell Reith LLP. 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 dynamic sample boreholes, 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 7 of this report. Attention is drawn to the General Notes and Investigation Procedures presented in Appendix 8 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. Project No: PN204160 February 2021

4.0 THE SITE

4.1 Location

The site is situated within the grounds of Whitworth Community High School, off Hall Street, located approximately 4.5km north of Rochdale town centre. The approximate Ordnance Survey National Grid Reference for the centre of the site is SD 880 179 and an extract from the relevant 1:50,000 Scale O.S. Map is included as Appendix 1.

4.2 Description

The site comprises a roughly rectangular area measuring approximately 160m from north to south and approximately 90m from east to west, situated immediately east of the existing main school building.

The area is currently occupied by a school building (noted as the existing science block), an area of hardstanding used as an additional car park and a part of the playing fields and hardstanding play area.

The site generally falls in level to the east, however, certain parts of the site (notably the playing fields and hardstanding courts) have been constructed at a higher elevation on terraces which are supported by retaining walls.

The site is accessed from the south via the school's main access road leading from Hall Street.

4.3 Site Geology

The British Geological Survey website, http://mapapps.bgs.ac.uk/geologyofbritain/home.html accessed on 13th January 2021, shows the site to be underlain by Till, consisting of *clay*, *silt*, *sand*, *gravel and cobbles* of Quaternary age.

The superficial deposits are underlain by rock strata of the Rossendale Formation, a member of the Millstone Grit Group, of Carboniferous age.



Collectively, the Rossendale Formation rocks are typically described as fine to very coarse grained, pebbly, feldspathic sandstone, interbedded with grey siltstone and mudstone.

Made Ground is not noted on or adjacent to the site on the website consulted. However, Made Ground may be present on site for which the BGS have no records or are too shallow for incorporation into the current maps or website.

4.4 Hydrogeology

The DEFRA Magic Map website, https://magic.defra.gov.uk/MagicMap.aspx, accessed on 13th January 2021, indicates the Glacial Till to be classified as a Secondary (undifferentiated) Aquifer. The underlying Rossendale Formation is indicated to be a Secondary A aquifer.

5.0 PROCEDURE

5.1 Commissioning

The work was awarded following submission of a tender for work designed by the Client 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+ A1:2020 – 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 + A1:2020 and BS EN ISO 14688-1:2018 and BS EN ISO 14689:2018.

The Exploratory Hole locations were specified by the Client and their locations are shown on the Exploratory Hole Location Plan in Appendix 7. The co-ordinates and levels shown on the Exploratory Hole Records were measured using a Leica GPS survey device. The depths quoted on the exploratory hole records are in metres below ground level.

A Ground Penetrating Radar (GPR) survey of the site was commissioned by the Client prior to the investigation to determine the location of any buried services. Prior to the commencement of the intrusive investigative works, available plans and records of buried services were checked and each exploratory hole location was scanned using a Cable Avoidance Tool (CAT) and Signal Generator (Genny) to check for the presence of any underground services.

Additionally, an inspection pit was excavated at each borehole location using hand tools to a depth of 1.20m below ground level to check for the presence of underground services.

5.3 Dynamic Sample Boreholes

Eleven (11 No.) Dynamic Sample Boreholes (numbered WS01 to WS09, WS09A and WS10) were undertaken to depths ranging between 3.00m and 5.45m below ground level. The work was carried out between 27th and 29th October 2020.

N.B. Boreholes WS07 and WS09A were terminated within the service inspection pits under instruction of the Client. WS07 was terminated at 0.80m below ground level due to groundwater inflow within the inspection pit; WS09A was terminated at 1.10m below ground level upon encountering a clayware drain.

Samples were taken from the service inspection pit, where appropriate, for laboratory examination and analysis. The dynamic samples were taken using the super-heavy Dynamic Probe apparatus which drives lined steel tubes into the ground in Im lengths. Samples were retrieved in the plastic liners which were subsequently split and the recovered soils described before being sub-sampled into ES, D and B samples as shown on the Dynamic Sample Borehole Records, presented in Appendix 2. The holes were not cased and progress depended on the nature of the strata penetrated.

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. Full details of the SPT results are summarised on the SPT Results Summary Sheets included with the borehole records.

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 Boreholes WS02, WS03, WS05, WS08 and WS10 (see Section 5.4). The other boreholes were backfilled with bentonite pellets and reinstated with arisings.

5.4 Instrumentation and Monitoring

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

Exploratory	Standpipe
Hole	Slotted Pipe & Filter Zone
	(m)
WS02	1.00m to 4.00m
WS03	1.00m to 4.00m
WS05	0.50m to 2.50m
WS08	1.50m to 4.00m
WS10	1.00m to 3.00m

Monitoring of the gas and groundwater levels at the site commenced on 23^{rd} November 2020 with further visits on 4^{th} and 9^{th} December 2020.

On each of the monitoring visits a record of the groundwater level in the standpipes was obtained. On 4^{th} December 2020 where water was recorded, samples were obtained (where possible) following purging of three well volumes of water from the standpipes.

In addition to the groundwater levels, the following parameters were measured and recorded in each standpipe using a Gas Data GFM436 Gas Analyser and a Geotechnical Instruments GA5000 Gas Analyser:

- Concentrations (% Vol) of CH₄, O₂, CO₂, along with (ppm) H₂S, CO
- Flow Rate
- Barometric Pressure

The results of the monitoring are presented in Appendix 3.

6.0 LABORATORY TESTING

6.1 Geotechnical

The laboratory testing schedule was specified by the Client. 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 4. 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

24 No. Water Content Determination

BS EN ISO 17892-4:2016

- 5 No. Particle Size Distribution Determination – Wet Sieving Method
- 5 No. Particle Size Distribution Determination – Pipette Method

BS EN ISO 17892-12:2018

7 No. Liquid and Plastic Limit Determination

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

BS 1377:1990

Test No. Test Description

Part 3

3 I0 No. Organic Matter Content

BRE Special Digest | Suite

13 No. Suites comprising:-Soluble Sulphate pH



6.2 Contamination

Selected samples of soil and groundwater were tested at the laboratories of Derwentside Environmental Testing Services (DETS) Limited (UKAS Accredited Laboratory, Number 2139) and Element Materials Technology Limited (UKAS Accredited Laboratory, Number 4225) for a number of determinands in order to check on potential site contamination. The determinands were specified by the Client and are detailed on the results sheets in Appendices 5 (Soil) and 6 (Groundwater) together with the test results as well as the test methods, accreditation and detection limits.

Signed for and on behalf of Geotechnics Limited.

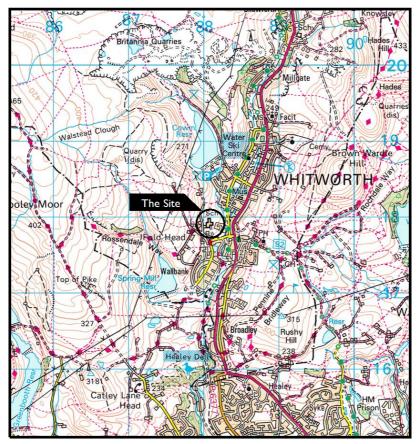
Prepared by: Tom Birch Bsc (Hons), MSc, FGS **Senior Engineer**

Reviewed by: Aaron Field BSc (Hons), MSc, FGS **Senior Engineer**



APPENDIX I

Site Location Plan



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Ground Investigation at Whitworth Community High School, Rochdale for Campbell Reith LLP



APPENDIX 2

Dynamic Sample Borehole Records and SPT Results Summary Sheets

DATA SHEET - Symbols and Abbreviations used on Records

Sample	e Types	Groundwater		Strata, Continued	
В	Bulk disturbed sample	Water Strike	∇	Mudstone	
BLK	Block sample	Depth Water Rose To	Y		
С	Core sample			C 11	* * * * * *
D	Small disturbed sample (tub/jar)	Instrumentation		Siltstone	× ×
E	Environmental test sample		22	Metamorphic Rock	
ES	Environmental soil sample	Seal	22	Fine Grained	******
EW	Environmental water sample			Medium Grained	
G	Gas sample				\sim
L	Liner sample	Filter	-	Coarse Grained	$\sim \sim$
LB	Large bulk disturbed sample		F T		\approx
Р	Piston sample (PF - failed P sample)		•	Igneous Rock	
тw	Thin walled push in sample			Fine Grained	~~~~~
U	Open Tube - 102mm	Seal			++++
	diameter with blows to take sample. (UF - failed U sample)			Medium Grained	+ + + + + + + + + + + + + + + + + + + +
UT	Thin wall open drive tube sampler - 102mm diameter	Strata	Legend	Coarse Grained	
	with blows to take sample. (UTF - failed UT sample)	Made Ground Granular		Backfill Materials	
V	Vial sample				X
W	Water sample	Made Ground Cohesive		Arisings	×.
#	Sample Not Recovered				\approx
Insitu [–]	Festing / Properties	Topsoil		Bentonite Seal	
CBRP	CBR using TRL probe				
CHP	Constant Head Permeability Test	Cobbles and Boulders	$^{\circ}$	Concrete	ې •
COND	Electrical conductivity		200	Concrete	•
TC	Thermal Conductivity	Gravel	· · · ·		<u> </u>
TR	Thermal Resistivity		* • • • • •	Fine Gravel Filter	
HV ICBR	Strength from Hand Vane CBR Test	Sand			-
IDEN	Density Test	Sand			
IRES	Resistivity Test			General Fill	
MEX	CBR using Mexecone Probe Test	Silt	× × × ×		
PID	Photo Ionisation Detection		× . × .	Gravel Filter	:
	(ppm)	Clay	× × ,		/
PKR PLT	Packer Permeability Test	Clay		_	6
PLI	Plate Load Test Strength from Pocket			Grout	1
	Penetrometer	Peat	ster.		000
Temp	Temperature	Teat	NV2	Sand Filter	
VHP	Variable Head Permeability Test		Mrs .		00
VN	Strength from Insitu Vane				
w%	Water content	Note: Composite soil typ by combined symbols	es shown	Tarmacadam	
(All otr undrain	ier strengths from ed triaxial testing)				
S	Standard Penetration Test	Chalk		Rotary Core	
С	(SPT) SPT with cone			RQD Rock Quality De	
N	SPT Result	Limestone		(% of intact core) FRACTURE INDEX	e >100mm)
-/-	Blows/penetration (mm) after seating drive			Fractures/metre FRACTURE Maximum	
-*/-	Total blows/penetration	Sandstone		SPACING (m) Minimum NI Non-intact	core
(mm)				NR No core re	covery
()	Extrapolated value			AZCL Assumed zc loss	one of core
		Coal		(where core recovery is unknow assumed to be at the base of th	
				assumed to be at the base of th	- · · · · · · ·

G

Project WHITWORTH COMMUNITY HIGH SCHOOL Engineer Borehole WS01 CAMPBELL REITH LLP PN204160 Project No 388131.2 National Grid E N Client Ground Level 224.69 m OD CAMPBELL REITH LLP Coordinates 417968.4 Scale 1:50 Sampling Properties Strata Depth Cased & Sample Strength w SPT N Level Depth Description Depth Leaend Туре (to Water) kPa % m OD 224.69 G.L. 0.00- 0.30 Grass over MADE GROUND: Firm friable dark brown в slightly gravelly sandy clay with some rootlets. Gravel is angular to subangular fine to coarse of 0.20 ES 0.30 224.39 0.50 D mudstone, limestone, sandstone, coal and concrete. 0.50 ES MADE GROUND: Firm dark grey mottled orangish brown slightly sandy slightly gravelly clay. Gravel is angular to subangular fine to coarse of mudstone, 0.70- 1.20 в 0.70 223.99 1.00 ES sandstone, limestone, concrete and brick fragments. 1.20- 1.65 1.20 2.00 1.50- 2.00 (DRY) **S10** D TR= 100% PROBABLE MADE GROUND: Firm friable brownish grey slightly sandy gravelly clay with a low subangular to subrounded cobble content of sandstone and limestone. Gravel is angular to subrounded fine to в 1.50 223.19 0 coarse of mudstone, sandstone and limestone. 2.00- 3.00 в 2.00 3.00 2.00- 2.45 Firm greyish brown slightly sandy slightly gravelly CLAY with frequent bands of silt and gravelly sand. TR= 80% (DRY) 25 S10 D Gravel is subangular to subrounded fine to coarse of mudstone, sandstone, limestone, quartzite and 2.00 ES coal. 3.00- 4.00 в 3.00 4.00 3.00- 3.45 TR= 80% D (DRY) **S**8 4.00- 4.45 4.00 5.00 4.00- 5.00 # (WET) S24 Below 4.00m, stiff. TR= 50% в 5.00 219.69 End of Borehole Boring Progress Groundwater Hole Denth Depth)enth to Depth Depth Denth Remarks on Depth Crew Date Rose to Technique Time of Hole Cased Water Cased Mins Sealed Dia Struck Groundwater 0.40 Inspection Pit 27/10/20 1.20 KD/DI G.L. 08:00 3.50 Seepage - no rise. 5.00 0.10 Dynamic Sampler KD/DF 5.00 3.50 27/10/20 18:00 TInspection pit hand excavated to 1.20m depth and no services were found. ES sample = 2 x vials, 1 x plastic jar and 2 x amber jars. The Dynamic Sample Borehole was terminated at 5.00m depth upon reaching scheduled depth. The engineer noted that the borehole collapsed back to 4.50m depth upon retrieval of the definition berefinite and the scheduled depth. Remarks Logged by DP Symbols and Figure 1 of 1 abbreviations are 22/02/2021 sampling barrel. Backfill details from base of hole: collapsed material up to 4.50m, bentonite seal up to explained on the accompanying 1.00m, arisings up to ground level. ezimbelogo key sheet. All dimensions Logged in accordance with BS5930:2015 + A1:2020 are in metres.

Project WHITWORTH COMMUNITY HIGH SCHOOL Engineer Borehole **WS02** CAMPBELL REITH LLP PN204160 Project No National Grid 388126.6 E N Client Ground Level 224.73 m OD CAMPBELL REITH LLP Coordinates 417947.4 Properties Scale 1:50 Sampling Strata Depth Cased & Sample Strength w SPT N Level Depth Description Depth Leaend Туре (to Water) kPa % m OD G.L. 224.73 0.00- 0.60 Grass over MADE GROUND: Firm friable dark brown в Slightly gravelly sandy clay with some rootlets. Gravel is angular to subangular fine to coarse of mudstone, sandstone, coal and brick fragments. Low 0.50 0.50 ES ES subangular cobble content of concrete. 0.60 224.13 0.60- 1.20 в PROBABLE MADE GROUND: Stiff friable brownish grey slightly sandy slightly gravelly clay with a low subangular to subrounded cobble content of sandstone and limestone. Gravel is angular to subangular fine to coarse of mudstone, sandstone 1.00 ES 1.20- 2.00 1.20 2.00 1.20- 1.65 1.20 223.53 в TR= 100% and limestone. D (DRY) 15 s4 Soft becoming firm greyish brown slightly gravelly sandy CLAY with frequent bands of gravelly sand. Gravel is angular to subangular fine to coarse of mudstone, sandstone, limestone, quartzite and coal. 2.00- 3.00 в 2.00 3.00 2.00- 2.45 TR= 100% (DRY) 12 S10 D 2.00 ES 3.00- 4.00 Below 3.00m, stiff. Slightly sandy. ∇ в 3.00 4.00 3.00- 3.45 TR= 90% D (WET) 14 s22 4.00- 4.25 (WET) \$50/95 D At 4.25m, cobble obstruction. 4.25 220.48 End of Borehole Boring Progress Groundwater Hole Denth Depth)enth to Depth Depth Denth Remarks on Depth Crew Date Rose to Technique Time of Hole Cased Water Cased Mins Sealed Dia Struck Groundwater 0.40 Inspection Pit 27/10/20 1.20 KD/DI G.L 08:00 3.00 Seepage - no 4.25 0.10 Dynamic Sampler KD/DF 4.25 3.00 27/10/20 18:00 rise. Inspection pit hand excavated to 1.20m depth and no services were found. Set sample = 2 x vials, 1 x plastic jar and 2 x amber jars. The Dynamic Sample Borehole was terminated at 4.25m depth due to the presence of an Remarks Logged by DP Symbols and Figure 1 of 1 obstruction abbreviations are 22/02/2021 A 50mm standpipe was installed to 4.00m with a geowrapped slotted section from 1.00m to 4.00m with flush lockable protective cover. Backfill details from base of hole: gravel filter up to 1.00m, bentonite seal up to 0.15m, concrete up to ground level. explained on the accompanying ezimbelogo key sheet. All dimensions

Project WHITWORTH COMMUNITY HIGH SCHOOL

Engineer CAMPBELL REITH LLP

Borehole WS03 Project No PN204160

388116.4 National Grid E N Client Ground Level 225.15 m OD CAMPBELL REITH LLP Coordinates 417979.3 Properties Scale 1:50 Sampling Strata Depth Cased & Sample Strength w SPT N Level Depth Description Depth Leaend Туре (to Water) kPa % m OD 225.15 G.L. 0.00- 0.50 Grass over MADE GROUND: Firm friable dark brown в slightly sandy slightly gravelly clay with some rootlets. Gravel is angular to subangular fine to 0.20 ES 0.40 ES coarse of limestone, sandstone, mudstone, coal and 0.50 224.65 0.50- 1.20 в concrete. PROBABLE MADE GROUND: Stiff friable brownish grey slightly sandy gravelly clay with a low angular to subangular cobble content of limestone and sandstone. Gravel is angular to subrounded fine to coarse of limestone, sandstone and mudstone. 1.00 ъ 16 ES 1.00 1.20- 1.65 (DRY) **S**8 D 2.00 TR= 100% 1.30 223.85 1.20 1.30- 2.00 в Firm becoming stiff greyish brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse of limestone, siltstone, sandstone and coal. Locally grading to clayey silt. At 2.00m, locally very stiff. Occasional bands of gravelly medium to coarse sand. 2.00- 3.00 в 2.00 3.00 2.00- 2.45 TR= 100% (DRY) 14 s35 D 2.00 ES 3.00- 4.00 в 3.00 4.00 3.00- 3.45 TR= 90% D (DRY) 10 s24 4.00- 5.00 в 4.00 5.00 4.00- 4.45 70% TR= (DRY) S18 D 14 5.00- 5.45 D (WET) 13 S14 At 5.00m, firm. ∇ 5.45 219.70 End of Borehole Boring Progress Groundwater Denth Depth)enth to Depth Depth Denth Remarks on Depth Crew Date Rose to Technique Time of Hole Cased Water Cased Mins Sealed Dia Struck Groundwater 0.40 Inspection Pit 27/10/20 1.20 KD/DI G.L. 08:00 5.45 Seepage - no 5.45 0.10 Dynamic Sampler KD/DF 5.45 5.45 27/10/20 10:45 rise. Inspection pit hand excavated to 1.20m depth and no services were found. Es sample = 2 x vials, 1 x plastic jar and 2 x amber jars. The Dynamic Sample Borehole was terminated at 5.45m depth upon reaching scheduled depth. A 50mm standpipe was installed to 4.00m with a geowrapped slotted section from 1.00m to are 4.00m with flush lockable protective cover. Backfill details from base of hole: gravel filter up to 1.00m, bentonite up to ground level. Remarks Logged by DP Symbols and Figure 1 of 1 abbreviations are 22/02/2021 explained on the accompanying geoleginies key sheet. All dimensions Logged in accordance with BS5930:2015 + A1:2020 are in metres.

Project WHITWORTH COMMUNITY HIGH SCHOOL

Engineer CAMPBELL REITH LLP

Borehole W Project No PN

WS04 PN204160

Client	CAMPE	ELL RE	TH LLP				Nationa Coordin		388109.1 417954.7					Ground	Level 2:	25.69 m	OD
Sampl	ing		Transis	Prope			Strata								-	Scale 1	:50
Depth		Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Descrip	tion							Depth	Legend	Level m OD
0.10-	0.40	в					MADE	GROUND	: Black t	armaca	dam.			,	G.L.		225.69 225.59
0.30 0.50 0.50	1 00	ES B ES					suban	gular ı	: Light b medium to ub-base).	coars					0.45		225.24 225.09
1.00	• 1.00	E B					organ	ic clay	: Firm da y. Gravel f limesto	is an	gular (co suba	ngular				
1.20	1.65 2.00 2.00	р - В -	(DRY)	TR=	100% 11	S8	sligh subro	tly sam	DE GROUND ndy grave fine to c ne.	lly cl	ay. Gra	avel is	angula	ir to	1.20 1.40		224.49 224.29
2.00	3.00 3.00 2.45	B D B	(WET)	TR=	70%	S16	coars	e SAND	own grave . Gravel rse of sa	is sub	angula	to su	brounde			$\nabla \stackrel{\circ}{\underset{\circ}{\overset{\circ}{}}} \stackrel{\circ}{\underset{\circ}{}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}{}} \stackrel{\circ}{\underset{\circ}{}} \stackrel{\circ}{\underset{\circ}{}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}}} \stackrel{\circ}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \stackrel{\circ}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}}} \overset{\circ}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}}{\underset{\circ}} \overset{\circ}}{\circ$	
2.00		ES -					grave sand.	lly san Grave	mottled ndy CLAY l is suba udstone,	with f ngular	to sul	bands brounde	of gra d fine	to -			
3.00-	3.39	_ D	(WET)			\$50/ 235			obble obs						F F	· · · · · · · · · · · · · · · · · · ·	
		-							En	d of B	orehole	9			3.39		222.30
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Boring		_				Progre	ess				Grour	ndwate	r				
Depth	Hole Dia		Technique	9	Crew	Depth of Hole		Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed		rks on dwater
1.20 3.39			ion Pit Sample		KD/DP KD/DP	G.L. 3.39		2.00	27/10/20 27/10/20							Seepage rise.	- no
Remar	ks 🖵	Inspect	ion pit	hand o	excavat	ed to	1.20m d	epth an	nd no ser amber ja	vices	were fo	ound.			Logr	jed by i	DP
Symbols a	and	ES sam <u>r</u> The Dyr obstrud	namic Sa	x vial: mple B	s, 1 x orehole	plasti was t	c jar a erminat	nd 2 x ed at 3	amber ja 3.39m dep	rs. th due	to the	e prese	nce of	an	Figu	re	1 of 1
abbreviati explained	ons are on the	Backfil							seal up t level.	o 1.00	m, ari:	sings u	p to 0.	25m,	Ţ.		22/02/2021
accompar key sheet		-					5								Ø	<u>olet</u>	miss
All dimens are in met		Logged in	accordance	with BS59	30:2015 +	A1:2020										7	

Project WHITWORTH COMMUNITY HIGH SCHOOL

Engineer CAMPBELL REITH LLP

Borehole Project No Project No

WS05 PN204160

Client	CAMPE	ELL REI	TH LLP				National Coordina		388117.8 417925.0				(Ground	Level 22	4.57 m	OD
Sampl	ing		Transis	Prope			Strata									Scale 1	:50
Depth		Sample Type	Cased & (to Water)	Strength kPa	w %	SPT N	Descript	ion							Depth	Legend	Level m OD
0.00- 0.20 0.50	0.15	- B - ES - D					slight	ly gra	TOPSOIL: avelly sa ubangular	ndy cl	ay witl	n many	rootlet		G.L.		224.57 224.32
0.50	1.20	- ES - ES - B - ES					to coa	arse g	: Reddish ravel of , slightl	limest	one and			ium	0.60		223.97
1.20- 1.20	1.65 2.00 2.00	 D В	(WET)	TR=	60%	S6	gravel of lin subang	lly cla mestone gular i	: Soft da ay with a e and bri fine to c d brick f	high ck. Gr oarse	subang avel is of lime	ılar co s angul	bble co ar to	ntent	1.50		223.07
2.00 2.00 2.20	2.45 3.00	D ES D	(WET)	TR=	90%	s10	gravel	lly san to coan	DE GROUND ndy silty rse of sa	clay.	Grave	l is su	brounde	d	2.40		222.17
2.50-	3.00	_ В					Gravel	l is an	ff brown ngular to imestone,	subro	unded :	Eine to	coarse		-		
	4.00 3.45	ES	(WET)	TR=	40%	S12		gular g	, frequen gravel of					oarse			
	4.45	- - D - D	(WET)	TR=	10%	S24									+ - - -		
4.50		D															
5.00-	5.45	- D -	(WET)			S14									- - - -		
									En	d of B	orehole	•			5.45	· · · · · · · · · · · · · · · · · · ·	219.12
											010101	-			-		
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Boring	Hole		<u>.</u>			Progre	SS Depth L	Depth to		_	Grour Depth	ndwate Depth		in	Depth	Remai	ks on
Depth 1.20	Dia	Inspect	Technique		Crew KD/DP	of Hole	Cased	Water	Date 28/10/20	Time 08:00	Struck	Cased	Rose to	Mins	Sealed		dwater
5.45		Dynamic			KD/DP KD/DP	5.45		0.20	28/10/20		5.50					rise	
Remar	ks 🗔	Inspect	ion pit	hand o	excavat	ed to	1.20m de	epth a	nd no ser amber ja	vices	were fo	ound.			Loaa	ed by I)P
Symbols a	and	The Dyn	amic Sa	mple B	orehole	e was t	erminate	ed at !	amber ja 5.45m dep rapped sl	th upo	n reacl	ning sc			- Eigur	e i	L of 1
abbreviati explained accompar	on the	with fl to 2.50	ush loo	kable p	protect	ive co	ver. Bac	kfill	details seal up	from b	ase of	hole:	bentoni	te seal	up	\sum	2/02/2021
key sheet. All dimens		level.													e	oceŕ	niæ
are in met		Logged in a	accordance	with BS59	30:2015 +	A1:2020											

Project WHITWORTH COMMUNITY HIGH SCHOOL Engineer Borehole **WS06** CAMPBELL REITH LLP Project No PN204160 National Grid 388120.9 E N Client Ground Level 224.77 m OD CAMPBELL REITH LLP Coordinates 417903.5 Properties Strata Scale 1:50 Sampling Depth Cased & Sample Strength w SPT N Level Depth Description Depth Leaend Туре (to Water) kPa % m OD 224.77 G.L. 0.10- 0.40 MADE GROUND: Black tarmacadam. 0.10 224.67 в 0.20 ES MADE GROUND: Grey slightly sandy slightly clayey 0.40 224.37 subangular fine to coarse gravel of limestone, sandstone, coal and concrete. 0.40- 0.90 в 0.50 ES MADE GROUND: Light brown mottled grey slightly 0.90 223.87 0.90- 1.20 в gravelly sandy clay. Gravel is subangular fine to coarse of limestone and sandstone. 1.00 ES 1.20- 1.65 D (DRY) **S**8 13 TR= 80% PROBABLE MADE GROUND: Loose orangish brown gravelly slightly clayey medium sand. Gravel is angular to subangular fine to coarse of sandstone. 1.20 2.00 1.50- 2.00 в 1.50 223.27 Firm brown slightly sandy slightly gravelly to gravelly CLAY. Gravel is subangular to subrounded fine to coarse of sandstone, mudstone and 2.00- 3.00 в 2.00 3.00 2.00- 2.45 TR= 100% (DRY) 16 s8 D limestone. 2.00 ES 3.00- 4.00 в 3.00 4.00 3.00- 3.45 TR= 60% D (DRY) 8.3 S12 4.00 - 4.33(DRY) 9.5 S50/ D 180 At 4.33m, cobble obstruction. 4.33 220.44 End of Borehole Boring Progress Groundwater Hole Denth Depth)enth to Depth Depth Depth Remarks on Depth Crew Date Rose to Technique Time of Hole Cased Water Struck Cased Mins Sealed Dia Groundwater 0.40 Inspection Pit 28/10/20 1.20 KD/DI G.L 08:00 None 4.33 0.10 Dynamic Sampler KD/DP 4.33 DRY 28/10/20 18:00 encountered. Inspection pit hand excavated to 1.20m depth and no services were found. Es sample = 2 x vials, 1 x plastic jar and 2 x amber jars. The Dynamic Sample Borehole was terminated at 4.33m depth due to the presence of an Remarks Logged by DP Symbols and Figure 1 of 1 obstruction. abbreviations are 22/02/2021 Backfill details from base of hole: bentonite seal up to 1.00m, arisings up to ground level explained on the

geolecimies

All dimensions are in metres. Logged in accordance with BS5930:2015 + A1:2020

accompanying

key sheet.

Project	WHITV	WORTH CO	OMMUNITY	HIGH S	SCHOOL		Enginee	er	CAMPBELL	REITH	LLP			Boreho Project		VSO		
							Nationa	l Grid	388089.6	Е			ſ	TOJECT		N2041	100	
Client		BELL REI	ITH LLP	Duran			Coordir	ates	417918.0	Ň			(Ground	Level 2			
Sampl	ling	Sample	Depth	Prope Strength			Strata	1									le 1:	
Depth		Туре	Cased & (to Water)	kPa	%		Descrip	tion							Depth	Le	gend	Level m OD
	- 0.40	- в					MADE	GROUND	: Black t	armaca	dam.			/	G.L. 0.10			227.43 227.33
0.20		ES							: Dark gr					/	0.40			227.03
0.50 0.50		- D - ES					sands	tone a	a high s nd concre	te. Gr	avel i	s angul	ar to	E	0.60	▼		226.83
0.60- 0.70	- 0.80	B ES					suban concr		fine to c	oarse	of coa	l, ash	and		0.80	∇ XX		226.63
							grey is an	slight: gular	: Soft to ly sandy to subang	slight ular f	ly gra ine to	velly c coarse	lay. Gra					
							MADE	GROUND ar to a	coal, ash : Dark gr subangula	ey sli r fine	ghtly ; to co;	sandy c arse gr	avel of					
									coal, sla ngular co					ete.	<u> </u>			
		-							En	d of B	orehol	e		,	+			
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Boring						Progre	200				Group	ndwate	r		<u> </u>			
Depth	Hole		Technique	e	Crew	Depth	Depth	Depth to	Date	Time	Depth	Depth	Rose to	in	Depth		Remark	
0.80	Dia 0.40		tion Pit		KD/DP	of Hole G.L.	Cased	Water	28/10/20		Struck	Cased	0.60	Mins 20	Sealed		Ground	
	. = -					0.80		0.60	28/10/20					-				
Remar	ks 🖵	Inspect	tion pit	hand e	excavat	ted to	0.80m d	lepth a	nd no ser amber ja	vices	were fo	ound.			Log	ged by	/ D	P
Symbols		The Dyr	namic Sa	ample Bo	orehole	e was t	erminat	ed at a	a depth o	£ 0.80	m due '	to grou			۰ ۰. Eigu			of 1
abbreviati	ons are		ll detai ground l		n base	of hol	e: aris	ings u	p to 0.25	m, con	crete 1	up to 0	.15m, ta	armacad	iam '' ^{yu}			2/02/2021
accompar key sheet	nying														പ്	्रकी	පුව්ධ	ਗੀਵਤ
All dimens	sions	Logged in	accordance	with BS59	30:2015 +	A1:2020									E		لائند ح	

Project WHITWORTH COMMUNITY HIGH SCHOOL

Engineer CAMPBELL REITH LLP

Borehole W Project No PN

WS08 PN204160

Client	CAMPI	BELL REI	TH LLP				Nationa Coordir		388097.6 417876.3	E N				Ground	Level 22	6.46 m	DD
Sampl	ing	T	- Frank	Prope			Strata	1								Scale 1:	50
Depth		Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Descrip	tion							Depth	Legend	Level m OD
0.20-	- 0.60	в					MADE	GROUND	: Black t	armaca	dam.			/	G.L. 0.15		226.46 226.31
0.20 0.50	· 1.00	ES ES B					sand	and sul	: Brownis bangular sandstone	fine t	o coars	se grav	elof	ium /	0.60		225.86
1.00		- ES					sandy	grave	: Stiff b lly clay	with a	high s	ubroun	ded cob		-		
	- 1.65 2.00	D	(DRY)	TR=	90%	s10	subar	gular i	sandstone fine to c d brick f	oarse	of lime			one,	1.30		225.16
	2.00	В			17		Firm	brown 1	mottled g l is suba	rey sl	ightly				_	····	
	- 3.00	в					coars	e of l:	imestone, ding to c	sands	tone, s				-		
	3.00 2.45	D ES	(DRY)	TR=	100% 30	S 8									-	· · · · · ·	
		-														0 0 0 0 0 0	
	- 4.00	в													-	• 0 • • • • • • •	
	4.00 - 3.45	D	(DRY)	TR=	100% 17	S11									-	· · · · · · · · · · · · · · · · · · ·	
															-	· · · · ·	
4.00-	4.32	- D	(DRY)		9.3	S50/											
		-				170	At 4.	32m, co	obble obs	tructi	on.				4.32		222.14
									En	d of B	orehole	2			-		
		-													-		
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Roring		F				Drogr	0.55				Group	ducto	r		_		
Boring Depth	Hole		Techniqu	e	Crew	Depth of Hole	Depth	Depth to Water	Date	Time	Depth Struck	Depth Cased	r Rose to	in Mins	Depth Sealed	Remar Ground	
1.20 4.32		Inspect	ion Pit		KD/DP KD/DP	G.L. 4.32			28/10/20 28/10/20	08:00		Caseu		1711112		None encounte	
1.52	0.10	- J Homit (- Sambre		107 02	1.54		DRI	20/20/20	10.00						Succurre	
Remar	ks 🗖	Inspect	ion pit	hand o	excavat	ted to	1.20m d	lepth a	nd no ser	vices	were fo	ound.				ad b::	
Symbols a		ES samp The Dyn obstruc	namic Sa	x vial	s, 1 x orehole	plasti was t	c jar a erminat	nd 2 x ed at	nd no ser amber ja 4.32m dep	rs. th due	to the	prese	nce of	an	Logg Figur	5	DP of 1
abbreviati explained accompar	ons are on the	A 50mm flush 1	standpi lockable	prote	ctive o	cover.	Backfil	l deta:	slotted ils from						,	2	2/02/2021
key sheet			bentoni		-	-	d level	•							e	<u>ojad</u> í	niæ
are in met		Logged in	accordance	with BS59	30:2015 +	A1:2020										```	

Project WHITWORTH COMMUNITY HIGH SCHOOL Engineer Borehole **WS09** CAMPBELL REITH LLP Project No PN204160 National Grid 388062.8 E N Client Ground Level 227.47 m OD CAMPBELL REITH LLP Coordinates 417927.2 Properties Strata Sampling Scale 1:50 Depth Cased & Sample Strength w SPT N Level Description Depth Depth Leaend Туре (to Water) kPa % m OD 227.47 G.L. 0.05 227.42 MADE GROUND: Grey concrete paving slab. 227.32 0.30- 0.80 MADE GROUND: Grey gravelly coarse sand. Gravel is в 0.30 ES angular fine to coarse of quartzite and limestone. MADE GROUND: Soft greyish brown slightly sandy slightly gravelly clay with a medium subrounded cobble content of sandstone. Gravel is angular to subrounded fine to coarse of sandstone, coal, 0.70 ES 1.20 0.80 226.67 0.80в . . 1.00 ES 1.20- 2.00 1.20 2.00 в mudstone and concrete. 1.20 2.00 1.20- 1.65 100% TR= Very soft to soft brown slightly gravelly sandy CLAY with a low subrounded cobble content of D (DRY) 14 s4 sandstone. Gravel is angular to subrounded fine to coarse of sandstone, limestone, mudstone and coal. Locally grading to clayey silt. 2.00- 3.00 в 2.00 3.00 2.00- 2.45 Below 2.00m, high cobble content. TR= 90% (DRY) s3 3.00- 3.30 (DRY) 22 s50/ D 150 At 3.30m, cobble obstruction. 3.30 224.17 End of Borehole Boring Progress Groundwater Hole Denth Depth Depth to Depth Depth Depth Remarks on Depth Crew Date Rose to Technique Time Water of Hole Cased Struck Cased Mins Sealed Dia Groundwater 0.40 Inspection Pit 29/10/20 1.20 KD/DI G.L. DRY 08:00 Seepage - no 3.30 0.10 Dynamic Sampler KD/DP 3.30 DRY 29/10/20 18:00 rise. Inspection pit hand excavated to 1.20m depth and no services were found. Es sample = 2 x vials, 1 x plastic jar and 2 x amber jars. The Dynamic Sample Borehole was terminated at 3.30m depth due to the presence of an Remarks Logged by DP Symbols and Figure 1 of 1 obstruction abbreviations are 22/02/2021 Backfill details from base of hole: arisings up to 0.05m, concrete up to ground level. explained on the accompanying geoleginies key sheet.

Project	WHITW	ORTH CC	MMUNITY	HIGH :	SCHOOL		Engine	er	CAMPBELL	REITH	LLP			Boreho Project	NO PI	/S09A	
Client							Nationa	al Grid	388060.9	E							
Sampl		BELL REI	TH LLP	Prope	rties		Coordir Strata		417924.8	N				Ground		27.67 m (Scale 1:	
Depth	0	Sample Type	Depth Cased &	Strength kPa			Descrip	otion							Depth	Legend	Level m OD
			(to Water)	кга	76				TOPSOIL:	Dark b	rown si	lightly	sandy	clay	G.L. 0.10		227.67 227.57
							MADE dark	GROUND: brown s	: Soft to slightly	sandy	gravel	ly clay	. Grave	lis	+		
		- -					limes	stone, d	subrounde coal and 50mm diam	concre	te.			one,	E		
		-							En	d of B	orehole	Э			1.10		226.57
		E													- -		
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Boring						Progre						ndwate	r				
Depth	Hole Dia		Technique	9	Crew	Depth of Hole		Depth to Water	Date	Time	Depth Struck	Depth Cased	Rose to	in Mins	Depth Sealed	Remar Ground	
1.10	0.40	Inspect	ion Pit	:	KD/DP	G.L. 1.10			29/10/20 29/10/20							None encounte:	red.
Domo	ke ∎7	Inspect	ion nit	hand a	axcavat	ted to	1.10m d	lepth									
Remar		The Dyn	namic Sa	mple B	orehole	e was t	erminat	ed at 1	the engi 1.10m dep	neer. th upo	n enco	unterin	g a 150	mm clay	Logg ware _{r:}	jed by I	of 1
Symbols a abbreviati explained	ons are	F-Fo an							, to grou						rigui		of 1 2/02/2021
accompar key sheet	nying														ட	Destri	ह्यांत
All dimens	sions	Logged in	accordance	with BS59	30:2015 +	A1:2020										7	

Project WHITWORTH COMMUNITY HIGH SCHOOL Engineer

neer CAMPBELL REITH LLP

Borehole WS Project No PN2

WS10 PN204160

Client	CAMPB	ELL REI	TH LLP				Nationa Coordir		388051.4 417896.3					Ground	Level 22		
Samplin	ng		Depth	Prope			Strata	1								Scale 1	:50
Depth		Sample Type	Depth Cased & (to Water)	Strength kPa	w %	SPT N	Descrip	tion							Depth	Legend	Level m OD
0.10-	0.45	В					MADE	GROUND	: Black t	carmaca	dam.			/	G.L. 0.10		227.53 227.43
0.35 0.45-	1.20	ES B					grave conte angul	el with ent of a ar to a	: Soft da a high s sandstone subangula al and mu	subangu e and c ar fine	lar to oncrete to coa	subrou . Grav	nded co el is		0.45		227.08
1.00 1.20- 1.20 1.20-	2.00	ES - - - - - - - - - -	(DRY)	TR=	100% 13	s20	grave cobbl angul	e conte ar to s	: Soft br ay with a ent of sa subangula andstone,	a high andston ar fine	subangu e and o to coa	lar to concret arse of	subrou e. Grav limest	unded vel is	1.20		226.33
2.00- 2.00 2.00- 2.00	3.00	- B - D - ES	(DRY)	TR=	80% 11	S7	angul silts	ar to stone, s	slightly subrounde sandstone ocally st	ed fine e and c	to coa						
3.00- 3.00 3.00-	4.00	- - - - - - - - -	(DRY)	TR=	70% 20	s3	At 3.	00m, lo	ocally ve	ery sof	t.						
4.00- 4.00		- - - - - -	(DRY)	TR=	20 0%	S6	Betwe	en 4.00	Om and 5.	.00m, n	o recov	very.				$\begin{array}{c} \sigma & \circ & \sigma \\ \bullet & \circ & \sigma \\ \bullet & \circ & \circ \\ \bullet & \circ & \circ \\ \sigma & \circ & \circ \\ \sigma & \circ & \circ \\ \bullet & \circ & \circ &$	
		- - - - - - -							EI	nd of B	orehole	2			5.00		222.53
		- - - - -															
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		- - - - -													-		
Boring Depth	Hole		Technique	2	Crew	Depth	Depth	Depth to	Date	Time	Depth	Depth	r Rose to	in	Depth	Remai	
1.20		Inspect	ion Pit Sample	:	KD/DP KD/DP	of Hole G.L. 5.00	Cased		29/10/20 29/10/20	08:00		Cased		Mins		Ground None encounte	
Remark: Symbols and abbreviation explained or accompanyi key sheet. All dimensio are in metre	nd ns are n the ing	The Dyr Client. A 50mm 3.00m v materia 0.20m,	namic Sa standpi vith flu al up to	pe was sh loc 4.00m e up to	insta insta kable p , bento o 0.10	e was to lled to protect onite so n, tarm	erminat 3.00m ive cov eal up	with a ver. Bac to 3.00	nd no sen amber ja a depth o geowrapp ckfill de Dm, grave ground le	of 5.00 ped slo stails al filt	m under tted se from ba	r the i ection ase of	from 1. hole: c	00m to collapse	the Figur	e 1	DP L off 1 22/02/2021

Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith LLP

Hole	Depth	Level	Type	SWP	Seating	g Drive		Test	Drive		SPT 'N'		Uncor		d SPT	-
TOTE	m bgl	m OD	Type	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	10	20	'N' 30	40	50
/S01	1.20	223.49	s	-	2	2	2	2	3	3	10	*	 	1	I I I	
/S01	2.00	222.69	S	-	2	2	2	2	3	3	10	*	1		 	
VS01	3.00	221.69	S	-	2	2	2	2	2	2	8	*	 		 	
VS01	4.00	220.69	S	-	5	5	6	6	6	6	24		*	 	 	
Driller				/incent			Remar	ks								
Hammer No.			AR17													
Energy Ratio			65.00													
Calibration D	ate		18/05	/2020												

SWP Penetration under own weight (mm)

L - Split Spoon with liner used

Project WHITWORTH COMMUNITY HIGH SCHOOL **Project No** PN204160

Client Campbell Reith LLP

	Depth		Туре	SWP	Seating	g Drive		Test	Drive		SPT 'N'		Unco		d SPT	
	m bgl	m OD	Type	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	10	20	'N' 30	40	50
VS02	1.20	223.53	s	-	1	1	2	1	-	1	4	*				
VS02	2.00	222.73	S	-	1	1	2	2	3	3	10	*		1		
VS02	3.00	221.73	S	-	3	4	4	6	6	6	22	1	*			1
VS02	4.00	220.73	s	-	10	10	10	40/20			50/95			 		- A
Driller				/incent			Remarl	ks								
Hammer No.			AR17													
Energy Ratio,			65.00													
Calibration Da	ite		18/05	/2020												



AGS

Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith LLP

Depth Level n bgl m OD 1.20 223.95 2.00 223.15 3.00 222.15 4.00 221.15 5.00 220.15	S S S S	SWP (mm)	0-75 (mm) 1 2 6 3 3	75-150 (mm) 2 2 6 3 3	0-75 (mm) 2 2 6 3 3	75-150 (mm) 2 6 6 5 3	150-225 (mm) 2 12 6 5 4	225-300 (mm) 2 15 6 5 4	Value 8 35 24 18 14	*		'N') 30 		50
2.00 223.15 3.00 222.15 4.00 221.15	S S S	-	2 6 3	2 6 3	2 6 3	6 6 5	12 6 5	15 6 5	35 24 18	*	* I	*	*	
3.00 222.15 4.00 221.15	S S	-	6 3	6 3	6 3	6 5	6 5	6 5	24 18		*	*	*	
4.00 221.15	S	-	3	3	3	5	5	5	18		*	* 		
										1	*			
5.00 220.15	S	-	3	3	3	3	4	4	14		*			
					Remark	s								
	AR176	60												
ir (%)	65.00													
e	18/05/	/2020												
	6)	AR17 6) 65.00	Carl Vincent AR1760 65.00 18/05/2020	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00	AR1760 65.00

SWP Penetration under own weight (mm)

L - Split Spoon with liner used

Project WHITWORTH COMMUNITY HIGH SCHOOL **Project No** PN204160

Client Campbell Reith LLP

Hole	Depth	Level	Type	SWP	Seating	Seating Drive Test Drive				SPT 'N'		Unco		d SPT	•	
поје	m bgl	m OD	туре	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	10	20	'N' 30	40	50
VS04	1.20	224.49	s	-	2	2	2	2	2	2	8	*		 	1	
VS04	2.00	223.69	S	-	3	3	4	4	4	4	16		*			
VS04	3.00	222.69	S	-	6	6	6	6	6	32/10	50/235	 		 		- >
Driller				/incent			Remar	(S								
Hammer No.			AR17													
Energy Ratio			65.00													
	7a(C		18/05/	2020												

SWP Penetration under own weight (mm)



Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith LLP

Hole	Depth	Level	Type	SWP	Seating	g Drive		Test	Drive		SPT 'N'		Un		cted S	PT
liole	m bgl	m OD	Type	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	1	0 2		N' 30 40) 5
/S05	1.20	223.37	s	-	1	1	1	1	2	2	6	*	1	 		
/S05	2.00	222.57	s	-	2	2	2	2	3	3	10					
V S05	3.00	221.57	s	-	3	3	3	3	3	3	12			 	 	
VS05	4.00	220.57	s	-	3	4	6	6	6	6	24			 *	<u> </u> 	
VS05	5.00	219.57	s	-	7	7	5	3	3	3	14		 *	 		
Driller			Carl V	/incent			Remar	ks						1		I
Hammer No.			AR17					-								
Energy Ratio	, Er (%)		65.00													
	ate			/2020												

SWP Penetration under own weight (mm)

L - Split Spoon with liner used

Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith LLP

Hole	Depth	Level	Type	SWP	Seating	g Drive		Test	Drive		SPT 'N'	I	Jncoi	corrected SPT		
TIOLE	m bgl	m OD	Type	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	10	20	'N' 30	40	50
/S06	1.20	223.57	s	-	2	2	2	2	2	2	8	*	 	1	 	
/S06	2.00	222.77	s	-	2	2	2	2	2	2	8	*	1		 	
VS06	3.00	221.77	S	-	2	2	2	2	4	4	12	*			 	
WS06	4.00	220.77	S	-	5	5	5	8	37/30		50/180		 	 	 	
Driller			Carl V	/incent			Remar	ks								
Hammer No.			AR17													
Energy Ratio			65.00													
Calibration D	ate		18/05	/2020												

SWP Penetration under own weight (mm)

Project WHITWORTH COMMUNITY HIGH SCHOOL **Project No** PN204160

Client Campbell Reith LLP

Hole [Depth	Level	Type	SWP	Seating	g Drive		Test	Drive		SPT 'N'		Uncorrected SPT 'N'		-	
	m bgl	m OD	Type	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	10	20	'N' 30	40	50
V S08	1.20	225.26	s	-	2	2	2	2	3	3	10	*		 	I I I	
VS08	2.00	224.46	S	-	2	2	2	2	2	2	8	*:	1	 	 	1
V S08	3.00	223.46	S	-	2	2	2	3	3	3	11	*		 	 	I I
V S08	4.00	222.46	S	-	7	7	7	7	36/20		50/170			 	 	>
Driller			Carl V	/incent			Remarl	ks								
Hammer No.			AR17													
Energy Ratio	, Er (%)		65.00													
Calibration D	ate		18/05/	/2020												

SWP Penetration under own weight (mm)

L - Split Spoon with liner used

Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith LLP

Hole Depth		Level	Туре	SWP	Seating	g Drive		Test	Drive		SPT 'N'		Unco	rrecte	d SPT	•
Tiole	m bgl	m OD	Type	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	1	0 20	'N' 30	40	50
V S09	1.20	226.27	s	-	1	1	1	1	1	1	4			 	 	I I I
V S09	2.00	225.47	S	-	1	-	1	-	1	1	3		 	1	 	
VS09	3.00	224.47	S	-	5	5	5	45			50/150		<u> </u> 			- >
Driller				/incent			Remar	KS								
Hammer No. Energy Ratio	Fr (%)		AR17 65.00													
-norgy natio	ate			/2020												

SWP Penetration under own weight (mm)

L - Split Spoon with liner used

Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith LLP

Hole	Depth	Level	Type	SWP	Seating	g Drive		Test	Drive		SPT 'N'		Unco		d SPT	•
поје	m bgl	m OD	ype	(mm)	0-75 (mm)	75-150 (mm)	0-75 (mm)	75-150 (mm)	150-225 (mm)	225-300 (mm)	Value	10	20	'N' 30	40	50
S10	1.20	226.33	s	-	2	2	5	5	5	5	20		*	 	1	1
S10	2.00	225.53	s	-	1	2	2	1	2	2	7	*			 	
S10	3.00	224.53	S	-	1	-	1	-	1	1	3	*		 	 	I I
S10	4.00	223.53	S	-	1	1	1	2	2	1	6	*		 		
							Descri									
riller				/incent			Remar	KS								
ammer No. nergy Ratio alibration I	o, Er (%)		AR17 65.00 18/05													

SWP Penetration under own weight (mm)

n with liner used

Printed: 22/02/2021 Page 9 AGS

SPT Hammer Energy Test Report

in accordance with BSEN ISO 22476-3:2005

ARCHWAY ENGINEERING (UK) LTD AINLEYS INDUSTRIAL ESTATE ELLAND WEST YORKSHIRE HX5 9JP

Instrumented Rod Data

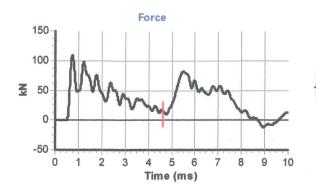
Diameter d _r (mm):	54
Wall Thickness tr (mm):	6.0
Assumed Modulus E _a (GPa):	200
Accelerometer No.1:	7080
Accelerometer No.2:	11609

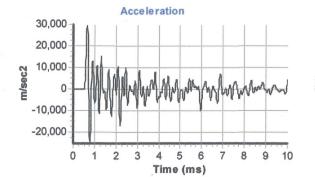
SPT Hammer Ref:	AR1760
Test Date:	18/05/2020
Report Date:	18/05/2020
File Name:	AR1760.spt
Test Operator:	CM

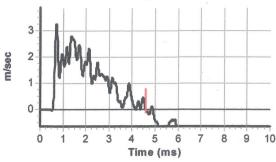
SPT Hammer Information

Hammer Mass m (kg): 63.5 Falling Height h (mm): 760 SPT String Length L (m): 10.0

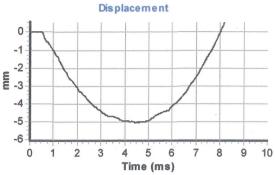
Comments / Location RAY MAKLIN







Velocity



Calculations

Area of Rod A (mm2):905Theoretical Energy E
theor(J):473Measured Energy E
meas(J):309

Measured Energy E_{meas} (J): 309 Energy Ratio E_r (%): 65

O.Ma

Signed: C.McCLUSKEY Title: FITTER

The recommended calibration interval is 12 months

SPTMAN ver.1.93 All rights reserved, Testconsult ©2010

APPENDIX 3

Monitoring Results

FIELDWORK - Water Level Monitoring

Project WHITWORTH COMMUNITY HIGH SCHOOL

Project No PN204160

Client Campbell Reith	LLP				Sheet No 1	
Borehole	WS02	WS03	WS05	WS08	WS10	
Instrument (dia. mm)	S (50mm)	S (50mm)	S (0mm)	S (50mm)	S (50mm)	
Depth to Base (m)	4.00	4.00	2.50	4.00	3.00	
Filter Zone (m)	1.00-4.10	1.00-4.00	0.50-2.50	1.50-4.00	1.00-3.00	
Level	224.73 m OD	225.15 m OD	224.57 m OD	226.46 m OD	227.53 m OD	
Date Time	Depth (m) Level	Depth (m) Lev				
23 Nov 2020	1.43 223.30	3.35 221.80	0.68 223.89	0.52 225.94	1.20 226.33	
4 Dec 2020	0.82 223.91	3.25 221.90	0.60 223.97	0.97 225.49	1.22 226.31	
9 Dec 2020	0.82 223.91	3.20 221.95	0.56 224.01	0.43 226.03	1.56 225.97	



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



FIELDWORK - Insitu Gas Monitoring - Hole Record

Project WHITWORTH COMMUNITY HIGH SCHOOL

Client Campbell Reith LLP

Project No:	PN204160
Hole	WS02
Sheet No:	1 (Sheet 1)

		1	1	1	 Sheet No:	1 (Sheet 1)	
Hole		WS02	WS02	WS02			
Date of Rea	ading (dd/mm/yyyy) 23/11/2020	04/12/2020	09/12/2020			
Installation Details	Type Depth to Base (m) Ground Level Filter Zone (m) Date Installed Cover Type	S (50mm) 4.00 224.73 m O 1.00 - 4.10 27/10/2020 Flush lockable	S (50mm) 4.00 224.73 m O 1.00 - 4.10 27/10/2020 Flush lockable	S (50mm) 4.00 224.73 m O 1.00 - 4.10 27/10/2020 Flush lockable			
Weather	Wind	Still	Light	Still			
	Precipitation	Dry	Slight	Dry			
	Cloud	Cloudy	Overcast	Overcast			
Site Conditions	Temperature °C	0					
Conditions	Ground Condition	Frozen	Wet	Moist			
Equipment Use	ed	GA5000	GFM436 Gas Analyser	GA5000			
Monitored by		JA	AVM	JA			
Current Hole D	epth m bgl	3.78	3.72	3.78			
Methane (Peak	x) (CH4) % VOL	0.1	0.0	0.1			
Methane (Stead	dy) (CH4) % VOL	0.1	0.0	0.1			
Carbon Dioxide	e (Peak) % VOL	5.6	6.7	8.0			
Carbon Dioxide	e (Steady) % VOL	5.6	6.7	8.0			
Oxygen (Peak)	% VOL	20.5	6.6	20.4			
Oxygen (Stead	y) % VOL	16.7	6.6	11.3			
Hydrogen Sulp	hide (H2S) ppm	0	0	0			
Carbon Monoxi	ide (CO) ppm	0	0	0			
Balance Check	x %	77		80			
Barometric Pre	essure mbar	998	948	978			
Flow Rate (Pea	ak) l/hr	0.0	7.8	3.8			
Flow Rate (Ste	ady) l/hr	0.0	0.0	3.0			
Remarks							
					COC	NTACH	



Project WHITWORTH COMMUNITY HIGH SCHOOL

Client Campbell Reith LLP

Project No:	PN204160
Hole	WS03
Shoot No:	2 (Sheet 1)

	•				Sheet N	lo: 2 (Sheet	1)
Hole		WS03	WS03	WS03			
Date of Rea	ading (dd/mm/yyyy)	23/11/2020	04/12/2020	09/12/2020			
Installation Details	Type Depth to Base (m) Ground Level Filter Zone (m) Date Installed Cover Type	S (50mm) 4.00 225.15 m O 1.00 - 4.00 27/10/2020 Flush lockable	S (50mm) 4.00 225.15 m O 1.00 - 4.00 27/10/2020 Flush lockable	S (50mm) 4.00 225.15 m O 1.00 - 4.00 27/10/2020 Flush lockable			
	Wind	Still	Light	Still			
	Precipitation	Dry	Slight	Dry			
	Cloud	Cloudy	Overcast	Overcast			
Site Conditions	Temperature °C						
	Ground Condition	Frozen	Wet	Moist			
Equipment Use	ed	GA5000	GFM436 Gas Analyser	GA5000			
Monitored by		JA	AVM	JA			
Current Hole D	epth m bgl	4.08	4.11	4.04			
Methane (Peak	x) (CH4) % VOL	0.1	0.0	0.0			
Methane (Stead	dy) (CH4) % VOL	0.1	0.0	0.0			
Carbon Dioxide	e (Peak) % VOL	7.0	5.2	6.5			
Carbon Dioxide	e (Steady) % VOL	7.0	5.2	6.5			
Oxygen (Peak)	% VOL	20.5	20.3	20.3			
Oxygen (Stead	y) % VOL	0.2	1.4	0.1			
Hydrogen Sulp	hide (H2S) ppm	20	0	0			
Carbon Monoxi	ide (CO) ppm	0	0	0			
Balance Check	x %	92		93			
Barometric Pre	ssure mbar	998	995	979			
Flow Rate (Pea	ak) l/hr	0.0	2.4	0.0			
Flow Rate (Ste	ady) l/hr	0.0	1.8	0.0			
Remarks							
					~		



Project WHITWORTH COMMUNITY HIGH SCHOOL

Client Campbell Reith LLP

Hole

20.3		
20.3		
0		
0		
79		
978		
0.0		
0.0		

Sheet No: 3 (Sheet 1)

Date of Rea	ading (dd/mm/yyyy)	23/11/2020	04/12/2020	09/12/2020		
Installation Details	Type Depth to Base (m) Ground Level Filter Zone (m) Date Installed Cover Type	S 2.50 224.57 m O 0.50 - 2.50 28/10/2020 Flush lockable	S 2.50 224.57 m O 0.50 - 2.50 28/10/2020 Flush lockable	S 2.50 224.57 m O 0.50 - 2.50 28/10/2020 Flush lockable		
Weather	Wind	Still	Light	Still		
	Precipitation	Dry	Slight	Dry		
	Cloud	Cloudy	Overcast	Overcast		
Site	Temperature °C					
Conditions	Ground Condition	Frozen	Wet	Moist		
Equipment Use	ed	GA5000	GFM436 Gas Analyser	GA5000		
Monitored by		JA	AVM	JA		
Current Hole D	epth m bgl	2.30	2.30	2.33		
Methane (Peak	x) (CH4) % VOL	0.1	0.0	0.1		
Methane (Stead	dy) (CH4) % VOL	0.1	0.0	0.1		
Carbon Dioxide	e (Peak) % VOL	0.2	0.2	0.3		
Carbon Dioxide	e (Steady) % VOL	0.2	0.2	0.2		
Oxygen (Peak)	% VOL	20.4	17.0	20.3		
Oxygen (Stead	y) % VOL	20.4	17.0	20.3		
Hydrogen Sulp	hide (H2S) ppm	0	0	0		
Carbon Monoxi	ide (CO) ppm	0	0	0		
Balance Check	x %	79		79		
Barometric Pre	ssure mbar	998	995	978		
Flow Rate (Pea	ak) l/hr	0.0	0.1	0.0		
Flow Rate (Ste	ady) l/hr	0.0	0.0	0.0		
Remarks						



Project No: PN204160

WS05 Hole

WS05

WS05

WS05

Project WHITWORTH COMMUNITY HIGH SCHOOL

Client Campbell Reith LLP

Hole	WS08	
Shoot No:	4 (Sheet 1)	

					Sheet I	No: 4 (Sheet	1)
Hole		WS08	WS08	WS08			
Date of Rea	ading (dd/mm/yyyy)	23/11/2020	04/12/2020	09/12/2020			
Installation Details	Type Depth to Base (m) Ground Level Filter Zone (m) Date Installed Cover Type	S (50mm) 4.00 226.46 m O 1.50 - 4.00 28/10/2020 Flush lockable	S (50mm) 4.00 226.46 m O 1.50 - 4.00 28/10/2020 Flush lockable	S (50mm) 4.00 226.46 m O 1.50 - 4.00 28/10/2020 Flush lockable			
Weather	Wind	Still	Light	Still			
	Precipitation	Dry	Slight	Slight			
	Cloud	Cloudy	Overcast	Overcast			
Site Conditions	Temperature °C						
Conditions	Ground Condition	Frozen	Wet	Moist			
Equipment Use	ed	GA5000	GFM436 Gas Analyser	GA5000			
Monitored by		JA	AVM	JA			
Current Hole D	epth m bgl	3.86	3.90	3.86			
Methane (Peak	(CH4) % VOL	0.5	0.0	0.1			
Methane (Stead	dy) (CH4) % VOL	0.5	0.0	0.1			
Carbon Dioxide	e (Peak) % VOL	1.5	1.0	1.1			
Carbon Dioxide	e (Steady) % VOL	1.5	1.0	1.1			
Oxygen (Peak)	% VOL	20.9	18.8	20.0			
Oxygen (Stead	y) % VOL	17.6	18.8	19.2			
Hydrogen Sulp	hide (H2S) ppm	0	0	0			
Carbon Monoxi	ide (CO) ppm	3	0	0			
Balance Check		80		79			
Barometric Pre	ssure mbar	998	995	978			
Flow Rate (Pea	ak) l/hr	0.0	17.5	6.1			
Flow Rate (Ste	ady) l/hr	0.0	1.2	5.7			
Remarks							
							ļ
					C	20160	



Project WHITWORTH COMMUNITY HIGH SCHOOL

Client Campbell Reith LLP

Project No: PN	204160
Hole W	S10
Sheet No: 5 (Sheet 1)

Hole		WS10	WS10	WS10			
поје		W310	VV310	VV310			
Date of Rea	ading (dd/mm/yyyy) 23/11/2020	04/12/2020	09/12/2020			
Installation Details	Type Depth to Base (m) Ground Level Filter Zone (m) Date Installed Cover Type	S (50mm) 3.00 227.53 m O 1.00 - 3.00 29/10/2020 Flush lockable	S (50mm) 3.00 227.53 m O 1.00 - 3.00 29/10/2020 Flush lockable	S (50mm) 3.00 227.53 m O 1.00 - 3.00 29/10/2020 Flush lockable			
Weather	Wind	Still	Light	Light			
	Precipitation	Dry	Slight	Dry			
	Cloud	Cloudy	Overcast	Overcast			
Site	Temperature °C						
Conditions	Ground Condition	Frozen	Wet	Moist			
Equipment Use	ed	GA5000	GFM436 Gas Analyser	GA5000			
Monitored by		JA	AVM	JA			
Current Hole D	epth m bgl	3.00	2.95	2.88			
Methane (Peak	x) (CH4) % VOL	0.1	0.0	0.1			
Methane (Stead	dy) (CH4) % VOL	0.1	0.0	0.1			
Carbon Dioxide	e (Peak) % VOL	0.7	1.9	4.2			
Carbon Dioxide	e (Steady) % VOL	0.2	1.9	4.2			
Oxygen (Peak)	% VOL	20.9	19.2	19.2			
Oxygen (Stead	y) % VOL	19.9	19.2	7.6			
Hydrogen Sulp	hide (H2S) ppm	0	0	0			
Carbon Monoxi	ide (CO) ppm	0	0	0			
Balance Check	x %	78		88			
Barometric Pre	ssure mbar	998	995	979			
Flow Rate (Pea	ak) l/hr	0.0	0.0	10.4			
Flow Rate (Ste	ady) l/hr	0.0	0.0	8.4			
Remarks							
		ł	ļ	ļ	ļ	·	



APPENDIX 4

Laboratory Test Results - Geotechnical

Classification and Strength Symbol C - Clay М-Silt (0 - containing organic matter) Plasticity L -Low 1 Intermediate H - High V Very High -Extremely High Е lр **Plasticity Index** % % retained on 425 µm sieve, shown under lp value Liquid Limit W **Plastic Limit** WP NP Non-Plastic NAT Sample tested in natural state Water Content w Particle Density Pd Quick undrained triaxial tests Test SS Single stage - 102mm diameter. S3 Single stage - set of 3 38mm diameter. MS Multistage - 102mm diameter. D **Drained Test**

- HV Hand Vane PP Pocket Penetrometer (kg/cm²)
- NST Not suitable for test
- γ_b Bulk Density
- σ₃ Triaxial Cell Pressure
- $\sigma_1 \sigma_3$ Deviator Stress
- ## Excessive Strain
- c_u Undrained Cohesion
- c Cohesion Intercept
- φ Angle of Shearing Resistance
- Linear Linear Shrinkage Shrink

Stab add- Stabiliser which is added

Consolidation

m _v	Coefficient of Volume Compressibility
c _{v50}	Coefficient of Consolidation - Log t

 c_{v50} Coefficient of Consolidation - Log c_{v90} Coefficient of Consolidation - \sqrt{t}

Rock

UF Unacceptable Failure

Chemical Analysis

Acid Soluble	Total sulphate in specimen, expressed as $SO_3 $ %, value in brackets expressed as $SO_4 $ %
Water Soluble	Soluble sulphate in 2:1 water : soil extract, expressed as SO ₃ g/l, value in brackets expressed as SO4 g/l
In Water	Sulphate content of groundwater, expressed as SO_3 g/l, value in brackets expressed as SO_4 g/l
рH	pH value
Organic content	t Organic content expressed as a percentage of dry weight
Chloride	Chloride lon content expressed as a percentage of dry weight

MCV, Compaction, CBR

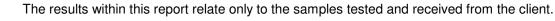
MCV	Moisture water co	Condition Value at natural ntent
MCC	Moisture	Condition Calibration
CCV	Chalk Cr	rushing Value
Compac	tion	
Туре	4.5 =	2.5 kg Rammer 4.5 kg Rammer Vibrating Hammer
γ_{b}	Bulk Den	nsity
γ_{d}	Dry Den	sity
CBR Ca	lifornia B	earing Ratio
Туре	2.5 =	Test on Specimen Recompacted using 2.5 kg Rammer
	4.5 =	
	V =	As above but using
	M =	
	s =	specimen cut in field Soaked Specimen
Тор	CBR at to	op of mould
Bottom	CBR at b	ottom of mould
ND	None De	etected
<u>ب</u> لە		

* In the Sample Description denotes a laboratory only description

Laboratory Test Certificate

ssued To	Geotechnics Ltd	Date of issue	11/12/2	2020	
	The Geotechnical Centre	Issue No.	1		
	Unit 1B, Borders Industrial Estate	N//	4		
	River Lane, Saltney	Samples / Materia	al Source		
	Chester CH4 8RJ	Samples Recv'd	18/11/2	2020	
Testing Start Date	18/11/2020	Sample State	As rece	eived	
Testing Complete	11/12/2020	Sampled by	Geotechnic	s Limited	
Comments					
Project No	PN204160				
Project Name	WHITWORTH COMMUNITY HIGH SCHOO	DL			
	Summary of Tes	sts			
Standard	Test Description	Test Description		UKAS	
BS EN ISO 17892-1:2014	Water Content	Water Content			
BS EN ISO 17892-12:2018 Cl. 5.3 & 5.5	Liquid Limit and Plastic Limit (4 Pc	7	Yes		
BS EN ISO 17892-4:2016 Cl. 5.2	Particle Size Distribution by Siev	5	Yes		
BS EN ISO 17892-4:2016 Cl. 5.4	Particle Size Distribution by Pipe	ette Method	5	Yes	

Note: Any descriptions, opinions or interpretations are outside the scope of UKAS accreditation.





Test Results checked and approved for issue. Signed for and on behalf of Geotechnics Limited

Schians



203 Torrington Avenue, Tile Hill, Coventry, CV4 9UT

Stephane Schiano (Laboratory Testing Manager)

LABORATORY RESULTS - Classification and Strength

Project WHITWORTH COMMUNITY HIGH SCHOOL

Sampl	e				Cla	ssific	atio	n		Str	ength				
Hole	Depth (Specimen Depth) M	Туре	Sample Ref	Description	Symbol	І _р (>425) %	w _L %	wp %	w (p _d) %	Test	$\gamma_{b} \ (\gamma_{d})_{3} \ Mg/m$	σ ₃ kN/m ²	σ₁−σ₃ kN/m²		C _{Avg}
WS01	2.00- 2.45 (2.00)	D	N82304	Brown very gravelly clayey fine to coarse SAND.		(36%)	24	NP	24.9						
WS02	1.20- 1.65 (1.20)	D	N82307	Soft brown slightly sandy slightly gravelly CLAY.					15.2						
WS02	2.00- 2.45 (2.00)	D	N82309	Firm brown slightly sandy slightly gravelly CLAY.					12.4						
WS02	3.00- 3.45 (3.00)	D	N82310	Stiff brown slightly sandy gravelly CLAY.	CL	14 (56%)	28	14	14.3						
WS03	1.00 (1.00)	D	N82311	PROBABLE MADE GROUND: Brown slightly sandy clayey silt.		(0%)	22	NP	15.6						
WS03	2.00- 2.45 (2.00)	D	N82313	Stiff brown slightly sandy slightly gravelly CLAY.					13.7						
WS03	3.00- 3.45 (3.00)	D	N82314	Stiff brown slightly sandy slightly gravelly CLAY.					10.4						
WS03	4.00- 4.45 (4.00)	D	N82315	Stiff brown slightly sandy slightly gravelly CLAY.					14.3						
WS03	5.00- 5.45 (5.00)	D	N82316	Firm brown slightly sandy slightly gravelly CLAY.					13.4						
WS04	1.40- 2.00 (1.40)	В	N82318	Brown sandy very clayey fine to coarse GRAVEL.		(68%)	23	NP	10.7						
WS06	1.20- 1.65 (1.20)	D	N82323	PROBABLE MADE GROUND: Orangish brown gravelly clayey medium to coarse sand.					12.7						
WS06	2.00- 2.45 (2.00)	D	N82325	Stiff brown slightly sandy slightly gravelly CLAY.	CL	16 (29%)	31	15	15.7						
WS06	3.00- 3.45 (3.00)	D	N82326	Firm brown slightly sandy slightly gravelly CLAY.					8.3						
WS06	4.00- 4.33 (4.00)	D	N82327	Stiff brown slightly sandy slightly gravelly CLAY.					9.5						
WS08	1.30- 2.00 (1.30)	В	N82328	Brown slightly sandy slightly gravelly clayey SILT.		(32%)	22	NP	17.4						
Remar		For St w% - '	andards ^ = Rock	able for Test followed see Laboratory Test Certficate water content test; x = Aggregate moisture ontents: <failure zone="">, [After test]</failure>	conte	nt test				ge	GCC otechnical	nc and geo		NIC ental spe	S

LABORATORY RESULTS - Classification and Strength

Project WHITWORTH COMMUNITY HIGH SCHOOL

Samp	le				Cla	ssific	atio	n		Str	rength				
Hole	Depth (Specimen Depth) M	Туре	Sample Ref	Description	Symbol	l _p (>425) %	w _L %	wp %	w (p _d) %	Test	$\gamma_{b} \ (\gamma_{d})_{3} \ Mg/m$	σ ₃ kN/m ²	σ₁−σ₃ kN/m²	C _u kN/m ²	C _{Avg} kN/m
WS08	2.00- 2.45 (2.00)	D	N82329	Firm brown slightly sandy slightly gravelly CLAY.					29.6						
WS08	3.00- 3.45 (3.00)	D	N82330	Firm brown slightly sandy slightly gravelly CLAY.					17.1						
WS08	4.00- 4.32 (4.00)	D	N82331	Stiff brown slightly sandy slightly gravelly CLAY.					9.3						
WS09	1.20- 1.65 (1.20)	D	N82332	Brown gravelly sandy clayey SILT.		(48%)	21	NP	14.2						
WS09	3.00- 3.30 (3.00)	D	N82333	Stiff brown slightly sandy slightly gravelly CLAY.					22.1						
WS10	1.20- 1.65 (1.20)	D	N82334	Firm brown slightly sandy slightly gravelly CLAY.					12.9						
WS10	2.00- 2.45 (2.00)	D	N82335	Soft brown slightly sandy slightly gravelly CLAY.					10.9						
WS10	3.00- 3.45 (3.00)	D	N82336	Very soft to soft brown slightly sandy slightly gravelly CLAY.					20.4						
WS10	4.00- 4.45 (4.00)	D	N82337	Soft brown slightly sandy slightly gravelly CLAY.					20.3						
Remai	rks <mark>Ags</mark>	NST - For St	Not suit	able for Test followed see Laboratory Test Certficate						6	Sec	יזת			25
				water content test; x = Aggregate moisture ntents: <failure zone="">, [After test]</failure>	conte	nt test					otechnical				

LABORATORY RESULTS - Atterberg Limit

Project WHITWORTH COMMUNITY HIGH SCHOOL

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Hole	Depth (Specimen Depth) M	Туре	Sample Ref	Description	Test Type	Point Cone Pene.	Data Water % (Factor)	Sym- bol	р %	>425 sieve µm	w _L %	w р %
WS01	2.00- 2.45 (2.00)	D	N82304	Brown very gravelly clayey fine to coarse SAND.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					36%	24	NP
WS02	3.00- 3.45 (3.00)	D	N82310	Stiff brown slightly sandy gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	14	56%	28	14
WS03	1.00 (1.00)	D	N82311	PROBABLE MADE GROUND: Brown slightly sandy clayey silt.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					0%	22	NP
WS04	1.40- 2.00 (1.40)	В	N82318	Brown sandy very clayey fine to coarse GRAVEL.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					68%	23	NP
WS06	2.00- 2.45 (2.00)	D	N82325	Stiff brown slightly sandy slightly gravelly CLAY.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve			CL	16	29%	31	15
WS08	1.30- 2.00 (1.30)	В	N82328	Brown slightly sandy slightly gravelly clayey SILT.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					32%	22	NP
WS09	1.20- 1.65 (1.20)	D	N82332	Brown gravelly sandy clayey SILT.	Fall Cone 4pt with increasing water content, cone type: 80g/30, washed over 425um sieve					48%	21	NP
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GRAVEL			36	1	10 m 6.3 m 5 m	nm nm	74 70 68						Pre-treated with	Hydrogen Peroxide	
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Certificate Number 20-24031

Client Geotechnics LTD 203 Torrington Avenue Tile Hill Coventry CV4 9AP

- Our Reference 20-24031
- Client Reference PN204160

Order No AUTH-OL27661

Contract Title Whitworth Community High School

Description 13 Soil samples.

Date Received 25-Nov-20

Date Started 25-Nov-20

Date Completed 01-Dec-20

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick Contracts Manager



01-Dec-20



Summary of Chemical Analysis

Soil Samples

Our Ref 20-24031

Client Ref PN204160

Contract Title Whitworth Community High School

			Lab No	1766636	1766637	1766638	1766639	1766640	1766641	1766642	1766643	1766644	1766645	1766646
		.Sa	mple ID	WS01	WS02	WS04	WS05	WS05	WS06	WS08	WS09	WS09	WS10	WS03
			Depth	3.00-3.45	1.20-1.65	2.00-2.45	2.20	4.50	3.00-3.45	2.00-2.45	1.20-1.65	3.00-3.30	2.00-2.45	1.00
		(Other ID											
		Samj	ple Type	D	D	D	D	D	D	D	D	D	D	D
		Sampli	ing Date	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
		Sampli	ng Time	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units											
Inorganics														
рН	DETSC 2008#		рН	8.6	8.2	7.1	6.9	5.2	8.1	7.1	7.0	6.6	8.2	8.1
Organic matter	DETSC 2002#	0.1	%	1.3	3.6	0.3	0.6	0.6	0.2	0.6	1.1	0.7	1.1	
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	940	39	57	18	12	10	28	24	16	26	14



Summary of Chemical Analysis

Soil Samples

			Lab No	1766647	1766648
		.Sa	ample ID	WS04	WS06
			Depth	0.60-1.00	1.20-1.65
			Other ID		
		Sam	ple Type	В	D
		Sampl	ing Date	n/s	n/s
		Sampl	ing Time	n/s	n/s
Test	Method	LOD	Units		
Inorganics					
рН	DETSC 2008#		рН	7.5	7.5
Organic matter	DETSC 2002#	0.1	%		
Sulphate Aqueous Extract as SO4	DETSC 2076#	10	mg/l	11	17



Information in Support of the Analytical Results

Our Ref 20-24031 Client Ref PN204160 Contract Whitworth Community High School

Containers Received & Deviating Samples

contail		Date	inpies		Inappropriate container for
Lab No	Sample ID	Sampled	Containers Received	Holding time exceeded for tests	tests
1766636	WS01 3.00-3.45 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766637	WS02 1.20-1.65 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766638	WS04 2.00-2.45 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766639	WS05 2.20 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766640	WS05 4.50 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766641	WS06 3.00-3.45 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766642	WS08 2.00-2.45 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766643	WS09 1.20-1.65 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766644	WS09 3.00-3.30 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766645	WS10 2.00-2.45 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days),	
				Organic Matter (Manual) (28 days), pH +	
				Conductivity (7 days)	
1766646	WS03 1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH	+
				Conductivity (7 days)	
1766647	WS04 0.60-1.00 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH	+
				Conductivity (7 days)	
1766648	WS06 1.20-1.65 SOIL		PT 1L	Sample date not supplied, Anions 2:1 (30 days), pH	+
				Conductivity (7 days)	

Key: P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.



Information in Support of the Analytical Results

Our Ref 20-24031 Client Ref PN204160 Contract Whitworth Community High School

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425µm sieve, in accordance with BS1377. Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis. The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX 5

Laboratory Test Results - Contamination (Soil)



,		
	Client	Geotechnics LTD
		The Geotechnical Centre
		Unit 1B Borders Ind. Park

11-Nov-20

Our Reference 20-22487

Certificate Number 20-22487

- Client Reference PN204160
 - Order No ON27375
 - Contract Title Whitworth Community, High School

River Lane Saltney Chester CH4 8RJ

- Description 14 Soil samples.
- Date Received 04-Nov-20
- Date Started 06-Nov-20
- Date Completed 11-Nov-20
- Test Procedures Identified by prefix DETSn (details on request).
 - *Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick Contracts Manager



Summary of Chemical Analysis Soil Samples

			Lab No	1756942	1756943	1756944	1756945	1756946
		Sa	mple ID	WS01	WS02	WS03	WS04	WS04
			Depth	0.50	0.20	0.50	0.30	0.50
			Other ID					
			ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		-	ing Date	27/10/2020	27/10/2020	27/10/2020	27/10/2020	27/10/2020
		Sampli	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Preparation								
Moisture Content	DETSC 1004	0.1	%	32	23	18	9.5	26
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	9.8	9.9	11	6.4	11
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.3	0.3	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	20	18	19	19	19
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	33	39	34	23	42
Lead	DETSC 2301#	0.3	mg/kg	47	50	52	16	48
Mercury	DETSC 2325#	0.05	mg/kg	0.10	0.18	0.11	< 0.05	0.11
Nickel	DETSC 2301#	1	mg/kg	20	20	21	25	29
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	61	77	70	66	68
Inorganics								
рН	DETSC 2008#		pН	6.3	7.5	7.3	8.8	7.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	0.2	0.2	< 0.1	0.2
Total Organic Carbon	DETSC 2084#	0.5	%	4.5		2.9		6.5
Sulphide	DETSC 2024*	10	mg/kg	< 10	32	< 10	20	20
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.06	0.08	0.05	0.04	0.06
Petroleum Hydrocarbons			·	·	·			
EPH (C6-C8)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C8-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	14	< 10	56	< 10
EPH (C21-C40)	DETSC 3311	10	mg/kg	< 10	190	< 10	1700	350

Summary of Chemical Analysis Soil Samples

			Lab No	1756942	1756943	1756944	1756945	1756946
		Sa	ample ID	WS01	WS02	WS03	WS04	WS04
			Depth	0.50	0.20	0.50	0.30	0.50
			Other ID					
			ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		-	ing Date	27/10/2020	27/10/2020	27/10/2020	27/10/2020	27/10/2020
		•	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	0.04	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.10	0.06	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.09	0.05	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.05	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	0.04	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.33	0.12	< 0.10	< 0.10
Phenols	·	·						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3	< 0.3	0.3

Summary of Chemical Analysis Soil Samples

			Lab No	1756947	1756948	1756949	1756950	1756951
		Sa	ample ID	WS05	WS05	WS06	WS06	WS07
			Depth	0.50	1.00	0.20	1.00	0.20
			Other ID					
		Sam	ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampl	ing Date	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
		Sampl	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Preparation								
Moisture Content	DETSC 1004	0.1	%	8.3	27	6.2		24
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	5.7	12	7.2		9.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.3	0.2		0.4
Chromium	DETSC 2301#	0.15	mg/kg	14	15	20		13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	24	25	26		31
Lead	DETSC 2301#	0.3	mg/kg	20	27	8.5		13
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.07	< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg	16	16	25		23
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg	53	58	78		39
Inorganics								
рН	DETSC 2008#		рН	8.2	8.1	8.5		8.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%		2.4		0.5	14
Sulphide	DETSC 2024*	10	mg/kg	20	20	< 10		68
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.05	0.03		0.07
Petroleum Hydrocarbons								
EPH (C6-C8)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1
EPH (C8-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10		< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10		14
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10	26		110
EPH (C21-C40)	DETSC 3311	10	mg/kg	110	< 10	970		1600

Summary of Chemical Analysis Soil Samples

			Lab No	1756947	1756948	1756949	1756950	1756951
		Sa	ample ID	WS05	WS05	WS06	WS06	WS07
			Depth	0.50	1.00	0.20	1.00	0.20
			Other ID					
			ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		-	ing Date	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
		•	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03		0.68
Pyrene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03		0.72
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.29
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.39
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.05	< 0.03	0.04		0.43
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.21
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.29
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.13
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.04
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03		0.16
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.16	< 0.10	< 0.10		3.4
Phenols				1				
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3		< 0.3

Summary of Chemical Analysis Soil Samples

			_				
			Lab No	1756952	1756953	1756954	1756955
		Sa	ample ID	WS08	WS09	WS09	WS10
			Depth	0.20	0.30	0.80	0.35
			Other ID				
		Sam	ple Type	SOIL	SOIL	SOIL	SOIL
		Sampl	ing Date	28/10/2020	29/10/2020	29/10/2020	29/10/2020
		Sampl	ing Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
Preparation							
Moisture Content	DETSC 1004	0.1	%	8.4	13		15
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	4.9	4.6		6.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.1		0.5
Chromium	DETSC 2301#	0.15	mg/kg	15	17		10
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	20	25		27
Lead	DETSC 2301#	0.3	mg/kg	6.1	13		13
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg	18	22		20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg	43	50		89
Inorganics							
рН	DETSC 2008#		pН	8.9	7.1		8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%			0.7	
Sulphide	DETSC 2024*	10	mg/kg	16	44		60
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.05	0.03		0.08
Petroleum Hydrocarbons							
EPH (C6-C8)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1		< 0.1
EPH (C8-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1		< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10		< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10		15
EPH (C16-C21)	DETSC 3311	10	mg/kg	12	< 10		44
EPH (C21-C40)	DETSC 3311	10	mg/kg	270	< 10		1300

Summary of Chemical Analysis Soil Samples

			Lab No	1756952	1756953	1756954	1756955
		Sa	mple ID	WS08	WS09	WS09	WS10
			Depth	0.20	0.30	0.80	0.35
		(Other ID				
		-	ole Type	SOIL	SOIL	SOIL	SOIL
		Sampli	ing Date	28/10/2020	29/10/2020	29/10/2020	29/10/2020
		-	ng Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
PAHs						<u>.</u>	
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.04
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.32
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		1.6
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		1.2
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		4.8
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		2.3
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		8.6
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		7.9
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		3.8
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		3.4
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		4.8
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		2.4
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		5.6
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		2.0
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.48
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		3.0
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10		52
Phenols		· · · · · ·					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3		< 0.3

Summary of Asbestos Analysis Soil Samples

Our Ref 20-22487 Client Ref PN204160 Contract Title Whitworth Community, High School

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1756942	WS01 0.50	SOIL	NAD	none	Darryl Fletcher
1756945	WS04 0.30	SOIL	NAD	none	Darryl Fletcher
1756946	WS04 0.50	SOIL	NAD	none	Darryl Fletcher
1756948	WS05 1.00	SOIL	NAD	none	Darryl Fletcher
1756949	WS06 0.20	SOIL	NAD	none	Darryl Fletcher
1756951	WS07 0.20	SOIL	NAD	none	Darryl Fletcher
1756952	WS08 0.20	SOIL	NAD	none	Darryl Fletcher
1756955	WS10 0.35	SOIL	NAD	none	Darryl Fletcher

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * · not included in laboratory scope of accreditation.

Inappropriate

Information in Support of the Analytical Results

Our Ref 20-22487 Client Ref PN204160 Contract Whitworth Community, High School

Containers Received & Deviating Samples

					mappiopilate
		Date			container for
Lab No	Sample ID	Sampled	Containers Received	Holding time exceeded for tests	tests
1756942	WS01 0.50 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756943	WS02 0.20 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756944	WS03 0.50 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756945	WS04 0.30 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756946	WS04 0.50 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756947	WS05 0.50 SOIL	28/10/20	GJ 250ml x2, GJ 60ml		
1756948	WS05 1.00 SOIL	28/10/20	GJ 250ml x2, GJ 60ml		
1756949	WS06 0.20 SOIL	28/10/20	GJ 250ml, PT 1L		
1756950	WS06 1.00 SOIL	28/10/20	GJ 250ml, PT 1L		
1756951	WS07 0.20 SOIL	28/10/20	GJ 250ml x2, GJ 60ml		
1756952	WS08 0.20 SOIL	28/10/20	GJ 250ml, PT 1L		
1756953	WS09 0.30 SOIL	29/10/20	GJ 250ml x2, GJ 60ml		
1756954	WS09 0.80 SOIL	29/10/20	GJ 250ml x2, GJ 60ml		
1756955	WS10 0.35 SOIL	29/10/20	GJ 250ml x2, GJ 60ml		
1756955			,		

Key: G-Glass J-Jar P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425μm sieve, in accordance with BS1377. Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis. The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report



,		
	Client	Geotechnics LTD
		The Geotechnical Centre
		Unit 1B Borders Ind. Park

11-Nov-20

Our Reference 20-22487

Certificate Number 20-22487

- Client Reference PN204160
 - Order No ON27375
 - Contract Title Whitworth Community, High School

River Lane Saltney Chester CH4 8RJ

- Description 14 Soil samples.
- Date Received 04-Nov-20
- Date Started 06-Nov-20
- Date Completed 11-Nov-20
- Test Procedures Identified by prefix DETSn (details on request).
 - *Notes* Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick Contracts Manager



Summary of Chemical Analysis Soil Samples

			Lab No	1756942	1756943	1756944	1756945	1756946
		Sa	mple ID	WS01	WS02	WS03	WS04	WS04
			Depth	0.50	0.20	0.50	0.30	0.50
			Other ID					
			ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		-	ing Date	27/10/2020	27/10/2020	27/10/2020	27/10/2020	27/10/2020
		Sampli	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Preparation								
Moisture Content	DETSC 1004	0.1	%	32	23	18	9.5	26
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	9.8	9.9	11	6.4	11
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.3	0.3	0.2	0.3
Chromium	DETSC 2301#	0.15	mg/kg	20	18	19	19	19
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	DETSC 2301#	0.2	mg/kg	33	39	34	23	42
Lead	DETSC 2301#	0.3	mg/kg	47	50	52	16	48
Mercury	DETSC 2325#	0.05	mg/kg	0.10	0.18	0.11	< 0.05	0.11
Nickel	DETSC 2301#	1	mg/kg	20	20	21	25	29
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Zinc	DETSC 2301#	1	mg/kg	61	77	70	66	68
Inorganics								
рН	DETSC 2008#		pН	6.3	7.5	7.3	8.8	7.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	0.3	0.2	0.2	< 0.1	0.2
Total Organic Carbon	DETSC 2084#	0.5	%	4.5		2.9		6.5
Sulphide	DETSC 2024*	10	mg/kg	< 10	32	< 10	20	20
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.06	0.08	0.05	0.04	0.06
Petroleum Hydrocarbons			·	·	·			
EPH (C6-C8)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C8-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10	< 10	< 10
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	14	< 10	56	< 10
EPH (C21-C40)	DETSC 3311	10	mg/kg	< 10	190	< 10	1700	350

Summary of Chemical Analysis Soil Samples

			Lab No	1756942	1756943	1756944	1756945	1756946
		Sa	ample ID	WS01	WS02	WS03	WS04	WS04
			Depth	0.50	0.20	0.50	0.30	0.50
			Other ID					
			ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		-	ing Date	27/10/2020	27/10/2020	27/10/2020	27/10/2020	27/10/2020
		•	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.05	0.04	< 0.03	< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.10	0.06	< 0.03	< 0.03
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	0.09	0.05	< 0.03	< 0.03
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	0.05	< 0.03	< 0.03	< 0.03
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	0.04	< 0.03	0.04	< 0.03
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	0.33	0.12	< 0.10	< 0.10
Phenols	·	·						
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	0.4	< 0.3	< 0.3	0.3

Summary of Chemical Analysis Soil Samples

			Lab No	1756947	1756948	1756949	1756950	1756951
		Sa	ample ID	WS05	WS05	WS06	WS06	WS07
			Depth	0.50	1.00	0.20	1.00	0.20
			Other ID					
		Sam	ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampl	ing Date	28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
		Sampl	ing Time	n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
Preparation								
Moisture Content	DETSC 1004	0.1	%	8.3	27	6.2		24
Metals								
Arsenic	DETSC 2301#	0.2	mg/kg	5.7	12	7.2		9.0
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.3	0.2		0.4
Chromium	DETSC 2301#	0.15	mg/kg	14	15	20		13
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	24	25	26		31
Lead	DETSC 2301#	0.3	mg/kg	20	27	8.5		13
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	0.07	< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg	16	16	25		23
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5	< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg	53	58	78		39
Inorganics								
рН	DETSC 2008#		рН	8.2	8.1	8.5		8.0
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%		2.4		0.5	14
Sulphide	DETSC 2024*	10	mg/kg	20	20	< 10		68
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.03	0.05	0.03		0.07
Petroleum Hydrocarbons								
EPH (C6-C8)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1
EPH (C8-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1	< 0.1		< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10	< 10		< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10	< 10		14
EPH (C16-C21)	DETSC 3311	10	mg/kg	< 10	< 10	26		110
EPH (C21-C40)	DETSC 3311	10	mg/kg	110	< 10	970		1600

Summary of Chemical Analysis Soil Samples

			Lab No	1756947	1756948	1756949	1756950	1756951
		Sa	ample ID	WS05	WS05	WS06	WS06	WS07
			Depth	0.50	1.00	0.20	1.00	0.20
			Other ID					
			ple Type	SOIL	SOIL	SOIL	SOIL	SOIL
		Sampling Date		28/10/2020	28/10/2020	28/10/2020	28/10/2020	28/10/2020
		Sampling Time		n/s	n/s	n/s	n/s	n/s
Test	Method	LOD	Units					
PAHs								
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03		< 0.03
Fluoranthene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03		0.68
Pyrene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03		0.72
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.29
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.39
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	0.05	< 0.03	0.04		0.43
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.21
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.29
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.13
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03	< 0.03		0.04
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	0.04	< 0.03	< 0.03		0.16
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	0.16	< 0.10	< 0.10		3.4
Phenols	· ·			L			-	
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3	< 0.3		< 0.3

Summary of Chemical Analysis Soil Samples

			_				
			Lab No	1756952	1756953	1756954	1756955
		Sa	ample ID	WS08	WS09	WS09	WS10
			Depth	0.20	0.30	0.80	0.35
			Other ID				
		Sample Type Sampling Date			SOIL	SOIL	SOIL
					29/10/2020	29/10/2020	29/10/2020
		Sampl	ing Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
Preparation							
Moisture Content	DETSC 1004	0.1	%	8.4	13		15
Metals							
Arsenic	DETSC 2301#	0.2	mg/kg	4.9	4.6		6.2
Cadmium	DETSC 2301#	0.1	mg/kg	0.3	0.1		0.5
Chromium	DETSC 2301#	0.15	mg/kg	15	17		10
Chromium, Hexavalent	DETSC 2204*	1	mg/kg	< 1.0	< 1.0		< 1.0
Copper	DETSC 2301#	0.2	mg/kg	20	25		27
Lead	DETSC 2301#	0.3	mg/kg	6.1	13		13
Mercury	DETSC 2325#	0.05	mg/kg	< 0.05	< 0.05		< 0.05
Nickel	DETSC 2301#	1	mg/kg	18	22		20
Selenium	DETSC 2301#	0.5	mg/kg	< 0.5	< 0.5		< 0.5
Zinc	DETSC 2301#	1	mg/kg	43	50		89
Inorganics							
рН	DETSC 2008#		рН	8.9	7.1		8.2
Cyanide, Total	DETSC 2130#	0.1	mg/kg	< 0.1	< 0.1		< 0.1
Total Organic Carbon	DETSC 2084#	0.5	%			0.7	
Sulphide	DETSC 2024*	10	mg/kg	16	44		60
Sulphate as SO4, Total	DETSC 2321#	0.01	%	0.05	0.03		0.08
Petroleum Hydrocarbons							
EPH (C6-C8)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1		< 0.1
EPH (C8-C10)	DETSC 3321*	0.1	mg/kg	< 0.1	< 0.1		< 0.1
EPH (C10-C12)	DETSC 3311	10	mg/kg	< 10	< 10		< 10
EPH (C12-C16)	DETSC 3311	10	mg/kg	< 10	< 10		15
EPH (C16-C21)	DETSC 3311	10	mg/kg	12	< 10		44
EPH (C21-C40)	DETSC 3311	10	mg/kg	270	< 10		1300

i DETS

Summary of Chemical Analysis Soil Samples

Our Ref 20-22487 Client Ref PN204160 Contract Title Whitworth Community, High School

			Lab No	1756952	1756953	1756954	1756955
		Sa	mple ID	WS08	WS09	WS09	WS10
			Depth	0.20	0.30	0.80	0.35
		(Other ID				
		-	ole Type	SOIL	SOIL	SOIL	SOIL
		Sampli	ing Date	28/10/2020	29/10/2020	29/10/2020	29/10/2020
		-	ng Time	n/s	n/s	n/s	n/s
Test	Method	LOD	Units				
PAHs						<u>.</u>	
Naphthalene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.04
Acenaphthylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.32
Acenaphthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		1.6
Fluorene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		1.2
Phenanthrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		4.8
Anthracene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		2.3
Fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		8.6
Pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		7.9
Benzo(a)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		3.8
Chrysene	DETSC 3303	0.03	mg/kg	< 0.03	< 0.03		3.4
Benzo(b)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		4.8
Benzo(k)fluoranthene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		2.4
Benzo(a)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		5.6
Indeno(1,2,3-c,d)pyrene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		2.0
Dibenzo(a,h)anthracene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		0.48
Benzo(g,h,i)perylene	DETSC 3303#	0.03	mg/kg	< 0.03	< 0.03		3.0
PAH - USEPA 16, Total	DETSC 3303	0.1	mg/kg	< 0.10	< 0.10		52
Phenols		· · · · · ·					
Phenol - Monohydric	DETSC 2130#	0.3	mg/kg	< 0.3	< 0.3		< 0.3

i DETS

Summary of Asbestos Analysis Soil Samples

Our Ref 20-22487 Client Ref PN204160 Contract Title Whitworth Community, High School

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1756942	WS01 0.50	SOIL	NAD	none	Darryl Fletcher
1756945	WS04 0.30	SOIL	NAD	none	Darryl Fletcher
1756946	WS04 0.50	SOIL	NAD	none	Darryl Fletcher
1756948	WS05 1.00	SOIL	NAD	none	Darryl Fletcher
1756949	WS06 0.20	SOIL	NAD	none	Darryl Fletcher
1756951	WS07 0.20	SOIL	NAD	none	Darryl Fletcher
1756952	WS08 0.20	SOIL	NAD	none	Darryl Fletcher
1756955	WS10 0.35	SOIL	NAD	none	Darryl Fletcher

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * · not included in laboratory scope of accreditation.

i DETS

Inappropriate

Information in Support of the Analytical Results

Our Ref 20-22487 Client Ref PN204160 Contract Whitworth Community, High School

Containers Received & Deviating Samples

					mappiopilate
		Date			container for
Lab No	Sample ID	Sampled	Containers Received	Holding time exceeded for tests	tests
1756942	WS01 0.50 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756943	WS02 0.20 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756944	WS03 0.50 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756945	WS04 0.30 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756946	WS04 0.50 SOIL	27/10/20	GJ 250ml x2, GJ 60ml	pH + Conductivity (7 days)	
1756947	WS05 0.50 SOIL	28/10/20	GJ 250ml x2, GJ 60ml		
1756948	WS05 1.00 SOIL	28/10/20	GJ 250ml x2, GJ 60ml		
1756949	WS06 0.20 SOIL	28/10/20	GJ 250ml, PT 1L		
1756950	WS06 1.00 SOIL	28/10/20	GJ 250ml, PT 1L		
1756951	WS07 0.20 SOIL	28/10/20	GJ 250ml x2, GJ 60ml		
1756952	WS08 0.20 SOIL	28/10/20	GJ 250ml, PT 1L		
1756953	WS09 0.30 SOIL	29/10/20	GJ 250ml x2, GJ 60ml		
1756954	WS09 0.80 SOIL	29/10/20	GJ 250ml x2, GJ 60ml		
1756955	WS10 0.35 SOIL	29/10/20	GJ 250ml x2, GJ 60ml		
1756955			,		

Key: G-Glass J-Jar P-Plastic T-Tub

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Soil Analysis Notes

Inorganic soil analysis was carried out on a dried sample, crushed to pass a 425μm sieve, in accordance with BS1377. Organic soil analysis was carried out on an 'as received' sample. Organics results are corrected for moisture and expressed on a dry weight basis. The Loss on Drying, used to express organics analysis on an air dried basis, is carried out at a temperature of 28°C +/-2°C.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :-Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

End of Report

APPENDIX 6

Laboratory Test Results - Contamination (Groundwater)



Element Materials Technology Unit 3 Deeside Point Zone 3 Deeside Industrial Park Deeside CH5 2UA P: +44 (0) 1244 833780 F: +44 (0) 1244 833781

W: www.element.com

Geotechnics Unit 1B Borders Industrial Park River Lane Chester Chestire CH4 8RJ		
Attention :	Jon Hutchinson	
Date :	15th December, 2020	
Your reference :	PN204160	
Our reference :	Test Report 20/17150 Batch 1	
Location :		
Date samples received :	4th December, 2020	
Status :	Final report	
Issue :	1	

Five samples were received for analysis on 4th December, 2020 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc Senior Project Manager

Please include all sections of this report if it is reproduced

Reference:	Geotechn PN204160					Report :	Liquid					
Location: Contact:	Jon Hutch	iinson				Liquids/pr	oducts: V=	40ml vial, G	=glass bottl	e, P=plastic	bottle	
EMT Job No:	20/17150					H=H ₂ SO ₄ , 2	Z=ZnAc, N=	NaOH, HN=	HN0 ₃			
EMT Sample No.	1-4	8-11	12-15	16-19								
Sample ID	WS02	WS05	WS08	WS10								
Depth	0.82-3.72	0.60-2.30	0.97-3.90	1.22-2.95						Please se	e attached n	otes for all
COC No / misc											ations and a	
Containers	VPG	VPG	VPG	VPG								
Sample Date	04/12/2020	04/12/2020	04/12/2020	04/12/2020								
Sample Type				Ground Water								
Batch Number	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt		04/12/2020	04/12/2020									
Dissolved Arsenic [#]	<0.0009	0.0019	<0.0009	<0.0009						<0.0009	mg/l	TM170/PM14
Dissolved Boron [#]	< 0.012	< 0.012	0.046	0.017						<0.012	mg/l	TM170/PM14 TM170/PM14
Dissolved Cadmium [#] Total Dissolved Chromium [#]	0.00004	<0.00003	<0.0003 <0.0002	<0.0003 <0.0002						<0.00003 <0.0002	mg/l mg/l	TM170/PM14 TM170/PM14
Dissolved Copper [#]	0.0004	0.003	0.001	<0.0002						<0.0002	mg/l	TM170/PM14
Dissolved Lead [#]	<0.0004	< 0.0004	<0.0004	< 0.0004						<0.0004	mg/l	TM170/PM14
Dissolved Mercury#	<0.0005	<0.0005	<0.0005	<0.0005						<0.0005	mg/l	TM170/PM14
Dissolved Nickel [#]	0.0016	0.0010	0.0008	0.0016						<0.0002	mg/l	TM170/PM14
Dissolved Selenium [#]	<0.0012	0.0017	<0.0012	<0.0012						<0.0012	mg/l	TM170/PM14
Dissolved Zinc [#]	0.0019	<0.0015	0.0017	<0.0015						<0.0015	mg/l	TM170/PM14
Total Dissolved Sulphur as S	7.42	5.12	17.39	6.27						<0.01	mg/l	TM30/PM14
PAH MS												
Naphthalene	<0.1	<0.1	0.8	<0.1						<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.01	<0.01	0.04	<0.01						<0.01	ug/l	TM4/PM30
Acenaphthene	<0.01	<0.01	2.51	0.05						<0.01	ug/l	TM4/PM30
Fluorene	<0.01	<0.01	0.86	0.01						<0.01	ug/l	TM4/PM30
Phenanthrene	<0.01	<0.01	0.83	0.02						<0.01	ug/l	TM4/PM30
Anthracene	<0.01	<0.01	0.27	<0.01						<0.01	ug/l	TM4/PM30
Fluoranthene	<0.01	<0.01	0.41	< 0.01						<0.01	ug/l	TM4/PM30 TM4/PM30
Pyrene Benzo(a)anthracene	<0.01 <0.01	<0.01 <0.01	0.31	<0.01 <0.01						<0.01 <0.01	ug/l ug/l	TM4/PM30
Chrysene	<0.01	<0.01	0.07	<0.01						<0.01	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.01	<0.01	0.08	<0.01						<0.01	ug/l	TM4/PM30
Benzo(a)pyrene	<0.01	<0.01	0.05	<0.01						<0.01	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.01	<0.01	0.02	<0.01						<0.01	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	<0.01	<0.01						<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.01	<0.01	0.02	<0.01						<0.01	ug/l	TM4/PM30
PAH 16 Total	<0.1	<0.1	6.3	<0.1						<0.1	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	0.06	< 0.01						<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01 66 ^{sv}	<0.01 58 ^{SV}	0.02	<0.01 58 ^{sv}						<0.01 <0	ug/l %	TM4/PM30 TM4/PM30
PAH Surrogate % Recovery	66	58	11	58						<0	70	11014/121030
EPH (C8-C40) [#]	<10	<10	<10	<10						<10	ug/l	TM5/PM30
Total Phenols HPLC	<5	<5	6	<5						<5	ug/l	TM26/PM0
Sulphate as SO4 [#]	21.2	16.5	55.3	17.2						<0.5	mg/l	TM38/PM0
Free Cyanide	<1	<1	<1	<1						<1	ug/l	TM89/PM0
Total Cyanide	<1	<1	3	<1						<1	ug/l	TM89/PM0
Hexavalent Chromium	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM38/PM0

Client Name: Reference:	Geotechn PN20416					Report :	Liquid					
Location: Contact: EMT Job No:	Jon Hutch 20/17150					Liquids/pr H=H ₂ SO ₄ , 2				e, P=plastic	bottle	
			40.45	40.40		2 10			5	1		
EMT Sample No.	1-4	8-11	12-15	16-19								
Sample ID	WS02	W\$05	WS08	WS10								
Depth	0.82-3.72	0.60-2.30	0.97-3.90	1.22-2.95						Please se	e attached n	otes for all
COC No / misc											ations and ac	
Containers		VPG	VPG	VPG								
Sample Date				04/12/2020								
Sample Type												
	1	1	1									
Batch Number				1						LOD/LOR	Units	Method No.
Date of Receipt					 -	-	-	-	-	-0.04		
Sulphide Thiocyanate	<0.01 <20	<0.01 <20	<0.01 <20	<0.01 <20						<0.01 <20	mg/l ug/l	TM107/PM0 TM107/PM0
mooyunato	-20	-20	-20	-20						-20	ugn	
рН#	6.99	7.67	7.17	7.29						<0.01	pH units	TM73/PM0
												!

Client Name: Geotechnics Reference: PN204160

Location:

Contact: Jon Hutchinson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
					No deviating sample report results for job 20/17150	

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/17150

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
со	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
ос	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics extracted.
#2	EU_Total but with fatty acids extracted.
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 20/17150

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
ТМ30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377- 3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.				
TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			



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W: www.element.com

Geotechnics Unit 1B Borders Industrial Park River Lane Chester Cheshire CH4 8RJ		
Attention :	Jon Hutchinson	
Date :	15th December, 2020	
Your reference :	PN204160	
Our reference :	Test Report 20/17150 Batch 1	
Location :		
Date samples received :	4th December, 2020	
Status :	Final report	
lssue ·	1	

Five samples were received for analysis on 4th December, 2020 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:

Paul Boden BSc Senior Project Manager

Please include all sections of this report if it is reproduced

Reference:	Geotechn PN204160					Report :	Liquid					
Location: Contact:	Jon Hutch	iinson				Liquids/pr	oducts: V=	40ml vial, G	=glass bottl	e, P=plastic	bottle	
EMT Job No:	20/17150					H=H ₂ SO ₄ , 2	Z=ZnAc, N=	NaOH, HN=	HN0 ₃			
EMT Sample No.	1-4	8-11	12-15	16-19								
Sample ID	WS02	WS05	WS08	WS10								
Depth	0.82-3.72	0.60-2.30	0.97-3.90	1.22-2.95						Please se	e attached n	otes for all
COC No / misc											ations and a	
Containers	VPG	VPG	VPG	VPG								
Sample Date	04/12/2020	04/12/2020	04/12/2020	04/12/2020								
Sample Type				Ground Water								
Batch Number	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt		04/12/2020	04/12/2020									
Dissolved Arsenic [#]	<0.0009	0.0019	<0.0009	<0.0009						<0.0009	mg/l	TM170/PM14
Dissolved Boron [#]	< 0.012	< 0.012	0.046	0.017						< 0.012	mg/l	TM170/PM14 TM170/PM14
Dissolved Cadmium [#] Total Dissolved Chromium [#]	0.00004	<0.00003	<0.0003 <0.0002	<0.0003 <0.0002						<0.00003 <0.0002	mg/l mg/l	TM170/PM14 TM170/PM14
Dissolved Copper [#]	0.0004	0.003	0.001	<0.0002						<0.0002	mg/l	TM170/PM14
Dissolved Lead [#]	<0.0004	< 0.0004	<0.0004	< 0.0004						<0.0004	mg/l	TM170/PM14
Dissolved Mercury#	<0.0005	<0.0005	<0.0005	<0.0005						<0.0005	mg/l	TM170/PM14
Dissolved Nickel [#]	0.0016	0.0010	0.0008	0.0016						<0.0002	mg/l	TM170/PM14
Dissolved Selenium [#]	<0.0012	0.0017	<0.0012	<0.0012						<0.0012	mg/l	TM170/PM14
Dissolved Zinc [#]	0.0019	<0.0015	0.0017	<0.0015						<0.0015	mg/l	TM170/PM14
Total Dissolved Sulphur as S	7.42	5.12	17.39	6.27						<0.01	mg/l	TM30/PM14
PAH MS												
Naphthalene	<0.1	<0.1	0.8	<0.1						<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.01	<0.01	0.04	<0.01						<0.01	ug/l	TM4/PM30
Acenaphthene	<0.01	<0.01	2.51	0.05						<0.01	ug/l	TM4/PM30
Fluorene	<0.01	<0.01	0.86	0.01						<0.01	ug/l	TM4/PM30
Phenanthrene	<0.01	<0.01	0.83	0.02						<0.01	ug/l	TM4/PM30
Anthracene	<0.01	<0.01	0.27	<0.01						<0.01	ug/l	TM4/PM30
Fluoranthene	<0.01	<0.01	0.41	< 0.01						<0.01	ug/l	TM4/PM30 TM4/PM30
Pyrene Benzo(a)anthracene	<0.01 <0.01	<0.01 <0.01	0.31	<0.01 <0.01						<0.01 <0.01	ug/l ug/l	TM4/PM30
Chrysene	<0.01	<0.01	0.07	<0.01						<0.01	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.01	<0.01	0.08	<0.01						<0.01	ug/l	TM4/PM30
Benzo(a)pyrene	<0.01	<0.01	0.05	<0.01						<0.01	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.01	<0.01	0.02	<0.01						<0.01	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	<0.01	<0.01						<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.01	<0.01	0.02	<0.01						<0.01	ug/l	TM4/PM30
PAH 16 Total	<0.1	<0.1	6.3	<0.1						<0.1	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01	<0.01	0.06	< 0.01						<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01 66 ^{sv}	<0.01 58 ^{SV}	0.02	<0.01 58 ^{sv}						<0.01 <0	ug/l %	TM4/PM30 TM4/PM30
PAH Surrogate % Recovery	66	58	11	58						<0	70	11014/121030
EPH (C8-C40) [#]	<10	<10	<10	<10						<10	ug/l	TM5/PM30
Total Phenols HPLC	<5	<5	6	<5						<5	ug/l	TM26/PM0
Sulphate as SO4 [#]	21.2	16.5	55.3	17.2						<0.5	mg/l	TM38/PM0
Free Cyanide	<1	<1	<1	<1						<1	ug/l	TM89/PM0
Total Cyanide	<1	<1	3	<1						<1	ug/l	TM89/PM0
Hexavalent Chromium	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM38/PM0

Client Name: Reference:	Geotechn PN20416					Report :	Liquid					
Location: Contact: EMT Job No:	Jon Hutchinson 20/17150				Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle H=H ₂ SO ₄ , Z=ZnAc, N=NaOH, HN=HN0 ₃							
			40.45	40.40		2 10			5	1		
EMT Sample No.	. 1-4	8-11	12-15	16-19								
Sample ID	WS02	W\$05	WS08	WS10								
Depth	0.82-3.72	0.60-2.30	0.97-3.90	1.22-2.95						Please se	e attached n	otes for all
COC No / misc	;										ations and ac	
Containers		VPG	VPG	VPG								
Sample Date				04/12/2020								
Sample Type												
Batch Number		1	1	1						LOD/LOR	Units	Method No.
Date of Receipt												
Sulphide Thiocyanate	<0.01 <20	<0.01 <20	<0.01 <20	<0.01 <20						<0.01 <20	mg/l	TM107/PM0 TM107/PM0
mocyanale	<20	<20	<20	~20						~ 20	ug/l	TWITOTTEIWO
рН#	6.99	7.67	7.17	7.29						<0.01	pH units	TM73/PM0
												l

Client Name: Geotechnics Reference: PN204160

Location:

Contact: Jon Hutchinson

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason				
	No deviating sample report results for job 20/17150									

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 20/17150

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCI (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overesitimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
В	Indicates analyte found in associated method blank.
DR	Dilution required.
М	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher, this result is not accredited.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
со	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
ТВ	Trip Blank Sample
ос	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.						
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.						
CU	Clean-up - e.g. by florisil, silica gel.						
1D	GC - Single coil gas chromatography.						
Total	Aliphatics & Aromatics.						
AL	Aliphatics only.						
AR	Aromatics only.						
2D	GC-GC - Double coil gas chromatography.						
#1	EH_Total but with humics extracted.						
#2	EU_Total but with fatty acids extracted.						
_	Operator - underscore to separate acronyms (exception for +).						
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total						
MS	Mass Spectrometry.						

EMT Job No: 20/17150

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
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TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
ТМ30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
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TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993 (comparabl	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377- 3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
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TM107	Determination of Sulphide/Thiocyanate by Skalar Continuous Flow Analyser	PM0	No preparation is required.				
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			

APPENDIX 7

Exploratory Hole Location Plan